2.0 Proposed Action and Alternatives

2.1 Formulation of Alternatives

This chapter describes the alternatives considered in this EIS. These alternatives were developed in response to issues and concerns from public comments submitted during the public scoping period and interaction between the BLM resource specialists.

In addition to the No Action Alternative, the proponent's Proposed Action and two other action alternatives are analyzed in detail. The Record of Decision (ROD) may include individual elements from any of these alternatives.

The BLM also considered alternatives raised during the scoping and alternatives development processes that are not carried forward for detailed analysis. These alternatives, with the reasons why they were not included for detailed analysis, are described in Section 2.3.

This chapter concludes with a summary of the environmental effects of the Proposed Action and the other alternatives that are analyzed in the EIS.

2.2 Summary of Alternatives

A brief summary of the alternatives analyzed in detail is included in this section.

2.2.1 No Action Alternative

The No Action Alternative would deny the approval of the proposed project and would not grant the requested ROWs and preference right leases. Current land and resource uses would continue under current conditions in the project area. There are several circumstances that could lead to the selection of the No Action Alternative in compliance with 43 CFR 3507.19. The effect of the occurrence of these circumstances must be evaluated in this EIS.

- If it is determined that the polyhalite cannot be economically recovered under the lease terms required by the BLM, then the existence of a valuable deposit would not be demonstrated and no preference right leases would be issued.
- If it can be demonstrated that the lease is not in the public interest, then the preference right leases would not be issued and other leases may be offered in exchange.

2.2.2 Alternative A—Proposed Action

The Proposed Action would include approval of ICP's Ochoa Mine Plan of Operations (MPO), granting new ROWs, and approval of preference rights leases to allow the mining and processing of polyhalite ore to produce the fertilizer SOP, a component of agricultural fertilizer.

Following is a brief summary of ICP's proposed operations, projected to function for 50 years in Lea County, New Mexico. More detail on the components and activities associated with the Proposed Action is included in Section 2.4.2.

- Development of an underground mine to be accessed by a shaft and a ramp.
- Construction and operation of office and processing facilities including the ore processing plant, dry stack tailings pile, and evaporation ponds on BLM land.

- Full development of brackish water wells in the Capitan Reef Aquifer and a new pipeline to serve the processing plant and mine operations.
- Construction and operation of a railroad loadout facility near Jal, New Mexico, for shipment of the finished marketable potash product.
- At the completion of the project, all project components and all disturbed areas would be reclaimed and infrastructure would be decommissioned.

2.2.3 Alternative B

Under Alternative B, there would be no change to the mining methods and operations, processing methods and buildings, and management of co-development described under the Proposed Action. The goal of this alternative is to reduce the volume or height to minimize the visual impacts of the tailings stockpile while allowing the BLM to approve the MPO, grant ROW requests, and issue preference rights leases for mining.

2.2.4 Alternative C

Alternative C would not change the mining methods and operations and processing methods and buildings described under the Proposed Action. The goal of this alternative is to establish standards and guidance for managing concurrent development of minerals while allowing the BLM to approve the MPO, grant ROW requests, and issue preference rights leases for mining. The guidance would be implemented to make management decisions fairly and consistently regarding the development of both potash and fluid minerals.

2.2.5 Alternative D

An alternative location for the processing facilities was proposed during public scoping. There would be no change in the proposed mining methods and operations but the location of the evaporation ponds and tailings stockpile would be located to the east of the site described under the Proposed Action (Alternative A). The proposed location would require the use of state and private land as well as public land.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

2.3.1 Convert Mine to Storage Facility for Hazardous or Radioactive Waste

There was a recommendation raised during public scoping to convert the underground mine to a storage facility for hazardous or radioactive waste at the end of the mine's life. This alternative was considered but eliminated from detailed analysis because it is outside the authority of the BLM to make that decision and it would require impact analysis far beyond the scope or timeframe for the proposed project.

2.3.2 Construct Rail Line to Jal

ICP evaluated the feasibility of constructing a railroad spur from the plant facilities to the existing railroad line instead of trucking the finished SOP and langbeinite to the Jal loadout. The 30-mile railroad spur would have to be constructed across mostly private land. Because the proponent did not identify a proposed route for a rail line, evaluation of an alternative transportation system by the BLM would be speculative and was eliminated from detailed analysis on that basis.

2.3.3 Alternative Processing Site Location and More Evaporation Ponds

Prior to submitting the MPO, ICP considered using 210 evaporation ponds rather than crystallizers for processing and producing SOP. The evaporation pond scenario involved different processing steps than that described for the Proposed Action, including, in order, crushing, calcination, leaching, pond harvesting and salt preparation, crystallization, and granulation. Due to the requirements of the pond harvesting step, the evaporation pond sizes must be variable (up to 1,500 acres) to allow adequate

surface area for evaporation and salt formation during any season, covering a total of more than 6,800 acres. The implementation of this processing option would require approximately 9,000 gallons per minute (gpm). To implement this processing scenario, engineers working for ICP determined that the base material in the ponds would have to be a 12-inch-thick layer of concrete to enable the use of heavy equipment to scrape the precipitated salts from the ponds. It was determined that this option would require approximately 4 square miles of concrete using about 4 million cubic yards. Given the high demand for concrete from other mineral development and construction projects in the region, ICP determined that it would not be feasible to obtain the required volume of concrete within the timeframe necessary for constructing the project if it could be obtained at all. Due to the unavailability of the resources necessary to construct this option, this alternative was eliminated from detailed analysis.

2.3.4 Lower Water Demand for Crystallizer

In the MPO that was submitted to the BLM in September 2011, ICP estimated that the project's water demand would be approximately 2,000 gpm, based on a specific type of crystallizer (mechanical vapor recompression). However, during testing performed after submitting the MPO, ICP found that it was not possible to make large enough crystals of langbeinite using this crystallizer, causing a problem for the solid-liquid separation step and resulting in poor SOP production. This option was determined to be technically infeasible as initially proposed. Therefore, this alternative was eliminated from detailed analysis.

2.4 Alternatives Analyzed in Detail

2.4.1 No Action

The No Action Alternative must be addressed under provisions of NEPA and serves as a basis for comparison of environmental impacts among alternatives. Under the No Action Alternative, the BLM would deny ICP's application for ROWs, MPO, and request for preference right leases, allowing the prospecting permits to expire.

There are several circumstances that could lead to the selection of the No Action Alternative in compliance with 43 CFR 3507.19.

- If it is determined that the polyhalite cannot be economically recovered under the lease terms required by the BLM, then the existence of a valuable deposit would not be demonstrated and no preference right leases would be issued.
- If it can be demonstrated that the lease is not in the public interest, then the preference right leases would not be issued.

If the preference right leases were not issued, the project as proposed in this EIS could not be developed. It is possible that a similar, though smaller scale, project could be developed on state and private leases. However, if BLM-managed surface access and ROWs were needed for the project, this modified proposal would be subject to a separate NEPA analysis.

If the existence of a valuable deposit is demonstrated and the BLM denies the preference right leases because it is not in the public interest due to concerns related to the need to preserve public resources or social values, then the government is required to offer a lease of similar value to the proponent in a different location or provide compensation. Exchanging a lease would shift the impacts of mineral operations from development of the preference right lease to other unleased lands, and a separate NEPA analysis would be required. If other suitable lands and minerals are not available for lease, or if the applicant will not agree to enter into an exchange, the government must consider compensating the applicant for the denied preference right leases.

If ICP decides that the project could not proceed without the issuance of the preference right leases, the proposed new mine, processing facilities, loadout facility, and water pipeline would not be constructed, leaving the current uses of the land in the project area unchanged.

2.4.2 Alternative A—Proposed Action

2.4.2.1 Overview

The Proposed Action consists of ICP's proposal to construct and operate an underground mine to extract polyhalite ore for the purpose of producing SOP and langbeinite products to be used as a constituent in fertilizer. ICP submitted a MPO to the BLM on September 30, 2011 (ICP 2011) that details their proposal. Under this alternative, the MPO would be approved as proposed, ROWs would be granted, and preference right leases would be issued.

The ore would be extracted from the Rustler Formation approximately 1,500 feet deep, using the room-and-pillar mining method, leaving support pillars as mining progresses. Once mined, the polyhalite would be transported to the surface, crushed, calcined, leached, crystallized, and granulated to produce SOP, the saleable product. The final product would be moved via truck to a loadout facility near Jal, New Mexico, to be loaded on trains and shipped.

New processing facilities would be constructed south of the mine. The processing plant facilities would consist of buildings housing processing equipment, offices, warehouse, laboratory, maintenance shops, and product storage, as well as roads, parking lots, septic systems, power lines, evaporation ponds, and a tailings pile. Other infrastructure includes up to eight water wells located to the east of the mine, a pipeline to transport water to the processing plant, and a railway loadout station near Jal.

The project area consists of the 50-year mine area, the processing plant site, the water well field and pipeline, and the loadout facility, encompassing a total of 31,134 acres. The 50-year mine area is defined as the area projected to be mined within 50 years, which is the timeframe for this EIS analysis. **Table 2-1** lists the acreage of each land status in the project area. The locations of the project facilities are displayed in **Figure 2-1**.

Table 2-1 Surface Land Status in the Project Area

Facility	BLM (acres)	State of New Mexico (acres)	Private (acres)	Total Acres
50-year Mine Area	5,007	16,053	6,142	**27,202**
Processing Plant Site	1,842	0	0	**1,842**
Water Well Field and Pipeline ROW	6	293	1,332	**1,631**
Jal Loadout Facility	13	85	361	**459**
Total	**6,868**	**16,431**	**7,835**	**31,134**

