

1.0 Introduction

1.1 Brief Project Description

Intrepid Potash, Inc. (Intrepid) is proposing to extract the potash, a potassium compound commonly used for fertilizer, remaining in inactive underground mine workings using solution mining. Intrepid proposes to construct and operate a solution mine project in an existing deep mine located approximately 20 miles northeast of Carlsbad in Eddy County, New Mexico (see **Figure 1-1**).

Instead of excavating the remaining potash left in the remaining underground pillars and walls of the inactive workings, the process would inject saline water into the mine workings and extract a mineral-rich solution. This mineral-rich solution would be pumped to the surface and transported to evaporation ponds. Once the solution evaporates in the ponds, the potassium-bearing salts would be harvested from the ponds and transported to a newly constructed mill for ore refinement.

The project area, which encompasses the proposed facilities and inactive workings under consideration, includes a total of 38,453 acres, of which 31,439 acres (82 percent) is on public lands managed by the U.S. Department of the Interior (USDI), Bureau of Land Management (BLM), 4,954 acres (13 percent) is managed by the State of New Mexico, and 2,060 acres (5 percent) are privately owned.

1.1.1 Background

Potash is the term used to describe compounds of potassium that occur in combination with other compounds including magnesium, sodium, chloride, sulfate, and nitrate in varying quantities. Most potash is used for agricultural fertilizer, but other uses include pharmaceuticals, salt substitutes, soap, glass, and batteries (Barker et al. 2008).

Commercial potash reserves occur in New Mexico primarily within the Secretary's Potash Area (SPA), first designated in 1939 when the federal government, through an order by the Secretary of the Interior, withdrew 2,560 acres from oil and gas leasing in deference to potash mining (1939 Order). The 1939 Order remained in effect until 1951, at which time the Secretary of the Interior issued a new Order allowing for concurrent operations in the prospecting and development and production of oil and gas and potash deposits owned by the U.S. A succession of orders followed (1951, 1965, 1975, and 1986), expanding the SPA each time. On October 21, 1986, the Order of the Secretary of the Interior (51 *Federal Register* 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 497,002 acres. Commonly referred to as the 1986 Order, it governs the current management of federal oil, gas, and potash leasing and development within the SPA.

The potash mines and most of the land affected by the proposed project are located on land managed by the BLM. Under the requirements of the federal National Environmental Policy Act (NEPA) of 1969, an environmental impact statement (EIS) must be prepared for major federal actions that may have a significant effect on the environment. The BLM Carlsbad Field Office has determined that an EIS is required to analyze the potential environmental impacts of the proposed project before the agency makes a decision on whether to allow the proposed project to proceed.

