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Chapter 5
Cumulative Effects

5.1 Introduction

Cumulative effects are those impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions on the Cumulative Effects Areas (CEAs). They can result from individually minor, but collectively significant actions taken over a period of time. Major past and present land uses and disturbances in the area, which are also projected to continue into the future, include: roads, wildfires, livestock grazing, agriculture, and mining. Dispersed recreation (including hunting and fishing) and residential development also occur in parts of the CEAs.

The CEAs for this EIS vary by resource. The configuration of the Proposed Action and Action Alternatives, as well as public scoping input gathered for this EIS, provided the foundation for identifying CEAs. Cumulative effects should be evaluated in terms of the specific resource, ecosystem, and human community being impacted, and therefore, the boundaries of the CEAs vary by resource. An attempt was made for each environmental resource to determine the extent to which the environmental effect could be reasonably detected and then include the geographic areas of resources that could be impacted by the environmental effect. However, for simplicity, ease of cumulative impact analysis, and in an attempt to avoid having only slightly different CEAs for a number of resources, CEA boundaries were left identical for multiple resources where it seemed reasonable and conservative to do so. The CEA boundaries are reasonably sized to prevent dilution of the cumulative effects over large areas. Guidance from the Council on Environmental Quality (CEQ), "Considering Cumulative Effects – January 1997," was used in identifying geographic boundaries and ultimately the CEA for each resource. The CEA for each environmental resource – and the rationale for its boundaries – is described below in each specific resource subsection. Maps for the various CEAs are also included.

Table 5.1-1 details the land ownership by CEA. The information in this table will be referred to throughout the discussions by resource topic in the proceeding sections.

Table 5.1-2 details the existing quantifiable land uses within each CEA that will be discussed by resource topic in the proceeding sections.

Table 5.1-3 details the future quantifiable land uses within each CEA that will be discussed by resource topic in the proceeding sections. Detailed descriptions of most of the projects are provided in **Section 5.2**. Projects that are not discussed in **Section 5.2** are detailed under the resource topic for which they are evaluated.

Because the primary cause of impacts to groundwater would be due to pumping and use rather than surface disturbance, the groundwater CEA is not included in **Tables 5.1-1, 5.1-2,** or **5.1-3**.

The cumulative effects of the air quality impacts from the EEC were modeled at different scales for the Class I and Class II areas. Plus there were additional evaluations for impacts from permitted air emissions sources that were not modeled. Because of these complexities, the air quality CEA is not included in **Tables 5.1-1, 5.1-2** or **5.1-3**.

TABLE 5.1-1. LAND OWNERSHIP BY CEA

LAND OWNERSHIP	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE CEA		GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTO-LOGICAL RESOURCES CEA		WILDLIFE AND SPECIAL STATUS SPECIES CEA		RANGE RESOURCES CEA		LAND USE CEA*		SPECIAL DESIGNATIONS** AND RECREATION CEA		SOCIOECONOMICS CEA	
	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA
Bankhead-Jones	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,300	0.01>	3,303	0.01	3,303	0.01
Bureau of Land Management	1,741,392	87.40	1,442,572	85.9	1,902,275	77.84	5,231,520	93.54	24,500,901	66.82	17,313,010	72.50	23,421,370	67.00
Bureau of Indian Affairs	4,883	0.25	4,883	0.29	169,429	6.93	6,073	0.11	296,837	0.81	148,786	0.62	148,786	0.43
Bureau of Reclamation	N/A	N/A	N/A	N/A	N/A	N/A	627	0.01	29,053	0.08	36,383	0.15	N/A	N/A
Department of Defense	N/A	N/A	N/A	N/A	N/A	N/A	2	0.01>	2,654,243	7.24	1,187,291	4.97	2,645,066	7.57
Department of Energy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	863,004	2.35	1,388	0.01>	863,004	2.47
National Park Service	N/A	N/A	N/A	N/A	NA	NA	N/A	N/A	440,624	1.20	398,116	1.67	183,998	0.53
U.S. Fish & Wildlife Service	69,486	3.49	69,486	4.14	68,968	2.82	27,350	0.49	322,251	0.88	791,084	3.31	279,110	0,80
U.S. Forest Service	62,458	3.13	62,458	3.72	169,429	6.93	437	0.01	3,893,558	10.62	1,708,757	7.16	3,918,368	11.21
Total Federal	**1,878,219**	**94.3**	**1,579,399**	**94.05**	**2,310,101**	**94.53**	**5,266,009**	**94.15**	**33,003,771**	**90.02**	**21,588,118**	**90.40**	**31,463,005**	**90.00**
Open Water	2,257	0.11	2,257	0.13	2,255	0.09	4,857	0.09	94,373	0.26	143,117	0.60	49,396	0.14
Private	111,157	5.58	97,001	5.78	130,743	5.35	312,008	5.58	3,500,542	9.55	2,082,412	8.72	3,415,096	9.77
State of Nevada	700	0.04	700	0.04	693	0.03	10,042	0.18	65,996	0.18	67,951	0.28	31,982	0.09
Total All Owners	**1,992,334**	**100.0**	**1,679,357**	**100.0**	**2,279,168**	**100.0**	**5,592,916**	**100.0**	**36,664,682***	**100.0**	**23,881,598****	**100.0**	**34,959,479**	**100.0**

Source: BLM\bnd_landownership_2006_Sept_poly updated with the new Ely Shoshone file

*There are discrepancies among the shape files for land use, therefore the total acreage for the CEA is slightly less than actual.

**The CEA for Special Designations extends into the State of Utah as the CEA includes lands within a 50-mile radius of project components. However, data in this table is only available for the State of Nevada. Therefore, acreages and percentages are slightly less than actual for the CEA.

TABLE 5.1-2. EXISTING QUANTIFIABLE LAND USES BY CEA

LAND USE DISTURBANCES	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE		GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTO-LOGICAL RESOURCES		WILDLIFE AND SPECIAL STATUS SPECIES		RANGE RESOURCES		LAND USE		SPECIAL DESIGNATIONS AND RECREATION		SOURCES
	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	ACRES	% OF CEA	
Mining (active & abandoned)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	N/A
Mine tailings (KCC-McGill tailings)	3,700 acres	0.19	3,700 acres	0.23	3,700 acres	0.16	3,700 acres	0.07	3,700 acres	0.07	3,700 acres	0.07	KCC Undated
Gravel Pits (active & abandoned)	565 acres	0.03	554 acres	0.03	714 acres	0.03	581 acres	0.01	1,157 acres	0.01>	1,157 acres	0.01>	Source: unknown File Name: gravelpits_poly
Burned Areas	86,734 acres	4.35	84,861 acres	5.20	94,267 acres	4.14	255,480 acres	4.57	3,317,873 acres	9.05	1,272,193 acres	5.33	Source: BLM, File Names: 1999, 2000, 2001, 2002, 2003, 2005t, 2006, & 2007
Roads – Interstate and Primary U.S.	2,170 acres 179 linear miles	0.11	2,024 acres 167 linear miles	0.12	2,085 acres 172 linear miles	0.09	2,115 acres 349 linear miles	0.04	7,503 acres 1,238 linear miles	0.02	7,436 acres 1,227 linear miles	0.03	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 100 foot right-of-way assumed to calculate acreage from linear miles
Roads – Secondary State Highway	121 acres 10 linear miles	0.01	121 acres 10 linear miles	0.01	121 acres 10 linear miles	0.01	533 acres 88 linear miles	0.01	6,485 acres 1,070 linear miles	0.02	4,255 acres 702 linear miles	0.02	
Roads – Local, neighborhood, rural, city	16,539 acres 2,729 linear miles	0.83	13,921 acres 2,297 linear miles	0.85	19,903 acres 3,284 linear miles	0.87	45,824 acres 7,561 linear miles	0.82	258,533 acres 42,658 linear miles	0.71	204,097 acres 33,676 linear miles	0.85	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 50 foot right-of-way assumed to calculate acreage from linear miles
Vehicular Trail – passable by 4WD only	978 acres 538 linear miles	0.05	778 acres 428 linear miles	0.05	1,136 acres 625 linear miles	0.05	3,055 acres 1,680 linear miles	0.05	14,909 acres 8,200 linear miles	0.04	11,725 acres 6449 linear miles	0.05	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 15 foot right-of-way assumed to calculate acreage from linear miles
Grazing Lands	1,803,850 acres	90.54	1,458,199 acres	89.32	2,071,704 acres	90.90	5,231,957 acres	93.55	28,394,459 acres	77.44	19,021,767	79.65	Assumed to include BLM and USFS lands
Irrigated Agriculture	4,036 acres	0.20	N/A	N/A	4,658 acres	0.20	8,182 acres	0.15	N/A	N/A	N/A	N/A	Source: BLM File Name: nv04 ReGap.mdb
Utility ROWs	5,418 acres 447 linear miles	0.27	5,273 acres 435 linear miles	0.32	5636 acres 465 miles	0.25	7,636 acres 630 linear miles	0.14	26,303 acres 2,170 linear miles	0.07	25,224 acres 2,081 linear miles	0.11	Source: http://sagemap.wr.usgs.gov/datalist_thm.asp 100 foot right-of-way assumed to calculate acreage from linear miles
Urban (medium-high density)	121 acres	0.01	N/A	N/A	123 acres	0.01	2,625 acres	0.05	N/A	N/A	N/A	N/A	Source: BLM File Name: nv04 ReGap.mdb

Acreages are not necessarily exclusive and may overlap

TABLE 5.1-3. POTENTIAL QUANTIFIABLE PERMANENT DISTURBANCE (IN ACRES) FROM REASONABLY FORESEEABLE PROJECTS

PROPOSED PROJECT DISTURBANCES	SURFACE WATER, SOILS, VEGETATION, WETLANDS, FISH & AQUATICS, CULTURAL RESOURCES, NATIVE AMERICAN CONCERNS, VISUAL, AND NOISE	GEOLOGY, MINERALS, TOPOGRAPHY, AND PALEONTO-LOGICAL RESOURCES	WILDLIFE AND SPECIAL STATUS SPECIES	RANGE RESOURCES	LAND USE	SPECIAL DESIGNATIONS AND RECREATION
Spruce Mountain Restoration Project	16,000	N/A	16,000	16,000	16,000	N/A
Ely Airport Expansion	1,545	N/A	1,545	N/A	1,545	N/A
Coyote Springs Community Development	43,000	43,000	43,000	N/A	43,000	43,000
Hidden Valley Community Development						914
Apex Industrial Park	6,000	N/A	6,000	N/A	6,000	6,000
Northern Nevada Railroad reconstruction	2,600	N/A	2,600	2,600	2,600	N/A
Yucca Mountain Geologic Repository railroad	600	N/A	600	3,252	600	N/A
Nevada Wind Company Wind Farms	4,470	N/A	4.470	N/A	4,470	4,470
Enexco Wind Farm	4,536	N/A	4,536	N/A	4,536	4,536
White Pine Energy Station	1,510	1,510	1,510	1,510	1,510	1,510
Ely Energy Center (EEC)	7,070	7,070	7,070	7,070	7,070	7,070
Totals	**87,331**	**51,580**	**87,331**	**30,432**	**88,331**	**67,500**

N/A: Information not quantifiable, the project does not fall within the CEA, or would not impact the resource.
Note: Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time but would contribute additional future disturbance.

5.2 Water Resources

5.2.1 CEA Boundary

Surface Water Resources - The CEA for surface water resources includes the Steptoe Valley hydrologic basin area from Duck Creek north to the divide with Northern Butte Valley and Goshute Valley, along with a 2.5-mile buffer either side of the linear facilities consisting of: 1) the Alternative Rail Line/water line alignment, and 2) the SWIP Corridor, including the transmission line alternatives (**Figure 5.2-1**). The total area of this CEA is 1,992,334 acres.

Groundwater Resources – The CEA for groundwater resources includes the Steptoe Valley hydrologic basin area from approximately Hercules Gap north to the divide with Northern Butte Valley and Goshute Valley (**Figure 5.2-2**). The total area of this CEA is 878,597 acres.

Wetlands – The CEA for wetlands would be the same as that described for surface water (**Figure 5.2-1**).

Rationale

Surface Water Resources - The direct and indirect effects of the Proposed Action and Action Alternatives on flow and quality of surface streams is confined to the Duck Creek watershed from the Duck Creek impoundment downstream to Goshute Lake. All other components of the project are designed to have no or minimal effects on surface streams outside of their direct disturbance areas, which are confined within the larger boundaries along the linear facilities.

Note that impacts of air emissions on surface water and other surface resources are considered within the larger CEA of the Air Quality resource section.

Groundwater Resources – Groundwater in the project area that would be affected by the direct and indirect impacts from the Proposed Action and Action Alternatives is contained within the alluvial fill of this hydrologic basin. This aquifer is contained within the hydrologic basin separated from surrounding basins by topographic and hydrologic divides with minimal movement of groundwater across these divides, compared to the overall water balance within the basin. In addition, the groundwater resources within this hydrologic basin are regulated by the State Engineer separately from surrounding basins. While there is consideration of water movement between the valley fill aquifer and the underlying volcanic rock aquifer, and of movement between hydrologic basins within the carbonate aquifer underlying the volcanic rock aquifer, this movement is not well-understood and is within the margin of error inherent in water balance calculations (Welch and Bright 2007).

Wetlands – Wetlands are supported by surface water and near-surface ground water. The CEA incorporates natural watershed boundaries including all past, present, and reasonably foreseeable disturbances in the Duck Creek watershed downstream of the Duck Creek Impoundment. Wetland resources in the electric transmission facilities ROWs would be avoided by design (**Section 4.2.3.2**). Impacts by the project on wetlands should not be noticeable beyond the CEA area.

Figure 5.2-1. Surface Water CEA

Figure 5.2-2. Ground Water CEA

5.2.2 Introduction

Water Rights

Water physically available for use in any water basin is the difference between the water coming into the basin (e.g. from precipitation or other basins), minus water consumed through natural and anthropogenic uses, and any change in basin storage. As described in **Section 3.2.3.5**, several studies have developed a range of water budgets for the Steptoe Valley that account for natural processes that use water (primarily evapotranspiration) and anthropogenic uses (such as irrigation, domestic, industrial, stock watering, etc.). Water rights are a legal requirement for use of water in Nevada, and represent the cumulative use of water by people living and working in the State. The Nevada State Engineer's Office is responsible for administering water rights in a way that ensures that water will be put to beneficial use, and that water used will not exceed that which is available on an annual basis. One subject of **Section 5.2** is to discuss the availability of water for the Proposed Action and Action Alternative in the context of other foreseeable demands for available water in the Steptoe Valley Basin.

Surface Water Resources

Surface water hydrology of the project area is described in **Section 3.2** of this document and depicted on **Figure 3.2-1**. Direct and indirect impacts of the construction and operation of the proposed power plant and associated facilities are described in **Section 4.2**. Potential cumulative effects to surface water resources within the CEA can occur from any surface disturbance, change in vegetation, surface water withdrawal for irrigation or other purposes, change in land use or alteration of natural drainage patterns and deposition impacts that change water quality.

Water quality is discussed in **Section 3.2.3.2**, including water quality degradation that is attributed to past and current development.

Groundwater Resources

Groundwater conditions in the CEA are described in numerous studies, which were summarized and cited in **Section 3.2.3.5**, and will not be repeated here. Depths to groundwater at the valley margins, beneath Goshute Lake and along Duck Creek largely preclude surface activities from contaminating the valley fill aquifer. Therefore, the primary potential cumulative impact to groundwater is from withdrawal of water through pumping.

<u>Groundwater Quantity</u>

NDWR estimates the perennial yield or recharge of the Steptoe Valley Basin to be 70,000 acre-feet (NDWR 2007b). This is the quantity of water that can be pumped from groundwater annually without depleting stored groundwater.

See **Section 3.2.3.5** for further discussion of efforts to quantify groundwater budgets in the Steptoe Valley Basin and groundwater quality data.

Wetlands

Locations and descriptions of wetlands in the project area are found in reports by JBR (2007a) and Frontier Corporation USA (2007), which are summarized in **Section 3.2.3.3**. These include naturally occurring wetlands, as well as those created by developed facilities (e.g., irrigation reservoirs, irrigation or drainage ditches) or heavily influenced by anthropogenic development. See also **Figure 3.2-1**. Naturally occurring wetlands are primarily associated with surface water features such as streams and springs, but wetlands in the CEA also occur as wet meadows in

areas of local high groundwater. The USGS estimates that 52 percent of native wetlands in Nevada have been lost since European settlement. According to USGS (1996):

> More than one-half of Nevada's original wetlands have been lost, primarily due to conversion of wetlands to cropland and diversion of water for agricultural and urban use; many others have been seriously degraded by human activities. Some wetlands have been created by mine dewatering and sewage treatment.

5.2.3 Past and Present Disturbances

Surface Water Resources

The primary source of impacts to surface water resources is surface disturbance, which is directly affected by land use. Impacts can be to water quality or water quantity, which are interrelated in many cases (see **Section 3.2.2**). Types of development that might affect surface water resources would include road construction and maintenance, livestock grazing, timber harvest, agricultural activities, residential development, energy development, recreational trails/facilities, utility corridors, landfills, and mining activities. Point-source wastewater and storm drain discharges from urbanization and industrial development are regulated under National Pollution Discharge Elimination System (NPDES) permitting, which minimizes their impact on receiving surface water quality. Non-point storm water runoff from land uses such as transportation corridors, livestock grazing, and timber harvest are less easily regulated and have the potential to affect surface water quality as well as the timing and volume of surface water flows. Events such as wildfires or failed culverts can have impacts on water quality.

Analysis of cumulative effects on surface water for the EEC project is simplified by its location in the Steptoe Valley Hydrographic Unit, which is a closed basin, and the Proponents' proposed use of existing utility corridors outside the Steptoe Valley Basin. With the exceptions of portions of the transmission lines and northernmost portion of the Alternative Rail Line, most new facilities and surface disturbance from the project are confined within the Duck Creek drainage in the northern Steptoe Valley Basin. Active grazing and agricultural activities, including irrigation, dominate surface use in the CEA. The largest land disturbance related to industrial activity in this area is the reclaimed Kennecott tailings and slag disposal property adjacent to McGill.

<u>Land Use</u>

Table 5.1-1 gives land ownership by acreage and **Table 5.1-2** gives land uses for the surface water CEA. Note that there is a great range of potential impacts within some categories. For example, a paved multi-lane highway, like US-93, would have different impacts than an unpaved, abandoned logging road. Land use is described in greater detail in **Sections 3.12**, **4.12**, and **5.12**.

Agriculture, Forestry, and Similar Sources of Surface Disturbance. Other anthropogenic impacts to surface water in the transmission line CEA include reservoirs in the White River Basin, such as those in the Kirch Wildlife Management Area in Nye County (Adams-McGill, Cold Springs, Haymeadow, Whipple, and Dacey reservoirs) (NDOW 2007d). The Adams-McGill Reservoir was a ranch irrigation reservoir prior to its purchase by the Nevada Division of Wildlife (NDOW) in 1959 (NDOW 2007d). Irrigation reservoirs, diversions, and delivery systems (e.g., ditches) impact surface water by altering natural drainage systems as well as the timing and volume of runoff. Irrigated agricultural lands can result in increased sediment and nutrient loads in surface water.

Agricultural and forestry practices can alter or remove vegetation temporarily or over long periods. This has the potential to increase erosion and sediment delivery to streams or other surface water features. In addition, fertilizer and other chemicals applied to the land can be carried into surface water bodies. **Table 5.1-2** lists the areal extent of agriculture and related land uses in the CEA.

Vegetation loss and soil permeability can be severely impacted by wildfires and efforts to control them. During the most recent nine years, over 86,000 acres within the CEA burned, and most notably, nearly 68,000 of those acres burned in 2005 (BLM 2007i). Widespread burning of lands can result in deposition of sediment in surface water; loss of riparian areas (shading of streams and temperature effects); change in quantity and timing of runoff; and loss of the organic soil layer, impeding new vegetation and infiltration.

Community Development. Community development can affect quantity and timing of storm water runoff. Hardscaping, such as buildings, roads and parking lots, can affect surface water by reducing or eliminating infiltration over large areas and changing drainage patterns. This, in turn, affects the timing and quantity of overland flow and runoff to surface water features, and can lead to increased sediment yield by increasing the erosion potential of runoff by concentrating it. **Table 5.1-2** gives an indication of overall urbanization, roads, and industrial land uses within the CEA. Most roads and hardscaping development in recent years has integrated infiltration basins and other best management practices into their storm water design and permitting, substantially mitigating the effect of development on surface water resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas and Oil Exploration/Development). Development associated with extractive industry (mining, oil/gas exploration) includes road construction, drilling, mining disturbance, dewatering, and supportive facilities. Extractive industry disturbance is more likely to be long-term in nature as the extractive process is lengthy, and rehabilitation of disturbances can take many years. The extractive industry can impact water quality through increased acidity, metals, nutrients, or sediment in the water. Mining can affect both surface and ground water resources, and, in some cases, consumes substantial quantities of water.

KCC ceased operation of its copper mining and smelting in 1983. While the mine and smelter were operating, tailings and slag from the smelting process were deposited upstream (southeast) of Bassett Lake and Tailings Creek (Wiemeyer 2004). The tailings cover approximately 3,700 acres from a depth of about 10 feet in the western portion to as much as 90 feet on the eastern edge (Wiemeyer 2004).

Releases from the tailings area to surface water have occurred. A flash flood in 1975 resulted in a tailings release to Tailings Creek, which caused a fish kill estimated to involve 10,000 to 13,000 trout (Ecology and Environment, Inc. 1990). The tailings have resulted in metals and other contaminants in surface waters; and modification to drainage patterns and timing. USFWS reported analytical results for metals in surface water from multiple sampling events by several agencies over a 6-year period (Wiemeyer 2004). These are provided in **Table 5.2-1**. The report (Wiemeyer 2004) goes on to indicate the following:

In 1986, NDOW analyzed water, sediment, and fish from Bassett Lake (Ecology and Environment, Inc. 1990). They found 8.6 µg/g arsenic, 2,226 µg/g copper, and <0.25 µg/g mercury in sediment, as well as 0.04 µg/g mercury in fish. Copper tailings were said to have undoubtedly reached the lake.

Wetlands occur down gradient of the area, downstream of Bassett Lake. These wetlands provide habitat for up to six species that were previously classified as species of concern by the USFWS.

TABLE 5.2-1. ANALYTICAL RESULTS* FOR METALS IN BASSETT LAKE WATER SAMPLES (MICROGRAMS/LITER [µG/L])

YEAR	ARSENIC	CADMIUM	CHROMIUM	COPPER	IRON	LEAD	MERCURY	NICKEL	ZINC
1985				20	150				10
1986	<3			10	90		<0.5		nd
1988		<5		10	70	<5		20	<10
1990			50	20	90	<5		20	20

*as reported in Wiemeyer (2004)

Water diverted from Duck Creek that was used for mining and smelting operations is now used to irrigate vegetation on the reclaimed tailings area. The combination of water and vegetation has greatly reduced dust emissions from the tailings area,. Results of sampling in the USFWS study (Wiemeyer 2004) were summarized as follows:

> Two samples each of sediment, vegetation, and aquatic invertebrates, and three samples of fish were collected from the vicinity of the site of the McGill copper smelter in White Pine County, Nevada in August 1997. Concentrations of cadmium iron, mercury, manganese, and zinc in sediment samples from Bassett Lake, downstream of tailings on the smelter site, closely approached or exceeded threshold effect concentrations for aquatic ecosystems, whereas the concentration of copper greatly exceeded the probable effect concentration. Concentrations of boron, mercury, and zinc in biological samples from Bassett Lake exceeded threshold concentrations for adverse dietary effects to migratory birds or wildlife, whereas concentrations of chromium in aquatic invertebrates from creeks adjacent to tailings greatly exceeded the potential dietary effect level. The zinc concentrations in common carp from Bassett Lake and Tailings Creek were of concern.

Section 3.3.3.3 describes the mining districts within the project area. **Table 3.3-2** shows the project element nearest to each mining district, the mineral commodities (e.g., gold, copper, phosphate), and the mining claim number for active claims. **Figure 3.3-4** shows the locations of the districts. **Table 5.3-2** expands on **Table 3.3-2** to include a larger area (the minerals CEA), and historical context to mining in the area. **Section 3.3.3.3** also shows active oil and gas leases in the area and authorized geothermal leases. The preceding was obtained primarily from BLM databases. In addition to the active mines and oil and gas leases, there are mining claims within the CEA that have been abandoned or patented (BLM 2007i), such as a portion of the Robinson Nevada Mine (Mine Development Associates 2004) 22 miles west of Ely.

Abandoned mines can be troublesome for surface water, since many of them were mined before environmental regulations, reclamation bonding, or other types of permitting went into effect. At some sites, disturbed areas do not support plant growth, particularly on tailings or waste rock depositories. Consequently, these sites may yield higher sediment loads, acid mine drainage, metals, and other water quality contaminants. The Nevada Bureau of Mines and Geology (NBMG) estimates that there are as many as 225,000 to 310,000 inactive and abandoned mine sites statewide, including 102,464 that had been digitized statewide as of 1995, and 7,925 in White Pine County (NBMG 1995).

Table 5.3-1 shows current sand and gravel operations in the geology CEA, and **Section 5.3** describes other current, historic and anticipated mining activities in the project area. Gravel pits can result in deposition of sediment in surface waters, as well as changes in drainage patterns. Landfills in the project area are discussed in **Section 5.19**.

Grazing. In the case of the water resources CEA the predominant land use is grazing for livestock and for wild horses. **Figures 3.9-1a** through **c** and **Figure 3.9-2** show BLM grazing allotments and herd management areas, which are described in **Sections 3.9** and **4.9**, under Range Resources. Grazing can result in loss of vegetation leading to increased sediment delivery, promotion of less palatable species, loss of riparian vegetation, increased nutrients in surface waters, and stream bank failure due to trampling and loss of riparian vegetation. BLM is reducing grazing impacts through increased monitoring and use restrictions on new and renewed grazing leases.

Industrial Development. The Apex Industrial Park (the Park) is located at the southern tip of the CEA in Clark County. It is noteworthy that the Park appears to represent substantial industrial development in close proximity to the project area. The Park consists of 21,000 acres with contiguous lots ranging from 5 to 500 acres. The Park is zoned allowing most industrial uses, pays no corporate income tax, and has utility services access, including electric transmission and distribution service, an interstate natural gas pipeline, and fiber-optic communications capability. The Park currently contains operating power plants, as well as quarries, industrial facilities, and landfills. Existing utility infrastructure includes Reid Gardner Station, Harry Allen Substation, Chuck Lenzie Generating Station, numerous transmission lines, and other types of utilities (such as underground petroleum pipelines). These types of facilities can consume large quantities of water for process or cooling purposes. Permitting requirements under the federal Clean Water Act have mitigated impacts from wastewater at industrial facilities.

Recreation. BLM's Ely District contains the majority of the area within the CEA. Off-highway vehicle (OHV) activity is a popular recreational pursuit in Nevada (see description of recreational uses in **Section 3.14**). OHVs are notably destructive of natural resources under some conditions, damaging vegetation, compacting soils in some areas and breaking up soil in others. These impacts lead to increased erosion, changes in infiltration of precipitation, and mobilization of sediment. Restricting OHV use to well defined and maintained areas can substantially mitigate impacts to water resources.

Roads. Roads within the CEA result in changes in drainage patterns, vegetation, infiltration and wetlands. Sanding and deicer materials may affect vegetation and result in vegetative loss, ultimately impacting water quality through increased sedimentation. BLM's Ely District RMP (2007a) currently restricts OHV use to existing roads and trails. Previously, OHV use on the Ely District was unrestricted, and present use within the BLM's Southern Nevada District is unrestricted. Unrestricted use of OHVs results in a creation of a network of social roads that lead to a wide range of resource impacts. Vehicular trails greatly increase sediment delivery, overland flow, flood risk and erosion, while decreasing vegetation.

Utility Production and Distribution. Existing power production and distribution within the CEA includes the Harry Allen complex consisting of the generating station, switchyards, and substations; and segments of numerous transmission lines. Utility ROWs within the CEA have been developed for power transmission, and placement of water and gas pipelines and fiber optic cable. The majority of acreage disturbed within the CEA by utilities installation (for example, transmission lines associated with the Harry Allen Substation; and existing SNWA, Lincoln County and NPC transmission lines) is in the southern portion of the CEA, within the utility ROW.

The Kern River gas pipeline enters the southern tip of the CEA and terminates in the Apex Industrial Park. The project consists of a 36-inch diameter natural gas pipeline originating in Salt Lake City, Utah.

Utility line construction and operation can increase sediment, affect quantity and timing of runoff, and adversely impact water quality through snow management materials (including salts and sand). Construction of power generation facilities and towers supporting associated transmission lines have had short-term adverse impacts due to ground disturbance, and permanent adverse effects on water resources as existing permeable surfaces (vegetated areas) have been replaced by structures creating impermeable surfaces. Placement of existing water supply lines, gas lines, and fiber optic cable within utility ROWs also have resulted in ground-disturbing activities. However, because there are little or no surface facilities associated with these buried lines, there would be minimal permanent impacts.

Wastewater Discharge. NDEP Bureau of Water Pollution Control reports no industrial NPDES permits for discharge of wastewater to surface water in the Steptoe Valley Basin (Kaminski 2007). All sources permitted for wastewater disposal are classified as having "zero discharge to waters of the State" (Kaminski 2007). "Waters of the State" are defined as follows in Nevada Revised Statutes (NRS 445A.415):

> all waters situated wholly or partly within or bordering upon this State, including but not limited to:
>
> 1. All streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems and drainage systems; and
>
> 2. All bodies or accumulations of water, surface and underground, natural or artificial.

This definition is quite broad and inclusive, covering closed basins and other waterbodies that are not federally regulated Waters of the U.S. (see **Section 3.2.3.3**).

Water Use

Table 5.2-2 shows surface water rights claimed in the Steptoe Valley Hydrographic Basin for the CEA, including all active rights in the basin north of, and including Township 16 North. The table is from the NDWR water rights database. It shows claimed water usage by type of use (e.g., irrigation, municipal, stockwatering, etc.) and annual volume in acre-feet/year (NDWR 2007a).

TABLE 5.2-2. CLAIMED SURFACE WATER RIGHTS IN THE STEPTOE VALLEY BASIN NORTH OF (AND INCLUDING) TOWNSHIP 16 NORTH

USE	SURFACE WATER VOLUME (AF/Y)
Industrial	42,714
Irrigation	64,330
Mining & Milling	10,296
Municipal*	7,246
Other	31
Power	4,706
Recreational	1
Stockwater	770
Wildlife	724
Total	**130,818**

*includes "quasi-municipal"

The NDWR database shows 395.53 acres in Steptoe Valley (T16N and north) as being irrigated from groundwater sources and 4,969.88 acres irrigated from surface water sources, including streams, springs, lakes/reservoirs or effluent (e.g., treated municipal sewer system waste water) sources. Under the Proposed Action and Action Alternatives, the Proponents would be using purchased (existing) water rights that have been in use for many years.

Groundwater Resources

Cumulative effects to groundwater in the CEA would consist primarily of groundwater withdrawals from wells or water quality effects caused by surface land uses that contribute contaminants to the groundwater beneath or down gradient from these land uses. Effects from timber harvesting, grazing, transportation or utility corridors, and other land uses on groundwater resources are negligible (see **Section 4.2**). Infiltration from the EEC waste disposal landfill and evaporation ponds would be negligible as designed and would have the potential to affect groundwater quality only if their liner systems fail. The only remaining active mining operations in the CEA are the KCC mine tailings, which are currently undergoing reclamation. As with surface water resources (see above) this section describes anthropogenic influences north of T15N basin-wide except where otherwise stated.

Land Use

Wastewater Discharge. Groundwater quality can be affected by wastewater discharge in several ways. Individual septic systems can contribute nitrates and other contaminants to groundwater if they are not functioning properly or if they are located too close, hydraulically, to the water table. In high groundwater areas activities at the surface can cause contaminants to leach into groundwater. Injection wells have been used for decades as a means of disposing of waste liquids, particularly from industrial sources. Underground storage tanks, like those commonly used to store gasoline and diesel at gas stations, leaked into, and contaminated, many aquifers over the years. An accounting of these potential contamination sources is found in **Section 5.19**.

The City of Ely discharges effluent from its wastewater facility through irrigation application during the growing season and rapid infiltration basins the remainder of the year (NDEP 2007b). Monitoring wells at both locations are sampled for nitrogen compounds and chloride. In only one exception did nitrate levels exceed the drinking water standard of 10 mg/l in quarterly samples from November 2002 through November 2006 (NDEP 2007b). Sample results were not reported for the McGill Waste Water Treatment Facility (NDEP 2007c).

Water Use

Table 5.2-3 shows groundwater use in the Duck Creek drainage of Steptoe Valley. The table includes active groundwater water rights by use in acre-feet/year, as published in the NDWR Hydrographic Basin Summary By Manner of Use (NDWR 2007b). In the third column, pending or protested rights are shown, and in the fourth column are estimates of actual use based on field surveys or other methods (see table footnotes). In the fifth column, column three entries have been subtracted from the active GW rights (column 2) and column four entries substituted to estimate actual annual use based on NDWR data. The final column is from the USGS BARCAS report (Welch and Bright 2007).

TABLE 5.2-3. GROUNDWATER USE IN THE STEPTOE VALLEY BASIN, NOV. 14, 2007

USE	ACTIVE GW RIGHTS (AFY)	PENDING APPLICATIONS OR PROTESTED RIGHTS (AFY)	NDWR ESTIMATES OF ACTUAL USE (AFY)	ESTIMATE OF WATER USE (AFY) BASED ON NDWR DATA	ESTIMATE OF WATER USE BY USGS (AFY)[5]
Commercial	17.92			17.92	
Domestic	6.97			6.97	855
Environmental	146.38			146.38	
Industrial	25,056.39	23,892[1]		1,164.39	
Irrigation	44,261.26	945	18,816[2]	18,816	12,859
Mining & Milling	21,279.69[3]			21,279.69	6,098
Municipal	5,066.32[4]			5,066.32	5,423
Quasi-Municipal	1,936.14	22.99		1,913.15	
Recreational	32.41			32.41	
Stockwater	199.23	72.20		127.03	84
Wildlife	2.45			2.45	
Total	**98,005.18**			**48,572.71**	**25,319**

1 Applications for new water rights submitted by Nevada Power and Sierra Pacific, who subsequently purchased irrigated land with water rights
2 Estimates based on 2006 field reconnaissance by NDWR (Perry 2007) and may include fields irrigated from surface water rights
3 Primarily water rights owned by Robinson Nevada Mining Company and KCC
4 These are primarily supplemental rights for the towns of Ely and McGill-Ruth
5 USGS estimates based on LANDSAT and other aerial imagery (Welch and Bright 2007)
Source: NDWR 2007b

NDWR estimates irrigated acreage for the Steptoe Valley Basin to be 5,379 acres for 2006, with an average application rate of 3.5 acre-feet/acre, resulting in use of 18,816 acre-feet of water (Perry 2007) as shown in **Table 5.2-3**. The NDWR estimate is based on field reconnaissance (Perry 2007). The USGS estimated 3,742 irrigated acres during the 2005 irrigation season with an application rate of 3.4 acre-feet/acre and total irrigation use of 12,859 acre-feet of water (Welch and Bright 2007). The USGS estimate is based primarily on LANDSAT and other aerial imagery.

Robinson Nevada Mining Company reportedly pumps 10,000 gallons/day (11.2 AFY) of wastewater to its tailings impoundment (which is south of the EEC groundwater CEA) (NDEP 2007a). Although most of the facilities of the Robinson Nevada Mine are in the Steptoe Valley Basin, the tailings impoundment is located in the White River hydrographic basin (Gray 2007). Mine operators demonstrated that the location and geology of the impoundment precluded the need for a liner; depth to groundwater at the site is 600-700 feet below the ground surface (Gray 2007).

The City of Ely and the towns of Ruth and McGill (McGill-Ruth Consolidated Sewer and Water General Improvement District) have municipal water supply systems. Ely has primary municipal surface water rights totaling 7,652 AFY and secondary municipal groundwater rights totaling 3,035 AFY; Ely also has irrigation rights (including effluent source rights) and stockwater rights. McGill-Ruth has primary municipal groundwater rights totaling 1,064 AFY and secondary municipal groundwater rights totaling 2,295 AFY (NDWR 2007a). Ely discharges an average of 0.937 million gallons/day (2.875 af/day = 1,049 AFY) and McGill-Ruth discharges an average of 0.180 million gallons/day (0.55 af/day = 201 AFY) (NDEP 2007b; NDEP 2007c). Water use from individual wells for rural residences is not well documented. Quasi-municipal uses are public or commercial water supplies that are not on a municipal system, such as rural truck stops, motels, or restaurants.

EMS-I (2008) modeled multiple scenarios for meeting the water supply requirements for the EEC. The results of EMS-I's modeling for cumulative effects is described in some detail later in **Section 5.2.6**, under "Cumulative Effects, Groundwater Pumping."