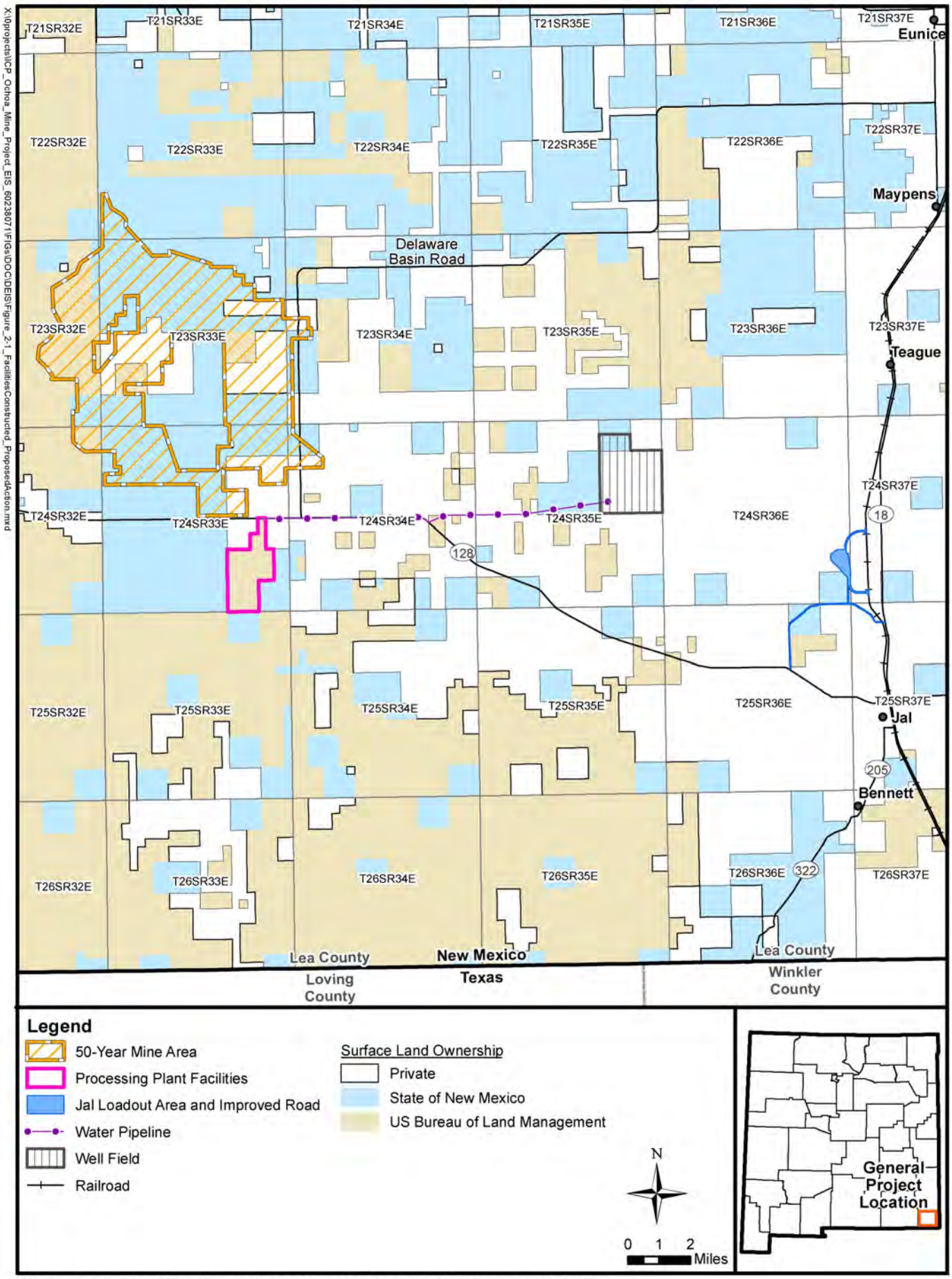

Figure 2-1 Facilities To Be Constructed Under The Proposed Action

ICP currently holds 34 BLM prospecting permits encompassing 77,884 acres and 17 state mineral leases from the New Mexico State Commissioner of Public Lands encompassing 25,889 acres. These permits and leases allow ICP to prospect and explore for potassium minerals in Lea and Eddy counties. Should the BLM approve the proposed MPO, the BLM prospecting permits would be converted to preference right leases.

During the 2-year construction period, it is estimated that 1,339 construction workers and 101 operations workers would be employed at the peak period of activity (months 7 through 18). Throughout operations of the mine and processing facilities, ICP would employ an estimated 496 people annually at full production, including operations, administrative, management staff, and contracted truck drivers for the 50-year life of the mine.

ICP estimates a total new investment of approximately $960 million for initial project development under the Proposed Action. During the production phase, annual production costs of between $175 million and $180 million are estimated. At full production, approximately 5.5 million tons per year (tpy) of polyhalite ore would be processed. The finished product generated at full production is estimated to be approximately 850,000 tpy of SOP and approximately 410,000 tpy of langbeinite.

2.4.2.2 Mine

A deep mine would be established to extract the polyhalite ore approximately 1,580 feet below the ground surface. The target formation is the Tamarisk Member of the Rustler Formation. The rock overlying the ore zone is the Dewey Lake Formation, often called the Dewey Lake redbeds.

One shaft and one ramp would be constructed and used for mine access, ventilation, and production. The shaft, to be used as the access for miners and small equipment, as well as a fresh air intake, would be 20 feet in diameter and extend to 1,640 feet below the ground surface. Equipment and structures for the shaft located within approximately 3.3 acres in the adjacent area would include hoists, fans, ventilation equipment, offices and other buildings, employee parking area, safety fence, and waste rock stockpiles. The waste rock material in the shaft area would be stored in two piles, 40 feet and 25 feet high. This rock would ultimately be used to back fill the shaft during mine closure and reclamation.

The ramp entrance would extend about 10,800 feet from the surface on a 15 percent slope until it reaches the polyhalite mining horizon at a depth of about 1,540 feet. It would be 20 to 30 feet wide and range in height from 10 feet along the sides to 13 feet in the center. The ramp would be used to move large equipment into and out of the mine, to exhaust air for ventilation, and to move the ore by conveyor or by truck.

Polyhalite would be mined using a variation of the room and pillar mining method that is common in southeastern New Mexico. The difference from customary room and pillar mining is that ICP proposes using a herringbone or chevron extraction pattern rather than the conventional rectangular mining pattern.

An extraction rate of 90 percent would be targeted for most of the mine, with a reduced extraction rate of 60 percent near active oil or gas wells. The two main drifts used to access the mine would be separated by a safety pillar (500 feet by 75 feet), which is an area of no mining. The main portion of the mine would be separated into mining panels.

In areas of 90 percent extraction, the mined rooms would be 40 feet wide, separated by 8-foot by 20-foot support pillars, spaced 13.5 feet apart. The pillars in this area would be designed to collapse over time as mining retreats toward the main drifts. Once mined, the intention is not to access these mine areas again.

In areas of 60 percent extraction, the rooms would be 27 feet wide with 22-foot by 116-foot pillars, spaced 13.5 feet apart, within a 1,500-foot radius of an active oil or gas well. The larger pillars near active wells would be designed to minimize subsidence. The pillars in this part of the mine would be designed to support the overburden indefinitely. Once mined, the areas would be monitored and maintained where necessary where high stress is documented.

Polyhalite ore would be extracted using a continuous miner with shuttle cars transporting the ore from the continuous miner to the conveyor system that carries the ore out of the mine. Following removal of the polyhalite, the continuous miner would remove the thin layer of anhydrite from the top and bottom of the room, leaving the more stable halite to minimize the potential for falling rock. The final roof height of each room would be approximately 6 feet. The anhydrite waste rock would be stockpiled in previously mined rooms.

While there are no natural sources of gas within the ore zone, there are oil and gas wells within the mine area. For this reason, all mine equipment and ventilation would follow the rules and regulations for a gassy mine under Category IV of the Mine Safety and Health Administration (MSHA), 30 CFR Part 57.22003. Categories are assigned based on the types and levels of gas in a mine. Category IV applies to mines from which noncombustible ore is extracted where non-explosive methane may exist based on the geology of the area.

2.4.2.3 Processing Plant Site

ICP proposes to construct new processing facilities on the 1,842-acre plant site managed by the BLM, located south of the mine area and New Mexico Highway 128 (NM 128). The plant site also would include infrastructure such as parking lots, access and haul roads, electrical substation and transmission lines, septic systems, gas and water pipelines, topsoil storage piles, coarse ore stockpile, evaporation ponds, dry stack tailings pile, monitoring wells, and storm water management structures. Following construction, approximately 30 percent of the area would be stabilized with vegetation where not needed for operations. **Figure 2-2** displays the general location of the processing facilities.

Processing Facilities

The buildings, processing equipment, and other structures would be located in the northern part of the plant site, directly accessible by the roads from NM 128. Processing facilities include buildings such as the reverse osmosis plant, processing plant, maintenance shops, laboratory, warehouses, offices, and product storage. These facilities would be grouped together and constructed within approximately a 60-acre area.

The processing facilities would be rectangular in shape and the tallest buildings (6 to 8 buildings) would be approximately 120 feet tall. Stack heights for 2 dryers and 2 dust control systems would be approximately 150 feet tall.

The processing plant would operate 24 hours a day with either three, 8-hour shifts or two, 12-hour shifts. ICP's processing of polyhalite ore would involve seven major steps, listed below and displayed in **Figure 2-3**:

1. Crushing
2. Wet grinding and salt removal
3. Calcination—driving off water, making the potassium and magnesium sulfate soluble in water
4. Leaching using hot water as the solvent
5. Evaporative crystallization of SOP
6. Evaporative crystallization of langbeinite
7. Drying and granulation of SOP and langbeinite

