

**United States Department of the Interior
Bureau of Land Management**

**Finding of No Significant Impact
Environmental Assessment
DOI-BLM-UT-Y010-2017-0113-EA**

October 2017

**Stronex Resources, LLC
Salt Wash #2 Application for Permit to Drill
And
Access Road and Pipeline Rights-of-Way**

Location: NENE Section 18, T23S, R17E
Grand County, Utah

Applicant/Address: Stronex Resources, LLC
83 Panorama Hill Close NW
Calgary, AB T3L 5J2

Bureau of Land Management
Moab Field Office
82 East Dogwood
Moab, Utah 84532
Office (435) 259-2100
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FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment

DOI-BLM-UT-Y010-2017-0113-EA

Stronex Resources, LLC

Salt Wash #2 Application for Permit to Drill

And

Access Road and Pipeline Rights-of-Way

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the Salt Wash #2 Application for Permit to Drill along with the associated rights-of-way will not have a significant effect on the human environment. An environmental impact statement is therefore not required.



Christina Price, Field Manager

10/27/2017

Date

**United States Department of the Interior
Bureau of Land Management**

**Decision Record
Environmental Assessment
DOI-BLM-UT-Y010-2017-0113-EA**

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Environmental Assessment
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Stronex Resources, LLC
Salt Wash #2 Application for Permit to Drill
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It is my decision to authorize the Salt Wash #2 Application for Permit to Drill (APD) and associated access road and pipeline rights-of-way (ROW), submitted by Stronex Resources, LLC (Stronex), and analyzed as the Proposed Action in the attached Environmental Assessment (EA). This decision is contingent upon Stronex fulfilling the environmental commitments built into the Proposed Action and mitigation measures in the EA, attached as Conditions of Approval (COAs) to the APD and ROW grants.

Authorities:

APD: Onshore oil and gas operations, including exploration and development of oil and gas leases, are conducted under the authority of the Mineral Leasing Act of 1920, as amended and supplemented (30 U.S.C. 181 *et seq*), and are subject to the Federal regulations found at 43 CFR 3160.

Pipeline ROW: ROWs for pipelines and related activities are permitted under the authority of Section 28 of the Mineral Leasing Act of 1920, as amended, and are subject to the federal regulations found at 43 CFR 2880.

Access Road ROW: ROWs for roads are permitted under Title V of the Federal Land Policy and Management Act (FLPMA; 43 U.S.C. 1761-1771) and the Federal regulations at 43 CFR 2800.

Compliance and Monitoring: The BLM will routinely inspect all phases of the project to verify compliance with applicable laws, regulations, the Surface Use Plan of Operations (SUPO), and COAs for the APD and ROWs. The operator will monitor reclamation efforts as specified in the SUPO included with the APD. For interim and final reclamation, the BLM will monitor reclamation efforts to determine if additional reclamation is required.

Terms/Conditions/Stipulations: Potential resource impacts from the Proposed Action are mitigated with applicant-committed environmental protection measures incorporated into the Proposed Action, in conjunction with the mitigation measures identified in Chapter 4.0 of the EA. The applicant-committed environmental protection measures and mitigation measures below are included as COAs to this decision.

COAs Resulting from Applicant-Committed Environmental Protection Measures

General

1. The Operator will contact the BLM at least 24 hours prior to beginning construction, drilling, and reclamation activities at the location.
2. A copy of the approved APD, including conditions of approval, will be kept at the well site for reference during construction and drilling phases.
3. Prior to moving any equipment for the purpose of construction, drilling or completion, all equipment will be power-washed prior to entering public lands to avoid the spread of noxious weeds.
4. If dust control is needed during drilling and completion operations, water from a local municipal source will be applied to the Class D access road and well pad.
5. Vehicular travel will be limited to "designated" roads and the well pad.
6. If archaeological, historical, or vertebrate fossil materials are discovered during construction activities, the Operator will suspend all operations that further disturb such materials and immediately contact the BLM. Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM.

