BUREAU OF RECLAMATION

Draft Environmental Assessment for Hilcorp Energy Company's San Juan 32-7 Unit 202H Natural Gas Well Project

Navajo Unit
Upper Colorado Basin: Interior Region 7
Western Colorado Area Office

U.S. Department of the Interior

August 21, 2025

Mission Statements

The mission of the Department of the Interior is to protect and manage the Nation's natural resources and cultural heritage; provide scientific and other information about those resources; and honor its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Prepared for the Bureau of Reclamation by
EIS Environmental & Permitting Solutions

August 21, 2025

Cover Photo: View from southwest of well pad, August 2024, San Juan County, New Mexico. (EIS 2024).

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CHAPTER 1 – INTRODUCTION

This Environmental Assessment (EA) has been prepared to explain and evaluate the potential environmental effects of Hilcorp Energy Company's (Hilcorp) proposed San Juan 32-7 Unit 202H natural gas well. The Federal action ("Proposed Action") evaluated in this EA is whether the Bureau of Reclamation ("Reclamation") would approve the issuance of a land use authorization (license agreement) for the reconstruction and expansion of an existing well pad (currently supporting the existing San Juan Unit #029A natural gas well and associated appurtenances), use of an existing access road, the drilling and completion of a multilateral coalbed methane well, a produced water pipeline, in addition to other project staging and other temporary surface impacts (e.g., use of area roads, etc.), and long-term operations and maintenance.

Access to Reclamation land would be provided by granting the requested license agreement. Reclamation's implementing regulations are found at 43 CFR, §429 Subpart C – Requesting Authorization to Use Reclamation Land, Facilities, and Waterbodies, to respond to a request for use of Reclamation lands. The proposed project would be built per lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM078423X) in conjunction with a License Agreement granted by Reclamation.

Reclamation has prepared this EA in compliance with the National Environmental Policy Act (NEPA) and the Department of the Interior's NEPA regulations at 43 C.F.R. §§ 46.10-46.450. If potentially significant impacts to environmental resources are identified, an Environmental Impact Statement (EIS) will be prepared. If no significant impacts are identified, a Finding of No Significant Impact (FONSI) will be issued.

1.1 Project Location and Legal Description

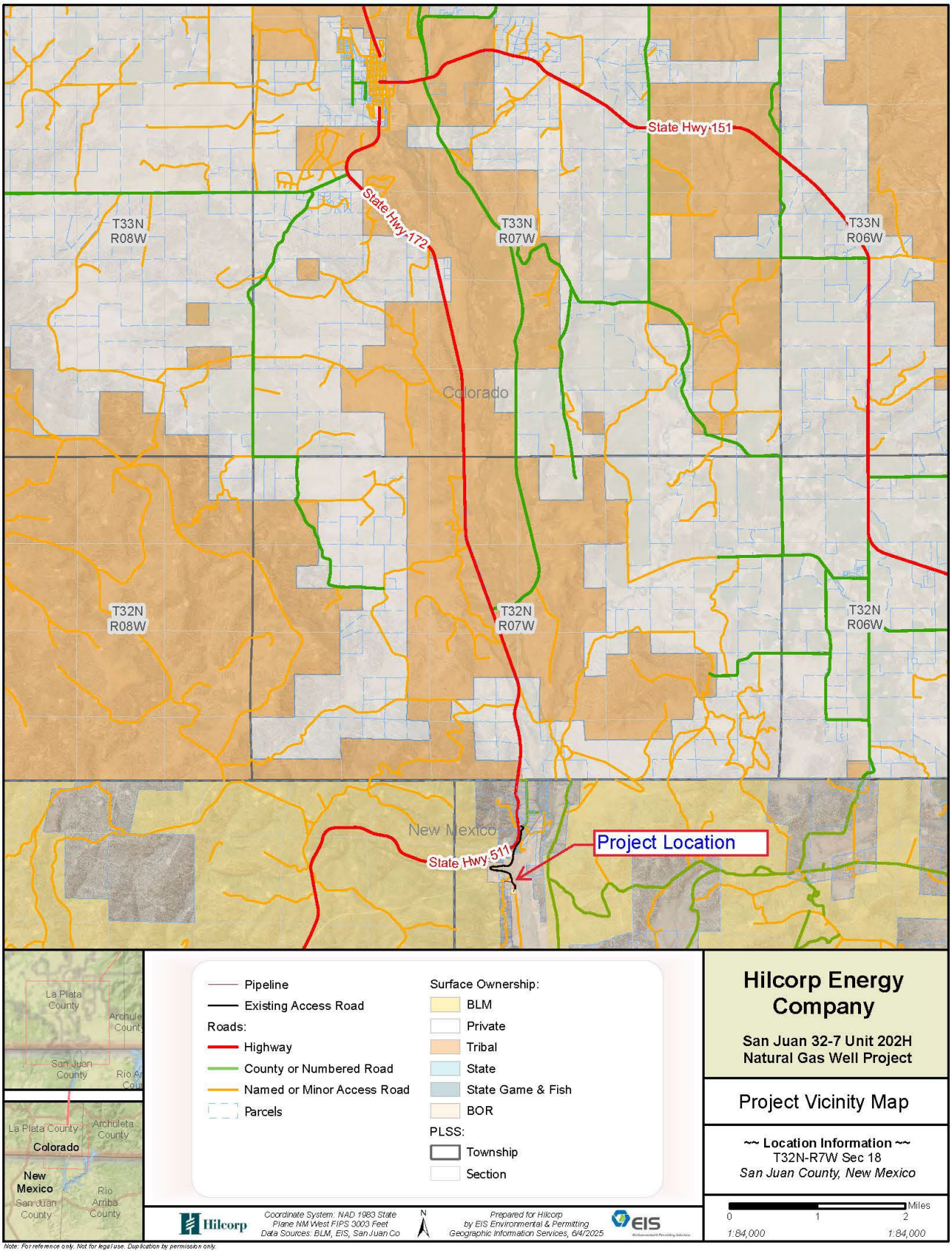
The Project is located in northeastern San Juan County, New Mexico, approximately 1.5 miles south of the Colorado border (see Figure 1, below).

The project is located just west of the Los Piños River, near the confluence of Reese Canyon and the Los Piños River. In this area, the Los Piños River is approximately 1-mile upstream of the inundated area associated with Navajo Reservoir. The entire project is located on Reclamation lands, but immediately to the west is a collection of small private parcels which are mostly undeveloped (but for natural gas well pads and associated infrastructure). Surrounding the Los Piños River in this area are public lands managed by the Bureau of Land Management (BLM). The areas that would be affected by the Project (the "Project Areas") and their general physical locations are summarized in **Table 1**.

Table 1. Areas Involved in the Project

Project Area	Specific Project Element or Activity	General Physical Location	Previous Analyses Incorporated by Reference
San Juan 32-7 Unit #202H Well Pad	Grading import of fill material to expand and improve existing well pad to support drilling activity. Redeveloped well pad would be 350-feet x 325-feet.	T32N R7W of the NM PM: Section 18, all in San Juan County.	Under the Navajo Reservoir RMP/FEA (USBR 2008), within the Navajo Unit the existing oil/gas leases are held by production, with operations administered by NMOCD; USBR is the surface management agency within the reservoir area (see Appendix. C of FEA).
Access Road	Use of 968 feet (0.18 mile) of existing access road to well pad.	T32N R7W of the NM PM: Section 18, all in San Juan County.	
Produced Water Pipeline	New 1,079.13-foot (0.2-mile) 3-inch buried steel pipeline, within 40-foot corridor.	T32N R7W of the NM PM: Section 18, all in San Juan County.	

Figure 1. Vicinity Map



1.2 – Need and Purpose

The need for Reclamation's action is to respond to the submittal of an Application for Transportation and Utility Systems and Facilities on Federal Lands, Standard Form 299 (SF-299). Reclamation's implementing regulations are found at 43 CFR, §429 Subpart C – Requesting Authorization to Use Reclamation Land, Facilities, and Waterbodies, to respond to a request for use of Reclamation lands.

The purpose of the action on Bureau of Reclamation lands is to allow Hilcorp reasonable access across Reclamation-managed lands for the construction, operation, and maintenance of the project components, consistent with the lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM078423X), in the orderly development of Hilcorp's fluid mineral estate. The project area would total 2.9-acres, requiring a land use authorization (license agreement) for the reconstruction and expansion of an existing well pad, a new access road, a produced water pipeline, and the drilling and completion of a multilateral coalbed methane well, in addition to other project staging and other temporary surface impacts (e.g., use of area roads, etc.), and long-term operations and maintenance. Access to Reclamation land would be provided by granting the requested license agreement..

As a necessary component of that response, Reclamation has prepared this Environmental Assessment (EA) to evaluate the potential impacts of the Proposed Action to the environment, in conformance with the National Environmental Policy Act (NEPA) (42 USC § 4321).

1.3 – Decision to be Made

Reclamation will decide whether to issue a land use authorization (license agreement to the Applicant to implement the Project and under what terms and conditions.)

1.4 – Background

1.4.1 – Oil and Gas Development

The United States has established national policy through administration and legislation. Executive Order 14154 – Unleashing American Energy, encourages energy exploration and production on Federal lands and waters, including on the Outer Continental Shelf, in order to meet the needs of our citizens and solidify the United States as a global energy leader long into the future.

EO 14154 requires federal agencies, to the extent permitted by law and regulation and where appropriate, to expedite their review of permits for energy-related projects or take other actions as necessary to accelerate the completion of such projects while maintaining safety, public health, and environmental protections.

The San Juan Basin is currently the nation's second largest gas field and will play a major role in meeting the nation's energy needs. Natural gas exploration and production activities and the associated facilities have been a predominant land use within and adjacent to Navajo Reservoir, since the 1950s, and will continue to be for the foreseeable future. Conventional gas extraction from the San Juan Basin began in the 1920s and became extensive by the 1950s. Production of coalbed methane from the Fruitland Formation first began in 1954 but dramatically increased following the passage of the Crude Oil Windfall Profits Tax Act in 1980 (USBR 1999, USBR 2008); coalbed methane gas development has been a primary focus since then. For more detailed description of current oil/gas development in the vicinity of the reservoir, please refer to the 2003 Farmington RMP/FEIS (BLM 2003).

Management of the oil/gas development within Reclamation's Navajo Reservoir area occurs in accordance with applicable laws and regulations and includes various measures to protect other resources both on the surface and down hole. The respective state oil/gas conservation agencies (New Mexico Oil Conservation Division (NMOCD)) regulate the development of State and private leases and, to a degree, federal leases within their respective states. Reclamation, as the federal surface management agency for the reservoir area, has the responsibility to ensure that other land use and resources within its area of jurisdiction are adequately protected. The respective counties may also have land use plans or codes which address oil/gas development.

The majority of the reservoir area is leased for oil/gas development and most of these leases are held by production. These leases include federal, state, and private leases, some of which predate the construction of the Navajo Unit. Each of these leases has specific stipulations, terms, and conditions that apply to the development of the oil/gas within that particular lease. Some of the private and Southern Ute Indian Tribe (SUIT) oil/gas rights within the reservoir area were subordinated to United States interests regarding the Navajo Reservoir and Dam at the time Reclamation acquired the reservoir area. Appendix C in the Navajo Reservoir Resource Management Plan/Final Environmental Assessment has a partial listing of the major valid existing rights within the reservoir area, including oil/gas leases (USBR 2008).

Within the reservoir area in New Mexico, any future federal leases will have a No Surface Occupancy (NSO) stipulation. In addition, various Controlled Surface Use (CSU) and noise reduction requirements are applied to development on all federal leases to the fullest extent possible, consistent with valid existing rights. In order to be consistent in its management, Reclamation applies the same or similar requirements on all proposed oil/gas development within the reservoir area, to the fullest extent possible consistent with valid existing rights.

1.4.1.1 – 500 Foot No Surface Occupancy Stipulation

A No Surface Occupancy (NSO) stipulation within 500 feet of the reservoir high water line has been part of the oil/gas development policy for Reclamation's Upper Colorado Region since at least February 1989, and, perhaps, earlier. The rationale for that requirement is to minimize the possibility of pollution and interference with operation and maintenance of the reservoir. However, the actual wording has varied over time and by the office administering Reclamation lands (USBR 2008).

Reclamation recognizes that the 500-foot NSO may reduce the amount of natural gas recovered from the reservoir area due to current technical and economic limitations on directional drilling. The existing San Juan Unit #029A well pad was constructed prior to the 500-foot NSO stipulation.

Guidance from the Navajo Reservoir Resource Management Plan/Final Environmental Assessment states:

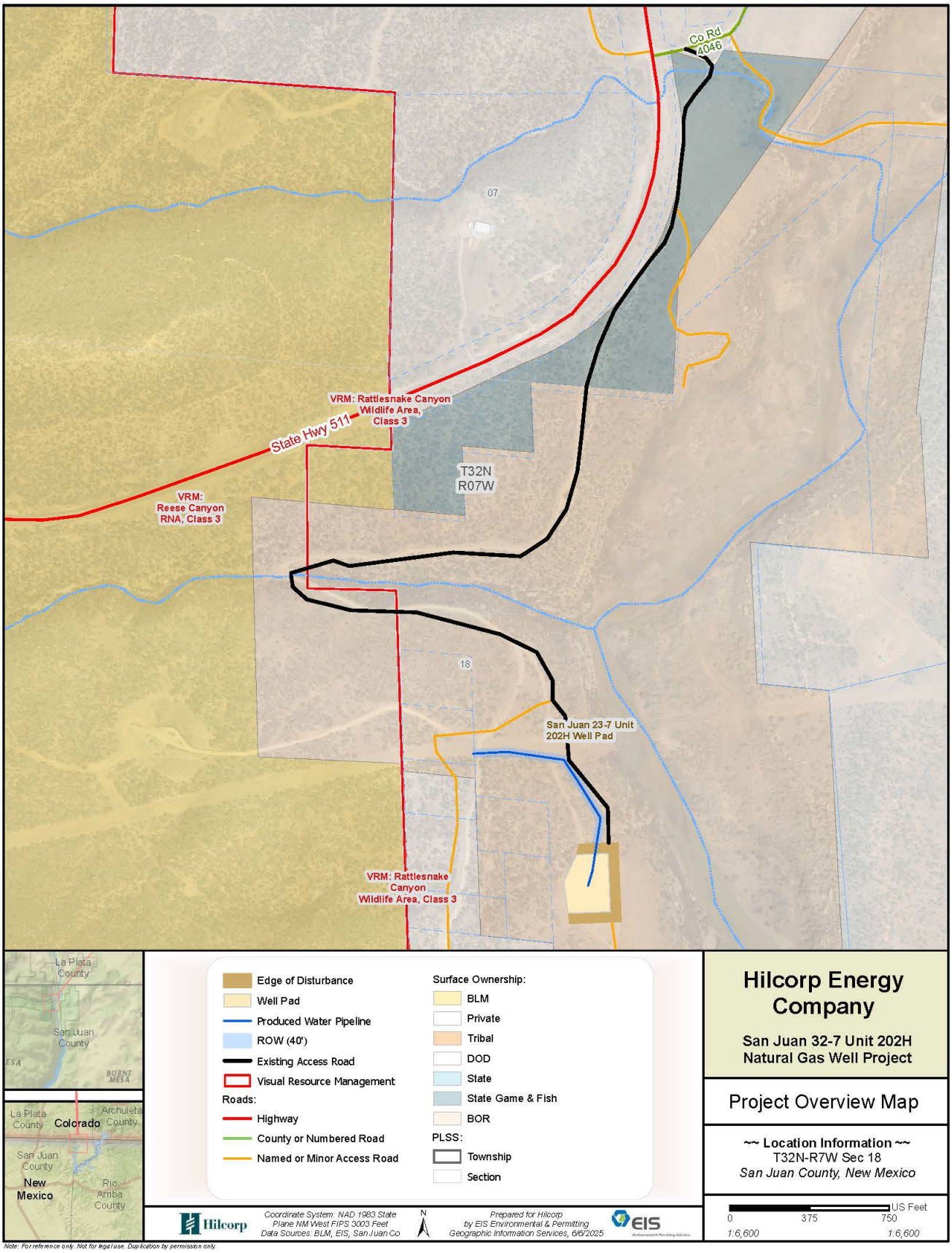
> Exceptions to the NSOs and no drilling constraints within the reservoir area for protection of Reclamation project purposes, facilities, and water quality may be granted by USBR if the operator shows in writing and to the satisfaction of Reclamation that its operations:
>
> - Adequately protect the integrity of Reclamation's facilities potentially affected by the action
>
> - Will not interfere with the construction, operation, and maintenance of any works of the Navajo Unit, CRSP, or other Reclamation projects.
>
> - Will prevent pollution, and
>
> - Will not adversely affect the water supply of the Navajo Unit, CRSP.
>
> - Adequately protects natural and cultural re-sources.

The proposed San Juan 32-7 202H well pad would be approximately 210-feet from the ordinary high water mark of the Los Piños River and would be approximately 120-feet higher in elevation than the high water mark of the river. Hilcorp's proposed action has met the criteria for an exception to the NSO stipulation and drilling constraints.

1.4.2 – The Applicants

Hilcorp Energy Company is a privately owned exploration and production company, operating in the United States for approximately 36 years, incorporated in the State of Delaware, and operating in a number of locations across San Juan County and northern New Mexico and southern Colorado. The well pad currently supports an existing well (San Juan 32-7 #029A) which was developed in 1979 and is currently operated by Hilcorp.

Figure 2. Project Overview Map



1.5 – NEPA Sufficiency Review for Certain Project Features

This project review tiers to the Navajo Reservoir Area Resource Management Plan, Final Environmental Assessment and Finding of No Significant Impact (USBR 2008). There has been no recent NEPA reviews associated with this project within at least the past five years[1].

1.6 – Project Planning

Project planning and coordination for this EA was completed by Reclamation, in consultation with the Bureau of Land Management, New Mexico Game and Fish, and New Mexico Oil Conservation Division to identify the potential environmental and human environment issues and concerns associated with implementation of the Proposed Action and No Action Alternatives. Please see **Appendix C - Distribution List** for entities which will receive notice for comment of the Draft EA.

Resources analyzed in this EA are discussed in Chapter 3. The following resources in **Table 2** were identified as ***not present or not affected***, and are not analyzed further in this EA:

Table 2. Resources Eliminated from Further Analysis

Resource	Rationale for Elimination from Further Analysis
Indian Trust Assets and Native American Religious Concerns	No Indian trust assets have been identified within the Project Area. No Native American sacred sites were identified within the Project Area. Neither the No Action Alternative, nor the Action Alternative, would affect Indian trust assets or Native American sacred sites. To confirm this finding, Reclamation will provide the Southern Ute Indian Tribe with a description of the Project and a written request for comments regarding any potential effects on Indian trust assets or Native American sacred sites.
Wild & Scenic Rivers, Land with Wilderness Characteristics, or Wilderness Study Areas	No Wild and Scenic Rivers, land with wilderness characteristics, or Wilderness Study Areas exist in the Project Area. Therefore, neither the No Action Alternative nor the Action Alternative would have an effect on these resources.

[1] Executive Order 14154, *Unleashing American Energy* (Jan. 20, 2025), and a Presidential Memorandum, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity* (Jan. 21, 2025), require the Department of Interior to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 et seq. Further, such Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. Reclamation verifies that it has complied with the requirements of NEPA, including the Department's regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President's January 2025 Order and Memorandum. Reclamation has also voluntarily considered the Council on Environmental Quality's rescinded regulations implementing NEPA, previously found at 40 C.F.R. Parts 1500–1508, as guidance to the extent appropriate and consistent with the requirements of NEPA and Executive Order 14154.

CHAPTER 2 – ALTERNATIVES

Alternatives evaluated in this EA include the No Action Alternative, and the Proposed Action Alternative.

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not approve the land use authorization (license agreement) for the Project. The existing well (San Juan Unit #029A) at the location would continue to be operated under current plans. Other land uses in the area (recreational access, livestock grazing, other oil and gas operations, etc.) would also continue on current trajectories under current land use management guidance.

2.2 – Proposed Action

2.2.1 – Summary

The Proposed Action would include Reclamation's approval of the land use authorization (license agreement) as submitted, with conditions of approval, design features, and applicable environmental commitments that are developed as a result of this analysis. As a result of Reclamation approval, the proposed project would take place.

Hilcorp would re-develop the San Juan Unit #029A well pad to construct the San Juan 32-7 Unit 202H well pad, horizontally drill and operate a multilateral natural gas well; install above ground appurtenances and facilities on the well pad, and construct and operate a produced water pipeline. When the proposed well is no longer needed, the well would be plugged and abandoned and the proposed well pad and associated access road would be reclaimed. The produced water pipeline would be capped, filled with inert gases, and abandoned in place. The proposed infrastructure associated with the San Juan 32-7 202H Project would be located on-lease and would be built per lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM 078423X). The proposed well would access fee minerals within Hilcorp's San Juan 32-7 Unit. Natural gas produced from the new well would be delivered to Harvest Four Corners (Harvest) existing meter house located on the well pad. Natural gas custody would be transferred to Harvest, and the natural gas would be conveyed through Harvest's existing natural gas pipeline (grant number NMNM40345) for processing and delivery to national markets.

Details of well development can be found in the approved APD on file with the NMOCD, including additional construction and maintenance activity details (which are also detailed below, and detailed in **Appendix A – Surface Use Plan of Operations**). The proposed project components would be constructed at roughly the same time.

The Proposed Action would result in a total of approximately 1.06 acres of new surface disturbance on Reclamation–managed surface, and 2.02 acres of disturbance on previously disturbed areas. Approximately 1.66 acres would be reclaimed (reseeded and recontoured) during interim reclamation. The remaining 1.24 acres would remain disturbed throughout the life of the project and would be reclaimed when the well is abandoned. The existing natural gas pipeline is within the limits of the pad, and no new surface disturbances would occur for the natural gas pipeline. Surface disturbance associated with the Proposed Action is summarized in **Table 3** below.

Table 3. Surface Disturbance by Project Component

Project Component	Disturbance Acreage			Disturbance Following Interim Reclamation	
	Total	Existing Disturbance Utilized	New Disturbance	Fully Reclaimed	Long-term Disturbance
Well Pad & Construction Zone	2.06	1.50	0.56	0.82	1.24
Produced Water Pipeline	0.84[2]	0.5	0.5	0.84	0
Existing Road[3]	0	-	0	0	0
Total:	**2.90**	**2.02**	**1.06**	**1.66**	**1.24**

[1] 0.14 acres of disturbance is accounted for within the well pad. Tie in would be on existing pad.
[2] 0.16 acres of the water pipeline construction corridor disturbance is accounted for within the well pad and construction zone
[3] Approximately 4,828 feet (0.82 miles) of existing road on Reclamation would continue to be used consistent with their existing lease agreement.

2.2.2 – Access Road

The existing access road to the San Juan 32-7 Unit #029A well pad has been recently maintained and graveled and is in suitable condition. Approximately 4,828 feet (0.82 miles) of the access road occurs on Reclamation and would continue to be used consistent with the new lease agreement. No additional upgrades to the road are planned. However, where the road splits to allow access to the well pad or for the public to access other Reclamation lands to the south, Hilcorp is proposing to install a lockable gate to prevent public access to the well pad during construction. Keyed access will be provided to Reclamation and the grazing allottee(s) at all times. The locking of this gate is dependent upon Reclamation implementing the appropriate notifications and procedures in 43 CFR, §423 Subpart B – Areas Open and Closed to Public Use. Where the produced water pipeline crosses the road, boulders would be placed at the edge of the road to prevent vehicles (e.g., OHVs) from leaving the road and travelling down the produced water pipeline corridor. New culverts with site-specific stormwater controls would also be installed. The access road would be maintained to Reclamation standards, which generally follow BLM Gold Book standards and BLM 9113-1 (Roads Design Handbook) and BLM 9113-2 (Roads National Inventory and Condition Assessment Guidance and Instructions Handbook).

2.2.3 – Well Pad

The proposed well pad reconstruction would be an irregularly shaped, 215-foot by 275-foot (1.24 acres) working surface, with a 50-foot construction buffer on the north, east and south sides of the pad (totaling 0.82 acres). A large quantity of fill material would need be brought in from off-site to level the current two-tiered configuration of the existing well pad. Total fill material would be 6,000 cubic yards of material. The working area for the pad (1.24 acres) would remain disturbed throughout the life of the project, but this acreage would be reclaimed during final reclamation. The remaining disturbed areas of the well pads and construction zones would be reseeded and recontoured during interim reclamation. See **Table 3** (above) for each proposed project's components and associated surface disturbance.

The production equipment for the well pad would include three low profile above ground produced water tanks, separator, two (2) meter house assemblies and solar panels, and well head appurtenances (such as valving and a glycol unit). Any fluid storage tanks would be within secondary containment vessels (including lined and bermed areas). Containment areas would be capable of containing 110% of the fluids in the largest tank in the containment area and would also include sufficient freeboard for precipitation.

2.2.4 – Produced Water Pipeline

For the produced water pipeline, which would be installed and operated by Hilcorp, a 3-inch diameter, steel, buried, produced water pipeline would start at the well pad and run north and northwest for 1,079.13 feet (0.2 mile), closely paralleling and partially overlapping the access road. The produced water pipeline would tie-into Hilcorp's existing produced water pipeline network for reuse and disposal in an existing injection well. The easement area for the produced water pipeline would be 40-feet wide. The produced water pipeline would also be used to supply water for the drilling and completion of the well.

The construction of the produced water pipeline would result in approximately 0.84-acre of temporary surface disturbance on Reclamation lands. Most of this disturbance would be in and adjacent to previously disturbed areas parallelling the access road, and in sparse shrubland/grass vegetation types, and would cross existing pipeline rights-of-ways (see section **3.2.6 – Vegetation**, below).

Prior to construction, the pipeline construction area would be clearly marked in the field. Construction of the project would overlap previous disturbance to the maximum extent practicable. Site-specific Best Management Practices (BMPs) for sediment and erosion control would be implemented for the proposed project to minimize impacts to surface water quality.

All work would be restricted to the approved pipeline corridor, but use of the adjacent road is would also be used for construction access and, where appropriate, parking and off-loading of materials. Overall, construction of the project would be sequenced as follows:

- The construction area would be clearly marked and/or staked.
- The construction area would be cleared and grubbed, as needed; rough grading may be necessary at this stage of construction.

    - Vegetation material and topsoil removed during this stage would be stockpiled for later use during reclamation.
- One trench would be excavated for the entire length of the produced water pipeline.
    - Trenching would be completed by a large track hoe with a 4-foot-wide bucket.
        - Available topsoil would first be removed from the trench and stockpiled, or windrowed, to one side of the trench line.
        - Subsoils would then be excavated to a depth of approximately 4 to 6 feet, as applicable based on conditions.
        - Topsoil would be stockpiled on one side of the trench and subsoils stockpiled on the opposite side. The pipe would be staged along the trench and welded together.
        - Any trenches left open while cattle grazing is occurring in the area would need to be temporarily fenced off, or have escape ramps no more than 100-feet apart.
        - No more than ½ mile of trench or the amount of trench that can be worked in one day will be open at any given time.
- Once a section of pipe has been lowered into the trench it would be backfilled.

2.2.5 – Construction, Drilling, and Completions

Prior to construction, the proposed project area would be staked to ensure that all activity would be confined to authorized areas. Staking would be maintained for the duration of construction activities.

The construction phase would begin the fall of 2025, if Reclamation approves the license agreements. The project would take approximately 4 months to complete, which includes well pad construction, pipeline(s) construction, and well drilling and completion. Within the 4 months of construction activities, it would take 3 weeks to construct the well pad, 2 weeks for pipeline construction, and approximately 3 months to drill and complete the well. The existing meter house and associated piping would be slightly relocated, on pad, to accommodate the meter house and piping for the new well. Both wells would connect to the existing pipeline at the edge of the well pad; these operations would take approximately one week to construct.

Prior to construction of the well pad, the upper six inches of topsoil (if available) would be stripped following vegetation and site clearing. Topsoil would not be mixed with the underlying subsoil horizons and would be stockpiled as a berm along the eastern perimeter of the well pad within the construction buffer zone or as a windrow along the road/pipeline corridor, separate from subsoil horizons or other excavated material. Topsoil and sub-surface soils would be replaced in the proper order, prior to final seedbed preparation. Spreading shall not be done when the ground or topsoil is wet. Vehicle/equipment traffic would not be allowed to cross topsoil stockpiles. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments would be added to the topsoil as advised by the Hilcorp environmental scientist or appropriate agent/contractor. See Topsoil Map, in Appendix A of **Appendix A – Surface Use Plan of Operations**.

Once well pad grading and modifications are complete, a drilling rig would be transported and erected on the well pad. Additional equipment and materials needed for drilling operations would be trucked and stored at the well pad. Following completion of the proposed natural gas well, the drilling rig would be rigged down. Drilling and completions would take approximately 3 months, and no hydraulic fracturing of producing zones is proposed (see Appendix D. Drill Rig Diagrams and Equipment Layout, in **Appendix A – Surface Use Plan of Operations**).

Equipment mobilization and demobilization would consist of six to eight transport truckloads to deliver and remove heavy equipment to and from the project area; this equipment would remain onsite until construction is complete. During construction of the well pad and pipeline, it is estimated that 20 to 30 construction personnel would be onsite 6 days per week (Monday–Saturday) between the hours of 6:00 a.m. and 6:30 p.m.; they would be transported to and from the site by 10 to 15 standard-size pickup trucks. Construction personnel would be onsite 24 hours per day/7 days per week during the well drilling and completion phases for the project.

During drilling operations, traffic at the site would include:

- 2-4 rig crew trucks daily
- vendor/delivery/water trucks daily
- 5-10 trucks per day for 15 days for preparation and completion

Drilling operations would be conducted in compliance with all Federal Onshore Oil and Gas Orders and all applicable Federal and State of New Mexico rules and regulations. The proposed well would have two horizontal wells off the primary well bore targeting the Fruitland Coal formation. The proposed wells would be drilled to a total vertical depth of approximately 4,000 feet (depending on well) and then horizontally drilled up to 3,363 feet to the bottom hole objective. More details on the horizontal wells can be found in Appendix C. Well Pad Plats with Access Route and Directions, in **Appendix A. Surface Use Plan of Operations**, and in the API on file with the NMOCD.

The installation of production equipment would take approximately 2 to 3 weeks. Production equipment would be in place for the life of the well (approximately 30 years).

Construction equipment may include chainsaws, a brush hog, scraper, maintainer, excavator, dozer, backhoe, hydrovac, welder, trencher, side-boom, and miscellaneous specialty equipment. Standard drilling operation equipment includes drilling rig with associated equipment, temporary office trailers equipped with sleeping quarters for essential company personnel, toilet facilities, and trash containers.

2.2.5.1 – Water Usage and Conveyance

Produced water from Hilcorp's existing wells in the surrounding area would be utilized for drilling operations. In addition, if needed, fresh water may be purchased from the list of fresh water sources below.

A. Water would be trucked from these sources to the proposed location (See Appendix F in **Appendix A – Surface Use Plan of Operations**).

   - Ignacio Water Shed - northwest ¼ of Section 20 Township 33 North, Range 7 West, Permit Number (SJ-206)

- Self-water Hole- northeast ¼ Section 7 Township 32 North, Range 6 West, Permit Number (SD 02964 2A)
- Faverino Water Hole- northwest ¼ of Section 7 Township 32 North, Range 6 West, Permit Number (SJ-17)
- Aztec Water Shed- southeast ¼ of Section 3 Township 30 North, Range 11 West, Permit Number (SJ-55)
- Basin Disposal- northwest ¼ of Section 3 Township 29 North, Range 11 West, Permit Number (SJ-26)

B. Sources for produced water may come from the list below and would be piped through Hilcorp's existing waterline infrastructure and the proposed waterline associated with this project to the proposed location.

- Middle Mesa 1 SWD- API 30-045-27004, operated by Hilcorp Energy Company, located in the Southwest ¼ of the Northeast ¼ Section 25, Township 32 North, Range 7 West (on BLM lands).
- San Juan 32-7 Unit 301 SWD- API 30-045-28549- operated by Hilcorp Energy Company, located in the Southwest ¼ of the Southwest ¼ Section 34, Township 32 North, Range 7 West (on BLM lands).
- SJ 32-8 253 Water Transfer Station- operated by Hilcorp Energy Company- Northeast ¼ of the Southwest ¼ Section 27, Township 32 North, Range 8 West (on BLM lands).

A total of up to 0.36 acre-feet (AF) of recycled/produced water would be used, and 0.15 AF of fresh water, totaling 0.51 AF of water use for drilling and completion of the well.

These leased water rights are specifically designated for commercial and industrial use by Hilcorp and would be obtained from the Navajo Reservoir at the permitted Middle Mesa 1 SWD, the San Juan 32-7 Unit 301 SWD, and the SJ 32-8 253 Water Transfer Station, on BLM-managed surface.

Use of produced water from existing wells for drilling fluid is authorized under New Mexico State Regulations (NMAC 19.15.2.52). Hilcorp may choose to use fresh water for drilling if sufficient produced water is not available or cannot be reasonably delivered to the well pad in a timely manner. It is estimated that development of the well would require 0.36 AF (or approximately 70-percent of water needed) of non-potable groundwater (produced water from other oil and gas wells in the area). Fresh water trucked into the site for development-related activities would total 0.15 AF, or approximately 30-percent of all water needed. Total water usage (produced and recycled water) for the Proposed Action at 0.516 AF.

Following drilling and completion, the produced water pipeline would flow produced water from the San Juan 32-7 #202H to Hilcorp's existing water pipeline networks for disposal at the Middle Mesa 1 SWD or at the San Juan 32-7 Unit 301 SWD.

2.2.6 – Interim Reclamation

Following the completion of the produced water pipeline construction, Hilcorp would initiate reclamation of the pipeline corridor and temporarily impacted areas around the well pad, consisting

of re-contouring the disturbed areas, preparing a seed bed by re-distributing any available topsoil, ripping to reduce compaction, disking and seeding. New fill areas and other reclaimed areas at the well pad may not have enough available topsoil to provide growth medium, and in these areas the existing soil would be amended to help begin the establishment of topsoil or a viable growth medium (see Appendix A. Surface Reclamation Plan in **Appendix A – Surface Use Operation Plan**). A mulch would be used as temporary stabilization and to promote successful re-vegetation. Mulch typically consists of crimped straw, with the use of a tackifier, as necessary. Slopes steeper than 3:1 would have a hydromulch applied. Hilcorp would monitor for invasive species or noxious weeds for the life of the project. Management of invasive species or noxious weeds would be in accordance with the Navajo Reservoir RMP (USBR 2008). Additionally, Reclamation is requiring a noxious weed management plan from Hilcorp given the amount of off-site fill material being imported; this plan can be found in Appendix A of **Appendix A – Surface Use Operation Plan**. A list of design features, also captured in the APD, and BMPs that Hilcorp has committed to, is provided in **Appendix A – Surface Use Operation Plan**.

2.2.7 – Operation

The projected in-service date is December 1, 2025. The lifespan of the Proposed Action is 30 years.

Daily maintenance activities would be conducted during the operational phase. During the first month, an average of 2.5 pickup trucks per day would visit the well pad. By the sixth month of operation, the number of vehicles visiting the well pad would be reduced by half, with 1.0 pickup truck visiting the well pad once per day. The number of maintenance visits would be even further reduced after Year 3 of operation. It is expected that a Hilcorp operator would have to visit each well once per month for the lifespan of the Proposed Action.

2.2.8 – Final Reclamation

When the proposed well is no longer needed, the well would be plugged and abandoned following procedures approved by NMOCD and Reclamation. Final reclamation of the pad would be performed once the wellhead has been plugged and abandoned. Additional details are provided in **Appendix A – Surface Use Plan of Operations**.

Following the completion of the produced water pipeline construction, Hilcorp would initiate reclamation consisting of re-contouring the disturbed areas, preparing a seed bed by re-distributing topsoil, ripping to reduce compaction, disking and seeding. A mulch would be used as temporary stabilization and to promote successful re-vegetation. Mulch typically consists of crimped straw, with the use of a tackifier, as necessary. Slopes steeper than 3:1 would have a hydromulch applied. Hilcorp would monitor for invasive species or noxious weeds for the life of the project. Management of invasive species or noxious weeds would be in accordance with the Navajo Reservoir RMP (USBR 2008), and as detailed in **Appendix A – Surface Use Plan of Operations**.

2.2.9 – Permits & Authorizations

2.2.9.1 – Agreements & Authorizations

The following interagency agreements or permits would be required prior to Project implementation:

2.2.9.2 – Construction Permits & Plans

The following construction permits and plans would be required prior to Project implementation:

- Spill Response Plan, to be prepared in advance of construction by the contractor for areas of work where spilled contaminants could flow into water bodies.

Utility clearances, to be obtained by the construction contractor prior to construction activities from local utilities in the area.

Compliance with the following federal laws and Executive Orders (E.O.) are required prior to and during Project implementation (this list is not intended to be all-inclusive):

Natural Resource Protection Laws

- Clean Air Act of 1963 (42 U.S.C. § 7401)
- Endangered Species Act of 1973 as amended (16 U.S.C. 1531-1544, 87 Stat. 884)
- Clean Water Act of 1972 as amended (33 U.S.C. 1251 et seq.)
- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712)
- Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668- 668c)
- Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

Cultural Resource Laws

- National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-470mm et seq.)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 et seq.)
- American Indian Religious Freedom Act of 1978 (42 U.S.C. Public Law 95-341)
- Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48 FR 44716)

Paleontological Resource Laws

- Paleontological Resources Preservation Act of 2009 [Section 6301-6312 of the Omnibus Land Management Act of 2009 (Public Law 111-11 123 Stat. 991-1456)]

CHAPTER 3 – AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

3.1 – Introduction

This chapter discusses resources that may be affected by the Action Alternative and the No Action Alternative. For each resource, the affected area and/or interests are identified, existing conditions described, and impacts are disclosed under the No Action and Proposed Action. This section concludes with a summary of impacts.

3.2 – Affected Environment & Environmental Consequences

3.2.1 – Air Quality

Air quality is determined by the quantity and chemistry of atmospheric pollutants in consideration of meteorological factors (e.g., weather patterns) and topography, both of which influence the dispersion and concentration of those pollutants. The presence of air pollutants is generally due to a number of different and widespread sources of emissions.

The analysis area for effects on air quality includes San Juan, Sandoval, Rio Arriba, and McKinley Counties because they overlap the Mancos Shale Formation and associated sandstones referred to as the Gallup Zone, which includes the Gallup Sandstone, El Vado Member, and Tocito Sandstone Lentile and has the highest potential for oil and gas development near Nageezi and Counselor, New Mexico (Crocker and Glover 2018). This spatial scope of analysis was identified based on the regional nature of air pollution and to facilitate analysis using the best available air quality data, which are generally provided at the county level.

Much of the information referenced in this section is from the BLM 2023 *Air Resources Technical Report for Oil and Gas Development: New Mexico, Oklahoma, Texas and Kansas* (herein referred to as the Air Resources Technical Report (ARTR) and incorporated into this EA by reference) (BLM 2023).

3.2.1.1 – National Ambient Air Quality Standards for Criteria Pollutants

The Clean Air Act (CAA) requires the EPA to set National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants considered harmful to public health and the environment: carbon monoxide (CO); nitrogen dioxide (NO_2); ozone (O_3); particulate matter (PM_{10} and $PM_{2.5}$); sulfur dioxide (SO_2); and lead (Pb). Nitrogen oxides (NO_x) and volatile organic compounds (VOC) emissions also contribute to secondarily formed pollutants of O_3 and $PM_{2.5}$ through a complex series of atmospheric chemical interactions. The CAA categorizes NAAQS as "primary" or "secondary." Primary standards provide public health protection, including the health of at-risk populations, with

an adequate margin of safety (EPA 2024a), and secondary standards provide for public welfare, including protection against degraded visibility and damage to animals, crops, vegetation, and buildings (EPA 2024a). A detailed description of these pollutants, along with their health effects and their sources, can be found in Chapter 3 of the ARTR (BLM 2023).

As a non-regulatory agency, Reclamation follows the regulations of the EPA and state agencies. The EPA has delegated the responsibility of regulation and enforcement of the NAAQS to the state level for states with approved State Implementation Plans, and has approved the New Mexico State Implementation Plan, which allows the State of New Mexico to enforce both the New Mexico Ambient Air Quality Standards (NMAAQS) and the NAAQS on all federal and private lands with the exception of tribal lands and lands within Bernalillo County (NMED 2024b). Tribal lands under EPA jurisdiction follow the Federal Implementation Plan for the *Indian Country Minor New Source Review Program for the Oil and Gas Industry* (80 Federal Register 51991).

Concentrations of air pollutants are measured at air monitoring sites and expressed in parts per million (ppm), parts per billion (ppb), or micrograms per cubic meter ($\mu g/m^3$), depending on the unit of measure for a specific standard. Design values are statistics that describe the air quality in any given area relative to the NAAQS levels. Compliance with the NAAQS is typically demonstrated through monitoring of ground-level concentrations of atmospheric air pollutants. Design values are used to designate and classify nonattainment areas, as well as to assess progress toward meeting the NAAQS. Areas where pollutant concentrations are below the NAAQS are designated as attainment or unclassifiable. Locations where monitored pollutant concentrations are higher than the NAAQS are designated nonattainment, and air quality is considered unhealthy. All of the planning area is in attainment/unclassified for each of the NAAQS; however, air monitoring data show that 3-year average O_3 concentrations in the planning area are within 95% of the 8-hour O_3 NAAQS. If the NMED determines that emissions from sources within its jurisdiction cause or contribute to O_3 concentrations in excess of 95% of the NAAQS for O_3, it must adopt a plan, including regulations, to control emissions of NO_X and volatile organic compounds (VOCs) to provide for attainment and maintenance of the standard. See N.M.S.A. 1978, § 74-2-5. The NMED initiated an Ozone Attainment Initiative (OAI) to address O_3 levels in the area, including recent new rulemaking. See New Mexico Oil Conservation Commission (NMOCD) Waste Prevention Rule, NMAC 19.15.27.9 (NMOCD 2021), and NMED O_3 Precursor Rule, NMAC 20.2.50.1-20.2.50.128 (NMED 2022). The NMED also participates in the voluntary Ozone Advance Program, which is a collaborative effort to encourage O_3 emission reductions in attainment areas. Through this program, states, tribes, and local governments work with EPA to take near-term steps to improve local air quality and ensure continued health protection over the long term. The goal is to avoid NAAQS violations and maintain an attainment designation. In total, the Ozone Advance Program and outreach efforts include the following nine counties: Chaves, Doña Ana, Eddy, Lea, Rio Arriba, San Juan, Santa Fe, Sandoval, and Valencia.

The EPA's Air Quality Design Values webpage lists the Design Value Reports used for making NAAQS and NMAAQS compliance determinations (EPA 2024). Design values that are representative of the impact analysis area are provided in **Table 4**. It is assumed that counties without reported design values have good air quality and pollutant concentrations are below the NAAQS.

Table 4. Design Values Compared with NAAQS and NMAAQS for Counties within the Analysis Area

Pollutant	2023 Design Concentrations	Averaging Time	NAAQS	NMAAQS
CO	La Plata County, Colorado: Ute 1 at 0.7 ppm, Ute 3 at 0.3 ppm	8-hour	9 ppm	8.7 ppm
CO	La Plata County, Colorado: Ute 1 at 1.8 ppm, Ute 3 at 2.9 ppm	1-hour	35 ppm	13.1 ppm
O_3	Rio Arriba County: 0.063 ppm Sandoval County: 0.067 ppm San Juan County: 0.070 ppm: four stations; Bloomfield at 0.065 ppm, Navajo Dam at 0.070 ppm, Shiprock at 0.067 ppm, Chaco Culture National Historical Park (NHP) at 0.067 ppm	8-hour*	0.070 ppm	–
NO_2	San Juan County: 9 ppb, four stations; Bloomfield at 9 ppb, Navajo Dam at 6 ppb, Chaco Culture NHP at 1 ppb, and Shiprock at 2 ppb	Annual†	53 ppb	50 ppb
NO_2	San Juan County: 33 ppb, four stations; Bloomfield at 33 ppb, Navajo Dam at 22 ppb, Chaco Culture NHP at 4 ppb, Shiprock at 20 ppb	1-hour‡	100 ppb	–
SO_2	San Juan County: 8 ppb: two stations; Bloomfield 1 ppb, Shiprock at 4 ppb	1-hour§	75 ppb	–
$PM_{2.5}$	Taos County: 4.9 μg/m^3	Annual†,**	9 μg/m^3	–
$PM_{2.5}$	Taos County: 15 μg/m^3	24-hour‡,**	35 μg/m^3	
PM_{10}	San Juan County: 3	24-hour†,**	150 μg/m^3, not to be exceeded more than once per year on average over 3 years	–

Source: EPA (2024)

ppm = parts per million, ppb = parts per billion, μg/m^3 = micrograms per cubic meter

* Annual fourth highest daily maximum 8-hour concentration, averaged over 3 years.

† Not to be exceeded during the year.

‡ 98th percentile, averaged over 3 years.

§ 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

** Annual mean averaged over 3 years.

The main pollutants of concern in the project area are O_3, $PM_{2.5}$, and PM_{10} as these are the pollutants with reported design values nearest the NAAQS. O_3 (ozone) is not emitted directly into the air, but results from chemical reactions between a group of highly reactive gases called NO_X and VOCs when they are exposed to sunlight (EPA 2024). O_3 and NO_2 are criteria air pollutants (CAPs) and are regulated under the NAAQS and NMAAQS. VOCs are not criteria pollutants; however, emissions of both VOCs and NOX (particularly NO_2, which is used as an indicator for the larger group of gases) are used as proxies for determining potential levels of secondary formation of O_3. People most at risk from breathing air containing O_3 include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers. In addition, people with certain genetic characteristics, and people with reduced intake of certain nutrients, such as vitamins C and E, are at greater risk from O_3 exposure (EPA 2024). Additional information on O_3, along with its health effects and sources, can be found in Section 3 of the ARTR (BLM 2023).

