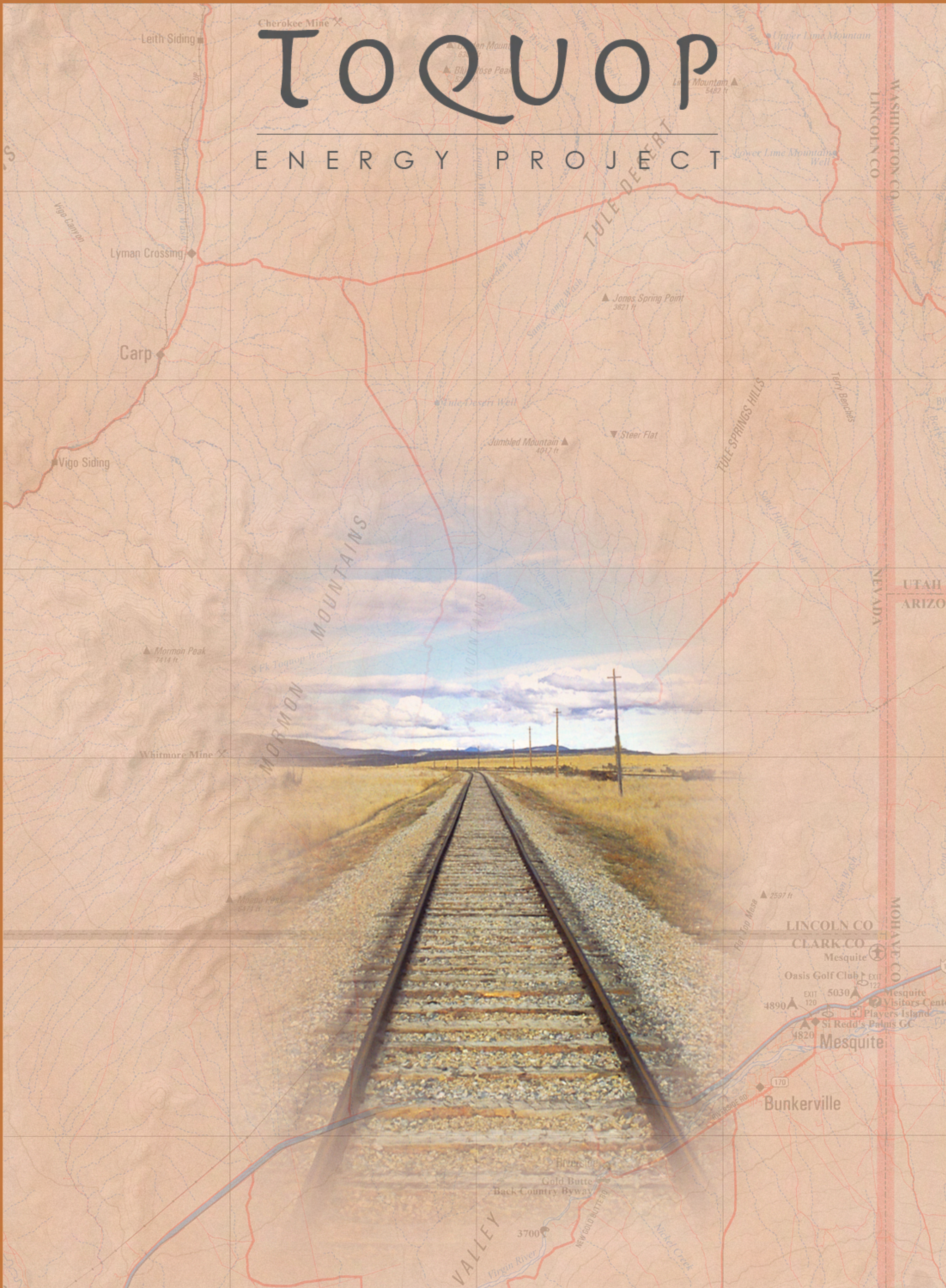
TOQUOP

ENERGY PROJECT



CHAPTER 2.0 - ALTERNATIVES INCLUDING THE PROPOSED ACTION ALTERNATIVE

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION ALTERNATIVE

2.1 INTRODUCTION

This chapter describes the two alternatives analyzed in this Environmental Impact Statement (EIS). Section 2.4 describes alternatives that were considered but eliminated from detailed analysis and briefly explains why they were eliminated. The alternatives that are analyzed in Chapter 4 are described below.

2.2 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, a 1,100-megawatt (MW) natural-gas-fired power plant would be constructed and operated on a site in Lincoln County, Nevada, as permitted in the 2003 EIS (Bureau of Land Management [BLM] 2003a). Ancillary facilities would include a 14.4-mile-long access road and a water-supply system including a well field and 12.5-mile-long water pipeline (refer to Map 1-1).

2.2.1 <u>BLM Actions</u>

Under the No-Action Alternative, no additional decision or action would be required by BLM beyond those set forth in the September 2003 Record of Decision for the Toquop Energy Project rights-of-way (ROWs) (BLM 2003b). Table 2-1 summarizes the ROWs that have been granted.

Table 2-1
Rights-of-Way Granted in the 2003 Record of Decision (No-Action Alternative)

Right-of-Way Serial Number	Description	Permanent Rights-of-Way	Temporary Use Permit
N-77484	1,100-MW natural-gas-fired power plant	80 acres	
N-77484-01	Access road from the main access road to power plant	20 acres (400 feet wide, 2,178 feet long)	
N-77484-02	Overhead transmission line connecting power plant to Navajo-McCullogh transmission line		
N-77484-03	20-inch-diameter gas pipeline connecting power plant to Kern River pipeline		
N-77485	Access road from Interstate 15 to power plant site	87 acres (50 feet wide, 76,032 feet long)	40 feet wide (20 feet to each side of permanent right-of-way) and two 10-acre storage sites
N-77486	Underground electric power line from power plant to well field	45 acres (30 feet wide, 66,000 feet long)	30 feet wide (15 feet to each side of permanent right-of-way) and two 3-acre storage sites
N-77486-01	Buried 24-inch-diameter water pipeline from well field to power plant		

SOURCE: Bureau of Land Management 2003b
NOTES: MW = megawatt

2.2.2 Project Components

The components of the No-Action Alternative include facilities and actions as described in the sections below.

2.2.2.1 Power Plant and Associated Facilities

The 640-acre site for the proposed power plant is located in southeast Lincoln County, Nevada; Township 11 South, Range 69 East, Section 36. Under the No-Action Alternative, the 640-acre site, on which the natural-gas-fired power plant would be constructed, would be disposed of through sale. The BLM subsequently would turn over the ownership of the 640-acre power plant site to Toquop Energy Company, LLC (Toquop Energy). Although the land sale was not carried through to completion, BLM did issue the ROWs for the gas-fired plant site and associated access road, power lines, water pipeline, and gas pipeline (refer to Map 1-1).

The plant would use a combined-cycle technology to generate electricity, which would be transmitted to the existing Navajo-McCullough electric transmission line that passes through the southeastern corner of the site. The power plant, switchyard, equalization and evaporation ponds, and associated facilities would cover about 100 acres on the site and would be enclosed within an 8-foot-high chain-link fence, incorporating tortoise fencing to exclude the desert tortoise from the plant site. BLM would issue ROWs for the construction and operation of the power plant and all related facilities. The No-Action Alternative power plant employs combined-cycle technology, which would use four combustion-turbine generators in series with four heat-recovery steam generators and four steam-turbine engines. Exhaust gas would pass through a series of emissions-control systems and would be vented through an elevated exhaust stack that would be 180 feet high. A 5-acre uncovered equalization pond would be constructed onsite to keep the water chemistry balanced for use in the cooling system and a 20-acre evaporation pond also would be constructed to handle the wastewater disposal (BLM 2003a).

The power generation operations would be fueled by natural gas arriving to the site via the 36-inch-diameter Kern River Gas Transmission Company pipeline, which currently passes through the southeastern corner of the site. A tap, meter station, and connective pipeline would be constructed and connected to the existing gas line to provide natural gas to the site.

