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Chapter 4.0 Environmental Consequences

4.1 Introduction

This chapter describes environmental consequences that would result from the construction, operation, and maintenance of the White Pine Energy Station (the Station) for the Proposed Action and Alternative 1. The impact analysis focuses on potential direct, indirect, and cumulative impacts on project area resources that were described in Chapter 3, *Affected Environment*. Direct and indirect effects of the Proposed Action and Alternative 1, together with mitigation measures that would avoid, reduce, rectify, or compensate for certain adverse effects, are discussed by project area resource in Sections 4.2 through 4.18 of this chapter. Effects of implementing the No Action Alternative also are described in each of these sections.

Sections 4.2 through 4.18 also summarize potential impacts of two connected actions that were described in Section 2.2.3.7, *Connected Actions.* They are the Southwest Intertie Project (SWIP) and the Nevada Northern Railroad (NNR) Project. The Council on Environmental Quality defines connected actions as those actions that are being pursued independently but must occur if the subject action is to proceed, and therefore requires a description of their effects in environmental documents. Potential impacts of the SWIP and the NNR Project are summarized in this Draft Environmental Impact Statement (DEIS) because they have been determined to be actions connected to the proposed White Pine Energy Station. Section 4.1.2, *Connected Actions Data Sources*, provides additional background information on these two connected actions. The order of discussion of effects in Sections 4.2 through 4.18 is Proposed Action, Alternative 1, Connected Actions, and No Action Alternative.

Descriptions and cumulative effects of projects listed in Chapter 1, Section 1.7, *Projects Considered for Cumulative Analysis* are presented in Section 4.19, *Cumulative Impacts*. The SWIP and the upgrade and operation of the NNR Project are among those projects analyzed for cumulative effects and discussed in Section 4.19. The final sections of this chapter describe unavoidable adverse impacts, short-term uses of the environment and long-term productivity, the irreversible and irretrievable commitments of resources, energy requirements and conservation potential, and monitoring.

4.1.1 Assumptions and Assessment Guidelines

Assumptions and assessment guidelines for specific resources are summarized in the appropriate resource topics in this chapter. Common assumptions that were followed during the preparation of this DEIS include the following:

- Station features were designed only to the feasibility level, which represents reasonable approximations for assessing potential project impacts and recommending appropriate mitigation measures.
- The expected life of the Station is 40 years or longer.
- WPEA wants to have the flexibility to construct the Station in up to 3 phases. Each phase would include the construction of a 530-megawatt (MW) unit. Three scenarios of how the sequencing of construction would

occur are analyzed in Section 4.17, *Socioeconomics*, of this chapter.

- The design of the wellfield and associated pipeline would have sufficient capacity to supply the Station.
- Environmental resource data have been developed and analyzed to the level of detail necessary to understand potential impacts and to distinguish Station effects (both beneficial and adverse) among the Proposed Action, Alternative 1, and the No Action Alternative.
- Ground water data developed for this study are the best available representation of current and predicted conditions.
- Measures described in Appendix A, *Best Management Practices*, are an integral part of the Proposed Action and Alternative 1.
- Any required mitigation measures would be implemented prior to the construction of Station features.
- As required for the issuance of rights-of-ways (ROWs) by the BLM, a Plan of Development would be finalized for the alternative selected for implementation. Prior to construction, a Construction, Operation, and Maintenance Plan would be prepared that details the methods and procedures to be used in the construction of Station features. The Construction, Operation, and Maintenance Plan will incorporate site-specific stipulations, terms, and conditions in order to satisfy all Station-related construction requirements, as well as operational, maintenance, and restoration requirements associated with lands administered by the Ely Field Office of the BLM where Station features would be located.
- Cumulative impacts consist of the potential impacts of the Proposed Action or Alternative 1 for the White Pine Energy Station plus the potential impacts of the past, present, and reasonably foreseeable projects identified in Section 1.7, *Projects Considered for Cumulative Analysis*. Only those projects that meet the criteria listed in Section 1.7 and discussed in Section 4.19, *Cumulative Impacts*, are assessed for potential cumulative impacts. As described in Section 4.1.3 below, incomplete or unavailable information for many of these projects necessitated a broad qualitative analysis and characterization of possible cumulative effects.

4.1.2 Connected Actions Data Sources

The SWIP and NNR Project have been determined to be actions connected to the proposed White Pine Energy Station. SWIP transmission lines from the north and south would be connected to the Station power plant to provide a precautionary measure of redundancy. The rehabilitated and upgraded NNR would be used to convey coal to the Station railroad spur and power plant for use in generating electricity. The SWIP and NNR Project will occur even without the White Pine Energy Station.

4.1.2.1 Southwest Intertie Project

Potential impacts that were described in the Southwest Intertie Project (SWIP) Final EIS (BLM, 1993) for the segment of the proposed SWIP electrical transmission line between Midpoint, Idaho, and the Harry Allen Substation in Nevada are

summarized in Sections 4.2 through 4.18. Major concerns for each resource area that were identified in the assessment of possible SWIP effects, together with mitigation measures that were recommended to avoid or minimize the potential occurrence of these major concerns, are noted. Specific impacts identified in the SWIP Final EIS for that portion of the SWIP corridor that would contain the proposed White Pine Energy Station transmission line are noted. This DEIS incorporates the SWIP Final EIS (BLM, 1993) by reference.

4.1.2.2 Nevada Northern Railroad (NNR) Project

Potential impacts that were described in the Environmental Assessment (David Evans and Associates, Inc., 2002) for the proposed rehabilitation and reinstatement of train operations over the existing NNR are summarized in Sections 4.2 through 4.18. The Environmental Assessment analyzed the effects of NNR rehabilitation and reinstatement between Shafter (milepost 18.5, to the north) and McGill Junction (milepost 128.4, to the south). Information presented in the Rehabilitation Plan for the NNR that was prepared for WPEA by Caldwell Richards Sorensen (CRS) Consulting Engineers and Mountain States Contracting (MSC) (CRS and MSC, 2005) also is summarized in Sections 4.2 through 4.18. The Rehabilitation Plan covers the NNR from milepost 0 at Cobre (juncture of the NNR with the Union Pacific Railroad) to milepost 115 (site of the White Pine Energy Station Alternative 1 railroad spur). For purposes of reference, the White Pine Energy Station railroad spurs leading from the NNR to the Proposed Action and Alternative 1 power plant sites would be located at approximately mileposts 103 and 115, respectively. The NNR Rail Line referred to in Sections 4.2 through 4.18 includes the NNR and the land within the original NNR ROW that was granted by the BLM, but has since been conveyed by the BLM to the City of Ely. This DEIS incorporates the NNR Environmental Assessment (David Evans and Associates, Inc., 2002) and the NNR Rehabilitation Plan (CRS and MSC, 2005) by reference.

Where information on specific resources along the NNR was not available, the best available representative information was used. Information available in the Environmental Assessment (David Evans and Associates, Inc., 2002) for the NNR Project was informative but limited for some of the resources because of the rather brief resource descriptions typically required in an Environmental Assessment for assessing potential project effects. The NNR Environmental Assessment was never filed as a NEPA document. By comparison, much more detailed information was available for the SWIP because of the NEPA-driven EIS (BLM, 1993) that was required and prepared for that project, and the extensive resource descriptions typically required in an EIS for assessing potential project effects.

4.1.3 Incomplete and/or Unavailable Information

The Code of Federal Regulations at 43 CFR 1502.22 mandates that agencies evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS must identify potentially incomplete or unavailable information. Potentially incomplete or limited information was available for many of the projects considered in the cumulative impact analysis. This necessitated a broad qualitative analysis and characterization of possible cumulative effects as opposed to a site-specific quantitative assessment.

4.2 Geology, Soils, and Minerals

Potential Station-induced environmental consequences to geology, soils, and minerals include impacts associated with seismic events, soils removal or possibly increased erosion, and impacts to mining operations.

4.2.1 Proposed Action

4.2.1.1 Seismic Events

The risk of adverse ground acceleration (shaking) as a result of seismic events is perceived to be very low throughout the project area for the Station Proposed Action.

4.2.1.2 Soils

Potential Station-induced environmental consequences to soil resources include loss of soils resulting from direct removal during Station construction or through enhanced opportunity for soil erosion.

The Station has been designed to minimize the acreage of soils disturbed. Approximately 1,902 acres would be temporarily disturbed during the construction of the various Station components under the Proposed Action (see Table 2-1 in Chapter 2). Of this total, approximately 392 acres would be reclaimed, and approximately 1,510 acres, including 1,281 acres for the Power Plant ROW that BLM would sell to WPEA, would be used for Station features.

Soils disturbed during Station construction activities could result in a temporary increase in erosion and windblown dust until construction is completed. Construction of the transmission line in areas where soils are shallow and on steep slopes (through the Egan Range) is a particular concern. The planned implementation of protective measures contained in Appendix A, *Best Management Practices,* would minimize erosion and soil loss during and following Station construction.

4.2.1.3 Minerals Operations

No active mining operations exist in the immediate vicinity of the proposed Station components (energy station, access roads, wellfield, water pipeline, rail spur, or transmission line) that would be affected by the construction and operation of the Station Proposed Action. The Proposed Action neither is located on nor crosses property with active leases for oil and gas, development, except for active leases for either oil or gas at the proposed Thirtymile Substation site. Currently, there are several active leases for geothermal development in the vicinity of the project features for the Proposed Action, but none of these leases currently have active development of geothermal resources.

The 40-acre mineral materials sale area that would supply sand and gravel needs to the Station would no longer be available for mining. In addition, all ROWs would restrict future mining operations for the life of the Station, as well as the potential for oil, gas, and geothermal development.

The BLM has the option of including any underlying minerals beneath the Proposed Action Power Plant ROW in the sale of the power plant site to WPEA. If the BLM chooses not to use that option, there is the potential for a split estate with WPEA only owning the land surface at the power plant site.

4.2.1.4 Mitigation

No mitigation is required for the Proposed Action.

4.2.2 Alternative 1

4.2.2.1 Seismic Events

The risk of adverse ground acceleration (shaking) as a result of seismic events is perceived to be very low throughout the project area for Station Alternative 1.

4.2.2.2 Soils

Approximately 1,946 acres of soils would be temporarily disturbed during the construction of Station components under Alternative 1 (see Table 2-3 in Chapter 2). Of this total, approximately 377 acres would be reclaimed, and approximately 1,569 acres, including 1,330 acres for the Power Plant ROW that BLM would sell to WPEA, would be used for Station features. Protective measures contained in Appendix A, *Best Management Practices* would be implemented to minimize Station-related erosion and soil loss.

4.2.2.3 Minerals Operations

No active mining operations exist in the immediate vicinity of Station components that would be affected by the construction and operation of Alternative 1. The Alternative 1 site is not located on property with active leases for oil and gas, development, except for active leases for either oil or gas at the proposed Thirtymile Substation site. Currently, there are several active leases for geothermal development in the vicinity of the project features associated with Alternative 1, but none of these leases currently have active development of geothermal resources.

The 40-acre mineral materials sale area that would supply sand and gravel needs to the Station would no longer be available for mining. In addition, all ROWs would restrict future mining operations for the life of the Station, as well as the potential for oil, gas, and geothermal development.

As noted for the Proposed Action, the BLM has the option of including any underlying minerals beneath the Alternative 1 Power Plant ROW in the sale of the power plant site to WPEA. If the BLM chooses not to use that option, there is the potential for a split estate with WPEA only owning the land surface at the power plant site.

4.2.2.4 Mitigation

No mitigation is required for Alternative 1.

4.2.3 Connected Actions

4.2.3.1 SWIP

4.2.3.1.1 Geology

No specific areas of geologic concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.2.3.1.2 Soils

Major soils concerns addressed in the SWIP Final EIS included wind erosion, water erosion, compaction, reduced productivity, and areas of prime or unique farmlands (BLM, 1993). Impacts to soils could occur for short distances (approximately 0.4 mile at a time) where roads would be constructed in the SWIP corridor on slopes steeper than 35 percent. Most areas with steep slopes and potential soils impacts from road construction and use could be avoided by spanning with transmission lines (BLM, 1993). Primary areas of soils concerns in Nevada were initially identified along SWIP alternative study corridors in the Egan Range. However, no such concerns were identified in this mountain range for the SWIP corridor selected as the Agency Preferred Alternative in the SWIP Record of Decision and in which the White Pine

Energy Station transmission line would be located (BLM, 1994).

4.2.3.1.3 Minerals

The major concern was potential impacts to mineral resource recovery in areas of existing or possible future mineral activity (BLM, 1993). Most of the SWIP corridor crosses areas where the development of mineral resources is uncertain. With the implementation of mitigation measures (for example, avoid mineral resources or follow existing ROWs), potential impacts on mineral resources along the SWIP corridor would be reduced. The proposed transmission line would have a positive effect on sand and gravel operators who would supply these materials during project construction. Also, the transmission line could benefit mining operators by providing a nearby source of electricity for their operations (BLM, 1993). No specific areas of mineral resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line.

4.2.3.2 NNR

4.2.3.2.1 Geology

No impacts to geologic resources are expected as a result of NNR rehabilitation and operation (David Evans and Associates, Inc., 2002).

4.2.3.2.2 Soils

Soils would be disturbed during NNR construction from excavations within the NNR alignment to replace rails, cross ties, and ballast (David Evans and Associates, Inc., 2002). As a result, some fugitive dust would be generated and some limited erosion could occur. Only limited soil disturbance would occur during NNR operation. Recommended measures during NNR upgrade to reduce project-related soil erosion and fugitive dust include erosion control (soil binders, reseeding), dust control (watering), directional drainage away from the track bed, and reseeding disturbed areas (David Evans and Associates, Inc., 2002). Any surface disturbance to lands within the NNR alignment (except at culverts and drainage channels) would be cleaned and restored to allow the re-growth of native vegetation after NNR restoration is complete (CRS and MSC, 2005).

Because ballast beneath and along the NNR is scarce and the rail bed shoulders are steep between mileposts 55 and 115, ballast would need to be widened approximately 2 to 5 feet on each side from the base of the rail bed. Ballast would be procured from local sources or imported from remote sources, depending on cost and availability (CRS and MSC, 2005). Sub-ballast along the track is non-existent, but likely would not be required for rehabilitation except in areas with soft, wet soils (CRS and MSC, 2005).

4.2.3.2.3 Minerals

Restoration of NNR operations would not adversely impact mineral resources and activities. NNR operation would allow the cost-effective transport of ore from the Robinson Mining District by train to outside areas, which is a beneficial impact (David Evans and Associates, Inc., 2002). This benefit would also apply to any other new mining ventures.

4.2.4 No Action Alternative

No Station-induced environmental consequences on geology, soils, or minerals would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.3 Surface Water Resources

This section discusses potential Station-induced environmental consequences and corresponding mitigation associated with surface water resources in Steptoe Valley. As described in the following text, implementation of either the Station Proposed Action or Alternative 1 would have the same or similar environmental consequences with respect to surface water resources.

4.3.1 Proposed Action

4.3.1.1 Potential for Flooding

The location of the Proposed Action power plant site is within a Zone D flood area (undetermined flood hazards) as designated by the Federal Emergency Management Agency. While the local flood hazard is officially undetermined, some portions of the footprint of the proposed power plant site have a potential to flood as a result of high runoff in Duck Creek and/or the smaller local ephemeral drainages and washes that cross this site. This potential, however, is considered very low based on observations of an absence of flooding at the proposed Station sites during the spring of 2005, which was characterized by relatively high precipitation and snowmelt runoff (see Section 3.3.2, *Local Climate*). This conclusion is further supported by the absence of evidence of historical Duck Creek flooding at the plant site. The difference in elevation between Duck Creek (about 0.5 mile to the west) and the Proposed Action power plant site is approximately 15 feet.

The local ephemeral washes that cross the Proposed Action power plant site footprint could be affected by locally high-intensity rainfall events, which, in turn, could cause these local washes to carry high volumes of runoff for short periods of time. The potential for the actual flooding of some portion of the power plant site from runoff in these washes under these conditions, however, is considered low.

4.3.1.1.1 Impacts

Power Plant Site

Construction of the Proposed Action power plant at the proposed location would create areas that are impervious (covered by impermeable surfaces such as roofs, roads, parking areas), which would increase the amount of local runoff during storms. The area rendered impervious by the power plant would be collectively (from the power plant facilities, coal pile area, solid waste disposal facility area, evaporation pond, and cooling towers) approximately 400 total acres. Based on the maximum daily rainfall recorded at Ely Airport (2.87 inches), the corresponding storm water runoff from these 400 impervious acres would be approximately 96 acre-feet, or approximately 48 cfs, averaged over 24 hours collectively from all impervious areas on the power plant site.

Linear Features

During both Station construction and operation, the linear facilities associated with the Station (for example, access road, water pipeline, and rail spur) would not affect the ephemeral washes they cross. The water pipeline connecting the water supply wells to the power plant would be buried sufficiently deep so as not to affect water flow or erosion processes (scouring) in the bottom of these drainages. Any crossing of a local drainage by a road would utilize culverts to channel storm water under the road. These culverts would be sized appropriately according to local requirements. Therefore, the road would be flooded only during extreme

runoff events, and flooding would not constitute an environmental impact. The rail spur would be constructed on a raised berm and cross Duck Creek and adjacent wetland areas via a bridge. These support features would be constructed to enable flood water to flow past the rail spur and prevent any associated damage to the rail spur from flooding. As a result, the rail spur would not result in an environmental impact with respect to flooding.

Wellfield

The wellhead structures associated with each well would occupy an area of less than 1 acre and would be located away from ephemeral washes and other low-lying areas susceptible to flooding. In addition, the impervious area around each well would be small (likely less than 300 square feet). No additional surface water runoff would be generated by these impervious areas. Therefore, construction and operation of the wellfield would not affect the local surface water resources of Steptoe Valley.

4.3.1.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.3.1.2 Potential for Surface Water Features to Be Affected as a Result of Station-Induced Ground Water Level Declines

This is discussed in Section 4.4, *Ground Water Resources*.

4.3.1.3 Potential for Surface Water Quality Degradation

4.3.1.3.1 Impacts

Both Station construction and operation could potentially affect the surface water quality of the local washes and Duck Creek. Water quality in the washes could be degraded by the addition of both suspended solids (sediment) and dissolved constituents (substances commonly found in storm water runoff from parking lots and industrial areas).

During Station construction, Best Management Practices (BMPs) to control erosion and sedimentation will be employed.

During Station operation, erosion and sedimentation BMPs will control runoff from parking surfaces and possibly areas where plant equipment could come in contact with precipitation and could add low concentrations of dissolved petroleum hydrocarbons, metals, and possibly other substances to the runoff in the local washes. Runoff from the access road could also contribute low concentrations of similar dissolved substances to the flows of local washes, and runoff from the rail spur could similarly contribute low concentrations of these substances to Duck Creek. In addition, the design of the rail spur and the operation of the trains on the spur would avoid having rail cars parked on the bridge over Duck Creek. These actions would minimize the potential for contaminant releases to Duck Creek from the rail spur.

With the implementation of Station design features described in Chapter 2 and commitments in Appendix A, *Best Management Practices*, no impacts to surface water quality are anticipated from the utilities that link the wellfield to the power plant site, or from the development and operation of the wellfield. Accordingly, under normal operational practices of the proposed Station, the potential resulting concentrations in the receiving water bodies would not be elevated to levels that would constitute an environmental impact.

4.3.1.3.2 Mitigation

No mitigation is required for the Proposed Action.

4.3.2 Alternative 1

4.3.2.1 Potential for Flooding

4.3.2.1.1 Impacts

The proposed location of the Alternative 1 power plant also is within a Zone D flood area (undetermined flood hazards as designated by the Federal Emergency Management Agency), the same as the Proposed Action. The potential for Station-related flooding and impacts at the Alternative 1 power plant site, along linear features, and in the wellfield is the same as described for the Proposed Action in Section 4.3.1.1. Although the rail spur would not cross mainstem Duck Creek under Alternative 1, the same kinds of support features as described for the Proposed Action would be constructed, where needed, to cross tributary drainages and adjacent wetlands, thus allowing flood water to flow past the rail spur and avoid environmental impacts.

4.3.2.1.2 Mitigation

No mitigation is required for Alternative 1.

4.3.2.2 Potential for Surface Water Features to Be Affected as a Result of Station-Induced Ground Water Level Declines

This is discussed in Section 4.4, *Ground Water Resources*.

4.3.2.3 Potential for Surface Water Quality Degradation

4.3.2.3.1 Impacts

Potential Station-related effects on surface water quality under Alternative 1 are the same as described for the Proposed Action. Because the rail spur would not cross Duck Creek under Alternative 1, there is no potential for the accidental release of contaminants from rail cars to this drainage except where the rail spur crosses tributary waters.

Alternative 1 also includes a Class III solid waste disposal facility and an evaporation pond with the same levels of environmental protection as described under the Proposed Action.

With the implementation of commitments in Appendix A, *Best Management Practices*, no impacts to surface water quality are anticipated from the utilities that link the wellfield to the power plant site, or from the development and operation of the wellfield.

4.3.2.3.2 Mitigation

No mitigation is required for Alternative 1.

4.3.3 Connected Actions

4.3.3.1 SWIP

Major water resources concerns were to avoid or minimize potential impacts from increased sedimentation caused by soil disturbance and channel alteration during construction, and from sedimentation, construction, maintenance, safety, and tower stability problems in areas susceptible to flooding (BLM, 1993). Areas of greatest potential concern are perennial streams and lakes, intermittent streams in steep to moderately steep terrain, and springs and swamps in or near the SWIP corridor. By implementing proposed mitigation measures (primarily spanning and avoiding sensitive features and areas like these), there would be few to no potential impacts to surface water resources in Nevada and Idaho from SWIP construction and maintenance (BLM, 1993). The potential for flooding was

identified along the SWIP corridor north of the White Pine Energy Station project area near the boundary of White Pine County and Elko County. However, no specific areas of surface water resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.3.3.2 NNR

No adverse impacts to hydrology are expected, but there may be minor benefits. NNR rehabilitation and operation would not result in an increase in impervious areas or greater runoff (David Evans and Associates, Inc., 2002). CRS and MSC (2005) reported that many of the drainage crossings appear to be functional but most of these would need to be cleaned, maintained, repaired, or upgraded to meet current railroad standards because they have silted in, deteriorated, or collapsed. CRS and MSC (2005) suggested some drainage benefits could be achieved during NNR rehabilitation by constructing drainage swales on each side of the railroad to convey water away from the rail bed and into culverts at low points. In addition, new culverts should be installed to help convey water from one side of the track to the other in areas where the railroad bed currently acts as a dam and can erode and fail (CRS and MSC, 2005). See Section 4.4, *Ground Water Resources*, for potential effects of the NNR Project on water demand and water quality (ground water and surface water discussed together).

4.3.4 No Action Alternative

No Station-induced environmental consequences on surface water resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.4 Ground Water Resources

This section presents the evaluation of the potential environmental consequences and identifies corresponding mitigation associated with pumping ground water from the basin-fill aquifers of Steptoe Valley to supply up to 5,000 acre-feet per year to the proposed White Pine Energy Station for 40 years. Although this demand for water would be the same for either the Station Proposed Action or Alternative 1, the demand would be met through the operation of two different well fields each consisting of eight water supply wells located in a linear configuration on the valley floor roughly parallel to U.S. 93 (see *Chapter 2, Description of Proposed Action and Alternatives*). Specifically, for the Proposed Action, the eight wells in the proposed well field would be located at intervals of between approximately 1 and 3 miles extending from the Proposed Action power plant location northward for approximately 12 miles. The eight wells in the proposed wellfield for Alternative 1 would be located at intervals of between approximately 1 and 2.5 miles extending from the Alternative 1 power plant location south for approximately 5 miles.

The following evaluation of the Station Proposed Action and Alternative 1 is presented according to the potentially affected water resource. It includes discussion of the potential Station-induced effects on ground water resources, and considers the potential Station-induced effects on other water resources (springs and surface water bodies). This section concludes with a discussion of the potential effects on ground water resources of the connected actions (SWIP and NNR Project) and the No Action Alternative.

4.4.1 Proposed Action Impacts

4.4.1.1 Decline in Ground Water Levels and Depletion of Ground Water Resources

Based on the results of an analysis of potential water level decline (drawdown), ground water levels would be lowered within Steptoe Valley as a result of 40 years of ground water pumping for the Station Proposed Action by no more than approximately 10 feet within a radius of 1 mile from a representative production well (see Figure 4.4-1). This amount of decline is within the range of historical ground water level fluctuation observed in wells in Steptoe Valley (Figure 3.4-3). This estimate of the potential decline in ground water levels is based on continuous pumping at a rate of 387 gallons per minute (gpm) at each of the eight wells in the Proposed Action well field under the conditions determined from the local aquifer testing (see Table 3.4-1, Section 3.4.2.2, *Ground Water Movement and Storage Characteristics in Steptoe Valley*). The analysis of potential declines in ground water levels is based on a computer model of ground water conditions in Steptoe Valley that is presented in Appendix H, *Numerical Model Documentation*. The ground water level declines shown in Figure 4.4-1 reflect the model simulated conditions in the aquifer between 100 and 1,000 feet below the water table (Layer 2 in the model, which represents the depths of the well screens of the Proposed Action wells), where the greatest level of ground water level decline occurred.

Estimates of the annual rate of ground water recharge range from 85,000 to 132,000 acre-feet, and the State of Nevada has established a value of perennial yield of 70,000 acre-feet (see Section 3.4.2.8,

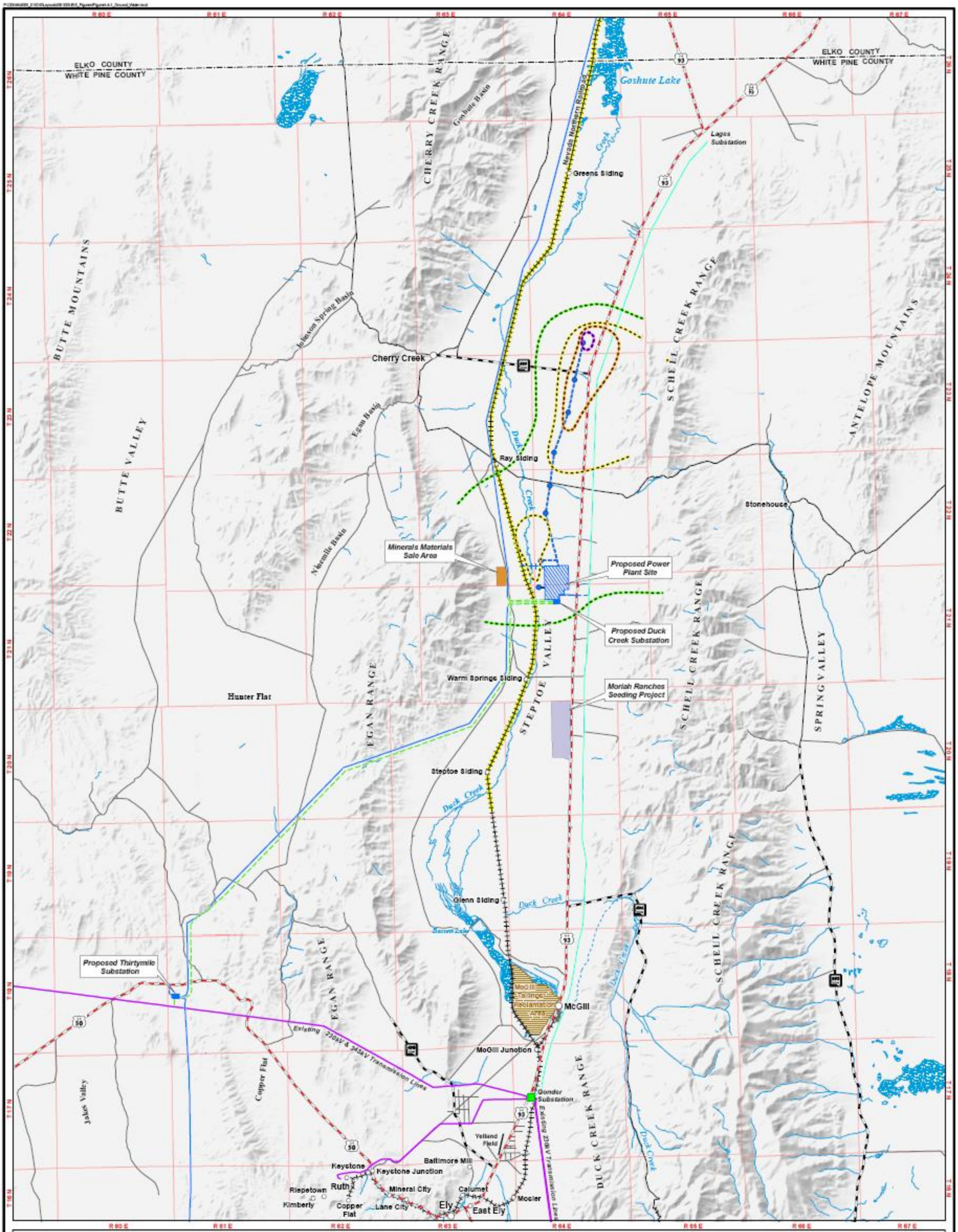
Ground Water Use and Perennial Yield). The most recent estimate of annual ground water pumping (for 2000) is 6,360 acre-feet. The Station would add 5,000 acre-feet to this amount of annual ground water withdrawal. Therefore, the total amount of annual pumping under the Proposed Action would be considerably less than the established perennial yield of the basin.

4.4.1.2 Decrease in Spring Discharge

Pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water under the Proposed Action would result in ground water level declines in the vicinity of some of the springs on the floor of Steptoe Valley. Depending on the nature of the specific affected springs, some of these features could be adversely impacted by these water level declines caused by Station pumping.

Specifically, based on the results of an analysis of potential water level decline (drawdown), 12 areas where springs have been documented to be present (BLM Ely Field Office Database) are located where ground water levels would be lowered within Steptoe Valley by at least 2, but less than 6, feet as a result of Station pumping. The analysis, which is presented in Appendix H, *Numerical Model Documentation*, is based on simulations of a ground water model developed by Frick (1985). For the purpose of this current analysis, the model was modified to enable time-dependent simulations representing 40 years of project pumping. Results of these simulations are presented in Figure 4.4-2 along with the locations of the springs that are in areas where water level declines are anticipated to be between 2 and 6 feet. These results represent the extreme case of 40 years of continuous pumping from all eight wells at the constant rate of 387 gpm per well. This rate corresponds to the maximum annual water demand of 5,000 acre-feet and assumes the instantaneous and continuous requirement of this amount of water over a 40-year period. These results are slightly different than presented in Figure 4.4-1 because the results in Figure 4.4-2 represent the ground water conditions at the water table (simulated model layer 1; see Appendix H), that best represent ground water conditions as they relate to spring discharge.

When viewing Figure 4.4-2, it is important to understand that the presence of a spring located in an area where ground water levels are anticipated to drop does not necessarily mean, in all cases, that the spring would cease to flow. Actual impacts to specific springs are a function of the mechanism(s) that create the spring and the nature of the spring discharge. In some cases, where the potentially affected spring, (1) discharges from a pronounced break in the local topography; and (2) has a relatively high discharge (greater than approximately 5 gpm), or where the discharge area has been modified to capture the discharge for a subsequent use (for example, livestock watering), these springs are less likely to be adversely affected by Station pumping. In addition, warm springs and hot springs (for example, Collar and Elbow Spring) are unlikely to be adversely affected by Station pumping because the source of water to these springs is deep circulating regional ground water. Similarly, carbonate springs that have as their source regional as opposed to local ground water are also less likely to be adversely impacted.



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Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

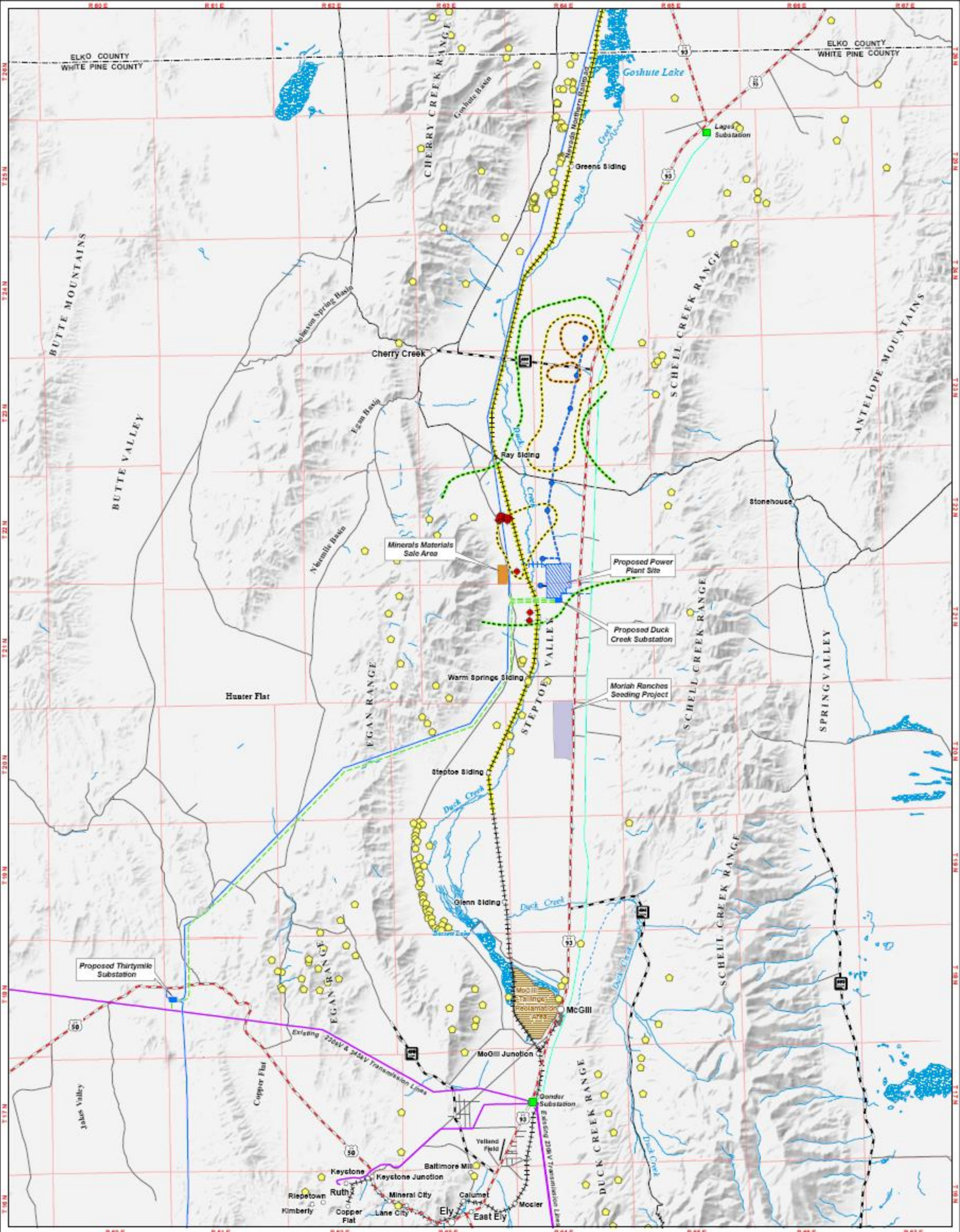
Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Ground Water Level Decline
- 2 Feet
- 4 Feet
- 6 Feet
- 8 Feet

Proposed Action Potential Project Induced Ground Water Level Declines White Pine Energy Station Project

Figure 4.4-1



Proposed Action Potential Project Induced Ground Water Level Declines and Potentially Affected Springs White Pine Energy Station Project

Figure 4.4-2

Conversely, those springs that are low-flowing ground seeps with very little discharge (less than 1 gpm), may cease to exist as a result of Station pumping, particularly during dry years. The locations of specific springs that are likely to be impacted by ground water pumping for the Station Proposed Action are shown in red on Figure 4.4-2.

4.4.1.3 Surface Water Features

No streams or creeks in Steptoe Valley would be adversely affected by ground water pumping for the Station Proposed Action. None of these features in Steptoe Valley are sustained perennially by ground water discharge under natural conditions. The principal stream in the vicinity of the Proposed Action power plant site, Duck Creek, is a losing stream in which flows progressively decrease downstream as water infiltrates through the stream bed (under natural conditions, the ground water table is below the bottom of the stream bed) (see Section 3.3.3.1, *Streams*).

Consequently, even though the results of specific analysis of potential ground water level declines caused by Station pumping (discussed above in Section 4.4.1.1) indicate that ground water level declines of more than 4 feet (but less than 6 feet) could occur beneath Duck Creek west of the Proposed Action power plant site, the flow in this reach of Duck Creek would not be adversely affected. Even though Duck Creek is a losing stream, lowering of the water table as a result of Station pumping would not adversely affect the flow in the stream because it is fed by runoff from precipitation or snowmelt.

The various local drainages and washes that cross the Proposed Action power plant site are ephemeral and, therefore, also flow only in the vicinity of these locations when runoff is sufficiently high. As a result, Station ground water pumping would not adversely impact these resources.

4.4.1.4 Existing Ground Water Permits

Under the Proposed Action, pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water would result in ground water level declines in the vicinity of some of the locations where other users have permits to pump ground water. The locations do not necessarily correspond to actual existing wells, just where a current permit to divert (to pump) has been granted by the Nevada State Engineer.

Specifically, based on the results of an analysis of potential water level decline (drawdown), five pumping permits are located in areas where ground water levels would be lowered within Steptoe Valley by between approximately 4 and 8 feet as a result of Station pumping. The only permits that would be affected by more than 8 feet are those associated with the wells for the Proposed Action. The analysis, which is presented in Appendix H, *Numerical Model Documentation*, is based on current simulations of a ground water model developed by Frick (1985) and updated for this study. For the purpose of this current analysis, the model was modified to enable time-dependent simulations representing 40 years of Station pumping. Results of these simulations are presented in Figure 4.4-3 along with the locations of ground water permits. These results represent the extreme case of 40 years of continuous pumping from all eight wells at the constant rate of 387 gpm per well. This rate corresponds to the maximum annual water demand of 5,000 acre-feet by the Proposed Action power plant and assumes

the instantaneous and continuous requirement of this amount of water over a 40-year period.

4.4.1.5 Ground Water Quality Degradation

Ground water quality would not be degraded as a result of the Proposed Action because of Station design features and BMPs (see Appendix A, *Best Management Practices)* that would be implemented. The pumping of ground water and the resulting localized water level declines would not alter the water quality of the basin-fill aquifers in Steptoe Valley.

4.4.1.6 Land Subsidence

Based on detailed analysis of the soil conditions in Steptoe Valley basin-fill deposits, and the potential drawdown that could occur in these deposits as a result of Station pumping under the Proposed Action, the potential for land subsidence is insignificant and the corresponding potential loss of ground water storage negligible.

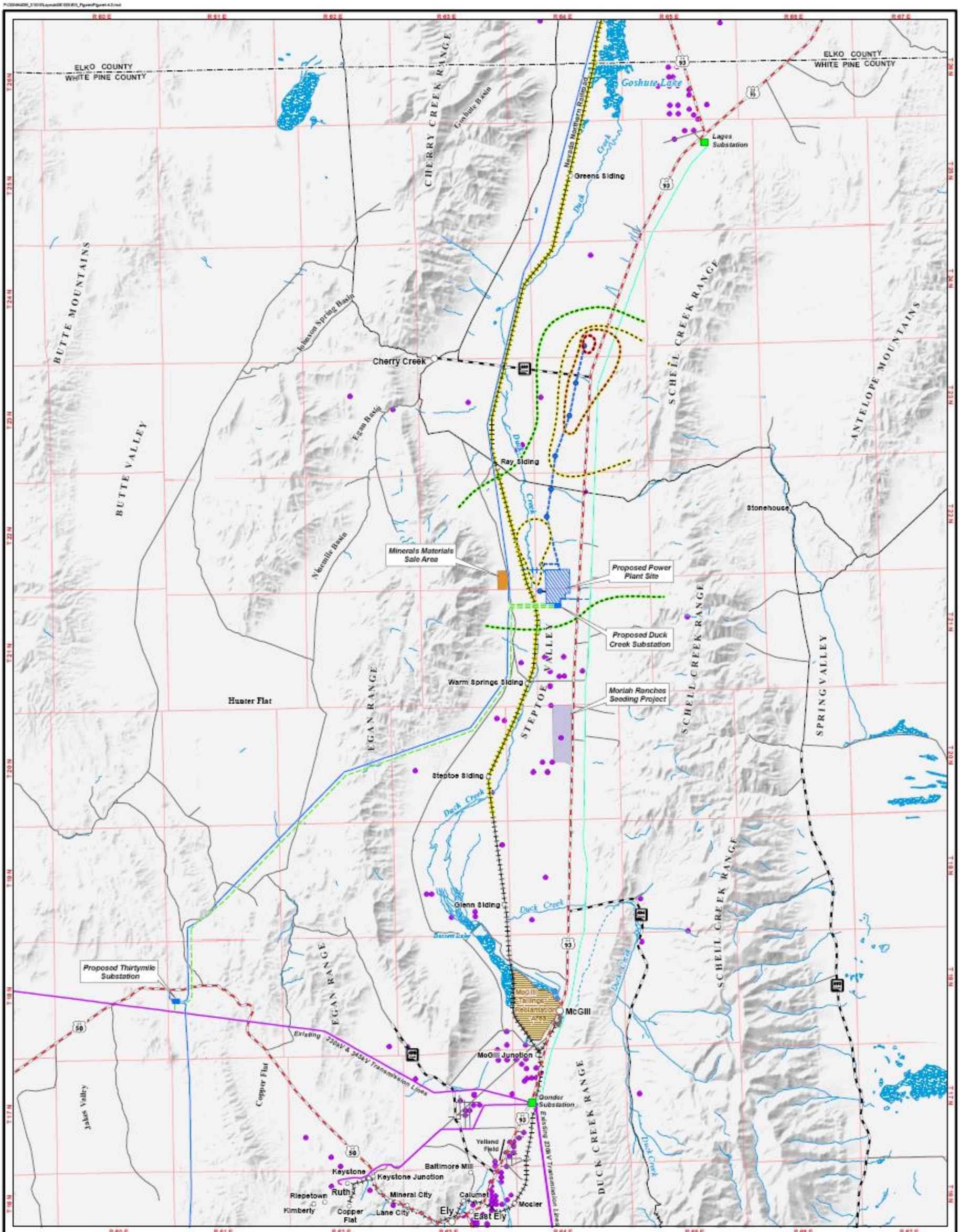
4.4.2 Proposed Action Mitigation

A ground water monitoring and reporting program will be implemented by WPEA that is consistent with the requirements of the Office of the Nevada State Engineer. Monitoring information will be used to determine if there are unanticipated effects from Station pumping on ground water levels or in flow rates and water levels of nearby springs. Ground water levels will be measured and recorded in monitoring wells located between production wells and springs. Monitoring of selected springs, including those containing potentially affected sensitive spring snail and fish species, will consist of measuring spring flow rate, spring water level, and photo-documenting general site conditions.

If the monitoring program indicates that the White Pine Energy Station is adversely affecting ground water levels or spring flow rates and water levels, and therefore may potentially affect sensitive species present in those springs, WPEA will modify their pumping strategy in the well field to mitigate the potential for impacts. One form of mitigation would involve modifications to the operation of the water supply wells to control the location and timing of, and to minimize, ground water level declines. Examples of possible changes in pumping strategy include pumping from different wells (perhaps those farthest from affected springs) and varying the amount of water being pumped from each well (reduce pumping rates nearest affected springs) in order to meet overall project needs while reducing the potential for adverse Station effects.

In addition to the above and depending on the nature of the spring and its discharge, some site-specific mitigation may be possible on a spring-by-spring basis. Specifically, those springs that have been developed and put to beneficial use may have their associated infrastructure to capture discharge modified to maintain flow (for example, through excavation to lower the point of discharge collection/diversion. This is a current practice by landowners and ranchers).

Appendix I, *Ground Water Monitoring Program* provides detail on the ground water monitoring program that would be implemented for the White Pine Energy Station.



Proposed Action Potential Project Induced Ground Water Level Declines and Locations of Groundwater Permits White Pine Energy Station Project

Figure 4.4-3

4.4.3 Alternative 1 Impacts

4.4.3.1 Decline in Ground Water Levels and Depletion of Ground Water Resources

Based on the results of an analysis of potential water level decline (using the same methodology and assumptions as for the Proposed Action), ground water levels would be lowered within Steptoe Valley as a result of ground water pumping for Station Alternative 1 by no more than approximately 2 feet within a distance ranging from approximately 1 to 2 miles from a representative production well (see Figure 4.4-4). This estimate is based on Station pumping at a rate of 387 gpm under the conditions determined from the local aquifer testing (see Table 3.4-1, Section 3.4.2.2, *Ground Water Movement and Storage Characteristics in Steptoe Valley*). The analysis of potential declines in ground water levels is presented in Appendix H, *Numerical Model Documentation*.

Estimates of the annual rate of ground water recharge to the Steptoe Valley Hydrographic Area range from 85,000 to 132,000 acre-feet, and the State of Nevada has established a value of perennial yield of 70,000 acre-feet (see Section 3.4.2.7, *Ground Water Use and Perennial Yield*). The most recent estimate of annual ground water pumping within Steptoe Valley (for 2000) is 6,360 acre-feet. The Station would add 5,000 acre-feet to this amount of annual ground water withdrawal. Therefore, the total amount of annual pumping under Alternative 1 would be considerably less than the established perennial yield of the basin.

4.4.3.2 Decrease in Spring Discharge

Pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water under Alternative 1 would not result in ground water level declines in the vicinity of known springs in Steptoe Valley (see Figure 4.4-5).

4.4.3.3 Surface Water Features

No streams or creeks in Steptoe Valley would be adversely affected by ground water pumping under Alternative 1 for the same reasons as described for the Proposed Action in Section 4.4.1.3.

4.4.3.4 Existing Ground Water Permits

Under Alternative 1, pumping ground water from the basin-fill aquifers in Steptoe Valley to meet the Station demand for water would result in ground water level declines of between 2 and 4 feet in the vicinity of two locations where other users have permits to pump ground water (see Figure 4.4-6). This conclusion is based on an analysis of potential water level decline (drawdown) presented in Appendix H, *Numerical Model Documentation*. Ground water level declines of 4 feet are not considered to represent a substantial adverse impact.

4.4.3.5 Ground Water Quality Degradation

Potential Station-related effects on ground water quality under Alternative 1 would be the same as described for the Proposed Action in Section 4.4.1.5.

4.4.3.6 Land Subsidence

Under Alternative 1, the potential for land subsidence is insignificant and the corresponding potential loss of ground water storage negligible for the same reasons as described for the Proposed Action.

4.4.4 Alternative 1 Mitigation

Mitigation required for ground water resources under Alternative 1 is the same as described for the Proposed Action.

4.4.5 Connected Actions

4.4.5.1 SWIP

No potential impacts to ground water resources were identified as a result of SWIP construction and maintenance in Nevada and Idaho. No specific areas of ground water resources concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line (BLM, 1993).

4.4.5.2 NNR

4.4.5.2.1 Water Demand

No new wells would be constructed, and no impacts to neighboring wells and ground water resources are expected (David Evans and Associates, Inc., 2002). No substantial impacts associated with water demand are expected (David Evans and Associates, Inc., 2002). Water requirements would be limited to water used during construction (trucked in for dust control) and in the event of fire on the NNR. No substantial consumption of water is expected, and delivery capabilities of neighboring wells would not be affected.

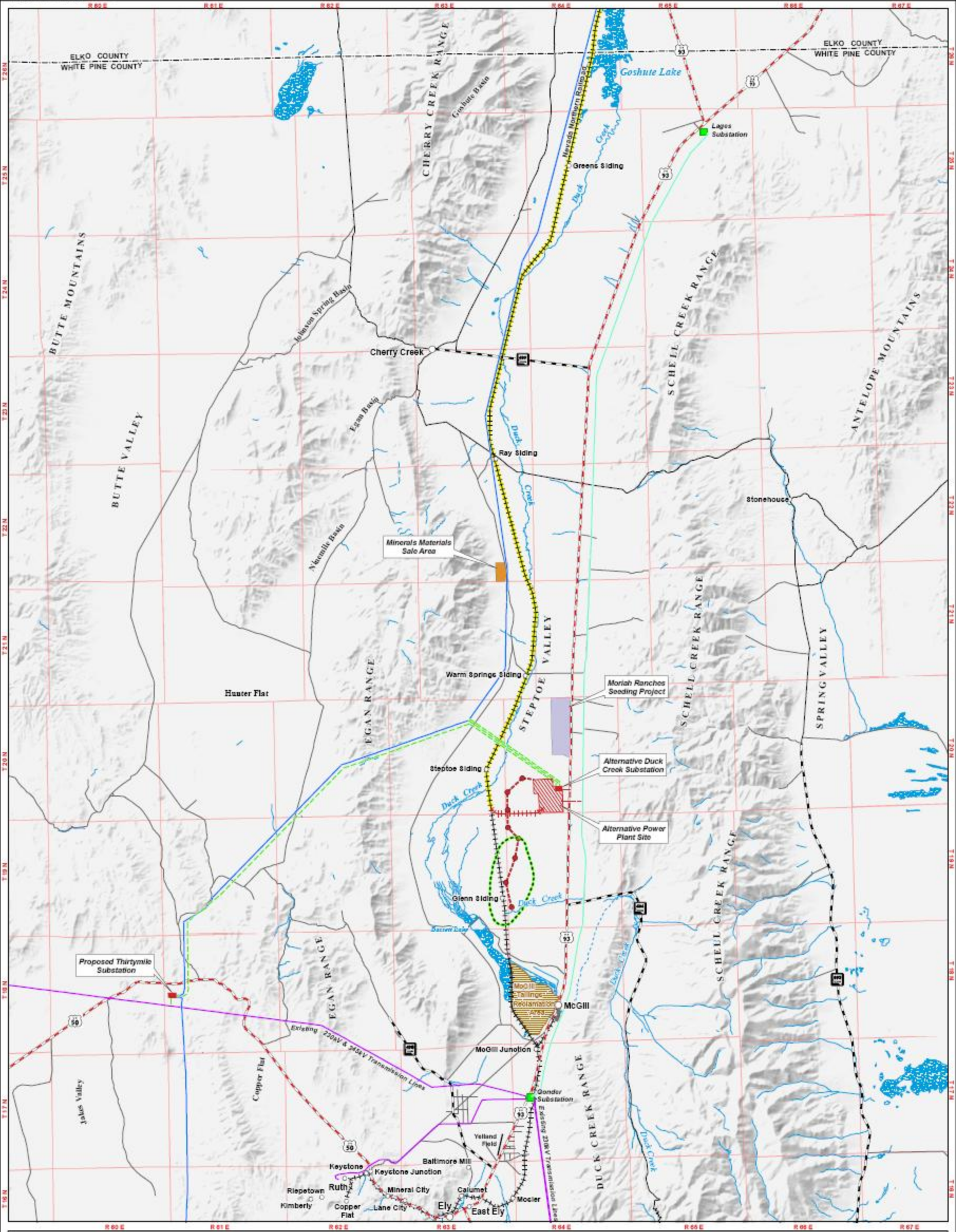
4.4.5.2.2 Water Quality

Several types of impacts on water quality could occur. Stormwater discharges from the NNR Rail Line may become contaminated if rainfall and runoff contact pollutants on exposed surfaces during NNR construction and operation (David Evans and Associates, Inc., 2002). Stormwater runoff over exposed areas such as graded land, materials storage and stockpile areas, and materials loading and unloading facilities may pick up pollutants (for example, sediment, oil and grease, hydraulic fluids, gasoline, diesel fuel) that can degrade and adversely impact surface water quality. BMPs that would be part of a Stormwater Pollution Control Permit are recommended to prevent or reduce runoff pollution. In addition, chemicals used in pest management activities along the NNR Rail Line could leach into soils and ground water, and adversely impact water quality. Implementation of an Integrated Pest Management Plan developed in coordination with the BLM was recommended to reduce the potential for chemical impacts on water quality. David Evans and Associates, Inc. (2002) also stated the above recommended measures would reduce the potential for impacts on water quality to below a level of significance.

A potential impact on water quality could occur if an NNR derailment resulted in the release of a hazardous material (for example, diesel fuel or crude oil) while being shipped on the NNR. This could cause substantially adverse impacts on water resources and on wildlife, depending on the type, amount, and location of material released. David Evans and Associates, Inc. (2002), citing results of a risk analysis presented in the Final EIS for the Robinson Mine Project, stated that the likelihood of an NNR derailment and release of a hazardous material is quite small, but it is not zero.

4.4.6 No Action Alternative

No Station-induced impacts on ground water resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.



N

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Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

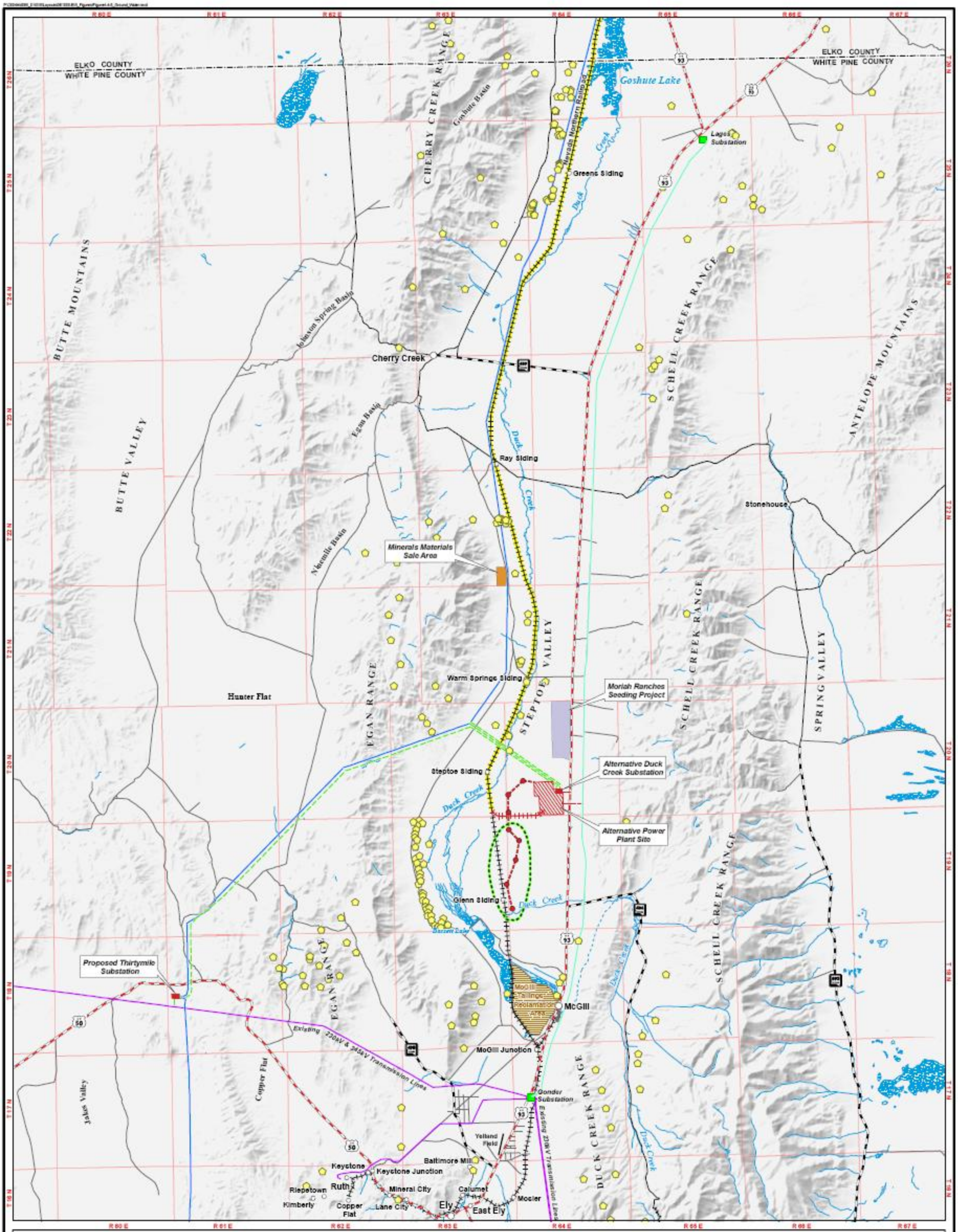
Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Ground Water Level Decline
- 2 Feet

Alternative 1 Potential Project Induced Ground Water Level Declines White Pine Energy Station Project

Figure 4.4-4



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Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
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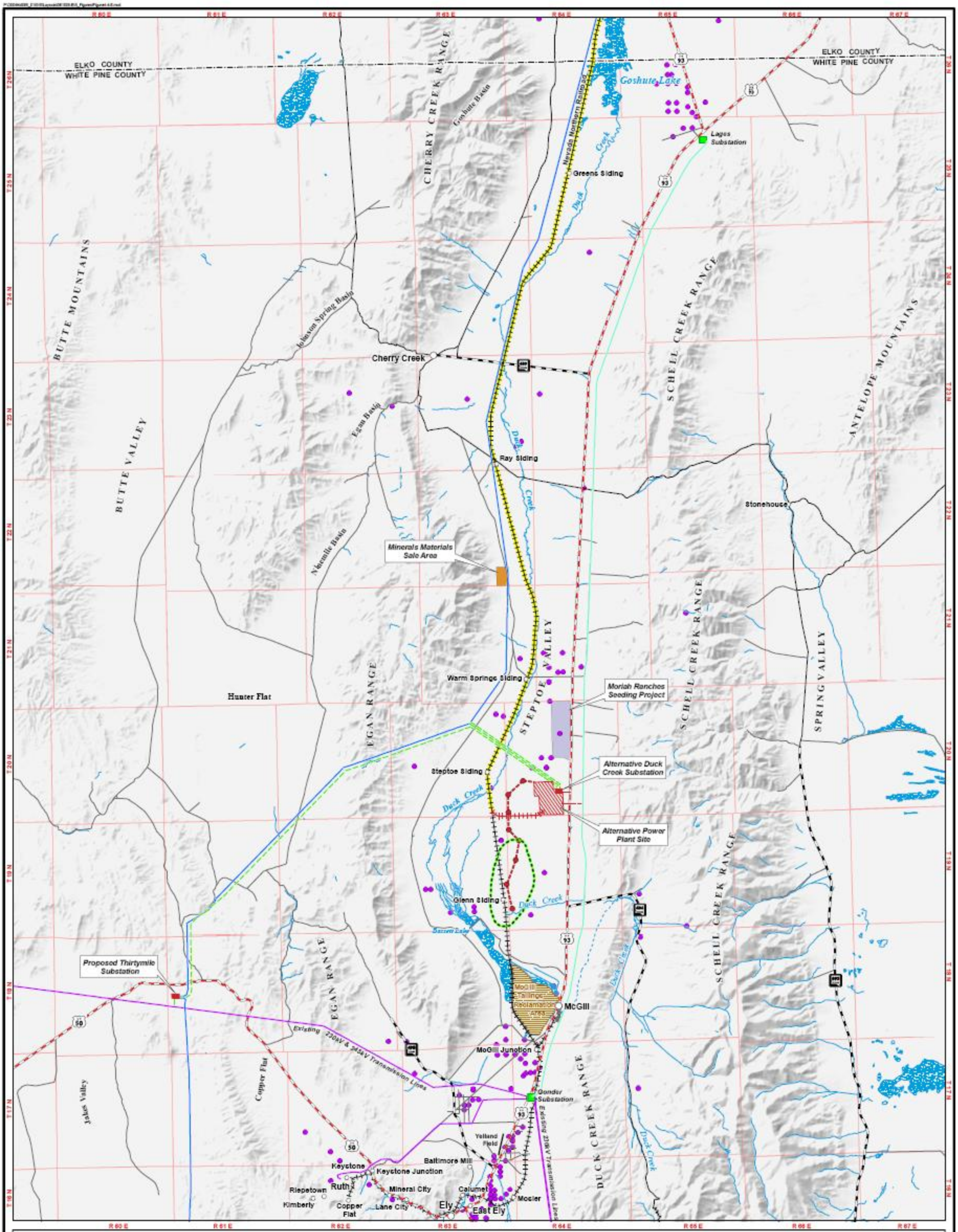
Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

- Spring (Source: BLM, EDAW)

Ground Water Level Decline
- 2 Feet

Alternative 1 Potential Project Induced Ground Water Level Declines and Potentially Affected Springs White Pine Energy Station Project

Figure 4.4-5



Alternative 1 Potential Project Induced Ground Water Level Declines and Locations of Groundwater Permits White Pine Energy Station Project

Figure 4.4-6

4.5 Biological Resources

4.5.1 Vegetation

This section describes the potential impacts on vegetation communities, including wetlands, that would result from implementing the White Pine Energy Station Proposed Action or Alternative 1, as described in Chapter 2, *Description of Proposed Action and Alternatives.* Discussions regarding effects of noxious and invasive weed species are provided in Section 4.5.2, *Noxious and Invasive Weeds*. Potential impacts on wildlife and aquatic resources are discussed in Section 4.5.3, *Wildlife and Fisheries Resources*. Discussions of potential impacts on special-status animal and plant species are provided in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Potential direct and indirect effects on vegetation resources are assessed in the following text. Direct effects are those that could occur as a direct result of Station implementation, such as direct construction disturbance. Indirect effects could result from providing increased human and vehicular access to areas that currently do not have such access, increased potential for sedimentation of vegetated swales near Station features, increased risk of spreading of noxious weeds because of disturbance (see discussion in Section 4.5.2), and long-term desiccation of springs (and potential effects on associated vegetation) from ground water pumping during Station operation.

Both permanent and temporary vegetation impacts would occur. Permanent impacts would occur in construction ROWs where Station features would be built, resulting in vegetation loss. Temporary impacts to vegetation would occur during Station construction, but they would be short-term in nature or would be minimized or avoided using BMPs described in Appendix A, *Best Management Practices*). Temporary impacts would primarily include the removal or disturbance of vegetation through trampling, soil compaction, or erosion outside of a permanent ROW or Station feature footprint during construction activities.

The following factors were considered in determining an effect on vegetation resources.

- Federal or state legal protection of the resource or species
- Federal or state agency regulations and policies
- Local regulations and policies
- Uniqueness or rarity of the resource both locally and regionally
- Biological importance of the resource (for example, sagebrush communities, wetlands, and springs as wildlife habitat)
- Magnitude of the disturbance, loss, or effect
- Susceptibility of the affected resource to disturbance

Based on NEPA guidelines and the factors identified above, effects on vegetation resources were considered adverse if the Station could result in any of the following:

- Long-term degradation of a sensitive plant community because of substantial alteration of landform or site conditions (for example, alteration of wetland hydrology)
- Filling or degradation of wetlands and other waters of the United States subject to the jurisdiction of the

USACE pursuant to the federal Clean Water Act

- Substantial loss of a plant community and associated wildlife habitat
- Fragmentation or isolation of plant communities with important wildlife habitat values, especially riparian and wetland communities

4.5.1.1 Proposed Action

4.5.1.1.1 Construction Impacts

Direct permanent impacts on vegetation resources from the Station Proposed Action would occur because of construction of the power plant, substations, permanent access roads, transmission and distribution line tower footings, water supply wellfield, and rail spur. Temporary impacts would occur at locations of short-term construction access and activities. Table 4.5-1 displays estimated acres of temporary and permanent impacts of the Proposed Action on each vegetation community in the project area. Station features whose locations are still undefined at the time the DEIS was completed (access roads, pulling and tensioning sites, and staging areas) are not included in Table 4.5-1, but are discussed below in the impacts analysis.

Power Plant

Impacts to vegetation resources resulting from construction and operation of the Proposed Action power plant would be relatively larger than impacts associated with the water supply system and electric transmission and distribution lines.

Permanent impacts resulting from construction of the power plant would total approximately 1,287 acres at the power plant site and 6 acres for associated access roads. (It is important to note that GIS mapping of Station features and impact calculations may differ slightly from those numbers described in Chapter 2, *Description of Proposed action and Alternatives*, as a result of Station features being uploaded into ArcView GIS from CAD software. In addition, vegetation impacts calculations did not include access roads unless the access road(s) was included in the Station features ROW.) Vegetation communities permanently affected by power plant construction would include: Big Sagebrush Shrubland, Montane Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland (see Figure 3.5-1). The vegetation community type that would be impacted to the greatest extent is Mixed Great Basin Shrubland (688 acres). A portion of the power plant site is already disturbed and used for gravel storage. The power plant site would directly affect eight ephemeral drainages that are dry except during peak snowmelt and major precipitation events. Additional information on impacts to drainages of potential concern to the USACE and NDEP is discussed in Section 4.3, *Surface Water Resources*.

In addition to the permanent vegetation losses, it is expected that construction would result in temporary impacts on vegetation around the perimeter of the power plant site from trampling or destruction of vegetation by construction equipment and materials storage. These temporary impacts would affect an unknown acreage of similar vegetation community types as listed for permanent impacts, primarily Sagebrush Shrubland communities. Impacts to vegetation can be reduced or avoided by landscape protection and impact avoidance measures and revegetation with appropriate native species as outlined in Appendix A, *Best Management Practices.*

TABLE 4.5-1

Proposed Action: Estimated acres of Temporary and Permanent Impacts on Vegetation Communities

Vegetation Community		Power Plant	Electric Transmission Facilities	Water Supply System	Additional Construction ROW	Rail Spur	Access ROW	Total
Big Sagebrush Shrubland	Temporary	0	56	52	4	0	0	112
	Permanent	361	12	8	0	0	0	381
Montane Sagebrush Shrubland	Temporary	0	30	1	0	0	0	31
	Permanent	29	75	0	0	0	0	104
Mixed Great Basin Shrubland	Temporary	0	9	35	3	0	0	47
	Permanent	688	47	5	0	1	0	741
Salt Desert Scrub	Temporary	0	9	2	0	0	0	11
	Permanent	59	1	1	0	2	0	63
Low Scrub and Grassland	Temporary	0	12	11	0	0	0	23
	Permanent	150	1	2	0	1	0	154
Greasewood	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Pinyon-Juniper Woodlands	Temporary	0	16	0	0	0	0	16
	Permanent	0	1	0	0	0	0	1
Wetlands	Temporary	0	2	0	0	0	0	2
	Permanent	0	0	0	0	4	0	4
Alkali Meadow	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Unknown*	Temporary	0	106	0	39	8	0	153
	Permanent	0	57	1	0	1	9	68
Total Impacts	**Temporary**	**0**	**240**	**101**	**46**	**8**	**0**	**395**
	Permanent	**1,287**	**194**	**17**	**0**	**9**	**9**	**1,516**

Electric Transmission Lines

Total temporary vegetation impacts for the 163 transmission tower footings along the Proposed Action transmission lines would be approximately 134 acres, while permanent impacts would be less than 1 acre. Permanent impacts on vegetation communities would also include approximately 56 acres for new road construction and existing road upgrade.

Based on preliminary structure placement the ROWs would cross all vegetation types, with the largest acreage in Big Sagebrush Shrubland and Montane Sagebrush Shrubland vegetation communities (see Figure 3.5-1).

Temporary impacts on vegetation communities would also include 3.3 acres for temporary access roads within the transmission ROWs. These roads would be used to access tower sites during construction. The roads would be used minimally thereafter and allowed to revegetate naturally.

Another 1.8 acres would be temporarily impacted at each pulling and tensioning site used during construction for a total of approximately 51 acres of temporary impact. The exact locations of these sites have not been determined.

More specific impacts to vegetation resources resulting from the construction of the transmission line include the following:

- Permanent vegetation loss at the transmission towers is estimated to total 0.4 acre (including 0.04 acre of potentially jurisdictional wetland near Duck Creek).
- 50 acres of vegetation permanently impacted along the 31.9-mile-long (200-foot-wide ROW) 500-kV transmission line between the Duck Creek Substation and the Thirtymile Substation. A little more than 49 acres of this impact would be the result of new road construction or existing road upgrades and about 1 acre would be from the towers.
- 6.1 acres of permanent vegetation loss resulting from new road construction along the 2.5-mile-long corridor for two parallel 500-kV transmission lines to connect the previously permitted SWIP utility corridor to the Duck Creek Substation.
- Permanent loss of 0.5 acre of vegetation from road construction related to the 0.2-mile-long corridor for two 345-kV lines to interconnect the existing Falcon to Gonder 345-kV line to the Thirtymile Substation.

Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.04 acre of permanent and 0.04 acre of temporary impacts to wetlands. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span).

The portion of the transmission line that would traverse the Egan Range would result in long-term losses of juniper and pinyon trees around towers and within 55 feet of the centerline, which is needed to maintain electrical clearance. Trees over 15 feet high may need to be cut if they occur within the clearance curve between two towers. This impact is likely to be greatest along the portion of the 500-kV line that spans the Egan Range. On level terrain, shorter trees may not need to be cut near the support towers because the conductor is higher. Conversely, more trees would have to be removed or trimmed in the middle third of each span because the wire sags closer to the ground. Pinyon and juniper trees small enough not to affect transmission line operation (as determined by the growth envelope, terrain, and clearance curve between towers) would be left in place. In rough terrain, only trees at higher elevations may need to be removed.

