

CHAPTER 2

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIVITIES

This chapter summarizes past, present, and reasonably foreseeable activities in the Carlin Trend. This information forms the basis for discussion of cumulative effects in Chapter 3. Information contained in this chapter includes summaries of changes and/or progress made for activities within the Cumulative Effects Study Area (Study Area) since 2002 – the year that the SOAPA Final EIS document was completed and a Record of Decision (ROD) was issued for the project.

The Council on Environmental Quality (CEQ) defines cumulative impact as:

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The geographic area for which past, present, and reasonably foreseeable future activities are described encompasses the Carlin Trend mining complex. The Carlin Trend is a mineralized zone approximately 50-miles-long by 5-miles-wide in north central Nevada where multiple mining operations have been developed. Some activities described in this chapter are located proximal to the mining operations, and other activities are located in adjacent areas (**Figure 2-1**).

Past, present, and reasonably foreseeable land uses (e.g., grazing and recreation), activities (mining), and phenomena (wildfire) cumulatively affect resources to various degrees over a given area. Cumulative effects are discussed on a resource by resource basis in Chapter 3. With the exception of social and economic resources, the past, present, and reasonably foreseeable activities and subsequent cumulative effects to the various resources generally fall within the area shown on **Figure 2-2**. Detailed descriptions and rationale used to develop individual resource cumulative effects study areas are provided in Chapter 3.

GRAZING and AGRICULTURE

PAST and PRESENT ACTIVITIES

Livestock grazing has been and continues to be a co-dominant (with mining) land use in the Carlin Trend area. Multiple grazing allotments have been permitted and administered by BLM over the past several decades. Portions of 13 grazing allotments and/or federal fenced range exist within the Carlin Trend area (**Figure 2-3**). Carrying capacity of the 13 grazing allotments totals approximately 114,000 animal unit months (AUMs). Capacity of these allotments has been adjusted over the years in response to mine development, drought, wildfires, and availability of stock water.

Surface water sources that support livestock grazing and agriculture within the area include the Humboldt River, Willow Creek Reservoir, perennial creeks, springs, and seeps. Improved water sources include developed springs, stock wells, stock ponds, water pipelines, and troughs. Livestock will generally congregate near these

features. Cow-calf pairs, heifers, steers, and cows graze on residual forage in alfalfa fields, irrigated pastures, and rangeland within the Study Area.

A parcel of private land located in the southern portion of Boulder Valley (TS Ranch) is owned and operated by Elko Land and Livestock Company, a subsidiary of Newmont. In 1990, Barrick Goldstrike Mines, Inc., (Barrick) began dewatering the Betze/Post Mine as it advanced below the groundwater level. Barrick and the TS Ranch entered into an agreement to put mine dewatering water to beneficial use through irrigation (TS Ranch 2009).

In lieu of pumping existing groundwater wells to fulfill water rights owned by Elko Land and Livestock Company for irrigation purposes in Boulder Valley, the State Engineer allowed a “substitution of use” authorizing TS Ranch use of water from Barrick’s dewatering wells. The “substitution of use” authorization does not preclude future pumping of groundwater by TS Ranch commensurate with their original water right upon cessation of dewatering operations by Barrick (Pettit 2007).

Barrick began providing water for irrigation on the TS Ranch in the Boulder Valley in 1991 and this irrigation is ongoing today. Water from dewatering of Barrick’s Betze/Post Mine and Newmont’s Leeville Mine (beginning in 2003) is used for irrigation purposes from April through October. Water is used to grow alfalfa hay - a major cash crop for the TS Ranch. Up to four cuttings are harvested annually, with yields averaging 5.2 tons per acre. Top end hay is directed to the California dairy markets, with the balance being sold to neighboring ranchers or consumed by the TS Ranch cowherd (TS Ranch 2009).

Irrigation rates range from an average of 10 pivots applying 5,497 acre feet (af) of water over an average of 2,670 acres during the 1991

season (April through October) to an average of 53 pivots irrigating 7,936 acres with 23,438 af of water during the 2006 season (April through October) (Newmont 2009b). During the period of November through March of each year all excess water from Barrick’s Betze/Post Mine and Newmont’s Leeville Mine dewatering operations flow to the TS Ranch Reservoir (Barrick 2007a).

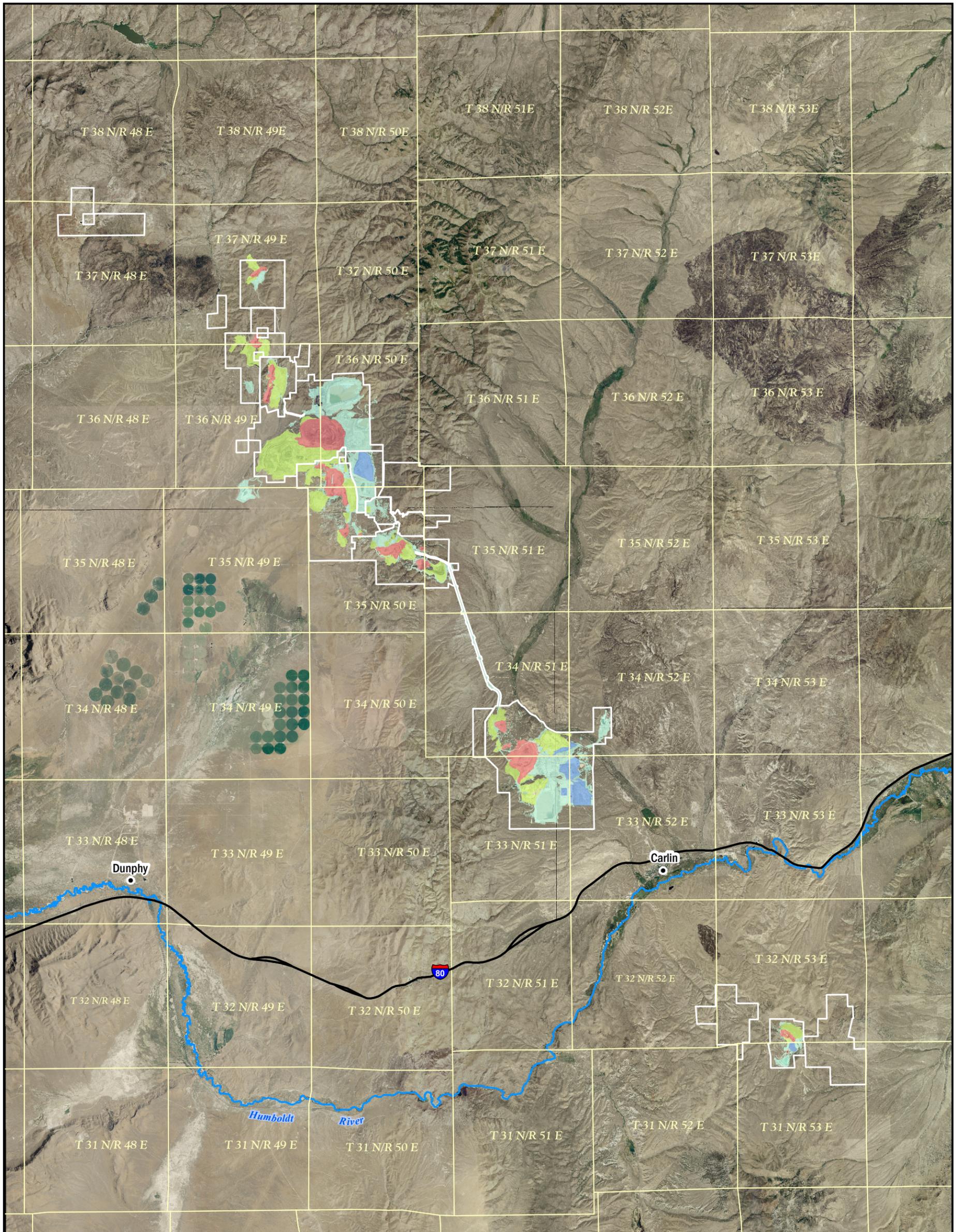
Willow Creek Reservoir is used to support alfalfa and native grass hay production on the Squaw Valley Ranch owned by Barrick Goldstrike (**Figure 2-3**). Information on irrigation rates for this ranch is not available. The ranch also raises cattle.

Other private land operations in the Study Area include the Dean and Sharon Rhoads and Van Norman Ranches Inc. which use surface water sources to support native grass hay production (**Figure 2-3**). These ranches also raise cattle and horses. Information on water sources and rates of irrigation are not available.

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Livestock grazing is expected to continue at levels established on the various grazing allotments included in the vicinity of the Carlin Trend. Short-term (typically 2 to 4 years) adjustments to livestock numbers are expected in response to range fires which have impacted forage levels. Livestock water supplies affected by mine dewatering activities would be replaced in accordance with permit conditions for each mining operation.

The following project is proposed as part of the on-going livestock management program for the BLM Elko District Office, separate from mining-related activities:



SOURCE: USGS 1:250K TOPOGRAPHIC MAPS--ELKO, MC DERMITT, WELLS, AND WINNEMUCCA, NV.



- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads
- Plan Boundaries
- Townships
- Mine Disturbance**
- Ancillary
- Leach Pad
- Pits
- Waste Rock Dumps



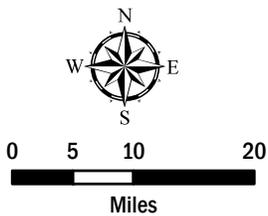
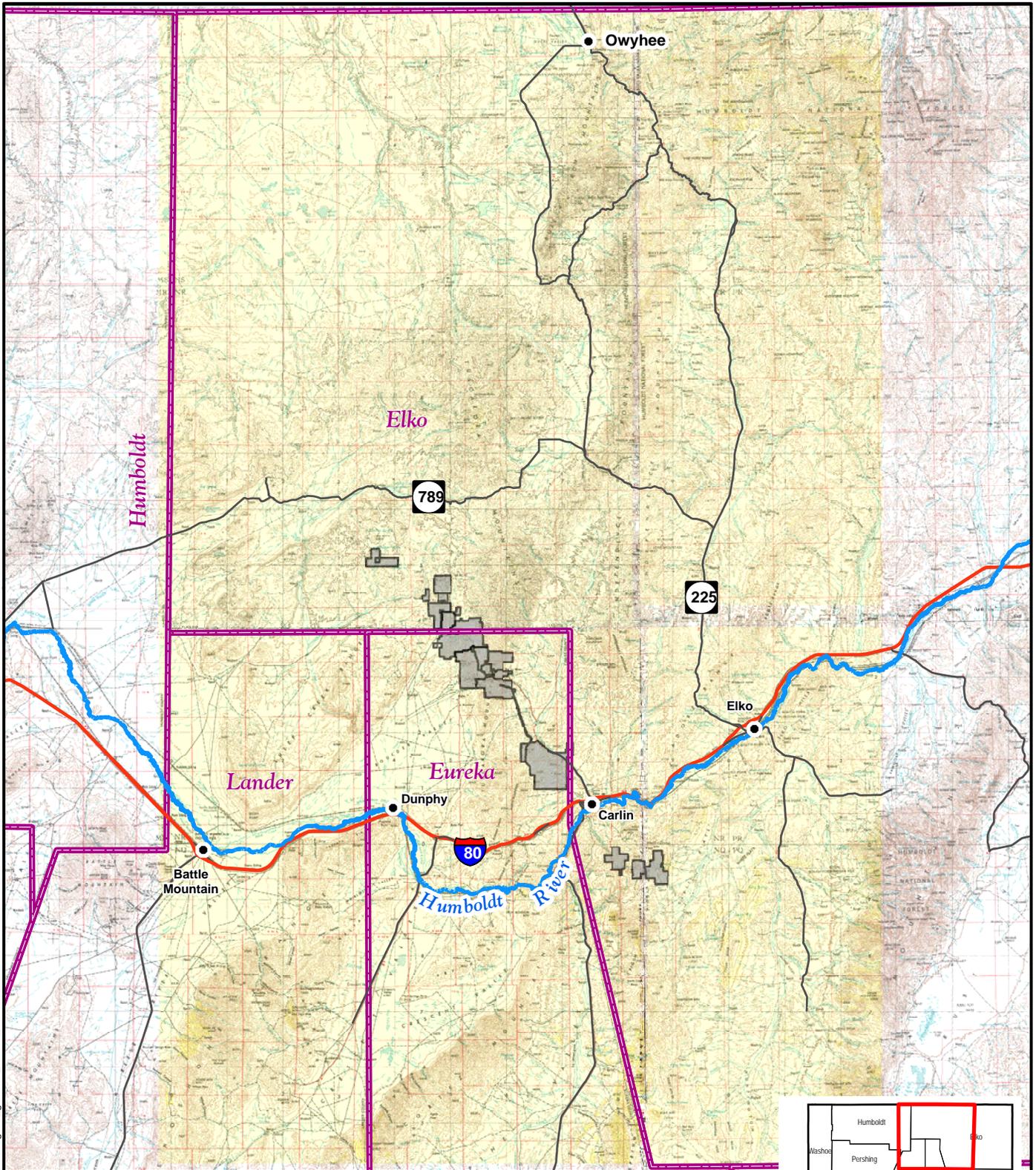
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MINE DISTURBANCE - CARLIN TREND IN NEVADA
SOAPA Project
Final Supplemental EIS
Eureka and Elko Counties, Nevada