A new well field and new water pipeline would be developed in the Tule Desert hydrologic basin to supply groundwater for use in an evaporative wet-cooling tower system. Facilities would include 15 wells, each approximately 1,000 to 1,500 feet deep; a manifold system to connect the output from these wells to a single buried pipeline 24 inches in diameter; an extension of this buried pipeline and buried electrical distribution lines to the plant site; and a storage tank with a capacity of approximately 500,000 gallons. Although the exact location of each well is not yet known, they would be spatially dispersed in the southern third of the Tule Desert (refer to Map 1-1) and would be located as close as possible to one of the several existing dirt roads in the area. It is estimated that, under the No-Action Alternative, the natural-gas-fired power plant could require up to 7,000 acre-feet per year (af/yr) of water. More than 90 percent of this water (approximately 6,300 acre-feet) would be used by an evaporative cooling tower system. The 24-inch-diameter water pipeline would be 12.5 miles long, would be located partially along an existing road, and would require a permanent ROW width of 30 feet. The pipeline would be buried under 36 inches of cover, well below potential streambed scour, erosion, and exposure, and away from potential lateral bank migration. New access roads would be constructed to the wells and storage tank as necessary for use during construction and maintenance activities (BLM 2003a).

About 14.4 miles of an existing dirt-and-gravel road would be upgraded by paving to a width of 24 feet. Some sections would be straightened to facilitate truck access between Interstate 15 (I-15) and the plant site (refer to Map 1-1). The permanent ROW for the access road would encompass 138 acres (50 acres in Clark County and 88 acres in Lincoln County) (BLM 2003a).

2.2.2.2 Construction Activities

Under the No-Action Alternative, construction activities would occur over a period of approximately 26 months. The average construction crew would total about 500 people. Construction activities related to the power plant facilities would be completed within the 640-acre plant site in four phases and would include (1) site clearing and preparation, (2) foundation construction, (3) building and equipment installation, and (4) site cleanup and project startup (BLM 2003a).

The access road that would serve the power plant is currently used to maintain a microwave station, fiber-optic lines, natural gas pipelines, and electric transmission lines located on the southern end of the East Mormon Mountains. Construction activities would increase the traffic along this road. Various types of diesel-powered construction equipment, such as bulldozers and dump trucks, would be used for approximately 120 days each as summarized in Table 2-2.

Table 2-2
Land in Clark and Lincoln Counties Affected by the Access Road

	Clark County (acres)	Lincoln County (acres)	Total (acres)
Construction ROW for access road	89	157	246
Existing access road	10	20	30
Net new construction ROW disturbance	79[a]	137[b]	216
Staging areas	0	20[a]	20
Long-term ROW for access road	50	88	138
Net new permanent disturbance within long-term ROW[c]	23	42	65

SOURCE: Bureau of Land Management 2003a
NOTES: ROW = right-of-way
[a] All within the Mormon Mesa Area of Critical Environmental Concern (ACEC)
[b] 123 acres within the Mormon Mesa ACEC
[c] Except for these acres, all other lands disturbed as a result of project activities in the construction ROW, permanent ROW, and staging areas would be reclaimed.

Temporary ROWs for construction access and staging areas would be required along the access roads and water pipelines and within the well field. The construction ROW for the 14.4-mile-long access road to the power plant site would vary in width because of terrain and would occupy 246 acres. The current access road in this location occupies about 30 acres, and the net increase in disturbance due to construction activities therefore would be about 216 acres. Staging areas for road construction would require an additional 20 acres in Lincoln County. The staging areas and temporary road construction ROWs would be reclaimed after construction, in accordance with restoration plan requirements of the appropriate BLM field office.

ROW area requirements for each of the proposed wells would be a maximum of 1 acre per well. Approximately 0.33-acre would be used for a new 300-foot-long well access road and pipeline, with a construction ROW that would be 60 feet wide. The other 0.66-acre would be for construction activities at each well site. A 500,000-gallon water-storage tank would be required to maintain flow and pressure to the plant. The maximum disturbed area for the water-storage tank also would be 1 acre. The water pipelines would require a temporary construction ROW of 60 feet in width to allow for soil disturbance during pipeline trenching, laying, and backfilling operations and the laying of electrical lines to the well field. Staging areas would include 3 acres near the northern end of the pipeline, 3 acres midway along the pipeline east of Toquop Gap, and 3 acres at the plant site. All areas temporarily disturbed by construction in the ROWs and staging areas would be reclaimed (BLM 2003a).

2.2.2.3 Operation and Maintenance

Under the No-Action Alternative, permanent water rights to supply up to 7,000 af/yr of water would be required. These water rights were included in a joint application by Vidler Water Company Inc. and Lincoln County that was submitted to the Nevada State Engineer. In Ruling 5181, the State Engineer granted the right to use 2,100 af/yr to Vidler Water Company Inc. and Lincoln County. A request for the required additional 4,900 acre-feet water rights was included in a second application, by the same proponents, which is being held for action pending results of additional hydrologic studies requested by the State Engineer. Most of the water for the power plant would be used in the evaporative cooling system (90 percent, or 3,800 gallons per minute under annual average design operating conditions). The remaining water would be filtered, as necessary, to provide service water, potable water, and water for the demineralized water-treatment system. That system would supply the high-purity water needs of the heat-recovery steam generators.

Permanent employees at the plant site would total 25. These employees would travel to the site along the improved access road from I-15.

Occasional maintenance and monitoring of production wells would occur, requiring travel over the access roads to reach the wells. Maintenance of the water pipeline would require periodic inspection of the entire route, and include routine exercising of all valves in the system. It is anticipated that this activity could be supported using low-impact all-terrain vehicles.

2.2.2.4 Decommissioning

The gas-fired power plant would have a life expectancy of 42 years, including construction. At the end of its useful life, the plant would be decommissioned, and all structures and equipment at the site would be dismantled and removed. The onsite evaporation and equalization ponds would be excavated of sediment. The excavated material would be tested and disposed of at an approved offsite disposal facility in accordance with Federal, state, and local regulations. All pond liners would be removed and the land surface would be reclaimed. The water pipeline and electric distribution line would be closed and left in place. All wells would be decommissioned and abandoned in accordance with state regulations. Potential uses of water rights by Lincoln County or Vidler Water Company Inc., after the 42-year project life, would be residential and commercial development. Hazardous materials, byproducts, and chemicals would be disposed at the time of decommissioning according to Federal, state, and local regulations.

2.3 PROPOSED ACTION ALTERNATIVE

Toquop Energy proposes to construct, operate, and maintain a 750-MW coal-fired power plant and associated facilities. Toquop Energy also would construct and maintain a new rail line to transport the coal to the power plant, although it is unclear at this time who would operate the rail line. This section summarizes the Proposed Action Alternative, highlighting how that alternative differs from the No-Action Alternative. Additional information on the Proposed Action Alternative is provided in Appendix A.

2.3.1 BLM Actions

Because ROWs have already been granted for the original project (i.e., Proposed Action Alternative in the 2003 EIS) and, therefore, the Proposed Action Alternative in this EIS, BLM approval has been requested for an additional ROW for the rail line and to amend the power plant site ROW. A 100-acre ROW was originally granted for the gas-fired plant; however, an amendment to the ROW is needed to accommodate the proposed 475-acre coal-fired plant. The permitted and requested ROW are summarized in Table 2-3. As part of the Proposed Action Alternative, BLM would dispose (by sale) of the 640-acre parcel that the power plant would occupy.

2.3.2 Project Components

The components of the Proposed Action Alternative would include the facilities and actions as described in the sections below.

2.3.2.1 Description of Facilities

Project facilities would include a single 750-MW generation unit and plant-cooling system, a 31-mile-long rail line to transport coal to the plant, coal-storage facilities, a water-supply system (including a well field and a 12.5-mile-long water pipeline), waste-management operation facilities, and a power-transmission interconnection to an existing power-transmission line that passes through the southeast portion of the project area (Map 2-1). The water-supply system, power-interconnection facilities, and improvements to the access road from I-15 to the site would be the same as those described in the No-Action Alternative. All materials used in roadway improvements and other associated project construction, such as gravel, sand, and ballast would be transported to the site from existing sources. No new excavations or pits would result from the project.

Within the same 640-acre site as described in the No-Action Alternative, the power plant block would occupy 261 acres, ash disposal would occupy 150 acres, and topsoil-storage areas would occupy 64 acres, with the remaining 165 acres left undisturbed.

Administration Building and Control Center

The administration building and control center for each generating unit would be a multi-use facility consisting of administrative offices, training and conference facilities, technical libraries, operations offices, and locker rooms for operations personnel.

Turbine Hall

The turbine hall would contain the primary steam-turbine driver and the electric-power generator. This elevated building would also contain all of the necessary equipment (e.g., gantry cranes) to properly maintain rotating equipment and piping systems on this deck.