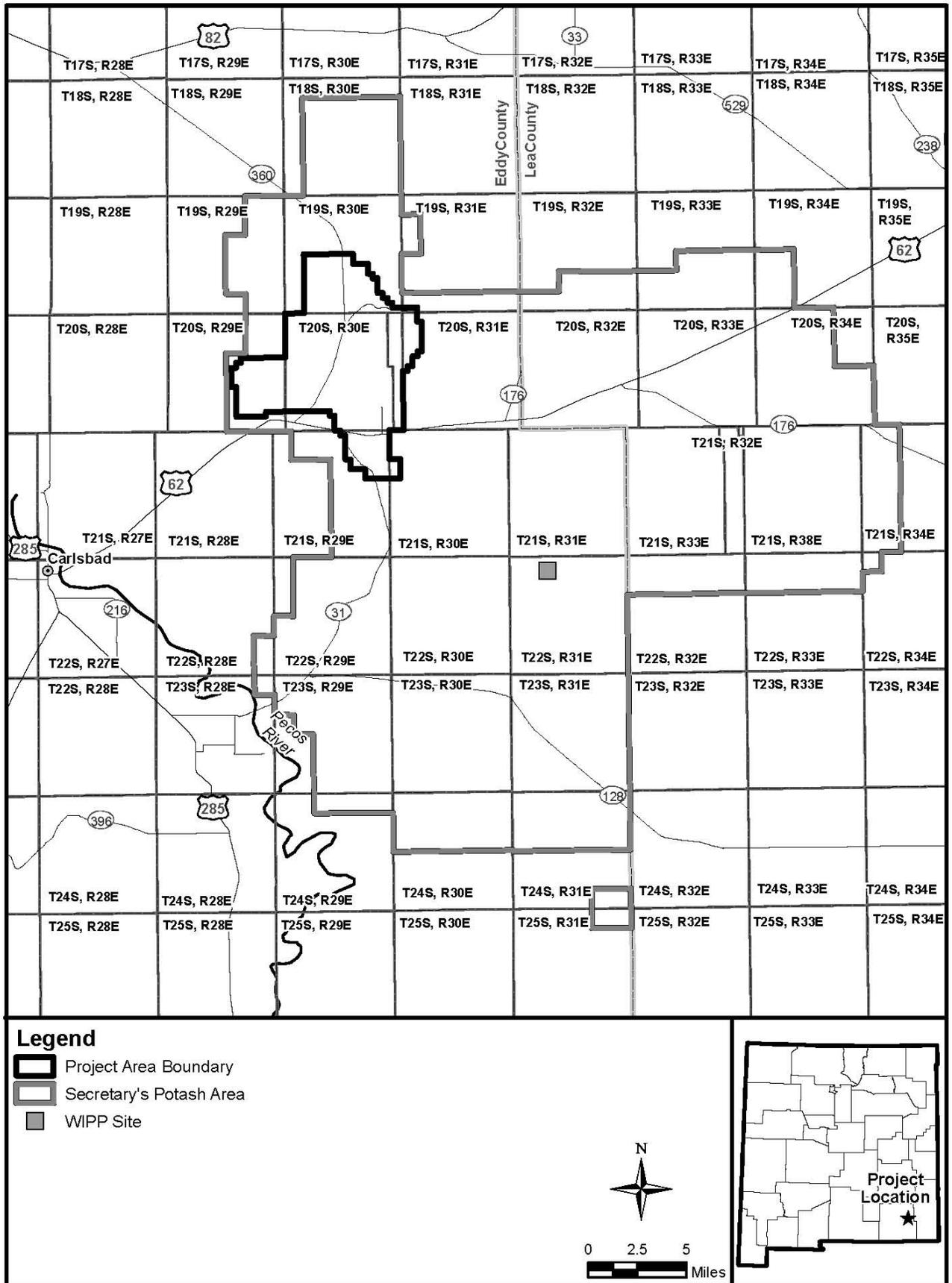


Figure 1-1. General Location of HB In-Situ Solution Mine Project Area

1.2 Purpose and Need for the Project

Under the NEPA, there is a requirement to present the purpose and need for a proposed project. The “Regulations for Implementing NEPA” from the Council on Environmental Quality (CEQ), 40 Code of Federal Regulations (CFR) §1502.13, state the following about the description of the purpose and need in an EIS.

“The statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.”

The purpose and need statement is intended to explain the reason that the proposed project is needed by the lead agency (BLM in this case) and serves as the basis for developing a reasonable range of alternatives.

The BLM is responsible for the balanced management of the public lands and resources and their various values in a fashion that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; combinations of uses that take into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific, and cultural values (BLM 1997).

Potash is an important industrial mineral in wide demand in the U.S. The BLM has the responsibility to promote the orderly and efficient development and maximum recovery of leasable minerals, including potash, as specified under 30 United States Code (USC) Chapter 2 §21a, the Mineral Leasing Act of 1920 as amended, the Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1761), and the Secretary of the Interior’s 1986 Potash Order (51 *Federal Register* 39425, October 28, 1986). The BLM has the duty to allow and encourage leaseholders to develop their leases subject to reasonable restrictions.

The BLM will evaluate and respond to Intrepid’s proposal (Proposed Action) to construct, operate, maintain, and decommission an in-situ solution mining operation, including approval of the mine operation plan, rights-of-way (ROWs), and lease modifications.

The purpose of this project is to provide for technically viable development of the potash resources, as required by federal law and the federal leases and to allow the lessee to exercise its right to develop their leases subject to applicable mine and safety laws and the 1986 Order.

The proposed project would:

1. Further develop a potash mining operation by utilizing an in-situ solution mining technique that allows for the recovery of additional ore.
2. Extract the maximum technically feasible quantity of potash from inactive workings (HB Eddy, HB South, HB North, and HB Crescent) in accordance with mining and safety regulations.