Another pollutant of concern in the southwestern United States is particulate matter. The EPA regulates particulate matter 10 micrometers in diameter or smaller (PM_{10} and $PM_{2.5}$) because these smaller particles are associated with negative health effects, including respiratory and cardiovascular problems, and because they can become more deeply imbedded into the lungs and may even get into the bloodstream (EPA 2024). The EPA does not regulate particles larger than 10 micrometers in diameter (such as sand and larger dust particles). Like O_3, particulate matter is formed by reactions between other chemicals, specifically between SO_2 and NO_X, which are emitted from vehicles, power plants, and other industrial processes (EPA 2024). Additionally, particulate matter emissions often result directly from activities like construction, traffic on unpaved roads, fields, and fires (EPA 2024d). $PM_{2.5}$ is not currently monitored in the analysis area because, per previous monitoring and/or state regulatory expertise, it is expected to meet the EPAs standard. *See generally*, 42 U.S.C. § 7407. Previous annual monitoring of $PM_{2.5}$ in San Juan County resulted in design values of 4.7 $\mu g/m^3$ (2011-2013), 4.5 $\mu g/m^3$ (2012-2014), and 4.1 $\mu g/m^3$ (2013- 2015) (BLM 2024, EPA 2024), which is below the new NAAQS of 9.0 $\mu g/m^3$.

The current 2021-2023 design value in San Juan County (ID 350451005) is above the 24-hour PM_{10} NAAQS; however, the area is still designated as attainment. The PM_{10} NAAQS metric is the annual estimated number of exceedances, averaged over three consecutive years. The number of PM_{10} exceedances was zero in 2018, zero in 2019, one in 2020, zero in 2021, eight in 2022, and one in 2023. The high number of exceedances in 2022 corresponds to the extreme fire season that occurred in New Mexico during that year (second most acres burned since 1990 at 909,318 acres (SWCC 2024). Design values that did not include the 2022 year were below the PM_{10} NAAQS (2018-2020 and 2019-2021) in San Juan County. Additional information on particulate matter, along with health effects and sources, can be found in Section 3 of the ARTR (BLM 2023), incorporated by reference.

3.2.1.2 – Air Quality Related Values

The prevention of significant deterioration (PSD) is a CAA permitting program for new or modified major sources of air pollution located in attainment areas. It is designed to prevent NAAQS violations, preserve and protect air quality in sensitive areas, and protect public health and welfare (EPA 2024). Under PSD regulations, the EPA classifies airsheds as Class I, Class II, or Class III. The CAA PSD requirements give more stringent air quality and visibility protection to national parks and wilderness areas that are designated as Class I areas, but a PSD designation does not prevent emissions increases. Federal land managers are responsible for defining specific air quality related values (AQRVs), including visual air quality (haze), and acid (nitrogen and sulfur) deposition,

for an area and for establishing the criteria to determine an adverse impact on the AQRVs. The nearest Class I areas are Mesa Verde National Park and the Weminuche Wilderness Area to the north, San Pedro Parks Wilderness Area and Bandelier Wilderness Area to the southeast and the Petrified National Park to the southwest. The analysis area is in attainment for the NAAQS and the NMAAQS and is categorized as a Class II area (EPA 2024; NMED 2024c). This project is not subject to PSD analysis or permitting.

As required by the Regional Haze Rule, state reasonable progress goals must provide for an improvement in visibility for the 20% most anthropogenically impaired days relative to baseline visibility conditions and ensure no degradation in visibility for the 20% clearest days relative to baseline visibility conditions (EPA 2018). Model simulations projected visibility out to the model year 2028 using the average visibility (in deciviews) for the years 2014 through 2017 for each Class I area. The visibility conditions in these years are the benchmark for the "provide for an improvement" and "no degradation" requirements. A line drawn between the end of the 2000-2004 baseline period and 2064 (dv/year) shows a uniform rate of progress or "glidepath" between these two points. The glidepath represents a linear or uniform rate of progress and is the amount of visibility improvement needed in each implementation period to stay on the glidepath; there is no rule requirement to be on or below the glidepath. Results for the nearest Class I areas to the analysis area shows improving trends for the future year (2028) deciview values on the 20% clearest and most impaired days. The 2028 default adjusted glidepath shows that 2028 projected 20% most impaired days are below the glideslope for the nearest Class I areas (in some cases, the unadjusted is slightly above). More information can be found in the *Technical Support Document for EPA's Updated 2028 Regional Haze Modeling* (EPA 2019), incorporated by reference. Visibility extinction trends based on air monitoring data from the IMPROVE monitors in the BLM New Mexico State Office area of responsibility show that visibility trends have been flat or improving (Figures 10 through 22 of the ARTR [BLM 2023]). Specifically, visibility trends shown for Bandelier, San Pedro Parks, Mesa Verde, and Weminuche indicate that visibility on the best days has been flat to improving and that visibility on worst days has shown little change over the period of record, although a trend is difficult based upon the yearly variability. Based on the current monitoring and projected 2028 modeled data, the Class I areas within the analysis area are on track for meeting the visibility and light performance requirement for the 2064 end point. Implementation of Best Available Retrofit Technology (BART) strategies as required under the federal Regional Haze Rule over the next few years should result in further improvements (BLM 2023).

The National Park Service (NPS) monitors and evaluates deposition to determine which parks are most at risk from air pollution and where conditions are declining or improving. Nitrogen deposition conditions in NPS-managed areas near the project area are generally fair to good with no trend for improving or worsening conditions, while sulfur deposition conditions are fair to good and generally improving (where trend data are available) (**Table 5**) (NPS 2024).

Table 5. Nitrogen and Sulfur Deposition Conditions at NPS-Managed Areas in New Mexico

Class I Areas	**Nitrogen (Conditions / Trend)**	**Sulfur (Conditions / Trend)**
Bandelier National Monument	Fair / Relatively unchanging trend	Good / Improving trend
Mesa Verde National Park	Fair / Relatively unchanging trend	Good / Improving trend
Petrified Forest National Park	Poor / Relatively unchanging trend	Good / Improving trend
Other Class II Areas	**Nitrogen (Conditions / Trend)**	**Sulfur (Conditions / Trend)**
Aztec Ruins National Monument	Good / Trend not available	Good / Trend not available
Canyon de Chelly National Monument	Fair / Trend not available	Good / Trend not available
Chaco Culture National Historic Park	Fair / Trend not available	Good / Trend not available
El Malpais National Monument	Fair / Trend not available	Good / Trend not available
El Morro National Monument	Fair / Trend not available	Good / Trend not available
Manhattan Project National Historical Park	Poor / Trend not available	Fair / Trend not available
Petroglyph National Monument	Poor / Trend not available	Good / Trend not available
Valles Caldera National Preserve	Fair / Trend not available	Good / Trend not available

Sources: NPS (2024).
Note: Only areas with air monitoring equipment are reported in this table.

3.2.1.3 – Criteria Pollutant Emissions within the Analysis Area

Along with criteria pollutant concentrations as measured by air monitors, the EPA provides data on criteria pollutant emissions, expressed in tons per year or total volume of pollutant released into the atmosphere. Emissions data point to which industries and/or practices are contributing the most to the general level of pollution (BLM 2023). Emissions associated with industry and other anthropogenic practices within the San Juan Basin are primarily the result of electrical power generation, oil and gas development, vehicles (highway and off-highway traffic), and other industrial activities (EPA 2024; BLM 2023).

The NMED compiles statewide emission inventories to assess the level of pollutants released into the air from various sources. The 2020 National Emissions Inventory (NEI) data for the state of New Mexico and San Juan, Sandoval, Rio Arriba, and McKinley Counties (four counties in the San Juan Basin) are listed in **Table 6** (EPA 2024). Sources of criteria air pollutants in the analysis area are two coal-fired electrical generation units: the San Juan Generating Station 15 miles west of Farmington, New Mexico which was closed in September 2022, and the Four Corners Power Plant on the Navajo Nation near Fruitland, New Mexico (BLM 2023; EPA 2024).

Table 6. 2020 NEI Air Pollutant Emissions for San Jan Basin Counties in New Mexico

Source of Data	Emissions (tons per year)						
	PM_{10}	**$PM_{2.5}$**	**VOC**	**NO_X**	**CO**	**SO_2**	**HAPs**
2020 NEI – San Juan, Sandoval, Rio Arriba, and McKinley Counties*	24,218	6,042	141,794	53,708	108,755	2,301	15,278
2020 NEI – State of New Mexico	129,132	42,623	712,639	199,462	615,513	87,828	105,528

Source: EPA (2024e); data pulled from NEI as of September 13, 2024.
HAPs = hazardous air pollutants
* 2020 data include the point, nonpoint, onroad mobile, and nonroad mobile data. Values may not always sum correctly if queried on demand as the NEI database updates its emissions periodically with newer emission information.

The largest 2020 NEI anthropogenic sources of criteria air pollutants in San Juan, Sandoval, Rio Arriba, and McKinley Counties are: oil and gas sources for CO and NO_x; area sources for PM_{10} and $PM_{2.5}$ and ammonia (NH_3); natural sources (biogenic) for VOCs; and point sources for SO_x (**Table 7**). The Area Sources category includes all area sources except biogenic (natural) sources, forest wildfires, and prescribed fires. From the period of 2008 to 2020, air pollutant emissions have fluctuated. NOx decreased from 57,085 tons in 2008 to 53,708 tons in 2020, SO_2 decreased from 13,146 tons to 2,301 tons, PM_{10} decreased from 221,003 tons to 24,218 tons, $PM_{2.5}$ decreased from 25,868 tons to 6,042 tons, CO emissions decreased from 147,491 tons in 2008 to 108,755 tons in 2020, and VOCs decreased from 209,861 tons to 141,794 tons. Emissions from natural sources (biogenics) decreased from 229,692 tons in 2008 to 81,279 tons in 2020, while criteria air pollutant emissions from oil and gas production increased from 2,309 to 116,232 tons (EPA 2008, 2024a). Additional information on the reductions can be found in Section 4.1 of the ARTR (BLM 2023) and has been incorporated by reference.

Table 7. 2020 NEI Air Pollutant Emissions for San Juan Basin Counties in New Mexico, by Source

Source	Emissions (tons per year)						
	PM_{10}	$PM_{2.5}$	VOC	NO_X	CO	SO_x	NH_3
Area sources	20,805	2,989	4,571	322	2,064	34	5,605
Oil and gas sources	287	283	59,129	22,582	33,662	289	0
Nonroad mobile	128	124	737	2,978	7,469	4	2
Onroad mobile	362	193	1,763	6,826	25,162	14	146
Point sources	2,264	2,139	6,216	18,591	25,670	1,926	200
VOC refueling	-	-	924	-	-	-	-
Natural sources (biogenic)	-	-	67,639	2,336	11,304	-	-
Forest wildfires	330	279	723	64	3,039	30	51
Prescribed fires	42	35	92	9	385	4	6
San Juan, Sandoval, Rio Arriba, and McKinley Counties Total	**24,218**	**6,042**	**141,794**	**53,708**	**108,755**	**2,301**	**6,010**

Source: EPA (2024a).

3.2.1.4 – Hazardous Air Pollutants

A pollutant is classified as a hazardous air pollutant (HAP) if it has been identified by the EPA as a compound that is known or suspected to cause cancer or other serious health effects, such as compromises to immune and reproductive systems, birth defects, developmental disorders, and/or adverse environmental effects (BLM 2023). There are currently 188 compounds listed as HAPs by the EPA. HAPs emitted by the oil and gas industry include benzene, toluene, ethyl benzene, mixed xylenes, formaldehyde, and normal-hexane (n-hexane). National Emissions Standards for HAPs (NESHAPs), established by the EPA, limit the release of specified HAPs from specific industries (40 C.F.R. §§ 61, 63). NESHAPs for oil and gas development include control of benzene, toluene, ethyl benzene, mixed xylenes, and n-hexane from major sources, and benzene emissions from triethylene glycol dehydration units as area sources (BLM 2023).

The ARTR discusses the relevance of HAPs to oil and gas development and the particular HAPs that are regulated in relation to these activities (BLM 2023); the ARTR is incorporated by reference. Potential health risks associated with HAPs released into the air from oil and gas operations have been evaluated by review of existing emissions data, air quality monitoring, and modeling studies. The ARTR discusses in detail a 2019 health assessment study for which scientists from Colorado State University conducted on-site air monitoring for 47 VOCs (including HAPs) during various stages of well development and production at oil and gas extraction facilities in Colorado. In summary, simulated cancer risks to average individuals were below one in one million at distances of 1,400 feet from the well pads, four in one million at 500 feet from the well pads, and ten in one million at 300 feet from the well pads. Fewer than one in one million people at distances of 2,000 feet from the well pads experienced the worst potential long-term combination of individual risk

factors, oil and gas emissions, and local meteorological conditions (maximum exposed individual). This figure rises to seven in one million at 500 feet from the well pads, and 10 in 1 million at 400 feet from the well pads (BLM 2023).

The Air Toxics Screening Assessment (AirToxScreen), published by the EPA, provides a screening tool for state, local, and tribal air agencies (EPA 2022a). The EPA Air Toxics Screening Assessment is used to evaluate impacts from existing HAP emissions in New Mexico. AirToxScreen is the successor to the previous National Air Toxics Assessment. In December 2022, EPA released the results of its 2019 AirToxScreen (EPA 2022a). Currently, the 2020 AirToxScreen results are being rolled out from EPA but are incomplete; therefore, 2019 AirToxScreen results are discussed and presented. AirToxScreen calculates concentration and risk estimates from a single year's emissions data using meteorological data for that same year. The risk estimates assume a person breathes these emissions each year over a lifetime (or approximately 70 years). AirToxScreen provides quantitative estimates of potential cancer risk and five classes of non-cancer hazards (grouped by organ/system: immunological, kidney, liver, neurological, and respiratory) associated with chronic inhalation exposure to real-world toxics for each county and census tract (BLM 2023). AirToxScreen is a cumulative HAP assessment based on total HAP emissions from all sources contained in the NEI. Per the AirToxScreen Technical Support Document, this national-scale assessment (AirToxScreen) is consistent with EPA's definition of a cumulative risk assessment, as stated in EPA's *Framework for Cumulative Risk Assessment*, as "an analysis, characterization, and possible quantification of the combined risks to health or the environment from multiple agents or stressors" (EPA 2003; 2022b).

The 2019 AirToxScreen analysis reveals that the total cancer risk (defined as the probability of contracting cancer over the course of a 70-year lifetime, assuming continuous exposure) in San Juan, Sandoval, Rio Arriba, and McKinley Counties is 17.6, 18.7, 12.3 and 11.1 in 1 million, respectively, which is lower than the nationwide level (25.5 in 1 million) and in the same range as the state of New Mexico (19.1 in 1 million). The contribution of the oil and gas industry to the cancer risk in San Juan, Sandoval, Rio Arriba, and McKinley Counties is 2.06, 0.01, 0.04, and 0.01 in 1 million, respectively (EPA 2022a).[2] Bright lines[3] could not be used in the analysis of the HAP results to determine if a particular risk level is acceptable or not, as no such construct for risk exists within the CAA framework akin to the NAAQS (that is, there are no NAAQS against which to compare modeled HAP concentrations). Rather, values or ranges of values published by EPA (e.g., AirToxScreen [National Air Toxics Assessment] or 40 C.F.R. Part 300.430 [Remedial Investigation/Feasibility Study]) were used to provide useful context to risk estimates. While no explicit risk thresholds are available, EPA uses 1 in 1 million and 100 in 1 million risk for context (EPA 2022b). The values for San Juan, Sandoval, Rio Arriba, and McKinley Counties are within the contextual range published by the EPA.

AirToxScreen non-cancer hazards (i.e., respiratory) are expressed as a ratio of an exposure concentration to a reference concentration (RfC). RfCs are indicators defined by the EPA as the daily inhalation concentrations at which no long-term adverse health impacts are expected. For a given air toxin, exposures at or below the RfC (i.e., hazard quotients [HQs] 1 or less) are not associated with adverse health effects. As exposures increase above the RfC (i.e., HQ greater than 1),

[2] A one in 1 million lifetime cancer risk is defined as for every 1 million people who are continuously exposed over 70 years to a certain level of a pollutant, one person may develop cancer (EPA 2022a).

[3] "A "bright line" in risk characterization refers to a threshold value that separates acceptable and unacceptable levels of risk. It is regarded as a clear and unambiguous limit used to determine whether a particular level of exposure to a hazardous substance is safe or not." (BLM and Ramboll 2024).

the potential for significant adverse effects also increases (BLM 2023). Chronic non-cancer hazards are estimated for multiple air toxics by summing the HQs, creating a hazard index (HI). The HI in the analysis area (San Juan, Sandoval, Rio Arriba, and McKinley Counties) ranges from 0.28, 0.22, 0.13, and 0.12, respectively, which is lower than the national HI (0.31) and within a similar range as the New Mexico HI (0.22) (BLM 2023). A review of the results of the 2019 AirToxScreen shows that cancer, neurological risks, and respiratory risks in the analysis area are all lower than national levels and are generally the same as the state of New Mexico (EPA 2022a).

Additional HAPs analysis was prepared in response to an adverse decision of the U.S. Court of Appeals for the Tenth Circuit. Diné Citizens Against Ruining Our Env't v. Haaland, 59 F.4th 1016, 1047 (10th Cir. 2023) ("Diné CARE II").[4] The BLM Cumulative Hazardous Air Pollutants Modeling – Final Report (BLM and Ramboll 2023a) and the BLM Summary of Cumulative Oil and Gas Hazardous Air Pollutant Analysis for the FFO (BLM and Ramboll 2024), incorporated by reference and summarized below, detail the modeling methods used and the results of the modeling for the analysis area.

The BLM's Western United States HAP photochemical modeling assessment was prepared to support BLM's analysis of cumulative oil and gas impacts from HAPs originating from oil and gas production in Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming (states where the BLM commonly authorizes federal activities for fossil energy development) on public health. Given the location of the proposed project within the San Juan Basin, this assessment is appropriate and relevant to this Environmental Assessment. In regard to which HAPs to consider in the analysis, the Diné CARE II Court specifically mentioned five HAPs—benzene, toluene, ethylbenzene, mixed xylenes, and n-hexane—as applying to oil and gas development activities based on the National Emission Standards for HAPs (NESHAPs). See 43 C.F.R. Part 63. The modeling assessment evaluated emissions from existing federal, new federal, and non-federal oil and gas sources and includes six key HAPs—benzene, toluene, ethylbenzene, xylene, n-hexane, and formaldehyde—because these compounds are common in the oil and gas sector and consistent with regulatory requirements described in the Environmental Protection Agency's New Source Performance Standards, see 43 C.F.R. Part 60, and NESHAPs. HAP emissions in this study include emission sources associated with wellsite exploration, wellsite production, and midstream sources (BLM and Ramboll 2023a).

The modeling analysis evaluated air quality out to a future year of 2032[5] utilizing data from the 2028 Western Regional Air Partnership (WRAP)/Western Air Quality Study (WAQS) modeling platform, the Environmental Protection Agency SPECIATE 5.14 speciation profiles, the EPA's 2016v2 emissions modeling platform (EPA 2022c), and the BLM oil and gas development projections to quantify and apportion federal and non-federal oil and gas emissions (BLM and Ramboll 2023a).

[4] The federal Clean Air Act defines a Hazardous Air Pollutant (HAP) as "any air pollutant" of which "emissions, ambient concentrations, bioaccumulation or deposition of the substance are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effect." 42 U.S.C. § 7412.

[5] EPA's 2016v2 modeling platform (EPA 2022c), the most advanced dataset at the time of model development, includes emissions for the years 2016, 2023, 2026, and 2032. Future year 2032 was used in this modeling assessment. The Western Regional modeling for the FFO and RPFO included all the wells that were producing and expected to be producing up to 2032. The HAPs modeling followed the RFDs for both the FFO and the RPFO up until 2032, but total RFD production was not analyzed because of the limits of the current EPA data.

The model output allows the BLM to compare concentrations of HAPs to calculated risk-based thresholds in order to provide the hard look at the effects on public health required by NEPA.

Carcinogenic and noncarcinogenic chronic risks from modeled oil and gas concentrations were calculated for the 2032 future year. As noted in **Appendix B**, the Reasonably Foreseeable Development (RFD) scenarios (FFO and RPFO) for the New Mexico portion of the San Juan Basin represents a conservative projection for oil and gas production based on the number of completions occurring compared to the RFD forecast value. Health-based inhalation thresholds and cancer unit risk estimate threshold values were obtained from the weight of evidence for carcinogenicity under the 2005 EPA cancer guidelines (without revisions) (EPA 2021a). A residency exposure adjustment factor was applied to the cancer inhalation risk by multiplying the annual modeled concentration by the cancer unit risk factor and multiplying this product by an applicable exposure adjustment factor. The residency exposure adjustment factor[6] is computed by taking the average residency of the county where development is proposed and dividing that by length of exposure over an assumed 70-year life span. For San Juan, McKinley, Sandoval, and Rio Arriba Counties, the residency exposure adjustment factor would be 15.5/70, 18.5/70, 14.1/70, and 19.8/70, respectively (BLM 2023).

The oil and gas cancer risk from federal sources (existing and new) and from all mineral designations together from the combination of benzene, ethylbenzene, and formaldehyde are in the BLM Summary of Cumulative Oil and Gas Hazardous Air Pollutant Analysis for the FFO (BLM and Ramboll 2024) and the ARTR (BLM 2023). The risk analysis was performed only for the three HAPs (benzene, ethylbenzene, and formaldehyde) because these pollutants had EPA-provided non-zero unit risk estimate (URE) values based on the weight of evidence approach (EPA 2021b). The non-adjusted (70-year) cancer risk from all oil and gas sources for San Juan, McKinley, Sandoval, and Rio Arriba Counties is less than 30 in a million (maximum of 27.48, 2.21, 9.60, and 21.74, respectively). The maximum total oil and gas residency exposure-adjusted cancer risk for San Juan, McKinley, Sandoval, and Rio Arriba Counties, as described above, is 6.09, 0.58, 1.93, and 6.15, respectively (BLM and Ramboll 2017; BLM 2023).

Risk characterization is a description of the nature and, often, magnitude of human risk, including resulting uncertainties. Risk characterization is accomplished by integrating information from the components of the risk assessment and synthesizing an overall conclusion about risk that is complete, informative, and useful for decision makers (EPA 2000[7]). A "bright line" in risk characterization refers to a threshold value that separates acceptable and unacceptable levels of risk. It is regarded as a clear and unambiguous limit used to determine whether a particular level of exposure to a hazardous substance is safe or not.

Bright lines were not used in the analysis of the cumulative oil and gas HAPs results to determine if a particular risk level is acceptable or not, as no such construct for risk exists within the Clean Air Act framework akin to the national ambient air quality standards (that is, there are no national ambient air quality standards against which to compare modeled HAP concentrations). Rather, values or ranges of values published by EPA (e.g., AirToxScreen [National Air Toxics Assessment] or 40 C.F.R. Part 300.430 [Remedial Investigation/Feasibility Study]) were used to provide useful

[6] EPA 2024f. Exposure Assessment Tools by Routes – Inhalation, https://www.epa.gov/expobox/exposureassessment-tools-routes-inhalation.

[7] EPA 2000. Science Policy Council Handbook "Risk Characterization", EPA 100-B-00-002, December 2000, https://www.epa.gov/sites/default/files/2015-10/documents/osp_risk_characterization_handbook_2000.pdf.

context to risk estimates associated with the cumulative oil and gas HAPs study. As described in the BLM Cumulative Hazardous Air Pollutants Modeling Final Report (BLM and Ramboll 2017), EPA uses 1 in 1 million and 100 in 1 million risk for context, as no explicit risk thresholds are available. Both the 70-year cancer risk and the adjusted cancer risk are within the contextual range published by the EPA.

It is important to note that the cancer risks estimated by this assessment only consider cumulative oil and gas sources and six common oil and gas HAP pollutants. While the cumulative oil and gas contribution is within the contextual range published by EPA (1 in 1 million and 100 in 1 million), additional HAPs from non-oil and gas sources could increase the overall risk in the project area. This modeling assessment looked at cumulative oil and gas sources to address the court's holding in regards to analysis of cumulative HAP emissions. It was beyond the scope of this modeling assessment to determine cumulative HAP values from non-oil and gas sources.

AirToxSreen is consistent with EPA's definition of a cumulative risk assessment. The contribution, based on EPA's most recent AirToxScreen results (2019), of the oil and gas industry to the cancer risk in San Juan, Sandoval, Rio Arriba, and McKinley Counties ranged from 0.01 to 2.06 in a million (BLM 2023). While not paired in time, the BLM's cumulative oil and gas study showed the contribution of the oil and gas industry to cancer risk (circa 2032) in San Juan, Sandoval, Rio Arriba, and McKinley Counties ranged from 0.58 to 6.15 in a million (maximum county values) (BLM 2023). While different methods were used by EPA and the BLM to determine cumulative oil and gas contributions and this could result in inconsistencies when comparing the data, the overall trend projects cumulative oil and gas contribution increases between 2019 and circa 2032, which could be offset by projected declines in other sectors based on increased electrification, equipment efficiency, and renewable technologies for electricity generation. To have an entirely consistent analysis between BLM and EPA would have required BLM to project the entire national emission inventory forward to a common future year (2032 in the BLM study) and use the CMAQ model with the unique chemical mechanism within CMAQ used in AirToxScreen. To BLM's knowledge, in the near 30-year history of EPA's National Air Toxics Assessment (NATA), of which AirToxScreen is part of, a future year projection for NATA has never been attempted and such an exercise would be outside the scope of this EA. Therefore, using the AirToxScreen results described above, if one were to simply add the risk values for respective counties between EPA's and BLM's modeling (would not be scientifically valid given the varying methodologies), the addition of the other source categories, places the total risk from other sources in addition to future projections of HAPs impacts from oil and gas development still well within the 1 in 1 million and 100 in 1 million risk range.

The BLM Cumulative Hazardous Air Pollutants Modeling – Final Report (BLM and Ramboll 2023) and the ARTR (BLM 2023) shows the Hazard Quotients (HQs) for each compound and the HI for all New Mexico counties. EPA estimates chronic noncancer HQs by dividing a chemical's estimated long-term exposure concentration by the reference concentration for that chemical. Chronic noncancer hazards from multiple air toxics were assessed by calculating a HI through the summation of individual HAP HQs that share similar adverse health effects, resulting in a target organ-specific HI representing the risk to a specific organ or organ system. An HQ or HI value less than 1 indicates that the exposure would not result in adverse noncancer effects (BLM and Ramboll 2023a; EPA 2022a, 2022b). San Juan, McKinley, Sandoval, and Rio Arriba Counties show HQ and HI values below 1 for all mineral designations, indicating that cumulative oil and gas source exposure would not result in adverse noncancer effects. The maximum HI from total oil and gas production is also below 1, at 0.208, 0.017, 0.071, and 0.168, for San Juan, McKinley, Sandoval, and

Rio Arriba Counties, respectively (BLM and Ramboll 2023; BLM 2023). It is important to note that the noncancer risks estimated by this assessment only consider cumulative oil and gas sources and the six common oil and gas pollutants. While the cumulative oil and gas contribution are below 1, additional HAPs from non-oil and gas sources could increase the overall risks in the project area. This modeling assessment looked at cumulative oil and gas sources to address the court's holding in regards to analysis of cumulative HAP emissions. It was beyond the scope of this modeling assessment to determine cumulative HAP values from non-oil and gas sources.

3.2.1.5 – No Action Alternative

Under the No Action Alternative, Reclamation would not grant a land use authorization/license agreement easement area, and the new wells and associated infrastructure described in the Proposed Action would not be implemented. Potential impacts to air quality would not occur because the proposed wells would not be developed, and no new emissions of pollutants would occur. Although no new criteria pollutant emissions would occur under the No Action Alternative, non-federal oil and gas supply may increase if the wells were not developed but such projections are speculative and cannot be predicted.

3.2.1.6 – Direct and Indirect Impacts from Proposed Action

The Proposed Action would result in four general phases of development that would generate air pollutant emissions: 1) well development (well site construction, well drilling, and well completion), 2) well production operations (extraction, separation, and gathering), 3) mid-stream (refining, processing, storage, and transport/distribution), and 4) end-use (combustion or other uses) of the fuels produced. While well development and production operation emissions (phases 1 and 2) occur on-lease and Reclamation has program authority over these activities on federal surface and federal minerals, mid-stream and end-use emissions (phases 3 and 4) typically occur off-lease where Reclamation may have little to no program authority.

Annual estimated emissions from the Proposed Action, summarized in **Table 8**, are estimated from the NMED Air Emissions Calculator Tool and the BLM Emissions and Modeling Impacts Tool (EMIT). The wells would be drilled from the proposed well pad expansion. Emissions related to construction were averaged over all wells in the single well construction/development phase in **Table 8**. After the wells are drilled, only operation emissions would occur on an annual basis. Operation annual emissions were based upon the maximum emission year. Future-year operational annual emissions would be less based on production decline of the wells.

Table 8. Proposed Action Emissions (tons per year)

	Total Emissions (tons per year)						
	PM_{10}	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_x**	**Total HAPs**
Single well construction/development phase	2.963	0.465	0.276	2.079	1.589	0.040	0.059
Single well operation phase	4.490	0.490	0.091	0.793	0.830	0.005	0.160
Single well total	**7.453**	**0.955**	**0.367**	**2.872**	**2.418**	**0.045**	**0.219**
Current emissions (San Juan, Sandoval, Rio Arriba, and McKinley Counties)	24,218	6,042	141,794	53,708	108,755	2,301	15,278
Project percent increase compared to San Juan, Sandoval, Rio Arriba, and McKinley Counties	**0.031%**	**0.016%**	**0.0002%**	**0.005%**	**0.002%**	**0.002%**	**0.001%**

Source: Hilcorp (2025) and EPA (2024b)

Well development would include NO_x, SO_2, and CO tailpipe emissions from construction equipment, vehicle traffic, drilling, and completion activities. Fugitive dust concentrations would occur from vehicle traffic on unpaved roads, construction equipment, and from wind erosion where soils are disturbed. Drill rig engine operations would result mainly in NO_x and CO emissions, with lesser amounts of SO_2. VOC, and HAP emissions during completions (flowback) would also occur. These emissions would be short term, approximately 15 days for development and completion. During well production, NO_x, CO, VOC, and HAP emissions would originate from well pad separators, storage tank vents, compressor engines, generators, equipment tailpipes, and flares (if applicable). Fugitive road dust (PM_{10} and $PM_{2.5}$) would be produced by operations vehicles visiting and servicing the wells. HAP emissions would occur from storage tanks, pneumatic devices, and other production equipment. The project area is located in an existing oil/gas field and the proposed well pads are located approximately 0.57 miles from the nearest houses or residential buildings. There are 25 oil/gas wells within a 1-mile radius of the project area. Emissions would be minimized through design features and COAs such as limiting surface disturbance, requiring interim reclamation, and requiring dust control on dirt roads. Additionally, emissions would be minimized by following applicable NMED rules and regulations.

Construction activities would be one of the primary sources of particulate matter emissions as a result of dust and fine particles generated from on-site equipment use and related groundwork, as well as on- and off-site vehicles (Araújo et al. 2014). How particulate matter interacts with the environment is dependent on a variety of factors, with the size and chemical composition of the airborne particles being the most important in terms of dispersion (distance from the source) and deposition from the atmosphere. Effects of all particulate matter emissions would not be confined to the construction site because $PM_{2.5}$ (fine particles) can travel farther in terms of distance than PM_{10} (dust) and other total suspended particulates (particles of sizes up to 50 micrometers) (Araújo et al. 2014). Construction site activities may influence the environment in the immediate area or

neighborhood through emissions of total suspended particulates (Araújo et al. 2014). Total suspended particulates are particles that have lower permanence in the atmosphere, thereby depositing near the emission sources (Araújo et al. 2014). The dispersion and concentration of particulate matter emissions depend on the technology and management control methods used by each project and the weather condition variables (i.e., wind speed, wind direction, and humidity/moisture) (Araújo et al. 2014). Some particles can remain in the atmosphere for days to weeks. Consequently, particle pollution generated in one area can travel hundreds or thousands of miles and influence the air quality of regions far from the original source (EPA 2018b). Compliance with state permitting requirements and following BMPs can reduce off-site effects from fugitive dust.

Levels of HAPs would also temporarily increase during construction and completion activities under the Proposed Action. A 2019 health assessment study completed by Colorado State University (ICF and Colorado State University 2019) during various stages of well development and production at oil and gas extraction facilities in Colorado found that chemical air concentrations for VOCs (including HAPs) and associated exposure levels decreased rapidly with distance. Simulated chronic cancer risks over a lifetime of exposure during production operations to average individuals were below 1 in 1 million at distances of 1,400 feet from the well pads, 4 in 1 million at 500 feet from the well pads, and 10 in 1 million at 300 feet from the well pads. Maximum exposed individuals were below 1 in 1 million at distances of 2,000 feet from the well pads, 7 in one million at 500 feet from the well pads, and 10 in 1 million at 400 feet from the well pads (ICF and Colorado State University 2017). This data is provided to give an estimate of the potential impact area. This project may also have a larger or smaller impact area based on differences in emissions and the presence of other HAPs sources nearby.

VOCs and NO_X contribute to the formation of O_3, which is one of the pollutants of most concern in northwestern New Mexico, and because O_3 is not a direct emission, emissions of NO_X and VOCs are used as proxies for estimating O_3 levels. Under the Proposed Action, the additional NO_X and VOC emissions (quantified in **Table 8**) from the proposed development would incrementally add to O_3 levels within the analysis area. Reclamation and the BLM do not predict a significant change in the number of wells drilled per year based upon this action and production in the San Juan Basin is predicted to remain at or below the forecasted RFD numbers for wells drilled per year. Based on the current rate of development (below the projected RFD) and the RFD projections compared to the CARMMS 2.0 modeling (discussed in **Appendix B**), the corresponding CARMMS 2.0 low modeling scenario, which represents a conservative estimate of federal impacts through 2025, indicates that the emissions from this project would not be expected to result in any exceedances of the NAAQS or NMAAQS for any criteria pollutants in the analysis area. Additionally, as discussed in **Appendix B**, modeling results for the future year (2032) simulations for New Mexico from the BLM Regional CAP Model (BLM and Ramboll 2023b), show that O_3 cumulative concentrations ranged between 50 and 65 ppb over the state, with the higher concentrations located in the San Juan Basin and isolated regions on the western side of the state. The modeled values did not lead to any O_3 NAAQS exceedances in the state (ca. 2032), including in the FFO (BLM and Ramboll 2023b).

Emissions of criteria air pollutants would also occur outside the planning area from transport, processing, distribution, and end-use. Generally, crude oil from the well fields in the San Juan Basin of northwestern New Mexico is transported to the crude oil refinery in Artesia, located in southeastern New Mexico, although the refinery also processes crude oil from other areas, including Canada. The refinery processes crude oils and serves markets in the southwestern United States and

northern Mexico. A small refinery in northwestern New Mexico, which processed local San Juan Basin crude oil, closed in 2020 (EIA 2023b). Natural gas is produced from shales, low permeability sands, and coalbeds in the San Juan Basin in northwestern New Mexico. Interstate pipelines bring natural gas into New Mexico from Texas and Colorado and carry most of the natural gas that leaves the state to Arizona or back to Texas. Some of New Mexico's natural gas is placed in the state's two underground storage fields. Since combustion of all petroleum products emit criteria and hazardous air pollutant emissions, local ambient concentrations of these pollutants could increase in areas where products from the San Juan Basin (oil and gas) are combusted. This could contribute to an area exceeding either national or local air quality standards. Air quality involves complex physical and chemical transformations at a local/regional level, so impacts would vary considerably depending on background concentrations, meteorology, and other local pollutant sources. If any pollutant concentration is near or above its standard in a particular area, the combustion of oil and gas products could contribute to or exacerbate nonattainment. Potential pollutant concentration change resulting from combustion is therefore often a key driver of public policy to mitigate air quality and public health impacts in such areas. Downstream combustion and end uses are regulated by the EPA or delegated to state agencies.

The Proposed Action would not result in any significant adverse impacts to air quality because of the project's small size and scale and the implementation of dust control BMPs, and other design features to reduce emissions. All impacts are less than 0.03% of basin-wide emissions.

3.2.1.7 – Other Impacts

Summarized in **Appendix B**, here and included in the ARTR are estimates of reasonably foreseeable trends in air quality and how they relate to past and present oil and gas activities, as well as projected emissions through modeling of the New Mexico portion of the San Juan Basin (BLM 2023).

3.2.1.7.1 – Emissions Control Measures and Residual Effects

Operator design features (**Appendix A – Surface Use Plan of Operations**) have been established to minimize dust by limiting surface disturbance, requiring interim reclamation, and requiring dust control on dirt roads. In addition to operator design features, Reclamation requires the measures below to reduce impacts to air quality:

- Areas not required for facilities would be revegetated during interim reclamation.
- Dirt roads would be watered during periods of high use; magnesium chloride, organic-based compounds, and/or polymer compounds could also be used on dirt roads upon approval by Reclamation.
- BMPs provided in *The Gold Book* would be implemented for proposed and existing roads (BLM and USFS 2007).
- The operator would obtain an air permit, if required by the regulatory agency, for equipment operating under this Proposed Action and would follow regulatory requirements.

BMPs are designed to reduce emissions from field production and operations. These BMPs are applied to oil and natural gas drilling and production to help minimize impacts to air quality. Reclamation encourages oil and natural gas companies to adopt other proven, cost-effective technologies and practices that improve operational efficiency and minimize impacts to air quality. The Four Corners Air Quality Task Force was convened in 2005 to address air quality issues in the

Four Corners region in light of continued energy development and growth in the region and consider options for reducing air pollution. This task force published a report in 2007 detailing a wide range of options and continues to meet annually since that time as the Four Corners Air Quality Group (BLM 2023).

The BLM also encourages industry to participate in the Natural Gas STAR program, administered by the EPA. The Natural Gas STAR program is a flexible, voluntary partnership that encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions (EPA 2024c). Additionally, EPA and the State of New Mexico rules/regulations help to reduce emissions. Together, 40 C.F.R. § 60, Subparts OOOO thru OOOOc, serve to control CH_4 emissions from oil and natural gas industry sources by requiring reduced emissions completions ("green" completions) on new hydraulically fractured gas wells as well as emissions controls on pneumatic controllers, pumps, storage vessels, and compressors (BLM 2023).

At the state level, the EMNRD published the New Mexico Oil Conservation Division Statewide Natural Gas Capture Requirements (Waste Prevention Rule), NMAC 19.15.27, as part of the New Mexico statewide enforceable regulatory framework to secure reductions in oil and gas sector emissions and to prevent natural gas waste from new and existing sources. Key provisions include prohibition of unnecessary venting and flaring of waste natural gas where it is technically feasible to recover the gas by routing it to a pipeline or using it for some other beneficial purpose (such as on-site fuel consumption). In limited circumstances, and if recovery is infeasible, operators must flare gas rather than venting it, which results in uncombusted VOC emissions. Venting is only permissible "in an emergency or malfunction ... to avoid a risk of an immediate and substantial adverse impact on safety, public health, or the environment." NMAC 19.15.27.8. These provisions will reduce VOC emissions as well as emissions of NO_X, CO, SO_2, GHGs, and particulate matter. The NMED developed the "Oil and Natural Gas Regulation for Ozone Precursors," NMAC 20.2.50, which went into effect on August 5, 2022. Approximately 50,000 wells and associated equipment will be subject to this regulation. It is anticipated that the regulation will annually reduce VOC emissions by 106,420 tons, nitrogen oxide emissions by 23,148 tons, and CH_4 emissions by 200,000 to 425,000 tons. The regulation includes emissions reduction requirements for compressors, engines and turbines, liquids unloading, dehydrators, heaters, pneumatics, storage tanks, and pipeline inspection gauge launching and receiving. A description of federal and state rules and regulations can be found in Section 2 of the ARTR (BLM 2023), incorporated by reference.

3.2.2 – Greenhouse Gas Emissions

Development of the Proposed Action could lead to emissions of methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O), the three most common GHGs associated with oil and gas development. These GHG emissions would be emitted from proposed activities, and from the consumption of any fluid minerals produced. For the purposes of this analysis, Reclamation has evaluated the potential impacts of the Proposed Action by estimating and analyzing the projected potential GHG emissions from oil and gas development. Projected emissions estimates are based on past actual oil and gas development analyses, and any available information from existing development within the state. Further discussion of climate science and predicted impacts as well as the reasonably foreseeable and cumulative GHG emissions are included in the *2023 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends* (BLM 2024) (Annual GHG Report) and

the Air Technical Resources Report (BLM 2023). The Annual GHG Report presents the estimated emissions of GHGs attributable to development and consumption of fossil fuels produced on lands and mineral estate managed by the BLM. The Annual GHG Report and Air Technical Resources Report are incorporated by reference as an integral part of this analysis.

3.2.2.1 Affected Environment

GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component. GHGs may influence the global climate by increasing the amount of solar energy retained by land, water bodies, and the atmosphere. GHGs can have long atmospheric lifetimes, which allows them to become well mixed and uniformly distributed over the entirety of the Earth's surface no matter their point of origin. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming. Past, current, and projected future GHG impacts are described in Chapters 4, 8, and 9 of the Annual GHG Report (BLM 2024). These chapters describe currently observed climate trends globally, nationally, and in each state, and present a range of projected impact scenarios depending on future GHG emission levels.

The incremental impacts of global GHGs from a single proposed land management action cannot be accurately translated into its potential global or localized climate effects in the area specific to the action. Currently, global climate models are unable to forecast local or regional effects on resources resulting from a specific subset of emissions. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to the accumulation of GHG emissions over time. In this EA, Reclamation uses GHG emissions as a proxy for impacts and provides context with other proxies such as GHG equivalents.

For the purposes of this EA, the projected emissions from the Proposed Action can be compared to modeled emissions that have been shown to have definitive or quantifiable impacts on the climate. **Table 9** shows the total estimated GHG emissions from fossil fuels at the global, national, and state scales from 2016 to 2022 (7 years). Emissions are shown in megatonnes (Mt) per year of carbon dioxide (CO_2). Chapter 3 of the Annual GHG Report contains additional information on GHGs and an explanation of carbon dioxide equivalent (CO_2e). State and national energy-related CO_2 emissions include emissions from fossil fuel use across all sectors (residential, commercial, industrial, transportation, and electricity generation) and are released at the location where the fossil fuels are consumed.

Table 9. Global, United States, and New Mexico Fossil Fuel GHG Emissions, 2016–2022 (Mt CO_2/year)

Scale	2016	2017	2018	2019	2020	2021	2022
Global (CO_2 Only)	36,465.6	36,935.6	37,716.2	37,911.4	35,962.9	37,500	38,522.0
U.S.	4,909.9	4,852.5	4,989.8	4,855.9	4,344.9	4,639.1	4,699.4
New Mexico	48.8	49.4	45.2	48.4	45.03	46.0	47.2

Source: Annual GHG Report (BLM 2024), Chap. 5, Table 5-1 (U.S.) and Table 5-2 (State). Global emissions (CO_2 only) from the Emissions Database for Global Atmospheric Research (EDGAR) 2024 Report - https://edgar.jrc.ec.europa.eu/report_2024?vis=co2tot#emissions_table (EDGAR 2024). State 2022 data: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2023 (EPA 2024c).
Mt (megatonne) = 1 million metric tons
NA = Not Available

Additional information on current state, national, and global GHG emissions as well as the methodology and parameters for estimating emissions from BLM fossil fuel authorizations and cumulative GHG emissions is included in Chapters 5, 6, and 7 of the Annual GHG Report (BLM 2024c).

3.2.2.2 No Action Alternative

Under the No Action Alternative, Reclamation would not authorize the land use authorization (license agreement), and the new well described in the Proposed Action would not be drilled. Although no new GHG emissions would result under the No Action Alternative, the national and global demand for energy is not expected to differ regardless of Reclamation decision-making.

Reclamation does not have a model to estimate energy market substitutions at a spatial resolution needed for this onshore production scenario. Reductions in natural gas produced from federal lands may be partially offset by non-federal production (state and private) in the United States (in which case the indirect GHG emissions would be similar), or overseas, in which case the GHG emissions could be higher, to the extent environmental protection requirements for production are less vigorous, and the produced energy would need to be physically transported into the United States. There may also be substitution of other energy resources to meet energy demand. These substitution patterns will be different for gas because oil is primarily used for transportation, while natural gas is primarily used for electricity production and manufacturing, and to a lesser degree by residential and commercial users. Coal and renewable energy sources are stronger substitutes for natural gas in electricity generation. The effect of substitution between different fuel sources on indirect GHG emissions depends on the replacement energy source. For example, coal is a relatively more carbon-intense fuel than natural gas and hydroelectricity is the least carbon-intense energy source (see Table 10-3 of the Annual GHG Report [BLM 2024]). In the transportation sector, alternatives to oil are likely to be less carbon intensive.

Finally, substitution across energy sources or gas production from other locations may not fully meet the energy needs that would otherwise have been realized through production. Price effects may lower the market equilibrium quantity demanded for some fuel sources. This would lead to a reduction in indirect GHG emissions. These three effects would occur in some combination under the No Action Alternative, but the relative contribution of each is unknown. Regardless, GHG emissions under the No Action Alternative are not expected to be zero.

3.2.2.3 Direct and Indirect Impacts from Proposed Action

Four general phases of development processes would generate GHG emissions: 1) well development (well site construction, well drilling, and well completion), 2) well production operations (extraction, separation, gathering), 3) mid-stream (refining, processing, storage, and transport/distribution), and 4) end use (combustion or other uses) of the fuels produced. While well development and production operation emissions (phases 1 and 2) occur on-site and Reclamation has authority over these activities on federal surface, mid-stream and end-use emissions (phases 3 and 4) typically occur off-lease where Reclamation may have little to no authority.

The amount of gas (and incidental oil) that may be produced from the well is unknown. For purposes of estimating production and end-use emissions, the well is assumed to produce gas in similar amounts as existing nearby wells (estimated ultimate recovery [EUR]). While Reclamation has no authority to direct or regulate the end-use of the products, for this analysis, Reclamation assumes

all produced gas would be combusted (such as for domestic heating or energy production). Reclamation acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the proposed well. These sources may include emissions of methane (CH_4 [a more potent GHG than CO_2 in the short term]) from pipeline and equipment leaks, storage, and maintenance activities. These sources of emissions are highly speculative at the permitting stage; therefore, Reclamation has chosen to assume that mid-stream emissions associated with the proposed wells for this analysis would be similar to the national level emissions identified by the Department of Energy's National Energy Technology Laboratory (NETL) (NETL 2019). Section 6 of the Annual GHG Report includes a more detailed discussion of the methodology for estimating midstream emissions (BLM 2024).

The emission estimates calculated for this analysis were generated using the assumptions previously described above in the BLM Lease Sale Emissions Tool (BLM 2024), using the APD option. Emissions are presented for each of the four phases described above.