Supercritical Boiler

A supercritical boiler is a modern, high-efficiency steam generator that provides the driving energy for the turbine generator. The boiler would allow the facility to have an operating efficiency ranging between 37 and 41 percent. The major equipment in the boiler system would include coal-storage bunkers, pulverizers, primary-air fans, an economizer, and a selective catalytic reduction unit.

Turbine Generator and Associated Systems

The steam turbine would be the mechanical driver for the generator. The turbine and condenser would receive the steam from the boiler and convert the energy to rotational energy, driving the generator and then converting that energy to electricity. The turbine generator would be equipped with lubrication, cooling, and protection systems to assure the reliability of the equipment and safety of the employees.

Air-Emission-Control Equipment and Facilities

State-of-the-art emission controls would be used to minimize potential air pollutants. Air-pollution controls for the pulverized coal-fired boilers would consist of the following:

- Low-nitrogen-oxide (NO_x) burners and selective catalytic reduction to control NO_x emissions
- Low-sulfur coal and wet-flue gas desulfurization (FGD) to control sulfur dioxide (SO_2) emissions
- Wet FGD and a wet stack to control acid-gas emissions, including sulfuric-acid (H_2SO_4) mist
- Wet FGD to control mercury emissions
- Activated carbon and hydrated quicklime injection, installed before the fabric-filter baghouse, if needed for additional reductions, with secondary reductions in SO_2 emissions and H_2SO_4 mist
- A fabric filter to control particulate emissions
- High-efficiency combustion to control carbon monoxide and volatile organic compound emissions

Figure 2-1 is a flow diagram illustrating the air-emission controls and Table 2-4 is the key to Figure 2-1.

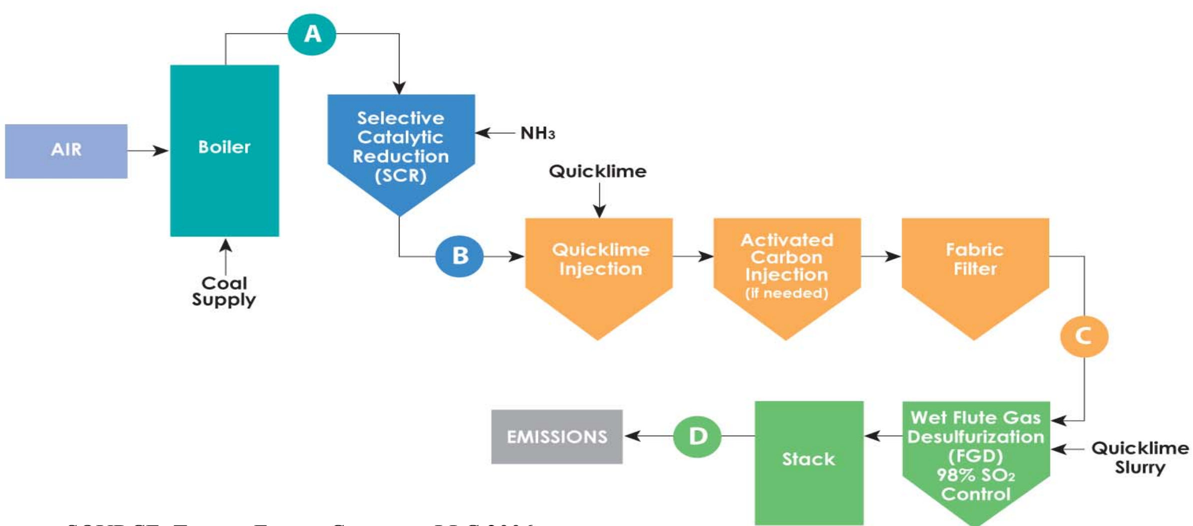
Table 2-3
Rights-of-Way Granted and Proposed for the Proposed Action Alternative

Right-of-Way Serial Number	Description	Permanent Rights-of-Way	Temporary Use Permit
NA (requires amendment to N-77484)	750 MW coal-fired power plant Access road from the main access road to power plant	475 acres	
	Overhead transmission line connecting power plant to Navajo-McCullogh transmission line 20-inch-diameter gas pipeline connecting power plant to Kern River pipeline		
NA (right-of-way has been requested)	Rail line from Union Pacific Railroad at Leith Siding to power plant	356 acres (100 feet wide, about 31 miles long)	200 feet wide (100 feet to each side of the permanent right-of-way)

Right-of-Way Serial Number	Description	Permanent Rights-of-Way	Temporary Use Permit
N-77485	Access road from Interstate 15 to power plant site	87 acres (50 feet wide, 76,032 feet long)	40 feet wide (20 feet to each side of permanent right-of-way) and two 10-acre storage sites
N-77486	Underground electric power line from power plant to well field	45 acres (30 feet wide, 66,000 feet long)	30 feet wide (15 feet to each side of permanent right-of-way) and two 3-acre storage sites
N-77486-01	Buried 24-inch-diameter water pipeline from well field to power plant		

SOURCE: Bureau of Land Management 2003b
NOTES: MW = megawatt, NA = Not applicable

Figure 2-1
Air Emission Controls



SOURCE: Toquop Energy Company, LLC 2006a

Table 2-4
Key to the Air Emission Controls Flowchart

Emissions	A (lb/hr*)	B (lb/hr*)	C (lb/hr*)	D (lb/hr*)
Sulfur dioxide (SO_2)	18,150	17,969	17,969	363
Nitrogen oxides (NO_x)	3,630	363	363	363
Sulfuric acid (H_2SO_4)	58.5	240	24	24
Particulate matter	6,050	6,050	60.5	60.5

SOURCE: Toquop Energy Company, LLC 2006
NOTE: *lb/hr = pounds per hour

Maintenance Shops

Each unit would have a maintenance shop equipped with all of the machinery and equipment required to maintain each unit as well as the other common facilities. These buildings also would contain storage for parts and consumables, as well as offices for the maintenance supervisory staff.

Diesel Generators and Building

The facility would be equipped with standby generators to supply electric power to serve critical loads during periods when station power is unavailable. The fuel source for these engines would be from the fuel-oil-storage tank. A diesel-fuel day-tank with appropriate containment would be located in this building.

Diesel Fire-Water Pumps and Building

The fire-water systems would be charged with pumps driven by diesel engines. The fuel source for these engines would be from the fuel-oil-storage tank. A diesel-fuel day-tank with appropriate containment would be located in this building. Fire water would be drawn from the raw-water-storage tank.

Rail Line

The project includes a 31-mile-long single-track rail line that would extend from the existing Union Pacific Railroad (UPRR) rail line at Leith Siding to the power plant site. In addition, a side-track rail would be constructed at Leith Siding in order to accommodate intersection traffic between trains traveling the existing UPRR line and the proposed rail line to the power plant.

Desert Tortoise Fencing

Permanent tortoise fencing would be constructed, as appropriate, along the proposed rail line's permanent ROW and access road and around the power plant site in those areas where desert tortoise are known to exist. The fence would protect the desert tortoise. By erecting fencing along the rail line, tortoises would be prevented from becoming trapped between track rails.