1.3 Decisions to be Made

This EIS provides the analysis upon which the BLM can base its decisions. The decisions to be made by the BLM are:

1. Whether to approve Intrepid’s HB In-Situ Solution Mine Operation and Closure Plan, requested ROWs, and lease modifications, and if so, under what terms and conditions.
2. If in-situ solution mining is approved by the BLM, a further decision is how to modify Intrepid’s potash leases to be in compliance with the allowable acreage stated in 43 CFR §3503.37, as

amended. Intrepid's leases that cover the proposed solution mining will be changed from conventional to solution mining leases and that acreage will not be counted against the 96,000-acre cap. Acreage changes would be calculated based on one of the following scenarios.

- Add the acreage of all leases underlain by the flood pool for in-situ solution mining (3,644 acres under the Proposed Action).
- Add the acreage of all HB Potash leases in the project area (22,189 acres).
- Add the acreage of all leases, in their entirety, which touch the flood area (12,867 acres).

1.4 Authorizing Laws and Regulations, Relationship to Policies, Plans, and Programs

1.4.1 Resource Management Plans

The BLM has the responsibility and authority to manage the surface and subsurface resources on public lands located within the jurisdiction of the Carlsbad Field Office. The Carlsbad Resource Management Plan (RMP) (BLM 1988) designated lands within the proposed project area as open for mineral exploration and development. Under Continuing Management Guidance for Energy and Mineral Resources, the RMP states that the “BLM will encourage and facilitate the development by private industry of public land mineral resources so that national and local needs are met, and environmentally sound exploration, extraction, and reclamation practices are used.”

The RMPA for the Carlsbad Resource Area (BLM 1997) was prepared to address the management of oil and gas resources in the field office area. In general, it reiterates the goals of the 1986 Order for oil and gas drilling where there is potash mining. It states that drilling for oil and gas is allowed in the SPA if the drilling does not interfere with potash mining and does not create a hazard. It states that the infiltration of oil, gas or water into potash deposits, mines, or workings must be prevented when wells are abandoned.

The Special Status Species RMPA for the BLM Pecos District Office was adopted to address specific management prescriptions to ensure the continued habitat protection of two special status species, the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and the sand dune lizard (*Sceloporus arenicolus*).

1.4.2 Other Applicable Federal Laws and Regulations

BLM authority for land management derives from the FLPMA. General BLM regulations are described in 43 CFR, Subtitle B—Regulations Relating to Public Lands, Chapter II—BLM, USDI. BLM regulations for the management of mining on federal potash leases are included in 43 CFR Subpart 3590, Solid Minerals (Other Than Coal) Exploration and Mining Operations—General. Subpart 3592.1, Operating Plans, specifies that before any operations are conducted under any lease, the operator must submit a detailed mine and reclamation plan to the BLM, which BLM must approve before operations can begin. These regulations contain specific criteria that the mine and reclamation plan must address to assure the protection of nonmineral resources and the reclamation of the lands affected by the operations. It also requires coordination with state agencies.

Potash is a solid leasable mineral that is managed by BLM under the authority of the Mineral Leasing Act of 1920, as amended, the Potash Leasing Act of 1927, and, in southeastern New Mexico, the 1986 Order. The Mineral Leasing Act establishes qualifications for mineral lessees, defines maximum limits on the total acres of a mineral that can be held by a lessee, and authorizes the BLM to grant these leases. Federal regulations that pertain to leasing these minerals are contained in 43 CFR Part 3500, Leasing of Solid Minerals Other than Coal and Oil Shale. The State of New Mexico's Order No. R-111-P (see **Appendix A**) applies to state lands and minerals in the area. While the BLM may incorporate elements of R-111-P into its management of the SPA, the BLM is not mandated to follow it. In particular, Life of Mine Reserves, as defined in R-111-P, are not used for management of federal lands and minerals.

The Mining and Mineral Policy Act of 1970 (MMPA) mandates that federal agencies ensure that closure and reclamation of mine operations be completed in an environmentally responsible manner. The MMPA states that the federal government should promote the “development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined lands, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining mineral activities.”

Other major federal and state regulations and permits that are relevant to the proposed project include those listed in **Table 1-1**, which is not all-inclusive.