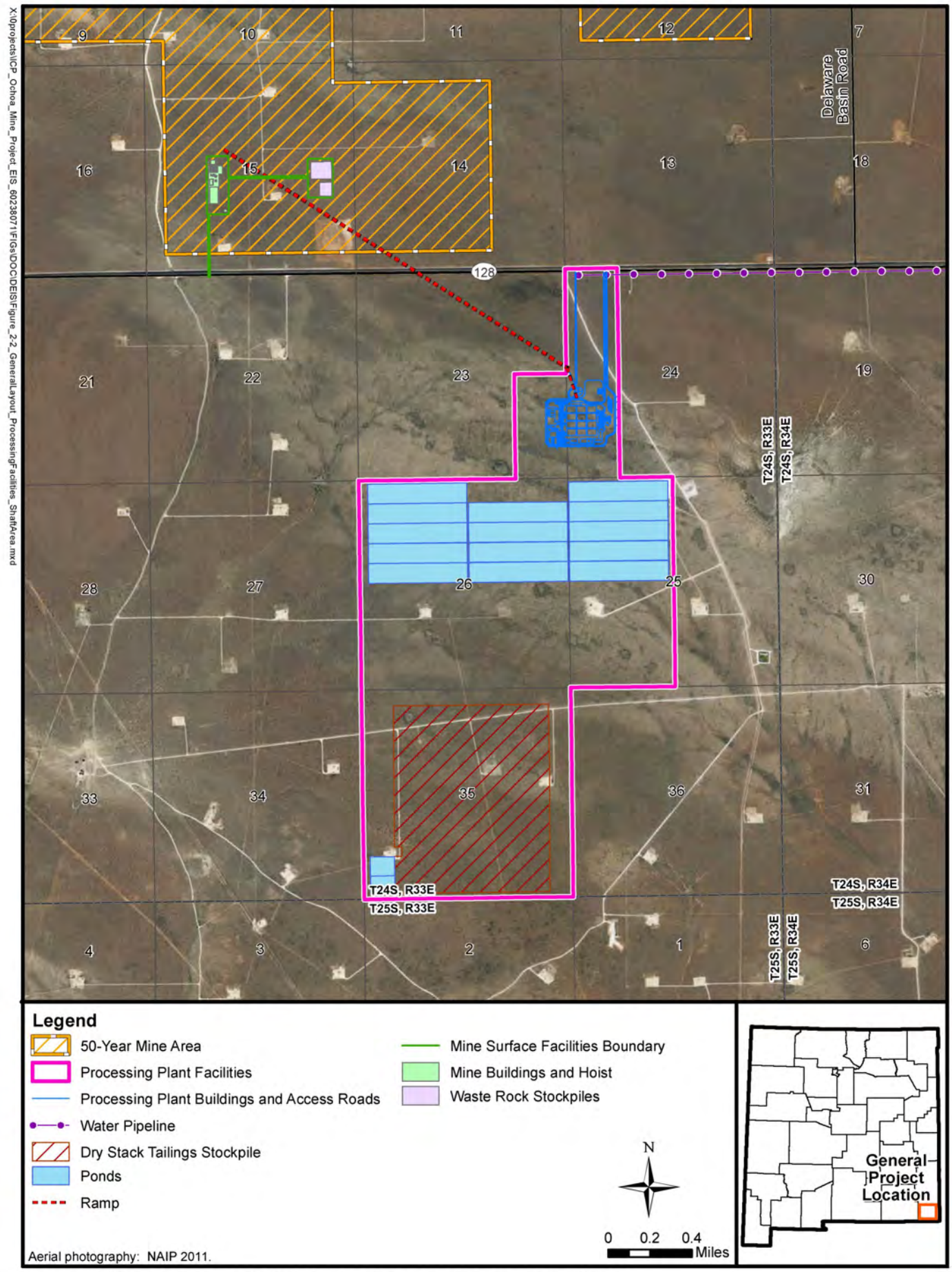

Figure 2-2 General Layout of the Processing Facilities and Shaft Area

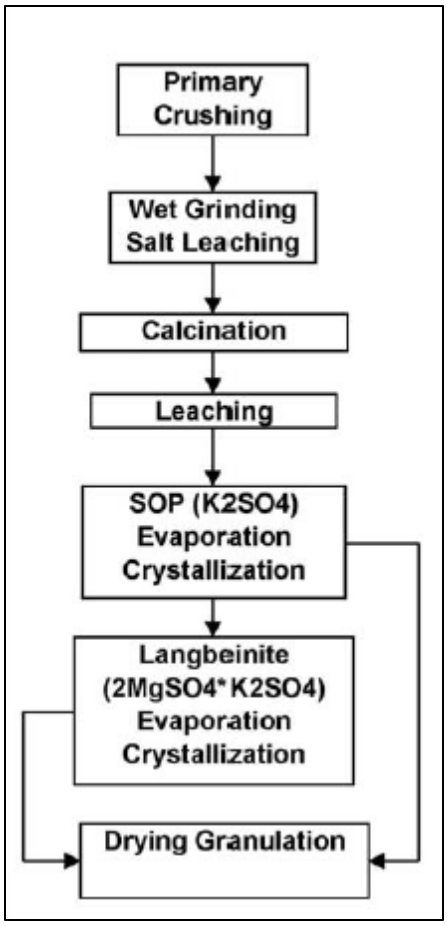

Figure 2-3 Polyhalite Ore Processing Steps

In the crushing stage, the mined ore would be crushed to generate a particle size distribution appropriate for the subsequent processes. Next the crushed ore would be washed to remove the salt. The calcination process heats the ore to transform it to a soluble state so that it may dissolve in the leaching stage. During the leaching stage, the calcined ore would be dropped into tanks containing hot water to dissolve the potassium and magnesium, producing a brine, while the calcium sulfate that is insoluble would be extracted from the tank as a solid. The solid calcium sulfate (gypsum) would be trucked to the dry stack tailings stockpile.

The potassium and magnesium brine would be sent to the crystallizer, from which, through a series of processing steps, ultimately produces a SOP stream and a langbeinite slurry. The liquid would be evaporated from the slurry resulting in a cake-like streams of SOP and langbeinite, which would then be dried and granulated to produce a dried, chip-like product that meets market standards.

At several steps in the process, solid or liquid wastes are generated by the system. Salt brine would be transferred to the disposal ponds from the wet grinding step (#2 above); anhydrous calcium sulfate would be transferred to the disposal ponds from the hot water leaching step (#4 above); and brine from the crystallization processes would be transferred to the disposal ponds (#5 and #6 above). Tailings generated during the SOP processing would be transported to the dry stack tailings stockpile located in the southern part of the plant site by truck.

Water Demands/Usage for Processing

Up to 4,000 gpm of water would be required at the plant site and the shaft facilities. **Table 2-2** summarizes the projected water needs, which include evaporation losses, water needs for different stages of processing, sanitation, and allows for additional water for contingencies.

Table 2-2 Water Needs at Processing Site and Mine

Water Uses	Gallons per Minute
Cooling tower evaporation	1,300
Cooling tower blow-down	390
Leach solid waste [1]	130
Evaporated water from calciner	80
Water loss from NaCl washing of polyhalite [1]	330
Water content from system purge [1]	370
Separation loss (SOP)	20
Separation loss (langbeinite)	10
Wash downs to maintain equipment [1]	90
Sanitation	25
Boiler blow-down [1]	50
Reverse osmosis [1]	675
Contingency	530
Total	**4,000** [2]

[1] Identifies water that flows to the evaporation ponds.

[2] 4,000 gpm equates to approximately 387,425 acre-feet over the 50-year life of the mine.

Ponds

There would be four types of ponds:

- To contain and segregate the sodium chloride wash water;
- To store and evaporate waste water from the reverse osmosis system;
- To store and evaporate waste water from the ore processing facilities; and
- To intercept surface water runoff from the dry stack tailings stockpile.

Fourteen of the 16 ponds at the processing facility, grouped together north of the tailings stockpile (see **Figure 2-2**), would measure approximately 29 acres each, approximately 500 feet by 2,500 feet, excluding the area needed for side slopes and berms. Each pond would have a geosynthetic liner over a compacted clay layer, and constructed with steep, sloped sides and flat bottoms. The liner would be protected by a hardened salt layer. The total depth of each pond, including freeboard, would be about 7 feet, with a maximum water depth of approximately 5.5 feet. Each pond would have an access ramp,

berms, and 8-foot-high fencing. The 14 ponds would be managed to precipitate the salts from the processing facilities, at which time the solids would be harvested by rubber-tired scrapers and transported by truck to the dry stack tailings stockpile.

The two ponds west of the tailings stockpile (see **Figure 2-2**) would encompass approximately 12 acres. The first pond would collect the leachate from the tailings stockpile and allow the material to settle out. It would have a double composite plastic liner. The second pond would be a storm water detention pond constructed to contain a 100-year, 24-hour storm event. It would have a single composite plastic liner with a lined spillway.

Dry Stack Tailings

The dry stack tailings stockpile would receive all waste solids coming from the ore processing. The stockpile would cover approximately 448 acres, with dimensions of 3,770 by 5,178 feet and a maximum height of 200 feet at the end of 50 years (see **Figure 2-2** for footprint and location). The tailings stockpile would be constructed in 20-foot-high lifts with 10-foot-wide benches with final side slopes of 3 feet (horizontal) to 1 foot (vertical). Earthen berms and drainage swales would divert surface water runoff away from the stockpile. Water falling on the stockpile would be contained by the two ponds at the southwest corner of the plant site.

The tailings would consist primarily of calcium sulfate, which would form gypsum through the interaction with the water to be sprayed on the pile to control dust. Once sprayed with water, the tailings would harden so they would not be susceptible to wind erosion.

Monitoring Wells

A monitoring well network would be installed in the area of the proposed disposal ponds to evaluate and characterize the site-specific hydrologic setting and the groundwater quality near the disposal ponds. These data will be used to support the discharge permitting activities regulated by the NMED Groundwater Quality Bureau.

The monitoring well network would include a minimum of one well upgradient of the ponds and three wells will be located downgradient of the ponds, positioned to optimize the spatial analysis of the groundwater characteristics within and adjacent to the disposal ponds.

A groundwater monitoring plan would be developed in consultation with the BLM and implemented before the mining operations begin. The objectives of the baseline groundwater monitoring would include the following:

- Identification of shallow aquifers;
- Identification of aquifer parameters;
- Evaluation of existing hydrogeology;
- Evaluation of groundwater quality characteristics;
- Interpretation of the flow regime; and
- Identification of pre-existing conditions not related to proposed mining activities.

These baseline data would be used to evaluate whether impacts occur during mine-related operations through implementation of a regular sampling program.

2.4.2.4 Maintenance and Public Safety

During construction, operations, and reclamation activities, signs would be installed in and around the operating facilities to inform workers and to protect the public from unauthorized entry. Perimeter fencing

would be installed around the plant site and internal fencing would be installed around the mine shaft, ramps, mine processing and support facilities, ponds, and dry stack tailings stockpile. Signs on perimeter fences and public-to-private road crossings would provide contact information for responsible parties and warn the public about unauthorized entry and potential hazards. Staff at the mine office would ensure that visitors have the proper training for the part of the mine facility to be visited. Traffic control signs would be posted along the facility entrance roads and internal facility roads.

The storage and use of hazardous materials would be limited. All hazardous substances would be inventoried, used, stored, controlled, and disposed of in accordance with all applicable regulations. Anticipated hazardous substances that could be present on site during construction, mining, or reclamation activities include vehicle and equipment fluids, cleaning solvents, and roadway treatment chemicals. A Spill Prevention, Control, and Countermeasures (SPCC) Plan in compliance with state and federal law would be developed before construction begins.

A Wildfire Management Plan would be developed to outline ICP's responsibilities for local and regional firefighting management.

A non-point source sediment monitoring plan or Storm Water Pollution Prevention Plan (SWPPP) would be developed in compliance with NMAC 20.6.4.13. The monitoring would meet the requirements for evaluating the quality of receiving drainages, including ephemeral, intermittent, and perennial waterbodies.

2.4.2.5 Well Field and Water Pipeline

In addition to the two wells already permitted and drilled, up to six more production wells, spaced approximately 1,000 to 1,500 feet apart, would be drilled in the well field east of the mine area shown on **Figure 2-4** to supply all processing and operations water to the mine and the plant site. The two existing wells are located in the southern half of Section 2 in Township 24 South (T24S), Range 35 East (R35E), which is in the northern part of the well field on state land. While the actual locations are not finalized, ICP anticipates drilling three new wells in Section 11 and three wells in Section 13 on private land owned by Jal's Woolworth Community Library Trust.

The water wells would be drilled into the Capitan Reef Aquifer and would supply untreated brackish water to the project. Each well would produce 500 gpm, for a total water demand of approximately 4,000 gpm. Two wells have been drilled and pump-tested to provide information on water quality and quantity to be used for the design of the full system.

The dimensions of each well pad would be 300 feet by 350 feet with a surface of at least 6 inches of compacted caliche. New access roads would be constructed from the nearest existing roads to each well pad for well construction and maintenance.

A 24-inch high-density polyethylene pipeline would be constructed within a 50-foot ROW along the route displayed on **Figure 2-5**. The pipeline would be 11.4 miles long. The top of the pipe would be buried at least 2 feet below the ground surface and the surface disturbance width would be approximately 35 feet. A pump station would be constructed at the end of the pipeline within the well field boundary and smaller diameter pipes would be installed to each well. All pipelines would be revegetated following construction.

ICP would develop ROW agreements with the private landowners as well as obtain authorization from the State of New Mexico along the pipeline route. Where the pipeline parallels NM 128, it would be located within the state highway ROW.