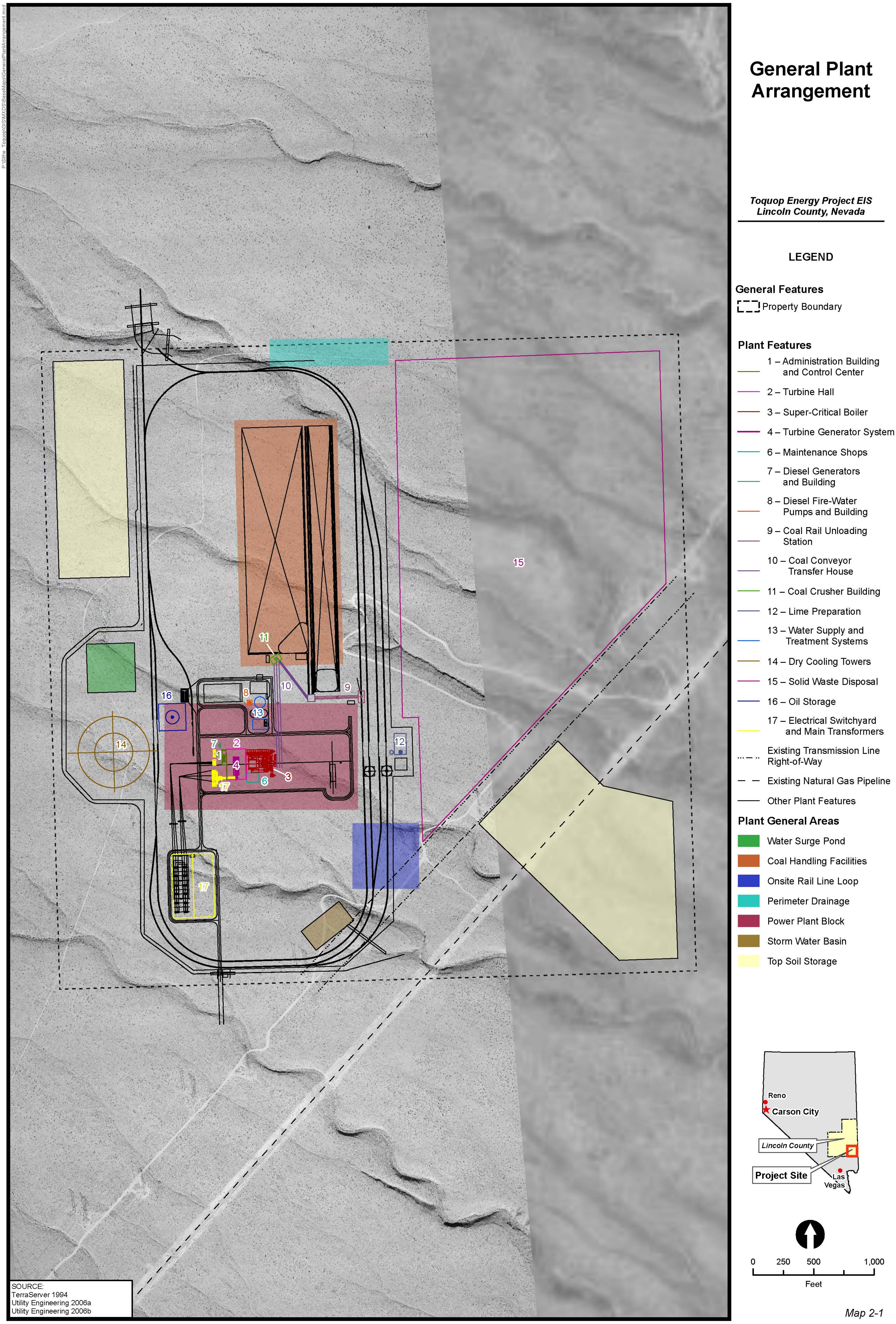
In accordance with current specifications, tortoise fencing would consist of 1-inch-horizontal by 2-inch-vertical mesh. The mesh would extend at least 18 inches above the ground and, where feasible, 6 to 12 inches below the ground. In situations where it is not feasible to bury the fence, the lower 6 to 12 inches of the fence would be bent at a 90-degree angle towards potentially approaching tortoises and covered with cobble or other suitable material to ensure that tortoises or other animals cannot dig underneath and create gaps that allow passage. Along the railroad, tortoise undercrossings would be provided at intervals of not greater than 1 mile. It is anticipated that not more than one or two under-crossings specifically placed for tortoises would be needed to meet this objective, since most of the railroad is located in terrain that would require frequent culverts for drainage purposes that also could be designed to function as tortoise crossings.

Coal-Rail Unloading Station

Powder River Basin coal from Wyoming would be delivered to the plant site by rail on trains containing up to 100 cars. Cars would be unloaded over a rapidly unloading trestle, and coal would be dropped onto a double-ended conveyor in the concrete-lowering well. Coal then would be conveyed to a turning well, where it would be weighed and tested, and then sent to either a passive pile (stacked by the mobile plant) or the active pile (stacked by the linear-rail-mounted stacker/reclaimer).

General Plant Arrangement

Toquop Energy Project EIS
Lincoln County, Nevada



Map 2-1

Coal-Conveyor Transfer House

The system would include all equipment necessary to reclaim coal from the lowering-well stack-out area and then crush, weigh, and convey coal to the boiler coal silos, as required. To accomplish the routing, and to minimize the potential dust and hazards associated with transferring to various conveyors, these transfer points would be enclosed and environmentally controlled.

To reduce dust, the coal-transfer systems at the plant site would have filtered-air collection systems and water fogging for the receipt and transport of coal. Three side-enclosed conveyors with fully enclosed transfer points would reduce noise and wind losses that create dust. Onsite passive coal storage would be compacted and covered by earth or treated with a surfactant to prevent emissions and spontaneous combustion. Dust suppression, enclosures, and baghouses would be used, as appropriate, to control emissions from material transfer points and the coal bunkers. All transfer stations would operate under a slight negative pressure with vents routed through a fabric filter in order to achieve a 99 percent particulate-matter-control efficiency. The coal-storage pile would be treated to reduce dust emissions.

Coal-Crusher Building

The coal crusher would be used to reduce coal to less than 6 inches in diameter, which is the size distribution recommended by the pulverizer manufacturer. The crusher would be fed directly by a belt conveyor using a controlled feed rate of coal of up to 2,000 tons per hour. A coal sorter would allow the bypass of any coal less than 1 inch in diameter.

Lime Preparation

Quicklime, used in the FGD process, would be delivered to the facility and stored in unit-specific silos. The lime would be fed into grinding mills that would prepare the lime as a fine powder, which would be mixed into slurry and then be delivered to the FGD vessel.

Water-Supply and Treatment Systems

Water delivered to the site from the Tule Desert well field would be stored in the raw water tank. Water would be drawn from this tank to be treated by reverse-osmosis units and demineralization systems in the water-treatment building and used in the boiler-feed-water and the cooling-water systems. Chemical injection systems also would be contained in this building to maintain the proper water chemistry for these systems. The wastewater streams in the facility would be recirculated and treated in this area as well to minimize the amount of water discharged to the environment and to reduce the amount of water drawn from the local aquifer. The chemicals required for the water-treatment systems would be stored in this building, which would contain appropriate containment systems.

Dry-Cooling Towers

The heat-rejection system used to cool the water in the steam-condensing system would be a closed-loop, water-cooled system using hyperbolic natural-draft-cooling towers. These towers would be equipped with multiple water-to-air heat exchangers designed to minimize the facility's water consumption by 80 percent when compared to a similar plan using traditional wet cooling.

Solid-Waste Disposal

The primary combustion byproducts from the facility would be fly ash and bottom ash derived from the combustion process, and synthetic gypsum derived from the FGD process. Combustion byproducts would be collected from the bottom of the boiler (“bottom ash”), from the flue-gas passages before and at the baghouse (“fly ash”), and from the separation system of the wet FGD (“synthetic gypsum”). These byproducts would each be stored in 10-day silos and made available for resale. When the byproducts cannot be sold to market and exceed plant storage capability, they would be transferred to a pug mill where they would be mixed with wastewater in order to attain an 18- to 21-percent moisture content to limit dust-control issues, and then transferred by conveyor to a byproducts hopper for subsequent disposal at the onsite landfill.

The bottom-ash removal system would convey bottom ash from the boiler as pyrites, which must be ground and then transferred pneumatically to a storage silo. The bottom-ash-storage silo would be equipped with a vent filter and truck-loading nozzle to control emissions of particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}). The fly-ash removal system internally would convey fly ash pneumatically into hoppers and then through air seals to silos equipped with a vent filter and truck-loading nozzle to control PM_{10} emissions. Bottom ash and fly ash are commonly sold into market as aggregate for use in road-bed and sub-bed material, road de-icing products, blasting grit, flowable fill for construction, brick manufacturing, roofing shingles, and concrete filler. The synthetic gypsum is created by spraying hydrated calcium oxide into the flue-gas stream, capturing sulfates and sulfites that would otherwise create H_2SO_4, but that instead create calcium sulfate dihydrate within the wet-FGD absorber. Forced oxidation creates nearly pure synthetic gypsum that must be removed from the reagent tank and dewatered, rinsed, and dewatered again before being transferred to a gypsum-storage silo that is equipped with a vent filter and truck loading nozzle to control PM_{10} emissions. Rinse water is returned to the wet FGD or sent to water treatment for recycling or use as a wetting agent for landfill. Synthetic gypsum products are used in the market as wallboard material and construction adhesives and in the cement and agricultural markets, thereby reducing the amount of natural gypsum that would otherwise be mined for these same purposes.

If it is not cost effective to resell these byproducts for use off site, the materials would be disposed of properly in the onsite landfill. The landfill would be constructed in accordance with all applicable Federal, state and U.S. Environmental Protection Agency laws and regulations

Oil Storage

Oil would be stored in a 50,000-gallon storage tank surrounded by an earthen-berm secondary containment system. Other lubricating oils and solvents would be stored in appropriately designated areas in the maintenance workshop and storage buildings. Oil would be transferred by truck or rail to the diesel-storage tank.