- Well development emissions occur over a short period and may include emissions from heavy equipment and vehicle exhaust, drill rig engines, completion equipment, pipe venting, and well treatments such as hydraulic fracturing.

- Well production operations, mid-stream, and end-use emissions occur over the entire production life of a well, which is assumed to be 30 years for this analysis based on the productive life of a typical oil/gas field.

- Production operation emissions may result from storage tank breathing and flashing, truck loading, pump engines, heaters and dehydrators, pneumatic instruments or controls, flaring, fugitives, and vehicle exhaust.

- Mid-stream emissions occur from the transport, refining, processing, storage, transmission, and distribution of produced oil and gas. Mid-stream emissions are estimated by multiplying the EUR of produced oil and gas with emissions factors from NETL life cycle analysis of U.S. oil and natural gas. Additional information on emission factors can be found in the Annual GHG Report (BLM 2024:Chapter 6, Tables 6-8 and 6-10).

- For the purposes of this analysis, end-use emissions are calculated assuming all produced gas is combusted for energy use. End-use emissions are estimated by multiplying the EUR of produced gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 C.F.R. § 98). Additional information on emission factors and EUR factors can be found in the Annual GHG Report (BLM 2024: Chapter 6).

Table 10 shows the estimated maximum year and average year GHG emissions over the life of the well for both 100-year and 20-year global warming potentials (GWPs). Section 3.4 of the Annual GHG Report provides a detailed explanation of GWP (BLM 2024).

Table 10. Estimated Direct and Indirect Emissions from the Proposed Action Wells on an Annual and Life of Well Basis (metric tonnes)

Timeframe	CO_2	CH_4	N_2O	CO_2e (100-year)	CO_2e (20-year)
Max Year	84,190	202.91	0.313	90,323	101,016
Average Year	9,447	27.83	0.033	10,285	11,752
Life of Well	283,399	834.83	1.004	308,551	352,546

Source: BLM Lease Sale Emissions Tool (BLM 2024)

Table 10 lists the estimated direct (well development and production operations) and indirect (mid-stream and end-use) GHG emissions in metric tonnes for the subject Proposed Action over the average 30-year production life of the well. In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 352,546 metric tonnes of CO_2e over the life of the well.

Table 11. Estimated Life-of-Well Emissions from Well Development, Well Production Operations, Mid-stream, and End-use (metric tonnes)

Activity	CO2	CH4	N2O	CO2e (100-yr)	CO2e (30-yr)
Well Development	460	0.01	0.003	461	462
Well Production Operations	18,688	212.15	0.016	25,014	36,195
Mid-Stream	41,049	618.46	0.564	59,633	92,225
End-Use	223,202	4.21	0.421	223,442	223,664
Total (life of well)	**283,399**	**834.83**	**1.004**	**308,551**	**352,546**

Source: BLM Lease Sale Emissions Tool (BLM 2024)

Note: Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report GWP: 100-year GWP (CO_2 = 1, CH_4 = 29.8, N_2O = 273); 20-year GWP (CO_2 = 1, CH_4 = 82.5, N_2O = 273).

GHG emissions vary annually over the production life of a well due to declining production rates over time. **Figure 3** shows the estimated GHG emissions profile over the production life of the proposed action including gross (total) emissions (metric tonnes) as well as emissions during the four phases of development processes—well development, well production operations, midstream, and end-use. Hilcorp estimates that each well will produce an average of 374 thousand cubic feet (mcf) of natural gas per day (Hilcorp 2025). Assuming a 30-year well life, the lifetime production (EUR) is estimated to be 4,100,000 mcf of natural gas for the one additional well (Table 11).

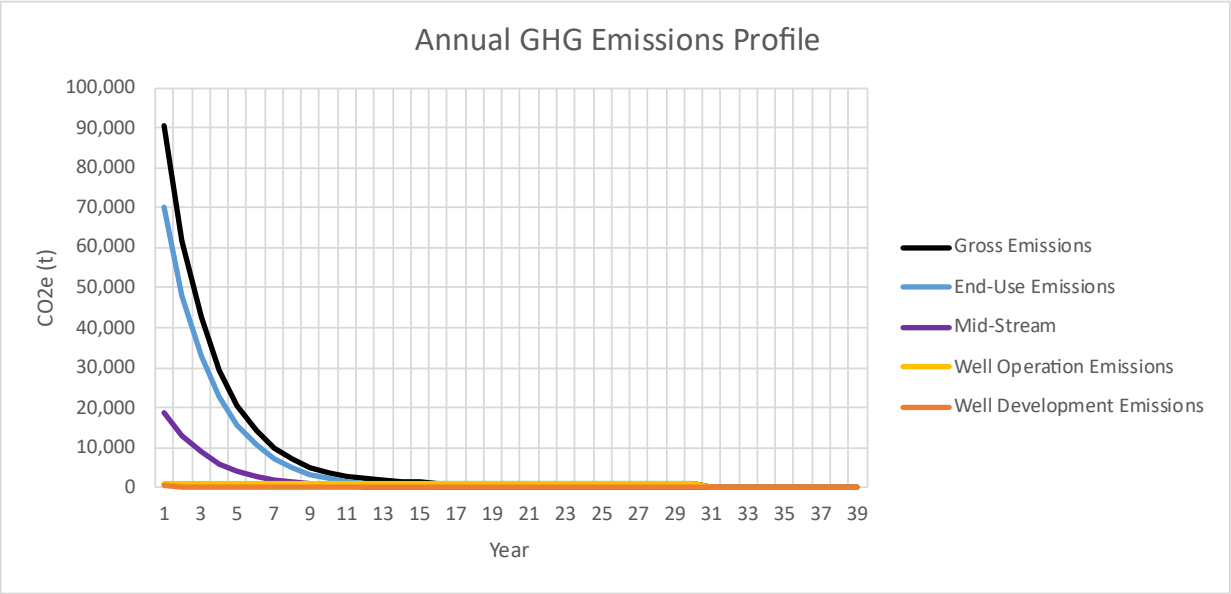
Table 12. Estimated Ultimate Recovery for the Proposed Action

San Juan 32-7 Unit 249H Production EUR*	1 well / day	1 well / 30-year life
Produced natural gas (mcf)	374	4,100,000

Source: Hilcorp 2025

* EUR is rounded to the nearest 1,000.

Figure 3. Estimated GHG emissions profile over the life of the Proposed Action.



Source: BLM Lease Sale Emissions Tool (BLM 2024) – modified to show emissions associated with the APDs for a 30-year life.

The EPA GHG equivalency calculator can be used to place potential average-year emissions from this proposed action in contexts relatable to everyday life (EPA 2024c). For instance, the projected average annual GHG emissions from potential development of the subject Proposed Action are equivalent to 2,397 gasoline-fueled passenger vehicles driven for 1 year, 1,381 homes' energy use for one year, or the emissions that could be offset by the carbon sequestration of 10,285 acres of forest land for 1 year.

Table 13 compares emission estimates over the 30-year life of the wells compared to the 30-year projected federal fossil fuel emissions in the state and nation from existing wells, the development of approved APDs, and emissions related to reasonably foreseeable federal oil and gas development.

Table 13. Comparison of the Life-of-Well Emissions to Other Federal Oil and Gas Emissions

Reference	Mt CO_2e (100-year)	Life of Well Percentage of Reference
Proposed Action Emissions (life of well)	0.309	100.000%
New Mexico reasonably foreseeable short-term federal (oil and gas)*	3,688.06	0.008%
New Mexico EIA-projected long-term federal (oil and gas)†	11,218.30	0.003%
United States reasonably foreseeable short-term federal (oil and gas)	6,282.00	0.005%
United States EIA projected long-term federal (oil and gas)	17,264.00	0.002%

Source: U.S. and federal emissions from BLM Lease Sale Emissions Tool (BLM 2024) data and Tables 7-18, 7-19 and Section 7 of the 2023 Annual GHG Report (BLM 2024).
* Short-term foreseeable is estimated federal emissions from existing producing wells, approved APDs, and 1 year of leasing.
† Long-term foreseeable are estimated federal emissions to meet EIA-projected energy demand.
Compared to emissions from other existing and foreseeable federal oil and gas development, the life of well emissions for the Proposed Action are between 0.003% and 0.008% of federal fossil fuel authorization emissions in the state and between 0.002% and 0.005% of federal fossil fuel authorization emissions in the nation. In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 0.303 Mt CO_2e over the life of the well.

Table 14. Comparison of Proposed Action Emissions to Other Sources (megatonnes)

Reference	Mt CO_2e (100-year)	Life of Well Percentage of Reference
Proposed Action emissions (maximum year)	0.090	-
New Mexico onshore federal (oil and gas) †	399.96	0.023%
New Mexico onshore federal (oil, gas, and coal) †	399.96	0.023%
U.S. onshore federal (oil and gas) †‡	611.55	0.015%
U.S. federal all (oil and gas) †‡	1,027.51	0.009%
U.S. federal onshore (oil, gas, and coal) †	1,046.33	0.009%
U.S. total	**7,260.36**	**0.0012%**

Source: BLM Lease Sale Emissions Tool (BLM 2024d)
* Mt (megatonne) = 1 million metric tonnes. Estimates are based on 100-GWP values.
† Federal values come from Tables ES-1 and ES-2 and Figure ES-1 of the Annual GHG Report (BLM 2024c).
‡ Includes offshore and onshore oil and gas production.

The relationship between GHG emissions and climate impacts is complex, but a project's potential to contribute to impact climate is reduced as its net emissions are reduced. When net emissions approach zero, the project has little or no effect on climate. Net-zero emissions can be achieved through a combination of controlling and offsetting emissions. Emission controls (e.g., vapor recovery devices, no-bleed pneumatics, leak detection and repair, etc.) can substantially limit the amount of GHGs emitted to the atmosphere, while offsets (e.g., sequestration, low carbon energy substitution, plugging abandoned or uneconomical wells) can remove GHGs from the atmosphere or reduce emissions in other areas. Chapter 10 of the Annual GHG Report (BLM 2024) provides a more detailed discussion of GHG strategies.

Several federal agencies work in concert to meet U.S. emissions reduction goals all while supporting U.S. oil and gas development and operations. The EPA is the federal agency charged with regulation of air pollutants and establishing standards for protection of human health and the environment. The EPA has issued regulations that will reduce GHG emissions from any development related to the Proposed Action. These regulations include the New Source Performance Standards (NSPS) for Crude Oil and Natural Gas Facilities, 40 C.F.R. § 60 Subpart OOOOa, and Waste Emissions Charge for Petroleum and Natural Gas Systems,40 C.F.R. § 99. In December 2023, the EPA released a separate rule under the CAA to reduce CH_4 and other harmful air pollutants from new and existing oil and gas operations nationwide, which includes the Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced after November 15, 2021, 40 C.F.R. § 60 Subpart OOOOb; and Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities, Subpart OOOOc. These regulations impose emission limits, equipment design standards, and monitoring requirements on oil and gas facilities and a waste emissions charge on CH_4 emissions that exceed 25,000 metric tonnes of CO_2e for applicable petroleum and natural gas facilities currently required to report under the GHG Reporting Rule. A detailed discussion of existing regulations that apply to BLM management of federal lands, as well as current federal and state regulations that apply to oil and gas development and production, can be found in Chapter 2 of the Annual GHG Report (BLM 2024). Section 2.5 of the Annual GHG Report, Executive Orders (EOs), has not been incorporated by reference as the EOs discussed therein have been rescinded as of January 20, 2025.

The EPA's Methane Rule will sharply reduce emissions of CH_4 and other harmful air pollution from oil and natural gas operations; including, for the first time, from existing sources nationwide. The final action includes NSPS to reduce CH_4 and smog-forming VOCs from new, modified, and reconstructed sources. It also includes Emissions Guidelines, which set procedures for states to follow as they develop plans to limit CH_4 from existing sources. First, the EPA Rule finalizes 40 C.F.R. § 60 Subpart OOOOb regulating GHG (in the form of a limitation on emissions of CH_4) and VOC emissions for the Crude Oil and Natural Gas source category pursuant to CAA Section 111(b)(1)(B). Second, the EPA finalizes the presumptive standards in 40 C.F.R. § 60 Subpart OOOOc to limit GHGs emissions (in the form of CH_4 limitations) from designated facilities in the Crude Oil and Natural Gas source category, as well as requirements under the CAA section 111(d) for states to follow in developing, submitting, and implementing state plans to establish performance standards. Third, the EPA finalizes several related actions stemming from the joint resolution of Congress, adopted on June 30, 2021, under the Congressional Review Act, disapproving the previous 2020 Policy Rule. Fourth, the EPA finalizes a protocol under the general provisions of 40 C.F.R. Part 60 for Optical Gas Imaging to detect gas leaks from industrial sources.

At the state level, the EMNRD enforces the New Mexico Oil Conservation Division Statewide Natural Gas Capture Requirements (Waste Prevention Rule), NMAC 19.15.27, as part of the New Mexico statewide enforceable regulatory framework to secure reductions in oil and gas sector emissions and to prevent natural gas waste from new and existing sources. Key provisions include prohibition of unnecessary venting and flaring of waste natural gas where it is technically feasible to route the gas to pipelines or to use this gas for some other beneficial purpose (such as on-site fuel consumption). In all cases, operators must flare rather than vent natural gas except where this is technically infeasible or would pose a safety risk. These provisions will reduce VOC emissions due to stringent limitations on natural gas venting (which results in uncombusted VOC emissions). Additionally, it proposes that natural gas be recovered and reused rather than flared, which would

result in reductions of VOCs, NO_X, CO, SO_2, GHGs, and particulate matter emissions. The NMED developed the "*Oil and Natural Gas Regulation for Ozone Precursors*," NMAC 20.2.50, which went into effect on August 5, 2022. Approximately 50,000 wells and associated equipment will be subject to this regulation. It is anticipated that the regulation will annually reduce VOC emissions by 106,420 tons, NO_X emissions by 23,148 tons, and CH_4 emissions by 200,000 to 425,000 tons. The regulation includes emissions reduction requirements for compressors, engines and turbines, liquids unloading, dehydrators, heaters, pneumatics, storage tanks, and pipeline inspection gauge launching and receiving. A description of federal and state rules and regulations can be found in Section 2 of the ARTR (BLM 2023), incorporated by reference.

The majority of GHG emissions resulting from federal fossil fuel authorizations occur outside of Reclamation's authority and control. These emissions are referred to as indirect emissions and generally occur off-site during the transport, distribution, refining, and end use of the produced federal minerals. Reclamation's regulatory authority is limited to those activities authorized under the land use authorization, which primarily occur in the "upstream" portions of natural gas and petroleum systems (i.e., the well development and well-production phases). This decision authority is applicable when development is proposed on public lands and Reclamation assesses the specific location, design, and plan of development. In carrying out its responsibilities under NEPA, Reclamation has developed BMPs designed to mitigate impacts to air quality, and by extension GHGs, from field production and operations. BMPs may include limiting emissions from stationary combustion sources, mobile combustion sources, fugitive sources, and process emissions that may occur during development of the wells. Analysis and approval of the Proposed Action may include the application of BMPs within Reclamation's authority, included as COAs, to reduce or mitigate impacts to air quality, and by extension GHGs. Additional measures are incorporated as applicant committed measures (**Chapter 4 – Environmental Commitments**) by the project proponent or added to necessary air quality permits. Additional information on mitigation strategies, including emissions controls and offset options, is provided in Chapter 10 of the Annual GHG Report (BLM 2024).

Given the small size and scale of the project, the use of industry standard emissions controls, and Environmental Commitments, the project would not result in a significant negative contribution to greenhouse gas emissions. The project would contribute 0.02% of New Mexico GHG emissions, and less than 0.001% of U.S. GHG emissions.

3.2.3 – Water Quality and Quantity

3.2.3.1 – Surface Water Resources

The geographic scope of the analysis for water quality and quantity is the lower Los Piños River, which encompasses portions of San Juan County, NM and La Plata County, CO. The Los Piños River is impounded at Navajo Dam, within Navajo Reservoir, approximately 1 mile downstream of the project area. The major tributaries in the southern portion of the Los Piños Basin are spring Creek, La Boca Canyon, Reese Canyon (immediately adjacent to the project area), Benito Canyon, and a number of other ephemeral and intermittent streams south of the project area (most of which drain into the inundated areas of Navajo Reservoir). Ephemeral flows in the southern Colorado and New Mexico San Juan and Los Piños Basins are generally of poor-quality water due to the highly erosive and saline nature of the soils, sparse vegetation cover, and rapid runoff conditions that are

characteristic of the area. Surface runoff generally contains 10,000 milligrams per liter (mg/L) of suspended sediment and greater than 1,000 mg/L of total dissolved solids (TDS) (BLM 2003a).

3.2.3.2 – Ground Water Resources

There are 11 major confined aquifers that host groundwater in the San Juan Basin: the Morrison Formation, Ojo Alamo Sandstone, Pictured Cliffs Sandstone, Cliff House Sandstone, Menefee Formation, Kirtland Shale/Fruitland Coal Formation, Point Lookout Sandstone, Gallup Sandstone, Mancos Shale, Dakota Sandstone, and Entrada Sandstone. Water yield from San Juan Basin aquifers is highly variable, ranging from less than 20 gallons per minute (gpm) in most aquifers to 100 gpm in Cenozoic (younger) aquifers such as the San Jose, Nacimiento, and Ojo Alamo formations (BLM 2003b).

The Water Support Document (BLM 2022) indicates that sources of groundwater can be found in nearly every area of the FFO, which the Navajo Reservoir area is within. There are four potential sources of groundwater in the analysis area: the Mesaverde aquifer, the Rio Grande aquifer, the Uinta-Animas aquifer, and the Entrada Sandstone aquifer (BLM 2022). The main sources of recharge for the Mesaverde aquifer are upland areas, mainly in areas of the Zuni Uplift, Chuska Mountains, and northern Sandoval County. The main sources of recharge for the Rio Grande aquifer are precipitation and snowmelt from the mountains and valleys that surround the basin. The main sources of recharge for the Uinta-Animas aquifer are in higher elevations that encircle the San Juan Basin. The main source of recharge of the Entrada Sandstone aquifer is through surface exposures on the margins of the basin in the foothills of the Laramide uplifts (BLM 2022). No additional information about recharge rates is available. In light of this uncertainty about water sources and recharge rates, the BLM therefore assumes that water use associated with oil and gas development would be a long-term effect and the potential for aquifer recharge may be affected by drought conditions associated with climate trends.

Groundwater quality in the New Mexico portion of the San Juan Basin is also highly variable (ranging from fresh to brackish) due to the complex stratigraphy and highly variable formation depths. Higher TDS concentrations typically make water less suitable for drinking or for agricultural irrigation. In groundwater, TDS is influenced by the dissolution of natural materials such as rock, soil, and organic material. Anthropogenic activities also contribute to TDS concentrations in shallow unconfined aquifers. Brackish and saline water/non-potable (TDS >10,000 mg/L) is typically found at depths greater than 2,500 feet below the ground surface and toward the center of the basin, where the water-bearing formations such as the Point Lookout, Gallup, Morrison, and Entrada Formations are deepest (Kelley et al. 2014). Fresh water (TDS <1,000 mg/L) is typically found on the basin margins at depths less than 2,500 feet below the ground surface where water-bearing formations such as the Ojo Alamo, Nacimiento, and San Jose are shallower. However, exceptions to this generalization occur in deeper formations such as the Gallup Sandstone and Morrison, which have been reported to contain potable water with less than 10,000 TDS at depths of 3,500 to 7,000 feet (Kelley et al. 2014).

3.2.3.3 – Past and Present Water Use

The 2015 U.S. Geological Survey report, *Estimated Use of Water in the United States in 2015* (Dieter et al. 2018), is used to estimate water use for the New Mexico portion of the San Juan Basin (BLM 2022: Table 4-5). Categories of water use include: aquaculture, domestic, industrial, irrigation, livestock, mining, public water supply, and thermoelectric power. The largest water-use categories in

the analysis area are irrigation (79%), followed by public water supply (8%). Approximately 2% (11,659 AF) of total 2015 water use in the analysis area is attributable to mining, the category under which oil and gas operations are reported (Dieter et al. [2018] do not detail the amount of water used specifically for oil and gas development). Mining operations in the analysis area mostly used groundwater sources (8,934 AF, or approximately 77%), with some use of surface water sources (2,724 AF, or approximately 23%). **Table 15** summarizes water use for the New Mexico portion of the San Juan Basin.

Table 15. Water Use for the New Mexico Portion of the San Juan Basin

Category	Surface Water (AF/year)			Groundwater (AF/year)			Total (AF/year)
	Fresh	Saline*	Total	Fresh	Saline*	Total	
Aquaculture	0	0	0	4,641	0	4,641	4,641
Domestic	0	–	0	8,979	–	8,979	8,979
Industrial	0	0	0	2,634	0	2,634	2,634
Irrigation	381,241	–	381,241	3,576	–	3,576	384,817
Livestock	437	–	437	986	–	986	1,424
Mining	2,724	0	2,724	3,677	5,257	8,934	11,658
Public water supply	21,613	0	21,613	17,958	0	17,958	39,571
Thermoelectric power	30,637	0	30,637	2,298	0	2,298	32,935
Basin totals	**436,652**	**0**	**436,652**	**44,750**	**5,257**	**50,008**	**486,660**

Source: BLM 2022.
Note: Values may not sum to total because of independent rounding (Dieter et al. 2018).
* Saline water withdrawals are not reported for domestic, irrigation, or livestock water use (Dieter et al. 2018).

3.2.3.4 – Current Water Use Associated with Oil and Gas Development

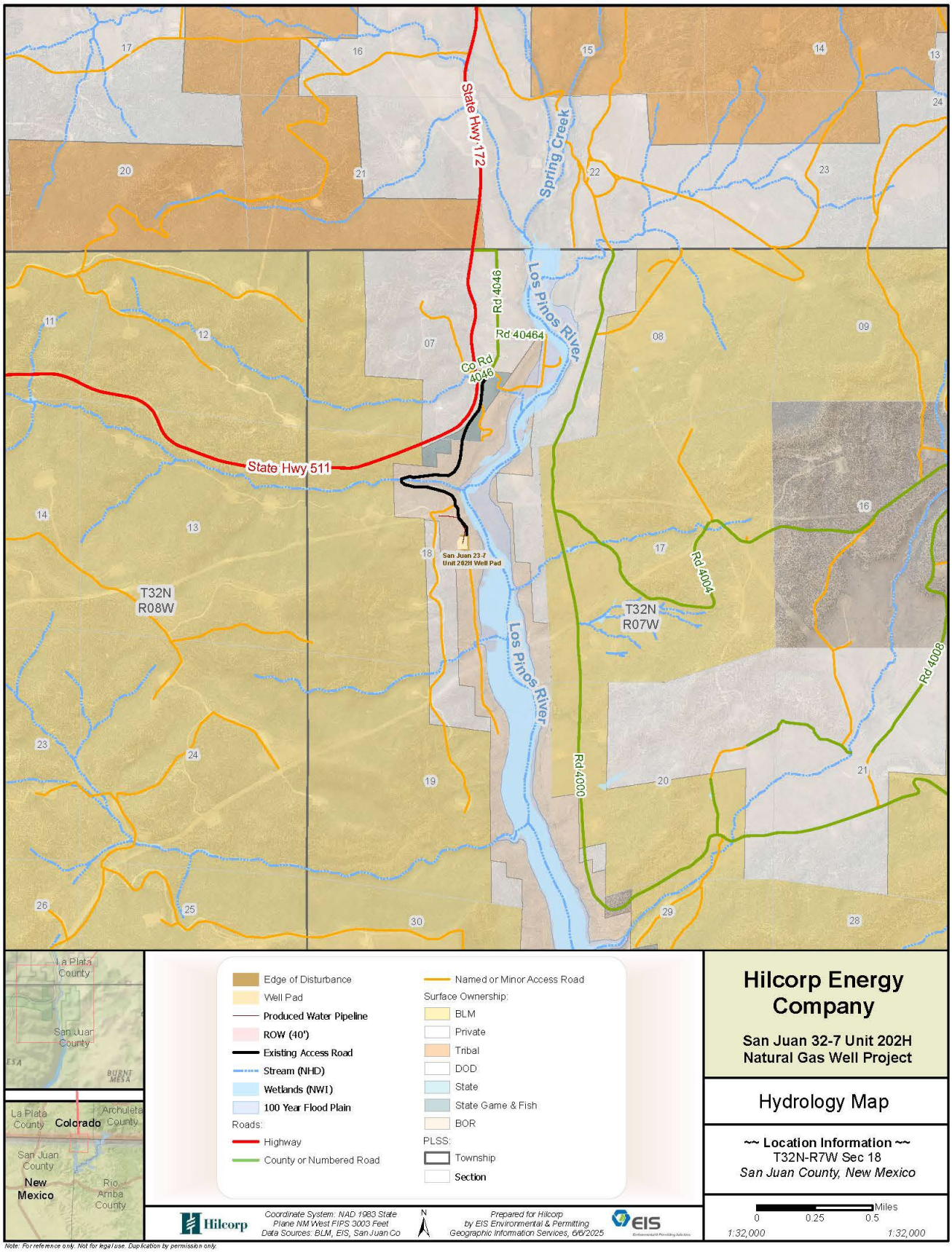
Water use associated with hydraulic fracturing (also called completion or stimulation) of wells comprises most oil and gas water use volume. According to interviews conducted with the largest operators currently operating within the San Juan Basin, approximately 95% of water used for well development is used to hydraulically fracture a well, and 5% is used for all other activities listed above (BLM 2022).

The amount of water needed for hydraulic fracturing is dependent on many factors, including the target geologic formation and the type of fracturing technologies used to hydraulically fracture oil and gas wells. Please see section **3.2.3.7 Cumulative Effects**, below, for additional discussion.

1.1.1.1. – No Action Alternative

No Action Alternative: There would be no effect to water quality or quantity from the No Action Alternative. The existing natural gas well would continue to operate in its current condition and the baseline status of produced water generation and conveyance, and water use (for things such as road maintenance) would remain unchanged.

Figure 4. Surface Hydrology Map



3.2.3.5 – Direct and Indirect Impacts from the Proposed Action

Water Use

Water is used for multiple purposes in the development of oil and natural gas wells, the largest use being well completion using hydraulic fracturing (which would not occur as part of the Proposed Action). Other water-use activities for well development include dust abatement of the well pad and road during construction activities, interim and final reclamation as well as rehabilitation, loosely packed soil during well construction, chemical flushes, spill cleanup (remediation activities), pressure tests, and potable water for personnel in trailers and living quarters. Well development would pose risks to groundwater, including potential contamination of freshwater aquifers from well integrity failures, spills, or surface spills during the drilling and completion processes. The regulatory program discussed in the Water Support Document (BLM 2022) and standard terms and conditions would greatly reduce effects to groundwater from the future well development.

Under the Proposed Action, Hilcorp would use recycled and produced water from their existing Middle Mesa 1 SWD, San Juan 32-7 Unit 301 SWD, and SJ 32-8 253 Water Transfer Station, with these waters being delivered to the proposed well pad via Hilcorp's existing water pipeline infrastructure, and the proposed produced water pipeline. If additional fresh water is needed for dilution or augmentation of recycled and produced waters, water would be trucked to the proposed well pad.

Under the Proposed Action, Hilcorp estimates total non-potable groundwater (produced water from other oil and gas wells in the area) for the Proposed Action at 0.36 AF (or approximately 70-percent of water needed). Fresh water trucked into the site for development-related activities would total 0.15 AF, or approximately 30-percent of all water needed. Total water use (produced and recycled water) for the Proposed Action at 0.516 AF.

The water uses described above would occur during the construction, drilling, and completion period and during the 30-year operation period (e.g., water use associated with dust control). The development of the Proposed Action would increase total potable (freshwater) surface water use (currently 2,724 AF) in the mining category water use by <0.00%, overall freshwater use (currently 436,652 AF) by <0.00%, and total overall water use within the New Mexico portion of the San Juan Basin (currently 486,660 AF) by <0.000%.

The development of the Proposed Action would increase the total water use (non-potable saline and potable/freshwater groundwater) in the mining category water use by <0.00%. Dieter et al. (2018) reported 5,257 AF of non-potable saline groundwater used for mining purposes in 2015; non-potable groundwater use from the Proposed Action would increase saline water use for mining within the San Juan Basin by <0.00%. Dieter et al. (2018) also reported 3,677 AF of potable groundwater used for mining purposes in 2015; potable groundwater use for construction of the well pad, pipeline, and dust control would increase freshwater use for mining within the San Juan Basin by <0.00%. Any additional fresh water needed for the Proposed Action would be purchased legally from those who hold water rights in the San Juan Basin. Non-potable groundwater would consist of produced water from existing Mesa Verde/Dakota and Fruitland coal wells in the area operated by Hilcorp.

Water Quality

Development of the Proposed Action is not expected to affect water quality. BLM's Onshore Oil and Gas Order No. 2 (which would apply to this well) outlines the casing and cementing requirements for wells to ensure that groundwater reservoirs containing water with less than 10,000 TDS are isolated from the well bore. Under the authority of the Mineral Leasing Act of 1920, as amended, Reclamation implements existing safeguards and regulations for the prevention of harm to the environment, health and human safety, specifically surface and groundwater resources. Protection of ground and surface water is enforced in concert with the State of New Mexico and any other applicable entities with jurisdiction (e.g., Tribal entities, U.S. Army Corps of Engineers, EPA). The mitigation of any water-contaminating event would occur in addition to the enforcement of applicable regulations.

The natural gas and liquids produced by the well would be piped to existing infrastructure. If any storage of produced liquids occurs at the proposed well pad, it would increase potential for hydrocarbon or produced water spills that could affect groundwater quality. As noted in section **2.2.3 – Well Pad**, design features and BMPs include containment areas surrounding all tanks. Containment areas would be capable of containing 110% of the fluids in the largest tank in the containment area and would also include sufficient freeboard for precipitation. Should a spill occur, Reclamation, NMOCD, and the operator would work together with any other necessary agency to immediately remediate spills in accordance with federal and state standards, including 43 CFR 3162.5-1 and 19.15.29.11 NMAC.

There would be no significant adverse impacts to water quality or quantity as a result of the Project because of the implementation of stormwater BMPs, adherence to BLM's Onshore Oil and Gas Order No. 2 (cementing and casing of the well), secondary containment at the well pad, primary use of recycled and produced water for drilling and completions, and the very small amounts of fresh water needed for the project.

3.2.3.6 – Cumulative Effects

Water Use for Oil and Gas Development

As part of oil and gas development, water is used for (among other things) activities such as drilling fluid preparation and make-up water for completion fluids; in-well stimulation (of which the most common method is hydraulic fracturing); and ancillary uses such as rig wash water, coolant for internal combustion engines, for dust suppression on roads or well or facility pads, and for equipment testing. According to interviews conducted with the largest operators currently operating within the San Juan Basin, approximately 95% of water used for well development is used to hydraulically fracture a well and 5% is used for all other ancillary activities listed above (BLM 2019).

Water use associated with hydraulic fracturing (also called completion or stimulation) of wells depends on many factors, including the target geological formation and availability of resources. Within the FFO, the two most prominent techniques utilized are nitrogen (which is a nitrogen-based fluid) and slickwater (which is a water-based fluid) (BLM 2022). An advantage to using nitrogen in place of water is the reduced quantity of water needed to achieve the same oil and gas yield. An advantage of using slickwater completion methods is that water with high saline contents can be used. As mentioned, the proposed development of the San Juan 32-7 Unit 202H would not utilize hydraulic fracturing.

As noted in the Water Support Document, historically the average of the water use associated with a vertical well was 0.537 AF/well; for a horizontal well, the average water use was 3.13 AF/well (Crocker and Glover 2018). FracFocus data indicate that the BLM FFO 9-year average water use is 413 AF/year and 5.8 AF per well (BLM 2022; FracFocus 2024: Table 4-6). However, FracFocus does not differentiate between wells that are new completions or recompletions of previously drilled wells. To address this issue, the BLM FFO also compiled additional data from NMOCD records and aggregated with FracFocus data to provide a more detailed analysis of water use by well type (new completion versus recompletion and completion method). From 2014 to 2022, recompletions of previously existing wells (vertical) used an average of 0.58 AF/well and completions of vertical wells used an average of 0.3 AF/well. Water use associated with new completions of nitrogen and slickwater wells used an average of 3.98 and 83.3 AF/well, respectively. Based on the most recent 3 years of data (2020–2022), the 3-year average is 10.3 AF per well. This is due to the higher volume of wells, the likelihood that horizontal wells are being drilled to longer lengths in the intervening time, and the continued use of hydraulic fracturing technologies in well drilling and completion. Given the increasing trend in water use seen in the FracFocus data, the 3-year average of 10.3 AF per well is considered a reasonable estimate of water use associated with future oil and gas development in the FFO (BLM 2022: Table 4-7).

Future Water Use: FFO 2018 and RPFO 2019 RFD Oil and Gas Development

The FFO 2018 RFD projects the development of 3,200 wells (2,300 horizontal wells and 900 vertical wells) in the FFO portion of the San Juan Basin between 2018 and 2037, or approximately 160 wells per year (Crocker and Glover 2018). Water use associated with the 900 vertical wells is estimated to require 483 AF for the 900 vertical wells projected in the 2018 RFD (0.537 AF/well). Given changes in horizontal well development and completion technologies, the BLM FFO developed four horizontal well water use projections (BLM 2022):

- Nitrogen scenario: This assumes all 2,300 horizontal wells predicted in the 2018 RFD will use nitrogen stimulation (3.8 AF per horizontal well), which would result in a 20-year cumulative water use of 9,223 AF by 2037 (including 483 AF for the 900 vertical wells projected in the 2018 RFD).

- 2018 RFD Revised water use projections scenario: Based on vertical and horizontal water use estimates contained in the 2018 RFD and refined through a review of 2018 FracFocus water use data ("2018 revised RFD scenario"), consumptive water use required for hydraulic fracturing of the wells projected in the RFD is currently estimated at 11,615 AF, or about 580 AF in any given year (including 483 AF for the 900 vertical wells projected in the 2018 RFD).

- Slickwater scenario: This scenario assumes that all 2,300 horizontal wells predicted in the RFD would use slickwater stimulation, with an average lateral length of approximately 2 miles, which would result in a 20-year cumulative water use of 125,483 AF by 2037 (including 483 AF for the 900 vertical wells projected in the 2018 RFD).

- 3% Annual Slickwater Increase Scenario: This scenario assumes a consistent 3% increase in the proportion of slickwater wells and a corresponding decrease in nitrogen-stimulated wells from 2020 through 2037. The values are based on an average water use of 3.8 and 41.3 AF per well for the nitrogen and slickwater scenarios, respectively, and 0.537 AF per well for

vertical wells. This scenario would result in a cumulative horizontal well water use of 29,822 AF.

The RPFO 2019 RFD forecasts development of 200 federal and non-federal oil and gas wells (160 vertical wells and 40 horizontal wells) over a 20-year period from 2020 to 2039, or approximately 10 wells per year (Crocker and Glover 2019). The 2019 RFD predicts an initial development of seven wells and a water use of 8.34 AF in 2020, which is predicted to increase to 13 wells and a water use of 22.49 AF by 2039, resulting in a 20-year average water use of 15.4 AF/year and a total cumulative water use of 308 AF (BLM 2023a: Figure 5-3).

Table 16 presents predicted water use associated with the 2018 and 2019 RFDs with consideration of the four water use scenarios in the FFO. Projected water use for the RPFO is from the 2019 RFD as data have not yet resulted in the development of alternative scenarios within that Field Office. Table A.6 also presents a prediction of RFD water use based on the current FracFocus water use trends over the past 9 years (5.8 AF per well and 413 AF/year, for a total of 9,685 AF for the FFO; predicted water use of the RPFO is carried forward in this projection as well, as there is no actual use data to consider in this prediction (BLM 2022).

Table 16. RFD Water Use by Completion Technology Scenario and Actual Water Use

	Nitrogen Stimulation Scenario (AF)	RFD Scenario (AF)	Slick Water Stimulation Scenario (AF)	3% Slickwater Stimulation Increase Scenario	Actual 9-year Water Use
Total FFO water use (3,200 wells)	9,223	11,615	125,483	29,822	9,685
Total RPFO water use (200 wells)	308	308	308	308	308
Total San Juan Basin Water Use (3400 wells)	**9,531**	**11,923**	**157,791**	**30,130**	**9,993**
Annual water use (over 20 years)	**477**	**596**	**6,290**	**1,507**	**500**

BLM 2022.
Note: The FFO RFD scenario used is the revised RFD scenario. Projected water use for the RPFO used that projected in the 2019 RFD under all scenarios as data have not yet resulted in the development of alternative scenarios in that Field Office. See Section 4.1.2.3 and Section 5.1.2 of the 2022 WSD for more information on RFD water use scenarios.

As shown in **Table 16**, the total consumptive water use required for hydraulic fracturing of the wells associated with the 2018 and 2019 RFDs could range from 9,531 AF (nitrogen scenario) to 157,791 AF (slickwater scenario) over the next 20 years, depending on the completion method used. Annual use would range from 477 AF per year (nitrogen scenario) to 6,290 AF per year (slickwater stimulation scenario). Annual water use would comprise between 4.1% (nitrogen scenario) and 54% (slickwater stimulation scenario) of the 2015 "mining" category water use, and less than 0.0001% of total 2015 water use within New Mexico portion of the San Juan Basin as disclosed in **Table 16**.

Other Future Water Use

Future water use for the other reported water use categories in the San Juan Basin is assumed to continue at current levels, and agricultural irrigation would continue to be the highest water use category in the San Juan Basin. See the Water Support Document (BLM 2022) for more information about the 2018 RFD scenario and water use estimates. Development of the 2018 and 2019 RFDs would also require some water for drilling, dust control, and construction of reasonably foreseeable transmission lines and pipelines (BLM 2022). It is assumed that these uses would not increase beyond the estimates already included in the mineral use category report in the 2015 U.S. Geological Survey report (Dieter et al. 2018).

No other planned actions with substantial use have been identified; however, predicted impacts from climate trends for the analysis area include intensified droughts. Overall water availability is predicted to decrease by one-quarter to one-third through the end of the twenty-first century for the Upper Rio Grande Basin (southern Colorado to central-southern New Mexico) (BLM 2022).

3.2.3.6.1 – Potential Sources of Water for Oil and Gas Development

Any ground or surface waters that have TDS concentrations greater than 1,000 mg/L are defined as "non potable" by the State of New Mexico (72-12-25 New Mexico Statutes Annotated 1978). Non-potable water is outside the New Mexico Office of the State Engineer's (NMOSE's) appropriative processes for the allocation of water resources and is mainly diverted for mineral exploration purpose. Water that is less than 1,000 mg/L TDS is "potable/fresh" and is generally within the appropriative process for the NMOSE. The BLM has identified anything less than 10,000 mg/L to be protected in the casing rule of the BLM's Onshore Order No. #2. Mining operations in the New Mexico San Juan Basin in 2015 used 5,258 AF of non-potable water, or 45% of mining water use, and 6,401 AF of potable/fresh water, or 55% of mining water use (Dieter et al. 2018).

Some San Juan Basin oil and gas operators use slickwater fracturing fluid, which can use lower-quality water (higher TDS levels) than other fracturing fluids such as nitrogen foam or gels. The higher allowable TDS levels that are acceptable for slickwater stimulation expand the possible water sources beyond those that have been historically used (e.g., potable surface or groundwater sources) into non-traditional sources of water (e.g., non-potable groundwater sources). Non-potable water sources in recent oil and gas projects include water source wells drilled specifically into the Entrada Formation, which lies stratigraphically below the Mancos Shale and other producing intervals.

Flowback water is sourced from fluid that flows back through the wellhead directly after hydraulic fracturing activities and goes through a separation process to remove proppant and hydrocarbons. Produced water is naturally occurring geologic water trapped in hydrocarbon-bearing formations that is produced as a byproduct of oil and natural gas extraction. The Water Support Document (BLM 2022) contains additional information regarding potential water sources that may be used in oil and gas development.

3.2.3.6.2 – Water Disposal

Produced water is commonly disposed through underground injection wells. The NMOCD regulates and monitors underground injection wells in the state of New Mexico. The NMOCD permits underground injection wells into formations that will allow water infiltration and has water with TDS concentrations greater than 10,000 mg/L. The majority of underground injection wells are

permitted in the Entrada Formation; however, some older injection wells were permitted in the Mesaverde Group. Using data from the NMOCD, over 600 underground injection wells are currently located throughout the San Juan Basin with an average depth of 6,715 feet (NMOCD 2024). Underground injection wells are synonymous with saltwater disposal wells, disposal wells, and injection wells; the terms are used interchangeably.

The Proposed Action would not result in significant impacts to water quality or quantity when considering the cumulative effects of other oil and gas activities occurring within the greater San Juan basin, based on the aforementioned use of BMPs, secondary containment, and the small amounts of recycled/produced water and fresh water needed for this project.

3.2.4 – Soils & Farmlands of Agricultural Significance

The Project Area (**Figure 2**) is the geographic scope of analysis for soils and farmlands of agricultural significance, the context within which Project activities have the potential to affect this resource. The soils units mapped by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in the Project Area are generally shallow sandy loams over shallow sandstone bedrock (see **Figure 5. Soil Types**). None of the soils are classified by NRCS (NRCS 2019) as "prime farmland if irrigated," "farmland of unique importance," or "farmland of statewide importance" under the Farmland Protection Policy Act. Soils in the area are also highly prone to erosion, given the steep slopes and shallow depth to bedrock. The NRCS lists two soil types within the approximately 6.4-acres of surface disturbance associated with the project.

The soil type and extents affected by the areas of long-term and temporary surface disturbance are given in **Table 17** below, and shown in **Figure 5 Soil Types**, below. All areas of temporary disturbance associated with the Project would be reclaimed, and permanent areas are located on existing disturbed areas.

In summary, the Project area is dominated by very shallow sandy loams overlaying shallow sandstone bedrock and shallow residuum weathered from sandstone. These soils are shallow to very shallow, and well-drained. Topography ranges from nearly level benches to side slopes to rocky outcrops. Runoff is medium after the soils become saturated. They are subject to water erosion, but the stones and rock outcrops help to stabilize the soils on gently sloping areas. Careful management is needed to maintain a cover of desirable forage plants and to control erosion. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and poor soil conditions.

These soils typically have scattered populations of squamulose lichens and a few crustose lichens, while gelatinous lichens and cyanobacteria are occasionally present primarily in the pockets of deeper soils. These soil crusts are important in binding loose soil particles together to stabilize the soil surface and reduce erosion. Biological soil crusts can contribute positively to soil stability, fixing atmospheric nitrogen, nutrient contributions to plants, water infiltration, and plant growth. They function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. In addition, they can act as living mulch which discourages the establishment of annual/invasive weeds. Structurally they form an uneven, rough carpet that reduces rain drop impact and slows surface runoff. Below the surface, lichen and moss rhizines, fungal hyphae, and cyanobacterial filaments all act to bind the soil surface particles just below and at the

surface. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

As presented in the Proposed Action, the upper six inches of topsoil (if available) would be stripped following vegetation and site clearing. Topsoil would not be mixed with the underlying subsoil horizons and would be stockpiled as a berm along the perimeter of the well pad within the construction buffer zone or as a windrow along the road/pipeline corridor , separate from subsoil horizons or other excavated material. Topsoil and sub-surface soils would be replaced in the proper order, prior to final seedbed preparation. Spreading shall not be done when the ground or topsoil is wet.

Additionally, it was determined that this area may lack topsoil. Therefore, Hilcorp proposes to incorporate soil amendments as part of the soil preparation in order to establish a seedbed for vegetative success. With the approval of Reclamation, the appropriate soil amendments would be applied to the reclamation area. The existing soil in the reclamation area would be recontoured to blend with the surrounding area. Approximately 7,000 lbs of soil amendments are proposed for use (see Appendix A in **Appendix A – Surface Use Plan of Operations**).

3.2.4.1 – No Action Alternative

The No Action Alternative would have no effect on soils. Soils in the Project Area would continue to support native shrubland vegetation as in the past. Salinity loading from irrigation water contact with saline soils in the involved ditches would continue as it has in the past.

3.2.4.2 – Direct and Indirect Impacts from Proposed Action

The Proposed Action would involve temporary surface disturbance of approximately 1.66 acres; and 1.24 acres of long-term disturbance (associated with the working surface of the well pad). Well pad and pipeline construction disturbance, as described in section **2.2 – Proposed Action**, would include removal of surface vegetation and grading of the well pad area, and excavation and removal of surface vegetation for the construction and excavation of the pipeline trench. The well pad construction and trench excavation area and associated disturbance to subsoil layers would be confined to the extent of the well pad and trenchline within the pipeline alignment. There is a high likelihood of wind- or water-driven soil erosion in the Project area. Since the Proposed Action would remove surface vegetation, any biological soil crust components that might be present would be removed, and construction activities would loosen and expose subsoil during the construction process. Because of the friable, dry soils in the area, there is a moderate risk of wind erosion during and after pipeline construction.