Although 2 acres of potentially jurisdictional wetlands are located within the three proposed 200-foot-wide transmission corridors that would cross the Duck Creek floodplain (Appendix B, *Wetland Delineation*), the actual impact to wetlands would be limited to the approximately nine tower sites (three sites per corridor assuming a 900- to 1,100-foot span) that would be within the wetland. Thus, the permanent impact to potentially jurisdictional wetlands would be approximately 0.01 acre. Construction activities would also result in approximately 0.04 acre of additional temporary impacts to wetland areas. The proposed transmission lines would cross 27 drainages, including 16 that are potentially jurisdictional “waters of the United States”.

Impacts on wetlands would be further minimized by incorporating the Landscape Preservation and Impact Avoidance BMPs listed in Appendix A, *Best Management Practices*, and in the mitigation measures described further below. All upland and wetland sites temporarily disturbed during Station construction would be revegetated with native plant species. Impacts to potentially jurisdictional wetlands would be mitigated in consultation with the USACE. Impacts to non-jurisdictional and jurisdictional wetlands on BLM-administered lands would also need to be assessed under Executive Order 11990, Protection of Wetlands (1977), which requires agencies to minimize impacts of federal activities on wetlands. Post-construction operation practices would include periodic visits to transmission line towers and access road maintenance. These activities may cause additional impacts on adjacent vegetation resources from disturbance, spread of invasive weeds, and erosion along the ROW. Long-term operational impacts to vegetation resources would be reduced by implementing BMPs (see Appendix A).

Substations

Sixty acres of permanent vegetation loss would occur at the proposed Duck Creek Substation, 77 acres at the proposed Thirtymile Substation, and 4 acres along a proposed gravel access road to the Thirtymile Substation.

Vegetation communities that would be most impacted would include 47 acres of Mixed Great Basin Shrubland at the proposed Duck Creek Substation and 56 acres of Montane Sagebrush Shrubland at the proposed Thirtymile Substation.

Water Supply System

Impacts to vegetation resources that may result from the construction of the proposed 13.2-mile-long water supply system, eight wells, and associated access road and staging area include the following:

- Construction of the linear water pipeline would lead to the temporary disturbance of 112 acres.
- Permanent total loss of 0.2 acre of vegetation would occur at eight ground water well sites. Temporary disturbance around well sites would total 4 acres.
- Excavation in 42 ephemeral drainages that drain the Schell Creek Range could eliminate or degrade vegetation through altered hydrology, removal, or soil compaction.
- Temporary disturbance to 2 acres of vegetation for the staging area (assumed to be located near the north end of the pipeline ROW).
- Permanent impacts to 17 acres of vegetation along an access road that would serve the water pipeline as well as the distribution line.

Following construction, the permanent ROW would be 40 feet wide. The majority of this ROW would be revegetated. Permanent impacts would be limited to 0.2 acre at well sites and 16 acres of graveled access road as described above. Temporary impacts on vegetation would be minimized by BMPs, including weed control during construction, and revegetation with approved native species once the pipeline is constructed and buried (see Appendix A, *Best Management Practices*).

The acreage of each vegetation community that would be permanently or temporarily affected by the Proposed Action water supply line is summarized in Table 4.5-1. Most of the impacts would occur in Big Sagebrush Shrublands and Mixed Great Basin Shrublands. Salt Desert Scrub, Low

Scrub and Grassland, and Montane Sagebrush Shrublands would also be impacted. The proposed water supply system would not directly affect any of the potentially jurisdictional wetlands identified in the project vicinity (Appendix B).

The Proposed Action water pipeline ROW would affect 42 drainages that drain into Steptoe Valley from the Schell Creek Range. Two of these drainages may potentially be considered jurisdictional "waters of the United States" and the other 40 drainages are of concern to the NDEP. During construction, increased erosion or sedimentation could occur along these small streambeds, especially if work is conducted during wet periods of the year. As discussed in Section 4.3, *Surface Water Resources*, the pipeline would be buried to a sufficient depth so as not to affect water flow of drainages within the valley including Duck Creek.

The Proposed Action ground water pumping could reduce discharge at springs in Steptoe Valley, which could result in long-term indirect loss of wetland vegetation at those springs. However, as described in Section 4.4, *Ground Water Resources*), ground water and spring monitoring will be conducted during Station operation and appropriate measures implemented to avoid adverse impacts. The ground water analysis (see Section 4.4, *Ground Water Resources*) describes the predicted impacts on spring hydrology and indicates the potentially affected springs are located in areas where ground water levels would be lowered by at least 2 to 4 feet, but less than 6 feet, as a result of Station ground water pumping. Most of these springs support narrow springbrooks with watercress, sedges, rushes, and other herbaceous wetland species that could be affected by reduced water availability. Predicting the exact effects of ground water withdrawal on individual springs and associated vegetation is impossible. The springs most at risk in the Steptoe Basin are those located on or near the valley bottom, whereas the springs closer to the alluvial fans of tributary washes and at higher elevations in the basin are not at risk based on hydrology modeling (see Section 4.4, *Ground Water Resources*).

Without the prescribed ground water monitoring and mitigation, if needed, ground water pumping under the Proposed Action could cause hydrophytic vegetation to be replaced over time with upland plant species because of decreased water availability. The magnitude of this change would be site-specific and dependent on the current flow rates, spring geology and water source, and species of plants. Species such as sedges and rushes that dominate virtually all of the springs in question have rooting depths that are generally less than 18 inches and are adapted to having readily available water in that zone during a significant portion, if not all, of the growing season (mid-June to mid-September). Therefore, a loss of ground water would rapidly kill existing hydrophytic plants, especially if high pumping rates coincide with drought.

Many special status plant species and invertebrate animal species are associated with the springs in the Station project area. Potential impacts on these species are discussed in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Electric Distribution Lines

An estimated 1.3 miles of distribution lines would be constructed to supply power to the water supply wellfield. Impacts on vegetation from construction of distribution lines would include less than 0.05 acre of permanent impact for all electric pole footing locations and approximately 15 acres of permanent impact for construction and use of access roads.

Vegetation communities affected by installation of the electric distribution lines primarily include Big Sagebrush Shrubland and Mixed Great Basin Shrubland (see Table 4.5-1). Impacts from the distribution lines would be minimized using BMPs contained in Appendix A, *Best Management Practices*.

Rail Spur

The approximately 1.3-mile-long rail spur under the Proposed Action would include a permanent 70-foot-wide ROW inclusive of 9 acres. In addition to crossing the main channel of Duck Creek, the rail spur would also cross three potentially USACE jurisdictional side channels. The rail spur has been designed to cross Duck Creek via a bridge with supports that would also require placement within the wetland but not within the creek.

Approximately 9 acres of permanent impacts on vegetation would result from construction of the rail spur. Additionally, 8 or more acres of temporary impacts would result from vehicle traffic and other construction activities within the larger 100-foot-wide temporary construction ROW. Approximately 5,300 linear feet of the Proposed Action rail spur ROW would transect a wetland community along the Duck Creek floodplain that is potentially "waters of the United States". The rail spur would directly impact and permanently eliminate 4 acres of potentially jurisdictional wetland. In addition to the Wetland communities, vegetation communities that would be affected by construction of the rail spur include Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland.

Other Project Features

An off-site borrow area would be used to supply rock and earth materials during the construction process. This borrow area would result in temporary impacts to 40 acres of vegetation. The exact location of the borrow pit would be determined through consultation with the BLM within the 320-acre area identified in Figure 2-16.

The batch plant would be active during construction and would temporarily impact approximately 3 acres of vegetation.

A temporary distribution line would be utilized to provide power during the construction of the power plant. The temporary ROW for construction power from the existing 69-kV distribution line to the power plant ROW would be 1.3 miles long and 40 feet wide. Once construction is complete the ROW would be revegetated using native vegetation.

4.5.1.1.2 Operation Impacts

During Station operation and maintenance, routine activities would increase the risk of spread of noxious and non-native invasive plant species because of increased vehicular access along the water supply system, transmission line, and distribution line (see Section 4.5.2, *Noxious and Invasive Weeds*). Maintenance could also result in minimal periodic impacts to vegetation over the life of the Station from soil disturbance along the Station facilities.

4.5.1.1.3 Mitigation

Mitigation measures for biological resources are directed primarily at wildlife habitat and wildlife resources, but they cover the range of potential effects on all biological resources addressed in the EIS. For this reason, all mitigation associated with biological resources and required for the Proposed Action is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.1.2 Alternative 1

4.5.1.2.1 Construction Impacts

The Proposed Action and Alternative 1 differ primarily in the proposed locations of the power plant site, transmission line alignment, water supply system, rail spur, and location and length of the transmission line that runs from the SWIP line into the power plant site**.** Potential effects of Alternative 1 on vegetation are described below and summarized in Table 4.5-2.

TABLE 4.5-2

Alternative 1: Estimated Acres of Temporary and Permanent Impacts on Vegetation Communities

Vegetation Community		Power Plant	Electric Transmission Facilities	Water Supply System	Additional Construction ROW	Rail Spur	Access ROW	Total
Big Sagebrush Shrubland	Temporary	0	45	7	5	2	0	59
	Permanent	718	66	1	0	4	0	789
Montane Sagebrush Shrubland	Temporary	0	29	2	0	1	0	32
	Permanent	23	68	1	0	3	0	95
Mixed Great Basin Shrubland	Temporary	0	13	2	0	2	0	17
	Permanent	303	1	1	0	5	0	310
Salt Desert Scrub	Temporary	0	23	8	0	2	0	33
	Permanent	24	0	1	0	5	0	30
Low Scrub and Grassland	Temporary	0	37	30	0	0.3	0	67
	Permanent	227	1	5	0	1	0	234
Greasewood	Temporary	0	0	0	0	0	0	0
	Permanent	0	0	0	0	0	0	0
Pinyon-Juniper Woodlands	Temporary	0	13	0	0	0	0	13
	Permanent	0	1	0	0	0	0	1
Wetlands	Temporary	0	11	13	0	4	0	27
	Permanent	0	0	2	0	4	0	6
Alkali Meadow	Temporary	0	1	0	0	0	0	1
	Permanent	0	0	0	0	0	0	0
Unknown*	Temporary	0	87	1	40	0	0	128
	Permanent	0	61	0	0	2	6	69
Total Impacts	**Temporary**	**0**	**259**	**63**	**45**	**11**	**0**	**378**
	Permanent	**1295**	**198**	**11**	**0**	**24**	**6**	**1534**

*Includes acreage of impact for project components whose locations have not been defined (primarily transmission line access roads, borrow area, pulling stations, etc.).

Power Plant

Vegetation communities that would be most affected at the Alternative 1 power plant site include Big Sagebrush Shrubland, Mixed Great Basin Shrubland, and Low Scrub and Grassland. Other communities affected include Salt Desert Scrub and Montane Sagebrush Shrubland. As described for the Proposed Action, direct impacts on vegetation communities would result from the construction of the power plant and associated access roads. Under Alternative 1, permanent impacts resulting from construction of the power plant would total 1,295 acres at the power plant site and 2.5 acres for the paved access road to the power plant. The Alternative 1 power plant would also directly affect six drainages, all of which are likely non-jurisdictional.

Temporary, direct impacts on vegetation would result from construction activity in the vicinity of the power plant site. Such impacts would include trampling or destruction of vegetation by construction equipment, materials storage, etc. These temporary impacts would be addressed by implementing BMPs contained in Appendix A, *Best Management Practices,* including revegetation with native species appropriate to the impacted vegetation community.

Electric Transmission Lines

Direct impacts resulting from construction-related disturbance would be similar to those described for the Proposed Action. The Alternative 1 transmission lines would span a smaller portion of Steptoe Valley because the line would cross the Egan Range and go slightly south to the Alternative 1 power plant location.

Total long-term vegetation loss for the 163 tower structures along the Alternative 1 transmission lines would be approximately 1 acre, even though temporary impacts would be up to approximately 163 acres. In order to create an estimate for potential vegetation community impacts for the Alternative 1 tower structures, tower locations were automated in GIS every 1,200 feet (average span for the lines) along the proposed transmission line and impacts around these potential tower sites were then calculated. Final tower placement would ultimately change in the field based on topography, soils, and occurrence of sensitive biological resources. Therefore, vegetation impact calculations for all transmission and distribution line structures are strictly estimates used to assess potential impacts. The actual acres of impact to vegetation communities based upon tower locations cannot be calculated until structure placement has been determined. The proposed ROWs cross all vegetation community types, with the largest acreage in Big Sagebrush Shrublands. Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.03 acre of permanent and 11 acres of temporary impacts to potentially jurisdictional wetlands. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span) at this particular location.

Permanent impacts on vegetation would also include approximately 60 acres for new road construction and upgrade of existing roads.

Temporary impacts on vegetation would also include 3.6 acres for temporary access roads within the transmission corridor. These roads would be used to access tower sites during construction. The roads would be used minimally thereafter and allowed to revegetate naturally.

Another 1.8 acres would be temporarily impacted at each pulling and tensioning site used during construction for a total of approximately 57 acres of temporary impacts. The exact locations of these sites have not been determined.

More specific impacts to vegetation resources resulting from the construction of the transmission line include the following:

- Permanent impacts from the 500-kV transmission line between the Duck Creek Substation and the Thirtymile Substation would include approximately 46 acres, most from new road construction or existing road upgrades.
- 14 acres of permanent vegetation loss would result from new road construction along the transmission line corridor to connect the previously permitted SWIP utility corridor to the Duck Creek Substation.
- Loss of 0.5 acre from road construction related to the 0.2-mile-long corridor for two 345-kV lines to interconnect the existing Falcon to Gonder 345-kV line to the Thirtymile Substation.

Temporary impacts would affect vegetation in these cover types in approximately 135 up to 151 acres at the footing sites (1 acre each) during construction. Temporary impacts from trampling vegetation and short-term disturbance would include 168 acres of primarily Big Sagebrush Shrublands and Montane Sagebrush Shrublands.

Under Alternative 1, the approximately 1 mile of parallel transmission lines crossing Steptoe Valley would result in approximately 0.3 acre of permanent and 11 acres of temporary impacts to wetlands potentially under the jurisdiction of the USACE. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span) at this particular location. The proposed transmission lines would cross 20 drainages, including 15 that are potentially under USACE jurisdiction.

Areas of temporary disturbance would be restored in the same manner as described for the Proposed Action using BMPs contained in Appendix A, *Best Management Practices*.

Substations

The Alternative 1 Duck Creek Substation would permanently impact 60 acres of predominantly Big Sagebrush Shrublands. The access road to be constructed into the Duck Creek Substation would permanently impact 1.4 acres. The alternative Thirtymile Substation would permanently impact approximately 77 acres of predominantly Montane Sagebrush Shrublands and Big Sagebrush Shrublands. In addition, the access road into the Thirtymile Substation site would permanently impact 2.2 acres.

Water Supply System

General ground disturbing impacts to vegetation would be similar to those described for the Proposed Action. Along the approximately 8-mile-long water supply system, a total of 67.5 acres of vegetation could potentially be temporarily impacted within the 70-foot-wide construction ROW. Within the permanent 40-foot-wide ROW, 38.6 acres of vegetation would be temporarily disturbed before post-construction revegetation. The vegetation community type affected most by the Alternative 1 water pipeline alignment would be Low Scrub and Grassland (Table 4.5-2). The Alternative 1 water pipeline would cross a

complex system of wetland swales, resulting in 8.3 and 6.2 acres of permanent and temporary impacts, respectively, to wetlands potentially under USACE jurisdiction. The Alternative 1 water pipeline ROW would affect 3 drainages, only 1 of which may potentially be considered "waters of the United States"

Temporary impacts associated with well sites for the Alternative 1 water supply system would total 4 acres, while 0.2 acre of permanent impacts would occur. The staging area for construction of the Alternative 1 water supply system would temporarily impact 2 acres of vegetation.

Electric Distribution Lines

An estimated 1 mile of distribution line would be constructed to supply power to the water supply well field. Impacts on vegetation from construction of distribution lines would include less than negligible permanent impact for all electric pole footing locations and approximately 5 acres of short-term impact for construction and use of temporary access roads.

Vegetation communities affected by installation of the electric distribution lines primarily include Big Sagebrush Shrubland. Impacts from the distribution lines would be minimized by using BMPs contained in Appendix A (for example, see *Landscape Protection and Impact Avoidance Measures*).

Rail Spur

Construction of the rail spur from the NNR to the Alternative 1 power plant site would permanently impact approximately 24 acres of vegetation, including 4 acres of wetlands along 5,010 feet of ROW. Temporary impacts would result from vehicles and human activity during construction activities. In addition to wetlands, all other vegetation communities would be affected by construction of the rail spur with the exception of the Greasewood and Pinyon-Juniper Woodland communities. The rail spur would not cross Duck Creek under Alternative 1; however, it would parallel Duck Creek. The Alternative 1 rail spur would result in approximately 4 and 3.5 acres of permanent and temporary impacts to wetlands potentially under USACE jurisdiction, respectively. The Alternative 1 rail spur would cross two potentially jurisdictional drainages.

Other Project Features

The same off-site borrow area described for the Proposed Action would be used to supply rock and earth materials during the construction process for Alternative 1. This borrow area would result in temporary impacts to 40 acres of vegetation. The exact location of the borrow pit will be determined through consultation with the BLM within the 320-acre area identified in Figure 2-16.

The batch plant would be active during construction and would temporarily impact approximately 3 acres of vegetation.

A temporary distribution line would be utilized to provide power during the construction of the Alternative 1 power plant. The temporary ROW for construction power from the existing 69-kV distribution line to the power plant ROW would be 1.3 miles long and 40 feet wide. Once construction is complete the ROW would be revegetated using native vegetation.

4.5.1.2.2 Operation Impacts

During Station operation and maintenance, routine activities would increase the risk of spread of noxious and non-native

invasive plant species because of increased vehicular access along the water supply system, transmission line, and distribution line (see Section 4.5.2, *Noxious and Invasive Weeds*). Maintenance could also result in minimal periodic impacts to vegetation over the life of the Station from soil disturbance along the Station facilities.

4.5.1.2.3 Mitigation

All mitigation associated with biological resources and required for Alternative 1 is the same as for the Proposed Action and is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.1.3 Connected Actions

4.5.1.3.1 SWIP

Potential direct and indirect impacts to vegetation and plant species of concern from SWIP construction and maintenance are summarized in the following text. Examples of proposed mitigation measures for the SWIP include avoiding or spanning sensitive areas, minimizing ground disturbance during construction, and using existing access roads during construction and maintenance (BLM, 1993).

Direct Impacts

Construction and maintenance of the SWIP would include ground disturbing activities that directly impact plants. The greatest impact would be the loss of vegetation and habitat from the construction of tower bases, access roads, spur roads, and substations (BLM, 1993). Plant populations that occur on or near the centerline where towers are constructed may be damaged or eliminated as habitat is dug up or destroyed during construction activities. Many of these effects would be permanent (BLM, 1993). Plant populations occurring near construction areas would likely be subject to trampling, but they may recover depending on the magnitude and extent of disturbance. Destruction of vegetation also may result in future habitat loss because of erosion unless some site rehabilitation occurs (BLM, 1993).

Ground disturbance may potentially have adverse effects on sensitive plants. Within the SWIP corridor in Nevada, the potential for direct impacts to sensitive plant species following the implementation of mitigation measures is greatest for threecorner milkvetch (*Astragalus triquetrus)*, two-tone beardtongue (*Penstomen bicolor* var. *bicolor* and *P. bicolor* var. *roseus)*, and Monte Neva paintbrush (*Castilleja salsuginosa)* (BLM, 1993). None of these species are reported to occur in the White Pine Energy Station project area. However, *C. Salsuginosa* (a FWS species of concern, BLM-Sensitive species, and state critically endangered species) has been reported to occur near the Monte Neva Hot Springs (BLM, 1993), which is west of the Station Proposed Action power plant site (BLM, 1993).

Indirect Impacts

Increased public access associated with the construction and maintenance of the SWIP would result in more opportunities for human activity and indirect impacts to plants in these areas (BLM, 1993). This would be especially true where no access existed before, and could result in increased disturbance and mortality of sensitive plant populations over the long term. Examples include increased collecting and trampling of sensitive plants and, in pinyon-juniper communities, harvesting a greater number of trees for use at Christmas and as firewood (BLM, 1993). Within the SWIP corridor in

Nevada, there could be indirect impacts to sensitive plant species, including *A. triquetrus*, *P. bicolor* var. *bicolor*, *P. bicolor* var. *roseus*, and sunnyside green gentia (*Frasera gypsicola)* (BLM, 1993). Only *F. gypsicola* (a FWS species of concern, BLM-Sensitive species, and state critically endangered species) has been reported to occur in the White Pine Energy Station project area.

4.5.1.3.2 NNR

Existing vegetation near the NNR tracks would be removed to permit train operation, and chemical treatments would be used to retard future vegetation growth (David Evans and Associates, Inc., 2002). Many areas of track between mileposts 55 and 115 are overgrown with sagebrush and other native vegetation because ballast is non-existent in much of this section, which now lies at or below natural grade (CRS and MSC, 2005). Removal of scrub vegetation along the NNR is not expected to substantially impact biological resources because of abundant vegetation in the surrounding area (David Evans and Associates, Inc., 2002). David Evans and Associates, Inc. (2002) reported that no federally sensitive plant species are known to occur in the NNR Rail Line. David Evans and Associates, Inc. (2002) stated that implementation of an Integrated Pest Management Plan, developed collaboratively with the BLM, would minimize the potential for impacts to wetlands and riparian resources during chemical treatment of weeds. There is the potential for rail-caused fires, which could adversely affect biological resources in the area. Recommended measures to reduce the likelihood of fires include using spark arrestors on locomotive exhaust stacks, using low-spark brake shoes, having fire extinguishers available, and complying with “Track Safety Standards” of the Federal Railroad Administration (David Evans and Associates, Inc., 2002).

CRS and MSC (2005) identified and mapped wet and heavily vegetated areas between NNR mileposts 18.5 and 115. In areas of standing water and saturated soil conditions, work would be performed “on-track” to the maximum extent possible to avoid or minimize potential impacts (CRS and MSC, 2005). Rehabilitation in these areas would include raising the track and placing ballast material to increase track elevation and provide adequate track shoulder for separation from adjacent wet areas. To the maximum degree possible, rehabilitation and restoration work in these areas would be performed with on-track equipment. Preliminary estimates indicate a total of 2 to 7 acres of wet or vegetated areas within the NNR Rail Line would be permanently impacted from widening the NNR roadbed (CRS and MSC, 2005). Any surface disturbance to lands within the NNR Rail Line (except at culverts and drainage channels) would be restored to allow the regrowth of native vegetation after NNR restoration is complete. Farther south, approximately 0.25 mile of wetlands along the NNR within the NNR Rail Line near milepost 123 could be affected by placement of ballast to stabilize the track. This wetland is south of the railroad spur sites for the Station Proposed Action (milepost 103) and Station Alternative 1 (milepost 115) (David Evans and Associates, Inc., 2002).

4.5.1.4 No Action Alternative

No Station-related impacts on vegetation resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.2 Noxious and Invasive Weeds

Noxious and invasive weed species create negative impacts on landscapes by displacing native plants, reducing biodiversity, affecting threatened and endangered species, altering normal ecological processes, decreasing wildlife habitat, reducing the recreational value of an area, and increasing soil erosion and stream sedimentation (Sheley et al., 2001).

Impacts would be considered adverse for noxious and invasive weeds if they result in any of the following effects:

- A reduction in native plant community cover, structure, and composition
- Degradation of wildlife habitats and habitats for sensitive plant species
- Reduction in range forage quality
- Alteration of soil structure and function
- The presence of weedy annuals may prevent establishment of desirable perennial grasses and may increase future fire hazards (Bunting, 1990)

Potential impacts related to noxious and invasive weeds are described in this section. Adverse impacts associated with noxious and invasive species would affect resources such as native vegetation and wildlife habitat, not the weeds themselves. A formal weed risk assessment was completed in 2006. Detail on the location and density of noxious and invasive weed species in the project area is provided in the BLM Noxious and Invasive Weed Risk Assessment, which is contained in (Appendix C, *Biological Resources Supplemental Information*). BMPs associated with noxious and invasive weeds would be implemented as an integral part of the proposed Station and are contained in Appendix A, *Best Management Practices*, under the heading *Noxious and Invasive Weed Management*.

4.5.2.1 Proposed Action

4.5.2.1.1 Construction Impacts

The noxious weed species, hoary cress, could potentially spread because of Station construction near the distribution line east of U.S. 93. This species could also spread in other areas from populations along existing roads that run through the Proposed Action power plant site. Sulphur cinquefoil could spread from construction along the transmission line corridor. Musk thistle was the only other noxious species that was found during field investigations (along roads outside of the Station project area), and could be inadvertently introduced into the Station project area during the transport and construction of Station facilities and structures. Risk from increased populations of invasive species would apply to all Station features. Table 4.5-3 lists weed densities at the sites of Proposed Action features.

Power Plant

Construction of the Proposed Action power plant could potentially cause the spread of existing invasive species' populations, including cheatgrass and flixweed. Access roads would be the main concern because of the potential for vehicles to transport weed species throughout this and other nearby areas (for example, the proposed water supply system). The proximity of these two Station Proposed Action features could introduce weed species located along one feature to the other feature once construction begins.

The Proposed Action power plant site contained fewer weed species and lower weed densities in 2005 than the Alternative 1 power plant site.

TABLE 4.5-3

Weed Densities for the White Pine Energy Station Proposed Action and Alternative 1 Sites

Scientific Name	Common Name	Noxious or Invasive	Transmission Lines ROW	Water Supply System ROW	Rail Spur ROW	Power Plant Site
Proposed Action						
Cardaria draba	Hoary Cress	Noxious	—	—	-	-
Bromus tectorum	Cheatgrass	Invasive	Moderate	High	Low to Moderate	High
Descurainia sophia	Flixweed	Invasive	Moderate	Moderate	Low	Moderate
Sisymbrium altissimum	Tumble mustard	Invasive	—	Moderate to High	—	—
Salsola iberica	Russian thistle	Invasive	Moderate to High	High	—	—
Halogeton glomeratus	Halogeton	Invasive	High	Low to Moderate	Moderate	—
Lepidium perfoliatum	Pepperweed	Invasive	Low	—	—	—
Ranunculus testiculatus	Bur buttercup	Invasive	Moderate to High	—	—	—
Convolvulus arvensis	Field bindweed	Invasive	—	—	—	—
Kochia scoparia	American kochia	Invasive	—	—	Low to Moderate	—
Potentilla recta	Sulphur cinquefoil	Noxious	Low	—	—	—
Taraxacum officinale	Common dandelion	Invasive	Low to Moderate	—	—	—
Lactuca serriola	Prickly lettuce	Invasive	—	Low	—	—
Alternative 1						
Cardaria draba	Hoary Cress	Noxious	—	—	Moderate	High
Bromus tectorum	Cheatgrass	Invasive	Moderate	Low to Moderate	High	High
Descurainia sophia	Flixweed	Invasive	Moderate	High	—	High
Sisymbrium altissimum	Tumble mustard	Invasive	—	Low to Moderate	—	—
Salsola iberica	Russian thistle	Invasive	Moderate to High	Moderate	—	—
Halogeton glomeratus	Halogeton	Invasive	High	Low to Moderate	—	—

TABLE 4.5-3

Weed Densities for the White Pine Energy Station Proposed Action and Alternative 1 Sites

Scientific Name	Common Name	Noxious or Invasive	Transmission Lines ROW	Water Supply System ROW	Rail Spur ROW	Power Plant Site
Lepidium perfoliatum	Pepperweed	Invasive	Low	—	—	—
Ranunculus testiculatus	Bur buttercup	Invasive	Moderate to High	—	—	—
Convolvulus arvensis	Field bindweed	Invasive	—	—	—	—
Kochia scoparia	American kochia	Invasive	—	—		—
Potentilla recta	Sulphur cinquefoil	Noxious	Low	—	—	—
Taraxacum officinale	Common dandelion	Invasive	Low to Moderate	—	—	—
Lactuca serriola	Prickly lettuce	Invasive	—	—	—	—

Electric Transmission Lines and Substations

Construction of the Proposed Action transmission line and substation could potentially impact vegetation communities and wildlife habitat through the spread of invasive plant species. Seven invasive species found within the proposed transmission line ROW, particularly halogeton, cheatgrass, and Russian thistle, are the species most likely to be spread by construction of the transmission line and substations. Sulphur cinquefoil is the only noxious species found along the Proposed Action transmission line ROW. Musk thistle was seen in Butte Valley along County Road 19. This species may be spread during construction and operation of the transmission line.

Water Supply System

Six species of invasive weeds were documented along the Proposed Action water pipeline ROW. The increased spread of these species, including cheatgrass, halogeton, and flixweed, could potentially impact vegetation communities along the pipeline. BMPs described in Appendix A, *Best Management Practices*, are directed at minimizing the spread of weeds and degradation of such areas.

Electric Distribution Lines

Weeds found in the Proposed Action temporary distribution line ROW include hoary cress, cheatgrass, flixweed, Russian thistle, and halogeton. Infestations vary from light to heavy and could increase with construction of the distribution line. Weeds found along the proposed distribution lines route running to the well fields along the water pipeline are similar to those described under the water supply system since they occur in the same area.

Rail Spur

Invasive species present in the Proposed Action rail spur ROW include cheatgrass,

halogeten, flixweed, and American kochia. These populations had low to moderate densities in summer 2005. Wetland communities in this area are relatively free of weeds. The Proposed Action rail spur ROW contains more weed species and a higher average density of invasive species than the Alternative 1 rail spur ROW.

4.5.2.1.2 Operation Impacts

Ongoing maintenance of Station features may increase the spread of noxious weeds in the Station project area. Implementation of BMPs listed in Appendix A, such as cleaning vehicles upon entering and leaving the Station project area, would help to minimize the potential for these impacts.

4.5.2.1.3 Mitigation

No mitigation is required for the Proposed Action.

4.5.2.2 Alternative 1

4.5.2.2.1 Construction Impacts

The Station Proposed Action and Alternative 1 differ primarily in the proposed locations of the power plant site, transmission line alignment, water supply system, and rail spur**.** Under Alternative 1, types of weed-related impacts from construction of the water supply system and electric distribution system would generally be similar to those for the Proposed Action. Potential impacts from noxious and invasive weeds at the Alternative 1 power plant, transmission line, and rail spur sites would vary based on the potential for the different weed populations to spread. Table 4.5-3 lists weed densities at the sites of Alternative 1 features.

Power Plant

Weeds present on the Alternative 1 power plant site include dense patches of the noxious hoary cress and the dominant invasives—cheatgrass and flixweed. Construction of the power plant could have potential adverse impacts caused by the spread of these weed species to surrounding areas, including access roads. The Alternative 1 power plant site contained a greater number and higher density of noxious and invasive species than the Proposed Action power plant site.

Electric Transmission Lines and Substations

Construction of the transmission line could result in the spread of existing invasive and noxious weed species populations. These include halogeton, cheatgrass, and Russian thistle, all invasive species that are found in heavy patches in some previously disturbed areas. Sulphur cinquefoil is found in the portion of the proposed transmission line ROW that spans the Egan Range.

Water Supply System

The proposed Alternative 1 alignment of the water supply system had fewer occurrences and a lower density of invasive weeds than the Proposed Action water supply alignment. No noxious weeds were observed in either proposed water supply alignment. These areas would be of particular concern during construction of the water pipeline, wellfield, and associated access roads. In areas such as these, which have little to no invasive weed infestations, the Station-induced loss or degradation of native vegetation resources resulting from vegetation removal, soil compaction, and exposure to weed infestations could be substantial.

Rail Spur

The Alternative 1 rail spur ROW contained fewer weed species and lower

average weed densities than the Proposed Action rail spur ROW. Construction of the rail spur under Alternative 1 could potentially spread existing infestations of hoary cress, together with cheatgrass that currently exists throughout the area.

4.5.2.2.2 Operational Impacts

Minimal weed-related impacts from Station operation could continue to affect vegetation communities once Station construction and appropriate reclamation is complete.

4.5.2.2.3 Mitigation

No mitigation is required for Alternative 1.

4.5.2.3 Connected Actions

4.5.2.3.1 SWIP

The SWIP Final EIS impact analysis did not specifically address noxious and invasive weeds, but it did note the presence of exotic plant species in the SWIP project area. Construction of the SWIP would increase the risk of spread of invasive weed species.

4.5.2.3.2 NNR

See Section 4.5.1, *Vegetation*, regarding noxious weeds, treatment, and potential effects of the NNR.

4.5.2.4 No Action Alternative

The No Action Alternative would not result in any Station-related impacts from noxious or invasive weed species. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.3 Wildlife and Fisheries Resources

The following sections describe anticipated direct and indirect impacts to general wildlife and fisheries resources within the Station project area. Construction and operation of Station facilities for the Proposed Action and Alternative 1 as described in Chapter 2 could result in direct, indirect, temporary, and permanent disturbances to common wildlife and wildlife habitat. Direct impacts are those impacts that result from the proposed Station and occur at the same time and place. Potential direct impacts on wildlife include the following:

- Long-term (permanent) and short-term removal of habitat
- Direct sedimentation or contamination of Duck Creek or other aquatic habitats
- Removal of ground-dwelling wildlife that are not highly mobile
- Increased human disturbance activities, structural features, and noise levels at Station locations

Potential indirect impacts occur later in time throughout the Station operational phase and may include the following:

- Degradation of wildlife habitat because of introduction of noxious/invasive weed species
- Habitat fragmentation and the loss of wildlife movement corridors
- Elevation of towers could result in aerial and ground habitat fragmentation and avoidance of the Station project area
- Impacts to ecosystem structure and function
- Contamination of Duck Creek and associated wetland habitats
- Ground water declines reducing spring habitat quality

- Increased human disturbance and noise levels at the Station location.

Habitat fragmentation is defined as the process by which a natural landscape is broken up into small parcels of natural ecosystems, isolated from one another in a matrix of lands dominated by human activities (Saunders and Hobbs, 1991). Operation of the proposed transmission lines could create aerial habitat fragmentation. Transmission towers provide increased perching opportunities for raptors. Some species may avoid the area near the transmission lines because of increased predator occurrence.

The proposed Station would also lead to short- and long-term increases in human population and traffic in the Ely and McGill region that could result in increased indirect habitat loss and increased risk of collision along roadways.

Noise and human disturbance during Station construction and operation could cause mobile wildlife to disperse into adjacent areas. The altered animal density could lead to increased competition for resources like food, cover, and water, leading to reduced survival and reproduction rates, and a change in predator/prey dynamics for the life of construction. The extent of this impact would likely be greatest near the Station power plant site where most of the activity would take place. However, noise impacts may also occur at other Station features. The impacts on wildlife would vary according to the site-specific magnitude and duration of noise/disturbance activities.

Resident and migratory bird species in the Station project area are protected under the Migratory Bird Treaty Act (MBTA) of 1919. All bird species listed in the affected environment discussion in Section 3.5.3, *Wildlife and Fisheries Resources*, are protected under the MBTA as well as the migratory and resident raptors that occur or have the potential to occur in the Station project area. Although no active raptor nests were found in the Station project area during 2004-2005, there are areas of suitable habitat for migratory and resident raptors in and near the project area. As described in Appendix A, *Best Management Practices*, during the breeding season surveys would be conducted prior to Station construction to avoid impacts to all nesting avian species protected under the MBTA. Many of these species are addressed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

Loss of nesting habitat could lower overall productivity within the Station project area; however, it would not likely affect the viability of the overall populations in White Pine County or the areas covered under the BLM's Egan Resource Management Plan.

In general, construction and operational disturbance of wildlife would be greatest during spring-summer breeding season and fall migration, and big game wintering periods (see Figure 4.5-1).

Potential impacts to wildlife were assessed for all Station features including the transmission lines, substation sites, power plant sites, water supply systems, distribution lines, NNR spurs, upgrade of the NNR to Shafter (although a separate Environmental Assessment has been prepared by White Pine County for this connected action and is summarized later in this discussion), additional access roads, and all other ancillary features under the Station Proposed Action and Alternative 1 as described in Chapter 2. The Station features are generally similar for the Proposed Action and Alternative 1. The primary differences between the Proposed Action and Alternative 1 are related to the

location of the power plant sites, the location of the water supply system and wells, and the facilities that would connect to and from the power plants.

The following analysis addresses potential impacts common to the Proposed Action and Alternative 1 and those impacts that are site- and resource-specific.

Table 4.5-1 summarized and Section 4.5.1, *Vegetation*, provided detail on the acres of vegetation community types, which represent wildlife habitat types, that would be temporarily and permanently impacted by Station construction and operation. The reader is referred to Table 4.5-1 and Section 4.5-1 for a detailed discussion of the number of acres of vegetation communities/wildlife habitat types that would be impacted. The following text broadly describes acres of impacts on wildlife habitats but focuses on the types of effects Station construction and operation would have on wildlife and their habitat.

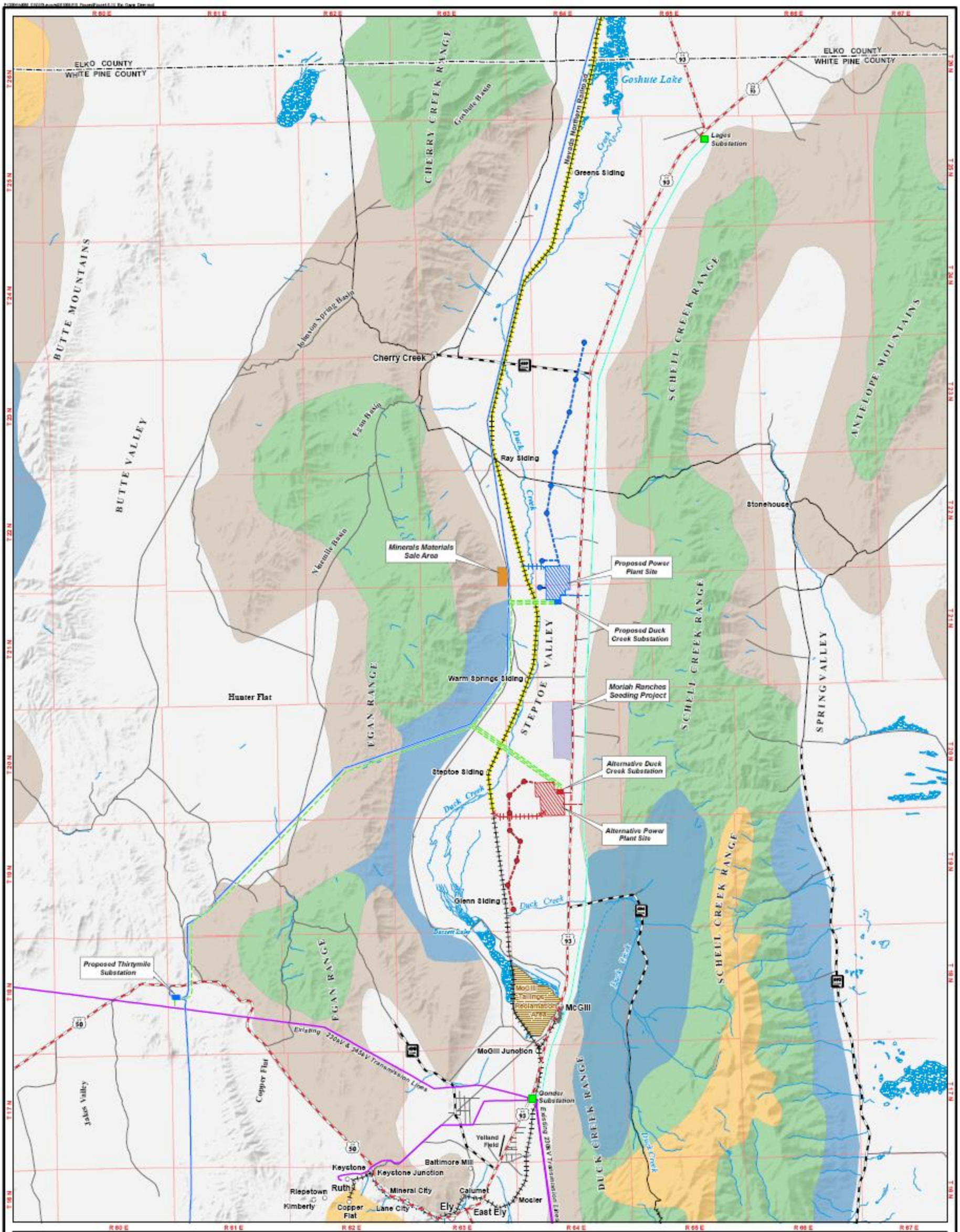
4.5.3.1 Proposed Action

4.5.3.1.1 Construction Impacts

Station construction would permanently remove vegetation/habitat in areas at transmission line and distribution line structures, and within the power plant site, at the Duck Creek and Thirtymile substations, along the water pipeline and at well sites, and at new access roads. In addition to the permanent habitat losses, additional temporary habitat disturbance would occur during the approximately 4- to 6-year Station construction period. In many areas, the temporary disturbance of wildlife habitat would last less than 1 year, except possibly near the perimeter of the Station Proposed Action power plant site where temporary disturbances would last longer. The Proposed Action (as well as Alternative 1) includes a provision to revegetate disturbed areas that are not necessary for Station operation utilizing a native species herbaceous seed mix agreed to by the BLM. This is an integral part of the proposed Station as discussed in Chapter 2 and is included in the BMPs in Appendix A, *Best Management Practices*.

The Proposed Action would permanently eliminate a total of 1,516 acres of wildlife habitat and temporarily disturb an additional 395 acres of habitat (see Table 4.5-1). By far, the most extensive impacts to wildlife habitat would be to the Sagebrush and Mixed Shrubland habitat types, which dominate the Proposed Action power plant and water supply system ROWs (see Table 4.5-1). The second most affected wildlife habitat would be the Low Scrub and Grassland type (see Table 4.5-1 for acreage of impacts). The numerous wildlife species that utilize these habitats, such as neotropical migratory birds, sage-grouse, small mammals, and reptiles such as northern desert short-horned lizards, western rattlesnakes, and sagebrush lizards, among others, could experience reduced habitat availability and quality.

Direct construction impacts would occur in emergent wetland and wet meadow communities that are potentially under the jurisdiction of the USACE (Appendix B, *Wetland Delineation Report*). The Proposed Action ROWs would involve excavation or other work in 77 drainages (Appendix B, *Wetland Delineation Report*). All but a few seasonal/intermittent channels of Schell Creek and Duck Creek are ephemeral swales or small channels that carry water only during high runoff events. Depending on when construction occurs, direct impacts could result in loss or degradation (from sedimentation) of some ephemeral aquatic habitats used by breeding amphibians, including leopard frogs that were observed in several of these types of areas.



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Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Deer Habitat
- Crucial Summer Range
- Crucial Winter Range
- Winter Range
- Habitat All Year

Big Game Species Deer
White Pine Energy Station Project

Figure 4.5-1

In terms of direct habitat loss or alteration, the Proposed Action power plant site would experience the largest permanent loss of habitat (Table 4.5-1). The electric transmission lines and substations followed by the water supply system, rail spurs, and access road ROWs would also lead to substantial habitat loss on a permanent and/or temporary basis. The overall extent of electric transmission line habitat losses would depend on the exact placement of structures and access roads required for Station construction and maintenance. Temporary habitat losses would be associated with the electric distribution line and off-site borrow area (mineral materials sale area).

Wildlife that have small home ranges, are not highly mobile, or are primarily fossorial (for example, gophers, ground squirrels, moles that live underground) could be directly killed by excavation activities. Active burrows may be eliminated within the construction ROWs. If construction occurs during the avian breeding season, surveys would be conducted prior to construction to avoid the taking of active nests and to comply with the MBTA (See BMPs described in Appendix A). During Station construction, elevated noise levels are anticipated to occur, especially near the power plant site, but also near the other ROWs (see Section 4.6.2, *Noise*). The construction-related noise impacts to wildlife would depend greatly on which species are present in the specific locations, seasonal and diurnal timing of construction, construction activity and equipment, and duration of activity at each site. In most situations, the use of multiple pieces of heavy equipment at a specific site could lead to noise levels of 90 to 100 dBA (at 50 feet). Thus, wildlife within this immediate area could be exposed to potentially injurious noise levels. Under basic noise attenuation of -7.5 dBA per distance doubling (“soft site”), noise levels of 70 dBA, a level that could disturb wildlife, would occur within approximately 660 feet of the noise source. The noise disturbance in this zone could decrease wildlife survival and productivity, depending on the timing and location of the activity. Noise levels would not return to ambient levels (assumed to be 45 to 50 dBA, see Section 4.6.2, *Noise*) until approximately 5,000 feet from the noise source. However, the impact to wildlife between 660 and 5,000 feet is likely to be minimal in most cases.

Construction of the Proposed Action rail spur, water supply system, and transmission lines presents a potential risk of adversely affecting aquatic habitats from sedimentation and release of fuels and other environmental contaminants. If contamination of Duck Creek occurred, it could lead to acute and chronic impacts to waterfowl, waterbirds, fish, amphibians, reptiles, and aquatic invertebrates. The risk of contamination impacts would be minimized through implementation of BMPs including a Spill Prevention Control and Countermeasures Plan (SPCCP) as described in Appendix A, *Best Management Practices*.

Direct impacts of Station construction on coyote, mountain lion, and bobcat habitats would be largely temporary in nature and should not impact the viability of these species in the area.

The following sections briefly discuss additional construction impact analysis for specific Proposed Action project features.

Power Plant

Construction of the Proposed Action power plant would permanently eliminate 1,287 acres of wildlife habitat including Big Sagebrush Shrubland, Montane

Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub Grassland. Construction of access roads into the power plant would also permanently remove wildlife habitat. Habitat loss and alteration impacts in these areas would be most substantial for species that rely on sagebrush habitats. All habitat that would be lost in the power plant footprint is year-round range pronghorn habitat. Although communication with BLM and NDOW indicated the Proposed Action power plant site does not contain critical mule deer habitat, this species likely use this area for some of their foraging, watering, cover, and movement requirements.

The power plant site would also eliminate eight ephemeral drainages from the Schell Creek Range that could provide seasonal aquatic habitat for amphibians and other species.

Construction noise impacts to wildlife at the Proposed Action power plant site would be concentrated and produce similar noise levels as discussed previously. However, the noise would likely occur throughout most of the 4- to 6-year construction period at all times of the year, which could increase the level of impact to breeding birds, pronghorns, and mule deer.

At the end of the power plant construction period, 30 to 50 steam blowouts would take place at the power plant site (see Section 4.6.2, *Noise*). Each blow-out would produce noise levels of approximately 166 dBA (15- to 30-dBA reduction with installation of mufflers) at the site and 74 dBA at 3 miles from the site. The steam blowouts may result in disturbance of wildlife present within this zone. The level of disturbance would be highly dependent on species and time of year when the steam blowouts occur, which is undetermined at this time. In addition to disturbance, the loud noise during these events could lead to direct injury of wildlife. Assuming that approximately 92 dBA represents a reasonable threshold of noise injury to wildlife, the steam blowouts could directly injure wildlife within approximately 1.5 miles of the site (assumes 6 dBA reduction per distance doubling).

Water Supply System

Impacts to wildlife that may result from the construction of the Proposed Action 13.2-mile-long water supply system, eight wells, and associated access roads and staging area include the following:

- Permanent loss of 17 acres of wildlife habitats including Big Sagebrush Shrublands, Mixed Great Basin Shrublands, Salt Desert Scrub, and Low Scrub and Grassland as a result of water pipeline distribution lines and access road construction.
- Permanent total loss of 0.2 acre of wildlife habitat for the ground water well sites Temporary disturbance of wildlife habitat around well sites would total 4 acres.
- Excavation in 42 ephemeral drainages that drain Schell Creek Range (see Appendix B, *Wetland Delineation Report*) that, depending on the timing of construction, could eliminate or degrade through altered hydrology, vegetation removal, or soil compaction, seasonal aquatic habitat for amphibians and other wildlife.
- Temporary disturbance of 2 acres of habitat for the staging area (assumed to be located near the north end of the pipeline ROW).
- Temporary loss of approximately 112 acres of habitat along the ROW.

- Direct removal of small mammals, reptiles, and other ground dwelling, foraging, and burrowing species that are unable to avoid construction equipment.

Habitat for mule deer, pronghorn, pygmy rabbits, greater sage-grouse, black-tailed jackrabbits, and ground squirrels and other mammal, avian, insect, reptile, and amphibian species would be temporarily affected by construction of the Proposed Action pipeline. The water pipeline would be reseeded according to BMPs contained in Appendix A, *Best Management Practices,* to avoid long-term impacts to wildlife habitat.

In addition to the above, the Moriah Ranches Seeding Project would be implemented to restore 700 to 900 acres of existing pasture on public land in BLM's Ely District to better ecological condition and increase forage for livestock and wildlife. The project would be designed to create a habitat mosaic that provides cover for sage-grouse and antelope. The project would be located 16 miles north of McGill and immediately west of U.S. 93.

Because construction of the water supply system may occur during winter months in some crucial winter habitats as identified by NDOW and BLM, there could be substantial disturbance to wintering big game.

Electric Transmission Lines

Long-term habitat loss associated with the 163 tower footings along the transmission lines would be approximately 57 acres (1 acre for tower footings and 56 acres for new access roads and road upgrades). Temporary impacts to wildlife habitat associated with electric transmission lines would total 434 acres. The breakdown of what habitats would be most affected cannot be determined until structure placement has been determined. The ROWs would cross all habitat types, with the largest acreage in Big Sagebrush Shrubland and Montane Sagebrush Shrubland habitats (see Table 4.5-1).

Temporary impacts on wildlife habitat would also include 3.3 acres for temporary access roads within the transmission corridor, another 1.8 acres that would be impacted in the medium-term by pulling and tensioning sites used during construction, and 3 acres for the batch plant. The exact location of these sites has not been determined. For a summary of acreage of impact according to community type see Table 4.5-1.

Most wildlife species would avoid areas near the construction sites as crews move along the ROWs and alter movement patterns during the construction period.

The entire Station project area contains pronghorn and mule deer year-round range, which would be temporarily and permanently impacted by the construction of the Proposed Action transmission line. Construction of access roads and use of construction equipment would also lead to impacts to year-round pronghorn and deer range. Access roads left within the construction corridor for use during Station maintenance would fragment habitat, create a permanent loss of habitat, and increase the potential for human disturbance to big game and other species.

Impacts to wildlife and wildlife habitat could be further reduced by avoiding placement of structures or access roads within the 27 drainages that are bisected by one or more of the proposed transmission line ROWs.

Substations

Construction of the two Proposed Action substations would result in the permanent

loss of 137 acres of wildlife habitat. An estimated 60 acres of Mixed Great Basin Shrubland, Montane Sagebrush Shrubland, and Big Sagebrush Shrubland habitat would be permanently removed at the Duck Creek Substation site. Construction of the Thirtymile Substation would result in permanent disturbance to 77 acres of Montane Sagebrush Shrubland and Big Sagebrush Shrubland habitats. In addition, 2.2 acres of these same two habitat types would be permanently removed to construct the gravel access road to the Thirtymile Substation. Mule deer likely use the area for foraging and cover.

Greater sage-grouse leks have been mapped by the BLM and NDOW approximately 4 to 4.5 miles to the west of the substation site. Direct impacts to greater sage-grouse leks are not expected in these areas. Greater sage-grouse are discussed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species.*

No wetlands or drainages would be affected by the Duck Creek Substation.

Electric Distribution Lines

In all, approximately 7.4 acres of wildlife habitat would be impacted by construction of the electric distribution lines. Types of impacts associated with the distribution lines that connect to the wellfields for the Proposed Action would be similar to those described for transmission lines. The distribution line to be constructed from the existing distribution line 0.6 mile east of U.S. 93, to the power plant along the northern side of the existing dirt road that connects U.S. 93 near milepost 86.9 would be approximately 1.3 miles long and result in temporary disturbance of up to 6 acres of primarily sagebrush and already disturbed habitats.

Rail Spur

Impacts that would result from the construction of the Proposed Action rail spur include the following:

- Permanent loss of 8.5 acres of wildlife habitat, including 4 acres of wetlands that could be important for amphibians and other water-dependent wildlife (Appendix B, *Wetland Delineation Report*)
- Potential contamination of aquatic habitats and wetlands along Duck Creek if accidental spills occur

The 1.3-mile-long rail spur would connect the Proposed Action power plant site to the existing NNR, which runs along the western portion of Steptoe Valley. The rail spur would cross a large wetland complex with multiple Duck Creek channels and seasonal and permanent ponds that support local and migratory avian species, as well as potentially amphibians, reptiles, and mammals.

Although steps were taken in routing and designing the rail spur to reduce potential impacts (see Section 2.5.6, *Alternative Rail Spurs),* the rail spur would, nonetheless, be constructed within one of the least disturbed areas and within the most diverse and largest wetland complex in the Station project area. The impact to wildlife habitat from this feature could be substantial given that the wetland habitat is highly diverse and the ponds associated with these wetlands are the largest permanent to semi-permanent open water habitats available between Bassett Lake and Goshute Lake. These wetlands provide habitat for waterfowl, shorebirds, wading birds, amphibians, fish, big game, greater sage-grouse, and other avian and mammalian species. Several areas had surface water during the driest times of 2004 and 2005.

In addition to the direct removal of wetland and associated vegetation, alteration of drainage patterns and the flow of Duck Creek could reduce habitat quantity or quality for some species of wildlife. As discussed previously, the elevated noise levels during construction with machinery present could lead to wildlife avoidance.

The Proposed Action rail spur would cross and directly affect 1.3 miles of overall pronghorn range. While this area was not mapped as habitat for mule deer, the area would provide water for pronghorn, mule deer, and other large mammals that exist in the project area.

The Egan Resource Management Plan (BLM, 1984b) stresses the importance of retaining, improving, and protecting wetlands and riparian areas. NDOW also recommends protecting wetland areas as critical wildlife habitats (Crookshanks, 2005).

The connected action of White Pine County rebuilding the NNR tracks to Shafter would cause additional wildlife habitat disturbance during construction. The extent of permanent impacts to wildlife habitat would be dependent on the need for rail realignment, ROW widening, excavation/grading, access road construction, and extent of revegetation along the ROW following construction. Section 4.5.3.3.2, *NNR*, summarizes potential impacts that were described in an Environmental Assessment prepared by David Evans and Associates, Inc. (2002) for the restoration and operation of the NNR.

Access Roads

Approximately 12 miles of existing roads would be upgraded (converted to 10-foot-wide) and 35 miles of new access roads would be constructed for all Station facilities. Construction of additional access roads may result in similar types of direct and indirect impacts to wildlife as described for other Station facilities.

4.5.3.1.2 Operation Impacts

Potential long-term indirect impacts that would occur during the operation and maintenance of the Station Proposed Action are discussed in the following text.

Wildlife would continue to avoid the most heavily impacted portions of the Station project area and would need to move around the powerplant, substations, and portions of the rail spur and water supply system that have high noise from humans. vehicles, or machinery. This could affect dispersion and migration of mammal, amphibian, and reptile species. Once operational, the Proposed Action power plant would result in continued elevated noise levels at the site. However, the noise is anticipated to drop to near ambient levels very quickly (see Section 4.6.2, *Noise*) so long-term noise impacts to wildlife would not extend far from the power plant site itself. The rail spur and NNR system in Steptoe and Goshutes Valleys would experience frequent coal car train traffic, resulting in elevated noise levels and disturbance of wildlife. This effect would be limited to several hundred feet from the railroad. The disturbance could lead to increased energy expenditure, exposure to predation, reduced productivity, and increased risk of mortality from collision with the train.

Operational noise levels along the water supply system would not be elevated above ambient levels (see Section 4.6.2, *Noise*). Periodic human activity along the water pipeline could cause localized disturbance to wildlife along the water supply system and access roads. Maintenance of the water supply system

and other Station facilities during the operation phase could increase disturbance, especially if conducted during the most sensitive time periods. Disturbance in areas near roads could lead to increased wildlife-vehicle collisions.

The increased vehicular traffic along the water supply system, transmission lines, and distribution lines could result in a continual risk for increased spread of noxious/invasive weeds that could reduce native grass and forb species that wildlife require for foraging and cover requirements.

At all of the Station features, the increased soil compaction and altered topography could lead to localized degradation of wildlife habitat from erosion and alteration of natural hydrology patterns in Duck Creek and the numerous drainages affected. At the Proposed Action power plant, increased impervious surface could also adversely affect the flows and water quality in nearby small drainages.

The frequent train and vehicular traffic could increase the potential risk of contamination of Duck Creek from accidental spills. This risk could be minimized by implementation of BMPs described in Appendix A, *Best Management Practices,* that are an integral part of the proposed project.

The 75-acre surface area evaporation pond operated at the power plant may attract waterfowl and other birds (collectively, avifauna). Over time, the water quality of this pond has the potential to become a threat to avifauna as well as terrestrial wildlife if they gain entrance to the pond. BMPs that would be implemented to minimize or avoid these potential risks at the evaporation pond are described in Appendix A, *Best Management Practices.* All mitigation associated with biological resources and required for the Proposed Action, including monitoring and mitigating for potential adverse effects at the evaporation pond, is discussed in Section 4.5.3.1.3, *Mitigation.*

Long-term ground water pumping is predicted to potentially reduce flow in 12 perennial springs in Steptoe Valley (Figure 4.4-2), which could adversely affect aquatic species (fish, amphibians, and invertebrates) and wildlife that rely on the springs for water sources. All 12 springs that are anticipated to experience ground water declines support relatively common species of mollusks and aquatic insects. Two of the springs predicted to be susceptible support sensitive endemic springsnails and a third sensitive springsnail population was recorded just south of the 2-foot drawdown area. There are no recorded relict dace occurrences within the predicted cone of depression. Reduced spring discharge flows caused by Station water pumping could eliminate or reduce local springsnail populations. Loss of even one spring that supports springsnails could be substantial, particularly because Steptoe Valley springs are in degraded condition and susceptible to loss of biotic diversity.

Results of hydrology modeling indicate that there would be no effects to flows or water levels in the Duck Creek channels. Operation of the rail spur could increase the risk of water quality impacts in Duck Creek. The primary fish species in Duck Creek are non-native species. Potential contamination of Duck Creek and associated wetlands if accidental spills occurred could adversely affect aquatic species. BMPs would be implemented as part of the Station and NNR operation to minimize risk of contamination (see Appendix A, *Best Management Practices*).

The site-specific characteristics of the springs in terms of flow rates, elevation, and topography, along with the uncertainty in pumping rates and interaction with annual ground water supplies, make it impossible to predict the significance of impact. Monitoring would be necessary to measure degree of effect. Monitoring/potential mitigation measures associated with sensitive aquatic resources in springs were addressed previously in Section 4.4, *Ground Water Resources*.

The long-term operation of the transmission and distribution lines could increase the risk of avian collision, especially for waterfowl and waterbirds that have a heavy wing-loading and relatively poor flying agility. The risk of bird collision would be greatest where the three parallel lines cross the Duck Creek floodplain and along the section spanning the Egan Range. The portion over Duck Creek would be most important for the waterfowl and wading birds that utilize the wetlands along the floodplain. The NNR rail spur bridge may also present a potential obstacle for flying birds, particularly waterfowl. Towers with ground guy wires could present collision hazards to ground-nesting birds such as sage-grouse (see Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*). The presence of the distribution lines may also pose a risk to avian species because of the small wire diameters.

Although collision with transmission lines is typically not a major factor for raptors because of their keen vision, risk to raptors would be greatest where the proposed transmission line would cross the Egan Range where HWI (2005) documented raptor flight-lines, particularly near the ridgelines. Risk also could be greatest for inexperienced young fledglings that have not yet honed their flight skills.

The addition of approximately 163 transmission line towers would substantially increase perching opportunities for birds and create both vertical and linear habitat fragmentation. This could be a potentially adversely affect nesting birds, including sage-grouse, small mammals, and pronghorn kids that would be subjected to increased predation from raptors and corvids. Increased predation may reduce the local populations of certain species over time. To minimize this impact, perch deterrents would be installed on all transmission lines in Steptoe Valley and Butte Valley (see Chapter 2, *Description of Proposed Action and Alternatives).*

Avian electrocution risk would increase because of the operation of the distribution lines and the substations. This is of particular concern for raptors. Electrocution is typically not a significant concern for transmission lines because of the wide spacing between electrical phases (60-inch minimum separation is recommended [Avian Power Line Interaction Committee, 1996]) (see Chapter 2 for a description of the tower configuration).

The presence of new access roads and greater human activity may lead to increased potential for poaching of wildlife, particularly pronghorn, mule deer, and other mammals. Given the additional developments planned in Steptoe Valley and surrounding areas, it is likely that over time, habitats and populations could be more adversely impacted than at present.

4.5.3.1.3 Mitigation

Five monitoring/mitigation programs have been identified for biological resources

and are listed below. Because of the implementation of BMPs contained in Appendix A, no mitigation measures for vegetation, wildlife and aquatic resources, noxious weeds, or threatened, endangered, and sensitive species are anticipated to be necessary beyond those measures listed as follows:

- LS Power will contribute approximately $150,000 to a mitigation fund that will allow the BLM/NDOW to fund wildlife habitat restoration work for project-related habitat disturbances and to mitigate for project-related unavoidable adverse impacts to species. At $200 per acre (per acre habitat enhancement cost estimated by NDOW) approximately 750 acres of habitat enhancement projects could be completed with this level of funding.
- The effectiveness of perch deterrents on the electrical transmission lines associated with the water distribution system will be monitored. Based on monitoring results, design of the deterrents will be modified to minimize perching and nest building if this is not already being achieved. Nests on electrical lines associated with the water system will be removed annually, per authorization by the U. S. Fish and Wildlife Service.
- Water quality in the 75-acre evaporation pond will be tested regularly and water quality conditions monitored. Degree of pond use by waterfowl and other birds (collectively, avifauna) also will be monitored. Over time, water quality in the pond has the potential to become a threat to avifauna through increasing concentrations of total dissolved solids and salinity. Active mitigation will be initiated prior to when critical water quality levels that could adversely impact avifauna are reached. A number of mitigation techniques have been identified to keep avifauna from entering the evaporation pond. Possible mitigation techniques that would be considered to keep avifauna from entering the evaporation pond include electronic sound devices that mimic predatory bird calls, visual scare tactics, and propane noise cannons. These techniques have all been found to be successful under various conditions. Habituation can be a problem with some of these techniques. Once active mitigation is initiated, the effectiveness of the techniques used will be monitored. In the event the techniques listed above are not adequate to prevent most avian mortality, more advanced techniques, such as netting, may be employed.
- At the evaporation pond, exclusionary fencing and textured escape ramps are included in BMPs for the protection of terrestrial wildlife. The success of these exclusionary techniques will be monitored to determine if additional exclusionary mitigation is necessary to protect terrestrial species.
- Monitoring/potential mitigation measures associated with sensitive aquatic resources in springs were addressed previously under Ground Water Resources.

4.5.3.2 Alternative 1

4.5.3.2.1 Construction Impacts

General impacts on wildlife and wildlife habitat were described under the Proposed Action. Potential effects of Alternative 1 differ from the Proposed Action in terms of acreage of impact to separate wildlife habitats and specific locations of the

Station facilities. General impacts common to both the Proposed Action and Alternative 1 include the following:

- Ground-disturbing activities leading to loss of habitats and direct mortality
- Increased human presence; increased risk of avian collision
- Increased raptor and corvid predation
- Impacts on wildlife habitat from a potential increase in non-native weed species
- Habitat fragmentation

Impacts on wildlife habitat for each major and ancillary Station facility associated exclusively with Alternative 1 are described below and summarized in Table 4.5-2.

Overall, Alternative 1 would result in a permanent loss of 1,534 acres and temporary impacts to approximately 378 acres. As with the Proposed Action, most impacts would occur to the Sagebrush and Mixed Shrubland wildlife habitats. The major differences of Alternative 1 from the Proposed Action in terms of Station construction impacts are the following:

- The Alternative 1 power plant site would be farther south but the primary habitats affected would be similar.
- The rail spur would not cross Duck Creek but would cross substantially more wetland habitats but much less permanent and seasonally flooded aquatic habitats (Appendix B, *Wetland Delineation Report*).
- The water supply system would also bisect a major portion of the wet meadow habitat (Appendix B, *Wetland Delineation Report*).
- Length of transmission line ROWs

The following sections provide additional construction impact analysis for specific project features associated with Station Alternative 1.

Power Plant

Wildlife habitats permanently affected by the construction and operation of the Alternative 1 power plant include Big Sagebrush Shrubland, Mixed Great Basin Shrubland, Low Scrub and Grassland, Salt Desert Scrub, and Montane Sagebrush Shrubland. The primary habitats affected are Big Sagebrush Shrubland (718 acres), Mixed Great Basin Shrubland (303 acres), and Low Scrub and Grassland (227 acres). Critical habitat does not exist for mule deer within the Alternative 1 substation footprint. As described under the Station Proposed Action, direct impacts on wildlife and wildlife habitats would result from the construction of the power plant and associated access roads. Under Alternative 1, permanent impacts from construction would total 1,295 acres at the power plant site and 2.5 acres for the paved access road to the power plant. Construction of the Alternative 1 power plant would not directly impact wetland habitats but would affect six ephemeral drainages that could impact the availability of seasonal aquatic habitat for amphibians and other wildlife.

Medium-term to, permanent, direct, and indirect impacts would occur under Alternative 1 and would be similar to those described for the construction of the Proposed Action power plant. Similar impacts would also occur in terms of habitat loss and fragmentation.

Water Supply System

General ground-disturbing impacts to wildlife and wildlife habitat resulting from

construction of the water supply system would be similar to those described under the Proposed Action. A total of 11 acres of habitat would be permanently removed during construction of the water supply system (see Table 4.5-2). The habitat type that would be affected most by the Alternative 1 water pipeline alignment is Low Scrub and Grassland. Temporary impacts associated with well sites for the alternative water supply system would total 4 acres of Big Sagebrush Shrubland, Mixed Great Basin Shrubland, Salt Desert Scrub, and Low Scrub and Grassland habitats. Permanent impacts associated with well sites would total 0.2 acre.

Portions of the southern water pipeline ROW would lie within wetland habitats (Appendix B, *Wetland Delineation Report*). The pipeline would directly impact 14.5 acres (8.3 acres permanently and 6.2 acres temporarily) of wetland that are potentially under the jurisdiction of the USACE that could be used by a variety of wetland-dependent wildlife species. Depending on consultation with the USACE regarding the jurisdiction determination, appropriate Clean Water Act permits would be obtained and protective measures developed. The Alternative 1 water pipeline would cross three seasonal or ephemeral drainages connected to Duck Creek as it flows out of the Schell Creek Range. Most of these washes are dry except during the wettest times of the year. However, several were found to have suitable amphibian habitat and could be adversely affected by construction of the pipeline across them.

The Alternative 1 water pipeline ROW would directly eliminate several stands of Big Sagebrush Shrubland that provide high quality habitat for a number of native wildlife species that depend on sagebrush. The pygmy rabbit, which is a BLM sensitive species, was found within this alignment (discussed further in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*). No raptor or greater sage-grouse leks were identified that would be affected by the Alternative 1 water pipeline, although that could potentially change by the time construction occurs.

Electric Transmission Line

The Alternative 1 transmission line would span a smaller portion of Steptoe Valley than the Proposed Action because the line would cross the Egan Range and go slightly south to the Alternative 1 power plant location.

Direct impacts resulting from construction-related disturbance would be similar to those described for the Proposed Action.

The final calculations for habitats impacted by construction of the Alternative 1 transmission line can not be determined until the structure locations are determined. For purposes of this analysis, structure locations were inserted every 1,200 feet using GIS software to approximate what community types would likely be affected. This information is provided in Table 4.5-1. Based on this analysis the Alternative 1 transmission line ROWs would cross all habitat types, with the largest acreage in Big Sagebrush Shrubland, Montane Sagebrush Shrubland, and Low Scrub and Grassland.

Approximately 1 mile of the three parallel transmission line corridors crossing Steptoe Valley would result in approximately 0.03 acre of permanent and 11 acres of temporary impacts to wetland wildlife habitats. This assumes that 15 towers would be required to span the wetland (5 sites per corridor assuming a 900- to 1,100-foot span).

Temporary impacts on wildlife habitat would also include 3.3 acres for temporary access roads within the transmission corridor, 1.8 acres that would be temporarily impacted by pulling and tensioning sites used during construction, and 3 acres for the batch plant. The exact location of these sites has not been determined.

The Alternative 1 transmission route contains overall pronghorn and mule deer habitat. Big game impacts would be similar to those described for the Proposed Action in that construction could alter movement patterns, predation risk, and productivity because of the high disturbance levels.

Substations

Permanent impacts would total 77 acres at the Thirtymile Substation, 60 acres at the Alternative 1 Substation, 1.4 acres along a gravel access road to the Alternative 1 Substation, and 2.2 acres along a gravel access road to the Thirtymile Substation.

Substation construction and operation would permanently remove approximately 60 acres of pronghorn year-round range. Mule deer also exist in this area and would sustain impacts similar to those described for the power plant sites, but the acreage would be substantially smaller.

Electric Distribution Lines

Construction of the Alternative 1 distribution lines would temporarily impact approximately 5 acres of Big Sagebrush Shrubland wildlife habitat. Types of impacts associated with construction of the distribution lines would be similar to those described previously for the Proposed Action.