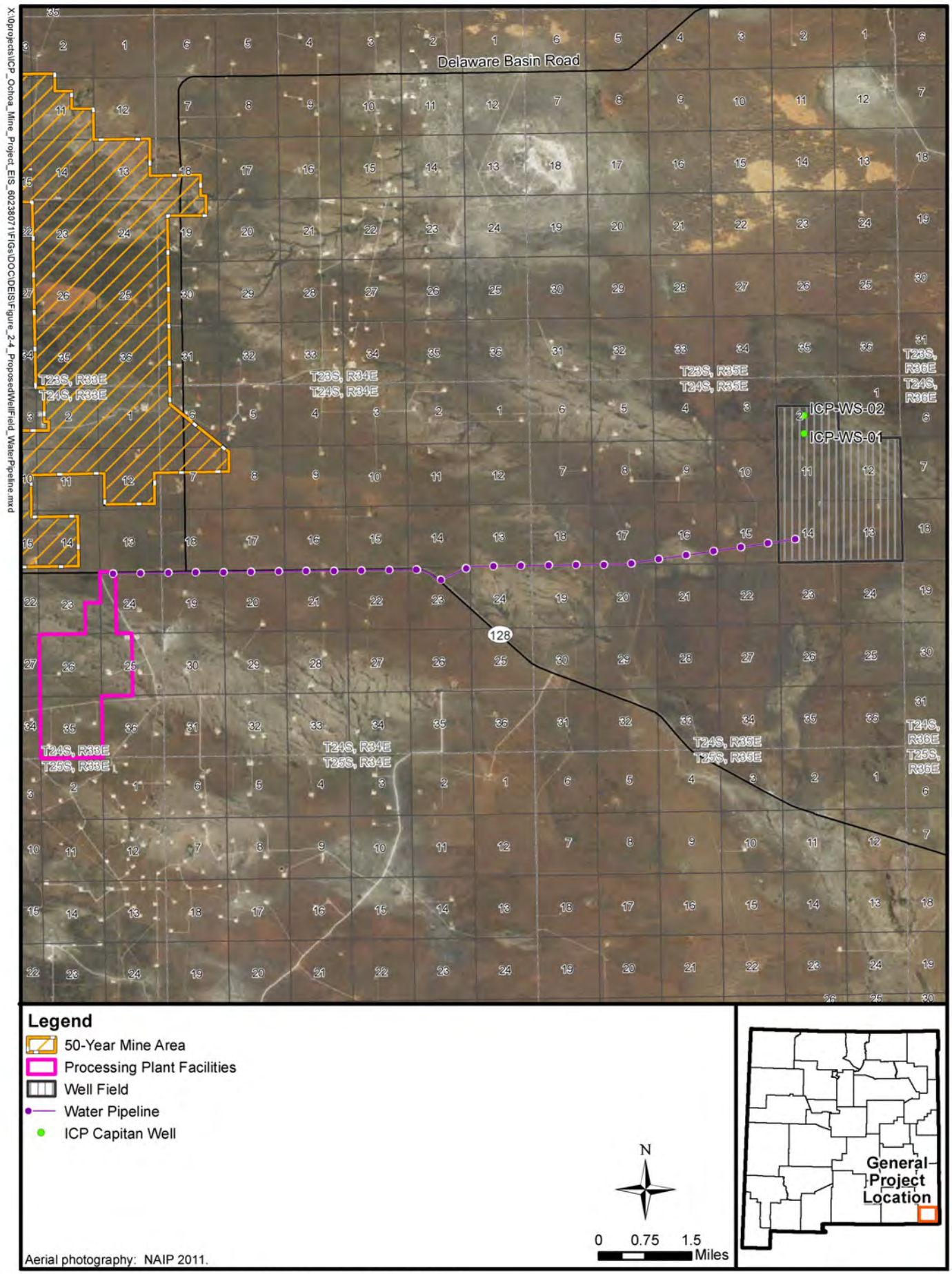

Figure 2-4 Proposed Well Field and Water Pipeline

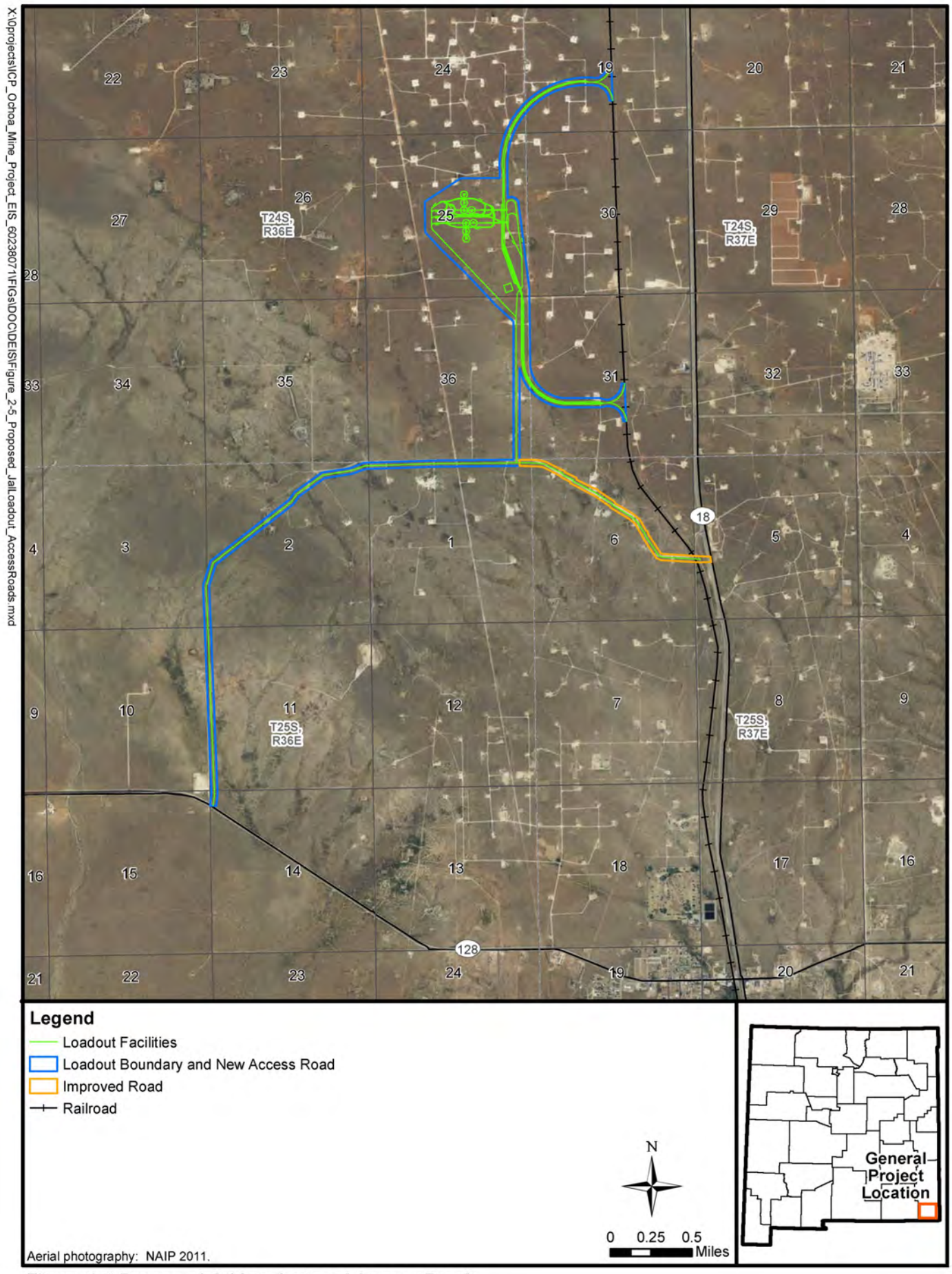

Figure 2-5 Proposed Jal Loadout and Access Roads

2.4.2.6 Jal Loadout Facility

The proposed loadout facility at Jal is approximately 33 miles from the processing plant site on private land along the existing railroad track. Trucks would transport the finished products from the processing plant along NM 128 to an access road to be improved by ICP. The access road would be improved to avoid having truck traffic on New Mexico Highway 18 (NM 18) through Jal. Seven 25-ton trucks would transport processed potash products 24 hours per day, 7 days per week, and 365 days per year.

Storage domes at the loadout facility would have enough capacity to store up to 3 months of finished products. Trucks would dump their contents into one of three separate circuits, which prevents co-mingling of each product. Once the finished product is ready to be shipped, it would be mixed to the customer's specification onsite and loaded into 100-ton rail cars.

The loadout facility would include storage and loadout facilities, a rail car wash area, and rail sidings to be constructed for the project. Water for loadout facility operations would be provided by the City of Jal municipal water supply system.

There would be a lined evaporation pond to collect all waste water from the rail car wash facility as well as any surface water runoff from the disturbed area. The evaporation pond would be approximately 5 acres in size, 18 feet deep, with a capacity of 90 acre-feet, sufficient to capture surface water runoff from a 100-year, 24-hour storm event.

2.4.2.7 Reclamation

During construction, topsoil and usable subsoil would be removed and stockpiled for use in reclamation. Topsoil would be segregated and revegetated to minimize wind and water erosion.

Reclamation activities would be performed following completion of mining and processing activities in compliance with BLM requirements under 43 CFR 3590 and state requirements where applicable. A detailed reclamation plan would be developed consistent with state and federal requirements and the terms of the reclamation bonds established for the sites. The overall intent of the reclamation would be to return the site to pre-project uses, primarily cattle-grazing, to the degree possible.

Access roads developed for the project would be regraded and revegetated. All structures and foundations would be removed and disposed of in an appropriate offsite landfill. Pond liners would be removed and disposed of in a permitted landfill after the residual salt is transferred to the dry stack tailings stockpile. All ponds and disturbed areas would be graded, spread with topsoil from stockpiles, tested for nutrients, fertilized, and revegetated using approved seed mixtures. Erosion and storm water control structures would be established and maintained according to the specific needs of the site.

The dry stack tailings stockpile would be reclaimed either in stages throughout the 50-year mining operations or at the end of mining operations. Excess waste rock from project excavations would be used to fill the terraces between the tailings lifts to establish a continuous final slope. Following placement of the rock, 2 feet of soil would be placed on top of the tailings stockpile. The soil would be amended to meet the nutrient needs for successful plant growth. If necessary, the topsoil would be worked to eliminate compaction with the surface left rough to minimize erosion. The entire stockpile would be drill-planted with a BLM-approved seed mixture. Additional topsoil would be purchased and trucked from development sites or commercial sources in the region if necessary to supplement onsite stockpiles.

The waste rock stockpiles near the shaft facilities would be used to backfill the shaft and ramp at the mine opening. Any remaining waste rock would be covered with 2 feet of topsoil, tested, fertilized, and revegetated similar to the process described for the tailings stockpile.

All mine shafts would be permanently sealed according to the rules, regulations, and laws in place at the time of abandonment. They would then be covered by soil that would be vegetated using a BLM-approved seed mixture.

Water supply and monitoring wells would be properly plugged and abandoned consistent with New Mexico State Engineer requirements in NMAC 19.27.4.

2.4.2.8 Utilities

Natural gas required for plant operations would be delivered by a new underground gas pipeline owned by Transwestern Pipeline Company. The new pipeline, approximately 4 miles long, would be installed along the southern side of NM 128 from a new connection in an existing line to the west of the plant site. The pipeline would be installed in previously disturbed areas and stabilized following construction.

Electric power to the Jal loadout and the well field would be supplied by Xcel Energy using existing transmission lines. The current power supplied through the existing 115-kilovolt (kV) transmission line located along the southern portion of the plant site would be adequate for construction operations. However, to operate the mine and processing plant facilities with an average load of 64 megawatts, an increased power supply would be required. ICP proposes two possible options for consideration under the Proposed Action.

- **Offsite Power Supply Option**—A new 230-kV transmission line from an Xcel Energy station to the Ochoa plant site would be constructed. Transmission line poles would be spaced approximately 300 feet apart and in accordance with the standards outlined in "Suggested Practices for Avian Protection on Power Lines" (Avian Power Line Interaction Committee [APLIC] 2006). ICP would build a substation on the Ochoa plant site to distribute power to the mine and plant site facilities.
- **Onsite Power Supply Option**—ICP would construct a cogeneration plant within the plant site boundaries. This option is under consideration because onsite power generation would result in approximately $15 million in savings of annual operating costs during full production with an increase in manpower of six employees with associated salaries of approximately $485,000 per year. A natural gas turbine would produce heat to operate a heat recovery steam generator. The equipment would be housed in one building together with the control room. The footprint of the cogeneration plant would be approximately 5 acres and would be located within the area identified on **Figure 2-2** as the processing plant facilities to the north of the evaporation ponds. The most visible structure associated with the cogeneration facilities would be the stack, which would be 20 feet in diameter and approximately 164 feet tall. At this time, there are no plans to sell excess power to the grid so the plant would be sized to provide enough power only for ICP's use for processing and mine operations.

2.4.2.9 Construction Sequence

Following issuance of the signed ROD and completion of the appeal period and before mobilizing construction equipment, ICP would secure all permits and complete any outstanding cultural resources clearances. SWPPPs would be developed for each construction site and implemented by installing erosion controls and constructing detention ponds where needed.

Construction would take approximately 20 months, beginning with the shaft and ramp construction, utilities, ponds, and infrastructure. Construction of the processing buildings would begin about 3 months following the start of ramp construction, at which time drilling of the Capitan wells also would begin. Mine development would begin later in the construction sequence, about 4 months from the end, at approximately the same time as construction of the Jal loadout.