Wetlands

Anthropogenic influences on wetlands within the CEA are described in **Section 3.2.3.3**. A number of significant wetland features in the CEA were created and/or maintained as a result of human development. The wetlands complex related to Bassett Lake, Tailings Creek and Steptoe Slough were created, or strongly influenced by the KCC tailings impoundment and related activities, such as the irrigation of the tailings and associated pipes and canals. **Section 3.2.3.3** also notes several other wetlands in the project area that are created by or supported by other impoundments and by linear features (e.g., roads or rail lines) that have inadequate or nonexistent culverts in natural drainage ways, thus leading to standing water and "created" wetlands. Wetlands can be reduced through withdrawals of water from their water source, such as withdrawals from springs or streams.

5.2.4 Foreseeable Future Disturbances

Surface Water

Land Use

Agriculture, Forestry, and Other Sources of Surface Disturbance. The planned Spruce Mountain Restoration Project, located in southeastern Elko County, would encompass 552,000 acres and include a series of hazardous fuel reduction and habitat restoration treatments. Initial plans include vegetation treatments of 10,000 to 16,000 acres during the next five to seven years to reduce the risk of large-scale fires on Spruce Mountain (BLM 2007m). Projects like the Spruce Mountain Restoration Project cause short-term disturbance but long-term benefits to water resources by reducing wildfire risk, restoring native vegetation to pre-development conditions, and, in some cases, increasing water yield.

Airport Expansion. The Yelland Field, the airport north of Ely, is proposed for expansion. The conveyance of 1,545 acres of public land to White Pine County has been proposed to lengthen the runway by 5,000 feet and construct additional hangars and fencing. The Yelland Field Expansion project will allow for the expansion and development of airport facilities in White Pine County, and encourage development of air service and aviation-related industry. As with any urban development, hardscaping can have negative impacts on the timing and quantity of runoff without appropriate mitigation.

Community Development. Another prominent development within the CEA that would impact vegetation will be the Coyote Springs community development. The planned development, currently in initial stages of construction, is on private property located on the Clark/Lincoln County line, east of US-93 and separated from the Desert National Wildlife Range by the highway and the SWIP Corridor. The development is planned for a total of 43,000 acres, of which 12,000 acres are planned for a nature preserve, trail system, parks open spaces and multi-species habitat. In addition, the development is planned to include a 17-acre lake (Las Vegas Review-Journal 2007a) and several golf courses, portions of which are already complete (Coyote Springs Investment 2007). The first phase of development is planned to include 13,000 acres in Clark County, 3,000 acres of which would accommodate approximately 10,000 homes. Coyote Springs developers own 6,100 af/y of water rights; their application for an additional 16,000 af/y brought objections from federal agencies and environmental advocacy groups. The

Nevada State Engineer has put a five-year moratorium on new water rights in the area while a study of sustainable levels of water use from local sources can be completed. The moratorium is delaying construction of the project.

Expanded Recreation Facilities. The Desert NWR has released a Draft Environmental Impact Statement for development of visitor facilities within the Range. Existing visitor use facilities do not provide adequate capacity or opportunities to inform visitors about recreational opportunities and increased visitation is anticipated to further strain existing facilities. New facilities would include a visitor center and administrative complex, along with associated roads and parking areas (USFWS 2007f).

Extractive Industry (Mining, Mine Tailings, Gravel Pits). Oil and gas exploration and development are accelerating in the CEA, with BLM and the U.S. Forest Service (USFS) actively leasing lands for this use. The Humboldt-Toiyabe National Forest released a Record of Decision (ROD) authorizing 255,603 acres of National Forest for oil and gas exploration leases (USFS 2007d). The ROD minimizes erosion hazards by restricting leasing on hillsides with a high potential for slope failure or difficult restoration after project completion; the ROD also stipulates "No Surface Occupancy – 30 meter buffer on perennial streams, springs, ponds, and wet meadows and 15 meter buffer on seasonal or subsurface streams" (USFS 2007d) as a means of minimizing impacts on surface water quality. Inspections, regulations, and construction requirements for the handling of hazardous materials and the drilling and construction of wells would minimize the risk that fresh water aquifers would be contaminated through the exploration, production and closure of oil and gas wells (USFS 2007d). The proposed EEC transmission lines within the SWIP Corridor crosses the White Pine Division of the USFS project. With these and other restrictions on surface occupancy, road construction, and seasonal use, oil and gas development leasing by the USFS and the BLM would have minimal cumulative effect on water resources.

Grazing. The majority of the grazing permits within the CEA are managed under the Ely BLM District RMP. The FEIS for the RMP was issued August 2008 (BLM 2008a). Under the new RMP, the goal is to manage livestock grazing on public lands to provide for a level of livestock grazing consistent with multiple use, sustained yield, and watershed function and health. The objective is to allow livestock grazing to occur in a manner and at levels consistent with multiple use, sustained yield, and the standards for rangeland health. Management actions in support of this goal and objective include:

- Continue livestock grazing at current levels of 545,267 AUMs on 11,246,900 acres on a long-term basis.
- Unavailability of the following lands for livestock grazing:
    - Mormon Mesa, Kane Springs, and Beaver Dam Slope ACECs (203,670 acres);
    - Baker Archeological Site ACEC (80 acres) and Snake Creek Indian Burial Cave ACEC (40 acres);
    - Leased public lands associated with the Coyote Springs Development (6,200 acres); and
    - Private/Utah Allotment above Beaver Dam State Park (4,400 acres).
- Allowing allotments or portions of allotments within desert tortoise habitat, but outside of ACECs, to remain at current stocking levels unless a subsequent evaluation indicates a need to change the stocking level.

- Continuing to monitor and evaluate allotments to determine if they are continuing to meet, or are making significant progress toward meeting the standards for rangeland health. Changes, such as improved livestock management, new range improvement projects, and changes in the amount and kinds of forage permanently available for livestock use, can lead to changes in preference, authorized season-of-use, or kind of livestock. Such changes will continue to meet the RMP goals and objectives, including the standards for rangeland health.

While historic grazing practices have damaged upland and riparian vegetation as well as stream banks and water quality, public agencies, like BLM, are promulgating more stringent regulations for new and renewed grazing leases that will mitigate these impacts to water resources over time.

Industrial Development. Approximately 6,000 acres of the Apex Industrial Park are available for immediate sale and development for a wide range of industrial uses. A privately held travel-center developer plans to develop a first class travel center at the intersection of U.S. US-93. Providing excellent access to US-93, I-15, and the Union Pacific Railroad, the Park is marketing future development of commercial business (truck, retail, transportation, lodging), warehousing and distribution, light and heavy industrial, and light and heavy manufacturing.

Railroad Development. Reconstruction of the NNRy would take place within the CEA. The NNRy is an existing ROW, extending from northern Goshute Valley, near Shafter, Nevada south through Steptoe Valley to the City of Ely, Nevada. The project includes reconstruction of the existing railroad. The City of Ely and the White Pine Historical Railroad Foundation currently own the rail line and ROW, and intend to rehabilitate the track to support economic development in the Ely area. The Proponents are supporting the City/Foundation in the rehabilitation of the rail line under a Joint Development Agreement. Construction staging areas would be necessary along the ROW. These areas would be on private land and would be located every 20 to 50 miles. No fencing of the private ROW is anticipated. A borrow pit and other earth materials would be required for grade construction/rehabilitation. Because the NNRy is in such disrepair, construction, operations, maintenance, and abandonment for the rehabilitation of the NNRy and the Alternative Rail Line would be very similar and are discussed in **Section 2.2.4**. The exception to the similarities would be that major grading activities would not be required for the NNRy rehabilitation. Disturbance from reconstruction of the NNRy may have a minor impact to surface water resources during construction, but, in the long-term, bringing the tracks up to today's standards for drainage and storm water, and maintaining the tracks, will reduce impacts compared to having abandoned tracks running through the area. Abandoned rail lines impact water resources when unmaintained culverts and bridges become clogged with debris, which can lead to loss of wetlands downgradient, flooding, and erosion of the railroad grade or adjacent streams. By contrast, well-maintained rail lines are regularly inspected and treated for weeds, storm drainage facilities, general safety, and the condition of the rails themselves, which reduces the risk of derailments.

The proposed railroad to serve a geologic repository at Yucca Mountain (for the storage of nuclear waste) would transect the CEA in north central Lincoln County. During construction, approximately 600 acres would be disturbed within the CEA (USDOE 2007b), and a small portion of that area would be permanently occupied by the rail line. This line would have minimal impact on surface water resources.

Recreation. The population of White Pine County is projected to temporarily increase with construction of both the EEC and WPES (**Section 4.17.2.1** and BLM 2007e). Increased

population would likely also increase recreational pressure on surrounding public lands. Increased ground disturbance from social roads and trails caused by increased recreational use would impact water resources.

Roads. Nevada Department of Transportation, the counties, and federal agencies have ongoing road improvement projects in their jurisdictions (see **Appendix 5A**, Past, Present and Reasonably Foreseeable Projects). Disturbance during construction, and increase hardscaping, affect the timing, quantity, and quality of runoff (e.g., suspended and dissolved sediment), but standards for storm water management on new roads and on road improvement projects mitigate these impacts to a minimal level.

Utility Production and Distribution. The most prominent disturbance within the CEA is utility corridor development. Three major planning efforts address the development of utility corridors: The West-wide Energy Corridor (WWEC) Programmatic EIS (PEIS), the designated BLM Utility Corridor, and the SWIP Corridor. The WWEC would encompass the BLM Utility Corridor and the SWIP Corridor. All three corridor projects address the utility corridor within the CEA in their planning (NEPA) documents.

The WWEC PEIS plans for a 3,500-foot-wide corridor where possible, and specifies actual widths allotted along various segments. The WWEC PEIS provides examples of full utilization of the corridor:

- Assuming an operational ROW width of 400 feet, about nine individual 500-kV transmission lines could be supported within a 3,500-foot-wide corridor
- As many as 35 liquid petroleum pipelines (each consisting of a 32-inch-diameter pipe and a 100-foot construction ROW) within a 3,500-foot-wide corridor
- 29 natural gas pipelines (42-inch diameter pipe and 120-foot construction ROW) within a 3,500-foot-wide corridor

The corridor would likely have a combination of several of the above utilities.

All segments of the proposed SWIP Corridor utilized for the transmission lines associated with the proposed EEC are designated to be 2,640 feet wide in the WWEC PEIS, except for Segment 10, which is designed to be 3,500 feet wide. At full utilization, the SWIP Corridor (except Segment 10) could contain as many as 6 500-kV transmission lines, 26 liquid petroleum lines, or 22 natural gas pipelines.

With the high percentage of public land in Nevada, linear projects must undergo public scrutiny through NEPA and are subject to state and federal environmental regulation. In addition, while buried utilities may disturb a significant number of acres during construction, permitting regulations require prompt revegetation of disturbed areas. In most of these corridors vegetation is not allowed to grow over a certain height (e.g., 6 feet), which alters the vegetation long-term, and therefore, to some degree, impacts water resources. At the same time, after the disturbance of construction is complete, land contours are generally restored and vegetation is reestablished, which minimizes impacts to water resources.

White Pine Energy Associates, LLC. (WPEA) has proposed construction of a coal-fired power plant approximately 34 miles north of Ely, Nevada in Township 22 North and Range 64 East. The proposed project would include the following:

- Issue ROWs for construction and operation of all station features on BLM-managed land and subsequent sale of the power plant site to WPEA. Long-term right-of-ways for the facility would cover 2,409 acres; 1,902 acres would be disturbed during construction;

and 1,510 acres would be disturbed permanently through the operations life-cycle of the plant. The proposed lined evaporation pond would cover 90 acres (including berms and setbacks), and would be used to dispose of both wastewater and storm water (a "zero-discharge" facility).

- Construct and operate up to a three-unit, approximately 1,590-MW coal-fired, hybrid-cooled power plant.
- Construct and operate a 32-mile-long overhead 500-kV transmission line connecting the Duck Creek Substation to the Thirtymile Substation. Construct and operate a 2.5-mile-long loop of the overhead 500-kV SWIP line connecting to the Duck Creek Substation.
- Construct and operate the 60-acre Duck Creek Substation at the power plant and the 77-acre Thirtymile Substation near Robinson Summit.
- Construct and operate a 1.3-mile-long rail spur crossing Duck Creek and connecting to the upgraded NNRy.
- Construct and maintain a 1-mile-long paved access road from US-93.
- Construct and operate a system of 8 wells north of the power plant site.
- Construct and operate 13 miles of 10- to 30-inch-diameter water pipeline connecting the wells to the power plant.
- Construct and operate 13 miles of 13.8-kV overhead distribution lines and a 10-foot-wide access road servicing each well site.
- Use, during construction, a 40-acre earth and rock borrow area.

The original proposal for the plant used a conventional wet cooling system that would have required up to 25,000 AFY of groundwater for the 1500 MW plant. The current proposal would use a hybrid cooling system that would require up to 5,000 AFY of groundwater for the plant. Project proponents would use existing White Pine County groundwater rights. In addition to cumulative effects from use of groundwater resources in the basin, land use changes and disturbance have the potential to impact and degrade surface water resources. Hardscaping of roadways, buildings, parking lots and other facilities affects timing and quantity of surface water runoff. Disturbed land surface and loss of vegetation can contribute to sediment delivery to surface water features (BLM 2007e). Potential risks from deposition of air contaminants is described in **Section 4.6** (human and ecological health risk assessments) for the EEC, and potential cumulative effects from combined deposition from both the EEC and WPES projects is described in **Section 5.6.6**.

Nevada Wind Company has identified a site in the North Egan Range for development of potential wind generation facilities. The proposed project would cover 4,470 acres. North Wind Energy has been monitoring the site and is expected to propose development. A 4,536-acre project has been proposed by Enexco, also in the North Egan Range.

The proposed UNEV petroleum products pipeline would enter the southern tip of the CEA, terminating at the Apex Industrial Park. The proposed project includes a 12-inch petroleum pipeline originating in Salt Lake City, Utah. After the brief period of construction the pipeline would have negligible impact to water resources.

Groundwater

Water Use

The Southern Nevada Water Authority (SNWA) has applied for groundwater rights in Clark, Lincoln, and White Pine counties totaling 167,000 AFY, and has secured water rights in the Spring Valley basin for 40,000 AFY for 10 years and potentially 60,000 AFY thereafter (SNWA 2008). The use of the water is to meet growing municipal and domestic needs in Las Vegas and Clark County. Applications are pending for the Snake Valley, Cave Valley, Dry Lake Valley, Delamar Valley, and Coyote Spring Valley. No direct claims are proposed on the over-appropriated groundwater resources of the Steptoe Valley Basin; however, there is considerable speculation and disagreement within the scientific community on possible interbasin movement of groundwater, primarily through the carbonate aquifer which underlies both the local valley fill alluvium aquifers and the regional fractured volcanic layer (SNWA 2008; Welch and Bright 2007; Mayo 2007a; EMS-I 2008). The USGS BARCAS study has suggested specifically that groundwater from the Steptoe Valley Basin may feed the Spring, Lake, and White River valleys, based on the higher water table in the Steptoe Valley Basin (Welch and Bright 2007; Bright 2007). The Nevada State Engineer, who is responsible for issuing and administering water rights in Nevada, is studying and ruling on the SNWA applications basin by basin (SNWA 2008).

In related projects, the Lincoln County Water District (LCWD) has applied for water rights and rights-of-way in the Kane Springs Valley (BLM 2007j), the Tule Desert Valley, and the Clover Valley to support municipal development in Lincoln County, including water for the Coyote Springs residential development. The SWIP Corridor goes through the Kane Springs Valley project area. The Nevada State Engineer has awarded 1,000 AFY to the project and an application for an additional 17,380 AFY is pending (BLM 2007j). Both the USFWS and the National Park Service filed objections to the project citing potential adverse impacts to those agencies' senior rights at their facilities. Both agencies have since signed agreements with the LCWD (BLM 2007j).

Phase II of EEC would have a requirement for additional industrial water, the quantity of which has not yet been determined.

Wastewater Discharge. With the population of White Pine County projected to decrease over the next 20 years (Crispin and Isaacson 2008) without the EEC and increase by approximately 9 percent after construction (Crispin and Isaacson 2008), increases in population and associated wastewater would be moderate.

Wetlands

The reasonably foreseeable developments with the potential to impact wetlands in the CEA are the same as those described above.

5.2.5 Cumulative Disturbances

Table 5.1-3 shows the acreage that would be disturbed by the reasonably foreseeable activities in the CEA. The table is based on the Proposed Actions as described in the respective EISs, NOIs, or other documents.

Surface Water

Quantifying the past and present surface disturbance in the CEA requires clarifying assumptions for a number of reasons, including the following:

- disturbances from various sources may overlap, such as utility corridors and grazing allotments,
- impacts of wildfires on a watershed, or the extent of these impacts, cannot always be accurately determined,
- historical disturbances, such as abandoned mines and old roadways, may have been reclaimed naturally over time or by agency action, and
- filling or draining of wetlands was common practice for many years and acreage was not recorded, therefore, a baseline or starting point may not be definite.

Consequently, the past and present surface disturbance in the CEA that could actually impact surface water could range from the sum of all disturbances in the CEA, which would be 1,924,232 acres (see **Table 5.1-2**) out of the total area of the CEA, which is 1,992,334 acres (96.6 percent). This includes all acres in grazing allotments, as well as urban areas, highways, mine tailings, and burned areas. To lump all of these types of disturbances together would not provide an accurate picture of the CEA, much of which, though grazed or burned, is relatively undisturbed. Removing these two disturbance categories (grazed and burned) leaves areas of long term disturbance, and a total disturbed acreage of 33,648 acres or 1.7 percent.

Groundwater

The known quantity of groundwater that would be consumed is represented in **Table 5.2-4**; note that some projects only partially overlap the CEA, so some or most of those acres may be outside the surface water CEA. Additional projects may be found in **Appendix 5A**.

TABLE 5.2-4. WATER CONSUMPTION FROM REASONABLY FORESEEABLE PROJECTS

PROPOSED PROJECT	WATER CONSUMED (AFY)
Coyote Springs community development	Owned 6,100 Additional Requested 16,000
Southern Nevada Water Authority (SNWA) Snake Valley	60,000
White Pine Energy Station	5,000
Ely Energy Center (EEC)	8,000
Lincoln County Water District (for Kane Springs Valley)	17,380
Totals	112,480

Direct use of surface water would occur if the Duck Creek water supply option were employed.

See also **Section 5.2.6** below.

5.2.6 Cumulative Effects

Surface Water

Under the Proposed Action or Action Alternatives cumulative effects to surface water resources in the surface water CEA would be negligible to minor, based on the findings in **Sections 3.2, 4.2** and **5.2**. Best management practices and storm water management during construction and operation would prevent any significant storm water runoff or wastewater from disturbed or hardscaped areas from reaching surface water features, groundwater, or wetlands. During operations, permitting requirements would ensure that water quality standards are met.

Should the water supply option be chosen for the EEC (piping surface water from the Duck Creek Impoundment to the South or North Plant Site), impacts to the perennial reaches of Duck Creek and the complex of water bodies and wetlands around the KCC tailings and Bassett Lake would occur. These impacts would be long term and moderate to major.

As discussed in **Section 4.2.2.1**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially cause changes in the pH and dissolved solute chemistry of surface waters exposed to this deposition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on surface waters within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for aquatic organisms in the near field area and are discussed in the Risk Assessment narrative in **Section 5.6**.

Groundwater Pumping

EMS-I (2008) modeled the combined (cumulative) effects of the proposed groundwater pumping of the EEC (8,000 AFY) and WPES (5,000 AFY) power plants. Detailed discussion of the methods of the analysis are available in the EMS-I report (EMS-I 2008); the report and a summary are provided with the EIS distribution CD. The cumulative effects scenario assumed EEC pumping at the Lages Station plus a single well at the power plant site, pumping simultaneously with the Proposed Action well field for White Pine Energy Station power plant for a period of 50 years. **Figure 5.2-3** shows the maximum drawdown after 50 years of pumping as determined through EMS-I's modeling. EMS-I (2008) found the following:

> Quasi-steady state conditions were achieved after 50 years of pumping and bi-annual change of head at each of the modeled wells was less than one percent. Maximum drawdown of 14.8 feet was observed at EEC-5 with an initial depth to water at that location of 60 feet. An area with one or more feet of drawdown extended to about 5 miles to the southwest of the well field and about 4.5 miles to the northwest of the well field. Drawdown greater than about 3 feet was localized to the general area of the well field and the area northeast of the well field.

The authors went on to conclude:

> The maximum area with drawdown greater than 1-foot in the vicinity of the White Pine Energy well field extended about 1 mile south of the well field and about 1.5 miles north, extending to the edge of both the eastern and western boundaries of the model.
>
> Drawdown under the northern Duck Creek channel and Goshute Lake was less than 2 feet. Drawdown in the vicinity of the alluvial fan springs located west of Goshute Lake was less than 2 feet with an estimated starting depth to water of 50 feet. Based upon the depth to water in the Valley-Fill Aquifer that would be affected and maximum drawdown observed in the vicinity of the springs, the modeling indicates that the proposed pumping will not impact the natural recharge and discharge processes of the alluvial fan springs.
>
> Drawdown in the vicinity of the alluvial fan springs located near Warm Springs, west of Duck Creek, was less than two feet. Based upon the depth to water in the Valley-Fill Aquifer that would be affected and maximum drawdown observed in the vicinity of the springs, the modeling indicates that the proposed pumping will not impact the natural recharge and discharge processes of the alluvial fan springs. (EMS-I 2008)

Figure 5.2-3. Cumulative Effects of 50 Years Groundwater Pumping, EEC & WPES

The combined groundwater usage of the EEC and WPES would total 13,000 AFY. As shown in **Table 5.2-3**, current (2007) groundwater use in the Steptoe Valley is estimated between 25,319 and 48,573 AFY, although up to 98,005 AFY may be pumped under existing water rights, including the water rights that have been purchased by Nevada Power Company for the EEC. Many of these existing water rights are supplemental to surface water rights and would likely only be used when surface water is not available, for economic reasons (e.g., groundwater rights are typically more expensive to utilize, given the added expense of pumping). Other major groundwater users include the mining and milling rights owned by Robinson Nevada Mining Company and KCC (used to irrigate the tailings at McGill), and the municipal rights owned by the towns of Ely and McGill-Ruth.

As with the alluvial fan springs, the substantial distance between the valley-fill aquifer water table and surface features, including streams and wetlands, precludes impacts to surface water features as a result of groundwater pumping for the South Plant Site or the North Plant Site Alternative. Some of the groundwater source alternatives, such as those using the Coyote Valley Ranch Well Field and the southern well field, had the potential to adversely affect wetlands associated with the complex comprised of the KCC Tailings, Steptoe Slough, Duck Creek, Tailings Creek and Bassett Lake (Mayo 2007b; EMS-I 2008).

In conclusion, cumulative effects of groundwater pumping for both the EEC and the WPES would be moderate, but within the allowed, sustainable limits set for the aquifer by the Nevada State Engineer.

Wetlands

Under the Proposed Action or Action Alternatives, cumulative impacts to wetland resources in the surface water CEA would occur, but the effects, even when combined with those for past, present, and reasonably foreseeable projects, would be minimal. The extensive historical damage to wetlands has occurred primarily from conversion to cropland or similar activities (see **Section 5.2.2**). With the possible exception of the extensive complex of wetlands around the KCC tailings and Bassett Lake (which were largely created by KCC mining and milling activities), it is unlikely that groundwater pumping has affected wetlands in the Steptoe Basin, based on the lack of direct connection between groundwater and surface water features (see under Groundwater Pumping in this section) (Mayo 2007b; EMS-I 2008). The White Pine Energy Station estimates temporary impacts (construction) to wetlands on 6 acres and long-term effects to 4 acres under the Proposed Action; and for its Alternative 1, temporary impacts to 27 acres and permanent impacts to 6 acres (WPES DEIS Table 4.5-1 and Table 4.5-2). EEC estimates that temporary impacts to 9.4 acres of wetlands (transmission line) would occur under the Segment 3 Alternative with 0.2 acres of permanent impact (**Section 4.2.2**). For the North Plant Site Alternative, electric transmission line Segment 1A Alternative, there would be, at a maximum, an additional 18.8 acres impacted temporarily and 0.8 acres long-term (**Section 4.2.3.2**). Other wetlands along the electric transmission line would be avoided, and drawdown of the water table from groundwater pumping would not affect wetlands (EMS-I 2008).

Under the EEC water source alternative of using surface water rights from the Duck Creek Impoundment (currently used, in part, by KCC to irrigate its tailing impoundment), there would likely be impacts to wetlands and other surface features associated with the complex comprised of the KCC Tailings Impoundment, Steptoe Slough, Duck Creek, Tailings Creek, and Bassett Lake. The extent of these impacts cannot be quantified with or without the cumulative impacts from White Pine Energy's groundwater withdrawals.

5.3 Geology, Minerals, and Topography

5.3.1 CEA Boundary

The CEA for geology, minerals, and topography consists of a 2.5-mile buffer surrounding the direct effects study area, including the Proposed Action and Alternative power plant sites; proposed Alternative Rail Line ROW; Proposed Action and alternative water supply surface disturbances and pipeline ROWs; and the proposed transmission lines and alternatives (including the SWIP Corridor) and substations (**Figure 5.3-1**). The total area of this CEA is 1,623,527 acres.

Rationale

The direct and indirect effects of the Proposed Action and Action Alternatives on these resources would be confined to the actual disturbance areas. However, the boundaries of the plant sites and the project areas outside the plant sites are larger than the actual disturbance areas within them and impacts to these resources would be undetectable outside of these larger boundaries.

5.3.2 Introduction

Potential effects to the geology, mineral, and topographic resources consist of mineral resource depletion, removal of mineral resources from availability for development, and topographic changes. Coal, diesel, and other mineral resources consumed in meeting the project purpose and need are also considered.

Sections 3.3 and **4.3** discuss in detail the geology of the project area and the project's likely affect on mineral resources, respectively. **Figures 3.3-2a** through **c** show geological resources of the project area.

The past, present, and future disturbances with cumulative impacts to geology, minerals and topography discussed below are described in detail in **Sections 5.3.3** and **5.3.4**.

5.3.3 Past and Present Disturbances

Current land ownership and uses within the geology, minerals, and topography CEA are presented in **Tables 5.1-1** and **5.1-2**, respectively.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Oil & Gas Exploration/ Development)

The NBMG shows no major mines in the CEA (NBMG 2007). **Table 5.3-1** shows mining operations in the CEA, taken from the Nevada Department of Business & Industry (NDBI) Directory of Mine Operations for 2006 (NDBI 2007), which includes smaller operations than the NBMG major mines database. All of these operations are in or are adjacent to proposed transmission ROWs.

Figure 5.3-1. Cumulative Effects Area for Geology, Minerals, Topography, and Paleontological Resources

TABLE 5.3-1. MINING OPERATIONS IN THE CEA (NDBI 2007)

OPERATION NAME	COUNTY	SECTION, TOWNSHIP, RANGE	COMMODITY/OPERATION
American Asphalt & Grading Co.	Clark	Sec 21, T13S, R63E	Aggregate, rock, sand, crushing
Silver States Landfill at Apex	Clark	Secs 13, 14, T18S, R63E	Sand, sand/gravel, crushing, screening
Coyote Springs Service Rock Products	Lincoln	Sec 13, T11S, R62E	Sand/gravel, crushing, screening
Nevada Slag Inc.	White Pine	Sec 2, T18N, R64E	Abrasives and slag products
White Pine County Public Works Pit	White Pine	Sec 31, T17N, R64E	Sand, sand/gravel, crushing, screening

Transmission lines, the private railroad alternative route, the South Plant Site and associated facilities overlap with mining districts where mining could have occurred in the past (see **Figure 3.3-4**). As described in **Section 5.2**, a substantial number of abandoned mine sites are found throughout the CEA. As commodity prices fluctuate and new uses are found for specific metals and other mineral products, some of these abandoned resources may become economically viable in the future and reopened. Since the major components of the EEC project are located on alluvial fans and basin-fill material, it is highly unlikely that construction and operation of the EEC would preclude development of any metallic mineral resources in the area. **Table 5.3-2** gives some history of the mining districts, which overlap or are adjacent to project facilities; the table is taken from NBMG Report 47, "Mining Districts of Nevada" (1998).

TABLE 5.3-2. MINING DISTRICTS IN THE EEC PROJECT AREA (NBMG 1998)

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Arrow Canyon Range/ Clark	silica, building stone	The Arrow Canyon Range lies east of U.S. US-93 about 8 miles west of Moapa. Silica and building stone deposits occur along the east and west flanks of the southern part of the range.
Bristol/ Lincoln	1971/ silver, copper, lead, zinc, gold, manganese, montmorillonite	The Bristol district is located in the northern Bristol Range about 15 miles north of Pioche. The historic Blind Mountain district (1871) covered the southern part of the present district. Bristol originally included only the area around mines on the western slope of the Bristol Range, and the Jackrabbit district included the area on east side of the range.
Cherry Creek/ White Pine	1872/ silver, gold, lead, copper, zinc, tungsten, antimony, coal, fluorspar, beryllium	The district extends from Cherry Creek Canyon in the south end of the Cherry Creek Range to north of Paris Ranch Canyon. The Gold Canyon (Egan Canyon) district, located in Egan Canyon about 5 miles to the south, was formerly included in the Cherry Creek district. Butte Valley, to the west, is also sometimes included in the Cherry Creek district.
Currant/ Nye & White Pine	1914/ gold, lead, copper, tungsten, magnesite, uranium, fluorspar	This district encompasses the southern White Pine Range, the Horse Range, and the northernmost part of the Grant Range. Kral (1951) included Railroad Valley (Butterfield) Marsh along with Silverton, to the west, in a large Currant district. Deposits of magnesite occur in the White Pine County part of the district.
Delamar/ Lincoln	1892/ gold, silver, copper, lead, perlite	Delamar came into use as the district name starting in mid-1930s. The main portion of the Delamar district is located on the western front of the range between Monkey Wrench Wash and Cedar Wash, although the district extends to the east almost to Rainbow Canyon and includes the upper part of Taylor Mine Canyon.

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Dolly Varden/ Elko	1872/ copper, silver, lead, zinc, gold, molybdenum, thorium and rare earths, uranium	Situated at the northern extremity of the Schell Creek Range (Dolly Varden Mountains). The original Dolly Varden district was located on the east side of the mountains; the Granite [Mountain] district was 3 miles to the west; and the Mizpah district was located to the north, near Mizpah Spring. All three areas are included in the present Dolly Varden district.
Duck Creek/ White Pine	1869/ lead, silver, copper, zinc, gold, limestone, fire clay	The Duck Creek district is located in the Duck Creek Range, a narrow ridge lying west of the main part of the Schell Creek Range. The northern part of the district was originally known as Enterprise (1869), the southern part as McDougal. The area on the west slope of the Duck Creek Range, opposite the Ely airport, was known as Peacock.
Ely Springs/ Lincoln	silver, zinc, lead, gold	The Ely Springs district is on the west side of the Ely Springs Range, about 13 miles west of Pioche.
Gold Canyon/ White Pine	1863/ gold, silver	This district is located in Egan Canyon and the northern part of the Egan Range, 5 miles west of Cherry Creek. The area is sometimes included in the Cherry Creek district.
Granite/ White Pine	1869/ lead, silver, gold, tungsten, copper	Located on the east slope of the northern Egan Range, north of the San Francisco district and 36 miles north of Ely. The district was described as near Perly's ranch but on the opposite side of the range. Discoveries in 1894 resulted in organization of the Granite district, near Granite railroad siding and the town of Steptoe. The area was referred to as the Gosiute district in 1916.
Hunter/ White Pine	1871/ lead, copper, silver, gold, uranium	Situated on the western slope of the northern Egan Range, 10 miles south of Egan Canyon and about 15 miles north of Robinson Summit.
Meadow Valley Mountains/ Lincoln	gold, silver, uranium	Located east of U.S. US-93.
Pequop/ Elko	phosphate, barite	Covers the area of phosphate occurrences in the southern Pequop Mountains, east of and adjoining the Spruce Mountain district, and all of the northern Pequop Range, including the portion north of Interstate 80.
Robinson/ White Pine	1868/ copper, gold, silver, zinc, lead, iron, manganese, tungsten, molybdenum, rhenium, platinum, palladium, nickel	The Robinson district is centered near the towns of Ely and Ruth, in the Egan Range. Originally organized as the Robinson district and includes the towns of Ely, East Ely, Ruth, Reipetown, Veteran, Kimberly, and Lane City (formerly Mineral City). New was located 7 miles west of the site of Mineral City.
Ruby Hill/ White Pine	1872/ silver	The Ruby Hill district is on the crest and western slope of the Schell Creek Range on the divide between Ruby and Indian Creeks. This area, along with Schellbourne and Siegel, was included in the historic Schell Creek district; in 1871 Ruby Hill was separated from the others and organized as a separate district.
San Francisco/ White Pine	1869/ silver, lead	The district occupies Heusser Mountain, an extension of the Egan Range west of McGill. Mines are located on the mountain's eastern and southwestern flanks, north of Hercules Gap (Hercules Gate).
Schellbourne/ White Pine	1871/ silver, tungsten	This district is located in the vicinity of Lovell Peak on the crest of the Schell Creek Range, north of Schellbourne Pass. Schellbourne is the northernmost of the five small districts sometimes included in the large Aurum district that covered all of the northern Schell Creek Range.
Silver Canyon/ White Pine	1880/ lead, silver, copper, gold	Located at the head of Silver Canyon, west of the site of old Aurum. Silver Canyon is the third district from the north of the five small districts sometimes grouped into the large Aurum district, covering all of the northern Schell Creek Range.

NAME/ COUNTY	YEAR ORGANIZED/ COMMODITIES	COMMENTS
Silver King/ Lincoln	1874/ silver, lead, copper, gold	The Silver King district includes a small area near Silver King Well on the west side of the southern Schell Creek Range (historic Lake Valley Range) in T7N, R62E, 16 miles northwest of Bristol, Lincoln County, and about 12 miles southeast of Sunnyside, Nye County.
Telegraph/ White Pine	1883/ gold, tungsten	The district includes the drainage area of Telegraph Canyon, north of Telegraph Peak in the Egan Range, and lies generally between the Gold Canyon and Granite districts.

Section 4.3 describes in detail current oil and gas leases in the project area, as recorded in the BLM database. **Table 5.3-3** is taken from the Nevada Oil and Gas Well Database (NBMG 2004), last updated in 2004. All of the wells in the table are within the CEA. Out of the 35 wells that were permitted, ten were never drilled (as of 2004) and 24 were abandoned; the status of the remaining well, permitted in 2002, is described only as "drilled." Despite the outcome of these wells, the leases identified in **Section 4.3** demonstrate renewed interest in finding and producing oil and gas in the CEA.

TABLE 5.3-3. NEVADA OIL AND GAS WELLS IN THE CEA AS OF 2004 (NBMG 2004)

COUNTY	SEC	TOWN	RANGE	PERMIT ISSUED	STATUS*	DEPTH (FT)	SHOW
Clark	14	18S	63E	10 JUN 81	P & A	17,110	Gas
Clark	7	18S	64E	02 JUN 50	A	1,455	
Elko	19	28N	64E	14 OCT 80	Never Drilled		
Elko	12	28N	64E	28 MAR 91	P & A	8,601	Oil Gas Water
Elko	19	32N	67E	03 NOV 75	P & A	5,569	
Elko	2	34N	66E	22 MAR 83	P & A	8,000	
Elko	07	34N	67E	06 NOV 03			
Nye	18	10N	61E	25 AUG 89	Never Drilled		
Nye	18	10N	61E	24 MAY 93	P & A	7,118	Oil
Nye	28	11N	60E	11 SEP 56	P & A	692	
Nye	10	5N	61E	09 JUL 84	Never Drilled		
Nye	11	5N	61E	09 JUL 84	Never Drilled		
Nye	14	5N	61E	07 OCT 02	Drilled		
Nye	33	5N	62E	02 JUL 98	P&A	4,447	Oil
Nye	33	5N	62E		Never Drilled		
Nye	5	8N	60E	19 MAY 70	P & A	800	
White Pine	3	13N	61E	09 JUL 84	Never Drilled		
White Pine	4	14N	61E	27 SEP 71	P & A	2,603	Water
White Pine	9	14N	61E	27 JAN 74	D & A	271	
White Pine	9	14N	61E	10 JUL 75	P & A	4,600	
White Pine	33	14N	61E	23 MAY 85	P & A	1,442	
White Pine	14	14N	61E	23 MAY 85	P & A	464	
White Pine	29	15N	61E	19 MAY 70	Never Drilled		
White Pine	29	16N	61E	21 OCT 93	P & A	7,356	
White Pine	16	19N	61E	19 MAY 70	P & A	712	
White Pine	21	19N	63E	30 NOV 77	P & A	4,407	Oil
White Pine	24	19N	63E	25 MAR 81	P & A	6,075	Oil
White Pine	36	19N	63E	12 DEC 94	P & A	7,810	

COUNTY	SEC	TOWN	RANGE	PERMIT ISSUED	STATUS*	DEPTH (FT)	SHOW
White Pine	17	19N	64E	16 SEP 65	P & A	6,100	
White Pine	21	19N	64E	03 MAR 03			
White Pine	27	20N	63E	30 NOV 77	P & A	9,263	
White Pine	16	23N	63E	12 JUL 79	P & A	6,444	
White Pine	19	24N	64E	03 FEB 76	P & A	8,406	
White Pine	17	24N	64E	09 JUL 84	P & A	11,700	Oil
White Pine	18	25N	64E	03 MAR 93			

*A = abandoned; D = drilled; P = plugged

5.3.4 Foreseeable Future Disturbances

Future disturbances to geology, topography, and minerals are quantified in **Table 5.1-3** above.