FIGURE
2-1

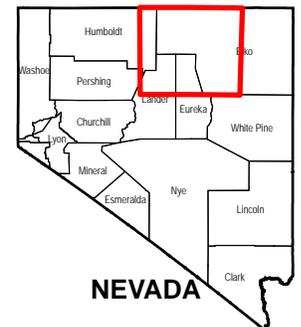
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Legend

- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads
- ▭ Counties
- ▭ Plan Boundaries
- ▭ General Cumulative Effects Study Area

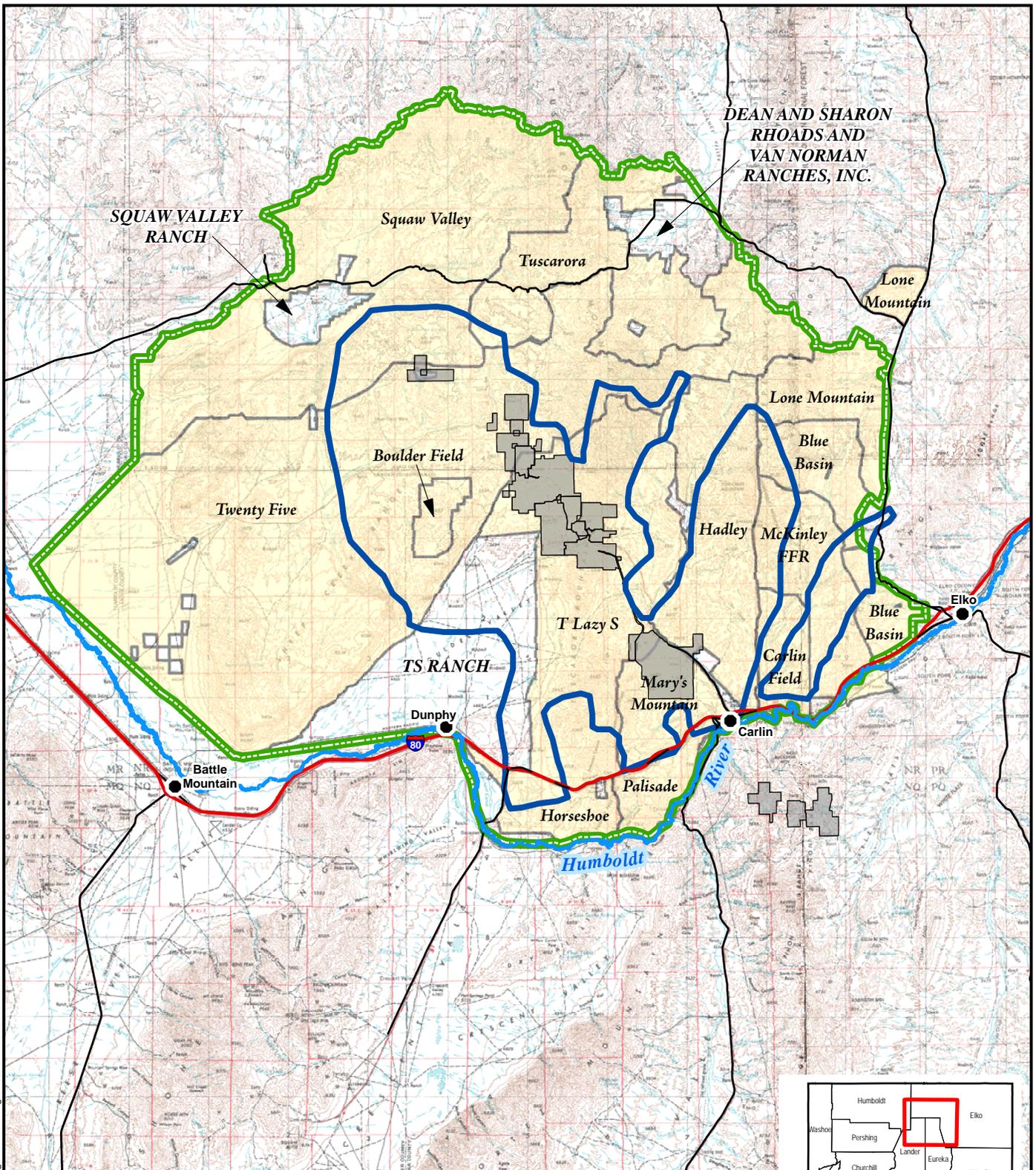


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**GENERAL CUMULATIVE EFFECTS AREA
 SOAPA Project
 Final Supplemental EIS
 Eureka and Elko Counties, Nevada**

FIGURE

2-2



DEAN AND SHARON
RHOADS AND
VAN NORMAN
RANCHES, INC.

SQUAW VALLEY
RANCH

Squaw Valley

Tuscarora

Lone Mountain

Boulder Field

Lone Mountain

Blue Basin

Twenty Five

Hadley

McKinley

FFR

T Lazy S

TS RANCH

Carlin Field

Elko

Dunphy

Carlin

Mary's Mountain

Horseshoe

Palisade

Humboldt River



Legend

- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads

- Plan Boundaries
- Grazing Allotments

- Cumulative 10 Foot Drawdown (BLM 2000)
- Cumulative Effects Study Area



NEVADA

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**GRAZING ALLOTMENTS
CUMULATIVE EFFECTS STUDY AREA
SOAPA Project
Final Supplemental EIS
Eureka and Elko Counties, Nevada**

FIGURE

2-3

- Black Mountain Division Fence – Approximately 3 miles of three-strand fence would be constructed to divide the Black Mountain and Sheep Creek Areas. This would be a temporary Emergency Stabilization/Rehabilitation (ESR) fence along Rock Creek in the 25 Allotment (BLM 2006a).

The following reasonably foreseeable actions have been identified through current scoping and/or planning to be considered and evaluated:

- 10-year Term Grazing Permit Renewal for the Spanish Ranch Allotment (scoping completed in 2008).
- 10-year Term Grazing Permit Renewal for Squaw Valley Allotment (scoping completed in 2008).
- 10-year Term Grazing Permit Renewal for all allotments within the Study Area will occur within the project lifetime as permits expire or as the need to fully process permits is identified.

ENERGY PRODUCTION AND DISTRIBUTION

PAST and PRESENT ACTIVITIES

Upgraded power lines have been installed throughout the Carlin Trend area to support ongoing mining activity. Rights-of-way have been established across public and private land to accommodate these distribution systems. In 2004, Sierra Pacific completed a 345-kilovolt (kV) electrical transmission line between the Falcon substation located near Dunphy south to the Gonder substation near Ely, Nevada. The transmission line corridor is near the Carlin Trend area, originating adjacent to Interstate-80 at the town of Dunphy.

Section 368 of the Energy Policy Act of 2005 (PL 109-58) directed the Secretary of the Interior to designate corridors for oil, gas, hydrogen pipelines, and electricity transmission and distribution facilities on public land administered by BLM. In a subsequent Programmatic EIS and Record of Decision (BLM 2009a) the BLM adopted interagency operating procedures for administration of energy transport development within the designated corridors; identified requirements to expedite coordinated, consistent, interagency management procedures for permitting rights-of-way within the corridors; and identified mandatory requirements to ensure that future projects developed within the corridors are planned, constructed, operated, and decommissioned in a manner that protects and enhances environmental resources and long-term sustainability. This Record of Decision amends the Elko Resource Management Plan (BLM 1987) to include energy corridor 17-35 which parallels Interstate Highway 80 in the Carlin area.

TS Power Plant

Construction of the TS Power Plant located 3 miles north of Dunphy in Eureka County, Nevada was completed in early 2008 and began commercial operations in June, 2008. The power plant consists of a pulverized coal-fired generator with a name plate generating capacity of 242 megawatts (MW), fueled by low-sulfur sub-bituminous coal. The plant includes state-of-the-art emission controls including low nitrogen oxide (NO_x) burners, overfire air and selective catalytic reduction for control of NO_x; spray dry absorber for control of sulfur dioxide (SO₂); powder activated carbon injection to collect mercury from the flue gas, and a fabric filter baghouse for particulate control.

The TS Power Plant was developed for the specific purpose of providing electric power to Newmont's gold mining and ore processing

operations at various locations across northern Nevada. Current peak loads to serve Newmont's operations range from 180 to 190 MW. The TS Power Plant supplies approximately 130 MW for Newmont operations in the Nevada Energy Power Company service area. Excess annual capacity is made available to the Nevada Energy Power Company system. A new 120 kV transmission line has been constructed from the power plant to the Falcon substation located about seven miles north of the plant, where power is distributed into the Nevada Energy transmission grid.

The power plant requires an estimated 4,800 acre-feet of water annually. Water is supplied from production wells located north of the power plant. Assuming a 24-hour power generation cycle, the water demand for the power plant is approximately 2,500 gal/min. The plant has a design life of about 50 years.

The TS Power Plant burns approximately 800,000 tons of Powder River Basin coal annually. Coal is delivered to the site via 130-car unit trains. During full load operations, one train load (approximately 15,000 tons) of coal is delivered to the site about every five days (Laybourn 2009).

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Ruby Pipeline, L.L.C. has proposed to construct and operate a 675-mile long buried natural gas pipeline extending from southwest Wyoming, across Utah, Nevada, and terminating near the Oregon – California border. The pipeline would be located about 15 to 20 miles north of the Carlin Trend and constructed within a 115-foot wide corridor. The Project would be constructed across 97 miles of public land administered by BLM and 70 miles of private land within Elko County, Nevada. A compressor station (Wieland Flat) would be constructed about 35 miles north of Elko, Nevada.