Table 17. Soil Types in Project Area

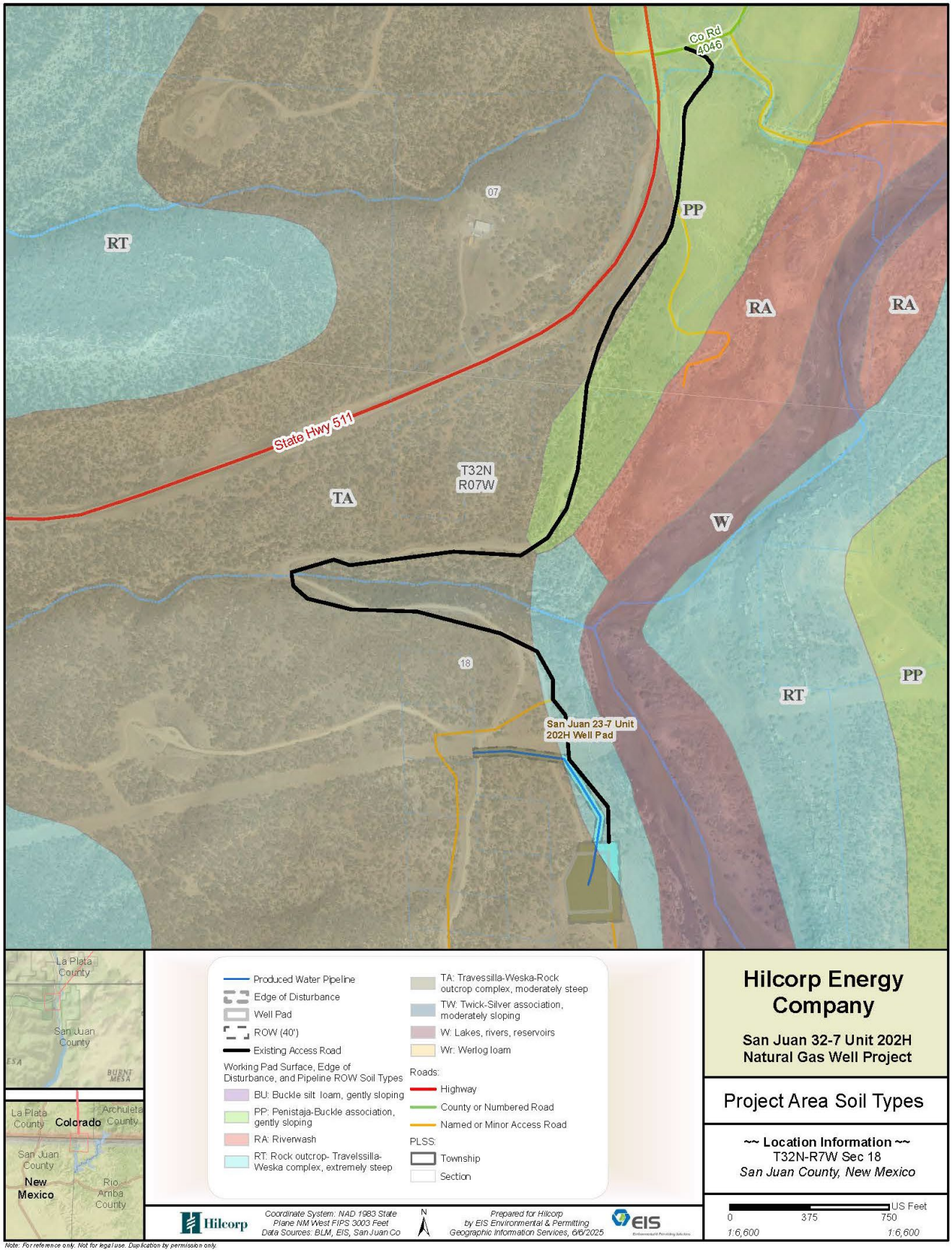
Soil Type Name	Map Unit Symbol	Total Acres	Percent of Disturbance
Travessilla-Weska-Rock outcrop complex, moderately steep	TA	2.14	75%
RT outcrop-Travessilla-Weska complex, extremely steep	RT	0.73	25%
	Total	**2.87**	**100%**

Impacts to soil resources are reduced by standard practices such as utilizing existing surface disturbance areas (e.g., existing roads), minimizing vehicular use, placing parking and staging areas on surfaced areas, and quickly establishing vegetation on reclaimed areas, and the proposed use of approximately 7,000 lbs of soil amendments. The specific measures that Hilcorp would employ are described in **Appendix A – Surface Use Plan of Operations** and are also summarized below.

While there are no areas of large-scale or notable biological crusts, these and other sensitive soil types are susceptible to compressional damage from vehicle traffic and construction activities. Disruption of crusts can result in decreased soil organism diversity, soil nutrient levels, soil stability, and organic matter. The biological crust community found in sandy soils, such as those that could occur in the Project area, typically contain only large filamentous cyanobacteria, and do not support the density or diversity of microorganisms found in more finely textured soils. The cyanobacteria that are present contribute to stabilizing the soil surface, contribute to available nitrogen and soil moisture levels, and their populations are susceptible to degradation from disturbance and soil compression associated with construction. It would take several years for cyanobacteria populations to reestablish in reclaimed areas of the disturbance area, but the existence of undisturbed soil surrounding the Project should provide source populations.

No significant impacts to farmlands of agricultural significance would occur as a result of the Proposed Action, because they do not occur in the Project Area. Soils affected by construction would be protected from erosion with BMPs and soils would be returned to production in the following years as a result of reseeding and revegetation activities. Given the types of soils in the area, the use of soil stockpiling, BMPs, soil amendments, and interim and final reclamation procedures, the Proposed Action would not result in significant impacts to soils, farmlands, or agriculturally significant areas.

Figure 5. Soil Types in Project Area



3.2.5 – Rangelands and Grazing

The Project area is within a BLM grazing allotment, called the Pump Mesa allotment. This BLM allotment crosses over onto Reclamation lands, and the BLM administers management of cattle grazing on Reclamation lands within the allotment boundaries in the Navajo Reservoir area, per a Memorandum of Agreement (Contract No. 0-LM-48-00003). Limited cattle grazing is allowed to occur above the 6,100-foot elevation line to help maintain water quality. The Pump Mesa allotment supports seasonal cow-calf rotation operations. Range improvement projects such as windmills, water delivery systems (pipelines, storage tanks, and water troughs), earthen reservoirs, fences, and brush control projects are located within the allotment, primarily on BLM lands.

3.2.5.1 – No Action Alternative

The No Action Alternative would have no effect on cattle grazing. Grazing in the Project Area would continue per BLM management, according to the MOU with Reclamation. Impacts to area vegetation profiles would continue on current trajectories, and operation of the existing San Juan 32-7 #029A well would continue on current trajectories.

3.2.5.2 – Direct and Indirect Impacts from the Proposed Action

Disturbance associated with the proposed well pad would result in approximately 2.90 acres of initial impacts, with 1.66 acres undergoing interim reclamation, and 1.24 acres remaining as long term disturbance, until final reclamation occurs. These impacts to vegetation would not affect the stocking of cattle authorized for livestock use in this area, but while the project area is revegetating, there would be reduced grazing opportunities. Construction of the project would result in a temporary loss of less than 0.01 percent of the acres within this allotment.

There are occasional livestock injuries or deaths due to accidents such as collisions with vehicles, falling into excavations, and ingesting plastic or other materials present at the work site. If trenches are left open for more than four hours, or the open trench spans a distance that does not allow livestock to reach a water source, livestock may become stressed from lack of water.

Impacts to livestock grazing operations are reduced by standard practices such as utilizing existing surface disturbance, minimizing vehicular use, and quickly establishing vegetation on the reclaimed areas. Any trenches left open while cattle grazing is occurring in the area would be fenced off or have escape ramps (see section **2.2.4 – Produced Water Pipeline**) to minimize potential impacts to livestock grazing.

Given the small amount of new disturbance to vegetation, impacts to grazing through a reduction in forage within the Pump Mesa allotment would be insignificant. If cattle loafing and grazing negatively impacts revegetation efforts, Hilcorp would need to fence off revegetation areas, but this would not meaningfully impact grazing or forage availability in the allotment.

3.2.6 – Vegetation

Land cover (vegetation communities) in the action area is predominantly classified as Colorado Plateau Piñon-Juniper Woodland, and is dominated by pinyon-juniper woodlands, oakbrush shrublands, and mixed mountain shrubland community types. The project and action areas contain previously disturbed areas associated with several pipelines and access road corridors. Most of the 2.9 acres of surface disturbance would be in previously disturbed areas, with the majority of the well pad being within the limits of the existing well pad. No wetland-associated vegetation is present within the project area.

Dominant plant species in the project area include pinyon pine (*Pinus edulis*), Utah juniper (*Sabina osteosperma*), rabbitbrush (*Ericameria nauseosus*), sagebrush (*Artemisia tridentata*), Utah serviceberry (*Amelanchier utahensis*), bitterbrush (*Purshia tridentata*), western wheatgrass (*Pascopyrum smithii*), Indian ricegrass (*Achnatherum hymenoides*), prairie junegrass (*Koeleria macrantha*), and scarlet globemallow (*Spahaeralcea coccinea*). Vegetation along the access road and around the existing well pad is periodically disturbed by routine maintenance, which includes periodic application of herbicides, stormwater management, and installation or maintenance of existing pipelines. Livestock grazing (cattle) occurs during the summer months.

Federally Listed Species

Listed or candidate wildlife species that were considered and evaluated for this assessment include those identified by the USFWS as potentially occurring in the project area (IPaC website accessed June 3, 2025, Project Code: 2025-0104904). While all listed species were initially considered, an elimination of species is indicated in **Table 18** below. This decision is based on known range distributions being outside of the project area or complete habitat incompatibility.

Based on information from the USFWS, two plant species listed under the Endangered Species Act (ESA) were assessed to determine if they may be present in the Project area or could potentially be impacted by actions occurring in the Project vicinity (USFWS 2025, **Table 18**).

The potential for occurrence and potential for adverse impacts are based on known habitat requirements, geographic ranges, and potential threats associated with the Proposed Action. There is no critical habitat within or adjacent to the Project area.

Table 18. Threatened and Endangered Species Potentially in Project Area

Species Name	Habitat	Warranting Detailed Evaluation?	Effects Determination
Knowlton's Cactus *Pediocactus knowltonii* Endangered	Pinyon-juniper woodlands	**No:** Most of the project area has been previously disturbed; project area was surveyed for this species, and was not observed.	**No Effect.** Project does not support habitat, and species does not occur in project area.
Mesa Verde Cactus *Scleocactus mesae-verde* Threatened	Occurs on Mancos and Fruitland shale formations.	**No:** Project area does not support suitable parent material types.	**No Effect.** Project does not support habitat, and species does not occur in project area.

3.2.6.1 – No Action Alternative

There would be no effect on existing vegetation from the No Action Alternative. The Applicant would continue to occasionally manage vegetation around the existing well pad, which includes periodic application of herbicides and stormwater management.

3.2.6.2 – Direct and Indirect Impacts from Proposed Action

Sagebrush and mixed shrublands would be temporarily impacted by pipeline construction. Pipeline construction would remove virtually all vegetation in the proposed alignment and in associated temporary use areas, but these disturbed areas would see recontouring, topsoil redistribution and reseeding after construction. Some of the vegetation material cleared in preparation for construction would be stockpiled adjacent to the alignment for use in reclamation, but effectively no viable vegetation would remain immediately after construction.

Long-term disturbance for the proposed well pad would result in approximately 2.90 acres of initial impacts, with 1.66 acres seeing interim reclamation, and 1.24 acres seeing long term disturbance, until final reclamation occurs.

Seeding on Reclamation would consist of a mix of native grasses, forbs and shrubs (see **Appendix A – Surface Use Plan of Operations**). Given site soils and climate, establishment of self-sustaining populations of desirable native grasses, forbs, and shrubs would require multiple growing seasons. The proximity of the pipeline to existing roads, well pads, and pipeline alignments makes it such that some noxious weeds (particularly bindweed (*Convolvulus arvensis*) and cheatgrass (*Anisantha tectorum*), see section **3.2.7 - Noxious Weeds and Invasive Plants**) and other invasive or non-native species associated with these areas would spread into reclaimed areas.

Another impact would be the length of time required for native forbs and shrubs to establish in seeded areas, even when weeds are not an issue. Winter and springtime winds and intense summer thunderstorms can make seedling establishment difficult, and sheetflow from stormwater runoff can also wash-away or redistribute seeds, prolonging the time to establish self-sustaining vegetation. Flowering forbs and shrubs are an important food source for pollinator species such as solitary bees, butterflies, moths, and birds, as well as local endemics species (see section **3.2.10 – Wildlife Resources**).

Adjacent native vegetation would not be directly affected by construction but could be indirectly affected by increased dust deposition on leaves and from wind-blown soils, as well as from stormwater runoff. Levels of fugitive dust and blowing sand from the construction area and well pad could be expected to increase in the short term from pipeline installation and well pad construction. Increased dust levels can negatively impact plants by clogging stomatal openings in the leaves, impeding gas exchange and reducing the ability of plants to take in carbon dioxide. Dust on the leaf surface can also reduce incident light at the leaf surface. Light and carbon dioxide are critical for plants to conduct photosynthesis, and reductions in either can reduce the quantity of carbohydrates plants can produce through photosynthesis and thereby reduce plant growth and seed production. Dust can also affect soil moisture availability, alter soil pH and nutrient availability, and result in changes in plant community composition.

The greatest long-term negative impact on vegetation from the Proposed Action would be the potential for establishment and spread of weeds or undesirable plants (section **3.2.7 – Noxious Weeds and Invasive Plants**), which could inhibit, or in some cases preclude, the establishment of

native plant species. Noxious weed control, as required by Reclamation, would limit the extent of weed spread and infestation, should weeds become established in the reclaimed area.

Implementation of revegetation practices would be required by Reclamation through environmental commitments attached to the license agreements and are therefore part of the Proposed Action. These practices include topsoil stripping and handling, seedbed preparation, seeding, mulching, and weed control. Establishment of desirable herbaceous vegetation on temporary disturbance areas sufficient to minimize erosion by wind or water and invasion by weeds would occur within 3 to 5 years. Annual monitoring and weed control, with follow-up re-seeding if necessary, would be required until the revegetation achieves Reclamation approval.

While there would be short-term negative impacts to vegetation and associated habitats, given the small size and scale of the project, use of weed control measures, the use of BMPs, and the use of interim and final reclamation procedures, no significant impacts to vegetation would occur as a result of the Project. The construction footprint would be revegetated with upland plants found in the existing well-established adjacent plant communities; areas in the construction footprint would be reseeded and revegetated to Reclamation standards.

3.2.7 – Noxious Weeds and Invasive Plants

Noxious weeds are plants that are aggressive competitors that are non-native to an area. Most have come from Europe or Asia, either accidentally or as ornamentals that have escaped. Once established in a new environment they tend to spread quickly because insects, diseases, and animals that normally control them are absent.

There are a number of plant species within the Navajo Reservoir area that are identified by Reclamation and would be managed per the Navajo Reservoir area RMP (BOR 2008). These species are Russian olive (*Elaeagnus angustifolia*), salt cedar (tamarisk; *Tamarix* spp.), musk thistle (*Carduus nutans*), and Canada thistle (*Cirsium arvense*). Cheatgrass (*Anisantha tectorum*) and field bindweed (*Convolvulus arvensis*) are relatively common around the Project Area and mainly occur along the shoulders of highways, state and county roads, lease roads, on well pads (especially abandoned well pads), and along pipeline corridors. Reclamation has an active noxious weed monitoring and treatment program, and partners with county, state and other federal agencies and industry to treat infested areas with chemicals and monitor areas for new infestations.

A noxious weed survey occurred as part of project planning; no Class A or Class B noxious weeds occur in the project area (EIS 2025; Appendix A in **Appendix A – Surface Use Plan of Operations**. Bindweed (*Convolvulus arvensis*), cheatgrass (*Anisantha tectorum*) are present in and around the project site. Russian olive (*Elaeagnus angustifolia*) occurs outside of the project, along the Los Pinos River.

In addition to State-listed noxious weeds, other invasive non-native species that can negatively affect native plant communities and interfere with revegetation are present in the Project area. These include goathead (*Tribulus terrestris*), Russian thistle (*Salsola* spp.), and halogeton (*Halogeton glomeratus*).

3.2.7.1 – No Action Alternative

Under the no action alternative, no additional activities would occur in the area which could impact or promote noxious weeds; ongoing management of noxious weeds by Reclamation and area oil & gas operators would continue on current trajectories. Noxious weeds would continue to spread in the Project Area and in surrounding lands through common vectors, including surface soil disturbances, vehicles, wildlife, and livestock moving through the Project Area.

3.2.7.2 – Direct and Indirect Impacts from Proposed Action

The most common herbaceous noxious weeds present within Project Area are field bindweed and cheatgrass (EIS 2025). Non-native shrubs or trees scattered along the Los Piños River include Russian olive (*Elaeagnus angustifolia*) and salt cedar (*Tamarisk* spp.). These weeds are common and widespread in the region, in disturbed areas such as roadsides, along ditch banks, in agricultural field margins, and in and around livestock corrals, feeding areas, and stockwater ponds, etc. Noxious weeds are well-adapted to colonize both newly disturbed soils and historically disturbed soils more quickly than most native plants. Flowing water in streams, as well as vehicles and livestock, are also vectors for the continued spread of noxious weeds in the Project Area. Although Hilcorp occasionally conducts vegetation management in the Project Area, noxious weeds are persistent in the Project Area, covering an estimated average of about 10 percent of previously disturbed areas (EIS 2025).

The same noxious weed species are persistent and scattered across the geographic area of analysis in advantageous (disturbed) locations, along waterways, and in developed areas of San Juan County at large. Given the presence of noxious weeds in the area, new soil disturbance will provide an opportunity for weeds to spread and become established. The importation of fill material for the pad site construction also increases the risk of new weed species being imported into the area. Hilcorp would need to be aggressive and diligent in their noxious weed management in the seasons following construction in order to keep weeds from spreading, and from new weed species from becoming established.

Reclamation has weed control standards and a noxious weed management plan; Reclamation has also required that Hilcorp develop a site specific and enforceable noxious weed management plan for this project, with an enforcement mechanism that triggers coordinated weed control in the Project area. Landowners in the geographic analysis area have varying levels of resources to dedicate to noxious weed management on their lands, and differences exist regarding effectiveness of management methods and which management methods are preferred (for instance, chemical versus biological or mechanical controls).

Given the small size and scale of the Project, and Hilcorp's implementation of a noxious weed management plan, which is enforceable by Reclamation, the Project would not have a significant negative impact through the spread of noxious weeds and invasive plants in the area.

3.2.8 – Visual Resources

The viewshed in the Project area includes hillslopes dominated by pinyon-juniper woodlands, with the Los Piños River dominating the scenery. Existing roads and pipeline corridors also punctuate the viewshed and vary in their dominance based on the observer's location. Most common passers-

bys would be on NM-511. Observers using the access road to Reclamation and BLM lands would cross a number of roads and pipeline corridors, with well pads and production equipment occurring intermittently. Given the woodland cover, some well pads and production equipment are harder to see, until the observer is very close. NM-511 is a regional state highway, seeing moderately low levels of vehicles per day. **Appendix D** presents the BLM Contrast Rating Sheet for this project, which has a key observation point at NM-511. The Project Area is not visible from the reservoir area or river bottom, given area topography.

The Los Piños River and the riparian zones along the waterway provide some variety within the landscape regarding lines, color, form, and texture. Colors within this character create soft neutral tones. Use in this area is primarily moderate and dispersed in the summer, with a short spike in visitation during the fall for big game hunting and for fuelwood gathering. Navajo Reservoir is a destination for both the water-based recreation and for camping.

The project area is almost entirely on Reclamation lands but crosses a small part of NM Game and Fish lands (primarily to ensure permanent public and agency access). The portion of the project on Reclamation-managed lands is classified as Visual Resource Management (VRM) Class II. Reclamation tiers to BLM's Manual H-8410-1 – Visual Resource Inventory (BLM 1986) for guidance, which states that VRM Class II objectives are to retain existing landscape character. The level of authorized change should be low. Management activities may be seen but should not attract a casual observer's attention. Any changes must repeat the basic elements of line, form, color, and texture found in the predominant natural features of the landscape. One of these requirements is that tanks must be low profile tanks.

VRM objectives do not apply to private land. However, visual resource values are protected at landowner discretion and addressed to the extent possible under Reclamation's regulatory authority when approving Federal actions involving private land.

3.2.8.1 – No Action Alternative

Under the No Action Alternative, the proposed action would not be constructed. No project-related impacts to visual resources from activities described above for the Proposed Action would occur. Reclamation management, State Parks management, currently permitted activities in the project area, and associated impacts, would continue. These include activities and impacts associated with private land residential development, continued oil and gas development and operations, NM-511 management, access roads, recreation, and grazing.

3.2.8.2 – Direct and Indirect Impacts from Proposed Action

Visual resources would be impacted temporarily by construction associated with the Proposed Action, as well as permanently impacted at the site of the well pad. Vegetation removal, surface disturbance, and fugitive dust emissions would impact the visual setting, including contrast in form, line, color, and texture. These impacts would be noticeable to the casual observer within the foreground-middle ground areas, mostly to travelers on NM-511 and any visitors travelling down the access road onto Reclamation lands. Pipeline construction would be less than ½ mile to NM-551 but occurs in areas already disturbed by roads and pipeline corridors. While taller trees would not be allowed to reestablish over the top of the pipeline, smaller shrubs (including some brush species) would be allowed to reestablish. Approximately 5 pinyon pine trees along the Northwest corner of the well pad would be removed on Reclamation lands, and conversion to grasses, forbs,

and smaller shrubs would alter the visual context in some areas on Reclamation lands. In some areas, it may take many years for shrub growth to establish to reduce visual impacts of the project.

Long-term visual impacts would be reduced by burial of the pipeline and prompt recontouring and reseeding with a diverse mix of native grasses. The casual observer from NM-511 would be able to discern the visual impact of the Proposed Action in a few places, but it would not dominate the view or significantly disrupt landscape elements. In some areas, however, the conversion to grasses, forbs, and smaller shrubs may result in longer-term visual contrasts, while shrubs become well established (which could be 10-20 years in some areas). In general, the landscape throughout the project vicinity contains linear elements in vegetation due to human activities such as roads, residential developments, fence lines, powerlines, and pipelines. In addition, the proposed pipeline alignment would follow existing alignments. The Proposed Action is compatible with the management objectives of VRM Class II on Reclamation lands.

Design features and other measures would minimize erosion over the long term and minimize visual resource impacts in the Project Area. In addition, conditions to be applied by Reclamation (see **Chapter 5 - Environmental Commitments**) include preserving vegetation to the extent practicable during construction. Reclamation may also direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features. Low profile tanks for storing produced water are also required. Lighting will be limited only for as needed nighttime construction, drilling or maintenance activities, and permanent lighting would not occur in order to maintain dark skies conditions (see **Chapter 5 - Environmental Commitments**). The project would have short-term impacts on visual resources during and immediately after construction, and in some areas, the project would have moderate-term visual impacts, but the project would not have any significant, long-term impacts on visual resources.

3.2.9 – Noise

The project area is located in a rural setting characterized by ranching, oil and gas production, cattle grazing, recreation, native vegetation types, sparse residences, local roads and NM-511. Noise levels in the area are generally created by traffic on NM-511, rural roads, and by activities associated with oil and gas operations. The nearest home to the well pad is 0.55 miles to the north, on the north side of NM-511. Within 1-mile of the project, an environmental screening tool estimates that the population is approximately 29 people (Public Environmental Data Partners 2025). These residents would be expected to experience some noise from NM-511 and local roads.

Noise is generally described as unwanted sound and may be measured with an A-weighted decibel (dBA) scale. The decibel (dB) scale is logarithmic, not linear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale. A dBA scale accounts for the lesser sensitivity of the human ear to low and high frequencies, which are in turn weighted less on the dBA scale than on the standard dB scale. Each 10-unit increase on the dB scale increases the sound intensity by a factor of 10.

Sound levels have been calculated for areas that exhibit typical land uses and population densities. In rural recreational areas, ambient sound levels are typically 30 to 40 dBA (EPA 1974, Harris 1991). As a basis for comparison, the sound level of a normal conversation between two people standing 5 feet apart is 60 dBA. Occasional operation of oil and gas equipment, agricultural equipment and

travel by heavy trucks associated with anthropogenic noise in the project area is present due to normal ranching activity and machinery operation, traffic on NM-511 and local roads, and intermittent heavy machinery operation for road maintenance. Noise associated with NM-511 can range upward from 70 to 85 dBA (FHA 1980, 2023). These noise levels are relatively consistent throughout the year, and from year-to-year.

3.2.9.1 – No Action Alternative

Under the No Action Alternative, there would be no change in the existing level of anthropogenic noise in the project area.

3.2.9.2 – Direct and Indirect Impacts from Proposed Action

Under the Proposed Action, there would be additional noise introduced in the project area, primarily due to the operation of heavy equipment during construction of the well pad and pipelines, and from the operation of the drill rig (which is powered by diesel generators). The noise associated with the heavy equipment would be limited to the construction phase and would be largely attenuated and mitigated by the presence of vegetation surrounding the project area and by ambient highway noise. The noise from the drilling rig generators would occur for approximately 3 months, during the drilling and completion of the well. Noise levels from the drilling rig are estimated to be within 60 to 65 dBA at 500-feet from the rig (FHA 2017). The nearest residence (0.55 miles from the project) would hear some low-level sounds from construction equipment, generally only during the daytime hours, and from the drilling rig, which sometimes runs 24 hours a day. Given the distance from the nearest home to the project, noise would not be expected to be consistently overly intrusive or impact daily activities. But loud noises may intermittently occur, primarily during the daytime hours when most construction occurs. After construction, and during drilling operations, this homesite should not hear noticeable sounds louder than regional noise levels, such as noise from NM-511. During the construction and drilling phase, this homesite (and other nearby homesites) could experience a decreased sense of rural lifestyles and diminished natural experiences, and construction and drill rig noise could be bothersome at times. After construction and drilling, noise from the well pad would be most associated with pickup truck and sometimes larger trucks accessing the well pad. Every few years, a maintenance rig may be used to perform service to the well, but this equipment is generally powered by smaller truck-mounted generators.

If construction or drilling occurs during the summer recreation/camping season (which at this time would not occur), visitors to Navajo Reservoir, would experience a diminished recreational experience due to nearby construction and drill rig noise while construction is occurring in this area. These elevated noise levels could last for 3 to 4 months while the well pad and pipelines are being constructed, and during drilling operations. However, the project is timed to occur well outside of the summer recreation season and would occur in the late fall/early winter, outside of the busy summertime camping season.

The Proposed Action would not contribute to any long-term regional trend in increased noise levels, due to the general absence of long-term impacts to the resource. As mentioned, there would be temporary local elevated noise impacts to reservoir visitors and homeowners. These impacts would generally be short-term but could be sporadically bothersome to some residents/ reservoir visitors. Impacts from the proposed action would not be significant given the short-term construction period, lack of residents near the project, and lack of noise generation in the long-term.

3.2.10 – Wildlife Resources

The geographic scope of analysis for wildlife is the Project Area plus an approximately one-mile buffer, the approximate area within which the Project has the potential to affect this resource. Habitats in the Project Area and in the vicinity are dominated by pinyon-juniper woodlands, and the notable Los Piños River. The characteristic feature of these habitats is co-dominance by various species of forbs, grasses, cacti, and sparse shrubs. These habitat types provide cover, forage, breeding, and nesting habitat for a variety of big game and small game species as well as nongame species.

Various bird, mammal, reptile, and invertebrate species inhabit the woodland and riparian ecosystems within and around the Project. Herbivorous mammals include mule deer, elk, cottontail rabbit, and numerous rodent species, including prevalent packrats and ground squirrels. Carnivores include coyote, black bear, bobcat, badger, striped skunk, and red fox. Upland game birds that may be found in the area include Merriam's turkey (aka wild turkey), dusky grouse and mourning dove. Many species of songbirds nest commonly in the area, with a much larger number using area habitats during migration and during the summer months. Common avian predators include Cooper's hawk, sharp-shinned hawk, Swainson's hawk, northern harrier, red-tailed hawk, kestrel, and common raven. Numerous snake and lizard species have been recorded in the area as well.

There were no active raptor nests detected within the project area during biological surveys (EIS 2025).

Suitable nesting habitat for migratory birds is present within the Project Area. During the winter, most breeding birds in the project area would have fledged their young and dispersed to winter ranges further south.

Bald eagles and golden eagles are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. These species were not detected during surveys, and the nearest bald eagle roost areas are well over a mile to the south, along the banks of Navajo Reservoir (EIS 2025).

Federally Listed Species

Listed or candidate wildlife species that were considered and evaluated for this assessment include those identified by the USFWS as potentially occurring in the project area (IPaC website accessed June 3, 2025, Project Code: 2025-0104904). While all listed species were initially considered, an elimination of species is indicated in **Table 19** below. This decision is based on known range distributions being outside of the project area or complete habitat incompatibility.

Based on information from the USFWS, one mammal, two birds, two fish, and three insects listed under the Endangered Species Act (ESA) were assessed to determine if they may be present in the Project area or could potentially be impacted by actions occurring in the Project vicinity (USFWS 2025, **Table 19**).

The potential for occurrence and potential for adverse impacts are based on known habitat requirements, geographic ranges, and potential threats associated with the Proposed Action. There is no critical habitat within or adjacent to the Project area.

Table 19. Threatened and Endangered Species Potentially in Project Area

Species Name	Habitat	Warranting Detailed Evaluation?	Effects Determination
New Mexico Meadow Jumping Mouse *Zapus hudsonius luteus* Endangered	Herbaceous wetlands dominated by dense sedges adjacent to permanent water. Designated critical habitat for the New Mexico meadow jumping mouse is located along Sambrito Creek near Navajo Reservoir.	**No:** The project area does not support any wetlands and is not proximate to any wetlands.	**No Effect.** Project does not occur in, or in proximity, to mesic riparian habitats.
Southwestern willow flycatcher *Empidonax taillii extimus* Endangered	Frequently associated with mature mixed-conifer, pine-oak, and riparian forests. Also found in canyon habitat. Designated critical habitat is located ~35 miles from the action area on the Carson National Forest in New Mexico.	**Yes:** Potential habitat along Los Piños River occurs but is over 200-feet from Project Area.	**No Effect.** Project is over 200-feet from riparian habitats, no SWWFL detected in habitats, and project would occur outside of occupancy season.
Yellow-billed cuckoo *Coccyzus americanus* Threatened	Occurs in willow and cottonwood forests along rivers from southern Canada south to the Greater Antilles and Mexico.	**No:** No habitat for this species occurs within or near Project Area.	**No Effect.** No suitable riparian woodlands along Los Pinos River.
Colorado pikeminnow *Ptychocheilus lucius* Endangered	Large rivers with strong currents, deep pools, eddies, and quiet backwaters. Designated critical habitat for this species is located ~50 miles to the southwest in the San Juan River.	**Yes:** No surface water resources will be affected by the project, and no new water depletions. Additionally, stormwater control methods would eliminate downstream sediment loading.	**No Effect.** No new water depletions, no potential for indirect impacts to downstream habitats.
Razorback sucker *Xyrauchen texanus* Endangered	Swift currents, eddies, and backwaters in the San Juan, Colorado, Green, and Yampa Rivers. Designated critical habitat for this species is located ~44 miles to the southwest in the San Juan River.	**Yes:** No surface water resources would be affected by the project, and no new water depletions. Additionally, stormwater control methods would eliminate downstream sediment loading.	**No Effect.** No new water depletions, no potential for indirect impacts to downstream habitats.
Monarch Butterfly *Danaus Plexippus* Proposed Threatened	Found throughout eastern and western North America in the spring and summer, laying their eggs on obligate milkweed host plant (primarily *Asclepias* spp.). This species is typically found in riparian areas where milkweed species are found. There is no critical habitat designated for this species.	**Yes:** The Project Area contains mainly arid piñon-juniper woodland and disturbed uplands, lacking more hydric areas containing milkweed species. However, the Los Piños River is approximately 200-feet from the project.	**No Effect.** No milkweeds in project area, but Monarchs are known to migrate through area.

Species Name	Habitat	Warranting Detailed Evaluation?	Effects Determination
Silverspot Butterfly *Speyeria nokomis nokomis* Threatened	The silverspot butterfly requires moist habitats in mostly open meadows with a variety of herbaceous and woody vegetation. Larvae feed exclusively on bog violet (*Viola nephrophylla/V. sororia* var. *affinis*). Known to occur between 5,200 feet and 8,300 feet in elevation. Distribution limited to east-central Utah through western and south-central Colorado and into north-central New Mexico.	**Yes:** The action area contains mainly arid piñon-juniper woodland, lacking wet meadows containing moist habitat with bog violet. However, the Los Piños River is approximately 200-feet from the project	**No Effect.** No wetland areas in project area; some potential habitat along Los Pinos River, but would not be impacted. Project occurs outside of flight season.
Suckley's cuckoo bumble bee *Bombus suckleyi* Proposed Endangered	Primarily found in montane meadows supporting extensive wildflowers suitable for foraging by host bumble bee species.	**No:** Project Area contains mainly arid piñon-juniper woodland, lacking meadows with good forb cover and foraging.	**No Effect.** No suitable habitat in project area, species is very rare outside of more suitable habitats.

The pinyon-juniper woodland habitats in the Project Area do not provide suitable habitat for any of the listed species, and the Los Piños River, being over 200-feet from the Project, limits the potential impact to species associated with wetter and more aquatic habitats. Water used for dust control during construction would come from industrial and non-tributary sources, and no water depletion impacts would occur to aquatic habitats.

Southwestern Willow Flycatcher. The southwestern willow flycatcher is a small, neotropical migratory bird, whose nesting habitat is restricted to relatively dense growths of trees and shrubs in riparian ecosystems in the arid southwestern United States and possibly extreme northwestern Mexico. These riparian habitats are associated with rivers, swamps, and other wetlands, including lakes and reservoirs. Most of these habitats are classified as palustrine and lacustrine forested wetlands and scrub-shrub wetlands. Some are non-wetland riparian forests. Surface waters or saturated soils are typically, but not always, present year-round or seasonally.

Southwestern willow flycatchers spend only three to four months on their breeding grounds and the remainder of the year is spent on migration and wintering in areas south of the U.S. They typically arrive on breeding grounds between early May and early June, although a few individuals may establish territories in late April (USFWS 2002).

The project area in the vicinity of the Los Piños River may support potential habitat for the southwestern willow flycatcher. In the immediate vicinity of the project, there are no suitable habitats for the willow flycatcher. No individuals were observed during surveys (EIS 2025).

Colorado Pikeminnow and Razorback Sucker. The USFWS identified the Colorado pikeminnow and the razorback sucker for potential impacts from this project. These species occur in lower elevation, larger rivers. Endemic to the Colorado River Basin, populations of these fishes had declined throughout their historic range due largely to habitat loss or habitat degradation (mainly through dams and water diversions) and introduction of competitive and predatory nonnative fish species. The San Juan River Basin Endangered Fish Recovery Implementation Program was

established in 1992 with the goal of recovering these two endangered fishes in the face of current and foreseeable future water depletions from the Upper Colorado River Basin.

Monarch Butterfly. The adults feed (gather nectar) from a variety of flowering plant species. By consuming milkweed plants (*Asclepias* spp.), monarchs obtain toxins, called cardenolides, that provide a defense against predators. Additionally, nectar from flowers is needed for adults throughout the breeding season, migration and overwintering. The monarch butterfly only lays eggs and larvae and only feed on milkweeds.

Monarchs have multiple generations during their migrations; the second, third and fourth generations return to their northern locations in the United States and Canada in the spring. For overwintering monarchs, habitats with a specific microclimate are needed for protection from the elements, as well as moderate temperatures to avoid freezing. These conditions vary between populations.

Surveys in the fall of 2024 and in the summer of 2025 did not identify any milkweeds in the project area, but monarch butterfly adults could be present in the project area during the construction process foraging on flowering plants during their southern migrations (EIS 2025). Areas along the Los Piños River may also support milkweeds.

Silverspot. The silverspot butterfly occurs in permanent spring-fed meadows, seeps, marshes, and boggy streamside meadows (USFWS 2021). The only known larval host plants are *Viola nephrophylla* and *V. sororia* var. *affinis* (bog violet). Microhabitat for the bog violet is soggy soil and shade often under willows or other shrubs that are typically at the margins of the habitat or sparsely mixed in with herbaceous vegetation. The violet is widely distributed in the western U.S. but occurs in naturally scarce habitats subjecting it to threats from development or excessive grazing or hydrological alteration. Forbs, which serve as nectar sources for adult silverspot, include native and introduced thistles, horsemint (*Agastache* spp.), joe pye weed (*Eupatorium maculatum*), and other native or introduced forbs (USFWS 2021).

Suckley's Cuckoo Bumble Bee. This species is considered to be relatively rare, even though it has historically been found throughout much of western North America, ranging from Arizona to northern Canada, and as far east as Newfoundland (USFWS 2024). This species has been found in higher elevation montane meadows in the central Colorado Rockies. This species is an obligate social parasite of social bumble bees in the genus *Bombus*. Cuckoo bumble bee females emerge from hibernation in the spring and usurp the nest of a suitable host colony, where host workers provision their young. Suckley's cuckoo bumble bee is described as a semi-specialist parasite and is confirmed to usurp nests of Western bumble bees (*Bombus occidentalis*) and Nevada bumble bees (*Bombus nevadensis*), with other potential hosts in subgenus *Bombus* throughout the extent of its range.

No surveys for this species have occurred. The project area is within the geographic range for this species, but the project area does not support many wildflowers or cultivars suitable for *Bombus* species foraging. It is therefore assumed that this species would not occur in or near the project area.

3.2.10.1 - No Action Alternative

There would be no effect on wildlife resources from the No Action Alternative. Wildlife would continue to use the habitat in the area as in the past. Ongoing oil and gas operations, recreational use, and local landowner use would continue on current trajectories within these habitats.

3.2.10.2 - Direct and Indirect Impacts from Proposed Action

Impacts to wildlife could result from actions that alter habitats, including changes to habitat and disturbances. Altering wildlife habitat in ways that would be considered adverse may occur directly (through habitat loss from surface disturbance) or indirectly (through the reduction in habitat quality caused by increased noise levels and increased human activity). The Project would result in approximately 6.4 acres of temporary habitat impacts, and 1.24-acres of long-term habitat impacts from well pad operations.

Short-term and temporary impacts to wildlife would include the removal or crushing of existing vegetation, risk of direct mortality to species during construction, loss or degradation of native habitats, and displacement of wildlife species from habitat due to development. Additional potential short-term indirect impacts could include disruption or displacement of species from nesting/birthing and foraging areas, changes in activity patterns due to construction, increased human activity, and noise disturbance. Noise disturbance could impact wildlife by interfering with animals' abilities to detect important sounds or by posing an artificial threat to animals. Construction equipment and the drill rig generators associated with the Project would contribute to the highest noise levels. Currently, the noise profile of the surrounding area is influenced by existing oil and gas infrastructure and NM-511 which would not change because of the Project.

If vegetation clearing occurs during the migratory bird breeding/nesting season (March–August), occupied nests within the Project area could be impacted and result in incidental mortality. Adult migratory birds would not be directly harmed by the Project because of their mobility and ability to avoid areas of human activity, but direct mortality and impacts could occur to eggs and nestlings.

After construction, all surface disturbance not needed for production, operation and maintenance of the Project would be reclaimed with Reclamation-prescribed, weed-free seed mixtures. Revegetation of the temporarily disturbed areas is expected to return the affected area to herbaceous production within 3-5 years after construction, depending on precipitation trends. However, the establishment of mature native plant communities may require many more years. As a result, the change in vegetative species composition could modify cover and foraging opportunities for wildlife; thereby, having some long-term impacts on wildlife and special status species. No long-term impacts resulting in permanent habitat loss are associated with this Project.

Because the Project area lacks suitable nesting habitat for bald and golden eagles, the Project would not cause take of individual bald or golden eagles, their nests, or eggs.

Threatened and Endangered Species

Southwestern Willow Flycatcher. The Los Piños River may support suitable foraging and breeding habitat for the southwestern willow flycatcher (SWWF), but these habitats are over 200-feet from the project area. No individuals were observed during surveys (EIS 2025), and occupancy of habitats along the Los Pinos River.

The project would have temporary construction-related visual and audible disturbances near the Los Piños River, which may result in flushing, decreased foraging or nesting opportunities, and decreased refugia opportunities; however, given the distance to the river and suitable habitats, this would not occur. Further, based on surveys in 2025, habitats along the Los Pinos River in this area are unoccupied (EIS 2025). Project construction and implementation would occur outside of the breeding season, and under this scenario, there would be no potential for direct or indirect impacts to SWWF, as SWWF would be on their winter ranges in Central America. No direct impacts to foraging habitats or breeding habitat for this species would occur. Therefore, a determination of ***No Effect*** is warranted for this species as habitats along the Los Pinos River appear unoccupied, and as the project would be implemented outside of the time period that SWWF occur in their summer range habitats.

Colorado Pikeminnow and Razorback Sucker. The construction process would mobilize fine sediments in uplands, which are up-gradient from the Los Piños River. Given the use of BMPs and other stormwater controls, use of secondary containment and implementation of spill control and countermeasures, and the distance to the Los Piños River (over 200-feet), the likelihood that any sediments or other contaminants would reach the river are extremely low. Any leaks or spills would also be controlled and cleaned up immediately.

Under the Proposed Action, Hilcorp would use recycled and produced water from their existing Middle Mesa 1 SWD, San Juan 32-7 Unit 301 SWD, and SJ 32-8 253 Water Transfer Station. If additional fresh water is needed for dilution or augmentation of recycled and produced waters, water would be trucked to the proposed well pad from existing, developed sources. Hilcorp estimates total non-potable groundwater (produced water from other oil and gas wells in the area) for the Proposed Action at 0.36 AF (or approximately 70-percent of water needed). Fresh water trucked into the site for development-related activities would total 0.15 AF, or approximately 30-percent of all water needed; fresh water would be from existing leased water rights, specifically designated for commercial and industrial use by Hilcorp, and would be obtained from the Navajo Reservoir at the Middle Mesa 1 SWD, San Juan 32-7 Unit 301 SWD, and SJ 32-8 253 Water Transfer Station. As such these waters have undergone consultation with USFWS (USFWS 2006, 2008). Hilcorp estimates total water usage (produced and recycled water) for the Proposed Action at 0.516 AF. The water use described above would occur during the construction, drilling, and completion period and during the 30-year operation period (e.g., water use associated with dust control). All freshwater for this project would come from existing developed water sources, and no new water depletions to the San Juan River would occur as a result of this project. Please see section **3.2.3 Water Quality and Quantity** for additional discussion.

The project would not result in any measurable or meaningful impacts to occupied habitats downstream. Given there would be no direct or meaningful indirect impacts to occupied habitats or these species, this project would have ***No Effect*** on these species, and ***No Effect*** to Critical Habitats.

Monarch Butterfly. The project area does not support a notable amount of flowering plants, and adults can easily fly away if disturbed. As the project area does not support milkweeds, monarch butterfly larvae and chrysalis would not be present, and adult monarchs would not frequent the area, due to a lack of flowering plants, and as the construction would begin in the fall (after monarchs have stopped migrating through the area). Nevertheless, monarchs are known to migrate through the area. The project is ***No Effect*** the Proposed Threatened Monarch butterfly.

Silverspot Butterfly. The project area does not support bog violet, though the Los Piños River does support some habitat for bog violet. Given there would be no direct or meaningful indirect impacts to bog violets and only temporary impacts to other upland foraging species, and that construction would begin in fall (after this butterfly has stopped flying), this project would result in a determination of and ***No Effect*** to the Proposed Threatened silverspot.

Suckley's Cuckoo Bumble Bee. Based on the best available information, Suckley's Cuckoo Bumble Bee has not been found in New Mexico since at least 1893 (USFWS 2024). Based on this information, the species is not currently known to occur in New Mexico. Additionally, according to the Species Status Assessment (2024), Suckley's Cuckoo Bumble Bee has been collected at elevations ranging from approximately 2,000 meters to 3,200 meters, and the proposed project is located at approximately 1,890 meters (6,200 feet). Because of the low potential for direct, indirect, or other impacts to this species, its host species, or to foraging habitats, this project warrants a determination of ***No Effect*** for the Proposed Endangered Suckley's cuckoo bumble bee.

In summary, no significant impacts to wildlife resources would occur as a result of the Project, because most construction impacts would be temporary and relatively small in comparison with surrounding available habitat. Timing restrictions would protect nesting birds during sensitive periods, and most project activities would occur outside of bird nesting seasons. Disturbed upland habitats would be revegetated, and wetland, aquatic, and riparian habitat values would be maintained through the use of secondary containment, spill cleanup and remediation, and use of BMPs.

3.2.11 – Cultural Resources

Cultural resources are defined as physical or other expressions of human activity or occupation. Such resources include culturally significant landscapes, prehistoric and historic archaeological sites, isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historical significance.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, mandates that Reclamation consider the potential effects of a proposed Federal undertaking on historic properties. Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). Potential effects of the described alternatives on historic properties are the primary focus of this analysis.

The affected environment for cultural resources is identified as the area of potential effects (APE), in compliance with the regulations to Section 106 of the NHPA (36 CFR 800.16). The APE is defined as the geographic area within which Federal actions may directly or indirectly cause alterations in the character or use of historic properties. The APE for this Proposed Action includes the maximum limit of disturbance that could be physically affected by any of the proposed Project alternatives.

La Plata Archaeological Consultants conducted a Class III cultural resource inventory of the Project Area for the original oil pad. The geographic area of analysis for these inventories were the potential ground disturbance areas involved with the Project, plus a 100-foot buffer (e.g. the Area of Potential Effect). The inventory did not reveal any cultural resource sites in the immediate project area (La Plata Archaeological Consultants 2018). However, there is an eligible site nearby. Consequently,

Reclamation is requiring temporary fencing to be placed beginning at the northeastern corner of the project and proceeding south for 150 feet. This fence is required during any construction and reclamation activities.

Reclamation is in the process of consulting with the State Historic Preservation Officer (SHPO) and Tribes about this project. The results of that consultation will be included in the Final EA.

3.2.11.1 No Action Alternative

The No Action Alternative would have no effect on cultural resources.

3.2.11.2 - Direct and Indirect Impacts from Proposed Action

No cultural resources were reported from the Class III cultural resources inventory of the Project Area, and consistent with guidance from the New Mexico State Historic Preservation Officer, Reclamation has determined that the Project would have an no effect on historic properties, and no potential to affect historic properties eligible for listing in the NRHP.

3.2.12 – Paleontological Resources

Paleontological resources include not only the actual fossils but also the geological deposits that contain them and are recognized as nonrenewable scientific resources protected by federal statutes and policies. For more information on paleontological classifications, see Permanent Instruction Memorandum No. 2022-009: Implementing the Paleontological Resource Preservation Act of 2009 (PRPA) (U.S. Bureau of Land Management 2022 and BLM Fact Sheet-Proposed rule at 43 CFR § 49: Paleontological Resources Preservation (BLM 2016).

The Project area occurs within very shallow sandy loams, mantling sandstone outcrops from the San Juan Formation (Tsj). The Potential Fossil Yield Classification (PFYC) is a tool that allows the BLM to predict the likelihood of a geologic unit containing paleontological resources. The PFYC is based on a numeric system of 1-5, with PFYC 1 having little likelihood of containing paleontological resources, whereas a PFYC 5 value is a geologic unit that is known to contain abundant scientifically significant paleontological resources. The project area is within a PFYC 5 area, which means there is a very high paleontological potential (BLM 2025).