Community Development

Use of mineral products for the construction of roads, railroads, buildings and other facilities would likely continue in the future. Impacts from use of licensed gravel pits and other borrow sources are regulated and minimal.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Oil and gas wells, mines for various commodities, and other mineral resources would likely continue to be developed as their economic value increases.

Railroad Development

A borrow pit would be required to supply materials for the rehabilitation of the NNRy railroad grade. Acreages for borrow pits for the project have not been proposed as of the writing of this EIS. **Section 5.3.5** describes the estimated amount of ballast that would be required for construction of the Alternative Rail Line (approximately 700,000 tons). Since the NNRy grade already exists, it is assumed that substantially less ballast would be required to reconstruct the NNRy than to build an Alternative Rail Line from the ground up. These borrow sources would occur on private lands or within currently permitted BLM pits.

Utility Production and Distribution

As discussed in **Section 5.2.4** above, the construction and operation of the proposed White Pine Energy Station (WPES) would require borrow and other construction materials. WPES has proposed a borrow pit of approximately 40 acres in section 35, T22N, R63E, for either its Proposed Action or Alternative 1, which WPES considers a temporary disturbance (BLM 2007e). The WPES is likely to have a slight impact on topography through the filling of its proposed, on-site combustion waste landfill and other project features (BLM 2007e).

5.3.5 Cumulative Disturbances

During construction of the EEC and, to a smaller extent, during operations, borrow material and other mineral resources would be obtained from both on and off-site sources. The Proponents have roughly estimated the aggregate requirements for these purposes and believe all such materials could either be obtained from on-site borrow or private off-site sources. In the event that the Alternative Rail Line is constructed for conveying coal to the power plant site, an

estimated 700,000 tons of aggregate base material would be imported for sub-ballast from private sources within 100 miles of the site.

Another mineral commodity that would be used by the EEC is limestone for flue gas desulfurization. The plant would require 86,400 tons annually during operations (Crispin and Isaacson 2008). Limestone is abundant in the region.

As noted in **Section 2.2.1.3**, the EEC phase 1 would consume 22,000 tons of coal per day for the duration of operation, which is expected to be 50 years. WPES estimates its coal use at 22,500 tons per day (BLM 2007e). Both projects would import their coal resources from the Powder River Basin (PRB) in Wyoming by rail. PRB coal production in 2006 was 431.3 million tons, which is 1.2 million tons per day (BLM 2007k).

In addition, the EEC would consume bulk quantities of lubricating oil, locomotive fuel oil, diesel fuel, and gasoline in various project facilities and components. Other mineral resources would likely be consumed in smaller quantities through the life of the project.

The WPES and EEC would have a minimal effect on topography within the CEA through development of landfills, evaporation ponds, roads, and other facilities.

Within the CEA, known quantifiable past and present disturbances total approximately 111,232 acres. Proposed future disturbances would potentially disturb another 51,580 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to geology, topography and minerals within the CEA would be approximately 268,812 acres, which is approximately 16 percent of the total area of the CEA.

5.3.6 Cumulative Effects

The cumulative effects of the EEC on mineral and geological resources would be minimal, and its effect on topography would be negligible. No existing or foreseeable mining districts or petroleum products wells would be affected by the project, either directly or by affecting site access. On-site mineral resources (aggregate) and off-site, private sources of mineral materials are currently thought to be sufficient for the EEC project. The WPES has included a mineral materials source within its Proposed Action. A borrow source(s) for ballast and possibly other mineral materials would be required for the NNRy reconstruction. The quantities of mineral materials required for all these projects would be satisfied for each from current or new sources. At peak construction times for these projects, especially if these times overlap each other, the availability of such materials for other purposes could be limited in the local area.

5.4 Paleontological Resources

5.4.1 CEA Boundary

The CEA for Paleontological Resources would be the same as described for geology (**Figure 5.3-1**). This boundary encompasses 1,679,357 acres.

Rationale

Because the project should not affect paleontological resources outside of the direct effects area, this CEA was chosen mainly for simplicity purposes. Activities attached to the Proposed Action and Action Alternatives that might affect paleontological resources could occur outside of the actual disturbance area, but not likely outside of this proposed CEA.

5.4.2 Introduction

Southeastern Nevada has yielded paleontological resources that have contributed to our understanding of the development and history of life on earth. Many studies and research papers include discussions and analysis of these (Reynolds 2007a). Paleontological resources are subject to cumulative impacts via loss through both natural processes of erosion and weathering, and man-made disturbances.

Cumulative effects to paleontological resources occur through the incremental degradation of the resources from various impacts, which reduce the information and scientific research potential of the resources.

The past, present, and reasonable foreseeable future disturbances with cumulative impacts to paleontological resources discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.4.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the paleontological resources CEA can be found in **Tables 5.1-1** and **5.1-2** above.

Recreation, Land Use, and Extractive Industry (mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

The primary activities/disturbances that have already affected paleontological resources in the CEA include off-highway vehicle use, recreational collecting, lands and realty management, and mining activities. Fossils have been and continue to be discovered during ground disturbances related to developments such as mining, oil and gas development, landfill development, quarrying, and other activities in the CEA. Natural processes such as soil erosion and rock weathering have also exposed fossils.

As discussed in **Section 3.3.3**, there are mining districts within or near the CEA (**Figure 3.3-4**). Also noted in **Section 3.3.3**, there are 26 active oil and gas leases and one geothermal lease within the CEA. All of these endeavors include ground disturbing activities related to exploration, development, and extraction that could encounter paleontological resources. Approximately 554 acres of quarrying/gravel pit disturbance are located within the CEA.

Roads, Utility Production, and Distribution

Roads, power lines, pipelines, and utility construction can impact near surface deposits of paleontological resources in general and possibly deeper deposits in areas that required excavation through landforms.

Vertebrate fossils such as dinosaurs, mammals, fishes, reptiles, and uncommon invertebrate fossils are collected by trained researchers under BLM permit. These remain public property and are placed in museums or other public institutions after they are studied. Although the resources are removed from their original context, the documentation adds to the body of knowledge about paleontological resources in the region. However, casual use and un-

permitted collection of fossils has contributed to the loss of the resource and its research potential and interpretation. The lack of regular site monitoring and public education about fossil collecting has led to illegal commercial collecting of trilobites and excessive unauthorized collection (BLM 2008a).

5.4.4 Foreseeable Future Disturbances

Future disturbances to paleontological resources are quantified in **Table 5.1-3** above. The reasonably foreseeable future actions all have the potential to impact paleontological resources. However, as much of the land in the CEA is publicly administered, these projects would all be subject to NEPA and federal and state regulations protecting paleontological resources.

Geological formations with exposures containing paleontological resources would continue to be impacted by natural agents (e.g., erosion, rock weathering, surface water drainage).

Community Development

Several proposed community development projects, including the Alamo land sale (376 acres), the Coyote Springs Development (43,000 acres), and the Hidden Valley Community Development (910 acres), have the potential to impact paleontological resources as well. Private development does not afford the same protections and standard operating procedures as activities under federal administration.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Any future mining development on public lands would require an inventory of paleontological resources, as well as documentation or collection of specimens uncovered during operations (BLM 2008a).

The White Pine & Grant-Quinn Oil & Gas Leasing program (USFS 2007c, 2007d) would lease up to 255,603 acres of National Forest System lands for oil and gas development, including exploration and possibly well development. A small portion of this falls within the paleontological resources CEA boundary.

Railroad Development

Rehabilitation of the NNRy would require minimal ground disturbance; however, improvements to segments of the NNRy that cross buried fine-grained Pleistocene sediments have the potential to impact paleontological resources below the surface. Further, the NNRy through Goshute Valley contacts gray lacustrine sediments of Pleistocene Lake Goshute that have the potential for paleontological resources at the surface (Reynolds 2007a).

Utility Production and Distribution

Ground disturbances related to the White Pine Energy Station, also in Steptoe Valley within the CEA, have the potential to expose/uncover significant fossils. The WPES plant site would disturb 1,281 acres of land while the associated proposed transmission ROWs would disturb an additional 621 acres.

Numerous linear developments, including the SWIP Corridor, BLM Utility Corridor, and the WWEC have been proposed through the CEA. These include new or expanded utility ROWs

for power transmission, water pipelines, roads (e.g., residential developments or access to other uses), fiber-optic, petroleum products, natural gas, and others (see **Appendix 5A**).

5.4.5 Cumulative Disturbances

Within the CEA for paleontological resources, known quantifiable past and present disturbances total approximately 26,400 acres. Proposed future disturbances would potentially disturb another 51,580 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to paleontological resources within the CEA would be approximately 183,980 acres, which is approximately 11 percent of the total area of the CEA.

5.4.6 Cumulative Effects

Encountering paleontological resources during development/disturbance has the potential to destroy and/or lose the resource. However, it also has the potential of providing additional data and rare or previously unknown specimens which can further scientific knowledge. Additional impacts to paleontological resources in conjunction with the EEC would not be known until discovered and evaluated. Impacts to paleontological resources associated with federal land management decisions/actions would be minimized or reduced in accordance with federal legislation and existing standard operating procedures. Thus, cumulative impacts to paleontological resources would be negligible to minor.

5.5 Soils

5.5.1 CEA Boundary

The CEA boundary for soils would be the same as described for surface water (**Figure 5.2-1**).

Rationale

This CEA boundary is the same as surface water due to the effect that soil disturbance has on surface water quality through erosion and sedimentation. Soil resources outside the watersheds for the Proposed Action and Action Alternatives would not be affected. The potentially affected drainages would include the Duck Creek Basin (within the Steptoe Valley Basin), the Goshute Valley Basin, and the White River Valley Basin.

5.5.2 Introduction

Section 3.5 details soil mapping units for the EEC project area within Steptoe Valley and depicts them on **Figure 3.5-1**. **Section 4.5** describes the impacts that would disturb soil resources and reduce their value or function for the short or long term. Prime farmland in the Lages Station Well Field would no longer be irrigated and would need to be stabilized from wind erosion. In other areas, very little soil disturbance would occur on steeper slopes that would increase erosion potential.

As noted in **Section 4.5**, disturbed soil loses its structure and porosity when disturbed through displacement or compaction by heavy equipment. Consequently, the soil is more prone to

erosion by water or wind and may be less able to support some kinds of vegetation (loss of productivity).

5.5.3 Past and Present Disturbances

The types of past and present disturbances that may affect soils in the CEA are the same as those described for surface water in **Section 5.2**. The current land ownership and uses for (thus disturbances within) the soils CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2** above.

5.5.4 Foreseeable Future Disturbances

The foreseeable future disturbances in the CEA that may affect soils are the same as those described for surface water in **Section 5.2**. Future disturbances to soils are quantified in **Table 5.1-3** above.

5.5.5 Cumulative Disturbances

The cumulative disturbances in the CEA that may affect soils are the same as those described for surface water in **Section 5.2**.

5.5.6 Cumulative Effects

Under the Proposed Action or the Action Alternatives, disturbance to soil resources would be minor to moderate during construction and negligible to minor post-construction. Use of BMPs during construction, and prompt post-construction reclamation at all facilities (plant, transmission lines, rail line, water production and conveyance, worker village), and management of the plant site for zero discharge of storm water assures that temporary soil disturbance would be of short duration and minimal impact. The same can be said of the WPES project and all proposed projects in or adjacent to the CEA, individually and cumulatively, based on current regulatory requirements for storm water permitting. The most likely source of moderate to severe impacts to soils in the CEA, short term or long term, is from wildfires, abandoned mines, and unrestricted use of OHVs (see **Section 5.2.3** and **Section 5.2.4**).

As discussed in **Section 4.5.2.4**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially cause changes in the chemistry of surficial soils exposed to this deposition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on soils within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for the near field area and are discussed in the Risk Assessment narrative in **Section 5.6**.

5.6 Air Resources

5.6.1 CEA Boundary

The CEA for air quality is consistent with the area where EPA and NDEP required cumulative impact air quality modeling for the air permit application of the EEC. The CEA would include all Class I areas and FLMs identified sensitive Class II areas within a 300 km radius of the EEC. It also includes a 50 km radius beyond all locations with predicted significant contributions to air pollution levels in Class II areas.

For the EEC South Plant Site, the CEA would be a 93.8 kilometer radius (58.25 miles) around the facility plus the two Class I areas within 300 km (Jarbidge Wilderness and Zion National Park).

For the North Plant Site Alternative, the CEA would be a 95.3 kilometer (59.22 miles) around the facility plus the two Class I areas within 300 km and the FLMs designated sensitive Class II area, Great Basin National Park.

Rationale

Air pollutant emissions and direct impacts associated with the EEC project are compared with all federal and State air quality standards within the direct effects area. This cumulative effects analysis analyzes cumulative activities in and affecting the CEA for their potential effects on all applicable ambient air quality standards, documents potential cumulative degradation in ambient air pollutant concentrations and air quality related values (AQRVs), compares those impacts against allowable and accepted ranges, and provides quantitative risk assessment modeling to assess air pathway risks to the public from the proposed action and the foreseeable WPES. An inventory of all existing emission sources and foreseeable permitted major emission sources within 200 km of either proposed power plant site is also provided..

Figure 5.6-1 shows the CEA for the air quality analysis.

5.6.2 Introduction

Section 3.6 documents that air quality in Steptoe Valley and the CEA is generally better than the National and Nevada Ambient Air Quality Standards. Air pollutant measurements onsite at the proposed EEC location showed concentrations less than fifteen percent of those standards for all pollutants except ozone. Other regional monitoring results reported by NBAPC (current PM_{10} monitoring in Elko and Battle Mountain, historic PM_{10} monitoring in the Steptoe Valley) and the IMPROVE monitoring network (historic and ongoing PM_{10}, $PM_{2.5}$, and ozone monitoring) show air pollutant concentrations well below those air quality standards in local urban areas and pristine sensitive areas. Winter inversions occur in the area valleys, but activity levels are generally low enough that not enough air pollutants are emitted to lead to significant buildups of pollution levels as documented by air quality monitoring data collected at the proposed EEC plant sites. Dispersed air pollution sources in the CEA include emissions resulting from ranching and land management activities including agricultural burning, and disturbed soils to wildfires and prescribed burning. Regional haze studies including the recent Western Regional Air Partners (WRAP) regional haze modeling effort show impacts within acceptable ranges from large regional sources, including power plants. The results of those WRAP studies have included permit compliance follow-up at facilities shown to have the potential to adversely affect ambient air quality or limits on incremental degradation. Cumulative effects to air quality in the CEA from past, present, and foreseeable future activities from permitted industrial source of emissions are documented in this section. A qualitative assessment of other air pollution sources from the dispersed or non-permitted sources is also included to provide a comprehensive look at overall air quality emissions and impacts. Because the analysis of cumulative effects to air resources utilizes sources as prescribed by air permits and is largely quantitative, this section of the cumulative effects analysis will be structured somewhat differently than others.

Figure 5.6-1. Air Quality CEA and Modeled Sources

5.6.3 Past and Present Disturbances

In Steptoe Valley, historic McGill operations, including the McGill Smelter operated by the Steptoe Valley Mining and Smelting Company, resulted in McGill and Steptoe Valley failing to meet SO_2 ambient air quality standards and being declared non-attainment for SO_2. The NNRy ran from Shafter to Ely, leading to some air quality impacts from diesel trains. The industrial activities in McGill, including the smelter, were closed down by 1990, bringing ambient concentrations of pollutants, including SO_2, in line with low regional background values. The railway was abandoned shortly thereafter. Those changes contributed to the current status of attainment with all applicable ambient air quality standards, including SO_2. EEC on-site measurements of ambient pollutant concentrations also show attainment, with measured concentrations of all criteria air pollutants except ozone an order of magnitude or more below the NAAQS and Nevada AAQS. The fourth maximum 8-hour average ozone concentrations measured onsite over one year of monitoring were 96 percent of the 8-hour average ozone NAAQS that applies to the average of three years of fourth maximum values, reasonably consistent with ozone concentration measurements regionally.

The mining industry has had a prominent role in the regional economy. In the immediate project vicinity that role included providing the raw materials to support the historic metal processing efforts in McGill. While overall volume of material mined in and immediately adjacent to Steptoe Valley is down since the closing of the McGill Smelter, there remain a number of mines operating in the CEA, including the Robinson Mine outside Ruth which continues to produce copper, silver, gold, and molybdenum. A number of larger mines operate around the CEA's perimeter, especially to the west and northwest toward the Carlin Trend. Dust is generated from winds over disturbed surfaces at closed mines, and from winds over surface disturbance and from mining activities at existing mines. That windborne dust could contain metals.

Regional population and development across the CEA historically and currently include regional air pollutant sources referred to as regional area sources. Few if any of those area sources have air quality permits. These sources include transportation related vehicle emissions along roadways and in the towns and cities, space heating emissions from residences and businesses, emissions associated with residential or business land management like dust generation from disturbed surfaces or small equipment exhaust, and any other small engine emissions or fossil fuel burning equipment. These sources also include smaller industrial emission sources like gas stations, vehicle maintenance facilities, and dry cleaners.

Emission Sources Included in Quantified Air Quality Modeling Analyses

An air quality modeling analysis was prepared for the NDEP air permit application to quantitatively assess ambient air quality impacts from current industrial sources in the CEA. The pollutants considered included all criteria air pollutants for which the proposed EEC potentially can have a significant contribution to air quality levels. In Class II areas, the three criteria air pollutants for which the air quality modeling has shown that EEC has the potential for significant contributions are NOx, PM_{10}, and SO_2. Cumulative air quality modeling analyses were prepared for those three pollutants to assess the Class II impacts from regional industrial sources with air permits. Consistent with EPA guidelines and requirements by the NDEP during air permit review, all industrial air pollutant sources with air quality permits (required for facilities above NDEP-defined significant emission thresholds) that emitted any of those three pollutants within 50 kilometers (31 miles) of where the EEC was predicted to have significant contributions to air quality levels were included in the cumulative impact modeling for the NDEP permit

application. **Table 5.6-1** documents the existing industrial sources included in the cumulative Class II modeling analyses, and the modeled emission rates consistent with their allowable potential emission rates. The cumulative impact analyses from the quantitative Class II air quality modeling include emissions from these identified industrial emission sources that have received an air permit.

Measured ambient air pollutant concentrations documented in **Section 3.6** were used as background values for the quantitative modeling analyses. Non-permitted air emissions sources potentially affect historic and current air quality in the CEA. Dust sources would include vegetation disturbing land management practices, including ranching; private and public grazing and agriculture; ground clearing in open lands and along utility corridors; road dust; smaller mining and rock crushing operations; recreational activities; and regional construction and maintenance efforts. Smoke is generated from agricultural burning, and wild and prescribed fires. Sources of gaseous air pollutants not requiring an air permit generally have low emission volumes individually, but could represent higher emission volumes cumulatively. Existing emission sources, permitted or non-permitted, were accounted for in the analysis consistent with actual activity levels during the air quality monitoring period, since the impact of their emissions was included in the background concentrations measured. Those sources include the regional area sources described above.

TABLE 5.6-1. EMISSION RATES FOR FACILITIES INCLUDED IN THE CLASS II AREA ANALYSIS

FIGURE 5.6-1 FACILITY NUMBER	FACILITY NAME	UTM E	UTM N	PERMITTED POTENTIAL TO EMIT (POUNDS PER HOUR)		
				PM10	NOX	SO2
1	Robinson Nevada Mining Company	671580	4347540	104.4	4.0	5.8
2	Newmont Gold Company	583930	4495990	7.9		
3	J & M Trucking, Inc.	684020	4346150	0.9		
4	Homestake Mining Company	589940	4376280	0.02		
5	Reck Brothers	689110	4348990	4.5	2.3	
6	Reed Distributing, Inc.	682780	4348580	0.005		
7	J & M Trucking, Inc.	589410	4373560	0.6		
8	Bald Mountain Mine Properties	630900	4420250	0.2		
9	Bald Mountain Mine Properties	617000	4423100	0.4	0.6	
10	Cooper & Sons, Inc.	688350	4356200	10.8	3.2	
11	Country Construction	685820	4353520	3.3		
12	White Pine County School District	684170	4346840	2.1	0.1	0.3
13	Chevron Environmental Management Company	683560	4347130		0.4	
14	U.S. Army - Dugway Proving Ground - Utah	820553	4448686			5.2
15	H. E. Hunewill Construction Co., Inc.	740760	4321140	107.5		86.6
16	Nevada Slag, Inc.	691300	4364600	14.3	2.4	

The modeling analysis of Class II cumulative air quality impacts also included the foreseeable sources within 50 kilometers of the maximum extent of the proposed EEC's area of predicted significant contribution documented in **Section 5.6.4** and **Table 5.6-6**, specifically the proposed WPES. The location of each source included in the Class II area cumulative air quality modeling analysis is identified in **Figure 5.6-1** by red triangle symbols.

The Class I direct impact analysis showed that the EEC could have impacts for one pollutant, SO_2, that exceed the Class I significant contribution threshold, as described in **Section 4.6**. As a result, EPA guidance and NDEP regulations required an analysis comparing cumulative impacts from the time of the PSD baseline dates (January 6, 1975 for major sources around Jarbidge Wilderness, and April 1, 1990 for major sources around Zion National Park, with "major source" defined as a source with permitted potential to emit of 250 tons per year) against incremental air quality degradation limits defined under the PSD program. The regional sources identified by NDEP as having increases in SO_2 emissions after those baseline dates within 300 kilometers of either Class I area, and therefore included in the Class I area cumulative impact analysis, are shown in **Table 5.6-2**.

The Class I modeling analysis provided quantified predictions of maximum increases in SO_2 impacts since the PSD baseline dates, for direct comparison against the applicable PSD impact limits.

TABLE 5.6-2. OPERATING REGIONAL CLASS I SO_2 INCREMENT CONSUMING EMISSION SOURCES MODELED

FIGURE 5.6-1 FACILITY NUMBER	FACILITY	LOCATION	EMISSION UNIT	SO2 EMISSIONS (LB/HR)
22	Graymont Western U.S.	Near Wendover, UT	Kiln 1	14.0
			Kiln 2	21.0
			Kiln 3	33.6
19	Newmont Mining, Gold Quarry	Near Battle Mountain, NV	Mill 6	27.4
			Preheaters	12.9
			Roasters	39.5
18	Barrick, Goldstrike Mine	Near Battle Mountain, NV	Mill 1	4.3
			Mill 2	4.3
			Roasting	44.9
			Agg. Dryer	10.6
23	Nevada Power, Reid Gardner	Northeast of Las Vegas, NV	Boiler #4	857.2
21	Chemical Lime, Apex Plant	Northeast of Las Vegas, NV	Kiln #4	127.7

The modeling analysis of Class I cumulative air quality impacts also included the foreseeable sources documented in **Section 5.6.4** and **Tables 5.6-5** and **5.6-6**, specifically two permitted but not yet built coal-fired power plant units in Utah and the proposed LS Power WPES. The location of each of the sources included in the Class I area cumulative air quality modeling analysis is shown in **Figure 5.6-1** as blue dots.

Emission Sources Qualitatively Addressed, Not Included in Quantified Air Quality Modeling Analyses

The emission sources not requiring individual air permits discussed in this section were not directly included as separate sources in the air quality modeling analysis. Their recent emissions during the one year that air quality monitoring was performed at each proposed energy center site were accounted for through the use of measured air pollutant concentrations

for background. That background data should be representative of actual emissions during the monitoring period, and their impacts in the vicinity of the proposed energy center sites. Any differences in actual air pollutant levels across the model domain during the monitoring period, or trends in emissions and their impacts in the future are not measured or measurable, and therefore will be addressed qualitatively.

For this EIS, an additional qualitative analysis of emission sources that may contribute to potential cumulative air quality impacts was prepared. Emissions data were gathered for all permitted industrial air pollution sources within 200 kilometers (124 miles) of either of the proposed EEC sites that had at least five tons per year of emissions of any criteria air pollutant. The resulting emission inventory, shown in **Tables 5.6-3** and **5.6-4**, gives a clear indication of industrial air emissions in a 200 kilometer radius around either EEC site, providing detailed coverage of the primary stationary air emission sources between the modeled Class II area in the vicinity of the proposed facility and the distant Class I areas for which impacts were analyzed. The sources and emissions listed in **Tables 5.6-3** and **5.6-4** represent an inventory of emissions in a 200 kilometer radius of either proposed energy center site. They were not included in the Class II area air quality modeling analysis unless they are also listed in **Tables 5.6-1** or **5.6-6**, and were only included in the Class I area impact analyses if they are listed in **Tables 5.6-2** or **5.6-5**. **Table 5.6-3** documents the currently permitted Nevada industrial sources within 200 kilometers of either potential EEC site identified from a comprehensive emission inventory provided by the NBAPC, and shows the potential to emit for each criteria air pollutant except lead. Greenhouse gas emissions were requested from the NDEP and UDAQ, but that information was not readily available. **Table 5.6-4** documents the currently permitted Utah industrial sources within 200 kilometers of either potential EEC site from a comprehensive emission inventory provided by the Utah Division of Air Quality (UDAQ). That table shows actual emissions reported by UDAQ, the higher of emissions reported for calendar year 2005 or 2006. The location of each permitted industrial air pollutant source included in the cumulative emission inventory can be seen on **Figure 5-6.1**.

TABLE 5.6-3. PERMITTED NEVADA AIR POLLUTION SOURCES*

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)				
					PM-10	NOX	SO2	CO	VOC
734420	4522850	22	Graymont Western Us, Inc	Class 1 PSD - Pilot Peak	2491.4	2102.4	300.5	5387.4	93.38
581610	4509370	25	University Of Nevada Fire Science Academy	Class 2 –Carlin	747.8	32.8	8.4	2032.8	923.9
539690	4510070	26	Newmont Nevada Energy Investment, LLC.	Class 1 PSD OPTC - Boulder Valley Power Proj.	597.0	0.1	334.6	1426.6	62.3
568120	4512620	19	Newmont Mining Corporation	Class 1 – Gold Quarry	548.9	248.7	354.4	277.7	64.7
554700	4536310	18	Barrick Goldstrike Mines, Inc	Class 1 - Goldstrike Mine	407.0	382.9	247.4	353.6	234.3
591760	4584600	27	Queenstake Resources Usa, Inc.	Class 1 - Jerrit Canyon Mine	171.9	203.7	89.4	119.1	3.1
583580	4410070	28	Moltan Company	Class 2	104.5	91.9	76.6	14.8	14.0
511310	4504090	29	Dyno Nobel Inc	Class 2 -Battle Mountain Facility	97.2	96.5	0.0	98.8	1.5
536800	4550500	30	Rodeo Creek Gold, Inc.	Class 1 - Hollister Block Development Project	1.9	76.1	13.1	21.4	5.6
583930	4495990	44	Newmont Mining Corporation	Class 2 – Mill 3 (Rain)	85.9	10.0	0.8	1.7	0.2
589940	4376280	4	Homestake Mining Company	Class 2 -Ruby Hill Project	73.8	0.0	0.0	0.0	0.0
670460	4600840	31	Spirit Minerals, Lp	Class 2	3.0	58.8	4.6	7.7	0.8
620240	4275540	32	Foreland Refining Corporation	Class 2 -Eagle Springs Refinery	11.5	0.0	0.0	0.0	48.5
606700	4520300	33	Province Health Care	Northeastern Nevada Regional Hospital	1.6	30.2	47.5	13.4	13.4
504870	4499868	34	M-I, LLC	Class 2 - Battle Mountain Grinding Plant	33.2	3.0	0.0	1.3	0.2
598150	4517340	35	Paiute Pipeline Company	Class 2 -Elko Station	0.3	25.4	0.0	3.1	1.0
510450	4456560	36	M-I Drilling Fluids, LLC.	Class 2 -Greystone Project	22.0	0.0	0.0	0.0	0.0
689110	4348990	5	Reck Brothers	Class 2	3.6	10.3	0.9	21.7	5.4
612400	4532100	37	Staker & Parson Companies	Class 2 –Osino	3.9	8.3	0.0	20.7	11.0
568250	4513800	38	Ames Construction, Inc.	Class 2 -Newmont Mining Project	14.2	19.8	5.6	0.5	6.8
749580	4513620	39	Wendover Casinos, Inc.	Class 2 -Montego Bay Casino Resort	0.5	18.4	0.3	2.5	0.4
605740	4521750	40	Thiessen Team USA	Class 2 -Elko Bagging Facility	17.1	13.1	0.0	11.0	0.4
677220	4361750	41	Nevada Department Of Corrections	Class 2 - Ely State Prison	0.5	5.0	16.0	1.3	0.1

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)				
					PM-10	NOX	SO2	CO	VOC
539610	4506700	42	Halliburton Energy Services, Inc	Class 2 -Dunphy Plant & Crusher	8.0	3.9	14.0	1.0	0.1
554600	4536000	43	Air Liquide Large Industries U.S. L.P.	Class 1a -Barrick Goldstrike Oxygen Plant	0.3	12.6	0.0	1.5	0.0
572650	4512740	45	Frehner Construction Company	Class 2 - Elko Airport Phase 3	3.0	12.3	0.9	10.8	4.3
749590	4513620	46	Stateline Nugget Hotel And Gambling Hall	Class 2	2.1	12.2	0.1	1.7	0.4
691300	4364600	16	Nevada Slag, Inc	Class 2	3.8	10.7	7.0	2.4	0.7
513370	4312190	47	NewWest Gold USA, Inc.	Class 2 -North Umberland Mine	0.7	10.0	0.7	2.2	0.8
747990	4513770	48	Wendover Casinos, Inc.	Class 2 - Rainbow Hotel Casino	0.3	9.8	0.1	1.3	0.2
548590	4546860	49	Halliburton Energy Services, Inc.	Class 2 - Rossi Jig Plant	8.4	0.0	0.0	0.0	0.0
606190	4522340	50	Elko Sand & Gravel	Class 2 -Elko Pit	1.1	8.3	0.5	1.8	0.7
569030	4495500	51	Elko Sand & Gravel	Class 2 -P. Pit	2.3	7.8	0.5	1.7	0.6
528890	4471900	52	Nevada Rae Gold, Inc	Class 2 -Crescent Valley Sluice Mining	7.3	0.0	0.0	0.0	0.0
607690	4497100	53	Canyon Construction Company	Class 2 - Spring Creek Rock Products	5.6	6.7	0.4	1.4	0.5
748730	4513830	54	Wendover Casinos, Inc.	Class 2 - Peppermill Hotel Casino	0.2	6.1	0.1	0.8	0.1

* Within 200 kilometers of either proposed site with a potential to emit of at least 5 tons per year of any criteria pollutant.

TABLE 5.6-4. PERMITTED UTAH AIR POLLUTION SOURCES*

UTM E	UTM N	FIG. 5.6-1 FAC. #	FACILITY NAME	FACILITY TYPE	PERMITTED POTENTIAL TO EMIT (TONS PER YEAR)					
					PM-10	PM-2.5	NOX	SO2	CO	VOCS
364239	4374448	61	Intermountain Power Service Corporation	Intermountain Generation Station	465.8	116.5	25406.4	4241.0	1484.2	14.6
343100	4311010	58	Graymont Western US Incorporated	Cricket Mountain Plant	236.7	140.8	1003.6	41.9	685.8	35.7
309300	4444300	14	Dugway Proving Ground	U.S. Army-Dugway Proving Ground	510.1	88.8	73.1	33.1	24.2	30.3
333812	4510930	56	Clean Harbors Aragonite LLC	Hazardous Waste Storage/Incineration	4.8	2.8	131.9	32.6	32.9	6.1
359960	4512180	55	Cargill Incorporated--Salt Division	Timpie Salt Processing Plant	53.1	53.1	48.8	3.9	17.5	3
320000	4258500	66	Twin Mountain Rock	Twin Mountain Rock	28.5	5.2	19.7	2.0	7.3	1.5
313700	4520000	57	Clean Harbors Grassy Mountain LLC	Grassy Mountain Landfill Facility	26.6	5.4	2.3	0.1	1.9	0.9
325570	4250830	64	Circle Four Farms	Circle Four Feedmill	15.5	7.9	2.6	0.02	2.2	0.1
296300	4267700	60	Indian Queen Marble LLC	Marble Mine	3.4	1.3	10.0	0.8	1.9	0.9
325000	4251000	65	Harborlite Corporation	Perlite Processing Plant	1.6	1.1	8.0	0.5	2.3	0.7
373637	4480896	63	Utah Refractories Corporation	Silica Stone Quarry	3.1	0.1	0.2	0	0.1	0
371220	4492360	59	Harper Contracting	Pit#23 Near Manila	1.4	1.4	0.3	0	0.1	0
276774	4512892	62	Solar Aluminum Technology Services	Aluminum Recovery Facility	0	0	0	0	0	0

*With actual 2005 or 2006 emissions of at least 5 tons per year of a criteria pollutant within 200 kilometers of either proposed site - sources with a potential to emit of at least 5 tons per year of any criteria pollutant.

UTM coordinates are UTM zone 12, which covers most of Utah, not zone 11 which covers most of Nevada including the proposed EEC site alternatives

Actual emissions (the maximum reported in 2005 or 2006) are reported here, in contrast to permitted potential to emit elsewhere in Chapters 4 and 5

5.6.4 Foreseeable Future Disturbances

Emission Sources Included in Quantified Air Quality Modeling Analyses

Quantitative air quality modeling analyses include emissions from all industrial emission sources that have received a draft or final air permit. Two foreseeable industrial activities, facilities with air permits that were not yet operating, are identified as major sources potentially capable of contributing to incremental air quality degradation in the Jarbidge Wilderness and/or Zion National Park Class I areas. Those sources were included in the modeling analyses to assess cumulative SO_2 air quality impacts. Their facility names and potential SO_2 emission rates are listed in **Table 5.6-5**.

TABLE 5.6-5. FORESEEABLE REGIONAL CLASS I SO_2 INCREMENT CONSUMING EMISSION SOURCES MODELED

FACILITY	FIGURE 5.6-1 FACILITY NUMBER	LOCATION	EMISSION UNIT	SO2 EMISSIONS (LB/HR)
Intermountain Power Plant	24	Near Delta, UT	Unit 3	905.0
Nevco Sigurd Power Plant	20	Sigurd, UT	S1	124.9

One project requiring an air permit was identified as foreseeable in the Class II CEA, the proposed WPES in Steptoe Valley. The allowable potential emissions from that facility's draft air permit were included in the cumulative air quality modeling analysis for the Class I and Class II impact areas. The WPES model sources for this analysis include all onsite emissions included in the WPES air permit application to NDEP. **Table 5.6-6** documents the cumulative emissions for the WPES modeled for the cumulative impacts analysis. As described for the Proposed Action's air permit air quality impact analysis, off-site emissions generated by the WPES project are not included in the modeling. They are addressed qualitatively later in this section.

TABLE 5.6-6. SOURCE EMISSION RATES FOR FORESEEABLE FACILITIES INCLUDED IN THE CLASS I AND CLASS II AREA ANALYSES

FACILITY NAME	FIGURE 5.6-1 FACILITY NUMBER	POLLUTANT	EMISSION RATE (LB/HR)	FACILITY UTM LOCATION (ME)	FACILITY UTM LOCATION (MN)
LS Power White Pine Energy Station	17	CO	2,367.5	690700	4399400
		NO_x	1,098.9		
		PM_{10}	626.5		
		SO_2	1,386.3		

Emission Sources Qualitatively Addressed, Not Included in Quantified Air Quality Modeling Analyses

Foreseeable new non-permitted emission sources, or changes from current emission patterns, are expected to include:

- growth in rail traffic once a rail link is established with this project and/or the WPES,
- potential local and regional growth in auto, truck, and air traffic,
- potential energy exploration and/or development,
- proposed mining ventures,

- range improvement and fire management efforts, and
- increases in ground disturbances from:
  - vegetation changes associated with grazing and agricultural activities,
  - under or along utility corridors, along fire breaks, and from construction efforts
- changes in emissions from non-permitted sources identified as currently existing.