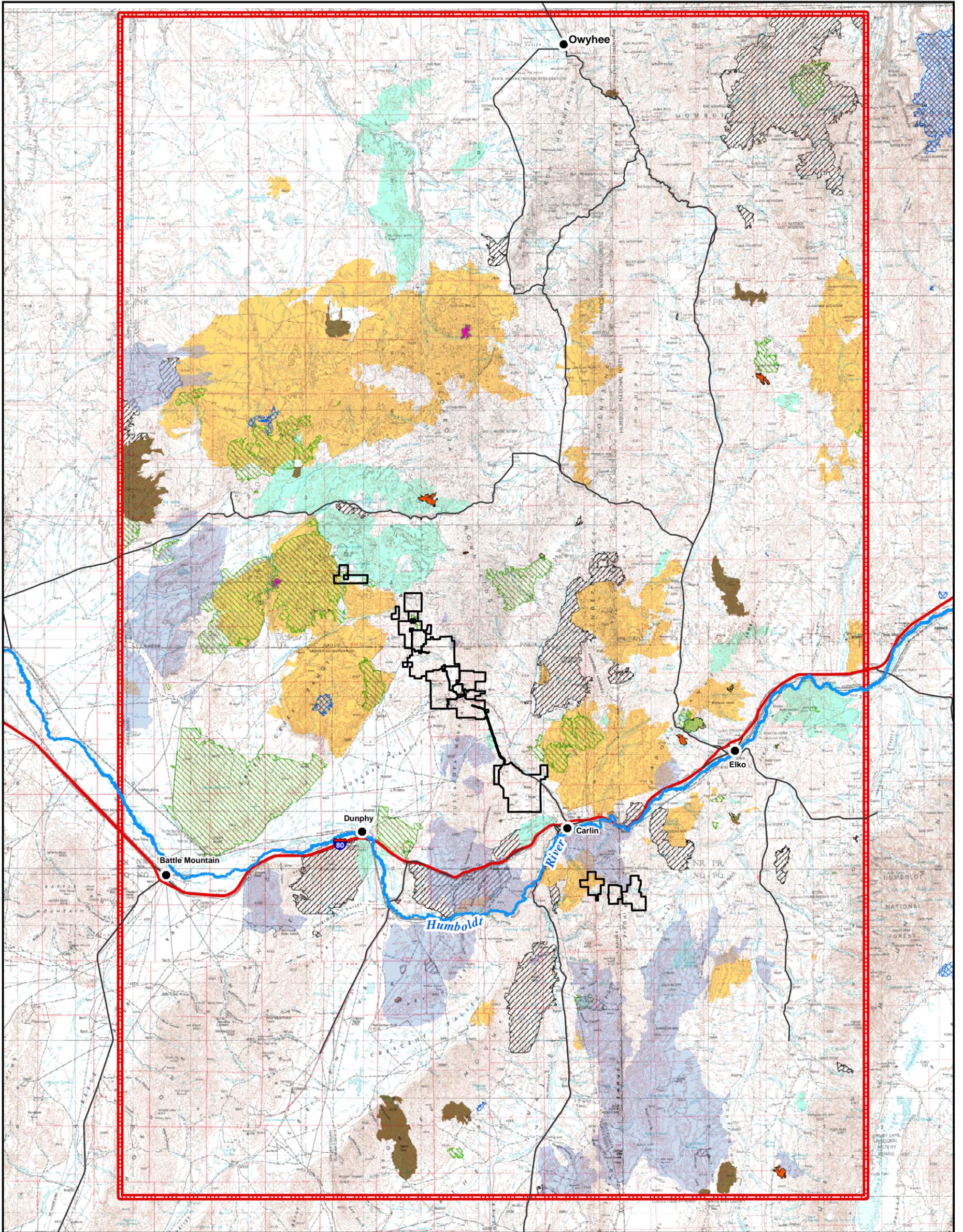
Construction would involve stripping and stockpiling growth media; trenching; placement and burial of a 42-inch diameter steel pipeline in a six-foot deep trench; replacement of growth media; and regrading and revegetation of disturbed areas. The Project is scheduled to begin in spring 2010 with completion projected by spring of 2011. Ruby Pipeline estimates that 400 to 700 workers would be required to construct the pipeline and Wieland Flat Compressor Station in Elko County (FERC 2009).

WILDFIRES AND RESEEDING

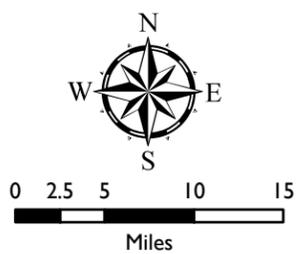
PAST and PRESENT ACTIVITIES

Over the last decade, the BLM Elko District Office averaged 150 fires per season that burned approximately 1,000,000 acres. Approximately 38 percent (941,793 acres) of wildlife and livestock grazing habitat in the Study Area has been impacted by fire between 1999 and 2008. This includes approximately 116,000 acres that burned more than once during the period (BLM 2007b). **Figure 2-4** depicts the cumulative burn areas for the period 1999 through 2008.

Since 1992, public and private entities have worked to restore range habitat for wildlife and livestock on areas affected by wildfire. Restoration work during 2006 by BLM and Nevada Department of Wildlife (NDOW) included fencing burned areas to preclude livestock grazing and reseeding within the Study Area. Some tracts of land are reseeded and others are allowed to reseed naturally (either through recovery of burned plants or under natural release of seeds from adjacent areas). Reseeding efforts are shown on **Figure 2-5**.



SOURCE: USGS 1:250K TOPOGRAPHIC MAPS--ELKO, MC DERMITT, WELLS, AND WINNEMUCCA, NV.

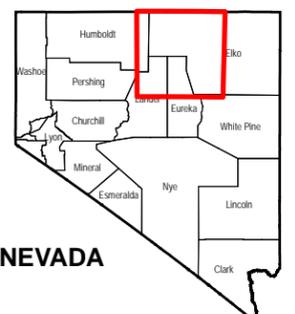


Legend

- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads
- General Cumulative Effects Area
- Plan Boundaries

Fire Years

- | | |
|------|------|
| 1999 | 2004 |
| 2000 | 2005 |
| 2001 | 2006 |
| 2002 | 2007 |
| 2003 | 2008 |

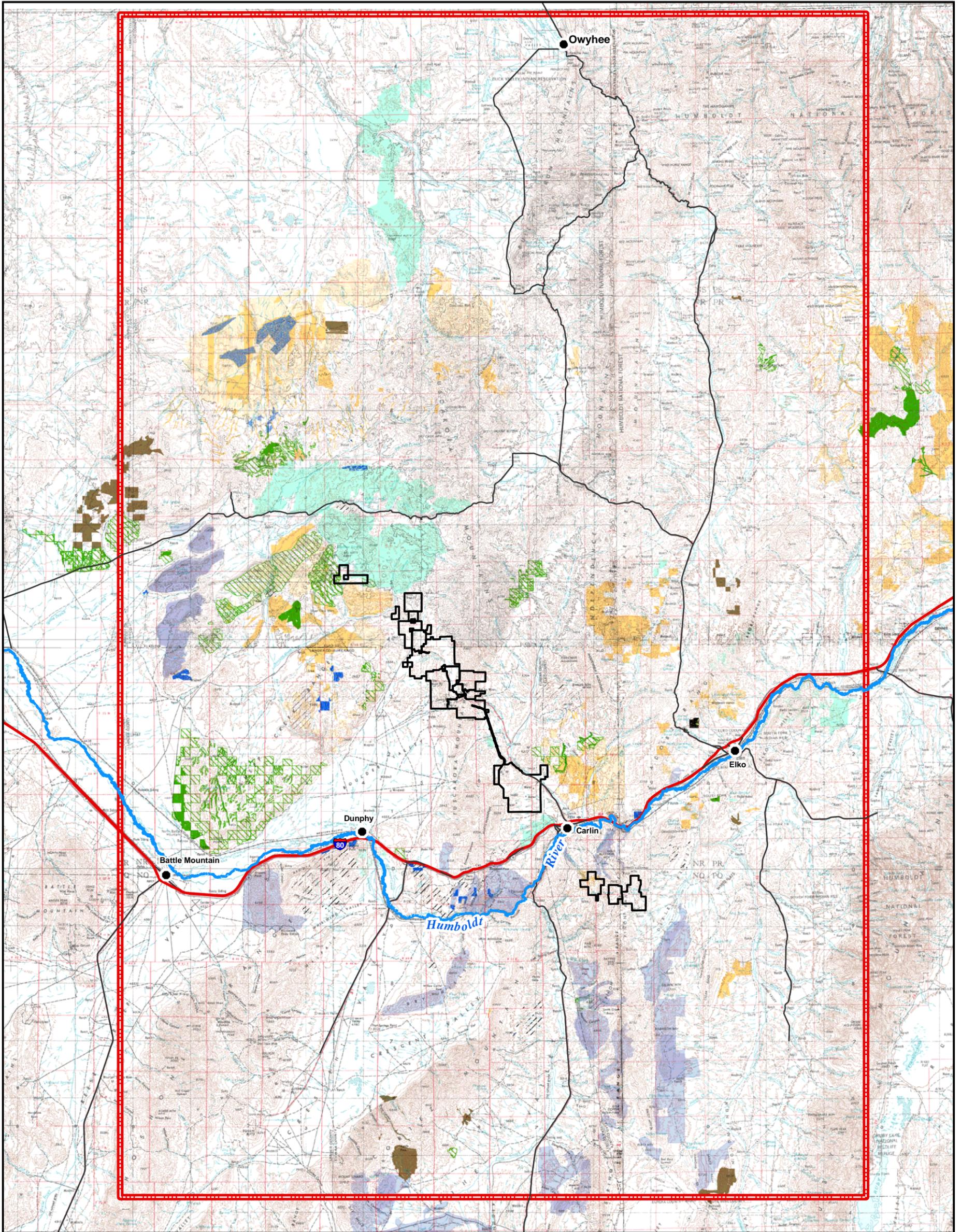


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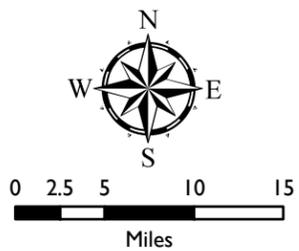
HISTORICAL FIRES - 1999 THROUGH 2008 - GENERAL CUMULATIVE EFFECTS AREA
SOAPA Project
Final Supplemental EIS
Eureka and Elko Counties, Nevada

FIGURE

2-4



SOURCE: USGS 1:250K TOPOGRAPHIC MAPS--ELKO, MC DERMITT, WELLS, AND WINNEMUCCA, NV.



Legend

- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads
- ▭ General Cumulative Effects Area
- ▭ Plan Boundaries

Years Reseeded

- 1999
- 2000
- 2001
- 2003
- 2005
- 2006
- 2007
- 2008



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Elko, Nevada

RESEEDED AREAS - 1999 THROUGH 2008 - GENERAL CUMULATIVE EFFECTS AREA
SOAPA Project
Final Supplemental EIS
Eureka and Elko Counties, Nevada

FIGURE

2-5

Critical habitat areas are being reseeded with forbs, grasses, and shrubs that can compete with invasive grasses such as cheatgrass, which is prevalent in northern Nevada. NDOW is focusing its efforts on areas prioritized for wildlife values. Habitat restoration/reseeding projects from 1999 through 2008 within the Study Area resulted in reseeding a total of 382,787 acres (55,328 acres private and 327,459 acres public).

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Fire (controlled burns and wildfire) will continue to be an important component of land management for public and private landowners. Controlled burns will be used to reduce fuel load in selected areas of public land. Wildfires are expected to continue in the Study Area. Some of this acreage would likely include burning of areas previously burned and seeded.

STABILIZATION AND REHABILITATION PROGRAMS

PAST and PRESENT ACTIVITIES

Mitigation Plans

Beginning in 1991, BLM in cooperation with Barrick, Newmont, and others developed comprehensive mitigation plans for mining-related impacts. Many aspects of the mitigation plans are focused in the Carlin Trend and specifically in the Maggie, Willow, and Rock creek drainage basins; however, some mitigation projects have been implemented in other parts of the region. Key aspects of these mitigation plans are summarized below.

Barrick Conservation and Mitigation of Riparian/Wetland Areas Fund – 1991 Betze Project

The Conservation and Mitigation of Riparian/Wetland Areas Fund was established through the ROD for Barrick's 1991 Betze Project (BLM 1991). As stipulated, Barrick contributed \$660,000 to an interest bearing account for the protection and enhancement of riparian and wetland areas as compensation for potential loss of up to 330 acres of riparian and wetland area predicted to occur from dewatering operations. The District Manager for the Elko District approves use of the funds for specific proposals developed by either BLM or Barrick in cooperation with NDOW. As of September, 2008, the following projects have been approved or implemented within the Study Area:

- Evaluation of factors affecting Lahontan cutthroat trout recovery in three watersheds;
- Protection of springs and seeps;
- Squaw Valley Allotment Lahontan cutthroat trout habitat management fences;
- Culvert replacement on Beaver Creek for Lahontan cutthroat trout;
- Maggie Creek diversion replacement for Lahontan cutthroat trout;
- Susie Creek land exchange;
- McKinley FFR Allotment Lahontan cutthroat trout habitat fence on Susie Creek; and
- Nonnative fish barrier design for Lahontan cutthroat trout on Maggie and Susie creeks.

The ROD for the 1991 Betze Project also provided \$50,000 for sage grouse habitat improvement projects including protection of riparian areas. To date, \$25,000 from this fund has been expended to purchase pipe rail fencing for protection of springs in the Study Area.

Additional projects funded through the 1991 Betze ROD included Mule Deer Habitat Improvement mitigation. Mule Deer Habitat Improvement mitigation funds (\$125,000) were used by BLM for seeding projects that included the Northwest Sheep Fuels Treatment Project, Rooster's Comb Seeding, Northwest Izzenhood Seeding, and browse seeding efforts on the Lander Seeding. These areas provide crucial mule deer winter range on the flanks of the Izzenhood and Sheep Creek ranges north of Battle Mountain.