2.4.2.10 Management of Co-development

Currently, the commercial potash mines in southeastern New Mexico are located within the SPA, first designated in 1939 when the federal government withdrew 42,685 acres from oil and gas leasing in deference to potash mining through an order by the Secretary of the Interior. A succession of orders followed (1951, 1965, 1975, 1986, and 2012), expanding the SPA each time except the most recent Order. On October 21, 1986, the Order of the Secretary of the Interior (51 FR 39425, October 28, 1986), titled "Oil, Gas and Potash Leasing and Development Within the Designated Potash Area of Eddy and Lea Counties, New Mexico" expanded the SPA to 497,630 acres. The most recent Secretary's Order (3324) was published in the FR on December 4, 2012 (77 FR 71822). Commonly referred to as the 2012 Order, it now governs the concurrent management of federal oil, gas, and potash leasing and development within the SPA. The proposed Ochoa Mine would not be located within the SPA or governed by the 2012 Order.

Many public comments submitted during the scoping period expressed concerns related to the potential for limiting existing and future oil and gas operations as well as oil and gas leases in the mine area as a result of developing a new mine. The proposed Ochoa Mine is not located within the SPA so it would not be governed by the concurrent development goals and management practices presented in the 2012 Order. Therefore, in order to set guidance for managing both fluid and solid minerals in the same area to fully develop both resources, ICP proposes a framework for managing mineral co-development. The goal of this framework would be to ensure that drilling for oil and gas does not interfere with potash mining, potash mining can proceed in a way that does not interfere with fluid mineral extraction, and both development activities would not create safety or environmental hazards. Management of co-development would maximize the recovery of both resources to prevent waste of state and federal minerals and to honor the rights of each lessee.

Under the Proposed Action, ICP's engineering design of the mine is intended to minimize interference with oil and gas development through implementation of the following actions:

- Reducing ore extraction in areas with active oil and gas wells.
- Establishing barrier pillars around active oil and gas wells that exceed MSHA safety standards by 50 feet.
- Implementing gassy mine ventilation standards that provide increased air flow and safe handling of gas in the event of intrusion from oil and gas wells. Monitoring methane in mine and implementing equipment standards to avoid explosions in the event of a gas intrusion from an oil or gas well.

ICP proposes to develop and sign individual memoranda of understanding (MOUs) with each oil and gas lessee to detail the coordination and management specific to each company and lease. These management goals would be applicable to both federal and state minerals. In general, ICP proposes joint planning with oil and gas lessees through the following steps:

- Hold annual meetings with oil and gas companies holding leases within the mine area.
- Prepare long-term development plans for the mine and oil and gas development.
- Share the plans between companies to facilitate sequencing potash mine extraction and oil and gas development. Sequencing could be accomplished through time or in spatial extent.
- Establish post-mining drilling islands to use for oil and gas wells.
- Establish benchmarks for measuring successful co-development.

2.4.2.11 Surface Disturbance Under The Proposed Action

The Proposed Action would result in an initial disturbance of approximately 2,400 acres of soil across all of the project locations. Approximately 30 percent of the processing plant site initially disturbed would be stabilized with vegetation or caliche, or would be covered with paving, gravel, or buildings over the long term. **Table 2-3** summarizes the acreage of surface disturbance projected for the Proposed Action.

Table 2-3 Surface Disturbance under Proposed Action

Facility	Initial Disturbance (acres)	Long-term Disturbance (acres)
Processing Plant Site	1,842	1,289
Shafts, ramp, Associated Mine Surface Facilities	36	28
Well Field (well pads and roads)	23	23
Water Pipeline	48	0
Jal Loadout (including access roads)	448	323
Total	**2,397**	**1,663**

2.4.3 Alternative B—Change Dry Stack Tailings Stockpile

During public scoping, concerns were raised regarding the visual impacts of the proposed high tailings pile that would remain unreclaimed for the 50-year mine life. The terrain at the plant site is gently sloping so any tall features would be visible for a long distance. In response to this public concern, Alternative B will be analyzed in detail to evaluate the potential impacts of reducing the dry stack tailings pile or modifying the reclamation plans.

Under Alternative B, there would be no change to the mining methods and operations, processing methods and buildings, and management of co-development described under the Proposed Action. The goal of this alternative is to minimize the visual impacts of the tailings pile while allowing the BLM to approve the MPO, grant ROW requests, and issue preference rights leases for mining.

Under Alternative B the volume or height of the dry stack tailings stockpile would be reduced by at least 30 percent, compared to the size under the Proposed Action. Tailings pile dimensions may be reduced by implementing one or a combination of the following methods.

- Sell marketable products to commercial buyers. Marketable products from the processing plant waste stream include:
  - Gypsum—used in the manufacture of wallboard, cement, plaster of Paris, soil conditioning, and as a hardening retarder in Portland cement.
  - Epsomite (hydrous magnesium sulfate)—used for the production of epsom salts, preparation of pharmaceutical products, production of paper and sugar, and as a dying material.
  - Sodium chloride salt—wide variety of commercial and industrial uses.
- If marketable products from the waste stream cannot be sold immediately, they would be placed in separate locations within the tailings stockpile so they can be removed when a buyer is available.

- Backfill the mined out areas with solid tailings to minimize the amount of aboveground tailings.
- Reinject clean waste brine, especially brine from the reverse osmosis system, using a saltwater disposal well.
- ICP to acquire Section 2, T25S, R33E on state land through lease, exchange, or purchase. The location of the tailings pile would be moved and expanded to allow for a lower total height. While this option would not necessarily reduce the total volume, it would enable the total height to be lower so that it would not be as obvious in the landscape.

Other modifications to management and design of the tailings pile intended to minimize visual impacts include redesigning the shape of the stockpile to a less rectangular and more natural configuration and reclaiming the tailings pile on a regular schedule. Regular reclamation by covering with topsoil and revegetating would cause the stockpile to blend in more with the natural environment.

The acreage of surface disturbance would be similar to that listed in **Table 2-3** for the Proposed Action. If the footprint of the tailings stockpile were expanded to reduce the total height, the acreage of long-term surface disturbance would increase in or adjacent to the proposed processing plant site. The water usage would be the same as that listed in **Table 2-2** under the Proposed Action.

2.4.4 Alternative C—Establishment of Local Potash Order

Alternative C would not change the mining methods and operations and processing methods and buildings described under the Proposed Action. The goal of this alternative is to establish standards for managing co-development of minerals while allowing the BLM to approve the MPO, grant ROW requests, and issue preference rights leases for mining. The acreage of surface disturbance would be the same as that listed in **Table 2-3** for the Proposed Action. The water usage would be the same as that listed in **Table 2-2** under the Proposed Action.

Under Alternative C, the BLM would work collaboratively with the State of New Mexico to establish guidance for managing concurrent development of potash and oil and gas. The guidance evaluated in this alternative may form the basis of a local potash order following publication of the ROD. The guidance would be implemented to make management decisions fairly and consistently regarding the development of both potash and fluid minerals.

Management guidance would include, but not be limited to, the following actions.

- ICP and the oil and gas industry would submit plans of development (PODs) annually that address proposed development for each company over the next 3 years. This would allow the BLM to coordinate development and establish areas of avoidance, drilling islands, or areas for larger mine pillars and reduced the extraction rate (60 percent potash extraction as described under the Proposed Action) before issuing oil and gas leases or permits to drill.
- The BLM would delineate a designated potash area outside the SPA using the extent of measured reserves, indicated reserves, and inferred reserves. This potash area would not be limited to ICP's leases or potash potential data.
  - Development area(s) would be established by the BLM within which drilling islands would be established.
    - ❖ Drilling islands may be established during the Application for Permit to Drill oil and gas wells process.
    - ❖ Oil and gas development areas would be managed under unit or communitization agreements.

- ❖ Once development areas are established, the BLM would issue Notices to Lessees to identify each development area, the location of drilling island(s), and the rules for development within the development area.
- ❖ No drilling islands would be established within 1 mile of approved potash mining operations identified by the 3-year mine plan of development.

- The BLM would devise setbacks or safety distances between oil and gas wells and the mine workings, based on engineering, geology, stability, and well design in consideration of appropriate current technology and the best available science. The setbacks would be developed based on information provided in each POD.
- Timed development may be considered to allow oil and gas drilling in the mine area ICP would not be mining for at least 20 years.

2.4.5 Alternative D

2.4.5.1 Overview

An alternative location for the processing facilities was proposed during public scoping. Under this alternative, the following would remain the same as that described for the Proposed Action (Alternative A).

- Mine—methods, location of the shaft and ramp, waste rock piles, buildings at the mine, and the extent of the 50-year mining area
- Water demands
- Well field and water pipeline location and operation
- Jal loadout facility location and operation
- Site reclamation
- Options for utilities (onsite and offsite)
- Maintenance and public safety implementation and management
- Management of co-development

The evaporation ponds, and tailings stockpile would be located to the east of the area described under the Proposed Action. **Figure 2-6** displays the boundary of the processing plant site and associated land status under Alternative D. **Table 2-4** provides a summary of the acreage by surface land status that would be included under this alternative. The differences from the Proposed Action are described in the remainder of this section.

Table 2-4 Surface Land Status in the Project Area Under Alternative D

Facility	BLM (acres)	State of New Mexico (acres)	Private (acres)	Total Acres
50-year Mine Area	5,007	16,053	6,142	**27,202**
Processing Plant Site	641	560	642	**1,843**
Water Well Field and Pipeline ROW	6	281	1,343	**1,631**
Jal Loadout Facility	13	85	361	**459**
Total	**5,667**	**16,991**	**8,477**	**31,135**