3.2.12.1 – No Action Alternative

The No Action alternative would have no soil or parent materials disturbance, and no impacts to paleontological resources would occur.

3.2.12.2 – Direct and Indirect Impacts from Proposed Action

The Project Area occurs within a PYFC 5 area, or an area with a very high potential for paleontological resources. However, based on the lack of mapped paleontological locales nearby and the visible surface exposures in the project area, the potential for paleontological findings is low. The following Condition of the License Agreement would be adhered to:

> "Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to Reclamation. Operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by Reclamation. An evaluation of the discovery will be made by Reclamation to determine appropriate actions to prevent the loss of significant scientific values. The operator will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by Reclamation after consulting with the operator."

With adherence to this condition, the Proposed Action would comply with the Paleontological Resources Preservation Act of 2009. The project would have no significant impacts to paleontological resources given a lack of nearby resources and adherences to conditions.

3.2.13 – Special Designations and Recreational Areas

A small portion of the existing access road occurs within the boundaries of the BLM's Rattlesnake Canyon Wildlife Area (RCWA). This area was created to promote the management of mule deer, with the goal of increasing mule deer herd sizes (BLM 2003a, b). The RCWA also provides important habitat for other wildlife species, such as elk, Merriam's turkey, mountain lion and numerous avian species (BLM 2003). Management Prescriptions within the RCWA include the following:

1. For new and current oil and gas leases, seasonal timing limitation on drilling and construction from 12/1 through 3/31.
2. Manage new oil and gas leases under Controlled Surface Use constraint.
3. Controlled Surface Use management constraint on leasable and salable minerals.
4. Acquire inholdings within the SDA.
5. Retain all public lands.
6. Allow ROWs on a case-by-case basis with special management constraints and conditions.
7. OHVs limited to maintained roads, designated routes and trails.
8. Implement Class III and IV VRM Designation.
9. Allow public wood collection with proper permit.
10. Manage key browse species such as antelope bitterbrush, mountain mahogany and big sagebrush to meet the needs of wintering deer. Manage for mature Gambel's oak to provide mast for fall/winter use by wild turkeys. In addition, apply proper grazing use to herbaceous species to provide enhanced opportunity for wild turkey brood rearing in spring and summer. Maintain mature ponderosa and piñon pine for potential turkey roosting. Apply limited fire suppression.
11. Continue permitted livestock grazing.
12. Implement wildlife habitat improvement practices.

A small portion of the existing access road is also within the boundaries of the BLM's Reese Canyon Research Natural Area (RCRNA). This area was created to help protect habitats for species federally listed under the Endangered Species Act (BLM 2003a), including plant species and wintering bald eagles. Management Prescriptions with the RCRNA include the following:

1. Manage existing oil and gas leases under Controlled Surface Use constraint.
2. Discretionary closure on new oil and gas leasing.
3. Close to all other forms of mineral entry.
4. Land ownership not available for disposal.
5. ROWs permitted with special management constraints and conditions.
6. OHV limited to maintained roads for the entire area.
7. Designate as Class II VRM Area.
8. Close to wood cutting and gathering except for administrative purposes with approval of wildlife staff.
9. Any vegetative management must benefit the purpose of the RNA. Apply limited fire suppression.
10. Open to livestock grazing.
11. Designate noise receptor points at identified cliff habitat for the protection of wintering bald eagles.

Existing roads through and around the Project Area continue south for approximately 1.6 miles and provide a number of points where recreationists can access the Los Piños River for fishing, boating, camping, and general recreation. The inundated parts of Navajo Reservoir preclude additional motor vehicle access further south. Most recreation in this area includes fishing and OHV use on existing roadways.

3.2.13.1 – No Action Alternative

Under the No Action Alternative, oil and gas operations on existing, valid leases would continue on current trajectories. Recreational use patterns would also continue on current trajectories.

3.2.13.2 – Direct and Indirect Impacts from Proposed Action

As the Proposed Action is consistent with the current lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM078423X), the Project would be compliant with continued existing road use in the small portion of the road that crosses the Wildlife Area and Resource Natural Area. The actual well pad is outside of both the RCWA and RCRNA. Well pad construction and well drilling, while outside of the RCWA, would still occur outside of the winter closure period (December 1 through March 31), and the use of the access road would still be compliant with this Management Prescription. The project is consistent with all other Management Prescriptions for both the RCWA and RCRNA.

During well pad construction and well drilling, recreationists using existing area roads would still be able to access Reclamation lands further to the south. Their travel would be directed onto other access roads which do not pass through the well pad area. Travelers would see and hear active

construction and drilling operations very close to the roadway, which could temporarily diminish their recreational experience. As well pad construction, drilling and pipeline construction would last 4 months, these impacts to recreationists experience would be very temporary, and after project implementation, conditions would return to existing condition. In the long term, the access road to the well pad would be gated, which would also increase the safety for visitors to the Navajo Reservoir area.

3.2.14 – Public Health and Safety

The Project is in an area with established oil and gas exploration and development, transportation, and processing operations with accompanying pipelines, compressor and processing facilities, drilling rigs, pumpjacks, traffic, and other related activities.

The Project Area occurs on public lands managed by Reclamation, in an area which sees public vehicle access to portions of the Navajo Reservoir area. The nearest paved road is NM-511, which is approximately 1.1 miles north of the project; this state highway would be the primary access to the project area. The access road to the proposed well pad is primarily on lands managed by New Mexico Game and Fish and Reclamation, but the access road also provides access to a number of private parcels. Seasonal recreation users (e.g., hunters, travelers, and OHV riders) may occasionally be near the Project area, given the nearby presence of Navajo Reservoir and BLM lands.

There is an overhead electrical powerline (OHE) just to the west of the proposed well pad, and there are other various overhead or buried utilities which are present near some elements of the Project. The utility entity operating the OHE is Farmington Electric Utility System.

Physicians and other medical practitioners in Farmington and Ignacio provide medical services to the area. Farmington hospitals provide family health, internal medicine, orthopedic, cardiopulmonary, surgery, radiology, physical therapy, laboratories, and other services.

The Ignacio Fire Department responds to the Project area. The San Juan County Sheriff's Office provides first-call law enforcement services in the Project vicinity. Criminal offenses reported to the Sheriff's Office are reported to be related primarily to larceny, vandalism, burglary, and assault.

3.2.14.1 – No Action Alternative

There would be no effect to public safety, transportation, or public access from the No Action Alternative. The existing well would continue to be operated in its current condition and the baseline status of access, public safety, transportation routes, and utilities in the vicinity would remain unchanged.

3.2.14.2 – Direct and Indirect Impacts from Proposed Action

During construction of the Project, physical hazards such as heavy machinery, vehicular traffic, and other typical construction-related activities and hazards would be present. Some potential risk is inherent in any construction project, and this could include the potential risk of contamination of soil through improper disposal of waste, leaks from equipment, or accidental releases. There is also potential for the release of hazardous materials from the proposed pipeline and tie-ins during operation.

When significant amounts of chemicals are stored on-site, governmental agencies would be notified as required under the Emergency Planning and Community Right-to-Know Act. The notification of hazardous substance releases outside a facility site is required under the Comprehensive Environmental Response, Compensation, and Liability Act and NMAC 19.15.29. All facilities must have informational signs, as directed under 43 CFR 3160.

The increase in traffic to area roads during construction could pose a hazard to other vehicles and road users. However, area roads are already used by oil and gas operations, and local traffic and users would be accustomed to the types of vehicles necessary for construction. Drivers would be warned of possible hazards by appropriate signage and would be expected to follow all rules of the road. This impact on area roads would be short term for construction of the Project and would lessen considerably during the operations phase.

Because of the Project's relatively short construction duration, it is not expected to have a substantial impact on medical service providers in the region. Increased demands potentially could be placed on Farmington and Ignacio Fire Department personnel and equipment. The Project is not expected to increase response demands on the San Juan County Sheriff's Office. In addition, short-term housing accommodations for the nonlocal workers associated with construction of the Proposed Action would be spread across neighboring communities, further reducing the potential for increased law enforcement demands on any single law enforcement agency.

A new gate would be installed on the access road to the well pad, which would help prevent unintended public access to the well pad. Access to Navajo Reservoir would still be maintained for the public (see section **2.2.3 – Well Pad**).

There would be no significant adverse impacts to Public Health and Safety as a result of the Project because of the short timeframes for construction and drilling and signage for road travelers.

3.1 – Summary

Table 20 provides a summary of environmental impacts, including consideration of other nearby impacts, for each the resources evaluated in this EA. Resource impacts are outlined for both the No Action and the Action Alternative. As described throughout Chapter 3, environmental impacts of the Action Alternative were not determined to be significant.

Table 20. Summary of Impacts for the No Action Alternative and the Action Alternative

Resource	Impacts: No Action Alternative	Impacts: Action Alternatives
Air Quality (3.2.1)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Minor increases of PM 10 and PM 2.5 during construction and drilling. Minor increases of constituents contributing to O3 production. All impacts are less than 0.03% of basin-wide emissions.

Resource	Impacts: No Action Alternative	Impacts: Action Alternatives
Greenhouse Gas Emissions (3.2.2)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Less than 0.02% contribution to statewide GHG emissions, and less than 0.001% to nationwide GHG emissions.
Water Quality and Quantity (Section 3.2.3)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Proposed action would use 0.36 AF of recycled/produced water, and 0.15 AF of fresh water, from existing water rights, resulting in less than 1 AF of water use. Low risk of impacts to water quality given use of BMPs, secondary containment, and distances to surface waters.
Soils & Farmlands of Agricultural Significance (Section 3.2.4)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Project would see 2.9 acres of surface disturbance, of which 2.02 acres would utilize existing disturbed areas, 1.06 acres would be new disturbance, 1.66 acres would undergo interim reclamation, and 1.24 acres would remain as long-term disturbance (for the working surface of the well pad). No farmlands would be impacted, and no interruption to agricultural production would occur. Some potential for soil erosion along temporarily disturbed areas, but BMPs and revegetation would occur.
Rangelands and Grazing (Section 3.2.5)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	2.9 acres of initial impacts, with 1.66 acres seeing interim reclamation, and 1.24 acres remaining as long-term disturbance; less than 0.01-percent of allotment would be impacted. No significant impacts to grazing resources, no impact to infrastructure within the allotment.
Vegetation (Section 3.2.6)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Impacts to montane shrublands and some pinyon-juniper woodlands from 1.06 acres of new surface disturbance. Re-disturbance to previously revegetated areas. All impacted vegetation types are very common on the landscape. Revegetation of temporarily impacted areas would allow native vegetation profiles to become established over time. No effect to Threatened or Endangered plant species.
Noxious Weeds and Invasive Plants (Section 3.2.7)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue. Noxious weeds would continue to be treated intermittently by operator.	Given the presence of noxious weeds in area, new soil disturbance will allow for spread and potential establishment of weeds. Import of fill material for well pad could also introduce new noxious weeds. Operator will need to be aggressive and diligent in weed treatment in the years following project.

Resource	Impacts: No Action Alternative	Impacts: Action Alternatives
Visual Resources (Section 3.2.8)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	There would be notable short-term impacts to visual resources in the project area due to well pad reconstruction, pipeline construction, and from the drilling rig operations. These project components may be visible from NM-511, and definitely would be visible to road users. After drilling and reclamation, impacts to visual resources would decrease dramatically.
Noise (Section 3.2.9)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Short term noise impacts would occur during construction and drilling operations, but nearest home is 0.5 miles away. Activities occur outside of busy summer tourist season for Reservoir. No significant impact would occur.
Wildlife Resources (Section 3.2.10)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue. Intermittent indirect impacts to wildlife habitat from oil and gas operations and Navajo Reservoir visitors would continue.	Construction and well drilling would create noise and visual cues that would temporarily disrupt wildlife use patterns in the project area, reducing habitat effectiveness in the area for around 4 months. Minor impacts to native habitats would occur, but given the small size of project, no major impacts to wildlife habitat would occur. Project would avoid more critical big game winter range timing periods (Dec. 1 through March 31). No effects to Threatened or Endangered wildlife species.
Cultural Resources (Section 3.2.11)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	No Effect; project area has been previously surveyed and no historic properties or cultural resources were documented. Nearby eligible site will be temporarily fenced during any construction and reclamation activities.
Paleontological Resources (Section 3.2.12)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	No Effect; fossil resources would not occur in area. If discovered, project is to halt until Reclamation can evaluate and recover or protect fossil resources.

Resource	Impacts: No Action Alternative	Impacts: Action Alternatives
Special Designations and Recreational Areas (Section 3.2.13)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue.	Portions of existing access road occur within BLM-designated Wildlife Habitat area and Resource Natural Area. Continued use of the road would not be inconsistent with guidance for these areas, especially with adherence to winter big game avoidance from Dec. 1 through March 31. Navajo Reservoir visitors would see and hear construction and drilling operations very near existing access road, which would diminish recreational experience during the 4-month activity period for the project. No long-term impacts to reservoir visitors' recreational experience would occur.
Public Health and Safety (Section 3.2.14)	No Effect; Proposed Action would not be completed; operation of San Juan Unit #029A would continue. Public would be able to access well pad.	Increased traffic on NM-511 and access road would occur, which could have minor increases in risk to public utilizing roads. Expanded well pad would be gated, reducing access. New equipment and secondary containment would reduce risk of spills.

CHAPTER 4 – ENVIRONMENTAL COMMITMENTS

This section summarizes the design features, BMPs, conservation measures, and other requirements (collectively, "Environmental Commitments") developed to further lessen the potential adverse insignificant effects of the Project. The actions in the following environmental commitment list would be implemented as an integral part of the Project and shall be included in any contractor bid specifications.

Note that in the event there is a change in the Project description, or any construction activities are proposed outside of the inventoried Project Area or the planned timeframes outlined in this EA, additional environmental review by Reclamation would be required to determine if the existing surveys and information are adequate to evaluate the changed project scope. Additional NEPA documentation may be required.

Roads

- Roads will be maintained to the same or better condition as they existed prior to the commencement of operations. Maintenance will continue until final abandonment and reclamation of the well location. A road maintenance plan has been submitted as part of the APD.
- Best management practices (BMPs) for dust abatement and erosion control will be utilized along the roads to reduce fugitive dust for the life of the project. Water application using a rear spraying truck or other suitable means will be the primary method of dust suppression along the roads.
- No routine maintenance activities will be performed during periods when the soil is too wet to adequately support construction equipment. If equipment creates ruts deeper than 6 inches, the soil will be deemed too wet for construction or maintenance.
- Large boulders will be placed along either side of the access road where the access road bisects pipeline corridors to prevent OHVs and vehicles from leaving the road and travelling down the pipeline corridors.
- A lockable gate will be installed at the intersection of the access road where it splits to the well pad to prevent the public from accessing the well pad during construction. Keyed access will be provided to Reclamation and the grazing allottee at all times.

Air Resources

- Areas not required for facilities will be revegetated during interim reclamation.
- Dirt roads will be watered during periods of high use (magnesium chloride, organic-based compounds, and/or polymer compounds could also be used on dirt roads upon approval of Reclamation).

- BMPs provided in *The Gold Book* would be implemented for proposed and existing roads (BLM and USFS 2007).

- The operator would obtain an air permit, if required by the regulatory agency, for equipment operating under this Proposed Action and would follow regulatory requirements.

Water Resources

- To prevent erosion, certain areas surrounding the proposed site will be recontoured during interim reclamation.
- Culverts and silt traps will be installed as appropriate, and locations will be determined during the Reclamation on-site and/or facility on-site visits.

Wildlife, Migratory Birds, and Special-Status Species

- The project is adjacent to the BLM's Rattlesnake Canyon Wildlife Area, as such Hilcorp will follow winter closure timing restrictions on construction, drilling, and completion activities from 12/1 – 3/31 each year. Hilcorp will be able to request exceptions to this winter closure from the BLM FFO and Reclamation each year, which will be at the discretion of the authorized officer.
- In the event that threatened or endangered species are discovered during construction, construction activities will halt until consultation is completed with the U.S. Fish and Wildlife Service and protection measures are implemented. Additional surveys may be required if construction plans or proposed disturbance areas are changed.
- If project construction or drilling occurs during the raptor nesting season (April 1 through August 31), a pre-construction nesting raptor survey would be required, and Reclamation may provide additional stipulations to protect nesting raptor activities.

Soil, Upland Vegetation, and Noxious Weeds and Invasive Species

- No construction or routine maintenance activities will be performed during periods when the soil is too wet to adequately support construction equipment. If equipment creates ruts deeper than six inches, the soil would be deemed too wet for construction or maintenance.
- Revegetation will follow the guidance provided in the *Farmington Field Office Bare Soil Reclamation Procedures* (BLM 2013). These procedures are referenced in the Operator's Surface Reclamation Plan.
- During the pre-disturbance on-site meeting with Reclamation, a suitable vegetation community from the *Farmington Field Office Bare Soil Reclamation Procedures* (BLM 2013) will be selected. Plant species would be chosen from the BLM FFO's seed pick list for the selected community, with Reclamation approval.
- A noxious weed inventory utilizing the New Mexico Noxious Weed List (New Mexico Department of Agriculture 2020) and the U.S. Department of Agriculture's (USDA's) Federal Noxious Weed List (USDA 2010) will be conducted. An enforceable noxious weed management plan will be developed and approved by Reclamation.

- Identified noxious weeds will be treated prior to new surface disturbance, as determined by Reclamation. A pesticide use proposal (PUP) will be submitted to and approved by Reclamation prior to application of any pesticide.
- To the extent practical, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. Cleared trees and rocks may be salvaged for redistribution over reshaped cut and-fill slopes or along linear features.
- If cattle grazing or loafing is negatively impacting revegetation, Hilcorp will fence off reclamation areas to prevent excessive cattle grazing of revegetation areas.
- See the above water resources section for erosion-control features.

Cultural Resources

- Temporary fencing shall be placed beginning at the northeastern corner of the project and proceeding south for 150 feet. Fencing shall remain in place for the duration of construction and during any reclamation work.
- All employees, contractors, and subcontractors will be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment; that it is illegal to collect, damage, or disturb cultural resources; and that such activities on federal and tribal lands are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 USC 470aa–mm).
- In the event of discovery of evidence of possible cultural or paleontological resources, all ground disturbing activities in the area shall immediately cease, and Reclamation shall be notified. Work shall not be resumed until authorized by Reclamation. Additional surveys will be required for cultural resources if construction plans or proposed disturbance areas are changed.

Visual Resources

- Equipment not subject to safety requirements would be painted a BLM Standard Environmental Color (Juniper Green) to minimize contrast with the surrounding landscape.
- Low profile tanks for produced water storage shall be used.
- If applicable, during reclamation, stockpiled rocks, if available, will be placed within the reclaimed area for erosion control and/or to discourage off-highway vehicle traffic (if requested by Reclamation). Rocks will be placed in a manner that visually blends with the adjacent, undisturbed landscape.

Public Health and Safety

- The hauling of equipment and materials on public roads will comply with New Mexico Department of Transportation regulations. Any accidents involving persons or property will be reported to Reclamation. Operator will notify the public of potential hazards by posting signage, having flaggers, or using lighted signs, as necessary.
- Worker safety incidents will be reported to Reclamation. Operator will adhere to company safety policies and Occupational Safety and Health Administration regulations.
- Vehicles will be restricted to proposed and existing disturbance areas.

- The proposed site will have an informational sign, delineating operator, legal description, etc.

Oil and gas industry traffic is expected to adhere to all posted speed limits and signs. Drivers will be appropriately licensed and inspected.

CHAPTER 5 – CONDITIONS OF LICENSE AGREEMENT

Note: The following conditions are based on BLM FFO Conditions of Approval.

Operators:	Hilcorp Energy Company (Hilcorp)
Well Name:	San Juan 32-7 Unit 202H Natural Gas Well Project
Legal Location:	Sec 18 T32N R97W, Rio San Juan County, NM
EA Number:	TBD
Onsite Date:	May 13, 2025

The following conditions will apply to the Hilcorp San Juan 32-7 Unit 202H Natural Gas Well Project, and other associated facilities, unless a particular Surface Managing Agency or private surface owner has supplied to Bureau of Reclamation and the operator a contradictory environmental stipulation. The conditions are also incorporated as Environmental Commitments in this EA.

Disclaimers: Reclamation's approval of the license agreement does not relieve the operator from obtaining any other authorizations that may be required by the BIA, Navajo Tribe, State, or other jurisdictional entities.

Copy of Plans: A complete copy of the permit, including Surface Use Plan of Operations, Bare Soil Reclamation Plan, Plan of Development (if required), and Terms and Conditions of the License Agreement shall be at the project area at all times and available to all persons.

Review of NEPA documents: It is the responsibility of the operator to follow all the design features, best management practices, and measures as contained in the Environmental Assessment, which contains additional design features and best management practices that must be followed. Copies of the EA and Finding of No Significant Impact may be obtained from Reclamation's Western Colorado Area Office, or online at: Environmental Assessments | Upper Colorado Basin | Bureau of Reclamation

Best Management Practices (BMPs): BLM Farmington Field Office established environmental Best Management Practices (BMP's) will be followed during construction and reclamation of well site pads, access roads, pipeline ties, facility placement or any other surface disturbing activity associated with this project. Bureau wide standard BMP's are found in the Gold Book, Fourth Edition-Revised 2007. Farmington Field Office BMP's are integrated into the Environmental Assessment, Surface Use Plan of Operations, Bare Soil Reclamation Plan, and conditions.

Construction, Production, Facilities, Reclamation & Maintenance

1. **Construction & Reclamation Notification:** The operator or their contractor will contact the Bureau of Reclamation, Land and Recreation Staff at (970) 903-1346 or by email, at least 48 hours prior to any construction or reclamation on this project.

2. **Grazing Allotments, Permittee Notification, and Concerns:** The operator will notify the grazing lease operator(s) of the allotment at least ten business days prior to beginning any construction activity to ensure there will be no conflicts between construction activities and livestock grazing operations. Any range improvement (fences, pipelines, ponds, etc.) disturbed by construction activities will be repaired immediately following construction and will be repaired to the condition the improvement was in prior to disturbance. Cattle guards will be installed to replace any livestock fencing or gates removed for construction. If fencing has to be temporarily open to place pipeline, ensure fencing secured.

3. **Livestock Grazing:** Cattle are in allotment between 11/15 and 6/10. Industry may need to coordinate with the BLM and permittee if concerns of livestock in area during construction.

4. **Production Facilities:** As marked in the SUPO, final design and layout of facilities will be deferred until an onsite with Reclamation staff is conducted to determine the best location. The operator or their contractor will contact the Bureau of Reclamation Land and Recreation Staff to schedule a facility layout onsite.

5. **Open Trenches:** No more than ½ mile of trench or the amount of trench that can be worked in one day will be open at any given time. If this amount is left open, it needs to be adequately protected/constructed to exclude livestock and wildlife while work is not underway, and, in the event of inadvertent entry, for wildlife and livestock to escape from these below grade areas.

6. **Staking:** The operator shall place slope stakes, culvert location and grade stakes, and other construction control stakes as deemed necessary by the authorized officer to ensure construction in accordance with the plan of development. If stakes are disturbed, they shall be replaced before proceeding with construction.

7. **Weather:** No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts more than 6 inches deep, the soil shall be deemed too wet.

8. **Stockpile of Soil:** The top 6 inches of soil material will be stripped and stockpiled in the construction zones around the pad [construction zones may be restricted or deleted to provide resource avoidance]. The stockpiled soil will be free of brush and tree limbs, trunks, and roots. The stockpiled soil material will be spread on the reclaimed portions of the pad [including the reserve pit, cut and fill slopes] prior to re-seeding. Spreading shall not be done when the ground or topsoil is frozen or wet.

9. **Painting of Equipment:** Within 90 days of installation, all above ground structures not subject to safety requirements shall be painted by the operator to blend with the natural color of the landscape. Reflective material may be used to reduce hazards that may occur when such structures are near roads. Otherwise, the paint use shall be a non-glare, non-reflective, non-chalking color of: Federal 595a-34127 (Juniper Green)

10. **Storage Tanks:** All open top permanent production or storage tanks regardless of diameter made of fiberglass, steel, or other material used for the containment of oil, condensate,

produced water and or other production waste shall be screened, netted, or otherwise covered to protect migratory birds and other wildlife from access.

11. **Compressors:** Compressor units on this well location not equipped with a drip pan for containment of fluids shall be lined with an impervious material at least 8 mils thick and a 12-inch berm. The compressor will be painted to match the well facilities. Any variance to this will be approved by Reclamation. Noise moderation may be required at the time of compressor installation.

12. **Acquisition of Water:** Water acquired to construct, produce, and maintain actions authorized by this permit to drill must be acquired from permitted water sources, or water authorized for use by the New Mexico Oil Conservation Division (OCD). Upon request Reclamation shall be provided with documentation of water sources.

13. **Culverts:** No culverts smaller than 18" will be installed. Silt Traps/Bell Holes will be built upstream of all culvert locations. Rip-rap will be placed at the downstream end of all culverts to prevent undercutting.

14. **Driving Surface Area:** All activities associated within the construction, operation, maintenance, and abandonment of the well location is limited to areas approved in the APD or ROW permit. During the production of the well, vehicular traffic is limited to the daily driving surface area established during interim reclamation construction operations. This area typically forms a keyhole or teardrop driving surface from which all production facilities may be serviced or inspected. A v-type ditch will be constructed on the outside of the driving surface to further define the driving surface and to deter vehicular traffic from entering onto the interim reclamation areas.

15. **Berms:** Berms or firewalls will be constructed around all storage facilities sufficient in size to contain the storage capacity of 110% of the largest tank, or 110% of the combined capacity of tanks if a rupture could drain more than one tank. Berm walls will be compacted with appropriate equipment to assure proper construction. Metal containment barriers, used for secondary containment, will be properly installed, per the manufacturer directions.

16. **Contouring of Cut and Fill Slopes:** The interim cut and fill slope grade shall be as close to the original contour as possible. To obtain this ratio, pits and slopes shall be back sloped into the pad during interim reclamation. Only subsurface soil and material shall be utilized in the contouring of the cut and fill slopes. Under no circumstances shall topsoil be utilized as substrate material for contouring of cut and fill slopes.

17. **Seed Mix:** The Pinyon/Juniper Seed Mix will be used for interim and final reclamation. The SUPO contains information on the specific seed mix and application rate. Seeding shall be accomplished within 120 days after final construction (time frame may be extended on a case-by-case basis with AO approval). Seeding shall be repeated if a satisfactory stand is not obtained as determined by Reclamation upon evaluation after the second growing season.

18. **Maintenance:** In order to perform subsequent well operations, right-of-way (ROW) operations, or install new/additional equipment, it may be necessary to drive, park, and operate on restored, interim vegetation within the previously disturbed area. This is generally acceptable provided damage is promptly repaired and reclaimed following use. Where vehicular travel has occurred as a "convenience" and interim reclamation/vegetation has been compromised, immediate remediation of the affected areas is required. Additionally, where erosion has occurred and compromised the reclamation of the well location, the affected area must be promptly remediated so that future erosion is prevented, and the landform is stabilized.

19. **Non-Permitted Disturbance:** Construction maintenance or any other activity outside the areas permitted will require additional approval and may require a new cultural survey and clearance.

20. **Layflat Lines:** Layflat lines used for development of the wells may be on the ground for a maximum of 6 months and shall be retrieved within 30 days of ending completion operations. If the layflat lines are needed for longer than 6 months or cannot be retrieved within 30 days of ending completion operations, a request must be submitted to Reclamationfor review and decision that includes a rationale for the time extension.

21. **"Hotwork" and Construction Affecting Fire Safety:** The holder or its contractors will notify Reclamation of any fires and comply with all rules and regulations administered by the BLM concerning the use, prevention and suppression of fires on federal lands, including any fire prevention orders that may be in effect at the time of the permitted activity. The holder or its contractors may be held liable for the cost of fire suppression, stabilization and rehabilitation. In the event of a fire, personal safety will be the first priority of the holder or its contractors.

    The holder or its contractors shall:

    a. Operate all internal and external combustion engines (including off-highway vehicles, chainsaws, generators, heavy equipment, etc.) with a qualified spark arrester. Qualified spark arrestors are maintained and not modified and meet the Society of Automotive Engineers (SAE) Recommended Practices J335 or J350. Refer to 43 CFR §8343.1.

        a. Refueling of any combustible engine equipment must be minimum of 3 meters away from any ignition source (open flame, smoking, etc.).

    b. Maintain and clean all equipment regularly to remove flammable debris buildup and prevent fluid leaks that can lead to ignitions.

    c. Carry at least one shovel or wildland fire hand tool (combi, Pulaski, McLeod) per person working, minimum 5 gallons of water, and a fire extinguisher rated at a minimum as ABC - 10 pound on each piece of equipment and each vehicle.

    d. When conducting "hotwork" such as, but not limited to welding, grinding, cutting, spark-producing work with metal, work that creates hot material or slag; choose an

area large enough to contain all hot material that is naturally free of all flammable vegetation or remove the flammable vegetation in a manner compliant with the permitted activity. If adequate clearance cannot be made, wet an area large enough to contain all hot material prior to the activity and periodically throughout the activity to reduce the risk of wildfire ignition. Regardless of clearance, maintain readiness to respond to an ignition at all times. In addition, keep one hand tool per person and at least one fire extinguisher ready, minimum, as specified earlier (#3) during this activity.

e. Keep apprised of current and forecasted weather at https://www.weather.gov/abq/forecasts-fireweather-links and fire conditions at www.wfas.net and take additional fire precautions when fire danger is rated High or greater. Red Flag Warnings are issued by the National Weather Service when fire conditions are most dangerous, and ignitions escape control quickly. Extra precautions are required during these warnings such as additional water, designate a fire watch/patrol and tools. If work is being conducted in an area that is not clear of vegetation within 50 feet of work area; then, when fire danger is rated High or greater and 1. There is a predicted Red Flag warning for your area or 2. If winds are predicted to be greater than 10 mph, stop all hotwork activities for the day at 10 am.

f. In the event of an ignition, initiate fire suppression actions in the work area to prevent fire spread to or on federally administered lands. If a fire spreads beyond the capability of workers with the stipulated tools, all will cease fire suppression action and leave the area immediately via pre-identified escape routes.

g. Call **911** or the **Taos Interagency Fire Dispatch Center (575-758-6208)** immediately of the location and status of any fire.

AND

Notify the respective Reclamation office for which the permit or contract was issued immediately of the incident.
Western Colorado Area Office at 970-385-6500

22. **Noxious Weeds**: Inventory the proposed site for the presence of noxious and invasive weeds. Noxious weeds are those listed on the New Mexico Noxious Weed List and USDA's Federal Noxious Weed List. The New Mexico Noxious Weed List or USDA's Noxious Weed List can be updated at any time and should be regularly check for any changes. Invasive species may or may not be listed as a noxious weed but have been identified to likely cause economic or environmental harm or harm to human health.

Russian Knapweed (*Centaurea repens*)	Musk Thistle (*Carduss nutans*)
Bull Thistle (*Cirsium vulgare*)	Canada Thistle (*Cirsium arvense*)
Scotch Thistle (*Onopordum acanthium)*	Hoary Cress (*Cardaria draba*)
Perennial Pepperweed (*Lepdium latiofolfium*)	Halogeton (*Halogeton glomeratus*)
Spotted Knapweed (*Centaurea maculosa*)	Dalmation Toadflax (*Linaria genistifolia*)
Yellow Toadflax (*Linaria vulgaris*)	Camelthorn (*Alhagi pseudalhagi*)

African Rue (*Penganum harmala*)	Salt Cedar (*Tamarix spp*.)
Diffuse Knapweed (*Centaurea diffusa*)	Leafy Spurge (*Euphorbia esula*)

a. Identified weeds will be treated prior to new surface disturbance. A Pesticide Use Proposal (PUP) must be submitted to and approved by Reclamation prior to application of pesticide.
b. Vehicles and equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
c. Construction equipment should be inspected and cleaned prior to coming onto the work site. This is especially important on vehicles from out of state or if coming from a weed-infested site.
d. Fill dirt or gravel may be needed for excavation, road construction/repair, or for spill remediation. If fill dirt or gravel will be required, the source shall be noxious weed free and approved by Reclamation.
e. The site shall be monitored for the life of the project for the presence of noxious weeds (includes maintenance and construction activities). If weeds are found Reclamation shall be notified at (505) 564-7600 and provided with a Weed Management Plan and if necessary, a Pesticide Use Proposal (PUP) . The FFO Coordinator can provide assistance developing the Weed Management Plan and/or the Pesticide Use Proposal.
f. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws and used only in accordance with their registered use and limitations. (Company Name)'s weed-control contractor would contact Reclamation's Land and Recreation Group prior to using these chemicals.
g. Noxious/invasive weed treatments must be reported to Reclamation's Land and Recreation Group. A Pesticide Application Record (PAR) is required to report any mechanical, chemical, biological or cultural treatments used to eradicate, and/or control noxious or invasive species. Reporting will be required annually or per request from Reclamation's Land and Recreation Group.

23. **Bare ground vegetation trim-out:** If bare ground vegetation treatment (trim-out) is desired around facility structures, the operator will submit a bare ground/trim-out design included in their Surface Use Plan of Operations (SUPO). The design will address vegetation safety concerns of the operator and Reclamation while minimizing impacts to interim reclamation efforts. The design must include what structures to be treated and buffer distances of trim-out. Pesticide use for vegetation control around anchor structures is not approved. If pesticides are used for bare ground trim-out, the trim-out will not exceed three feet from the edge of any eligible permanent structure (i.e., well heads, fences, tanks). Additional distance/areas may be requested and must be approved by Reclamation. The additional information below must also be provided to Reclamation:

    a. Pesticide use for trim out will require a Pesticide Use Proposal (PUP). A PUP is required ***prior*** to any treatment and must be approved by Reclamation. Only pesticides authorized for use on BLM lands would be used and applied by a licensed pesticide applicator. The use of pesticides would comply with federal and state laws

and used only in accordance with their registered use and limitations. The operator's weed-control contractor would contact the Reclamation prior to using these chemicals and provide Pesticide Use Reports (PURs) post treatment.

b. A Pesticide Use Report (PUR) or a Biological Use Report (BUR) is required to report any chemical, or biological treatments used to eradicate, or control vegetation on site. Reporting will be required annually or per request from the Reclamation's Land and Recreation Group.

24. **Paleontology**: Any paleontological resource discovered by the Operator, or any person working on his behalf, on public or Federal land shall be immediately reported to Reclamation. Operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by Reclamation. An evaluation of the discovery will be made by Reclamation to determine appropriate actions to prevent the loss of significant scientific values. The operator will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by Reclamation after consulting with the operator.

25. **Visual Resources**: Dark Sky design features need to be applied to existing lighting, which is not dark sky friendly and to any additional lights added as part of pad expansion. All permanent lighting will use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the lowest part of the light source). All permanent lighting will be pointed straight down at the ground in order to prevent light spill to the sides. All permanent lighting will be 4000° Kelvin or less with 3000° Kelvin preferred. Warmer light colors are less noticeable by humans and cause less impact to wildlife. All permanent lighting will be controlled by a switch and/or timer which allows the lights to be turned on when workers are on location during dark periods but will keep the lights off the majority of the time.

26. **Wildlife:** The proposed project would not have significant impacts on small or big game species. However, the project is located within the BLM FFO-designated Rosa Mesa Wildlife Area, requiring a closure from December 1st through March 31st of each year. This stipulation applies only to construction, drilling, and completion activities. It does not apply to operation and maintenance of production facilities.

27. **Hazards:** Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.

28. **Migratory Birds:** If construction will initiate between March 15th and August 15th a survey for active bird nests within the project footprint must be conducted prior to construction in order to avoid violating the Migratory Bird Treaty Act of 1918. If an active bird nest is present, construction will not begin until the nest fledges. The nest must be flagged, and no work may be done within 50 feet of the nest until the nest becomes inactive.

29. **Threatened, Endangered or Sensitive Species:** In the event that threatened or endangered species are discovered during construction, construction activities will halt until consultation is completed with the U.S. Fish and Wildlife Service and protection measures

are implemented. Additional surveys may be required if construction plans or proposed disturbance areas are changed.

Cultural Resources

30. **Discovery of Cultural Resources in the Absence of Monitoring:** Discovery of Cultural Resources in the Absence of Monitoring: If, in its operations, operator/holder discovers any previously unidentified historic or prehistoric cultural resources, then work in the vicinity of the discovery will be suspended and the discovery promptly reported to Reclamation. Reclamation will then specify what action is to be takenin accordance with 36 CFR Section 800.13, in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property. Minor recordation, stabilization, or data recovery may be performed by Reclamation or a third party acting on its behalf, such as a permitted cultural resources consultant. If warranted, more extensive **archaeological or alternative mitigation,** likely implemented by a permitted cultural resources consultant, may be required of the operator/holder prior to allowing the project to proceed. Further damage to significant cultural resources will not be allowed until any **mitigations determined appropriate through the agency's Section 106 consultation are completed**. Failure to notify Reclamation about a discovery may result in civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, **the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws**.

31. **Damage to Sites:** If, in its operations, operator/holder damages, or is found to have damaged any previously documented or undocumented historic or prehistoric cultural resources, excluding "discoveries" as noted above, the operator/holder agrees at his/her expense to have a permitted cultural resources consultant prepare a Reclamation approved damage assessment and/or data recovery plan. The operator/holder agrees at his/her expense to implement a **mitigation** that the agency finds appropriate given the significance of the site, which the agency determines in consultation with the appropriate State or Tribal Historic Preservation Officer(s) and Indian tribe(s) that might attach religious and cultural significance to the affected property. **This mitigation may entail execution of the data recovery plan by a permitted cultural resources consultant and/or alternative mitigations.** Damage to cultural resources may result in **civil or criminal penalties in accordance with the Archeological Resources Protection Act (ARPA) of 1979, as amended, the Native American Graves Protection and Repatriation Act (NAGRPA) of 1990, as amended, and other applicable laws.**

32. Temporary fencing shall be placed beginning at the northeastern corner of the project and proceeding south for 150 feet. Fencing shall remain in place for the duration of construction and during any reclamation work.

33. **Employee Education:** All employees of the project, including the Project Sponsor and its contractors and sub-contractors will be informed that cultural sites are to be avoided by all

personnel, personal vehicles, and company equipment. They will also be notified that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm) when on federal land and the New Mexico Cultural Properties Act NMSA 1978 when on state land.

CHAPTER 6 – CONSULTATION AND COORDINATION

6.1 – Introduction

Reclamation's public involvement process presents the public with opportunities to obtain information about a given project and allows interested parties to participate in the project through written comments. This chapter discusses public involvement activities taken to date for the Proposed Action.

6.2 – Public Involvement

Notice of the public review period and availability of the Draft EA will be distributed to private landowners adjacent to the Proposed Action, and the organizations and agencies listed in Appendix C.

5.1 – Distribution

The publicly available electronic version of the Draft EA will be available on Reclamation's website for a period of 30 days and will meet the technical standards of Section 508 of the Rehabilitation Act of 1973, so that the document can be accessed by people with disabilities using accessibility software tools.

CHAPTER 7 – PREPARERS

The following list contains the individuals who participated in the preparation of this EA.

Name	Agency	Title	Areas of Responsibility
Jennifer Ward	Reclamation	Environmental Group Chief	EA review
Eric Creeden	Reclamation	Land & Recreation Group Chief	EA review
Christina Wyatt	Reclamation	Natural Resource Specialist	EA review
Zachary Nelson	Reclamation	Archaeologist	EA review Cultural resources
Eric Petterson	Red Mountain Environmental (Consultant to the Applicant)	Principal Ecologist	General authorship
Tanner Paulek	EIS Environmental Solutions (Consultant to the Applicant)	Biologist	Biological surveys, SUPO, reclamation plan
Olivia Graeber	EIS Environmental Solutions (Consultant to the Applicant)	GIS	Mapping

CHAPTER 8 – REFERENCES

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APPENDIX A – Surface Use Plan of Operations

Hilcorp Energy Company's Surface Use Plan of Operations

San Juan 32-7 Unit 202H Natural Gas Well Project

June 2025

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1111 Travis Street
Houston, Texas 77002
Phone: (713) 209-2400

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Table of Contents

Pursuant to Onshore Oil and Gas Order No. 1 (43 CFR 3160), this Surface Use Plan of Operations (SUPO) has been prepared for Hilcorp Energy Company's (Hilcorp) proposed San Juan 32-7 Unit 202H Natural Gas Well Project. This SUPO is in accordance with Onshore Oil and Gas Order No. 1.

Hilcorp proposes the San Juan 32-7 Unit 202H Natural Gas Well Project (San Juan 202H Project). Infrastructure proposed to be constructed, operated, subsequently interim reclaimed, and eventually fully reclaimed as part of the San Juan 202H Project entails one well pad expansion with production facilities and construction buffer zone and one water pipeline. The aforementioned proposed infrastructure associated with the San Juan 202H Project would be located on-lease on lands managed by Bureau of Reclamation (BOR). The proposed project would be built per lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM078423X) in conjunction with a License Agreement granted by the BOR. One natural gas well would be horizontally drilled, possibly produced and eventually be plugged and abandoned from the proposed well pad location. The proposed well would access Fee minerals within Hilcorp's San Juan 32-7 Unit.

1) EXISTING ROADS

A. The project area would be located in northwest New Mexico; specifically, in the northwest portion of San Juan County, New Mexico:

- From the intersection of US Hwy 550 & State Hwy 173 in Aztec, NM, travel east on State Hwy 173 for 1.0 mile to fork in roadway;
- Go left (East) remaining on State Hwy 173 for 17.0 miles to T-intersection;
- Go left (North-East) exiting State Hwy 173 onto State Hwy 511 for 23.5 miles to County Road #4046 right-hand side of State Hwy 511 @ Mile Marker 31.7;
- Go right (East) onto County Road #4046 for 200' proceeding through cattle-guard to immediate fork in roadway;
- Go right (South) onto existing roadway for 1.0 mile to fork in roadway;
- Go left (South) for 0.2 miles to existing Hilcorp San Juan 32-7 Unit #29A location, with the Hilcorp San Juan 32-7 Unit #202H well flag staked offset #29A wellhead.

B. Approximately 4,828 feet (0.82 miles) of existing road on BOR would continue to be used consistent with their existing lease agreement.

C. Roads would be maintained to the same or better condition as existed prior to the commencement of operations. Maintenance would continue until final abandonment and reclamation of the well location (See Appendix B).

D. Best management practices (BMPs) for dust abatement and erosion control would be utilized along the roads to reduce fugitive dust for the life of the project. Water application using a rear-spraying truck or other suitable means would be the primary method of dust suppression along the roads.

E. No routine maintenance activities would be performed during periods when the soil is too wet to adequately support construction equipment. If equipment creates ruts deeper than six inches, the soil would be deemed too wet for construction or maintenance.

2) NEW OR RECONSTRUCTED ACCESS ROAD(S)

A. No new access road would be constructed as a result of the San Juan 32-7 #202H operations. This well would be drilled from the existing San Juan 32-7 #029A well pad location and would utilize its existing access road.

B. The existing access will be improved as needed.

C. A culvert and turnout(s), will be installed along existing access at the entrance of the pad, as listed below:

- One 18-inch culvert and associated turnout(s) would be installed on the northern edge of the well pad.

D. If the need for surfacing material arises for drilling this well, material would be obtained from an approved location as listed herein.

3) LOCATION OF EXISTING WELLS

Water wells and oil and gas wells (plugged and abandoned, active, and proposed) within a one-mile radius of the proposed San Juan 32-7 #202H Project area are depicted in Appendix F. There are two water wells and 29 oil and gas wells (plugged and abandoned, active, or proposed) within a one-mile radius of the proposed well pad location.

4) LOCATION OF EXISTING OR PROPOSED PRODUCTION FACILITIES

A. Pipelines

1 To accommodate gathering and transportation of produced water from the Hilcorp's proposed San Juan 32-7 #202H project, Hilcorp will be constructing, installing, and maintaining a produced water gathering pipeline with associated above ground appurtenances from the proposed San Juan 32-7 #202H well pad to their existing water pipeline. This pipeline corridor will be located on Bureau of Reclamation (BOR) surface. The total 1,079.13 feet of four-inch water pipeline will be constructed along an existing 40-foot-wide pipeline ROW.

2 Please see Appendix C for centerline survey of the proposed well-connect pipeline. Legal land description of the pipeline ROW is provided below:

- Southeast ¼ of the Northeast ¼ of the of Section 18, Township 32 North, Range 07 West, New Mexico Principal Meridian (NMPM).

3 To accommodate gathering and transportation of produced minerals from Hilcorp's San Juan 32-7 #202H natural gas well, Harvest Four Corners will be constructing, installing, and maintaining a pipeline connect with associated above ground appurtenances on the proposed San Juan 32-7 #202H pad to an existing pipeline. A total of 150.3 feet of gas pipeline will originate at the proposed San Juan 32-7 #202H natural gas well head and connect to the existing Harvest Four Corners gas pipeline located on the proposed San Juan 32-7 #202H pad.

4 Please see Appendix C for centerline survey of the proposed well-connect pipeline. Legal land description of the pipeline ROW is provided below:

- Southeast ¼ of the Northeast ¼ of the of Section 18, Township 32 North, Range 07 West, New Mexico Principal Meridian (NMPM).

B. Production Facilities

1 Hilcorp elects to defer providing the BOR with the well layout of production equipment per Onshore Order I Section VIII. Hilcorp will provide the well layout of production equipment Notice of Intent (NOI) once the Post Completion Facility set onsite has been conducted with the BOR's Realty Specialist.

2 Any production equipment encompassed by a dirt berm or one in which fluids are present shall be adequately fenced and properly maintained in order to safeguard both livestock and wildlife.

3 Facilities would be painted Federal Juniper Green, as designated during the project onsite, to blend with the natural color of the landscape surrounding the well pad. Where necessary, contrasting safety paint would be used to highlight areas that may be potentially hazardous.

5) LOCATIONS AND TYPES OF WATER SUPPLY

Produced water from Hilcorp's existing wells in the surrounding area would be utilized for drilling operations. In addition, if needed, fresh water may be purchased from the list of fresh water sources below.