Table 1-1 Major Federal and State Law, Regulations, and Applicable Permits

Regulation	Brief Description	Applicable Permit or Action
NEPA (P.L. 91-190) and CEQ – Regulations for Implementing NEPA (40 CFR Parts 1500 – 1508)	Disclosure of the potential impacts of federal actions on the human environment to the decision makers and the public to ensure that informed decisions are based on science.	EIS
Clean Water Act (CWA) and Federal Water Pollution Control Act Amendments	Regulate discharge to surface waters from point sources.	National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities
	Regulate surface water discharges associated with industrial facilities.	NPDES Industrial Storm Water Permit
New Mexico Water Quality Act, New Mexico Statutes Annotated (NMSA) 1978, §§74-6-1 et seq.	Prevent groundwater pollution, which could result from discharges of effluent or leachate, and to abate any groundwater pollution that occurs at permitted facilities such as mills and mines.	Groundwater Discharge Permit
Federal Safe Drinking Water Act, 40 CFR Parts 144 and 147; New Mexico Ground and Surface Water Protection, New Mexico Administrative Code (NMAC) Part 20.6.2, 2005	Allow underground injection of water; Ensure potable aquifers are not adversely affected by injection of water.	Underground Injection Control Permit
Underground Water, NMSA 1978, §§72-12-1 et seq.	Regulate groundwater use, water rights.	Permit to Appropriate the Underground Waters of the State of New Mexico
Endangered Species Act (ESA) of 1973, as amended (P.L. 93-205)	Comprehensive program for the conservation of threatened and endangered plant and animal species and the habitats in which they are found.	Informal or formal consultation under Section 7; Coordination under Section 9

Table 1-1 Major Federal and State Law, Regulations, and Applicable Permits

Regulation	Brief Description	Applicable Permit or Action
Migratory Bird Treaty Act (MBTA) of 1918, as amended; Bald and Golden Eagle Protection Act of 1940	Protection of birds that live, reproduce or migrate within or across international borders.	Determine compliance through internal review or external review with the U.S. Fish and Wildlife Service (USFWS)
Clean Air Act (CAA); delegated to the State of New Mexico under Air Quality Control Act, NMSA 1978, §§74-2-1 through 74-2-17	Ensure that air pollution sources meet applicable regulations and do not exceed ambient concentration standards for air pollutants.	Air Quality Permit
National Historic Preservation Act (NHPA) (36 CFR Part 80); New Mexico Cultural Properties Act, NMSA 1978, §§18-6-1 through 18-6-17	Review and compliance activities related to cultural resources.	Permits to conduct investigations
Solid Waste Disposal Act, as amended by Resource Conservation and Recovery Act (RCRA), 42 USC 6901 et seq. delegated to the state and implemented under New Mexico Hazardous Waste Act	Regulation of hazardous waste storage, treatment, and disposal.	Hazardous Waste Permit
NMSA 1978 Sections 19-1-1 and 19-7-57	Administration and management of all easements and ROWs to use state trust lands for such purposes as installation and maintenance of pipelines, power lines, and access roads.	Access Permit
NMAC Part 14.5.2	Permit to construct buildings from New Mexico Construction Industries Division	General Construction Permit

1.5 Public Participation and Issues

1.5.1 Public Scoping

The BLM initiated the NEPA process for the HB In-Situ Solution Mine Project by preparing an environmental assessment (EA) in 2008. Two public scoping meetings were held on September 16, 2008, to receive public input and comments on the proposed project. During development of the EA and prior to publication, the BLM determined that the preparation of an EIS would be required for the proposed project.

The Notice of Intent (NOI) to prepare an EIS for the HB In-Situ Solution Mine Project was published in the *Federal Register* on January 12, 2010. On the same day, BLM published the first project Bulletin, which was mailed to 146 interested parties including federal, state, and local agencies and governments. A public service announcement was prepared and submitted to KSVP Radio and the Carlsbad Community Television station for broadcasting. BLM issued a press release announcing the intent to

prepare an EIS and information about the upcoming public scoping meetings. Display advertisements were placed in the Artesia Daily Press, Hobbs News-Sun, and Carlsbad Current-Argus, to inform the public of the scoping meeting dates, times, and locations.

Two public scoping meetings, starting at 1:00 p.m. and 6:00 p.m. on January 26, 2010, were conducted in a semi-open house format, beginning with a formal presentation to the public to ensure that meeting attendees were informed about the project. The presentation was followed by an informal open house to allow meeting attendees to ask questions. BLM representatives staffed information stations on relevant resources and programs (e.g., biology, oil and gas, mining, realty, cultural) to receive public input and answer questions. Display boards showing the NEPA process and maps of the proposed project were provided to facilitate conversation. BLM’s Bulletin, which provided information about the project, the schedule, and the scoping process, was available as a handout to meeting attendees. A total of 35 members of the public attended the scoping meetings.