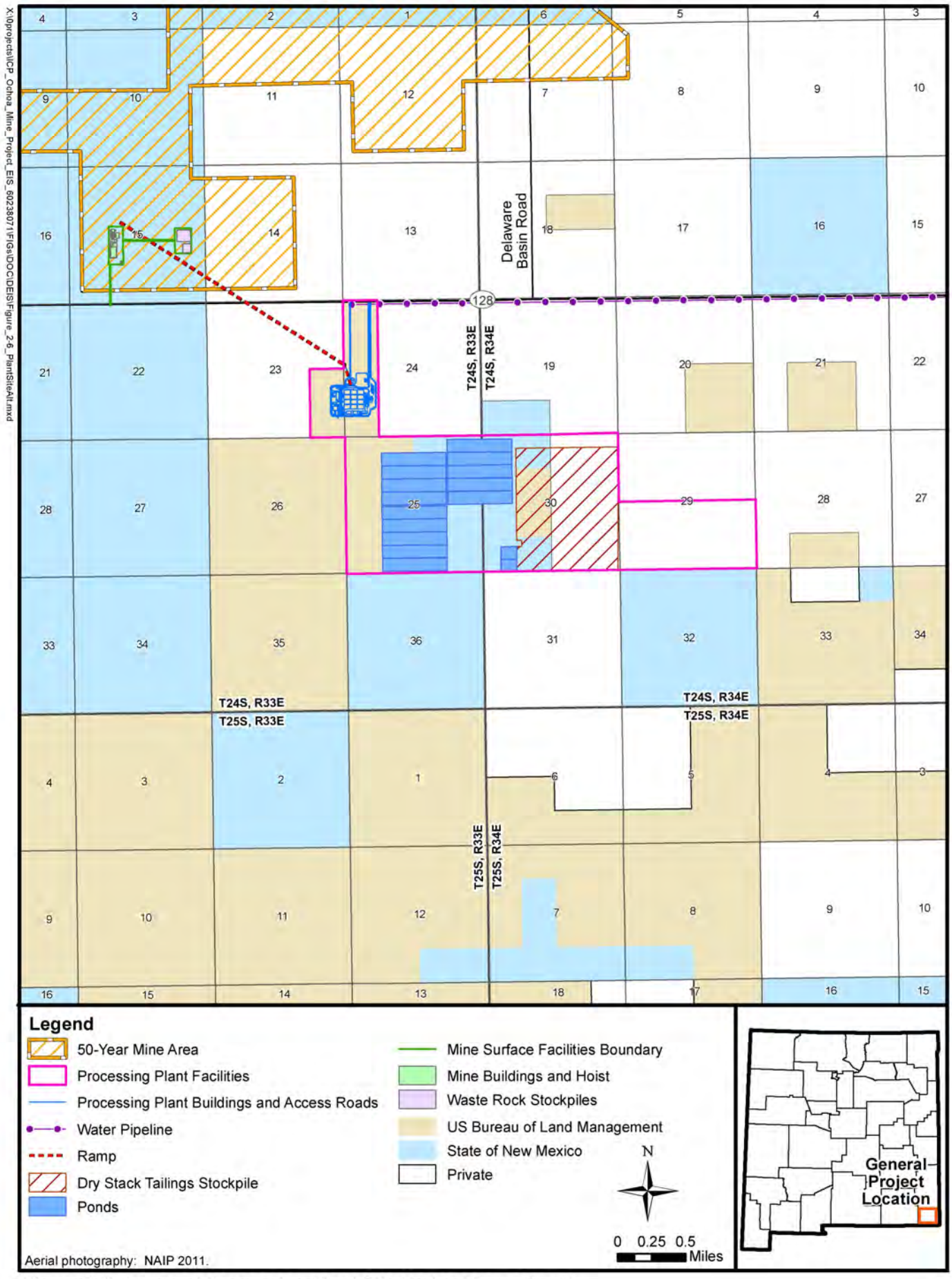

Figure 2-6 Proposed Processing Plant Site Under Alternative D

2.4.5.2 Processing Plant Site

The buildings and roads to access the site from NM 128 would be located and configured as described for the Proposed Action on public land within Sections 23 and 24 in T24S, R33E. When this alternative location for the processing plant was proposed during public scoping, the proposal also involved possible land exchanges with the private landowners, State of New Mexico, and the BLM. Because the BLM land exchange process is complex, lengthy (at least 18 to 24 months), and requires completion of specific phases with a separate NEPA process, this EIS will not evaluate land exchange under this alternative.

The ponds and tailing stockpile would be the same size and function in the same way as described for the Proposed Action but would be located in Section 25 of T24S, R23E and Section 30 of T24S, R34E.

The existing road (Vaca Lane) currently providing access to oil and gas wells from NM 128 that bisects Sections 24 and 25 in T24S, R33E would be relocated to go around the evaporation ponds in Section 25.

2.4.5.3 Construction Sequence

The leasing of private and state land in addition to public land managed by the BLM would require negotiation of leases or sales with the state and private landowners. The negotiations with additional landowners is likely to extend the start date for construction of the plant facilities by a few years beyond the construction schedule described under the Proposed Action (3 months following the start of mine ramp construction and at the same time that drilling of the Capitan wells begins). While the total time needed for construction activities may remain the same, the total time period and date for production of SOP would most likely be extended by at least 2 years.

2.4.5.4 Surface Disturbance

There would be a slight increase in the projected total initial surface disturbance assuming that the entire processing plant site would be disturbed for construction and supplies and equipment storage, compared to the Proposed Action, because the site is approximately 1 acre larger. **Table 2-5** summarizes the acreage of surface disturbance projected for Alternative D.

Table 2-5 Surface Disturbance under Alternative D

Facility	Initial Disturbance (acres)	Long-term Disturbance (acres)
Processing Plant Site	1,843	1,290
Shafts, ramp, Associated Mine Surface Facilities	36	28
Well Field (well pads and roads)	23	23
Water Pipeline	48	0
Jal Loadout (including access roads)	448	323
Total	**2,398**	**1,664**

2.4.6 Environmental Protection Measures Common to All Alternatives

ICP would adhere to all lease conditions, in addition to all relevant federal and state laws, regulations, and policies under all alternatives. Additional environmental protection and mitigation measures may be

identified during the EIS process. The following measures would be implemented, as needed depending on site-specific conditions, under any of the action alternatives to protect the human environment.

2.4.6.1 Other Federal Permits and Requirements

- NPDES Construction General Permit—where 1 acre or more of land is disturbed, this permit, implemented by the U.S. Environmental Protection Agency (USEPA), requires the development and implementation of SWPPPs to prevent sediment and other pollutants from being discharged in storm water runoff. Implementation includes establishment of erosion and sediment controls, temporary and permanent soil stabilization, storm water control structures, measures to keep construction sites clean.
- Consultation with the USFWS under the ESA—assess whether the proposed activities would jeopardize the existence of endangered or threatened species or their critical habitat.
- NHPA and EO 13175, and other laws pertaining to tribal coordination and management of cultural resources—identify and mitigate impacts to cultural resources that may be affected by proposed project and coordinate with tribes and pueblos that have an interest in the area.
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations—evaluate the potential for impacts to minority and low-income populations.

2.4.6.2 State Permits and Requirements

- Discharge Permit under the New Mexico Water Quality Act, Groundwater and Surface Water Protection (20.6.2 NMAC regulations)—control the discharges of water contaminants from the injection wells, extraction wells, evaporation ponds, potash processing mill, and brine management facility into groundwater and surface water under the terms and conditions of this permit issued by NMED, Water Quality Bureau.
- Construction and Operating Permits under the New Mexico Air Quality Control Act and Regulations (20 NMAC 2.72)—control the emission of criteria pollutants (such as nitrogen oxides [NO_X] and carbon monoxide [CO]) that exceed designated limits under the terms and conditions of permits issued by the NMED, Air Quality Bureau (NMED-AQB).
- ROW Easement Approval on New Mexico State Land—ROWs on state land must be approved for pipelines, roads, and power lines. The terms and conditions of the granted ROW require that the operator preserve and protect the natural environmental conditions of the land, including reclamation of disturbed areas and revegetation. Roads must meet specific state standards.
- Archaeological Permit under the Cultural Properties Act (Section 18-6-9 NMSA 1978, as amended)—archaeological field surveys to be completed prior to issuance of ROW on state land or earthmoving where there are archaeological sites on state land and privately owned land in New Mexico.

2.4.6.3 Applicant-committed Environmental Protection Measures

- Develop and implement a subsidence monitoring plan.
- Develop and implement a groundwater monitoring plan.
- Anti-perch equipment and other raptor protection would be installed on new power lines.
- Project access roads and well pads would be stabilized with a minimum of 6 inches of caliche.
- Ponds

  - Ponds would be lined with geosynthetic liners.
  - Liners on evaporation ponds requiring scraping would be covered by hardened salt to provide protection for the liner and minimize the potential for leaks.
  - All ponds would be constructed with freeboard to minimize the potential for overtopping and spills.
- Reclamation and revegetation using site-specific plans would be implemented following project completion.

2.4.6.4 BLM Carlsbad Field Office Requirements

In addition to compliance with agency-wide and statewide BLM policies, regulations, and guidelines, the Carlsbad Field Office has developed measures and guidance designed to minimize adverse impacts to natural and cultural resources from mineral development activities in the field office area. One design feature that would be required under all action alternatives is the designation of a person onsite to monitor construction activities for compliance with federal and state permits and requirements, such as the implementation of plans required by permits and mitigation measures identified in the ROD. This construction monitor would report to the BLM on a regular basis.

In compliance with federal regulations, the BLM will set a reclamation bond for the project sufficient to ensure that reclamation is completed at the end of the project lifespan.

Table 2-6 provides a summary of the environmental protection measures and best management practices (BMPs) required by BLM policy and guidelines. These measures would be applied as needed, depending on site-specific conditions to be determined by BLM resource specialists. The requirements with reference numbers starting with the number 1 are described in more detail in **Appendix A**.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
1.1.1	Damage Indemnity	General	Indemnifies the federal government and the BLM against damages.
1.1.2	Compliance with Laws and Regulations	General	Requires the lessee to comply with all existing and future laws.
1.1.3	Oil and Gas Production	General	Lessee shall not unreasonably interfere with oil and gas production.
1.1.4	Pollution Removal	General	Lessee is responsible for any pollution discharged by their operations.
1.1.5	Wood and Plant Removal	General	No fuel woods or live plants may be removed.
1.1.6	Mineral Removal	General	No minerals may be removed without the appropriate permit.
1.1.7	Antiquities	General	Collection, removal, or damaging of antiquities is prohibited.
1.1.8	Cultural Resources	General	All cultural or paleontological resources discovered must be reported to the BLM immediately.
1.1.9	Cultural Survey	General	A cultural survey must be conducted and accepted by the BLM prior to construction.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
1.1.10	New Construction	General	Written approval must be obtained from the BLM prior to any construction not previously approved.
1.1.11	Fences	General	Fences must not be damaged during construction or must be repaired.
1.1.12	Gates	General	Gates and cattle guards on public lands may not be closed to public use. Gates must be kept shut to contain cattle.
1.1.13	Surface Owner Notification	General	The surface owner or grazing allottee must be notified prior to construction.
1.1.14	Scattering	General	Soil, rock, and vegetation debris must be scattered not piled.
1.1.15	Blading	General	Blading will be minimized.
1.1.16	Pits	General	After construction is completed, all pits, other than those permitted for producing mineral materials, must be backfilled.
1.1.17	Trash	General	All trash must be hauled to an approved dump site.
1.1.18	Concrete	General	No concrete shall be dumped on federal land.
1.1.19	Noxious Weeds	General	The lessee is responsible for preventing the establishment of any noxious weeds or treating to eliminate weeds.
1.1.20	Painting	General	Structures must be painted with a BLM-approved color.
1.2.1	Road Width and Grade	Roads	Specifications for allowable road width and grade.
1.2.2	Surface Disturbance Width	Roads	Specifications for allowable surface disturbance width.
1.2.3	Cattle Guards	Roads	Requirements for cattle guards.
1.4.1	Core Hole Reclamation	Reclamation	Requirements and specifications for core hole reclamation.
1.4.2	Road and Site Reclamation	Reclamation	Specifications and requirements for road and site reclamation.
1.4.3	Facility Reclamation	Reclamation	Any surface structures must be removed at the end of operation.
1.4.4	Hazardous Waste Removal	Reclamation	Hazardous waste must be removed by the lessee by an approved method.
1.4.5.1	Seeding Techniques	Reclamation	Requirements for seeding.
1.4.5.2	Seed Mixture	Reclamation	Seed mixture specification.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
1.4.5.3	Soil Preparation	Reclamation	Requirements for soil preparation prior to reclamation planting.
2.1.1	Damage Indemnity	General	Indemnifies the federal governmental and the BLM against damages.
2.1.2	Toxic Substances Control Act Compliance (TOSCA)	General	Lessee will comply with TOSCA.
2.1.3	Hazardous Waste Indemnity	General	Indemnifies the federal government and the BLM against damages from toxic waste.
2.1.4	Fences	General	Fences must not be damaged during construction or must be repaired.
2.1.5	Scattering	General	Soil, rock, and vegetation debris must be scattered not piled.
2.1.6	Erosion Control Structures	General	Holder will install erosion control structures where required to stabilize soil.
2.1.7	Reseeding	General	The holder will reseed disturbed areas.
2.1.8	Painting Requirements	General	Painting requirements and specification.
2.1.9	Cultural Resource Requirements	General	All cultural or paleontological resource discovered must be reported to the BLM immediately.
2.1.10	Native American Graves Protection and Repatriation Act (NAGPRA)	General	Holder must comply with the NAGPRA.
2.1.11	Pollution Removal	General	Oil or other pollutant spills must be cleaned up.
2.2.1.1	Right-of-Way	Pipelines	Construction activity is confined to the authorized ROW.
2.2.1.2	Signage	Pipelines	Sign requirements for pipelines.
2.2.2.1	Cover	Pipelines	Pipelines must be buried 24 inches deep.
2.2.2.2	Blading Requirements	Pipelines	Blading requirements for buried pipelines.
2.2.3.1	Damage Liability	Surface Pipeline	Holder is liable for damage to the U.S.
2.2.3.2	Right-of-Way	Surface Pipeline	Construction activity is confined to the authorized ROW.
2.2.3.3	No Blading without Approval	Surface Pipeline	Blading for surface pipelines is not allowed without approval.
2.2.3.4	Minimize Suspension	Surface Pipeline	Suspension of surface pipelines over low areas will be minimized.
2.2.3.5	Crossing Burial	Surface Pipeline	Requirements for burying surface pipelines at road crossings.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
2.3.1	Karst Features	Cave/Karst	The BLM is to be informed of any subsurface features encountered during construction.
2.3.2	Surface Disturbance Buffer	Cave/Karst	Surface disturbance is not allowed within 200 meters of known cave entrances or significant karst features.
2.3.3	Oil and Gas	Cave/Karst	Guidelines for oil and gas drilling and production in karst areas.
2.3.4	Protection Protocols	Cave/Karst	Cave and karst features will be avoided.
2.3.5	Aquifer Recharge	Cave/Karst	Cave and karst features with significant aquifer recharge have special requirements for construction.
2.3.6	Cave/Karst Construction Mitigation	Cave/Karst	Construction requirements for cave/karst areas.
2.3.7	Cave/Karst Drilling Mitigation	Cave/Karst	Drilling requirements for cave/karst areas.
2.4.1	Invasive Plant Species	Roads	ROWs must be kept clear of invasive plants.
2.4.2	Road Width and Grade	Roads	Specifications for allowable road width and grade.
2.4.3	Crowning and Ditching	Roads	Crowning and ditching requirements.
2.4.4	Drainage	Roads	Drainage requirements for roads.
2.4.4.1	Lead-off Ditches	Roads	Lead-off ditch specifications.
2.4.4.2	Culvert Pipes	Roads	Culvert pipe specifications.
2.4.4.3	Drainage Dips	Roads	Drainage dip specifications.
2.4.5	Turnouts	Roads	Turnout requirements for roads.
2.4.6	Surfacing	Roads	Surfacing requirements for roads.
2.4.7	Cattleguard Requirements	Roads	Requirements for cattle guards.
2.4.8	Maintenance	Roads	The holder shall maintain the road in a safe and usable condition.
2.4.9	Public Access	Roads	Public access may not be restricted.
2.5.1.1	No Blading of Power Line ROWs	Power Lines	No clearing or blading of ROWs.
2.5.1.2	Power Line Signs	Power Lines	Signage requirements for power lines.
2.5.1.3	Abandonment	Power Lines	Holder must follow prescribed abandonment procedures.
2.5.1.4	Removal of Surface Structures	Power Lines	All surface structures must be removed within 180 days of abandonment.
2.5.2.1	Raptor Protection	Power Lines	Pipelines shall be “raptor safe.”