A. Water would be trucked from these sources to the proposed location (See Appendix F – Water Route Maps)

- Ignacio Water Shed - northwest ¼ of Section 20 Township 33 North, Range 7 West, Permit Number (SJ-206)
- Self-water hole- northeast ¼ Section 7 Township 32 North, Range 6 West, Permit Number (SD 02964 2A)
- Faverino water hole- northwest ¼ of Section 7 Township 32 North, Range 6 West, Permit Number (SJ-17)
- Aztec water shed- southeast ¼ of Section 3 Township 30 North, Range 11 West, Permit Number (SJ-55)
- Basin disposal- northwest ¼ of Section 3 Township 29 North, Range 11 West, Permit Number (SJ-26)

B. Sources for produced water may come from the list below and would be piped through Hilcorp's existing waterline infrastructure and the proposed waterline associated with this project to the proposed location.

- Middle Mesa 1 SWD- API 30-045-27004, operated by Hilcorp Energy Company, located in the Southwest ¼ of the Northeast ¼ Section 25, Township 32 North, Range 7 West.
- San Juan 32-7 Unit 301 SWD- API 30-045-28549- operated by Hilcorp Energy Company, located in the Southwest ¼ of the Southwest ¼ Section 34, Township 32 North, Range 7 West.
- SJ 32-8 253 Water Transfer Station- operated by Hilcorp Energy Company- Northeast ¼ of the Southwest ¼ Section 27, Township 32 North, Range 8 West.

6) CONSTRUCTION MATERIALS

A. The construction phase of the project would commence upon receipt of the BOR License Agreement. The Bureau of Reclamation would be notified (970-385-6533) at least 48 hours prior to the start of construction activities associated with the project. All project activities would be confined to permitted areas only.

B. Surface infrastructure would be constructed utilizing native borrow and approximately 2,000 yards of additional, weed free, fill dirt brought into create a balanced working surface.

C. Any additional fill dirt that would be used during construction for the berms around production tanks and for the padding for pipe as well as the gravel to use on the berms and around production facilities will come from one of the companies listed below. The construction material that will be brought in could be ¾-inch rock or ¾-inch road base and clean fill dirt.

- Sky Ute Sand and Gravel
- Four Corners Materials

- Mesa Sand and Gravel
- Paul & Sons
- Crossfire Aggregate Services
- Elam Construction
- La Boca Gravel Pit
- Aztec Excavation Pit
- Permitted BLM Sandstone Pits for Road Surface Material

D. Vegetation within the disturbance area, including trees that measure less than three inches in diameter (at ground level) and slash/brush would be chipped or mulched and incorporated into the topsoil as additional organic matter. All trees three inches in diameter or greater (at ground level) would be cut within 12 inches of ground level and de-limbed. Tree trunks (left whole) and cut limbs would be stacked and made available to the public. The subsurface portion of trees (tree stumps) would be buried in the fill slope or disposed of appropriately.

E. Construction equipment may include chain saws, a brush hog, scraper, maintainer, excavator, hydraulic mulcher, chippers, and dozer.

F. Construction and maintenance activities would cease if soil or road surfaces become saturated to the extent that construction equipment is unable to stay within the project area and/or when activities cause irreparable harm to roads, soils, or streams.

7) METHODS FOR HANDLING WASTE

A. Cuttings

1 Drilling operations would utilize a closed-loop system. Drilling of the horizontal lateral would be accomplished with water-based mud. All cuttings would be placed in roll-off bins and hauled to a commercial disposal facility or land farm. Hilcorp would follow Onshore Oil and Gas Order No. 1 regarding the placement, operation, and removal of closed-loop systems. No blow pit would be used.

2 Closed-loop tanks would be adequately sized for containment of all fluids.

B. Drilling Fluids

1 Drilling fluids would be stored onsite in above-ground storage tanks. Upon termination of drilling operations, the drilling fluids would be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical. All residual fluids will be hauled to a commercial disposal facility.

C. Spills

1 Any spills of non-freshwater fluids would be immediately cleaned up and removed to an approved disposal site.

D. Sewage

1 Portable toilets would be provided and maintained as needed during construction.

E. Garbage and other waste material

1 All garbage and trash would be placed in an enclosed metal trash containment. The trash and garbage would be hauled off site and dumped in an approved landfill, as needed.

F. Hazardous Waste

1 No chemicals subject to reporting under Superfund Amendments and Reauthorization Act Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the drilling, testing, or completing of these wells.

2 No extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities would be used, produced, stored, transported, or disposed of annually in association with the drilling, testing, or completing of these wells.

3 All fluids (i.e., scrubber cleaners) used during washing of production equipment would be properly disposed of to avoid ground contamination or hazard to livestock or wildlife.

G. Produced Water:

1 Hilcorp would dispose of produced water from the San Juan 32-7 Unit 202H well at the following facility:

- Middle Mesa 1 SWD, API 30-045-27004, operated by Hilcorp Energy Company, located in the Southwest ¼ of the Northeast ¼ Section 25, Township 32 North, Range 7 West.

2 Produced water would be transported via trucking or through Hilcorp's existing waterline infrastructure. Some produced water may also be used in future drilling and completion operations as an alternative disposal method.

8) ANCILLARY FACILITIES

A. Any existing Hilcorp locations may be used for staging during construction, drilling, and completion operations. Standard drilling operation equipment that will be on location includes drilling rig with associated equipment, temporary trailers equipped with sleeping quarters necessary for company personnel, toilet facilities, and trash containers.

9) WELL SITE LAYOUT

During construction, the proposed well pad would be leveled to provide adequate space and a level working surface for vehicles and equipment. Excavated materials from cuts would be used on fill portions of the well pad to level the surface. The approximate cuts, fills, and well pad orientation is shown on the construction plats in Appendix C. Rig orientation, the location of drilling equipment, and general equipment layout is depicted in Appendix D.

Drilling of the proposed San Juan 32-7 Unit 202H well would require constructing a 215-foot by 275-foot well pad expansion (1.24 acres), with an additional 50-foot construction buffer zone on the north, east and south sides (0.82 acres). The resulting area of the well pad expansion and construction buffer zone could encompass a 2.09-acre disturbed area. The well pad expansion could require a maximum cut of 7 feet on the southwest corner #2 and a maximum fill of 14 feet on the northeast corner #5. It was agreed upon at the onsite that Hilcorp would not make cuts into the slope along the western side of the pad and would round corner 3 to not impact the large boulders that exist. Notwithstanding anything contained herein to the contrary, the entire surface area would be utilized during construction, setting of production equipment, drilling and completion phases. Topsoil would be stored in a berm within the construction buffer zone, along the eastern edge of disturbance. Low profile tanks will be utilized for this project and placed within the cut slope to make to more visually aesthetic for the area.

10) PLANS FOR SURFACE RECLAMATION

A Surface Reclamation Plan for the San Juan 202H Project is attached hereto in Appendix A. This Surface Reclamation Plan was prepared in accordance with Onshore Oil and Gas Order No. 1.

The Surface Reclamation plan addresses:

- Configuration of the reshaped topography;
- Drainage systems;
- Segregation of spoil material (stockpiles);
- Surface disturbances;
- Backfill requirements;
- Redistribution of topsoil;
- Soil treatments;
- Seeding or other steps to reestablish vegetation;
- Weed control;
- and practices necessary to reclaim all disturbed areas.

11) SURFACE OWNERSHIP

The proposed well pad and waterline would be located on:

Bureau of Reclamation - Western Colorado Area Office
185 Suttle Street, Suite 2
Durango, CO 81303
(970) 385-6533

12) OTHER INFORMATION

A. Construction contractors would call New Mexico One-Call (or equivalent) to identify the location of any marked or unmarked pipelines or cables located in proximity to the proposed San Juan 202H Project or any other areas proposed to have ground disturbance at least two working days prior to ground disturbance.

B. The project area has been surveyed by La Plata Archeological Consultants (LAC). The cultural survey report was submitted to the BOR.

C. The San Juan 202H Project is located within the Rattlesnake Canyon (Big Game) SDA. Seasonal closures will apply (December 1st – March 31st) for drilling and construction.

D. All activities associated with the construction, use/operation, maintenance, and abandonment or termination of the San Juan 32-7 Unit 202H well would be limited to areas approved in the License Agreement.

APPENDIX A. SURFACE RECLAMATION PLAN

Hilcorp Energy Company's
Surface Reclamation Plan

San Juan 32-7 Unit 202H Natural Gas Well Project

June 2025

Prepared for

Hilcorp

1111 Travis Street
Houston, Texas 77002
Phone: (713) 209-2400

Developed by

EIS
Environmental & Permitting Solutions
479 Wolverine Drive
Bayfield, Colorado 81122
Phone: (970) 884-4080

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1 INTRODUCTION

Applicant	Hilcorp Energy Company
Project Name	Hilcorp Energy Company's San Juan 32-7 Unit 202H Natural Gas Well Project (San Juan 202H Project)
Project Type	One planned natural gas well, one well pad expansion, and one water pipeline
Legal Location	Section 18 of Township 32 North, Range 7 West; NMPM San Juan County, New Mexico
Lease Number(s)	San Juan 32-7 Unit (NMNM078423X)

Hilcorp Energy Company (Hilcorp) is providing this Surface Reclamation Plan as part of the Surface Use Plan of Operations (SUPO) to the Bureau of Reclamation (BOR) for their San Juan 32-7 Unit 202H natural gas well. This reclamation plan has been prepared following the guidelines of Onshore Oil and Gas Order No. 1. The project is located on public lands managed by the BOR.

The Hilcorp Contact person for this reclamation plan is:

Pat Hudman
Construction Forman
Hilcorp Energy Company
382 Road 3100
Aztec, NM 87410
505-320-1225

2 PROJECT DESCRIPTION

Hilcorp proposes the San Juan 32-7 Unit 202H Natural Gas Well Project (San Juan 202H Project). Infrastructure proposed to be constructed, operated, subsequently interim reclaimed, and eventually fully reclaimed as part of the San Juan 202H Project entails one well pad expansion with production facilities and construction buffer zone and one water pipeline. The aforementioned proposed infrastructure associated with the San Juan 202H Project would be located on-lease and would be built per lease authority associated with Hilcorp's San Juan 32-7 Unit (NMNM078423X) in conjunction with a License Agreement granted by the BOR. One natural gas well would be horizontally drilled, possibly produced and eventually plugged and abandoned from the proposed well pad location.

The infrastructure proposed for this project is located within Section 18 of Township 32 North, Range 7 West N.M.P.M. The proposed natural gas well would access Fee minerals within the San Juan 32-7 Unit.

A brief description of the surface hole location can be found in Table 2-1 below.

Table 2-1. Legal Coordinates for the Proposed Wellhead Location.

Well Number	Location	Legal Description
202H	Wellhead	2320 feet FNL and 1859 feet FEL, Section 18 of Township 32 North, Range 7 West NMPM San Juan County, New Mexico

2.1 Estimated Total Area of Disturbance

The San Juan 202H Project may result in a total of 2.90 acres of disturbance with approximately 1.06 acres of that resulting in new surface disturbance. New surface disturbance is placed with respect to: archeology, paleontology, geology, terrain characteristics, current/proposed Hilcorp infrastructure, efforts to minimize ground/vegetative disturbance and to avoid areas of concern for sensitive species. During interim reclamation, of the total 2.90 acres proposed surface disturbance, approximately 1.66 acre would be fully reclaimed, and 1.24 acres would be stabilized and used as a working surface throughout the life of the well. Approximately 4,828 feet (0.82 miles) of existing road on BOR would continue to be used consistent with their existing lease agreement. The working surfaces would be fully reclaimed during final reclamation.

Table 2-2. Project Disturbance Estimates for the Proposed San Juan 202H Project

Feature	Disturbance Acreage			Disturbance Following Interim Reclamation	
	Total	Existing Disturbance Utilized	New Disturbance	Fully Reclaimed	Long-term Disturbance
Well Pad & Construction Zone	2.06	1.50	0.56	0.82	1.24
Harvest Gas pipeline [1]	0	0	0	0	0
Produced Water Pipeline	0.84[2]	0.5	0.5	0.84	0
Total:	**2.90**	**2.00**	**1.06**	**1.66**	**1.24**

[1] 0.14 acres of disturbance is accounted for within the well pad. Tie in will be on existing pad.
[2] 0.16 acres of the water pipeline construction corridor disturbance is accounted for within the well pad and construction zone.

2.1.1 Well Pad

The proposed well pad would be a 215-foot by 275-foot (1.24 acres) area with an additional 50-foot construction buffer zone on the north, east and south sides of the pad (0.82 acres). The resulting area of the well pad and construction buffer zone would encompass a 2.06-acre working surface. During the construction of the well pad, elevated areas within the pad area would be excavated and utilized as fill material on low areas of the pad to establish a level working surface. Corner #3 would be rounded to avoid large boulders. The well pad would require a maximum cut of 7 feet on the southwest corner #2 and a maximum fill of 14 feet on the northeast corner #5. Hilcorp would haul approximately 2,000 yards of weed free material to fill areas which need to be leveled on the northern and eastern areas of the well pad.

It was agreed upon at the onsite that Hilcorp would not make cuts into the slope along the western side of the pad in the construction buffer zone. Notwithstanding anything contained herein to the contrary, the entire surface area would be utilized during construction, setting of production equipment, drilling, and completion phases. One horizontal well is planned to be drilled from this well pad. Once all drilling and completions phases are complete for the well, the well pad would be interim reclaimed. The proposed well pad would result in 1.24 acres of long-term disturbance and 0.82 acres of short-term disturbance.

2.1.2 Hilcorp's Produced Water Pipeline

To accommodate gathering and transportation of produced water for long-term disposal, Hilcorp proposes a buried waterline from the proposed well pad to the existing waterline infrastructure. The waterline would be 1,079.13 feet long within a 40-foot wide construction corridor. The entire length of the waterline would overlap existing disturbance by a width of approximately 20 feet (0.42 acres), resulting in approximately 0.50 acres if new surface disturbance. All pipeline disturbance would be fully reclaimed during interim reclamation.

2.1.3 Harvest Four Corners Well-connect Pipeline

To accommodate gathering and transportation of produced minerals from Hilcorp's proposed well, Harvest Four Corners will be constructing, installing, and maintaining a pipeline well-connect with associated above ground appurtenances on the proposed well to existing infrastructure. All activities associated with the construction, installation, operation, and maintenance will be on pad.

3 PRE-DISTURBANCE SITE VISIT

The pre-disturbance site visit occurred for the proposed project on August 30, 2018 and then again May 13, 2025. Table 3-1 provides a list of individuals present at the most recent onsite.

Table 3-1. Pre-disturbance San Juan 202H Well Pad May 13th, 2025 Onsite Attendees

Ben Mitchell	Hilcorp
Jim Formea	Bureau of Reclamation
Eric Creeden	Bureau of Reclamation
Bridget Motiff	Energy Inspection Services, LLC
Tanner Paulek	Energy Inspection Services, LLC

3.1 Vegetation Community

The proposed project area is located within the pinyon-juniper vegetative community. The dominant species throughout the entire action area was identified as pinyon pine trees (*Pinus edulis*). Ground cover by dominant species' varies across the project area due to existing disturbance. Visual estimate of ground cover is approximately 10 to 20 percent on average.

3.2 Proposed Reclamation Seed Mix

Disturbance would be re-contoured, and topsoil would be redistributed and prepared for seeding by the construction contractor. Ripping, disking, seeding, and crimping in of mulch across the site would be done by Hilcorp's construction contractor using the approved seed mix, which is shown in Table 3-2. The proposed reclamation seed mix takes into account the existing vegetation on the proposed project site.

Table 3-2. Pinyon Juniper Community Seed Mix.

Common Name	Scientific Name	Variety	Season	Form	PLS lbs/acre[1]
Antelope bitterbrush	*Purshia tridentata*	VNS	Cool	Shrub	2.0
Sand dropseed	*Sporobolus cryptandrus*	VNS	Warm	Bunch	0.5
Western wheatgrass	*Pascopyrum smithii*	Arriba	Cool	Sod- forming	4.0
Indian ricegrass	*Achnatherum hymenoides*	Paloma or Rimrock	Cool	Bunch	4.0
Prairie Junegrass	*Koeleria macrantha*	VNS	Cool	Bunch	2.0
Needle and thread	*Hesperostipa comate*	VNS	Cool	Bunch	3.0
Scarlet globemallow	*Sphaeralcea coccinea*	VNS	Warm	Forb	0.25
[1]Based on 60 PLS per square foot, drill seeded; double this rate (120 PLS per square foot) if broadcast or hydro-seeded.					

3.3 Vegetation Reclamation Standards

Reclamation success criteria would be determined by the reclamation percent cover standards for the representative community as outline in Table 3-3.

Table 3-3. Reclamation Goal for Pinyon-Juniper Community Cover – Wooded shrubland (deep soil) Vegetation Cover

Functional Group	Percent (%) Foliar Cover	Common Species
Trees/Shrubs/Grasses/Forbs	≥20	Utah juniper, Piñon pine, big sagebrush, four-wing saltbush, antelope bitterbrush, rubber rabbitbrush, broom snakeweed, bottlebrush squirreltail, western wheatgrass, Indian ricegrass, galleta, sand dropseed, threeawn grass, scarlet globemallow, wooly Indianwheat, fleabane spp., Penstemon spp., buckwheat spp., threadleaf groundsel.
Invasive/undesirables (10% allowed toward meeting standard of 20%)	≤10	Plants that have the potential to become a dominant species on a site where its presence is a detriment to revegetation efforts or the native plant community. Examples of invasive species include cheatgrass, Russian thistle, kochia.

3.4 Pre-Disturbance Weed Survey

During the onsite visit, the proposed action area was surveyed for noxious weeds listed on the New Mexico Department of Agriculture's A and B list. No New Mexico Department of Agriculture Class A-listed or B-listed species were found on the proposed San Juan 202H well pad area. The Onsite Noxious Weed form was completed and signed by the BOR representative. The form is attached to this Reclamation Plan.

Onsite Noxious Weed Form

If noxious weeds are found during the onsite, fill out form and submit to FFO weed coordinator
Operator Hilcorp Surveyor(s) Tanner Paulek, Bridget Motiff
Well Name and Number San Juan 32-7 202H Date Onsite 05/13/2025
Location: Township, Range, Section T32N R7W Sec 18 Form updated 07/01/2025
Location of Project NAD 83 Decimal Degrees _____ _____

Class A Noxious Weed – Check Box if Found

	Alfombrilla		Diffuse knapweed		Hydrilla		Purple starthistle		Yellow toadflax
	Black henbane		Dyer's woad		Leafy spurge		Ravenna grass		
	Camelthorm		Eurasian watermilfoil		Oxeye daise		Scotch thistle		
	Canada thistle		Giant salvinia		Parrotfeather		Spotted knapweed		
	Dalmation toadflax		Hoary cress		Purple loosestrife		Yellow starthistle		

Class B Noxious Weed – Check Box if Found

	African rue		Perennial pepperweed		Russian knapweed		Tree of heaven
	Chicory		Musk thistle		Poison hemlock		
	Halogeton		Malta starthistle		Teasel		

Comments: Bindweed and cheatgrass present in and around project site. Russian olive found outside of proposed project area, between project and Los Pinos River. Previosuly unidentified thistle identified as Wavyleaf Thistle.

FFO Representative: ERIC CREEDEN Digitally signed by ERIC CREEDEN Date: 2025.07.03 08:27:51 -06'00'
sign and date

Operator Representative Ben Mitchell
sign and date

3.5 Pre-Disturbance Site Photographs

Photographs were taken of the pre-disturbance sites. Each photograph in this Vegetation Reclamation Plan is notated with the direction the photograph was taken and the location of the photo point. The photographs and locations are listed in Table 3-4 below.

Table 3-4. List of required pre-disturbance site photographs

Photographs	Location Description
1, 2, 3, 4	From each well pad corner, looking toward the center stake

Figure 1. Well Pad Corner 5, Looking Towards the West.

Figure 2. Well Pad Corner 3, Looking Towards the Southeast.

Figure 3. Well Pad Corner 6, Looking Towards the Northwest.

Figure 4. Well Pad Corner 2, Looking Towards the Northeast.

4 Reclamation Techniques for Successful Revegetation

All activities associated with the construction, use/operation, maintenance, and abandonment or termination of the San Juan 202H Project are limited to areas approved in the License Agreement.

4.1 Vegetation and Site Clearing

Vegetation removed during construction, including trees that measure less than three inches in diameter (at ground level) and slash/brush, would be chipped or mulched and incorporated into the topsoil as additional organic matter. If trees are present, all trees three inches in diameter or greater (at ground level) would be cut within 12 inches of ground level and delimbed. Tree trunks (left whole) and cut limbs would be stacked. The subsurface portion of trees (tree stumps) would be disposed of appropriately.

4.2 Topsoil Stripping, Storage, and Replacement

The upper six inches of topsoil (if available) would be stripped following vegetation and site clearing. Topsoil would not be mixed with the underlying subsoil horizons and would be stockpiled as a berm along the perimeter of the well pad within the construction buffer zone or as a windrow along the

road/pipeline corridor, separate from subsoil horizons or other excavated material. Topsoil and sub-surface soils would be replaced in the proper order, prior to final seedbed preparation. Spreading shall not be done when the ground or topsoil is wet. Vehicle/equipment traffic would not be allowed to cross topsoil stockpiles. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments would be added to the topsoil as advised by the Hilcorp environmental scientist or appropriate agent/contractor.

4.3 Water Management/Erosion Control Features

The BOR Realty Specialist and a Hilcorp representative would work in collaboration to develop site-specific erosion control or water management features and to identify installation locations as appropriate. Potential erosion control or water management features that may be used include (but are not limited to) water bars or rolling dips for roads, sediment basins or sediment traps, check dams, silt fencing, outlet protection for culverts, erosion control blankets or geotextiles, and straw wattles.

Hilcorp (or its contractors) may use erosion control blankets, straw bales, or straw wattles as appropriate to limit erosion and sediment transport from any stockpiled soils. No specific erosion features were identified as being needed during the project onsite. The existing drainage ditch would be re-established, and the sediment trap cleaned out.

4.4 Seedbed Preparation

For cut-and-fill slopes, initial seedbed preparation would consist of backfilling and re-contouring. Disturbed areas would be re-contoured to blend with the surrounding landscape, emphasizing restoration of the existing drainage patterns and landform to pre-construction condition, to the extent practicable.

Within areas that would be reseeded, stockpiled topsoil would be evenly redistributed prior to final seedbed preparation. Topsoil would not be redistributed when the ground or topsoil is wet. Seedbed preparation within compacted areas would include ripping to a minimum depth of 18 inches and spacing furrows two feet apart. Ripping would be conducted perpendicularly in two phases, where practicable. If large clumps/clods result from the ripping process, disking would be conducted perpendicular to slopes in order to provide terracing and minimize runoff and erosion. Final seedbed preparation would consist of raking or harrowing to spread topsoil prior to seeding to promote a firm (but not compacted) seedbed without surface crusting. Seedbed preparation may not be necessary for topsoil storage piles or other areas of temporary seeding.

4.5 Soil Amendments

It was determined that this area may lack topsoil. Therefore, Hilcorp proposes to incorporate soil amendments as part of the soil preparation in order to establish a seedbed for vegetative success. With the approval of the BOR, the appropriate soil amendments will be applied to the reclamation area. The existing soil in the reclamation area will be recontoured to blend with the surrounding area. The below soil amendments will be applied.

Product Name	**Total Amount of Product Applied**
Triganics	3500 Pounds
Richlawn 4-6-2	2500 Pounds
Sulfur Granulars	1000 Pounds

.

4.6 Seeding

The seed mix chosen for this project area is listed in Table 3-2. Seeding would occur at the time of interim reclamation and upon final reclamation. A disc-type seed drill with two boxes for various seed sizes would be utilized for seeding the disturbed areas of the site. Hilcorp or its reclamation subcontractor would ensure that perennial grasses and shrubs are planted at the appropriate depth. Intermediate size seeds (such as wheatgrasses and shrubs) would be planted at a depth of 0.5-inch, larger seeds (such as Indian ricegrass) would be planted at a depth of one to two inches, and small seeds (such as alkali sacaton and sand dropseed) would be planted at a depth of 0.25 inch. In situations where differing planting depths are not practicable with the equipment being used, the entire mix would be planted no deeper than 0.25 inch. Seed would be drilled perpendicular to slopes in order to minimize runoff and erosion.

Drill seeding may be used on well-packed and stable soils that occur on gentler slopes and where tractors and drills can safely operate. Where drill seeding is not practicable due to topography, the contractor would hand-broadcast seed using a "cyclone" hand seeder or similar broadcast seeder. Broadcast application of seed requires a doubling of the drill-seeding rate. The seed would then be raked into the ground so the seed is planted no deeper than 0.25 inch below the surface.

4.7 Noxious and Invasive Weed Control

Weed inspections will be performed annually in the spring. Should any noxious or invasive weeds appear within the project area, they will be documented with date of observation, species, size of impacted area, treatment that was used, and date that treatment was applied. All annual inspection reports will be submitted to the BOR.

Hilcorp is required to use BLM approved herbicides. Reclamation requires that the contractor be fully certified to apply appropriate weed and vegetation control measures in the project area. The contractor (or designated subcontractor) must possess, at a minimum, a commercial applicator's license for the State of New Mexico to dispense herbicides. Documentation must be provided to BOR. Chemicals intended for use in the project area must be reviewed and approved by BOR prior to application. A safety hazard analysis and the Safety Data Sheets (SDS) for chemicals used must be submitted to BOR for each chemical with the chemical list at least 15 days prior to application of any chemical.

5 MONITORING REQUIREMENTS

The San Juan 32-7 202H Project is located on-lease within public lands managed by the BOR within Hilcorp's San Juan 32-7 Unit. Monitoring for BOR-managed lands would be initiated after the project is completed (Interim Monitoring), during the post disturbance earthwork, and seeding inspection process.

5.1 Interim Reclamation

5.1.1 Initiation

During the post-disturbance site inspection, the BOR representative (in collaboration with the Hilcorp Representative) would determine site-specific monitoring locations for photo point monitoring and vegetation line-point intercept transects. The BOR would GPS the monitoring locations, take the initial

monitoring photographs, and complete the initial monitoring report within 60 days of post-disturbance earthwork and seeding inspection. The initial report would be available by the BOR.

5.1.2 Annual Monitoring and Reporting

Hilcorp will be responsible for annual monitoring of the photo points and the vegetation line-point intercept transects for the on-lease well pad starting two years after the completion and approval of the earthwork and seeding. Monitoring may occur during any time of the year. Hilcorp will submit the initial monitoring report to the BOR by December 31 of the year monitored. Vegetation line-point intercept transects will be monitored annually by Hilcorp until attainment of vegetation reclamation standards is met.

5.1.3 Attainment of Vegetation Reclamation Standards

When vegetation on a reclaimed site appears to meet the required percent revegetation standard (see Section 3.3), Hilcorp may request BOR concurrence that vegetation percent cover standards have been attained any time after two calendar years of completion of earthwork and seeding. Hilcorp will submit a written report identifying that revegetation standards have been attained. The BOR will reply to the operator to confirm concurrence (or not) with a rational for the determination within 60 days of receiving the request.

If the revegetation standards are not attained, Hilcorp and the BOR will analyze the issues that may have contributed to vegetation reclamation failure or lack of meaningful progress. Remedial actions will be developed in collaboration with BOR if vegetation percent cover standards are not being attained.

5.2 Long-Term Monitoring

After the required percent revegetation standard has been attained, Hilcorp will begin long-term monitoring. Every fifth year after attainment, Hilcorp will monitor the site at all established photo points to ensure the site remains productive and stable.

5.3 Final Abandonment

Revegetation percent cover standards will be attained, documented, and submitted to the BOR by Hilcorp or an exception granted before the BOR will approve a final abandonment notice (FAN) or relinquishment.

5.4 Cessation of Monitoring

Monitoring requirements will remain in effect as long as the permit, grant, or authorization remains in force and until all infrastructure or associated facilities are abandoned by established BLM procedure and a FAN or relinquishment is issued by the BLM-FFO. Hilcorp will document that percent cover standards have been obtained when submitting a request for a FAN or a relinquishment.

6 REFERENCES

43 CFR Part 3160, “Onshore Oil and Gas Order No. 1; Onshore Oil and Gas Operations; Federal and Indian Oil and Gas Leases; Approval of Operations,” 72 Federal Register 44 (March 2007), pp. 10328-10338.

U.S. Department of the Interior - U.S. Department of Agriculture (USDI-USDA). 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development. BLM/WO/ST-06/021+307/REV 07. Bureau of Land Management. Denver, Colorado. 84 pp.

Topsoil Storage area Map

- Edge of Disturbance
- Well Pad
- Produced Water Pipeline
- ROW (40')
- Existing Access Road
- Visual Resource Management

Roads:
- Highway
- County or Numbered Road
- Named or Minor Access Road

PLSS:
- Township
- Section

Hilcorp

Coordinate System: NAD 1983 State Plane NM West FIPS 3003 Feet
Data Sources: BLM, EIS, San Juan Co

N

Prepared for Hilcorp
by EIS Environmental & Permitting
Geographic Information Services, 7/3/2025

EIS Environmental & Permitting Solutions

Hilcorp Energy Company

San Juan 32-7 Unit 202H
Natural Gas Well Project

Topsoil Map

~~ Location Information ~~
T32N-R7W Sec 18
San Juan County, New Mexico

US Feet
0 37.5 75
1:600 *1:600*

Note: For reference only. Not for legal use. Duplication by permission only.

Proposed Soil Amendments

Soil Amendments

TRITON ENVIRONMENTAL

RICHLAWN SOILWORX

4-6-2 with Biochar, Mycorrhizae, & Humates

Richlawn Soilworx is an agency approved natural, organic fertilizer containing slow release nitrogen and blended with biochar, mycorrhizae, and humates. Richlawn Soilworx restores and builds depleted soils with essential nutrients, beneficial fungal biomass, and organic matter to build a sustainable environment in which to quickly establish vegetation.

Manufactured by Richlawn Turf Food, LLC
15121 WCR 32, Platteville, CO 80651
Net Weight 50 lbs (22.68 Kg.)

Guaranteed Analysis

Total Nitrogen(N) 4.0%
3.42% Water Insoluble Organic Nitrogen*
0.58% Water Soluble Organic Nitrogen
Available Phosphate (P_2O_5)..... 6.0%
Soluble Potash (K_2O) 2.0%
Calcium (Ca) 10.0%

Plant Nutrient Sources: Dried poultry manure, bone meal, feather meal, and sulfate of potash.

*3.42% water insoluble nitrogen from dried poultry manure, bone meal, and feather meal.

Non-Plant Food Ingredients (per bag)
Biochar.....5.0%
Endo Mycorrhizae ..... 30,000 Propagules
7500 propagules glomus mosseae
7500 propagules glomus entunicatum
7500 propagules glomus intradices
7500 propagules glomus aggregatum
Humates.....9.0%

The Benefits of Richlawn Soilworx

- Great source of both macro and micro nutrients essential to plant growth.
- Slow release of nutrients allows plants to capture full nutrient value
- Promotes more robust plant root structure and helps choke out weeds
- Conditions soils by adding essential organic matter
- Sterilized and free of weed seeds
- ***Biochar*** is a powerful soil enhancer which captures carbon, retains moisture, improves fertility, and promotes microbial activity.
- ***Mycorrhizae*** is a natural soil fungus that increases the plant's root structure to better absorb and retain moisture and nutrients. A more robust plant root structure leads to better erosion control.
- ***Humates*** add a concentrated form of organic material to the soil promoting soil microbiology, water holding capacity and improving the soil's structure.

DISTRIBUTED BY:
TRITON ENVIRONMENTAL
5433 NEWPORT STREET
COMMERCE CITY, CO 80022
303.945.7588 (O) 303.945.7579 (F)

TriGanics™
BIOTIC SOIL MEDIA™

Designed as a topsoil alternative that brings depleted soils back to life!

MIXING AND INSTALLATION GUIDELINES

Soil Building and Revegetation

Mix seed and specified Prescriptive Agronomic Formulations at recommended rates in approved hydraulic seeding/mulching equipment when water has reached the level of first agitator. Add TriGanics™ Biotic Soil Media™ (BSM™) at a rate of:

- Hydroseeders equipped with gear or positive displacement pumps – Load 100 pounds to 100 gallons (45 kg/379 liters) of water while agitating.
- Hydroseeders equipped with centrifugal pumps – Load 75 pounds to 100 gallons (34 kg/379 liters) of water while agitating.

Add fertilizer when the tank is approximately 3/4 full. Apply over properly prepared surfaces that are deemed geotechnically stable. Confirm specific material loading rates with equipment manufacturer.

For Erosion Control Solution

Apply TriGanics as directed above being sure to include all Prescriptive Agronomic Formulations, fertilizer and recommended seed rates. Apply Flexterra® HP-FGM™, ProMatrix™ EFM™, or RECP over TriGanics as directed by manufacturers' recommendations.

INSTALL PRODUCT AT THE FOLLOWING TYPICAL APPLICATION RATES:		
% Organic Matter	lb/ac	kg/ha
< 0.75	5,000	5,600
≥ 0.75 & < 1.5	4,500	5,040
≥ 1.5 & < 2.0	4,000	4,480
≥ 2.0 & < 5.0	3,500	3,920

- Always conduct a soil test to determine agronomic needs. Soils with organic matter >5% typically do not require TriGanics.
- Depending on the test results, it is typically advisable to apply fertilizer, pH neutralizers and/or biostimulants with TriGanics.

PRODUCT COMPOSITION

NON PLANT FOOD INGREDIENTS

Thermally Processed (within a pressurized vessel)

Bark and Wood Fibers 94%

Wetting Agents 6%

NET WEIGHT 50 LB (22.7 KG)

Profile®
Solutions for your Environment™

MADE IN U.S.A.

PROFILE PRODUCTS LLC
750 W. LAKE COOK ROAD • SUITE 440 • BUFFALO GROVE, IL 60089
CUSTOMER SERVICE: 800-508-8681 • WWW.PROFILEPRODUCTS.COM

Soil Amendments

TRITON ENVIRONMENTAL

ELEMENTAL SULFUR

90% Sulfur Disintegrating Granules

Plants need at least sixteen nutrients for normal growth. Three of these nutrients – nitrogen, phosphorus, and potassium, have traditionally been known as the major nutrients. Plants need large amounts of these elements, and fertilizer programs are designed to supply them in adequate amounts. Another nutrient, Sulfur, is also needed in large amounts by plants. Many plants contain as much sulfur as phosphorus, and it ranks in importance with nitrogen and phosphorus in the formation of protein. It is an integral component of certain vitamins and enzymes. Sulfur also can serve as a valuable tool in pH adjustment in soils alkaline in nature. The bacteria in the soil will convert the sulfur into sulfuric acid over a period of time. Please consult on proper amounts of sulfur to apply.

Manufactured by Montana Sulphur & Chemical Company
627 ExxonMobil Road, Billings, 59101
Net Weight 50 Lbs (22.68 Kg.)

Guaranteed Analysis:

- **Sulfur Content**: 90+ wt.-% minimum as Elemental Sulfur
- **Bentonite** 8% – 10%
- **COLOR / APPEARANCE**: Light Yellow-Green Small Split Pea-Like Solid
- **Bulk Density**: Approx. 80 Lbs./Cu. Ft.
- **Source**: Production from high quality “Claus” Sulfur
- **Screen Specifications used**: Smaller than 5 mesh(.159″ opening) and larger than 9 mesh(.079″ opening)

DISTRIBUTED BY:
TRITON ENVIRONMENTAL
5433 NEWPORT STREET
COMMERCE CITY, CO 80022
303.945.7588 (O) 303.945.7579 (F)

APPENDIX B. ROAD MAINTENANCE PLAN

Hilcorp Energy Company's

Road Maintenance Plan

San Juan 32-7 Unit 202H Natural

Gas Well Project

June 2025

Hilcorp Energy Company
1111 Travis Street
Houston, Texas 77002
Phone: (713) 209-2400

Developed by:

479 Wolverine Drive #9
Bayfield, Colorado 81122
Phone: (970) 884-4080

1.0 Introduction

Hilcorp Energy Company (Hilcorp) is providing this Road Maintenance Plan (Plan) to the Bureau of Reclamation (BOR) as part of the Surface Use Plan of Operations (SUPO) for the San Juan 32-7 Unit 202H (San Juan 202H) Natural Gas Well Project. No new road is proposed for this project. The proposed Project will utilize existing Hilcorp lease roads in the area.

The road maintenance procedures provided in this Plan meet the standards established in The Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development and BLM Manual 9113.

Under the San Juan 202H well APD, Hilcorp will be responsible for road maintenance associated with the proposed wells. This responsibility will continue until Hilcorp transfers the permit or abandons the project and obtains a Final Abandonment Notice or relinquishment from the BOR. Refer to Conditions of Approval (COAs) attached to the approved APD for any upgrades to existing roads.

2.0 Road Inspections

Hilcorp Representatives will formally inspect the road biannually, in the spring and fall, to assess the condition of the road. The formal road inspection will be recorded on a Road Inspection Form (blank form attached to this Plan). Completed Road Inspection Forms will be kept on file at Hilcorp and can be provided to the BOR, if requested (See Attached Road Inspection Form).

Additionally, outside of the formal inspection period, Hilcorp representatives driving to/from the project area will assess the condition of the road and notify the Hilcorp Construction Supervisor if maintenance is needed.

Road maintenance activities will be documented at Hilcorp and can be provided to the BOR, if requested.

3.0 Road Maintenance

The following maintenance may be performed on an as needed basis:

- Water control structures (such as culverts, ditches, and silt traps) and/or cattle guards may be cleaned. If this occurs, the soil/sediment material will be spread on area roads or locations.
- Bar ditches may be pulled.
- Low-water crossings and drainage dips may be cleared and/or repaired.
- Crowning may be repaired.
- Litter may be collected.
- Noxious weeds may be controlled following the BOR noxious weed guidelines.
- The access road may be bladed.

In addition to inspection-triggered maintenance procedures, the road will be maintained following this Plan, as needed.

Attachment: Road Inspection Form

Road Inspection Form

Road Name:	**County:**
Date:	**Time (a.m./p.m.):**
Weather:	
Inspector(s):	
Road Surface Type:	

Road Condition Inspection Items	Road Condition		
	Good	Poor	Comments
Water-Control Structure(s)			
Low-Water Crossing(s)			
Road Crowning/Ruts/Potholes			
Road Surfacing			
Cattle guard(s)			
Litter			
Noxious Weeds Within/Adjacent to Roadway			
Vegetation Within Roadway			
Additional Site-Specific Inspection Notes:			

APPENDIX C. WELL PAD PLATS WITH ACCESS ROUTE AND DIRECTIONS

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
	71629	BASIN FRUITLAND COAL

[4] Property Code	[5] Property Name	[6] Well Number
	SAN JUAN 32-7 UNIT	202H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372171	HILCORP ENERGY COMPANY	6181'

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
J	18	32N	7W		2320	NORTH	1859	EAST	SAN JUAN

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
K	7	32N	7W		1500	SOUTH	2500	EAST	SAN JUAN

[12] Dedicated Acres		[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
320.00	SE/4 – Section 7 NE/4 – Section 18			

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

BOTTOM HOLE LOCATION
1500' FSL 2500' FEL
SEC 7, T32N, R7W
LAT: 36.992222 °N
LONG: 107.607408 °W
DATUM: NAD1927

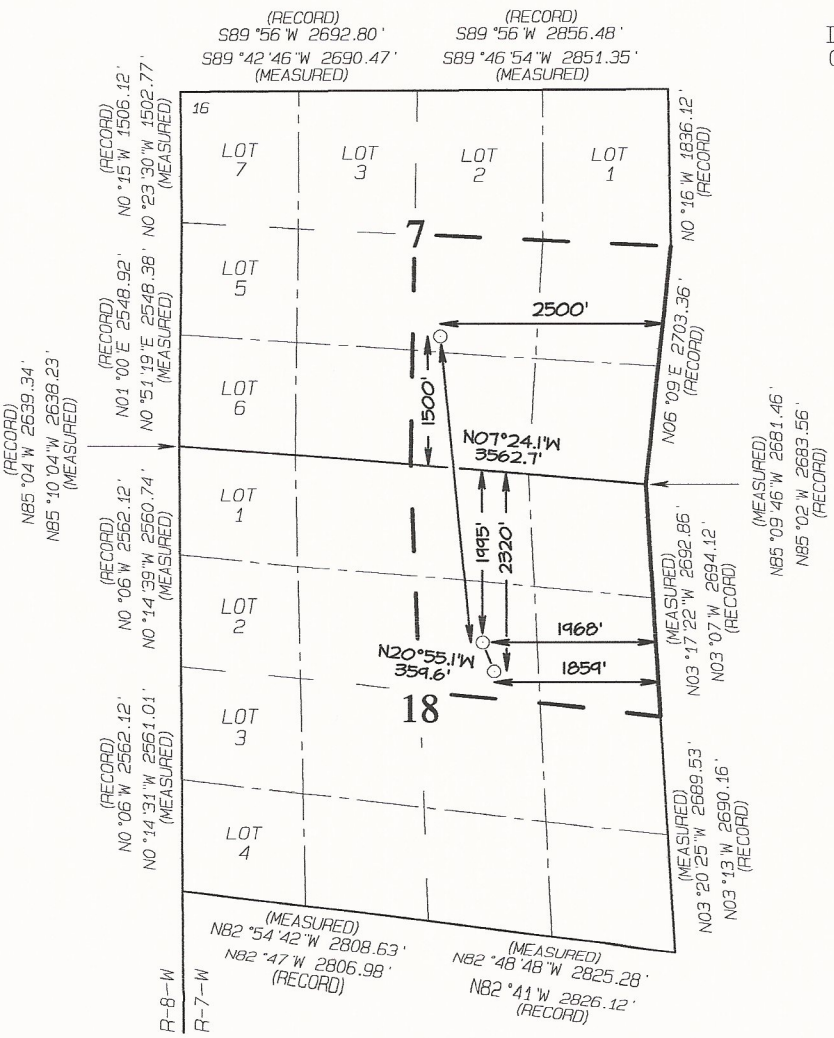
LAT: 36.992226 °N
LONG: 107.608019 °W
DATUM: NAD1983

FIRST TAKE POINT
1995' FNL 1968' FEL
SEC 18, T32N, R7W
LAT: 36.982515 °N
LONG: 107.605866 °W
DATUM: NAD1927

LAT: 36.982519 °N
LONG: 107.606477 °W
DATUM: NAD1983

SURFACE LOCATION
2320' FNL 1859' FEL
SEC 18, T32N, R7W
LAT: 36.981592 °N
LONG: 107.605429 °W
DATUM: NAD1927

LAT: 36.981596 °N
LONG: 107.606040 °W
DATUM: NAD1983



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: SEPTEMBER 17, 2018
Survey Date: SEPTEMBER 7, 2018

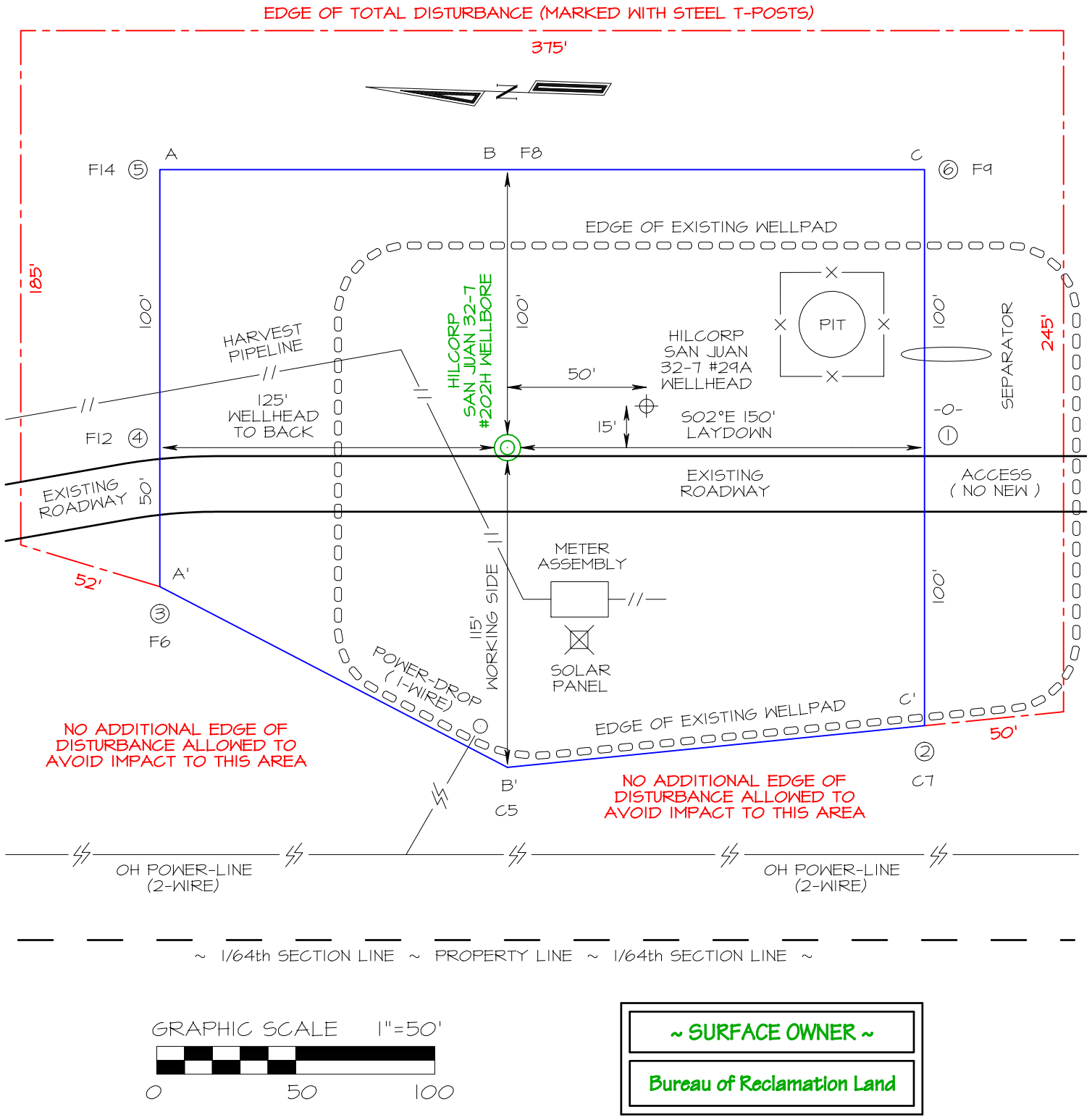
Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

HILCORP ENERGY COMPANY SAN JUAN 32-7 UNIT #202H
2320' FNL & 1859' FEL, SECTION 18, T32N, R7W, NMPM
SAN JUAN COUNTY, NEW MEXICO ELEVATION: 6181'
LAT 36.981596°N LONG -107.606040°W DATUM NAD1983

Area of Wellpad = 1.24 Acres **Area of Total Disturbance = 2.06 Acres**



GRAPHIC SCALE 1"=50'

0 50 100

~ SURFACE OWNER ~

Bureau of Reclamation Land

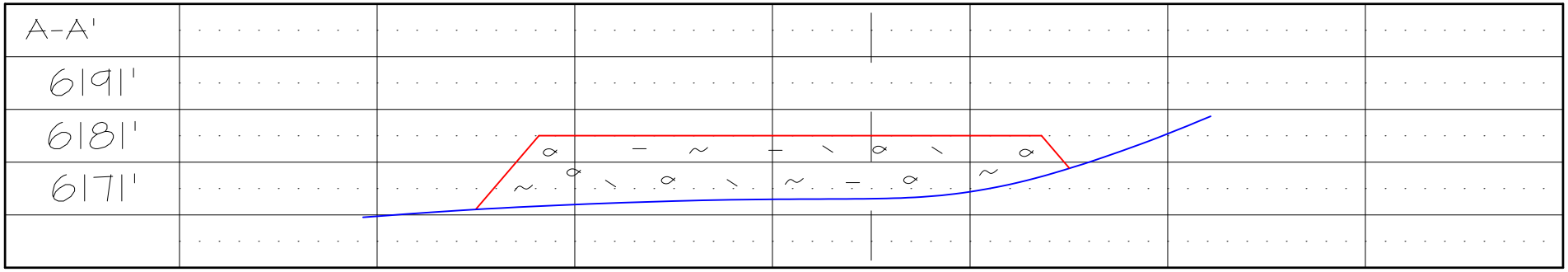
Steel T-Posts have been set to define Edge of Disturbance limits which are 50' offset from edge of wellpad, except as shown along West edge of wellpad which is restricted to 15' to avoid disturbance in rocky terrain.