Mitigation Plan for 1993 South Operations Area Project (SOAP)

As part of the 1993 Record of Decision for the South Operations Area Project (BLM 1993), BLM and Newmont developed a comprehensive mitigation plan (Mitigation Plan) for potential resource impacts identified through the EIS process without regard to public or private land status. The intent of the plan was to address potential adverse impacts before they occur and to improve important resources over pre-project baseline conditions.

A primary component of the Mitigation Plan was development of the Maggie Creek Watershed Restoration Project. In 1993, the BLM Elko District Office, Newmont, and the TS Ranch developed the Maggie Creek Watershed Restoration Project to enhance 82 miles of streams, nearly 2,000 acres of riparian habitat, and 40,000 acres of upland watershed in the Maggie Creek basin. The purpose of this project is to improve priority habitat for Lahontan cutthroat trout populations in the Humboldt River drainage. The project included fencing priority stream and riparian habitats, applying prescription grazing practices, water developments, and establishing a conservation easement. The project also included riparian plantings and comprehensive habitat monitoring.

Detailed discussions of the SOAP Mitigation Plan are contained in Appendix A of the Final EIS (BLM 1993). Other components of the plan include:

- Reclamation test plots;
- Fencing springs, seeps, stream segments, and livestock grazing pastures;
- Range reseeding projects;
- Stream flow augmentation plans (Maggie and Susie creeks);
- Augmentation of seeps and springs;
- Cultural resource site mitigation;
- Wildlife habitat enhancements;
- Water rights subordination;
- Contributed staff funding; and
- Resource monitoring programs.

Mitigation Plan for 2002 South Operations Area Project Amendment (SOAPA)

The SOAPA Mitigation Plan was developed as part of the 2002 ROD for SOAPA and established additions and revisions to the 1993 SOAP Mitigation Plan. Details of the SOAPA Mitigation Plan are contained in the SOAPA EIS (BLM 2002a). Components of the 2002 SOAPA Mitigation Plan include:

- Sinkhole remediation;
- Installation and monitoring three piezometers;
- Fencing springs and seeps;
- Wildlife enhancement measures;
- Construction of a wildlife friendly fence on the Stampede Ranch;
- Replacement of the Beaver Creek culvert for Lahontan cutthroat trout;
- Grazing prescription changes;
- Surface and groundwater monitoring programs; and
- Continuation of the SOAP (1993) Mitigation Plan.

Mitigation Plan for 2002 Leeville Project

The Leeville Mitigation Plan was developed as part of the 2002 Leeville Project ROD, and represents a project specific extension of the 1993 SOAP and 2002 SOAPA Mitigation Plans in addressing dewatering and dewatering related impacts. Many of the mitigation measures for potential loss of surface and groundwater flows are based on monitoring triggers. Details of the Leeville Mitigation Plan are contained in the Leeville EIS (BLM 2002b). Primary components of the Mitigation Plan include:

- Standards for construction of waste rock disposal facilities;
- Replacement of Coyote and Little Jack creek culverts for Lahontan cutthroat trout;
- Monitoring plans for refractory ore stockpiles and waste rock disposal facilities;
- Extended conservation easement for Maggie Creek Watershed Restoration Project;
- Minimize stripping operations during bird breeding season; and
- Expanded surface and groundwater monitoring.

Mitigation Plan for 2003 Betze Project

The Betze SEIS Mitigation Plan was developed as part of the ROD for Barrick's Betze Project (BLM 2003). A primary component of the Mitigation Plan was development of the Upper Willow Creek Habitat Enhancement Plan which was designed to provide mitigation for direct, indirect, and cumulative environmental effects analyzed in the Betze SEIS (BLM 2003). The area is located upstream of Willow Creek Reservoir and within the Squaw Valley allotment. The Enhancement Plan was established to restore upland and riparian conditions on approximately 12,300 acres of mostly private land in the upper reaches of the Willow Creek drainage including

headwater tributaries of Nelson and Lewis creeks. Components of the Enhancement Plan include:

- Conservation easement for the Upper Willow Creek Habitat Enhancement Plan;
- Spring/seep monitoring;
- Protection and improvement of 15 seeps and springs;
- Funding (\$25,000) to U.S. Fish and Wildlife Service for biota in the Humboldt River each year in which a discharge to the river occurs;
- Funding (\$50,000) for sage grouse habitat enhancement and pipe rail fencing for spring protection;
- Funding (\$50,000) for springsnail relocation study (Desert Research Institute); and
- Conveying 1.5 cubic feet per second (cfs) instream flow right to NDOW and BLM.

Mitigation for 2009 Betze Expansion Project

The Record of Decision for Barrick's Betze Pit Expansion Project (BLM 2009b) incorporated the following mitigation:

- Extension of the noxious weed management and reclamation plan.
- Barrick provided conceptual design documentation which proposes to construct the Clydesdale Waste Rock Disposal Facility in 100-foot lifts with 250-foot step-outs, allowing for an overall post-mining configuration of 2.5H:IV to 2.8H:IV slopes. Barrick will also reclaim the facility based on morphometric and hydrologic principles to resemble surrounding landforms to the extent practicable in order to minimize erosion and promote long-term stability.

- Reclamation of the eastern portion of the Clydesdale Waste Rock Disposal Facility and the western portion of the Bazza Waste Rock Disposal Facility along the wildlife migration corridor will be completed as soon as possible to minimize disturbance to the existing mule deer migration corridor.
- The haul road will be constructed with two strategically placed breaks/gaps to allow for wildlife movement while minimizing the potential for wildlife/vehicle collisions along the haul road.
- To provide a spatial buffer for Boulder, Bell, and Rodeo creeks, the Clydesdale Waste Rock Disposal Facility will be set back at least 100 feet from the uppermost edge of the creek banks.
- Limestone amendment to Betze Pit Lake - approximately 100 tons of limestone or other neutralizing material will be placed on the pit floor where the pit lake would first emerge or where ponding would occur to act as a neutralizing buffer for potential acidic runoff during the initial years of the groundwater recharge of the pit lake.

Susie Creek Riparian Restoration Project

Susie Creek has been identified as a potential reintroduction site for Lahontan cutthroat trout (USFWS 1995). Beginning in 1991, BLM, in cooperation with Maggie Creek Ranch, fenced approximately 9 miles of the lower reaches of Susie Creek for the purpose of improving stream and riparian habitat through prescriptive livestock management. Most of the remaining 13 miles of Susie Creek including several miles of tributary streams have been fenced for control and management of livestock as a result of cooperative projects between BLM, Newmont, U.S. Fish and Wildlife Service, and the Heguy and Maggie Creek ranches.

Other Projects and Programs

In addition to the mitigation plans described above, several projects and programs have been implemented to restore habitat for wildlife and riparian areas and/or manage livestock and wildlife within and adjacent to the Carlin Trend area. Primary programs and projects include the following:

Wildlife

- Carlin Trend Mule Deer Habitat Management Plan – Drafted by the Carlin Trend Mule Deer Working Group (Newmont, Barrick, NDOW, and BLM) to develop landscape scale, long term, habitat management practices to ensure maintenance or improvement of mule deer health.
- Mule Deer Transition Range Seeding - In 1997, Newmont, Elko Land and Livestock, NDOW, and BLM completed a Cooperative Agreement that developed and implemented the Bob's Flat Emergency Fire Rehabilitation and Mule Deer Mitigation Reseeding Project. Approximately 3,427 acres were seeded on public land in Bob's Flat and the southern portion of the Tuscarora Mountains through funds provided, in part, by Newmont, and placed in a mule deer habitat mitigation bank for Newmont. Seven Newmont projects totaling 1,790 acres have been withdrawn from the mitigation bank: 800 acres for the South Operations Area Project; 300 acres for the Bootstrap Project; 211 acres for Section 36 Project; 75 acres for the Lantern Project; 139 acres for the South Operations Area Project Amendment, 1-acre for the Leeville Project and 264 acres for the Pete Project. As a result, 1,637 acres remain

in the mule deer habitat mitigation bank. Application of these remaining acres would be for future projects resulting in the permanent loss of mule deer habitat for affected herds.

- T Lazy S Sage Grouse Habitat Improvements – This effort involved prescribed fire manipulation of about 275 acres of Newmont mitigation land (for SOAPA and Pete projects) within the T Lazy S Allotment to improve sage grouse habitat during fall 2005 (BLM 2006a). The same area was later aerially seeded during the winter of 2005 with a multiple grass and forb seed mixture. Newmont has also provided funding for habitat restoration on more than 8,000 acres of sagebrush habitat (Governor’s Sage Grouse Conservation Team 2001).
- BLM completed a 709-acre mule deer habitat improvement project in the Sheep Creek Range north of Battle Mountain in February 2006. The project was funded by Marigold Mining Company (formerly Glamis Dee Gold Mine Company), which provided \$25,000 in funds toward the treatment on public land as mitigation for impacts to mule deer and pronghorn antelope habitat.
- Mining companies and NDOW have worked together since 1990 to implement a regulatory program to prevent wildlife mortality at heap leach ponds and mine tailing (e.g., Industrial Artificial Pond Permit program). Industrial Artificial Pond Permits require controls including: fencing to prevent access by terrestrial wildlife; covering/containment for process solution ponds to preclude access by birds and bats; and chemical

neutralization or isolation of chemical-laden fluids in a pond too large to cover or contain.

- NDOW has relocated approximately 350 antelope and held emergency antelope and mule deer hunts to reduce herds to sustainable levels. Critical areas for affected wildlife are being reseeded with forbs, grasses and shrubs that can compete with invasive grasses such as cheatgrass.

Fisheries and Aquatic Resources

Trout Unlimited Strategies for Restoring Native Trout Program – Maggie and Willow/Rock Creek Drainages

In 2001, Trout Unlimited (2007a) introduced the “Strategies for Restoring Native Trout” program to scientifically monitor cooperative, large-scale restoration efforts to improve and expand existing aquatic habitat for native trout. The Maggie and Willow/Rock creek drainages were incorporated into the program in response to large-scale restoration projects being implemented through mine mitigation plans (described above). As part of the work in the Maggie and Willow/Rock creek basins, Trout Unlimited is monitoring Lahontan cutthroat trout populations annually to track progress of restoration efforts including application of prescriptive grazing management and replacement of culvert barriers. Other project partners including BLM, Newmont, Barrick, and NDOW monitor riparian and upland conditions, aquatic habitat, and water quantity and quality.

Open Range Consulting - Evaluation of Factors Affecting Lahontan Cutthroat Trout in Three Watersheds

Since 2006, the BLM Elko District Office has been working with Open Range Consulting, Inc. and other partners to develop innovative

strategies for monitoring and evaluation of mine mitigation restoration efforts in the Maggie and Willow/Rock creek basins. Partners include Newmont, TS Ranch, Barrick, Squaw Valley Ranch, Maggie Creek Ranch, USFWS, Trout Unlimited, and NDOW. Specific goals of the project are to: 1) evaluate effectiveness of large scale watershed restoration efforts for Lahontan cutthroat trout; 2) correlate aerial imagery to field measurements; 3) create software to evaluate and quantify fisheries habitat; and 4) use the information to guide regional trout recovery efforts. The Project was completed in fall of 2008, and BLM received a final report in February 2009.

Beaver Creek Riparian Pasture

The Beaver Creek drainage includes approximately 30 miles of habitat for Lahontan cutthroat trout on both public and private land. In 1992, the Nevada Mining Association, in cooperation with BLM and the 26 Ranch, constructed approximately 4 miles of fence in the headwaters resulting in creation of a 10,000 acre riparian pasture. A combination of rest from livestock and limited hot season grazing since 1993 has resulted in growth and establishment of an aspen/willow riparian corridor and improved habitat for fisheries and aquatic resources.

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Fisheries and Aquatic Resources

Programs to improve stream and riparian habitat through improved livestock grazing management practices are expected to increase in the Study Area. These programs are expected to result in improvements to fisheries and aquatic resources, including threatened, endangered, and candidate species.