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
2.5.2.2	Special Power Line Stipulations	Power Lines	Dispose of poles lines and transformers properly, fill in holes, limit all disturbance to authorized ROW.
2.5.3.1	Noxious Weeds	Power Lines	Holder shall ensure that construction equipment does not spread noxious weeds.
2.5.3.2	Waste Disposal	Power Lines	Holder shall ensure that the site is maintained in sanitary condition and that waste is disposed of properly.
2.5.3.3	Limits	Power Lines	Holder shall conduct all activities within authorized limits.
2.5.3.4	Construction Trenches	Power Lines	Trenches shall be covered at night.
2.5.3.5	Excavated Soil	Power Lines	Excess soil shall be evenly spread in the immediate vicinity of the excavation.
2.5.3.6	Special Buried Power Line Stipulations	Power Lines	Special requirements for buried power lines.
2.6.1.1	Interim Reclamation	Reclamation	All areas not needed for operations shall be reclaimed.
2.6.1.2	Reduction Strategy	Reclamation	Within 6 months of well completion, the holder will devise a strategy for interim reclamation.
2.6.1.3	Caliche Removal	Reclamation	Any caliche used in construction will be removed.
2.6.1.4	Reseeding Requirements	Reclamation	All disturbed areas will be reseeded.
2.6.1.5	Sundry Notice	Reclamation	A sundry notice will be submitted when reclamation is complete.
2.6.2.1	Final Reclamation	Reclamation	Final reclamation must occur after final abandonment.
2.6.2.2	Earthwork	Reclamation	Earthwork for final reclamation must be completed within 6 months of well plugging.
2.6.2.3	Revegetation	Reclamation	All disturbed areas will be reseeded.
2.6.2.4	Contact BLM prior to Abandonment	Reclamation	Operator shall contact the BLM prior to surface abandonment operations.
2.6.2.5	Abandoned Well Marker (Raptor Perching)	Reclamation	A ground level abandoned well marker shall be used to avoid raptor perching.
2.7.1	RMP Guidelines	Recreation	The rules in the 1997 RMPA will be followed.
2.7.2	Pipeline and Power Line Recreation Mitigation	Recreation	Specifications for pipelines and power lines in recreation areas.
2.8.1	Standard Range Practices	Range	Standard practices must be followed to minimize impacts to rangeland.
2.8.2	Livestock Watering Requirement	Range	Avoid or move livestock watering structures.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
2.9.1	Reclamation Requirements	Visual Resources	Reclaim infrastructure to eliminate visual impacts.
2.9.2	Low Profile Facilities	Visual Resources	All permanent structures will be low profile.
2.10.1	Slopes or Fragile Soils	Soil	Surface disturbance will not be allowed on slopes over 30 percent.
2.10.2.1	Standard ROW Practices	Soil ROW	Reduce impacts to soil by following standard practices.
2.10.2.2	ROW Mitigation	Soil ROW	Methods to minimize impacts including no blading, minimize traffic, temporary erosion control measures, etc.
2.10.3.1	Well Pad Standard Practices	Soil Well Pads	Reduce impacts to soil by following standard practices.
2.10.3.2	Well Pad Mitigation	Soil Well Pads	Mitigation measures for well pads.
2.11.1.1	Raptor Nests and Heronries	Wildlife	No surface disturbance within 200 meters of heronries.
2.11.1.2	Prairie Dog Towns	Wildlife	No surface disturbance within known prairie dog towns.
2.11.2.1.1	Lesser Prairie Chicken Timing Limitation	Wildlife	Timing limitations within lesser prairie chicken habitat.
2.11.2.1.2	Ground Level Dry Hole Markers	Wildlife	Ground level dry hole markers are required in prairie chicken habitat.
2.11.2.2	Sand Dune Lizards	Wildlife	No surface disturbance within occupied habitat areas.
2.12.1	Streams, Rivers and Floodplains	Watershed	No surface disturbance within 200 meters of 100-year floodplain.
2.12.2	Playas and Alkali Lakes	Watershed	No surface disturbance within 200 meters of playas or alkali lakes.
2.12.3	Standard Practices to Protect Watersheds	Watershed	Standard practices to protect watersheds.
2.12.4	Mitigation Measures To protect Watersheds	Watershed	Standard mitigation measures to protect watersheds.
2.12.5	Tank Batteries	Watershed	Requirements for tank batteries.
2.12.6	Surface Pipelines (Leak Detection Plan)	Watershed	A leak detection plan will be submitted to the BLM prior to construction.
2.13.1.1	Standard Practices to Reduce Impacts to Vegetation from Well Pads	Vegetation Well Pads	Standard practices to protect vegetation.
2.13.1.2	Mitigation to Reduce Impacts to Vegetation from Well Pads	Vegetation Well Pads	Caliche will be removed from well pads during reclamation.

Table 2-6 Summary of BLM Environmental Requirements

Reference #	Title	Purpose	Description[1]
2.13.2.1	Standard Practices to Reduce Impacts to Vegetation from ROWs	Vegetation ROW	Impacts to vegetation will be reduced by following standard practices.
2.13.2.2	Mitigation to Reduce Impacts to Vegetation from ROWs	Vegetation ROW	Mitigation measures to reduce vegetation impacts.
2.14.1	Mitigation for Weeds	Noxious Weeds	Mitigation measures to reduce the impact of noxious weeds.
2.14.2.1	African Rue (*Peganum harmala*)	Noxious Weeds	Operator is responsible if noxious weeds become established.
2.14.2.2	Spraying	Noxious Weeds	Spraying specifications for African rue.
2.14.2.3	African Rue Management Practices	Noxious Weeds	Management practices for African rue.
2.15.1	Archaeological, Paleontological, and Historical Sites	Archaeology	All cultural or paleontological resource discovered must be reported to the BLM.
2.15.2	Historic Properties	Archaeology	Historic properties are protected by law.
2.15.2.1	Professional Archaeological Monitoring	Archaeology	Professional archaeological monitoring is required.
2.15.2.2	Monitor Duties	Archaeology	Archaeological monitoring requirements.
2.15.3	Site Protection and Employee Education	Archaeology	Employee archaeological training requirements.
2.16	Welding (Fire Prevention)	Welding	Welding requirements to prevent fire.
2.17.1	Seed Requirements	Seed Mixtures	Specifications for seed mixes for reclamation.
2.17.2	Seeding Methods	Seed Mixtures	Seeding methods for reclamation.
2.18	Waste Material and Fluids	Drilling	All waste material from drilling must be disposed of properly.

[1] Note that the measures listed in this table would be applied on a case-by-case basis, to be determined by BLM specialists depending on site-specific conditions. See **Appendix A** for more detailed descriptions.

2.5 Reasonably Foreseeable Future Actions

The impacts of reasonably foreseeable future actions in the vicinity of the proposed project need to be considered in combination with the proposed Ochoa Mine Project to aid in the analysis of cumulative effects in the region. Reasonably foreseeable future actions are those that are known by the BLM at the time this EIS was developed. While it is assumed that current activities, such as livestock grazing and dispersed recreation, would continue into the foreseeable future, the primary known future activity would be oil and gas development. Mining, oil and gas, and other energy development such as uranium enrichment and solar energy are key elements of the existing regional economy and social conditions. Other historically and economically important segments of the region's economic base are agriculture, recreation, tourism, and more recently in the Carlsbad area, retirement migration. Ongoing and proposed

construction at the URENCO National Enrichment Facility (NEF) near Eunice also has the potential to create cumulative social and economic effects.

The recently completed "Reasonable Foreseeable Development (RFD) Scenario for the BLM New Mexico Pecos District" (Engler et al. 2012) estimated future drilling potential is low in the vicinity of the 50-year mine area and the plant site. There is an area of moderate drilling potential to the south and east of the project area, shown on **Figure 2-7**. There are oil and gas plays that overlap the project area and current oil and gas leases encompass approximately 45 percent of the 50-year mine area, 100 percent of the processing plant site, and 28 percent of the proposed well field. Recent drilling within or adjacent to the 50-year mine area demonstrate promising potential for oil and gas production. Therefore, oil and gas development of the project area and the land in between the various project boundaries (mine area, plant site, well field, and loadout) must be considered reasonably foreseeable. Because little site-specific information is known about future development, the future development of oil and gas must be addressed qualitatively for those resources that would be affected.