HILCORP ENERGY COMPANY SAN JUAN 32-7 UNIT #202H
2320' FNL & 1859' FEL, SECTION 18, T32N, R7W, NMPM
SAN JUAN COUNTY, NEW MEXICO ELEVATION: 6181'

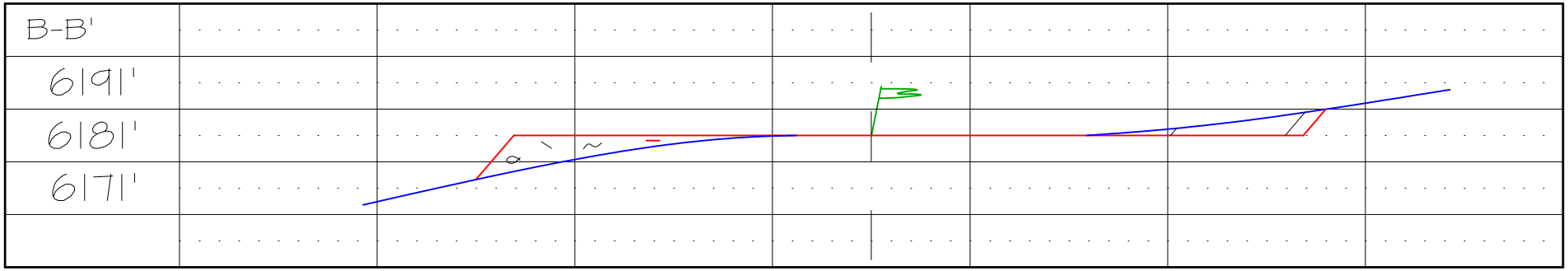
HORIZONTAL SCALE
1"=40'

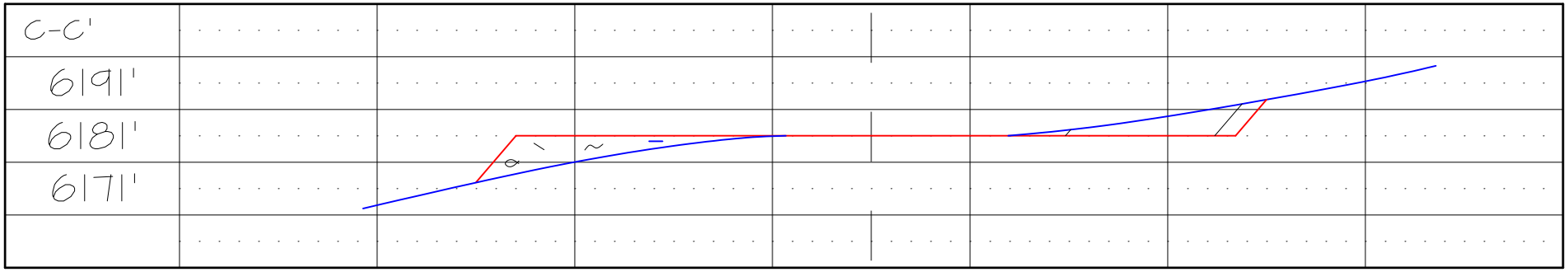
VERTICAL SCALE
1"=30'

C/L



C/L





EDWARDS SURVEYING, INC. IS NOT LIABLE FOR LOCATION OF UNDERGROUND UTILITIES OR PIPELINES.

CONTRACTOR SHOULD CONTACT ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED UNDERGROUND UTILITIES OR PIPELINES ON WELLPAD AND/OR ACCESS ROAD AT LEAST TWO WORKING DAYS PRIOR TO CONSTRUCTION.

June 9, 2025

HILCORP ENERGY COMPANY
SAN JUAN 32-7 UNIT #202H WELLPAD
LOCATED IN SW/4 NE/4 SECTION 18, TOWNSHIP 32 NORTH, RANGE 7 WEST
N.M.P.M., SAN JUAN COUNTY, NEW MEXICO

A parcel of land for a proposed wellpad located in SW/4 NE/4 of Section 18, Township 32 North, Range 7 West, N.M.P.M., San Juan County, New Mexico, being more particularly described as follows:

SAN JUAN 32-7 UNIT #202H WELLPAD

Commencing at the North East Section Corner of said Section 18, thence S38°36'38"W a distance of 2549.26 feet to the "true point-of-beginning" for this description;

Thence S02°17'09"E a distance of 375.00 feet to a point;
Thence S87°42'51"W a distance of 245.00 feet to a point;
Thence N07°59'47"W a distance of 201.00 feet to a point;
Thence N25°11'19"E a distance of 140.89 feet to a point;
Thence N14°24'48"E a distance of 52.20 feet to a point;
Thence N87°42'51"E a distance of 185.00 feet to the "true point-of-beginning".

The above described parcel of land contains 89,687.52 square feet or 2.059 acres, more or less.

BASIS OF BEARING: REAL-TIME KINEMATIC GPS SURVEY SOLUTION OBTAINED FROM SATELLITES TRACKED ON JUNE 4, 2025 FROM A REFERENCE STATION POSITIONED IN THE NE/4 NW/4 SECTION 18, T32N, R7W, SAN JUAN COUNTY, NEW MEXICO.

SURVEYOR'S CERTIFICATION

I, JASON C. EDWARDS, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15269, DO HEREBY CERTIFY THAT THIS SURVEY DESCRIPTION AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

Jason C. Edwards
JASON C. EDWARDS, NEW MEXICO LS #15269
REFERENCE DRAWING: 32718GT3

PROPOSED PIPELINE FOR

HILCORP ENERGY COMPANY

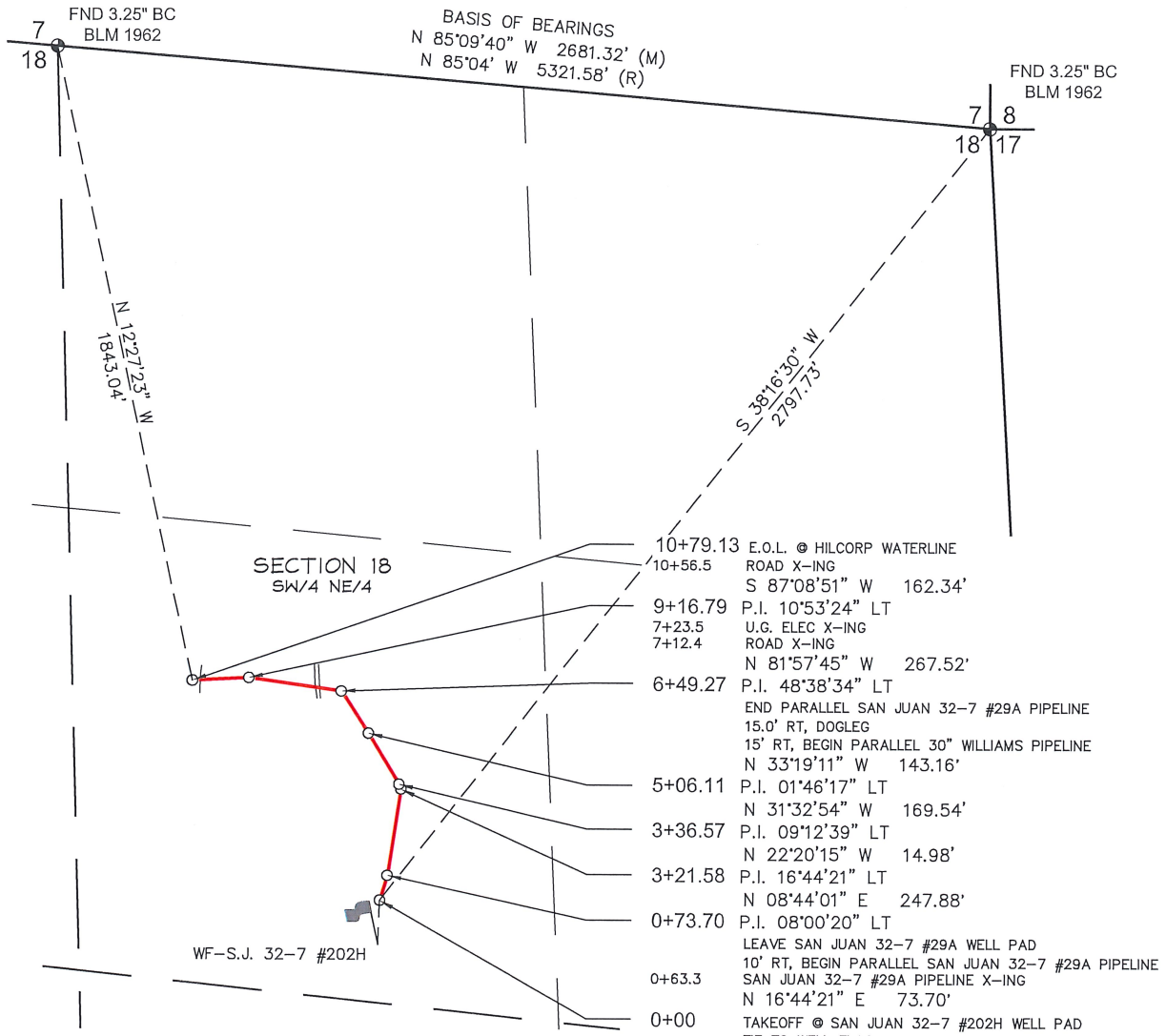
SAN JUAN 32-7 UNIT #202H

LOCATED IN THE SW/4 NE/4 OF SECTION 18,
T32N, R7W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO

Hilcorp

250' 0 250' 500'

SCALE = 500'



10+79.13 E.O.L. @ HILCORP WATERLINE
10+56.5 ROAD X-ING
S 87°08'51" W 162.34'
9+16.79 P.I. 10°53'24" LT
7+23.5 U.G. ELEC X-ING
7+12.4 ROAD X-ING
N 81°57'45" W 267.52'
6+49.27 P.I. 48°38'34" LT
END PARALLEL SAN JUAN 32-7 #29A PIPELINE
15.0' RT, DOGLEG
15' RT, BEGIN PARALLEL 30" WILLIAMS PIPELINE
N 33°19'11" W 143.16'
5+06.11 P.I. 01°46'17" LT
N 31°32'54" W 169.54'
3+36.57 P.I. 09°12'39" LT
N 22°20'15" W 14.98'
3+21.58 P.I. 16°44'21" LT
N 08°44'01" E 247.88'
0+73.70 P.I. 08°00'20" LT
LEAVE SAN JUAN 32-7 #29A WELL PAD
10' RT, BEGIN PARALLEL SAN JUAN 32-7 #29A PIPELINE
0+63.3 SAN JUAN 32-7 #29A PIPELINE X-ING
N 16°44'21" E 73.70'
0+00 TAKEOFF @ SAN JUAN 32-7 #202H WELL PAD
TIE TO WELL FLAG
S 02°03'23" W 124.68'

NOTES

1) BASIS OF BEARINGS FOR THIS SURVEY ARE BETWEEN FOUND MONUMENTS AT THE NORTHEAST CORNER AND THE NORTH QUARTER CORNER OF SECTION 18, TOWNSHIP 32 NORTH, RANGE 7 WEST, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO LINE BEARS: N 85°09'40" W 2681.32'
2) DATE OF FIELD SURVEY: AUGUST, 2018.
3) THIS EXHIBIT IS NOT A BOUNDARY SURVEY AND SHOULD NOT BE USED AS SUCH.
4) THIS EXHIBIT MAY NOT SHOW ALL EXISTING EASEMENTS AND UTILITIES.
5) CALL THE NEW MEXICO 811 SYSTEM FOR UTILITY LOCATIONS BEFORE EXCAVATING OR DIGGING.

HENRY P. BROADHURST, JR. NEW MEXICO 11393 PROFESSIONAL SURVEYOR 08/28/2018

~ SURFACE OWNERSHIP ~ 'BOR		
SECTION 18, T32N, R7W 0+00 TO 10+79.13 1079.13 FT / 65.40 RODS		
DATE OF SURVEY	08/21/18	GR

PREPARED BY:

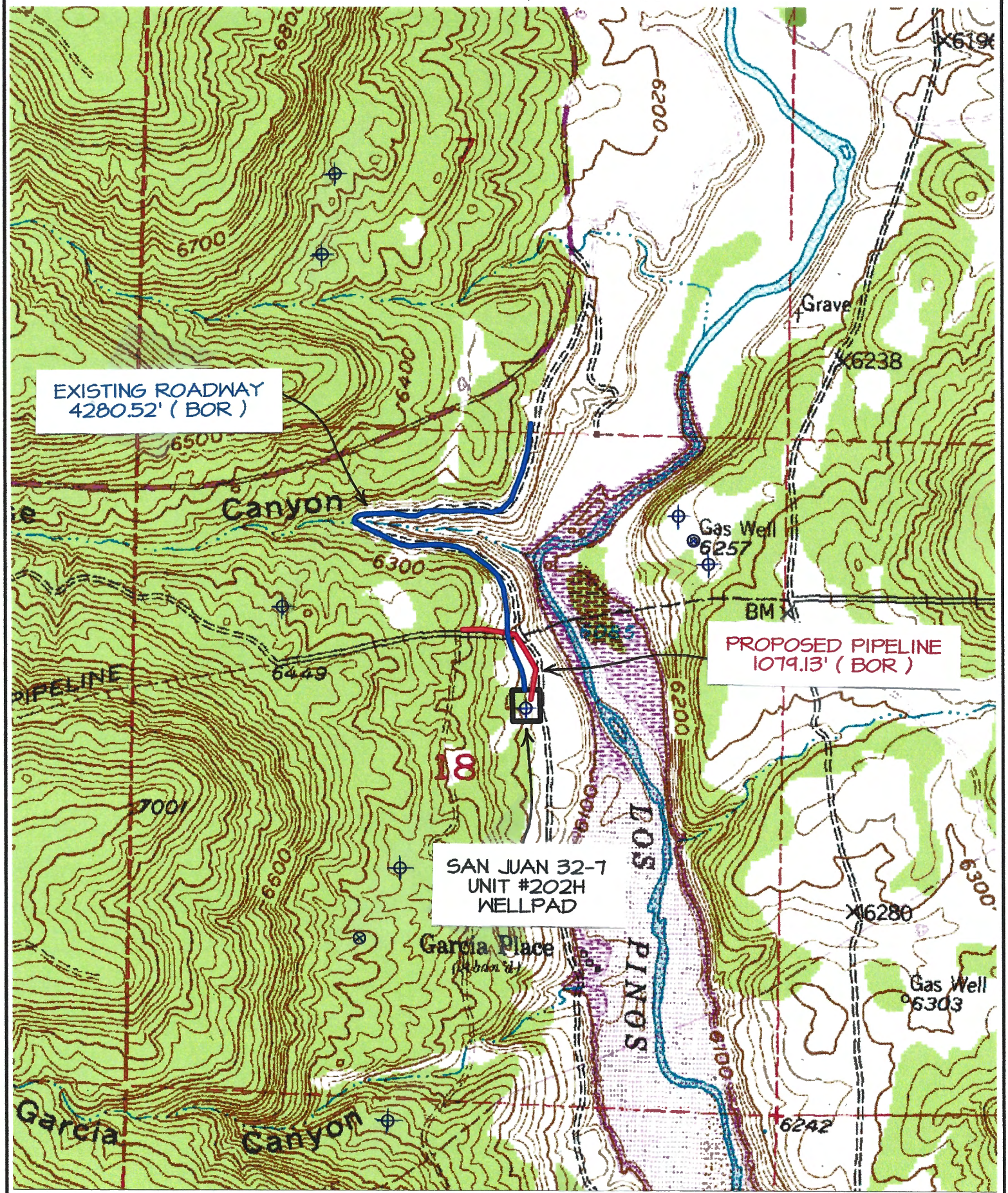
CCI
CHENAULT CONSULTING INC.
4800 COLLEGE BLVD #105
FARMINGTON, NM 87402
(505) 325-7707

I, HENRY P. BROADHURST, JR., A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I CONDUCTED AND AM RESPOSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

DRAWING: SAN JUAN 32-7 #202H	
SCALE: 1" = 500'	REV. 0 08/22/2018
DRAFTED BY: GRR	
SHEET: 1 of 1	

HILCORP ENERGY COMPANY SAN JUAN 32-7 UNIT #202H

2320' FNL & 1859' FEL, SECTION 18, T32N, R7W, N.M.P.M.
SAN JUAN COUNTY, NEW MEXICO



TOPO NAME : BURNT MESA ⊕ PRODUCING WELL ⊗ PLUGGED & ABANDONED WELL

May 15, 2025

HILCORP ENERGY COMPANY
SAN JUAN 32-7 UNIT #202H EXISTING ROAD SURVEY
LOCATED IN W/2 NE/4 & NE/4 NW/4 SECTION 18, TOWNSHIP 32 NORTH, RANGE 7 WEST N.M.P.M., SAN JUAN COUNTY, NEW MEXICO

A strip of land 30 feet wide across W/2 NE/4 & NE/4 NW/4 of Section 18, Township 32 North, Range 7 West, N.M.P.M., San Juan County, New Mexico, being 15 feet on both sides and perpendicular to the following described centerline:

Commencing at the North Quarter Section Corner of said Section 18, thence S85°09'46"E a distance of 934.41 feet to a point on the North line of Said Section 18 being the "true point-of-beginning" for this description;

Thence S14°57'08"W a distance of 44.80 feet to a point;
Thence S05°14'28"W a distance of 211.88 feet to a point;
Thence S14°05'45"W a distance of 185.77 feet to a point;
Thence S21°13'42"W a distance of 144.01 feet to a point;
Thence S17°10'00"W a distance of 95.95 feet to a point;
Thence S43°31'53"W a distance of 115.06 feet to a point;
Thence S72°02'55"W a distance of 81.78 feet to a point;
Thence N86°00'41"W a distance of 179.44 feet to a point;
Thence S84°39'53"W a distance of 161.07 feet to a point;
Thence N87°52'52"W a distance of 124.72 feet to a point;
Thence S81°34'25"W a distance of 71.61 feet to a point;
Thence S65°25'56"W a distance of 57.58 feet to a point on 1/4 Section Line;
Thence S65°25'56"W a distance of 26.93 feet to a point;
Thence S89°51'34"W a distance of 70.58 feet to a point;
Thence N82°16'01"W a distance of 128.83 feet to a point;
Thence S86°20'15"W a distance of 213.33 feet to a point;
Thence S77°29'37"W a distance of 53.52 feet to a point;
Thence S58°23'40"W a distance of 34.26 feet to a point;
Thence S23°35'59"W a distance of 25.01 feet to a point;
Thence S20°06'56"E a distance of 22.93 feet to a point;
Thence S67°44'52"E a distance of 123.25 feet to a point;
Thence S65°27'25"E a distance of 286.50 feet to a point;
Thence S83°25'31"E a distance of 74.36 feet to a point;
Thence N84°22'29"E a distance of 79.51 feet to a point on 1/4 Section Line;
Thence N84°22'29"E a distance of 3.22 feet to a point;
Thence N85°20'58"E a distance of 149.44 feet to a point;
Thence S83°59'31"E a distance of 140.23 feet to a point;
Thence S67°56'03"E a distance of 112.42 feet to a point;
Thence S55°22'35"E a distance of 202.35 feet to a point;
Thence S46°04'02"E a distance of 102.00 feet to a point;
Thence S25°22'13"E a distance of 16.40 feet to a point on 1/16th Section Line;
Thence S25°22'13"E a distance of 91.69 feet to a point;
Thence S09°58'59"E a distance of 197.15 feet to a point;
Thence S01°45'34"E a distance of 171.28 feet to a point;
Thence S13°52'21"E a distance of 68.50 feet to a point;
Thence S24°23'14"E a distance of 125.58 feet to a point;

Thence S25°14'29"E a distance of 123.76 feet to a point;
Thence S13°47'21"E a distance of 86.71 feet to a point;
Thence S06°34'47"E a distance of 68.92 feet to a point;
Thence S11°55'09"E a distance of 8.19 feet to a point on the North edge of Hilcorp San Juan 32-7 Unit #202H wellpad being the "true point-of-ending" for this description from whence the North East Section Corner of said Section 18 bears N40°40'13"E a distance of 2701.19 feet.

The above described strip of land totals 4280.52 feet or 259.43 rods in length and contains 2.948 acres more or less, and is allocated by 40-acre tracts as follows:

Section 18	NW/4 NE/4	2199.73 Feet	133.32 Rods	1.515 Acre(s)
Section 18	NE/4 NW/4	1139.01 Feet	69.03 Rods	0.784 Acre(s)
Section 18	SW/4 NE/4	941.78 Feet	57.08 Rods	0.649 Acre(s)
	Total	4280.52 Feet	259.43 Rods	2.948 Acre(s)

BASIS OF BEARING: REAL-TIME KINEMATIC GPS SURVEY SOLUTION OBTAINED FROM SATELLITES TRACKED ON MAY 14, 2025 FROM A REFERENCE STATION POSITIONED IN THE NE/4 NW/4 SECTION 18, T32N, R7W, SAN JUAN COUNTY, NEW MEXICO.

SURVEYOR'S CERTIFICATION

I, JASON C. EDWARDS, NEW MEXICO PROFESSIONAL SURVEYOR NO. 15269, DO HEREBY CERTIFY THAT THIS SURVEY DESCRIPTION AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER CERTIFY THAT THIS SURVEY IS NOT A LAND DIVISION OR SUBDIVISION AS DEFINED IN THE NEW MEXICO SUBDIVISION ACT.

Jason C. Edwards
JASON C. EDWARDS, NEW MEXICO LS #15269

Directions from the Intersection of US Hwy 550 & State Hwy 173

in Aztec, NM to Hilcorp Energy Company San Juan 32-7 Unit #202H

2320' FNL & 1859' FEL, Section 18, T32N, R7W, N.M.P.M., San Juan County, NM

Latitude: 36.981596°N Longitude: 107.606040°W Datum: NAD1983

From the intersection of US Hwy 550 & State Hwy 173 in Aztec, NM, travel Easterly on State Hwy 173 for 1.0 mile to fork in roadway;

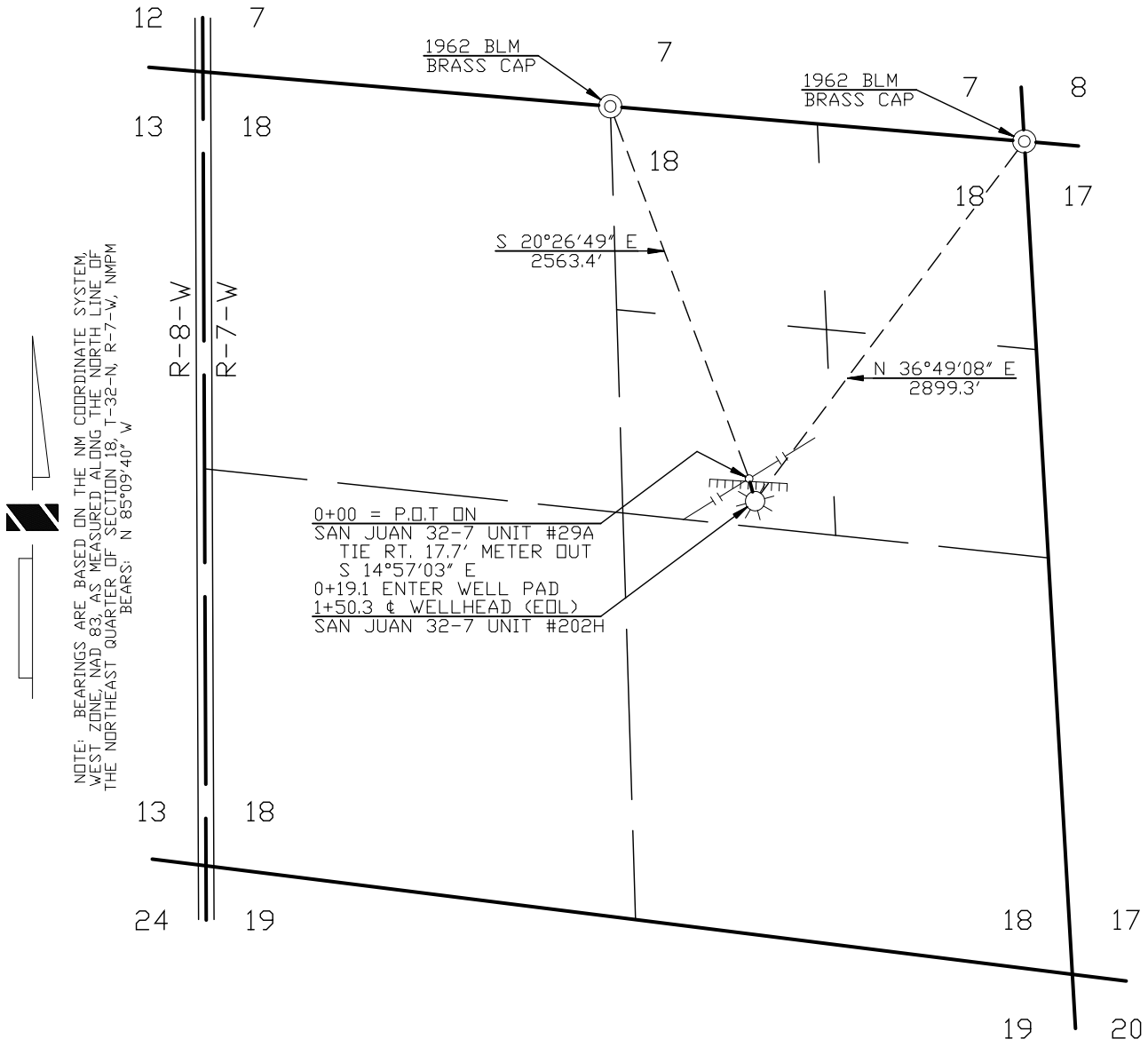
Go Left (Easterly) remaining on State Hwy 173 for 17.0 miles to T-intersection;

Go Left (North-Easterly) exiting State Hwy 173 onto State Hwy 511 for 23.5 miles to County Road #4046 right-hand side of State Hwy 511 @ Mile Marker 31.7;

Go Right (Easterly) onto County Road #4046 for 200' proceeding through cattle-guard to immediate fork in roadway;

Go Right (Southerly) onto existing roadway for 1.0 mile to fork in roadway;

Go Left (Southerly) for 0.2 miles to existing Hilcorp San Juan 32-7 Unit #29A location, with the Hilcorp San Juan 32-7 Unit #202H wellflag staked offset #29A wellhead.



PIPE DATA

SURVEYORS CERTIFICATION

I, HENRY P. BROADHURST, JR., BEING A LICENSED PROFESSIONAL SURVEYOR IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE SURVEY REPRESENTED BY THIS PLAT WAS MADE UNDER MY DIRECT SUPERVISION AND THAT THIS PLAT ACCURATELY REPRESENTS THIS SURVEY TO THE BEST OF MY KNOWLEDGE AND BELIEF.

HENRY P. BROADHURST, JR. N.M.P.L.S. #11393 DATE

HENRY P. BROADHURST NEW MEXICO 11393 08/28/2018 PROFESSIONAL SURVEYOR

OWNERSHIP

SUBDIVISION	OWNER	FEET	MILES	ACRES	RODS	
0+00 TO 1+50.3	BLM/BOR	150.3	0.028	0.138	9.109	

REVISION

NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.	NO.	DATE	BY	DESCRIPTION	W.O.NO.	CHK.	APP.
1	08/23/18	GR	ISSUED FOR REVIEW	1209747	DC								

INFO		DRAFTING	BY	DATE
R/W #: 11575497		DRAWN BY	GR	08/22/18
METER #:		CHECKED BY	DC	08/23/18
SURVEYED: 08/21/18		APPROVED BY		
		ENGINEER	BY	DATE
		DESIGNED BY		
		PROJ. APPROVED		

STATE: NEW MEXICO
COUNTY: SAN JUAN

SAN JUAN GATHERING SYSTEM
HILCORP-SAN JUAN 32-7 UNIT #202H
(REF DWG. N765.0-1)
SECTION 18, T-32-N, R-07-W, NMPM
0+00 = P.O.T. ON SAN JUAN 32-7 UNIT #29A

SCALE: 1" = 1000'
W.O. NO. 1209747

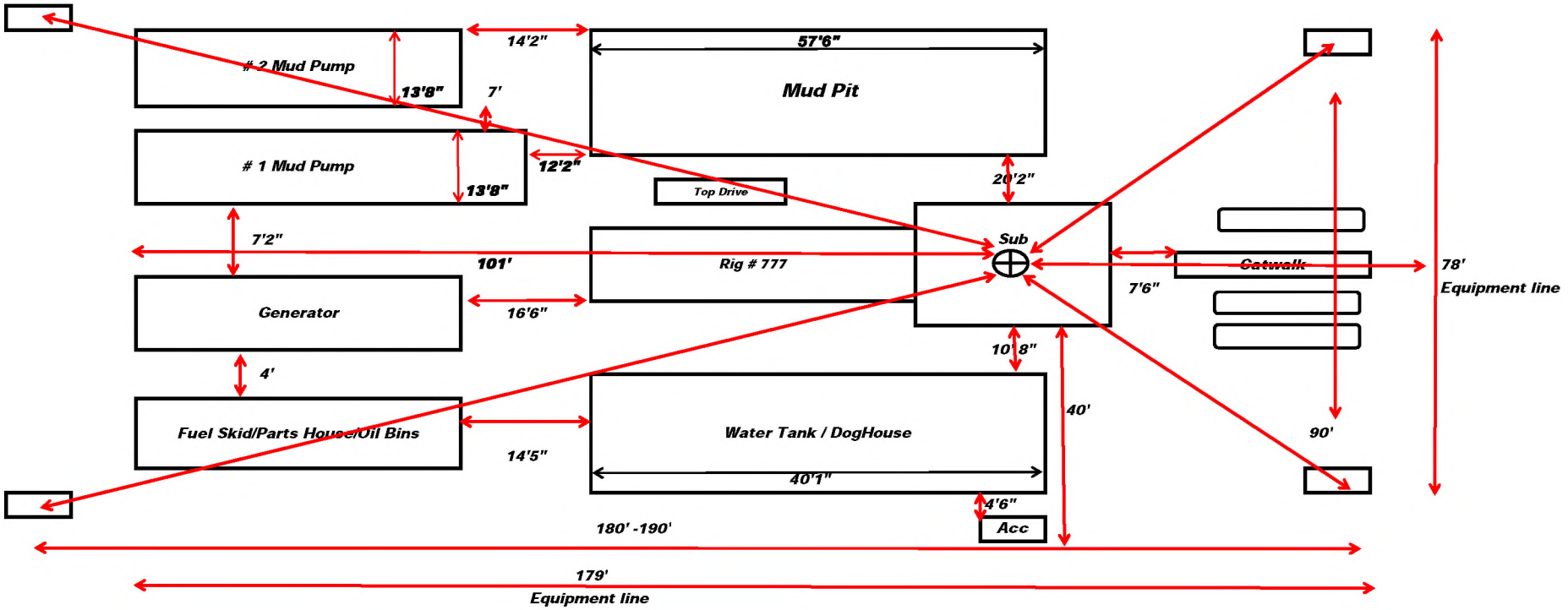
DWG NO. N765.0-247-1

SHEET 1 OF 1 | REV 1

T:\DS\MAPPING\DRAWINGS\SANJUAN\765\00\N7650-247-1_R01.DWG 08/23/2018 10:00AM DOMINICC

APPENDIX D. DRILL RIG DIAGRAMS & EQUIPMENT LAYOUT

AZTEC DRILLING

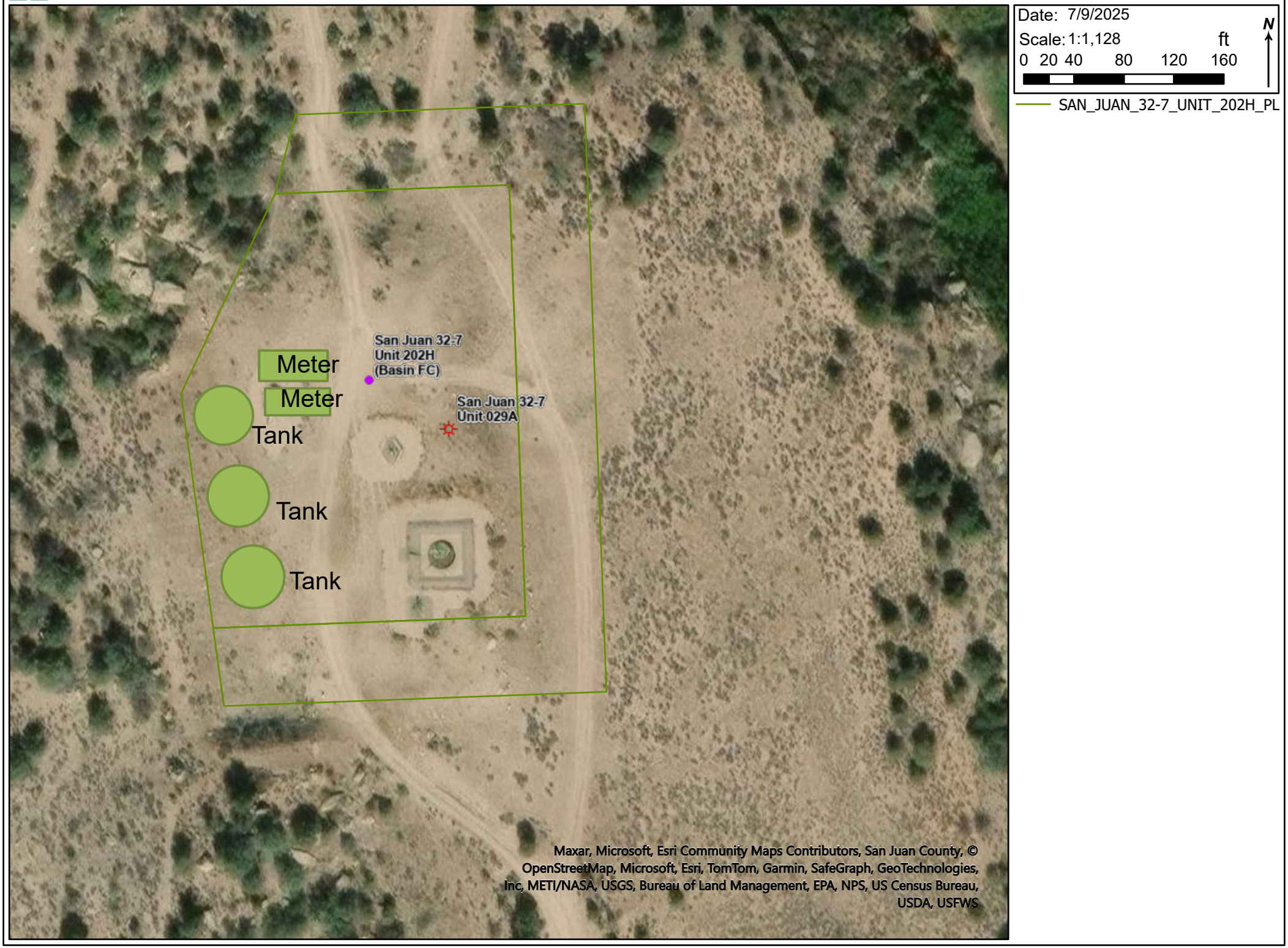


Rig 777 Foot Print

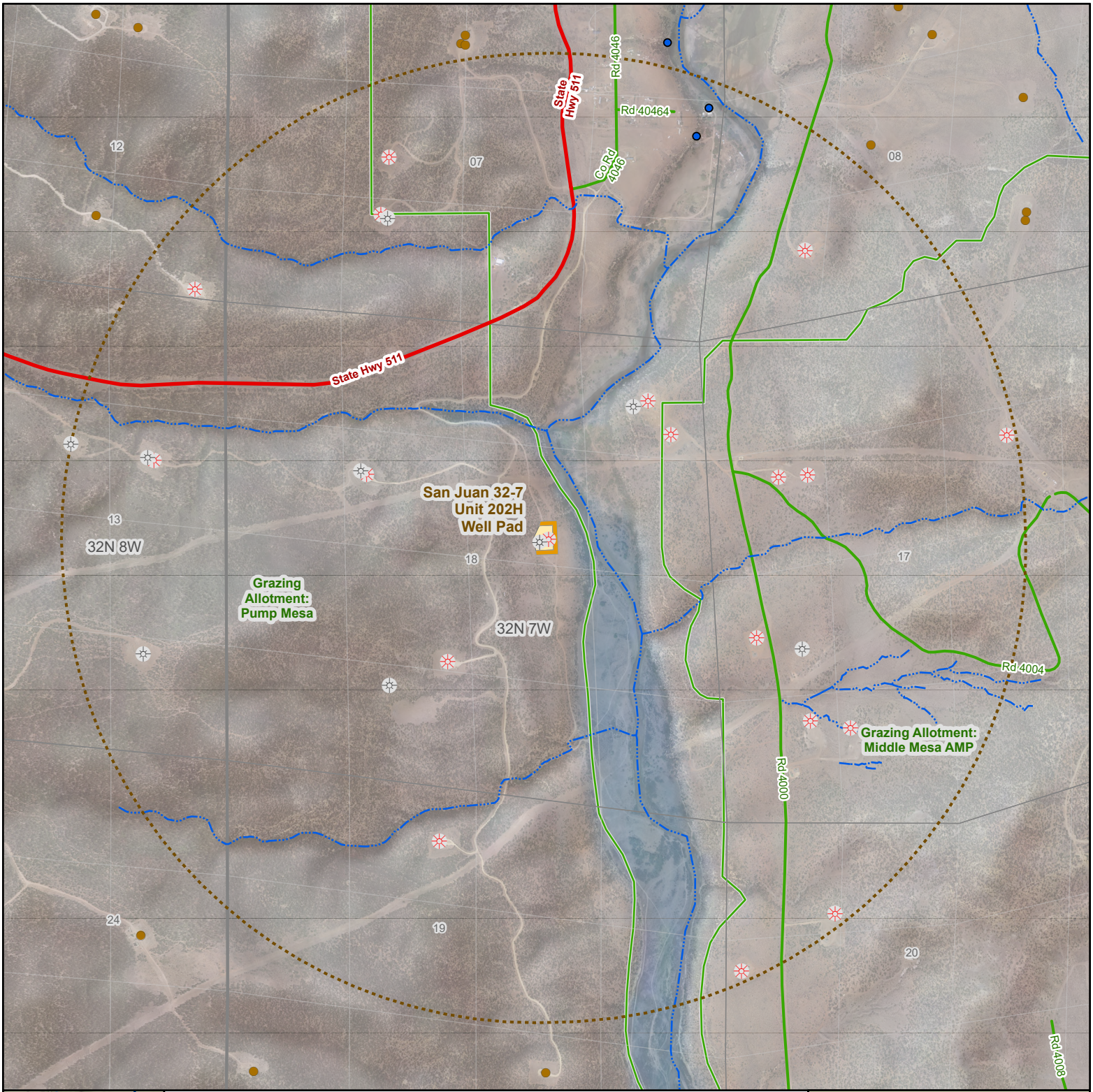
Updated March, 2012

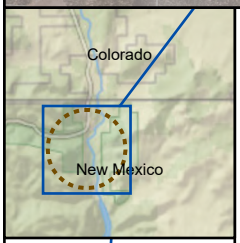
Hilcorp

General Equipment Layout SJ 32-7 Unit #202H



APPENDIX E. MAP OF EXISTING WELLS WITHIN 1-MILE





Gas Well Within 1 Mile Radius:
- Gas Active
- Gas Plugged
- Well Not in 1 Mile Radius

San Juan 32-7 Unit 202H:
- Edge of Disturbance
- Well Pad
- San Juan 32-7 Unit 202H Well Pad 1 Mile Buffer

Roads
- Highway
- County or Numbered Road
- Named or Minor Access Road

- Stream (NHD)
- BLM Range Allotment

Surface Ownership:
- BLM
- Private
- State
- Tribal

Public Land Survey:
- Township
- Section

Water Wells New Mexico
- Active

Hilcorp Energy Company
San Juan 32-7 Unit 202H Natural Gas Well Project

Existing Wells Within 1 Mile Radius

~~ Location Information ~~
T32N R7W, Section 18
San Juan County, New Mexico

Hilcorp

Coordinate System: NAD 1983 State Plane NM West FIPS 3003 Feet
Data Sources: BLM, Hilcorp, US Census, USGS

N

Prepared for Hilcorp Energy Company by EIS Environmental & Permitting Geographic Information Services, 6/9/2025

EIS

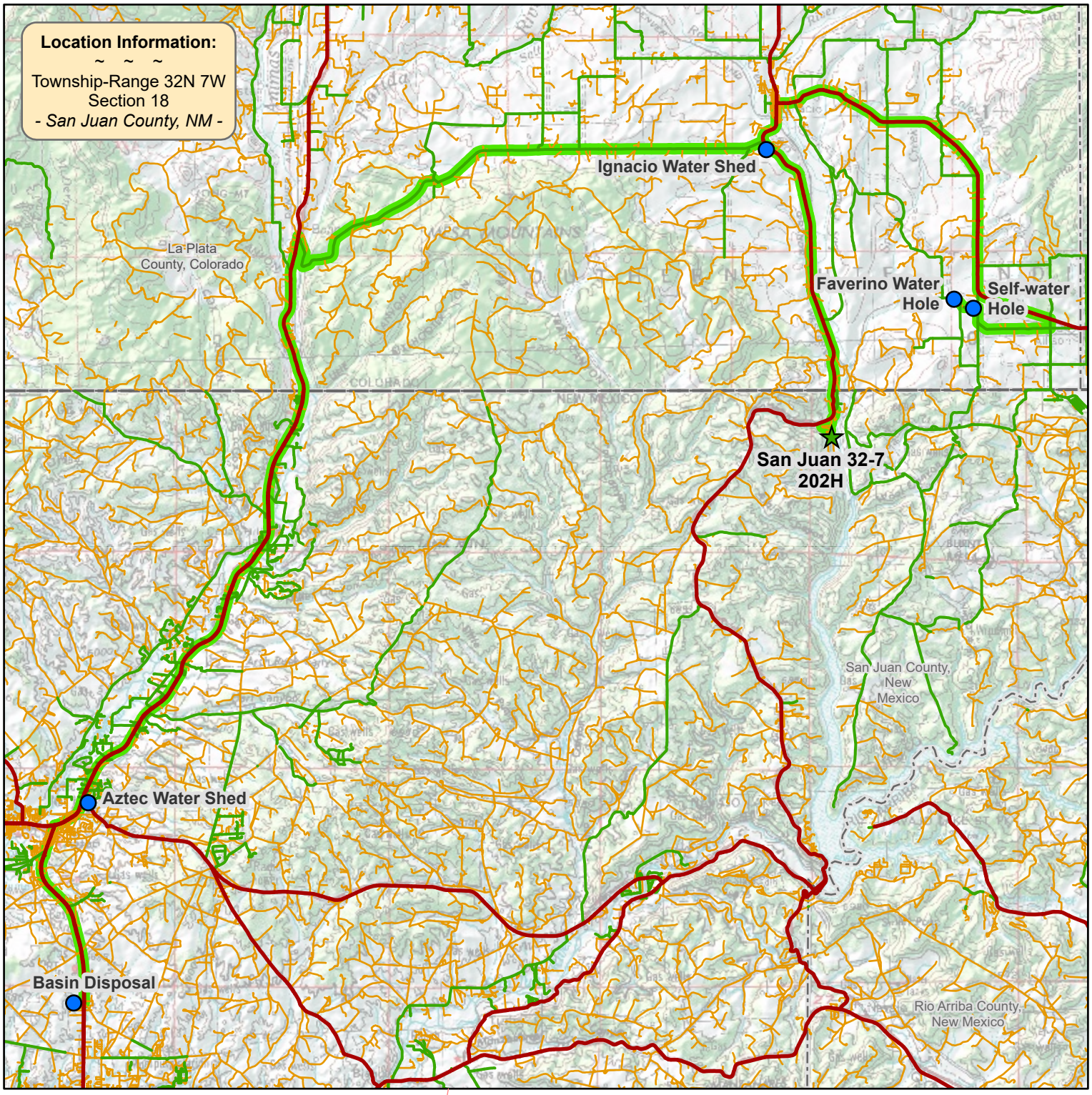
Feet
0 500 1,000 2,000
1:18,000 1:18,000

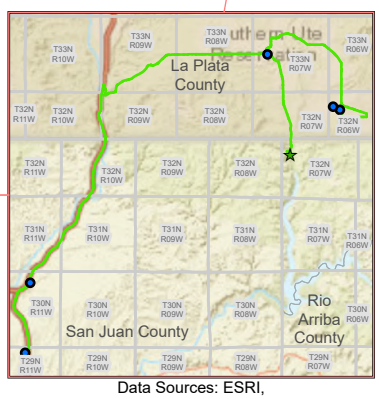
APPENDIX F. WATER ROUTE MAPS

Hilcorp Energy Company

Water Transportation Map

-- San Juan 32-7 202H --





N

- Water Source
- San Juan 32-7 202H

Roads:

- Highway
- County or Numbered Road
- Secondary Road
- Preferred Water Transportation Route

Coordinate System: NAD 1983 State Plane New Mexico West FIPS 3003 Feet

Data Sources: ESRI, US Census, USGS

0 0.5 1 2 Miles

1:240,000 *1:240,000*

Author: OC, EIS Environmental & Permitting Solutions

Date: 6/9/2025

APPENDIX B – Foreseeable Impacts Scenario for Air Quality

Considerations of impacts for air quality include the result of the incremental impacts from the Proposed Action when added to other past, present, and reasonably foreseeable future actions. The sections below describe trends in air quality and how they relate to past and present oil and gas activities, as well as projected emissions through modeling for the FFO RFD scenarios. More information regarding these effects can be found in Chapters 3, 6, 8, and 9 of the ARTR (BLM 2023).