5.6.5 Cumulative Disturbances

5.6.5.1 Currently Operating Emission Sources

Section 5.6.3 documents the currently operating permitted industrial sources identified as potentially affecting the CEA that were included in dispersion modeling analyses along with the EEC. Those sources are listed in **Table 5.6-1**. That section also lists, in **Tables 5.6-3** and **5.6-4** all existing permitted facilities in a 200 kilometer radius of the proposed EEC (either site). Only those sources in **Tables 5.6-3** and **5.6-4** that are also listed in **Table 5.6-1** were included in the air quality modeling analyses. The impacts of all other inventoried emissions documented in **Tables 5.6-3** and **5.6-4** are discussed qualitatively in this section.

The regional energy system includes a number of power plants surrounding the CEA. **Table 5.6-2** documents one existing power plant, the Reid Gardner 650MW coal-fired plant in Moapa that was included in the quantitative air quality modeling impact assessment. A review of all power plants within 300 kilometers of either proposed EEC plant site location shows eight currently operating facilities with permitted capacity of at least 100 MW, seven in Utah and one in Nevada. Only one of those facilities, the coal fired 1900 MW Intermountain Power Plant near Delta, Utah is within 200 kilometers and therefore included in the cumulative emission inventory and shown in **Table 5.6-4**. The other power plants with permitted capacities of 100 MW or greater within 300 kilometers of the proposed EEC plant sites are shown in **Table 5.6-7**.

TABLE 5.6-7. POWER PLANTS WITH AT LEAST 100 MW PERMITTED CAPACITY WITHIN 300KM OF EITHER PROPOSED EEC PLANT SITE

FACILITY	FIGURE 5.6-1 FACILITY NUMBER	LOCATION	FUEL	CAPACITY (MEGAWATTS)
Intermountain Power Plant	24	Near Delta, UT	Coal	1900
Pacificorp Summit Vineyard	74	Utah County, UT	Natural Gas	560
Pacificorp Current Creek (Mona)	73	Utah County, UT	Natural Gas	525
Sierra Pacific North Valmy	67	Valmy, Nevada	Coal	521
Pacificorp Gadsby	70	Summit County, UT	Natural Gas, Oil	380.5
Pacificorp West Valley	71	Salt Lake County, UT	Natural Gas	217
Kennecott KUCC	69	Salt Lake County, UT	Coal, Natural Gas	175
Utah Associated Municipal Power System Nebo (Payson)	72	Utah County, UT	Natural Gas	141

The emissions and impacts from all other existing regional power plants with emissions over 250 TPY of any air pollutant were included in the recent Western Regional Air Partnership (WRAP) modeling to assess potential air pollutant and regional haze impacts. That study included requirements for Best Available Retrofit Technology (BART) for any facility determined to have excess impacts in any Class I area. Other operational power plants that were distant

enough that their emissions were not directly included as point sources in the EEC's quantitative air quality impact analysis include:

- the 2400 MW coal-fired Four Corners Generating Station in Fruitland, NM,
- the 2250 MW coal-fired Navajo Generating Station outside Page, AZ,
- the 1800 MW coal-fired San Juan Generating Station outside Farmington, NM,
- three Pacificorp coal fired power plants in Utah not far beyond 300 kilometers from the proposed EEC plant sites: the 1112 MW Huntington plant, the 895 MW Hunter plant, and the 172 MW Carbon plant,
- four natural gas fired generating stations with a combined capacity of 2406 MW in the Apex Valley north of Las Vegas,
- two Pacificorp coal fired power plants in southeastern Wyoming: the 1413 MW Jim Bridger plant and the 700 MW Naughton plant,
- the 380 MW coal-fired Pacificorp Cholla facility in northeast Arizona,
- the 250 MW Escalante Generating Station northwest of Grants, NM,
- the 75 MW natural gas fired Harry Allen peaking power plant in Clark County, NV, and,
- a 51 MW plant in Broomfield owned and operated by the city of Farmington, NM.

The impacts (if any) of those power plants and all other sources of air pollutants existing during the September 2006 to August 2007 EEC onsite air quality monitoring period were included in the EEC impact analysis by way of the background ambient air concentrations.

Oil and gas exploration and extraction are established industries to the east and northeast of the CEA in Utah, Wyoming, the Four Corners area, and points beyond. Leasing activity has not occurred in Steptoe Valley, and is in the planning stage in areas on the western and northern fringes of the CEA.

The Nevada mining industry set an all time record for total value of mined commodities in 2006. There are currently at least eleven mines active or open in White Pine County (Driesner and Coyner 2007). The most significant producers are the Barrick Bald Mountain Mine in far western White Pine County, on a ridgetop two to three ranges to the west of Steptoe Valley, and the Robinson Mine outside Ruth. At least nine other smaller mines exist and are, or could be, active in the county. Outside the CEA, large mining operations exist that could impact the CEA. Most are identified on **Figure 5.6-1**. Those mines include the following, listed with 2006 production totals:

- Seven mines were operational in Elko County to the north, including the Queenstake Jerritt Canyon that was recently closed, the Barrick Goldstrike, and the Newmont Midas that each produced over 100,000 ounces of gold.
- To the northwest in northern Eureka County, the Barrick Goldstrike Betze-Post and Newmont Mining Eastern Nevada Operations each produced over one million ounces of gold.
- To the west in Lander County, the Battle Mountain Greystone Mine produced nearly 300,000 tons of barite and the Cortez Gold Mine produced over 400,000 ounces of gold.
- Farther north in Lander County, the Newmont Mining Mule Canyon Mine and Phoenix Project produced copper, gold, and silver near Battle Mountain.

- To the southwest in Nye County, Round Mountain Gold's Smoky Valley Common Operations produced over 600,000 ounces of gold and silver.

Wildfires and prescribed fires have historically affected the majority of forested and range lands in the CEA, the region, and most of the Western U.S. Agricultural development has changed the fire cycle where it has taken hold, and introduced agricultural burning, which has historically produced only a small percentage of the smoke generated on undeveloped lands. Fire has always been a part of the ecological cycle in this dry climate, and it will continue to be in the future. After decades of aggressive fire suppression in the mid-20th century, public land management efforts in recent decades generally try to minimize large magnitude smoke generation from large acreage wildfires by using prescribed burning and other techniques to control fuel accumulations. Those efforts do not change the long term volume of smoke and air pollutants generated, but they even out the distribution over time and minimize the high level exposures during fires that can have the most significant effects on public health.

Regionally distributed land use and land management choices affect regional air quality trends. Dust and vehicle exhaust emissions are generated from ranching operations which represent a prominent portion of land use and economic activity in Steptoe Valley. Similarly, management decisions on public and private lands, including vegetation management, construction, maintenance and use of roadways, and fire breaks affect vegetation patterns and the potential for dust generation. Utility corridors, including power transmission line corridors, gas and water pipelines, and fiber optic cable lines, can generate dust, especially where corridor access roads are open to public use and vegetation is managed or removed to maintain those corridors. Construction efforts to prepare or maintain activities throughout the CEA are also sources of dust generation and exhaust emissions.

Other regionally distributed contributors to air quality trends are area source emissions associated with transportation, residential and industrial space heating, and other household and small service industry activities associated with population density. All paved highways are sources of exhaust emissions from vehicles, and some dust generation as well. Unpaved roads generate considerably more dust from the roadbed materials. US-93 serves as a main artery north and south through Steptoe Valley. It runs approximately 1 mile east of the proposed EEC plant sites. US-50 also crosses east to west through the southern Steptoe Valley, traversing through Ely and then west toward Ruth via Robinson Summit. US-6 runs from Ely south. Numerous paved and unpaved roads in and around Steptoe Valley and in surrounding areas in the CEA facilitate local travel patterns. In the vicinity of the EEC, traffic volumes from 1996 to 2005 on US-93 have averaged about 3,000 vehicles per day south of McGill, with an upward trend north of McGill. Traffic volumes on Cherry Creek Road just west of US-93 have fluctuated from 50 to 60 vehicles per day during that period (HDR et al. 2007). The Ely airport features air and ground operations that generate exhaust and other air pollutant emissions. Commercial rail traffic and associated train exhaust and dust emissions have been limited to the UPRR line to the north since the NNRy ceased operation. Limited (recreational) rail operations on the southern portion of the NNRy near Ely have occurred recently. Space heating associated with occupied buildings, including residential, public, and private ownerships occur throughout the CEA consistent with population and development patterns. Those emissions, and others, like home, yard and street maintenance, are most concentrated in the few areas with population density in the CEA. The most notable areas where those types of emissions are concentrated are the cities of Ely and McGill. The same effect occurs, to a lesser extent, in the other smaller communities in and around Steptoe Valley.

The impacts of all existing air pollutant sources were included in the monitoring data from the proposed EEC sites used to determine background concentrations for the quantitative analysis. All recent local and regional NDEP air quality monitoring data showed particulate levels less than 60 percent of applicable NAAQS standards and ambient SO_2 concentrations orders of magnitude below applicable NAAQS standards. Those monitoring results, and the fact that the entire CEA is designated as attainment or unclassified for all pollutants, indicate that with current activity levels, air quality throughout the CEA does not approach any ambient air quality standards. Except in the immediate vicinity of the generally low volume emission sources identified, air pollutant concentrations, other than ozone seasonally during the warm weather season, are shown by measurements at the EEC to be typically an order of magnitude below applicable national and Nevada ambient air quality standards. Nowhere in the CEA is known to approach any applicable ambient air quality standard.

5.6.5.2 Foreseeable New Emission Sources, and Trends Anticipated For Emissions from Existing Emission Sources or Source Categories

Section 5.6.4 documents the permitted industrial sources identified as foreseeable potentially affecting the CEA that were included in dispersion modeling analyses along with the EEC. That section also documents a number of other foreseeable actions not included in the air quality modeling analyses that could have actual or potential impacts on air quality in the CEA. The nature of those foreseeable actions and their actual or potential air emissions are discussed below. Impacts associated with those actions are discussed in **Section 5.6.6**, Cumulative Effects.

The regional energy system is expected to retain most or all existing generating capacity in the foreseeable future. New nearby power supply facilities are also planned. **Table 5.6-3** (Newmont Gold), **5.6-5,** and **5.6-6** (White Pine Energy Station) document four foreseeable coal-fired power plant projects that have received draft or final air permits. The emissions from those four sources were included in the quantitative air quality impact modeling analyses. The 200 MW coal and oil fired Newmont Gold plant is scheduled to begin operating in 2008. The proposed 1600 MW coal-fired WPES has an air permit and is in the process of completing the NEPA permitting. The air permits for both Utah plants, the 270 MW coal-fired Nevco Sigurd Power Plant near Sigurd and 950 MW coal-fired Unit 3 at the Intermountain Power Project near Delta, were issued, but both permits are under appeal. Construction has not yet begun on either of those planned facilities. Foreseeable power plant projects not included in the quantitative air quality modeling analyses include the proposed 750 MW coal-fired Toquop Energy project 12 miles northwest of Mesquite, NV within 300 kilometers; the more distant proposed 1500 MW Desert Rock Energy Project 30 miles southwest of Farmington, NM, and the proposed 300 MW Mustang Energy Project near Grants, NM. The Desert Rock and Toquop projects are progressing through the latter stages of air permitting and through the NEPA process. One source included in the quantitative modeling, the Reid Gardner Moapa area plant included in the Class I modeling, could be scaled back as a result of the Proposed Action. Any such decrease from that facility in the future could offset some of the new emissions from sources mentioned in this paragraph.

Current planning efforts appear likely to result in public land leases for oil and gas exploration to the CEA and its vicinity. A Record of Decision in August 2007 approved the White Pine and Quinn Oil and Gas leasing projects authorizing exploratory drilling on USFS lands west of Steptoe Valley in western White Pine, eastern Nye, and eastern Lincoln counties. A similar action is planned by the Elko District of the BLM. Successful exploration efforts could lead to energy field development in the future. Air emission estimates are speculative at this time

because the volume of activity is unknown, though the energy recovery rates are expected to be modest in comparison to developed western fields further east in the Rocky Mountain region.

Mining is expected to remain a strong and vibrant part of the regional economy. The operating mines hope to maintain the production pace that resulted in record production volumes in 2006 (the last year comprehensive statistics were available). Six proposed mines in Nye County have either just completed their permitting and approval process or anticipate final decisions by 2008. The Barrick Bald Mountain Mine in western White Pine County is anticipating a final decision on its planned expansion in 2008. The larger regional mines have documented their emissions and impact estimates through air permitting programs.

Fire will continue to represent an important and ever-present part of the ecological cycle in the CEA. Public land management efforts are expected to continue to try to minimize large magnitude smoke generation from big wildfires by using prescribed burning and other techniques to control fuel accumulations. That effort would not be expected to change the long-term volume of smoke and air pollutants generated much, but would even the distribution of smoke and combustion by-products out over time and minimize the high uncontrolled exposures that can have the most significant effects on public health. Specific current plans include the Sacramento Pass Hazardous Fuels Reduction Project to the east, the Toano Fuel Break Project along I-80 and SR-223 to the north, and the fuel reduction portions of the Spruce Mountain Restoration Project south of Wells.

Ranching and agricultural activities are expected to remain near current levels, likely dropping off a little as a percentage of land use over time. Public and private lands management planning could affect dust generation directly or via changes in vegetation strength and density. Grazing management plans indicate trends toward maintaining or possibly gradually decreasing grazing rates for livestock, wild horses, and wildlife. Vegetation management and road building efforts, including the fuel break and Spruce Mountain Projects already mentioned, are anticipated to result in a slight trend toward increases in disturbed ground and dust generation. Utility corridor maintenance and expansion, including proposed water projects and numerous planned or approved utility corridors, would have the same effect. Construction efforts to prepare or maintain improvements throughout the CEA would also represent a source of dust generation and exhaust emissions that should increase gradually consistent with the level of regional activity and development.

Regional traffic and population rates are expected to receive a boost as a result of construction and to a lesser extent during the operational phase for the proposed EEC, and possibly from the proposed WPES as well. Employment opportunities in the mining industry are currently strong. Employment statistics show a steady increase in employment in White Pine County and surrounding areas from a low in the 1990s, which coinciding with a cyclic downturn in the mining industry. Employment trends show a shift in concentration toward government and service sectors. New development projects, including power plants, and the increased electrical supply would expand the employment base for the area and maintain the light upward trend in employment. Overall, the trend in emissions from space heating and residential activity is expected to remain stable or decrease slightly. Emission reductions from population decreases and improved heating efficiency could be offset somewhat by industrial expansion. Traffic projections prepared from Nevada Department of Transportation data and employment and economic trend data estimate that current traffic volumes on US-93 and Cherry Creek Road would increase by approximately one third per decade in the future. The total traffic volume predicted in 2030 would be a little more than twice the traffic volumes on US-93 north and south of McGill and on Cherry Creek Road (HDR et al. 2007). Vehicle exhaust emissions from those

traffic increases are expected to remain steady or decrease slightly, with improved efficiency and emission controls offsetting increased volume. Road dust emissions would be expected to increase proportionally to traffic volume increases.

The potential reestablishment of the NNRy service to and from Steptoe Valley would provide a boost to regional infrastructure, and also could stimulate the economy. Numerous planned highway improvement projects would maintain and strengthen the road network. Emissions of air pollutants from rail traffic, with train engines powered by diesel, from Shafter on the UPRR line to the north, would add train engine diesel exhaust and would return a historic source of emissions to the valley. Emissions from trains serving the EEC are documented in **Section 4.6**. Train traffic volume or track mileage covered to serve other sites in Steptoe Valley once service is established could occur. Rail traffic volumes would be difficult to predict for any other source than the proposed WPES. The WPES DEIS predicts rail traffic and exhaust emissions similar to those forecasted for the Proposed Action.

A cumulative evaluation of railway transport emissions would also include engine emissions along the full length of transport, from the coal mine to the EEC, though the act of mining the coal effectively ensures transport to the final user or distribution center. A number of coal sources are being considered. Given availability and transport practicalities, the most likely source of most of the coal for the project is expected to be the PRB in Wyoming. The Antelope Mine there was considered conservatively representative as a source of coal. Estimates of engine emissions from 1.35 trains per day over the 985 mile train route from the Antelope Mine to the UPRR line and along that line to Shafter are shown in **Table 5.6-8**. This table includes the Shafter to EEC emissions documented in **Section 4.6**.

TABLE 5.6-8. EMISSION RATES (TONS/YEAR) FROM COAL TRAIN ENGINES FROM MINE SOURCE TO PROPOSED EEC SITES

POLLUTANT	VOLATILE ORGANIC COMPOUNDS (VOCS)	CO	NO_X	PM	SO_2
South Plant Site	235.2	940.9	3164.8	192.5	249.7
North Plant Site Alternative	226.2	904.7	3043.0	185.0	240.1

Emission factors from EPA 420-F-97-048 emission factor (g/bhp-hr)

Uses EPA AP-42 Table 3.4-1 emission factor for S from large diesel engines, assumes 0.25% S content in fuel

5.6.6 Cumulative Effects

This section documents ambient air quality impacts of the Proposed Action and other existing or foreseeable activities in the CEA. For each Action Alternative, the predicted cumulative impacts of all foreseeable permitted industrial activities are presented quantitatively in terms of potential impacts on Class I areas and FLMs identified sensitive class II areas, and their impacts, including risks to human and ecological health, on Class II areas. Current and foreseeable emission sources not included in the quantitative modeling analyses are described above. Potential impacts from current and foreseeable emission sources not included in the quantitative modeling analyses are described qualitatively.

5.6.6.1 Ambient Air Quality Impacts With the South Plant Site

Class I Area and FLM Identified Sensitive Class II Area Impacts

The WRAP BART study included emissions from all major sources of SO_2 in a modeling analysis, documenting impacts from all regional large source permitted emissions as of 2005 and requiring retrofitted emission control enhancements for all sources that were shown to have excess impacts in Class I areas. That analysis, and historic air quality regionally and from the IMPROVE monitoring system in Class I areas show that all applicable ambient air quality standards are met in the Class I areas studied in the CEA, the Jarbidge Wilderness and Zion National Park.

Quantitative Cumulative Air Quality Modeling Impact Analyses.

The PSD program sets a regulatory limit on air quality degradation after a baseline date set by the dates a major source permit application was declared complete in the affected region. **Section 5.6.3** above documents that direct impact modeling results described in **Section 4.6** showed potential EEC impacts in the Class I areas reaching Class I significant contribution thresholds for only one pollutant, SO_2. Cumulative Class I criteria pollutant impact modeling, therefore, was limited to that one pollutant. The federal and state PSD programs limit degradation in air quality since baseline dates set by timing of air permit issuance. The baseline date for major SO_2 sources (sources with greater than 250 tons per year of emissions) in Nevada was set in January 1975. The minor source SO_2 baseline date (for sources emitting less than 250 tons per year) in the vicinity of Zion National Park, one of the two Class I areas for which the cumulative impact analysis was prepared, was set in April 1990. No permitting action has yet set a minor source baseline date for the area surrounding the Jarbidge Wilderness in Nevada, though the Jarbidge area is included in the statewide major source baseline area.

Air quality modeling for cumulative Class I area SO_2 impacts and increment consumption was prepared for all increases in emissions from permitted industrial sources after the baseline dates (major and minor sources for Zion National Park, major sources for Jarbidge Wilderness) within 300 kilometers of either facility consistent with requirements and guidance from the NBAPC. **Tables 5.6-2**, **5.6-5**, and **5.6-6** document the regional PSD SO_2 increment consuming sources included in the cumulative Class I impact modeling analysis. Those sources and their locations are also identified in **Figure 5.6-1**.

Table 5.6-9 compares the model predicted maximum cumulative SO_2 increment consumption since the baseline date against the applicable PSD increment limits at the two Class I areas in the CEA.

TABLE 5.6-9. EEC SOUTH PLANT SITE CUMULATIVE SO_2 CLASS I PSD INCREMENT IMPACTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (MG/M^3)			PSD INCREMENT LIMIT
		2002	2003	2004	
JARBIDGE WA					
SO_2	3 hours	3.51	6.73	4.02	25
	24 hours	0.75	0.98	0.90	5
	Annual	0.03	0.04	0.05	2
ZION NP					
SO_2	3 hours	1.42	2.81	3.22	25
	24 hours	0.55	0.49	0.56	5
	Annual	0.04	0.04	0.04	2

The tables show that the maximum incremental degradation of SO_2 since the PSD baseline dates, calculated consistent with NBAPC requirements and guidance, is well under half the allowable increment limit for all averaging periods at each Class I area in the CEA.

Section 4.6 documents that visibility impacts from the Proposed Action are within ranges deemed acceptable by FLAG, and acid deposition rates are within BLM recommended thresholds. Air quality modeling documented above shows compliance with all applicable air pollutant concentration limits in all Class I and Class II areas in the CEA.

Section 4.6 documents that the modeled acid deposition rates and visibility impacts associated with the EEC in Class I areas are below Class I screening levels. Cumulative SO_2 impacts from the EEC and other PSD regional sources are well within acceptable impact ranges. The EEC's impacts in the FLM-identified sensitive Class II areas, Ruby Lake National Wildlife Refuge and Great Basin National Park, are documented. Visibility impacts from the Proposed Action at the sensitive Class II areas are shown to exceed the thresholds recommended and enforceable for Class I areas by FLAG. The methodologies employed are considered appropriate for visibility impact analyses in Class II areas as well as Class I areas, but federal and state legislation and air permitting regulations provide direct methods for enforcing those visibility impact thresholds in Class I areas that are not as well defined for Class II areas.

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

Monitoring data in **Section 3.6** shows current trends for AQRV parameters visibility and acid deposition have been fairly steady, and criteria air pollutant levels are quite low in the Steptoe Valley and surrounding areas and slightly higher impacts in the more developed areas due to local activity. Proposed regional actions, including the White Pine Energy Station and the Toquop Energy Project have prepared analyses similar to the criteria pollutant and AQRV analyses provided here for the proposed action, meeting their regulatory requirements to demonstrate AQRV impacts within those same thresholds. Cumulative impacts on deposition and visibility from all foreseeable projects could exceed the impacts of any individual project, but would not be expected to reach double the predicted impacts of any individual project due to their spatial distribution. The National Park Service has noted that the three percent increase in deposition rates predicted from the Proposed Action would bring total nitrogen wet deposition to approximately 1.39 kg/ha-yr. NPS research in Great Basin National Park consistent with FLAG

guidance for determining critical load has indicated that soils there are acid sensitive. They note that adverse effects from acid deposition were observed at Rocky Mountain National Park's high mountain lake ecosystems when deposition rates there reached rates of 1.4 to 1.6 kg/ha-yr. The NPS is concerned that acid deposition from any new or increased regional emission source in addition to the proposed action could result in acidification of soils and waterways potentially detrimental to Great Basin National Park's high mountain lake ecosystems.

There is the possibility of some impacts in the two Class I areas from sources other than specific industrial activity that would not be included in the modeling. Regional or urban growth, cumulative impacts from current and foreseeable small industrial operations, and increases in regional traffic could cause increased fossil fuel burning that would increase regional SO_2 concentrations. The Jarbidge Wilderness Class I area is located at considerably higher elevations than surrounding areas, and is remote from any concentrated local or regional emission sources. That remoteness would likely buffer the Jarbidge Wilderness from significant impacts, but not from any possible impact. There are few existing or proposed emissions sources upwind of Zion National Park in the direction of the proposed EEC, though on trajectories with a more east-west orientation the proposed Toquop Energy project and the fast growing cities of southern Nevada and Utah not included in the Class I modeling analyses could contribute to incremental degradation in SO_2 air quality levels.

Land management decisions, including fire and vegetation management, grazing and agriculture, are also likely to have limited impact on air quality over the long term, though some such management efforts, especially those related to fire management, could have noticeable short term effects. Trends toward increased particulate levels are possible as a result of increased wind erosion, though planning for ecological integrity should minimize those possibilities.

Class II Area Impacts

Quantitative Air Quality Modeling Impact Analyses

Cumulative impact analyses were prepared for the three criteria air pollutants for which the direct impact of the proposed EEC resulted in contributions to air pollutant levels; PM_{10}, NO_2, and SO_2. The Class II cumulative air quality modeling analysis added model predicted maximum impacts of the modeled industrial sources associated with the proposed EEC and those of the identified sources identified in **Tables 5.6-1** and **5.6-6** to background concentrations based upon maximum measured air pollutant concentrations at the EEC sites. Those air quality measurements included the effects at the EEC sites of all existing emission sources during the monitoring period.

To compare maximum ambient air pollutant levels with the EEC and all other foreseeable activities operating requires adding three components: the impacts of emissions from the proposed EEC; the impact of emissions from all other air pollutant sources within 50km or the EEC Class II area of significant contribution that are permitted or currently have complete air permit applications being processed by the NDEP; and background concentrations to reflect the impacts of current activities not reflected in the specific modeled emission sources. The data used for each component is described earlier in this section. The cumulative modeling analysis predicted maximum impacts from the first two components; those resulting from emissions from the EEC and from all other modeled emission sources. Background concentrations measured at the South Plant Site were added to those model predicted maximum impacts to estimate the maximum predicted ambient air quality levels with all those sources operating. **Table 5.6-10**

documents the maximum predicted ambient air pollutant concentrations under Maximum Total Concentration. Two results are shown for each pollutant and averaging period: one for modeling with the Ely National Weather Service meteorological data, and one with meteorological data collected at the EEC sites starting in September, 2006. The reported Maximum Total Concentration represents the sum of the impacts from all modeled industrial sources (Cumulative Highest Modeled Concentration, also reported separately for analyses with the two meteorological data sets) and the background concentration. Maximum air quality impacts from all industrial sites modeled is listed under Cumulative Highest Modeled Concentration.

TABLE 5.6-10. NEVADA AAQS MODELING RESULTS FOR THE EEC SOUTH PLANT SITE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE HIGHEST MODELED CONCENTRATION (µG/M3)		BACKGROUND CONCENTRATION (µG/M3)	MAXIMUM TOTAL CONCENTRATION (µG/M3)		NAAQS, NEVADA AAQS(A) (µG/M3)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	4.5[(b)(c)]	3.4	3.7	8.2	7.1	100
SO_2	3 hours	295[(c)]	311	4.0	299	315	1,300
	24 hours	34.3[(c)]	39.7	3.0	37.3	42.7	365
	Annual	8.9[(c)]	4.8	3.0	11.9	7.8	80
PM_{10}	24 hours	32.2[(c)]	21.3	19.0	51.2	72.2	150
	Annual	8.9[(c)]	3.8	7.0	15.9	10.8	50

a NAAQS and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.

b The NOx to NO_2 conversion factor of 0.75 was applied.

c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.

The modeling results show predicted maximum ambient air quality levels compared to the Nevada AAQS and the NAAQS for all pollutants. The predicted maximum total concentration for each pollutant and averaging period can be seen from **Table 5.6-10** to be less than the applicable NAAQS.

Incremental degradation in ambient air quality was modeled for the three pollutants for which the facility was shown (in **Section 4.6**) to have potential areas of significant contributions to ambient air quality levels: NOx, PM_{10}, and SO_2 in Class II areas. The extended CEA and the emission sources included are described earlier in this section, and those emission sources are listed in **Tables 5.6-1** and **5.6-6**. The maximum cumulative incremental degradation at any point in the CEA is documented in **Table 5.6-11** under the cumulative PSD increment consumption header. Those results are directly comparable to the Class II area PSD increment limit. Model predicted results are again reported for model runs with two different meteorological data sets, data collected onsite at the proposed EEC site and data from the National Weather Service station at Ely's Yelland airport.

Model results show that modeled cumulative Class II area air quality degradation does not closely approach the PSD increment limits.

TABLE 5.6-11. PSD CLASS II AREA INCREMENT CONSUMPTION MODELING RESULTS FOR THE EEC SOUTH PLANT SITE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE PSD INCREMENT CONSUMPTION (µG/M^3)[(A)]		PSD INCREMENT LIMIT (µG/M^3)
		MODELING ANALYSIS USING EEC ON-SITE MET. DATA	MODELING ANALYSIS USING ELY NWS MET. DATA	
NO_2	Annual	4.2[(b)(c)]	3.4[(b)(c)]	25
SO_2	3 hours	253[(c)]	279[(c)]	512
	24 hours	27.4[(c)]	20.6[(c)]	91
	Annual	8.9[(c)]	4.8[(c)]	20
PM_{10}	24 hours	27.6[(c)]	14.9[(c)]	30
	Annual	9.9[(c)]	3.8[(c)]	17

a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)

b The NO_x to NO_2 conversion factor of 0.75 was applied.

c The receptor exhibiting maximum impact for this averaging period was directly adjacent to (and possibly within) the Nevada Slag site and did not exhibit a significant contribution from the EEC facility. It was therefore not included in the results.

Quantitative Risk Assessment modeling documents human and ecological risk associated with the combined emissions of the proposed EEC and the proposed WPES would be within recommended safe ranges at all locations within 50 kilometers of the proposed EEC. Cumulative risks associated with mercury emissions from coal-fired energy sources in Steptoe Valley would decrease with increased distance from the proposed EEC sites, since deposition rates decrease beyond that range would be lower than those in the Risk Assessment study area.

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

The only impacts potentially foreseeable in the future not included in either of the reported modeling results would be increases in emissions or background concentrations as a result of increased emissions from sources other than permitted industrial sources modeled. Pollutant concentrations measured at the proposed EEC site show levels an order of magnitude under applicable ambient air quality standards. Emissions from space heating and residential activity are expected to be steady or slightly downward, with efficiency improvements meeting or exceeding increases in the number of individual units. Vehicle exhaust emissions from road and air traffic are expected to remain steady, with increases in miles traveled offset by increased efficiency in miles per gallon and/or emissions per volume of fuel consumed. A peak in emissions from residential, space heating, and transmission sources would likely occur during construction of the EEC and/or the WPES and the associated rail line support, probably not lasting more than a year or two nor increasing regional emissions and having only local air quality impacts. Road dust would be expected to increase slightly. Emissions, primarily dust and

smoke, from land management activities including construction, public land management, grazing, agriculture, and utility corridor maintenance, are expected to be flat or trend slightly upward over time. Those emission trends would be expected to maintain average regional background concentrations an order of magnitude below applicable ambient air quality standards. Isolated areas in the immediate vicinity of sources, or brief periods like during fires or dust storms, could feature air quality impacts above significant contribution thresholds. Foreseeable distant major sources, including the power plants listed, have demonstrated through their NEPA analyses their areas of significant contribution to air quality levels and AQRV impacts, and have performed analyses to document cumulative impacts on air quality and AQRVs in those areas. Air quality permitting and compliance programs would ensure that impacts from other smaller industrial sources not included in the quantitative modeling, including small mines and rock and gravel operations, would have limited localized areas of significant contributions to air pollutant levels and not affect compliance with applicable ambient air quality impact standards.

Rail line traffic was not included in the quantitative air quality modeling results described. **Table 5.6-8** documents cumulative train engine emissions along the rail line from the coal source to the proposed EEC site. Air quality impacts along the UPRR rail line en route from the mine to Shafter generally reach significant contribution thresholds local to the tracks due to current traffic volumes. The 1.3 train round-trips per day forecast as a result of the EEC would not represent a significant increase in rail traffic volume or impacts along the UPRR lines. From Shafter to the EEC, **Section 4.6** documented that significant effects to air quality were expected within 100 yards of the tracks, occasionally over slightly larger areas, where terrain would tend to concentrate train engine emissions. An indirect effect of the EEC project, the establishment of regular rail service from the UPRR in Shafter down to the proposed EEC site, could lead to significant contributions to air pollutant levels in a corridor up to ¼ mile wide along that stretch of tracks if the rail line operators were able to expand traffic volume by offering the rail service to other local or regional businesses.

Ambient air quality impacts would be expected to continue to trend toward moderate levels in the few urban areas along primary transportation routes, or in the immediate vicinity of the few small business operating in the area from those activities not included in the air quality modeling.

Risk Assessment

The risk assessment methodology and results for the EEC South Plant Site are described in **Section 4.6** and **Appendix 4A**. In addition to modeling potential risks associated with the operation of the EEC South Plant Site alone, Tetra Tech (2008) also evaluated effects of the operation of the EEC South Plant Site in conjunction with the WPES out to 50 kilometers. Emissions for WPES combustions sources were obtained from the WPES PSD permit application (Tetra Tech 2008). HHRA and SLERA methodology was the same as for the EEC plant sites, with the addition of the WPES emissions.

Human Risk

Nine modeled receptors showed excess cancer risks of at least 1 in 1 million (10^{-6}) as a result of the combined operations of the two energy centers. None of the risks exceeded 10^{-5}, and all were well within the 10^{-4} to 10^{-6} range recommended by EPA. The receptors with predicted risks over 1 in 1 million included a subsistence fisherman fishing in Duck Creek, and subsistence farmer adults and children in the near vicinity of the South Plant Site.

Total Hazard and Acute Hazard quotients were below the recommended safety threshold of 1 for all receptors studied. The infant risk from breast milk was estimated using ADD_{infant} as 6.8 pg/kg, well below the EPA recommended safety threshold of 93 pg/kg. Lead concentrations in soil as a result of deposition of emissions from the energy centers were predicted to be a million times lower than the 400 mg/kg soil concentration EPA recommends as a threshold for residential properties.

Ecological Risk

HQ and HI values for the SLERA were less than 1 for all receptors for the maximum potential effect cumulative scenario involving operation of all three EEC boilers and the WPES boilers simultaneously. Because all HQ and HI values are less than 1, no adverse cumulative effects on ecological communities as a result of the operation of the EEC and WPES are anticipated.

5.6.6.2 Ambient Air Quality Impacts for the North Plant Site Alternative

Class I Area and FLM Identified Sensitive Class II Area Impacts

Quantitative Air Quality Modeling Impact Analyses

Section 5.6.6.1 above for the EEC South Plant Site describes the process for identifying sources to be considered, and how they were used to assess cumulative Class I area SO_2 impacts. That description and the same list of sources identified applies for the North Plant Site as well.

Section 4.6 showed that the impacts of the North Plant Site Alternative would represent a significant contribution to ambient air quality levels for SO_2 only. For the other PSD pollutants, PM_{10} and NO_2, projected impacts would be below significant contribution levels. **Table 5.6-12** shows that the maximum incremental degradation of SO_2 since the PSD baseline dates is well under half the allowable increment limit for all averaging periods at each Class I area, so cumulative air quality impacts since the PSD baseline dates set by permitting authorities are far from the PSD limits for cumulative degradation.

Section 4.6 documents that AQRV impacts from the North Plant Site Alternative, including acid deposition and visibility impacts, are within allowable ranges recommended by BLM based upon consultation with FLMs.

TABLE 5.6-12. NORTH PLANT SITE ALTERNATIVE CUMULATIVE SO2 CLASS I PSD INCREMENT IMPACTS

POLLUTANT	AVERAGING PERIOD	MODELED CONCENTRATION FOR METEOROLOGICAL YEAR (MG/M^3)			PSD INCREMENT LIMIT
		2002	2003	2004	
JARBIDGE WA					
SO_2	3 hours	5.00	9.63	5.24	25
	24 hours	0.91	1.22	1.02	5
	Annual	0.04	0.04	0.05	2
ZION NP					
SO_2	3 hours	2.11	2.15	2.38	25
	24 hours	0.56	0.53	0.52	5
	Annual	0.04	0.04	0.04	2

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

The potential for cumulative non-industrial impacts for the North Plant Site Alternative is consistent with the discussion offered for the South Plant Site. The only differences would be those described under indirect impacts in **Section 4.6**; the project rail line emissions would end 34 miles further north, and traffic and residential and support activities associated with the EEC site would be further north.

Class II Area Impacts

Class II area impact assessment modeling methodology for the North Plant Site Alternative is consistent with that described for the South Plant Site.

Quantitative Air Quality Modeling Impact Analyses

Table 5.6-12 documents the maximum predicted ambient air pollutant concentrations under Total Concentration. Two results are shown for each pollutant and averaging period; one for modeling with the Ely National Weather Service meteorological data, and one with meteorological data collected onsite starting in September 2006. The reported Total Concentration represents the sum of the impacts from all modeled industrial sources (Cumulative Highest Modeled Concentration, also reported separately for analyses with the two meteorological data sets) and the measured background concentration.

The modeling results show predicted maximum impacts directly comparable to the NAAQS and Nevada AAQS for all pollutants except ozone. The predicted maximum total concentration for each pollutant and averaging period can be seen from **Table 5.6-13** to be less than the applicable NAAQS.

TABLE 5.6-13. NEVADA AAQS MODELING RESULTS FOR THE EEC NORTH PLANT SITE ALTERNATIVE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE HIGHEST MODELED CONCENTRATION ($\mu G/M^3$)		BACKGROUND CONCENTRATION ($\mu G/M^3$)	TOTAL CONCENTRATION ($\mu G/M^3$)		NEVADA AAQS[(A)] ($\mu G/M^3$)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	7.2[(b)]	20.3[(b)]	2.0	9.2	22.3	100
SO_2	3 hours	130	415	13.0	143	428	1,300
	24 hours	22.1	18.6	12.0	34.1	30.6	365
	Annual	3.0	1.5	6.5	9.5	8.0	80
PM_{10}	24 hours	25.9	22.8	8.1	34.0	30.9	150
	Annual	6.8	5.2	2.4	9.2	7.6	50

a National and Nevada AAQS are identical in magnitude. Short-term national standards allow one exceedance per calendar year. Short term values are 1st-highest in accordance with NDEP policy.

b The NO_x to NO_2 conversion factor of 0.75 was applied.