Verbal comments were noted by BLM representatives, and attendees were encouraged to submit their comments in writing. Comment forms were available for the public to complete and submit to BLM at the meeting, or for mailing to the BLM at a later date. BLM received a total of 17 comment submittals (e.g., letter, comment form, verbal comments) containing 133 individual comments during the 30-day public scoping period. Following the close of the public scoping period, comments were compiled and analyzed to identify issues and concerns.

More details on the public scoping process, meetings, and the comments submitted can be found in the “HB In-Situ Solution Mine EIS Scoping Summary Report,” dated March 2010, which was posted to the project website hosted by the BLM, <http://www.nm.blm.gov/cfo/HBIS/>.

1.5.2 Issues

The preliminary issues of concern identified by BLM personnel, other agencies, and in meetings with individuals and user groups before completion of public scoping related to the potential effects of the proposed solution mining project on the ability to extract oil and gas resources, increased land subsidence, surface water and groundwater supplies, air quality, the stability of underground mine workings, regional socioeconomics, migratory birds, rangeland resources, access to recreation, and cultural resources. Similar concerns were expressed during the formal scoping period for this EIS. A majority of the comments received during scoping were related to the potential impacts associated with solution mining processes, potential impacts to groundwater, the potential for subsidence, and potential impacts to oil and gas exploration and operations. The number of comments by category is provided in **Table 1-2**.

Table 1-2 Comments Received by Category

Category Name	# of Comments
Alternatives	5
Biological Resources	12
Cumulative Impacts	2
Geology	6
Health/Safety	3
Land Ownership/Adjustment	1
Leasing	3
Livestock Grazing/Range Management	3

Table 1-2 Comments Received by Category

Category Name	# of Comments
Mining	26
Mitigation Measures	5
Monitoring	3
NEPA Process	8
Noise	1
Oil and Gas	28
Out of Scope	2
Project Description	21
Public Involvement	2
Reclamation	2
Requests for Information	1
RMP Consistency	1
Socioeconomics	2
Subsidence	19
Surface Disturbance	2
Threatened and Endangered Species	1
Vegetation/Botany	1
Water Resources	40
Wildlife	5
Total	205

Many scoping comments identified information that should be included in the description of the affected environment (Chapter 3.0) or effects that should be analyzed in the environmental consequences sections (Chapter 4.0). Examples of scoping comments that are addressed in either Chapter 3.0 or Chapter 4.0 of this EIS include the following:

- Biological resources—describe vegetation types, wildlife habitat, and special status species; evaporation ponds may be toxic to birds; drawdown of the shallow aquifer may affect karst features, fauna in caves, and forage; concerns for effects of leaks in surface pipelines on wildlife; effect of land subsidence and noise on wildlife.
- Geology and subsidence—characterize geologic and hydrologic conditions; effects of well drilling on karst features; potential for increased subsidence due to collapse of pillars and roof during solution mining and its effect on hydrology, oil and gas operations, and brine well collapse.
- Livestock grazing—potential effect of groundwater drawdown on water supplies used for livestock and forage production; existence of large diameter surface pipes would alter travel routes by livestock and wildlife.

- Mining—describe effect of solution mining on the ability to develop oil and gas resources; potential for pillar collapse and rubblization to affect flood pool extent; potential effect of salt and other contaminants on nearby ranch headquarters and rangeland.
- Mitigation and monitoring—establish standardized drilling process to follow regulatory requirements; monitor for leaks and mitigate vegetation damaged by salt contamination; establish ramps over pipelines to facilitate wildlife movement; monitor extent of brine in flood pools; establish mitigation measures to exclude birds from evaporation ponds and monitor success.
- Oil and gas operations—concern that solution mining would interfere with the ability of oil and gas lessees to develop their resources in the vicinity of the proposed project; potential for brine in flood pools to corrode fluid mineral well casings; concern for inadequate plug and abandon techniques of old oil wells that may be affected by the brine within the flood pools; concern that pillars around well casings in the flood pools may fail; allow for concurrent development of potash and fluid minerals.
- Water resources—describe pump tests completed; prepare aquifer modeling to predict drawdown and groundwater movement; effect of water pumping on flows in the Pecos River; drawdown of shallow aquifer may eliminate water in caves or reduce livestock water supplies; describe extent and quantity of the Rustler Formation; evaluate impacts of using alternative water supplies such as water from the Caprock; identify water rights available for project use and whether new water rights are needed; evaluate the effect of pumping on water supply; potential impact of subsidence on hydrology; impact of pumping on water quality; verify that the proposed water sources are adequate for the proposed project; describe the water requirements for the project.