Rail Spur

Construction of the rail spur to transport coal to the Alternative 1 power plant site would permanently impact 24 acres of wildlife habitat (see Table 4.5-1), including approximately 4 acres of wetland. Construction of the Alternative 1 rail spur would result in an additional 15 acres of permanent disturbance compared to the Proposed Action. The wetlands that would be impacted by the Alternative 1 rail spur are, however, less diverse than habitat present at the Proposed Action rail spur crossing. Nonetheless, the loss of wetland would reduce habitat for migratory and local avian species, big game, mammals, and amphibians that may potentially occur in these areas.

Approximately 2.8 miles of pronghorn year-round range would be permanently impacted by the construction and subsequently the operation of the Alternative 1 rail spur. Mule deer habitats have not been mapped in this area; however, the presence of wetlands in a portion of the crossing means big game and mammals of all species likely frequent the area.

Access Roads

Twelve miles of existing access roads would be upgraded (converted to 10-foot width) and approximately 31.5 miles of additional roads would be constructed for the Station Alternative 1. Construction of additional access roads may result in similar types of direct and indirect impacts to wildlife as described for other Station facilities.

4.5.3.2.2 Operation Impacts

Operation impacts of Alternative 1 would be similar to those described for the

Proposed Action except as described in the following text.

The potential for powerline structures to result in increased predation of birds, small mammals, and pronghorn kids would be similar to that described for the Proposed Action as long as perch deterrents are installed as part of the proposed Station.

The Alternative 1 water supply system would cause no ground water drawdown (greater than 2 feet) in the vicinity of any known springs in Steptoe Valley (see Section 4.4, *Ground Water Resources*). Therefore, ground water pumping that would occur under Alternative 1 would not cause operational impacts to aquatic wildlife habitat at the springs.

The Alternative 1 rail spur would result in less impact to wildlife species in Steptoe Valley than the Proposed Action, since the spur would not span Duck Creek. Although the rail spur itself would have less operational impact than the Proposed Action, it would still result in the disturbance of big game and other wildlife and potentially lead to altered movement patterns of mammals. In addition, the existing NNR crosses Duck Creek and could, therefore, affect wildlife in a similar manner as described for the Proposed Action because of coal car train traffic.

Amphibians found within the Alternative 1 project area are associated with ephemeral creeks, spring habitats, Duck Creek, and wetlands. The rail spur and water supply system pose the greatest risk of adverse impacts to amphibian habitat near intermittent and seasonal drainages south of the Alternative 1 power plant site. Potential impacts on amphibian species would be similar to those described for the Proposed Action with the exception of potential ground water declines near springs, which would not occur under Alternative 1.

Potential contamination of Duck Creek would be less likely under Alternative 1 than the Proposed Action because of the greater distance of the rail spur from Duck Creek. However, future railroad traffic on the NNR may result in risk of contamination, the same as discussed above under the Proposed Action.

4.5.3.2.3 Mitigation

Mitigation would be the same as described for the Proposed Action in Section 4.5.3.1.3, *Mitigation.*

4.5.3.3 Connected Actions

4.5.3.3.1 SWIP

The two wildlife species of primary concern in the SWIP corridor are ferruginous hawks (nest sites) and sage-grouse (leks and wintering grounds) (BLM, 1993). Other wildlife species of concern that occur on relatively few of the SWIP corridor segments are elk, bighorn sheep, and desert tortoise (in southern Nevada). There is habitat for pronghorns, mule deer, bald eagles, long-billed curlews, sandhill cranes, wild horses, and wild burros on many of the SWIP corridor segments. However, the potential for impacts to these species from SWIP construction and operation was considered to be minimal, except in those areas with specific sensitive habitats (for example, pronghorn kidding grounds, raptor nesting habitat, and key water use areas) (BLM, 1993).

Wildlife habitats of special concern occur in that portion of the SWIP corridor near the proposed White Pine Energy Station transmission line corridor. They include kidding grounds and summer and winter habitat for pronghorns along the northern half of the proposed White Pine Energy

Station transmission line corridor. Wildlife habitats of special concern along the southern half of the proposed White Pine Energy Station transmission line corridor include winter, spring, and summer habitat for mule deer; spring habitat for elk; strutting and wintering grounds for sage-grouse; and nesting sites for ferruginous hawks (BLM, 1993).

Potential direct and indirect impacts to wildlife and their habitats from the SWIP are summarized in the following text.

Direct Impacts

The greatest direct impact on terrestrial wildlife from ground disturbing activities would be the loss of habitat caused by the construction of tower bases, access roads, spur roads, and substations (BLM, 1993). These impacts may be temporary or permanent, depending on the mitigation measures employed. Impacts to wide-ranging species, such as pronghorn, generally would be indiscernible. However, smaller, ground-dwelling species such as ground-nesting birds, desert tortoises, other amphibians, mammals, and reptiles may be substantially impacted by ground disturbing activities because of the destruction of burrows and trampling by vehicles (BLM, 1993).

Another potential direct impact on wildlife from SWIP construction and maintenance activities is the disturbance and displacement of animals because of increased noise levels and human activity (workers, vehicles) in the area. These effects would generally be temporary. However, disturbance of animals in crucial habitats such as critical wintering areas for elk, raptor nesting habitat, and sage-grouse breeding grounds would represent a more substantial impact on wildlife (BLM, 1993).

SWIP construction and maintenance activities also may impact aquatic habitats and species such as relict dace and Bonneville cutthroat trout because of the displacement of soils, increased potential for erosion, and sedimentation of aquatic habitat. However, the potential for impacts to aquatic habitats was determined to be slight, assuming the necessary stipulations and mitigation measures would be implemented (BLM, 1993).

Within the SWIP corridor, and primarily in Nevada, there could be potential direct impacts to desert tortoise habitat; sage-grouse (leks, wintering grounds); pronghorn kidding grounds; key water use areas; crucial raptor nesting habitat; and elk winter/spring habitat (BLM, 1993). Mitigation measures proposed include many of the same techniques as described previously for plants, but also timing construction to avoid periods of crucial wildlife activities.

Indirect Impacts

Increased public access, particularly where none existed previously, associated with the construction and maintenance of the SWIP would result in more opportunities for human activity and indirect impacts to wildlife and their habitat in these areas (BLM, 1993). This would result in increased disturbance and mortality of wildlife over the long term. Examples include increased legal and illegal take of game species (wildlife and fish), illegal hunting and harassment of raptors, and taking of tortoises as pets. Also, increased vehicle traffic with increased public access would result in additional mortalities of wildlife, wild horses, and wild burros from collisions with vehicles on roads. Off-road vehicle use of the SWIP and its access roads may result in further destruction of wildlife habitat.

Another source of potential indirect impact is associated with SWIP transmission lines and towers. These structures would provide additional perch sites for birds of prey such as ravens and golden eagles. These perch sites may result in increased predation by ravens on juvenile tortoises, and increased predation by golden eagles on sage-grouse in the vicinity of sage-grouse leks and wintering grounds (BLM, 1993).

Within the SWIP corridor, and primarily in Nevada, BLM (1993) determined that there could be potential indirect impacts to wildlife habitats for the following: desert tortoise habitat; ferruginous hawk habitat or nests; crucial raptor nesting habitat; burrowing owl nesting habitat; bald eagle nesting habitat; pronghorns (kidding grounds, crucial summer habitat, critical habitat, and winter range); deer (winter staging area, key winter range, crucial summer range, migration corridor/ migration); elk (critical winter range, calving area); bighorn habitat/movement corridor; and key water use areas.

4.5.3.3.2 NNR

NNR restoration and reinstatement of freight rail operations is not expected to have substantial adverse impacts on wildlife north of milepost 123 (David Evans and Associates, Inc., 2002). Threatened and endangered species are not known to occur near the NNR in this reach and other wildlife species would likely avoid the area during construction. NNR operations in the past have not affected migration and foraging habits of wildlife and would not be expected to in the future (David Evans and Associates, Inc., 2002). Implementation of an Integrated Pest Management Plan would minimize the potential for chemical treatment impacts to wetlands and riparian resources, and thus wildlife. BMPs recommended by David Evans and Associates, Inc. (2002) to minimize the potential for track-related fires, and thus impacts to wildlife habitat, were described in Section 4.5.1, *Vegetation*. South of milepost 123, fish and other aquatic life could be adversely affected by placing fill within the NNR Rail Line to stabilize the track bed between mileposts 123 and 128.4. This reach is south of the White Pine Energy Station Proposed Action and Alternative 1 rail spur sites (David Evans and Associates, Inc., 2002).

4.5.3.4 No Action Alternative

No Station-related impacts on wildlife and fisheries resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.5.4 Threatened, Endangered, Candidate, and Sensitive Species

The following sections describe anticipated direct and indirect effects to special status species, which consist of Designated Threatened, Endangered, Candidate, and Sensitive species, from the White Pine Energy Station Proposed Action and Alternative 1. The upgrade of the NNR to Shafter has been addressed in a separate Environmental Assessment prepared by David Evans and Associates, Inc. (2002) for White Pine County and is summarized in this section.

Any impacts to sagebrush-dominated shrublands, wetlands, and springs that are important for a variety of special status species are of special concern. Approximately 100 bird species and 70 mammal species are found within sagebrush habitats (Braun et al., 1976), including special status species such as the

greater sage-grouse, Brewer's sparrow, sage thrasher, sage sparrow, and pygmy rabbit. According to Partners in Flight (Neel, 1999), 63 percent of U.S. populations of shrubland and shrub-dependant species and 70 percent of grassland species are declining. In the intermountain West, more than 50 percent of grassland shrubland species are showing a downward trend (Sauer et al., 1996). Sagebrush Shrublands are considered a Priority A Habitat in Nevada according to the *Coordinated Implementation Plan for Bird Conservation in Nevada* (Nevada Steering Committee Intermountain Joint Venture, 2005). Priority A Habitat has "high overall rating: high to medium value to birds, high to medium threat, high to medium opportunity for protection, restoration, and or enhancement of habitat." According to the *Coordinated Implementation Plan for Bird Conservation in Nevada*, native sagebrush habitats are in serious decline throughout the Great Basin, along with sagebrush-obligate bird species such as the greater sage-grouse. Remaining sagebrush habitat in Nevada is often badly damaged because of over-grazing and introduction of exotic grasses and forbs (Nevada Steering Committee Intermountain Joint Venture, 2005).

In the arid Great Basin, wetland habitat and the springs serve a similar critical importance for several special status species that rely on water sources and wetland vegetation communities.

In terms of special status plants, the Station Proposed Action and Alternative 1 both cross areas with potential habitat for several of the special status species. The impact assessment in this EIS is based on the presence of suitable habitat within the proposed Station ROWs.

Construction, operation, and maintenance of Station facilities for the Proposed Action and Alternative 1 may result in direct, indirect, temporary, and permanent disturbances to special status species and their associated habitats. Impacts are characterized in the same manner as was described in Section 4.5.3, *Wildlife and Fisheries Resources.*

A summary of likelihood of effects to special status wildlife species for the Proposed Action and Alternative 1 is presented in Table 4.5-4. The following sections discuss the potential impacts resulting from the Proposed Action and Alternative 1.

4.5.4.1 Proposed Action

4.5.4.1.1 Impacts to Federally Listed Species

Construction and operation of the Station Proposed Action may affect, but is not likely to adversely affect the bald eagle—the only federally listed species that is endangered, threatened, or proposed for listing that is known to occur in the Station project area. The yellow-billed cuckoo, a federal candidate species listed by the FWS as potentially occurring in the area, does not occur in White Pine County and is not discussed further. A separate Biological Assessment (BA) submitted to the FWS per Section 7 consultation requirements provides detailed analysis for the bald eagle.

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

Scientific Name	Common Name	Status	Potential for Adverse Effect	
			Proposed Action	Alternative 1
Mammals				
Brachylagus idahoensis	Pygmy rabbit	NDOW-SSC BLM-S	Yes	Yes
Microdipodops megacephalus	Dark kangaroo mouse	NDOW-P	Yes	Yes
Sorex prebli	Preble's shrew	BLM-S	Unknown	Unknown
Myotis thysanoides	Fringed myotis	NDOW-P BLM-S	Unknown	Unknown
Corynorhinus townsendii	Townsend's big-eared bat	NDOW-P/S BLM-S	Unknown	Unknown
Antrozous pallidus	Pallid bat	NDOW-P BLM-S	Unknown	Unknown
Euderma maculatum	Spotted bat	NDOW-P/T BLM-S	Unknown	Unknown
Myotis californicus	California myotis	BLM-S	Unknown	Unknown
Myotis ciliolabrum	Western small footed myotis	BLM-S	Unknown	Unknown
Myotis lucifugus	Little brown myotis	BLM-S	Unknown	Unknown
Birds				
Haliaeetus leucocephalus	Bald eagle	FWS-Threatened	Yes	Yes
Centrocercus urophasianus	Greater sage-grouse	NDOW-SSC BLM-SSC	Yes	Yes
Aquila chrysaetos	Golden eagle	NDOW-P BLM-S	Unknown	Unknown
Accipiter gentiles	Northern goshawk	NDOW-P BLM-S	Unknown	Unknown
Buteo regalis	Ferruginous hawk	NDOW-P BLM-S	Yes	Yes
Buteo swainsoni	Swainson's hawk	NDOW-P BLM-S	Yes	Yes
Agelaius tricolor	Tricolored blackbird	BLM-S	No	No
Lanius ludovicianus	Loggerhead shrike	NDOW-S BLM-S	Yes	Yes
Spizella breweri	Brewer's sparrow	NDOW-S	Yes	Yes
Oreoscoptes montanus	Sage thrasher	NDOW-S	Yes	Yes

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

			Potential for Adverse Effect	
Scientific Name	**Common Name**	**Status**	**Proposed Action**	**Alternative 1**
Asio otus	Long-eared owl	NDOW-P BLM-S	Unknown	Unknown
Asio flammeus	Short-eared owl	NDOW-P BLM-S	Unknown	Unknown
Athene cunicularia	Burrowing owl	NDOW-P BLM-S	Yes	Yes
Baeolophus griseus	Juniper titmouse	BLM-S	Yes	Yes
Charadrius alexandrius	Snowy plover	BLM-S	No	No
Chlidonias niger	Black tern	BLM-S	No	No
Falco mexicanus	Prairie falcon	NDOW-P BLM-S	Yes	Yes
Falco peregrinus	Peregrine falcon	NDOW-P BLM-S	Yes	Yes
Grus canadensis	Sandhill crane	BLM-S	Yes	Yes
Icteria virens	Yellow-breasted chat	BLM-S	Yes	Yes
Ixobrychus exilis	Least bittern	BLM-S	Yes	Yes
Leucosticte atrata	Black rosy-finch	BLM-S	Yes	Yes
Gymnorhinus cyanocephalus	Pinyon jay	BLM-S	Yes	Yes
Melanerpes lewis	Lewis's woodpecker	BLM-S	Yes	Yes
Numenius americanus	Long-billed curlew	BLM-S	Yes	Yes
Pooecetes gramineus	Vesper sparrow	BLM-S	Yes	Yes
Sphyrapicus nuchalis	Red-naped sapsucker	BLM-S	Yes	Yes
Vireo vicinior	Gray vireo	BLM-S	Yes	Yes
Otus flammeolus	Flammulated owl	BLM-S	Yes	Yes
Dolichonyx oryzivorus	Bobolink	BLM-S	Yes	Yes
Reptiles				
Eumeces gilberti rubricaudatus	Western red-tailed skink	BLM-S	Unknown	Unknown
Phrynosoma douglassii	Short-horned lizard	BLM-S	Yes	Yes
Amphibians				
Rana pipiens	Northern leopard frog	NDOW-P BLM-S	Yes	Yes
Rana luteiventris	Columbia spotted frog	NDOW-P	Unknown	Unknown

TABLE 4.5-4

Potential for Adverse Effects to Special Status Wildlife Species from the White Pine Energy Station Proposed Action and Alternative 1

Scientific Name	Common Name	Status	Potential for Adverse Effect	
			Proposed Action	Alternative 1
Insects				
Polites sabuleto nigrescens	Dark sandhill skipper	BLM-S	Unknown	Unknown
Cercyonis pegala pluvialis	White River wood nymph	BLM-S	Unknown	Unknown
Euphydryas editha koreti	Koret's checkerspot	BLM-S	Unknown	Unknown
Phyciodes pascoensis arenacolor	Steptoe Valley crescentspot	BLM-S	Unknown	Unknown
Euphilotes bernadino minuta	Baking powder flat blue	BLM-S	Unknown	Unknown
Fish				
Relictus solitaries	Relict dace	NDOW-P/S BLM-S	Yes	Yes
Springsnails				
Eremopyrgus eganensis	Steptoe hydrobe	NNHP-S1	No	No
Oreohelix nevadensis	Schell Creek mountainsnail	NNHP-S1	No	No
Pyrgulopsis anguina	Longitudinal gland springsnail	NNHP-S1	No	No
Pyrgulopsis cruciglans	Transverse gland pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis landyei	Landyes pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis marcida	Hardy springsnail	NNHP-S1	No	No
Pyrgulopsis neritella	Neritiform Steptoe Ranch springsnail	NNHP-S1	No	No
Pyrgulopsis orbiculata	Sub-globose Steptoe Ranch pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis peculiaris	Bifid duct pyrg	BLM-S NNHP-S1	No	No
Pyrgulopsis planulata	Flat-topped Steptoe springsnail	BLM-S NNHP-S1	No	No
Pyrgulopsis sathos	White River Valley springsnail	NNHP-S1	No	No
Pyrgulopsis serrata	Northern Steptoe Springsnail	NNHP-S1	Yes	No
Pyrgulopsis sulcata	Southern Steptoe pyrg	NNHP-S1	No	No

Potential effects to bald eagles that could result from the Proposed Action include the following:

- Direct loss and fragmenting of foraging habitat and indirect reduction of prey
- Risk of collision or electrocution from Station transmission and distribution lines and cooling towers
- Disturbance from increased Station-induced noise and human activity
- Potential for ingestion of prey with elevated levels of contaminants or accidental spills
- Increased risk of illegal poaching as a result of increase in people in Steptoe Valley

Construction of the Station Proposed Action would result in the permanent loss of approximately 1,516 acres of habitat, including 4 acres of wetland habitat, primarily in Steptoe Valley (see Table 4.5-1). Some wetland habitat could also be lost or degraded over time during Station operations at 12 springs in Steptoe Valley because of ground water pumping reducing outflows. Implementation of ground water monitoring and mitigation described in Section 4.4, *Ground Water Resources,* should substantially reduce this risk.

None of the habitat that would be affected by the Proposed Action in Steptoe Valley consists of suitable bald eagle nesting habitat. There are no nesting bald eagles in Steptoe Valley and the nearest site near aquatic foraging habitat that has trees is in the vicinity of Basset Lake, 17 miles from the Proposed Action power plant site. Although approximately 3 miles of the Proposed Action transmission line ROW would be within or adjacent to pinyon pine/juniper woodlands in the Egan Range, this area is more than 4.5 miles from Duck Creek and consists of relatively short trees. Thus, the Proposed Action would not eliminate or adversely affect any bald eagle nesting habitat.

Station construction and operation effects on upland and wetland habitats could result in a reduction of waterfowl and small mammals that are utilized as a food source by wintering eagles. The loss of wetland habitat would be most substantial in the immediate vicinity of the Proposed Action rail spur that would cross Duck Creek. Given the comparatively small acreage involved relative to the availability in Steptoe Valley and the infrequent use of Steptoe Valley by wintering eagles, this impact should be discountable.

Increased risk of electrocution of bald eagles could result from the construction of the electrical distribution lines along the approximately 13-mile-long water pipeline and at the power plant and substations. Risk of electrocution is reduced if electrical phases are at least 60 inches apart as recommended by Avian Power Line Interaction Committee (1996, 2006). Based on pole and tower designs described in Chapter 2, some of the distribution line structures may not meet Avian Power Line Interaction Committee guidelines and could therefore represent an electrocution risk without the installment of perch deterrents or other measures, which would occur as described in Chapter 2. The 345-kV and 500-kV transmission lines would not pose an electrocution risk because of the large distance between electrical phases (see Chapter 2 for additional information on the tower and pole designs). It is possible that the addition of lattice towers could attract bald eagles to attempt to nest or roost.

Collisions with power lines occur infrequently because of the eagle's visual acuity. Occasionally, problems arise where bald eagles concentrate for foraging. The cooling towers and other facilities at the Proposed Action power plant site should present a minimal collision or electrocution risk because of the high visibility of the structures and level of noise and human activity that could make eagles avoid the immediate site.

The Proposed Action transmission lines that may pose the greatest risk of collisions would be in the 2.5-mile-long ROW that crosses Duck Creek and Steptoe Valley where waterfowl occur and the portion of the 500-kV transmission line that would span the Egan Range.

During the 5- to 6-year construction period, operation of heavy equipment and machinery, and human activity could cause eagles to avoid the vicinity. Noise levels of more than approximately 70 dBA have been shown to cause disturbance of some wildlife species. Thus, under most construction periods, this zone would likely extend approximately 660 feet from the noise source. Given the small area affected relative to the overall area in Steptoe Valley and the low level of bald eagle use in most of Steptoe Valley, the construction activities are not likely to cause substantial disturbance to eagles.

At the termination of power plant construction, 30 to 50 steam blowouts would take place over a period of several weeks. Each blowout would produce short-duration (several minutes) noise levels of approximately 166 dBA (15 to 30 dBA reduction with the installation of mufflers) at the site and 74 dBA at 3 miles from the site (see Section 4.6.2, *Noise*). The steam blowouts may result in disturbance of wildlife within this zone. The level of disturbance would depend on time of year that they occur (undetermined) and presence of bald eagles. In addition to disturbance, the loud noise during these events could lead to direct injury of bald eagles if they are present within approximately 2 miles of the site. Noise levels more than 92 dBA are potentially injurious to birds, although there is likely substantial variation among species. Impacts to bald eagles could be minimized by conducting the steam blowouts during August and September. Appendix A, *Best Management Practices*, contains a BMP that calls for an observer to be present to visually search for and make sure no bald eagles are present in the power plant area prior to steam blowouts.

During Station operation, the train traffic noise level is estimated to be 42 dBA Leq (1 hour) at 3 miles away from the power plant, which is below the existing noise levels of 45 to 50 dBA. Therefore, coal train traffic would not cause adverse noise impacts very far from the immediate rail spur and power plant site. Transformer noise from the Duck Creek Substation and Thirtymile Substation would not cause a noise impact. Noise from the three natural draft cooling towers and forced draft fan would not cause a noise impact.

There should be no effect to the small number of eagles that occasionally forage near Basset Lake and the McGill Tailings Reclamation Area.

Emissions from the Proposed Action power plant would not be expected to increase contaminant levels in nearby bald eagle habitats. There would be a small risk of water quality impacts in Duck Creek because of the rail spur crossing. Potential contamination of Duck Creek could reduce wildlife use and thus prey availability and could potentially bio-accumulate in prey species upon which bald eagles forage. Appendix A, *Best Management Practices*,

contains BMPs that are an integral part of the proposed Station that would minimize or avoid the potential for contaminant risk. The proximity of the evaporation pond to the power plant may discourage most wildlife, including bald eagles, from the site. Water quality monitoring would be conducted in the evaporation pond as mandated by state law, to confirm water quality conditions and to ensure that no wildlife toxicity problems occur. Evaporation pond monitoring and mitigation are described in Section 4.5.3.1.3, *Mitigation.* Appendix A contains BMPs directed at resource protection at the evaporation pond. Overall, the Proposed Action is likely to cause relatively minimal effects to the bald eagle because of the low level of use and distance from important habitats.

4.5.4.1.2 Impacts to BLM and State of Nevada Sensitive and Protected Wildlife and Fish Species

Bats

Seven species of bats are protected under Nevada State Law or are BLM-Sensitive species. Six of the seven Sensitive species have the potential to occur in the Station project area. There is no site-specific information available to assess impacts on bats. However, impacts to bat species could primarily occur from the elimination and temporary disturbance of sagebrush and other shrublands and wetland habitats that provide foraging habitat. Long-term degradation of these habitats could also occur if noxious and invasive weeds increase in response to the increased activity and land disturbance. Similarly, if contamination of aquatic habitats occurred it could lead to adverse effects on bats that forage there.

The Proposed Action power plant, rail spur, and water supply system do not contain breeding or hibernating habitats for bat species. However, the sites could be used by species that forage in sagebrush and grassland habitats, and in the case of the rail spur, near wetland and aquatic habitats. Thus, Station construction could directly reduce foraging habitat, particularly with the permanent loss of 485 acres of sagebrush (Montane and Big) and 4 acres of wetlands. The Proposed Action electric transmission lines would span a portion of the Egan Range that may contain roosting and breeding habitat for BLM and State-protected bat species.

Depending on the constituents of water in the evaporation pond in site runoff, there is a potential risk of contamination impacts to bats. Contamination could result in effects to BLM sensitive bat species. Monitoring evaporation pond water quality and implementing mitigation measures as necessary would minimize the potential for adverse impacts.

The primary potential permanent or temporary impact to bat species associated with the operation of the Proposed Action water supply system is the potential for ground water drawdown Approximately 12 springs are in areas where pumping for the Proposed Action may result in at least 2 feet (up to 6 feet) of ground water decline. If drawdown in spring flows does occur, it could adversely affect bat prey availability if insect populations are affected. Ground water and spring monitoring and mitigation as necessary (see Section 4.4, *Ground Water Resources*) should minimize the likelihood of this potential effect.

The Proposed Action rail spur would span the largest wetland complex within the Station project area. This area provides foraging habitat for BLM sensitive bat species that could or are known to occur within Steptoe Valley. Potential temporary

impacts associated with construction of the rail spur include: avoidance of the construction area and important watering source; increased noise and human presence; and impacts to foraging areas prior to reclamation of the area. Potential permanent effects during operation of the rail spur include increased noise; spread of noxious and invasive weeds into important foraging areas; increased risk of contamination to aquatic insect populations; and permanent loss of habitat in areas with bridge structures (approximately 9 acres). It is uncertain to what extent noise would impact bat activity. Level of noise impact would likely depend on the timing of the trains entering and leaving the plant site. (If this occurred only during the day, impacts may be minimal). Rehabilitation and use of the NNR alignment that parallels portions of Duck Creek could cause additional direct and indirect impacts to bats and their foraging habitats.

The primary potential impact resulting from the operation of the two substation sites is the collision/electrocution risk with associated structures and disturbance to foraging habitats. The Thirtymile Substation site is located adjacent to an ephemeral drainage, which may be used by sensitive bat species.

The upgrade of 12 miles of existing access roads and construction of 35 miles (16 acres) of access roads would increase habitat fragmentation within Steptoe and Butte Valleys, increase risk of spread of noxious and invasive weeds, and increase human presence and disturbance in the area both during and following construction (maintenance activities). These effects could all contribute to the loss of bat habitat and increase disturbance threats.

Bird Species

No targeted surveys were conducted for special status avian species, except ferruginous hawk and the greater sage-grouse. Therefore, potential impacts to the majority of the avian special status species were assessed by evaluating habitat loss/ disturbance and other project effects. Section 4.5.3, *Wildlife and Fisheries Resources* discusses general types of wildlife impacts relative to reported occurrences and the presence of potential habitat in the Station project area vicinity. Potential permanent impacts to special status avian species and their habitats common to both the Proposed Action and Alternative 1 from Station construction, operation, and maintenance include the following:

- Loss of foraging, breeding, summer, and wintering habitats within Station footprints for the power plant sites, substation sites, and newly constructed access roads
- Increased potential for spread of noxious and invasive weed species that may lead to a reduction in forage for avian species of concern
- Increased habitat fragmentation within the affected portions of Steptoe and Butte Valleys
- Risk of collision associated with the electric transmission and distribution lines (including guy wires for poles), power plant and substation facilities
- Increased risk of contamination from the evaporation pond associated with the power plant site and the rail spur over Duck Creek
- Increased predation as a result of increased perching opportunities for

birds of prey (distribution lines, substations, well fields)

- Impacts to surface waters and springs that provide foraging habitats; increased human disturbance and noise
- Increased potential for poaching and hunting.

The MTBA requires that surveys be conducted prior to construction to prevent the inadvertent take of nests or nesting species protected under the MTBA. Surveys would be conducted prior to construction to comply with this federal law.

Avian species of special concern for the Station project area are primarily associated with sagebrush habitats. Approximately 1,226 acres of Big Sagebrush, Montane Sagebrush, and Mixed Great Basin Shrublands habitat types would be permanently impacted by the Proposed Action (see Table 4.5-10). Species found in sagebrush habitats are identified in Section 3.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*. Some of these species include the greater sage-grouse, ferruginous hawk, Brewer's sparrow, and the sage thrasher. Impacts to the greater sage-grouse and ferruginous hawk are described in detail later in this section. The Moriah Ranches Seeding Project (described in Section 2.2.6, *Enhancement Measures*) would be implemented to create a habitat mosaic that provides cover for sage-grouse and other species on 700 to 900 acres. Islands of big sagebrush cover would be identified for non-disturbance and the understory component of this habitat would be restored by mechanical treatment.

Sagebrush is a difficult species to restore to the landscape. As a result, sagebrush habitat may take an extended period of time to re-establish and may lead to long-term impacts to sagebrush affiliated species throughout the Station project area.

Loss of wetland habitat could adversely affect several special status species as well, such as sandhill cranes, hawks, and owls.

Approximately 4 acres of wetland would be permanently affected by the Proposed Action and could reduce habitat for the sandhill crane and the various hawk and owl species that could forage for small mammals there.

Construction activity and noise could result in the avoidance of areas near construction sites and, if occurring during the nesting season, could result in the failure of nests or direct loss of nests. This would be minimized by conducting preconstruction surveys as required by the MBTA (see Appendix A, *Best Management Practices).*

Permanent impacts associated with operation and maintenance of these Station features include the following:

- Risk of collision
- Increased human presence, and therefore noise in the Station area
- Fragmentation of habitat-both aerially and at ground level
- Disturbance to suitable nesting, brooding, foraging, and wintering habitats
- Increased predation on neotropical birds as a result of increased perching opportunities for corvids and other avian predators, especially where lattice towers are utilized

The estimated acres of permanent and temporary impacts by Station feature and

structure for the proposed action are described in Section 4.5.1, Vegetation and Section 4.5.3, *Wildlife and Fisheries Resources*. Table 4.5-1 summarizes permanent and temporary impacts by Station feature for the Proposed Action. The Proposed Action electric transmission lines would span a portion of the Egan Range and could result in elimination of suitable nesting and breeding habitat for BLM and State Protected raptor and avian species.

Greater Sage-grouse

Potential impacts to greater sage-grouse resulting from construction and operation of the Proposed Action would be similar to those described in the preceding text for special status avian species. Additional details are provided below for impacts that may apply to sage-grouse.

According to the vegetation mapping done for the proposed Station as described in Section 3.5.1, *Vegetation*, approximately 9 miles of the proposed transmission lines ROW within the SWIP corridor are located in sagebrush shrublands vegetation. Most of the Proposed Action water pipeline corridor is located in Big Sagebrush Shrubland or Mixed Great Basin Shrubland vegetation communities as defined in Section 3.5.1.1, *Vegetation Communities.*

As noted previously, a total of approximately 1,226 acres of potentially suitable sagebrush habitat types would be permanently impacted by construction of the Proposed Action, primarily in Steptoe Valley but also in Butte Valley (see Figure 3.5-2 and Table 4.5-1). One lek site (last active in 2005) would be directly impacted by construction and operation of the Proposed Action transmission line. There are five other historic leks within 2 miles of the Proposed Action transmission line ROW. While these leks were not active in 2006 they still provide suitable lek and breeding habitat for sage-grouse. Even after the revegetation of temporarily disturbed areas, the fragmented sagebrush habitat would likely be less suitable for potential nesting and foraging habitat in the future. According to Partners in Flight (Neel, 1999), greater sage-grouse and sharp-tailed grouse need several thousand hectares of adequately connected habitat to maintain self-sustaining populations.

Another potential adverse indirect effect of the Proposed Action is increased predation by raptors caused by the increased perch sites on transmission and distribution line structures. Sage-grouse are particularly vulnerable when strutting for female grouse on sites, known as leks. According to the *Greater Sage-grouse Conservation Plan for Nevada and Eastern California* (Connelly et al., 2004), sage-grouse will often nest and brood within 4 miles of an active lek site. Transmission towers may create both surface and vertical habitat fragmentation for the greater sage-grouse. As a result, construction and operation of Station features within 4 miles of leks may lead to loss and degradation of nesting habitat and permanent grouse abandonment of breeding habitats or direct mortality through increased predation. The use of perch deterrents on transmission and distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Sage-grouse have been documented to be negatively impacted by power lines through accidental contact while in flight and through predation by raptors that use power line poles as perches (Graul 1980, Ellis 1984, 1987). Studies show that sage-grouse use of areas near power lines, as

measured by pellet transects, increases as distance from the power line increases for up to 600 m (Braun, unpubl. data in Braun 1998). Power lines fragment habitats useful to sage-grouse and reduce their security in linear strips up to 1 kilometer wide. Estimates of areas impacted by power lines are not available at this time. Braun (1998) indicates that "it is possible to markedly reduce the impact of power lines upon sage-grouse through elimination of raptor perch sites." As noted previously, the use of perch deterrents on transmission and distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Operation of the Proposed Action transmission line would result in fragmentation of greater sage-grouse habitat. Consequences of fragmentation can vary, but may include competition for fewer suitable nesting sites, reduced food supplies, the isolation of breeding habitat from brood-rearing areas and leks from nesting habitat. Such outcomes may lead to lower reproduction rates for sage-grouse and other wildlife species that use this habitat for all or part of their life cycle (BLM, 2004).

In all, there are six known leks within 2 miles of the Station features that could be subjected to adverse impacts. The closest greater sage-grouse lek to the electric transmission line and distribution line is Log Canyon, N located 2,085 feet west of the transmission line corridor. Log Canyon was not active in 2006, but was active in 2005. The Log Canyon, N lek may be adversely impacted by construction and operation of the Proposed Action transmission lines. The lines would fragment surrounding habitats, and would potentially lead to an increase in raptor predation. There are five additional leks within 2 miles of the Proposed Action transmission lines that could be adversely affected by increased predation. In addition because future lek and nesting activity could occur in the sagebrush habitats anywhere in the valleys, suitable habitat within 2 miles of the transmission lines represents the area within which sage-grouse would be most directly affected. This impact would be minimized through installation of perch deterrents on the structures, as described under the Proposed Action (see Chapter 2). However, even with these measures it is likely that sage-grouse would avoid these lek sites in the future.

No known grouse leks are located within the Proposed Action power plant or water supply system footprints; however, sage-grouse may inhabit these areas because of the presence of sagebrush habitat.

Temporary and permanent impacts to sage-grouse from the construction and operation of the Proposed Action water supply system would be similar to those described previously for special status avian impacts. Riparian and aquatic habitats are frequently used by greater sage-grouse. A potential long-term indirect impact to the greater sage-grouse associated with the operation of the Proposed Action water supply system is the potential for ground water drawdown as a result of well pumping (see Section 4.4, *Ground Water Resources*). Twelve springs, including two that had sage-grouse sign detected during 2005, are in areas where pumping for the Proposed Action may result in at least 2 feet (up to 6 feet) of ground water decline. This potential for drawdown in surface waters may adversely affect greater sage-grouse inhabiting and foraging in aquatic/wetland habitats within Steptoe Valley at various

times throughout the year, particularly in spring and summer months.

The Proposed Action rail spur location spans the largest wetland complex within the project area. This area provides foraging habitat for greater sage-grouse. Potential impacts are similar to those described under the water supply system and under the special status avian impacts section. The loss of wetland habitats could also reduce habitat for foraging sage-grouse.

Ferruginous Hawks

No active ferruginous hawk nests are known to exist in the Station project area. Suitable nesting habitat exists only in the juniper stringers within the proposed transmission line corridor on the east and west flanks of the Egan Range and portions of Butte Valley. Suitable foraging habitat exists throughout Steptoe and Butte Valleys. The Proposed Action and Alternative 1 would have similar impacts to this species and, therefore, the following discussion applies to both. Under both the Proposed Action and Alternative 1, preconstruction surveys would be necessary to avoid potentially affecting active nests and complying with the MBTA (see Appendix A, *Best Management Practices*).

Ferruginous hawks would likely avoid all construction areas at all Station facilities (see previous discussion of bald eagle for additional information). The permanent loss of grassland, wetland, and shrubland habitat would reduce overall foraging habitat quality in Steptoe Valley.

The proposed Station transmission line would span approximately 17 acres of pinyon-juniper woodlands (see Figure 3.5-1 and Table 4.5-1), which may provide suitable nesting habitat for this species. The primary potential nesting habitats are located on the lower slopes of the Egan Range. The actual area of permanent impact in this community type, however, is approximately 0.03 acre. Potential temporary effects in the vicinity of transmission lines include avoidance of the project area, increased noise, and increased human presence. Because ferruginous hawks are highly sensitive to disturbance during the nesting season, the increased activity could eliminate nesting potential in the immediate area of the transmission line. No other Station facilities associated with the Proposed Action would directly affect potential nesting habitat (juniper stringers). Surveys would be constructed prior to construction to avoid impacts to nesting individuals as described in Appendix A, *Best Management Practices*. Permanent habitat impacts from Proposed Action construction and operation would include loss of foraging habitat within tower structure footprints; degradation of foraging habitat from the introduction of noxious and invasive weed species; habitat fragmentation; and increased risk of collision with power lines. The presence of the transmission and distribution lines would increase collision risk in the Station project area, but conversely would benefit this species by providing additional perches from which to hunt. Potential impacts caused by the water supply system would be similar to those described previously for special status avian species. The primary potential impact associated with this Station feature would be collision risk resulting from the well site distribution lines and increased perching opportunities (discussed above under distribution lines). The use of perch deterrents on distribution line structures as described in Chapter 2 should reduce the potential for increased direct mortality because of increased predation by raptors.

Other Raptor Species

Suitable habitat exists for a number of raptor species considered to be special status species in the Station project area, including the golden eagle and prairie falcon. Neither of these species was found nesting in the Proposed Action or Alternative 1 Station project areas during field surveys. However, surveys conducted by Hawkwatch International in the Egan and Schell Creek Ranges documented many sightings of golden eagles and a small number of prairie falcons in the area (HWI 2005). Potential impacts described previously for ferruginous hawk also apply to these species and to the other raptors (northern goshawk and Swainson's hawk) with the potential to occur in the Station project area.

Pygmy Rabbits

Pygmy rabbits occur in Steptoe Valley and could be affected by the direct loss of sagebrush habitat, disturbance during Station construction, and increased raptor predation. No pygmy rabbits were observed in the Proposed Action project area, so direct impacts may be minimal. However, suitable sagebrush habitat for pygmy rabbits exists within the Proposed Action power plant, transmission lines, and water supply system ROWs. The primary Proposed Action features that would potentially lead to permanent impacts to these species are the power plant footprints and the water supply system.

Loss of sagebrush habitat according to Station features is summarized in Table 4.5-1. The Proposed Action power plant would have the largest extent of permanent impacts of all project features on sagebrush habitat at 390 acres. More than 60 acres of potential pygmy rabbit habitat would be temporarily affected by the Proposed Action water supply system and approximately 8 acres would be permanently affected by construction of access roads to the water supply system. It is in this area of Proposed Action features that the potential for temporary and permanent impacts is greatest. No suitable pygmy rabbit habitat occurs near the Proposed Action rail spur.

Sagebrush is a difficult species to restore to the landscape. As a result, sagebrush habitat may take an extended period of time to re-establish and may lead to long-term impacts to pygmy rabbits and other sagebrush affiliated species.

Small Mammals

The two special status small mammal species that occur in the Station project area are the dark kangaroo mouse and the Preble's shrew. Potential impacts to these species from the Proposed Action and Alternative 1 are similar to those described for the pygmy rabbit since they are ground dwelling, burrowing species. Approximately 485 acres of sagebrush habitat and 4 acres of wetland habitat would be permanently impacted by the Proposed Action, as compared to 884 acres of sagebrush habitat and 6 acres of wetland habitat permanently impacted by Alternative 1 (see Tables 4.5-1 and 4.5-2).

Reptiles

Horned lizards were ubiquitous throughout both the Proposed Action and Alternative 1 project areas. Potential impacts to these species are similar to those described for small mammals and pygmy rabbits. These species are more susceptible to impacts because of their small size, and their inability to move long distances from disturbance. The construction phase for all Station features would likely adversely affect these species. Pulling cable and dragging

equipment may lead to the inadvertent take of these species and destruction of their habitats. Operation of the evaporation pond and use of access roads may also lead to inadvertent take and contamination of these species and their food chain.

Amphibians

Construction of the Proposed Action would result in the direct loss of 4 acres of wetlands, primarily along Duck Creek. In addition, numerous drainages that carry water during high flow events and spring runoff would be directly impacted by the Proposed Action (see Section 4.5.3, *Wildlife and Fisheries Resources*). These impacts to wetlands and small drainages could directly impact special status amphibians—northern leopard frogs—from direct loss of seasonal aquatic sites and alteration of flow patterns. Long-term ground water pumping during Station operation could also reduce flows and water levels at 12 springs in Steptoe Valley, which could eliminate or adversely affect habitat for northern leopard frog or Columbia spotted frog, if they occur in the area. Operation of the Proposed Action rail spur could increase risk of contamination of aquatic habitat along Duck Creek. Vehicular access along access roads of the water supply system could contribute to erosion or contamination of the seasonal or intermittent steams that could be used by these two species.

The evaporation pond could attract special status species of amphibians and could potentially lead to direct mortality from ingestion of contaminants. BMPs in Appendix A and mitigation described in Section 4.5.3.1.3, *Mitigation*, describe measures for monitoring and avoiding or minimizing the potential for evaporation pond impacts to terrestrial wildlife.

Aquatic Species of Concern

One species of special status aquatic springsnail (the Northern Steptoe Springsnail) occurs in ten springs in Steptoe Valley, including three of the 12 springs that are at risk of experiencing more than 2 feet of ground water drawdown (see discussion and figures in Section 4.4, *Ground Water Resources).* Reduced flows and water levels at these springs could eliminate populations of this species, which have extremely restricted distributions.

None of the 12 springs predicted to be susceptible to ground water drawdown under the Proposed Action were found to support relict dace during surveys conducted at 45 springs in the Station vicinity. It is unlikely that Duck Creek supports relict dace. As such, there is minimal potential for impacts to relict dace.

4.5.4.1.3 Impacts to BLM and State of Nevada Sensitive and Protected Plant Species

Ground-disturbing activities associated with the Station Proposed Action and Alternative 1 have the potential to directly disturb populations of special status plant species. Because surveys were not conducted for special status plant species, potential Station effects are summarized based on the presence of potential habitat observed during 2005 field examinations. Potential habitat for eight special status plant species would be affected by Proposed Action features. They include meadow milkvetch, dainty moonwort, White River catseye, sunnyside green gentian, sand cholla, Parish phacelia, Ute ladies'-tresses orchid, and woolly-head clover. A ninth species—Monte Neva paintbrush—occurs at Monte Neva Hot Springs, which would not be affected by the Station but should be considered throughout Station construction because of its proximity to the Station project area. By far, the

Proposed Action water pipeline, rail spur, and transmission line ROWs present the greatest potential risk of direct impacts to special status plant species because they cross a diversity of habitats, including wetlands and wet meadows.

During Station operation, ground water pumping could reduce flows and water levels at 12 springs in Steptoe Valley. Reduced flows could adversely affect special status plants, including meadow milkvetch, dainty moonwort, Parish phacelia, Ute ladies'-tresses orchid, and woolly-head clover.

4.5.4.1.4 Mitigation

Mitigation measures for biological resources are directed primarily at wildlife habitat and wildlife resources, but they cover the range of potential effects on all biological resources addressed in the EIS. For this reason, all mitigation associated with biological resources and required for the Proposed Action is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.4.2 Alternative 1

4.5.4.2.1 Impacts to Federally Listed Species

Potential impacts to bald eagles under Alternative 1 would be similar to the Proposed Action, with the following exceptions. The Alternative 1 rail spur would not cross Duck Creek, so less high-quality wetland habitat would be affected. Assuming that the NNR is rehabilitated and used to access the Alternative 1 power plant site, the potential risk of contamination in Duck Creek and associated wetlands would be similar to that of the Proposed Action. Pumping from the Alternative 1 wellfield would not affect wetland habitat associated with any of the springs in Steptoe Valley, thus reducing the potential for long-term effects to the bald eagle prey base.

The location of the power plant and water pipeline under Alternative 1 would be somewhat closer to the Basset Lake bald eagle foraging area than under the Proposed Action and could potentially have a greater impact on bald eagles relative to the Proposed Action. However, it would still be more than 1 mile from the area, so noise disturbance impacts should be minimal.

As with the Proposed Action, the distribution line poles may pose an electrocution risk to bald eagles that may perch on them. Use of perch deterrents as described in Chapter 2 should reduce the potential for this risk to occur. There is no obvious difference in terms of relative risk between Alternative 1 and the Proposed Action.

4.5.4.2.2 Impacts to BLM and State of Nevada Sensitive and Protected Wildlife and Fish Species

Bats

Potential impacts described for the Proposed Action are similar to those for Alternative 1 except for the water supply system and rail spur.

No springs would be affected by ground water pumping under Alternative 1 (see Section 4.4, *Ground Water Resources*), thus eliminating the risk of impacts to bat species that utilize the springs in Steptoe Valley. The water supply system ROW for Alternative 1 would temporarily affect 13 acres and permanently affect 2 acres of wetlands, not including associated wet meadows, which would reduce foraging habitats. Overall habitat impacts are summarized in Table 4.5-2 of the discussion of general vegetation community impacts in Section 4.5.1, *Vegetation*. Impacts to bat

foraging habitats are expected to be less than for the Proposed Action because of a smaller potential for ground water drawdown and a lack of springs in the Alternative 1 project area.

The Alternative 1 rail spur would not cross Duck Creek, so the potential for contamination adversely affecting the bat prey base and foraging habitat quality is less than for the Proposed Action. However, the rail spur would cross wetlands associated with Duck Creek and could still affect bat foraging habitats there. Even so, the NNR that the rail spur would connect with crosses Duck Creek, so adverse impacts from spills and contamination could potentially occur there.

Bird Species

As discussed for the Proposed Action, potential impacts to special status avian species would largely be a function of impacts to sagebrush and wetland habitats. Alternative 1 would result in greater impacts to sagebrush habitats compared to the Proposed Action, although some of the highest quality sagebrush habitat would be directly affected by the Alternative 1 water supply system. Potential wetland impacts would be greater for Alternative 1, but the high quality wetlands complex associated with Duck Creek would not be affected, assuming the NNR does not need major rehabilitation in that area.

Greater Sage-Grouse

Potential impacts to sage-grouse from Alternative 1 would be similar to those described for the Proposed Action with the following exceptions. Six would potentially be affected.

Alternative 1 would affect a higher percentage of sage-grouse habitat compared to the Proposed Action. Approximately 5 to 7 miles of the Alternative 1 water pipeline alignment and approximately 4 to 5 miles of the Alternative 1 distribution line would cross Big Sagebrush Shrubland or Mixed Great Basin Shrubland (see Figure 3.5-2).

Because the Alternative 1 transmission line length would be less than for the Proposed Action, the potential for increased predation by raptors may be less than for the Proposed Action. Perch deterrents would be used for the Alternative 1 transmission and electric distribution line towers to reduce the potential for predation by raptors, the same as noted for the Proposed Action.

No long-term impacts to wetland habitat associated with springs in Steptoe Valley would occur under Alternative 1 because ground water pumping under Alternative 1 would not reduce flows at any of the sites.

Ferruginous Hawks

Because ferruginous hawks were not found in the Alternative 1 project area, potential impacts associated with Station construction and operation would be similar to those described for the Proposed Action. The potential for primary effects would be from the portion of transmission line that would be located in the pinyon-juniper woodlands on the lower slopes of the Egan Range.

Pygmy Rabbits

Potential impacts to pygmy rabbits from the Alternative 1 features are similar to those described for the Proposed Action with one exception. Some high-quality habitat and several pygmy rabbits were observed in the Alternative 1 water supply system ROW during 2005 surveys. As a result, construction of the water supply system to the Alternative 1 power plant site may have greater impacts to pygmy rabbits than the Proposed Action.

Approximately 884 acres of potential pygmy rabbit sagebrush habitat would be permanently impacted under Alternative 1, the majority of which is associated with the power plant footprint. Noxious weed infestations in this area also contribute to habitat degradation for this species.

Amphibians

Impacts to special status species of amphibians would be less under Alternative 1 than the Proposed Action because the rail spur would not cross Duck Creek and no springs would be affected by ground water pumping.

Aquatic Species of Concern

No springs would be affected by ground water pumping under Alternative 1, so no impacts to special status aquatic species of concern would occur.

4.5.4.2.3 Impacts to BLM and State of Nevada Sensitive and Protected Plant Species

Potential effects for Alternative 1 would be similar as those for the Proposed Action. Because of the more extensive wet meadow habitat that would be crossed by the water supply system and rail spur under Alternative 1, there may be a greater potential for one or more of the special status plant species to occur there.

4.5.4.2.4 Mitigation

All mitigation associated with biological resources and required for Alternative 1 is discussed in Section 4.5.3, *Wildlife and Fisheries Resources*, under the heading 4.5.3.1.3, *Mitigation.*

4.5.4.3 Connected Actions

4.5.4.3.1 SWIP

See Section 4.5.1, *Vegetation*, and Section 4.5.3, *Wildlife and Fisheries Resources*, regarding plant and wildlife species of concern and potential effects of the SWIP on these resources as reported by the BLM (1993).

4.5.4.3.2 NNR

See Section 4.5.1, *Vegetation*, and Section 4.5.3, *Wildlife and Fisheries Resources*, regarding plant and wildlife species of concern and potential effects of the NNR on these resources as reported by David Evans and Associates, Inc. (2002).

4.5.4.4 No Action Alternative

No Station-related impacts on threatened, endangered, candidate, or sensitive species would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.6 Air Quality and Noise

4.6.1 Air Quality

This section describes potential impacts of air pollutant emissions from the White Pine Energy Station on ambient air quality. The proposed Station would involve two distinct phases that have the potential for impacting ambient air quality. The first phase is the construction of the power plant and ancillary facilities and the second phase is operation of the power plant. New ancillary facilities required for the power plant include electric transmission facilities, water supply system, rail spur, and access roads. The following analysis is based on the build-up of three pulverized coal fired units with a total capacity of 1,590 MW.

4.6.1.1 Effects of Air Pollution

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations (for example, asthmatics, children, and the elderly) against the effects of the pollutants noted below. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA has established NAAQS for six principal pollutants, which are called "criteria" pollutants: particulate matter, carbon monoxide, ozone, sulfur dioxide, nitrogen dioxide, and lead.

In addition, the Clean Air Act establishes the allowable "PSD increment," which is the maximum allowable deterioration of air quality against baseline conditions, regardless of the magnitude of those baseline conditions. In other words, whether an area has pristine background conditions or has significantly impacted air quality, the Clean Air Act specifies procedures to determine whether impact of sources will cause significant deterioration versus conditions existing as of trigger dates determined by the Clean Air Act.

Therefore, the analyses conducted to predict the impact of the Station on air quality include evaluation of cumulative impacts of the Station plus surrounding sources on both NAAQS and PSD increment. These analyses are noted below.

4.6.1.1.1 Particulate Matter

Particulate matter is a complex mixture of extremely small particles and liquid droplets. EPA is concerned about particles that are 10 micrometers in diameter or smaller (referred to as PM_{10}) because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.

4.6.1.1.2 Carbon Monoxide

Carbon monoxide can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. The health threat from lower levels of carbon monoxide is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to carbon monoxide at low levels may cause chest pain and reduce that person's ability to exercise. Repeated exposures may contribute to other cardiovascular effects. Even healthy people can be affected by high levels of carbon monoxide. People who breathe high levels of carbon monoxide can develop vision problems,

reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, carbon monoxide is poisonous and can cause death.

4.6.1.1.3 Ozone

Ground level ozone is formed when nitrogen oxides and volatile organic compounds react in the presence of sunlight. Children, people with lung diseases such as asthma, and people who work or exercise outside are susceptible to adverse effects such as damage to lung tissue and reduction in lung function. Ozone can be transported by wind currents and cause health impacts far from original sources. Millions of Americans live in areas that do not meet the health standards for ozone. Other impacts from ozone include damaged vegetation and reduced crop yields.

4.6.1.1.4 Sulfur Dioxide and Nitrogen Oxides

Peak levels of sulfur dioxide in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of sulfur dioxide gas and particles cause respiratory illness and aggravate existing heart disease. Sulfur dioxide reacts with other chemicals in the air to form tiny sulfate particles. When these are breathed, they gather in the lungs and are associated with increased respiratory symptoms and disease, difficulty in breathing, and premature death. Haze occurs when light is scattered or absorbed by particles and gases in the air. Sulfate particles are the major cause of reduced visibility in many parts of the U.S., including our national parks.

Sulfur dioxide and nitrogen oxides react with other substances in the air to form acids, which fall to earth as rain, fog, snow, or dry particles. Some may be carried by the wind for hundreds of miles. Acid rain damages forests and crops, changes the makeup of soil, and makes lakes and streams acidic and unsuitable for fish. Continued exposure over a long time changes the natural variety of plants and animals in an ecosystem. Sulfur dioxide accelerates the decay of building materials and paints, including irreplaceable monuments, statues, and sculptures that are part of our nation's cultural heritage.

4.6.1.1.5 Lead

People, animals, and fish are mainly exposed to lead by breathing and ingesting it in food, water, soil, or dust. Lead accumulates in the blood, bones, muscles, and fat. Infants and young children are especially sensitive to even low levels of lead. Lead causes damage to the kidneys, liver, brain and nerves, and other organs. Exposure to lead may also lead to osteoporosis (brittle bone disease) and reproductive disorders. Excessive exposure to lead causes seizures, mental retardation, behavioral disorders, memory problems, and mood changes. Low levels of lead damage the brain and nerves in fetuses and young children, resulting in learning deficits and a lowered intelligence quotient. Lead exposure causes high blood pressure and increases heart disease, especially in men. Lead exposure may also lead to anemia. Wild and domestic animals can ingest lead while grazing. They experience the same kind of effects as people who are exposed to lead. Low concentrations of lead can slow down vegetation growth near industrial facilities. Lead can enter water systems through runoff and from sewage and industrial waste streams. Elevated levels of lead in the water can cause reproductive damage in some aquatic life and cause blood and neurological changes in fish and other aquatic animals.

4.6.1.2 Proposed Action Construction Impacts

Construction emissions sources include fugitive dust emissions from excavation and

earthwork. The Station Proposed Action would have construction emissions associated with the construction of pipeline for water supply, power plant, coal handling facilities, solid waste disposal facilities, and substations. During construction, temporary and localized increases in ambient concentrations of nitrogen oxides, carbon monoxide, sulfur dioxide, volatile organic compounds, and PM_{10} would result from exhaust emissions of workers' vehicles, heavy construction equipment, diesel generators, and other machinery tools.

Appendix A, *Best Management Practices*, describes BMPs that would be implemented as an integral part of the proposed Station to minimize or avoid the potential for impacting air quality. For the duration of Station construction activities, actively disturbed areas would be stabilized through the use of water spray. Other measures to minimize dust emissions would include graveling of roadways, limitation of vehicle speeds on roadways, and minimization of duration that areas are disturbed.

Because limited technical data are available for the heavy equipment to be used to construct the Station facilities, a very conservative (assumed high) emission estimate of construction-related emissions was prepared using the emission estimates from the EIS for the Toquop Energy Project (Toquop) (BLM, 2003). Both fugitive dust emissions and the tailpipe exhaust emissions from the Toquop EIS were scaled up using the ratio of amount of land disturbed.

Construction of the Proposed Action power plant, switch yard, and coal storage facility would disturb approximately 510 acres. Construction of the solid waste disposal facility would disturb about 405 acres. Construction of the cooling towers would disturb some 95 acres of land. Collectively, the construction area that would be disturbed would total 1,010 acres. In addition, emissions were estimated from construction of 3 miles of access roads and 1 mile of railroad spur.

In addition to fugitive dust emissions, on-road and off-road vehicles would generate gaseous exhaust emissions during Station construction. Mobile emissions are functions of hours of operation, vehicle speed, vehicle type, and fuel burned. Because limited technical data are available for the Station, emissions were assumed to be proportional to the area of construction. Estimates from the Toquop EIS (BLM, 2003) were scaled up to calculate exhaust emissions from vehicles. Toquop emissions estimates were prepared using the emission factor for generalized construction activities from the California Air Resources Board *Emission Inventory Procedural Manual* (California Air Resources Board, 1997) and EPA document AP-42, Volume II, Emission Factors for Mobile Sources (EPA, 1995). Tables 4.6-1 and 4.6-2 summarize the short term and total emissions of carbon monoxide, nitrogen oxides, PM_{10}, and sulfur dioxide. The three construction scenarios described in Section 2.2.4.2, *Construction Schedule and Workforce*, were reviewed to identify the scenario that has maximum ambient air impact. Of the three options the worst-case scenario is where Units 1, 2, and 3 are constructed concurrently. The construction of all three units concurrently would result in the utilization of maximum number of off-road vehicles and also result in the largest amount of land disturbed in the shortest period of time. Emission calculation methodology assumes 61 months for construction of the power plant and 6 months for construction of ancillary facilities. Annual emissions calculations assume an average schedule of 10 hours per day and 5 days per week.

TABLE 4.6-1

Emissions During the Station Construction Phase

	Particulate (PM_{10}) (pounds per hour)	Carbon Monoxide (pounds per hour)	Sulfur Dioxide (pounds per hour)	Nitrogen Oxides (pounds per hour)
Power plant	61.6	10.0	7.9	52.9
Access roads	23.6	19.7	18.1	27.8
Rail spur	7.9	6.6	6.0	9.3
Solid waste disposal facility	41.2	6.6	5.4	7.9
Water pipeline	15.0	3.3	2.7	4.0
Wells	1.6	2.5	2.3	2.3

Note: Emissions scaled on the basis of the ratio of estimated disturbed area at the proposed Toquop and White Pine Energy Station power plant sites.

TABLE 4.6-2

Total Emissions During the Station Construction Phase

	Particulate (PM_{10}) (tons)	Carbon Monoxide (tons)	Sulfur Dioxide (tons)	Nitrogen Oxides (tons)
Power plant	407.1	65.8	52.5	349.3
Access road	15	13	12	18
Rail spur	5	4	4	6
Solid waste disposal facility	27	4	4	5
Water pipeline	10	2	2	3
Wells	1	2	2	1

Note: Emissions based on construction of the White Pine Energy Station power plant in 61 months and other ancillary facilities in six months. Annual emissions calculations assume an average schedule of 10 hours per day and 5 days per week.

Although no dispersion modeling was performed to determine the ambient impact of these estimated construction emissions, based on relatively low unit emission rates, the large acreage over which the emission sources would be dispersed, and results of similar modeling performed at other projects, it is predicted that the impact of these emissions would not cause ambient impacts that would exceed or approach the particulate NAAQS.

4.6.1.3 Proposed Action Operation Impacts

4.6.1.3.1 Air Emission Sources

The Proposed Action would include construction of a 1,590-MW coal-fired electric generating station. The facility would consist of up to three units, each with a supercritical pulverized coal fired boiler and a steam turbine generator, and would include three natural draft dry cooling towers. The power plant would have several point sources and fugitive sources of emissions of regulated

pollutants. Emission sources during project operation would include:

- Pulverized coal boilers
- Distillate oil fired auxiliary boiler
- Coal unloading and handling facilities
- Active and inactive coal piles
- Fly ash handling and storage facilities
- Lime unloading, handling, and storage facilities
- Paved and unpaved roadways
- Emergency diesel engine driven emergency generator and firewater pump
- Locomotive emissions

The pulverized coal boilers, auxiliary boilers, and generator would cause air emissions of the criteria pollutants nitrogen oxides, carbon monoxide, sulfur dioxide, PM_{10}, and volatile organic compounds. Minor quantities of hazardous air pollutants (HAPs) would also be emitted. Coal, flyash, and lime handling facilities would cause PM_{10} emissions. Paved and unpaved roads would also cause PM_{10} emissions. Locomotives transporting coal to the power plant site would cause nitrogen oxides, carbon monoxide, PM_{10}, sulfur dioxide, and volatile organic compound emissions.

4.6.1.3.2 Air Emission Controls

The proposed control technologies for the pulverized coal boilers are summarized in Table 4.6-3. For the auxiliary boiler, low sulfur distillate oil would be used to minimize emissions of sulfur dioxide and sulfuric acid. The use of low-nitrogen oxide burners and flue gas recirculation would minimize nitrogen oxides emissions, and good combustion practices would minimize fugitive emissions.

4.6.1.3.3 Magnitude of Emissions During Operation

Emissions from the Station would be regulated by state and federal air pollution permits. A facility must apply for and obtain a permit prior to commencement of construction under the PSD program. This is required by the Clean Air Act, and administered by the NDEP in Nevada. Maximum estimated emissions of criteria air pollutants from the Station stated in the PSD permit application are shown in Table 4.6-4.

Estimated locomotive emissions for transporting coal by the NNR from Shafter to the power plant site are shown in Table 4.6-5. These emissions are noted separately here because, as mobile sources not on the property of the project itself, the locomotive emissions are not covered under the PSD permit analysis required by the Clean Air Act. The emissions calculations were made assuming that 12 trains per week deliver coal from Shafter to the power plant site (total round trip distance of approximately 200 miles). Each train is assumed to have three locomotives each equipped with diesel engines (6,000 brake horsepower for each locomotive), and is conservatively assumed to be operating at full throttle (and thus full emissions output) for the entire distance. The diesel fuel was assumed to contain a maximum of 500 ppm sulfur. Average speed of the train was assumed to be 40 miles per hour. No dispersion modeling was performed for these emissions. However, because of the comparatively small total estimated emissions, and large geographic area over which the emissions would occur, the railroad emissions are predicted to have minimal ambient impact.

TABLE 4.6-3

Proposed Control Technologies for Pulverized Coal Boilers

Control technology	Pollutants Controlled
Good combustion practices	Carbon monoxide and volatile organic compound
Low-nitrogen oxide burners, overfire air and selective catalytic reduction (SCR)	Nitrogen oxides
Spray dyer absorber (dry scrubber)	Sulfur dioxide, HF, sulfuric acid, and mercury
Fabric filter baghouse	PM, PM_{10}, sulfuric acid, lead, and mercury
Halogenated activated carbon injection	Mercury

HF = hydrogen fluoride

TABLE 4.6-4

Total Facility Estimated Emission of Criteria Pollutants

Pollutant	Emissions (pound per hour)	Emissions (tons/year)
Nitrogen oxides	1,165	4,761
Carbon monoxide	2,367	10,174
Volatile organic compound	60	245
Sulfur dioxide	1,387	6,108
PM_{10}	633	2,664
Lead	0.28	0.81

TABLE 4.6-5

Estimated Emissions for Operation of Railroad Locomotive

Pollutant	Potential-to-Emit (tons/year)
Carbon monoxide	79
Nitrogen oxides	805
Sulfur dioxide	1.1
PM	20
Volatile organic compounds	30

Notes:

1. Emission factor from USEPA Publication “Emission Factors for Locomotives” December 1997 EPA420-F-97-051.

2. Potential to emit calculations assume 12 trains per week.

3. Sulfur dioxide emissions factor from USEPA publication AP-42, Compilation of Air Pollutant Emission Factors, Section 3.4 Table 3.4-1. Diesel fuel assumed to have 500 ppm sulfur.

4.6.1.3.4 Dispersion Modeling Methodology

Dispersion modeling was performed using the EPA-approved air quality dispersion models, which are mathematical descriptions of atmospheric diffusion and dispersion processes that can be used to predict pollutant impacts over a given area. Modeling was conducted in accordance with NDEP and EPA specified procedures, and was approved by the NDEP Bureau of Air Quality as part of the PSD permit process.

4.6.1.3.5 Class II Area Dispersion Modeling Results

Dispersion modeling of the maximum potential emissions from the White Pine Energy Station was performed for nitrogen oxides, carbon monoxide, PM_{10}, sulfur dioxide, and lead using the EPA-approved AERMOD model. Predicted impacts are compared to the "PSD Increment," which is the maximum allowable ambient air quality deterioration allowed under the PSD program. Predicted impacts are also compared to the NAAQS, which are the pollutant concentrations below which, as determined by the EPA, no adverse human health or environmental impacts are presumed to occur.

Table 4.6-6 presents the predicted maximum impacts from the Station Proposed Action and compares them to the PSD Increment and NAQQS. The values represent the highest results modeled at any receptor location for any of the meteorological conditions modeled. Table 4.6-7 presents the sources considered in addition to the Station Proposed Action in this analysis.

TABLE 4.6-6

Results of Full Impact Analysis

Pollutant	Averaging Time	Modeled Maximum (WPEA) Air Impact Concentrations (µg/m^3)	Class II Area SIL (µg/m^3)	Cumulative Increment Consumption (µg/m^3)	PSD Increments (µg/m^3)	Cumulative Impact (µg/m^3)	NAAQS (µg/m^3)
PM_{10}	24-hour	24.8	5	25.3	30	55.3	150
PM_{10}	Annual	7.4	1	7.5	17	17.5	50
Sulfur dioxide	3-hour	88.7	25	26.2	512	305	1,300
Sulfur dioxide	24-hour	17.4	5	73.0	91	81.0	365
Sulfur dioxide	Annual	2.0	1	6.5	20	9.2	80
Carbon monoxide	1-hour	433	2,000	NA	NA	NA	40,000
Carbon monoxide	8-hour	88.8	500	NA	NA	NA	10,000
Nitrogen dioxide	Annual	1.4	1	1.4	25	3.3	100
Lead	Quarterly	0.0009	NA	NA		NA	NA

µg/m^3 = micrograms per cubic meter

TABLE 4.6-7

Source Inventory for Increment and NAAQS Modeling

			Nitrogen Oxides	PM_{10}		Sulfur Dioxide	
ID	**State**	**Facility**	**tons per year**	**pounds per year**	**tons per year**	**pounds per year**	**tons per year**
373	Nevada	Robinson Nevada Mining Company	28.31	104.43	107.37	5.47	4.24
405	Nevada	Newmont Gold Company	--	7.96	23.4	--	--
543	Nevada	J&M Trucking -Ely	--	0.83	0.66	--	--
713	Nevada	Homestake Mining Company	--	0.01	0.06	--	--
835	Nevada	Reck Brothers	10.28	3.57	3.57	0.92	0.93
1065	Nevada	Nevada Slag	10.69	6.91	3.84	7.42	6.97
1124	Nevada	Reed Distributing	--	0.002	0.01	--	--
1177	Nevada	J&M Trucking -Eureka	--	0.57	0.92	--	--
1336	Nevada	Bald Mountain Mine - Mooney	--	0.20	0.83	--	--
1362	Nevada	Bald Mountain Mine - Huntington	2.56	0.35	1.49	0.0006	0.003
1377	Nevada	Cooper & Sons	14.11	5.85	4.61	4.95	4.45
1417	Nevada	Country Construction	--	3.30	1.2	--	--
1466	Nevada	White Pine County Schools	1.44	2.1	3.27	0.11	0.16
1594	Nevada	Chevron Environmental Mgt Co.	1.83				
10706	Utah	U.S. Army- Dugway Proving Ground	--	--	--	5.24	22.94
		Total	**68.2**	**136**	**151**	**24.1**	**39.7**

Estimates of incremental ozone concentration from the proposed Station were evaluated based on accepted screening level methodology. Rigorous analysis of ozone impacts is not possible without access to regional grid modeling, which has not been previously prepared by the agencies for this region. Based on the screening techniques, the Station is expected to have a near zero (significantly less than 0.08 ppb) contribution to ambient air ozone concentration based on its volatile organic compound-to-nitrogen oxides ratio. The Station is not predicted to cause or significantly contribute to a violation of the ozone standard.

A number of historic and new Wilderness areas are in the vicinity of the proposed Station. The four closest to the site are the Goshute Canyon, Becky Peak, and Bristlecone Wilderness Areas administered by the BLM, and the High Schells Wilderness administered by the USFS. Isopleths (a line on a map connecting points at which a given variable has a specified constant value) of Class II dispersion modeling results were examined to determine whether the proposed Station would have an impact on the wilderness areas. This analysis demonstrates that the Station would not have a significant impact on Goshute Canyon, Becky Peak, or Bristlecone. Impacts of nitrogen dioxide, PM_{10}, carbon

monoxide, and annual sulfur dioxide were also shown to be insignificant at High Schells. Impacts of 24-hour and 3-hour sulfur dioxide are significant over small portions of High Schells, but were less than 10 percent of the applicable PSD increments.

The Humboldt-Toiyabe National Forest was contacted to identify the closest designated roadless area to the proposed power plant site. Based on information provided by the Humboldt-Toiyabe National Forest, there currently is no designated roadless area on USFS lands in Nevada.

Although modeling of emissions from the Proposed Station site did not include receptors at the potential stellar observatory sites in Western Utah, several conclusions can be drawn regarding the potential impacts to visibility based on the relative location of the sites and the modeling performed at the Class I areas. One of the observatories is proposed to be located near Tooele, Utah and the other between Delta and Milford, Utah. The first is approximately 164 miles northeast of the Station site, and the second is about 110 miles east-southeast of the Station site.