Electrical Switchyard and Main Transformers

The electrical switchyard would be the primary connection point to the transmission grid. The switchyard is designed to provide the proper connections for putting energy into the grid as it is generated or to take power from the grid as required in the facility. The transformers would convert the generated energy to a level that is usable on the transmission grid.

Water-Surge Pond

At times, when the plant is shutting down, some of the water in the boiler is lost. This lost water is collected in the water-surge pond, sent through the water-treatment plant, and then reused. The majority of the time there would be no water in the pond.

2.3.2.2 Construction Activities

Site preparation activities would be carried out in accordance with a grading design, developed by the construction contractor, that responds to the site topography and mitigation requirements. Specific plans or measures proposed for fugitive-dust control, erosion and sedimentation control, site reclamation, stormwater-runoff control, and the protection of natural and cultural resources would be implemented as identified through this National Environmental Policy Act process.

Laydown areas, storage areas, and temporary construction facilities would be located on the 640-acre power plant site. Site laydown areas would be stylized or modified based on specific contours of the site, terrain, entry and exit points, and preventative maintenance and material-storage requirements. A nominal 200-foot-wide temporary ROW would be required for construction activities along the rail corridor. Areas requiring excavation and fill materials may be wider. Appendix A provides additional information on construction activities.

The construction ROWs and staging areas associated with the well field, water pipeline, and the access road would be the same as those evaluated in the 2003 EIS (refer to Section 2.2 of this chapter).

During construction of the rail line, a 200-foot-wide corridor would be used from Leith Siding at the existing UPRR to the Toquop Energy Project plant site. Access to the construction ROW would be from either end of the rail line, and by using existing roads identified on Map 2-2. There would be three areas that would require the installation of bridges or large culverts. Bridges would be needed to cross the Meadow Valley Wash and the Toquop Gap. Additional cut and fill and culverts would be used to span the washes going up from the Meadow Valley Wash Bridge. All construction personnel, equipment, and materials would be restricted to the 200-foot construction ROW and would enter the construction area at either end of the rail line. At this time it is anticipated that the rail construction period would be 24 months.

2.3.2.3 Operation and Maintenance

Power Plant

The project life for the Proposed Action Alternative would be 54 years, comprising 4 years of power plant construction and 50 years of plant operation. Water rights would be exercised at the beginning of plant construction. Operation of the power plant would require up to 3.1 million tons of coal per year. The plant would use natural gas supplied via the Kern River Gas Transmission Company line for the initial startup, and for startups during regular maintenance. Fuel oil would provide a backup source of startup fuel. Except at startup, the power plant would produce its own operating power and would not require nor use external sources of power supply. The coal would be delivered from the Powder River Basin to the plant site via an existing UPRR line and the new rail line. Coal would be blended, crushed, and pulverized to a powder for optimized burning in the boilers. The power plant would use a supercritical pulverized-coal boiler. Use of a “once-through” supercritical steam cycle and other design features would enable this plant to operate with a higher net efficiency than other coal-fired power plants.

Using a Heller system dry-natural-draft-cooling tower would minimize water consumption. A direct-contact jet condenser would be used with the Heller cooling tower system. In this system, the process steam from the steam turbine is fed to the condenser, where it is condensed by direct cooling with the cooling water from the closed-cooling cycle. The blended cooling water and condensate are collected in the hot well and extracted by circulating water pumps. Approximately 3 percent of this flow—corresponding to the amount of steam condensed—is fed to the boiler-feed-water system by condensate pumps. The major part of the flow is returned to the cooling tower for re-cooling. Cooling is performed by the delta-shaped heat exchangers at the base of the hyperbolic cooling tower, where cooling airflow is induced by temperature differential within the tower.

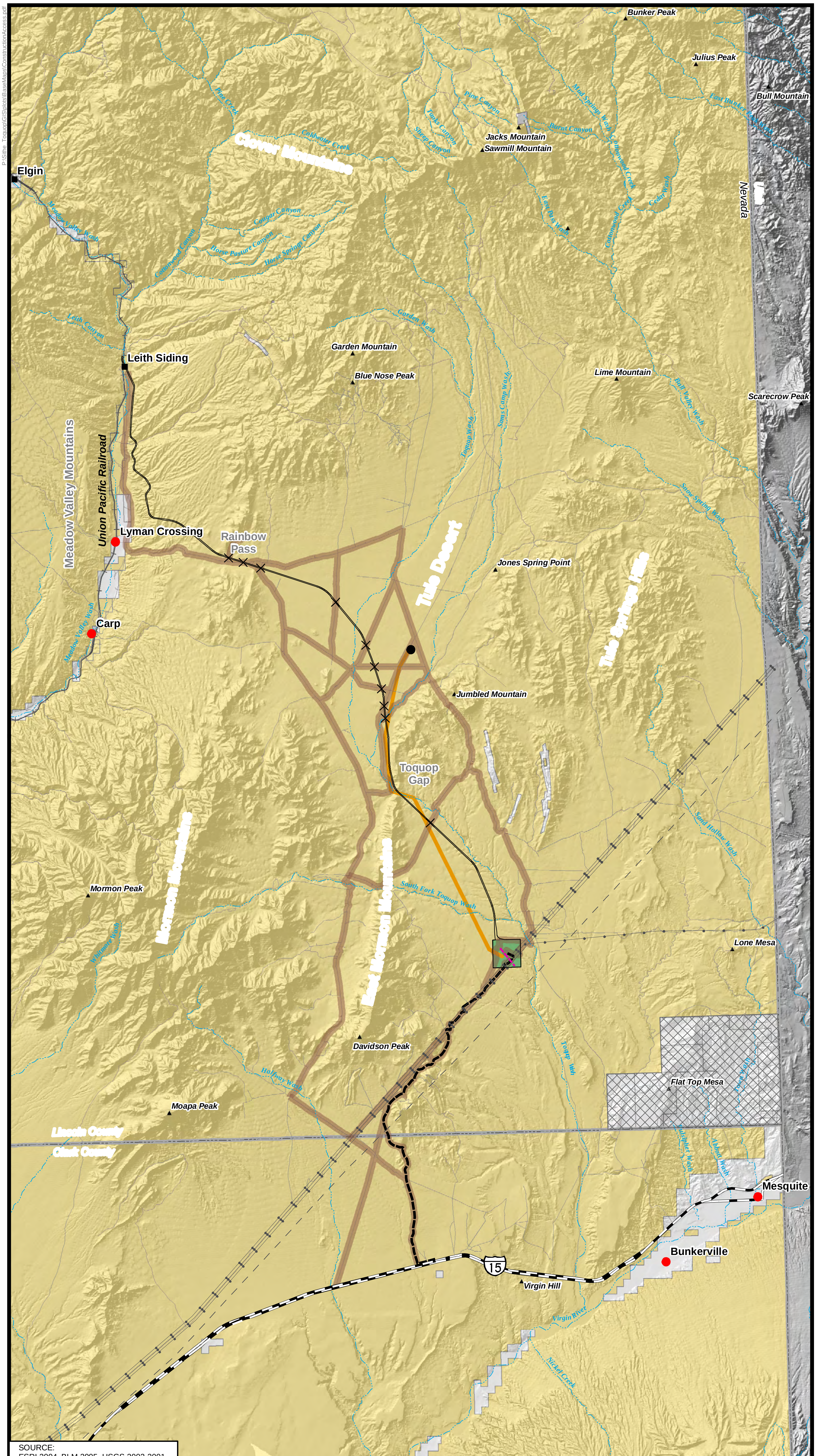
The hybrid cooling tower was selected because of its ability to minimize water consumption. When the ambient temperature is below 80 degrees Fahrenheit, the cooling tower operates as a dry-natural-draft-cooling tower. When the temperature exceeds 80 degrees Fahrenheit, the facility has the option of applying water overspray on the heating surfaces inside the cooling tower to provide additional cooling. This type of cooling tower has no particulate emissions. Due to the very limited amount of water used in the cooling process, no visible plume would be emitted from the cooling tower.