Incremental degradation of Class II ambient air quality was modeled for the three pollutants for which the facility was shown (in **Section 4.6**) to have significant contributions to air pollutant levels: NOx, PM_{10}, and SO_2. The extended CEA and the emission sources included have been previously described. The maximum cumulative incremental degradation at any point in the CEA for the North Plant Site Alternative is documented in **Table 5.6-14** under the cumulative PSD increment consumption header. Model predicted results are again reported for model runs with two different meteorological data sets, data collected onsite at the proposed EEC site and data from the National Weather Service station at Ely's Yelland airport.

TABLE 5.6-14. PSD CLASS II AREA INCREMENT CONSUMPTION MODELING RESULTS FOR THE EEC NORTH PLANT SITE ALTERNATIVE

POLLUTANT	AVERAGING PERIOD	CUMULATIVE PSD INCREMENT CONSUMPTION ($\mu G/M^3$)[(A)]		PSD INCREMENT ($\mu G/M^3$)
		EEC ON-SITE MET. DATA	ELY NWS MET. DATA	
NO_2	Annual	7.2[(b)]	20.3	25
SO_2	3 hours	64	252	512
	24 hours	10.8	10.2	91
	Annual	3.0	1.5	20
PM_{10}	24 hours	20.2	14.8	30
	Annual	6.8	5.2	17

a Value represents the highest modeled impact within the significant impact area and outside the EEC fence line (second highest value for short-term averages)

b The NO_x to NO_2 conversion factor of 0.75 was applied.

Model results show that cumulative air quality degradation after the baseline date does not closely approach the PSD increment limits.

Risk assessment modeling was performed for the North Plant Site Alternative as described for the South Plant Site. The discussion of AQRV impacts under the South Plant Site is valid for the North Plant Site Alternative, for which parallel modeling analyses provided comparable results using the same methodology.

Impacts from Foreseeable Actions Not Included in Quantitative Modeling

The discussion of the impacts of foreseeable air pollution sources not included in quantitative air quality modeling provided for the South Plant Site would be valid for the North Plant Site Alternative, with limited exceptions associated with differences in the location of actions of the proposed energy center. **Section 4.6** describes the differences in impacts with the EEC located at the North Plant Site Alternative rather than the South Plant Site. Those differences include a rail line approximately 34 miles shorter from Shafter and no project rail line emissions south of there; and differences in likely traffic patterns and employee residential locations. Those differences might result in slight differences in location of some of the subsequent growth and associated air quality impacts expected below significant contribution levels, but would not be expected to have much noticeable difference in regional air quality impacts or air pollution concentration trends. If the rail line ends further north under this alternative, and it is not extended south by any other party, the area between the North Plant Site Alternative and the

preferred South Plant Site would not see the train engine emissions and impacts described under the South Plant Site.

Risk Assessment

A cumulative analysis of the risk of combined operations of the proposed EEC and the proposed WPES was prepared for receptors out to 50 kilometers from the North Plant Site, as described for the South Plant Site.

Human Health Risk

Nine modeled receptors showed excess cancer risks of at least 1 in 1 million (10^{-6}) as a result of the combined operations of the two energy centers. None of the risks exceeded 10^{-5}, and all were well within the 10^{-4} to 10^{-6} range recommended by EPA. The receptors with predicted risks over 1 in 1 million included a subsistence fisherman living and fishing in the near vicinity of the North Plant Site, and subsistence farmer adults and children in the near vicinity of the North Plant Site.

Total Hazard quotients were below the recommended safety threshold of 1 for all receptors studied. The acute inhalation hazard quotient exceeded the screening threshold of 1 only at the maximally exposed location, which is unoccupied at present, and only in the unlikely scenario of simultaneous full operations of all main and auxiliary boilers. The infant risk from breast milk was estimated using ADD_{infant} as 2.7 pg/kg, well below the EPA recommended safety threshold of 93 pg/kg. Lead concentrations in soil as a result of deposition from energy facility operations were predicted to be more than a million times lower than the 400 mg/kg soil concentration EPA recommends as a threshold for residential properties.

Ecological Risk

HQ and HI values for the SLERA were less than 1 for all receptors for the maximum potential effect cumulative scenario involving operation of all three EEC boilers and the WPES boilers simultaneously. Because all HQ and HI values are less than 1, no adverse cumulative effects on ecological communities as a result of the operation of the EEC and WPES are anticipated.

5.7 Vegetation, Including Noxious and Non-native, Invasive Weeds and Special Status Plants

5.7.1 CEA Boundary

The CEA boundary for vegetation would be the same as described for surface water (**Section 5.2**).

Rationale

In addition to adopting a similar CEA for simplicity purposes, vegetation can be removed and affected by ground disturbances, which leads to habitat conversion and makes soil more susceptible to erosion, potentially contributing sediment to surface waters. The soil disturbance areas described previously to delineate the soil CEA boundaries would have associated vegetation disturbances. Cumulative vegetation impacts as a result of the project should not be noticeable beyond this area.

5.7.2 Introduction

Figure 5.2-1 depicts the CEA for vegetation. The CEA for vegetation includes nearly 2 million acres in the Central Basin and Range and Mojave Basin and Range ecoregions (EPA 2008). Data on land cover for the CEA for vegetation were obtained from the BLM landcover dataset (BLM 2007i). Fifty-six land cover types defined in the Nevada GAP data are represented within the CEA for vegetation. To facilitate analysis of land cover, and to better correlate the data with project-specific data presented in **Sections 3.7.4** and **4.7**, the 56 land cover types were condensed into 11 categories based on methodology provided within Nevada's Wildlife Action Plan (NDOW 2006). **Table 5.7-1** indicates the acreage of various types of land cover within the CEA and correlates the land cover types with the project-specific data presented in Chapters 3 and 4.

TABLE 5.7-1. LAND COVER ACREAGES FOUND WITHIN THE CEA FOR VEGETATION

LAND COVER CATEGORIES	VEGETATIVE COMMUNITIES WITHIN PROJECT AREA	LAND COVER ACREAGE WITHIN CEA
Agriculture	Agriculture	4,658
Barren Lands	N/A	9,956
Developed/Disturbed (includes medium and low density development, sand and gravel pits; does not include existing utility line development)	Disturbed Lands	918
Basins & Desert Scrub	Creosote Bush	725,595
	Greasewood	
	Joshua Tree	
	Salt Desert Shrub	
	Shadscale	
Lower Montane	Blackbrush	341,438
	Limestone Outcrop	
	Mountain Big Sagebrush	
	Pinyon-Juniper Woodland	
Montane to Alpine	N/A	19,221
Sagebrush Semi-desert	Basin Big Sagebrush	843,849
	Black Sagebrush	
	Douglas Rabbitbrush	
	Rubber Rabbitbrush	
	Winterfat	
	Wyoming Sagebrush	
Sand Dunes & Badlands	Dune	29,721
Riparian/Wetlands	Alkaline Meadow	13,849
	Desert Playa	
	Open Water	
	Riparian	
	Wetland	
Burned Areas	Burn/Fire Affected	86,734
Invasives[1]	N/A	3,530

[1]Acreage of invasives derived from the nv04_ReGap.mdb file from the BLM, which is based on the southwest regional GPA analysis, and represents gross infested acres.

Areas of sagebrush semi-desert, the land cover type with the greatest number of acres within the CEA for vegetation, are found within Steptoe Valley and the proposed utility ROW extending

south of Steptoe Valley into northern Lincoln County. Areas of basins and desert scrub vegetation, the second most prominent land cover type, are found in the central portion of Steptoe Valley, the proposed railroad ROW extending north from Steptoe Valley to Shafter, and the utility lines through most of Lincoln and Clark counties. Areas of lower montane vegetation are found within the proposed transmission facilities ROWs.

Historically, ecosystem process and vegetative cover were altered by grazing practices and development of the West. Present and future disturbance of vegetation in the CEA occurs primarily through activities related to grazing, followed by development of utility lines, roads and railroad lines, and extractive industries (mining and oil/gas exploration). The most extensive land use within the CEA is grazing.

The extent of special status plant species within the CEA for vegetation is unknown. The USFWS developed a biological sensitivity index and analysis of trust resources on BLM grazing allotments in Nevada (USFWS 2003). According to this analysis, none of the grazing allotments within the CEA for vegetation contain any plants with designations under the ESA. **Table 5.7-2** details the State sensitive species with a Global and State Rank, defined by the Nevada Natural Heritage Program (NNHP), found within grazing allotments in the CEA for vegetation.

TABLE 5.7-2. NNHP STATE SENSITIVE SPECIES FOUND ON GRAZING ALLOTMENTS WITHIN THE CEA FOR VEGETATION

SPECIES SCIENTIFIC NAME	SPECIES COMMON NAME	ALLOTMENT(S) WHERE FOUND	GLOBAL AND STATE RANK
Eriogonum phoeniceum	Scarlet Buckwheat	Wilson Creek	G1 S1
Mentzelia argillicola	Pioche Blazingstar	Wilson Creek	G1Q S1
Mentzelia tiehmii	Tiehm Blazingstar	Wilson Creek	G1G2 S1S2
Frasera gypsicola	Sunnyside Green Gentian	Sunnyside	G1 S1

Source: USFWS 2003

The past, present and future disturbances with cumulative impacts to vegetation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.7.3 Past and Present Disturbances

Development of the West changed vegetative conditions through historic grazing practices, activities that altered natural hydrology, introduction and transportation of invasive and exotic species, and fire suppression. The combination of these led to establishment and prolific expansion of invasive and exotic species, such as cheatgrass (*Bromus tectorum* L.). Changes in vegetative cover in conjunction with fire suppression led to further changes that favored invasive and exotic species over native vegetative cover. Widespread changes in vegetative cover changed the fire regime and enhanced the effects of uncontrolled fire (Young and Blank 1995). Together these effects have altered ecosystems processes and vegetative cover within the CEA.

The current land ownership and uses for (thus disturbances within) the vegetation CEA can be found in **Tables 5.1-1** and **5.1-2** above.

Vegetation

Agriculture, Forestry, and Similar Sources of Surface Disturbance

Burning of over 68,000 acres in the CEA (nearly 4.5 percent) changes the maturity of an area's vegetation, can affect the vegetative composition of an area, and can result in the spread of noxious and non-native, invasive weeds with disturbance in addition to the burn.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

No data is available estimating the total acreage of disturbance from the extractive industry within the CEA. Extractive industry disturbance has caused long-term disturbance to vegetation because the extractive process, including use of roads, is long-term. Various degrees of reclamation, either man-made or natural, have resulted in various levels of revegetation of these disturbances. Increased use of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas.

The tailings piles (approximately 3,700 acres) of the McGill Tailings Reclamation Area (see **Section 5.2.3**) were capped with a layer of topsoil and seeded with grasses native to the area. The revegetated area is irrigated annually May through September and is used for commercial grazing. While the grasses used in the revegetation effort are native to the area, the revegetated area does not represent a natural vegetation scheme due to the water received through irrigation (Kennecott Corporation Undated).

Development of 565 acres of sand and gravel pits in the CEA resulted in direct disturbance and elimination of areas of vegetation, approximately 0.03 percent of the CEA. Without rehabilitation efforts, vegetative recovery in former pit areas is a long-term process as soils have been removed and substrate will not support reestablishment of vegetation. In addition, disturbed areas associated with sand and gravel pits provide an opportunity for the spread of noxious and non-native, invasive weeds.

Grazing

The major past and present disturbance of vegetation in the CEA is due to grazing. Nearly 1.8 million acres of the nearly 2 million acre CEA (approximately 91 percent) is available for grazing. The majority of the CEA is enclosed within various BLM administered grazing allotments. Livestock grazing has utilized and continues to utilize the grass/forb species, reducing competition for natural regeneration of tree/shrub species. In addition, grazing activities can result in specific, localized damage in riparian areas from vegetation removal by cattle as well as increasing the introduction and spread of noxious and non-native vegetation species.

Some allotments within the vegetation CEA have been found to have substandard conditions, such as adversely impacted vegetative cover and riparian areas, most of which were created by historic grazing practices. Substandard conditions resulted in modifications to grazing management in order to achieve improvements in range conditions (BLM 2007b, BLM 2007c, and BLM 2007d).

Nearly 70,000 acres within the CEA lie within the Desert NWR and Pahranagat NWR. This area is not included within grazing allotments, thus vegetation should not experience effects from livestock grazing. In addition, under the Ely BLM District RMP (2007a), BLM public lands west of U.S. US-93, in the vicinity of the Desert NWR are not open for grazing. Lands within the Desert and Pahranagat NWRs consist predominantly of basins and desert scrub. The southern portion

of the CEA that falls within the Desert NWR contains some isolated areas of sand dunes and badlands.

Industrial Development

Apex Industrial Park, located at the southern tip of the CEA, is within an area of basins and desert scrub. An unknown portion of the 21,000-acre park is currently developed, therefore actual disturbance to vegetative communities is unknown. It is assumed that within the industrial park that development would result in vegetation removal and construction of structures, roads, and other hardened surfaces.

Roads

In addition to nearly 3,500 miles of roads in the CEA impacting vegetation permanently or in the long-term, roads have associated adverse effects on vegetation. In the case of large expanses of sparsely vegetated unfenced public lands (such as BLM lands), roads can beget other roads. Some people drive off road to access an area they want to reach. In desert climates, soil disturbances from vehicles and desert vegetation are slow to recover, and attract future additional vehicle use. Disturbed areas are much more likely to become infested with noxious and non-native, invasive weeds, and vehicles tend to spread seed from these species.

Utility Production and Distribution

The Harry Allen complex is located in an area consisting of basins and desert scrub vegetation. Power generation facilities and towers supporting associated transmission lines have a permanent adverse affect on vegetation, as existing vegetation has been replaced by structures. Placement of existing water supply lines and fiber optic cable within utility ROWs also has resulted in vegetation disturbances. However, because there are little or no surface facilities associated with these buried lines, there would be minimal permanent impacts.

Electric utility disturbance (Harry Allen complex, natural gas lines, Lincoln County, and NPC transmission lines) in the southern part of the CEA would have had a short-term minor impact on basins and desert scrub vegetation. Other utility development disturbance (for example, the Falcon to Gonder transmission line, and the Silver State East fiber optic line) has taken place within areas of sagebrush semi-desert vegetation, but this is much more limited in extent.

Noxious and Non-native, Invasive Weeds

Noxious and non-native, invasive weeds are prolific in areas of past disturbance, such as the intersection of State Highway 486 and US-93, and along White Pine County Road 27 (a heavily traveled dirt road) in the vicinity of Bassett Lake (see **Figure 3.7-1**). Populations of noxious and non-native, invasive weeds are infrequent in disturbance areas which are outside of drainages, washes, or generally not near moist environments.. Estimated total acreage for invasive species within the CEA is approximately 3,530 acres.

Special Status Plants

Past disturbances to special status plant species are unknown; however, because few to no special status plant species were found within the project area, it is unlikely that populations were significantly disturbed by past or present activities within the CEA.

Summary

Previously disturbed areas represent a measurable, but small proportion of the total CEA. In addition to temporarily and/or permanently reducing vegetation in the CEA, past and present disturbances also result in introduction and increased susceptibility for the establishment of noxious and non-native, invasive weeds. Past and present disturbances to special status plant species are unknown, but assumed to be minimal.

5.7.4 Foreseeable Future Disturbances

Future disturbances to vegetation are quantified in **Table 5.1-3** above.

Vegetation

Agriculture, Forestry, and Similar Sources of Surface Disturbance

The planned fire break in the Spruce Mountain Restoration Project disturbing approximately 16,000 acres of vegetation would have a short-term adverse impact from destruction of vegetation. However, the fire break would have indirect long-term beneficial impacts by protecting vegetation from the effects of fire.

Community Development

Ultimately, approximately 43,000 acres (Las Vegas Review-Journal 2007a) of basins and desert scrub vegetation would be disturbed in the Coyote Springs community development and likely replaced with roads, sports fields, structures (homes and other community infrastructure), and non-native vegetation (lawn grasses and ornamental shrubs and trees).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil/gas development) is possible in the future. At this time, all known plans are for exploration, which would involve some road construction and drilling in selected areas. Expansion of extractive industries exploration activities would have negligible adverse impacts on vegetation in the CEA. However, should economic feasibility of resource development improve in the future, adverse impacts to vegetation would increase in acreage as well as intensity.

Vegetation at the McGill Tailings Reclamation Area will presumably continue to be sustained at present levels as a result of the current irrigation and commercial grazing management regime.

Grazing

Grazing on public lands would continue within the CEA in the foreseeable future. Per the Ely RMP, the goal is to manage vegetation resources to achieve or maintain resistant and resilient ecological conditions while providing for sustainable multiple uses and options for the future across the landscape. These resistant and resilient ecological conditions include healthy, productive, and diverse populations of native or desirable nonnative plant species appropriate to site characteristics. In addition, the RMP specifies goals and objectives to meet range health standards, which are directly related to vegetative cover.

Future range health would be anticipated to improve. Under the Ely RMP, the BLM will continue to monitor and evaluate allotments to determine if they are continuing to meet or are making significant progress to meeting the standards for rangeland health, and management prescriptions adjusted accordingly.

As discussed in **Section 5.9**, changes to the livestock grazing management systems are proposed to improve the overall management of livestock on certain allotments, and updates to the allotment management plans would help to meet the objectives of the allotments. Future changes to grazing management on these allotments would be designed to improve range conditions, which would also result in improvements to vegetative communities.

Industrial Development

Of the 21,000 acres within the Apex Industrial Park, 6,000 acres are currently for sale and available for future development. As stated previously, it is assumed that development would result in construction of structures and other hardened surfaces, and removal of native basins and desert scrub vegetation.

Railroad Development

Reconstruction of the NNRy would result in disturbance of approximately 2,600 acres of vegetation. Indirect effects related to the reconstruction of the NNRy include temporary construction disturbance within the existing ROW, primarily to sagebrush semi-desert land cover. Worker camps, materials staging, and grading would potentially disturb vegetation along the railway. These areas would be revegetated upon completion of construction.

In the area of the proposed Yucca Mountain rail line, approximately 600 acres of vegetation would be disturbed within the CEA (less that 0.001 percent). This vegetation is a mixture of basins and desert scrub and sagebrush semi-desert land cover communities.

Recreation

Increased human recreational activity on arid lands from an expected population increase in White Pine County would result in increased disturbed areas, which could lead to infestations of noxious and non-native, invasive weeds, or increased erosion which would further decrease vegetative cover, adversely impacting vegetative resources.

Roads

Roads disturb a total of nearly 20,000 acres (approximately one percent) within the CEA for vegetation. Future short-term disturbance to vegetation would result from road rehabilitation efforts within the CEA. Adverse effects to vegetation would result from damage to and/or removal of vegetation within the construction zone, and the likely subsequent invasion of noxious and non-native, invasive weeds into the disturbed area.

Utility Production and Distribution

Several proposed projects within the CEA would develop electric transmission and water transport through pipelines to be located within the utilities corridor in White Pine, Lincoln, and Clark Counties (see **Section 5.2.4**). Should the entire SWIP Corridor be maximized with underground water, petroleum or natural gas pipelines, the entire 2,640-foot wide utility corridor would be disturbed; however, there would be little permanent vegetative disturbance. Maximizing the corridor with overhead transmission lines would result in the greatest permanent disturbance of vegetation. Because this area consists primarily of basins and desert scrub, adverse impacts to vegetation would be anticipated to be mostly short-term as grasses and smaller shrubs regenerate. Larger species (such as Joshua trees) would sustain longer-term effects.

Utilization of the SWIP Corridor for a combination of transmission lines and underground pipelines would be most likely, resulting in a combination of short-term and long-term disturbance. It is possible that the entirety of the corridor would not be developed. Construction ROWs can be revegetated; however, disturbance has high potential to lead to the incursion of noxious and non-native, invasive weeds.

As discussed in **Section 5.7.3**, land cover within the proposed utility ROW portion of the CEA for vegetation is primarily either basins and desert scrub or sagebrush semi-desert. Development along the length of the SWIP Corridor within the CEA would impact both vegetation types. Impacts to basins and desert scrub vegetation from disturbance would likely be short-term as the native vegetation would be more likely to reestablish in 10 years or less after disturbance. Impacts to sagebrush semi-desert vegetation would be long-term as many of the larger species of sagebrush do not reestablish after disturbance for approximately 20 years (Whitson et al. 2004). Other proposed utility development within the corridor (such as the natural gas lines, Lincoln County and SPPC/NPC transmission lines) would affect only the southern portion of the CEA, which are dominated by basins and desert scrub vegetation, and therefore adverse effects would be short-term.

Development of the WPES would result in permanent disturbance of approximately 1,510 acres of vegetation on sites occupied by the generating station and towers for associated transmission lines, as well as within a new proposed rail lead connector to the NNRy.

Development of wind farms by Nevada Wind and Enexco would result in disturbance to vegetation for construction of bases for wind turbines totaling 4,470 and 4,536 acres, respectively.

Noxious and Non-native, Invasive Weeds

Indirect effects of any ground disturbing activities would likely include the spread of noxious and non-native, invasive weeds. This would be particularly true for roadway and railroad facility rehabilitation and construction as there are existing infestations along the railway.

Special Status Plants

Development within the utility corridor is the only project in the cumulative impacts scenario that would affect the Wilson Creek and Sunnyside grazing allotments where sensitive species are found within the CEA. Given the limited findings of special status plant species within the project area, it is unlikely that populations would be extensive or significantly adversely impacted by utility corridor development in the cumulative impacts scenario.

Summary

Anticipated future disturbances to vegetation within the CEA would be a measurable but relatively small proportion of the total CEA. Future disturbances are anticipated to temporarily and/or permanently reduce vegetation in the CEA. The potential for future vegetation disturbances within the CEA that result in the introduction and increased susceptibility for the establishment of noxious and non-native, invasive weeds is high. The potential for disturbances to affect special status plant species is unknown, but anticipated to be low.

5.7.5 Cumulative Disturbances

Vegetation

Vegetative cover within the CEA that would be affected by projects in the cumulative impacts scenario primarily consists of basins and desert scrub and sagebrush semi-desert. Much of the disturbance to vegetation in the CEA has been and will continue to be mitigated by reclamation activities that follow the initial disturbances.

Permanent existing disturbances within the CEA are mostly for power plants and associated developments, roadways, and transmission line towers. Additional permanent disturbances are anticipated in the future with the construction of the WPES and several new transmission lines. Disturbances to the basins and desert scrub vegetative community would result from construction activities, and would largely be short-term in duration. Long-term impacts would occur to sagebrush semi-desert communities from construction activities due to the length of time required for sagebrush to reach maturity.

Over 90 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities.

The vegetation CEA totals nearly 2 million acres. Within the CEA for vegetation, known quantifiable past and present disturbances total approximately 120,382 acres. Proposed future disturbances identified above would potentially disturb another 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 107,713 acres, which is approximately 11 percent of the total area of the CEA.

Noxious and Non-native, Invasive Weeds

Occurrences of noxious and non-native, invasive weeds within the CEA along the SWIP where utility development has not taken place are sporadic. However, occurrences of noxious and non-native, invasive weeds in areas of disturbance, such as near the intersection of State Highway 486 and US-93, demonstrate a dense population and wide variety of noxious and non-native, invasive weeds. The probability of invasion of noxious and non-native, invasive weeds into disturbed areas, particularly transportation routes, is high.

Special Status Plants

Cumulative effects to special status plant species are anticipated to be negligible as no plants with designated status under the ESA are identified as being found within the grazing allotments within the CEA. Only two allotments contain a total of four state sensitive species and very few sensitive species were found within the project area.

5.7.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future vegetation disturbances, would result in cumulative effects to the vegetative community in the CEA being both short- and long-term and negligible to minor. Cumulative effects from noxious and non-native, invasive weeds would be long-term, minor to moderate. Cumulative effects to special status species would be negligible.

As discussed in **Section 4.7.2.1**, deposition of nitrogen and sulfur compounds from carbon fuel combustion sources can potentially lead to a reduction of available nutrients for plant growth causing stress which can lead to increases in the susceptibility of vegetation communities to effects of adverse climatic conditions; increases in pest and pathogen stress which results in reduced vegetation health; and to eventual changes in vegetation species composition. The emissions of this type from the EEC along with those of other combustion sources in the air quality CEA could pose potential cumulative effects on vegetation within this CEA. The cumulative effects of other COPCs in the emissions from both the EEC and WPES were modeled for the near field area and are discussed in the Risk Assessment narrative in **Section 5.6**.

5.8 Wildlife Resources, Including Special Status Wildlife, Migratory Birds, Fisheries, and Aquatic Species

5.8.1 CEA Boundary

Wildlife - Generally, the CEA includes suitable habitat for a given species within a 15-mile radius from the plant site, plus a 2.5-mile buffer on each side of all linear facilities. These arbitrary distances from the direct effect areas are further defined to the individual species' likely dispersal capabilities and/or more appropriately enlarged for big game (i.e. herd size and summer/winter ranges). The total area of this CEA is 2,443,792 acres.

Fisheries – The CEA boundary for fisheries is the same as for surface water, encompassing 1,992,334 acres (**Section 5.2**).

Impacts to wildlife from the air emissions within an even larger CEA are discussed in the Air Quality section of this chapter (**Section 5.6**) under the Ecological Risk Assessment discussion.

Rationale

Wildlife - Most impacts to wildlife would occur within or immediately adjacent to the project disturbance area. Impacts would mostly be limited to localized displacement at the plant site and substation sites and temporary displacement for all other components of the Project. Incidental take or permanently displacement of some individuals could occur; however, there should be no significant impacts to wildlife populations on whole. The project area does not provide unique habitats that are not already widely available adjacent to the project area, thus minimizing potential impacts related to displacement. How far individuals would displace, and the impacts of this displacement on resident populations is not known; however, given the scale of this Project, it is unlikely that any short-term or long-term, adverse impacts to wildlife species would be noticeable beyond the identified CEA.

Fisheries – Fisheries habitats are supported by surface water and near-surface ground water. The CEA incorporates natural watershed boundaries including all past, present, and reasonably foreseeable disturbances in the Duck Creek watershed downstream of the Duck Creek Impoundment.

5.8.2 Introduction

Figure 5.8-1 depicts the CEA for wildlife. Sagebrush semi-desert and basins, and desert scrub are the two dominant vegetation types within the CEA (BLM 2007i). Riparian areas and other vegetation communities also occur throughout the CEA in lesser amounts. This diversity in habitat types allows for many wildlife species to utilize the area. Types of wildlife species and their habitat found within the CEA would be very similar to those described in the affected environment for the Proposed Action, in **Section 3.8**.

In addition to BLM lands, over 68,000 acres of the 1.5-million acre Desert NWR, and nearly 1,300 acres of the 5,380-acre Pahranagat NWR fall within portions of CEA for wildlife. Both areas are managed by the USFWS, who, "…works with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people" (USFWS 2007c). A portion of the Desert NWR is contiguous with the Coyote Springs ACEC, and portions of the ACEC are contiguous with the Arrow Canyon, Meadow Valley Range, and Delamar Mountains Wilderness Areas. Taken together, the range and refuge along with the ACEC and wilderness areas provide a large expanse of public lands that provide wildlife habitat, in particular habitat for desert tortoise.

Past, present, and reasonably foreseeable actions in the wildlife CEA have likely resulted in both beneficial and negative impacts, at various levels, on wildlife. The foremost impact to wildlife within the area has been habitat changes associated with past and present grazing; utility transmission and distribution; and extractive industry activity. Negative impacts would include loss of habitat, displacement, and fragmentation as a result of utility distribution developments, extractive industry activity, roads, private land development, agriculture and recreation. Other impacts include noise disturbance/displacement from agriculture, extractive industry, roads, and recreational activities.

Specific to small and less mobile wildlife species (i.e., invertebrates, small mammals, amphibians, and reptiles), past impacts from direct crushing and mortality by livestock, large wild ungulates, and vehicles has likely also occurred within the CEA. In addition, grazing can contribute to impacts by increasing competition for forage, facilitating the spread of noxious and non-native, invasive weeds, changing the structure or composition of native plant communities, and degrading water quality and bank stability. Conditions in some wildlife habitat could be improved through revised grazing allotment management.

The past, present, and future disturbances with cumulative impacts to wildlife discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.8.3 Past and Present Disturbances

Within the CEA, past and present disturbances have primarily resulted from grazing and utility transmission and distribution. The majority of the CEA is enclosed within various grazing allotments. In general, wildlife are affected by livestock grazing due to competition for forage, direct mortality by trampling (i.e., amphibians and reptiles), and habitat removal/conversion.

Wildlife

Current land ownership and uses within the wildlife CEA are presented in **Table 5.1-1** and **5.1-2**, respectively.

Agriculture, Forestry, and Similar Sources of Surface Disturbance

In the previous nine years, over 4 percent of the CEA burned, and most notably, nearly 68,000 of those acres burned in 2005. In years immediately proceeding burns, barring other disturbances or significant erosion of burned areas, new vegetation growth can be prolific offering high quality forage for a wide range of wildlife species. However, loss of stands of mature vegetation reduces vegetative cover beneficial to the protection and survival of wildlife, particularly smaller species. With additional or associated disturbance (such as erosion) the spread of noxious and non-native, invasive weeds within burned areas can result, reducing the value of the area for wildlife habitat. Beneficial and adverse effects would be anticipated to be offsetting.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Extractive industry disturbance is more likely to be long-term in nature as the extractive process is lengthy, and rehabilitation of roads and other disturbance can take many years. Sand and gravel pits, including those that are active, inactive, and abandoned, occupy approximately 0.03 percent of the wildlife CEA. Development of sand and gravel pits results in long-term elimination of wildlife habitat, and reduction of the value of areas surrounding pits due to human activity. Increasing the number of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas, further degrading wildlife habitat.

Grazing

Studies of selected allotments within the CEA have found in some cases rangeland health standards are not being met (BLM 2007b, BLM 2007c, BLM 2007d). Current grazing practices are largely not to blame for substandard range conditions, rather, historic grazing practices resulted in currently experienced substandard conditions. Substandard range health conditions adversely affect wildlife as the forage for sheep and cattle also sustain populations of antelope, deer, and elk. Substandard conditions are found on a relatively small proportion of the CEA.

Roads

Approximately 2 percent of the CEA for wildlife is disturbed by existing roads. In addition, there are numerous unmapped dirt and two-track roads accessing areas within the open BLM lands. In addition to reducing forage, increasing opportunity for erosion to degrade habitat, and the increased possibility of introduction of invasive species, roads create breaks in vegetation that make it easier for smaller species to be preyed upon, and ultimately fragment habitat. Higher speed paved roads through undeveloped areas increase risk of collisions of wildlife with vehicles, resulting in increased levels of mortality.

Industrial Development

Apex Industrial Park, a development on private land, is located just south and east of the Coyote Springs ACEC and south of the Desert NWR. Given its proximity to other high quality wildlife habitat, it is assumed that the industrial park formerly contained wildlife habitat prior to development. The current level of development of the 21,000-acre park is unknown. Given the fact that 6,000 acres within the park are advertised for sale, it is assumed that some undisturbed lands remain; however, they would be impacted by other development in close proximity within the park.

Railroad Development

The majority of the existing railroad development within the CEA consists of the unused NNRy. Because the NNRy is currently unused, the impact of the railroad grade and track on wildlife and habitat is minimal, perhaps contributing to habitat fragmentation.

Utility Production and Distribution

Approximately 5,636 acres, or 0.25 percent within the CEA for wildlife are disturbed by utility ROWs. Utility ROWs within the CEA have been developed for power transmission and the placement of water and gas pipelines and fiber optic cable. Existing power production and distribution within the CEA includes the Harry Allen complex consisting of the generating station, switchyards, and substations; and segments of numerous transmission lines. Permanent towers supporting transmission lines eliminate range resources within the tower footprints that support wildlife, they also provide perches and nest sites for raptors, which prey on smaller sensitive species such as pygmy rabbits and sage grouse. Transmission lines can cause mortality to avian wildlife through electrocution and collisions although their design is intended to mitigate this.

Placement of existing water supply lines and fiber optic cable within utility ROWs has disturbed vegetation. However, there are little or no surface appurtenances associated with these buried lines so the impact is short term. Removal of vegetation, that provides both forage and cover during installation of lines or cable, results in both short and long-term adverse impacts to wildlife habitat.

Installation of transmission lines, water or gas lines, fiber optic lines, or extractive industry access often require construction of roads for access. Roads may be used long-term for ongoing operations or maintenance within a mining claim or utility ROW. Road construction along with utility construction or mine operations results in direct mortality of wildlife, while long-term use and maintenance of roads can result in habitat fragmentation. Increased use of roads can lead to transportation of noxious and non-native, invasive weeds into disturbed areas, further reducing the value of habitat in the vicinity of mines and utility development.

Special Status Wildlife

The current land ownership and uses for (thus disturbances within) the special status species CEA would be the same as those described for wildlife in **Tables 5.2-1** and **5.2-2** above.

The effects described above are often amplified for special status wildlife. Sensitive species, such as pygmy rabbits, burrowing owls, and sage grouse, are adversely affected by substandard range conditions, as these species also rely on the range for food sources as well as cover. The effect of habitat fragmentation from roads described above is particularly important for smaller sensitive species, such as pygmy rabbits and sage grouse, as the “breaks” in the habitat either separate populations from each other resulting in genetic isolation, separate habitat components that are crucial at different life stages, or offer greater opportunities for predators.

Figure 5.8-1. Wildlife CEA

Migratory Birds

The current land ownership and uses for (thus disturbances within) the CEA would be the same as those described for wildlife in **Tables 5.2-1** and **5.2-2** above.

The effects described above for general wildlife also similarly impact migratory birds. Past changes in vegetative communities and removal of native vegetation has changed or eliminated habitat used by migratory birds for cover, forage, and reproduction.

Fisheries

The current land ownership and uses for (thus disturbances within) the fisheries CEA would be the same as those described for surface water resources in **Tables 5.2-1** and **5.2-2** above.

The primary fisheries resources within the CEA are Duck Creek and Bassett Lake. Bassett Lake is used for recreational fishing. As described in Section 5.2.3 under extractive industry, the fish in these resources contain heavy metals, thus have been impacted by extractive industry in the area.

5.8.4 Foreseeable Future Disturbances

Future disturbances to wildlife are quantified in **Table 5.1-3** above.

Wildlife

Agriculture, Forestry, and Similar Sources of Surface Disturbance

The fire break component of the Spruce Mountain Restoration Project, anticipated to disturb approximately 16,000 acres, would have an adverse impact on wildlife from the destruction of vegetation that provides forage and cover. However, the fire break would have indirect long-term beneficial impacts by protecting vegetation, and thus wildlife habitat, from the effects of fire.

Community Development

The Coyote Springs community development, described in detail in **Section 5.2.4** under Community Development, could potentially have largely adverse effects on wildlife. Ultimately, approximately 31,000 acres of wildlife habitat (basins and desert scrub vegetation) would be removed for community development. Approximately 12,000 acres planned for parks, open space and multi-species habitat and a planned 17-acre lake would provide habitat and a new water source, enhancing habitability. However, overall wildlife impacts are anticipated to be long-term and adverse due to loss of habitat that was essentially contiguous with the Desert NWR (separated and somewhat fragmented by US-93) and the Coyote Springs ACEC, and from removal of native vegetation. While provision for open space and development of a man-made water source would enhance wildlife habitat, these changes would likely result in shifts in the kinds and the population levels of wildlife found as the ecosystem of the immediate area would be permanently altered and differ from the native ecosystem.

Another result of the Coyote Springs development would be increased traffic on US-93 between Coyote Springs and Las Vegas. Increased traffic in this area surrounded by public lands managed for wildlife values would likely result in increased collisions between wildlife and vehicles, increasing mortality.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities, which would involve some road construction and drilling in selected areas, would have adverse impacts on wildlife, is anticipated to be minimal at this time. However, should economic feasibility of resource development improve in the future, adverse impacts to wildlife (from direct mortality, habitat loss and fragmentation) would increase.

Grazing

Grazing would be anticipated to continue within the CEA in the foreseeable future. See **Section 5.9** for a detailed discussion of future grazing. Future range health (and therefore wildlife habitat) would be anticipated to improve with changes to the livestock grazing management systems and updated allotment management plans to meet the objectives of the allotments. Future changes to grazing management would be designed to improve range conditions, and as a result, wildlife habitat conditions would improve as well.

Industrial Development

Of the 21,000 acres within the Apex Industrial Park, 6,000 acres are currently for sale and available for future development. As stated above, it is assumed that development would result in construction of facilities that would eliminate any remaining lands from serving as wildlife habitat.