Emission Trends

Past and present actions that have affected and would continue to affect air quality in the analysis area include surface disturbance resulting from ongoing oil and gas development and associated infrastructure, geophysical exploration, ranching, and livestock grazing, range improvements, recreation (including OHV use), authorization of rights-of-ways (ROWs) for utilities and other uses, and road development. Past and present actions that have affected and would continue to affect air quality are too numerous to list here but would include the development or conversion of power plants; the development of energy sources such as oil and gas; the development of highways and railways; and the development of various industries that emit pollutants. These types of actions and activities can reduce air quality through emissions of criteria pollutants including fugitive dust, VOCs, and HAPs, as well as contribute to deposition impacts and to a reduction in visibility.

Emissions in the oil and gas sector roughly parallel oil and gas production. Future trends in oil and gas production growth for the Mountain Region (Montana, Idaho, Wyoming, Nevada, Utah, Colorado, Arizona, and New Mexico) are based on the EIA 2023 Annual Energy Outlook (AEO) (EIA 2023a)), which provides an estimate of the change in emissions from oil and gas sources in New Mexico. U.S. production of natural gas and petroleum and liquids is projected to rise amid growing demand for exports and industrial uses. U.S. natural gas production is expected to increase by 15% from 2022 to 2050, while crude oil is expected to increase by 11 percent during the same period. Similarly, oil and gas-related criteria air pollutant (CAP) and HAP emissions from existing and foreseeable wells, plus development of lease parcels, are anticipated to rise due to increasing production.

Design value trends for pollutants in the San Juan Basin can be found in Section 3 of the ARTR (BLM 2023), incorporated by reference. Ozone (8-hour) design value trends from the 2011-2013 design value to the 2021-2023 design value (EPA 2024b) indicate a slight increasing to a steady/flat trend, depending on the county in the San Juan Basin. Nationally, ozone (O_3) concentrations at urban and rural sites have decreased 26% from 1980 to 2023. Since the late 1990s, concentrations of O_3-depleting substances have been declining due to the successful implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer (United Nations Environment Programme [UNEP] 1987). The long-term decrease is also driven by reductions in global emissions of substances that lead to the formation of O_3, such as O_3 precursors such as VOCs and NO_x. In

correlation over the same period, emissions of VOCs and NO_x have decreased by 58% and 75%, respectively (BLM 2023).

In Farmington, New Mexico, O_3 concentrations decreased 1.4% from 2011 to 2023 (BLM 2023; EPA 2024b), although the data over this period has been variable with values ranging from 0.066 ppm to 0.071 ppm. Design values in the FFO for O_3 have shown a flat to slightly increasing curve from 2018 to 2023, more specifically San Juan County increased from 0.069 ppm to 0.070 ppm (1.4% increase over 5 years) (BLM 2023; EPA 2024b). Future reductions are anticipated as per the Statewide Natural Gas Capture Requirements (New Mexico Administrative Code [NMAC] 19.15.27.9) and the New Mexico Environment Department (NMED) Ozone Attainment Initiative (20.2.50.1 NMAC).

Additionally, monitored CO concentrations have decreased nationally 88% from 1980 to 2023 due to improvements in motor vehicle emissions control and monitoring. CO concentrations in the southwest region of the United States have decreased 34% between 2010 and 2023. While outside the project area, the closest CO monitors are located in La Plata County, Colorado, and show the CO 8-hour emission design values at a declining to flat curve from 2016 to 2023 (EPA 2024b). Nationally, SO_2 concentrations have decreased 87% from 2000 to 2023, but substantial decreases (95% reduction) have occurred since 1980 due to implementation of federal rules requiring reduction in SO_2 emissions from power plants and other larger sources of SO_2. SO_2 concentrations in the southwest region of the United States have decreased 94% between 2010 and 2023 (BLM 2023). Design values for SO_2 emissions in San Juan County have shown a decreasing curve from 2013 to 2016, then a flat to slightly decreasing curve from 2017 to 2023 (EPA 2024b).

Design values for nitrogen dioxide (NO_2) emissions in San Juan County have shown a relatively flat curve for the last 5 years. Design values for particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$) annual and 24-hour emissions at slightly declining to flat curves from 2013 to 2023 (EPA 2024b).

RFD

While there are other sources of emissions in the FFO, oil and gas development is one of the most prominent sources of emissions. There are approximately 21,873 active oil and gas wells in the New Mexico portion of the San Juan Basin. Of this total, roughly 15,631wells are federal, with the remainder falling in other jurisdictions (NMOCD 2024). Over the past 8 years, there have been a total of 375 federal well spuds, all of which occurred within the FFO and RPFO (Table B.1).

Table B.1 Water Use for the New Mexico Portion of the San Juan Basin

Number of Federal Well Spuds	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
BLM FFO New Mexico portion of San Juan Basin	67	43	33	11	49	71	35	63
BLM RPFO New Mexico portion of San Juan Basin	0	0	0	0	1	2	0	0
Total*	**67**	**43**	**33**	**11**	**50**	**73**	**35**	**63**

Source: BLM Petroleum Engineering Group, FFO (BLM FFO 2024)
*The number of well spuds within the FFO and RPFO.

As with past and present actions, continued oil and gas development is the most prominent reasonably foreseeable environmental trend and planned action affecting air quality in the analysis area. As stated in Section A.1.1, the FFO Mancos-Gallup RFD (2018 RFD) estimates that there could be an additional 3,200 (federal and non-federal) wells drilled within the analysis area by 2037, of which 2,490 would be federal (Crocker and Glover 2018). In addition, the RPFO RFD (2019 RFD) estimates that an additional 200 wells will be built within the analysis area by 2039, of which 129 would be federal (Crocker and Glover 2019). With consideration of both RFDs, there would be an estimated 3,400 wells drilled within the New Mexico portion of the San Juan Basin by 2039, with an average of 170 wells per year (of which 131 would be federal). The RFD scenarios attempt to predict the development scenario without factoring in economics and demand; therefore, the predicted numbers may not represent actual development. As noted above, there have been far fewer than 170 total (131 federal) wells spudded each year over the past 5 years. The FFO and RPFO RFD emissions/percentages shown in **Table B.2**. are a conservative estimate based on actual wells spudded per year. Emissions per well come from the Air Resources Technical Report (BLM 2023), which is incorporated by reference.

Table B.2 Total and Federal FFO/RPFO Emissions/Percentage Per Year Based on the RFD

	Total Emissions (tons per year)						
	PM_{10}	**$PM_{2.5}$**	**VOC**	**NO_x**	**CO**	**SO_x**	**Total HAPs**
Total emissions from RFD (170 wells)	2,346.00	346.80	2,254.20	2,896.80	1,604.80	0.36	86.70
Federal emissions from RFD (131 wells)	1,807.80	267.24	1,737.06	2,232.24	1,236.64	0.28	66.81
Current emissions (San Juan, Sandoval, Rio Arriba, and McKinley Counties)	24,218	6,042	141,794	53,708	108,755	2,301	15,278
Total RFD percent of San Juan Basin emissions (170 wells)	**9.69%**	**5.74%**	**1.59%**	**5.39%**	**1.48%**	**0.02%**	**0.57%**
Federal RFD percent of San Juan Basin emissions (131 wells)	**7.46%**	**4.42%**	**1.23%**	**4.16%**	**1.14%**	**0.01%**	**0.44%**

Air Quality and Air Quality Related Values Modeling

The Comprehensive Air Quality Model with Extensions (CAMx) photochemical grid model (PGM) is used in the Colorado Air Resources Management Modeling Study (CARMMS) 2.0 to assess the air quality (AQ) and Air Quality Related Value (AQRV) impacts associated with BLM-authorized

mineral development on federal lands within the BLM Colorado planning areas and the BLM FFO planning areas. CARMMS 2.0 uses data from the modeling platform of Western Air Quality Study from the Intermountain West Data Warehouse for the 2011 base year and 2025 future-year air quality modeling and has adopted a two-way nested 12/4 kilometer horizontal resolution domain. Three 2025 future-year oil and gas levels were developed for a range of potential outcomes, a high development scenario, a low development scenario, and a medium development scenario (which is a mitigated version of the high development scenario where additional emissions controls were applied). Additional information on CARMMS 2.0 methodology can be found in the CARMMS 2.0 Report, incorporated by reference (BLM and Ramboll 2018).

The estimated emissions, AQ, and AQRV impacts from oil and gas development from Mancos Shale are modeled in the CARMMS 2.0 and are used to estimate impacts from development in the Air Impact Assessment for BLM Farmington Field Office Oil and Gas Development report (BLM and Ramboll 2018), incorporated by reference. In CARMMS 2.0, 74% of Mancos Shale gas well activity is assumed to occur in New Mexico, with remaining Mancos Shale gas well activity occurring in Colorado. All Mancos Shale oil well activity is estimated to occur in New Mexico. Most Mancos Shale activity in New Mexico occurs in the FFO; a small portion of the southeastern part of Mancos Shale activity is located outside of the FFO (in the RPFO). The Mancos Shale was treated as a separate source group in the CARMMS 2.0 modeling and AQ and AQRV impacts from the Mancos Shale separately quantified, enabling this analysis for the FFO/RPFO. As stated above, with consideration of both RFDs, there would be an estimated 3,400 (federal and non-federal) wells drilled within the New Mexico portion of the San Juan Basin by 2039. Between 2018-2025, the Mancos-Gallup RFD predicts 809 total wells, with 629 being federal wells. In contrast, in CARMMS 2.0 it is estimated that between 2016-2025 there will be 2,756 new oil and gas wells for the high scenario and 1,378 new oil and gas wells for the low scenario in the Mancos Shale in New Mexico. To complete a comparison between the RFD and CARMMS 2.0, the 2016- and 2017-year estimates from CARMMS 2.0 were added to the Mancos-Gallup RFD to analyze the same years (2016-2025). As a result, the new Mancos-Gallup RFD well number estimates between 2016- 2025 are 1,009 new total oil and gas wells and 829 new federal oil and gas wells. Compared to the Mancos-Gallup RFD, CARMMS 2.0 predicts that 369 more total wells under the low scenario and 1,747 more total wells under the high scenario would be developed by 2025 than predicted by the RFD. Note, that if all the 200 wells from the RPFO RFD, the new well total through 2039, were added into the comparison of the CARMMS 2.0 modeling, it would still result in more wells developed by 2025 in the CARMMS 2.0 modeling than predicted by the RFD. While the wells associated with these APDs are included as part of the RFD, even if they were not, the CARMMS 2.0 modeling would still result in more wells developed by 2025 than predicted by the RFD. As a result, the low and high scenarios of CARMMS 2.0 well development estimates are conservatively high relative to the RFD baseline scenario and current development (BLM and Ramboll 2018, Section 2.1.1.1). Therefore, the low scenario can be used to represent a conservative estimate of federal and planning area-wide impacts through 2025.

The O_3 NAAQS are defined as the 3-year average of the fourth highest daily maximum 8-hour (DMAX8) O_3 concentration. Since CARMMS 2.0 only uses one year of meteorology (2011), the 2025 fourth highest DMAX8 O_3 concentration is used as a pseudo-NAAQS comparison metric. For the 2011 Base Case, there are vast regions where the modeled fourth high DMAX8 O_3 exceeds the NAAQS (all source groups). In the 2025 high, low, and medium development scenarios, the areas of O_3 exceedances decrease from the 2011 Base Case, with the 2025–2011 O_3 differences showing decreases in almost all areas. The large contribution of natural emissions (natural wildfires) to the

modeled fourth highest DMAX8 O_3 concentrations was noted in the analysis. Maximum O_3 contributions to the 2025 fourth highest DMAX8 O_3 due to the New Mexico FFO are 1.7 parts per billion (ppb), 0.9 ppb and 1.0 ppb for the 2025 high, low, and medium development scenarios, respectively. Maximum contributions of the New Mexico FFO O_3 to the fourth highest DMAX8 O_3 above the current O_3 NAAQS (71.0 ppb and higher) for the 2025 high, low, and medium development were 2.01%, 0.84%, and 0.90%, respectively (BLM and Ramboll 2017).

There are two $PM_{2.5}$ NAAQS, one for a 24-hour averaging time that is expressed as a 3-year average of the 98th percentile value in a year with a threshold of 35 microgram per cubic meter ($\mu g/m^3$) and an annual average over 3 years with a threshold of 12 $\mu g/m^3$ (although the standard is now 9 $\mu g/m^3$). With a complete year of modeling results, the 98th percentile corresponds to the eighth highest daily $PM_{2.5}$ concentration in a year. The modeling of the differences between the 2025 scenarios and 2011 Base Case (all sources) show decreases of $PM_{2.5}$ concentrations in most of the domain, but also increases in a number of regions, including Denver, eastern Utah, and central and northwestern New Mexico. Maximum $PM_{2.5}$ contributions to the eighth highest daily $PM_{2.5}$ concentrations are 0.8, 0.4 and 0.4 $\mu g/m^3$ in the 2025 high, low, and medium development scenarios, respectively. Compared to 2011, 2025 annual $PM_{2.5}$ concentrations for all sources are reduced in most of the domain, but increase in a number of regions, including near Denver. Maximum contributions to the annual average $PM_{2.5}$ concentrations for the New Mexico FFO are 0.3, 0.1, and 0.1 $\mu g/m^3$ in the 2025 high, low, and medium development scenarios, respectively. Maximum contributions to the second highest daily average PM_{10} for the New Mexico FFO are 2.7, 1.3, and 1.1 $\mu g/m^3$ in the 2025 high, low, and medium development scenarios, respectively (BLM and Ramboll 2017).

The differences in 1-hour NO_2 concentrations between the 2011 and 2025 emission scenarios (all sources) indicate increases at various regions throughout the domain, including large increases in northern and eastern Arizona and New Mexico. Maximum contributions to the 1-hour NO_2 concentrations for the New Mexico FFO are 5.8, 3.0, and 3.2 $\mu g/m^3$ in the 2025 high, low, and medium development scenarios, respectively. Maximum contributions to the annual average NO_2 concentrations for the New Mexico FFO are 1.5, 0.8, and 0.9 $\mu g/m^3$ in the 2025 high, low, and medium development scenarios, respectively (BLM and Ramboll 2017).

Contributions of the prevention of significant deterioration (PSD) pollutant concentrations across all PSD Class I and other Class II areas due to emissions from the FFO for each development scenario were also developed. Contributions of New Mexico FFO emissions to PSD pollutant concentrations at Class I and other Class II areas for the 2025 high, low, and medium development scenarios can be found in the Air Impact Assessment for BLM Farmington Field Office Oil and Gas Development report (BLM and Ramboll 2017) and has been incorporated by reference. All New Mexico FFO contributions are below the PSD Class I and Class II pollutant increments at the high, low, and medium development scenarios.

Annual sulfur deposition levels at Class I and other Class II areas within 100 km of the planning area (2025 total emissions), when compared against a critical load value of 5 kg/ha-yr showed all locations below the deposition analysis thresholds for all three scenarios. Annual nitrogen deposition levels at Class I and other Class II areas within 100 km of the planning area (2025 total emissions), when compared against a critical load value of 2.3 kg/ha-yr showed some locations in excess of the deposition analysis thresholds at all three scenarios. However, federal oil and gas activities do not appear to be the main driver of regional nitrogen deposition impacts as there is little change across

the high, medium, and low scenarios. All Class I and Class II areas experienced a reduction in annual nitrogen deposition between 2011 and 2025 (BLM and Ramboll 2017).

In summary, the CARMMS 2.0 low scenario, which represents a conservative estimate of federal impacts through 2025, does not exceed the indicator thresholds for any of the NAAQS, PSD Class I or Class II increment thresholds, the sulfur deposition threshold, the change in visibility threshold at any Class I area, or the thresholds for acid neutralizing capacity at sensitive lakes. The low scenario would exceed the indicator threshold for change in visibility at one Class II area, the Aztec Ruins National Monument, and the nitrogen deposition threshold at Mesa Verde National Park, San Pedro Parks Wilderness, Weminuche Wilderness, Aztec Ruins National Monument, Chama River Canyon Wilderness, South San Juan Wilderness, and Cruces Basin Wilderness. The CARMMS 2.0 high scenario would not exceed any of the PSD Class I or Class II increment thresholds, the change in visibility threshold at Class I areas, the sulfur deposition threshold, or the thresholds for acid neutralizing capacity at sensitive lakes. It would exceed the NAAQS indicator thresholds for O_3, annual average $PM_{2.5}$, and annual average NO_2; the change in visibility threshold at one Class II area, Aztec Ruins National Monument; and the nitrogen deposition threshold at Bandelier Wilderness, Mesa Verde National Park, San Pedro Parks Wilderness, Weminuche Wilderness, Aztec Ruins National Monument, Chama River Canyon Wilderness, Cruces Basin Wilderness, Dome Wilderness, Monte Vista National Wildlife Refuge, South San Juan Wilderness, and Sandia Mountain Wilderness.

BLM 2032 Regional Criteria Air Pollutants Modeling Study

The BLM developed a 12km grid spacing, Comprehensive Air quality Model with extensions (CAMx) photochemical modeling platform to assess the impacts of oil and gas development and coal production and other cumulative sources on air quality in the western United States (Utah, Colorado, New Mexico, Wyoming, Montana, North Dakota, and South Dakota). The modeling analysis evaluated air quality and air quality–related values out to a future year of 2032 using data from the Western Regional Air Partnership (WRAP)/Western Air Quality Study (WAQS) modeling platform, the EPA's 2016v2 emissions modeling platform (EPA 2022c), and the BLM oil and gas development projections to quantify and apportion federal and non-federal oil and gas emissions (BLM and Ramboll 2023b). Additional methodology can be found in the BLM Regional Criteria Air Pollutant Photochemical Modeling Study (BLM and Ramboll 2023b) and the ARTR (BLM 2023), incorporated by reference.

The BLM regional criteria air pollutant modeling study results showed that the cumulative concentrations over New Mexico range between 50 and 65 ppb in New Mexico, with the higher concentrations in the San Juan Basin and isolated regions on the western side of the state. The modeled values did not lead to any O_3 NAAQS exceedances in the state, including in the Farmington area. Farmington area ozone cumulative concentrations ranged from 55 to 65 ppb (highest value of 64.4 ppb). The largest contributions to O_3 are due to the modeled boundary conditions (contributions from sources outside New Mexico), followed by other anthropogenic sources (i.e., those not including oil, gas, or coal source groups) and natural sources.

1-hour NO_2 modeled cumulative concentrations showed the highest concentrations over the San Juan Basin (highest value of 60.0 ppb). The modeled values did not lead to any 1-hour NO_2 NAAQS exceedances in the state. Farmington area 1-hour NO_2 cumulative concentrations ranged from 0.5 to

60 ppb. The largest contributions to 1-hour NO_2 are due to federal, non-federal, and tribal oil and gas development.

24-hour $PM_{2.5}$ modeling showed a northwest to southeast gradient, with larger $PM_{2.5}$ concentrations on the southeastern side of New Mexico. The largest 24-hour $PM_{2.5}$ concentration in the state is 47.2 $\mu g/m^3$ in Socorro County (primarily due to wildfires). As a result, the modeled values did exceed the 24-hour $PM_{2.5}$ NAAQS in Socorro County, New Mexico, but nowhere else in the state was the NAAQS exceeded. Farmington area 24-hour $PM_{2.5}$ cumulative concentrations ranged from 2 to 10 $\mu g/m^3$. The largest contributors to 24-hour $PM_{2.5}$ are wildfires and non-coal, oil, or gas anthropogenic sources. Annual $PM_{2.5}$ modeled values showed cumulative concentrations over New Mexico did not lead to any annual $PM_{2.5}$ NAAQS exceedances. Cumulative annual $PM_{2.5}$ concentrations were highest near Albuquerque, which were due to other anthropogenic sources (i.e., those not including oil, gas, or coal source groups) and generally less than 4 $\mu g/m^3$ within the rest of New Mexico. Farmington area annual $PM_{2.5}$ cumulative concentrations ranged from >0 to 6 $\mu g/m^3$. The largest contributors to annual $PM_{2.5}$ are the anthropogenic and wildfire sources.

24-hour PM_{10} cumulative concentrations showed PM_{10} NAAQS exceedances in a few grid cells in southwestern New Mexico (primarily due to wildfires). PM_{10} cumulative concentrations over most of New Mexico ranged between 2 and 30 $\mu g/m^3$, with smaller areas of concentrations between 30 and 150 $\mu g/m^3$. Farmington area 24-hour PM_{10} cumulative concentrations ranged from 2 to 30 $\mu g/m^3$. The largest contributors to annual PM_{10} are wildfires and other anthropogenic sources (i.e., those not including oil, gas, or coal source groups).

1-hour SO_2 modeled cumulative concentrations over New Mexico did not lead to any 1-hour SO_2 NAAQS exceedances. Most of the state had concentrations that did not exceed 10 ppb, except for a few southeastern counties (e.g., Eddy, Lea and Roosevelt) where concentrations ranged from 5 to 69 ppb. Farmington area 1-hour SO_2 cumulative concentrations ranged from >0 to 5 ppb. The largest contributors to 1-hour SO_2 in New Mexico are oil and gas activities and wildfires. 3-hour SO_2 modeled cumulative concentrations showed no exceedances of the 3-hour SO_2 NAAQS. Farmington area 3-hour SO_2 cumulative concentrations ranged from >0 to 5 ppb. The largest contributors to 3-hour SO_2 in New Mexico were oil and gas activities, other anthropogenic sources (i.e., those not including oil, gas, or coal source groups), and wildfires.

1-hour CO modeled cumulative concentrations over New Mexico did not lead to any 1-hour CO NAAQS exceedances. Most of the state had concentrations less than 5 ppm, although Socorro County had concentrations to up 10 ppm. Farmington area 1-hour CO cumulative concentrations ranged from 0.1 to 3 ppm. 8-hour CO modeled cumulative concentrations over New Mexico did not lead to any 8-hour CO NAAQS exceedances. Most of the state had concentrations less than 5 ppm, although Socorro County had concentrations to up 6.9 ppm. Farmington area 8-hour CO cumulative concentrations ranged from 0.1 to 0.8 ppm. The location of the higher 1-hour and 8-hour CO concentrations is the same location as the PM_{10} peak, indicating that natural sources (i.e., fires) are responsible for the higher 1-hour and 8-hour CO in this area (BLM and Ramboll 2023b).

Cumulative annual nitrogen deposition over most of New Mexico varies between around 1 and 6 kilograms of nitrogen per hectare (kg N/ha-year) with an east-to-west gradient. The eastern part of the state shows nitrogen deposition generally between 2 and 6 kg N/ha-year, whereas the west side of the state is generally lower, with nitrogen deposition ranging from 1 to 4 kg N/ha-year (although higher deposition is present in a few grid cells in San Juan County). Nitrogen critical loads for the

Class I areas in the New Mexico analysis area range from 3.0 to 7.54 kg N/ha. The cumulative average nitrogen deposition ranges from 1.2 kg N/ha-year at Petrified Forest National Park to 2.7 kg N/ha-year at Carlsbad Caverns National Park. None of the areas exceed the critical load thresholds for cumulative average nitrogen deposition. The largest contributors to the cumulative average nitrogen deposition are other anthropogenic sources (i.e., those not including oil, gas, or coal source groups), ranging from 40% to 60% depending on the area of interest. The cumulative maximum nitrogen deposition values in all Class I areas of interest are below their critical loads for atmospheric nitrogen deposition, except for Carlsbad Caverns National Park. The Farmington region federal new and existing oil and gas source group did not contribute to the Carlsbad Caverns National Park values.

Cumulative annual sulfur deposition over most of New Mexico ranges between 0.1 and 2.0 kilograms of sulfur per hectare (kg S/ha-year), with higher concentrations in the southeastern part of the state. In the southeastern part of the state, concentrations generally range between 1 and 4 kg S/ha-year (although a few grid cells show concentrations between 4 and 9 kg S/ha-year in Roosevelt, Eddy, and Lea Counties.) For total sulfur deposition, the 5 kg/ha-year threshold published by Fox et al. (1989) is used as critical load for each area of interest. The cumulative average sulfur deposition ranges from 0.1 kg S/ha-year at Petrified Forest National Park and Great Sand Dunes National Park to 1.8 kg S/ha-year at Carlsbad Caverns National Park. None of the areas exceed for the critical load thresholds for cumulative average and maximum sulfur deposition. The largest contributors to sulfur deposition in New Mexico are oil and gas non-federal and existing federal sources and other anthropogenic sources (BLM and Ramboll 2023b). Additional modeling results can be found in the BLM Regional Criteria Air Pollutant Photochemical Modeling Study (BLM and Ramboll 2023b), incorporated by reference.

In summary, atmospheric concentrations for criteria air pollutants in the project area are projected to be below the NAAQS based on future year (ca. 2032) modeling.

New Mexico Ozone Attainment Initiative Modeling Study

The State of New Mexico initiated the New Mexico Ozone Attainment Initiative (OAI) Photochemical Modeling Study (New Mexico OAI Study) in the spring of 2018 to address the high O_3 concentrations in the state, protect the O_3 attainment status of the state, and ensure health and welfare of the residents of the state for future generations (NMED 2021). Based on the WRAP, Western Air Quality Study (WAQS) CAMx 2014 36/12-km modeling platform, a CAMx 2014 36/12/4-km O_3 modeling platform was developed with the 4-km domain focused on New Mexico and adjacent states. The New Mexico OAI Study also looked at 2028 future year base case modeling and oil and gas control sources. The 2028 oil and gas control strategy reduced oil and gas NO_x emissions by approximately 21,000 tpy (or by 64% compared to the 2028 base case) and oil and gas VOC emissions by approximately 53,000 tpy (or by 46% compared to the 2028 base case) (BLM 2023). The ARTR (BLM 2023) provides methodologies for the New Mexico OAI Photochemical Modeling Study and the results are summarized below.

For the San Juan Basin, the 2028 base case saw future O_3 design value reductions of −5.6 ppb at Bernalillo in Sandoval County, and −2.2 ppb and −3.3 ppb at Bloomfield and Navajo Lake, respectively, in San Juan County. The 2028 oil and gas control strategy saw future O_3 design value reductions of −1.5 ppb and −0.8 ppb at Navajo Lake and Bloomfield, respectively, and −0.3 ppb at

Bernalillo from the 2028 base case. Using this method and following EPA guidance, all 2028 projected O_3 future design values at monitoring sites in New Mexico were below the 2015 NAAQS for O_3 of 70 ppb using the 2012–2016 design value, including those in the San Juan Basin (base and control) (BLM 2023).

The New Mexico OAI study also looked at more recent design values (2015-2019 and 2017-2019). The results of the sensitivity study using the 2015-2019 O_3 design values for the San Juan Basin showed all 2028 projected O_3 future design values at monitoring sites were below the 2015 NAAQS for O_3 of 70 ppb (base and control). The results of the sensitivity study using the 2017-2019 O_3 design values for the San Juan Basin showed all 2028 projected O_3 future design values at monitoring sites were below the 2015 NAAQS for O_3 of 70 ppb (base and control) (BLM 2023).

The final part of the New Mexico OAI Study investigated source apportionment and was conducted to determine the contributions of source sectors to 2028 future year O_3 design values under the oil and gas control strategy scenario. One investigation involved international emissions. The speciated modeled attainment test (SMAT) O_3 projection tool was run without the contributions of international anthropogenic emissions for current design values 2012-2016, 2015-2019, and 2017-2019. In New Mexico, international anthropogenic emissions contributed from 11 to 26 ppb to the projected 2028 future design values. The Bloomfield site, in the northern part of the state and in San Juan County, had reductions of 13.8 ppb, 14.5 ppb, and 14.6 ppb, respectively. Bloomfield, which had not produced a projected 2028 O_3 exceedance for either the 2008 and 2015 NAAQS for O_3 under the current design value 2017-2019 scenario (68 ppb), was below 50 ppb for a future design value under all three design value scenarios (2012-2016, 2015-2019, and 2017-2019) (BLM 2023). Additional information on the New Mexico OAI study can be found in Section 6 of the Air Technical Report (BLM 2023), incorporated by reference.

Area Impacts Summary

In summary, the impacts to air quality covered in the impact analysis area is maintained at current levels or projected to improve. Atmospheric concentrations for CAPs are projected to be below the NAAQS. Visibility is generally projected to be steady or improving at national parks near the project area (BLM 2023). Results for the nearest Class I areas to the analysis area show improving visibility trends for both the base (2014-2017) and future year (2028) deciview values on the 20% clearest and most impaired days. Nitrogen deposition conditions in NPS-managed areas near the project area are generally fair to good with no trend for improving or worsening conditions, while sulfur deposition conditions are fair to good and generally improving (where trend data are available). The cumulative average nitrogen deposition ranges from 1.2 kg N/ha at Petrified Forest National Park to 2.7 kg N/ha at Carlsbad Caverns National Park in future year (circa 2032) modeling. None of areas exceed the critical loads for cumulative average nitrogen deposition. The cumulative maximum nitrogen deposition values in all areas of interest are below their critical loads for atmospheric nitrogen deposition, except for Carlsbad Caverns National Park. The cumulative average sulfur deposition ranges from 0.1 kg N/ha at Petrified Forest National Park and Great Sand Dunes National Park to 1.8 kg S/ha-year at Carlsbad Caverns National Park in future year (circa 2032) modeling. None of the areas exceed for the critical load thresholds for cumulative average and maximum sulfur deposition.

Using the best science and data available (EPA's AirToxScreen), the current San Juan, Sandoval, Rio Arriba, and McKinley Counties cancer risk is 17.6, 18.7, 12.3, 11.1 per 1 million, respectively, and is within the contextual range published by the EPA. Additionally, the oil and gas activity in the San Juan Basin contribute a max of 12% to the total cancer risk in San Juan County (the county percentages for Sandoval, Rio Arriba, and McKinley are lower). The BLM's Western United States HAP photochemical modeling study showed adjusted cancer risk from cumulative oil and gas production for 2032 ranged from 0.03 to 6.15 per million in the San Juan Basin, which is well within the contextual range published by the EPA. While new production from the foreseeable development of the Proposed Action and from approved and pending APDs could outweigh the production decline from currently producing wells (EIA 2023a) and result in slightly higher HAPs emissions, an increase in oil and gas related HAPs emissions should not make a substantial change to cumulative HAPs impacts since the cancer risk is well within the contextual range published by the EPA and oil and gas contributes a small percentage to the cancer risk.

APPENDIX C – DISTRIBUTION LIST

All landowners adjacent to the Project

Farmington Electric Unity system

Navajo Nation Heritage and Historic Preservation Department

Navajo Nation, Environmental Protection Agency

New Mexico Department of Transportation

New Mexico Game and Fish

New Mexico SHPO

San Juan County Community Development

San Juan County Public Works

Southern Ute Indian Tribe

U.S. Army Corps of Engineers

U.S. Bureau of Land Management, Farmington Field Office

U.S. Department of Agriculture Natural Resources Conservation Service

U.S. Fish and Wildlife Service

APPENDIX D – BLM CONTRAST RATING SHEET

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: 6/18/2025
District: Farmington
Resource Area: FFO
Activity (program): Oil and Gas

SECTION A. PROJECT INFORMATION

1. Project Name: San Juan 32-7 202H
2. Key Observation Point: From the road above the pad
3. VRM Class: II
4. Location: Township 32N; Range 7W; Section 18
5. Location Sketch: See Attached Map

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to rolling terrain, rugged-rocky canyon walls	Pinyon/juniper woodland-clumped, Cottonwoods-ordered	Vertical power poles, horizontal power lines
LINE	Horizontal and diagonal, somewhat weak, gently sloping	Simple, irregular on top line with juniper. Regular on road edge, regular on the river.	Vertical power poles, horizontal power lines
COLOR	Dark tan and brown	Juniper green, light brown, covert green, brown-cottonwood	Grey power pole, white-power line.
TEXTURE	Fine to smooth	Fine-grasses and shrubs on flat. Medium juniper. Uneven.	Fine

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Regular flat pad	Geometric and linear	Cylindrical, geometric, angular (only tops visible if any)
LINE	Horizontal pad	Linear road, bound edge effect, clearing	Vertical, horizontal, angular (only tops visible if any)
COLOR	Dark tan and lite brown	Dull to bright green-interim re-vegetation	Juniper green
TEXTURE	Smooth	Somewhat smooth, fine	Somewhat clumped

SECTION D. CONTRAST RATING ☐ SHORT TERM ■ LONG TERM

1. DEGREE OF CONSTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			✓				✓			✓		
Line			✓			✓				✓		
Color			✓			✓					✓	
Texture			✓				✓				✓	

2. Does project design meet visual resource management objectives? ■ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended? ■ Yes ☐ No (Explain on reverse side)

Evaluator's Names: Tanner Paulek
Date: 6/18/2025

SECTION D. (Continued)

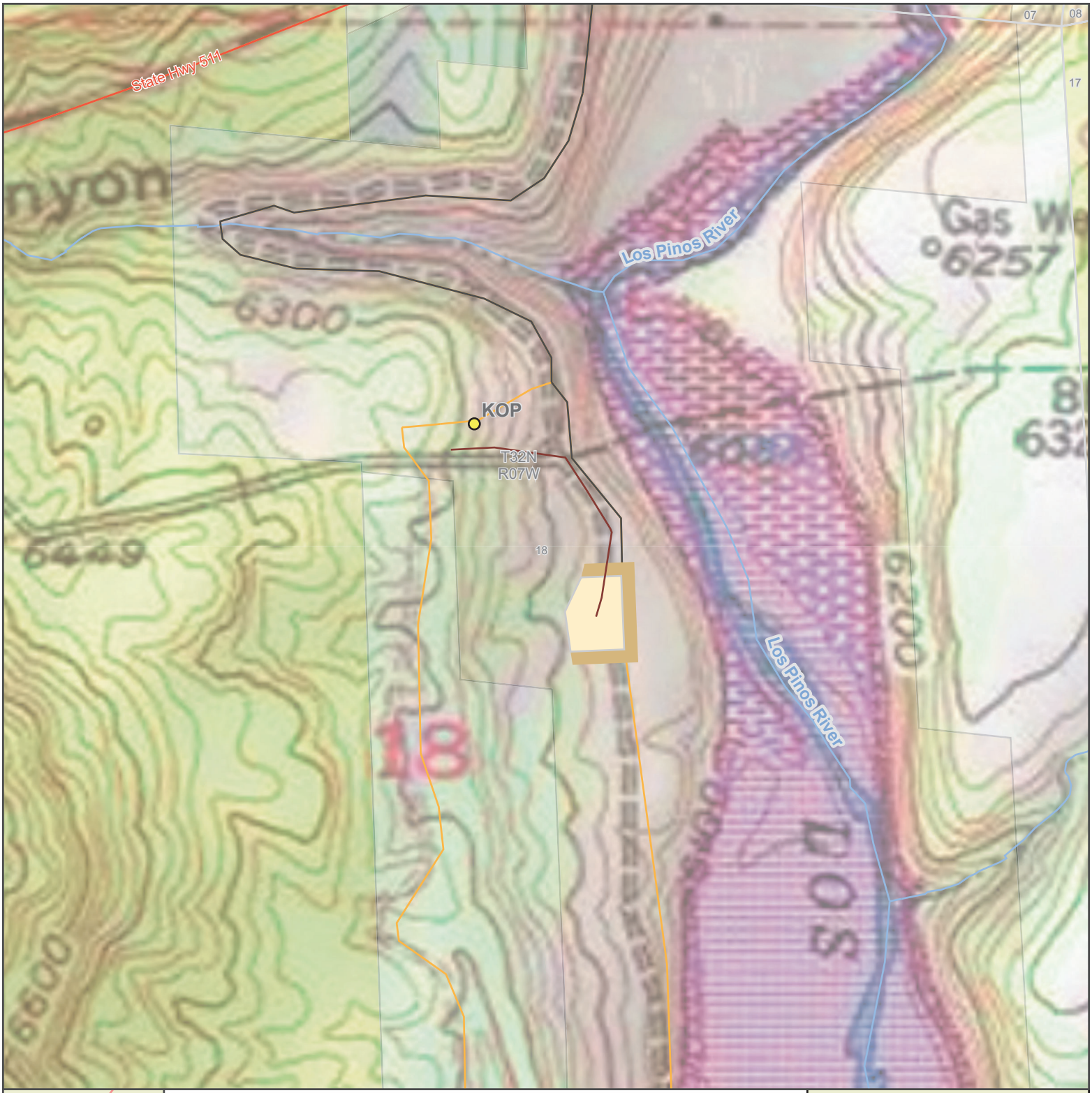
Comments from item 2.

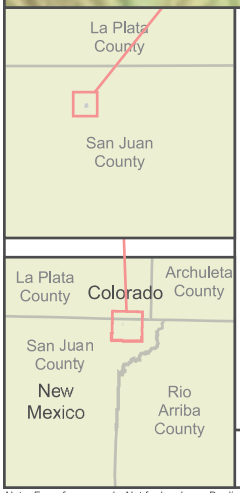
The proposed project is an extension of an existing pad, located on BOR surface. Majority of the disturbance will be on previously disturbed lands. No new access is being proposed. Facilities related to the new well will be consolidated and combined with the existing facilities on the existing and new pad(s). The KOP is located on the collector road above the proposed project. Majority of the project will not be visible from the KOP. Mainly the pad edge and potentially tops of facilities if applicable. The view from the KOP is superior to the project.

Additional Mitigating Measures (See item 3)

Facilities would be painted Juniper Green to blend in with the landscape.

U.S. GOVERNMENT PRINTING OFFICE: 1985-461-988/33094





Edge of Disturbance
Well Pad
Pipeline
Existing Access Road
Stream (NHD)

Roads:
Highway
County or Numbered Road
Named or Minor Access Road

Surface Ownership:
BLM
Private
Tribal
DOD
State
State Game & Fish
BOR

PLSS:
Township
Section

Hilcorp

Coordinate System: NAD 1983 State Plane NM West FIPS 3003 Feet
Data Sources: BLM, EIS, San Juan Co

N

Prepared for Hilcorp by EIS Environmental & Permitting Geographic Information Services, 6/6/2025

EIS

Hilcorp Energy Company

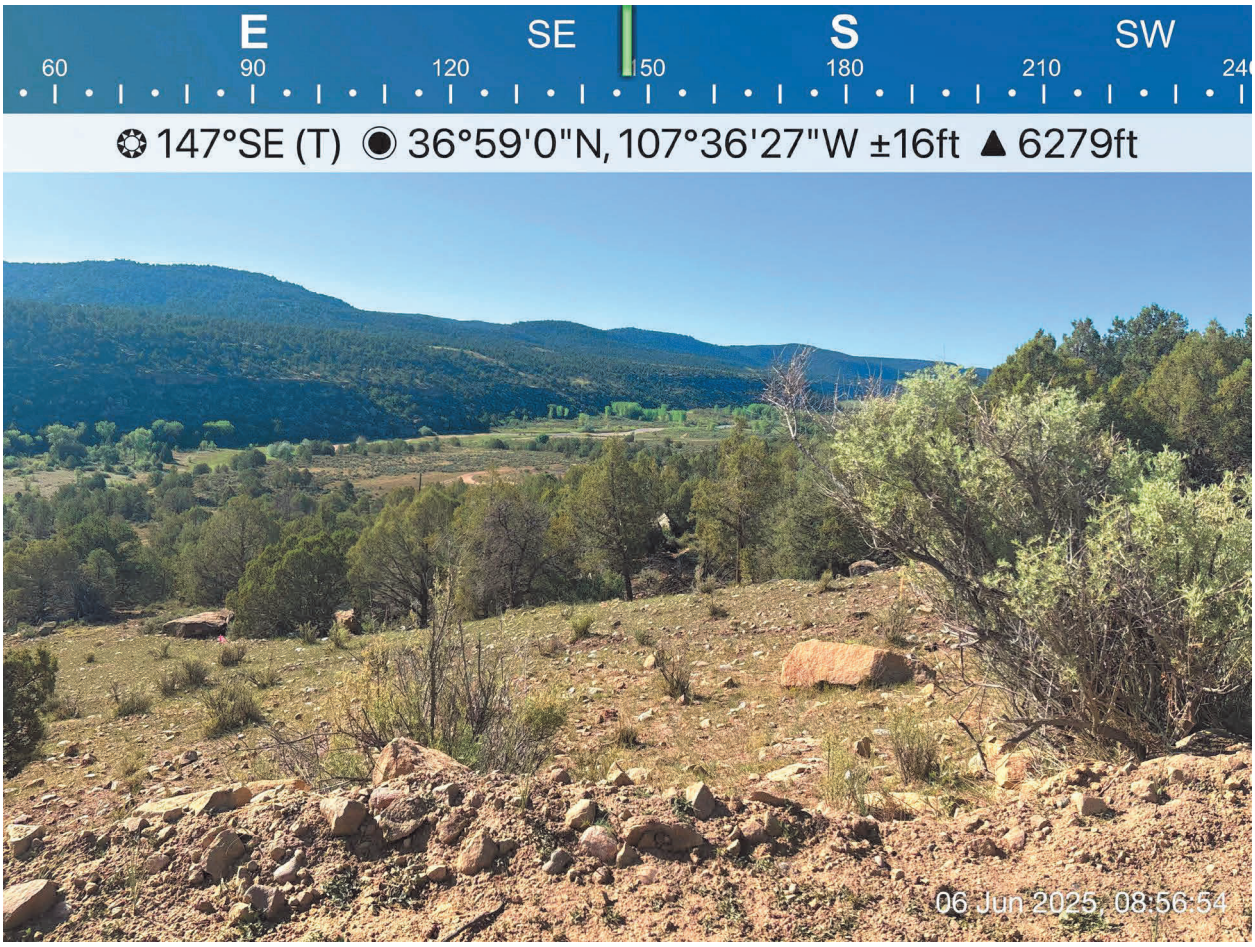
San Juan 32-7 Unit 202H
Natural Gas Well Project

Visual Contrast Rating Worksheet Map

~~ Location Information ~~
T32N-R7W Sec 18
San Juan County, New Mexico

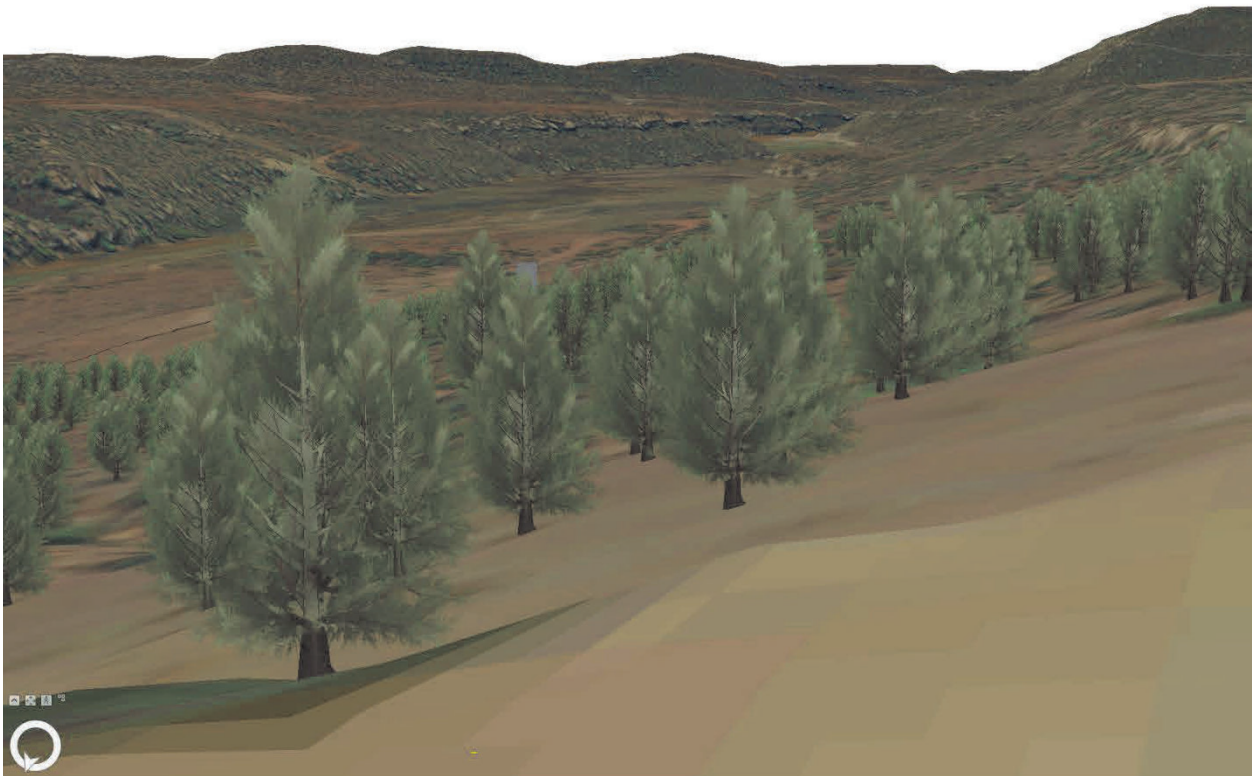
US Feet
0 375 750
1:6,000 *1:6,000*

Photo 1. Looking from Key Observation Point



Aerial of Proposed Project Area

Note: Tanks are assumed to be 20 foot tall



Note: Tanks are assumed to be 20 foot tall