Other materials that would be stored on site include limestone, quicklime, and ammonia. Quicklime would be purchased from local suppliers and delivered to the site by trucks that would off-load onto a pneumatic conveyer that delivers the quicklime to a storage silo. The silo would be equipped with a baghouse to control PM_{10} emissions. Quicklime would be withdrawn from the bottom of the silo by a rotary vane feeder and transported to the limestone slurry tank, where it would be mixed with water. The quicklime slurry would be used in the wet FGD. Activated carbon (if needed) and quicklime would be delivered to the site by trucks and pneumatically conveyed to storage silos that also would be equipped with a baghouse to control PM_{10} emissions. Quicklime would be injected into the duct prior to the fabric filter to control acid-gas emissions. Activated carbon would be injected, if necessary, into the duct prior to the fabric filter to control mercury emissions. A nontoxic surfactant would be applied as needed to control dust emissions from passive coal storage piles.

Anhydrous ammonia would be purchased from local suppliers and delivered to the site by truck for storage in a pressurized tank. There are no air-pollutant emissions from pressurized storage tanks. The anhydrous ammonia system consists of all equipment required to unload, compress, store, transfer, vaporize, dilute, and convey the ammonia/air mixture into the ammonia injection grid upstream of the selective catalytic-reduction system.

Byproducts from power generation would include fly ash, which would be collected by the main fabric filter. The pulverized-coal-fired boiler also would generate bottom ash. Fly ash and bottom ash would be stored in separate ash silos. A fabric filter would control emissions from the ash silos. Gypsum with water content in the 10 to 20 percent range would be generated by the wet FGD. It is anticipated that a market for recycling coal combustion byproducts would be available in growing metropolitan areas in southern Nevada, since fly ash and gypsum are used in concrete and other building materials. If it is not cost effective to resell these byproducts for use off site, the materials would be disposed of properly in a landfill on site. The landfill would be constructed in accordance with all applicable Federal, state, and U.S. Environmental Protection Agency laws and regulations.

The power plant would employ approximately 110 permanent employees, who would travel to the site along the improved access road. Traffic along the access road also would include deliveries of quicklime, ammonia, and other materials in accordance with all Federal, state and local regulations governing the management of hazardous materials.



Construction Access

Toquop Energy Project EIS
Lincoln County, Nevada

LEGEND

- Rail Line Construction Right-of-Way (200 feet)
- Construction Access Road

Surface Management

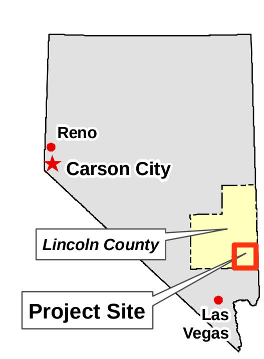
- Bureau of Land Management
- Private

General Features

- Proposed Rail Line
- Proposed Plant Site (640 acres)
- Permitted Well Field
- Permitted Water Pipeline
- Permitted Natural Gas Pipeline and Transmission Line Interconnection
- Permitted Access Road
- Toquop Township
- Future Rail Line Crossing

Reference Features

- Existing Road
- Interstate
- Existing Railroad
- Existing Transmission Line
- Existing Natural Gas Pipeline
- River, Stream, or Wash
- Mountain Peak
- Town
- Point of Interest



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Map 2-2

Rail Line

The proposed coal-fired power plant would use low-sulfur coal from northeast Wyoming's Powder River Basin; long-term coal-supply contracts would be completed with mines that are already permitted to provide adequate supply. The Powder River Basin is estimated to contain 64 billion tons of mineable coal that could last as much as 150 years at current usage rates (Wyoming Mining Association 2006). In 2005, 390 million tons of coal were mined from the Powder River Basin (BLM 2007a). To transport coal to the plant site, the existing UPRR network would be used from Wyoming to Leith Siding in Nevada. At this location, an approximately 31-mile-long rail line would be constructed to connect the UPRR line to the plant site (refer to Map 1-1). The permanent ROW for this rail line would be 100 feet wide.

Traffic along the new rail line is expected to be two trains with 80 to 100 cars per day, one loaded with coal coming from the UPRR, and the other empty and heading back toward the UPRR line. Within this ROW, there would be a maintenance road for periodic inspections of the rail and any fencing that may be within the ROW. Installing barriers at existing road crossings would restrict access to the rail ROW. The periodic inspections would be done by either car or off-highway vehicles (OHV), depending on the limiting factors of the terrain along the rail. Access to the ROW for the inspections would be by existing roads.

Well Field and Water Pipeline

The annual water requirements for power generation under the Proposed Action Alternative would total 2,500 acre-feet. Under the 2003 EIS, the State Engineer approved 2,100 acre-feet of water for the power plant. This water supply would still be granted under the Proposed Action Alternative; an additional 400 acre-feet would be required to reach the 2,500-af/yr water requirements for the proposed coal-fired power plant. The approval for the additional 400 acre-feet is pending. Maintenance of the well field and water pipeline would be the same as evaluated in the 2003 EIS, as mentioned previously under the No-Action Alternative in Section 2.2.2.1 of this chapter.

Lincoln County Water District has proposed the Lincoln County Land Act (LCLA) Groundwater Development Project. If this project is completed, it would develop additional groundwater resources in the Tule Desert and the Clover Valley and water pipelines that would deliver water to the LCLA development area and the Toquop Energy Project. This project's proposed water pipeline, if constructed, would eliminate the need for a separate water pipeline for the Toquop Energy Project and would allow for water from either the Clover Valley or Tule Desert hydrographic basins to serve the needs of the power plant.

As part of the LCLA Groundwater Development Project, the volume of water to be transported through the proposed facilities would be approximately 23,824 af/yr, including the 2,500 af/yr for the Toquop Energy Project. The additional water would be used to support development in the LCLA development area. The LCLA Groundwater Development Project is currently undergoing an EIS. The additive impact of this project is included in the evaluation of cumulative impacts in Chapter 4.

The proposed facilities that will be evaluated in the LCLA EIS include approximately eight groundwater production wells (16 inches in diameter) located in the Tule Desert and Clover Valley hydrographic basins, a 23-mile-long water transmission pipeline (24 inches in diameter), and lateral pipelines (12 inches in diameter) to connect the water transmission pipeline to the production wells. The proposed width of the ROW for the water transmission pipeline would be 30 feet with a temporary width of 60 feet during construction. The proposed width of the ROW for the lateral pipelines would be 20 feet with a temporary width of 60 feet during construction. The production well site ROWs would be 100 feet by 100 feet with a temporary construction area of 100 feet by 200 feet. Access roads approximately 12 feet in width would be needed from existing roads in the Tule Desert area to each well site. The proposed production wells in the Tule Desert would be located in the well field area previously authorized for the Toquop Energy Project. The proposed water transmission pipeline, if constructed, would eliminate the need for a separate water pipeline for the Toquop Energy Project. From the power plant site, the transmission pipeline would proceed to the LCLA development area. Electric lines, communication lines, and a natural gas pipeline would be located within portions of the proposed transmission pipeline ROW.

Access Road

Improvements to the access road would be the same as those evaluated in the 2003 EIS, including upgrading the paved surface, widening the ROW, and grading/straightening the existing roadway.

2.3.2.4 Decommissioning

The power plant is expected to have a 50-year design life without requiring major capital improvements. At the end of its life, the plant would be decommissioned, and all structures and equipment at the site would be dismantled and removed. The operator of the rail line (Toquop Energy or other parties) would coordinate with BLM regarding future use or decommissioning of the rail line. The landfill would be closed in accordance with all state regulations. All wells would be converted to other uses or decommissioned and abandoned in accordance with state regulations. Following removal or abandonment of facilities, any disturbed areas would be rehabilitated as nearly as possible to their original condition. Potential uses of water rights by Lincoln County or Vidler Water Company Inc. after the 54-year project life are not known at this time.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

A summary of the alternatives that were considered but eliminated from detailed analysis is provided below and is organized by (1) alternative locations for the power plant site, (2) alternative power generation technologies, and (3) alternative rail line alignments.

2.4.1 Alternative Location for the Power Plant

In the 2003 EIS, an alternative location was evaluated. The “northern” power plant site is located approximately 12 miles northwest of the Toquop Energy parcel, closer to Meadow Valley Wash, and further from the existing transmission and gas lines than the proposed parcel that is the subject of this EIS. The northern parcel site would require an additional 12 miles of gas pipeline, transmission lines, and access road, creating additional impacts to resource areas. These impacts are described in the 2003 EIS, Chapter 4. This alternative was not selected in the 2003 EIS because it did not provide any environmental advantage over the site selected in the 2003 Record of Decision.