Impacts analyses for Great Basin National Park were used to extrapolate information regarding impacts to the observatories. Modeled visibility impacts at the nearby (approximately 40 miles) Great Basin National Park indicated that perceptible changes in visibility resulting from the Station could occur on approximately 0.6 percent of the days in the worst-case year (see discussion of Calpuff modeling for Class II areas in the following section for Class I modeling). The perceptible change in visibility was calculated against relatively pristine background conditions at the park.

The prevailing winds at the Station site are from the south-southwest, which indicates that air-borne pollutants that could contribute to visibility degradation would travel toward the Tooele location more frequently than the Milford-Delta location. However, because the proposed observatory sites are considerably farther downwind than Great Basin National Park, it is likely that the frequency and magnitude of the visibility impacts would be considerably less than the modeled values at Great Basin National Park. In addition, the Tooele location likely has less than pristine background conditions because of its proximity to an urban area and the pollutants associated with urban sources. Therefore, perceptible changes as compared to background conditions would be less despite the additional dispersion afforded by the longer travel distance.

4.6.1.3.6 Class II Cumulative Impact Analysis

As noted above, Table 4.6-6 presents a cumulative Class II impact analysis based on the permitted projects and projects deemed to have the potential for significant contribution to ambient pollutant concentrations in the areas where the Station Proposed Action is also predicted to have significant contribution, as per PSD permitting guidelines. The potential cumulative impacts on the Class II areas in the vicinity of the proposed Station considering reasonably foreseeable future projects were also evaluated. Potential cumulative effects of the NNR upgrade and operation, White Pine County Airport Expansion, Basset Lake Expansion, Intermountain Power Project Phase III, Newmont Gold Coal-Fired Power Plant, Toquop Energy Coal-Fired Power Plant, and Ely Energy Center were considered for further evaluation. The NNR is described in Section 2.2.3.7.1,

Rehabilitation and Operation of Nevada Northern Railway, and the other projects are described in Section 4.19.2, *Description of Projects Considered for Cumulative Analysis.*

4.6.1.3.7 Class II Area Hazardous Air Pollutants

Ambient impacts of HAP emissions were estimated by prorating the AERMOD modeling results for the criteria pollutants based on the ratios of HAP emission rates to criteria emission rates for each pollutant and each source. Reasonable but conservative estimates for 8-hour, 24-hour, and annual average HAP concentrations are presented in Table 4.6-8. Estimated HAP concentrations (predicted ambient impact) were compared to available federal human health exposure guidelines based on exposure duration.

The estimated 8-hour average HAP concentrations were compared to the EPA acute exposure guideline levels (AEGL-1, AEGL-2). The estimated 24-hour average concentrations were compared to the Agency for Toxic Substances and Disease Registry Minimal Risk Levels. Minimal Risk Levels were derived based on exposures that occur over a 1- to 14-day time frame and are available for 12 HAPs. The estimated annual average HAP concentrations were compared to the EPA Prioritized Chronic Dose-Response. Chronic Dose response numbers are available for 52 chemicals.

As shown in Table 4.6-8, none of the estimated HAP concentrations exceed the available standards, based on the appropriate exposure term. Therefore, even if residences were located in close proximity to the Station site, it is very unlikely that the estimated HAP concentrations would result in an unacceptable risk to the occupants of those residences.

4.6.1.3.8 Class I Area Dispersion Modeling Results

Air quality and air quality related values impacts at the nearest federally designated Class I areas have been evaluated. Modeled Class I area impacts have been compared to the PSD Class I area increments, and modeled air quality related values impacts (visibility and deposition) have been compared to threshold levels established by the Federal Land Managers (FLMs). This section presents the approaches used and the results obtained for the Class I area air impact analysis.

The following Class I areas were identified by the FLM for inclusion in the air quality and air quality related values analysis:

- Zion National Park, for which the USDOI National Park Service is the applicable FLM
- Jarbidge Wilderness Area, for which the USFS is the applicable FLM

Zion National Park and Jarbidge Wilderness Area are located approximately 300 kilometers to the south-southeast and 260 kilometers to the north of the proposed Station, respectively. Because portions of Zion National Park are further than 300 kilometers from the proposed Station, the air quality and air quality related values impacts were only assessed at receptors in Zion within 300 kilometers of the proposed Station.

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact			EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (µg/m^3)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (µg/m^3)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (µg/m^3)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
	8-Hour Average Concentration (µg/m^3)	24-Hour Average Concentration (µg/m^3)	Annual Average Concentration (µg/m^3)						
Acetaldehyde	6.18E-02	2.05E-02	2.39E-03	NA[c]	No	NA[c]	No	0.45	No
Acenapthene	5.53E-05	1.84E-05	2.14E-06	NA[c]	No	NA[c]	No	NA[c]	No
Acenapthylene	2.71E-05	9.01E-06	1.05E-06	NA[c]	No	NA[c]	No	NA[c]	No
Acetophenone	1.63E-03	5.40E-04	6.29E-05	NA[c]	No	NA[c]	No	NA[c]	No
Acrolein	3.14E-02	1.04E-02	1.22E-03	69.0	No	0.11	No	0.02	No
Anthracene	2.28E-05	7.56E-06	8.81E-07	NA[c]	No	NA[c]	No	NA[c]	No
Antimony	2.49E-03	8.27E-04	9.63E-05	NA[c]	No	NA[c]	No	NA[c]	No
Arsenic[d]	4.54E-03	1.51E-03	1.76E-04	NA[c]	No	NA[c]	No	2.33E-04	No
Benzene	1.41E-01	4.68E-02	5.45E-03	2.90E+04	No	160.0	No	1.28E-01	No
Benzoanthracene	8.67E-06	2.88E-06	3.35E-07	NA[c]	No	NA[c]	No	9.10E-03	No
Benzopyrene	4.12E-06	1.37E-06	1.59E-07	NA[c]	No	NA[c]	No	9.09E-04	No
Benzofluoranthene	1.19E-05	3.96E-06	4.61E-07	NA[c]	No	NA[c]	No	9.09E-04	No
Benzoperylene	2.93E-06	9.73E-07	1.13E-07	NA[c]	No	NA[c]	No	NA[c]	No
Benzyl chloride	7.59E-02	2.52E-02	2.94E-03	NA[c]	No	NA[c]	No	0.02	No
Beryllium	3.73E-03	1.24E-03	1.44E-04	NA[c]	No	NA[c]	No	4.17E-04	No
Biphenyl	1.84E-04	6.12E-05	7.13E-06	NA[c]	No	NA[c]	No	NA[c]	No
Bis(2-ethylhexyl)phthalate	7.91E-03	2.63E-03	3.06E-04	NA[c]	No	NA[c]	No	4.17E-01	No
Bromoform	4.23E-03	1.40E-03	1.64E-04	NA[c]	No	NA[c]	No	0.91	No
1,3-Butadiene				NA[c]	No	NA[c]	No	0.33	No
Cadmium	5.87E-04	1.95E-04	2.27E-05	NA[c]	No	NA[c]	No	5.56E-04	No
Carbon disulfide	1.41E-02	4.68E-03	5.45E-04	6200.0	No	NA[c]	No	700.0	No
Chromium VI[e]	1.61E-03	5.37E-04	6.25E-05	NA[c]	No	NA[c]	No	8.33E-05	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact			EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (µg/m^3)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (µg/m^3)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (µg/m^3)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
	8-Hour Average Concentration (µg/m^3)	24-Hour Average Concentration (µg/m^3)	Annual Average Concentration (µg/m^3)						
Chrysene	1.08E-05	3.60E-06	4.19E-07	NA[c]	No	NA[c]	No	0.091	No
2-Chloroacetophenone	7.59E-04	2.52E-04	2.94E-05	NA[c]	No	NA[c]	No	0.03	No
Chlorobenzene	2.38E-03	7.92E-04	9.22E-05	NA[c]	No	NA[c]	No	1000.0	No
Chloroform	6.39E-03	2.13E-03	2.47E-04	NA[c]	No	490.0	No	98.0	No
Cobalt	8.89E-03	2.95E-03	3.44E-04	NA[c]	No	NA[c]	No	0.10	No
Cumene	5.74E-04	1.91E-04	2.22E-05	NA[c]	No	NA[c]	No	400.0	No
Cyanide	2.31E-02	7.68E-03	8.94E-04	NA[c]	No	NA[c]	No	NA[c]	No
2,4-Dinitrotoluene	3.03E-05	1.01E-05	1.17E-06	NA[c]	No	NA[c]	No	1.10E-02	No
Dimethyl sulfate	5.20E-03	1.73E-03	2.01E-04	45.0	No	NA[c]	No	NA[c]	No
Ethylbenzene	1.02E-02	3.39E-03	3.94E-04	NA[c]	No	NA[c]	No	1000.0	No
Ethyl chloride	4.55E-03	1.51E-03	1.76E-04	NA[c]	No	4.00E+04	No	1.00E+04	No
Ethylene dichloride	4.34E-03	1.44E-03	1.68E-04	NA[c]	No	NA[c]	No	3.80E-02	No
Ethylene dibromide	1.30E-04	4.32E-05	5.03E-06	NA[c]	No	NA[c]	No	1.70E-03	No
Fluorene	9.86E-05	3.28E-05	3.82E-06	NA[c]	No	NA[c]	No	NA[c]	No
Formaldehyde	2.60E-02	8.65E-03	1.01E-03	1100.0	No	49.0	No	9.80	No
Hexane	7.26E-03	2.41E-03	2.81E-04	NA[c]	No	NA[c]	No	200.0	No
Hydrochloric Acid	3.73E+00	1.24E+00	2.81E-04	2.70E+03	No	NA[c]	No	20.0	No
Hydrofluoric Acid	1.72E+00	5.71E-01	4.61E-02	8.20E+02	No	25	No	14.0	No
Indeno(1,2,3-cd)pyrene	6.61E-06	2.20E-06	2.56E-07	NA[c]	No	NA[c]	No	9.10E-03	No
Isophorone	6.29E-02	2.09E-02	2.43E-03	NA[c]	No	NA[c]	No	3.70	No
Lead	2.13E-02	7.09E-03	8.25E-04	NA[c]	No	NA[c]	No	1.50	No
Manganese	2.31E-01	7.68E-02	8.94E-03	NA[c]	No	NA[c]	No	0.05	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact			EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] (µg/m^3)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] (µg/m^3)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] (µg/m^3)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
	8-Hour Average Concentration (µg/m^3)	24-Hour Average Concentration (µg/m^3)	Annual Average Concentration (µg/m^3)						
Mercury	3.93E-03	1.30E-03	1.52E-04	NA[c]	No	NA[c]	No	0.30	No
5-Methyl chrysene	2.38E-06	7.92E-07	9.22E-08	NA[c]	No	NA[c]	No	9.09E-04	No
Methyl bromide	1.73E-02	5.76E-03	6.71E-04	2.60E+05	No	190.0	No	5.0	No
Methyl chloride	5.74E-02	1.91E-02	2.22E-03	NA[c]	No	1000.0	No	90.0	No
Methyl ethyl ketone	4.23E-02	1.40E-02	1.64E-03	5.90E+05	No	NA[c]	No	5.00E+03	No
Methyl hydrazine	1.84E-02	6.12E-03	7.13E-04	390.0	No	NA[c]	No	NA[c]	No
Methyl methacrylate	2.17E-03	7.20E-04	8.39E-05	7.00E+04	No	NA[c]	No	7.00E+02	No
Methyl tert butyl ether	3.79E-03	1.26E-03	1.47E-04	NA[c]	No	7200.0	No	3.85	No
Methylene chloride	3.14E-02	1.04E-02	1.22E-03	NA[c]	No	2100.0	No	2.13	No
Napthalene	1.41E-03	4.68E-04	5.45E-05	NA[c]	No	NA[c]	No	0.03	No
Nickel	2.49E-02	8.27E-03	9.63E-04	NA[c]	No	NA[c]	No	0.09	No
Phenanthrene	2.93E-04	9.73E-05	1.13E-05	NA[c]	No	NA[c]	No	NA[c]	No
Phenol	1.73E-03	5.76E-04	6.71E-05	2.40E+04	No	NA[c]	No	2.00E+02	No
Propylene Oxide				2.60E+04	No	NA[c]	No	0.27	No
Propionaldehyde	4.12E-02	1.37E-02	1.59E-03	NA[c]	No	NA[c]	No	NA[c]	No
Pyrene	3.58E-05	1.19E-05	1.38E-06	NA[c]	No	NA[c]	No	NA[c]	No
Tetrachoroethlylene	4.66E-03	1.55E-03	1.80E-04	NA[c]	No	NA[c]	No	NA[c]	No
1,1,1-Trichloroethane	2.17E-03	7.20E-04	8.39E-05	NA[c]	No	NA[c]	No	NA[c]	No
Toluene	2.60E-02	8.65E-03	1.01E-03	7.50E+05	No	3.80E+03	No	400.0	No
Selenium	3.55E-03	1.18E-03	1.38E-04	NA[3]	No	NA[c]	No	20.00	No
Styrene	2.71E-03	9.01E-04	1.05E-04	8.50E+04	No	NA[c]	No,	1.00E+03	No
Vinyl acetate	8.24E-04	2.74E-04	3.19E-05	NA[c]	No	NA[c]	No	2.00E+02	No

TABLE 4.6-8

Air Toxics Risk Assessment Analysis

Compound	Predicted Ambient Impact			EPA Acute Exposure Guideline Level [AEGL-1, AEGL-2, 8-hour][a] ($\mu g/m^3$)	8-hour Average Concentration Greater than AEGL?	ATSDR Minimal Risk Level [acute, 1-14 days][a] ($\mu g/m^3$)	24-Hour Average Concentration Greater than ATSDR Minimal Risk Level?	USEPA Prioritized Chronic Dose-Response [long-term exposure][b] ($\mu g/m^3$)	Annual Average Concentration Greater than USEPA's Prioritized Chronic Dose-Response Value?
	8-Hour Average Concentration ($\mu g/m^3$)	24-Hour Average Concentration ($\mu g/m^3$)	Annual Average Concentration ($\mu g/m^3$)						
Xylene (m,p)	4.01E-03	1.33E-03	1.55E-04	NA[c]	No	NA[c]	No	NA[c]	No
Xylene (o)	4.01E-03	1.33E-03	1.55E-04	NA[c]	No	NA[c]	No	NA[c]	No
Xylene (total)	4.01E-03	1.33E-03	1.55E-04	5.60E+05	No	4300.0	No	100.0	No
2,3,7,8-TCDD	1.55E-09	5.15E-10	6.00E-11	NA[c]	No	NA[c]	No	3.03E-08	No

Notes:

[a] EPA, 2005a, Table 2. Acute Dose-Response Values for Screening Risk Assessments

AEGL-2 used in lieu of missing AEGL-1 values; AEGL-1 = Guideline levels for "mild effects", AEGL-2 = Guideline levels for "moderate effects".

[b] EPA, 2005b Table 1 Prioritized Chronic Dose-Response Values

Chronic Inhalation values chosen as the more conservative of the two categories: "Non-Cancer" and "Cancer"

[c] NA = Value is not available for this compound.

[d] Arsenic concentrations based on coal analysis from 12 PRB coal mines anticipated to be the source of fuel for this project.

[e] Chromium emission factor based USEPA Emission Factor Documentation for AP-42, Section 1.1, Reference Facility #27

Approach

The CALPUFF modeling system was used to estimate air quality and air quality related values impacts at the two Class I areas. CALPUFF is the only EPA accepted model for prediction of impacts at receptors at distances greater than 50 kilometers from the source. The model was originally designed for receptors of up to 200 kilometers from the source, although it has been commonly applied to receptors up to 300 kilometers from the source. Use of the model for distances between 200 kilometers and 300 kilometers has thus resulted in scientific debate regarding the validity of the results, with concern that impacts may be significantly overpredicted. The basic procedures used in the Class I area air quality and air quality related values impact assessment followed FLM and Federal guidance:

- **Modeling Period.** 3 years of meteorological data (1996, 2001, and 2002) were used.
- **Source of MM5 Data.** The 1996 36-kilometer MM5 data developed by EPA and used by WRAP for their Section 309 SIP modeling were used as input for the 1996 annual modeling. The 2001 MM5 data were developed by the EPA at 36-kilometer resolution for the continental U.S. For 2002, MM5 data were developed by the WRAP for the western U.S.
- **Observed Meteorological Data.** Observed surface and upper-air National Weather Service meteorological data within and nearby the CALPUFF modeling domain were acquired, subjected to quality assurance, and reformatted for input into the CALPUFF meteorological model (CALMET).
- **Modeling Domain and Configuration.** The extent of the modeling domain was defined based on an examination of the sources and receptors of interest. In the direction from the proposed Station to the Jarbidge Wilderness Area and Zion National Park Class I areas, a minimum 350-kilometer distance was included in the domain to allow at least a 50-kilometer buffer past the furthest receptors of interest. The modeling domain was defined using a Lambert Conformal Conic Projection. A 1-kilometer grid resolution was used.
- **CALMET Parameters.** CALMET parameters were defined following the standard default CALMET application with enhancements based on best judgment from experienced CALMET modelers.
- **CALPUFF Parameters.** Standard default CALPUFF parameters for PSD applications were specified. Background ammonia was defined following EPA's Inter-Agency Work Group on Air Quality Modeling (IWAQM) guidance. Hourly surface ozone measurements based on EPA's Air Quality Stations network available from AIRS were used in the analysis. Other CALPUFF parameters were defined using the standard regulatory default settings.

The modeling domain extended 428 kilometers in the east-west direction and 660 kilometers in the north-south direction. A 1-kilometer grid resolution was used to better resolve the complex terrain in the region, resulting in a 428 by 660 horizontal grid for the CALMET meteorological modeling. The horizontal grids were defined using a Lambert Conformal Conic Projection with a projection origin of 40.0 degrees north latitude and 97.0 degrees west longitude and standard parallels at 33 and 45 degrees.

Meteorological Inputs. For the 1996, 2001, and 2002 CALMET application, surface and upper-air meteorological observations for 4 sites and precipitation observations from approximately 70 sites were provided as inputs.

Modeling Receptors. Receptors for the Jarbidge Wilderness Area and Zion National Park were taken from the National Park Service (NPS) website at http://www2.nature.nps.gov/air/maps/Receptors/.

The NPS receptor database yielded 174 receptors for the Jarbidge Wilderness Area and 51 receptors for Zion National Park, respectively.

Background Pollutant Concentrations. The CALPUFF model requires the input of background ozone and ammonia for the chemical conversion. Hourly ozone data from sites within the modeling domain from EPA's AIRS compliance network were used in the CALPUFF refined analysis.

The IWAQM guidance contains the following recommended background ammonia concentrations for three categories of land use type, as follows:

- 10.0 ppb for grasslands
- 0.5 ppb for forested lands
- 1.0 ppb for arid lands

Based on the EPA IWAQM Guidance document reference: Phase II Summary Report for Modeling Long Range Transport Impacts (EPA-454/R-98-019) and in consultation with NPS, FS, and FLMs a background value of 1.0 ppb for ammonia was applied in the modeling analysis.

Emissions. Emissions from the two proposed boiler stacks were considered in the analysis. Emission rates for sulfur dioxide, primary particulate sulfate (SO_4), oxides of nitrogen; and particulate matter (PM) emissions of elemental carbon (EC), organic carbon (OC), other fine particulate ($PM_{2.5}$), and coarse particulate (PM_{10}) were used in the CALPUFF modeling analysis. The stack parameters and (maximum allowable) emission rates used in the modeling are given in Tables 4.6-9 and 4.6-10.

TABLE 4.6-9

Stack Parameters Used in the Modeling Analysis

Height (meters)	Elevation (meters)	Diameter (meters)	Exit Velocity (meters per second)	Exit Temperature (Kelvin)
182.9	1825.0	9.57	19.81	347.6
182.9	1825.0	6.77	19.81	347.6

TABLE 4.6-10

Emission Rates Used in the Modeling Analysis *

	Sulfur Dioxide	SO_4	Nitrogen Oxides	$PM_{2.5}$	EC	OC	PM_{10}
Stack 1	924.0	36.0	730.0	73.70	2.98	204.0	76.60
Stack 2	462.0	18.0	365.0	36.85	1.49	102.0	38.34

* Values expressed in pounds per hour

Versions of the CALPUFF Modeling System. Version 5.5 Level 030402 of CALMET and Version 5.7 Level 030402 of CALPUFF were used in the analysis.

CALMET Options. The CALMET options used in the analysis for 1996, 2001, and 2002 are provided in the modeling protocol prepared for this study with updates based on comments from the FLMs. A few of the key specifications for the CALMET modeling were:

- Use of a Lambert Conformal Conic Projection system at 1 kilometer horizontal resolution
- Use of 10 vertical layers
- Observations from 4 surface and 4 upper-air meteorological stations and 73 precipitation stations
- Extrapolate surface winds aloft using similarity theory (IEXTRP=-4)
- Use of Diagnostic Wind Model (DWM) for generating wind fields (IWFCOD=1)
- Use of MM5 data as an initial guess field for the DWM (IPROG=14)

CALPUFF Options. The CALPUFF options used in the Class I area modeling are provided in the modeling protocol prepared for this study. Some of the key options include the following:

- Use same modeling domain as CALMET
- Gaussian puff representation
- MESOPUFF-II transformation rates (MCHEM=1)
- Dry and wet deposition modeled (MDRY=1)
- PG dispersion coefficients for rural areas (MDISP=3)
- Technical options must conform to USEPA Long Range Transport (LRT) guidance (MREG=1)

CALPUFF Modeling Results

The CALPUFF results for air quality and air quality related values are presented in this section. The results are compared against threshold levels that are either not to be exceeded (for example, PSD increments) or are levels that when exceeded raise concerns and should be evaluated for their significance (for example, visibility thresholds). The results are first presented using the basic FLAG (Federal Land Managers Air Quality Related Values Work Group Phase 1 Report, December 2000) procedures following IWAQM and EPA guidance, followed by an examination of the frequency, magnitude, and duration of the impacts.

Threshold Levels: PSD Pollutants. EPA has proposed established Class I area threshold concentration levels for sulfur dioxide, nitrogen dioxide, and PM_{10} concentrations as part of the PSD program. The FLMs have also developed threshold levels for visibility and sulfur and nitrogen deposition at Class I areas.

As part of EPA's PSD policy, Class I and Class II area concentration increments have been established. The cumulative air quality impacts of all new sources are required to be below the PSD Class I increments. In 1996, EPA published a Federal Register notice of proposed Class I area significant impact level (SIL) thresholds for a single project. These proposed SILs are defined as being approximately 4 percent of the PSD Class I area increment. If a project's impact is below the Class I area single project proposed SIL thresholds, then its impacts are interpreted to be insignificant. If the project's estimated impact exceeds the Class I SIL, then a cumulative impact

analysis is run to determine the total impact of the project plus surrounding sources of air pollution. If this cumulative analysis indicates total impacts are less than the Class I area PSD concentration increment, then the project impacts are acceptable. However, if total impacts exceed the increment, then the frequency, magnitude, and duration of such impacts are examined to determine whether the project is the driving factor in the exceedance. Finally, if a project's estimated impact exceeds the Class I area PSD concentration increment, or is shown to be a driving factor in a cumulative exceedance, then the project must perform mitigation to achieve impacts below the PSD increment. Table 4.6-11 lists the PSD increments and SIL concentration thresholds for Class I areas.

Threshold Levels: Deposition. The FLAG procedures require estimation of total sulfur deposition from the CALPUFF-estimated wet and dry sulfur dioxide and SO_4 deposition. For nitrogen, wet and dry deposition from all of the nitrogen modeled species are included (nitrogen oxides, nitric acid, and particulate nitrate).

The NPS has posted a document "Guidance on Nitrogen and Sulfur Deposition Analysis Thresholds" on their Website. The NPS DATs for nitrogen and sulfur deposition are as follows:

East DAT: 0.010 kg/ha/yr
West DAT: 0.005 kg/ha/yr

East and west refer to Class I areas east and west of the Mississippi River. The western U.S. DATs are applicable to the Station. Table 4.6-12 lists the sulfur and nitrogen deposition thresholds that the Station deposition estimates were compared against.

TABLE 4.6-11

Class I Area Single Source Significant Impact Levels (SIL) and Cumulative Sources PSD Increments for Class I Areas

	Class I Area Thresholds	
Species and Averaging Time	**Proposed SIL ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**
Sulfur dioxide annual	0.10	2.00
Sulfur dioxide 24-hour	0.20	5.00
Sulfur dioxide 3-hour	1.00	25.00
PM_{10} annual	0.20	4.00
PM_{10} 24-hour	0.30	8.00
Nitrogen dioxide annual	0.10	2.50

TABLE 4.6-12

Department of Interior National Park Service (NPS) Sulfur and Nitrogen Deposition Analysis Thresholds (DATs)

	Average Deposition	
Class I Area	**Sulfur (kg-S/ha/yr)**	**Nitrogen (kg-N/ha/yr)**
NPS DAT	0.005	0.005

Threshold Levels: Visibility. The FLAG workgroup recommends procedures for estimating the visibility impacts because of proposed new sources at Class I areas using refined CALMET/CALPUFF modeling. The FLAG visibility metric is the estimated maximum 24-hour change in extinction over clean natural visibility conditions at the Class I area. The FLAG thresholds for extinction change over natural background are as follows:

- If the source's visibility impact is less than 0.4 percent on all days, the source is considered insignificant and the FLM will not object to the permit.
- If the source's visibility impact is less than 5 percent on all days, the FLM will likely not object to the permit.
- If there are days when the source's visibility impact is greater than 10 percent, the FLM may object to the permit.
- If there are days in which the source's visibility impact is above 5 percent, the frequency, magnitude, and duration of the visibility impacts are examined to make a significance determination.
- If a source exceeds a specific threshold at a Class I area, then the frequency, magnitude, and duration of the impacts are examined to interpret the modeling results. More recent interpretation of the FLAG procedures for evaluating the visibility impacts estimated by the CALPUFF modeling system has allowed the introduction of extenuating circumstances that account for natural obscuration of visibility.

Relative humidity adjustment factors [f(RH)] for refined CALPUFF modeling calculations can be made using hourly (MVISBK=2) and monthly average (MVISBK=6) f(RH) values. The natural conditions used in the project's visibility assessment are based on clean conditions with no man-made or weather interference. The inclusion of the occurrence of natural weather influence in the visibility calculations (for example, fog, rain, snow, etc.) has been allowed in Class I area visibility assessments.

PSD Pollutant Concentrations. Table 4.6-13 lists the CALPUFF estimated PSD pollutant concentrations resulting from Station emissions at the Jarbidge Wilderness Area and Zion National Park and compares them with the PSD Class I increments and proposed single source SILs. The CALPUFF-estimated concentration impacts because of the Station are always well below (less than 10 percent of) the Class I area PSD concentration increments. The Station's estimated concentrations at the Class I areas are also below the proposed Class I area single-source SIL for most PSD pollutants and averaging times. The exceptions are for estimated 3-hour and 24-hour average sulfur dioxide concentrations that exceed the proposed SIL at both the Jarbidge and Zion Class I areas.

The applicable regulations (40 CFR §52.21 and 40 CFR Part 51, Appendix W) are ambiguous regarding whether the first-high concentration or the design value (the second-high concentration for short-term averaging periods, as is used for some pollutants for the increment and NAAQS analysis) is compared to the SIL to determine the pollutants and averaging periods for which a cumulative analysis is conducted. Thus, air permitting agencies have the discretion to accept either methodology in a permitting action. In the interest of providing additional information for this EIS, Table 4.6-14 reports cumulative analysis results for

each pollutant and averaging period for which a predicted first-high concentration exceeds the corresponding single-source SIL. Thus, the cumulative analysis, including impact of the Station and other regional emission sources, was conducted for 3-hour and 24-hour sulfur dioxide for all 3 years for both Class I areas, with the exception of 24-hour sulfur dioxide at Zion National Park for 1996.

TABLE 4.6-13

CALPUFF Estimated PSD Pollutant Concentrations Impacts at Class I Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and with Puff Splitting

	Class I Area Thresholds		CALPUFF at Class I Areas (Highest 1st High Concentration)	
Species and Averaging Time	**Proposed SIL ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**Jarbidge ($\mu g/m^3$)**	**Zion ($\mu g/m^3$)**
1996				
Sulfur dioxide annual	0.10	2.00	0.0039	0.0065
Sulfur dioxide 24-hour	0.20	5.00	0.48	0.19
Sulfur dioxide 3-hour	1.00	25.00	1.41	1.01
PM_{10} annual	0.20	4.00	0.0004	0.0005
PM_{10} 24-hour	0.30	8.00	0.045	0.016
Nitrogen dioxide annual	0.10	2.50	0.0009	0.0020
2001				
Sulfur dioxide annual	0.10	2.00	0.0151	0.0059
Sulfur dioxide 24-hour	0.20	5.00	0.56	0.42
Sulfur dioxide 3-hour	1.00	25.00	1.58	1.13
PM_{10} annual	0.20	4.00	0.0014	0.0004
PM_{10} 24-hour	0.30	8.00	0.047	0.011
Nitrogen dioxide annual	0.10	2.50	0.0036	0.0014
2002				
Sulfur dioxide annual	0.10	2.00	0.0117	0.0054
Sulfur dioxide 24-hour	0.20	5.00	0.57	0.21
Sulfur dioxide 3-hour	1.00	25.00	1.75	1.15
PM_{10} annual	0.20	4.00	0.0011	0.0005
PM_{10} 24-hour	0.30	8.00	0.05	0.018
Nitrogen dioxide annual	0.10	2.50	0.0038	0.0013

TABLE 4.6-14

CALPUFF Estimated Short-Term Sulfur Dioxide PSD Pollutant Concentrations at Class I Areas for the White Pine Energy Station Plus Cumulative Sulfur Dioxide Sources Using 1-Kilometer CALMET Meteorological Fields, 1.0 ppb Background Ammonia and without Puff Splitting

Species and Averaging Time	Class I Area Thresholds	Cumulative Sulfur Dioxide CALPUFF at Class I Areas (Highest 2nd High Concentration)	
	PSD Increment ($\mu g/m^3$)	Jarbidge	Zion
1996			
Sulfur dioxide 24-hour	5.00	0.95	N/A
Sulfur dioxide 3-hour	25.00	2.02	3.98
2001			
Sulfur dioxide 24-hour	5.00	0.55	0.60
Sulfur dioxide 3-hour	25.00	1.75	2.90
2002			
Sulfur dioxide 24-hour	5.00	0.58	0.66
Sulfur dioxide 3-hour	25.00	1.85	3.17

The cumulative sulfur dioxide impacts analysis demonstrates no exceedances of the Class I PSD increment at either Jarbidge Wilderness Area or Zion National Park.

Effects of Puff Splitting. It is generally believed that CALPUFF results over large transport distances (approximately 300 kilometers and beyond) may be overly conservative without puff splitting because the effects of wind shear are underestimated. The results for the CALPUFF-estimated highest second high 3-hour and 24-hour sulfur dioxide concentrations at the Jarbidge Class I area with and without using puff splitting are shown in Table 4.6-15. Also shown in Table 4.6-15 is the percent difference of the estimated highest second high concentrations at the Jarbidge Wilderness Area, where positive differences indicate the puff spitting produces higher concentrations than without puff splitting and negative percent differences indicate that puff splitting produces lower concentrations than without puff splitting. Puff splitting in CALPUFF for the Station has from essentially no effect to exacerbating the possible CALPUFF overestimation bias when puff splitting was not used. Thus, at least for the conditions of the Station and Class I areas studied and the 3 years of modeling data, the possible CALPUFF overestimation bias is not mitigated by puff splitting.

Visibility Impacts. The visibility impacts were first calculated from the refined CALPUFF modeling results following the procedures in the FLAG final report, which include:

- Current IMPROVE extinction equation.
- Use of hourly relative humidity adjustment factors [f(RH)] as provided in the CALPUFF modeling system.
- Use of clean natural conditions for background that use estimates of clean aerosol conditions and do not account for weather interference (for example, fog, rain, snow) or other natural phenomena (smoke from fires, aerosols from sea salt, volcanoes).

TABLE 4.6-15

Comparison of the Highest Second High CALPUFF-Estimated 3-Hour and 24-Hour Sulfur dioxide Concentrations at the Jarbidge Class I Area from White Pine Energy Station Emissions Running CALPUFF with and without Using Puff Splitting

Rank	With Puff Splitting ($\mu g/m^3$)	Without Puff Splitting ($\mu g/m^3$)	Difference With - Without (percent)
3-Hour Sulfur Dioxide			
1996	1.1738	1.1404	+2.9 percent
2001	1.4626	1.3363	+9.5 percent
2002	1.7034	1.6714	+1.9 percent
24-Hour Sulfur Dioxide			
1996	0.2361	0.2311	-2.1 percent
2001	0.4355	0.4390	-0.8 percent
2002	0.3732	0.3585	+4.1 percent

At the request of NPS/USFS, there were two revisions made to the FLAG visibility impact procedures that are typically used in more recent Class I area impact assessments:

- Use of latest EPA default RH curves rather than the older FLAG values.
- Use of a maximum relative humidity (RHMAX) value of 95 percent compared to the 98 percent value recommended in FLAG.

Another enhancement to the FLAG guidance used in this study was the speciation of the Station's PM_{10} emissions into its PM components: SO_4, elemental carbon (EC), organic carbon (OC), fine particles ($PM_{2.5}$), and coarse particles ($PM_{2.5-10}$). The extinction properties of the individual PM components are greater than used for total PM_{10} so this speciation provides a more refined and conservative estimate of the visibility impacts than assuming the emissions are entirely PM_{10}.

Table 4.6-16 summarizes the number of days that the maximum daily CALPUFF estimated visibility impacts over natural conditions at the Jarbidge Wilderness Area and Zion National Park exceed the 5 percent and 10 percent thresholds during the 3 years of modeling. On a vast majority of modeling days (approximately 98 percent for Jarbidge and 99 percent for Zion) the proposed Station is estimated to have no visibility impact at either of the two Class I areas.

Relative Humidity and Particle Growth. The effects of relative humidity (RH) and particle growth on the CALPUFF-estimated visibility impacts at the two Class I areas were examined two ways:

- Use of monthly average f(RH) values as recommended in EPA's Best Available Retrofit Technology (BART) guidance for calculating visibility from aerosol concentrations; and
- Use of the latest f(RH) values from EPA guidance instead of the older values in the CALPUFF modeling system.

TABLE 4.6-16

CALPUFF Estimated Maximum Daily Extinction Estimates at Class I Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields, with Puff Splitting and Using the Basic FLAG Procedures for Visibility Calculations (Using 1.0 PPB Background NH3)

	Class I Area Visibility Impacts		
	Number of Days >5 percent	**Number of Days >10 percent**	**Maximum Change (percent)**
Jarbidge Wilderness Area			
1996	9	4	22.4
2001	15	8	29.8
2002	8	4	32.3
Zion National Park			
1996	2	1	10.6
2001	3	0	6.3
2002	4	0	7.7

Table 4.6-17 lists the number of days the CALPUFF-estimated visibility at the two Class I areas exceeds the 5 percent and 10 percent thresholds using hourly CALPUFF f(RH), using monthly average f(RH) (MVISBK=6), and using hourly f(RH) values from EPA guidance. The CALPUFF modeling system f(RH) values are generally the most conservative, estimating more days that exceed the 5 percent and 10 percent visibility thresholds than the other two methods. The number of days exceeding the 5 percent threshold at Zion National Park is reduced from 9 using the CALPUFF hourly f(RH) values to 2 using the monthly f(RH) values. The number of days exceeding the 10 percent threshold as Jarbidge Wilderness Area remains unchanged at 16 with the monthly f(RH).

Effects of Natural Obscuration. The issue of natural effects on the background in visibility assessments has been discussed and there have been various procedures proposed for incorporating weather interference (for example, presence of atmospheric liquids water content) and other natural obscuration phenomena (for example, sea salt) in the natural background. In fact, one of the options in the CALPUFF modeling system for assessing visibility impacts uses observed background visibility including weather effects (MVISBK=7) rather than estimates of natural background (clean aerosol concentrations) with no weather interference.

Table 4.6-18 lists the hourly surface weather observations for February 4, 1996. This is a period that yielded one of the highest raw modeled impacts at the Jarbidge Wilderness Area. On this day, local weather observations indicate that light rain or snow is falling for 13 of 24 hours in the day. When accounting for this naturally occurring water in the natural background, the presence of just one hour of rain or snow would increase the 24-hour average natural background extinction by over a factor of ten. As a result, the calculated visibility impacts on this day would be less than 5 percent. Thus, when accounting for rain/snow in the visibility background, the change in extinction over natural background would be reduced to below the 5 percent threshold.

TABLE 4.6-17

Sensitivity of White Pine Energy Station CALPUFF Estimated Visibility Impacts at Class I Areas to Relative Humidity (RH) Including Original Hourly CALPUFF f(RH), Monthly Average f(RH), and Updated Hourly f(RH) Values from EPA Guidance

	Hourly CALPUFF f(RH)			Monthly f(RH)			EPA Guidance Monthly f(RH)		
	Number of Days > 5%	Number of Days >10%	Max %	Number of Days > 5%	Number of Days >10%	Max %	Number of Days > 5%	Number of Days >10%	Max %
Jarbidge Wilderness Area									
1996	9	4	22.4	7	4	23.5	9	5	21.2
2001	15	8	29.8	15	7	22.7	15	8	27.4
2002	8	4	32.3	8	5	21.9	8	4	28.5
Zion National Park									
1996	2	1	10.6	1	0	7.2	2	0	9.7
2001	3	0	6.3	1	0	7.0	3	0	6.3
2002	4	0	7.7	0	0	4.0	3	0	7.2

TABLE 4.6-18

Summary of Hourly Surface Meteorological Observations at National Weather Service Site Nearest to the Jarbidge Wilderness Area Class I Area on February 4, 1996

Site	Date	Hour	Rain/Snow Showers?	T (F)	RH (percent)	Sky Cover (tenths)
24128	2/4/1996	0		26	75	Overcast
24128	2/4/1996	1		25	81	Overcast
24128	2/4/1996	2		26	75	Overcast
24128	2/4/1996	3		27	75	Overcast
24128	2/4/1996	4		26	78	Overcast
24128	2/4/1996	5	Yes	27	78	Overcast
24128	2/4/1996	6	Yes	28	82	Overcast
24128	2/4/1996	7		28	85	Overcast
24128	2/4/1996	8	Yes	29	92	Overcast
24128	2/4/1996	9	Yes	30	89	Overcast
24128	2/4/1996	10	Yes	30	92	Overcast
24128	2/4/1996	11	Yes	31	96	Overcast
24128	2/4/1996	12	Yes	32	92	Overcast
24128	2/4/1996	13	Yes	32	96	Overcast
24128	2/4/1996	14	Yes	33	96	Overcast
24128	2/4/1996	15	Yes	33	96	Overcast
24128	2/4/1996	16	Yes	33	96	Overcast
24128	2/4/1996	17	Yes	33	96	Overcast

TABLE 4.6-18

Summary of Hourly Surface Meteorological Observations at National Weather Service Site Nearest to the Jarbidge Wilderness Area Class I Area on February 4, 1996

Site	Date	Hour	Rain/Snow Showers?	T (F)	RH (percent)	Sky Cover (tenths)
24128	2/4/1996	18		33	96	7
24128	2/4/1996	19		33	100	Overcast
24128	2/4/1996	20		33	96	0
24128	2/4/1996	21		33	100	7
24128	2/4/1996	22		33	100	3
24128	2/4/1996	23		34	96	3

Examination of the weather occurrences during the days greater than 5 percent at the Jarbidge Wilderness Area and Zion National Park reveals that rain and/or snow was falling at the closest weather station for many of the estimated adverse visibility days. These events are summarized in Table 4.6-19. For these days, background visibility would be naturally obscured, and any impact from the Station would be reduced below the 5 percent threshold.

Summary of Visibility Impacts.
Table 4.6-20 summarizes the CALPUFF-estimated visibility impacts at the Jarbidge Wilderness Area and Zion National Park using: (1) the CALPUFF hourly f(RH); (2) the EPA Guidance hourly f(RH); (3) the EPA Guidance monthly f(RH); and (4) accounting for the effects for rain/snow. Using monthly f(RH) values and EPA natural conditions, there are 28 days at the Jarbidge Wilderness Area and 2 days at Zion National Park that exceed the 5 percent threshold using 3 years of modeling. When eliminating days where weather indicates natural obscuration (rain, etc.) and using monthly f(RH), there are 21 days at the Jarbidge Wilderness Area and 2 days at the Zion National Park that exceed the 5 percent threshold.

TABLE 4.6-19

Weather Interference Events During Estimated Adverse Visibility Days

Date	Year/Julian Date	Comment
Jarbidge Wilderness Area Class I Area		
02/04/96	96035	13 Hours of rain/snow
02/17/96	96048	1 Hour of rain
06/26/96	96178	8 Hours of rain
10/30/96	96304	5 Hours of rain
01/08/01	01008	8 Hours of rain
01/11/01	01011	9 Hours of rain
01/24/01	01024	4 Hours of rain/snow
01/26/01	01026	8 Hours of snow
11/12/01	01316	1 Hour of rain
12/29/01	01363	3 Hours of snow

TABLE 4.6-19

Weather Interference Events During Estimated Adverse Visibility Days

Date	Year/Julian Date	Comment
12/30/01	01364	1 Hour of rain
01/02/02	02001	2 Hours of rain, some moderate
09/16/02	02260	2 Hours of rain, some moderate
Zion National Park Class I Area		
01/29/01	01302	9 Hours of snow
11/23/01	01327	7 Hours of rain
04/08/02	02098	5 Hours of rain, some moderate
10/03/02	02276	6 Hours of rain
10/31/02	02304	4 Hours of snow

TABLE 4.6-20

Summary of Estimated Visibility Impacts at the Jarbidge Wilderness Area and Zion National Park Using CALPUFF f(RH) Factors, EPA's f(RH) Factors, Monthly f(RH) Factors, and Accounting for Rain and Snow in the Visibility Backgrounds

						Percent Change in Extinction over Natural Background (percent)			
Year	**Day**	**REC**	**BEXT**	**BKG**	**BEXT (tot)**	**CALPUFF f(RH)**	**EPA f(RH)**	**Monthly f(RH)**	**Monthly f(RH) and Natural Obscuration**
Jarbidge Wilderness Area									
1996	35	165	3.59	16.041	19.631	22.38	20.31	14.59	<<5
1996	48	156	1.029	15.227	16.256	6.76	6.09	4.70	<5
1996	178	1	1.288	15.644	16.932	8.23	7.75	4.95	<<5
1996	284	94	0.956	14.893	15.849	6.42	6.40	7.75	7.75
1996	304	15	3.023	16.648	19.671	18.16	15.24	5.91	<<5
1996	314	94	0.78	14.881	15.661	5.24	5.65	6.97	6.97
1996	315	65	3.006	14.928	17.934	20.14	21.15	23.45	23.45
1996	316	156	1.465	14.873	16.338	9.85	10.76	12.00	12.00
1996	317	156	1.968	14.855	16.823	13.25	14.22	16.54	16.54
2001	8	165	3.292	15.349	18.641	21.45	17.6	11.41	11.41
2001	9	18	1.719	15.838	17.556	10.85	9.11	5.52	5.52
2001	21	156	0.871	15.03	15.901	5.79	6.26	7.88	7.88
2001	22	79	1.504	15.007	16.51	10.02	10.35	11.77	11.77
2001	23	4	2.395	15.038	17.433	15.92	16.5	18.56	18.56
2001	24	18	4.565	15.299	1.864	29.84	27.41	22.68	<<5
2001	26	1	2.495	15.537	18.032	16.06	13.93	10.12	10.12
2001	63	52	1.442	14.957	16.399	9.64	10.39	10.62	10.62

TABLE 4.6-20

Summary of Estimated Visibility Impacts at the Jarbidge Wilderness Area and Zion National Park Using CALPUFF f(RH) Factors, EPA's f(RH) Factors, Monthly f(RH) Factors, and Accounting for Rain and Snow in the Visibility Backgrounds

						Percent Change in Extinction over Natural Background (percent)			
Year	**Day**	**REC**	**BEXT**	**BKG**	**BEXT (tot)**	**CALPUFF f(RH)**	**EPA f(RH)**	**Monthly f(RH)**	**Monthly f(RH) and Natural Obscuration**
2001	309	156	1.557	14.872	16.428	10.47	11.43	12.62	12.62
2001	310	165	1.155	14.868	16.023	7.77	8.48	8.54	8.54
2001	314	94	0.765	14.795	15.561	5.17	5.52	7.62	7.62
2001	315	79	0.754	14.854	15.608	5.08	5.38	7.05	<5
2001	316	165	0.931	14.988	15.919	6.21	6.26	7.99	<5
2001	363	156	3.194	15.997	19.191	19.96	16.24	8.90	<<5
2001	364	165	1.586	16.202	17.791	9.81	7.84	4.02	<5
2002	2	4	5.027	15.56	20.587	32.31	28.46	21.88	<5
2002	47	4	1.13	14.814	15.943	7.63	7.86	11.79	11.79
2002	259	165	0.923	15.573	16.496	5.92	5.66	3.68	<5
2002	325	156	1.654	15.561	17.215	10.63	10.38	9.64	9.64
2002	334	1	1.499	14.875	16.374	10.08	11.05	13.40	13.40
2002	340	18	1.512	15.03	16.542	10.06	10.69	12.45	12.45
2002	341	165	0.934	14.77	15.704	6.33	6.93	10.37	10.37
2002	343	156	0.968	14.882	15.85	6.5	7.16	9.72	9.72
Zion National Park									
1996	6	188	1.597	15.08	16.677	10.59	9.65	7.19	7.19
1996	76	221	0.881	14.994	15.876	5.88	5.97	4.56	4.56
2001	29	225	0.975	15.81	16.786	6.17	5.0	2.79	<<5
2001	327	221	1.045	16.61	17.656	6.29	5.17	2.51	<<5
2001	361	221	0.873	14.947	15.82	5.84	6.26	7.02	7.02
2002	98	223	1.272	16.534	17.806	7.69	6.05	1.87	<<5
2002	276	214	1.027	18.013	19.04	5.7	4.58	1.36	<<5
2002	304	210	1.164	15.818	16.982	7.36	7.18	4.06	<<5
2002	307	225	1.118	15.363	16.482	7.28	6.4	3.88	3.88

Deposition. The CALPOST postprocessor can provide estimates of annual dry and wet deposition for each modeled species at each receptor. CALPOST was run to provide annual total dry and wet deposition in units of $g/m^2/s$ for sulfur dioxide, SO_4, nitrogen oxides, HNO_3, and NO_3 species at each receptor in the Jarbidge Wilderness Area and Zion National Park Class I areas. The deposition values were averaged across all receptors in each Class I area to estimate area-wide average deposition for each Class I area. Units of the annual deposition were then converted from $g/m^2/s$ to kg/ha/yr for comparison with thresholds. The deposition for each of the sulfur species (sulfur dioxide and SO_4) and nitrogen species (nitrogen oxides, HNO_3, and NO_3) was converted to deposition of sulfur or nitrogen, respectively, and then summed to estimate total sulfur or nitrogen deposition. These results are presented in Tables 4.6-21 and 4.6-22 for the Jarbidge Wilderness Area and in Tables 4.6-23 and 4.6-24 for Zion National Park.

TABLE 4.6-21

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Jarbidge Wilderness Area for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000134	0.000000	
HNO_3	0.000164	0.000032	
NO_3	0.000005	0.000056	
Total nitrogen	0.000303	0.000088	0.000391
2001			
Nitrogen oxides	0.000490	0.000000	
HNO_3	0.000480	0.001351	
NO_3	0.000021	0.000536	
Total nitrogen	0.000991	0.001887	0.002878
2002			
Nitrogen oxides	0.000556	0.000000	
HNO_3	0.000381	0.000989	
NO_3	0.000014	0.001065	
Total nitrogen	0.000951	0.002054	0.003005

TABLE 4.6-22

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Jarbidge Wilderness Area for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.001149	0.000171	
SO_4	0.000016	0.000196	
Total sulfur	0.001165	0.000367	0.001532
2001			
Sulfur dioxide	0.003771	0.008283	
SO_4	0.000043	0.001398	
Total sulfur	0.003814	0.009681	0.013495
2002			
Sulfur dioxide	0.003081	0.012206	
SO_4	0.000031	0.002418	
Total sulfur	0.003112	0.014624	0.017736

TABLE 4.6-23

Nitrogen Deposition (kg-N/ha/yr) Averaged Across Zion National Park for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000413	0.000000	
HNO_3	0.000271	0.000143	
NO_3	0.000010	0.000564	
Total nitrogen	0.000694	0.000707	0.001401
2001			
Nitrogen oxides	0.000387	0.000000	
HNO_3	0.000249	0.000275	
NO_3	0.000028	0.000562	
Total nitrogen	0.000664	0.000837	0.001501
2002			
Nitrogen oxides	0.000342	0.000000	
HNO_3	0.000237	0.000195	
NO_3	0.000030	0.000283	
Total nitrogen	0.000609	0.000478	0.001087

TABLE 4.6-24

Sulfur Deposition (kg-S/ha/yr) Averaged Across Zion National Park for the 3 Years of CALPUFF Modeling

NPS DAT	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.002695	0.003106	
SO_4	0.000022	0.000515	
Total sulfur	0.002717	0.003621	0.006338
2001			
Sulfur dioxide	0.002665	0.006181	
SO_4	0.000052	0.001082	
Total sulfur	0.002717	0.007263	0.009980
2002			
Sulfur dioxide	0.002337	0.002640	
SO_4	0.000048	0.000834	
Total sulfur	0.002485	0.003474	0.005959

Estimated annual total nitrogen deposition because of Station emissions at the two Class I areas ranges from 0.00039 to 0.00301 kg-N/ha/yr, which is below the NPS western U.S. Deposition Analysis Threshold (DAT) of 0.005 kg-N/ha/yr.

At the Jarbidge Wilderness Area, the estimated annual total sulfur deposition is below the NPS western U.S. DAT (0.005 kg-S/ha/yr) for 1996 (0.0015 kg-S/ha/yr). However, for 2001 and 2002, the estimated total sulfur deposition (0.013 and 0.018 kg-S/ha/yr) at the Jarbidge Wilderness Area is above the NPS western U.S. DAT (0.005 kg-S/ha/yr). At Zion National Park, the estimated sulfur deposition levels (ranging from 0.006 to 0.010 kg-S/ha/yr) exceed the western U.S. DAT for all 3 modeling years. It should be noted that impacts in excess of a DAT do not necessarily represent an adverse impact, but do indicate a management concern.

NPS Comments to PSD Permit Application Regarding Class I Impacts. The NPS has submitted comments to NDEP on WPEA's PSD permit application (NPS, January 31, 2007). The NPS comments include the following findings from NPS analysis of WPEA's modeling results included in the application:

- The modeling indicates that the Class I PSD increments for sulfur dioxide and nitrogen oxides are not violated at Zion National Park.
- Visibility at Zion National Park would not be adversely affected by the emissions from WPEA alone.
- Visibility at Great Basin National Park would be significantly affected by the emissions from WPEA alone.
- Sulfur deposition from WPEA exceeds the NPS Deposition Analysis Threshold at Zion National Park. However, there is currently no information to indicate that sulfur would acidify aquatic or terrestrial ecosystems in the park.
- It is likely that both sulfur and nitrogen deposition from WPEA exceeds the NPS DATs at Great Basin National

Park, with potential impacts to aquatic and terrestrial ecosystems.

- The impacts of WPEA's emissions upon visibility in Zion National Park are not adverse.
- The impacts of WPEA's emissions upon visibility in Great Basin National Park are significant.

Further, the NPS comments recommend WPEA reconsider using integrated gasification combined cycle (IGCC) technology or make more effective use of the control technologies chosen for the pulverized coal boilers. NPS further recommends that a Continuous Emissions Monitor (CEM) be installed upon startup of the Station. Finally, the NPS has recommended to NDEP that sufficient emission reductions could be secured from other sources in the area to further mitigate WPEA's potential impacts at Great Basin and Zion National Parks. The BLM will look to NDEP as the air permitting regulatory agency to determine if a PSD permit will be issued and what conditions will be imposed. In the event that NDEP issues a final PSD permit for the White Pine Energy Station prior to publication of the Final EIS, the terms and conditions of said permit will be included in the Final EIS.

Additional Class II Area Impacts Analysis. The CALPUFF Modeling System was also used to estimate impacts for two Class II areas, Ruby Lake National Wildlife Refuge (RLNW) and Great Basin National Park (GRBA). Tables 4.6-25 through 4.6-30 summarize results of those comparisons.

TABLE 4.6-25

CALPUFF Estimated PSD Pollutant Concentrations Impacts at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and With Puff Splitting

	Class II Area Thresholds		CALPUFF Estimates*	
Species and Averaging Time	**NAAQS ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**GRBA**	**RLNW**
1996				
Sulfur dioxide annual	80	20	0.0798	0.0157
Sulfur dioxide 24-hour*	365	91	1.1403	0.4693
Sulfur dioxide 3-hour*	NA	512	4.2910	1.6955
PM_{10} annual	50	17	0.0058	0.0016
PM_{10} 24-hour*	150	30	0.0806	0.0484
Nitrogen dioxide annual	100	25	0.0402	0.0028
2001				
Sulfur dioxide annual	80	20	0.0922	0.0158
Sulfur dioxide 24-hour*	365	91	1.4677	0.5680
Sulfur dioxide 3-hour*	NA	512	4.7192	2.6470
PM_{10} annual	50	17	0.0069	0.0012
PM_{10} 24-hour*	150	30	0.1080	0.0522
Nitrogen dioxide annual	100	25	0.0447	0.0047

TABLE 4.6-25

CALPUFF Estimated PSD Pollutant Concentrations Impacts at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station Using 1-Kilometer CALMET Meteorological Fields and With Puff Splitting

	Class II Area Thresholds		CALPUFF Estimates*	
Species and Averaging Time	**NAAQS ($\mu g/m^3$)**	**PSD Increment ($\mu g/m^3$)**	**GRBA**	**RLNW**
2002				
Sulfur dioxide annual	80	20	0.1090	0.0140
Sulfur dioxide 24-hour*	365	91	1.1867	5.2527
Sulfur dioxide 3-hour*	NA	512	4.1846	2.5534
PM_{10} annual	50	17	0.0085	0.0014
PM_{10} 24-hour*	150	30	0.0945	0.0438
Nitrogen dioxide annual	100	25	0.0532	0.0042

* Highest second high at any receptor in the GRBA or RLNW area for short-term (not annual) impacts.

TABLE 4.6-26

CALPUFF Estimated Maximum Daily Extinction Estimates at the Great Basin National Park (GRBA) and Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the White Pine Energy Station*

	Class II Area Visibility Impacts		
	# Days > 5%	**# Days >10%**	**Max Change (%)**
Great Basin (GRBA)			
1996	37	16	20.34
2001	40	20	27.94
2002	51	21	32.29
Ruby Lake (RLNW)			
1996	10	4	17.06
2001	11	4	26.52
2002	9	2	16.80

* Using 1 kilometer CALMET Meteorological Fields, with puff splitting and using the basic FLAG procedures for visibility calculations.

TABLE 4.6-27

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Great Basin National Park (GRBA) Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.009549	0.000000	
HNO_3	0.002213	0.002375	
NO_3	0.000127	0.005416	
Total nitrogen	0.011889	0.007791	0.019680
2001			
Nitrogen oxides	0.010949	0.000000	
HNO_3	0.002434	0.001435	
NO_3	0.000148	0.004229	
Total nitrogen	0.013531	0.005664	0.019195
2002			
Nitrogen oxides	0.011850	0.000000	
HNO_3	0.002302	0.001216	
NO_3	0.000230	0.003748	
Total nitrogen	0.004382	0.004964	0.009346

TABLE 4.6-28

Nitrogen Deposition (kg-N/ha/yr) Averaged Across the Ruby Lake National Wildlife Refuge (RLNW) Class II Areas for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Nitrogen oxides	0.000687	0.000000	
HNO_3	0.001551	0.000189	
NO_3	0.000022	0.000023	
Total nitrogen	0.002260	0.000212	0.002472
2001			
Nitrogen oxides	0.000996	0.000000	
HNO_3	0.000855	0.001444	
NO_3	0.000041	0.002722	
Total nitrogen	0.001892	0.004166	0.006058
2002			
Nitrogen oxides	0.000846	0.000000	
HNO_3	0.000847	0.000770	
NO_3	0.000021	0.000656	
Total nitrogen	0.001714	0.001426	0.003140

TABLE 4.6-29

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Great Basin National Park (GRBA) Class II Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.035897	0.033707	
SO_4	0.000172	0.006238	
Total sulfur	0.036069	0.039945	0.076014
2001			
Sulfur dioxide	0.041610	0.017386	
SO_4	0.000215	0.005542	
Total sulfur	0.041825	0.022928	0.064753
2002			
Sulfur dioxide	0.043625	0.016974	
SO_4	0.000266	0.004998	
Total sulfur	0.043891	0.021972	0.065863

TABLE 4.6-30

Sulfur Deposition (kg-S/ha/yr) Averaged Across the Ruby Lake National Wildlife Refuge (RLNW) Class II Area for the 3 Years of CALPUFF Modeling

	Dry Deposition	Wet Deposition	Total Deposition
1996			
Sulfur dioxide	0.009611	0.001249	
SO_4	0.000081	0.000405	
Total sulfur	0.009692	0.001654	0.011346
2001			
Sulfur dioxide	0.007523	0.018682	
SO_4	0.000065	0.003332	
Total sulfur	0.007588	0.022014	0.029602
2002			
Sulfur dioxide	0.006726	0.005065	
SO_4	0.000045	0.001067	
Total sulfur	0.006771	0.006132	0.012903

In all cases, modeled WPEA pollutant concentrations at Ruby Lake and Great Basin are less than 2 percent of the PSD increment and less than 1 percent of the applicable NAAQS. Perceptible (greater than 5 percent) changes in visibility are indicated for approximately 12 percent of the modeled days for Great Basin and approximately 3 percent of the modeled days for Ruby Lake. Sulfur and nitrogen deposition in excess of the NPS DATs is also indicated for both Great Basin and Ruby Lake. It should be noted that impacts in excess of a DAT do not necessarily

represent an adverse impact, but do indicate a management concern.

4.6.1.3.9 Greenhouse Gas Emissions

As with any fossil-fuel fired project, WPEA will contribute to global emissions of green house gasses, including carbon dioxide, methane, and nitrous oxide. Of these three, carbon dioxide contributes more than 98 percent of the total green house gasses impact. Table 4.6-31 compares estimated carbon monoxide emissions for the proposed Station with similar sized subbituminous coal fired subcritical pulverized coal boiler and natural gas fired combined cycle power plants. The comparison was made using WPEA design heat rate, estimated typical heat rates for subcritical pulverized coal and combined cycle natural gas power plants, and emission factors stated in EPA Climate Leaders program guidance documents.

4.6.1.4 Proposed Action Mitigation

As noted above, the ambient impact analyses performed for the Station demonstrate that the estimated impacts are within the standards that are deemed to be protective of human health and the environment. One area of concern is in regards to predicted impacts on visibility within Jarbidge Wilderness Area and Zion National Park during conditions that have historically occurred for a small fraction of the time. Visibility and acid deposition impacts within Great Basin National Park are also of concern.

As part of the PSD permitting process, NDEP and EPA have the responsibility for assessment of Station impacts and specification of any mitigating actions deemed necessary to protect air quality. NDEP issued a draft air permit for WPEA in December 2006 and required no further mitigation of visibility impacts as part of that permit.

To enable the BLM to monitor compliance by the Station operators with the terms and conditions of the NDEP issued Class I Air Quality Permit and to identify any unanticipated effects to air quality, WPEA shall simultaneously submit to BLM and NDEP all monitoring and other reports required under the Class I Air Quality Permit for the White Pine Energy Station issued by the Nevada Division of Environmental Protection.

TABLE 4.6-31

Green House Gas Comparison

Emission Source	Pollutant	Power Plant Capacity MW - net	Heat Rate Btu/nkW-hr	Hourly Emission Rate (pounds per hour)	Annual Emission Rate (tons /year)
Station proposed action	Carbon dioxide	1,590	9,856	4,596,201	20,131,362
Subcritical pulverized coal fired boiler	Carbon dioxide	1,590	10,000	4,663,354	20,425,489
Combined cycle gas fired power plant	Carbon dioxide	1,590	7,500	1,311,750	5,745,465

Note: Emission estimated based on EPA Climate Leaders program guidance document for Stationary Combustion Sources.

4.6.1.5 Alternative 1

4.6.1.5.1 Impacts

The Station Alternative 1 power plant site is approximately 12 miles south of the Station Proposed Action power plant site and approximately 22 miles north of Ely. There are slight differences in the air impact analysis at the two sites, but terrain and meteorology are similar between the two sites. Impacts of other existing sources of air pollution also were evaluated for both sites. Based on these criteria, a qualitative conclusion is that differences in air quality impacts between the Station Proposed Action and Alternative 1 should not be significantly different and mitigation measures would not be required. However, the Alternative 1 power plant site is closer to human receptors and to the Robinson Mine near Ruth. The BLM's preferred alternative (the Station Proposed Action) is presumed to have more acceptable impacts because of the greater distance from human receptors and particulate emissions from the mine. The Alternative 1 power plant site is also approximately half the distance to the Bristlecone and High Schells Wilderness areas versus the Proposed Action power plant site, and as such it is likely to have higher ambient pollutant impacts; as such, the Proposed Action is again presumed to be preferable. It is important to note that if Station Alternative 1 is selected, a revised PSD air permit application providing quantitative modeling and analysis of impacts from operations at the Alternative 1 power plant site would be required by the Clean Air Act.

4.6.1.5.2 Mitigation

Mitigation required for Alternative 1 is the same as described for the Proposed Action.

4.6.1.6 Connected Actions

4.6.1.6.1 SWIP

Transmission line construction would cause a temporary increase in particulate matter (airborne dust), primarily from constructing new roads, upgrading existing roads, moving heavy construction equipment, and traveling to and from construction sites. Gaseous emissions from construction vehicles would be temporary, disperse quickly, and likely be far below NAAQS (BLM, 1993). Air quality impacts from operating the transmission system would include dust and emissions from maintenance checkups and emergency activities (for example, repair a fallen transmission line). Air quality impacts would not be significant during transmission line construction or operation as long as mitigation measures are implemented. Mitigation measures proposed include limiting construction during periods of strong winds, using water to control dust during construction, and maintaining vehicles to prevent excessive exhaust emissions (BLM, 1993).

4.6.1.6.2 NNR

The reinstatement of freight rail service on the NNR would generate pollutant emissions during the construction phase and to a lesser extent during rail operation. Air quality impacts during construction are expected to be short-term and would cease when restoration activities are completed. Because of the distance of the NNR to adjacent developments, these emissions are not expected to adversely affect adjacent residents or sensitive receptors (David Evans and Associates, Inc., 2002). Air quality impacts from the reinstatement of freight rail service are expected to be minimal. Because of the projected low level of rail traffic on the NNR (up to four trains per day, on average), emissions

during NNR operation would not be large enough to cause the area to violate sulfur dioxide or ozone standards (David Evans and Associates, Inc., 2002). Long-term train emissions would not result in significant adverse regional or local air quality impacts (David Evans and Associates, Inc., 2002). Estimated locomotive emissions associated with the transport of coal via the NNR to the Station power plant were described in Section 4.6.1.3.3, *Magnitude of Emissions During Operation*, and were predicted to have minimal ambient impact.

4.6.1.7 No Action Alternative

No Station-related impacts on air quality would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.6.2 Noise

This analysis addresses potential temporary noise impacts from Station construction, noise from steam blowouts prior to normal operation of the proposed power plant, and potential noise impacts from Station operation.

4.6.2.1 Proposed Action

4.6.2.1.1 Impacts

Construction

Construction activities would result in a temporary direct increase in ambient noise levels around the construction area. The actual increase in ambient noise levels would depend on the construction activity occurring, and the number and mix of construction vehicles and equipment in use. Construction activities are anticipated to occur during the day when residents are typically less sensitive to noise than they are at night.

Construction of a power plant can generally be divided into five phases that use different types of construction equipment. The five phases are grading and excavation, concrete pouring, steel erection, machinery installation, and site clean-up. In addition, construction of electric transmission facilities, the water supply system, a rail spur, and access roads would occur.

Estimated construction noise levels were calculated based on the equipment list contained in the Toquop Energy Project Final EIS (BLM, 2003). As proposed at the time, the Toquop Energy Project in Nevada is similar to the proposed White Pine Energy Station. The same general kinds and numbers of equipment would be used to construct the Station as the proposed Toquop Energy Project, and this approach provides a representative estimate of the range of expected noise levels during construction of the Station. Table 4.6-32 shows the calculated construction noise levels at Hot Springs Ranch, the nearest noise sensitive receptor, that would be associated with construction of various Station Proposed Action features.

TABLE 4.6-32

Calculated Proposed Action Construction and Operation Total Noise Levels at Hot Springs Ranch

Noise Source	Range of Sound Pressure Levels at 50 feet at Construction Site (dBA)	Total Noise Level at Ranch (dBA)
Construction		
Power plant approximately 3 miles from Hot Springs Ranch	71 (electrical generator) to 87 (D8 bulldozer)	51
Electric transmission facilities approximately 2 miles from Hot Springs Ranch	84 (pickup truck) to 87 (D8 bulldozer)	51
Water supply system approximately 1 mile from Hot Springs Ranch	84 (pickup truck) to 86 (trackhoe or D6 bulldozer)	53
Rail spur approximately 3 miles from Hot Springs Ranch	84 (pickup truck) 87 (D8 bulldozer)	48
Construction of power plant access road approximately 3 miles from Hot Springs Ranch	84 (pickup truck) to 87 (D8 bulldozer)	48
Operation [a]		
Substation transformer at 3 miles from the power plant	100[d]	18[b]
Forced draft fan at 3 miles from the power plant	123[d]	32
Coal tower at 3 miles from the power plant	132[d]	39[c]
Coal train at 3 miles from the power plant	67 [e]	42[b]
Total noise with coal delivery work at 3 miles from the power plant		44
Total noise without coal delivery work at 3 miles from the power plant		32

Source: Allouche, Cowan and Gilchrist, 2003 (bulldozers); Miller, 1988 (all other equipment); Harris, Miller & Hanson, 2006 (coal train)

[a] Background noise level is 45-50 dBA at the Proposed Action power plant and Alternative 1 power plant sites, and 40-45 dBA at the Thirtymile Substation site. The calculated noise levels are all below the background noise levels.

[b] Atmospheric absorption is ignored in the calculation. Therefore, the calculation is very conservative.

[c] This analysis is conservative in that it assumes coal handling equipment would be located outdoors, where in reality most noise sources associated with coal handling would be indoors.

[d] Sound power

[e] Sound pressure level (dBA), L_{eq} (1 hour), 50 miles per hour at 50 feet from track

During the construction phase, maximum total noise level is estimated to be 58 dBA at Hot Springs Ranch approximately 3 miles from the Proposed Action power plant site. However, during actual construction, construction noise levels at Hot Springs Ranch would be far below the estimated 58 dBA because of the following reasons:

- Overall construction noise level is estimated based on the maximum rated power of each piece of equipment, but in field operation, most equipment is not driven at full speed or power
- In estimating construction noise levels, it is assumed that all construction activities and equipment are fully operated at the same time, but in field operation, it is not likely that all

construction activities would occur simultaneously

- It is assumed that the construction of electric transmission facilities, the water supply system, a rail spur, and access roads occur at the locations closest to Hot Springs Ranch. In field operation, it is not likely that these construction activities would occur simultaneously at the nearest locations to Hot Springs Ranch
- Atmospheric absorption, which reduces noise levels, is not accounted for in the analysis

Steam Blowouts. Near the end of power plant construction, it would be necessary to generate steam in the boiler and release it to the atmosphere to clean the steam piping. This process is called "steam blowouts." This noise is broadband and only occurs for a few minutes during each blowout for the first few weeks of boiler operation. Approximately 30 to 50 total "blows" are required for a typical power plant before the boiler is operated. This work would likely occur during both daytime and nighttime to avoid the need to heat and cool the boiler during these cycles.

The "Overall Sound Power Level" for a typical steam blowout is 166 dBA (Beranek and Ver, 1992). After accounting for distance and atmospheric absorption for this specific activity, typical noise level for each boiler steam blowout would be 74 dBA at 3 miles from the power plant.

Operation

Outdoor equipment operation is the primary source of noise during power plant operation. Outdoor equipment that would generate the highest noise levels during Station operation is listed in Table 4.6-32 and assumed to include the following:

- One substation transformer in the Duck Creek Substation and one in the Thirtymile Substation. The maximum rating of the substation transformer is assumed to be 60 MVA. "Overall Sound Pressure Level" (dBA) for the substation transformer at 150 meters away is 48 dBA (Beranek and Ver, 1992).
- One forced draft fan.
- Coal tower.

Other significant noise sources during Station operation include coal crushers, the induced draft fan, and de-aerators, but these sources would be located indoors and have less impact than the outdoor forced draft fan. Although the fans associated with typical air cooled condensers are very loud, the proposed natural draft cooling towers are virtually silent.

The NNR is an existing railroad that runs from Cobre to Ely. This railroad is currently inactive from Cobre to a point near McGill. Once the Station power plant becomes operational, the coal trains would come near Shafter and pass through Currie on the way to the plant. Based on a site visit, there are no residences in Currie. Coal would be delivered to the power plant via the rehabilitated and upgraded NNR and the new rail spur to the power plant site. The coal train would be another noise source in addition to the outdoor equipment listed above. In this analysis, it is assumed that only one coal train would operate per hour.