Wetlands and Riparian Areas

Restoration of riparian areas and programs to increase habitat for mule deer, sage grouse, and other wildlife are expected to continue in the future. Many of these programs are implemented by mining companies to offset losses of habitat that could occur as a result of operations and mine development. Other programs are implemented to restore vegetation and habitat in areas impacted by fire.

The Barrick 15 Spring Improvements project was identified as part of Barrick's mitigation commitment in the 2003 Betze Project SEIS and would restore up to 15 spring riparian sites by constructing protective fencing around seeps and springs (BLM 2006a).

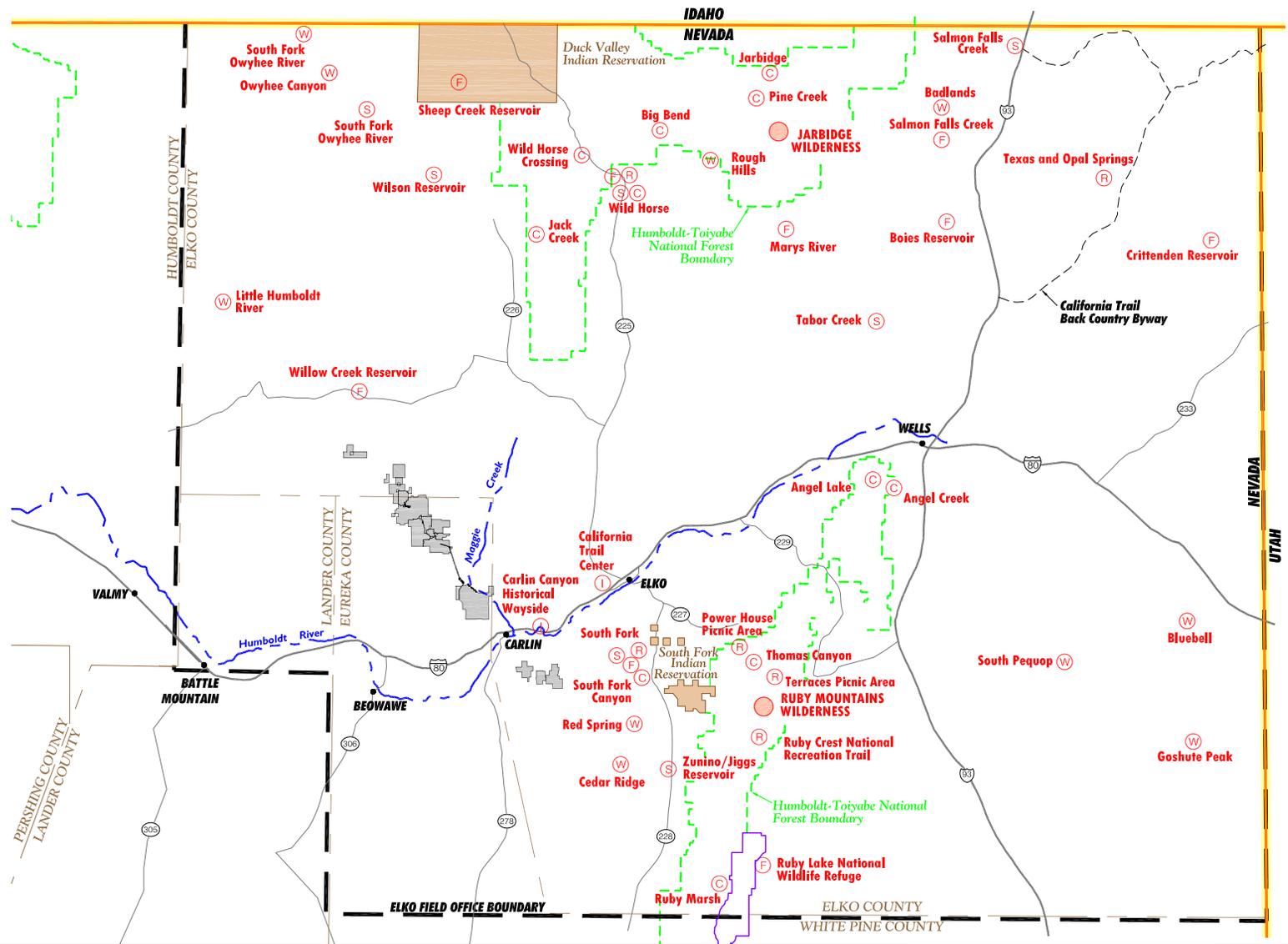
RECREATION

PAST and PRESENT ACTIVITIES

Outdoor recreational areas and facilities in the vicinity of the Carlin Trend include those managed by BLM, Nevada Division of State Parks, U.S. Forest Service (USFS; Humboldt-Toiyabe National Forest), USFWS, Bureau of Indian Affairs (BIA), and private operators. These areas and facilities are described in the SOAPA EIS (BLM 2002a) and shown on **Figure 2-6**.

Public land within these areas provide diverse recreational activities, including fishing, sightseeing, hunting, cross-country skiing, horseback riding, white-water rafting, photography, rock-hounding, and off-highway vehicle use. The majority of public land in the Carlin Trend has been designated as "open" for off-highway vehicles.

Recreational use of public land in the vicinity of mining operations in the Carlin Trend consists primarily of off-highway vehicle use and hunting. The area is hunted for deer, antelope, and upland game birds.



- Sources**
1. Bureau of Land Management 2004
 2. Humboldt-Toiyabe National Forest 2004
 3. Nevada Division of State Parks 1992



U.S. Department of the Interior
 Bureau of Land Management
 Elko District Office
 Tuscarora Field Office
 Elko, Nevada

- | | |
|-----------------------|--|
| (I) Interpretive Site | Plan Boundaries |
| (C) Campground | (W) Wilderness Study Area |
| (F) Fishing Area | (R) Wilderness Area |
| (R) Recreation Area | (S) Special Recreation Management Area |

RECREATION AREAS
SOAPA Project
Final Supplemental EIS
Eureka and Elko Counties, Nevada

FIGURE
2-6

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REASONABLY FORESEEABLE FUTURE ACTIVITIES

The two primary recreational activities occurring in the vicinity of Carlin Trend are off-highway vehicle use and hunting. These activities would likely continue at current levels through the foreseeable future.

BLM is currently building a California trail interpretive center located at the Hunter exit on Interstate 80, about 6 miles west of the town of Elko. The center encompasses 40 acres and includes a building, access road, interpretive plaza, 65-car parking lot, 1.5-mile walking trail, amphitheater, and day use area. BLM estimates approximately 65,000 people/year will visit the center once all exhibits are in place by 2011 (Jamiel 2007).

LAND DEVELOPMENT

PAST and PRESENT ACTIVITIES

Approximately 565 acres have been platted for development in the vicinity of Carlin. The majority of platted area lies between Interstate 80 and the Humboldt River in and adjoining the town of Carlin. Other development is occurring east of Highway 766 near its intersection with Interstate 80 (Newmont 2010a).

Approximately 23 acres have been platted at Palisades, midway between Carlin and Dunphy. Development in the Dunphy area consists of approximately 6 acres (Newmont 2010a). Information concerning the level and stages of these developments is not available.

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Land development in the Carlin-Dunphy area would likely continue commensurate with population and employment increases in the area.

MINE AND MINERAL DEVELOPMENT

PAST and PRESENT ACTIVITIES

Exploration and Mining

Exploration activities in the Carlin Trend began in the early 1870s with staking of the Good Hope claims in the Maggie Creek District (Coope 1991). These claims produced mainly lead and silver, with minor amounts of barite and gold. The first significant gold discovery was made on Lynn Creek in 1907, approximately 1.5 miles north of the present Carlin Mine. Placer gold discoveries followed in Sheep, Rodeo, and Simon creeks.

Newmont initiated its mining activities in the North Operations Area at the Carlin open pit mine in 1965. The North Operations Area includes the North Area Leach Pad, and the Bootstrap, Genesis-Bluestar, Lantern, Carlin, Pete, and Bullion Monarch open pit mines, and the Leeville underground mine.

Activities in the South Operations Area Project have expanded periodically since production began in 1985. Facilities include the Gold Quarry open pit mine, waste rock disposal facilities, tailing impoundments, dewatering wells, and ancillary facilities. The North-South Haul Road connecting the North Operations Area with the South Operations Area was approved in 1993.

Polar Resources began mining operations at the Betze/Post Mine in 1974; the mine was acquired by American Barrick Resources in 1986 and subsequently became the Betze/Post open pit mine (McFarlane 1991). Barrick began development of the Meikle underground mine in 1995, with processing occurring at the Betze/Post operation.

In March 2009, Barrick received authorization to amend its Plan of Operations for the Betze/Post Mine Complex to include enlarging the existing open pit, extend mining and dewatering operations through year 2015, and construction of waste rock disposal and tailing storage facilities.

Ore processing in the Carlin Trend has included installation and operation of cyanide heap leach facilities, carbon-in-leach systems, milling of ore, and disposal of tailing. In addition, exploration projects involving drilling, trenching, and sampling are ongoing.

Changes in exploration and mining activity since 2002 include advancement of exploration projects to active mining level (Barrick's Goldbug and Storm Projects, and Newmont's Pete and Chuckar Projects). Expansions have been made to the Known Deposit Areas (Newmont's North Lantern and Lantern #3 and Barrick's Dee Mine area).

Areas of past and present mining and exploration activities in the Carlin Trend are shown on **Figure 2-7**. Disturbance associated with each mine is shown in **Table 2-1**.

Sand and Gravel Operations

Approximately 395 acres of private land have been disturbed by sand and gravel operations in the Carlin area. These operations generally lie adjacent to major transportation routes (Interstate 80 and State Highway 766) in the area and have been used to support construction and maintenance of area roads over an extended period of time (Newmont 2010a).

Reclamation

In concert with mining activity in the Carlin Trend, several hundred acres of land have been reclaimed in response to cessation of active mining. A total of 1,920 acres of land have been

reclaimed in the Carlin Trend, of which reclamation bond has been released on 833 acres (including 756 acres associated with the Marigold Mining/Glamis Dee Gold Mine released in November 2008). The remaining acreage is pending review for bond release. The following projects have requested bond release:

- Newmont - Bootstrap Mine – 895 acres
- Newmont - Gold Quarry SOAP – 192 acres

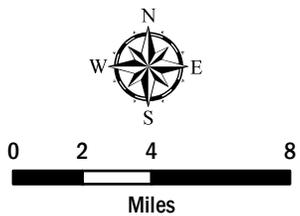
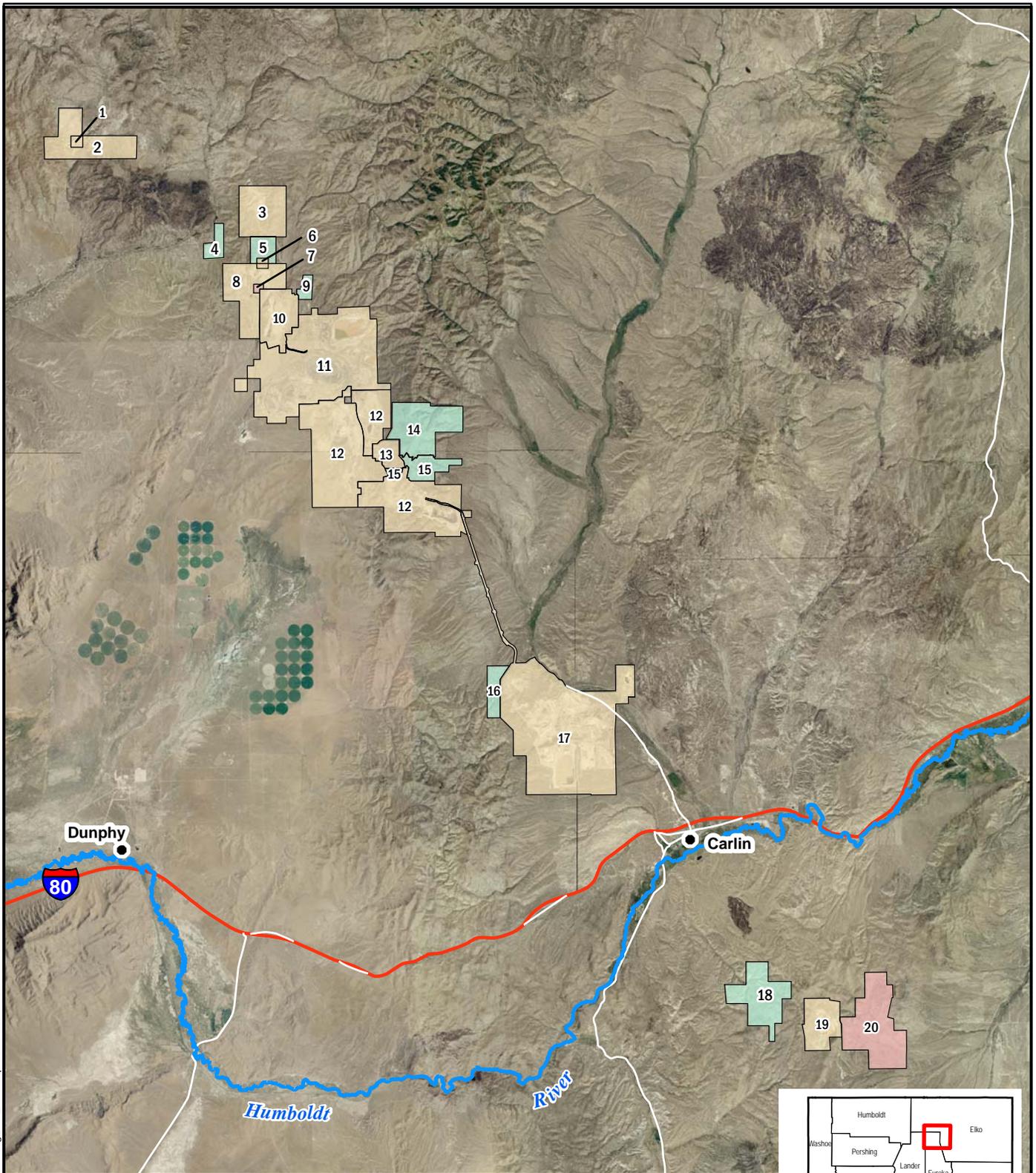
Dewatering and Discharge