2.4.2 Alternative Power Generation Technologies

The 2003 EIS evaluated several alternative power generation technologies, including use of hydroelectric resources, biomass, fuel oil, and wind and solar resources (BLM 2003a). A coal-fired plant was eliminated from detailed consideration in the 2003 EIS because of the high cost of a rail line, impact of air emissions, and higher demand for water use. However, by incorporating dry-cooling and high-efficiency technology into the proposed coal-fired power plant design, potential emissions and water use would be reduced. Increasing natural gas prices also have made coal-fired power plants a more cost-effective method of power production. Due to the reasons mentioned above, a coal-fired power plant could be operated more cost-effectively than was assumed in the 2003 EIS. The other alternative generation technologies have been eliminated from detailed consideration in this EIS.

2.4.3 Alternative Coal Generation Technologies

2.4.3.1 Integrated Gasification Combined Cycle

Integrated gasification combined cycle (IGCC) is a developing coal technology that offers the potential for improved environmental performance and comparable (i.e., slightly lower) efficiency to pulverized coal-fired power plants. Proponents of IGCC point to low air-pollutant emissions, less solid waste by-products, and reduced water consumption when compared to specific examples of direct coal-combustion technologies. Although carbon dioxide (CO_2) capture is not a currently proven technology or required, the ability of IGCC to provide for easier CO_2 capture than direct coal-combustion technologies may prove to be an advantage in the future. In addition, the potential for coproduction of hydrogen adds potential to the production of clean transportation fuel. Comparisons between IGCC and direct coal-combustion technologies are affected by fuel composition, assumed air-pollution-control methods and performance, site elevation, cooling technology, and other factors. For example, IGCC heat rates increase as the ash content of the coal increases. High ash concentrations in some coals also create operating and maintenance issues to the extent that IGCC is not feasible due to the high ash content of the coal.

Currently there are only four operating coal-based power-generation IGCCs in the world. Two of these are demonstration plants in the United States. The two demonstration plants are single-train systems consisting of one gasification process, one gas cleanup process, one combustion turbine, and one steam turbine. The demonstration plants, which are all partially supported by government and research funding, have net capacities of 250 MW (Tampa Electric Polk Power Plant in Florida) and 262 MW (Wabash River Plant in Indiana). Recently, the Polk Power Plant has been operating on a 55 percent petroleum coke/45 percent coal feed, and the Wabash River Plant has operated on 100 percent petroleum coke since the U.S. Department of Energy demonstration program ended in 2000 (Holt 2004). Petroleum coke is less expensive than coal and offers better IGCC performance and reliability due to low ash and high heating value. In late 2004, the Wabash River Plant was reported as not operating due to business reasons (Holt 2004).

IGCC is not an inherently low-emitting or pollution-free process. Emission levels of existing IGCC plants as well as "qualifying advanced coal projects," as defined by the Energy Policy Act of 2005, are not, in total, lower than proposed emission rates for the Toquop Energy Project as shown in Table 2-5.

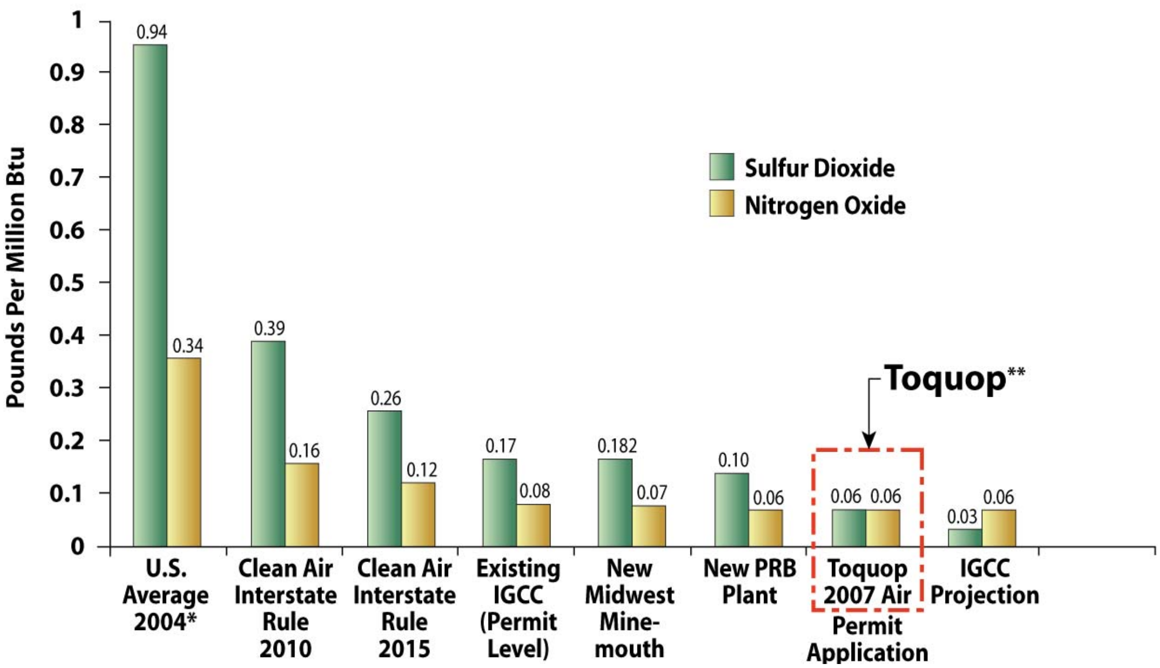
Table 2-5
Emission Levels

	Existing IGCC (percent)	Advanced Coal Projects (percent)	Toquop Energy Project (percent)
Removal percentage of SO_2	98.0	99.0	98.0
NO_x emissions (lb/MMBtu*)	0.07	0.07	0.06
PM_{10} emissions (lb/MMBtu*)	0.015	0.015	0.01
Mercury removal percentage	90.0	90.0	90.0

SOURCE: Holtz 2004, ENSR Corporation 2006a
NOTES:
IGCC = integrated gasification combined cycle
SO_2 = sulfur dioxide
NO_x = nitrogen oxides
PM10 = particulate matter with an aerodynamic diameter less than 10 microns
lb/MMBtu = pounds per million British thermal units

Figure 2-2 compares SO_2 and NO_X emissions of different types of coal-fired power plants, including IGCC, in relation to the Toquop Energy Project.

Figure 2-2
Sulfur Dioxide and Nitrogen Oxide Emissions from Coal-Fired Generating Plants



SOURCE: Toquop Energy Company, LLC 2006
NOTES: Inserted for discussion purposes only to show relationship of the estimated emissions of the Toquop Energy Project
* Estimate
** Estimate

Capital costs for an IGCC plant would be affected by the location of the Toquop Energy Project and would exceed the Toquop Energy Project costs by $350 to $600 million. While some of the cost difference might be reduced by incentives in Title XVII of the Energy Policy Act of 2005, the credits are limited to a maximum of $135.5 million to a single project and the amount of the credit can be reduced or eliminated depending on the actual allocation of the credits to a given project.

The cost of electricity for an IGCC plant would be $3.5 per megawatt-hour to $6 per megawatt-hour higher than the Proposed Action Alternative ($17 to $30 million annually).

IGCC plants have lower reliability than supercritical pulverized-coal plants, especially in the early years of operation, and they are more prone to incidents of forced outage as the plant ages over time. Therefore, there may be additional costs associated with lost electricity production and a need for a firm natural gas supply. These potential additional costs have not been quantified.

The technological risk of building an IGCC plant might make the plant less desirable to utility investors and power purchasers. The increased risk also would increase financing costs, as lenders would want more equity and higher maintenance and debt coverage reserves. These factors would increase the total capital cost.

IGCC was determined to not be a commercially viable option for the Toquop Energy Project. The IGCC project would not result in lower overall emissions. The project would have a much higher cost and there would be substantial technological risk that would make the plant unattractive to power purchasers and investors.

2.4.3.2 Circulating Fluidized Bed

The technology choice between circulating fluidized bed (CFB) combustion power plants, subcritical pulverized-coal power plants, and supercritical pulverized-coal plants depends on many factors including the size of the project, the types of fuel that would be burned, fuel properties, plant location, and local solid-waste and water issues. In addition, the technology choice is affected by the developer's or utility's experience with the technology and perception of technological risk and maintenance issues, as well as future fuel costs and electricity prices.

The maximum size of a CFB boiler is currently 300 MW net, while pulverized-coal units can be as large as 1,200 MW net. For large plants, the need for multiple CFB units adversely impacts the capital cost. Currently, all CFB plants in operation are subcritical units with significantly higher heat rates and lower efficiencies as compared to supercritical pulverized-coal units. In some areas of the country, the ability of CFB plants to provide fuel flexibility and the ability to burn poor-quality fuels such as petroleum coke, waste coal, and biomass is important.