The public comments recommended two possible EIS alternatives that should be considered in addition to the Intrepid's proposed HB In-Situ Solution Mine Project. The options recommended consideration of other water sources to supply brine for the flood pools and increased or concurrent recovery of oil and gas resources.

1.5.3 Consultation and Coordination

On February 1, 2010, the BLM-Carlsbad Field Office sent letters to the following pueblos and tribes notifying them of the proposed HB In-Situ Solution Mine project:

- Apache Tribe of Oklahoma
- Comanche Indian Tribe
- Hopi Tribe
- Kiowa Tribe of Oklahoma
- Mescalero Apache Tribe
- Pueblo of Isleta
- Ysleta del Sur Pueblo

To date, BLM received responses from the Pueblo of Isleta and the Ysleta del Sur Pueblo. Both Pueblos stated that the project will not impact either Pueblos' religious or cultural sites; however, should discoveries be found during project construction, notification of findings would be appreciated.

On January 27, 2009, prior to initiation of the EIS, the BLM-Carlsbad sent letters to the same tribes listed above to inform them of plans to treat some archaeological sites that are located where the evaporation ponds are planned to be constructed. Responses to these letters were received from the Hopi Tribe and the Pueblo of Isleta. The Hopi Tribe responded that if any prehistoric human remains are discovered

during project construction, they would like to be notified prior to excavation and would like to receive copies of reports for their review and comment. The Pueblo of Isleta requested that they be informed of any discoveries found during construction, and would like to receive copies of all environmental documents.

A cooperating agency is typically invited to participate in NEPA projects because it has “special expertise,” as defined in CEQ’s NEPA regulations at 40 CFR 1508.26. On December 21, 2010, the BLM mailed letters of invitation for cooperating agency status to 42 tribes, pueblos, and federal, state, and local government agencies. Any of these groups that respond will be sent a memorandum of understanding that outlines the responsibilities of the lead agency (BLM) and the cooperating agency. To date, five local governments, two state agencies, and one federal agency have requested cooperating agency status, two of which have signed agreements.

1.6 Organization of the Document

Chapter 1.0 of the EIS provides an introduction and general overview of the proposed project. In addition, this chapter describes the purpose of and need for the proposed project; the decisions to be made; conformance of the proposed project to existing BLM policies, plans, and programs; relevant laws, regulations, and permits that apply to the proposed project; and a summary of outreach activities.

Chapter 2.0 provides a summary of the EIS alternatives; a summary of the alternative eliminated from detailed analysis and the reasons for elimination; detailed descriptions of the alternatives analyzed in the EIS; a summary of applicant-committed environmental protection measures and BLM-required measures; and a comparison of impacts under each alternative.

Chapter 3.0 describes the existing natural and human environment within the proposed project area, focusing on the conditions that may be affected by the proposed project.

Chapter 4.0 describes the potential direct and indirect impacts to the natural and human environment that would result from the implementation of the Proposed Action and alternatives. It also recommends mitigation measures that would reduce significant impacts. This chapter also discusses the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and irreversible and irretrievable commitment of resources.

Chapter 5.0 describes the cumulative impacts to the natural and human environment that would result from the implementation of the Proposed Action and alternatives, in combination with the impacts contributed by other past, present, and reasonably foreseeable future actions

Chapter 6.0 provides a summary of the public participation and scoping process used to solicit comments on the Proposed Action and identify issues or concerns; a summary of consultation and coordination undertaken to prepare the EIS; a list of federal, state, and local agencies, tribes, pueblos, and private organizations and companies that were contacted during the preparation of the EIS; agencies, organizations, and persons to whom copies of the EIS were sent; and the list of BLM and consultant team members that developed the EIS.

Following Chapter 6.0 are the list of references cited in the EIS, a glossary of terms the readers can use to obtain definitions for scientific or technical terms, and an index of key terms and information presented in the EIS.

Appendices included in the EIS provide supplemental detailed information used to support statements or findings documented in the EIS. **Appendix A** includes the full text of the 1986 Order, a state order that governs oil and gas development in the SPA, and the most recent interim New Mexico BLM guidance for management of the SPA. **Appendix B** includes descriptions of the lease stipulations and environmental protection measures required by BLM for mineral development in the SPA. **Appendix C** lists the type, location, and status of ROWs within the project area boundaries.