Railroad Development

Reconstruction of the existing NNRy railroad and new construction of a rail lead to the WPES plant site would take place within the CEA for wildlife. Reconstruction of the NNRy would result in disturbance of approximately 2,600 acres of wildlife habitat. Since an existing rail grade is present, direct effects of the NNRy reconstruction to wildlife habitat would result from trampling or destroying surrounding vegetation and from human activity temporarily dispersing wildlife.

Indirect effects on wildlife related to the reconstruction of the NNRy include temporary habitat disturbance within the existing ROW, primarily to greasewood and Wyoming sagebrush habitats. Worker camps, materials staging areas, borrow pits, and general grading, would potentially disturb wildlife habitat along the railway. Most of these areas would be revegetated upon completion of construction. During NNRy operations wildlife could be directly affected by noise, increased rail and vehicle traffic, and an increase in human presence along the ROW.

The proposed railroad to serve a geologic repository at Yucca Mountain would transect the project area and the wildlife CEA in north central Lincoln County. During construction, approximately 600 acres of vegetation would be disturbed, and a small portion of that area would be permanently occupied by the rail line. This area is potential range for pronghorn, elk, and bighorn sheep, and serves as winter range and a migration corridor for mule deer, therefore this development could potentially adversely impact these species.

Recreation

White Pine County and NDOW's acquisition of 6,000 acres including Bassett Lake from Kennecott Copper Company is planned to result in improvements to the lake and wetlands, which could improve riparian habitat and benefit wildlife. The improvements also include a proposed campground, picnic areas, boat launch, and restrooms, which would potentially increase human activity and deter wildlife utilization of habitat in parts of the area.

Increased human population in White Pine County would likely also increase recreational pressure on surrounding public lands. Increased human activity, hunting, and potential

increased poaching would all lead to short-term impacts to wildlife. Adverse effects to wildlife would also be experienced in the long-term with permanent increases in human population from plant operations.

Roads

While no new major highway development is currently proposed, development within the proposed utility ROWs would involve development of roads for construction as well as ongoing maintenance of infrastructure within the ROW. Additionally, increased use of public lands would lead to increased development and use of informal roads on public lands that would adversely impact wildlife through increased potential for collisions, displacement, and habitat fragmentation.

Utility Production and Distribution

The most prominent anticipated disturbance of wildlife within the CEA would be utility production and ROW development. The WPES would result in an approximate 1,902 acre disturbance which would, in part, be mitigated by a permanent development of existing wildlife habitat in White Pine County, and would contribute to further development of utility ROWs through the installation of transmission lines. Development of the WPES would result in permanent disturbance of approximately 1,510 acres of wildlife habitat on sites occupied by the generating station and towers for associated transmission lines, as well as within a new proposed rail lead connector to the NNRy.

Three major planning efforts address the development of multiple-use utility corridors: the WWEC Programmatic EIS (PEIS); the designated BLM Utility Corridor; and the SWIP Corridor. All three planning projects address the utility corridor within the CEA. The possible development scenarios for this corridor are discussed in greater detail in **Section 5.2**.

Maximizing the corridor with overhead transmission lines would result in the greatest permanent long-term impact to wildlife through placement of structures for transmission lines, creating perches as well as hazards for birds of prey, and construction of maintenance roads that fragment habitat. As described above, the corridor would be able to accommodate up to six transmission lines in a 2,640-foot wide corridor.

Several proposed projects within the CEA would develop water resources and transport the water through pipelines to be located within portions of the utilities corridor. Should the entire corridor be maximized with underground water, petroleum, or natural gas pipelines, wildlife habitat would be disturbed in the short term due to construction; however, assuming effective reclamation, there would be little permanent disturbance of habitat.

Utilization of the corridor for a combination of transmission lines and underground pipelines would be most likely, resulting in a combination of short-term and long-term disturbance. It is possible that the entirety of the corridor would not be developed. Construction corridors can be revegetated; however, disturbance has high potential to lead to the incursion of noxious and non-native, invasive weeds that reduce the quality of wildlife habitat.

Special Status Wildlife

Future effects to special status wildlife would be similar to those described under past and present disturbances above.

Migratory Birds

Future effects to migratory birds would be similar to those described under past and present disturbances above.

Fisheries

Fisheries resources would continue to be impacted by metals contamination resulting from the extractive industry downstream of the KCC tailings area. They would also be impacted by land disturbing activities that would result in increased sedimentation and degraded water quality, as described in **Section 5.2**.

5.8.5 Cumulative Disturbances

The wildlife CEA totals over 2.2 million acres. Within the CEA for wildlife, known quantifiable past and present disturbances total approximately 132,343 acres. Proposed future disturbances would potentially disturb another approximately 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 325,674 acres, which is nearly 13 percent of the total area of the CEA.

Over 90 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities, which would result in improved wildlife habitat.

5.8.6 Cumulative Effects

TEPC Species

<u>Desert Tortoise</u>

Approximately 138,000 acres of the CEA for wildlife are desert tortoise habitat, located in an area approximately 40 miles either side of the Cark/Lincoln County line. Both above and below ground development within the utility corridor in this area would adversely impact desert tortoises. Temporary adverse impacts to desert tortoise would result from noise and human activity associated with construction activities within the corridor. Short-term impacts could result from direct mortality of individuals reducing population levels and potential destruction of burrows, although these impacts would be reduced and possibly eliminated through implementation of mitigation measures. Short- to long-term impacts to desert tortoise would result from clearing of vegetation that provides forage and cover.

Long-term impacts would result from the permanent loss of habitat as new transmission line towers would occupy land; from transmission line towers creating perches for birds of prey (particularly ravens); increasing predation in the vicinity of the transmission lines; from maintained access roads creating permanent breaks in vegetation and potentially fragmenting

habitat. Fragmentation is a major contributor to population declines in desert tortoises because tortoises have large home ranges (over 1.5 square miles of habitat per tortoise, USFWS 1994). When home ranges are fragmented, tortoise movements are restricted and tortoises are less able to self regulate population densities and find mates outside an isolated pool. This creates relatively small populations that are more susceptible to extinction.

The Coyote Springs development, located within the wildlife CEA, is essentially surrounded on the north, east, and south sides by the Coyote Springs ACEC protecting critical desert tortoise habitat. As the development is surrounded by desert tortoise habitat, the development would result in a loss of up to 31,000 acres of desert tortoise habitat, reducing available habitat and further fragmentation of remaining habitat.

Implementation of mitigation measures as those described in **Section 4.8.2.5** would help to reduce potential impacts to desert tortoise. Overall cumulative effects to desert tortoise would be short- and long-term and moderate.

BLM Sensitive and State of Nevada Special Status Species

Sage Grouse

Most of the area within a 50-mile radius of the proposed plant sites, and the CEA along the proposed transmission line ROW south from the plant sites to just inside the Lincoln County border is yearlong sage grouse range, totaling nearly 700,000 acres. In this area, the projects that could result in cumulative effects to sage grouse would include the White Pine Energy Station, utility corridor development, development and use of roads, and increased recreational activity.

Temporary effects to sage grouse due to human activity during construction would extend to acreage beyond the actual development due to the fact that human disturbance associated with construction activities would discourage habitation of the area. Vegetation trampling and clearing required for transmission facility distribution would reduce or eliminate vegetation for foraging and cover in the short term. Because some species of sagebrush require 20 or more years to mature, some adverse wildlife effects from vegetation removal may be long-term as well.

Construction of the WPES facility would permanently reduce yearlong sage grouse range, resulting in a long-term adverse impact to sage grouse. However, this would represent less than a 0.5 percent reduction in sage grouse range within the CEA for wildlife. Development of the WWEC/SWIP Corridor for infrastructure related to the WPES, as well as other transmission facilities, would adversely impact sage grouse. Construction of transmission line towers would permanently remove lands from sage grouse habitat. In the long term, despite installation of perch prevention devices, transmission towers would likely serve as perches for birds of prey, enhancing predation of sage grouse along the corridor.

Roads developed for construction or ongoing maintenance would break the vegetative cover and depending on the level of use could further fragment habitat. Increased recreational use on public lands could result in increased habitat fragmentation and unintentional disturbing of leks and mating strategies that could lead to further population declines. However, the amount of public lands available for recreation and the extent of potential sage grouse habitat available moderates these effects.

Implementation of mitigation measures such as those described in **Section 4.8.2.5** during work within the utility corridors on public lands would help to reduce potential impacts to sage grouse.

Overall cumulative effects to sage grouse would be short- and long-term, minor to moderate.

Pygmy Rabbits

Because pygmy rabbits are typically found in areas of tall, dense Wyoming sagebrush, and were observed in the northern portions of the project area, they would most likely be found in the northern portions of the CEA in areas of Wyoming sagebrush semi-desert vegetation. Because of the pygmy rabbits' dependence upon sagebrush habitat and susceptibility to predation, cumulative impacts to pygmy rabbits would be very similar to those described above for sage grouse. Overall cumulative effects to pygmy rabbits would be short- and long-term, minor to moderate.

Raptors

Known locations for various species of raptors are found within the CEA in the northern portions of the CEA within the radii of the proposed plant sites. In addition, many species of raptors utilize the diversity of habitats that exist throughout all of the proposed electric transmission line segments, and thus would utilize these areas. Noise and increased human activity associated with the construction of the transmission lines and power production facilities would have a temporary impact on nesting and foraging activities. Mitigation measures similar to those discussed in **Section 4.8.2.5** could be employed prior to and during construction activities that would greatly reduce the likelihood of raptor nesting behavior being disrupted or nests being destroyed. Transmission lines result in adverse effects to raptors due to collisions between birds and lines. Beneficial effects to raptors from transmission lines result from improved hunting opportunities from the towers. The intensity of these impacts would vary according to species, but impacts that are a direct result of construction activities and presence of towers and lines are not expected to exceed a negligible level.

Increased usage of US-93 and human presence on public lands may result in increased mortality and affect habitat usage patterns; however, these long-term adverse effects to raptors would be anticipated to be negligible.

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future disturbances, would result in expected cumulative effects to wildlife being short- and long-term, minor and adverse.

Burrowing Owls

Suitable habitat for burrowing owls occurs throughout various portions of the project area, and thus throughout the CEA. The introduction of new transmission lines in utility corridors within the CEA for wildlife increases the likelihood of burrowing owls experiencing in-flight collisions with towers and lines. The presence of transmission lines may also deter burrowing owls from nesting in previously occupied habitat. The operations, maintenance, and abandonment of electric transmission lines would have both short-term and long-term impacts on burrowing owls. The magnitude of these cumulative impacts could range from minor to moderate.

Burrowing owls may habituate themselves to humans as well as anthropogenic structures and machinery. As a result, burrowing owls would likely avoid nesting in these areas, but over time may resume foraging in these areas. Overall cumulative effects to burrowing owls would be short- and long-term, negligible to minor.

Bats

Bat roosting areas could be present within the CEA. Construction activities could disturb bats in the short term, while increased population and industrialization could have a longer term adverse impact. Bats likely use most of the CEA for foraging opportunities. Construction activities could cause bats to temporarily abandon foraging within active work zones. Changes to or removal of vegetative cover could reduce the quality of insect life available to sustain bat populations. However, short- and long-term cumulative effects to bats would only be anticipated to be negligible.

General Wildlife

Pronghorn Antelope

Most of the CEA for wildlife is habitat for pronghorn antelope, except for the higher elevations. Development within the SWIP Corridor throughout the CEA north of Segment 9B would disturb pronghorn antelope in the short term due to human activity. Cumulative adverse impacts to pronghorn would be short-term and negligible to minor, depending on the magnitude of concurrent development within the SWIP Corridor.

Potential concurrent construction of the WPES and EEC in the northern portion of the CEA for wildlife would result in increased traffic on US-93. Increased traffic on US-93 would be expected to result in an increase in collisions between individuals and vehicles. Mortality from vehicle collisions resulting from increased traffic on US-93 would be expected to have negligible to minor short-term adverse impacts on pronghorn populations.

Adverse effects to pronghorn antelope from construction of the proposed WPES would be similar to those of the EEC, resulting in permanent loss of habitat. However, due to the extent of pronghorn habitat within the CEA, permanent losses of habitat should result in negligible long-term effects. An increase in the human population within White Pine County would result in increased human activity within pronghorn habitat, potentially concentrating pronghorn populations in lesser used areas. Long-term loss of habitat from permanent transmission towers located within the SWIP Corridor and from increased human activity within pronghorn habitat would be anticipated to have negligible adverse impacts on pronghorn antelope due to the large extent of suitable habitat within the CEA.

Overall cumulative effects to pronghorn antelope would be short- and long-term, and negligible to minor.

Mule Deer

Mule deer year-round range is found within the CEA for wildlife in the northern portions of the CEA at higher elevations within the radii of the proposed plant sites. The majority of development contained within the cumulative effects scenario would not be within the mule deer year-round range. The SWIP Corridor does cross through summer and winter range, crucial winter range and migration corridors in several locations. Effects to mule deer from power plant construction, increased traffic on US-93, development of the SWIP Corridor, and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to mule deer would be short- and long-term, and negligible to minor.

Elk

The majority of the area of the CEA for wildlife is potential elk habitat, with exception of the WWEC/SWIP utility corridor south of and along US-93 in Lincoln County. The construction of the Robinson Summit Substation in conjunction with development within the utility corridor may disturb elk and alter their movement patterns. Because those developments are in the immediate vicinity of US-50, the disturbance could result in increased elk presence along the highway, and increased incidence of collisions with vehicles. All other effects to elk from power plant construction, increased traffic on US-93, development of the SWIP Corridor, and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to elk would be short- and long-term, and negligible to minor.

Bighorn Sheep

A large area of potential bighorn sheep habitat is found within the CEA for wildlife in the northern portions of the CEA at higher elevations within the radii of the proposed plant sites. However, no projects within the cumulative effects scenario are anticipated to impact these areas.

The SWIP Corridor within the CEA for wildlife crosses both potential and occupied desert bighorn habitat from the vicinity of the proposed plant sites to the southern terminus of the CEA. Increased traffic on US-93 between Las Vegas and the new Coyote Springs development could result in increased collisions between vehicles and individuals, increasing mortality. Effects to bighorn sheep from development of the SWIP Corridor and increased recreational use of public lands would be similar to those described above for pronghorn antelope.

Overall cumulative effects to bighorn sheep would be short- and long-term, and negligible to minor.

Migratory Birds

The introduction of new transmission lines increases the likelihood of avian wildlife and waterfowl experiencing in-flight collisions with towers and lines. Development of the EEC and WPES and the utility ROWs would increase the number of transmission lines and towers, increasing the potential incidence of collision. In areas where high-density migration takes place within the utility ROWs, including design features intended to reduce collisions by making transmission lines more visible to avian wildlife and waterfowl would likely take place. Transmission towers would be designed to reduce electrocutions, roosting, perching, and nesting. These measures would mitigate most adverse effects.

Overall cumulative effects to migratory birds would be short- and long-term, and negligible to minor.

Fisheries

Fisheries resources have metals contamination resulting from the extractive industry downstream of the KCC tailings area, and are stressed by sedimentation resulting from ground disturbance. Such contamination and ecological stress would be anticipated to continue in conjunction with existing disturbances and future development, particularly extractive industry activity. However, the Proposed Action would only make a negligible contribution, at most, to cumulative adverse effects to fisheries resources species.

5.9 Range Resources

5.9.1 CEA Boundary

The CEA boundary for range resources includes the full extent of the allotments and the permittees of those allotments that occur within the boundaries of the power plant sites, NNRy/rail leads, the Alternative Rail Line, and the SWIP Corridor, including the transmission line alignment alternatives. The total area of this CEA is 5,592,916 acres.

Rationale

Portions of each of these allotments occur within the direct effects area and could be impacted by the Project. Livestock displaced from the direct effects area by the project would likely be moved to other portions of the allotments outside of the direct effects area.

5.9.2 Introduction

Figure 5.9-1 depicts the CEA for range resources. The entire CEA for range resources is enclosed within various grazing allotments. Range resources within the CEA would be similar to those described for the project area in **Section 3.9**.

Cumulative effects to range resources in the CEA primarily occur from historic fire suppression and grazing activities; ongoing grazing; utility production and distribution; recreation; and extractive industry activities. These activities reduce public lands available as range resources, or result in adverse effects to the resource such as spread of noxious and non-native, invasive weeds, or loss of vegetative cover.

5.9.3 Past and Present Disturbances

Current land ownership and uses within the range resources CEA are presented in **Tables 5.1-1** and **5.1-2,** respectively.

Development of the West changed range conditions through historic grazing practices; activities that altered natural hydrology; irresponsible use of fire; introduction and transportation of invasive and exotic species; and fire suppression. The combination of these led to establishment and prolific expansion of invasive and exotic species, such as cheatgrass. Changes in vegetative cover in conjunction with fire suppression led to further changes in range conditions that favored invasive and exotic species over native vegetative cover. Widespread changes in vegetative cover changed the fire regime and enhanced the effects of uncontrolled fire (Young and Blank 1995). Together these effects have altered ecosystems processes, vegetative cover, and range resources found within the CEA.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Thirty existing mining claims or districts are located within the CEA. Approximately 581 acres, or 0.01 percent, of the CEA is disturbed by gravel pits. The area disturbed by the extractive industry (mining, gas/oil exploration and development) reduces acreage available for grazing within the CEA, resulting in long-term impacts to range resources. Currently, extractive activities within the CEA for range resources are minimal; therefore adverse impacts would be negligible.

The McGill Tailings Reclamation Area is private land that has been revegetated with native grass species, and provides lands for grazing that would otherwise have been displaced by tailings storage.

Grazing

The foremost past and present impacts to range resources within the area have been recent past grazing practices; utility production and transmission/distribution; and extractive industries activity. Over five million acres, nearly 94 percent of the CEA is available for grazing.

Past and present disturbances to range resources from grazing would be the same as conditions described for range resources in the affected environment, **Section 3.9**.

Roads

The CEA for range resources contains over 51,000 acres of disturbance from roads. Existing roads impact livestock by reducing acreage available for grazing, separation of grazing allotments, and through collisions between livestock and vehicles. Given that roads only occupy 0.92 percent of the CEA, the impacts on range resources from roads are minimal.

Railroad Development

Existing railroad developments within the CEA include the NNRy and UPRR. The currently unused NNRy has little effect on range resources as it is not currently operational. As the grade and track occupy land, there is a small reduction in grazing land; however, this would have no appreciable effect on grazing.

Utility Production and Distribution

Existing utility production and distribution facilities reduce available acreage in grazing allotments in the long term as structures (power plants, substations, transmission line towers) permanently remove vegetation and occupy the land. Existing roads and railroads transect grazing allotments, removing vegetative cover. In areas where the roadways are fenced, this creates a separation in the allotment. Unfenced areas create the potential for collision of automobiles and trains with livestock.

5.9.4 Foreseeable Future Disturbances

Future disturbances to range resources are quantified in **Table 5.1-3** above.

Agriculture, Forestry and Similar Sources of Surface Disturbance

The planned Spruce Mountain Restoration Project fire break, an approximate disturbance of 16,000 acres, would have direct adverse effects by reducing forage, and indirect long-term beneficial impacts by protecting range resources from the effects of uncontrolled wildfire, and continued deterioration of range resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil and gas development) and related impacts on range resources would be anticipated to be minimal. However, should economic feasibility of resource development improve in the future, adverse impacts to range resources would increase in acreage as well as intensity.

Figure 5.9-1. Grazing CEA

Grazing

Grazing on public lands would continue within the CEA in the foreseeable future. Management of grazing under the Ely BLM District RMP (2007a) is discussed in detail in **Section 5.2.4** above. Under the Ely RMP, the BLM will continue to monitor and evaluate allotments to determine if they are continuing to meet or are making significant progress to meeting the standards for rangeland health, and management prescriptions would be adjusted accordingly.

Future range health would be anticipated to improve. Changes to the livestock grazing management systems are proposed to improve the overall management of livestock on the affected allotments, and updates to the allotment management plans would help to meet the objectives of the allotments. Through the permitting process some allotments have been identified where standards have not been met, however, significant progress is being made toward meeting standards. Future changes to grazing management on any identified substandard allotments would be designed to improve range conditions, resulting in a long-term negligible to minor beneficial impact to range resources. However, without active improvements to grazing management, the substandard conditions could contribute to the expansion of invasive and exotic species and ecological change that result in long-term adverse effects to range resources.

Railroad Development

Reconstruction of the existing NNRy railroad, anticipated to disturb approximately 2,600 acres, and new construction of a rail lead to the WPES plant site would take place within the CEA. An existing rail grade is present and direct effects of the NNRy reconstruction and associated access roads, laydown areas, and borrow pits would result from trampling or destroying surrounding vegetation and from human activity temporarily dispersing livestock grazing. The reconstructed railroad would cross 15 allotments and may separate livestock from water sources. The rail line would not be fenced, therefore some hazard of collisions between trains and livestock would be anticipated as a minimum 21 train trips per week (9 for EEC and 12 for WPES) would be anticipated with operation of the NNRy.

The proposed railroad to serve a geologic repository for disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain would transect the project area and the CEA for range resources, cutting across the Wilson Creek and Ely Spring (cattle) grazing allotments. Construction of the proposed rail line across the CEA for range resources would result in disturbance of a total of 3,252 acres (USDOE 2007a). Upon completion of construction, the rail line would permanently occupy lands currently used for grazing, potentially displacing up to 194 AUMs from these two allotments. These two allotments are currently permitted to graze over 50,000 AUMs (USDOE 2007b); therefore the adverse impact of reduction in AUMs would be minimal. In addition to reducing AUMs, the rail line would create separation within the allotments requiring animals to learn new routes and could potentially lead to collision with trains. Because the density of animals on these allotments is low, the potential adverse effects from collision with trains would be minimal.

Recreation

Increased human population would likely also increase recreational pressure on surrounding public lands. Increased human activity would likely involve increased vehicular use on public lands, resulting in increased soil disturbance that would lead to increased infestation of noxious and non-native, invasive weeds. These effects could result in long-term degradation of range resource quality.

Roads

Under the new Ely BLM District RMP, OHV use will be largely limited to existing roads and trails within the majority of the CEA. Enforcement of this management policy would result in maintaining the number and extent of existing roads and trails, and prevention of establishment of new road disturbance within grazing allotments, avoiding future degradation of range resources.

Utility Production and Distribution

Future WPES production and distribution facilities and fixtures would adversely impact grazing allotments in both the short and long term. Approximately 1,900 acres would be disturbed through construction. Approximately 1,500 acres permanently occupied by facilities and transmission towers would no longer be available for grazing, potentially reducing the AUM capacity of the allotments. Impacts to range resources from future utility production and distribution facility development would be similar to those discussed above in **Section 5.7**, Vegetation.

5.9.5 Cumulative Disturbances

The CEA for range resources totals nearly 5.6 million acres. Within the CEA for range resources, known quantifiable past and present disturbances total approximately 329,731 acres. Proposed future disturbances identified above would potentially disturb another approximately 30,432 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to vegetation within the CEA would be approximately 466,163 acres, which is approximately 8 percent of the total area of the CEA.

Nearly 94 percent of the CEA is available for grazing. Grazing on allotments within the CEA has resulted in disturbance, has adversely impacted vegetation to varying degrees, and would continue in the future. Management of grazing on BLM grazing allotments under the new Ely BLM District RMP would result in monitoring of effects from grazing and modification of practices to maintain or improve vegetative communities, which would result in improved range resources.

5.9.6 Cumulative Effects

Adverse effects have occurred to range resources from historic practices, but the affected acreage is relatively small. Future short- and long-term adverse cumulative impacts to, and permanent loss of range resources would result from construction associated with additional development of utility production and transmission facilities, and railroads within the CEA. Long-term beneficial impacts to range resources may be realized through modified grazing management practices on allotments with substandard conditions.

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future range resources disturbances, would result in cumulative effects to range resources, expected to be short- and long-term, minor and adverse.

5.10 Cultural Resources

5.10.1 CEA Boundary

The CEA boundary for cultural resources is the same as that for surface water (**Figure 5.2-1**).

Rationale

The entire Steptoe Valley needs to be considered due to the project's visibility from historic properties (i.e., NRHP-eligible cultural resources) in the valley. Beyond Steptoe Valley, the project should not affect cultural resources outside of the direct effects area. Activities attached to the Proposed Action and Action Alternatives that might affect cultural resources could occur outside of the actual disturbance area, but not likely outside of this proposed CEA.

5.10.2 Introduction

Cultural resources potentially vulnerable to the cumulative effects of the EEC include prehistoric sites, prehistoric landscapes, historic sites, historic structures, traditional cultural properties, and historic landscapes. The incremental degradation of the resources reduces the information and interpretive potential of historic properties. Data recovery in the form of excavation or artifact collection is considered an adverse effect. Further, large projects tend not to mitigate every site to be impacted but rather a representative sample of sites. Therefore there is the loss of information from those sites not mitigated. Although this approach may not have a large impact on cultural resources as a result of a single project, the cumulative effect of many large projects in a region can amount to a major loss of scientific and historic information about the local and regional past.

A records search of all lands within a one-mile radius of the EEC project components was conducted. The search revealed that 308 previous cultural resource studies have been conducted resulting in the documentation of 1,006 sites. The previous inventory information for the CEA was compiled from data collected for the project-specific cultural resource inventories associated with the EEC and does not include the entire CEA area.

5.10.3 Past and Present Disturbances

Land ownership and use as it relates to cultural resources is detailed in **Tables 5.1-1** and **5.1-2** above.

Past and present disturbances in the CEA that have potentially affected cultural resources include fire, road construction and maintenance, utilities, mining, mineral material activities (quarry/gravel pit), ranching/agriculture, and other developments (see **Section 5.2.3** and also **Appendix 5A**). Known sites that have been determined ineligible for the NRHP do not require avoidance; have been discharged from management (BLM 2008a); and therefore have likely been impacted by activities requiring the inventory (i.e. utility installation, fence projects, energy exploration). As directed by Section 106 of the NHPA, eligible sites are generally avoided or mitigated if avoidance is not possible for projects with a federal or state nexus. Projects/development disturbances conducted prior to 1966 (i.e., prior to NHPA) and/or those without a federal or state nexus generally did not identify/quantify cultural resource sites or impacts to them.

5.10.4 Foreseeable Future Disturbances

The reasonably foreseeable disturbances in the CEA are described in **Section 5.2.4** and quantified for the cultural resources CEA in **Table 5.1-3** above.

Railroad Development

Reconstruction of the NNRy has been proposed by the City of Ely and is currently being evaluated by the Army Corps of Engineers (Corps 2008); however the BLM has assumed responsibility for completing the Section 106 compliance for the railroad reconstruction in accordance with the EEC Programmatic Agreement. This project could impact numerous NRHP-eligible sites located along the rail line (Southworth 2008). Further, the NNRy is itself an eligible historic property. The NRHP-eligible sites within the NNRy right-of-way would be avoided by design or mitigated (Corps 2008). Rehabilitation of the railway could adversely affect aspects of its integrity including design, materials, and workmanship; this would be an adverse impact and would be mitigated.

Utility Production and Distribution

As disclosed in the WPES EIS (BLM 2007e), construction of the WPES would impact six or seven NRHP eligible sites, depending on the plant location. Data recovery efforts would minimize these impacts. Construction of proposed utilities within the SWIP Corridor (**Appendix 5A**) could also potentially impact eligible sites.

Community Development, Recreation, and Land Use

Changes to private agricultural lands within the CEA are likely as some of these lands are converted in the future from traditional agricultural utilization (farming and ranching) to more residential and recreational utilization. However, specific plans are not known and cannot be evaluated for this analysis. Other lands, private and public, have been proposed for community development (e.g. Coyote Springs Development, Hidden Valley Community Project).

Impacts to cultural resources would depend on the exact project location and extent of ground disturbance. As much of the CEA is on federal land (87.4 percent), future disturbances would be subject to NEPA, Section 106 of the NHPA, and state and federal regulations providing protection and management of cultural resources.

5.10.5 Cumulative Disturbances

Past and present disturbance to cultural resources in the CEA have been the result of utility installation, road development, ranching/agriculture, private development, archaeological excavation, recreational activities, and likely vandalism and unauthorized artifact collection (**Appendix 5A**). Since the majority of the CEA is under federal jurisdiction, impacts to eligible cultural resources have generally been avoided or mitigated through Section 106 oversight. Cumulative impacts to cultural resources from reasonably foreseeable projects would mostly result from ground disturbance related to new commercial or industrial developments.

Past and present disturbance has impacted cultural resources (**Section 5.2.3**). NRHP-eligible sites within permitted disturbance areas were subject to oversight of Section 106 of NHPA; therefore impacts or the loss of the resource was mitigated.

Increased disturbance from multiple actions could result in cumulative adverse impacts to currently unknown cultural resource sites. Increased accessibility created by new roads built in

association with projects can cause cumulative impacts related to increased public visitation, recreational impacts, unauthorized artifact collection, and vandalism.

The cultural resources CEA totals nearly 2 million acres. Within the CEA for cultural resources, known quantifiable past and present disturbances total approximately 120,382 acres. Proposed future disturbances identified above would potentially disturb another 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to cultural resources within the CEA would be approximately 313,713 acres, which is approximately 16 percent of the total area of the CEA.

5.10.6 Cumulative Effects

Current and future development will contribute to the cumulative effects, both direct and indirect, on prehistoric and historic cultural resources in the region. All proposed, reasonably foreseeable developments would be completed under the oversight of Section 106 of NHPA if there were a federal nexus and project impacts would therefore be individually addressed. The effects of adding the EEC impacts to existing cultural resource disturbances would be minimal. Section 106 of the NHPA requires avoidance and/or mitigation of impacts to NRHP-eligible cultural resources by federal undertakings; therefore, cumulative impacts from the EEC and reasonably foreseeable future activities should be minimal. Data recovery of NRHP-eligible sites would expand the regional database and knowledge of prehistoric and historic contexts. The mitigation measures developed to avoid direct impacts to cultural resource would also minimize contributions to cumulative effects.

In regard to the Steptoe Valley Historic Landscape, the addition of two coal-fired power plants (the EEC and WPES) within Steptoe Valley would constitute an adverse cumulative impact. The power plants would be visible to varying degrees over a large portion of Steptoe Valley. These modern industrial complexes would alter the rural feeling and setting of the Steptoe Valley Historic Landscape, affecting its integrity (i.e. the characteristics which make it eligible for the NRHP). The cumulative impact on the area landscape from multiple projects would be greater than from the EEC project alone.

Use of the NNRy for projects such as the WPES and the EEC would be consistent with its original intent and purpose: to support industrial development. An operating railroad can be expected to have had its rails and ties replaced periodically; however, one of the unique features of the NNRy is that there was no wholesale replacement of rails and most are original dating to around 1905 (Murphy 2008). Working historic transportation facilities can retain integrity if physical features essential to the property remain (such as route, roadbed, associated features, alignment, and setting). Reconstruction of the track would at a minimum require replacement of culverts, bridges and other supporting features, which would adversely impact its integrity under Criterion C and limit its future physical research potential under Criterion D. Reconstruction to modern railroad standards (**Section 2.2.4.3** and **Figure 2.2-8**) with a 30 foot wide roadbed as well as borrow ditches, borrow areas, and slope cuts would likely obliterate the entire historic grade and associated features, as well as many of the other cultural resources within the corridor. The NNRy is currently eligible for the NRHP under criteria A (association with broad patterns of history), C (technology), and D (future data potential). It would remain

eligible under criterion A for its association with significant events in local and regional history, specifically development of mining, transportation, commerce, and settlement of the Ely area and the western United States. The cumulative effect of the NNRy reconstruction project on the historic railway and use of the railroad by the EEC and WPES would constitute an adverse impact to the site's integrity; mitigation measures would minimize the cumulative impact to the extent possible.

5.11 Native American Concerns

5.11.1 CEA Boundary

The CEA boundary for Native American concerns is the same as that for surface water (**Figure 5.2-1**).

Rationale

This boundary was chosen because it encompasses the area where there could be indirect effects to known culturally significant places and direct affects to cultural resource sites.

5.11.2 Introduction

The BLM initiated Native American consultation with regard to the EEC project with the Section 106 consultation letter sent out in July 2007, and since then consultation has been ongoing. The Tribes consulted are listed in **Table 3.11-1**. Consultation included letters, phone calls, and meetings. Through this process, the BLM requested information from the Tribes about geographically important places, traditional cultural places (TCPs), and sacred sites that may be impacted by the EEC Project. Further, previous ethnographic studies have identified places of geographic interest to the Tribes within the CEA.

Native American tribes are generally concerned with public distribution of information regarding the nature or location of TCPs, sacred sites, or geographically important places; therefore any specific information provided to the BLM has been held as confidential.

The ability of Native Americans to practice their traditional culture may be reduced through modification of the landscape; loss of available or open land due to developments and private ownership; and degradation of resources over time. Resources such as water, plants, and wildlife not only provide subsistence, but play an important role in Native American culture and lifeways. In addition, archaeological sites and artifacts retain power and life-force; alteration of these places or removal of objects can disturb traces of the past and existing power relationships.

5.11.3 Past and Present Disturbances

Land ownership and uses for (thus disturbances within) the Native American concerns CEA is detailed in **Tables 5.1-1** and **5.1-2** above.

Past and present impacts to resources utilized by Native Americans, such as water, vegetation, and wildlife, are described in **Sections 5.2**, **5.7**, and **5.8,** respectively. Projects/ developments/disturbances that occurred prior to implementation of the NHPA of 1966 or without a federal or state nexus may have impacted archaeological sites and objects of importance to the Tribes. A record search indicates that 308 previous cultural resource studies have been conducted within one-mile of the EEC project components and over 1,000 cultural resource sites were recorded. While not all cultural resource sites identified by these studies

have been impacted by the projects for which they were conducted, other cultural resource sites have been impacted by projects and other land use activities for which cultural resource studies were not conducted. In general, artifact collection associated with archaeological surveys and archaeological excavations as mitigation are considered impacts to the Tribes and contribute to cumulative impacts. No previous disturbances to TCPs, sacred sites, or geographically important places were indicated by the Tribes during consultation at this time.

Three places of cultural and/or geographic interest are located within close proximity along the NNRy in Steptoe Valley. It is unknown whether these have been disturbed by activities associated with the NNRy, ranching, or other activities.

As noted in **Table 5.1-2**, a minimal amount of the CEA has been disturbed. Approximately five percent of the CEA has been impacted by disturbances including mine tailings, gravel pits, roads, agriculture, utility ROWs, and urban development. Additional unquantified disturbances such as mining and rural development have also disturbed area within the CEA. Further, grazing has taken place on 90 percent of land within the CEA. Cumulative disturbances to resources utilized by the Tribes are presented in the associated sections (**Section 5.2** - Water, **Section 5.7** - Vegetation, **Section 5.8** - Wildlife).

5.11.4 Foreseeable Future Disturbances

Reasonably foreseeable future impacts to resources utilized by the Tribes within the CEA are described in **Section 5.2.4** and would likely include continuation of grazing, recreation, development of private lands, energy development, utility line development, fire management, and mining (see **Appendix 5A**). Disturbances to Native American concerns within the CEA are quantified in **Table 5.1-3** above.

Utility Production and Distribution

The predominant landscape altering disturbances would be the proposed EEC project, the WPES, the Egan Range Wind Generating Project, and the SWIP Corridor project. Additional projects that would likely impact Native American archaeological sites, in addition to those projects listed above, would include the SNWA water pipeline project, the UNEV pipeline, and other large ground disturbing projects. These projects are discussed in detail in **Section 5.2.4** above.

5.11.5 Cumulative Disturbances

As shown in **Section 5.2.5**, approximately 120,382 acres of the CEA has been disturbed by past and present activities, not including grazing. Quantifiable reasonably foreseeable disturbances, including the EEC would add another 87,331 acres of disturbance for a total disturbance in the CEA of approximately 313,713 acres or slightly more than 16 percent. This does not include land lost to community development and private ownership. Cumulative disturbances to water, vegetation, and wildlife are presented in **Sections 5.2**, **5.7**, and **5.8**. Mitigation has been included with the Proposed Action and Action Alternatives which is protective of the resources.

5.11.6 Cumulative Effects

There are potentially 64 culturally and/or geographically significant areas identified within or in proximity to the EEC CEA (Bengston 2007); not all of these have verified locations but rather identified general vicinities. These areas include traditional use areas, habitations, battle sites, burials, ceremonial areas, and areas associated with traditional stories. The commitment of

approximately 7,070 acres of public land for the proposed EEC and approximately 1,500 acres of public land for the WPES, in addition to the other projects and developments in the CEA (**Appendix 5A**), would constitute a cumulative effect to Native American tribes that claim the region as their traditional use area. As Steptoe Valley is modified through construction of industrial complexes associated with energy development and the population growth that will accompany that, it would change the rural/natural setting that currently exists. This may affect the relationship of the Tribes to the landscape. The cumulative impact on the landscape from multiple projects would be greater than from the EEC project alone.

The continued modification of the landscape through numerous regional projects that impact culturally and/or geographically important places or modify the Tribes' visual relationship to the landscape can have a cumulative impact on Native Americans. However, how this cumulative impact affects the Tribes or the individual over time is unknown and difficult to quantify.