There are several key differences between a CFB plant and a supercritical pulverized-coal plant.

Two or three CFB units would be required instead of one supercritical pulverized-coal unit to achieve the planned Toquop Energy Project power output. The smaller CFB units would perform less efficiently than one supercritical pulverized unit, i.e. the cost and air emissions per unit of power generated would be higher with CFB units. The construction and operation of CFB units also would have higher capital and operational costs than the proposed Toquop Energy Project.

On a pound-per-million-British thermal unit basis, most emissions from a CFB plant would be similar to the Proposed Action Alternative supercritical pulverized-coal power plant.

The heat rate for a CFB plant would be about 9,950 British thermal units per kilowatt-hour, while the heat rate for the Toquop Energy Project is 8,792 British Thermal Units per kilowatt-hour (net, higher heating value basis). For the same net electricity production and emission rates, a CFB plant would generate 11 percent more emissions than the Toquop Energy Project, and 15 to 20 percent higher CO_2 emissions.

On an annual tons-per-year basis, all emissions from a CFB plant would be higher than the Proposed Action Alternative supercritical pulverized-coal power plant due to the higher heat rate.

Based on annual emissions, a supercritical pulverized-coal power plant is the preferred technology. For reasons of economic feasibility and annual emission rates, this alternative was eliminated from further study.

2.4.4 Alternative Rail Line Routes

Several alternative routes for the rail line were considered but eliminated from detailed analysis. The primary reasons for their dismissal were grade and slope considerations or potential impacts on specially designated areas (Map 2-3).

Alternative Rail Line 1

Alternative Rail Line 1 begins at the Hoya Siding of the UPRR with less than a 1.5 percent maximum grade heading south. The route heads east through the Mormon Mountains pass (Jacks Pockets) to Mormon Mesa, then northeast through the East Mormon Mountains pass to the plant site. The total track length is 35 miles. This route was dismissed as a viable alternative because it crosses Mormon Mesa Area of Critical Environmental Concern (ACEC) and approximately 8 miles of the Mormon Mountains Wilderness.

Alternative Rail Line 2

Alternative Rail Line 2 begins at UPRR's Hoya Siding with less than a 1.3 percent maximum grade, circumvents the Mormon Mountains by traveling farther south and east than Alternative Rail Line 1, and crosses Mormon Mesa. This route approaches the plant site across Halfway Wash, south of Davidson Peak. Multiple wash crossings would require the installation of box culverts. This route would have a total track length of 39 miles. The maximum grade would be 1.3 percent; however, the grade could be reduced with additional minor earthwork. Alternative Rail Line 2 was eliminated from further consideration because it crosses the Mormon Mountains Wilderness and Mormon Mesa ACEC.

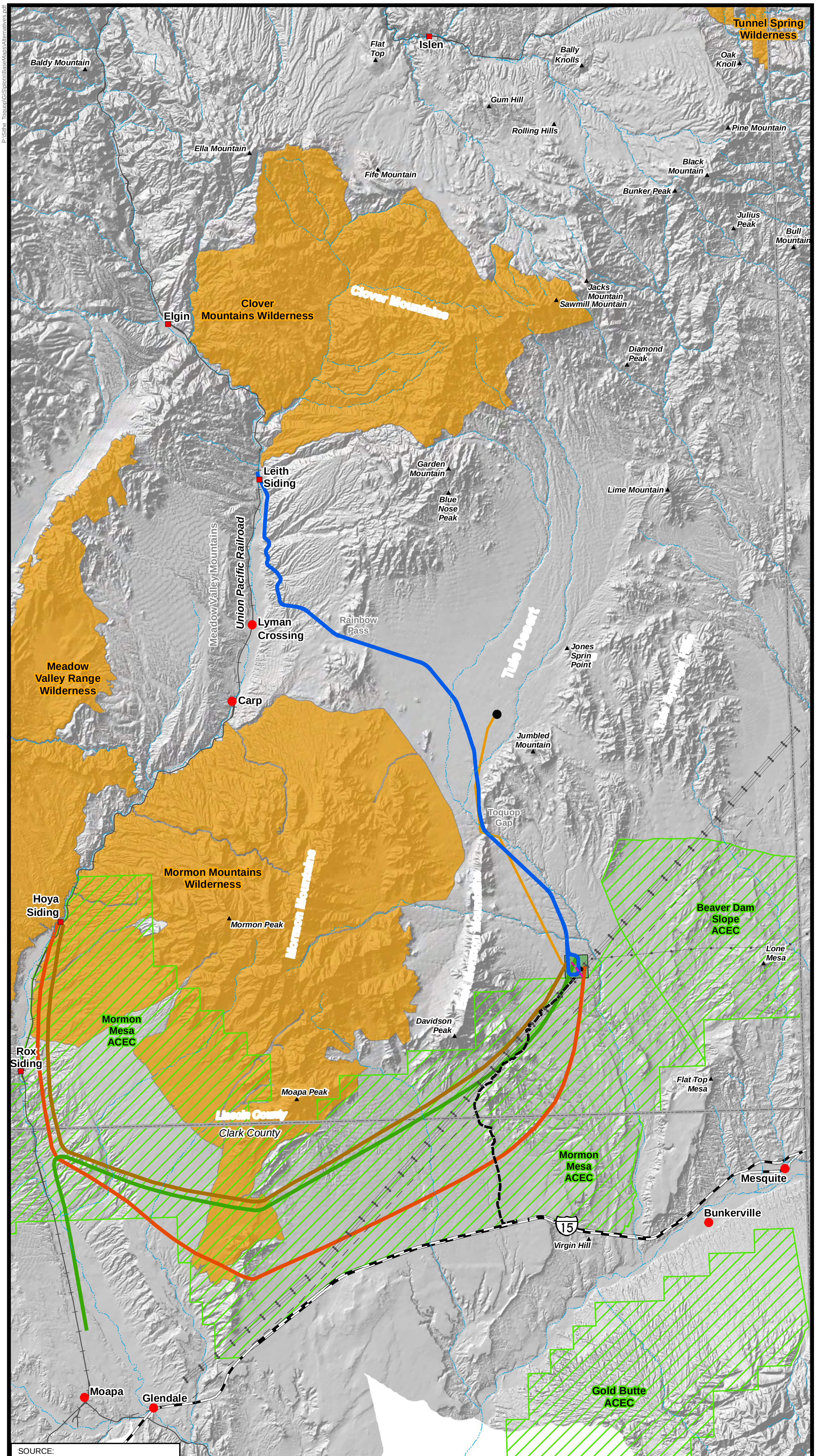
Alternative Rail Line 3

Alternative Rail Line 3 originates south of Glendale in Moapa Valley and heads north across the Muddy River from the UPRR to arrive at the same plateau as Alternative Rail Line 1. The route then traverses through the Mormon Mountains pass to the plant site along the same route as the Alternative Rail Line 1. This route would result in a total track length of 42 miles, with up to 3 miles on trestle or bridging.

This route was dismissed as a viable alternative because it passes through the Mormon Mountains Wilderness and Mormon Mesa ACEC.

2.4.5 No Power Plant Development

In the 2003 EIS, the scenario in which no power plant would be built was analyzed. ROWs are now in place, as described in 2003 Record of Decision. Toquop Energy could, at this time, move forward with the construction of the gas-fired plant and ancillary facilities without additional ROW grants.



Alternative Rail Line Routes Considered

Toquop Energy Project EIS
Lincoln County, Nevada

LEGEND

Rail Line Alternatives

- Proposed Rail Line
- Alternative Rail Line 1
- Alternative Rail Line 2
- Alternative Rail Line 3

Special Designation

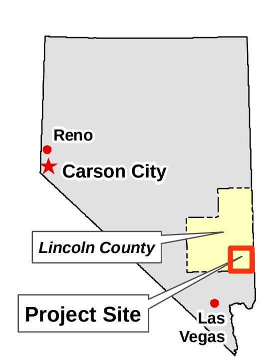
- Wilderness
- Area of Critical Environmental Concern

General Features

- Proposed Plant Site (640 acres)
- Permitted Well Field
- Permitted Water Pipeline
- Permitted Natural Gas Pipeline and Transmission Line Interconnection
- Permitted Access Road

Reference Features

- Existing Road
- Interstate
- Existing Railroad
- Existing Transmission Line
- Existing Natural Gas Pipeline
- River, Stream, or Wash
- Mountain Peak
- Town
- Point of Interest



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Map 2-3