Production and Maintenance Operations

1. The Class D access road will be maintained in the same or better condition as existed prior to commencement of operations. Maintenance will include, but is not limited to, blading, ditching, culvert and/or low water crossing installation, and will continue until final abandonment and reclamation of the well location.
2. The Class D access road, borrow ditches, cuts, fills, cattle guards and fences will be kept in a safe and usable manner and be maintained to good standards.
3. Erosion control methods will include, but are not limited to, revegetating disturbed areas as soon as practical, placement of straw wattles, hay bales, silt fences, water bars, or wing ditches as needed.
4. All drainage ditches will be kept clear and free-flowing and will be maintained to good standards. All culverts will be kept free of trash, free-flowing, and serviceable.
5. No blading or clearing of vegetation will be conducted along the pipeline route.
6. Rights-of way will be kept free of trash.
7. All permanent above ground structures located at the well site, not subject to safety requirements, will be painted Covert Green according to the BLM environmental color chart. Painting will be completed within six months of installation unless winter weather conditions exist.
8. Storage tanks, drums, and containers will be surrounded by a containment berm capable of holding at least 110% of the volume of the largest vessel. Storage tank load out lines will end inside the containment berm.
9. All undesirable events (fires, accidents, blowouts, spills, discharges) will be reported in accordance with NTL-3A.
10. All open-vent exhaust stacks on production equipment will be designed to prevent entry by birds and bats and to discourage nesting or perching.
11. A weed monitoring and control program will be implemented beginning the first growing season following construction. Noxious weeds identified during monitoring will be promptly treated and controlled.

Construction and Reclamation

1. Any remaining topsoil not utilized during interim reclamation will be stockpiled and seeded with the approved seed mix.
2. Excess subsoil (spoil) generated during construction of the pad will be segregated and stockpiled separately from topsoil.
3. Three feet of overburden will be placed over the reserve pit to allow for subsidence.
4. All disturbed areas will be ripped on the contour, one-foot deep, using ripper teeth set on one-foot centers.
5. Final seedbed preparation will consist of spreading topsoil and cultivating along the contours to a depth of 4 to 6 inches. Seeding will be conducted no more than 24 hours following completion of final seedbed preparation.
6. As specified by the BLM, the native species mixture identified in the following table will be used on all reclaimed areas.

Species	Application Rate
Curly Grass (<i>Hilaria jamesii</i>)	1 lb./acre
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	1 lb./acre
Globemallow (<i>Sphaeralcea coccinea</i>)	1 lb./acre
Shadscale (<i>Atriplex confertifolia</i>)	1 lb./acre
Castle valley clover (<i>Atriplex corrugate</i>)	1 lb./acre
Morman Tea (<i>Ehpedra nevadensis</i>)	1 lb./acre
Total	6 lb./acre

7. The seed will be certified, pure-live and weed-free. Seed will be broadcast or drilled between September 15 and April 15. In areas that will not be drill-seeded, the seed mix will be broadcast-seeded at twice the application rate shown in the table above. If the seed is broadcast, a harrow or some other similar implement will be dragged over the seeded area to assure coverage.
8. Seed will be drilled on the contour with a seed drill equipped with a depth regulator in order to ensure even depths of planting. Seeding depth will be maintained between ¼ and ½-inch deep.
9. Final abandonment of pipelines and flow lines will involve flushing and properly disposing of any fluids in the lines. All surface lines will be removed.

COAs Resulting from Mitigation Identified in the EA

Air Quality

To address oil and gas development emissions that may have impact on regional O₃ formation, the following Best Management Practices (BMPs) are attached as COAs:

1. All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NO_x per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower.

2. All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 gram of NOx per horsepower-hour.

PLAN CONFORMANCE AND CONSISTENCY:

The Proposed Action has been reviewed and found to be in conformance with the Moab Resource Management Plan (RMP), (October 2008). The Moab RMP designates the project area open to oil and gas leasing and development subject to standard terms and conditions and controlled surface use.

Alternatives Considered: The EA considered two alternatives: the Proposed Action and the No Action Alternative.

The Proposed Action includes construction, drilling, completion, installation of production facilities on the well pad, interim reclamation of the well pad, eventual plugging of the well, and final reclamation of the well pad. The well would be drilled to produce federal minerals. The Proposed Action also includes a request for two rights-of-way (ROW) for: 1) continued access and maintenance of an existing, off-lease Class D road, and 2) a proposed off-lease surface pipeline. Reclamation plans and BMPs included in the Proposed Action would mitigate impacts to other resources.

The No Action Alternative would deny approval of the APD and/or ROWs and would not allow Stronex the ability to exercise their valid existing rights to explore and develop their lease, and would be inconsistent with the goals, objectives, and decisions of the Moab RMP. The BLM's authority to implement the No Action Alternative may be limited because oil and gas leases allow drilling subject to the stipulations of the specific lease agreements. The BLM can deny an APD only if the proposal would violate lease stipulations, applicable laws or regulations, or found to result in undue and unnecessary degradation.

Rationale for Decision: The Proposed Action is selected because it would allow Stronex to exercise their valid existing rights to explore for and develop the oil and gas resources within their oil and gas lease. Conducting exploration on Federal oil and gas leases is an integral part of the BLM's oil and gas leasing program under the Mineral Leasing Act of 1920, as amended, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The Proposed Action is in conformance with the federal regulations at 43 CFR 3160, 43 CFR 2880, 43 CFR 2800, Notices to Lessees, and Onshore Oil and Gas Orders. In addition, exploration and development for oil and gas resources is recognized as an appropriate use of public lands in the 2008 Moab RMP.