2.6 Summary of Impacts

Table 2-7 provides a summary of the key direct and indirect environmental impacts for each resource analyzed. Detailed descriptions of impacts are presented for each alternative under each resource in Chapter 4.0. The summarized impacts assume the implementation of applicant-committed environmental protection measures and the BLM required environmental protection measures. However, it is not assumed that the recommended mitigation measures would be implemented. Implementation of the recommended mitigation measures identified in Chapter 4.0 potentially would reduce impacts beyond that described in this table.

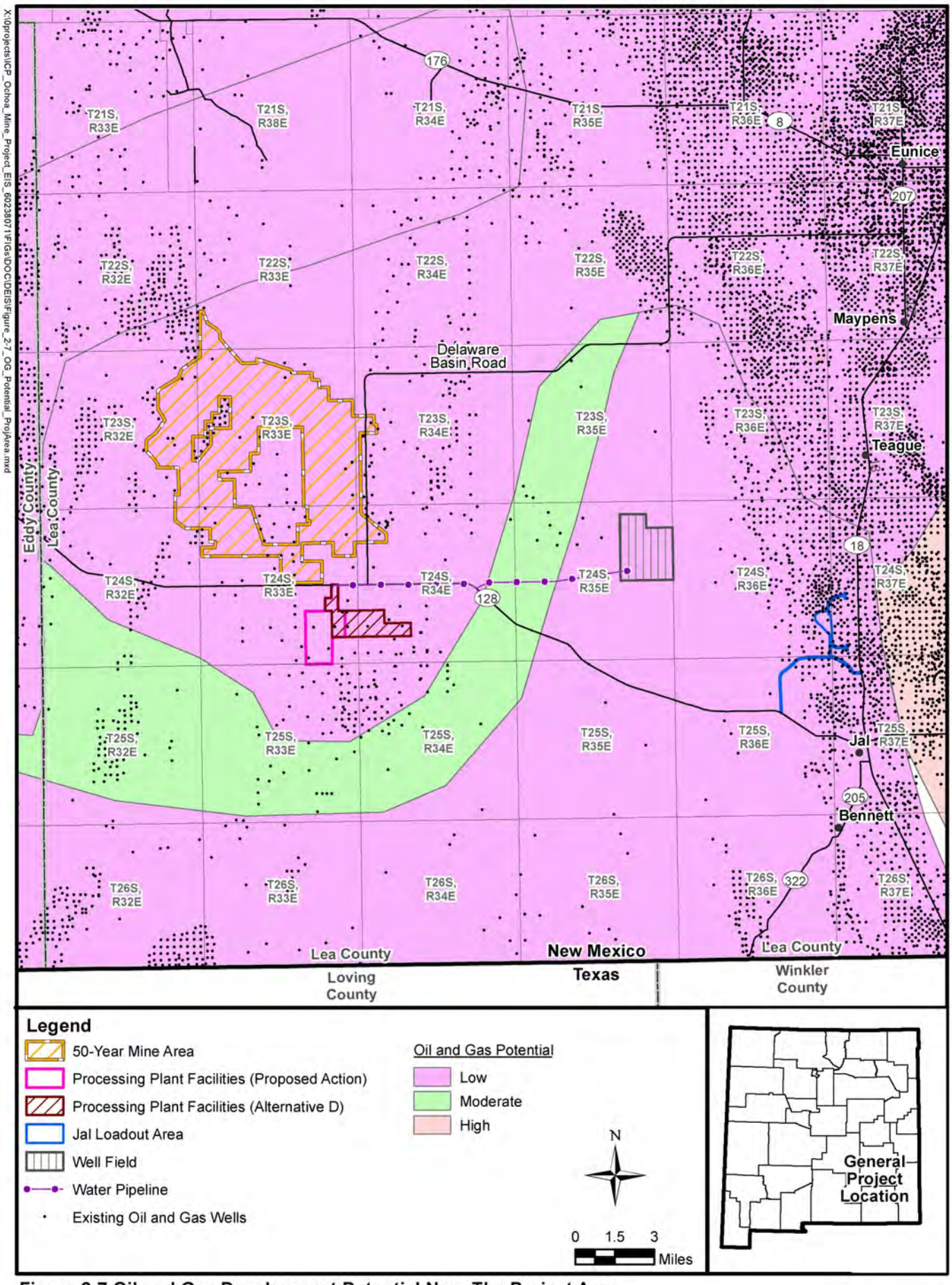

Figure 2-7 Oil and Gas Development Potential Near The Project Area

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Geology and Minerals					
Subsidence Hazards	No mine-related subsidence would occur. Natural subsidence due to dissolution of evaporite rocks would continue to develop topographic depressions slowly.	Mining-related subsidence would occur in areas overlying the 90 percent extraction rate of polyhalite ore. The maximum depth of subsidence at the surface would be 4 feet within 1,500 feet beyond the edge of the mine workings.	Same as Proposed Action, unless tailings are placed as backfill in the mine, providing fill in the mine void and less subsidence.	Same as Proposed Action.	Same as Proposed Action.
Minerals	No polyhalite would be recovered from the project region. Fluid mineral development would continue.	Polyhalite ore mining and oil and gas development would be developed jointly. Existing well casings in the 50-year mine area may require checking and additional treatment to ensure mine safety.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Paleontological Resources	No impacts to paleontological resources from mining operations would occur.	Potential impacts are small because proposed mine is within an area of low potential fossil yield.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Water					
Surface Water	No impacts to surface water would result from mining or processing operations.	Impacts to surface water quality and quantity would be avoided or reduced to less than significant levels by project design and operational controls, compliance with permit requirements, and implementation of environmental protection measures.	Same as Proposed Action.	Same as Proposed Action.	Similar to the Proposed Action. Placement of facilities on the playas and adjacent to defined ephemeral drainage networks would increase the potential for damage to project components and downstream land uses from severe runoff events.
Capitan Aquifer	Pumping of the Capitan Aquifer is likely to continue to supply water demands from the oil and gas industry. No project-related drawdown or effects to groundwater quality would occur.	Quantity: Pumping 4,000 gpm to supply water for processing would result in a maximum drawdown of the Capitan Aquifer of approximately 650 feet in the well field after 50 years of pumping. Recovery of the aquifer would begin when pumping ends. No effect on shallow groundwater quantity would result. Quality: An increase of salinity in the Capitan Aquifer may result. No effect on shallow groundwater quality would result.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Pecos River	Flows to the Pecos River would not be reduced as a result of the project.	Flows to the Pecos River would be slightly reduced by 28 acre-feet per year (afy), or 0.06 percent of the average flow of 50,000 afy.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Soils					
Long-term effects on soil productivity	None from the proposed project. Other surface-disturbing activities would continue.	1,663 acres of soil would be altered from project-related structures. All except the tailings stockpile (425 acres) would be available after project closure and reclamation.	Similar to Proposed Action. If the larger footprint for the tailings stockpile were implemented, more acreage (542 acres) would be unavailable for future uses.	Same as Proposed Action.	Similar to the Proposed Action. There is the potential to impact a playa.
Air Quality					
Ambient air quality standards	None.	No exceedence of ambient air quality standards or Prevention of Significant Deterioration (PSD) increment.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Ozone	No impacts.	NO_X emissions for the project would be less than 1.3 percent of total Lea County emissions.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Sensitive areas	No impacts.	Not affected by emissions from project.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Climate and Greenhouse Gas (GHG) Emissions					
GHG carbon dioxide (CO_2) equivalent emissions	None.	Negligible impacts to global climate change or state GHG emissions from construction and project operations.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Vegetation					
Dominant vegetation types disturbed (acres)	None.	Mesquite Upland Scrub: 2,270 acres: Mixed Desert Scrub: 92 acres	Same as Proposed Action.	Same as Proposed Action.	Mesquite Upland Scrub: 1,831 acres: Creosote Desert Scrub: 332 acres
Wildlife and Fish					
Terrestrial wildlife habitat	None.	Impacts from surface disturbance, habitat disruption, and habitat fragmentation would be relatively minor. Less mobile small game and nongame species likely to be the most affected by surface disturbance, especially during construction. Significant potential adverse impacts to migratory birds from exposure to evaporation pond water unless mitigation measures are implemented. No impacts to aquatic species.	Same as Proposed Action.	Same as Proposed Action.	Similar to the Proposed Action. Alternative D would affect one additional vegetation community, playa, that would not be affected under Alternatives A.
Sensitive Species	None.	No adverse impacts to the 14 terrestrial wildlife sensitive species would occur.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Rangelands/ Livestock Grazing					
Animal unit months (AUMs) lost due to permanent facilities	None.	Approximately 218 AUMs and associated forage lost due to long-term project use.	Same as Proposed Action unless the larger tailings stockpile option were implemented. In that case, more acreage would be permanently unavailable for livestock grazing within the processing plant site at the end of the project.	Same as Proposed Action.	Same as Proposed Action.
Lands and Realty					
Effect on other land uses	None.	Changes in land use would primarily affect the processing plant site and the Jal loadout. Both would have major land use changes over the long term, although the processing plant site may be returned to livestock grazing at the end of the project, except for the dry stack tailings stockpile. During operations, traffic from the processing plant to Jal would result in at least a 10 percent increase from 2010 levels.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Recreation					
Effect on recreational uses	None.	Surface disturbance and land use changes would alter dispersed recreation activities that may occur where project facilities are proposed. In general, the effect on dispersed recreation would be minor.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Visual Resources					
Changes to visual landscape	No change.	Strong contrast in form, line, and color from the finished dry stack tailings stockpile and processing buildings. Structures in Jal would be similar to surrounding development.	Slightly less impact than under the Proposed Action.	Same as Proposed Action.	There would be slightly fewer visual impacts to sensitive landowners from changes to the tailings stockpile location than under the Proposed Action, but increased visual impacts from NM 128.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Cultural Resources					
Effect on archaeological sites	None.	Potential direct effects to the 12 National Register of Historic Places (NRHP)-eligible sites from construction would be avoided or mitigated through data recovery. Further evaluation of site eligibility is needed at the Jal loadout. Potential loss of ineligible sites.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Hazardous Materials, Health and Safety					
Emergency plans	None.	Development of emergency response and spills plans, and health and safety training for employees would minimize potentially adverse impacts.	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Socioeconomics, Environmental Justice					
Total Employment (# of employees)	None for project. Continuation of existing regional employment.	Short-term construction peak: 1,400 employees (months 7 – 18) Long-term operations: up to 502 including contract employees	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Indirect or Induced employment (# of employees)	None.	During construction peak: 728 employees During operations: 283 employees	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.

Table 2-7 Summary of Environmental Impacts

Resources Affected	No Action	Proposed Action	Alternative B	Alternative C	Alternative D
Population changes	Projected net growth of 24 percent in Lea County and 14 percent in Eddy County.	Peak construction short-term: Up to 2,432 Long-term operations: 1,293	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Housing demands	None for project; long-term increase projected for region.	Peak construction short-term: 1,179 units (53 percent temporary units) Long-term operations: 459 units	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
Federal and state mineral royalties, average annual	None from project. Current oil and gas royalties would continue.	Approximately $13.8 million (51 percent federal)	Same as Proposed Action.	Same as Proposed Action.	Same as Proposed Action.
New Mexico resources excise tax, average annual	None.	$3.9 million at full production	Same as Proposed Action. May be higher if some of the “waste” products were sold rather than stockpiled.	Same as Proposed Action.	Same as Proposed Action.
Local ad valorem/property taxes, average annual	None.	$6 million	Same as Proposed Action. May be higher if some of the “waste” products were sold rather than stockpiled.	Same as Proposed Action.	Same as Proposed Action.
Environmental justice	No disproportionate adverse effects on minority or low-income populations.	Same as No Action.	Same as No Action.	Same as No Action.	Same as No Action.