Table 4.6-32 shows the calculated noise levels from the coal train and from project operation equipment and activities at 3 miles, the minimum distance from the nearest sensitive receptor (Hot Springs Ranch) to the Proposed Action power plant site. All of the calculated noise levels are below the existing noise levels of 45 to 50 dBA. Total estimated noise levels

3 miles from the power plant during Station operation without and with coal delivery work are 32 dBA and 44 dBA, respectively, and are below the background noise level of 45 to 50 dBA (see Table 4.6-32).

4.6.2.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.6.2.2 Alternative 1

4.6.2.2.1 Impacts

Construction noise levels at the nearest noise sensitive areas associated with the Alternative 1 power plant would be less than those described for the Proposed Action. This is because the Alternative 1 power plant would be farther from noise sensitive areas than the Proposed Action power plant. Plant operation noise levels also would be less than those described for the Proposed Action because of greater distances to the nearest noise sensitive areas.

Under Alternative 1, coal trains would pass within approximately 0.5 mile of Hot Springs Ranch. At this distance, the calculated train noise level at Hot Springs Ranch is 50 dBA L_{eq} (1 hour), which is near the existing noise levels of 45-50 dBA.

4.6.2.2.2 Mitigation

No mitigation is required for Alternative 1.

4.6.2.3 Connected Actions

4.6.2.3.1 SWIP

The SWIP Final EIS did not specifically address noise. It is expected that noise associated with the construction of the SWIP transmission facilities would generally be similar to that calculated for the White Pine Energy Station. The calculated noise level two miles away from the construction site of Station transmission facilities would be approximately 51 dBA, which is near the range of background noise levels of 45 to 50 dBA in the Station project area.

4.6.2.3.2 NNR

There would be temporary noise impacts associated with NNR construction activities, while noise from passing trains would be intermittent, short-term, and limited. David Evans and Associates, Inc. (2003) reported that these impacts would not be significant because there are few sensitive receptors nearby, none are immediately adjacent to the NNR, and there are no substantial concentrations of sensitive land uses in the area (David Evans and Associates, Inc., 2002). As discussed previously for the White Pine Energy Station, the calculated noise levels at Hot Springs Ranch from a train passing within 0.5 mile and within 3 miles of the ranch are 50 and 42 dBA L_{eq} (1 hour), respectively. These values are less than or within the range of existing background noise levels of 45-50 dBA. Once restored, up to 4 trains per day or approximately 30 trains per week may use the NNR. About 12 of these trains would be conveying coal to the Station power plant each week.

4.6.2.4 No Action Alternative

No Station-related noise impacts would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.7 Visual Resources

This section provides a general description of Station facilities that would have an impact on visual resources and references BMPs that would be followed to reduce visual impacts. This section discusses the seen area analysis that was conducted for the Station Proposed Action and Alternative 1 facility components, and describes the impacts of the Proposed Action and Alternative 1 sites on the six KOPs. This section also discusses impacts of the Station Proposed Action and Alternative 1 on visual resources and VRM consistency and the potential impacts of Station light on night skies. Visual resource impacts that would be associated with the two connected actions (SWIP and NNR Upgrade and Operation) and with the No Action Alternative are described. Cumulative impacts are discussed in Section 4.19, *Cumulative Impacts*.

4.7.1 Description of Facilities

Power generating plants are large-scale features in a landscape. Table 4.7-1 describes some of the larger Station facilities associated with power generation that would be most visible to the general public. These facilities would be present at both the Station Proposed Action and Alternative 1 sites, but the layouts of each site would differ. Chapter 2, *Description of Proposed Action and Alternatives*, provides detailed descriptions of the facilities and layouts.

TABLE 4.7-1

Visible Facilities Associated with the White Pine Energy Station Power Plant Site

Facility	Notes
Cooling towers	The towers (up to three, approximately 550 feet tall) would be the Station's most visible facilities. Color would be concrete gray, which would darken over time. Texture would be smooth. The natural draft dry towers would not have steam plumes or fog associated with them. Night lighting required by the Federal Aviation Administration (FAA) (on all structures over 200-feet above the level of the adjacent ground) would be visible at night to varying degrees.*
Steam generator stacks	The two approximately 600-feet high stacks would be second most visible Station facilities. Would be a gray concrete color that would darken over time. Night lighting required by the FAA would be visible to varying degrees during the night.
Power plant block	Power blocks that house the steam generator/boiler structures would be very visible.
Coal storage, unloading, treating, and handling facilities	The storage pile area would take up to 45 acres. The unloading, treating, conveying, and handling facilities would be visible as large structures.
Solid waste disposal facility for ash and berms	Ash berms would be up to 100 feet high and take up to 200 acres.
Evaporation pond and berms	Pond would be 75 acres in area and with berms and setbacks would total 90 acres.
Fuel oil storage tanks	Seen as large structures.
Duck Creek Substation	Would be most visible as Station facility that is connected to the transmission lines.
Railroad siding and project siding roads	Would be somewhat visible on ground plane.

*Source: U.S. Department of Transportation, 2000.

In addition to the facilities associated with the power plant, other types of facilities would have potential effects on the existing visual conditions. The facility that would be most visible would be the 500-kV line that would run from the proposed Duck Creek Substation at either power plant site to the proposed Thirtymile Substation. Under the Proposed Action, there would be approximately 34 miles of transmission line and cleared ROW. Under Alternative 1 there would be approximately 28 miles of transmission line. Spans between tower structures are expected to be between 600 and 1,500 feet. The most visible component of the transmission line would be the tower structures, which would range from 90 to 160 feet high. ROWs with large vegetation removed also would be visible in places. ROWs would be 500 feet wide in most locations (to eventually accommodate up to three transmission lines).

The development of the water supply system would also potentially have some effects on existing visual conditions. The system would consist of eight wells and a 12-mile-long underground pipeline system under the Proposed Action and an 8-mile-long underground pipeline system under Alternative 1. Some wells would have approximately 12-foot-wide access roads built for them, some would be associated with water storage tanks, others might contain pumping stations, and some would require new electrical distribution lines. All of the wells would be surrounded by chain link fencing. Construction of the pipeline would be expected to disturb a 60-foot-wide area. The pipeline would have a 30-foot-wide cleared ROW.

To help reduce potential visual impacts of the power plant and other Station facilities and to preserve the landscape near these facilities to the extent possible, a number of BMPs have been developed as an integral part of Station construction and operation. The BMPs for visual resources are described in Appendix A, *Best Management Practices.*

4.7.2 Proposed Action

4.7.2.1 Site description

The Proposed Action power plant site would encompass approximately 1,281 acres and contain the cooling towers, steam generator stacks, and other power plant facilities highlighted previously. The site would be approximately 34 miles north of Ely, 22 miles north of McGill, and 12 miles south of the community of Cherry Creek. Distances between the site and the six KOPs are discussed in Section 4.7.2.3, *Impacts on KOPs and Consistency with VRM Classes*. To determine how visible facilities associated with the Proposed Action site would be, a seen area analysis was conducted and is discussed in the following text.

The Proposed Action facilities would be located on the line that separates a VRM Class II area from a VRM Class III area in the Draft Resource Management Plan. As described in Section 3.7.3, *BLM Visual Resource Management (VRM) System*, the exact location of lines that divide VRM classes in the Draft Resource Management Plan did not take site-specific characteristics into consideration. The intent of the Draft Resource Management Plan was that specific VRM class locations would be determined when reviewing specific projects. For this EIS, the Ely District decided that the VRM class for the lands near the Proposed Action site would be more appropriate as Class III. New lines demarcating the Class III and Class II areas near the Proposed Action site will be updated in the future. The impact assessment for the Proposed Action site assumes that it is located in a VRM Class III area.

4.7.2.2 Seen Area Analysis

A seen area analysis can be used to help determine the likelihood that an object can be viewed in the landscape. It identifies all areas that can potentially be seen from a single point via a straight line. A seen area analysis does not take into account factors that can influence visibility such as atmospheric conditions, light intensity, and vegetation. This analysis is useful for determining and assessing maximum viewed areas, and as such can be considered a worst-case analysis.

4.7.2.2.1 Cooling Tower and Steam Generator Stack Height Seen Area Analysis

The proposed cooling towers would be approximately 600 feet high. The actual height for the cooling towers and steam generator stacks could change to some degree. Therefore, a seen area analysis for four different heights was conducted. The heights were 200, 300, 400, and 700 (for a worst-case scenario) feet As depicted in Figure 4.7-1, the seen area for the top of a 700-foot structure (which as stated previously would be approximately 100 feet higher than the likely 600-foot high cooling tower and generator stacks) would range from north of Goshute Lake, south through Steptoe Valley to near Ely. The seen area for a 700-foot structure would also include the slopes of the Schell Creek Range to the east and the Egan and Cherry Creek Ranges to the west. Figure 4.7-1 also displays the seen area for each successively lower facility height. Because of the flat nature of Steptoe Valley, all of the lower facility heights would potentially be seen through much of Steptoe Valley and from the slopes of some adjacent mountains.

4.7.2.2.2 Power Plant Height Seen Area Analysis

Although the height and bulk of the various facilities associated with the power plant would vary, a height of 300 feet was assumed for the seen area analysis. The 300-foot height is the approximate height of the power blocks that would house the steam generator/boiler structures. The same seen area analysis that is depicted in Figure 4.7-1 for a 300-foot-tall facility was used to represent the seen area of a hypothetical 300-foot-tall power block. The seen area of the power block would include most of Steptoe Valley north to approximately Greens Siding.

The power block also could potentially be seen along slopes immediately adjacent to the valley. Ely and most of McGill would not be in the power block seen area, but part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness would be. The color scenario that is proposed for the power plant facilities would help reduce the visual impact of the facilities.

4.7.2.2.3 Transmission Line Structure Height Seen Area Analysis

Transmission line structures could vary from 90 to 160 feet in height. The span between the structures would be expected to range between 600 and 1,500 feet. For the seen area analysis, a 140-foot-high structure with 800-foot spacing was modeled. Figure 4.7-2 displays the potential seen area of the transmission towers associated with the Proposed Action. This information is further broken down based on ranges of the numbers of transmission structures potentially seen. The potential impact would increase with the number of structures that could potentially be seen. The portion of the transmission line route that would be most visible to the greatest number of people is the section that leaves the Duck Creek Substation at the power plant site and runs along the upper (western) edge of Steptoe Valley, and then up the eastern slope of the Egan Range. Once over the Egan Range, the

transmission line would be very visible from Hunter Flat and parts of Butte Valley, but would be seen by few people.

4.7.2.3 Impacts on KOPs and Consistency with VRM Classes

Appendix E, *Visual Inventory Forms*, contains Visual Resource Inventory Forms that were completed based on field examinations of the visual settings of each KOP. The forms describe the existing conditions of the characteristic landscape seen from each KOP, types of viewers, sensitivity of viewers, and other relevant information.

The following text describes impacts of the Station Proposed Action on each of the six KOPs. Impacts on each KOP were analyzed by reviewing the Visual Contrast Rating Worksheets that were developed for each KOP (see Appendix E, *Visual Inventory Forms*), seen area maps, facility descriptions, and simulations. Visual simulations were developed for the two KOPs (KOP 2: Pony Express Route and KOP 3: Lincoln Highway) that would be located closest to the Proposed Action power plant site).

4.7.2.3.1 KOP 1: Cherry Creek

KOP 1 is approximately 12-miles northwest of the Proposed Action power plant site in the background distance zone. It would be within the seen area for all potential cooling tower and steam generator stack heights as depicted in Figure 4.7-1.

Because of the distance from this KOP to the Proposed Action power plant, site facilities would be relatively small components of the viewed landscape and the Proposed Action would meet VRM Class III objectives.

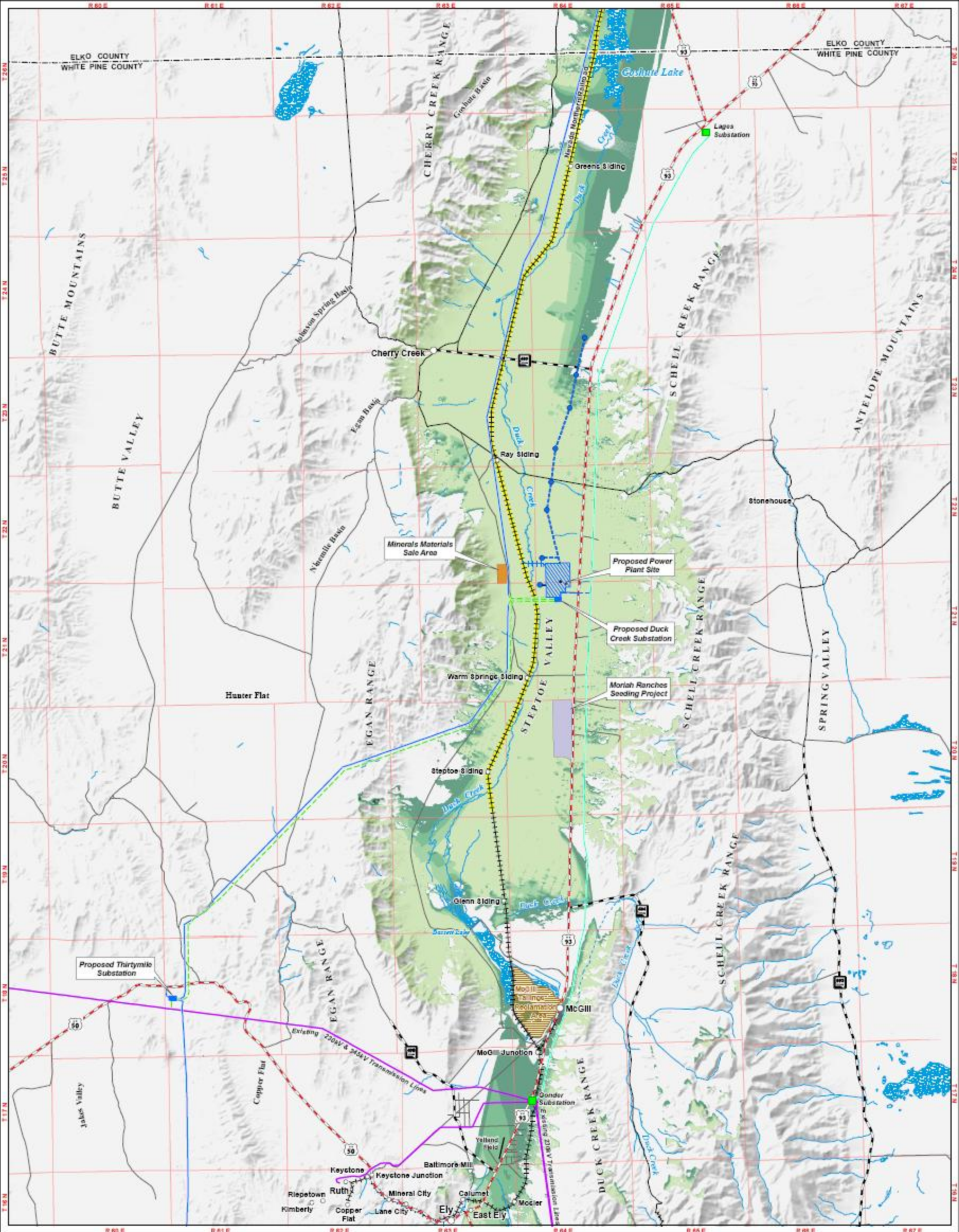
Views of most of the transmission line would be blocked by topography and the part that would be seen would meet VRM Class III objectives. The portions of the upgraded railroad and water pipeline ROW seen from this location would pass through VRM Class II lands and would meet VRM Class II objectives.

4.7.2.3.2 KOP 2: Pony Express Route

The Proposed Action power plant site is approximately 4.5 miles south of KOP 2 in the foreground-middleground distance zone. KOP 2 would be in the seen area of all cooling tower heights (see Figure 4.7-1). The concave cylindrical shape of the cooling towers and the cylindrical shape of the stacks would be seen in the distance silhouetted against the sky and mountains from this location as depicted in the simulation seen as Photo (Simulation) 4.7-1. FAA-required lights on the cooling towers and stacks would be clearly seen at night from KOP 2. Other power plant site facilities such as the power block, berms for the evaporation pond, solid waste disposal areas, and piles of stored coal would be seen from this KOP as long horizontal forms in the landscape. The waters of the evaporation pond would not be seen because of view blockage by the berms.

Changes to the characteristic landscape seen from this location would be moderate to high. The Proposed Action power plant site would meet VRM Class III objectives.

The segment of the transmission line that directly feeds into the Proposed Action power plant site would be visible (11 to 25 structures) from KOP 2 (see Figure 4.7-2). The closest part of the transmission line would be approximately 6 miles south of KOP 2 and would be in an area of VRM Class III. The transmission line would meet VRM Class III objectives.



N

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

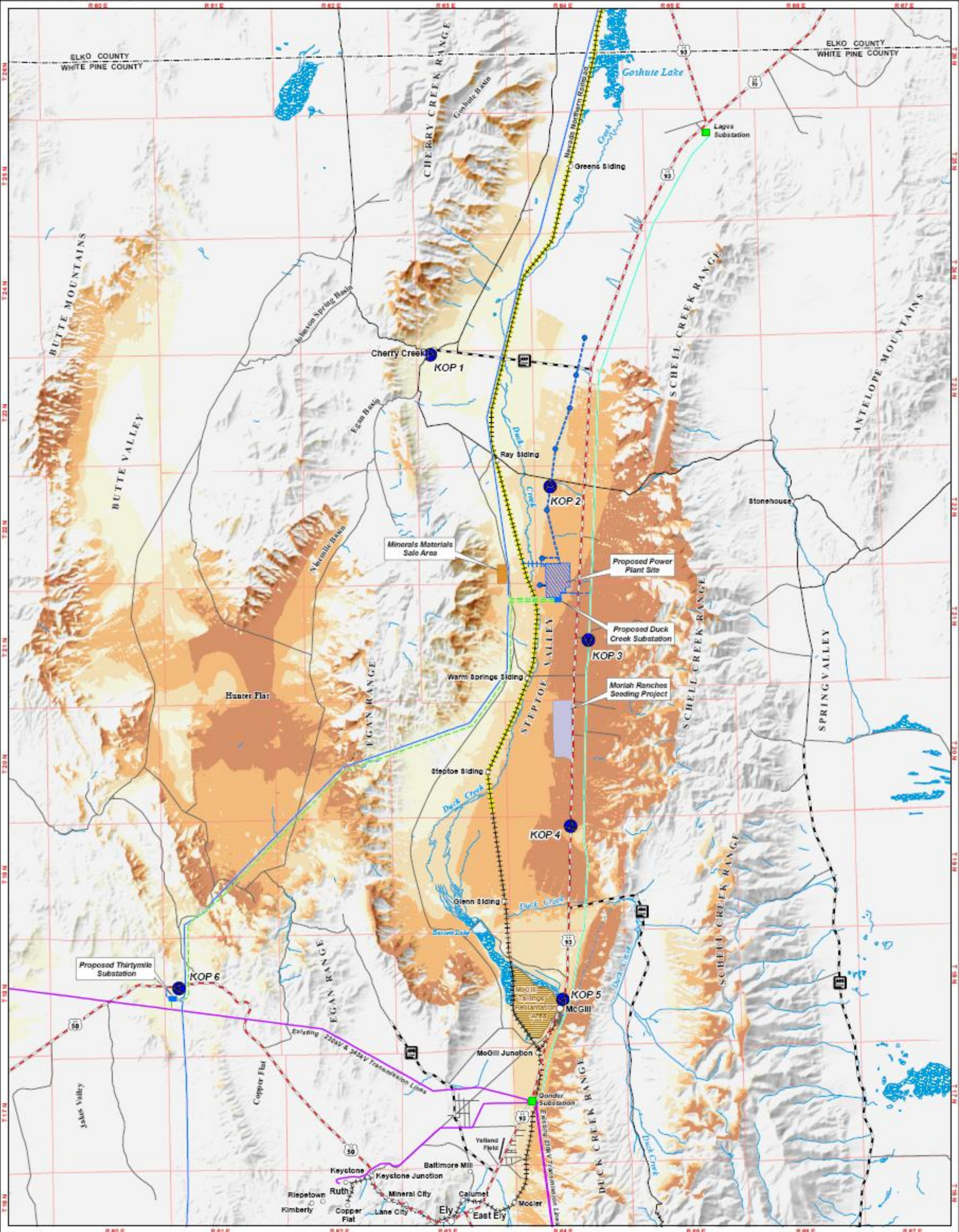
Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- Modeled Stack Height Visible-200 feet
- Modeled Stack Height Visible-300 feet
- Modeled Stack Height Visible-400 feet
- Modeled Stack Height Visible-700 feet

Proposed Action Stack & Power Block
Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-1



N

0 1.5 3 Miles

1:300,000 when printed at 11 x 17 inches

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Key Observation Point (KOP)

Proposed Action Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- 1 - 10 Transmission Structures Seen
- 11 - 25 Transmission Structures Seen
- 26 - 50 Transmission Structures Seen
- 51+ Transmission Structures Seen

Proposed Action Transmission Line
Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-2

The upgraded rail line and water pipeline ROW as well as the electrical distribution line (primarily the 55-foot high poles) for well pumps would be visible from KOP 2. Parts of the rail line and the occasional train (approximately 12 trains a week) would likely be seen approximately 2.5 miles to the west in an area of VRM Class II. The improved rail line would meet the VRM Class II objectives when viewed from this location.

The 30-foot wide ROW for the waterline would be seen from this KOP. After construction the cleared ROW would revegetate over time. An unpaved access road and 55-foot-high poles with an electrical distribution line would be located within the ROW. VRM Class II objectives should be met when looking at the ROW from near this location.

4.7.2.3.3 KOP 3: Lincoln Highway

This KOP is located along the Lincoln Highway approximately 2.5 miles south of the Proposed Action power plant site. The three cooling towers and two steam generator stacks would be very visible from this location as depicted in the simulation displayed in Photo (Simulation) 4.7-2. The three concrete colored cooling towers and steam generator stacks would contrast enough with the characteristic landscape that they would cause a moderate change to the landscape, which would not meet VRM Class III objectives. A number of other facilities within the power plant site would also be visible as depicted in the visual simulation that was done to represent the view of the site from KOP 3 (see Photo [Simulation] 4.7-2). Although the other facilities would be visible, they would not be visually dominant. These facilities would be visible and would contrast with the adjacent landscape in form, shape, and scale. A range of colors similar to those in the nearby landscape is proposed to be used for some of the facilities as illustrated in Photo (Simulation) 4.7-2 Painting the facilities these colors would help reduce the visual impacts of the facilities, but VRM Class III objectives still would not be met.

The segment of the transmission line that directly feeds into the Proposed Action power plant site would be visible from KOP 3 and would meet VRM Class III objectives. The upgraded railroad and water pipeline ROW would likely not be visible from this location and if seen would meet VRM Class III objectives.

4.7.2.3.4 KOP 4: U.S. 93 Turnoff

This KOP is approximately 12 miles south of the Proposed Action power plant site in the background distance zone. The tops of the three cooling towers and stacks would be visible in the distance from this KOP but would be far enough away to meet VRM Class III objectives. The closest segment of the transmission line and water pipeline would meet VRM Class III objectives. The upgraded railroad line would not be seen.

4.7.2.3.5 KOP 5: McGill

KOP 5 would be approximately 21 miles south of the Proposed Action power plant site. The Proposed Action power plant site would meet VRM Class III objectives as would the transmission line, water pipeline, and upgraded railroad.

4.7.2.3.6 KOP 6: U.S. 50

The only Station facility that would be visible from this KOP along U.S. 50 would be the transmission line, which would be approximately 0.25-mile west of the KOP and the entrance road to the Thirtymile Substation (and possibly signs and vehicles). The transmission line would meet objectives of VRM Class III.

4.7.2.4 VRM Consistency

Facilities associated with the Station Proposed Action would be viewed to varying degrees throughout much of Steptoe Valley and from adjacent slopes. Station facilities (or parts of

Station facilities) could potentially be viewed throughout the valley. The BMPs contained in Appendix A, *Best Management Practices*, for Visual Resources as well as Landscape Preservation and Impact Avoidance, would help to reduce the visual impacts of some facilities (other than the cooling towers and generator stacks) throughout much of the seen area and have been considered in this assessment of whether or not VRM class objectives would be met. VRM class objectives would be met for the Proposed Action when viewed from most of the KOPs. As depicted in Table 4.7-2, the Proposed Action would meet VRM objectives at four of the six KOPs and would not meet VRM Class III objectives at the two KOPs located closest to the Proposed Action.

TABLE 4.7-2

Summary of White Pine Energy Station Proposed Action and Alternative 1 VRM Class Objective Consistency

		VRM Class Objective Met					
Facility	**VRM Class(es)**	**KOP 1: Cherry Creek**	**KOP 2: Pony Express Route**	**KOP 3: Lincoln Highway**	**KOP 4: U.S. 93 Turnoff**	**KOP 5: McGill**	**KOP 6: U.S. 50**
Proposed Action							
Cooling towers and stacks	III	Yes	Yes	No	Yes	Yes	Not seen
Power plant	III	Yes	Yes	No	Yes	Yes	Not seen
Evaporation pond	III	Yes	Yes	Yes	Yes	Yes	Not seen
Solid waste storage	III	Yes	Yes	Yes	Yes	Yes	Not seen
Transmission line	III	Yes	Yes	Yes	Yes	Yes	Yes
Railroad track	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not Seen	Not seen	Not seen
Water pipeline cleared ROW	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen
Alternative 1							
Facility	*VRM Class(es)*	*VRM Class Objective Met*					
Cooling towers and stacks	III	Not seen	Yes	Yes	No	Yes	Not seen
Power plant	III	Not seen	Yes	Yes	No	Yes	Not seen
Evaporation pond	III	Not seen	Not seen	Yes	Yes	Yes	Not seen
Solid waste storage	III	Not seen	Not seen	Yes	Yes	Yes	Not seen
Transmission line	III	Not seen	Yes	Yes	Yes	Yes	Yes
Railroad track	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen
Water Pipeline cleared ROW	II and III	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	II = Yes III = Yes	Not seen	Not seen

PHOTO 4.7-1
Simulation of View of Proposed Action from KOP 2. Representative of simulation of view from KOP 1.

PHOTO 4.7-2
Simulation of View of Proposed Action from KOP 3

In summary, the Station Proposed Action sites would meet VRM Class III objectives when viewed from most of Steptoe Valley. VRM Class III objectives would not be met when viewed within several miles of the Proposed Action power plant site because of the scale of cooling towers, generator stacks, and to a lesser degree, the power plant.

4.7.2.5 Night Sky Effects

In addition to the potential impacts of the proposed Station facilities themselves, lights associated with the Station facilities could have potential impacts on the visual environment (although not measurable in the VRM system). As mentioned in Section 3.7.2, *Existing Conditions*, the issue of dark skies is receiving attention nationally, particularly in relationship to potential effects of light on dark skies associated with National Parks. The NPS provided suggestions on ways to help minimize light impacts on dark skies from development projects (Moore, 2005). These suggestions are important parts of the Station visual resources BMPs contained in Appendix A, *Best Management Practices*. They include using directional lights that do not allow lights to shine into the sky, screening lights, using timers and motion detectors so that lights are only on when necessary, and designing a lighting system than minimizes lighting to only meet functional requirements. Even with implementing the BMPs, some lights associated with the Proposed Action would be visible from parts of Steptoe Valley. The new lights would likely add somewhat to the “island” or “dome” of light that is produced by the towns of Ely and McGill. The addition of some night light from the Proposed Action Station may possibly be seen as slightly isolated from the “dome” of light from Ely and McGill because the Proposed Action power plant site is approximately 34 miles and 22 miles, respectively, north of these two communities. However, by following the BMPs in Appendix A that were established to minimize the effect of night light associated with the Station, it is not believed that the Proposed Action would add appreciably to the glow from Ely and McGill that can be seen from Great Basin National Park.

4.7.2.6 Mitigation

No mitigation is required for the Proposed Action.

4.7.3 Alternative 1

4.7.3.1 Site Description

The Alternative 1 power plant site would be approximately 22 miles north of Ely, 10 miles north of McGill, and 22 miles south of Cherry Creek. The site would cover approximately 1,330 acres and contain the same facilities as the Proposed Action power plant site. However, the layout of the facilities would be different as described in Chapter 2, *Description of Proposed Action and Alternatives*. The Alternative 1 power plant site is in an area that has a VRM Class of III. Most of the transmission line would pass through VRM Class III lands. The upgraded railroad and the water pipeline would pass through BLM lands that are VRM Class II and III.

4.7.3.2 Seen Area Analysis

A seen area analysis for Alternative 1 facilities was developed to help analyze visual impacts. Figure 4.7-3 depicts the seen areas associated with Alternative 1 cooling tower heights and the power block, and Figure 4.7-4 illustrates the seen areas of the Alternative 1 transmission line.

4.7.3.2.1 Cooling Tower and Steam Generator Stack Height Seen Area Analysis

As with the Proposed Action, seen area maps for cooling tower and structure heights of 200, 300, 400, and 700 feet (the potential "worse-case" height) were developed, even though the cooling tower and generator stack heights would be approximately 600 feet. The seen area of the 700-foot height would range from parts of the west shore of Goshute Lake in the north to areas near Ely in the south. The 700-foot-height seen area under Alternative 1 would be less visible at the northern parts of Steptoe Valley than for the Proposed Action. The stack would be more visible at the southern portion of the valley. The seen area for each successively lower height would be somewhat reduced as depicted in Figure 4.7-3. However, even the 200-foot height would potentially be seen through much of the middle and southern parts of Steptoe Valley.

4.7.3.2.2 Power Plant Height Seen Area Analysis

The height of the power block of the power plant was assumed to be 300 feet for the seen area analysis. As shown in Figure 4.7-3, the seen area of a 300-foot-tall power block would extend north to Ray Siding (and the lower eastern slopes of the Cherry Creek Range) and south to areas east of Ely. The power block would also potentially be seen along slopes immediately adjacent to Steptoe Valley. Parts of Ely and McGill would be in the power block seen area, but Cherry Creek would not. As stated previously, the colors that are proposed for power plant facilities would help reduce the visual impact of the facilities when viewed from a distance. FAA-required lights on the stacks would likely be seen at night throughout the seen area of the cooling towers.

4.7.3.2.3 Transmission Line Structure Height Seen Area Analysis

The transmission line information discussed under the Proposed Action is applicable to Alternative 1. Figure 4.7-4 displays the potential seen area of the transmission towers associated with Alternative 1. The transmission line route associated with Alternative 1 would cross the width of Steptoe Valley. As a result, more structures associated with the transmission line route of Alternative 1 would potentially be seen by more people than with the Proposed Action. After reaching the base of the Egan Range, the routes would be the same.

4.7.3.3 Impacts on KOPs and Consistency with VRM Classes

The following text describes impacts of Alternative 1 on each of the six KOPs. As was the case with the Proposed Action, the analysis was conducted by reviewing the Visual Contrast Rating Worksheets that were developed for each KOP (Appendix E, *Visual Inventory Forms*), seen area maps, facility descriptions, and simulations.

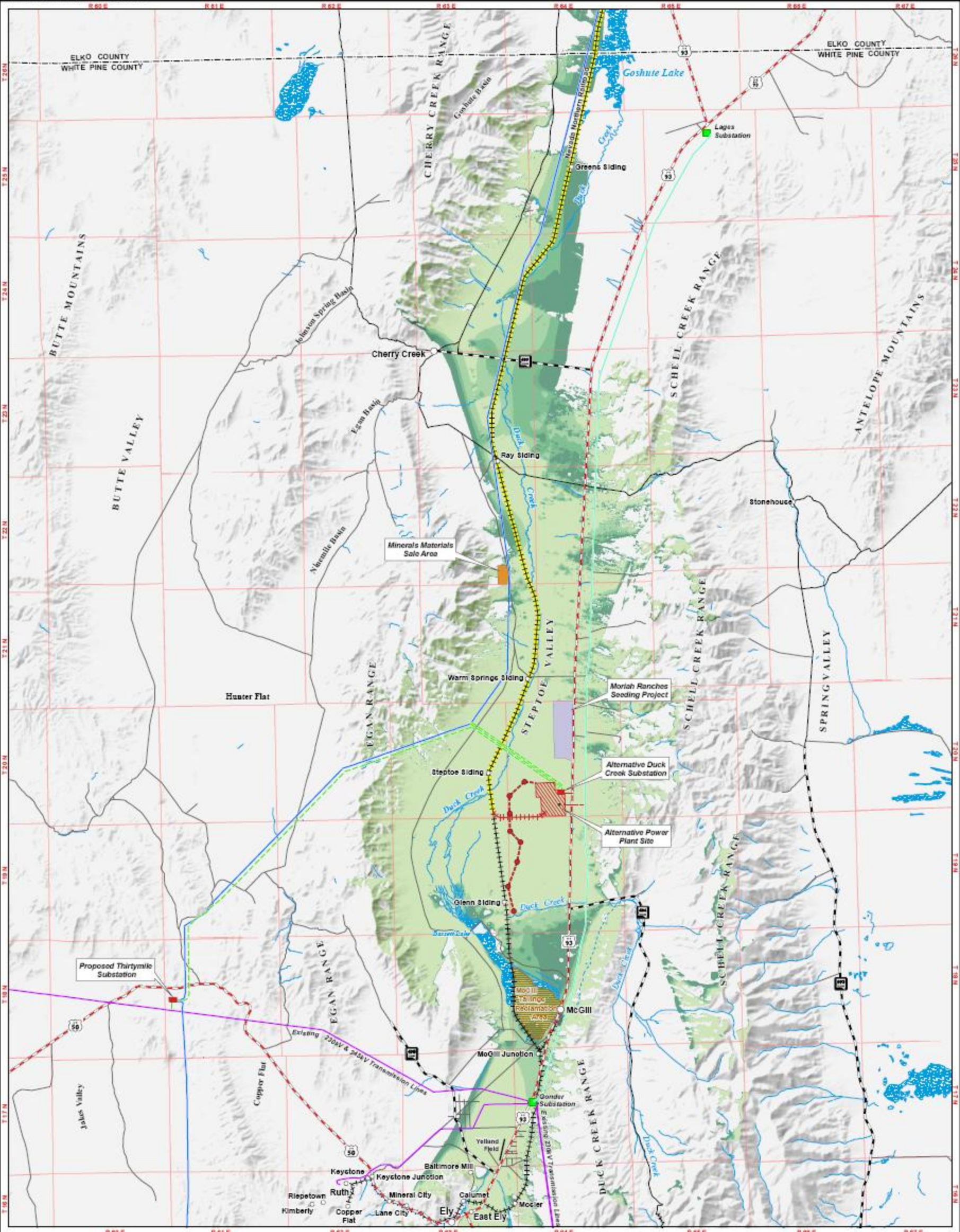
4.7.3.3.1 KOP 1: Cherry Creek

The Alternative 1 power plant site and transmission line would not be seen from the community of Cherry Creek. Parts of the upgraded rail line and water pipeline ROW would be potentially seen and would meet VRM Class II objectives.

4.7.3.3.2 KOP 2: Pony Express Trail

The Alternative 1 power plant site would be approximately 16 miles south of this KOP and would meet VRM Class III objectives.

KOP 2 is not in the seen area of any segments of the transmission line associated with Alternative 1.



N

0 1.5 3 Miles

1:0,000 when printed at 11 x 17 inches

Existing Electrical Features
- Existing Substation
- Existing Transmission Line
- Existing Distribution Line

Surface Water
- Perennial Stream or River
- Wetland

Connected Action
- SWIP Transmission Line
- NNR Upgrade

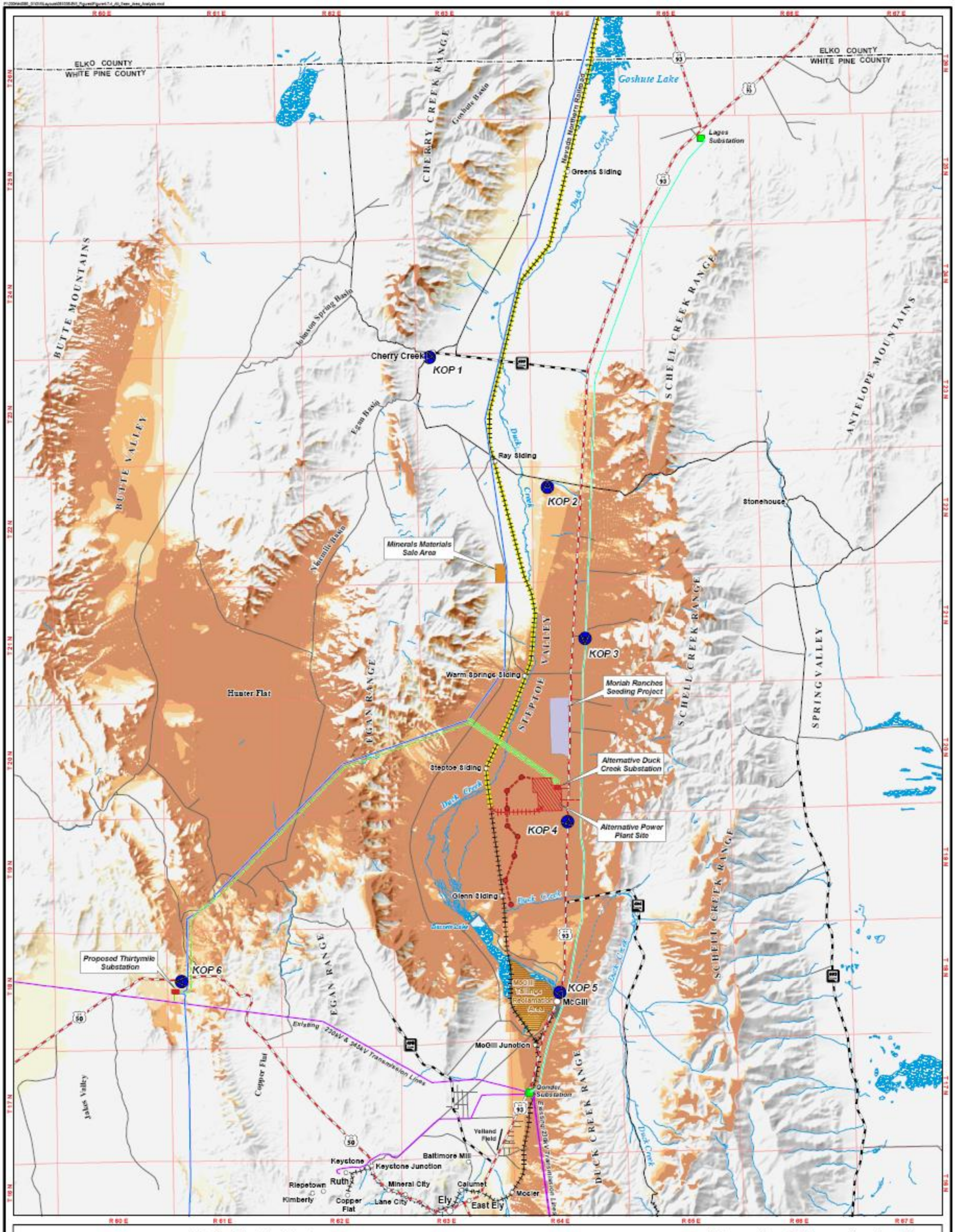
Common Project Features
- Minerals Materials Sale Area
- Moriah Ranches Seeding Project

Alternative 1 Project Features
- Proposed Well Site
- Proposed Water Pipeline/ Distribution Line
- Proposed Rail Spur
- Proposed Transmission Line
- Proposed Electric Distribution Line
- Proposed Access Road
- Proposed Substation Site
- Proposed Power Plant Site

Seen Area Analysis
- Modeled Stack Height Visible-200 feet
- Modeled Stack Height Visible-300 feet
- Modeled Stack Height Visible-400 feet
- Modeled Stack Height Visible-700 feet

Alternative 1 Stack & Power Block
Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-3



Alternative 1 Transmission Line
Seen Area Analysis
White Pine Energy Station Project

Figure 4.7-4

Impacts of the upgraded railroad and the water pipeline associated with Alternative 1 would be the same as those discussed for the Proposed Action.

4.7.3.3.3 KOP 3: Lincoln Highway

This KOP is located along the Lincoln Highway approximately 7 miles north of the Alternative 1 power plant site. KOP 3 would be within the seen area of all cooling tower heights and the power block (see Photo 4.7-2 [Simulation]). FAA-required lights on the cooling towers would be seen from this location at night, as would some exterior lighting. Alternative 1 would meet VRM Class III objectives. KOP 3 would be within the seen area of the Alternative 1 transmission line (see Figure 4.7-3) and would meet VRM Class III objectives. Impacts from the upgraded railroad and water pipeline associated with Alternative 1 would be the same as those discussed for the Proposed Action.

4.7.3.3.4 KOP 4: U.S. 93 Turnoff

This KOP is approximately 1 mile southeast of the Alternative 1 power plant site in the foreground-middleground distance zone. A number of project facilities would be visible from this vantage point as illustrated in Photo (Simulation) 4.7-3, which is a visual simulation of the Alternative 1 site as seen from KOP 4. The cooling towers (600 feet high in the simulation) and the stacks would be the facilities most visible to people driving north on U.S. 93. Both the cooling towers and the stacks would be the color of concrete and would be silhouetted against the sky. The coal storage area would be visible and would appear as a long, dark horizontal form in the landscape. Other visible large facilities such as the power block, coal conveyers, water filters, and storage tanks would be less visible than the stacks and the coal storage area because they would be painted different colors (see Section 4.7.1, *Description of Facilities*). Painting the facilities different appropriate colors found in the nearby landscape would help reduce the color contrast and visual impacts of the facilities most of the year. When snow is present on the ground and in the mountains in the background, the painted facilities would contrast with the white environment. The site would be within the foreground-middleground distance zone in an area of VRM Class III. From the vantage point of KOP 4, the changes to the characteristic landscape from the project would not meet VRM Class III objectives.

The transmission line would be seen as it would leave the Alternative 1 Duck Creek Substation at the power plant site and as it would progress southwest along the base of the Egan Range. The transmission line would meet the VRM objectives of the VRM Class III area it would pass through. The railroad line would be as close as 1 mile away from this KOP and would also meet VRM Class III objectives. The water pipeline ROW might be seen. Even if seen, it would meet VRM Class III objectives.

4.7.3.3.5 KOP 5: McGill

KOP 5 is approximately 10 miles south of the Alternative 1 power plant site, which would meet VRM Class III objectives (see Photo [Simulation] 4.7-4). The transmission lines, railroad, and water pipeline ROW would not be seen from this location.

4.7.3.3.6 KOP 6: U.S. 50

The impacts for KOP 6 that were described under the Proposed Action would be the same under Alternative 1.

4.7.3.4 VRM Consistency

Facilities associated with Station Alternative 1 would be viewed to varying degrees throughout much of Steptoe Valley and from adjacent slopes. Station facilities (or parts of Station facilities) could potentially be viewed throughout the valley. As described for the Proposed Action, the BMPs contained in Appendix A, *Best Management Practices*, for Visual Resources as well as Landscape Preservation and Impact Avoidance, would help to reduce the visual impacts of some facilities (other than the cooling towers and generator stacks) throughout much of the seen area and have been considered in this assessment of whether or not VRM class objectives would be met. VRM class objectives would be met for Alternative 1 when viewed from most of the KOPs. As depicted in Table 4.7-2, Alternative I would meet VRM objectives at five of the six KOPs and would not meet VRM Class III objectives at one KOP (which is the closest KOP to the Alternative 1 power plant site).

In summary, the Station Alternative 1 sites would meet VRM Class III objectives when viewed from most of Steptoe Valley. VRM Class III objectives would not be met when viewed within several miles of the power plant site because of the scale of cooling towers, generator stacks, and to a lesser degree, the power plant.

4.7.3.5 Night Sky Effects

The same kinds of potential effects of Station light on night skies and BMPs that would be implemented to reduce these effects would occur under Alternative 1 as were described for the Proposed Action. However, the addition of some night light under Alternative 1 may appear to blend more into the “dome” of light from Ely and McGill because the Alternative 1 power plant site is approximately 12 miles closer to these communities than the Proposed Action power plant site. By following the BMPs in Appendix A that were established to minimize the effect of night light associated with the Station, it is not believed that Alternative 1 would add appreciably to the glow from Ely and McGill that can be seen from Great Basin National Park.

4.7.3.6 Mitigation

No mitigation is required for Alternative 1.

4.7.4 Connected Actions

4.7.4.1 SWIP

The presence of SWIP transmission towers and lines would result in varying levels of visual contrasts with the existing, background scenery and visual impacts to the area being viewed. Areas of potentially high visual impacts due to views of the SWIP corridor are from rural residences and agricultural areas in southern Idaho (for example, near Hagerman) and from isolated rural residences in Nevada (BLM, 1993).

Potentially high visual impacts to views along travel routes in Nevada would occur where the SWIP corridor crosses or parallels portions of U.S. Highway 93 (a designated scenic highway south from Majors Place); the California Trail Backcountry Byway; and the Kane Spring Backcountry Byway. High impacts also would occur where the SWIP corridor crosses roads in visually sensitive areas that provide primary access to Goshute Canyon WSA (now Wilderness) and Arrow Canyon WSA (BLM, 1993). There would be high visual impacts to recreation and tourist views from the Minidoka Relocation Center interpretive site in Idaho and from the Kane Springs Backcountry Byway in Nevada (BLM, 1993).

PHOTO 4.7-3
Simulation of View of Alternative 1 from KOP 4

PHOTO 4.7-4
Simulation of View of Alternative 1 from KOP 5

Visual contrasts in the area of Salmon Falls Canyon and Rock Creek in southern Idaho and northern Nevada would not comply with VRM Class I designations in Nevada or VRM Class II designations in Idaho. Strong and moderate visual contrasts in areas that would not comply with VRM Class II designations in Nevada include crossings of Interstate 80 in northern Nevada and Pahranagat Wash in southern Nevada (BLM, 1993).

4.7.4.2 NNR

Restoration, operation, and maintenance of the NNR would retain the visual quality of the railroad track and surrounding landscape, would not obstruct public views, and would not adversely affect existing visual conditions (David Evans and Associates, Inc., 2002). In addition to upgrading the existing NNR, a rail loop would be built from the main line to the power plant that would be approximately 2 miles long for the Proposed Action and 3 miles long for Alternative 1. Construction of the loops would not adversely affect existing visual conditions. Approximately 12 trains of coal per week would be expected to use the upgraded NNR, which would introduce a visual element to the landscape that has not been seen in a number of years. The presence of the trains moving across the landscape would not adversely affect existing visual conditions.

4.7.5 No Action Alternative

No project-related impacts on visual resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.8 Recreation Resources

This section describes the potential effects of the proposed White Pine Energy Station on recreation resources within the project area. It also discusses the relevant recreation plans and policies that may be impacted.

The Station would be considered to have an adverse impact to recreation resources if any of the following apply:

- Directly disturb federal, state, local, or private recreation sites
- Restrict access to federal, state, local, or private recreation sites or restrict access to public land
- Substantially reduce the scenic values of undeveloped federal, state, local, or private recreation sites or Wilderness (BLM, 2001a)

4.8.1 Proposed Action

4.8.1.1 Impacts

4.8.1.1.1 Impacts to Recreational Opportunities on Federal, State, and County Lands.

The power plant site for the Proposed Action encompasses approximately 1,281 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holding. Transferring ownership of the 1,281-acre parcel from public to private would preclude the continuation of existing recreational opportunities on the fenced site, which may include hiking, scenic viewing, camping, and all-terrain vehicle use. However, this effect would not be substantive because recreation in this area is dispersed and limited in nature on this site. These opportunities would still be available on lands adjacent to the parcel.

While a few developed recreation sites exist within the Station project area, the majority of recreational opportunities are dispersed and casual in nature. The closest developed recreation site to the Station site is the Goshute Cave Recreation Area, located near the Goshute Canyon Wilderness, approximately 24 miles from the location of the Proposed Action power plant. The Egan Crest Trailhead, located along U.S. 50, is approximately 15 miles from the proposed Thirtymile Substation. The closest State of Nevada managed recreation area is Comins Lake, approximately 10 miles southeast of Ely on U.S. 50. Numerous White Pine County recreation facilities exist within the Station analysis area, including a golf course, neighborhood parks, town parks, a swimming hole, and a shooting range. None of these facilities are anticipated to be directly impacted by the Station Proposed Action.

The Station's two steam generator stacks and three sets of cooling towers would be the Station facilities most visible to the general public. Final heights of the proposed stacks and cooling towers have not been determined, but they are expected to range between approximately 500 and 600 feet. Night lighting required by the Federal Aviation Administration (FAA) would be visible to varying degrees during the night throughout the seen area of the stacks and towers, depending on their heights and atmospheric conditions (see Section 4.7.2.5, *Night Sky Effects*, for further discussion). Although not anticipated to have an adverse impact on any developed recreation opportunities within the Station project area, Station facilities may negatively affect the visual quality of those recreational experiences that are dispersed in nature. The power plant could potentially be seen along slopes immediately adjacent to the valley,

including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness. Because designated Wilderness is intended to provide for the experience of an area being "untrammeled by man," (Wilderness Act) this could present a negative recreational experience to the user.

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to recreation areas in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of the recreational opportunities in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential effects are considered to be minor and would be temporary.

Access Road Impacts

As part of the Proposed Action, some existing dirt roads would be improved for enhanced access, and several new spur roads would be constructed. These improved and new roads leading from existing state and county roads to the Station project area may increase accessibility into areas that were previously inaccessible. Because these access road improvements would primarily occur on federal lands and such activities as dispersed recreation and general sightseeing/nature viewing are currently permitted on most BLM administered lands, no adverse effect to recreational resources would occur. These access roads would not traverse or restrict access to existing developed recreation sites, as none exist in the immediate Station project area. These access roads would not traverse or restrict access to existing developed recreation sites, as none exist in the immediate Station project area. Improved access would provide increased access opportunities for dispersed recreational four-wheel-drive use, hiking, or general sightseeing.

Impacts to Developed Recreational Access and Visitation

The closest developed recreation site to the proposed Station is the Goshute Cave Recreation Area, in the Goshute Canyon Wilderness, approximately 6 miles from the location of the proposed water pipeline. The Egan Crest Trailhead, along U.S. 50, is approximately 15 miles from the proposed Thirtymile Substation. Station transmission lines and the water pipeline would traverse only a few roadways within BLM administered lands that provide access to these and the other developed and dispersed recreational resources in the Station project area. Visitation to these sites is largely dependent on automobile access via local highways. Any impacts to these roads during construction would be temporary, and no closures are anticipated. Because no alterations to these roads are expected and the transmission lines would span these routes, allowing unrestricted access beneath them, the proposed Station is anticipated to have little, if any, temporary effect on developed recreational access or visitation rates. Consequently, no impacts to access or visitation of developed state or county recreation areas are anticipated either.

Based on the estimated proportion of non-local workers serving the proposed Station, an average short-term increase in population of up to approximately 700 people would occur during the construction period. As many as 900 to 1,000 new residents would live in the area during peak periods. As such, it can be

expected that there would be an increase in the use of developed recreation facilities and sites as well as dispersed recreation throughout the Station project area. As part of this, use of roads and access points for recreation may increase as well. It is not anticipated that this increase would adversely impact the current use of developed recreation sites or access to those sites. This increased workforce also may lead to an increased use of local municipal recreation facilities. It is not anticipated that this increase would adversely impact the current use of local facilities.

4.8.1.1.2 Impacts to Private Recreational Opportunities

Several privately run campgrounds and recreational vehicle (RV) parks are located in the Station study area, primarily south of the City of Ely. Potential impacts to these facilities may result from increased use by Station workers as they use these facilities for temporary housing while in the area. There also may be increased use of Basset Lake resulting from Station workers seeking a nearby location at which to fish during their free time.

4.8.1.1.3 Potential Conflicts with Recreational Plans or Policies

The Station Proposed Action does not conflict with existing recreational plans or policies. The BLM recreation goals and policies, as described in the Egan Resource Area Resource Management Plan, are primarily related to WSAs or Wilderness or general enhancements to dispersed recreation on an area-wide basis. The proposed Station would avoid all Wilderness, and no specific BLM recreational goals or policies are directed toward the areas proposed for the Station Proposed Action facilities. However, the power plant could potentially be seen along slopes immediately adjacent to the valley, including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness. Because designated Wilderness is intended to provide for the experience of an area being “untrammeled by man,” this could present a negative recreational experience to the user.

Recreational goals and policies contained in the White Pine County Land Use Plan are primarily concerned with improving recreational opportunities within the more urbanized portions of the county where county-run recreational resources are located. No specific recreational policies are in place in areas that would be affected by the Proposed Action.

The water pipeline ROW would cross the Pony Express National Historic Trail in Steptoe Valley at the intersection of the pipeline and White Pine County Road 18. This trail has value from a recreationist’s perspective as well as a historical resource and, therefore, is briefly discussed here. The NPS identifies this segment of the trail (Overland Canyon to Simpson Park Station) as a “high-potential segment” with high scenic resource values (NPS, 2000). This portion of the Pony Express Trail would be in the seen area of the power plant. Some of the power plant facilities, such as the power blocks, stacks, and cooling towers, would be visible to varying degrees, as would some night lighting. Berms for the evaporation pond and solid waste disposal areas would be seen as long horizontal forms in the landscape. It should be noted that the segment of the Pony Express Trail closest to the Proposed Action power plant site is not located in a pristine setting. This part of the trail route follows a developed road (County Road 18) and crosses U.S. 93 near an area that has commercial buildings, a paved parking area, and rest

stop. (See discussion in Section 4.7, *Visual Resources*, for further detail on visual impacts.) Because the Pony Express Trail in this location lies within a heavily modernized area, no impacts on recreation or conflicts with the National Park Service Historic Trails Management Plan are anticipated for the Proposed Action.

4.8.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.8.2 Alternative 1

4.8.2.1 Impacts

Alternative 1 varies from the Proposed Action primarily in the location, size, and layout (see Figure 2-8 in Chapter 2) of the power plant site and in the initial 6 miles of the transmission lines. The Alternative 1 power plant site is approximately 10 miles south of the Proposed Action power plant site and is about 50 acres larger (1,330 acres total). The Alternative 1 transmission line would run approximately 6 miles northwest from the Alternative 1 substation where it would intersect with the SWIP utility corridor, and then continue south identical to the Proposed Action route. The 600-foot-tall stacks and 500-foot-tall cooling towers seen area under Alternative 1 would be less visible at the northern parts of Steptoe Valley than under the Proposed Action. The seen area for each successively lower stack and cooling tower height would be somewhat reduced as depicted in Photo (Simulation) 4.7-2. It is not anticipated that the power plant would be seen along slopes immediately adjacent to the valley, including part of Cherry Creek and some of the lower slopes of the Goshute Canyon Wilderness as in the Proposed Action. The overall impact on recreation resources under Alternative 1 would be very similar to those described for the Proposed Action. Potential impacts on recreational opportunities on federal, state, local, and private lands and potential conflicts with recreational plans or policies under Alternative 1 would be similar to those described for the Proposed Action in Section 4.8.1.1.

4.8.2.2 Mitigation

No mitigation is required for Alternative 1.

4.8.3 Connected Actions

4.8.3.1 SWIP

Major concerns associated with recreation, parks, and preservation areas would include potential physical impacts to the Pony Express Trail (west of the White Pine Energy Station Proposed Action power plant site), the California Trail Backcountry Byway, and the California National Study Trail in Nevada; and the Minidoka Relocation Center interpretive site and the Oregon Trail in Idaho. Impacts would be minimized by placing towers at the maximum feasible distance from where these areas would be crossed or visible. Impacts to the quality of the recreational/scenic use experience would be expected where SWIP transmission lines and towers cross or are near U.S. 93, which is a designated scenic route (BLM, 1993).

4.8.3.2 NNR

The rehabilitation and operation of the NNR would not adversely impact recreation in the White Pine Energy Station project area. The NNR would not affect access to recreation uses near the NNR. Expansion of NNR tourist train operations between McGill Junction and Shafter would have a beneficial effect on tourist recreation. Sport fishing

opportunities in Tailings Creek near milepost 124 could be impacted by placing fill in the creek to stabilize the track bed (David Evans and Associates, Inc., 2002). This location is south of the White Pine Energy Station Proposed Action and Alternative 1 rail spur sites at mileposts 103 and 115, respectively.

4.8.4 No Action Alternative

No project-related impacts on recreation resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.9 Land Use

This section examines potential impacts of the proposed White Pine Energy Station on land use and access. The primary land use issues associated with the Station are related to potential physical conflicts with land uses or restriction of access (for example, conflicts with grazing areas, mining operations, private lands, or transportation routes). Other issues examined in this section include the Station's potential conflict with applicable land use and resource management plans of federal, state, and local agencies.

Impact Criteria

Station construction and operation activities would be considered to have an adverse impact on land use and access if they would result in one or more of the following (BLM, 2001):

- Permanently preclude a permitted or current land use over a substantial area
- Permanently displace existing, developing, or approved urban/industrial buildings or activities over a substantial area (residential, commercial, industrial, governmental, or institutional)
- Conflict with an existing ROW
- Substantially conflict with applicable general and regional plans and/or approved or adopted policies, goals, or operations of communities or governmental agencies

4.9.1 Proposed Action

4.9.1.1 Impacts

4.9.1.1.1 Existing Land Uses and Ownership

The power plant site for the Proposed Action encompasses approximately 1,281 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holdings. Transferring ownership of the 1,281-acre parcel from public to private ownership would preclude the continuation of existing land uses on the fenced site. The following sections analyze potential impacts on land use and access that are relevant to the Proposed Action.

Potential Impacts on Land Uses on Private Property

The Proposed Action would be located in sparsely populated areas containing little or no development. Most elements of the Proposed Action would occur primarily on undeveloped lands. Impacts on existing or developing residential, commercial, industrial, governmental, or institutional uses are generally expected to be low given the infrequency of these uses in the Proposed Action project area and the relatively far distance between these uses and Station facility sites. The nearest developed community is McGill, approximately 21 miles south of the Proposed Action power plant site and 7 miles from any other Station facility site.

It is anticipated that 2,510 acres of public land and no private land would be impacted as a result of ROWs for the Proposed Action. These would consist of 101 acres of temporary ROWs and 2,409 acres of permanent ROWs. The nearest private structure to any one element of the proposed Station is a single-family residence located within 1 mile of the northernmost section of the water pipeline. Construction of the underground water pipeline would result in only a temporary disturbance. A related construction access road, approximately 40 feet wide, for the pipeline would be minimally used but maintained after installation.

Because of the potential increase in population in White Pine County resulting

from Station construction, the Proposed Action would likely result in a short-term need for temporary rental housing or other accommodations to serve the construction workforce. These workers would likely temporarily relocate to the Station project area during construction, traveling to/from their permanent residence as their services are needed. Although temporary housing has been sufficient in the past as evidenced by high vacancy rates for rental units, the re-opening of the Robinson Mine near Ruth, Nevada, has caused a current shortage of available rental housing in White Pine County. However, sufficient motel and/or RV space appears to be available in the county to accommodate construction workers that may stay in the local area during the standard work week (Rajala, 2005). Section 4.17, *Socioeconomics,* elaborates further on the potential impact to the local economy.

Table 4.9-1 identifies the ROW requirements associated with major Station features for the Station Proposed Action and Alternative 1. Information presented in Table 4.9-1 is based on acres of temporary and permanent ROWs that would be required for Station facilities as summarized in Table 2-1 in Chapter 2. Table 4.9-2 identifies the developed land uses that would be within 1,000 feet and within 1.5 miles of the Station centerline for the Proposed Action and Alternative 1.

Potential Impacts on Grazing

Once the 1,281-acre parcel for the Proposed Action power plant site is transferred from public to private ownership, grazing would no longer be permitted. Although the transmission line towers and water pipeline access road may temporarily disturb or remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. Grazing could continue beneath the transmission lines. As such, it is anticipated that other than the removal of grazing on the Proposed Action power plant site itself, the overall Station would result in minimal impacts to grazing. Section 4.10, *Rangeland Resources*, provides a more detailed analysis of the impacts to livestock grazing.

Potential Impacts on Mining

Section 4.2, *Geology, Soils, and Minerals*, provides an analysis of potential interference of the Proposed Action with active mining operations and mining districts. The proposed transmission line would cross three mining districts (Telegraph, Hunter, and Granite Districts). None of these districts are currently active, however, and this land use category only generally indicates areas with mining potential or areas that have been previously mined. The Proposed Action power plant site is not located within an existing mining district. Similarly, none of the ancillary power plant infrastructure sites (water wells and water pipeline) are located within an existing mining district.

Potential Impacts on Transportation Routes

As shown in Table 4.9-3, the route of the Proposed Action would cross existing major and minor roads, as well as a railroad line. Final design of the selected route would place transmission towers to avoid conflicts with transportation routes. The impact of construction activities on transportation routes is expected to be only temporary. The major impact would likely be a slight delay in the speed of traffic on minor roads as a result of slow moving construction vehicles. However, there may be occasion when a road may need to be closed temporarily for transmission line stringing operations.

TABLE 4.9-1

Land Uses Direct Impacts

Segment[d]	Public (BLM) (acres)
Proposed Action	
Power plant site and associated facilities[a] (footprint)	1,281
Transmission line ROW and associated facilities[b] (200/500 feet)	1,042
Water pipeline ROW and associated facilities[c] (60 feet)	118
Railroad spur ROW (35 to 70 feet)	14
Alternative 1	
Power plant site and associated facilities[a] (footprint)	1,330 [f]
Transmission Line ROW and associated facilities[b] (200/500 feet)	1,116
Water pipeline ROW and associated facilities[c] (60 feet)	74
Railroad spur ROW (35 to 70 feet)	34

[a] Associated facilities include access road.

[b] Associated facilities include substations and substation access road.

[c] Associated facilities include wellheads.

[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

[e] Rounded to next whole acre.

[f] Includes 80 acres to be transferred to the Ely Shoshone Tribe pursuant to the White Pine County Conservation, Recreation, and Development Act of 2006

Source: EDAW GIS analysis, May 2005.

TABLE 4.9-2

Developed Land Uses and Distance from Center Line

Segment[d]	Distance		Type of Use	Adjacent
	1,000 feet	1.5 miles		
Proposed Action				
Power plant site and associated facilities[a]	0	0	N/A	
Transmission line ROW and associated facilities[b]	0	0	N/A	
Water pipeline ROW and associated facilities[c]	2	3	Single Family Residential, Agricultural Deferred	
Railroad spur ROW	0	0	N/A	
Total	**2**	**3**		

TABLE 4.9-2

Developed Land Uses and Distance from Center Line

	Distance			
Alternative 1				
Power plant site and associated facilities[a]	0	1	Agricultural Deferred	Indian Trust Lands
Transmission line ROW and associated facilities[b]	0	1	Agricultural Deferred	Indian Trust Lands
Water pipeline ROW and associated facilities[c]	2	3	Single Family Residential, Agricultural Deferred	
Railroad spur ROW	0	0	N/A	
Total	**2**	**5**		

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access road.
[c] Associated facilities include wellheads.
[d]An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

Source: EDAW GIS analysis, May 2005; White Pine County 2005b.

TABLE 4.9-3

Road Crossings by Segment and Route Alternative In the Station Project Area[a]

Segment[d]	Number of Major Road Crossings	Number of Minor Road Crossings	Total Road Segment Crossings
Proposed Action			
Power plant site and associated facilities[a]	0	0	0
Transmission line ROW and associated facilities[b]	1	4	5
Water pipeline ROW and associated facilities[c]	3	2	5
Railroad spur ROW	0	0	0
Total	**4**	**6**	**10**
Alternative 1			
Power plant site and associated facilities[a]	0	0	0
Transmission line ROW and associated facilities[b]	1	4	5
Water pipeline ROW and associated facilities[c]	3	2	5
Railroad spur	0	0	0
Total	**4**	**6**	**10**

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access road.
[c] Associated facilities include wellheads.
[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

Source: EDAW GIS analysis, May 2005.

During transmission line stringing phases, it may be necessary to erect temporary structures over major roadways to position un-tensioned lines away from potential ground-based conflicts. Access beneath these structures would remain largely unrestricted, with few closures or other alterations to existing transportation routes occurring. In some cases, NDOT may require temporary road closures for some construction activities (BLM, 2001a). The location of the water pipeline would also cross various roadways along the Proposed Action route. Any road closures resulting from pipeline installation would be subject to the same regulations as those closed for transmission line construction.

As discussed in Chapter 2, numerous existing dirt access roads have been identified for possible use during construction and maintenance of the power plant site, transmission line, and water pipeline. Some of these dirt roads would require improvements and/or paving to enable construction vehicles and large equipment to access the construction areas. Impacts from these actions might include slow moving traffic and possible temporary road closures while paving takes place. A benefit to these actions is possible paved roads where dirt roads once existed.

Construction access to the Thirtymile Substation would be via U.S. 50 over an existing dirt road as well as a new dirt or gravel road that would extend to the substation site. The existing dirt road would not be paved, but would be widened (ROW width of 30 feet) and improved to a condition suitable for construction and permanent access. Any impacts resulting from this action would be temporary and the road would be improved as a result.

Access to the water pipeline would be via existing roads to the extent possible. Impacts from these actions might include slow moving traffic and would be temporary.

4.9.1.1.2 Designated Land Uses

Potential Impacts on BLM Land Use Authorizations

Many of the segments of the Proposed Action would traverse or be located adjacent to existing BLM land use authorizations (see Table 4.9-4). These are primarily in the form of ROWs for other transmission lines, roads, telephone lines, water facilities, recreation or public purpose leases, airport leases, and material sites for road construction. Any time a portion of the Proposed Action would conflict with an existing land use authorization, consultation with the holder of the respective land use authorization about any possible direct impacts to current use would occur. This may also include locating any existing utilities and obtaining any required permits from the BLM for permission to cross the authorization, as well as obtaining any other necessary permits from state and county authorities.

Potential Conflicts with Land Use Plans and Policies

Potential conflicts with federal, state, and county land use plans are discussed in the following text.

TABLE 4.9-4

BLM Land Use Authorizations in or Adjacent to Site/Row

Segment[d]	Number of Land Use Authorizations	Largest land Holder(s) in Terms of acreage	Number of Land Use Authorizations Crossed	Name of Land Holders Crossed
Proposed Action				
Power plant site and associated facilities[a] (footprint)	0	N/A	0	N/A
Transmission line ROW and associated facilities[b] (200/350/500 feet)	23	Sierra Pacific Power, WPEA, Idaho Power, NDOT	17	Sierra Pacific Power, Sierra Touch America, AT&T, NDOT, Mt. Wheeler Power, BLM, White Pine Cty, JDL Const.
Water pipeline ROW and associated facilities[c] (60 feet)	42	BLM, Mt. Wheeler Power, NDOT	17	NDOT, Mt. Wheeler Power, Greg Chacas, Nevada Bell, BLM
Railroad spur ROW (35 to 70 feet)	1	Intermountain Power	0	N/A
Total[e]	**66**		**34**	
Alternative 1				
Power plant site and associated facilities[a] (footprint)	1	BLM	0	N/A
Transmission line ROW and associated facilities[b] (200/350/500 feet)	20	Sierra Pacific Power, WPEA, Idaho Power, NDOT	14	Sierra Pacific Power, Sierra Touch America, AT&T, Mt. Wheeler Power, BLM, Intermountain Power
Water pipeline ROW and associated facilities[c] (60 feet)	42	BLM, Mt. Wheeler Power, NDOT	17	NDOT, Mt. Wheeler Power, Greg Chacas, Nevada Bell, BLM
Railroad spur ROW (35 to 70 feet)	1	Intermountain Power	1	Intermountain Power
Total[e]	**64**		**32**	

[a] Associated facilities include access road.

[b] Associated facilities include substations and substation access road.

[c] Associated facilities include wellheads.

[d] An additional 30 acres of permanent ROW would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW; however, the disturbance is anticipated to be only temporary.

[e]Some authorizations may be affected by two or more ROWs, and therefore have been counted separately.

Source: BLM LR2000 database report, Run date: 05/17/05.

BLM Resource Management Plans and Policies

The Egan Resource Area Resource Management Plan contains policies related to existing and planned utility corridors in these planning areas. The Resource Management Plan designates utility corridors and identifies additional miles of planning corridors. The Resource Management Plan contains policies which state that applicants for use of a corridor would be required to locate new facilities proximate to existing facilities, except where considerations of construction feasibility, cost, resource protection, or safety are over-riding. Most of the length of the Proposed Action transmission line (32.5 miles) and facilities would be located within the existing SWIP utility corridor. However, the potential exists when specific siting is done along the utility corridor that the transmission line may be located outside the corridor at specific locations if deemed appropriate to mitigate or minimize potential impacts to a resource.

County Land Use Plans and Policies

The Proposed Action would traverse small amounts of private land administered by White Pine County. The White Pine County Land Use Plan contains no goals or strategies related specifically to utilities or utility corridors, other than a provision for the efficient use of community infrastructure.