Mining operations in the Carlin Trend have advanced to depths that require lowering the regional groundwater table to limit inflow to mine pits. Each of the major mine developments have installed dewatering wells and discharge systems to ensure mining can proceed without groundwater inflow into open pits and underground workings. Dewatering in the Carlin Trend has been ongoing for approximately 20 years.

Maggie Creek Basin

Newmont's South Operations Area Project is the only mining operation with dewatering and discharge activities in the Maggie Creek Basin. The Gold Quarry Mine currently pumps water at a rate of about 14,000 gpm or 22,500 acre-feet per year (af/yr). Of this amount, approximately 5,000 af/yr are used in mine operations (e.g., makeup water in ore processing or dust control); 200 af/yr are pumped to Maggie Creek Reservoir for storage during times of high runoff in Maggie Creek; 8,400 af/yr are used to irrigate the Hadley Fields west of lower Maggie Creek during the growing season; and 8,900 af/yr are discharged directly to Maggie Creek. Newmont has implemented the Maggie Creek Basin Monitoring Plan to monitor effects of dewatering at Gold Quarry on surface water and groundwater (Newmont 1992).

h:\Newmont Leeville-SOAPA SEIS\15000 GIS\Projects\SEIS_Figures\Fig_2-1_Development.mxd



Legend

- Cities
- Humboldt River
- Interstate Highway
- Other Major Roads
- Area of Major Exploration
- Areas of Existing and Reasonably Foreseeable Development As Defined By Mine Plan
- Locations of Reasonably Foreseeable Mine Developments



U.S. Department of the Interior
 Bureau of Land Management
 Elko District Office
 Tuscarora Field Office
 Elko, Nevada

**PAST, PRESENT, AND REASONABLY FORESEEABLE
 FUTURE MINING ACTIVITIES - CARLIN TREND IN NEVADA
 SOAPA Project
 Final Supplemental EIS
 Eureka and Elko Counties, Nevada**

**FIGURE
 2-7**

TABLE 2-1 Past and Present Mining and Exploration Related Carlin Trend				
Map Reference No.²	Facility	Existing Disturbance (acres)		
		Pre – 2002	2002 - 2009	Total
Mining Operations				
1	Newmont/Rodeo Creek Gold-Hollister	268	0	268
3	Halliburton-Rossi	224	149	373
6	Barrick-Storm Underground	-	185	185
8	Marigold – Dee Mine	802	-	802
10	Newmont-Bootstrap	1,900	-	1,900
11	Barrick-Betze/Post, Meikle, Rodeo, Goldbug, (Mill & TSF transferred from Newmont)	7,882	1,180	9,062
12	Newmont-Blue Star/Genesis, Section 36, Deep Star, Lantern, North Lantern, Bullion Monarch	1,775	1,183	2,958
	Newmont-North Area Leach	494	932	1,426
	Newmont-Carlin Mine/Mill I, Pete	1,598	2,075	3,673
13	Newmont- Leeville	-	566	566
17	Newmont- Gold Quarry/SOAP, MC Reservoir, N-S Haul Road	8,641	1,320	9,961
19	Newmont-Rain	954	7	961
Subtotal		24,538	7,597	32,135
Exploration				
1	Rodeo Creek Gold	15	-	15
2	Hecla- Hollister Development Block	-	51	51
4	Trio Gold Corp-Rodeo Creek	-	42	42
5	Barrick-Meridian JV-Rossi	51	-	51
9	Centerra -Ren	30	-	30
11	Barrick-Goldstrike Project	233	-	233
12	Newmont -Carlin	255	-	255
14	Newmont- Chevas	168	-	168
15	Newmont-High Desert	164	-	164
16	Newmont -Mike	48	-	48
18	Newmont- Woodruff Creek	66	-	66
20	Newmont-Emigrant Springs	63	92	155
Subtotal		1,093	185	1,278
TOTAL		25,631	7,782	33,413

¹ Projects permitted by BLM as of March 2009.

² See **Figure 2-7** for disturbance sites.

Source: BLM 2010a.

In November 1993, BLM adopted the SOAP Mitigation Plan (BLM 1993). Measures included in the SOAP Mitigation Plan and subsequent revisions to the Mitigation Plan for SOAPA (BLM 2002a) address potential adverse impacts from dewatering without regard to whether they occur on public or private land. Measures in the Mitigation Plan that deal directly with dewatering include groundwater monitoring and reporting protocols. Monitoring data are used to trigger implementation of mitigation measures found in the Mitigation Plan, including flow augmentation for individual springs, seeps, and streams.

Boulder Valley

Dewatering rates at Barrick's Betze/Post pit and underground Meikle Mine will range from approximately 14,500 gpm in 2009 to 10,500 gpm in 2015. Dewatering is conducted in accordance with the existing water management plan. After cessation of active mining in 2015, it is anticipated that the mine would dewater at a rate of about 2,000 gpm for an additional 10 years (2025) while it completes milling of stockpiled ore. Water not used for mine operations is conveyed to the TS Ranch Reservoir, Boulder Valley irrigation projects, Boulder Valley reinjection system, Sand Dune drainage and evaporation network, and/or discharged to the Humboldt River (BLM 2009b).

Newmont's Leeville Project was approved in 2002 to develop an underground mine and associated mine dewatering system (18-year projected life). Dewatering rates in 2009 averaged about 13,400 gpm or 21,535 af/yr, of which 1,200 af/yr are used for mine operations and the remainder discharged to the TS Ranch Reservoir and Boulder Valley irrigation projects (Newmont 2010b).

In 2005, Hecla Mining Company was permitted to construct and dewater an underground decline at the Hollister Development Block

Exploration Project, located at the northernmost end of the Carlin Trend within Boulder Valley. Rodeo Creek Gold currently operates the Hollister Development Block exploration project. Groundwater entering the exploration decline is pumped from mine sumps to the surface and discharged into a primary water management recycle pond with a capacity of 1.4 million gallons. The recycle pond is used for storing decline water for reuse in the underground drilling program, underground dust control, and fire suppression. Excess water, beyond the working capacity of the surge pond and project water needs, is pumped via a pipeline to a holding tank and two rapid infiltration basins located on an alluvial terrace near the confluence of Little Antelope Creek and Antelope Creek, approximately 5 miles from the portal. Dewatering associated with the exploration decline development has averaged 900 to 1,000 gpm during its operation.

Humboldt River

Current mine discharges occur to the Humboldt River from the Gold Quarry Mine (via Maggie Creek). This discharge was evaluated by BLM in the *Cumulative Impact Analysis of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project Amendment, and Leeville Project* (CIA) (BLM 2000). The Lone Tree Mine was also evaluated in that report; however, the Lone Tree Mine is not included in this Final SEIS because it no longer pumps groundwater or discharges to the Humboldt River.

Refractory Ore Processing

Newmont Mining Corporation and Barrick Gold Corporation operate refractory ore processing mills at their operations located at the Gold Quarry Mine and the Betze-Post Mine respectively. These facilities operate ore roasters or autoclave processes that use heat to liberate sulfide minerals from refractory or

sulfidic ore thereby allowing efficient recovery of gold from the ore using standard cyanide extraction methods. In the process of removing sulfide minerals through this process, mercury contained in the ore is also removed and captured to ensure minimal mercury is released to the environment.

Mercury Emissions

The USEPA has not established a National Emission Standard for Hazardous Air Pollutants (NESHAPS) for mercury emissions from gold

ore processing facilities. Mercury is not considered a primary pollutant, and no National Ambient Air Quality Standards (NAAQS) have been established under the Clean Air Act. Mercury emissions from Newmont's Gold Quarry Mill 5/6 and Barrick's Betze/Post operation are shown in **Table 2-2**.

The TS Power Plant, located in the Boulder Valley, became operational in 2008. Mercury emissions associated with that facility are regulated by NDEP. Mercury emissions from the plant total 35 pounds/year.

Facility	Tons Ore Processed Annually (Mt)	Annual Hg Emissions (lbs)		
		2006	2007	2008
Newmont Mill 5/6	12.0	210	504	422
Barrick Goldstrike	12.9	616	708	166
TOTAL	24.9	826	1,212	588

Mt = million tons; Hg = mercury; lbs = pounds.
Source: NDEP 2009a.

Particulate Matter (PM) and Gaseous Emissions

Air quality in Nevada is regulated under primacy of the Nevada Division of Environmental Protection (NDEP). NDEP defines air basins as those hydrographic basins where regulated emission sources are located. Air basins that comprise the cumulative effects study area for air resources are described in Chapter 3.

Particulate matter in the 10 micron size fraction (PM₁₀) is currently regulated under the Nevada Air Quality standards at mine projects. Particulate matter particles are in the respirable size range for humans and are typically associated with fugitive dust and engine exhaust. Controlling PM₁₀ is required for stationary sources such as mills, crushers, and diesel-powered generator sets. Mobile equipment (e.g., loaders, haul trucks, light vehicles) are not regulated under current regulations. Fugitive dust from wheel traffic is

controlled as a condition of air quality permits (road watering or chemical binding agents).

Ambient air monitoring results of concentrations from 2000 through 2009 at Newmont's South Operations Area (Gold Quarry) indicate arithmetic mean concentration values ranging from 16 to 20 µg/m³ were within the ambient air quality standard of 50 micrograms per cubic meter (µg/m³) on an annual basis and 150 µg/m³ on a 24-hour basis (Newmont 2010c). Ambient monitoring of gaseous emissions at the SOAPA and Betze/Post mine projects is not required under the air quality permits. No violations of air quality permits have been issued by NDEP to date for any mine activities in the Study Area.

Gaseous emissions regulated by NDEP include nitrous oxide (NO_x), carbon monoxide (CO), and sulfur dioxide (SO₂). Emission sources for these constituents at mine projects are typically

associated with equipment engine emissions (diesel-powered mining equipment). Because the sources of these regulated constituents are mobile, no air quality permit is required.

The U.S. Environmental Protection Agency has proposed to set the primary standard for ozone between 0.060 ppm and 0.070 ppm measured over 8 hours to protect human health and safety and a secondary standard within the range of 7 to 15 ppm to protect plants and trees (EPA 2010). Mining and ore processing within the Study Area would have no effect on ozone levels.