5.12 Land Use

5.12.1 CEA Boundary

The CEA boundary for land use includes Elko, White Pine, Nye and Lincoln Counties, and a portion of northern Clark County. The total area of this CEA is 36,664,882 acres.

Rationale

Cumulative effects to land use are closely associated with socioeconomics. The majority of lands in the affected counties are federally owned. Shifts in land ownership (such as the sale of public lands into private ownership) and changes in land management (such as wilderness designations) not only indicate shifts in land use, but also indicate shifts in socioeconomic drivers.

Elko, White Pine, Nye, and Lincoln counties consist of predominantly federally owned land; are rural; have relatively low populations and economic activities; and contain most of the proposed facilities. Two federal laws passed in recent years direct changes in federal land ownership and management within Lincoln County. A bill recently passed by Congress will provide similar provisions for White Pine County. For these reasons, evaluation of cumulative effects to land use within these counties is appropriate and relevant to this environmental analysis.

The Clark County Comprehensive Plan divides the county into different planning areas. The proposed southern terminus of the transmission line and the Harry Allen Substation are located within the Northeast County Planned Land Use Area of Clark County. Socioeconomic effects from the proposed project have been evaluated as negligible for Clark County because the City of Las Vegas so overwhelmingly affects the socioeconomics of the county. For these reasons, only the portion of the county that contains the project (the Northeast County Planned Land Use Area) is contained within the CEA for land use.

5.12.2 Introduction

Figure 5.12-1 depicts the CEA for land use. County and BLM land use plans for the lands, and land use within the Desert NWR and the Pahranagat NWR, encompassed by the CEA would be the same as those described in **Section 3.12** for the Proposed Action.

The 1.5-million acre Desert NWR and the 5,380-acre Pahranagat NWR fall within the CEA for land use. Both areas are managed by the USFWS, who "…works with others to conserve, protect, and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people."

Historically, the predominant use of the lands within the CEA was for ranching/grazing and the extractive industry. The public lands administered by the BLM within the CEA are managed for multiple use including grazing, hunting, recreation, and extractive industries. More recently, energy industry developments have led to an increase in utility production and transmission infrastructure. Over the past 10 years, federal legislation has been enacted directing sale of public lands to private interests and establishment of designated wilderness. Proposed community developments would expand residential communities into previously rural, undeveloped areas.

The past, present, and future disturbances with cumulative impacts to land use discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.12.3 Past and Present Disturbances

Current land ownership and uses within the land use CEA are presented in **Tables 5.1-1** and **5.1-2,** respectively.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

In addition to the mining districts adjacent to or within the project ROWs (**Table 3.3-2**), there are 30 mining districts along with oil and gas exploration activities within the CEA. For cumulative effects related to minerals, see **Section 5.3**. Excavated areas of sand and gravel occupy 1,157 acres, less than one percent of the CEA.

Federal Legislation Governing Land Use

Five laws enacted by Congress within the past 10 years directly affect the land use within the CEA. **Table 5.12-1** outlines the requirements of the various pieces of legislation.

TABLE 5.12-1. RECENT ENACTED FEDERAL LEGISLATION AFFECTING LAND USE AND REALTY

ACT TITLE, YEAR	ACT PROVISIONS
Southern Nevada Public Lands Management Act of 1998	Within the CEA for land use, the SNLMA: • First piece of legislation establishing authority for retention of land sale proceeds by BLM, State and County for various uses (Ensign 2008a).
Lincoln County Lands Act of 2000	• Disposal of over 13,000 acres of public land • Retention of a portion of the proceeds by the State for general education; • Retention of a portion of the proceeds by the County with an emphasis on support for schools • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multi-species habitat conservation plan; reimbursement of the State and County for costs associated with sales; and for acquisition of environmentally sensitive land (GPO 2008).

ACT TITLE, YEAR	ACT PROVISIONS
Clark County Conservation of Public Land and Natural Resources Act of 2002	Within the CEA for land use, the CCCPLNRA: • Established the Arrow Canyon, Jimbilnan, Jumbo Springs, Lime Canyon, Muddy Mountains, and Pinto Valley Wilderness Areas • Released Wilderness Study Area lands on the southeast boundary of the Desert NWR, contiguous with the Arrow Canyon, Muddy Mountains, and Lime Canyon WAs, and south of the Lime Canyon WA. • Expanded the boundary of the SNPLMA to include 22,000 additional acres identified for disposal, with retention of proceeds for conservation initiatives within Clark County. • Transfer of land parcels from the BLM to the USFWS and NPS for administrative jurisdiction (BLM 2008).
Lincoln County Conservation, Recreation, and Development Act of 2004	• Disposal of up to 90,000 acres of public land • Retention of a portion of the land sale proceeds by the State for the educational fund • Retention of a portion of the proceeds by the County for economic development • Retention of a portion of the proceeds by the BLM in special accounts to be used for inventory, evaluation and protection and management of unique archaeological resources; development of a multispecies habitat conservation plan; reimbursement of BLM costs associated with sales; for management of the Silver State Off-Highway Vehicle Trail; and for management of the wilderness designated by the act. • Designation of nearly 770,000 acres of wilderness. • Release of over 245,000 acres of wilderness study area • Establishment of utility corridors for the Southern Nevada Water Authority and the Lincoln County Water District, and relocation of an existing utility corridor along US-93. • Designation of the Silver State Off-Highway Vehicle Trail • Conveyance of nearly 5,000 acres of BLM land to the State and County for use as parks and open space • Transfer of administrative jurisdiction for over 8,000 acres associated with the relocated utility corridor from the USFWS to the BLM, and transfer of over 8,500 acres of land from the BLM to the USFWS near the Desert NWR (Ensign 2008b).
White Pine County Conservation, Recreation and Development Act (WPCCRDA) of 2006	• Disposal of up to 45,000 acres of BLM lands • Designation of approximately 558,000 acres of wilderness • Release of over 54,000 acres of wilderness study areas • Allow for land transfers to protect areas around Great Basin NP and expand two Nevada State Parks • Conveyance of approximately 1,750 acres of BLM lands to White Pine County for airport and industrial park expansion • Study of an off-highway vehicle trail • Transfer of lands into trust for the Ely Shoshone Tribe • Amendments to the SNPLMA • Funding of All-American Canal Projects, in return for which Nevada would be guaranteed the right to divert and consume a portion of water from Lake Mead (Ensign 2008c).

In general, the above legislation resulted in transfer of ownership of public lands to private interests, along with the designation wilderness areas and release of some wilderness study area lands. Conversion of Wilderness Study Areas to designated wilderness assured permanent protection for the wilderness values for the areas, with no change to existing land use as wilderness study areas are managed as wilderness until final determination is made. The

release of wilderness study area lands would have freed the lands under study for broader multiple use.

Grazing

For the most part, grazing appears to be in conformance with established BLM RMPs and standards. Substandard conditions on a few allotments, created largely by historic grazing use rather than current use, are being addressed to bring allotments into conformance with plans and standards. For cumulative effects related to grazing, see **Section 5.9**.

Industrial Development

The Apex Industrial Park represents concentrated industrial development within the CEA. Because of the location of the park, it is surrounded by open space and removed from other potentially conflicting uses, such as recreation or communities.

Utility Production and Distribution

Existing electric utility production and distribution systems within the CEA for land use include the Harry Allen Generation Station, Crystal Substation, Chokecherry power line, Falcon to Gonder transmission project, numerous transmission lines to and from the Harry Allen Generating Station, Lincoln County Power District transmission line, Gonder to Machacek transmission line, SPPC transmission line, and the Mount Wheeler transmission line. All existing transmission lines appear to be within established utility ROWs.

Summary

Past and present land uses within the CEA for land use appear to be in accordance with BLM land use plans or county zones or land use designations.

5.12.4 Foreseeable Future Disturbances

Future disturbances to land use are quantified in **Table 5.1-3** above.

Community Development

Residential/community development on private land in the Coyote Springs area (described in detail in **Section 5.2**) deviates from the other surrounding and historic land uses in the area. This development would represent a shift in land use in the future. However, this development is consistent with the comprehensive plans for Clark County. The transmission lines for the EEC, within the SWIP Corridor, would lie between the Coyote Springs development and within the Desert NWR, a prominent land use in the immediate vicinity of Coyote Springs. Development of the residential area and the SWIP Corridor would result in three very different land uses occurring in immediate proximity to each other. While these land uses are not necessarily incompatible, they could detract from one another.

Another residential community, Hidden Valley, to be developed on a 914-acre ranch would be located near Moapa, Nevada. The community would include a small commercial center surrounded by over 4,000 homes. Home sites would range from half-acre lots up to multi-family homes with 18 units per acre. The property is adjacent to the Reid Gardner power plant. Nevada Power Company raised concerns about the development limiting future economic growth through industrial development because of the proximity of the proposed residential development to the power plant (Moapa Valley Progress 2006).

Federal Legislation Governing Land Use

The five pieces of federal legislation listed in 5.12.3 above provided for release of BLM land for sale into private ownership. While sale of some tracts has been accomplished or is underway, future sales of lands under these laws would continue to result in shifts land use into the future.

Industrial Development

As described in **Section 5.2.4** above, approximately 6,000 acres of lots are available for sale within the 21,000-acre Apex Industrial Park. The number of acres currently disturbed is unknown. The intent is for further development of industry within the park, which would be compatible with existing uses, and thus would have no adverse impact on land use.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities (mining or oil and gas development) would involve some road construction and drilling in selected areas, and would have negligible adverse impacts on land use. However, should economic feasibility of resource development improve in the future, additional impacts to land use could occur. As extractive operations increase in acreage and legislated land sales reduce availability of public land for recreational activity, conflicts in land use could result. Permits issued by the BLM for planned mining, oil, and gas exploration assure that future exploration and development would be consistent with BLM RMPs.

Railroad Development

Reconstruction and use of the NNRy would cross 15 grazing allotments and could affect access of livestock to all areas of these allotments and lead to land use conflicts such as collisions between trains and livestock. Long-term use of the NNRy is intended to increase commercial and industrial development north of Ely which would be a change to the existing agricultural land use.

The proposed railroad to serve a geologic repository at Yucca Mountain (for the storage of nuclear waste) would transect the project area and the CEA for land use. The proposed railroad would bisect 27 grazing allotments within the CEA for land use (USDOE 2007a). Creating division within grazing allotments could lead to conflicts in use in those areas, such as collisions between trains and livestock.

Recreation

Increased White Pine County population would lead to increased recreational use of public lands in the County and in the vicinity. Increased recreational use could lead to increased use conflicts on those lands. Additionally, the Desert NWR is proposing to develop a visitor center to improve visitor services, increase wildlife-dependent recreational opportunities, and protect unique natural, cultural and historical resources. A new visitor facility could result in increased public use of the NWR. New visitor facilities could result in both beneficial and adverse effects to land use. Increased public use could lead to increased land use conflicts. However, increased public contact and information could enhance environmentally responsible use of public lands.

Utility Production and Distribution

Development of the WPES in White Pine County, along with associated infrastructure and transmission lines, would result in the sale of approximately 1,300 acres of federal lands into private ownership. Installation of various electric transmission lines, water supply lines, and

Figure 5.12-1. Land Use CEA

petroleum product lines within the SWIP and other utility corridors (discussed in greater detail in **Section 5.7** above) within the CEA would affect surface land uses, such as grazing, to a minor extent in the short term, and to a very limited extent in the long term. Utility developments identified within the CEA appear to be consistent with county land use plans and BLM RMPs. Together these developments would result in a slight reduction in federal land ownership and a shift away from grazing uses.

A compatible use is defined by the USFWS as "…a proposed or existing use of a national wildlife refuge that, based on sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the refuge" (USFWS 2007c). The established SWIP Corridor runs through both the Desert NWR and the Pahranagat NWR; therefore development of future utility transmission facilities within the corridor is considered a compatible use.

Future identified development of transmission and other utility lines within established utility corridors includes the WPES/GBT transmission line, Harry Allen-Mead transmission line, SNWA transmission line, Lincoln County Power District transmission line, SPPC/NPC transmission lines, and the TransCanada transmission lines. These identified developments would be consistent with planned uses for the corridors. Future addition of the transmission lines associated with the Proposed Action and the Action Alternatives, as well as other proposed transmission and pipelines would compliment existing land uses in the Apex Industrial Park.

Sithe Global Power LLC's proposed development of the Toquop Energy Project, a 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, providing 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 (Toquop Energy Project 2007). A 2003 BLM Record of Decision on the Toquop Project approved a proposed 1100 MW natural gas fired power plant and its associated components (land, water delivery infrastructure, transmission line). The proposed modification to fuel the plant with coal is based on the increased cost of natural gas and improved environmental controls for coal fired utilities. The new proposal would require additional land for storage of combustion by-products (e.g. ash) and a 31-mile railroad spur for coal delivery. The previously approved plant was granted 2,100 acre-feet per year of the 7,000 acre-feet per year of water needed to run that plant; the Nevada State Engineer was studying the availability of the additional 4,900 acre-feet per year requested (Toquop Energy Project 2007).

Summary

Foreseeable future land uses within the CEA appear to be in accordance with BLM land use plans or county zones or land use designations.

5.12.5 Cumulative Disturbances

Past, present and future land use appears to be in accordance with BLM land use plans, or county zones or land use designations. Past, present, and future development of utility production and distribution facilities, along with residential development, potential extractive (mine, gas, and oil) development, and legislated land sales would result in a trend shifting land ownership from public to private, and land use away from past uses such as grazing to industrial. Additionally land sales would reduce public lands available for recreation and other public use.

The CEA for land use totals 36,664,682 acres. Within the CEA for land use, known quantifiable past and present disturbances total approximately 460,590 acres. Proposed future disturbances would potentially disturb another approximately 87,331 acres, including approximately 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to land use within the CEA would be 653,921 acres, which is approximately 2 percent of the total area of the CEA.

5.12.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future land uses, cumulative adverse effects to land use are expected to be long-term and negligible to minor, resulting largely from sale of public lands and increased potential for use conflicts.

5.13 Special Designations

5.13.1 CEA Boundary

The CEA boundary for Special Designations includes an area within a 50-mile radius of developments and 50 miles either side of linear features (e.g. transmission lines and pipelines). The total area of this CEA is 23,881,598 acres.

Rationale

As stated in **Section 4.13**, analysis of impacts to special designations is from the perspective of people utilizing SDAs. Impacts to SDAs should not be noticeable beyond this area (i.e., people using SDAs outside of the identified CEA would not likely perceive impacts from the Project).

5.13.2 Introduction

The CEA for special designations is depicted in **Figure 3.13-1**. There are 64 SDAs within the CEA, established by the federal or state government to protect wilderness, wildlife habitat, and other recreational, ecological or historical values. Special designations within the CEA are described in detail in **Section 3.13**.

Depending on proximity of SDAs to disturbances, impacts to the areas can be from visual or air quality degradation, or noise. Projects within the CEA could result in adverse impacts to air quality through ground disturbance and emissions, or create visual or auditory disturbances. When combined with the effects of the Proposed Action or Action Alternatives, these projects could affect qualities managed for within the Special Designations that are found in the CEA.

The past, present, and future disturbances with cumulative impacts to SDAs discussed below are described in detail in **Section 5.2.3** and **5.2.4**.

5.13.3 Past and Present Disturbances

Current land ownership and uses within the special designations CEA are presented in **Tables 5.1-1** and **5.1-2**.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Existing extractive industry uses within the CEA may impact SDAs. Open pit mined areas are susceptible to wind erosion and can impact air quality and visibility. Mining, oil, and gas exploration involve road construction and use of drilling equipment. Construction has short-term impacts through increased road dust, and the visual intrusion of the equipment. Long-term effects would result from the presence of roads on the landscape.

Grazing

Existing grazing uses throughout the CEA should have little effect on SDAs. Grazing uses can result in dust that would adversely affect air quality and visibility, but the effects would be localized in areas of degraded range conditions and susceptible to wind erosion.

Industrial Development.

The Apex Industrial Park containing utility infrastructure, landfills, quarries, and manufacturing could impact SDAs a couple of ways. The power plants produce emissions that in the long term would affect SDAs that lie within a 10 to 15 mile radius of the plants, as well as SDAs down wind. Disturbed areas are susceptible to wind erosion and could impact air quality and visibility down wind in the long term.

Utility Production and Distribution

Existing transmission lines west of US-93 may be in the view shed for the Delamar Mountains WA, and would clearly be visible from within the Desert NWR.

5.13.4 Foreseeable Future Disturbances

Disturbances to SDAs are quantified in **Table 5.1-3** above.

Community Development

Development of the residential areas of Coyote Springs and Hidden Valley (described in detail in **Section 5.7** and **5.12.4** above) could impact down-wind SDAs in both the short and long term. Short-term effects would result from construction dust and emissions impacting air quality and visual resources. Long-term effects would result in visual disturbance from the density of development, and adverse impacts to air quality from residents motor vehicle use. Both developments would create new or additional light sources in the area, potentially affecting dark night skies, but those effects would be incremental to the effects of the City of Las Vegas and its suburbs. Construction or operation of transmission lines associated with the proposed action or its alternatives would not be anticipated to contribute to these cumulative effects to dark night skies.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Future development of mining and gas and oil leases could impact air quality and visual resources through ground disturbance and distribution of dust particles in the air during construction. Long-term impacts to air quality and visual resources could result should mineral resources be developed within claims, resulting in establishment of new mines, or expansion of existing surface mining operations.

Industrial Development

Sale of remaining lots and full development of the approximately 6,000 acres available within the Apex Industrial Park could increase emissions and dust affecting visibility, and could result in increased population affecting recreational use of SDAs in the area.

Recreation

Increased White Pine County population would lead to increased recreational use of public lands in the county and in the vicinity. Increased recreational use would likely lead to increased contact between persons using remote and wilderness areas, and potentially increased opportunity for degradation of natural conditions. Additionally, the Desert NWR is proposing to develop a visitor center to improve visitor services, increase wildlife-dependent recreational opportunities, and protect unique natural, cultural and historical resources. A new visitor facility could result in increased public use of the NWR.

Utility Production and Distribution

Development of additional transmission lines and other development within the SWIP in particular could impact SDAs. Any construction of transmission lines or underground pipelines could impact air quality and thus, visibility in the short term. Long-term effects from transmission line development within the SWIP could include visual impacts in proximity to SDAs.

Development of the WPES would result in short-term impacts to air quality and visual resources from ground disturbance and emissions from construction. In the long term the facility itself would be visible in the surrounding area, emissions would impact air quality, visibility and visual resources, and night lighting of the facility would impact dark night skies. These effects would combine with the effects of the EEC to impact SDAs in the immediate vicinity and down wind of the power plants.

As discussed in **Section 5.15.4** below, wind generators would introduce large scale visual disturbances on the landscape of Steptoe Valley, potentially visually impacting SDAs in the vicinity.

5.13.5 Cumulative Disturbances

The special designations CEA totals 23,881,598 acres. Within the CEA for special designations, known quantifiable past and present disturbances total approximately 353,023 acres. Proposed future disturbances would potentially disturb another 67,500 acres, including 7,070 acres for the EEC power plant and related facilities. Acreages of disturbance for future proposed developments within the SWIP Corridor, BLM Utility Corridor, and the WWEC cannot be accurately quantified at this time, but the total area within the roughly 3,500-foot wide corridor from the Robinson Summit to Harry Allen substations (about 250 miles) that is subject to disturbance for proposed developments would be about 106,000 acres or about 6 percent of the CEA. The total quantifiable cumulative disturbance to special designations within the CEA would be approximately 526,523 acres, which is approximately 2 percent of the total area of the CEA.

Light Pollution

Given the magnitude of the two proposed power plants in Steptoe Valley, and their relative proximity to each other, their combined night glow would adversely impact dark night skies. It would be expected to be noticeable in SDAs located in immediate proximity to the power plant locations, including the Bristlecone and High Schells WAs, and the North-South Schells RNA under the Proposed Action, Becky Peak and Goshute Canyon WAs under the North Plant Site

Alternative. The FAA-required lighting on the wind turbines of the Egan Range Wind Generating Project and the lighting required for the stacks and nighttime operation of the WPES and EEC would add man-made light sources to the night skies. This new light source could potentially impact dark night skies in the South Egan Range and Mount Grafton WAs. There would be a cumulative light impact to the generally unpolluted night sky for these SDAs.

Changes to Ambient Air Quality

Section 5.6 of this EIS discusses air quality and visibility degradation due to the construction and operation of the EEC power plant in conjunction with other projects in the Air Quality CEA. Evaluation of past and present projects is contained within analysis of the existing ambient air conditions, and discussed in conjunction with impacts of the EEC on SDAs in **Section 4.13.2.1**.

Sections 5.6.6.1 and **5.6.6.2** describe ambient air quality impacts from the Proposed Action and its alternative, to include future projects, most notably, WPES. The same analysis approach described in **Section 4.13.2.1** was used for cumulative impact analysis.

Based on information provided by the BLM, cumulative impacts to air quality in SDAs within a 45 to 90 km radius of the proposed plant sites within the CEA would be long-term and would comply with applicable NAAQS. Cumulative effects to air quality of SDAs from transmission lines in conjunction with other construction in nearby areas within the CEA would be short-term and negligible. Cumulative effects to air quality of SDAs from railroad operation in conjunction with other projects would be long-term and negligible.

Changes to Viewsheds

The stack and boiler from the EEC would be visible within a broad area of Steptoe Valley, as would the WPES (described in detail in **Section 5.15**). Other new visual intrusions in the vicinity of the power plants would include transmission lines (both associated with the EEC and WPES, and those installed in conjunction with the SWIP and WWEC). These visual developments would expand the visual intrusion of human development on the natural scene primarily for Goshute Canyon, Becky Peak, Bristlecone, and High Schells WAs, the Pony Express Trail, and for the Cleve Creek Baldy RNA.

In the southern portion of the CEA, cumulative visual effects to SDAs would occur to the Desert NWR, Delamar Mountains, Meadow Valley Range, and Arrow Canyon WAs, and the Mormon Mesa and Kane Springs ACECs from increased development within the SWIP/WWEC combined with the Coyote Springs community development. Utility corridor development would contribute a short-term impact on visual resources if the infrastructure were underground (pipelines). Above ground transmission lines would contribute a long-term impact. Future development, in conjunction with transmission lines in the Apex Industrial Park area would increase the density of development in the area, potentially making it more visible from Coyote Springs ACEC, and the Arrow Canyon and Muddy Mountains WAs. Such development could contribute both short-term (construction) and long-term (permanent structures) visual impacts.

Changes to Noise Levels

Because of the distance between both the proposed South and North Plant Sites and the WPES, there is not anticipated to be any overlap of noise effects from the two power plants. Cumulative noise effects to the Goshute Canyon, Becky Peak, Bristlecone, and High Schells WAs, and the North-South Schells RNA would result from the cumulative effects of construction and increased worker traffic in the short term, and power plant operation along with increased

permanent power plant staff traffic in the long term. Increased noise effects may be noticeable in some nearby SDAs at certain times, depending on wind direction and speed; however, those effects would not be expected to be a prominent disturbance in the natural setting.

Changes in Recreation

The northern section of the CEA in Elko, White Pine, and northern Lincoln counties would likely see increases in recreational use of SDAs from the population influx associated with construction and operation of the two new power plants. Those SDAs located in closest proximity, or more easily accessed from the developed population centers (Goshute Canyon, Becky Peak, Bristlecone, High Schells and Mount Moriah WAs; North-South High Schells and Cleve Creek Baldy RNAs; and Great Basin NP) would likely see the most intensive recreational use.

5.13.6 Cumulative Effects

Table 5.13-1 indicates which SDAs within the CEA would experience either temporary or permanent impacts to various aspects of the SDA. Those SDAs not listed in **Table 5.13-1** would experience no or negligible effects.

TABLE 5.13-1. CUMULATIVE IMPACTS TO SDAS

SPECIAL DESIGNATION AREA	LIGHT POLLUTION	AIR QUALITY & VISIBILITY	VISUAL	NOISE	RECREATION
Arrow Canyon WA			X		
Becky Peak WA	X	X	X	X	X
Bristlecone WA	X	X	X	X	X
Delamar Mountains WA			X		
Goshute Canyon WA	X	X	X	X	X
High Schells WA	X	X	X	X	X
Meadow Valley Range WA					
Mormon Mountains			X		
Mount Grafton WA	X				
Mt. Moriah WA					X
Muddy Mountains WA			X		
South Egan Range WA	X				
Arrow Canyon ACEC					
Coyote Springs ACEC			X		
Hidden Valley ACEC					
Kane Springs ACEC			X		
Mormon Mesa ACEC			X		
Desert NWR			X		
Cleve Creek Baldy RNA			X		X
Mt. Moriah RNA					
North-South Schells RNA	X	X		X	X
Great Basin NP	X	X			X
Pony Express NHT	X	X	X	X	X

5.14 Recreation

5.14.1 CEA Boundary

The CEA boundary for Recreation is the same as for Special Designations.

Rationale

Recreation impacts should not be noticeable beyond this area (i.e., people recreating outside of the identified CEA would not likely be impacted from the Project).

5.14.2 Introduction

Figure 3.13-1 depicts the CEA for recreation. Existing recreational use within the CEA is generally dispersed and light, and includes activities such as hiking, primitive camping, horseback riding, OHV use, hunting and fishing. In addition to dispersed recreational use, within the CEA there are 32 developed federal and state recreational use areas. Descriptions of dispersed and developed recreational opportunities and associated recreational management plans for areas within the CEA are discussed in detail in **Section 3.14**.

The primary land uses within the CEA are grazing, utility production and transmission, and extractive activities (mining, gas and oil leases). These land uses all have the potential to affect the quality and quantity of recreational activities within the CEA by affecting the actual acreage available for recreation; or visual impacts such as transmission lines, air pollution or disturbances associated with extractive industries. The transient workforce associated with project construction would increase the areas population and would likely introduce different cultures that may use recreational resources differently from the existing culture of the rural area. While the area for dispersed recreation is expansive, developed recreation sites are limited in scope and capacity. With increased population, users of dispersed recreation areas may experience more encounters with other recreational users. Increased levels of recreational use may increase competition for access to developed facilities. Thus, increased levels and different types of recreational use increases the potential for use conflicts that can reduce the quality of recreational experiences.

The past, present, and future disturbances with cumulative impacts to recreation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.14.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the recreation CEA can be found in **Tables 5.1-1** and **5.1-2**.

Federal Legislation Governing Land Use

Five pieces of federal legislation resulted in the sale of BLM lands and the establishment of numerous wilderness areas. Provisions of this legislation are discussed in detail in **Section 5.12** above. Sale of BLM lands would effectively reduce the amount of public lands available for recreation. Conversion of Wilderness Study Areas to designated wilderness assured permanent protection for the wilderness values for the areas, with no change to existing recreational resources.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Past and present extractive activities include approximately 30 mining districts, and numerous oil and gas exploration leases within the CEA. Lands occupied by extractive activities have reduced recreational value, or may reduce acreage available for recreation when vegetation and/or wildlife are adversely affected. Development of roads associated with mining, gas and oil exploration can enhance recreational use of an area by improving access.

Utility Production and Distribution

Past and present disturbance associated with utility infrastructure includes existing power plants, transmission lines, and underground pipelines within designated corridors. Lands occupied by utilities infrastructure are no longer available for recreation.

5.14.4 Foreseeable Future Disturbances

Future disturbances to recreation are quantified in **Table 5.1-3**.

Expanded Recreation Facilities

The Desert NWR has released a Draft Environmental Impact Statement for development of visitor facilities within the Refuge. Existing visitor use facilities do not provide adequate capacity or opportunities to inform visitors about recreational opportunities and increased visitation is anticipated to further strain existing facilities. New facilities would include a visitor center and administrative complex, along with associated roads and parking areas (USFWS 2007b).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Expansion of extractive activities exploration (mining or oil and gas development) is possible in the future, and would minimally adversely impact recreation. However, should economic feasibility of resource development improve in the future, adverse impacts to recreation could increase.

Federal Legislation

The five pieces of federal legislation listed in **Section 5.12.3** provided for release of BLM land for sale into private ownership. While sale of some tracts has been accomplished or is underway, future sales of lands under these laws would continue to result in relatively slight reductions of public lands available for recreation in the future.

Utility Production and Distribution

In addition to construction of the proposed EEC, construction of the proposed WPES would result in an influx of temporary workers. The effect of increased population would be most evident in the northern portion of the CEA, in White Pine County, where the existing population is relatively small. An influx of temporary workers would also utilize recreational resources in the southern portion of the CEA; however, these effects would be overshadowed by recreational use by people living in the Las Vegas area.

Developed recreational outlets, particularly those in proximity to the plant sites, would see increased visitation and more intensive use due to population increases associated with

construction and operation. Existing developed campgrounds on federal lands generally are designed to accommodate 10 or fewer parties (publiclands.org 2008). Increased use could mean that facility users recreate in a more heavily used setting, encountering other users and different types of use. User conflicts over the limited number of developed facilities, and adverse impacts to the resource/facilities from intensive use could result. Increased dispersed use within the CEA could make it more difficult to recreate without encountering other people, or experiencing human effects. Increased transient population could result in higher demand for hunting permits, and thus increased competition for limited resources, traditionally utilized by the long-term or permanent residents of the area. Increased transient population could also result in increased illegal hunting that could adversely impact wildlife conditions, further adversely impacting hunting.

Future addition of transmission lines within designated corridors would result in towers supporting transmission lines occupying acreage, thus reducing acreage available for recreation. Future rights-of-way granted for transmission lines could include exclusive access provisions, reducing or eliminating recreational access to certain areas.

Consolidation and development of utility transmission lines within identified corridors (such as the SWIP) reduces potential cumulative effects to recreational resources from utility infrastructure as multiple entities could use the same access roads for construction as well as line maintenance.

5.14.5 Cumulative Disturbances

Grazing, development of utility infrastructure, and extractive industry would have minimal effect on recreation within the CEA as the proportion of lands impacted by these uses in comparison with lands available for recreation is relatively small. Cumulative adverse effects to recreation would primarily result from increased and different types of use of recreational resources within the CEA. Effects of increased population and recreational use of public lands are increased by the sale of BLM lands. Increased use of recreational resources would result in varying kinds of uses that may conflict with each other, increased competition for limited developed facilities creating potential user conflicts, and could potentially result in degraded quality of recreational experiences and resources from intensive use. The effects of increased use would be felt primarily in the northern portion of the CEA, resulting from the population increase associated with power plant construction and operation. However, the proportion of lands available for recreation is far greater than the potential increases in recreational use or lands to be sold into private ownership.

Quantification of acreages of past, present and anticipated future disturbances to recreation would be the same as those described for special designations in **Section 5.13.5**.

5.14.6 Cumulative Effects

Adding the Proposed Action or Action Alternatives disturbances to past, present, and foreseeable future disturbances with the potential to impact recreation, cumulative effects to recreation are expected to be long-term and minor to moderate.

5.15 Visual Resources

5.15.1 CEA Boundary

The CEA boundary for visual resources is the same as described for surface water (**Figure 5.2-1**).

Rationale

This boundary was chosen for simplicity purposes and the fact that vantage points from which the Proposed Action and Action Alternatives, and other past, present, and reasonably foreseeable disturbances can be discerned are roughly contained within these areas.

5.15.2 Introduction

The CEA is within a region of generally north- to south-trending mountain ranges and valleys. Scenic variety exists in the topography and densities, arrangements, and colors of vegetation found in the CEA. The VRM of the BLM lands within the CEA are generally Class III or Class IV with small intermittent areas of Class I and II. The VRM designations (proposed in Ely BLM district) that exist within the CEA are shown in **Table 5.15-1**.

TABLE 5.15-1. BLM VISUAL RESOURCE MANAGEMENT (VRM) DESIGNATIONS IN THE CEA

VISUAL QUALITY OBJECTIVE	ELKO DISTRICT (ACRES)	ELY DISTRICT (ACRES)	SOUTHERN NEVADA DISTRICT (ACRES)	TOTAL ACRES	PERCENT OF BLM IN THE CEA
Class I	-	94,009	4,285	98,294	5.64
Class II	13,423	248,107	799	262,330	15.06
Class III	40,242	639,902	76,650	756,794	43.46
Class IV	-	351,693	24,432	376,125	21.60
Unknown	-	-	-	247,849	14.24
Total	53,665	1,333,711	106,166	1,741,392	100.00

Source: BLM 2008a (RMP)

The past, present, and future disturbances with cumulative impacts to visual resources discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.15.3 Past and Present Disturbances

The current land ownership and uses for (thus disturbances within) the visual resources CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2**.

Visual disturbances within the CEA are fairly minimal and generally include roads, mining, agriculture, sparse residential development, and utility corridors. Past and present disturbances have visually altered approximately five percent of the CEA. Burned areas and agricultural areas are more or less visually acceptable; burned areas if occurring as a natural wildland event are noticeable, but typically are not perceived as man-caused or intrusive development. Agriculture is a common land use in the area, and visually is part of the historic and present landscape. Past and existing mining operations are generally not visible within the CEA, except for the KCC tailings area.

The City of Ely and the State Prison, both located in the south portion of Steptoe Valley, project light into the night skies (**Section 3.15.3.4**).

5.15.4 Foreseeable Future Disturbances

There are several reasonably foreseeable projects with the potential to impact the visual environment in the CEA by adding industrial man-made features to the landscape. Future disturbances to visual resources are quantified in **Table 5.1-3**.

Agriculture, Forestry, and Similar Sources of Surface Disturbance

The proposed Toano fuel break would burn about 400 to 667 acres of vegetation along I-80 and SR-233. However, this area is outside the CEA and should not be visible with the CEA.

Community Development

Coyote Springs would develop 43,000 acres of land, of which 12,000 acres is slated for green space. However, the development would create a visual change in an area currently undeveloped.

Railroad Facilities

Rehabilitation of the NNRy would increase its visibility as vegetation is cleared during reconstruction. However, the NNRy is generally a surface feature without high profile features. Train traffic would draw attention to the feature.

Utility Production and Distribution

The WPES power plant cooling towers (550 feet tall), stacks (600 feet tall), and boilers (300 feet tall) would be visible for long distances and from many locations in Steptoe Valley. The associated transmission lines (towers 120-200 feet tall) would also be seen from various locations, but would be less intrusive than the WPES facility itself.

The Egan Range Wind Generating Project, proposed to be located along the top of Egan Range on the west side of Steptoe Valley, would be visible along different portions of the valley. Turbines (140-328 feet tall towers) and transmission lines associated with this project would introduce large-scale visual elements.

Numerous transmission lines, including those proposed to be located within the SWIP Corridor (encompasses the WWEC and BLM Utility Corridor through the CEA), would also add large-scale man-made elements to the landscape. The transmission facilities within the SWIP Corridor would be noticed mostly where it parallels in close proximity or crosses transportation routes such as US-93.

The FAA-required lighting on the wind turbines of the Egan Range Wind Generating Project and the lighting required for the stacks and nighttime operation of the WPES would add man-made light sources to the night skies.

5.15.5 Cumulative Disturbances

The EEC power plant would add high-profile man-made elements to the landscape that would be visible from long distances. The EEC would add a new 3,000-acre industrial facility to the generally undeveloped landscape setting of Steptoe Valley. Similar to the WPES, the stack (700+ feet tall), boilers (280 feet tall), and other structures (70 to 125 feet high) would be visible for long distances and from many locations in the valley. The associated transmission line towers would range from 100 to 185 feet in height. The EEC and the WPES would both be visible within the landscape from certain areas of Steptoe Valley. These projects could also

have an effect on visibility in Steptoe Valley because of exhaust gases and dust produced (see **Section 5.6)**.

Exterior lighting associated with the proposed power plants (EEC and WPES) would require exterior lighting that is adequate for safe and efficient operation, and these lights have potential to affect the quality of the night sky. The tower lighting required by FAA for the wind turbines (Egan Range Wind Generating Project) would further introduce light into the area.

Quantification of acreages of past, present, and anticipated future disturbances to visual resources would be the same as those described for vegetation in **Section 5.7.5**.

5.15.6 Cumulative Effects

Considering the relative remoteness and natural state of Steptoe Valley, the reasonably foreseeable projects combined with the EEC would represent a substantial cumulative impact to the character/scenic integrity of the landscape. Co-location of utility rights-of-way and communication sites into designated corridors (i.e. SWIP, BLM Utility Corridor, WWEC) would serve to lessen impacts.

Further, nighttime skies in Steptoe Valley would be cumulatively affected by exterior lighting associated with these projects, even after implementing mitigation measures. There would be a cumulative light impact to the generally unpolluted night sky.

5.16 Noise

5.16.1 CEA Boundary

The CEA boundary for noise is the same as described for surface water (**Figure 5.2-1**).

Rationale

Noise from construction is quickly attenuated by distance, vegetation, and topography. Noise related to construction and operation of the power plant, road and rail traffic, and transmission line construction is of importance to human receptors along these areas. All of these noise sources are contained within the CEA boundaries.