4.9.1.1.3 Temporary Impacts

Existing roads would be used to access the electrical transmission line alignment for construction purposes. Some additional temporary access between tower sites may be required during construction. In a worst-case analysis, no more than 129 acres would be temporarily disturbed by a construction access road between towers. This assumes the road would be 30 feet wide, about 35.25 miles long (the length of the entire corridor), and there would be no other access points to towers from existing roads. Temporary road segments between towers would be allowed to revegetate naturally following construction. Permanent access for inspection and maintenance of the electrical transmission line would not be required and there would be no long-term access road disturbance. Temporary ground disturbance would also take place during construction of each of the footings for the electric towers. Ground disturbance is estimated to average approximately 1 acre. In total, an estimated 144 towers would be located along the 35.25-mile-long transmission corridor, with approximately 144 acres temporarily disturbed during their construction. Disturbed areas beneath the towers would be allowed to revegetate naturally following construction.

An additional 30 feet of temporary ROW (60-foot wide ROW total during construction) would be required for construction of the 12-mile-long water supply system, disturbing up to an additional 88 acres along the pipeline route during construction. This access road would be minimally used, but maintained, following construction of the water supply system. Some temporary ROW and construction disturbances (up to 50 acres) also may be required at locations along the route for construction equipment and material laydown and staging. Two or three staging areas would be required to support construction of the water pipeline and electric distribution lines serving the well field. Potential use of existing NDOT material sites along U.S. 93 as staging areas would minimize new vegetative disturbance and related impacts. Additional minimal, but presently

unknown, construction ROWs may be required for water storage tanks or pumping stations if needed to support the water supply system.

4.9.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.9.2 Alternative 1

4.9.2.1 Impacts

4.9.2.1.1 Existing Land Use and Ownership

The power plant site for Alternative 1 totals 1,330 acres. This land has been identified for disposal by the BLM and upon sale would be removed from BLM permanent holdings. Pursuant to the White Pine County Conservation, Recreation and Development Act of 2006 (PL 109-432) the SW1/4 and SE1/4 of the NW1/4 of Section 28, containing 80 acres more or less of the Alternative 1 power site is to be held in trust by the United States for the benefit of the Ely Shoshone Tribe. The Act effectively reduces the size of the Alternative 1 power plant site available for disposal by BLM for use in developing the Station. The Alternative 1 solid waste disposal and transmission facilities immediately north of the proposed Duck Creek Substation are within or cross land identified in the Act for transfer to the Ely Shoshone Tribe. Because the reported uses of the lands by the Tribe are energy-related economic development, development and operation of the Station on adjacent BLM land would not be a conflicting land use with the newly acquired Tribal lands. Transferring ownership of the 1,330-acre parcel from public to private would preclude the continuation of existing recreational opportunities on the fenced site. The following sections analyze potential impacts to land use and access that would be relevant to Alternative 1.

Potential Impacts on Land Uses on Private Property

The Alternative 1 power plant site would be 12 miles south of the Proposed Action power plant site. As such, the land and land use in the area is much the same as described for the Proposed Action. The area encompasses sparsely populated areas containing little or no development. Impacts on existing or developing residential, commercial, industrial, governmental, or institutional uses are generally expected to be low given the infrequency of these uses in the project area and the relatively far distance between these uses and the route alternatives. The nearest community is McGill, approximately 11 miles south of the Alternative 1 power plant site and 7 miles from any other project facility site.

Because of the potential increase in population in White Pine County resulting from project construction, Alternative 1 would likely result in a short-term need for temporary rental housing or other accommodations to serve the construction workforce. These workers would likely temporarily relocate to the project area during construction, traveling to/from their permanent residence as their services are needed. Although temporary housing has been sufficient in the past as evidenced by high vacancy rates for rental units, the re-opening of the Robinson Mine near Ruth, Nevada, has caused a current shortage of available rental housing in White Pine County. However, sufficient motel and/or RV space appears to be available in the county to accommodate construction workers that may stay in the local area during the standard work week (Rajala, 2005). Section 4.17, *Socioeconomics*,

elaborates further on the impact to the local economy.

Tables 4.9-1 and 4.9-2 present information for Alternative 1 facility sites on general land uses and land uses near project centerlines, respectively. It is anticipated that 2,568 acres of public land and 59 acres of private land would be impacted as a result of ROWs for Alternative 1. This represents more than 97 percent public land and less than 3 percent private land. Current uses of the private land include recreation, grazing, residential, and other minor improvements including, but not limited to, fencing and outbuildings. The transmission line extending from the proposed power plant site of Alternative 1 would cross private property in Section 19, T20N, R54E. The current use of this land is identified as agricultural deferred.

Construction of the underground pipeline would result in only a temporary disturbance. A related construction access road, approximately 30 feet wide, for the pipeline would be minimally used but maintained after installation.

Potential Impacts on Grazing

Although the transmission line towers and water pipeline access road may remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. Grazing could continue with little impact beneath the transmission lines.

Potential Impacts on Mining

No mining-related effects would occur under Alternative 1, the same as described for the Proposed Action.

Potential Impacts on Transportation Routes

Potential impacts on transportation routes and traffic access, delays, and speed would be the same as described for the Proposed Action.

4.9.2.1.2 Designated Land Uses

Potential impacts on BLM Land Use Authorizations

Types of potential impacts on BLM land use authorizations under Alternative 1 would be the same as described for the Proposed Action.

Potential Conflicts with Land Use Plans and Policies

Potential conflicts with federal, state, and county land use plans are discussed in the following text.

The utility routes for Alternative 1 would be similar to the Proposed Action except that the transmission line and water pipeline routes would differ as described in Chapter 2.

BLM Resource Management Plans and Policies

The discussion presented for the Proposed Action regarding the Egan Resource Area Resource Management Plan and potential impacts also applies to Alternative 1. Under Alternative 1, the majority of the length of the transmission line (24 miles) and facilities would be located within the existing SWIP utility corridor. However, when specific siting is done, the potential exists along the 30.25-mile-long utility corridor that the transmission line may be located outside the corridor at specific locations if deemed appropriate to mitigate or minimize potential impacts on a resource.

County Land Use Plans and Policies

Alternative 1 would traverse only small amounts of private land administered by White Pine County. The White Pine County Land Use Plan contains no goals or strategies related specifically to utilities or utility corridors, other than a provision for the efficient use of community infrastructure. Alternative 1 should have little or no effect on local infrastructure.

4.9.2.1.3 Temporary Impacts

Existing roads would be utilized to access the electrical transmission line alignment for construction purposes. Some additional temporary access between tower sites also may be required during construction. In a worst-case analysis, no more than 110 acres would be temporarily disturbed by the construction access road between towers. This assumes the road would be 30 feet wide, approximately 30.25 miles long (the length of the entire corridor), and there would be no other access points to towers from existing roads. Temporary road segments between towers would be allowed to revegetate naturally following construction.

An additional 30 feet of temporary ROW (60-foot-wide ROW total during construction) would be required for construction of the 8-mile-long water supply system, disturbing up to an additional 58 acres along the pipeline route during construction. This access road would be minimally used, but maintained, following construction of the water supply system. Some temporary ROW and construction disturbances (up to 50 acres) also may be required at locations along the route for construction equipment and material laydown and staging. Two or three staging areas would be required to support construction of the water pipeline and electric distribution lines serving the well field. Potential use of existing NDOT material sites along U.S. 93 as staging areas would minimize new vegetative disturbance and related impacts. Additional minimal, but presently unknown, construction ROWs may be required for water storage tanks or pumping stations if needed to support the water supply system.

4.9.2.2 Mitigation

Relocation of the Duck Creek Substation electrical transmission lines, and solid waste disposal facility within the Alternative 1 power plant site may serve to avoid or minimize land use conflicts with designated Ely Shoshone Tribal lands.

4.9.3 Connected Actions

4.9.3.1 SWIP

Major land use concerns were to avoid or minimize potential impacts to existing and planned land uses along the SWIP corridor, including agricultural improvements (for example, water tanks, windmills, wells, and corrals), irrigated prime and unique farmlands, gravel pits or quarries, residences, and a school (BLM, 1993). Potential conflicts with these features and land uses would be avoided or minimized through transmission line routing and tower placement, and would result in low to no identifiable impacts (BLM, 1993).

Major concerns regarding Air Force military training areas from the Ely area to Dry Lake in southern Nevada would result from transmission lines and towers that directly conflict with low-level flight training operations and are hazardous to pilots. The Air Force also would have to alter flight plans and established training operations. The use of shorter towers in military training areas would be expected

to result in a moderate rather than a high level of impacts (BLM, 1993).

There would be the potential for impacts to land uses and features at the Thousand Springs Series Compensation Station site (range improvements, railroad, oil wells). These impacts would be reduced to a low level of effect by siting the facilities to avoid sensitive land uses and or restoring/replacing affected land uses (BLM, 1993).

4.9.3.2 NNR

The rehabilitation and reinstatement of NNR operations would not impact land uses in the project area. The current NNR Rail Line configuration would not be altered, and existing and planned land uses on adjacent areas would not be affected (David Evans and Associates, Inc., 2002). The NNR Rehabilitation Plan does not constitute a deviation from the location or alignment of the existing track and facilities and it does not constitute a change in the use or operation from the original Rail Line Agreement between the BLM and the City of Los Angeles Department of Water and Power (CRS and MSC, 2005).

4.9.4 No Action Alternative

Under the No Action Alternative, impacts on land use and access associated with the proposed WPES Project would not occur. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.10 Rangeland Resources

For purposes of this discussion, "short-term" is defined as the period during project construction (approximately 16 months for the transmission line and 6 months for the water supply line) and shortly thereafter during initial project operation. "Permanent" is defined as the entire commercial life of the Station Proposed Action and Alternative 1, which is estimated to be at least 40 years. After this time the Station could be decommissioned or continue with its proposed use. Implementation of the Station Proposed Action or Alternative 1 would necessitate uses of the environment whose effects would be apparent during Station construction and operation, and which would result in both beneficial and adverse effects on permanent productivity.

4.10.1 Proposed Action

4.10.1.1 Impacts

4.10.1.1.1 Livestock Grazing.

Although the transmission line towers and water pipeline access road may cause short-term disturbances or remove some grazing allotment land, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments. The water pipeline would be located underground and cause only short-term disturbance during construction. However, the pipeline wells and construction access road would result in the permanent disturbance of land. While the road is anticipated to be only minimally used, it would be maintained. The following grazing allotments would be crossed by one or more of the Proposed Action ROWs:

- Middle Steptoe
- Thirty Mile Spring
- North Steptoe
- Steptoe
- South Butte
- Cherry Creek
- Gold Canyon
- Medicine Butte
- Butte Seeding

Table 4.10-1 shows the number and size (acres) of the grazing allotments that would be permanently impacted by the construction and operation of Station features for the Proposed Action and Alternative 1. The power plant sites for the Proposed Action and Alternative 1 would remove the most amount of land from grazing during the life of the project. Grazing could continue unrestricted beneath the transmission lines. As such, it is anticipated that the Station would result in minimal impacts on grazing.

Fencing that is within the ROW of the transmission line, water supply line, or railroad spur would be removed during construction to allow for continual access to the construction site. After construction the fencing would be replaced along the transmission line. If fencing would obstruct the maintenance road along the water supply line, it would not be replaced. Cattle guards would be used instead. No change is anticipated in either the availability or quality of forage.

TABLE 4.10-1

Grazing Allotments Permanently Impacted by the White Pine Energy Station Proposed Action and Alternative 1

Segment	Number	Size (acres)
Proposed Action		
Power plant site and associated facilities[a]	2	1,293
Transmission line and associated facilities[b]	7	197
Water pipeline and associated facilities[c]	4	17
Railroad spur	1	9
Alternative 1		
Power plant site and associated facilities[a]	1	1,298
Transmission line and associated facilities[b]	7	201
Water pipeline and associated facilities[c]	2	11
Railroad spur	2	24

[a] Associated facilities include access road.
[b] Associated facilities include substations and substation access roads.
[c] Associated facilities include wellheads.

Note: An additional 30 acres would be required for those sections of electric distribution line to the wells located outside the water pipeline ROW, however the disturbance is anticipated to be short-term.

Source: EDAW GIS analysis, May 2005.

4.10.1.1.2 Wild Horses

Butte Herd Management Area (HMA)

Approximately 47 acres (13 miles by 30 feet) would be disturbed in the short-term within the Butte HMA because of construction of the transmission line from the Proposed Action site for the access road. The proposed transmission line would run along the edge of the Butte HMA from its intersection with Water Canyon on the eastern bench of the Egan Range southwest to its intersection with Rock Spring Canyon.

An estimated 68 electric transmission towers would be located along the 13 mile-long transmission corridor through the Butte HMA, with approximately 68 acres disturbed in the short term during construction. The 68 tower footings would result in a combined total permanent disturbance of less than 1 acre. Disturbed areas beneath the towers would be allowed to revegetate naturally following construction.

No substantial change in forage availability or quality would be expected because of the construction of the transmission line. The change in forage availability would not alter BLM's determination of Appropriate Management Level for the Butte HMA. The quantity of disturbed land in the Butte HMA would be approximately 0.01 percent of its total land area. The location of the transmission line, near the southern edge of the HMA, would further reduce the likelihood of disrupting the foraging patterns of wild horses. Wild horses in this HMA tend to stay on its west side, although

some have been identified on Telegraph Hill in the Egan Range.

Antelope HMA

The water supply line would run through the Antelope HMA for approximately 4 miles between U.S. 93 and the NNR on the southern border of the HMA to just north of SR 489. The proposed location of the water supply system is constrained by defined well locations as specified under water right permits issued to White Pine County by the Nevada State Engineer's Office.

A permanent disturbance within the Antelope HMA of 14.5 acres would result from the water supply line, and an additional 1.5 acres would result from the three wells along the water supply line. The permanent ROW also would include a 40-foot-wide construction access road of dirt or gravel along the water supply line route and to the eight wells. The access road would be maintained, but minimally used, following construction of the water supply system. A minimal, but presently unknown, quantity of permanent ROW acreage may be required for water storage tanks or pumping stations if needed to support the water supply system.

Electric service to the wells would be extended from existing electric lines near the wells. The route for the new electric distribution lines would follow existing ROWs (roads, pipeline, etc.), the water supply system ROW, or existing features to the extent practicable.

Communication lines needed to remotely operate the wells would either be buried with the pipeline or placed on overhead electric distribution line poles. Wireless communication systems may also be used.

No substantial change in forage availability or quality is expected to occur because of the construction of the water supply line. The change in forage availability will not alter BLM's determination of Appropriate Management Level for the Butte HMA. The quantity of disturbed land in the Antelope HMA would be approximately 0.004 percent of its total land area. Also, an existing fence west of U.S. 93 and extending its length provides a barrier between the water supply line and the rest of the HMA.

4.10.1.2 Mitigation

4.10.1.2.1 Livestock Grazing

No mitigation is required for the Proposed Action.

4.10.1.2.2 Wild Horses

If foaling horses are present, Station construction in the Butte and Antelope HMAs will be scheduled to occur outside of the foaling season, which is primarily in the spring.

4.10.2 Alternative 1

4.10.2.1 Impacts

4.10.2.1.1 Livestock Grazing.

Although the transmission line towers and water pipeline access road may remove some grazing allotment land under Alternative 1, the amount of land would be relatively small and dispersed along the entire length of the corridor and along numerous grazing allotments (see Table 4.10-1). The water pipeline would be located underground and result in only short-term disturbance. However, the pipeline wells and construction access road would result in the permanent disturbance of land. While the road is anticipated to be minimally used, it would be maintained. The following grazing

allotments would be crossed by one or more of the Alternative 1 ROWs:

- Becky Springs
- Middle Steptoe
- Heusser Mountain
- Thirty Mile Spring
- North Steptoe
- Duckcreek Flat
- Steptoe
- South Butte
- Cherry Creek
- Medicine Butte
- Butte Seeding

Grazing could continue unrestricted beneath the transmission lines. Fencing that is within the ROW of the transmission line, water supply line, or railroad spur would be removed during construction to allow for continual access to the construction site. After construction, fencing would be replaced along the transmission line. If fencing would obstruct the maintenance road along the water supply line, it would not be replaced. Cattle guards would be used instead.

4.10.2.1.2 Wild Horses

Impacts on wild horses in the Butte HMA under Alternative 1 would be the same as described for the Proposed Action (see Section 4.10.1.1.2, *Wild Horses*). Alternative 1 would not affect the Antelope HMA.

4.10.2.2 Mitigation

If foaling horses are present, Station construction in the Butte HMA will be scheduled to occur outside of the foaling season, which is primarily in the spring.

4.10.3 Connected Actions

4.10.3.1 SWIP

Construction of the SWIP would be expected to have generally similar kinds of effects on livestock grazing and wild horses as described for the construction of transmission lines for the White Pine Energy Station. SWIP tower footings would occupy a relatively small portion of the total land available for grazing, and land beneath the transmission lines would be open to unrestricted use by livestock and wild horses. The amount of land disturbed would be relatively small and dispersed along the entire length of the SWIP corridor and along numerous grazing allotments. No substantial change in forage availability or quality for wild horses or livestock would be expected because of the construction of the SWIP.

4.10.3.2 NNR

Rehabilitation of the NNR would not adversely impact livestock grazing or wild horses, except possibly for some localized short-term disturbance during NNR construction. There is the potential for wild horses and livestock to be hit and injured or killed by trains during operation of the NNR.

4.10.4 No Action Alternative

No Station-related impacts on livestock grazing or wild horses would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.11 Wilderness and Areas of Critical Environmental Concern

As described in Section 3.11, *Wilderness and Areas of Critical Environmental Concern,* the White Pine County Conservation, Recreation and Development Act of 2006 was passed by Congress on December 20, 2006. This bill provides for 545,000 acres of Wilderness through the establishment of 12 new areas and the expansion of two existing areas.

This section also provides a discussion of the relevant management plans and policies that may be impacted. It is anticipated that an increase in visitation to Wilderness within the Station project area would result from the increase in workforce during construction of the power plant. Because no Areas of Critical Environmental Concern (ACECs) exist in the study area, there would be no impacts on these particular resources.

4.11.1 Proposed Action

4.11.1.1 Impacts

4.11.1.1.1 Wilderness

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to Wilderness in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of Wilderness in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential impacts would be minor.

Potential Conflicts with Management Plans or Policies

The BLM goals and policies as described in the Egan Regional Management Plan (BLM, 1984b) are primarily related to general enhancements to dispersed recreation on an area-wide basis. The Proposed Action would avoid all Wilderness, and no specific BLM goals or policies are directed toward the areas proposed for the Proposed Action features. The power plant and some associated features could potentially be seen along slopes immediately adjacent to the valley, and from higher peaks within each Wilderness. Any potential visual impacts are discussed in detail in Section 4.7, *Visual Resources*.

Access Road Impacts

As part of the Station, some existing dirt roads would be improved for enhanced access, and a few new spur roads would be constructed. Because the Station features would avoid all Wilderness, no access road impacts would occur.

Impacts on Wilderness Access and Visitation

The Proposed Action power plant site is approximately 15 miles from the Goshute Canyon Wilderness, 17 miles from the Bristlecone Wilderness, 12 miles from the Becky Peak Wilderness, and 13 mile from the High Schells Wilderness. The closest other Proposed Action feature, a proposed well site, would be approximately 4 miles away from the Becky Peak Wilderness. Station transmission lines and the water pipeline would traverse only a few roadways that provide access to Wilderness in the Station project area. Visitation to Wilderness is largely dependent on automobile access via local highways. Because no alterations to local roads are anticipated as a result of the

Station and the transmission lines would span these routes allowing unrestricted access beneath them, the project is anticipated to have little or no effect on Wilderness access or visitation rates.

4.11.1.1.2 Areas of Critical Environmental Concern

Because no ACECs exist within the study area, no impacts would occur.

4.11.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.11.2 Alternative 1

4.11.2.1 Impacts

4.11.2.1.1 Wilderness

Potential Conflicts with Construction-Related Truck Traffic

Construction-related truck traffic may have a temporary effect on local roadways by delaying access to Wilderness in the Station project area because of the slow-moving nature of trucks hauling materials to construction sites. Given the dispersed nature of the Wilderness in the region, the relatively light traffic in the area, and the temporary nature of construction-related travel on local roadways, these potential impacts would be minor.

Potential Conflicts with Management Plans or Policies

The BLM goals and policies described in the Egan Resource Area Resource Management Plan are primarily related to general enhancements to dispersed recreation on an area-wide basis. Alternative 1 would avoid all Wilderness and no specific BLM goals or policies are directed toward the areas proposed for Alternative 1 features. Therefore, the Station would not conflict with BLM plans or policies.

Access Road Impacts

As part of the Station, some existing dirt roads may be improved for enhanced access, and a few new spur roads would be constructed. Because the Station features would avoid all Wilderness, no access road impacts would occur.

Impacts on Wilderness Access and Visitation

The Alternative 1 power plant site is approximately 22 miles from the Goshute Canyon Wilderness, 8 miles from the Bristlecone Wilderness, 19 miles from the Becky Peak Wilderness, and 7 miles from the High Schells Wilderness. The closest other Alternative 1 feature, the 500-kV transmission line within the SWIP corridor, would be approximately 4 miles away from the Bristlecone Wilderness.

Station transmission lines and the water pipeline would traverse only a few roadways that provide access to Wilderness in the Station project area. Visitation to these areas is largely dependent on automobile access via local highways. Because no alterations to local roads are anticipated as a result of the Station and the transmission lines would span these routes allowing unrestricted access beneath them, the Station would have little or no effect on Wilderness access or visitation rates.

4.11.2.1.2 Areas of Critical Environmental Concern

Because no ACECs exist within the study area, no impacts would occur.

4.11.2.2 Mitigation

No mitigation is required for Alternative 1.

4.11.3 Connected Actions

4.11.3.1 SWIP

See Section 4.7, *Visual Resources,* regarding Wilderness and potential effects of the SWIP.

4.11.3.2 NNR

The NNR Environmental Assessment did not specifically address Wilderness or ACECs. Figure 3.8-1 shows that the NNR does not pass through such areas.

4.11.4 No Action Alternative

No Station-related impacts on Wilderness, or ACECs would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.12 Wastes, Hazardous and Solid

This section addresses the potential for impacts from solid and hazardous waste generation, transport, and disposal during Station construction and operation.

4.12.1 Proposed Action

4.12.1.1 Impacts

No hazardous materials were found at the Station Proposed Action power plant site or are known to occur at the other Proposed Action project feature sites. Therefore, it is unlikely that hazardous materials would be found or disturbed at these sites during construction and earthmoving activities.

Station construction and operation activities could create the potential for a hazardous materials spill or require disposal of hazardous materials. BMPs described in Appendix A, *Best Management Practices,* would be implemented as an integral part of the Proposed Action to minimize or avoid the potential for a spill to occur *(*see section titled *Hazardous Material Storage, Handling, and Disposal and Safety Measures).* A Spill Prevention Control and Countermeasures Plan (SPCCP), outlined in this same section of Appendix A, *Best Management Practices,* would provide procedures for cleaning up in the event of a spill or release during Station construction or operation. Implementation of these environmental controls during Station construction and operation should result in no environmental impacts.

The BLM (1994) estimated the probability of an accidental release of a hazardous substance along the NNR corridor for the Robinson Mine Project. Results of that analysis are summarized below in the Connected Actions discussion in Section 4.12.3.2, *NNR*, and indicate that the probability of an accidental release is low. Based on that analysis, the probability of an accidental release of a hazardous substance in the NNR corridor over the life of the White Pine Energy Station also would be expected to be low.

4.12.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.12.2 Alternative 1

4.12.2.1 Impacts

Potential effects and BMPs associated with Alternative 1 would be the same as described for the Proposed Action.

4.12.2.2 Mitigation

No mitigation is required for Alternative 1.

4.12.3 Connected Actions

4.12.3.1 SWIP

The SWIP Final EIS did not specifically address hazardous and solid wastes (BLM, 1993). During construction of the SWIP, waste materials would be generated and disposed of at a licensed landfill.

4.12.3.2 NNR

All NNR areas would be maintained in a sanitary condition to avoid public health hazards. NNR waste materials would be disposed of at a State of Nevada approved sanitary landfill site. NNR restoration and operation would not adversely affect airport service at Yelland Airfield or conflict with airport safety and safety standards. No significant adverse impacts from the storage and use of hazardous materials (for example, pesticides, herbicides, diesel fuel, cleaning solvents) are expected because of compliance with

applicable government regulations regarding their proper storage, use, and disposal (David Evans and Associates, Inc. 2002).

David Evans and Associates, Inc. (2002) stated that in the Final EIS for the Robinson Mine Project, the BLM (1994) estimated that over the 15-year operational life of the mine, 0.32 releases of diesel fuel and 2.6 releases of sulfuric acid could accidentally occur along the NNR corridor. These spills could lead to ground contamination and health hazards. The BLM (1994) concluded that the probability of a large sulfuric acid or diesel fuel release along the NNR corridor was low and that is was unlikely wildlife would be affected. David Evans and Associates, Inc. (2002) stated that if a large spill of hazardous material occurred in wetland/riparian areas along the NNR corridor, site remediation would be critical in keeping adverse impacts short-term in duration and re-establishing riparian and wetland areas.

4.12.4 No Action Alternative

There is no potential for Station-related hazardous or solid waste impacts under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.13 Cultural Resources

This section discusses potential Station-related direct and indirect effects on NRHP-eligible properties (historic properties). Such properties include prehistoric and historic archaeological deposits, and historic-era properties. This section also describes the criteria used to determine effect, the proposed White Pine Energy Station features and their associated area of potential effect (APE), and potential direct and indirect impacts on NRHP-eligible properties resulting from the construction and operation of the Proposed Action and Alternative 1. Final determination of elegibility will be made by SHPO upon receipt and review of cultural resources reports.

4.13.1 Criteria for Determining Effect

For this DEIS, an adverse effect to a cultural resource deemed eligible for inclusion on the NRHP (as determined by the BLM in consultation with the SHPO) would be considered a significant impact under NEPA.

A project results in an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the NRHP. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics [36CFR800.9(a)].

An adverse effect under 36 CFR Section 800.9(b) is one that occurs when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that would qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. All qualifying characteristics need to be considered, even those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP.

Adverse effects may include reasonable foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR Section 800.9(b)(1). For example, an adverse effect can result from the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features [36 CFR Section 800.9(b)(2)], or result in isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP. These criteria for determining effect are in accordance with the State Protocol Agreement between the Nevada BLM and the Nevada SHPO, and the Cultural Resources Programmatic Agreement (PA) (contained in Appendix F, *Programmatic Agreement*) that was developed for the proposed Station by LS Power Associates, the BLM Ely Field Office, and the Nevada SHPO.

4.13.2 Station Description

The Proposed Action and Alternative 1 consist of various Station elements (Station components and activities) that may adversely affect, either directly or indirectly, the integrity of historic properties. The following summarizes Proposed Action and Alternative 1 Station elements that may result in adverse direct and indirect effects to cultural resources.

4.13.2.1 Direct Effects

Construction activities associated with the Station would involve the use of heavy

equipment and the removal of vegetation and up to several feet of the existing surface. For the Proposed Action, the direct effects APE consists of approximately 1,281 acres for the power plant site, and ROWs for the Duck Creek Substation, 12 miles for waterline piping, construction, and electrical distribution lines and wells, 1.2 miles of new railroad spur connecting the power plant site to the existing NNR ROW, the Thirtymile Substation and 1.0 mile of access road, 1.2 miles of access road to the power plant and Duck Creek Substation, and 2.5 miles of electric transmission line connecting the Duck Creek Substation to the SWIP. For Alternative 1, the direct effects APE consists of 1,330 acres for the power plant site, and ROWs for the Duck Creek Substation, 8 miles for waterline piping, construction, electrical distribution lines and wells, 3.0 miles of new railroad spur connecting the power plant site to the existing NNR ROW, the Thirtymile Substation and 1.0 mile of access road, 0.8 mile of new access road to the power plant and Duck Creek Substation site, and 6.0 miles of overhead transmission line connecting the Duck Creek Substation to the SWIP.

4.13.2.2 Indirect Effects

The following Station components have the potential to result in adverse indirect visual impacts to identified historic resources located within eight miles of the Proposed Action and Alternative 1. These components are the same for the Proposed Action and Alternative 1 and are described in detail in Chapter 2.

- Cooling towers and steam generator stacks
- Power plant
- Electric transmission facilities
- Water supply system
- Rail spur and existing NNR

BMPs would be implemented to reduce visual effects of the power plant, cooling towers, and steam generator stacks. These BMPs are an integral part of the proposed Station that was described in Chapter 2 (see Appendix A, *Best Management Practices*, for a complete list). BMPs of importance to an assessment of indirect effects to historic-era resources also were discussed in Section 4.7, *Visual Resources*, and are listed and can be reviewed in Appendix A under the heading *Visual Resources*. Those BMPs would be implemented to reduce the visual impacts of Station features (for example, power plant and associated facilities, transmission line towers, etc.) on historic-era resources.

4.13.3 Assessment of Direct Impacts

Implementation and operation of the Proposed Action and Alternative 1 would involve numerous constructed elements, all of which would result in some form of ground-disturbing activity and the potential to adversely impact significant archaeological sites. Except for the 500-kV transmission line ROW, a Class III inventory has been conducted within the majority of the footprint for each of the Station components. This inventory resulted in the documentation of eight prehistoric and historic-era resources that have been recommended eligible to the NRHP, pending a determination by the BLM and the Nevada SHPO.

The following discussion summarizes the direct impacts and mitigation for the Proposed Action and Alternative 1, followed by a discussion of the Thirtymile Substation whose construction and operation is common to both alternatives. The description of potential direct impacts on cultural resources concludes with

discussions of unanticipated finds and discovery of human remains.

4.13.3.1 Proposed Action

4.13.3.1.1 Impacts

Pending Nevada SHPO review, technical studies (EDAW 2006a), consisting of Class I and Class III inventories, have recommended the Pony Express Trail/Overland Stage route, the route of the Transcontinental Telegraph, and two segments of the NNR as eligible to the NRHP under one or more of the four criteria (A-D). Based upon a lack of features and archaeological constituents, direct impacts woud not adversely impact either the Pony Express Trail/Overland Stage route nor the route of the Transcontinental Telegraph, but would result in adverse direct impacts to a segment of the NNR, which has been recommended as a contributing element to NRHP eligibility of the entire NNR route from Ely to Cobre. The inventories also indicated the potential for additional NRHP-eligible sites to be located within the 500-kV transmission line ROW linking the Duck Creek Substation to the SWIP. This proposed ROW would also bisect the NNR, which may also result in a direct impact.

4.13.3.1.2 Mitigation

Mitigation of historic properties identified during the Class III inventory and additional properties that may be identified during future inventories of the 500-kV transmission line would be handled according to the guidelines outlined in the PA, which would include the development of a Historic Properties Treatment Plan (see Appendix F, *Programmatic Agreement*). According to the PA, all treatment shall be conducted in a manner consistent with the BLM/SHPO Protocol. The BLM, in consultation with the SHPO, shall ensure that WPEA avoids effects to historic properties through Station design, or redesign, relocation of facilities, or by other means in a manner consistent with the BLM/SHPO. When avoidance is not feasible, the BLM, in consultation with SHPO, Indian Tribes, WPEA, and interested persons, shall develop, or ensure that WPEA develops, an appropriate treatment plan designed to lessen or mitigate Station-related effects to historic properties. For properties eligible under criteria (a) through (c) (36CFR 60.4), mitigation, other than data recovery, may be considered in the treatment plan (for example, HABS/HAER recordation, oral history, historic markers, exhibits, interpretive brochures or publications, etc.). Where appropriate, treatment plans shall include provisions (content and number of copies) for a publication intended for dissemination to the general public. When data recovery is required as a condition of approval, the BLM, in consultation with the SHPO, shall develop, or ensure that WPEA develops, a data recovery plan that is consistent with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-37) and *Treatment of Historic Properties: A Handbook* (Advisory Council, 1980).

4.13.3.2 Alternative 1

4.13.3.2.1 Impacts

Four prehistoric and historic-era properties would be adversely affected by the implementation of Alternative 1. These four known resources consist of the two prehistoric archaeological sites, a historic homestead, and a segment of the NNR that has been recommended for NRHP eligibility under Criterion C, based on integrity and association, and under Criterion D, for the presence of archeological deposits that have the

potential to provide information on the maintenance and operations of the NNR route from Ely to Cobre. In addition, it is possible that additional archaeological deposits and historic resources may be present and affected by activities within the 500-kV transmission line linking the Duck Creek Substation to the SWIP (EDAW, 2006a). The route will also bisect the NNR at a second point located north of the documented segment mentioned above.

4.13.3.2.2 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2.

4.13.3.3 Thirtymile Substation

4.13.3.3.1 Impacts

Three prehistoric sites recommended eligible for listing on the NRHP are located along the access road or within the proposed footprint of the Thirtymile Substation (see Table 3.13-1 in Chapter 3, Section 3.13, *Cultural Resources)*. Direct impacts to these sites in the form of substation construction and road improvements and maintenance would result in adverse impacts to these NRHP-eligible resources. Impacts would most likely occur during construction; however, access road maintenance following construction may also result in impacts. Given these potentials, the following mitigation measures are recommended to reduce or eliminate direct construction and maintenance related impacts to these NRHP-eligible properties under both the Proposed Action and Alternative 1.

4.13.3.3.2 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2 (Council, 1980).

4.13.3.4 Unanticipated Finds

4.13.3.4.1 Impacts

While technical studies were designed to locate cultural resources and assess the potential for buried archeological deposits, it is possible that subsurface archaeological deposits may be identified during ground-disturbing activities associated with implementation of the Proposed Action or Alternative 1. In addition, although remote, there is also the possibility that human remains may be discovered during implementation of the Proposed Action or Alternative 1.

4.13.3.4.2 Mitigation

When previously unidentified cultural resources, including human remains, are discovered, the procedures outlined in the PA, Section D (Discovery Situations) will be adhered to. Under the agreement, all Station-related activities will cease within 100 meters of the find, and WPEA or its authorized representative shall notify the BLM authorized officer. The BLM, in coordination with the SHPO, interested persons, and Indian tribes, shall determine if undertaking related activities can proceed or if mitigation is required. If mitigation is required the BLM, in consultation with the SHPO, interested persons, and Indian Tribes, shall notify WPEA of the need for mitigation, and that mitigative actions are implemented. The BLM shall ensure that reports of mitigation efforts for discovery situations are completed in a timely manner and conform to the Department of Interior's Formal Standards for Final Reports of Data Recovery Program (42 FR 5377-79). Activities may resume after the BLM notifies WPEA that the mitigation process is complete.

4.13.4 Assessment of Indirect Visual Impacts

Technical studies were conducted to assess the visual impacts of the various elements of the Proposed Action and Alternative 1, and to determine if those impacts would impair the NRHP eligibility of historic-era resources (that is, the six ranches recommended elegible to the NRHP, two ranches unevaluated for NRHP elegibility, and three linear resources [the Pony Express NHT, the NNR, and the Lincoln Highway]) (EDAW, 2006b). For an additional two ranches (Pescio and Fitzhugh Ranches) a lack of access prevented completion of the NRHP evaluation. For Section 106 both are categorized as unevaluated and are assumed eligible for the purposes of NEPA.

A portion of the study focused on the recommendations of eligibility of the historic-era resources and those elements of integrity that contribute to their significance (see discussion in Section 3.13, Cultural Resources). The Schellbourne, Whiteman Creek and Magnuson Ranches, and dug-out structures at the Kemp Ranch are recommended NRHP-eligible under Criterion A based on their association with historically significant events, and their physical setting, association and feeling that conveys that significance. Therefore, the integrity of these four historic-era properties, and the two unevaluated ranches (Fitzhugh and Pescio), which are assumed to be eligible, could be adversely impacted by implementation of the Proposed Action or Alternative 1.

One structure at the Kemp Ranch and structures at two other ranches (Mattier and Monte Neva) have been recommended NRHP-eligible under Criterion C for their architectural style. The adobe structure at Monte Neva was also recommended eligible under Criterion A, for its association with the Monte Neva Hot Springs Resort, of which only the adobe structure remains. Because indirect visual effects would not alter the association of the adobe structure with the location of the historic resort or those characteristics for which the other structures have been determined eligible to the NRHP, the single structure at the Kemp ranch and those of the Mattier and Monte Neva Ranches were not considered in this assessment.

Of the three linear resources, the NNR and Lincoln Highway have not been formerly evaluated and were assumed NRHP-eligible for the purposes of the technical study. The following discussion summarizes study methods and results.

4.13.4.1 Methods of Assessment

Effects may be qualitative in nature, consisting of aesthetic or obstructive impacts. Regardless of the distance of the Station feature from the historic property, it can change the visual appreciation of a landscape and possibly diminish a property's historic integrity. One or more of the following factors determines adverse aesthetic effects:

- Property's historic significance
- The existing visual features at the project location
- The compatibility of the proposed project as it relates to the mass, scale and proportion, height, shadows, color, aesthetic value, contrast, and open space

Projects can block the historic property from being viewed or block a view seen from the historic property, thereby diminishing the property's integrity. A determination of adverse obstructive

effects is dependent upon one or more of the following factors:

- Property's historic significance
- Nature and quality of the view from the historic property
- Extent of obstruction of a historic property

4.13.4.2 Assessing the Intensity of Impact

Based on the criteria listed above, impacts may be defined as very low, low, moderate, or high, as follows:

- **Very Low.** Impact is at the lowest levels of detection-barely perceptible and not measurable.
- **Low.** Impact does not affect the character-defining features or elements of integrity of a NRHP-eligible or listed building, structure, object, or district.
- **Moderate.** For a NRHP-eligible or listed building, structure, object, or district, the impact alters a character-defining feature(s) of the resource, but does not diminish the integrity of the resource to the extent that its NRHP eligibility is jeopardized.
- **High.** For a NRHP-eligible or listed building, structure, or district, the impact alters a character-defining feature(s) of the resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed on the NRHP.

4.13.4.3 Significant View Shed

Because of its scale and mass, the Station would be visible to varying degrees over a large area within Steptoe Valley. To provide a method of assessing the potential indirect impacts of the proposed Station, viewshed maps (see Figures 4.7.1 and 4.7.3 in Section 4.7, *Visual Resources*) provided a basis for assessing the height of the various Station elements associated with the Proposed Action and Alternative 1 that would be visible throughout Steptoe Valley.

An analysis of visual impacts was conducted at points up to 10 miles from the Proposed Action and Alternative 1 locations. At a distance beyond 10 miles the mass, height, and contrast would appear so small in relationship to the natural features and elements of Steptoe Valley that any effect to the historic integrity of the resources would be negligible. Therefore, these points beyond 10 miles were not considered in the following discussion.

4.13.4.4 Key Observation Points

To better understand the visual impacts that may compromise the integrity and NRHP eligibility of a historic resource, three visual simulations and key observation points (KOPs) were developed for the Station. While these were not conducted from each of the KOPs assessed for visual impacts (see Section 4.7, *Visual Resources*), they do present a variety of views from various distances that may be used to interpret the view and impact of the proposed Station features on the integrity of historic-era resources. The following text describes each of these KOPs.

4.13.4.4.1 KOP 2: Pony Express Route

Located at the point where the proposed water pipeline crosses County Road 18 (Pony Express NHT) this simulation (see Photo [Simulation 4.7-1]) provides a view to the south from the central portion of Steptoe Valley towards the Proposed Action power plant facility. It is approximately 5.5 miles north of the

power plant. Station facilities viewed from this point would consist of the proposed water pipeline ROW and the Proposed Action power plant site.

4.13.4.4.2 KOP 3: Lincoln Highway

This KOP represents views from the historic Lincoln Highway, just north of Magnuson Ranch (see Photo [Simulation 4.7-2]). The Proposed Action power plant would be located approximately 3 miles to the north. From this point the power plant facilities, and the 500-kV transmission line linking the plant to the SWIP would be quite visible. Other constructed features within the vicinity of this location are limited to fencing.

4.13.4.4.3 KOP 4: U.S. 93 Turnoff

This location is approximately 1/2-mile south of Alternative 1 at a turn-out along U.S. 93 (see Photo [Simulation 4.7-3]). Currently, human-made features include some fences and unpaved roads. From this point the Alternative 1 power plant site and facilities, the transmission line along the pipeline corridor, and the 500-kV transmission line linking the power plant to the SWIP would be visible. However, the closest portion of the transmission line would be hidden from view by the power plant facility.

4.13.4.5 Indirect Effects of the Proposed Action

This section discusses the indirect visual effects from the Proposed Action that have the potential to affect or otherwise compromise the integrity of three linear historic resources (Pony Express NHT, Lincoln Highway, NNR) and four historic ranches (Magnuson, Schellbourne, Fitzhugh, and Whiteman).

4.13.4.5.1 Historic Ranches

Of the six ranches, four have been identified within the viewshed of the Proposed Action. Two historic ranches (Pescio and Kemp) are more than 15 miles distant, are not within the viewshed, and were therefore not considered in this discussion. The Magnuson and Schellbourne Ranches are discussed below in Sections 4.13.4.5.2 and 4.13.4.5.3.

Fitzhugh Ranch

A lack of access prevented a full assessment of the indirect impacts to the Fitzhugh Ranch. However, its location within a small side canyon of Steptoe Valley, coupled with the distance from the proposed power plant (6.0 miles), would result in the majority of the power plant features being screened from observation points within the boundaries of the ranch. Only the very tops of the cooling towers and stacks would be visible, and these would be silhouetted against the Egan Range, resulting in low to moderate impacts. Night time lighting would be visible on the horizon to the west, but would be primarily screened from within the ranch boundaries. Because of its topographical location, the integrity of the ranch and its associated structural remains would not be seriously compromised to the point that they affect the NRHP eligibility.

Whiteman Ranch

While a low ridge will partially obscure the plant block (see Photo 4.13-1), and the Proposed Action facilities would be silhouetted against the Egan Range, the proximity of the ranch structures (approximately 3.0 miles) from the Proposed Action features would result in the majority of the features, including the cooling towers and stacks, from being clearly seen and would appear slightly larger than as depicted in KOP 3 (see Photo [Simulation] 4.7-2]. Project lighting would also be clearly visible

at night. These indirect effects would result in moderate to high impacts, which would compromise the natural historic setting of the historic structures, thereby compromising the integrity of the historic structures.

4.13.4.5.2 Pony Express National Historic Trail (NHT)

Four points have been identified for the indirect effects assessment to the Pony Express NHT. These are Schellbourne Ranch, the intersection of County Road 18 (Pony Express NHT and Lincoln Highway), a point along County Road 18 directly north of the Proposed Action, and at the intersection of the Pony Express NHT (County Road 18) and Ray Siding, a feature along the NNR. Of importance to this discussion and assessment is the statement by the NPS that lists the Pony Express route from the Nevada-Utah border to a point just east of Austin, including the route within Steptoe Valley, as a high potential route, which affords a high quality recreation experience in a portion of the route having greater than average scenic values.

Schellbourne Ranch

The historic structures located at Schellbourne Ranch reflect multiple historic events, from a stop on the Pony Express and Overland Stage, early mining, early settlement and farming and ranching, and later as a rest stop along the 1913 route of the Lincoln Highway. Two contemporary residences and associated fencing and landscaping have partially impacted the setting and association of the historic site. The view toward the Proposed Action from the historic buildings is currently screened by trees (see Photo 4.13-2). Because it cannot be assumed that the trees would always screen the Proposed Action, another view (see Photo 4.13-3) depicting the view toward the Proposed Action (5.5 miles distant) indicates that the power plant facility would be silhouetted against the Egan Range. From this point the features would be viewed from above, all would be visible, and project lighting would be clearly visible at night. However, the mass and scale of Station features would be smaller than that depicted at KOP2 (see Photo [Simulation] 4.7-1), and when compared to the expanse of Steptoe Valley coupled with the implementation of BMPs, it appears that the impact would be low, and that it would not result in a significant contrast or further detract from the natural setting of the remaining historic structures, the original route of the Lincoln Highway, or the Pony Express NHT.

Intersection of Pony Express NHT and Lincoln Highway

This location is east of Schellbourne Ranch. From this point the facilities of the Proposed Action would be approximately 4.5 miles to the southwest, and would be silhouetted against the Egan Range (see Photo 4.13-4). The view would be similar to that of KOP2 (see Photo [Simulation] 4.7-1). Within view of this location are telephone and power lines and commercial businesses at the intersection of U.S. 93 and County Road 18, approximately 0.5 mile to the west. The cooling towers, power plant block structures, and stacks would be visible, and Station lighting would be clearly visible at night. However, the mass of the facility as seen from this location would be of a small size within Steptoe Valley. It does not appear that the facilities would significantly compromise the setting, association, or feeling of the Pony Express NHT, whose integrity at this location has been compromised by contemporary developments. Considering these factors the impact would be moderate and would not significantly compromise the integrity of the resource.

PHOTO 4.13-1
View Toward Proposed Action with Historic Structure in Foreground (Source EDAW, 2006)

PHOTO 4.13-2
View Toward Proposed Action with Schellbourne Ranch in Foreground (Source EDAW, 2006)

PHOTO 4.13-3
View of Proposed Action (5.5 Miles Distant) from Schellbourne Ranch (Source EDAW, 2006)

PHOTO 4.13-4
View of Proposed Action From County Road 18 (the Intersection of Pony Express NHT and Lincoln Highway) (Source EDAW, 2006)

Intersection of Pony Express NHT and Proposed Pipeline

The Pony Express NHT follows the bladed County Road 18 from east to west across Steptoe Valley, with a commercial development located approximately two miles to the east at the intersection with U.S. 93, and the NNR to the west. Previous investigations (EDAW, 2006a) recommended that this segment, because of subsequent conversion to a bladed and well maintained gravel road, does not meet the requirements for eligibility under Criterion C.

From this point on County Road 18, the stacks, cooling towers, and power block would be silhouetted against the sky and mountains (see Photo 4.13-5 and Photo [Simulation] 4.7-1), and night lighting from the Station would be clearly visible. Considering that the integrity of the route has been compromised by construction of the county road and nearby commercial development, the mass and scale of the Proposed Action would not result in a severe contrast with the natural environment in such a way that it would further compromise the natural setting of the route.

Pony Express NHT at Ray Siding

Except for the NNR, the vicinity of Ray Siding is quite open, with only minimal changes in the surrounding environments since the NNR was constructed 100 years ago. Because the feature is located 6.5 miles from the Proposed Action (see Photo 4.13-11), when viewed from this location the Proposed Action would appear much smaller in size and mass than that depicted for KOP 2 (see Photo [Simulation] 4.7-1), and would be silhouetted against the Schell Creek Range. Stacks and cooling towers would be visible and Station lighting would be visible at night. However, the mass and contrast of the facilities would result in low to moderate impacts. Therefore, it does not appear that the Proposed Action would deter from the nature and quality of the view from this feature along the Pony Express NHT.

4.13.4.5.3 Lincoln Highway

This segment of the Lincoln Highway is listed as a road with landscape vistas (NPS, 2004); however, it has not been formerly evaluated for eligibility to the NRHP. Currently, the route is in an area with limited human development (see Photos 4.13-6 and 4.13.-7), which consists of fences, dirt roads, and a telephone line that parallels the route on the upslope (east) side. South of the Proposed Action the Warm Springs, Twitchell, and Monte Neva Ranches are visible on the west side of Steptoe Valley. While traffic is visible along U.S. 93 for the majority of the route, the highway itself is not in view. The Magnuson Ranch is a prominent feature along the route, and still retains the residence that is mentioned in the 1915 Lincoln Highway tour guide. Because the area has remained virtually unchanged in the last 95 years, the travelway does appear to possess excellent integrity of location, design, setting, feeling, and association. Assessments of the route were conducted, and the visual impacts from north to south are described in the following text.

Intersection with County Road 18

This location is east of Schellbourne Ranch. From this point the facilities of the Proposed Action would be approximately 4.5 miles to the southwest, and would be silhouetted against the Egan Range (see Photo 4.13-4). The view would be similar to that of KOP2 (see Photo [Simulation] 4.7-1). The cooling towers, power plant block structures, and stacks would be visible, and Station lighting would be clearly visible at night. The mass of the facility as seen from this location

PHOTO 4.13-5
View South Toward Proposed Action From County Road 18 (Source EDAW, 2006)

PHOTO 4.13-6
Lincoln Highway Facing North – South of the Proposed Action (Source EDAW, 2006)

PHOTO 4.13-7
Lincoln Highway Facing South – North of Alternative 1 (Source EDAW, 2006)

PHOTO 4.13-8
View of Proposed Action Facing West (Source EDAW, 2006)

PHOTO 4.13-9
View of Proposed Action From the North End of Magnuson Ranch (Source EDAW, 2006)

PHOTO 4.13-10
Cherry Creek Station – View of Proposed Action From North of Water Tank (Source EDAW, 2006)

would be of a small size within Steptoe Valley, resulting in a moderate impact. Therefore, the severity of the impact would not greatly diminish the setting, association, or feeling, or otherwise compromise the NRHP eligibility of the Lincoln Highway.

Point East of Proposed Action

As depicted in Photo 4.13-8 this location along the Lincoln Highway is within a rural environment. The Magnuson Ranch, a rest stop along the original 1913 route, is approximately 4 miles to the south. The point of assessment is approximately 1 mile directly east of the Proposed Action, and would visually appear similar to KOP4 depicted in Photo (Simulation) 4.7-3. From this point all of the Station facilities could be clearly seen, including the 500-kV transmission extending west to the SWIP. Although silhouetted against the Egan Range, the Station's mass and contrast with the existing natural environment would be significant. Therefore, the impacts to the integrity, including, setting, association, and feeling, would be severely compromised, resulting in a high impact that would significantly compromise the eligibility of the resource.

Magnuson Ranch

While subsequent development at the Magnuson Ranch has impacted the integrity of the setting, this has been a relatively low impact. The ranch still retains the setting, feeling, and association of rural landscape associated with the original 1913 Lincoln Highway. This is reflected in the residence that dates to that period, which is recommended as eligible to the NRHP for its association with the Lincoln Highway. From the Magnuson Ranch/Lincoln Highway Rest Area the Proposed Action would be located 3.5 miles to the northwest (see Photo 4.13-9) and would appear similar to that depicted for KOP3 (see Photo [Simulation] 4.7-2). All of the Station facilities would be clearly visible, including the 500-kV line extending west to the SWIP corridor. Station lighting at night would severely detract from the natural setting. The Station's size and mass as viewed from this location would create a distraction from the natural landscape and a moderate to high impact to the association, setting, and feeling associated with the Lincoln Highway.

4.13.4.5.4 Nevada Northern Railroad

Cherry Creek Station

Field investigations at the Cherry Creek Station (see Photo 4.13-10) revealed that the locale has been substantially compromised from the built environment present during the period of significance (for example, during operation of the NNR). The station has been moved to the town of Ely and now serves as the Ely Historical Society Museum. In addition, the water tank and flagging signal have been removed, further compromising the integrity of the Cherry Creek Station. The rural environment of the location appears to have remained unchanged since construction of the NNR in 1906. Except for the town of Cherry Creek, in the distance, no other man-made features are visible from this locale.

At a distance of 10 miles the location of the Proposed Action would be slightly visible on the horizon and would be silhouetted against the Schell Creek Range, with only the stacks and cooling towers visible. Night time Station illumination also would be only slightly visible on the horizon. Therefore, considering the impacts from removal of several key elements of the Cherry Creek station the indirect Station-related visual impacts would be very low and imperceptible.

PHOTO 4.13-11
View Towards Proposed Action From Ray Siding (Source EDAW, 2006)

PHOTO 4.13-12
Raiff Siding – View toward Proposed Action (Source EDAW, 2006)

PHOTO 4.13-13
View Toward Proposed Action From Warm Springs Siding (Source EDAW, 2006)

PHOTO 4.13-14
View Toward Proposed Action (Source EDAW, 2006)

PHOTO 4.13-15
View Toward Alternative 1 From Western Edge of Ranch Property (Source EDAW, 2006)

PHOTO 4.13-16
View Toward Alternative 1 (Historic structure in lower portion of photograph) (Source EDAW, 2006)

Ray Siding

Ray Siding appears as a single track, and presumably any switches or siding that may have been present were removed prior to cessation of NNR operations (see Photo 4.13-11). Within the vicinity of Ray Siding the rural landscape is quite open, with only minimal changes in the surrounding environment since the NNR was constructed 100 years ago. Because the feature is located 6.5 miles from the Proposed Action, when viewed from this location the Proposed Action would appear much smaller in size and mass than that depicted for KOP2 (see Photo [Simulation] 4.7-1), and would be silhouetted against the Schell Creek Range. Therefore, it does not appear that the Proposed Action would compromise the quality of the setting and association when viewed from this feature, resulting in low impact.

Raiff Siding

Raiff Siding retains all of the features that existed during NNR operations (see Photo 4.13-12). Other than ranches and fencing in the distance, there are no objects of a built environment visible from the siding. Therefore, the siding retains the elements of setting, association, and location. From this location the Proposed Action would be 2 miles to the south, and would appear slightly smaller in mass than that depicted for KOP 4 (see Photo [Simulation] 4.7-3). All of the features of the power plant would be clearly visible, with the stacks and cooling towers extending above the crest of the Schell Creek Range. Nighttime Station illumination also would be clearly visible. The mass and scale of these facilities would create a major contrast with the existing natural environment and setting, thereby compromising the integrity and resulting in a very high indirect impact.

Warm Springs Siding

Warm Springs Siding appears to retain the elements of association and setting in place during NNR operation. The switches and paddles are still in place and operational, and the natural environment has remained almost unchanged since NNR construction in 1906. While the Warm Springs Ranch and Monte Neva Hot Springs Ranch are clearly visible from this location, these features were also present in the early 1900s, during the period of significance. At a distance of 4 miles from the Proposed Action (see Photo 4.13-13), the power block, stacks, and cooling towers would be the most visible facilities from this location, and would be silhouetted against the skyline similar to the simulation depicted by KOP3 (see Photo [Simulation] 4.7-2). In addition, nighttime Station lighting would be quite visible. The Station's height and mass would be in direct contrast with the natural environment, severely compromising the setting, association, and feeling, and resulting in moderate to very high indirect impacts.

Steptoe

The function of this named area along the NNR is uncertain. Currently there are no sidings and the only feature is a small square structure constructed of railroad ties. From a distance of 9.5 miles, the features of the Proposed Action would be visible and would be silhouetted against the sky and Schell Creek Range (see Photo 4.13-14). Station lighting would be visible in the distance at night. The mass of the facility would appear to be much less than that depicted in KOP2 (see Photo [Simulation] 4.7-1). Given the distance, the mass and scale of the facility would result in a minor contrast with the natural surroundings, and therefore would not significantly compromise the integrity of the NNR at this locale.

PHOTO 4.13-17
View of Lincoln Highway Facing South (Alternative 1 would be located in the background to the right) (Source EDAW, 2006)

PHOTO 4.13-18
View of Alternative 1 From Magnuson Ranch (Source EDAW, 2006)

PHOTO 4.13-19
View of Alternative 1 directly west from Lincoln Highway (Source EDAW, 2006)

PHOTO 4.13-20
View of Alternative 1 From Lincoln Highway and Duck Creek Road (Source EDAW, 2006)

PHOTO 4.13-21
View Toward Alternative 1 From Warm Springs Siding (Source EDAW, 2006)

PHOTO 4.13-22
View Toward Alternative 1 From Corrals (Source EDAW, 2006)

PHOTO 4.13-23
View Toward Alternative 1 (Source EDAW, 2006)

PHOTO 4.13-24
Glenn Siding – View toward Alternative 1 site (Source EDAW, 2006)

4.13.4.5.5 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.3.1.2.

4.13.4.6 Indirect Effects of Alternative 1

This section discusses visual effects that may be expected from implementation of Alternative 1. Like the Proposed Action, only those locations that are 10 miles or less from the proposed Station features are discussed. Distances of all points along the Pony Express NHT, including Schellbourne Ranch and the historic Whiteman Ranch are greater than 10 miles and were, therefore, not considered in this discussion.

4.13.4.6.1 Historic Ranches

The four historic ranches (Magnuson, Pescio, Fitzhugh, and Kemp) within the viewshed of Alternative 1 were assessed for indirect effects. Magnuson Ranch is discussed further below in Section 4.13.4.6.2 and the other ranches are discussed immediately below.

Pescio Ranch

This ranch is situated on the east side of Steptoe Valley, north of Cherry Creek Road. Although not directly inspected because of a lack of access, the structures at this ranch are along the southern edge of a ridge that may obscure all but the very tops of the cooling towers and stacks. When viewed from the western ranch boundary (see Photo 4.13-15), the power block and other Station facilities including cooling towers and stacks would be silhouetted against the Egan Range, and at a distance of 5.0 miles would appear similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1). Although visible from this location, the scale and mass of the Station facilities at this distance would be low and would not present a significant contrast to the natural setting and association of the ranch such that the historic integrity and NRHP eligibility would not be compromised

Fitzhugh Ranch

Similar to the Pescio Ranch the historic property and structures of the Fitzhugh Ranch are situated within a side canyon of Steptoe Valley that opens to the west. Alternative 1 would be located approximately 5.0 miles to the southwest with most if not all of the Station facilities obscured by an intervening ridge. While Station night lighting would be visible on the horizon it would not significantly detract from the historic-era setting. Because the impacts would be very low to low, the historic integrity and NRHP eligibility of the ranch would not be compromised.

Kemp Ranch

Three dug-out structures located on this ranch have been recommended eligible under Criterion A, based upon their association with new settlement and ranching development as a response to the copper mining boom of the early 1900s. Because of the limited amount of development that has occurred since construction, these buildings retain the setting, feeling, and association within Steptoe Valley of this early 1900s theme (see Photo 4.13-16). When viewed from the log structures, Alternative 1 features would appear smaller in size and mass than that depicted for KOP2 (see Photo [Simulation] 4.7-1, and would be silhouetted against the Schell Creek Range. The transmission line linking the substation with the SWIP would also be visible on a small scale, and Station night lighting would also be highly visible. Because of the small scale when viewed at this distance in comparison to the vast expanse of Steptoe Valley, the indirect effect would be low to moderate, and would not severely compromise the setting, feeling, and association of the buildings.

4.13.4.6.2 Lincoln Highway

Currently, development at the southern end of Steptoe Valley is similar to that at the north. It is limited to fencing, a telephone/power line to the east paralleling the highway, and dirt and gravel roads. The area retains the rural setting and association that existed during the early 1900s (see Photo 4.13-17).

Magnuson Ranch

Magnuson Ranch was a rest stop along the Lincoln Highway. The ranch has retained the integrity of setting within Steptoe Valley, association with the Lincoln Highway, and the feeling associated with transcontinental travel in the early 1900s. Alternative 1 facilities, when viewed from this location, would be 6.0 miles away (see Photo 4.13-18) and would be similar to that depicted for KOP1 (see Photo Simulation 4.7-1). Facilities and features would be silhouetted against the Egan Range and Station lighting would be visible at night. While visible from this location, it does not appear that Alternative 1 facilities would detract from the association and feeling of the Magnuson rest stop and the Lincoln Highway at this point, and it does not appear that Station facilities would represent a significant detraction from the natural setting and association. Therefore, the impact would be low and would not significantly compromise the integrity or NRHP eligibility.

Point East of Alternative 1

This point would be approximately 1 mile directly east of the Proposed Action (see Photo 4.13-19), and would visually appear slightly smaller than depicted in KOP4 (see Photo [Simulation] 4.7-3). From this point all of the Station facilities could be clearly seen, including the 500-kV transmission line extending west to the SWIP, and the transmission line along the waterline ROW. Station night lighting would also be clearly visible. At this locale impacts to the integrity, including, setting, association, and feeling would be significantly compromised, resulting in a very high impact.

Intersection with Duck Creek Road

Currently, the view to the west and north in the vicinity of the Lincoln Highway and Duck Creek Road is a rural landscape with fences, U.S. 93, and the paved Duck Creek Road (see Photo 4.13-20). The community of McGill is visible to the south. From this point Alternative 1 facilities would be approximately 5 miles to the northwest. All of the facilities would be visible and would appear silhouetted against the Egan Range to the west, similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1). At this distance, the Station's mass and size would not significantly compromise the visual setting and association of the Lincoln Highway. Similarly, the transmission line along the pipeline ROW would be more than five miles distant and the 500-kV line linking the Duck Creek Substation would extend from 6 to 12 miles from this point. Both of these features would be minimally visible from this location, resulting in low to moderate impacts, which would not compromise the integrity or NRHP eligibility of the route.

4.13.4.6.3 Nevada Northern Railroad

Four features along the southern portion of the NNR are within 10 miles of the Alternative 1 power plant site. Potential indirect impacts to these features are discussed below.

Warm Springs Siding

Warm Springs Siding has retained the integrity of feeling, association, location, and setting from the early 1900s, the period of significance. From this location Alternative 1 facilities would be 5 miles away. Similar to the Proposed Action, these facilities would be silhouetted against the skyline (see Photo 4.13-21), appearing very similar to the

simulation depicted in KOP2 (see Photo [Simulation] 4.7-1). Visually, the stacks and cooling towers would be seen: however, because of the terrain and distance, the other features of the facility would not. The 500-kV transmission line, linking the Duck Creek substation to the SWIP, may also be partially visible. Nighttime Station lighting would be clearly seen. While the Station's height and mass would affect the view to the south, it would not present a severe contrast to the existing natural environment such that it created a significant impact to the setting, association, and feeling in the vicinity of Warm Springs Siding.

Corrals

Associated features along the NNR include corrals with a loading chute and an operating windmill. These ranch-related features appear to have been constructed in the 1920s after completion of the NNR; however, they do not appear out of place or in contrast with the surrounding natural environment (see Photo 4.13-22). From this location, the components of Alternative 1 would appear slightly closer than those depicted for KOP3 (see Photo [Simulation] 4.7-2). Although silhouetted against the Schell Creek Range and sky, all associated elements of the power plant and substation would be clearly visible as would the transmission line within the pipeline ROW, and the railroad spur line linking the Duck Creek Substation with the existing NNR. Because of the mass and extent of the facilities when viewed from this location, they would result in a very high indirect impact to setting, association, and feeling of the NNR, compromising the integrity of the feature.

Steptoe

Features associated with the NNR at this location include a small, covered structure constructed of railroad ties. To the north, remnants of a telegraph line paralleling the railroad are visible along the west side of the NNR (see Photo 4.13-23). At a distance of 2.5 miles, the components of the Alternative 1 power plant would be highly visible, similar to but with slightly larger mass than those depicted in KOP3 (see Photo [Simulation] 4.7-2). In addition, the transmission line within the pipeline ROW and the railroad spur extending from the Duck Creek Substation to the railroad spur would also be visible. Silhouetted against the Schell Creek Range and sky the Station constituents would present a major contrast to the existing natural environment and setting, significantly compromising the setting, feeling, and association of the NNR at this location.

Glenn Siding

Glenn Siding has retained its integrity of feeling, association, setting, materials, workmanship, and design. Currently, the view and setting from Glenn Siding is that of open range land to the north (see Photo 4.13-24). The community of McGill, which was in place during the period of significance, is visible to the southeast. From this location, Alternative 1 facilities would be silhouetted against the sky and Schell Creek Range. While the distance to Alternative 1 facilities would be 5 miles, similar to that depicted in KOP2 (see Photo [Simulation] 4.7-1), the terrain slopes upward from Glenn Siding towards the Schell Creek Range. Therefore, all of the components and elements of Alternative 1 would be clearly visible. The transmission line along the pipeline connecting the water wells and the proposed spur connection to the existing NNR would also be visible. Night lighting from the Station would also be clearly seen from this location. Given the size, mass, and contrast of the Alternative 1 facilities, it appears that they would significantly compromise the feeling, setting, and association of Glenn Siding and the NNR at this location, resulting in a very high impact compromising NRHP eligibility.

4.13.4.6.4 Mitigation

Mitigation of impacts would be the same as summarized in Section 4.13.4.5.4, *Nevada Northern Railroad*.

4.13.5 Connected Actions

4.13.5.1 SWIP

Potential direct and indirect impacts to cultural resources from SWIP construction and operation were assessed (BLM, 1993). Direct impacts could result from physical disturbance or destruction of cultural resources during construction activities such as clearing vegetation, installing tower foundations, assembling and erecting towers, stringing and tensioning conductors, upgrading and constructing access roads, and restoring disturbed areas. It was estimated that for each linear mile of transmission line approximately 1 acre of land would be directly and substantially disturbed at transmission tower sites and work areas, and that another 5 acres might be minimally and temporarily disturbed (for example, crushing vegetation) (BLM, 1993).

Two types of indirect impacts to cultural resources could occur as a result of SWIP construction and operation. First, a general increase in public access to currently remote areas because of new or upgraded access roads could lead to a degradation of cultural resources, either from inadvertent damage because of uncontrolled recreational use or off-road travel, or from intentional vandalism. The second type of indirect impact would be visual intrusions that degrade the settings of cultural resource sites (BLM, 1993).

Several specific sites of potential SWIP-related cultural resources impacts are in the vicinity of proposed White Pine Energy Station feature sites. The first site is Dry Canyon Spring located along the SWIP/proposed White Pine Energy Station transmission line corridor southwest of the White Pine Energy Station Proposed Action power plant site. There is potential for a high direct impact at the Dry Canyon Spring site. The second site is the Pony Express/Lincoln Highway route near the White Pine Energy Station Proposed Action power plant site. There would be visual intrusion of SWIP transmission lines and towers into the site setting (BLM, 1993).

Mitigation potential was considered to be very high for most cultural resources located in the SWIP corridor. The transmission line alignment or tower sites could be shifted to some degree within a corridor to minimize or avoid direct and indirect impacts to cultural resources (BLM, 1993).

4.13.5.2 NNR

Inventory of short NNR segments that articulate with the proposed rail spurs linking to the Proposed Action and Alternative 1 power plant sites indicate that portions of the route appear eligible to the NRHP, and other elements have been designated a National Historic Landmark. However, the majority of the NNR route has not been surveyed for cultural resources. As stated in the Programmatic Agreement (see Appendix F, Page 4), an inventory of historic properties along and the landscape adjacent to the segment of the NNR to be improved within White Pine and Elko Counties shall be conducted. David Evans and Associates, Inc. (2002) recommended that the reach of track extending from north of Ely (milepost 128.4) to Cobre be evaluated for eligibility to the NRHP, and that the Nevada State Historic Preservation Office and BLM be consulted to mitigate any potentially adverse effects resulting from

NNR rehabilitation and reinstatement (David Evans and Associates, Inc., 2002).

4.13.6 No Action Alternative

No Station-related direct or indirect impacts to NRHP-eligible cultural resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.14 Environmental Justice

This section identifies and assesses potential effects of the Proposed Action, Alternative 1, Connected Actions, and the No Action Alternative on environmental justice.

4.14.1 Proposed Action

4.14.1.1 Impacts

Communities and residences more than 1/2-mile away are too far from Proposed Action Station features, including the associated transmission line and water line, to experience most of the potential adverse impacts, such as increased noise, dust, and traffic—except for traffic effects during construction. Those communities separated from Station features by natural barriers, such as the Egan Range, and constructed barriers would experience very little potential impact.

White Pine County conducted an income survey for the community of Cherry Creek in 2005. While the survey indicates more than 51 percent of the population surveyed fall within the definitions of low and moderate income, the community Cherry Creek is outside of the study area based on the natural and man-made barriers that would separate the community from the Station.

Project features, including the transmission line and water line, would affect communities at a distance through the need for increased services, such as water supply or emergency services. Issues of shared revenue payments and job creation could impact the communities as a whole. The Proposed Action power plant would be approximately 34 miles and 22 miles north of the communities of Ely and McGill, respectively. No people would be displaced as a result of implementing the Proposed Action.

Improved access roads associated with the Proposed Action would be located within a sparsely developed area. The access roads would not pass through or be adjacent to any known minority or low-income communities. For this reason, access road improvements would have no effect on minority or low-income communities.

Project features associated with the Proposed Action would be visible throughout Steptoe Valley, which contains approximately 50 percent of White Pine County's population and includes Ely and McGill. Ely and McGill are both more than 0.5 mile from Station feature sites. The 600-foot-tall steam generator stacks and the 550-foot-tall cooling towers at the Proposed Action power plant site would be visible from approximately 32 miles to the south, 4 miles to the west, 30 miles to the north, and 6 miles to the east. Views of the Station features from the closest community, Cherry Creek, located north of the Station site, would be obstructed by the Cherry Creek Range. Based on distance and the existence of natural barriers, there would be no disproportionate effect on minority or low-income communities.

Pollutants of concern generally include PM, nitrogen oxides, sulfur dioxide, and volatile organic compounds. The Nevada Department of Environmental Protection, Bureau of Air Pollution Control, addresses emissions of these pollutants and issues permits based on amount and type of pollutant to be emitted. Section 4.6.1, *Air Quality*, provides a complete description of effects on air quality.

The sparse population within 23 miles to the south of the Proposed Action power

plant site and more than 50 miles in other directions precludes the opportunity for disproportionately high, adverse human health or environmental effects regarding air quality on minority or low-income populations.

4.14.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.14.2 Alternative 1

4.14.2.1 Impacts

No disproportionate adverse impacts on minority or low-income populations associated with Station construction and operation or access road, visual, and air quality effects would occur under Alternative 1 for the same reasons as described previously for the Proposed Action. No people would be displaced as a result of implementing Alternative 1. The Alternative 1 power plant would be approximately 22 miles and 11 miles north of Ely and McGill, respectively. The 600-foot tall steam generator stacks and the 550-foot-tall cooling towers at the Alternative 1 power plant site would be visible from approximately 20 miles to the south, 8 miles to the west, 40 miles to the north, and 3 miles to the east. The sparse population within 11 miles to the south of the Alternative 1 power plant site and more than 50 miles in other directions precludes the opportunity for disproportionately high, adverse human health or environmental effects regarding air quality on minority or low-income populations.