Carbon Dioxide

Carbon dioxide (CO₂) is not a regulated gas; however, recent court rulings have directed BLM to consider the amount of CO₂ that is produced for activities that are regulated by BLM. CO₂ emission sources in the Carlin Trend include energy production (TS Power Plant), mining equipment consumption of fuel, and milling and ore processing operations associated with beneficiation of ore. No data is available to quantify the amount of CO₂ that has been generated during mining that began in the early 1980s. Based on the most recent year for which data has been published (NDEP 2008), the TS Power Plant emitted approximately 1.4 million metric tons of CO₂ equivalent (MTCO₂e) to the atmosphere. Mining and ore processing in the Carlin Trend represents about 3.5 percent of total CO₂ emissions (56.3 MTCO₂e) from all sources in Nevada (NDEP 2008).

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Exploration and Mining

Mine development and exploration projects are expected to continue in the foreseeable future in the Carlin Trend. Operations include Newmont's Emigrant Project, expansion of the

Gold Quarry pit (Greater Gold Quarry) and the 5/6 Tailing Storage Facility, and expanded operations in the Genesis-Bluestar Operations Area. Newmont's proposed Emigrant Mine Project would include an open pit mine, heap leach facility, waste rock dumps, and ancillary facilities located about 10 miles south of Carlin. Expansion of the Genesis-Bluestar Project would involve backfilling mine pits, vertical expansion of waste rock disposal facilities, and development of the Bluestar Ridge pit. As of this date, Newmont has not submitted a proposed Plan of Operations for expansion of the Gold Quarry pit and associated construction of the 5/6 Tailing Storage Facility.

BLM has also received proposed Plans of Operations for underground mining at Rodeo Creek Gold Co.'s Hollister Development Project and Barrick's Arturo open pit mine. Reasonably foreseeable mining operations in the Carlin Trend from 2010 through 2020 are shown on **Figure 2-7** and detailed in **Table 2-3**.

Reclamation

In conformance with approved plans of operation, mining operations would continue to reclaim land disturbed for mine development. Reclamation plans provide for removal of mine infrastructure (i.e., mill buildings, pipelines, roads, and office and warehouse complexes); regrading spent ore piles and waste rock piles; replacement of topsoil; and revegetation. Reclamation must meet acceptance of regulatory agencies prior to release of financial assurances.

Reclamation of mine related disturbances in the Carlin Trend will be incremental as various operations reach the end of active mining and begin closure activities. Based on the current approved disturbance acreage in the Carlin Trend (approximately 33,500 acres), approximately 7,800 acres would remain as

open pits. Once dewatering activity ceases, some of the pits would form pit lakes from reestablishment of the groundwater table (e.g., Gold Quarry and Betze/Post mine pits).

Allowing for some infrastructure that could remain to support post-closure sustainable opportunities such as industrial parks or training

facilities, approximately 25,700 acres would be reclaimed to approved post-mine uses in the reasonably foreseeable future. Reclamation involves use of an approved seed mix that includes native and introduced species of grasses, forbs, and shrubs to establish sustainable vegetative communities beneficial to livestock grazing and wildlife habitat.

Map Reference	Facility	Estimated Disturbance (acres)	Comment
1	Rodeo Creek Gold-Hollister	124	Foreseeable underground gold mine and facilities. Same location as the Hollister Development Block Project. Hollister Development Block Project would go from underground exploration to underground mining operation.
3	Halliburton-Rossi Mine	584	Rossi mine expansion of Queen Lode and Sage Hen areas and may include expansion of open pits and waste rock dumps.
		100	Increase acreage for surface exploration.
7	Barrick-Arturo	2,347	Foreseeable future open pit gold mine. Development of a new open pit mine at the existing Dee Gold Mine.
9	Centerra-Ren	100	Foreseeable underground mine.
12	Newmont-North Area Leach Facility	100	Reasonably foreseeable future activities include the expansion of the heap leach pad.
	Newmont-Genesis Project	43	Continued mining of the Genesis Area. Project includes open pit mining, sequential backfill and increased height of existing external waste rock facilities.
16	Newmont-Mike	100	Foreseeable future gold mine project.
17	Newmont-South Waste Rock Disposal Facility	100	Expansion of Non-property Leach Pad and construction of Property Pad 2 in Section 18.
	Greater Gold Quarry	1,424	Expansion of Gold Quarry Pit
	5/6 TSF East Expansion	782	Tailing Storage Facility (TSF) expansion
20	Newmont-Emigrant	1,418	Proposed open pit mine, sequential backfilling, heap leach pad facility and waste rock dump; permitting in progress.
TOTAL		7,222	

* Reasonably foreseeable assumes 100 acres disturbance per plan or plan amendment. Actual disturbance will vary as plans are developed.

Source: BLM 2010a.

Dewatering and Discharge

Maggie Creek Basin

Gold Quarry Mine – Newmont’s South Operations Area Project is the only mining operation in the Carlin Trend that discharges water to Maggie Creek. Mining, ore processing, and pit dewatering are projected to continue at

the South Operations Area through mine life. Projected dewatering rates for the Gold Quarry Mine would be a maximum of 23,000 gpm (HCItasca 2009).

Boulder Valley

Newmont has submitted an amendment to its Plan of Operations for the Genesis Bluestar pit

which would include installation of up to 35 drains and ten wells to dewater isolated groundwater zones in the Genesis pit east highwall. A maximum dewatering rate of 250 gpm is predicted.

Hollister Development Block - A Plan of Operations has been submitted to and is under review by BLM for Rodeo Creek Gold's Hollister Development Block. Based on the current Plan of Operations for the proposed operation, mine dewatering is predicted at rates up to 1,500 gpm with a cumulative discharge volume of approximately 2,400 af/yr.

Leeville Mine – Projected dewatering rate for Nemont's Leeville Mine is a maximum of 20,000 gpm (2008-2010) reducing to approximately 9,000 gpm to end of mine life (HCltasca 2009).

Humboldt River

The Humboldt River would continue to periodically receive flow from dewatering activities associated with ongoing and future mine projects in the Carlin Trend. Contribution of water from these sources would diminish over time as projected dewatering rates are expected to decrease. Groundwater models have been used to predict potential effects on base flow conditions for the Humboldt River and tributary streams resulting from mine dewatering and discharging (see Chapter 3 - *Water Quantity and Quality*).

Air Emissions

Levels of gaseous emissions and particulate matter are expected to continue at levels similar to existing conditions. Equipment and manpower would be shifted from mine areas where ore sources are becoming exhausted to areas where new or expanded development is becoming active. No major increase in equipment or labor has been identified to support future development in the Carlin Trend.

HAZARDOUS / SOLID WASTE AND HAZARDOUS MATERIALS

PAST and PRESENT ACTIVITIES

Hazardous Waste

SOAPA and Barrick/Betze currently operate as Large Quantity Generators of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). These facilities generate more than 1,000 kilograms per month of RCRA-regulated hazardous waste (40 CFR Part 260-270). All hazardous wastes currently generated at the mines are managed according to existing, approved permits or are disposed of according to local, state, or federal regulations.

Hazardous waste streams associated with mining and ore processing in the Carlin Trend are shown in **Table 2-4**. These wastes are accumulated and stored at designated sites at each mine operation and periodically transported to one of two Clean Harbors Treatment, Storage, and Disposal (TSD) facilities in Utah. All hazardous wastes are stored, packaged, and manifested in compliance with applicable federal and state regulations.

Solid Waste

All non-hazardous solid waste generated through operations in the Carlin Trend is disposed in NDEP approved Class III waived landfills established at the mine sites.

Hazardous Materials

A compilation of hazardous materials stored in the Carlin Trend was obtained from the Nevada Fire Marshall's office and is contained in **Appendix A**. The records included in **Appendix A** are for individual facilities in the Carlin Trend and represent the annual maximum volume of these materials that are to be stored. Recent authorizations (March 2009) allowing expansion of Barrick's Betze

TABLE 2-4 Hazardous Waste Stream Carlin Trend Operations				
Stream	Generator	EPA Hazardous Waste Code	Treatment, Storage, Disposal Facility	Generation Rate
Newmont Operations				
Paint-related material	Mill 6	D001, F003	Clean Harbors by Incineration	1,100 gals
Mercury PPE/debris	Mill 6	D009	Clean Harbors by HW Landfill	31,600 lbs
Spent MIBK	Assay Lab.	D001, D002	Clean Harbors by Incineration	350 lbs
Mercuric/Mercurous chloride	Mill 6	D009, D002	Air Pollution Control on Roaster in HW Landfill	42,000 lbs
Mercury Solids	Mill 6	D009	Clean Harbors by HW Landfill	4,000 lbs
Solvents	Mills, Leach	D001, F003	Clean Harbors by Incineration	1,100 gals
Hydrochloric, Sulfuric acid	Mills, refinery	D002	Clean Harbors by Incineration	5,000 lbs
Caustic solutions	Mills	D002	Clean Harbors by HW Landfill	2,000 lbs
Lab packs	Mills, Lab	Varies	Clean Harbors/varies	500 lbs
Lead-bearing waste	Assay Lab	D008	Clean Harbors by HW Landfill	25,000 lbs
Halogenated oil	Mills	F002	Clean Harbors by Incineration	3,000 gals.
Vanadium pentoxide catalyst	Mill 6	D009	Clean Harbors by Incineration	28,500 lbs
Barrick Operations				
Aerosol can waste, filters, paint filters	Property wide	D001, D005, D008, D018, D029, D035, D039, D040, F002, F003, F005	Clean Harbors by Incineration	1,440 lbs
Waste paint and related material	Property wide	D001, D004, D007, D008, D009, D039, F002, F003, F005	Clean Harbors by Incineration	1,120 lbs
Debris contaminated with used oil and tetrachloroethylene	Property wide	D039	Clean Harbors by Incineration	240 lbs
Inorganic lab waste	Lab	D008	Clean Harbors by Incineration	92.82 tons
Computer equipment	Property wide	D008	Clean Harbors/Metal recovery including retorting, smelting, chemical	17.11 tons
Baghouse dust from assay lab	Lab	D008	Clean Harbors by HW Landfill	5.07 tons

**TABLE 2-4
Hazardous Waste Stream
Carlin Trend Operations**

Stream	Generator	EPA Hazardous Waste Code	Treatment, Storage, Disposal Facility	Generation Rate
Brick, mortar , and soil	Autoclave	D008	Clean Harbors by HW Landfill	9.59 tons
HEPA filters and debris	Processing and Refining	D008	Clean Harbors by HW Landfill	7.12 tons
Used oil	Property wide	D039, D040	Clean Harbors by Incineration	17.5 tons
Used solvent	Property wide	D001	Clean Harbors by Incineration	440 lbs
Waste lead/acid batteries	Property wide	D002, D008	Clean Harbors by other treatment	400 lbs
Lead contaminated sandblast grit	Property wide	D008	Clean Harbors by HW Landfill	4.5 tons

EPA - Environmental Protection Agency; TSDF = Treatment, Storage, or Disposal Facility; gals = gallons; lbs = pounds; PPE = Personal Protection Equipment; HW = Hazardous Waste; MIBK = Methyl Isobutyl Ketone

¹ Laboratory Clean-out Chemical Wastes

Source: BLM 2002a; Barrick 2006; Newmont 2007b.

operations will extend the use of hazardous materials at current levels. Hazardous materials used and stored on-site in the Carlin trend are shown in **Table 2-5**.

Toxic Release Inventory

In May 1997, The U.S. Environmental Protection Agency (EPA) promulgated a final rule (62 FR 23834) that added several industries to the list of facilities subject to reporting under Section 313 of the Emergency Planning and Community Right-To-Know Act, including most metal mining facilities. The Emergency Planning and Community Right-To-Know Act (EPCRA) 313 program is commonly referred to as the Toxic Release Inventory (TRI) program. Beginning in 1998, metal mining operations were required to report releases and other waste management activities involving a specific list of chemicals and compounds of those chemicals.

Included in the EPCRA Section 313 guidance, metal mining operations were required to report the amount of TRI chemical contained in waste rock placed in waste rock disposal

facilities as a “release amount.” The majority of TRI chemicals found in waste rock is naturally-occurring and reported as a result of handling and moving waste rock as a part of mining operations. In 2003, the District Court for the District of Columbia issued a decision in *Barrick Goldstrike Mines Inc. vs. Whitman*, (Civ. Action No. 99-958 (TPJ)), which ruled that waste rock is exempt as *de minimis* and that non-persistent bioaccumulative toxins under certain percentages by weight are also exempt from TRI reporting.