5.16.2 Introduction

The CEA encompasses the broad Steptoe Valley, which is deep enough to minimize most cross range noise transport, and generally wide enough to attenuate all but high volume sources of noise across its width. Tight canyons or other features that could concentrate sound exist along the valley walls, but those features typically do not feature sensitive receptors in areas where noise from current or foreseeable sources could be concentrated.

Section 3.16 documents current noise levels in Steptoe Valley and its vicinity. **Section 4.16** documents the noise anticipated to be generated by the Proposed Action and Action Alternatives, and the impacts to local residents and on areas of human activity in the vicinity. This cumulative effects analysis assesses anticipated noise levels and impacts within the CEA based upon foreseeable activities within or potentially affecting that area.

The past, present, and future disturbances with cumulative impacts to noise discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.16.3 Past and Present Noise Sources

The current land ownership and uses for (thus disturbances within) the noise CEA would be the same as those described for surface water resources in **Tables 5.1-1** and **5.1-2**.

Noise measurements documented in **Section 3.16** describe current noise levels. Those measured values include the impacts of all current noise sources.

Background noise levels in rural areas in the CEA, including along rural roads identified in the vicinity of the proposed project location in Steptoe Valley, were measured to be in the 30 dBA L_{eq} range. Noise levels away from the isolated noise sources are low level, typically dominated by natural sources including winds. In areas of concentrated residential or urban development, like Ely and McGill, local noise generation sources combined with slower moving traffic typically result in noise levels in the 50 to 60 dBA range. In smaller communities or along roads with moderate traffic volumes, current noise levels are estimated to be in the 40 to 50 dBA L_{eq} range based upon measurements documented in **Section 3.16**.

Aircraft

Air traffic impacts are generally isolated to near the vicinity of the Ely Yelland Field airport. Takeoffs and landings generate brief but loud local impacts. Air traffic over Steptoe Valley is generally light, with small planes at altitudes that generate only brief impacts comparable to road traffic volumes. Crop spraying can generate higher impacts from low flying planes, but if those efforts occur it would be infrequently during late spring and summer.

Community Development

As described in **Section 3.16**, the most prominent noise impacts in the CEA result from transportation sources and urban or residential sounds generated in areas of higher population density. Background noise measurements in Steptoe Valley indicate values consistent with rural areas with low population density. Natural sound sources including wind represent a significant portion of observable noise, and average noise volumes are at or below 30 dBA L_{eq}, comparable to sound levels within a typical residential home. **Table 3.16-2** documents roadside noise readings at levels near the 30 dBA L_{eq} alongside lesser traveled roadways. Maximum measured noise levels approached 60 dBA L_{eq}, alongside busier stretches of road, comparable to conversational voice levels at six feet but below FHWA noise mitigation levels for residential areas.

The Ely and McGill urban areas concentrate traffic and other noise sources associated with human activity and commerce. Noise from in town traffic, business activities, and residentially generated sounds ranging from mowing to human and pet noises combine to elevate in town noise levels above those measured alongside local roads. Traffic is slowed by lower speed limits and safety considerations in these areas of concentrated development. Similar but smaller magnitude effects are observed in the smaller communities in the CEA, with human activity and commerce increasing noise levels slightly above those measured alongside nearby roadways.

Isolated noise sources exist across the CEA. The non-industrial sources are governed by county nuisance laws. Noise generation is generally low enough that effects are localized, and the noise generated is not sufficient to impact residential areas or areas of regular human activity at rates higher than roadway traffic. Examples of such sources include the Robinson Mine, restaurants, cafes, bars, retail outlets, and water pumping stations. Regional construction and maintenance efforts include the use of heavy construction equipment with the potential to

generate noise levels of up to 95 dBA L_{eq}, typically affecting any developed areas for short durations.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Isolated noise sources across the CEA have localized noise impacts that typically affect few residences or areas of human activity. Eleven mines were listed as operating in White Pine County in 2006. The Robinson Mine outside Ruth is the only one in the CEA with production levels sufficient to list among the major mines of Nevada in 2006 (Driesner and Coyner 2007).

Industrial Development

Impacts of public noise sources are generally controlled by county noise ordinances. Transient construction efforts occur at least intermittently across the CEA. No long-term stationary construction efforts are currently underway in the CEA.

Railroad Facilities

Rail traffic currently generates noise impacts at the northern extent of the CEA, with the UPRR traversing east to west through Shafter. Sound generated by current rail traffic along the UPRR through Shafter elevates current noise levels within ¼-mile of those tracks.

5.16.4 Foreseeable Future Noise Sources

The following section documents foreseeable sources of noise potentially affecting the CEA in addition to those described in **Section 4.16** from the EEC. The nature of those foreseeable actions and their actual or potential noise are discussed below. Impacts associated with those actions are discussed in **Section 5.16.6**, Cumulative Effects.

Foreseeable changes from current noise emission patterns are expected to include growth in rail traffic once a rail link is established with the EEC project and/or the WPES. Other foreseeable changes include potential local and regional growth in auto, truck, and/or air traffic, proposed mining ventures, and construction efforts and/or changes in emissions from industrial sources identified as currently existing.

Airport Expansion

The proposed Yelland Field airport expansion could increase the localized area of moderate air traffic noise impacts locally, and lead to noticeable increases in noise levels along approaching and departing flight paths. New or extended runways would expand the area where people could potentially be exposed to noise from incoming and departing planes. If the expansion included longer runways, they could allow for larger planes to come in and out. The frequency and duration of exposure to noise could also be increased if the airport expansion has the desired effect of increasing air traffic volume. The most significant effects of an airport expansion would be felt in the areas in the immediate vicinity of the airport, including where it would expand, and for at least a few miles along preferred flight paths into and out of Yelland Field.

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

Hard rock mining is expected to remain a strong and vibrant part of the regional economy, with operating mines hoping to maintain the production pace that resulted in record production volumes in 2006 (the last year for which comprehensive statistics are available). Six proposed mines in Nye County have either just completed their permitting and approval process or anticipate final decisions by 2008. The Barrick Bald Mountain Mine in western White Pine County is anticipating a final decision from the BLM on its planned expansion in 2008. The larger regional mines have documented their noise generation and impacts through National Environmental Policy Act (NEPA) analysis during their authorization efforts.

Railroad Facilities

A cumulative look at railway transport emissions would also include engine noise the full length of transport, from the mine to the energy center, though the act of mining the coal effectively ensures transport to the final user or distribution center. The direct impact of noise associated with rail transport from the UPRR junction at Shafter to the EEC is included in **Section 4.16**. Coal could come from a number of sources, and that a conservative assumption used for the cumulative effects analysis is that the coal would come from the Antelope Mine in the Powder River Basin of Wyoming. Noise generation analyses assume an average speed of 37 miles per hour over the generally open 985 mile train route from the Antelope Mine to the UPRR line, slightly higher than the 33 mile per hour average speed assumed for the local trains from Shafter to the EEC.

Traffic & Transportation

EEC project traffic projections estimate increases in traffic volumes on US-93 north and south of McGill and on local arterials like the Cherry Creek Road to increase by 33 percent per decade (HDR et al. 2007). At least 10 road improvement projects are planned in the CEA, focusing on US-93 and local arterials SR-318 (Sunnyside Road), Ely Colony Route 102, and Forest Road 23 along Duck Creek. Those efforts should maintain dependable road service along most project area roadways. Those improvements in traffic flow would generally maintain or enhance average travel speeds. Higher travel speeds or more traffic would generally increase noise levels along the affected roadways, though that effect could be offset if the traffic features smaller vehicles.

Utility Production and Distribution

The proposed WPES in Steptoe Valley and associated development represents the one prominent foreseeable industrial noise source in the CEA other than noise sources associated with the proposed EEC. The Proposed Action or Action Alternatives would result in a noise profile similar to that described for this project in **Section 4.16**. The proposed WPES would be located between the EEC's preferred South Plant Site and the North Plant Site Alternative. Onsite noise emissions described in the WPES's DEIS indicate an energy center with 1500 MW generating capacity would generate a very similar noise pattern as predicted for the proposed 1500 MW EEC, including noise generated by train traffic from Shafter to the project's energy station location.

5.16.5 Cumulative Noise Sources

Section 4.16 of this EIS documents the anticipated direct and indirect impacts of the proposed EEC.

5.16.6 Cumulative Effects

Impacts of the Proposed Action and Action Alternatives, primarily driven by construction, and operation of the EEC and associated rail traffic to support the EEC, are described in **Section 4.16**.

The most prominent foreseeable industrial project in Steptoe Valley would be the WPES. That project would include a 1500 MW coal-fired power production center with rail transport of coal from the UPRR rail line near Shafter, similar to the Proposed Action of this EIS. The EIS for the WPES documents moderate noise impacts localized around the proposed energy station and along the rail lines from Shafter to the proposed WPES. Noise generated onsite at the WPES during construction would be attenuated down to background levels within approximately eight miles of the facility. During operation, it would be attenuated down to background levels within seven miles. Those impact areas would not overlap with the noise impacts of the EEC during construction or operation because of the approximately 14 miles between the two facility locations. The impacts of the EEC would overlap with those of the WPES only along the rail lines from Shafter to the WPES location and its impact zone another few miles south. The net effect would be more frequent train passages that would be loud near the tracks. Rail line owners would strive to increase business along the rail lines in Steptoe Valley, potentially increasing rail traffic above the combined use levels anticipated to serve just the EEC and the WPES. Because the noise impact scale is logarithmic, overall rail traffic volumes of two to three times the rail activity predicted from this project on the rail lines from the WPES north to Shafter would increase predicted average noise impacts predicted for the Proposed Action by approximately 2 to 3 dBA L_{eq}, assuming the speed of the other trains was comparable to the 33 miles per hour predicted for the EEC trains. Between the proposed WPES and the South Plant Site, the average noise impact of the rail line would increase by approximately 2 dBA L_{eq} if rail traffic volume from other sources equaled rail traffic volume to and from the South Plant Site. In the immediate vicinity of the WPES, the maximum impact of that facility predicted in that project's EIS would be 53 dBA L_{eq}. The 1.4 round-trip train passages per day associated with the EEC South Plant Site would increase average noise impacts in the vicinity of the WPES by 2 to 5 dBA L_{eq} above the maximum impact predicted for that facility alone. The resulting maximum noise impacts in the vicinity of the WPES would still be below 60 dBA L_{eq}, moderate in intensity, but well below levels recommended for mitigation for highway projects.

Traffic volumes in the vicinity of the South Plant Site are forecasted to increase by approximately 33 percent per decade. Road maintenance projects should maintain smooth flow of traffic along US-93 and across most regional arterial roads. Those trends would be expected to lead to an increase in traffic noise generation of approximately 2 to 3 dBA L_{eq} by 2030 along US-93 and roads where the Proposed Action or Action Alternatives would generate increased travel. The EEC and WPES would lead to sharp short-term increases in population during their construction phases. Though no formal projections are known, air traffic is likely to remain near current levels or possibly to increase slightly. Foreseeable actions are therefore anticipated to result in increases in noise impacts along US-93 and local arterial roads that would remain below the FHWA mitigation level of 67 dBA L_{eq}. Air travel impacts would likely change little from the present, and little change in residential or urban noise generation or impact except for the increases described in close proximity to US-93 and local arterial roads.

Mining activities would continue to have localized impacts. Record 2006 mining production in Nevada and the numerous new ventures seeking approval to commence operations nearby could cause expanded mining activity in and around the general area, though the mining industry has historically proven to be cyclical. Expanded mining activity would have localized noise impacts within the CEA.

Across the CEA, noise impacts would be expected to remain below national average levels in most areas. No point of human activity would be expected to have routine noise levels reaching the 67 dBA L_{eq} level at which the FHWA recommends mitigation for road projects.

5.17 Socioeconomics

5.17.1 CEA Boundary

The CEA for socioeconomics includes Elko, Lincoln, and White Pine, Nye and Clark counties (**Figure 5.17-1**). In-depth analysis was only performed for Elko, Lincoln, and White Pine counties for reasons stated below and in **Section 4.17.1**. The total area of this CEA is 35,118,276 acres.

Rationale

The power plant would be constructed in White Pine County under either alternative utilizing a rail line from Shafter in Elko County to provide coal to the EEC. The majority of power plant employees would likely live in White Pine County. Lincoln County lies south of White Pine County and would be within commuting distance of the EEC. These counties are rural, have relatively low populations and economic activities, and contain most of the proposed facilities, with the exception of a portion of transmission line in Nye County and the southern terminus of the transmission line at the Harry Allen Substation in Clark County. Nye County is not included in the impact analysis as only a small portion of the transmission lines pass through the county and there would be negligible local socioeconomic impacts. Clark County is not included in the impact analysis for socioeconomics as impacts to Clark County would be negligible and a cumulative impact would be indiscernible compared to the existing and future economic activity in the county driven by the growth of the Las Vegas urban area. Additionally, including the economic activity in this cumulative impact analysis would artificially reduce the significance of the overall economic impact of the project on the three main counties that would be impacted.

5.17.2 Introduction

The social and economic structures and relationships that are in place in the three main counties of the CEA are described in **Section 3.17**. Along with the description in **Section 3.17**, the analysis presented in **Section 4.17** of the EIS includes a detailed discussion of the potential direct and indirect social and economic impacts of the Proposed Action and Alternatives, including No Action, for the CEA.

The past, present, and future disturbances in regards to cumulative impacts to socioeconomics discussed below are described in detail in **Sections 3.17** and **5.2.4**.

Land ownership within the socioeconomics CEA is presented in **Table 5.1-1**.

5.17.3 Past and Present Disturbances

The past and present disturbances as related to the socioeconomics of the three main counties of the CEA are discussed in detail in **Section 3.17**.

5.17.4 Foreseeable Future Disturbances

Community Development

Proponents for the Coyote Springs development project as many as 240,000 residents at full build-out in 30-40 years. The development would encompass 14,000 acres in Clark County and 29,000 acres in Lincoln County and include golf courses, conservation areas, and 150,000 homes. A development of this magnitude, if constructed, would have a substantial impact on the economics of Lincoln County and a moderate impact on Clark County. Proponents would first have to obtain enough water rights to support the development (see **Section 5.2.4**).

Extractive Industry (Mining, Mine Tailings, Gravel Pits, Gas & Oil Exploration/Development)

As discussed in **Section 5.2.4**, interest in oil and gas exploration and production has increased in the project area and the socioeconomic CEA. This interest, coupled with increasing commodity prices that may make previously abandoned mineral mines profitable in the future, have the potential to trigger a new economic "boom" cycle in the CEA.

Federal Legislation

Several Congressional actions have the potential to promote economic growth in Lincoln, Clark and White Pine counties. As noted in **Sections 3.17**, **4.17**, and throughout this document, land in Lincoln and White Pine counties, in particular, is over 90 percent federal in ownership, which limits economic development. The Southern Nevada Public Lands Management Act of 1998; the Lincoln County Lands Act of 2000; the Clark County Conservation of Public Land and Natural Resources Act of 2002; the Lincoln County Conservation, Recreation, and Development Act of 2004; and the White Pine County Conservation, Recreation and Development Act of 2006 all direct transfer of federal lands to private, tribal, state, county or local sectors. In addition to freeing federal lands for development, these acts allow proceeds from land sales to benefit tribal, state, and local governments.

Another likely economic benefit of the above noted legislation is associated with conservation and wilderness areas, which generate tourism and contribute to an area's quality of life. The Lincoln County Conservation of Public Land Natural Resources Act of 2002, for example, designates 770,000 acres of wilderness, and the White Pine County Conservation, Recreation, and Development Act of 2006 designates 558,000 acres of wilderness.

Utility Production and Distribution

The proposed EEC would contribute effects on public services beyond existing levels as there would be a temporary increase in the White Pine County population of up to 26 percent during construction.

In addition to the EEC, there are three other potential projects in the three-county area that would contribute to cumulative social and economic effects. The largest of these is the WPES. Secondly, Sithe Global Power LLC is developing the Toquop Energy Project. The third project for consideration is the SNWA Groundwater Development Project to be located in White Pine, Lincoln, and Clark Counties.

The direct employment involved in constructing the EEC is estimated to average approximately 1,390 workers over the life of the construction project (**Table 5.17-1**). The WPES would have a

Figure 5.17-1. Cumulative Effects Area Socioeconomics

workforce of about 760 persons (BLM 2007e) while the Toquop Energy Project would employ a construction workforce of about averaging 500 over the 26-month construction period (Toquop Energy Project 2007). The Groundwater Development Project planned by the SNWA is projected to have an average workforce of about 240 persons (SNWA 2007).

TABLE 5.17-1. CUMULATIVE DIRECT EMPLOYMENT IMPACTS (# OF ESTIMATED EMPLOYEES)

	CONSTRUCTION	OPERATIONS
Ely Energy Center	1,390	180
White Pine Energy Station	760	135
Toquop Energy Project	500	110
SNWA Groundwater Development Project	240	N/A
Totals	2,890	340

Each of these major construction projects slated for east-central Nevada would increase the permanent workforce in the area. The total workforce associated with operating the three power plants in the area is estimated to be about 340 persons. The workforce necessary to operate the SNWA Groundwater Development Project is unknown, but the permanent workforce should be fairly small.

The WPES would be the project that coincides the most with the EEC and would contribute the most to cumulative impacts. The WPES is scheduled for construction in approximately the same time period as the EEC and is also located in Steptoe Valley north of McGill.

The Toquop Energy Project would be located in the southern part of Lincoln County, approximately 180 miles south of Ely and 80 miles northeast of Las Vegas. Although it would be located in the CEA considered for social and economic impacts, it would have very little impact on White Pine County. The social and economic impacts arising from the Toquop Energy Project would be concentrated in the southern portion of Lincoln County and extend south into Clark County.

The SNWA Groundwater Development Project is slated for development in six different groundwater basins in Clark, Lincoln, and White Pine Counties. Construction in the different basins would be staged and occur at different times. The construction crews building the Groundwater Development Project would be located at different locations during the life of the project, according to what phase is being built at the time. Construction is scheduled to begin in 2009 and continue through 2018. Work in the Spring Valley, the area closest to Ely is scheduled for the first quarter of 2010 through the first quarter of 2016.

The SWIP and the WWEC are two major utility corridors through eastern and southern Nevada (see **Section 5.2.4**) that would facilitate economic and population growth in the CEA, rather than cause it (indirect impacts). During construction of individual transmission lines within the corridors there would be brief population and economic increases, but negligible long-term direct impact.

5.17.5 Cumulative Disturbance

The WPES would be a coal-fired power plant similar in size to the EEC and would generate an influx of workers to White Pine County. The developers of the WPES are planning to provide temporary workers accommodations, similar to the workers village planned for the EEC. Although the proponents of both facilities are making arrangements to house construction workers, the influx of the workforce necessary to build both power plants would result in a temporary demand for housing in White Pine County.

The WPES would generate approximately $74.7 million in tax receipts for the various government entities in White Pine County (BLM 2007e). This includes an estimated $51.6 million in sales/use taxes and $23.1 million in property taxes. The operations of the WPES will generate 8.2 million annually for White Pine County ($6.6 million in property taxes and $1.6 million in sales/use taxes). When added to the approximately $15.9 million in property tax revenue from the EEC during operations, total property tax revenue in White Pine County may increase by about $22.5 million annually. For comparison, projected property tax revenue for White Pine County for the 2006-2007 tax year was $8.4 million (Nevada Department of Taxation 2006b).

The Toquop Energy Project will generate an estimated $14 million in sales/use taxes for Lincoln County. No estimate of potential property tax impacts is available for Toquop. When the facility is fully operational, sales/use tax payments received by Lincoln County are estimated at $390,000 annually. The estimated annual property tax attributed to the project is $7.0 million. The amount of property tax that would be disbursed to Lincoln County is not available (Toquop Energy Project 2007). Since the SNWA is a government agency, the Groundwater Development Project would be exempt from property tax and property that the SNWA has purchased in Spring Valley for the Groundwater Development Project has been removed from the tax roles. This represents a decrease of approximately $20,000 in annual property tax payments to White Pine County and the amount may increase to up to $50,000 in subsequent years. Discussions are underway for the SNWA to possibly compensate White Pine County with payments in-lieu of taxes (Las Vegas Review-Journal 2007b).

5.17.6 Cumulative Effects

The cumulative effects of the EEC Project in conjunction with other upcoming projects would strain resources in the area such as schools, medical facilities, and housing during the construction phases. Mitigation, such as the worker villages and tax collections, would greatly reduce these strains. The EEC proponents plan to enter into a cooperative agreement with White Pine County and other local agencies to study the potential social and economic impacts of the EEC on local services and infrastructure and develop mutually agreeable mitigation measures.

Once construction of the EEC and WPES were complete and the facilities were operational, there would be a permanent addition to the workforce, employment, and income of White Pine County. This would aid in insulating the area from the cyclical nature of the metal mining industry. Further, the EEC would add to employment and economic stability within the CEA that result from an additional industry in an area historically dependant on mining, agriculture, and tourism. Operation of the EEC would result in additional diversification of the east-central Nevada economy and help insulate the area against the traditional boom-bust cycles due to heavy dependence on the metal mining industry.

5.18 Environmental Justice

As discussed in **Sections 3.18** and **4.18**, minority populations of Native Americans were identified as residing in or near the project area, concentrated primarily on the Goshute, Ely, Duckwater, and Odgers Ranch Reservations. In addition, Lincoln County was identified as having a meaningfully greater percentage of individuals and families living at or below the poverty level than the general population of the State of Nevada. For the purpose of cumulative effects analysis, impacts from the combined operations of the EEC and the WPES were

considered to determine if they would constitute a disproportionate adverse impact on any of these minority or low income populations.

As for analysis of direct and indirect effects of the EEC in **Section 4.18.2.1**, CEQ and EPA guidelines for environmental justice compliance were applied with the following results:

- Geographically, no concentrated minority population (e.g., Goshute, Ely, Duckwater, South Fork (Odgers Ranch), Elko, Wells, and Duck Valley Indian Reservations) would be directly impacted (no project facilities on or through the reservation)
- Economically, overall impacts would be positive, not adverse
- Tribes have had, and continue to have, opportunity to participate in project discussions, through the public participation process, as a Cooperating Agency (Goshute Reservation), and in solicited requests (see **Sections 3.11** and **4.11**)
- Both the Human Health Risk Assessment and the Screening Level Ecological Risk Assessment (Tetra Tech 2008a, Tetra Tech 2008b) found that the combined projects (EEC and WPES) with all boilers operating simultaneously would not adversely affect any modeled receptors, including receptors at the Goshute, Ely and Odgers Ranch Reservations
- The population of the poor in Lincoln County are not concentrated in any geographically identifiable area, and, as for the minority populations, would not experience any disproportionate adverse effects from the project, during construction or operations.

In general, the area is rural. The area is within the traditional use area of Native Americans and dispersed casual use may continue (**Section 5.11** Native American Concerns). The analysis of environmental justice is affected by the incremental effects of employment, income, governmental revenue, and other social and economic characteristics that may change over time. No disproportionately high and adverse impacts to an environmental justice population were identified under past, present, or the reasonably foreseeable future developments for the Proposed Action or Action Alternatives. Therefore, the overall projected effects of this project to identified minority and low income populations are beneficial impacts resulting from increased economic opportunity, as discussed in **Section 5.17** Socioeconomics.

5.19 Hazardous and Solid Waste Materials

5.19.1 CEA Boundary

The CEA for hazardous and solid waste materials includes all landfills impacted by the Proposed Action and Action Alternatives (no figure).

Rationale

Hazardous and solid waste generated by the Proposed Action and Action Alternatives would be handled and disposed of either at on-site landfills or transported by contractors to other permitted landfill facilities.

5.19.2 Introduction

This section provides an inventory of existing or reasonably foreseeable facilities that generate, treat, transport, or dispose of solid or hazardous waste in the immediate vicinity of the proposed

project, and any landfills that may be impacted by the Project. **Section 3.19** describes current conditions of hazardous and solid waste within the project footprint. **Section 4.19** describes in detail the substances, or their hazardous criteria, that would be used by the EEC facility during construction or operation, and how those substances would be managed in compliance with all applicable state, federal, and local regulations.

Solid and hazardous waste materials that would be generated through air deposition are discussed in sections focused on air quality (**Section 3.6**, **Section 4.6**, and **Section 5.6**). Chemicals used for agricultural applications are not considered here.

5.19.3 Past and Present Disturbances

The City of Ely has a licensed Class I municipal landfill for solid waste (WPCC 2006). This landfill has capacity to accept the solid waste generated during construction and operation of the EEC, along with other local sources. Class II landfills (low volume facilities) were formerly located in Baker, Cherry Creek, Eight Mile Community, Lages, Lund/Preston, Moorman Ranch, Preston, and Schellbourne; an open dump for medical waste was located in Ely (NDEP 2007d). These were removed and are not covered in the White Pine County Solid Waste Management Plan (WPCC 2006).

The US EPA (2007b) totals 886 underground injection wells for all of Nevada. Twelve of those are Class II wells (brines and other fluids associated with oil and gas production and with hydrocarbons for storage); one is a Class IV well (hazardous or radioactive wastes into or above an underground source of drinking water [USDWs] – these are banned except when authorized by a federal or state ground water remediation project); and the rest are Class V wells (generally non-hazardous fluids into or above USDWs and are typically shallow, on-site disposal systems) (EPA 2007c). Data are not available on specific locations, owners, depths, or character of the waste.

There are five commercial facilities in the region of the EEC that can accept various types of waste that might be generated at the site.

NDEP lists only one facility licensed to dispose of RCRA hazardous waste in the State of Nevada, which is U.S. Ecology in Beatty. In addition, NDEP lists two private Treatment, Storage, or Disposal (TSD) facilities and two federal TSD facilities (NDEP 2007b). U.S. Ecology also operates a hazardous waste disposal facility at Grand View, Idaho, about 70 miles southeast of Boise. This facility accepts hazardous waste, industrial waste, and low-level radioactive waste. Clean Harbors LLC operates the Aragonite Incinerator facility about 34 miles west of Grantsville in western Utah. It also operates the Grassy Mountain hazardous waste landfill about 80 miles west of Salt Lake City, Utah. Both of these facilities also accept industrial waste.

Energy Solutions operates the Clive landfill about 80 miles west of Salt Lake City. This facility accepts low-level radioactive waste and mixtures of such waste with hazardous waste.

Table 5.19-1 shows the EPA Toxic Releases Inventory (TRI) database for White Pine County for 2005, the most recent year for which the database is available. Only two facilities in the county are among the industries required to report these data to the EPA, and both are outside the CEA (EPA 2007e). Note that the term “release” in the TRI program includes permitted emissions and discharges; wastes managed in regulated disposal facilities; and accidental spills and releases. “On-site releases” are those emitted to the air, disposed of on-land, or discharged to surface waters or underground injection wells. “Off-site releases” are wastes that

are shipped off-site for management in regulated disposal facilities (NDEP 1998b). The U.S. National Library of Medicine (NLM) TOXMAP shows no TRI Reporting Facilities in the EEC project area, including transportation and transmission corridors (NLM 2007).

TABLE 5.19-1. TOXIC RELEASE INVENTORY FOR WHITE PINE COUNTY, NEVADA, 2005 (EPA 2007E)

FACILITY	CHEMICAL	TOTAL ON-SITE DISPOSAL OR OTHER RELEASES (LBS)
BALD MOUNTAIN MINE		**725,452**
	Hydrogen Cyanide	8,200
	Lead Compounds	666,782
	Mercury Compounds	49,670
	Methyl Tert-butyl Ether	800
ROBINSON NEVADA MINING CO		**20,580,912**
	Ammonia	820
	Chromium	72,010
	Dioxin & Dioxin-Like Compounds	0.0014994
	Lead Compounds	20,179,034
	Manganese	52,018
	Nickel	67,010
	Nitrate Compounds	210,010
	Nitric Acid	10
TOTAL		**21,306,364**

The EPA (2007d) database for White Pine County shows seven conditionally exempt small quantity generators (generating less than 220 lbs RCRA waste in any single month), two transporters of RCRA waste, one small quantity generator (generators of 220 to 2,200 lbs of RCRA waste in any single month), and one “used oil program” facility. The quantity and character of wastes generated by small and conditionally exempt generators is not reported.

The EPA (2005c) shows 8,863 tons of RCRA hazardous waste interstate shipments from Nevada, and 50,072 tons of RCRA hazardous waste interstate receipts for 2005. The state’s five RCRA hazardous waste receivers accepted 61,996 tons of material in 2005 (EPA 2005c). Specific routes, transportation corridors, or modes of transportation (e.g. truck, rail) were not reported.

The NLM (2007) shows no Superfund or National Priority List sites in the project area or CEA. The NDEP Bureau of Corrective Actions (NDEP 2007d) shows two active leaking underground storage tank (LUST) sites in White Pine County and five non-LUST sites, all of which were for petroleum product releases (e.g., diesel, gasoline, motor oil). The same source shows 76 closed sites where clean-up and/or remediation have been completed (NDEP 2007d). These sites include some leaks to soil and/or groundwater which occurred during transportation (mobile), buried lines that were dug up, and Brownfields (Old White Pine County Landfill). A number of these sites are within the CEA.

5.19.4 Foreseeable Future Disturbances

Reasonably foreseeable generators of solid and/or hazardous waste in the CEA include the construction/development of the WPES along with the reconstruction of the NNRy. Proponents

of the WPES have stated that the facility and its contractors (during both construction and operational phases) would comply with all state, federal and local regulations relevant to the handling and disposal of all wastes (BLM 2007e). This includes construction and operation of utilities within the SWIP Corridor, substation, and other facilities.

The U.S. Department of Energy (USDOE) Preferred Alternative for the Proposed Action for a new rail line to transport radioactive waste to the proposed repository at Yucca Mountain crosses the SWIP Corridor in Lincoln County (USDOE 2007b). Construction of the rail line is expected to "increase the overall rate of disposal of solid waste by less than 0.01 percent and industrial and special waste in the region of influence by about 0.261 percent" (USDOE 2007b).

5.19.5 Cumulative Disturbance

As described in **Section 2.2.1.1**, the on-site landfill for combustion by-products would cover 1,000 acres over the 50 years the EEC is in operation. The landfill would be operated in stages or cells, with only one active cell in use at a time. Cells would have crowns of 70 to 100 feet in height with a projected 50-year volume of 89 million cubic yards. The landfill would be a lined, zero-discharge facility, fully compliant with state, local and federal regulations. Each cell would be reclaimed after it is filled and abandoned, capped and vegetated.

All other solid and hazardous wastes generated during the construction phase and during the operations phase of the EEC would be transported to licensed facilities off-site for treatment and disposal. These wastes cannot be quantified at this time with any degree of certainty; however, in the context of existing and foreseeable solid and hazardous waste generation locally and regionally, the EEC would constitute a minimal increase in waste generation and management, well within existing capacities and infrastructure.

5.19.6 Cumulative Effects

Given the existing capacity and regulatory framework for generators, transporters, and TSD facilities, the EEC would have minimal effects on solid and hazardous waste generation and management. As noted in **Sections 3.19** and **4.19**, the EEC would comply with all local, state and federal regulatory requirements.

5.20 Transportation

5.20.1 CEA Boundary

The Transportation CEA consists of the existing transportation routes into the project area including Highways 6, 50, 93, and 318, Interstates 15 and 80 (**Figure 3.20-1**), along with major rail lines and airports.

Rationale

Transportation into the project area would primarily be on these existing and established access routes. Transportation should not be noticeably affected outside of these major roads.

5.20.2 Introduction

The transportation system in and around the proposed EEC Project contains established routes including highways, county roads, local roads, and a railway. Transportation associated with the Proposed Action and Action Alternatives would continue to be along existing routes. The existing transportation routes include paved, graveled, and dirt roads providing access to

communities, industrial areas, utility ROWs, private land, and public lands. The current condition of the transportation system is generally good with a Level of Service (LOS) A designation (free flow, low traffic density, or delay) along US-93 (**Section 3.20**), the main access to the proposed EEC.

The past, present, and future disturbances with cumulative impacts to transportation discussed below are described in detail in **Sections 5.2.3** and **5.2.4**.

5.20.3 Past and Present Disturbances

Past and present developments, such as mining, utility projects, community development, ranching, and recreation, have influenced transportation routes, their improvement, and increased use.

Population Increases

Increases in state and regional populations (**Section 3.17**, Socioeconomics) have contributed to increased traffic and use of the transportation system. The CEA includes segments of the CANAMEX corridor (US-93, I-15), a generally north-south route running from Arizona north into Canada (NDOT 2000). Being designated as a major regional corridor indicates US-93's importance as an interstate and regional route for the transportation of goods in and through Nevada. Recreational use increases (**Section 3.14**, Recreation) have also impacted the area transportation system and likely increased the miles of unimproved dirt roads.

5.20.4 Foreseeable Future Disturbances

Future increases in road use, and subsequent road damage, and road improvements could result in subsequent changes to the LOS designations of roads within the CEA. However, future road improvements could mitigate increased utilization of the transportation system.

Airport Expansion

The Yelland Field Expansion project will allow for the expansion and development of airport facilities in White Pine County, and encourage development of air service and aviation-related industry. Additional air service into the Ely area could result in less long-distance vehicle traffic within the CEA; however, this would be negligible to average traffic volumes on the interstates and highways.

Railroad Facilities

The NNRy is proposed to be reconstructed and upgraded to support economic development in the Ely area. The reconstruction of the railway would provide improved transportation of goods into the area, possibly resulting in less truck traffic on the highways. This would be a beneficial impact. If the NNRy were utilized by the EEC, it is estimated that nine coal trains would travel to the power plant site per week. The use of the NNRy by the WPES would require 12 coal trains per week. Quantity of additional train trips due to other economic development is unknown.

Roads

The NDOT STIP for 2008-2011 and 2008-2017 lists future transportation improvement projects (http://www.nevadadot.com/traveler/construction_projects/STIP/). These include maintenance (resurfacing) projects along US-93 and US-50 and another along Duck Creek Road (**Table 5.20-1**).

TABLE 5.20-1. PROJECTS FROM THE NEVADA PROPOSED HIGHWAY PROJECTS FOR FY2008-2017 AND STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM FOR FISCAL YEARS 2008-2011

PROJECT NUMBER	DESCRIPTION	FY '08	FY '09	FY '10	FY '11	PROJECT SPONSOR
WP200501	FH-23, Duck Creek from US-93 north of McGill for 10.2 miles south.	X	X			Forest Service
WP200609	US-50 from 9.93 miles east of Pancake Summit to 3.28 miles east of Jct. Ruth/ Kimberly Rd.	X				State
WP200711	US-50 at 11.40 miles east of Jct. Rd. to Strawberry (SR-892) and at 4.08 miles east of Jct. Ruth/Kimberly Rd.	X				State
WP200812	US-50 at 4.70 miles east of Robinson Summit. WP 54.40	X				State
WP200813	US-50 at 9.30 miles east of Robinson Summit. WP 59.00	X				State
WP200801	US-93 from Cherry Creek Rd. to US-93A. WP 98.56 to 111.76.	X				State
WP200802, WP200803, and WP200811	US-93 from Jct. US-93A north to the WP/Elko County Line. WP 112.76 to 116.69.	X				State
WP200809	US-93 from 15.39 miles north of Jct. Success Summit Rd. to Jct. US-93A. WP 86.00 to 112.76.	X				State

Source: NDOT 2007a and 2007b

Utility Production and Distribution

Projects that would include a large amount of construction workers and materials, and therefore would increase traffic would include the EEC, the WPES, and the Egan Range Wind Generating Project. Construction of the EEC and WPES would happen concurrently, at least in part, requiring several thousand workers in the area depending on the stage of construction for each project.

5.20.5 Cumulative Disturbance

The transportation network in the CEA in the reasonably foreseeable future would be the same as past and present with no change to existing transportation routes. Project specific access routes would not provide public thoroughfares. Road upgrades and improvements associated with present and future developments would improve the transportation network and make it generally safer. The added traffic during construction and operation of the EEC and the WPES would be noticeable to locals.

The EEC would require 1.3 coal trains to travel the NNRy or private railroad per day (9 per week). An additional 12 coal trains would travel along the NNRy to and from the WPES per week. These train trips may cause some traffic delay at road crossings.

5.20.6 Cumulative Effects

Traffic increases on the transportation network due to construction of the WPES, scheduled to begin in 2008-2009 and expected to continue for 4-5 years (BLM 2007e), would overlap with traffic increases associated with the EEC. There would be a cumulative impact on

transportation due to construction worker traffic and truck delivery traffic. Although there would be an increase in traffic on the entire CEA, the impact would be most noticeable on US-93. The degree and location of this impact would be dependent on which power plant site is selected for the EEC, as the North Plant Site Alternative is 16 miles north and the South Plant Site is 14 miles south of the WPES, respectively, and how many workers travel the same access routes to the construction sites. This cumulative effect would be temporary during construction and would not affect the overall level of service (LOS A) of US-93.

There would be minor impacts to the transportation network in the CEA as it develops to meet the demands of industrial development and increased population. There would be no net increase or decrease in transportation routes as a result of the EEC Project. There would be a general need to expand and improve existing infrastructure to accommodate cumulative regional transportation needs.