4.14.2.2 Mitigation

No mitigation is required for Alternative 1.

4.14.3 Connected Actions

4.14.3.1 SWIP

The SWIP Final EIS did not identify any disproportionately high or adverse impacts to minority or low-income populations that would result from SWIP construction and maintenance (BLM, 1993).

4.14.3.2 NNR

There are no specific low-income or minority populations along the NNR Rail Line that would be adversely affected or displaced by restoration and operation of the NNR. The Environmental Justice evaluation that was prepared by David Evans and Associates, Inc. (2002), in accordance with Executive Order 12898, concluded that the NNR Project would not result in disproportionately high and adverse human health or environmental effects to minority populations or low-income populations.

4.14.4 No Action Alternative

No Station-related impacts on environmental justice would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.15 Native American Religious Concerns

4.15.1 Proposed Action

4.15.1.1 Impacts

No issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for the Station Proposed Action.

4.15.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.15.2 Alternative 1

4.15.2.1 Impacts

No issues or concerns have been raised to date by the various Tribes regarding any religious or traditional cultural property concerns for Station Alternative 1.

4.15.2.2 Mitigation

No mitigation is required for the Proposed Action.

4.15.3 Connected Actions

4.15.3.1 SWIP

The SWIP Final EIS did not identify any potential impacts on Native American religious concerns. However, there is the potential for disruption to the Moapa Indian Reservation in southern Nevada (see Section 4.17, *Socioeconomics*) (BLM, 1993).

4.15.3.2 NNR

No Native Americans reside along the NNR Rail Line that would be adversely affected or displaced by restoration and operation of the NNR. The NNR would not adversely affect Indian Tribes (David Evans and Associates, Inc., 2002).

4.15.4 No Action Alternative

No Station-related impacts on Native American religious practices or traditional cultural properties would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.16 Paleontological Resources

This section describes the potential impacts of the proposed Station on paleontological resources. For purposes of definition, an adverse impact on paleontological resources would occur if project construction and operation activities would substantially compromise the scientific and educational values of paleontological resources present at that site.

4.16.1 Proposed Action

4.16.1.1 Impacts

Steptoe Valley is on sediments mapped as Quaternary alluvium and playa deposits (see Section 3.2.1, *Geology*, for further discussion). No fossil localities have been recorded in the area except in the general vicinity of the proposed transmission line ROW, and the impact potential on paleontological resources is low. Appendix A, *Best Management Practices*, describes BMPs that would be implemented to minimize or avoid the potential for impacting paleontological resources if discovered during Station construction or operation.

4.16.1.2 Mitigation

No mitigation is required for the Proposed Action.

4.16.2 Alternative 1

4.16.2.1 Impacts

Steptoe Valley is on sediments mapped as Quaternary alluvium and playa deposits. No fossil localities have been recorded in the area except in the general vicinity of the proposed transmission line ROW, and the impact potential on paleontological resources is low. Appendix A, *Best Management Practices*, describes BMPs that would be implemented to minimize or avoid the potential for impacting paleontological resources if discovered during Station construction or operation.

4.16.2.2 Mitigation

No mitigation is required for Alternative 1.

4.16.3 Connected Actions

4.16.3.1 SWIP

Potential impacts from the construction of SWIP transmission line towers and access roads on known unique and potential paleontological resources within geologic formations would be avoided or minimized by avoiding or spanning sensitive paleontological features (BLM, 1993). As a result, potential impacts would be low to not identifiable. No specific areas of paleontologic concern were identified in that portion of the SWIP corridor that would contain the White Pine Energy Station transmission line.

4.16.3.2 NNR

The NNR Environmental Assessment did not specifically address paleontological resources. The impact potential of the NNR on paleontological resources is probably bounded by estimates of impact potential for the SWIP and the proposed White Pine Energy Station, which range from low to not identifiable.

4.16.4 No Action Alternative

No Station-related impacts on paleontological resources would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.17 Socioeconomics

This section summarizes the potential effects of the White Pine Energy Station Proposed Action and its alternatives on socioeconomic resources, focusing on impacts that would occur in White Pine County. Overall, the development of the Station would result in a range of economic benefits to White Pine County. These benefits include, but are not limited to, local income and job creation, generation of tax revenue, and the development of a reliable and affordable source of power. Also, the Station would help diversify the local economy and support the development of local community infrastructure, resulting in less dependence on the boom-and-bust cycle of the mining industry and leading to an improvement in public services for local residents. Economic benefits would likely also extend outside of the county based on purchases of goods and services during Station construction and operations, as well as power- and railroad-related benefits. These economic benefits would be derived, in part, from putting to beneficial use water rights held by White Pine County (see discussion of Other Indirect Economic Benefits near the end of the Socioeconomics discussion) and the re-establishment of the NNR.

Conversely, the Station would induce mostly short-term population growth into the region, and some long-term population growth, thereby creating additional demand for public services and other community-based infrastructure and resources. The potential beneficial and adverse socioeconomic effects of the proposed Station are described below.

Methodology

To evaluate the potential effects of the Station on socioeconomic resources, both quantitative and qualitative analytical techniques were used. Where quantitative analyses were not warranted or feasible, potential socioeconomic effects were analyzed qualitatively. All quantified monetary values are presented in 2006 dollars. For the analysis of local economic impacts, an input-output analysis using IMPLAN (Impact Analysis for Planning) was used to quantify Station effects on economic output, income, and employment in White Pine County. Economic output refers to the value of goods and services produced in a region. IMPLAN is a computer-driven system of software and data commonly used to perform economic impact analysis. It was originally developed by the USFS to assist in land and resource management planning. The IMPLAN system has been in use since 1979, and is widely used as a tool for applied economic analysis. The system is now maintained and marketed by the Minnesota IMPLAN Group, Inc. IMPLAN estimates total economic effects of the Station based on Station-related spending and production values (direct effects), which generate indirect and induced economic effects from money circulating throughout the economy. These multiplier (or “ripple”) effects are based on inter-industry linkages in the study area and household spending patterns. Indirect economic effects refer to changes in output, income, and employment resulting from the iterations of businesses in some industries purchasing from businesses in other industries and initially caused by the direct economic effects. Induced economic effects refer to changes in output, income, and employment caused by the expenditures associated with new household income generated by direct and indirect economic effects. The economic parameters of the Station and related assumptions, including Station-related

spending over time, the likely sources of purchased materials, available local labor, power production and other values, were defined with input from WPEA and White Pine County staff, and were used as inputs to the IMPLAN model. For the purposes of the input-output analysis, a 2004 economic model for White Pine County was used to estimate economic impacts, which is based on the latest available IMPLAN dataset. The model was modified to more accurately represent local industry conditions based on the economic parameters related to the proposed Station.

Potential impacts to the fiscal resources of local agencies and related public services were assessed using a number of sources. Estimated tax revenues are based on a separate fiscal analysis (Applied Analysis, 2005) prepared for the Station, which considered the level of economic activity that would be generated by the Station and applicable tax rates and regulations. The distribution of tax revenues was estimated using historic data on revenue distributions and established formulas found in the tax regulations. Available budget and other fiscal data were provided by White Pine County. Potential effects on public services are based on communications with affected agencies via White Pine County staff and those familiar with the services likely to be affected by the construction and operation of the proposed Station. In addition, the actions that WPEA and the County are expected to take to minimize adverse effects on local public services during Station construction and operation were also considered. These actions are referred to as BMPs and are referenced in the related impact sections below, in the Station description (see Chapter 2), and in Appendix A, *Best Management Practices*.

The socioeconomic analysis, including the economic modeling conducted for the Station, assumes the Station would be developed in two phases. The first phase (Phase I) involves the concurrent development of two generating units with a nominal generating capacity of 1,060 MW. The second phase of the Station (Phase II) consists of the development of a third generating unit, which would add another nominal 530 MW of generating capacity for a total of 1,590 MW. For the purposes of this analysis, it is assumed the third unit, if developed, would be constructed subsequently to the first two units. Because of the uncertainty regarding the actual development of the third generating unit, the focus of the narrative is on the first phase of the Station, although the socioeconomic effects associated with the development of the third generating unit are referenced where applicable and included in the data tables.

Lastly, the construction and operation phases of the Station would result in unique socioeconomic effects. Therefore, the impact analysis is organized into construction- and operations-related impacts for each of the resource topics. Impacts are characterized as either positive (beneficial) or negative (adverse), and where possible, they are evaluated relative to regional conditions to help put their magnitude into perspective.

4.17.1 Proposed Action

4.17.1.1 Impacts

4.17.1.1.1 Construction-Related Effects

Population

Development of the proposed Station would require a substantial construction work force. Over the approximate 52-month construction period, it is estimated that the work force would fluctuate between approximately 40 and 50 workers (during Station start-up and completion) and 1,200 workers (during peak construction periods), resulting in an average annual construction work force of about 760 workers (WPEA, 2006). This construction period is for the concurrent development of two generating units. Construction of a third generating unit is expected to last about 44 months if developed independently of the first two units. To the extent that local labor is available, construction workers would likely be hired from the local labor force, primarily workers living in Ely and the surrounding communities of McGill and Ruth. The extent to which local labor would be used to serve the construction needs of the Station is not known at this time and depends on the selection of the prime contractor and their hiring policies. The availability of local workers with appropriate and specialized skills also may be limited because of the number of other large construction projects that are expected to be developed in the general area during the same timeframe as the Station (see Section 4.19.2). For the purposes of this analysis, estimates of the utilization of local construction labor are based on the size of the existing construction work force (approximately 150 employed workers), number of unemployed workers in the county and their qualifications, and assumptions regarding the potential shift in the currently employed construction labor force from existing and yet-to-be-constructed projects to the Station. Discussions with the Nevada Employment Security Department indicate that it is estimated that about 10 workers of the unemployed work force (147 workers) would qualify for Station-related construction jobs (Rajala, 2006). Further, it is assumed that there would be a 20 percent shift in the existing employed construction work force from other projects and jobs to meet the labor needs of the Station. Based on these assumptions, it is estimated that an average of approximately 40 jobs (or about 5 percent of the average annual construction job base serving the Station) would be filled by local residents from White Pine County. Over the life of the Station's construction (approximately 4 to 5 years), up to approximately 300 construction jobs could be filled by local residents, which includes workers already employed by local contractors who may serve as sub-contractors during Station construction. Most of the work force would likely come from areas outside the county (Las Vegas, Reno, Salt Lake City, other parts of rural Nevada, or other areas). Workers drawn to the Station project area from outside the county, as well as some workers from distant areas of the county, may choose to temporarily relocate to the project area during construction. It is anticipated that most of these non-local workers would utilize the proposed temporary housing that would be developed by WPEA on and off the Proposed Action power plant site. These housing facilities would accommodate up to 1,000 workers on the power plant site and an additional 300 workers (and their families) in/near the nearby community of Ely. Assuming full occupancy in the new

Station housing units and an average household size for those workers bringing families, and recognizing the extent of local construction labor that would be utilized, it is estimated that there would be an average short-term population increase in the county of approximately 1,320 people during the approximate 52-month construction period. During peak construction periods, which would last about 10 months. As many as 1,760 people could be drawn to the area on a temporary basis. U.S. Census data show that the average household size in White Pine County is 2.45 people. For the purposes of this analysis, it is conservatively assumed that the average household size for workers bringing families would be higher (3.0 people per household) to account for typically larger household sizes for families.

In summary, the Proposed Action is expected to result in temporary increases in local population levels. This could be particularly evident in Ely where the proposed family housing serving the Station would be located. Specifically, approximately 900 new people may relocate to Ely, an increase of nearly 21 percent relative to its existing population of about 4,300 residents. The magnitude of the temporary population effects at the county level would be relatively smaller (about an 18 percent increase during peak construction periods) based on its larger population base of approximately 9,500 residents. Potentially, some workers, particularly those with specialized skills that are not available in the local labor pool, may decide to move to the area permanently. This effect is expected to be negligible. The potential effects of these temporary increases in local population levels are described in the sub-sections that follow and address related resource topics, primarily housing and public services.

Housing

Based on the potential increase in population in the county resulting from Station construction, the Proposed Action would result in a short-term need for temporary housing to accommodate the construction work force. As described previously, these workers would likely relocate to the Station project area on a temporary basis during construction as opposed to traveling to/from their permanent residences in outlying areas based on the remote nature of the Station site. This pattern is typical in the region because of the cyclical nature of Nevada's predominantly rural economy where much of the construction work force has become fluid, moving from one project site to the next. In other words, many workers travel to various job locations across the state while maintaining a permanent residence at another location.

In anticipation of temporary housing needs during project construction, the Proposed Action includes provisions to provide temporary housing to serve the construction work force. Construction worker housing would include a combination of modular dormitory-style housing and recreational vehicle (RV) facilities on the power plant site, as well as modular apartments and/or homes in or near the communities of Ely or McGill to serve workers relocating with their families. Specifically, up to 20 modular facilities (with a capacity of 800 workers) and RV facilities (with a capacity of 200 additional workers) would be provided onsite and an additional 300 apartments/homes would be established offsite. In total, Station housing would be able to accommodate up to 1,300 workers, which is greater than the estimated peak construction work force of

1,200 workers. Based on the provision of on- and offsite Station housing, the Proposed Action would not generate a substantial demand for other types of temporary housing in the Ely or McGill areas or other parts of the county. This would preclude potential adverse impacts on rental housing (which there is a current shortage of because of the re-opening of the Robinson Mine near Ruth, Nevada) and on available motel and/or RV space. Accordingly, it would also preclude potential adverse impacts on the local tourism industry, which relies on the adequate availability of motel space and other accommodations.

Local Economic Activity

Construction of the proposed Station would require substantial expenditures for capital equipment, construction-related goods and services, and labor. These expenditures would generate local economic activity, as measured by changes in economic output, labor income, and employment, over the approximate 52-month construction period. The estimates of changes in local economic activity generated by the Station, and contained in this section, are based on input-output economic modeling using IMPLAN (see Methodology for more information).

Under the Proposed Action, the total capital investment of Phase I of the Station is estimated at approximately $1.75 billion. Of that total, construction spending on goods/services and major equipment (including pollution control equipment) accounts for approximately $1.35 billion; $350 million is attributed to construction labor payroll. Other costs (primarily composed of “soft costs”) represent the remaining $50 million. Soft costs consist primarily of payments on debt used to finance the Station. The direct value of Station-related construction output in White Pine County, which excludes these other costs, totals $1.7 billion, or about $392.3 million annually over the construction timeframe. By definition, the direct value of construction output is attributed entirely to the location of the Station site, in this case, White Pine County.

However, a substantial portion of construction expenditures would be made outside of White Pine County, including spending on specialized equipment that is not manufactured locally (for example, boilers, steam turbines, and pollution control equipment), as well as pipe conduit, wiring, pumps, motors, steel, etc. Based on the construction-related values presented above and using representative data for gas and electric facilities derived from IMPLAN, it is estimated that a total of approximately $667.1 million in specialized equipment would be purchased from outside the county and installed at the Station site. Because these products are not produced and/or sold locally, no additional *economic* activity directly attributable to these expenditures would be generated in the county. However, ancillary monetary benefits would be realized, such as spending for transportation and construction labor needed to transport and install the equipment, as well as use tax revenues on out-of-state purchases. (Refer to the discussion of potential fiscal impacts below for more information on use tax revenues).

To the extent that construction expenditures are made locally, construction of the proposed Station would generate additional local economic activity, including income and employment benefits in White Pine County. Local expenditures would primarily consist of spending on

construction labor and materials such as aggregate/gravel, concrete, electricity, lumber, paint, tools, vehicles, office supplies, lubricants, furnishings, hardware and software, well drilling services, asphalt, etc. Excluding those expenditures on major equipment that are expected to occur outside the county, it is estimated that the Station would generate a total demand for about $682.9 million ($157.6 million annually) in other construction goods and services (excluding labor). However, the existing industries serving the construction sector in White Pine County are limited, and only a portion of local demand would be met by local industries in the county.

In addition to spending on construction-related goods and services, the proposed Station would also generate direct employment and labor income benefits during Station construction. In terms of jobs, construction of the Station would directly support an average of 760 temporary construction jobs over a 52-month period, with peak employment levels at about 1,200 jobs. Based on available construction labor, it is anticipated that about 40 jobs would be filled by local residents of White Pine County (please refer to the analysis of population impacts discussed previously in this section for more information).

Payroll expenditures required to fund the Station's construction labor requirements are estimated to total $350 million over the initial construction period, averaging about $80.8 million annually. Of this annual total, approximately $4.3 million would be earned by construction workers from White Pine County, with the remaining $76.5 million accruing to non-local workers. This represents the direct income effect of Station construction. A portion of construction income would be retained and spent in the local economy resulting in additional economic activity. Labor income earned by local workers is expected to be spent in the county in accordance with typical household spending patterns. Conversely, most of the labor income earned by non-local workers is expected to be transferred out of the county (to the area of primary residence). However, it is assumed that 20 percent of income earned by non-local employees would be spent in the local economy to pay for standard living expenses, such as food and entertainment, while temporarily residing in the county. Overall, it is estimated that approximately $19.6 million of direct labor income from construction would be retained and spent locally annually, which would generate additional economic activity.

Table 4.17-1 summarizes the estimated annual economic impacts of the Proposed Action during the initial construction phase (Phase I) of the Station. The table includes the direct economic effects of construction activities described above, as well as the additional (indirect and induced) economic benefits that would result as money circulates throughout the White Pine County economy.

Based on direct construction spending, employment, and payroll levels, it is estimated that construction of the Station would generate an additional $22.1 million in local economic output for a total output value of $414.4 million per year. In total, about $1.8 billion in economic output would be generated during the initial construction phase of the Station, of which about $95.6 million represents additional economic production beyond the construction value of the Station.

TABLE 4.17-1

Summary of Estimated Annual Economic Output, Income, and Employment Impacts of the Proposed Action (Phase I-Two Generating Units) [a,b,c]

Economic Impact	Direct	Indirect	Induced	Annual Total
Construction				
Output	$392.3 million	$17.2 million	$4.9 million	$414.4 million
Labor Income/Earnings	$80.8 million	$5.9 million	$1.1 million	$87.8 million
Employment (Temporary)	760 jobs	212 jobs	43 jobs	1,015 jobs
Operations				
Output	$315.7 million	$1.9 million	$2.1 million	$319.7 million
Labor Income/Earnings	$10.5 million	$707,000	$457,000	$11.7 million
Employment (Permanent)	135 jobs	27 jobs	19 jobs	180 jobs

Source: ENTRIX, 2006
[a] Numbers in the table represent annual average values. Monetary values are in 2006 dollars.
[b] Direct effects are based on information provided by White Pine Energy Associates. Indirect and induced effects are based on estimates derived from IMPLAN.
[c] Economic effects listed in the table are for White Pine County only.

More pertinent to local economic conditions are the income and employment benefits that would be generated by the Station. Construction of the Station under the Proposed Action is estimated to generate approximately 255 jobs in the county in addition to the average annual employment requirements at the Station site (760 jobs). In total, the estimated employment benefits attributed to the initial construction phase of the Station under the Proposed Action is 1,015 jobs annually. This is equal to 23 percent of the existing job base in the county. Of this total, employment of local workers could reach nearly 300 jobs (40 direct construction jobs plus 255 additional jobs), which accounts for almost 7 percent of the local labor force in White Pine County.

Overall, employment generated by construction of the Station would be a major and temporary economic benefit of the Proposed Action. Further, to the extent that these construction jobs are filled utilizing locally unemployed residents, the local unemployment rate could temporarily decrease. Because most construction workers are expected to be drawn from areas with a substantially larger employment base, there would likely be a negligible effect on unemployment rates in areas outside White Pine County.

Potential increases in employment during construction would also have a positive effect on the earnings/income of construction workers serving the Station. The direct income effect from construction of the Station is estimated at $80.8 million annually, and the additional income generated as a result of Station construction is estimated to be $7.0 million per year. Total labor income benefits generated by Station construction are estimated at $87.8 million annually, which accounts for about 55 percent and 34 percent of existing wage earnings and personal income levels in the county, respectively. Over the entire construction

period, total labor income generated by the Station is expected to reach about $380.4 million. The income benefits generated by Station construction would be a short-term and positive economic impact of the Proposed Action.

Economic Impacts Associated with a Third Generating Unit (Phase II)

A summary of the economic benefits attributed to the construction of a third generating unit is presented in Table 4.17-2. Generally, subsequent construction of additional generating capacity at the power plant would prolong the economic benefits of Station construction by an additional 44 months. On an average annual basis, the magnitude of economic benefits under Phase II of the Station would be smaller relative to Phase I. Specifically, the direct economic effects of Phase II construction are estimated to be $231.8 million in economic output, $47.7 million in labor income, and 502 jobs. These direct effects, in turn, would generate additional economic benefits for a total of $245.0 million in output, $51.9 million in labor income, and 655 jobs annually over the 44-month construction period.

Tax Receipts and Fiscal Resources

White Pine County, as well as the State of Nevada and its other counties, would experience fiscal benefits during construction of the Station. Fiscal benefits during construction would be attributed to sales and use taxes (including out-of-state purchases of equipment and materials), ad valorem (property) taxes, and business taxes. Another potential source of additional tax revenue is the Motor Fuels Tax. Revenue from this tax would be generated by construction-related fuel consumption (although as noted below, this tax is not expected to be a major source of revenue for White Pine County).

TABLE 4.17-2

Summary of Estimated Annual Economic Output, Income, and Employment Impacts of the Proposed Action (Phase II-Third Generating Unit) [a,b,c]

Economic Impact	Direct	Indirect	Induced	Annual Total
Construction [d]				
Output	$231.8 million	$10.1 million	$3.1 million	$245.0 million
Labor income/earnings	$47.7 million	$3.5 million	$701,300	$51.9 million
Employment (temporary)	502 jobs	125 jobs	27 Jobs	655 jobs
Operations [e]				
Output	$157.9 million	$773,400	$608,000	$159.2 million
Labor income/earnings	$3.0 million	$282,900	$134,300	$3.4 million
Employment (permanent)	40 jobs	11 jobs	6 jobs	56 jobs

Source: ENTRIX, 2006
[a] Numbers in the table represent annual average values. Monetary values are in 2006 dollars.
[b] Direct effects are based on information provided by White Pine Energy Associates. Indirect and induced effects are based on estimates derived from IMPLAN.
[c] Economic effects listed in the table are for White Pine County only.
[d] Construction effects in Phase II would occur after Phase I of the Station is complete.
[e] Operations effects represent the incremental increase in economic effects from development of Phase II of the Station, and are in addition to the effects listed for Phase I.

A separate estimate of direct fiscal revenues generated during Station construction (and operations) was prepared for the Station by Applied Analysis (Applied Analysis, 2005). This fiscal analysis does not include revenue from the Motor Fuels Tax, and does not address the indirect fiscal impacts associated with indirect or induced economic activity that would be generated by the proposed Station. This analysis was based on a proprietary model and a number of assumptions, which correspond closely to the parameters of Phase I of the Station (the scenario where two generating units are developed concurrently). The following assumptions were made in the fiscal analysis prepared by Applied Analysis:

- The Station would have a generation capacity of 1,000 MW with a total capital investment of $1.6 billion over a 5-year period.
- Construction employment would average 800 jobs, with a peak of 1,200 jobs.
- Permanent employment payroll would be $1 to $3 million per year.
- Annual coal purchases subject to sales and use tax would be $33 million per year. The fiscal analysis assumes that coal used to fuel the proposed power plant would be subject to use taxes. A court case is currently pending that is examining the applicability of use taxes to such items.
- There would be no change in ad valorem tax rates. White Pine County would continue to maintain the maximum allowed rate.
- No tax abatements or other economic incentives would be provided to WPEA other than the exemption for pollution control equipment that is currently available. It should be noted that that the State does offer incentive programs; however, to date, an application has not been made to the State Commission of Economic Development to request the incentives.

The results of the Phase I fiscal analysis have been extrapolated to provide a rough approximation of fiscal impacts under Phase II of the Station (the scenario where a third generating unit is developed subsequent to the first two units). The Phase I and II fiscal analysis results are summarized in the tables presented and described below.

The results of the Phase I fiscal analysis indicate that the Station would generate an estimated $129.4 million in total tax revenues during the 5-year construction period (see Table 4.17-3). Total tax revenues consist of $77.3 million in sales and use taxes, $27.7 in real property taxes, $22.9 million in personal property taxes, and $1.4 million in modified business taxes. On an annual basis, tax revenues are estimated to average $25.9 million per year during the 5-year construction period.

TABLE 4.17-3

Summary of Estimated Tax Revenues Generated Under the Proposed Action (Phase I-Two Generating Units) [a,b,c]

Construction	2007	2008	2009	2010	2011	Total
Modified business tax	$105,625	$359,125	$430,950	$392,925	$147,875	$1,436,500
Ad valorem property tax – real	$1,087,721	$3,403,679	$5,990,509	$8,208,276	$9,031,050	$27,721,235
Ad valorem property tax – personal	$809,182	$2,774,339	$5,317,482	$6,762,450	$7,224,840	$22,888,293
Retail sales and use tax	$10,687,500	$19,593,750	$23,868,750	$15,318,750	$7,837,500	$77,306,250
Total	**$12,690,028**	**$26,130,893**	**$35,607,691**	**$30,682,401**	**$24,241,265**	**$129,352,278**
Operations	**2012**	**2013**	**2014**	**2015**	**2016**	**Annual Average**
Modified business tax	$40,138	$40,138	$40,138	$40,138	$40,138	$40,138
Ad valorem property tax – real	$8,960,595	$8,826,090	$8,826,090	$8,557,080	$8,422,575	$8,718,486
Ad valorem property tax – personal	$6,882,630	$6,245,926	$5,694,118	$5,209,083	$4,773,813	$5,761,114
Retail sales and use tax	$2,351,250	$2,351,250	$2,351,250	$2,351,250	$2,351,250	$2,351,250
Total	**$18,234,613**	**$17,463,404**	**$16,911,596**	**$16,157,551**	**$15,587,776**	**$16,870,988**

Source: Applied Analysis, 2005
[a] Monetary values are in 2006 dollars.
[b] Values represent direct fiscal impacts. Indirect and induced fiscal effects have not been estimated.
[c] Motor Fuels tax revenue and franchise fees are not included in the fiscal analysis.

Sales and use tax revenues are expected to be the largest source of tax revenues generated by the Station, averaging about $15.6 million per year over the construction period. This type of tax revenue is collected by the State of Nevada, which, in turn, distributes a portion of the money back to local jurisdictions based on established formulas. Based on historic distributions, it is estimated that annual sales/use tax revenues generated by Station construction would be distributed as follows: White Pine County (including White Pine County School District) (approximately $10.3 million), State of Nevada (about $4.4 million), and other Nevada counties (approximately $733,000). In total, sales tax revenues realized by White Pine County during Phase I construction are estimated at $51.6 million. These tax revenues would be a major fiscal benefit to state and local government agencies, particularly those in White Pine County. To ensure that sales and use tax revenues are collected in a timely and appropriate manner, White Pine County and the Nevada Department of Taxaton would work with WPEA to develop policies and procedures for reporting and payment of sales and use taxes generated during project construction.

Station construction also would generate sales tax benefits from construction worker spending in the local economy. The extent of such benefits depends on how much labor income is retained in the county and the proportion of local spending on taxable goods and services. Although not quantified, these indirect sales tax revenues would be another positive fiscal impact of Station construction.

Property tax benefits would be realized by White Pine County and its local agencies/districts, as well the State of Nevada. It is estimated that of the approximate $50.6 million in property tax revenues generated by the Station, approximately $23.1 million would go directly to White Pine County (excluding local agencies/districts) and about $2.4 million would go to the state.

As indicated above, potential Motor Fuels Tax benefits have not been quantified for the proposed Station. Gasoline tax revenues are very difficult to quantify because of a range of statutory provisions that govern their applicability. For example, the following provisions apply to the Motor Fuels Tax in White Pine County: (1) it applies to gasoline but not diesel fuel; (2) fuel used by vehicles that are not registered and are used off road (on the construction site for example) is not taxed; (3) Motor Fuels Tax on vehicles that are registered out-of-state is distributed on a nation-wide formula rather than the state formula; and (4) fuel purchased for a centralized distribution point on the construction site is taxed on the wholesale price at the point of delivery, and if the contractors set up a central tank for construction vehicles, they can submit a claim to be reimbursed for the fuel used by unregistered off road vehicles. Discussions with the Nevada Department of Taxation indicate that gasoline tax revenues generated by the Station and realized by White Pine County would likely be minimal (Rajala, 2007).

Fiscal Impacts Associated with a Third Generating Unit (Phase II)

Based on estimates of construction spending for the third generating unit, which is expected to be approximately 50 percent of projected spending under Phase I, related fiscal impacts are expected to also be approximately half of the fiscal impacts presented for the two-generating unit scenario (see Table 4.17-4). This includes approximately $38.7 million in total sales and use taxes, $13.9 million in real property taxes, $11.4 million in personal property taxes, and $718,000 in modified business taxes. Although limited, additional gasoline tax revenue would also be generated during the construction of a third generating unit. In total, and excluding the limited gas tax revenues, the revenues generated during construction of Phase I and II of the Station are estimated to be over $194 million over an approximate 9-year construction period.

Property Values

The potential effect of the Station on local property values and related tax revenues is addressed below in Section 4.17.1.1.2, *Operations-Related Effects*.

TABLE 4.17-4

Summary of Estimated Tax Revenues Generated Under the Proposed Action (Phase II-Third Generating Unit) [a,b,c,d]

Construction	2012	2013	2014	2015	Total
Modified business tax	$70,463	$256,591	$256,591	$134,604	$718,250
Ad valorem property tax – real	$1,359,788	$4,951,640	$4,951,640	$2,597,549	$13,860,618
Ad valorem property tax – personal	$1,122,721	$4,088,367	$4,088,367	$2,144,690	$11,444,147
Retail sales and use tax	$3,792,042	$13,808,647	$13,808,647	$7,243,789	$38,653,125
Total	**$6,345,014**	**$23,105,246**	**$23,105,246**	**$12,120,633**	**$64,676,139**

Operations [e]	2016	2017	2018	2019	2020	Annual Average
Modified business tax	$20,069	$20,069	$20,069	$20,069	$20,069	$20,069
Ad valorem property tax – real	$4,480,298	$4,413,045	$4,413,045	$4,278,540	$4,211,288	$4,359,243
Ad valorem property tax – personal	$3,441,315	$3,122,963	$2,847,059	$2,604,542	$2,386,907	$2,880,557
Retail sales and use tax	$1,175,625	$1,175,625	$1,175,625	$1,175,625	$1,175,625	$1,175,625
Total	**$9,117,307**	**$8,731,702**	**$8,455,798**	**$8,078,776**	**$7,793,888**	**$8,435,494**

Source: ENTRIX, 2006

[a] Fiscal impacts are based on fiscal study prepared for Phase I (two generating units), and are based on the proportion of construction spending that would occur under Phase II (third generating unit).

[b] Monetary values are in 2006 dollars.

[c] Values represent direct fiscal impacts. Indirect fiscal effects have not been estimated.

[d] Motor Fuels taxes and franchise fees are not included in the fiscal analysis.

[e] Operations-related fiscal impacts shown in the table are incremental to the impacts presented for Phase I.

Community Infrastructure and Public Services

This section addresses potential impacts to public services in White Pine County. These types of potential effects are a concern given the County's relatively precarious financial condition (see Section 3.17.5) and the need for the County to provide some services before the new tax revenue stream estimated in the previous section begins. While the fiscal benefits of the Station would be substantial and would likely help fund a variety of public services in the county in addition to those needed by the Station and its construction work force, there would be an initial delay between the start of construction and when the revenue would become available to the County. The length of delay would vary based on the type of tax and is determined by the length of time it would take to go through the tax reporting and collection process, and because tax revenues are collected by the State of Nevada, the length of time it takes until these revenues are re-distributed to

White Pine County from the state. Generally, and based on discussions with the Nevada Department of Taxation, tax revenues generated by the Station's construction would be realized by White Pine County within 6 to 18 months after assessment and reporting (Rajala, 2007).

Since the new tax revenue stream is expected to eventually be more than sufficient to cover the costs of public services needed by the Station over the long-term, this section focuses on those local services that could be affected during the Station's construction phase and prior to when the new revenue stream associated with the Station would begin.

Law Enforcement

Based on the Station's relatively large construction work force and the County's previous experiences with crime increases during previous large construction projects (see Section 3.17.7.1), the Proposed Action would likely result in an increase in demand for traffic control and law enforcement services in the Station project area during construction. The increased demand for law enforcement services may strain police protection services in White Pine County, and preliminary discussions with the Sheriff's Department indicate that an additional one to two deputies and one patrol car would be needed to serve the Proposed Action power plant (Romero, 2005). The costs associated with adding these resources would ultimately be covered by the increased tax revenue generated by the Station. However, until this tax revenue stream is established, WPEA has agreed to provide funding for these additional resources such that there would be no interim service deficiencies. Other security-related BMPs have been included as part of the Station, consisting of an onsite security office to provide space and facilities for security personnel, a guardhouse for security personnel at the entrance to the power plant site, security fencing around the power plant site, and security vehicles to patrol the site. Speed limit and caution signs would be placed near construction sites and access routes. Traffic control personnel would also be employed at road crossings and construction access ingress and egress sites and would also help minimize the potential increase in demand for sheriff patrols and reduce the need for issuing speeding tickets.

Another type of law enforcement-related impact would be a likely increase in jail inmates during Station construction. Up to 1,200 workers and their families would live in the Station project area during the construction period and would thus increase the likelihood of arrests requiring the use of the County's jail facility or juvenile detention services, both of which have capacity limitations under existing conditions. While it is difficult to estimate related increases in the inmate or juvenile detention populations, the County has experienced such population increases in the past as discussed in Section 3.17.7.1. Therefore, WPEA has agreed to monitor this situation with the Sheriff's Department, and if necessary, would place a temporary building next to the jail to increase jail capacity, or would help the County expand its existing permanent facility, until a long-term solution can be implemented by the County at a later date. Such facilities would be developed in accordance with all applicable standards and regulations governing jail facilities. Given the large amount of tax revenue to be generated by the Station, some of the new revenue from the Station may be used to help fund long-term expansions and/or improvements to the existing jail and juvenile detention facilities.

Fire Protection and Other Emergency Services

Construction activities, in conjunction with the potential increase in the number of people temporarily residing in the Station project area during construction, may increase the need for emergency services in the project area, such as fire protection and emergency medical aid. An increase in demand for such services could result from accidents that could possibly occur with the use of heavy equipment, construction vehicles, toxic chemicals, or other hazardous materials. Also, approximately up to 25 percent of the peak construction work force (300 out of 1,200 workers) would commute to the Station site from the new housing units developed in or near Ely by WPEA (as opposed to living onsite) and thus could be involved in traffic accidents en route to the Station site.

The proposed Station would be served primarily by volunteer fire departments in the County, including emergency medical technicians (EMTs). The closest emergency services to the Station site are in McGill, approximately 22 miles south of the Proposed action power plant site. According to White Pine County, an important issue facing these outlying volunteer departments is covering emergencies during the day when most of their volunteers are at their regular places of employment during daytime business hours (Rajala, 2005). Because construction activities would occur during the time that most volunteers are at work, providing fire protection and emergency services to the Station may strain existing services levels in White Pine County or cause delays in response times until Station-related tax revenue can fund any necessary service upgrades (additional staff and/or equipment).

To address this issue, WPEA has agreed to have up to four permanent employees of WPEA that are trained in EMT and fire-fighting procedures on the site and available to serve as first responders during the Station's construction phase. Further, WPEA would coordinate these efforts with the White Pine Ambulance Service ensuring that all applicable licensing requirements are met and that onsite emergency response efforts are integrated with local emergency medical services, including transport of victims to local medical facilities. WPEA staff trained in EMT procedures would likely be supported by similar personnel that work for the contractor firms hired by WPEA to help construct the Station. At least one emergency ambulance/paramedic vehicle would also be supplied on the Station site by either WPEA or its contractors to expedite response and transport times as well as assist with treatment of patients while being transported to the hospital. WPEA would also make available within the power plant site an onsite helicopter pad, thus facilitating the use of helicopters during emergencies.

The Station's BMPs also include a number of measures that would effectively support first responders if they have to fight fires before fire-fighting personnel from McGill or Ely arrive, including extra water storage, backup diesel generators and pumps, water trucks, and other equipment.

Other Medical Aid

If necessary, serious medical emergencies occurring at the Station site or related to the construction work force temporarily residing in the Station project area would be directed to the William Bee Ririe Hospital in Ely, which provides emergency room services. Based on plans for hospital expansion and existing

capacity levels, hospital capacity is not anticipated to be an issue, and no additional hospital beds and/or medical staff are expected to be required to serve Station workers or their families.

Education and Schools

The majority of construction workers are likely to come from outside White Pine County and would move into the Station project area temporarily. Most of these workers are not expected to bring their families with them or would be single without families, and would thus likely live in the 1,000 unit, onsite and temporary, housing facility that would be provided by WPEA. Married workers and workers with children would likely live in the temporary housing units that would be developed in or adjacent to Ely. WPEA has committed to building up to 300 of these family units. Using a range of census data for the county regarding people per household and children as a percentage of the population, a worst-case analysis approach leads to an estimate of 115 to 144 school age children potentially residing in the temporary family housing units. While 2000 census data for White Pine County indicate an average of 2.45 people per household, the county has a relatively high retirement population (WPCEDC 2006). (According to the 2000 Census, in White Pine County, persons 60 years and older account for 18 percent of the population, compared to 14 percent for Nevada as a whole and 15.2 percent for the United States., The percentage of the County's population that was 60 years and older in 2000 is higher than it was in 1990.) Also, because most of the workers are expected to come from areas outside of the county and families tend to have more people living in their households, a higher figure of 3.0 people per household was used to develop a range of the total number of people that may live in the 300 family housing units (735 to 900 people). County statistics on the average number of school age children as a percentage of the total population (15.67 percent) (Rajala, 2006) were then applied to this estimate to come up with an estimated range of school age children (115 to 144).

Based on the available data regarding school capacity summarized in Section 3.17.7.4, sufficient capacity is expected to be available in the White Pine County School District to accommodate this potential increase in enrollment.

Social Services

The relatively large number of jobs that would need to be filled by WPEA and its contractors to construct the Station would attract a number of workers seeking new employment in the county. Some of these people may be unemployed or may need assistance from the county's social services organizations. While an increase in demand for county social services can be expected, this increase would be temporary, the number of people needing assistance would likely not be large, and the county Social Services Department and other existing organizations described in Section 3.17.7.6 are expected to be able to help most, if not all, of these people (Hill, 2006). Nevertheless, and as discussed in Section 4.17.1.2, White Pine County and WPEA would monitor and mitigate social service and other types of socioeconomic impacts during project construction if warranted.

The county has very few homeless people that stay for extended periods of time, possibly because of very cold temperatures much of the year. Most of the unemployed that come to town looking for work are transients who typically leave town and

seek opportunities elsewhere if they are unsuccessful securing employment locally (Rajala, 2006). Also, some of the increase in demand for temporary housing for those who need assistance while looking for other work locally, or before they leave the area, could be met with the new temporary housing that would be developed by WPEA.

In addition, the Proposed Action would have a minor affect on the ability of local motels to provide emergency shelter to the local residents as part of the county's existing motel voucher program. The demand for motel space generated by the Station would be minimal because construction workers would be required to utilize the onsite project housing.

Solid Waste Disposal

Construction of the Proposed Action power plant would generate solid waste (for example, wood and metal construction debris, household waste from onsite housing, etc.) that would require disposal. Until an onsite waste disposal facility is developed by WPEA, which is expected to take 1 or 2 years to construct, all solid waste generated during project construction would be hauled to the City of Ely Landfill for disposal. The City of Ely Engineer's office estimates that approximately 300,000 cubic yards of capacity is available at the landfill for construction waste (Rajala, 2006). In addition, the landfill has approximately 35 years of capacity for household waste (Rajala, 2007). If local landfill capacity becomes constrained during construction because of the disposal needs of the Station and other large construction projects in the area, it has been confirmed that the City of Elko Landfill has available capacity for construction and household waste and is licensed as a solid waste importer (Dotson, 2007). Once the onsite landfill facility is operating, it would be large enough to handle all of the solid waste generated by the Station's construction process. The Station would generate revenue for the City of Ely from disposal fees at the landfill and in the long-term, the new tax revenue generated by the Station could be a major source of funding for any necessary expansions at the landfill.

Road Maintenance

The single county road that would be used to transport gravel to the construction site could experience a relatively fast rate of wear and tear (compared to No Action Alternative conditions) as large gravel trucks would need to travel this route for as many as 96 months (assuming the third unit of the power plant is built after construction of the first two units is completed). However, gravel roads require less maintenance than paved roads and future tax revenues generated by the Station should be sufficient to maintain this road (Rajala, 2006). These tax revenues would be from motor fuel taxes on construction-related gasoline purchases, as well as other project-generated tax revenues deposited into the County General Fund. (There is also pending legislation that may authorize the use of sales tax revenues for road improvements.) Lastly, White Pine County and WPEA would monitor the condition of the County road affected by the Station and work together to develop and implement appropriate mitigate if needed.

Water and Wastewater

Water required to construct the Station would come from the proposed water supply system developed as part of the Proposed Action. The system would ultimately consist of eight ground water wells and an underground water pipeline

system. It is anticipated that until the distribution system is developed, water would be trucked to the Station site for construction activities, including dust control. The Proposed Action well field is expected to provide sufficient water to support construction activities, and no existing water utilities would be affected.

Generation of wastewater during construction would be from human and industrial sources. An onsite wastewater treatment plant would be constructed to serve the wastewater treatment needs in the immediate vicinity of the Station. Until that time, portable toilets would be placed at the Station site and along linear facilities during construction and used to contain human wastewater. Waste in the toilets would be collected by the local companies that already service such facilities, treated at the City of Ely Waste Water Treatment Plant (WWTP), and disposed of at the Ely Landfill. Based on the temporary nature of this impact and low volume of waste generated, the Station is not expected to exceed local treatment capacity (Day, 2007). If capacity does become an issue at the Ely facility, the City of Elko WWTP has the capacity to accept the waste from the septic services' companies providing portable toilets during construction (Sawyer, 2007).

In addition, industrial wastewater and storm water runoff generated by Station facilities that is collected after coming into contact with potential pollution sources would be discharged to an onsite evaporation pond in accordance with applicable federal and state regulations.

Power

Power during Station construction, including electric service to the wells, would be supplied by the local electric provider, Mount Wheeler Power Cooperative. Mount Wheeler would also provide electrical service to construction workers residing in the temporary housing to be developed by WPEA. This electrical cooperative has adequate capacity to meet these needs, and the Station is not expected to affect its ability to adequately serve its other customers (Rajala, 2006).

Out-of-County Economic Effects

Construction of the Station would also result in notable economic benefits outside of White Pine County. These benefits are driven primarily by expenditures for large equipment and other goods and services that are not produced locally. Items that would likely be imported from out of the county include major equipment such as boilers, steam turbines, and pollution-control equipment, as well as standard construction materials (for example, pipe conduit, wiring, pumps, motors, and steel). It is estimated that approximately $667 million worth of major equipment would be imported to serve the Station over the initial 52-month construction period, with an additional $334 million in major equipment purchased from outside the county if a third generating unit is developed. These expenditures are in addition to the purchase of other construction goods and materials that cannot be provided by local industries. These out-of-county construction expenditures would result in direct and indirect economic benefits (income and employment) in the economies where these items are produced. In addition, to the extent that local labor is not available and/or specialized labor is needed, workers could be drawn in from surrounding counties, including Clark County or Salt Lake City, which have relatively large and diverse construction work forces. This would result in employment benefits and generate wage

earnings that are spent primarily outside the county. Finally, fiscal benefits would be realized by those jurisdictions where this out-of-county spending occurs.

Another potential economic benefit to other Nevada counties is an increase in tax revenues resulting from White Pine County no longer being a "guaranteed" tax county. Currently, the county earns a guaranteed amount of tax revenue based on its past fiscal hardship. The tax revenue benefits generated by the Station would likely change the county's status from a guaranteed tax importer to a tax export county, which would allow more tax revenues to be distributed to other Nevada counties.

4.17.1.1.2 Operations-Related Effects

Population

The size of the work force needed to operate the first two generating units is expected to be approximately 135 full- and part-time staff. It is assumed that approximately half of the workers would be hired from the labor pool in White Pine County, while the remaining positions would need to be filled by workers with specialized skills not available locally. New employees involved in Station operation that are not existing county residents would be expected to relocate to the county with their families. Based on the estimated proportion of employees that would need to relocate and the average household size in the county, there could be a long-term increase in the local population of about 165 people, a 1.8 percent increase relative to existing conditions. If a third-generating unit is developed under Phase II, an additional 40 permanent employees would be required at the power plant, and the total population increase is estimated to be 214 new people in the county. The potential effects on related resources, and associated with this long-term increase in population, are addressed below.

Housing

To the extent that new workers elect to move into the local area from outside the county or from other areas within the county, the Station's operational phase would result in a minor increase in demand for permanent housing. Based on existing vacancy rates and ongoing efforts by the County to facilitate the development of new housing in the county, including up to 170 new housing units in the Ely/Ruth/McGill area over the next two years, existing and anticipated future housing resources in the county would likely be sufficient to meet demand. Additionally, new housing may be constructed and financed by the salaries of these new employees during Station operation, some of whom may be able to afford to build their own homes on undeveloped lots.

Local Economic Activity

Operation of the Proposed Action power plant would result in long-term economic benefits to the local economy of White Pine County. The direct economic benefits of power plant operations consist of the value of power generated by the plant (this includes the value of the Station's power sales and is referred to by economists as the direct output effect) and operations-related work force requirements and related payroll (direct employment and labor income effects, respectively). These direct effects, in turn, generate additional economic activity (indirect and induced effects) based on local expenditures that are required for the power plant to operate and local spending of income earned by the operations work force and other local workers.

Based on the maximum capacity of the power plant if only the first two generating units are built (1,060 MW), and assuming an operational load factor of 85 percent, the proposed Station would generate approximately 7.9 million MWh of electricity annually, with an estimated wholesale market value of approximately $315.7 million per year. This estimated value of the power produced represents the direct output effect of the Station. It is based on representative current wholesale market values for electricity in the southwestern United States, which serves as a proxy for the value of power that would be generated at the plant. For purposes of this analysis, the wholesale value of electricity in the regions served by the Proposed Action power plant is estimated at $40/MWh and is based on data in the California Independent System Operator's (ISO) 2005 "Annual Report on Market Issues and Performance," and related spot market and power exchange data provided by California ISO staff. Representative market values were used because the proposed power plant would be a private merchant facility and contract agreements and projected revenue data are proprietary.

Power plant operations would require local expenditures for goods and services, which would generate additional economic activity in the county. Operational expenditures (excluding labor and fuel costs) are estimated to be approximately $25 million annually, a portion of which would be spent locally (as estimated by IMPLAN). This value includes expenditures for items such as lime, ammonia, water treatment additives, electricity, fuel oil, lubricants, office supplies, janitorial services, landscaping services, asphalt, vehicles, rail cars, etc. This figure does not include the cost of coal that would be used to fuel the power plant (about $36.5 million annually in 2004 dollars) and related coal shipping costs (about $49.5 million annually in 2004 dollars). Because the coal would be imported from out of state (the Powder River Basin in Wyoming), coal purchases and shipping costs would not affect local economic conditions. These out-of-county effects are discussed separately below.

In terms of employment and payroll, power plant operations would require 135 full- and part-time staff, which represents the direct employment effect of operations. The annual payroll associated with the operations work force is estimated at $10.5 million annually.

Similar to construction-related effects, operations-related expenditures and labor income would generate additional economic benefits in White Pine County beyond the direct effects described above. A summary of operations-related economic effects, as measured by changes in output, earnings/income and employment, is presented in Table 4.17-1 above.

The total value of economic output generated in White Pine County as a result of power plant operations is estimated at $319.7 million annually. This includes the direct value of power production ($315.7 million), as well as an additional $4.0 million in output that is generated from local operational expenditures and local spending of labor income.

As for employment effects, in addition to the operations work force at the power plant (135 employees), it is estimated that the Station would generate an additional 45 jobs annually in the county during operations. Total employment generated by Station operations (about 180 jobs) accounts for approximately 4 percent of the county's employment base and labor

force, and could potentially lower existing unemployment rates. Overall, these employment effects represent a positive and long-term economic benefit for White Pine County.

Operation of the Proposed Action power plant would also have a positive long-term effect on income levels in White Pine County. The total income generated by Station operations is estimated at $11.7 million annually, which consists of direct income effects ($10.5 million in operations payroll) and indirect and induced income effects totaling $1.2 million annually. Total labor income that would be generated by the Station represents about 7 percent of wage earnings and almost 5 percent of total personal income generated in the county under existing conditions.

The operations-related economic benefits described in this section would continue to be generated through the life of the Station (expected to be 40 years or longer).

Economic Effects Associated with a Third Generating Unit (Phase II)

If a third generating unit were developed at the power plant site, the operations-related economic benefits of the Station would increase. Table 4.17-2 shows the incremental increase in economic benefits with the construction of a third generating unit under Phase II of the Station. The incremental economic benefits resulting from Phase II of the Station, if developed, include $157.9 in direct annual economic output, $3.0 million in direct annual labor income, and 40 additional jobs at the power plant. Considering the additional (indirect and induced) economic benefits generated by these direct effects, Phase II of the Station would result in an incremental increase of $159.2 million in total output, $3.4 million in total labor income, and 56 jobs on an annual basis during Station operation.

Tax Receipts and Fiscal Resources

Similar to construction, operation of the Proposed Action power plant would generate sales/use, property (real and personal), and business tax revenues, which represent major long-term fiscal benefits that would be realized at the local and state level (see Table 4.17-3). Based on the fiscal study prepared by Applied Analysis, it is estimated that an average of $16.9 million per year in total tax revenues would be generated during Station operations. The fiscal study evaluated fiscal effects over the first 5 years of Station operations. The largest source of tax revenues during operations are property taxes ($14.5 million annually), followed by sales/use taxes ($2.4 million annually) and business taxes ($40,000 annually).

Property taxes generated during Station operations would provide a fiscal benefit to White Pine County and the state. Because the Station would generate electricity that is sold outside of White Pine County, Station facilities would be centrally assessed by the Centrally Assessed Properties Section of the State Department of Taxation, which is responsible for the valuation, assessment, collection, and distribution of ad valorem taxes related to property of an interstate or inter-county nature (NRS 361.320). Recent legislation (NRS 361.320 (4)) provides that all property taxes generated by a facility such as the proposed power plant remain in the county of origin and not be proportioned out over the system using the unitary system of value. However, the state would still collect 17 mils of the assessed value. Based on estimated revenues and historic distributions of property tax revenues,

White Pine County, excluding the local school district and special districts, would receive approximately $6.6 million in property tax revenues annually, and the state would receive about $673,000 per year, during the initial construction period.

A minor increase in property tax revenues would result from the transfer of public lands into private ownership upon purchase of the power plant site from BLM. These property tax effects would depend on the appraised value of the land and changes in PILT payments received by the County, and are considered negligible in the context of the other type of potential property tax revenues described above.

Taxable sales would be generated from expenditures during Station operations. White Pine County would collect sales and use tax on all taxable real property purchased and delivered to the Station site, including coal. Sales/use taxes generated by Station operations would result in an estimated $1.6 million in revenues to White Pine County, $671,000 to the State of Nevada, and $112,000 to other Nevada counties annually.

Fiscal Effects Associated with a Third Generating Unit (Phase II)

The fiscal impacts of the Station under the scenario where a third generating unit is built are presented in Table 4.17-4. It is estimated the average incremental fiscal effect of the third unit includes an additional $7.2 million in property tax revenues, $1.2 million in sales/use tax revenues, and $20,000 in business tax revenues annually. These benefits would be realized at the county and state level.

Property Values

Local property values could be affected by the construction and long-term operations of the proposed Station. In fact, since the Station has been proposed, properties near the Station site (which are currently undeveloped for the most part and used for some cattle grazing) have been rising in value as speculators are hoping additional economic development will take place in the area near the Station (According to the County Assessor, property values in Steptoe Valley have increased at a greater rate than the rest of the county and roughly doubled from 2005 to 2006; Bishop. 2007).

Overall, and from a county-wide perspective, the positive employment and income effects associated with the Station, and its potential for helping to improve public services, recreational amenities and other important elements affecting the quality of life in White Pine County (by providing important new tax revenues), are expected to cause positive property value effects and should outweigh any negative effects on nearby properties that may experience adverse air quality, noise, or visual effects. Therefore, the Proposed Action is expected to have an overall positive effect on property values and the additional tax revenues and community amenities the Station would make possible would benefit all county residents. Increasing land values in Steptoe Valley would also provide a favorable market for those who elect to sell their property near the proposed site.

Some individual property owners who own property near the Station site may experience negative effects. There could be some isolated and negative effects on properties where air quality, noise, or visual effects take place, or where those residing near the Station experience other changes in their quality of life.

The different types of property value effects that could be associated with the

Proposed Action are described in more detail below.

The effect that different industrial facilities have on property values has been researched in numerous economic studies. The primary technique used to evaluate these effects is the hedonic property-pricing method, which uses statistical techniques to isolate the effects of a range of distinct housing characteristics on a property's value. A summary and review of such studies has been conducted and presented in *A Survey of House Price Hedonic Studies of the Impact of Environmental Externalities* (Boyle and Kiel, 2001). Several studies included in this article specifically evaluated the effect that power plants have on property values. For example, Blomquist (1974) concluded that distance to a power plant (up to 11,500 feet, or approximately 2 miles) has a positive and statistically significant effect on property values (the price increases with distance from the plant, all else being constant). Clark and Nieves (1994) conducted a large empirical study that found that property values are lower in areas that have a greater density of "noxious" facilities, which included power plants that emit pollutants and cause adverse noise and visual impacts. Generally, the results of studies that focused on the effect that industrial land uses have on property values showed a statistically significant relationship that implies these types of facilities adversely affect property values for properties directly affected by air, noise, and/or visual impacts. However, the magnitude of these effects varies substantially and some individual property owners owning property near the proposed Station may not feel that the county-wide positive impacts outweigh the negative impacts they perceive for their property and their way of life. They may attribute values to their property other than dollar values. Thus, increasing land values may not resolve concerns they have over changes in nearby land uses that become more industrial in nature, or if they experience new and adverse visual, air quality or noise impacts at their property. They may place a high value on their specific piece of property because of family history, the investment they made for their retirement years, or because of the peace and quiet and pristine surroundings they experienced when they originally purchased the property.

The construction of the Proposed Action power plant could positively affect local property values by creating approximately 135 to 175 permanent jobs in the local area during its operational phase, and thus increasing the long-term demand for housing in the county. While some of these jobs would be filled by local residents who already live in the county, some workers from other areas could be expected to be drawn to the region as these jobs are filled. To the extent that employees permanently move into the area, the demand for local housing would increase, tending to increase local housing prices, particularly if there is no change in supply.

The proposed Station would generate a substantial amount of new tax revenue that would be available to local government agencies to improve community infrastructure, including schools, crime control, libraries, parks and recreational opportunities, social services, and other public services. Improvements to these services would likely result in an improvement in the quality of life for local residents. This would make the county's local communities a more desirable place to live and could draw people to the region, resulting in higher property values.

Community Infrastructure and Public Services

This section addresses potential direct and operations-related effects on community infrastructure and public services, including impacts on law enforcement, emergency services and medical aid, education and schools, solid waste disposal, and public utilities (water, wastewater, and power). Potential indirect effects on community infrastructure and public services are covered in the "Other Indirect Economic Benefits" section below.

Direct effects on community infrastructure and public services would primarily be caused by the potential long-term increase in population attributed to the Station and associated with the creation of permanent employment opportunities. The estimated operations work force is expected to be 135 to 175 staff, which is estimated to result in a permanent population increase in the county of up to approximately 165 to 215 people, which is only about 2 percent of the county's existing population. As a result, adverse effects on community infrastructure and public services from the Station-related population increase are expected to be minimal during Station operations. Other aspects of the Station's operation, aside from population increases, could potentially affect community infrastructure and public services. These effects are discussed in the following text.

Law Enforcement

Although the number of sheriff patrols of the power plant site during operation would be less than those needed during the construction phase, patrols during operations would likely be needed, especially given concerns regarding utility infrastructure as terrorist targets, potential vandalism, stealing of equipment, etc. However, public law enforcement services would be funded by project-generated tax revenues, and private security officers, fencing, a guard station, alarms and other security measures would be employed at the site by WPEA, thus likely reducing the need for assistance from the Sheriff's Department.

Fire Protection and Other Emergency Services

Operation of the proposed Station involves public safety risks that are inherent to all major power plants and industrial facilities. However, the Station would incorporate a wide range of safety features to minimize the risk of injury that would require medical attention. For example, public access to the power plant site would be restricted through the use of fencing and security gates, and the power plant would be equipped with numerous fire suppression systems and industry-recognized BMPs would be implemented to minimize fire and safety risks. In addition, by the time the power plant starts operating, any necessary increase in fire or emergency services would be funded by the new tax revenue generated by the Station.

Water and Wastewater

Operation of the proposed power plant would also generate a demand for water and wastewater treatment. Water supplies that would be used for power plant operations and potable water needs would come from the Station's proposed water supply system. No public water supplies are available in the Station project area. Industrial wastewater and storm water runoff generated by project facilities and collected after coming into contact with potential pollution sources would be discharged to an evaporation pond in

accordance with applicable federal and state regulations. Domestic wastewater would be treated at the Station site with onsite septic systems. Therefore, public water and wastewater service providers would not be affected.

Solid Waste

The different types of solid waste that would be generated during the project's operational phase are described in Section 2.2.3.1.3. An onsite solid waste disposal facility would be constructed and operated to dispose of the coal combustion byproducts and the other types of wastes described in Section 2.2.3.1.3. All other types of waste generated by the Station (for example, office wastes, oil, liquids, etc.) would be hauled to the City of Ely's offsite landfill facility, which should have sufficient capacity to handle waste that is not treated at the onsite facility. If the Ely facility does not have sufficient capacity, waste from the Station can be sent to the Elko facility as described in the sub-section above regarding waste disposal during construction.

Out-of-County Economic Effects

Operation of the Proposed Action would generate notable and positive economic effects outside of White Pine County. These effects include: (1) economic benefits (jobs and income) in areas where coal is extracted and purchased for use at the power plant; (2) benefits related to the purchase of goods/services from outside the local area; (3) benefits attributed to regional rail operations; (4) benefits associated with renewable energy development in eastern Nevada counties; and (5) power reliability- and cost-related benefits in areas where White Pine Energy Station power is used. Also, long-term tax benefits to other Nevada counties would extend from the construction phase to the operational phase if White Pine County is no longer a guaranteed tax county and instead becomes a tax revenue exporter.

Coal used to fuel the proposed power plant would come from the Powder River Basin in Wyoming. Approximately 4.5 to 6.8 million tons of coal would be needed to fuel the power plant annually (depending on the number of generating units built) at a cost of approximately $36.5 to 54.7 million per year. Expenditures made to purchase the coal that fuels the plant would support mining-related employment and income in the Powder River Basin area of Wyoming. An additional $49.5 to 74.3 million would be spent annually to ship the coal from its origin to the Proposed Action power plant site. This money would support jobs and generate income for the railroad companies serving the plant, which may include Union Pacific, Burlington Northern Santa Fe, or the Nevada Northern Railroad.

Some goods and services required to operate the proposed power plant, other than coal, would be purchased locally in White Pine County. However, most operating expenses would require expenditures outside the county resulting in out-of-county economic benefits. Operational expenditures for goods and services not available in White Pine County would likely occur in surrounding counties with a relatively more diversified economy (for example, Clark County). However, it is plausible that the local economy would adapt quickly, with new businesses established to meet the needs of the Station, thereby capturing a much larger share of operational expenditures and related economic benefits that would otherwise by enjoyed by out-of-county businesses.

Economic benefits would also be realized outside White Pine County because of expanded railroad operations. By improving the regional rail network to serve the Station, other regions would be able to supply White Pine County and utilize the improved transportation infrastructure, thereby resulting in employment opportunities (and related income benefits) in the transportation sector, as well as potential expansion of industries utilizing rail services. These regional economic benefits would be realized mainly in surrounding counties, such as Elko County, including the cities of Elko and Wells.

Another out-of-county benefit is the possible expansion of renewable energy projects throughout eastern Nevada, including Eureka, Elko, and Lincoln counties. Such expansion would be attributed to the development of required infrastructure under the Proposed Action and connected actions, especially transmission capacity, which would help to encourage smaller, renewable energy projects that could not physically support or afford the transmission capacity on their own. This would also help support the state's goals of increasing the use and development of the technology to support renewable energy options. The State of Nevada has an aggressive renewable energy portfolio standard that requires the state's utilities to rely on renewable power sources for 25 percent of their generation over the long-term. This is indicative of the state's desire to further develop its ample biomass (including the use of pinyon-juniper as a fuel source), wind, and other renewable power sources. Such projects can increase local employment and income opportunities, and generate additional tax revenue for local government. The BLM's Ely District, NDOW and others are also planning on thinning much of the dense, pinyon-juniper trees found in eastern Nevada to improve sage-grouse, elk and other wildlife habitat, reduce fire risks, and improve local economic opportunities. An important piece of the puzzle for achieving these goals is facilitating the development of biomass energy projects that can use the pinyon-juniper as a fuel source, and the enhanced transmission capacity associated with the Proposed Action and its connected actions would be needed by future biomass projects.

Finally, the electrical power produced by the Station would generate economic benefits to the region and state. The Station is expected to generate nearly 7.9 to 11.8 million MWh of power annually, which would be used to serve the State of Nevada (via the Falcon-to-Gonder and SWIP transmission systems) as well as surrounding states in the west. By providing more power to the market, power rates would potentially decrease if demand remains relatively constant. Furthermore, the proposed Station is expected to be operated as a "base load" plant (in contrast to more expensive power plants that operate less frequently, for example, just during peak power usage periods), and coal as a fuel source is less expensive than such other traditional power plant fuels as oil, natural gas, and uranium. Additional power supplies on the market from the Station combined with a low-cost fuel source and its baseload operating mode should result in lower operating costs for the utilities and businesses that use Station power, which in turn, enhances profit margins, improves the efficiency of the regional economy where the businesses are located, and has positive effects on income, jobs, and agency tax revenues. In addition, lower power rates have a positive effect on disposable incomes of residential

customers, thus allowing people to spend more money in the local economy, which stimulates economic activity.

The Proposed Action power plant would also provide important power benefits related to what are collectively referred to as "ancillary benefits." Ancillary benefits include voltage support and greater system stability for those portions of the western U.S.'s transmission system that would be connected to Station-related transmission lines. Improvements in system stability in turn result in less frequent and shorter power outages, thus helping avoid reductions in business output and related adverse income and employment effects.

Other Indirect Economic Benefits

Construction and operation of the Station would help White Pine County realize some other economic benefits that are less tangible than the other economic effects described in this section, but nevertheless, important to the local economy.

The first type of indirect benefits would be associated with planned railway improvements to the NNR. These upgrades are necessary to allow the delivery of coal to the Proposed Action power plant site and could lead to other benefits as well. In addition to improvements directly paid for by WPEA, a local redevelopment agency may be created to help fund the rehabilitation costs of the railroad. These improvements may extend beyond the segment to be used by WPEA and approximately 20 percent of the property tax revenues from the Station may be used by this redevelopment agency. This money would be invested locally for the railroad infrastructure and could attract new business to White Pine County, including the City of Ely, and provide additional rail access for a variety of materials needed for new commercial and industrial developments in the county, or expansion of existing industrial activities or mining operations. The improved rail system may also be used to help boost rail-related tourism.

Another type of indirect benefits would be associated with putting the water needed by the Station to beneficial use locally, as opposed to exporting the water outside the county for beneficial uses elsewhere. There is great concern in the counties north of Las Vegas, primarily White Pine and Lincoln Counties, that the Southern Nevada Water Authority (SNWA) will eventually try to export more ground water from these counties to help meet the fast-growing water demands of the Las Vegas metropolitan area. While SNWA has not filed for the rights to water underlying Steptoe Valley where the Station would be located, it has filed for the rights to appropriate ground water from Spring and Snake Valleys, which are east and south of Steptoe Valley. By using the ground water of Steptoe Valley for in-county economic development purposes, the many direct and indirect employment, income, and tax revenue benefits associated with the use of local water resources can be realized locally as opposed to being exported out of the county.

As described in the potential property value impacts section above, another type of indirect benefit from enhanced tax revenues are the many positive community and social benefits that occur when community infrastructure and public services improve once the additional revenue is available.

4.17.1.2 Mitigation

BMPs (see Appendix A, *Best Management Practices*) and the other measures and commitments described in this section would minimize adverse socioeconomic

effects. These BMPs and other measures and commitments were designed to address all of the major socioeconomic issues associated with the Proposed Action. Therefore, socioeconomic mitigation is not proposed at this time. In addition, White Pine County would work closely with WPEA to monitor socioeconomic impacts during the Station's construction and operation phases. If the socioeconomic effects are of a greater magnitude than currently expected and problematic, appropriate mitigaton would be developed and implemented by the County and WPEA as warranted.

4.17.2 Alternative 1

4.17.2.1 Impacts

Development of the White Pine Energy Station under Alternative 1 would entail approximately the same level of capital and operating expenditures, labor force requirements, and power generation as the Proposed Action. Because the proposed transmission line route would be shorter under Alternative 1, there would be slightly lower construction-related expenditures compared to the Proposed Action, However, this difference is expected to have a negligible effect on socioeconomic conditions. Therefore, the values reported in the summary tables (Tables 4.17-1, 4.17-2, 4.17-3, and 4.17-4) also apply to Alternative 1. The primary difference between Alternative 1 and the Proposed Action is the physical location of the Station. Under Alternative 1, the Station would be located approximately 10 miles south relative to the Proposed Action, closer to the communities of McGill and Ely. This location could lead to minor benefits related to response times for law enforcement and emergency services. With that exception, Alternative 1 is expected to result in the same type and magnitude of socioeconomic impacts as described above under the Proposed Action.

4.17.2.2 Mitigation

Alternative 1 is expected to result in the same types (and nearly identical levels) of impacts as described for the Proposed Action. The BMPs and other measures and commitments described in Section 4.17.1.2 and provided in Appendix A, *Best Management Practices*, would apply. As described in Section 4.17.1.2, WPEA and White Pine County would also monitor socioeconomic effects during the Station's construction and operation and mitigate such effects if warranted. Therefore, mitigation is not required at this time.

4.17.3 Connected Actions

4.17.3.1 SWIP

4.17.3.1.1 Construction Impacts

The analysis of SWIP construction impacts considered the size and staging of the construction effort, the nearness and size of communities along the transmission line route, and available accommodations (BLM, 1993). A minimum of 105 workers would begin construction of the SWIP at one end of the route, with another group of workers possibly beginning construction at the opposite end of the route. Fenced construction yards would be spaced every 20 to 30 miles. Construction would occur over 3 years. About 60 percent of the workers would be unskilled laborers hired locally and the remainder would be skilled laborers from other areas. About half the workers would require temporary accommodations near the construction site. Temporary accommodations were anticipated to be adequate to house

workers, except in Elko where there was a housing shortage (at the time of analysis in the early 1990s) because of mining activity. Local communities would benefit from purchases by construction workers, but benefits would be minimal because the work force would be small and moving from one worksite to the next (BLM, 1993).

4.17.3.1.2 Social and Economic Impacts

The effects of transmission lines on social structures and economic activities are generally relatively small (BLM, 1993). Construction effects are typically minimal because of the small, short-term work force and their mobile nature. Potential adverse effects may include conflicts with tourist activities, such as space for lodging (motels, parks, trailers, and campgrounds) and increased traffic from construction workers and equipment. Mitigation for such conflicts includes scheduling construction to avoid tourist areas during holidays, establishing worker camps, and busing workers. Principal areas of tourist-related concern in the vicinity of the SWIP project in Nevada are Humboldt National Forest and Great Basin National Park. Additional social and economic concerns in Nevada include potential disruptions to residences, agricultural properties, the Moapa Indian Reservation, gravel pits or quarries, a school, and two airstrip clear zones. New land rights would be required for the transmission line and transmission line access roads. Use of federal lands would require ROW grants, while use of private lands would be via easement or purchase (BLM, 1993).

4.17.3.1.3 Fiscal Impacts

Annual property tax revenues during the first year of SWIP operation were estimated for the States of Idaho and Nevada and for each of the counties the transmission line would pass through (BLM, 1993). Estimated revenue (in 1992 dollars) during the first year of SWIP operation would be over $1 million for Idaho and over $2.2 million for Nevada.

4.17.3.2 NNR

4.17.3.2.1 Demographics and Population

Reinstatement of operations on the NNR is expected to indirectly benefit the demographics and population of the City of Ely, White Pine County, and Elko County. Economic diversification and increased employment opportunities associated with NNR operations could lead to long-term, sustained growth in the region (David Evans and Associates, Inc., 2002).