Appendix B is a compilation of data available in Facility Profile Reports obtained from the EPA Envirofacts website ([://www.epa.gov/enviro/html/tris/index](http://www.epa.gov/enviro/html/tris/index).) for Barrick’s Betze/Post Mine and Newmont’s North and South Operations area. Additional data about these facilities and other mining operations are available on this website, including annual amounts of TRI chemicals recycled or treated on site or at remote locations. These facilities are representative of

**TABLE 2-5
Hazardous Materials Used and Stored
Carlin Trend**

Substance	Newmont		Barrick		Rodeo Creek Gold, Inc.	
	Annual Use	Stored On-site(s)	Annual Use	Stored On-site(s)	Annual Use	Stored On-site(s)
Diesel Fuel	45 Mgals.	1.3 Mgals.	16.6 Mgals.	85,000 gals.	510,000 gals.	30,000 gals.
Gasoline	730,000 gals.	30,000 gals.	376,539 gals.	10,500 gals.	7,100 gals.	5,000 gals.
Hydraulic Oil	80,000 gals.	12,000 gals.	NA	NA	2,000 gals.	500 gals.
Motor Oil	50,000 gals.	10,000 gals.	41,000 gals.	NA	2,000 gals	500 gals.
Antifreeze	40,000 gals.	8,000 gals.	45,000 gals.	27,000 gals.	3,600 gals.	220 gals.
Explosives	-	25,000 lbs.	NA	NA	115,720 lbs.	NA
Prill	40,000 tons	800 tons	18,731 tons	217 tons	8,000 lbs.	NA
Propane	1.8 Mgals.	350,000 gals.	17.5 Mgals.	2.7 Mgals.	NA	NA
Grease	80,000 lbs	50,000 lbs	NA	NA	NA	NA
Cyanide	18.2 Mgals.	75,000 gals.	10.5 Mlbs.	580,010 lbs.	NA	NA
Lime	112,354 tons	1,502 tons	290,657 tons	4,150 tons	NA	NA

Mgals. = million gallons; gals. = gallons; Mlbs = million pounds; lbs. = pounds; NA = Not Available

Source: Newmont 2010d; Barrick 2007b; Rodeo Creek Gold 2008.

mining-related releases of EPCRA 313 regulated chemicals in Elko and Eureka counties on an annual basis. Data for Newmont's operations are included through 2008. Data for Barrick's operations during 2007 and 2008 were not available on the website.

EPA cautions that: "Users of TRI information should be aware that TRI data reflect releases and other waste management activities of chemicals, not whether (or to what degree) the public has been exposed to those chemicals. Release estimates alone are not sufficient to determine exposure or to calculate potential adverse effects on human health and the environment. TRI data, in conjunction with other information, can be used as a starting point in evaluating exposures that may result from releases and other waste management activities which involve toxic chemicals. The determination of potential risk depends upon many factors, including the toxicity of the chemical, the fate of the chemical, and the amount and duration of human or other exposure to the chemical after it is released." TRI chemicals released during the period from 1998 through 2008 provide a general indicator of the amount of TRI chemicals handled by the various mining operations in the area and to determine trends associated with recycling efforts and waste minimization at the sites in question and potential new sites planned for development.

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Solid and Hazardous Waste

Reasonably foreseeable projects in the Carlin Trend would result in similar volumes of solid and hazardous wastes stored on site, transported on state and federal highways, and disposed of at approved sites. The volumes of solid and hazardous wastes transported are

expected to remain at current levels (see *Past and Present Activities* and **Appendix A**).

Production levels for mills and heap leach operations are expected to be optimized for the foreseeable mine expansions and developments. As a consequence, the volume of hazardous materials transported, stored, consumed, and disposed would remain at current levels. Portions of Gold Quarry operations that remain to be built would not result in a change in the volume or type of solid or hazardous materials currently being used in SOAPA operations.

Hazardous materials that would be stored and used at the proposed Emigrant Mine and Rodeo Creek Gold's Hollister Development Block are included in **Table 2-6**.

OIL, GAS, AND GEOTHERMAL LEASES

Elko District Competitive Oil and Gas Lease sales are conducted quarterly, in March, June, September, and December. Parcels proposed for lease are posted on the Nevada BLM website (www.nv.blm.gov) 45 days prior to the sale date.

Within the vicinity of the Carlin Trend, 24 tracts of land have been issued leases for oil and gas. These tracts lie within Townships 31 North to 39 North; Ranges 46 East to 54 East. Recent oil exploration activity includes two "dry" holes; one drilled in Section 34, Township 31 North, Range 51 East in February 2008, and one in Section 16, Township 34 North, Range 54 East, which was plugged in September 2009. Two tracts have been issued leases for geothermal. The last geophysical survey for oil and gas in the Study Area was in 2006 (BLM 2010b).

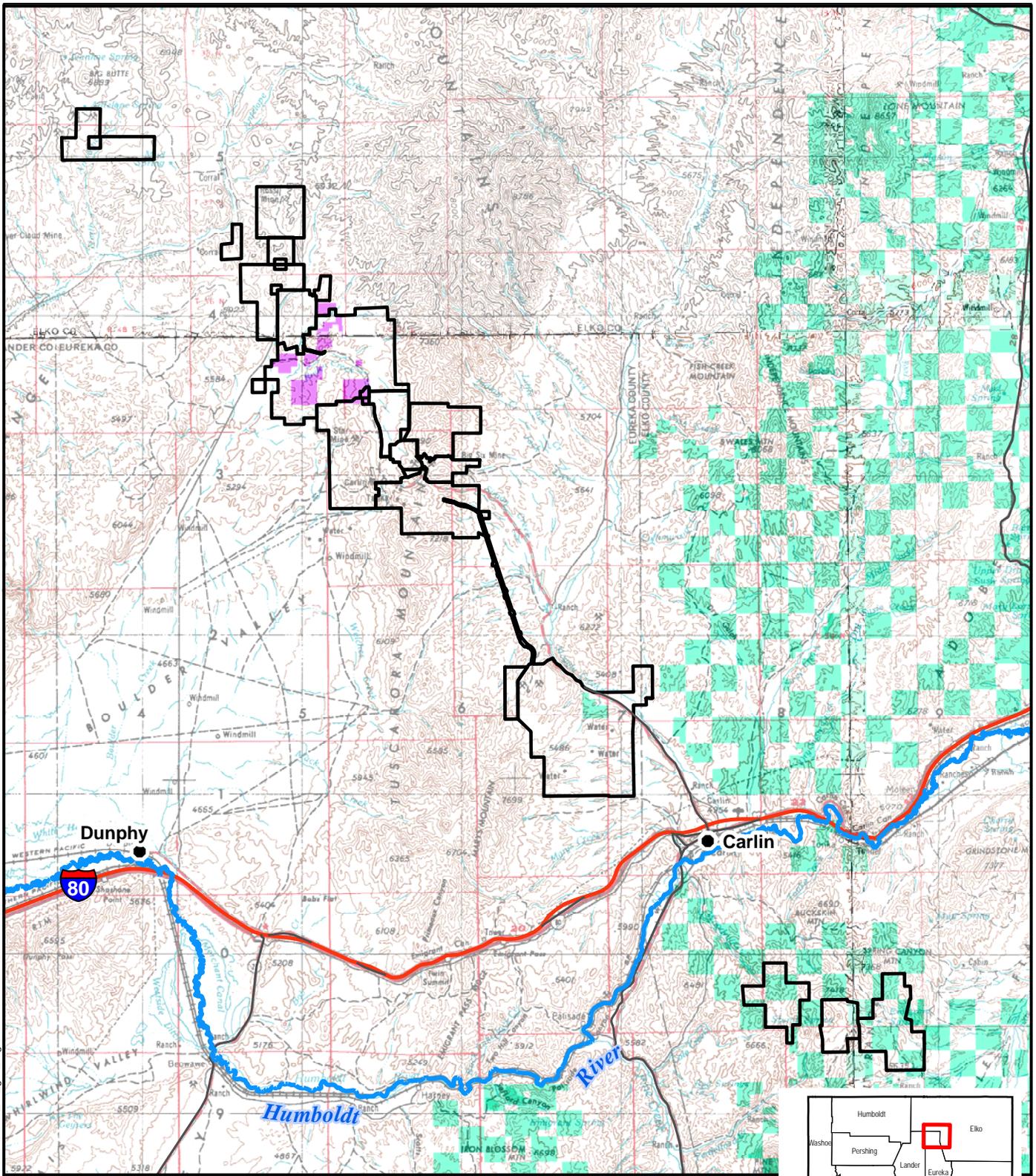
TABLE 2-6 Hazardous Materials Management Emigrant and Hollister Projects					
Substance	Area Used/Stored	Rate of Use (per year)	Quantity Stored On- site	Storage Method	Waste Management
Emigrant Project					
Diesel Fuel	Mine/truck shop	5,300,000 gals.	35,000 gals.	Bulk tank	No waste
Hydraulic Fluid	Mine/truck shop	-	5,000 gals.	Bulk tank totes, drums	Recycled
Motor Oil	Mine/truck shop	-	5,000 gals.	Bulk tank totes, drums	Recycled
Antifreeze	Mine/truck shop	-	5,000 gals.	Bulk tank totes, drums	Recycled
Explosives	Prill Silo	8,000,000 lbs.	370,000 lbs.	Silo	No waste
	Explosive (powder) magazine	50 tons	2,500 lbs.	Magazine	No waste
Gasoline	Mine/truck shop	-	5,000 gals.	Bulk tank	No waste
Propane	Mine/surface	-	5,000 gals.	Bulk tank	No waste
Grease	Mine/truck shop	-	1,000 gals.	Totes, drums	Recycled
Cyanide	Leach Pad	8,200,000 lbs.	7,000 gals.	Bulk tank	No waste
Lime	Heap Leach Facility/Lime silo	26,000 tons	250 tons	Silo	No waste
Rodeo Creek Gold (Hollister Development Block)					
Diesel Fuel	Mine/truck shop	510,000 gals.	30,000 gal.	Bulk tank	No waste
Gasoline	Mine/truck shop	7,100 gals.	5,000 gals.	Bulk tank	No waste
Antifreeze	Mine/truck shop	3,600 gals.	220 gals.	Drums	Recycled
Caustic Soda	Water Treatment & Desilting Plant	800 gals.	2,400 gals	Bulk tank	No waste
Naphia	Maintenance Shop	500 gals.	55 gals.	Drum	Recycled
Sulfuric Acid	Water Treatment & Desilting Plant	38,400 gals.	1,650 gals.	-	-
Lime	Water Treatment & Desilting Plant	20,000 lbs.	47,000 lbs.	-	-
Hydrochloric Acid	Water Treatment & Desilting Plant	800 gals.	300 gals.	-	-
Concrete Stripper (CS-141)	Surface Containment Area	55 gals.	55 gals.	Drum	-
Chemco #1-degreaser	Maintenance Shop	55 gals.	55 gals.	Drum	-
Ammonium Nitrate and Fuel Oil (ANFO)	*	*	*	*	No waste
gals. = gallon; lbs. = pounds; * = information available from Department of Homeland Security Source: Newmont 2007c; Rodeo Creek Gold 2008.					

PAST and PRESENT ACTIVITIES

There are currently 24 tracts of land leased for oil and gas within the Study Area. These tracts lie within the area shown on **Figure 2-8**.

REASONABLY FORESEEABLE FUTURE ACTIVITIES

Leasing parcels is expected to continue in the future as energy demand continues to increase. No exploration or development permit applications for projects in the Study Area have been submitted to BLM. Future proposed actions may create surface disturbance, which will be analyzed when a lessee submits plans for the action (BLM 2006a).



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- Legend**
- Cities
 - Humboldt River
 - Interstate Highway
 - Other Major Roads
 - Plan Boundaries
 - Oil and Gas Leases
 - Geothermal Leases



U.S. Department of the Interior
 Bureau of Land Management
 Elko District Office
 Tuscarora Field Office
 Elko, Nevada

**OIL, GAS, AND GEOTHERMAL LEASE AREAS
 GENERAL CUMULATIVE EFFECTS AREA
 SOAPA Project
 Final Supplemental EIS
 Eureka and Elko Counties, Nevada**

**FIGURE
 2-8**