4.17.3.2.2 Employment and Income

Restoration and operation of the NNR rail freight service is expected to result in direct and indirect short-term and long-term employment opportunities and income for skilled and unskilled laborers. CRS and MSC (2005) anticipate that NNR rehabilitation between mileposts 18.5 and 115 would take one or two construction seasons, occurring primarily during the dry months (May through November). Construction crew size usually ranges from 6 to 12 men. Three or four crews of this size would be able to complete the work in one construction season while one or two crews of this size may require two construction seasons (CRS and MSC, 2005). Expanding the excursion tourist train operation would result in increased tourism activities and generate additional income. These effects would economically benefit the City of Ely, White Pine County, and Elko County (David Evans and Associates, Inc., 2002).

4.17.3.2.3 Community Infrastructure

No NNR-related impacts on community infrastructure are anticipated. Infrastructure-related activities would be limited to reconstruction and improvement of NNR road and highway crossings and replacement or possibly addition of NNR culverts to facilitate storm drainage (David Evans and Associates, Inc., 2002; CRS and MSC, 2005).

4.17.3.2.4 Public Services

Reinstatement of NNR operations would potentially cause a slight increase in the demand for fire protection, law enforcement, and emergency services in the area because of more people in the vicinity. No major demands for medical services are anticipated. No direct impact on school services is anticipated because residential growth is not expected to generate a substantial increase in the student population (David Evans and Associates, Inc., 2002).

4.17.4 No Action Alternative

No Station-related socioeconomic effects would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.18 Transportation

This analysis addresses the potential temporary traffic impacts from Station construction activities, and the potential traffic impacts from Station operation.

4.18.1 Proposed Action

4.18.1.1 Impacts

Construction of the Station Proposed Action Scenario 1 as described in Chapter 2 (constructing Units 1 and 2 simultaneously, and constructing Unit 3 at a later date) would last approximately 52 to 55 months (see Section 2.2.4.2, *Construction Schedule and Workforce*, and Table 2-2. As such, constructing Units 1 and 2 would result in a 52- to 55-month temporary direct increase in average daily traffic (ADT) on highways that are considered potential access routes to the Proposed Action power plant site. Constructing Unit 3 would result in an approximate 44-month temporary direct increase in ADT on those same highways at a later date. Normal construction hours are expected to be from 6:00 a.m. to 6:00 p.m. on weekdays. Some activities may require weekend construction. Nighttime construction may be necessary to meet the overall Station schedule.

The construction workforce for the two construction durations would range from a low of 20 workers to a peak of 1,200 workers, with the average number of construction workers expected to be 760 to construct Units 1 and 2, and approximately 500 to construct Unit 3. The peak construction force would work for approximately 10 months of the 52- to 55-month construction period for Units 1 and 2. For Unit 3, the peak construction force would work for approximately 3 months.

Housing and dining facilities for 1,000 Station construction workers would be provided at the power plant site. As a conservative worst-case scenario, for this analysis, it is assumed that, of the 1,200 construction workers who would be working at the Station during the peak construction period, up to 200 workers would commute on Tuesday, Wednesday, and Thursday to the worksite during the peak construction period, resulting in 200 trips arriving at the power plant site by 6:00 a.m., and 200 trips leaving the power plant site at 6:00 p.m. on those days (assuming that each worker drove alone to and from the power plant site). As indicated in Section 3.18, *Transportation*, the potential source towns and cities in Nevada and Utah for construction workers include Elko, McGill, Wells, West Wendover, Wendover, Salt Lake City, Ely, Eureka, Austin, Pioche, and Las Vegas. It is likely, however, that the majority of construction workers would originate from Ely, Elko and Wendover (Leegard, 2007). The increase of 200 vehicle trips would result in a Level of Service (LOS) A for all highways and freeways being evaluated (I-15 and I-80, and U.S. 6, U.S. 50, U.S. 93, and SR 318) (Leegard, 2007), resulting in no impact on LOS. LOS A represents a free flow of traffic with low volumes and high speed (see Table 3.18-2).

Also as a worst-case scenario, it is assumed that all 1,200 workers could leave the Proposed Action power plant site on Fridays at 6:00 p.m. to travel to such towns and cities in Nevada and Utah as Elko, McGill, Wells, West Wendover, Wendover, Salt Lake City, Ely, Eureka, Austin, Pioche, and Las Vegas. Then all 1,200 workers would return to the power plant site on Mondays by 6:00 a.m. This scenario would result in 1,200 trips on Friday evenings after 6:00 p.m. and

1,200 trips on Monday mornings before 6:00 a.m. added to the existing condition ADT. This increase of 1,200 vehicle trips would result in a LOS A for I-15 and I-80, and LOS C for U.S. 6, U.S. 50, U.S. 93, and SR 318 (Leegard pers. comm., 2007). LOS C indicates a stable flow zone of traffic, but most drivers are restricted in the freedom to select their own speeds (see Table 3.18-2).

Construction workers are expected to start their work day at 6:00 a.m. The 200 construction workers who are expected to commute daily to the power plant site may live in local motels, apartments, or RV parks and/or campgrounds. Their commute to the power plant site would occur before 6:00 a.m. For most of the highways in the area, the morning peak hour traffic is expected to occur between 6:00 a.m. and 7:00 a.m. Construction worker traffic would have already subsided by the time the morning peak hour traffic starts. Similarly, construction workers would end their work day at 6:00 p.m., which is at the end of the p.m. peak hour (5:00 p.m. to 6:00 p.m.) for highway traffic. Therefore, no impact on the local peak hour traffic is expected.

If construction workers are required to work at night, the additional traffic would increase the ADT on the highways; however, with lower local and through traffic on the highways at night than day, the impact on traffic flow and LOS would be less than if it occurred during peak hours.

In addition to construction workforce traffic, traffic would also be generated by deliveries of equipment. However, once equipment is delivered to the Station project area, no effect on traffic would occur until the equipment is removed. These infrequent deliveries would not result in an impact on local highway traffic. Deliveries of materials and concrete would also generate traffic, and would average 10 deliveries per day over the 52 to 55-month construction period. This would result in approximately 20 daily vehicle trips (10 trips accessing the Station project area and 10 trips leaving the Station project area). This increase in traffic would not adversely impact existing highway traffic, but could result in a potential public safety impact to children traveling to and/or from school (see discussion below).

Classes at the elementary and secondary (middle and high) schools in the White Pine County School District begin daily between 8:00 a.m. and 8:30 a.m., with children arriving at school beginning at 7:45 a.m. Classes at school end between 2:30 p.m. and 3:15 p.m. (Farnworth, 2007). Bus service to schools in the district typically runs between 7:00 a.m. and 8:30 a.m. and between 2:00 p.m. and 5:00 p.m.; this bus schedule accommodates both regular school hours and the after-school tutor programs (White Pine County School District, 2007; Walker, 2007). In addition, high school children are allowed to leave campus at lunch time (approximately 11:20 a.m. to 12:30 p.m.), children leave school at noon on Wednesdays to allow for teachers' continuing education (known as Professional Learning Communities), and Lund Elementary School has a 4-day school week (school is closed on Fridays) (McIntosh, 2007). As indicated above, construction workers would not be commuting at the time when children are traveling to or from school, so no public safety impact from construction worker traffic is expected. It is possible, however, that the 20 daily trips to deliver materials and concrete to the project site could occur during the times when children are

traveling to and/or from school, resulting in a potential public safety risk to those children because of increased traffic.

It should be noted that the daily commuter construction workers and those leaving for the weekend may carpool. If that occurs, then the increase in vehicles on the road because of project construction would be less than the 200 and 1,200 vehicles mentioned previously.

Parking for the construction workers (including those commuting daily and those living onsite would be provided at the power plant site, which has sufficient area to accommodate large numbers of personal vehicles.

Because I-15 and I-80 were designed to handle interstate traffic, they would adequately handle the loads of semi-trucks and trailers. Therefore, construction of the Station Proposed Action would not affect existing interstate highway conditions. Similarly, the U.S. and state highways were designed to handle semi-truck and trailer loads. Therefore, Station construction would not affect existing U.S. and state highway conditions.

Prior to project construction, access roads to the Proposed Action power plant site and ancillary facilities (transmission line, water pipeline, wells, and rail spur) would be improved to accommodate materials delivery vehicles, equipment, and construction worker transport vehicles. The access roads would be constructed to be wide and straight enough to accommodate semi-trucks and trailers, and may need to be paved.

The Proposed Action power plant would operate 24 hours per day, 365 days per year. The plant would be operated by an estimated 135 full-time employees who would work in three shifts: 65 employees from 7:00 a.m. to 3:00 p.m.; 35 employees from 3:00 p.m. to 11:00 p.m.; and 35 employees from 11:00 p.m. to 7:00 a.m. These 135 employees would generate an additional 270 vehicle trips per day associated with project operation (if they all commuted daily (100 trips at 7:00 a.m., 100 trips at 3:00 p.m., and 70 trips at 11:00 p.m.). This amount of operation-induced traffic would not adversely affect local highways or the traffic patterns of the U.S. 93 onramp/offramp to the project site. In addition, it would not change the LOS of the highways. The operations personnel vehicle trips at 7:00 a.m. and 3:00 p.m. have the potential to create a public safety risk to children traveling to and from school at those times because of increased traffic.

Because no train deliveries to the power plant site are anticipated to occur during Station construction, no effect on NNR operations is expected. However, if the NNR is upgraded in time for train deliveries during Station construction, this use would be consistent with one of the intended and desired uses of the NNR and would reduce the number of highway deliveries. The proposed transmission line would be aligned so that it would cross the NNR rail line in one location. Construction of the transmission line would be coordinated with NNR operations personnel to minimize impacts on rail operation in the Station vicinity.

An estimated 12 loads of coal would be delivered by train to the Proposed Action power plant site each week when the power plant is operational. Prior to the plant becoming operational, the existing NNR rail line would be rehabilitated in the vicinity of the Proposed Action as part of a separate, but connected, action. The NNR rehabilitation would be 110 miles long and extend from Shafter south past the

Proposed Action (and Alternative 1) power plant site to McGill. That rehabilitation would allow service to the Proposed Action power plant site in addition to other proposed uses of the railroad. The increased rail traffic from the Proposed Action would not affect these other uses. Several sidings to allow the passage of trains would be provided along the NNR (perhaps one near Shafter and one approximately midway between Shafter and the Proposed Action power plant site).

The Proposed Action would include a spur line from the main track to the power plant site. Construction of the spur line would not interfere with existing road or rail traffic patterns in the area because of the lack of existing roads in the area and because the construction contractor would coordinate construction activities with NNR operations personnel.

Potential impacts of NNR rehabilitation and operation are addressed in an Environmental Assessment (David Evans and Associates, Inc., 2002) that was prepared in support of a grant application to the U.S. Department of Commerce, Economic Development Administration, by the City of Ely. Potential transportation-related impacts of NNR rehabilitation and operation are summarized below in Section 4.18.3, *Connected Actions.* Potential impacts of coal train traffic (12 trains per week) are addressed in applicable sections of Chapter 4.

4.18.1.2 Mitigation

As a component of requirements to obtain, an enchroachment permit to access U.S. 93, WPEA will coordinate with the Nevada Department of Transportation regarding levels of traffic expected during Station construction, modifications that may be required to U.S. 93 to accommodate Station construction and operation workforce traffic. In addition, WPEA will work with the White Pine County School District and the White Pine County Road Department regarding the routes used by school buses and by children walking to local schools so that routes to the Station site can be established for Station materials and concrete deliveries and Station operation personnel that would minimize the public safety impact.

4.18.2 Alternative 1

Traffic impacts associated with Alternative 1 for both Station construction and operation would be similar to those described for the Proposed Action.

Mitigation taken as part of the Proposed Action to minimize traffic impacts would also be applicable to Alternative 1.

4.18.3 Connected Actions

4.18.3.1 SWIP

Construction of the SWIP would require that heavy vehicles access the tower sites along the transmission line ROW. Roads along existing utility corridors would be used where possible. When existing roads are used, spur roads would be constructed to the tower sites. Where no roads exist, new access and spur roads would be constructed to the tower sites. Impacts on highways and other major public roads would be limited to the increase in traffic from trucks and equipment used to construct new access roads and from equipment used to construct towers. Disruptions to existing traffic from this additional traffic would be short-term, minimal, and localized (BLM, 1993).

4.18.3.2 NNR

Restoration of NNR freight service would improve the rail transportation of goods to and from White Pine County, which is a beneficial impact. However, the potential exists for train-vehicle accidents at grade crossings, delays of vehicle traffic at grade crossings, train collisions at crossings with other rail lines, and train derailments (David Evans and Associates, Inc., 2002). CRS and MSC (2005) reported that there are 9 public and 13 private at-grade road crossings between NNR mileposts 18.5 and 115. These crossings generally do not meet current standards and would require rehabilitation because of structural deficiencies and lack of proper signage and paint striping. Rehabilitated road crossings would comply with requirements and specifications of the Nevada Department of Transportation, White Pine and Elko Counties, Public Utilities Commission, and the Federal Railroad Administration (CRS and MSC, 2005).

David Evans and Associates, Inc. (2002) stated that the potential for transportation conflicts and accidents would be prevented or minimized by providing railroad crossing stop signs at private road crossings, flashing lights and crossbucks at public road crossings, and electric locks at crossings with other rail lines. Tourist excursion trains and rail freight services on the NNR would be scheduled to avoid conflicts and the potential for collisions with one another (David Evans and Associates, Inc., 2002). CRS and MSC (2005) recommended that a railroad siding be constructed somewhere between NNR mileposts 49 and 61 to allow trains to safely pass. CRS and MSC (2005) also identified the likely need for the rehabilitation and enlargement to approximately 10,000 feet of the NNR and Union Pacific Railroad sidings near the Shafter Interchange to allow room for trains, locomotives, and clearances from the switches and signals at these locations.

The likelihood of an NNR train derailment and release of a hazardous material is quite small, but it is not zero. David Evans and Associates, Inc. (2002) concluded that if such an event were to occur, the potential impact is not expected to be substantial because of the largely vacant and undeveloped lands adjacent to the NNR Rail Line, the low density of nearby developments, anticipated limited train traffic, compliance with Federal Railroad Administration safety regulations to prevent derailment, and implementation of emergency procedures if a spill occurred (David Evans and Associates, Inc., 2002).

4.18.4 No Action Alternative

No Station-related impacts on transportation would occur under the No Action Alternative. It is assumed that the NNR and SWIP connected actions would be implemented and effects described previously would occur.

4.19 Cumulative Impacts

4.19.1 Introduction

This section addresses potential cumulative impacts that would result from the effects of the White Pine Energy Station Proposed Action or Alternative 1 when combined with the effects of other past, present, and reasonably foreseeable future projects. Reasonably foreseeable projects include those future actions that have been sufficiently defined to be: (1) relevant to potential impacts; (2) within the Station project area of influence; and (3) of a magnitude that could potentially result in a significant cumulative impact. Eleven interrelated projects were identified in Section 1.7 whose effects may extend across a broad range of resources assessed in this document and possibly result in cumulative impacts on those resources. Descriptions of these interrelated projects are presented in the following text in Section 4.19.2, *Description of Projects Considered for Cumulative Analysis*. A discussion of the specific resources not cumulatively impacted is presented in Section 4.19.3, *Resources Not Cumulatively Impacted*. That section is followed by a discussion of resources that were analyzed in detail for potential cumulative impacts (see Section 4.19.4, *Resources Analyzed in Detail for Potential Cumulative Impacts*).

Potential cumulative effects of the 11 interrelated projects, and of any other interrelated projects whose potential cumulative effects would be very resource-specific (for example, other projects that may only affect air quality), are described in the following text. Data on interrelated projects were sufficient for determining those resource areas where cumulative impacts would be expected and where they would not, and for assessing qualitatively or quantitatively (depending on the level of detail available) the potential for cumulative impacts on regionally important resources such as ground water, air quality, and others.

4.19.2 Description of Projects Considered for Cumulative Analysis

Eleven projects were considered in the cumulative impact analysis. They include six power generation or conveyance projects, two railroad (upgrade and operation) projects, and three individual projects associated with a municipal airfield, ground water production, and lake expansion. Figure 1-2 in Chapter 1 shows the locations of these projects in relation to the White Pine Energy Station Proposed Action and Alternative 1 power plant sites.

4.19.2.1 Southwest Intertie Project (also a connected action)

The Southwest Intertie Project (SWIP) was described in Chapter 2 in the discussion of connected actions (see Section 2.2.3.7.2, *Southwest Intertie Project)*.

4.19.2.2 Nevada Northern Railway Upgrade (also a connected action)

The Nevada Northern Railway (NNR) upgrade was described in Chapter 2 in the discussion of connected actions (see Section 2.2.3.7.1, *Rehabilitation and Operation of Nevada Northern Railway)*.

4.19.2.3 Nevada Northern Railway Operation (also a connected action)

The Nevada Northern Railway (NNR) operation was described in Chapter 2 in the discussion of connected actions (see

Section 2.2.3.7.1, *Rehabilitation and Operation of Nevada Northern Railway).*

4.19.2.4 White Pine County Airport (Yelland Field) Expansion

The proposed expansion of the White Pine County Airport consists of the conveyance of approximately 1,545 acres of public land to the county and the lengthening of the runway by approximately 5,000 feet. Facilities to be added include hangars for small aircraft. The airport would be fenced. An Environmental Assessment for the project is being prepared. Following the NEPA process, FAA will evaluate the project. No schedule for construction is available.

4.19.2.5 Basset Lake Expansion

White Pine County negotiated with Kennecott Copper Company of Nevada and NDOW regarding the purchase of Bassett Lake, surrounding acreage, and water rights. The County applied for a state Question 1 grant for 75 percent of the purchase price and worked with the Rocky Mountain Elk Foundation and other groups to secure the 25 percent match required. The purchase includes 6,000 acres and 53 cfs of water rights. The County would secure the funding, but NDOW would take ownership of the property and water rights directly from Kennecott. The proposal for development of the area once acquired is to replace the dam, improve the lake and wetlands, and provide recreational developments in the form of picnic areas, a boat launch, and restrooms. The Bassett Lake project grant funds have been awarded and a matching commitment has been made by the Rocky Mountain Elk Foundation, completing the agreement among Kennecott, White Pine County, and the State Lands Division.

4.19.2.6 Egan Range Wind Generating Project

A maximum of 200 wind turbine generators, with a maximum nominal design capacity of 1,800 MW, would be constructed in the proposed Egan Mountain Range near Telegraph Peak. The wind turbine generators would be supported on 140- to 328-foot-tall conical tubular steel towers with a foundation diameter of approximately 15 feet. They would be spaced a minimum of 400 feet apart. Rotor diameters would range from 229 feet to 361 feet. Ancillary improvements would include transformers, underground and overhead 34.5-kV collection and distribution lines, communication systems, access roads, meteorological towers, electric substations, and an operation and maintenance building. The overhead distribution line system would connect the energy-generating area to a new electrical substation. Power from the Proposed Egan Range Wind Energy Generating Facility would be transmitted approximately 32 miles via a new overhead transmission line to the existing Gondor Substation near McGill, Nevada, for delivery to the Sierra Pacific Power Company system serving northern Nevada. The 2.1-acre electric substations would be enclosed in a 10-acre fenced area. Access to the wind turbine generators in the Egan Mountain area would be via U.S. 93 and Warm Springs Road through Log Canyon Road. Road improvements and new road construction would be required on Egan Mountain. New construction and improvements to existing roads would be required for turbine access. An operations and maintenance facility would be constructed within the 2-acre laydown area collocated with the Proposed Egan Range Wind Energy Generating Facility.

4.19.2.7 Intermountain Power Project Phase III

Intermountain Power Service Corporation (IPSC) currently operates the Intermountain Power Project (IPP) site located near the town of Delta in Millard County, Utah. The plant consists of two conventional Babcock & Wilcox, drum-type, pulverized coal-fired, generating units. These units are designated Unit 1 and Unit 2, and have a currently approved, combined gross generation capacity of 1,900 MW. The IPP facility is a major stationary source of air emissions. The Intermountain Power Agency is proposing to expand the IPP facility by adding one additional nominal 950-gross MW (nominal 900-net MW) unit designated as Unit 3. The addition of Unit 3 to IPP would constitute a major modification of the existing major stationary source.

The IPP facility is located in an area of relatively low population density in the Sevier Desert of west central Utah. The IPP facility is situated in a broad valley that is favorable to plume dispersion. The nearest Class I area is approximately 149 kilometers southeast (Capitol Reef National Park). State-of-the-art pollution controls are proposed for Unit 3 that would make the new unit one of the cleanest pulverized coal-fired power plants in the nation. Nitrogen oxides emissions would be controlled by low nitrogen oxide burners, overfire air, and selective catalytic reduction to an outlet concentration of 0.07 pound/million British thermal units (lb/mmBtu). Sulfur dioxide emissions would be controlled by forced oxidation wet limestone flue gas desulfurization to an outlet concentration of 0.10 lb/mmBtu. Particulate matter less than 10 microns in diameter emissions would be controlled by a reverse air fabric filter baghouse to an outlet concentration of 0.015 lb/mmBtu.

The atmospheric dispersion modeling aspects of the project are required to ensure that construction of Unit 3 would not result in adverse impacts to the many National Parks and wilderness areas in Utah or to the area surrounding the plant. The air quality modeling performed by CH2M HILL demonstrates that the IPP will meet all NAAQS and the Class I and Class II PSD increments in the vicinity of the plant, which is described at (http://www.ch2m.com/corporate/services/site_and_infrastructure_planning/assets/ProjectPortfolio/Intermountain.pdf). Unit 3 is scheduled to start operation in 2012.

4.19.2.8 Newmont Gold Coal-Fired Power Plant

Newmont Gold's Nevada operations are constructing a 200-MW coal-fired power plant near the Carlin Trend. The Carlin Trend is North America's most prolific gold producing area, situated in north-central Nevada near Elko. It is a 40-mile-long northwest/southeast strip of low grade, epithermal deposits of ore, first located in 1961. Newmont plans to sell excess capacity from the plant to local utility Sierra Pacific Power Company. The plant will use low sulfur coal sourced from the Powder River Basin in northeastern Wyoming. Power plant construction commenced in 2006 with startup scheduled for the first half of 2008. The proposed power facility will employ up to 200 people during its 2-year construction period and will have an operating staff of about 25 employees.

4.19.2.9 Clark, Lincoln, and White Pine Counties Ground Water Development (GWD) Project (SNWA Project)

Southern Nevada Water Authority (SNWA) has applied to the BLM for ROWs to construct and operate a system of regional water supply facilities. The GWD Project includes construction and operation of ground water production wells, water conveyance facilities, and power facilities.

Total volume of water to be developed and conveyed through the project would be 180,000 acre-feet per year from Coyote Spring Valley, Delamar Valley, Dry Lake Valley, Tikaboo North Valley, Cave Valley, Spring Valley, and Snake Valley. The primary transmission pipeline would extend north from the Las Vegas Valley through Coyote Spring, Delamar, Dry Lake, and Spring Valleys. Secondary lateral pipelines are also planned into Snake, Cave, and Tikaboo North Valleys. All pipelines would be buried. Pumping stations would pump water over higher elevations. An aboveground 230-kV power line would be constructed along the transmission pipeline route with at least two new primary substations. The 230-kV power line would connect on the north end into the existing Gondor Substation near Ely.

4.19.2.10 Toquop Energy Coal-Fired Power Plant

Sithe Global Power's Toquop Energy Project is a proposed 750-MW coal-fired electric power plant with a natural draft cooling tower located 14 miles northwest of the City of Mesquite, Nevada in Lincoln County. The project would be fueled by Wyoming, Powder River Basin low-sulfur coal and provide electrical power to utilities in Nevada. The electric power-generating facility would be located on a 640-acre parcel of land. The plant would average 812 construction workers for the 4-year construction period, and 110 full time operations personnel. The direct and indirect payroll during construction would average $159 million per year over the 4-year construction period and $14.8 million per year during plant operations.

In 2003, an EIS for the proposed Toquop Power Project and other permitting requirements were completed for a 1,100-MW natural gas-fired power plant in Lincoln County. In July 2005 an amended application was received for a coal-fired power plant at the same location. BLM has determined that a new EIS must be completed to evaluate the components of Sithe Global's proposed project that vary from previously permitted technology and facilities. These components include the reduction of plant capacity from 1,100 to 750 MW, an expanded site plan for coal and coal-handling facilities, construction of a rail spur for the coal, and the change in technology for a coal-fired facility, including air pollution control technology. The plant would require up to 2,500 acre-feet of water annually and would be supplied by existing water rights purchased via the Lincoln County Water District.

4.19.2.11 Ely Energy Center

Sierra Pacific Power Company and Nevada Power Company propose to construct a coal-fired power facility in White Pine County and approximately 540 to 630 miles of new 500-kV electric transmission line. Proposed and alternative power plant sites for the Ely Energy Center are located in Steptoe Valley, approximately 18 miles north of Ely

(South Steptoe Valley site—the preferred site) and 50 miles north of Ely (North Steptoe Valley site). Each power plant site would require approximately 3,000 acres of land, including approximately 1,000 acres for landfilling ash and other combustion by-products.

The facility would be constructed in two phases. Phase 1 would include constructing two, 750-MW units that use pulverized coal technologies. The first unit is expected to become operational in December 2011 followed by the second unit in June 2013. Phase 2 would include constructing two 500-MW integrated gasification combined cycle units when this technology is determined to be commercially viable. When fully built out, the project would total 2,500 MW of generating capacity. Project life is estimated to be 50 years

The electric transmission facilities would interconnect the Ely Energy Center with the Sierra Pacific Power Company and Nevada Power Company electric system in northern and southern Nevada. Specific facilities would include two new 500-kV transmission lines, expansion of the existing 500-kV Harry Allen switching station, one new 500-kV switching station at the Ely Energy Center, and one new 500/345-kV switching station. Other facility requirements include a water supply well field and pipeline to the power plant, power to the water supply pump stations, a rail spur for access to the existing NNR system for fuel delivery, permanent and temporary access roads from U.S. 93 to the power plant site, an electrical distribution line for construction power, and access along all of the linear facilities. Approximately 8,000 acre-feet of water would be required annually for both Phase 1 units, with a peak flow rate of approximately 15,000 gallons per minute (gpm). Water supplied to the South Steptoe Valley power plant site would come primarily from ground water at a well field in southern Butte Valley via a 40-mile-long pipeline. Two other possible water sources for the South Steptoe Valley site that are being evaluated are a surface water supply at Duck Creek impoundment and a ground water supply near Lages Station in northern Steptoe Valley. Possible water sources being evaluated for the North Steptoe Valley power plant site are the southern Butte Valley well field, the ground water supply near Lages Station in northern Steptoe Valley, and the Duck Creek impoundment.

4.19.3 Resources Not Cumulatively Impacted

Results of impact analyses presented in Sections 4.2 through 4.18 of this chapter show that some resources in the White Pine Energy Station project area would either: (1) not be impacted by the Station Proposed Action or Alternative 1; or (2) potential impacts would be very minor, localized, and/or temporary and not overlap with the area of influence for interrelated projects. In these instances, neither the Station Proposed Action nor Alternative 1 would contribute to cumulative impacts. These resource areas were not selected for detailed analysis for cumulative impacts and are not discussed further in this section. They are as follows:

- Geology and Minerals
- Surface Water Resources
- Rangeland Resources
- Wilderness and Areas of Critical Environmental Concern
- Wastes, Solid and Hazardous
- Native American Religious Concerns
- Environmental Justice

- Paleontological Resources

4.19.4 Resources Analyzed in Detail for Potential Cumulative Impacts

The potential for cumulative impacts was analyzed for those resources that would be impacted by the Station Proposed Action or Alternative 1. Potential cumulative impacts for affected resources are discussed in the following text. Those resource areas are as follows:

- Soils
- Ground Water Resources
- Biological Resources
- Air Quality and Noise
- Visual Resources
- Recreation Resources
- Land Use
- Cultural Resources
- Socioeconomics
- Transportation

4.19.4.1 Soils

4.19.4.1.1 Proposed Action

Potential Station-related impacts on soils (removal, covering, compaction, and loss from production) would be localized and limited to areas associated with project features. Potential regional cumulative effects on soils may result from nearby projects, including construction and operation of the proposed Ely Energy Center, upgrade and operation of the NNR, and construction and operation of the SWIP. The degree and types of potential effects of the Ely Energy Center on soils would be expected to be generally similar to those of the White Pine Energy Station Project, while NNR effects on soils would be minimal and limited to the area within the NNR rail line alignment. Potential SWIP-related cumulative effects on soils would be minimal and localized or lacking. Potential cumulative effects on soils resulting from several other projects in the vicinity, including the proposed Egan Range Wind Generating Project and the White Pine County Airport Expansion, also would be expected to be minimal and localized.

4.19.4.1.2 Alternative 1

Potential cumulative effects on soils under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.2 Ground Water Resources

4.19.4.2.1 Proposed Action

Under the Proposed Action, pumping ground water from basin-fill aquifers in Steptoe Valley could result in localized ground water level declines between 2 and 6 feet in the vicinity of several nearby springs on the floor of Steptoe Valley. To the extent possible, operation of the water supply wells would be planned to avoid adversely affecting ground water levels in the vicinity of other existing wells and water resources features, such as springs. However, it is unknown at this time whether all potential effects could be avoided.

The Ely Energy Center would be located approximately 15 miles south (proposed Ely Energy Center site) or 15 miles north (alternative Ely Energy Center site) of the White Pine Energy Station Proposed Action site. Depending on the location of the Ely Energy Center well-field compared to the White Pine Energy Station well-field location, the potential exists for cumulative effects on ground water resources.

The proposed primary source of water to the Ely Energy Center is a wellfield located in Butte Valley, which is the hydrographic area to the west of Steptoe Valley. If the source of water is a wellfield

in Butte Valley, then no cumulative impacts would be related to the Proposed Action and ground water resources in Steptoe Valley. However, the proposed secondary source of water for the Ely Energy Center is the Lages Station ground water source. Although the well field associated with this source of water is only conceptual at this stage, it would be located approximately 14 miles north of the northern-most well in the White Pine Energy Station Proposed Action well field. If all of the water demand for the Ely Energy Center (16,000 acre-feet pre year at completion of the Phase II buildout) were obtained from pumping at the Lages Station ground water source, there most likely would be cumulative effects on ground water resources in the Steptoe Valley, including impacts to spring discharge that would not be anticipated to occur with only the White Pine Energy Station. Most likely, these impacts would be largely from the concentrated pumping of this much water from a single general area in the northern portion of Steptoe Valley to meet the demands of the Ely Energy Center, irrespective of the White Pine Energy Station. If only Phase I of the Ely Energy Center were ultimately built, pumping the associated water demand from the Lages Station ground water source (8,000 acre-feet per year) could also have cumulative effects on ground water resources in Steptoe Valley including spring discharge. Noted springs in the vicinity of Lages Station (for example, Collar and Elbow Spring) could be affected by Phase I of the Ely Energy Center irrespective of the White Pine Energy Station.

The intent is to operate the White Pine Energy Station in a manner that would minimize or avoid adverse effects on ground water resources including related effects on spring discharge. No quantitative ground water modeling results or other information are available for the proposed Ely Energy Center to assess further the potential for cumulative impacts on ground water resources. No other projects considered in the cumulative impacts analysis would be close enough to the Station or are expected to require ground water resources to the extent that cumulative effects would be expected.

4.19.4.2.2 Alternative 1

No potential Station-related impacts on ground water resources are predicted to occur under Alternative 1. In addition, the potential sources of ground water supply to the Ely Energy Center are located either in another hydrographic area (Butte Valley) or over 40 miles from the White Pine Energy Station Alternative 1 wellfield (Lages Station ground water source). It is anticipated there would be no cumulative effects on ground water resources under Alternative 1. However, as noted for the White Pine Energy Station Proposed Action, the water demands and the location of the identified potential source of ground water for the Ely Energy Center could impact ground water resources and associated spring discharge in the Steptoe Valley irrespective of the White Pine Energy Station.

As also noted for the White Pine Energy Station Proposed Action, no quantitative ground water modeling results or other information are available for the proposed Ely Energy Center to assess further the potential for cumulative impacts on ground water resources. In addition, no other projects considered in the cumulative impacts analysis would be close enough to the Station Alternative 1 well field or are expected to require ground water resources to the extent that cumulative effects would be expected.

4.19.4.3 Biological Resources

4.19.4.3.1 Vegetation

Proposed Action

The White Pine Energy Station would disturb vegetative cover that provides habitat for a variety of wildlife species. Potentially reduced flows and water levels at 12 springs near the Proposed Action power plant site resulting from ground water pumping may adversely affect plant species associated with spring environments. Cumulative impacts to vegetation resources resulting from the projects described in Section 4.19.2 would result in additional loss of native vegetation within the development footprint and areas of increased activity in Steptoe Valley. Construction and operation of the Ely Energy Center in Steptoe Valley would result in a similar amount of impact to vegetation resources as the Proposed Action. In addition, the Ely Energy Center could result in additional impacts to vegetation communities associated with springs and drainages if ground water pumping lowers water availability.

SWIP development would result in the temporary disturbance to vegetation during construction and the permanent loss of vegetation at tower bases, access roads, spur roads, and substations (BLM, 1993). Increased access associated with construction and long-term maintenance of the SWIP would result in impacts to vegetation in some areas. In addition, if the proposed expansions of Basset Lake and the White Pine County Airport move forward, they would have a very localized cumulative effect on vegetation in proximity to the White Pine Energy Station project area.

The upgrade and operation of the NNR would result in some removal of vegetation within the existing NNR Rail Line alignment during restoration activities. Impacts to vegetation communities would not likely be substantial because of the abundance of vegetation in the surrounding areas. Some wetlands along the NNR tracks could be impacted. Approximately 2 to 7 acres of wet or vegetated areas within the NNR Rail Line alignment would be permanently impacted from widening the NNR roadbed (CRS and MSC, 2005).

In addition to the projects listed in Section 4.19.2, continued livestock grazing on BLM-administered lands would contribute to determining the overall species composition and structure of vegetation communities throughout the area.

Alternative 1

Potential cumulative effects on vegetation under Alternative 1 would generally be the same as described for the Proposed Action, with the following exception. It is not anticipated that springs or plant species associated with spring environments would be affected under this alternative.

4.19.4.3.2 Noxious and Invasive Weeds

Proposed Action

Cumulative impacts described in the preceding text for vegetation could also result in an increase in noxious and invasive weed populations if temporarily disturbed areas are not properly reclaimed. The additional public access is likely to result in an increase of weed populations along access roads and developed areas.

Alternative 1

Cumulative impacts under Alternative 1 would be the same as described for the Proposed Action.

4.19.4.3.3 Wildlife and Fisheries Resources

Proposed Action

The White Pine Energy Station Project, NNR, SWIP development, and Ely Energy Center would disturb habitat for a variety of wildlife species within Steptoe and Butte Valleys. Some residual unavoidable adverse effects on wildlife would potentially occur from all projects, including mortalities of unprotected reptile and small mammal species, loss of foraging and nesting habitats, and increased noise and human disturbance in the valleys. Potentially reduced flows and water levels at 12 springs near the Proposed Action power plant site resulting from ground water pumping may adversely affect wildlife and fisheries resources associated with spring environments. The Ely Energy Center may also add to ground water declines that could lead to impacts to sensitive aquatic resources. Elevated noise levels as the result of operation and construction of cumulative actions would reduce habitat suitability near these features.

The other activities and projects described in Section 4.19.2 would contribute to cumulative habitat loss, disturbance, and direct mortality of wildlife. Of these activities and projects, the Ely Energy Center would potentially contribute the greatest number of cumulative effects to all wildlife. Construction and operation of multiple energy developments in Steptoe Valley would result in cumulative impacts to wildlife including: increased noise and human activity leading to wildlife disturbance; increased direct mortality of wildlife species within the development footprint; further removal and fragmentation of foraging habitats and of winter, summer, and breeding habitats for a variety of wildlife species; potential aquatic and water quality impacts; increased risk of collision as a result of additional power and distribution lines; increased perching opportunities for birds of prey, leading to further adverse effects on prey species such as the greater sage-grouse and other ground-nesting birds; and increased poaching potential. As discussed previously for ground water resources under the Proposed Action, it is uncertain whether there is a potential for cumulative effects on spring water levels and, therefore, cumulative effects on wildlife and fisheries resources using those springs.

Alternative 1

Potential cumulative effects on wildlife, fisheries, and their habitat under Alternative 1 would generally be the same as described for the Proposed Action, with the exception of impacts to spring resources. It is anticipated there would be no effects on ground water under Alternative 1 and, therefore, no cumulative effects on springs or on wildlife and fisheries resources using those springs.

4.19.4.3.4 Threatened, Endangered, Candidate, and Sensitive Species

Proposed Action

Potential effects of the Proposed Action on special status species in the project area were described in Section 4.5.4, *Threatened, Endangered, Candidate, and Sensitive Species*. The other activities and projects described in Section 4.19.2 are likely to contribute to cumulative effects to special status species, when combined with the effects of the White Pine Energy Station.

Of the projects and activities listed above, the proposed Ely Energy Center would be expected to potentially contribute the greatest number of cumulative effects to all wildlife species, including special status species, in Steptoe Valley and Butte

Valley. Construction and operation of multiple energy developments in Steptoe Valley would result in cumulative impacts to special status species including: increased human presence; increased direct mortality of wildlife species within the development footprint; further removal and fragmentation of foraging habitats and of winter, summer, and breeding habitats for a variety of wildlife species; potential aquatic and water quality impacts; increased risk of collision as a result of additional power and distribution lines; increased perching opportunities for birds of prey, leading to further adverse effects to prey species such as the greater sage-grouse; and increased poaching potential. If built closer to Basset Lake, another energy project such as the Ely Energy Center could have greater impacts to species associated with Basset Lake through increased noise levels and human activity.

Increased transmission line development in both Steptoe Valley and Butte Valley would continue to fragment habitat for a number of special status species, particularly greater sage-grouse. Within Butte Valley, former active leks located adjacent to or within an existing power line ROW are no longer in use. Increased development in Steptoe Valley would continue to cause a reduction in overall habitat quality and extent within the valley.

In addition to those projects described in Section 4.19.2, continued livestock grazing may contribute to adverse effects on endemic springsnail populations that rely on the isolated springs. Livestock grazing can reduce water quality and lead to a reduction in the health of spring function and vegetative structure.

Further water diversion in Steptoe Valley may lead to additional adverse effects to endemic springsnail populations, relict dace, and northern leopard frogs. Reduction in available ground water over time as a result of water diversion projects would eventually result in adverse effects to waterfowl, migratory bird species, and greater sage-grouse, among others. However, as discussed previously for ground water resources under the White Pine Energy Station Proposed Action, it is uncertain whether there is a potential for cumulative effects on spring water levels, and therefore on special status species using those springs, that would be attributable to the White Pine Energy Station.

Alternative 1

Potential cumulative effects on special status species under Alternative 1 would generally be the same as described for the Proposed Action, with the following exception. As described previously for ground water resources, it is anticipated there would be no cumulative effects on ground water under Alternative 1 and, therefore, no cumulative effects on springs or on special status species using those springs.

4.19.4.4 Air Quality and Noise

4.19.4.4.1 Air Quality

Nevada Northern Railway

The NNR line was originally built by Nevada Consolidated Copper Company in 1905. The rail line extends approximately from the historic town of Cobre to Ely, Nevada. Use of the rail line ceased in the late 1990s and it has fallen into disrepair. The City of Ely and the White Pine Railroad Foundation currently own the rail line and intend to rehabilitate the track. Railroad upgrade activity would involve emissions from the constructions. However, these emissions would be of short duration. The increase in railroad operations for

freight rail service and tourist excursions would also have emissions from the diesel engines. Air quality impacts of these actions would be of short duration and intermittent. Even though these impacts are cumulative, the impacts from construction activities and locomotive operations would not be expected to contribute substantially to cumulative impacts on the local air quality.

White Pine County Airport Expansion

The proposed White Pine County Airport expansion has been planned at the current airport site approximately 20 miles south of the Station Alternative 1 power plant site. No data were available to conduct an in-depth analysis of cumulative air quality impacts from this project.

Basset Lake Expansion

No significant air quality impact is expected from the development of recreational use of Basset Lake.

Intermountain Power Project Phase III

The proposed IPP Unit 3 would be located near the town of Delta in Millard County Utah, approximately 120 miles east of the proposed Station site and well outside the radius of impact of the Station. Air quality impacts from the proposed IPP Unit 3 on the Class II area surrounding the Station site would be insignificant. No cumulative analysis was conducted for IPP Unit 3 impacts.

Newmont Gold Coal-Fired Power Plant

Newmont Gold has permitted a 200-MW coal-fired power plant approximately 120 miles north of the Station site near Carlin Trend. Again, the project is well outside the radius of impact of the Station and as such it is assumed that the air quality impact from the proposed Newmont Gold power plant would be insignificant on the surrounding Class II area.

Toquop Energy Coal-Fired Power Plant

Because permit applications have not been filed for the Sithe Global Power Toquop Plant, any emission estimates from this facility would be speculative. Furthermore, the Toquop project would be well outside the radius of impact of the Station. As such, the project was not considered for cumulative impacts analysis.

Ely Energy Center

Nevada Power Company and Sierra Pacific Power Company have filed a Preliminary Plan of Development with the Public Utility Commission of Nevada for the construction of 2,500 MW coal–fired generation facility near Ely, Nevada. The initial phase would consist of two 750-MW supercritical pulverized coal–fired units. The second phase would be comprised of two additional 500-MW IGCC units, when the IGCC technology is commercially viable. The impact of the Ely Energy Center and the White Pine Energy Station would likely overlap due to close proximity. However, at this time no detailed emissions information or stack height information for the Ely Energy Center is available to estimate cumulative impacts of the Station and the Ely Energy Center. The Nevada Department of Environmental Protection in their air permit review process would consider cumulative impacts where one or both projects are greater than Significant Impact Levels.

4.19.4.4.1.1 Proposed Action

The air quality impact assessment presented in Section 4.6.1, *Air Quality*, also contains a cumulative impacts analysis. That analysis considered all increment-consuming sources as required

by federal land managers and concluded that all predicted concentrations are well below the regulatory PSD Class I increments.

4.19.4.4.1.2 Alternative 1

Conclusions for the air quality cumulative impacts analysis for the Proposed Action also apply to Alternative 1.

4.19.4.4.2 Noise

The potential for cumulative effects of noise from the White Pine Energy Station and several other projects identified in Section 14.9.2 on wildlife resources and on Threatened, Endangered, and Candidate species was described in Sections 4.19.4.3.3 and 4.19.4.3.4, respectively.

4.19.4.5 Visual Resources

4.19.4.5.1 Proposed Action

Some of the larger facilities associated with the Proposed Action such as cooling towers, stacks, and transmission lines would be visible from many locations throughout Steptoe Valley. Depending on the distance from which the facilities would be viewed and the VRM Class in which they are located, the larger Station facilities would be consistent with VRM objectives from some locations and inconsistent from other locations. The cooling towers and stacks would not meet VRM Class II objectives (and in some cases Class III objectives) when viewed from relatively close proximity (within approximately 1 to 2 miles of viewers). However, as described in Chapter 4, most views of the Station facilities would be from greater distances and frequently would meet both Class II and Class III objectives.

Several of the projects identified in Section 4.19.2 would have cumulative impacts to visual resources. Many of these projects would have challenges meeting VRM Class II and III objectives when viewed up close, but would meet them when viewed from greater distances. The project that would have the greatest cumulative impact on visual resources would be the proposed Ely Energy Center. It would contain many of the large-scale facilities that the Station Proposed Action would contain and would be very visible from throughout Steptoe Valley. It would be more visible from McGill and Ely than the Proposed Action would be. If the same precautions regarding reducing the impacts of project lighting that are proposed for the White Pine Energy Station would be used for the Ely Energy Center Project, the cumulative impacts on “Dark Skies” would be greatly reduced. The Egan Range Wind Generating Project would introduce new large-scale visual elements (turbines and transmission lines) along the top of the Egan Mountain Range on the west side of Steptoe Valley. Some project elements such as the turbines and FAA-required lights on top of turbines (that would be seen at night) would potentially be seen throughout parts of Steptoe Valley. They would cumulatively add more human-made elements to the viewed landscape of what is currently an area largely devoid of large-scale human development. The SWIP would also add large-scale human-made elements (transmission line towers) to the viewed landscape. Its impacts would be most obvious in areas where the transmission line would parallel U.S. 93, designated Byways, and along access ways into the Goshute Canyon Wilderness.

4.19.4.5.2 Alternative 1

Potential cumulative effects on visual resources under Alternative 1 would generally be the same as described for the Proposed Action. However, depending on the location of the Ely Energy Center, the

impacts could be more concentrated farther south in Steptoe Valley.

4.19.4.6 Recreation Resources

4.19.4.6.1 Proposed Action

The projects described in Section 4.19.2 would add additional large structures in addition to those of the proposed White Pine Energy Station that could be visible from Cherry Creek, from some of the lower slopes of the Goshute Canyon Wilderness and possible from parts of three other recently designated Wilderness Areas (Bristlecone, Becky Peak, and High Schells). Because Wilderness is intended to provide for the experience of an area being "untrammeled by man," this could present a negative recreational experience to the user. The SWIP, NNR, and northern alternative of the Ely Energy Center would be those projects most likely to be visible and potentially contribute to cumulative adverse effects on Wilderness. The southern alternative of the Ely Energy Center would also be highly visible from Bassett Lake. The expansion at Bassett Lake itself would have a positive effect on recreation in Steptoe Valley. Depending on the location of wind turbines and related transmission facilities, elements of the Egan Range Wind Generating Project, it too could be visible from key recreational areas in Steptoe Valley.

Development of the Egan Range Wind Generating Project and Ely Energy Center would eliminate additional open space that is presently available for recreational uses. During the construction periods, an influx of temporary workforce would increase pressure on existing recreational resources in the Ely area. Although recreational resources in the area were determined to be capable of accommodating the demand for recreation associated with the White Pine Energy Station construction and operation workforce, the cumulative demand for recreation added by the construction and operation of other reasonably foreseeable future projects may exceed the capability of recreation resources in the Station project area to meet said demands.

Four Wilderness Areas lie within the White Pine Energy Station study area. Goshute Canyon Wilderness is located in the Cherry Creek Mountains in northern White Pine County. Goshute Canyon Wilderness comprises approximately 42,544 acres of BLM-managed land. Bristlecone Wilderness is located in the Egan Range, approximately 3 miles west of McGill. Bristlecone Wilderness comprises approximately 14,095 acres of BLM-managed land. Becky Peak Wilderness is located in the Schell Creek Range in northern White Pine County. Becky Peak comprises approximately 18,119 acres of BLM-managed land. High Schells Wilderness is located in the Schell Creek Range, approximately 3 miles east of McGill. High Schells Wilderness comprises approximately 121,497 acres of USFS-managed land.

4.19.4.6.2 Alternative 1

Potential cumulative effects on recreation under Alternative 1 would be nearly identical to those described for the Proposed Action. The degree and location of potential cumulative impacts during construction would depend on whether the Ely Energy Center is constructed 90 miles north (Ely alternative site) or 10 miles south (Ely Proposed Action site) of the White Pine Energy Station Alternative 1 site and how many workers are in the area at any one time.

4.19.4.7 Land Use

4.19.4.7.1 Proposed Action

Potential cumulative effects of the projects described in Section 4.19.2 on land use include an incremental loss of public grazing land, and depending on the exact location of the other projects, increased conflicts with private land uses, mining districts, or BLM land use authorizations. The Ely Energy Center and the Egan Range Wind Generating Project present the greatest potential for effects because of their size and location. Although available rangeland would be reduced, the relative reduction resulting from the cumulative development would be minimal.

4.19.4.7.2 Alternative 1

Impacts under Alternative 1 would generally be the same as described for the Proposed Action.

4.19.4.8 Cultural and Historical Resources

4.19.4.8.1 Proposed Action

Each of the projects described in Section 4.19.2 would result in an increased risk of ground-disturbing activities, potentially adversely impacting significant archaeological sites in the region. The degree of impact to archaeological resources would depend on the exact project location and extent of ground disturbance. Similarly, the Ely Energy Center, SWIP, and Egan Range Wind Generating Project would add additional structures that may be visible from historic properties. If the projects are located where they would significantly alter characteristics of the property, they may not qualify for inclusion in the NRHP. Restoration of the NNR could disturb historical resources along the ROW, which itself is eligible for NRHP listing. Other historical resources potentially impacted from the cumulative development within the region include the Pony Express National Historic Trail, the Lincoln Highway, and six historic ranches in Steptoe Valley.

4.19.4.8.2 Alternative 1

Potential cumulative effects on cultural and historical resources under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.9 Socioeconomics

4.19.4.9.1 Proposed Action

Overall, development of the projects listed in Section 4.19.2 would lead to additional economic benefits in White Pine County and the following three out-of-county areas:

- Areas that supply coal for the proposed coal projects,
- Locations that provide the material used during construction of the projects, and
- Those areas where power generated by the proposed projects is used.

The types of benefits that would occur in the out-of-county areas listed above are described in more detail in the out-of-county effects discussion in Section 4.17.1.1.2. They include, but are not limited to, positive income and employment impacts, additional property, sales and income tax revenue, and in areas where the power is used, a relatively more reliable and affordable power supply, which in turn would result in additional economic benefits.

The energy projects and other types of proposed development projects described in Section 4.19.2 and located within White Pine County would lead to many positive

economic impacts within White Pine County. These projects would help diversify the local economy, resulting in less dependence on the boom-and-bust cycle of the mining industry. Beneficial and much-needed increases in tax revenue would be realized by White Pine County, its local agencies and special districts, as well as the State of Nevada.

The number of construction workers for these projects would vary greatly, but in the case of the Ely Energy Center Project, both construction and operation work forces could be similar to or greater than those needed for the White Pine Energy Station. Because there could be an overlap in the construction schedules of the Station and Ely Energy Center, the increases in the area's temporary population relative to its current population could be substantial with a combined total peak work force of as many as 3,200 workers. While planning for the Ely Energy Center is in its early stages and thus many of the project details are not known at this time, including project BMPs and mitigation that could help minimize or avoid potentially adverse socioeconomic impacts, worker housing arrangements for the Ely Energy Center would likely be similar to the White Pine Energy Station. Based on these worker housing plans and White Pine County's past experience with the construction of large projects (Rajala, 2007), the majority of the workforces for both projects would likely stay in the area for a relatively short period of time while their specific areas of expertise are used. Under this likely scenario, the majority of the workers would not bring their families, they would stay in temporary housing, and there would be minimal impact on family related infrastructure and services. Workers that do bring their families would likely live in temporary housing in or near Ely.

Given the temporary nature of the workforce demands for public services, the large amount of new tax revenue to be generated by both projects and expected to be available to White Pine County and its affected agencies, and the BMPs associated with the White Pine Energy Station and likely to be associated with the Ely Energy Center, family-related infrastructure and services would likely incur less-than-significant impacts.

Note that, as summarized in Section 4.17.1.1.1, the new tax revenue stream to be realized by White Pine County from the WPES is expected to average about $26 million per year during the project's construction period. A preliminary fiscal analysis conducted by the Nevada Commission on Economic Development (Nevada Commission on Economic Development. 2007), estimated the direct annual tax revenue to be received by White Pine County and its neighboring counties from the ECC to be approximately $52 million per year over an assumed ten year construction period. This analysis further assumes White Pine County would receive the "strong majority" of these positive fiscal impacts.

Nevertheless, the expected construction of multiple projects with multiple phases may mean that workers may be in the area long enough to relocate their families, thus increasing the construction-related impacts on schools, pre-school and day care, medical services, and recreation facilities and programs.

Economic diversification and increased employment opportunities associated with the NNR's upgrade and operation could lead to long-term, sustained growth in the region (David Evans and Associates, Inc., 2002), including expansion of mining activities and other types of new economic development that is located to benefit from

the enhance transportation network. An increase in the area's long-term population growth could create additional demand for public services and other community-based infrastructure and resources; however, these effects would likely be less-than-significant as White Pine County's tax base, fiscal health, and public services improve over time. The projects would substantially increase the economic activity in the area, although a great deal of the materials would likely be purchased outside of the region.

4.19.4.9.2 Alternative 1

Potential cumulative effects on socioeconomics under Alternative 1 would be similar to those described for the Proposed Action.

4.19.4.10 Transportation

4.19.4.10.1 Proposed Action

White Pine Energy Station impacts on transportation would include traffic increases during project construction on highways that are potential access routes (for example, U.S. 93, 50, and 6) to the Proposed Action power plant site. Cumulative impacts on transportation would occur if other large reasonably foreseeable projects, such as the Ely Energy Center Project, were constructed during the same time period and in the vicinity of the Station. Construction of the Ely Energy Center is scheduled to begin in 2008, with the first unit to become operational in 2011 followed by the second unit within the next 3 years. Construction of the Station is scheduled to begin in 2007 and continue over the next 4 to 5 years depending on number of units constructed and construction scenario. Scheduled construction periods of the White Pine Energy Station and Ely Energy Center Projects overlap and would result in cumulative impacts on transportation. The degree and location of potential cumulative impact during construction would depend on whether the Ely Energy Center is constructed approximately 50 miles north (Ely alternative site) or 50 miles south (Ely Proposed Action site) of the White Pine Energy Station Proposed Action site and how many workers travel the same access routes to the construction sites.

4.19.4.10.2 Alternative 1

Potential cumulative effects on transportation under Alternative 1 would be similar to those described for the Proposed Action. Scheduled construction periods for the White Pine Energy Station and Ely Energy Center Projects would overlap the same as described for the Proposed Action. The degree and location of potential cumulative impact during construction would depend on whether the Ely Energy Center is constructed 90 miles north (Ely alternative site) or 10 miles south (Ely Proposed Action site) of the White Pine Energy Station Alternative 1 site and how many workers travel the same access routes to the construction sites.

4.20 Unavoidable Adverse Impacts

Unavoidable adverse impacts are residual impacts after implementation of mitigation measures. Those unavoidable adverse impacts associated with the White Pine Energy Station that would remain after mitigation are summarized in the following text. Potential impacts for the Proposed Action and Alternative 1 are the same unless otherwise noted.

4.20.1 Geology, Soils, and Minerals

Some soils would be removed, covered, or compacted during the construction of Station features and lost from production. Biological soils crusts have not been documented to occur in the Station area. Under the Proposed Action, approximately 1,902 acres of soils would be temporarily disturbed during Station construction, approximately 392 acres would be reclaimed, and approximately 1,510 acres of soils would be permanently disturbed. Under Alternative 1, approximately 1,946 acres of soils would be temporarily disturbed during Station construction, approximately 377 acres would be reclaimed, and approximately 1,569 acres of soils would be permanently disturbed. No unavoidable adverse impacts on geological and mineral resources would occur.

4.20.2 Surface Water Resources

No unavoidable adverse impacts on surface water quality or the hydrology of streams and creeks would occur, and the potential to cause flooding would be very low. Unavoidable adverse effects on springs as affected by ground water interaction are discussed in Section 4.20.3, *Ground Water Resources.*

4.20.3 Ground Water Resources

The proposed Station would not result in a substantial decline in ground water levels or a substantial depletion of ground water resources in Steptoe Valley, and it would not impact ground water quality. The anticipated amount of ground water level decline is within the range of historical ground water level fluctuation observed in wells in Steptoe Valley. However, under the Proposed Action, pumping ground water from basin-fill aquifers in Steptoe Valley could result in localized ground water level declines between 2 and 6 feet in 12 nearby areas where springs are present on the floor of Steptoe Valley. Results of a ground water monitoring program will be used to determine if there are unanticipated effects from Station pumping on ground water levels or in flow rates and water levels of nearby springs. If the monitoring program indicates that the White Pine Energy Station ground water pumping is actually affecting spring flow rates and water levels, and therefore may potentially affect sensitive species present in those springs, WPEA will modify their pumping strategy in the well field to mitigate the potential for impacts. No unavoidable adverse effects on springs were identified for Alternative 1.

4.20.4 Biological Resources

The Proposed Action and Alternative 1 would disturb wildlife habitat and vegetative cover used by a variety of wildlife species. Under the Proposed Action, 395 acres of habitat would be temporarily disturbed by Station construction and 1,516 acres of habitat would be permanently disturbed by Station operations. The power plant ROW that the BLM would subsequently sell to WPEA would make up 1,281 acres of the permanently disturbed habitat under the

Proposed Action. Under Alternative 1, 378 acres of habitat would be temporarily disturbed and 1,534 acres of habitat would be permanently disturbed. The power plant ROW would make up 1,330 acres of the permanently disturbed habitat under Alternative 1. The loss of habitat under both the Proposed Action and Alternative 1 would be partially offset by the 700 to 900 acre Moriah Ranches Seeding Project. The Moriah Ranches Seeding Project would be implemented to enhance wildlife value on 700 to 900 acres of public land in the Ely BLM District.

Some residual unavoidable adverse effects on wildlife would potentially occur, including mortalities of unprotected reptile and small mammal species. Potentially reduced flows and water levels at 12 areas where springs are present near the Proposed Action power plant site from ground water pumping may adversely affect one species of special status aquatic springsnail (the Northern Steptoe Springsnail) and possibly other wildlife and plant species associated with spring environments. Section 4.20.3, *Ground Water Resources*, summarized monitoring and mitigation that will be implemented to avoid or minimize impacts to sensitive species in and around springs. Other possible Station-related effects on biological resources include the potential spread of noxious and invasive weeds. There also is the potential to affect special status species because of loss of habitat. The Station "may affect but is not likely to adversely affect" bald eagles.

4.20.5 Air Quality and Noise

Minimal air quality impacts would occur during Station construction. The primary issue would be fugitive dust, which would be controlled by water spray on disturbed areas. Emissions during Station operations would meet PSD permit requirements, including a modeled demonstration that all "Class II area" ambient impacts would be within applicable ambient air quality standards and that PSD increment (a measure of change in air quality) would not be exceeded. The dispersion modeling shows that "Class I area" impacts would be within applicable ambient air quality standards except that some potential exceedances of visibility criteria may occur in Jarbidge Wilderness Area and Zion National Park. While Great Basin National Park and Ruby Lake National Wildlife Refuge are not PSD Class I areas, the dispersion modeling also demonstrates that acid deposition and visibility criteria may be exceeded in these locations if managed to Class I standards.

No unavoidable adverse noise impacts would occur except for the short-term effects from steam blowouts during Station construction.

4.20.6 Visual Resources

Unavoidable adverse impacts would include the presence of construction vehicles, equipment, personnel, and activities, and associated fugitive dust emissions during construction. The constructed Station power plant, particularly the stacks and cooling towers, and transmission towers would be visible from much of Steptoe Valley. However, all Station features would meet VRM class objectives except for one location for both the Proposed Action and Alternative 1.

4.20.7 Recreation Resources

No unavoidable adverse impacts on recreation resources would occur. There would be a minor effect from the power plant site being unavailable for recreation. The increase in number of workers during Station construction and operation would increase the use of recreation resources in

the Station project area. However, these increases are not considered adverse impacts.

4.20.8 Land Use

Unavoidable adverse impacts on land use include transferring a 1,281-acre parcel under the Proposed Action or a 1,330-acre parcel under Alternative 1 from public to private ownership. This land has been identified for disposal by the BLM but transferal would preclude the continuation of existing land uses (some recreation, grazing) on the fenced site. All other Station facilities would be on BLM-administered land and would comply with federal and local land use policies. Proposed Station ROWs would be shared with some other ROW holders.

4.20.9 Rangeland Resources

No unavoidable adverse impacts on rangeland resources, including livestock grazing and wild horses, would occur.

4.20.10 Wilderness and Areas of Critical Environmental Concern

No unavoidable adverse impacts on Wilderness or ACECs would occur. Station-related effects would be temporary and minor.

4.20.11 Wastes, Hazardous and Solid

No unavoidable adverse impacts from hazardous or solid wastes would occur. The Station would result in a solid waste disposal area being constructed and operated at the power plant site and would be permanently located there. Some hazardous materials would be stored on the power plant site.

4.20.12 Cultural and Historical Resources

No known direct unavoidable adverse impacts on cultural or historical resources would occur. Potential indirect unavoidable impacts on these resources could result from increased human activity in the area. Unavoidable adverse visual impacts of Station features on the historic integrity of the NNR, Magnuson Ranch rest stop, Whiteman Ranch, and Lincoln Highway could be minimized but not entirely mitigated.

4.20.13 Native American Religious Concerns

No unavoidable adverse impacts on Native American religious practices or traditional cultural properties would occur.

4.20.14 Environmental Justice

No unavoidable adverse impacts on minority or low-income populations would occur.

4.20.15 Paleontological Resources

No unavoidable adverse impacts on paleontological resources would occur.

4.20.16 Socioeconomics

Unavoidable adverse impacts resulting from the proposed Station would include induced mostly short-term population growth into the region, and some long-term population growth, thereby creating additional demand for public services and other community-based infrastructure and resources. Local infrastructure would be stressed during construction but Station construction commitments would prevent most impacts. Economic benefits would

result from Station construction and operation.

4.20.17 Transportation

Unavoidable adverse impacts on transportation would include traffic increases on U.S. 93 during Station construction, but the increases would not reduce the Level of Service (LOS) class. The NNR would be upgraded to Class 3 status and accommodate 12 coal trains to and from the power plant per week.

4.21 Relationship Between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

4.21.1 Introduction

For purposes of this discussion, "short-term" is defined as the approximate 4 to 6 years during Station construction and shortly thereafter during initial Station operation. "Long-term" is defined as the commercial life of the Proposed Action or Alternative 1, which is estimated to be 40 years or longer. At the end of this period, decisions would be made regarding continuing to use the property for electric generation purposes or another industrial use. Implementation of the Proposed Action or Alternative 1 would necessitate uses of the environment whose effects would be apparent during Station construction and operation, and which would result in both beneficial and adverse effects on long-term productivity.

Potential impacts associated with implementation of the Proposed Action or Alternative 1 are discussed in Sections 4.1 through 4.18 of this document. Section 4.19 discusses cumulative impacts associated with the Proposed Action or Alternative 1 when combined with proposed and/or anticipated projects. Unavoidable adverse impacts resulting from Station construction and operation that would remain after implementation of mitigation measures are described in Section 4.20 of this document. Many of the potential impacts described in Sections 4.1 through 4.18 are either temporary in nature, not substantial in magnitude, or they would be mitigated to prevent the occurrence of unavoidable adverse effects. These use-related effects are briefly summarized in the following text, as are the effects on long-term productivity.

4.21.2 Short-Term Uses

Most impacts on environmental resources would initially result from construction activities and be temporary in duration, but others would persist for the operational life of the Station. The range of these effects includes the following:

- Transferal and change in land use of a 1,281-acre parcel under the Proposed Action or a 1,330-acre parcel under Alternative 1 from public (BLM) to private (WPEA) ownership.
- Use of local soils and commitment of habitat during Station construction and operation
- Increased erosion potential until disturbed areas are reclaimed
- Use of ground water during Station construction and operation and potential localized effects on nearby springs under the Proposed Action
- Temporary disturbance and/or loss of habitat and/or vegetative cover used by numerous terrestrial and several aquatic species of wildlife; the federally-listed threatened bald eagle; various BLM and State of Nevada sensitive and protected wildlife, fish, and plant species; recreationists; wild horses; and livestock
- Visual impacts on several key observation points and historical resources from the presence of cooling towers and power plant components.

Construction and operation of the Proposed Action would result in the temporary disturbance of 1,902 acres and the permanent loss of 1,510 acres.

Construction and operation of Alternative 1 would result in the temporary disturbance of 1,946 acres and the permanent loss of 1,569 acres. Up to 5,000 acre-feet per year of ground water from the Steptoe Valley wellfield would be necessary to operate the White Pine Energy Station under the Proposed Action or Alternative 1.

Additional effects would result from short-term uses of the environment. Effects on air quality would primarily be short-term and localized, resulting from construction activities that create fugitive dust and vehicle and equipment engine emissions. Station construction and operation activities would impact the area's visual resources and ambient noise levels, but not substantially (except at several visual viewpoints as discussed previously) and not at levels that would affect recreationists' use and enjoyment of the Station project area or adjacent lands. Any cultural or paleontological resources encountered during construction activities could be degraded or destroyed, unless they are fully mitigated as described in this document. Local and regional economies would benefit from the construction and operation of the proposed White Pine Energy Station, especially in White Pine County because of increases in tax receipts resulting from the proposed Station. No long-term adverse effects would result from transportation-related activities. There would be no effects on geologic features, minerals, Wilderness or ACECs, Native American religious concerns, environmental justice, or hazardous and solid wastes.

4.21.3 Maintenance and Enhancement of Long-Term Productivity

Long-term productivity related to the Proposed Action or Alternative 1 includes long-term increases in the regional supply of reliable, electrical power at competitive costs for use by consumers to help meet shortages in the western United States. On a more local level, this includes an increased availability of electrical power for the State of Nevada. The Proposed Action or Alternative 1 would help meet short-term and long-term power requirements of existing regional population areas, both for residential and commercial/industrial uses. The direct and indirect economic benefits of Station construction and operation and of increased power production would support or contribute directly to the long-term economic growth, both locally and regionally, and particularly in White Pine County.

Conversion to private ownership of public land in White Pine County on which the Station power plant would be located, and the construction of associated Station facilities including the wellfield and linear infrastructure on public land, would result in increased long-term power production. This land sale would require short-term uses of the environment and affect the long-term productivity of several resources as summarized in Section 4.21.2.

4.22 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources occurs if the commitment cannot be changed once made. An irretrievable commitment of resources occurs when resources are used, consumed, destroyed, or degraded during Station construction, operation, and maintenance and cannot be reused or recovered for the life of the Station or beyond. Table 4.22-1 summarizes irreversible and irretrievable commitments of resources for the Proposed Action or Alternative 1. Determinations of whether or not there would be irreversible and irretrievable commitments of environmental resources were based on discussions of direct and indirect Station effects in Sections 4.1 through 4.18 of this document and discussions of cumulative Station effects in Section 4.19. As summarized in Section 4.20, few of those effects would result in unavoidable adverse impacts on environmental resources.

TABLE 4-22-1

Irreversible and Irretrievable Commitments of Resources

Resource	Irreversible Commitment?	Irretrievable Commitment?*	Nature of Commitment
Geology	No	No	
Soils	Yes	Yes	See *Construction materials and fuels* below
Minerals	No	No	
Surface water	No	No	
Ground water	No	Yes	Used in construction, plant processes, and cooling operations
Vegetation	No	Project life span	Disturbance and/or loss of vegetation and habitat
Noxious and invasive weeds	No	Project life span	Potential for weed introduction and spread
Wildlife and fisheries	No	Project life span	Some harassment and/or loss of wildlife species and habitat
Threatened, endangered, candidate and sensitive species	No	Project life span	Some harassment and/or loss of special status species and habitat
Air quality	No	Project life span	Some minor degradation of air quality during construction and operation
Noise	No	Project life span	Noise sometimes exceeds ambient levels during construction and operation at a relatively minor level
Visual resources	No	Project life span	Viewshed intrusion from cooling towers and power plant components at several locations
Recreation resources	No	Project life span	Power plant construction and operation eliminate recreation use at site.

TABLE 4-22-1

Irreversible and Irretrievable Commitments of Resources

Resource	Irreversible Commitment?	Irretrievable Commitment?*	Nature of Commitment
Land use	No	Project life span	Transferal and change in land use of 1,289 acres under the Proposed Action or 1,333 acres under Alternative 1 from public to private ownership
Rangeland resources	No	No	
Wilderness and Areas of Critical Environmental Concern	No	No	
Hazardous and solid wastes	No	No	
Cultural and historical resources	Yes	Yes	Potential disturbance if sites are inadvertently discovered during construction or from increased human activity; visual impacts of cooling towers and power plant components on the historic integrity of the NNR, Magnuson Ranch rest stop, and Lincoln Highway
Native American religious concerns	No	No	
Environmental justice	No	No	
Paleontological resources	No	No	
Socioeconomics	No	Project life span	Increased regional and local employment and revenues during construction and operation
Transportation	No	No	
Construction materials and fuels			
Sands and gravels	Yes	Yes	
Ground water	Yes	Yes	
Steel	Yes	Project life span	
Aluminum	Yes	Project life span	
Concrete	Yes	Yes	
Chemicals	Yes	Yes	
Wood	Yes	Project life span	
Petroleum products	Yes	Yes	
Coal	Yes	Yes	

*Notes:
"Project life span" indicates an irretrievable impact would extend through project construction and operation. "Yes" indicates impact duration would be forever.

4.23 Energy Requirements and Conservation Potential

Energy requirements under the Proposed Action or Alternative 1 for Station construction, operation, and maintenance activities would include the use of the following:

- Petroleum products (diesel, gasoline, oil, and grease)
- Various building, operations, and maintenance materials such as aggregate from borrow areas, water from the Steptoe Valley wellfield, steel, aluminum, concrete, and wood

Other energy requirements would include the use of coal from the Powder River Basin, Wyoming, for fueling the steam turbine generators, and the use of various chemicals for treating power plant condensate and circulating water. These basic energy requirements cannot be determined specifically for the Proposed Action or Alternative 1 because of the variability of potential actions. The Proposed Action and Alternative 1 would be expected to have generally similar energy requirements, overall. The Proposed Action transmission lines and water supply pipeline would be slightly longer than those for Alternative 1, but the more southern location of the Alternative 1 power plant would require greater NNR travel distances to haul coal to the Alternative 1 site than to the Proposed Action site. The No Action Alternative would have no Station-related energy requirements.