The No Action Alternative was not selected because it would deny Stronex their Federal lease rights.

Administrative Review/Appeal Procedure

Any adversely affected party that contests a decision of the authorized officer issued under the regulations contained in 43 CFR 3160 may request an administrative review before the State Director, either with or without oral presentation. Such request, including all supporting documentation, must be filed in writing to:

Utah State Director
BLM Utah State Office
440 West 200 South, Suite 500
Salt Lake City, Utah 84101

The request for administrative review along with supporting documents must be received by the State Director within 20 business days of the date such notice of decision was received or considered received. Upon request and showing of good cause, an extension for submitting supporting data may be granted by the State Director (43 CFR 3165.3(b)).

Any party adversely affected by the decision of the State Director after State Director's review, under 43 CFR 3165.3(b), of a notice of decision may appeal that decision to the Interior Board of Land Appeals pursuant to regulations set out in 43 CFR Part 4 (43 CFR 3165.4(a)).


Christina Price, Field Manager

10/27/2017
Date

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Stronex Resources, LLC
Salt Wash #2 Application for Permit to Drill
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Access Road and Pipeline Rights-of-Way
(DOI-BLM-UT-Y010-2017-0113-EA)

CHAPTER 1
INTRODUCTION AND NEED FOR THE PROPOSED ACTION

INTRODUCTION

Stronex Resources, LLC (the Operator) submitted an Application for Permit to Drill (APD) an oil and gas well, Salt Wash #2, on the existing Government 18-2 well pad located on federal lease UTU12368 in T23S, R17E, section 18, in Grand County, Utah. In order to drill and produce the new well, the Operator proposes to expand the surface area of the existing Government 18-2 well pad by 1.3 acres. The Operator also requested two rights-of-way (ROWs) for: 1) continued access and maintenance of an existing, off-lease Class D road, and 2) a proposed off-lease surface natural gas pipeline. This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences resulting from the Proposed Action.

PURPOSE AND NEED FOR THE PROPOSED ACTION

The underlying need for the Proposed Action is for the Operator to explore its federal leases by drilling the proposed oil and gas well, and if successful, to develop and produce commercial quantities of oil or gas under the terms and stipulations of the lease.

The Bureau of Land Management (BLM) is considering approval of private exploration and production from federal oil and gas leases because the activity is an integral part of BLM's oil and gas leasing program under authority of the Mineral Leasing Act of 1920, as amended by the Federal Land Policy and Management Act of 1976 (FLPMA) and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The BLM's issuance of the lease conveyed to the Operator legal contractual and property rights to explore for and develop the underlying oil and natural gas. The Moab Field Office Resource Management Plan (RMP), which provides management direction for leased areas, recognizes oil and gas exploration and development as an appropriate use of public lands.

CONFORMANCE WITH BLM LAND USE PLAN

The Proposed Action has been reviewed for conformance with the Moab Field Office Record of Decision (ROD) and RMP (October 2008).

Conformance Review:

Page 65: Land and Realty Goals and Objectives

- Meet public needs for use authorizations such as rights-of-way, alternative energy sources, and permits while minimizing adverse impacts to resource values.

Page 73: Minerals Goals and Objectives

- Provide opportunities for environmentally responsible exploration and development of mineral and energy resources subject to appropriate BLM policies, laws and regulations.
- Establish conditions of use through land-use planning to protect other resource values.

The Operator's oil and gas lease was issued prior to the issuance of the ROD and will continue to be managed under the stipulations in effect when the leases were issued; however, environmental best management practices (BMPs) will be incorporated into permits and authorizations to mitigate impacts and conflicts with other uses. Resources and resource values will be managed in consideration of resource protection measures included in the RMP.

RELATIONSHIPS TO STATUTES, REGULATIONS AND OTHER PLANS

This EA was prepared in accordance with the NEPA of 1969 and with all applicable regulations subsequently passed (Public Law (P.L.) 91-190; 42 United States Code (U.S.C.) 43211 and 4331-4335, January 1969).

A number of federal, state, and local governmental agencies may have authority over various aspects of oil and gas development. Regulatory authorities that may apply to the Proposed Action are listed in **Table 1-1**.

Table 1-1: Regulatory Authorities

Issuing Agency/Permit Name or Authorizing Action	Nature of Permit/Approval	Regulatory Authority
Bureau of Land Management		
Application for Permit to Drill (APD)	Authorizes drilling for oil and gas resources under federal jurisdiction.	43 CFR 3160-3
Onshore Oil and Gas Orders	Provides procedural direction for drilling for oil and gas resources under federal jurisdiction.	43 CFR Group 3100, Subpart 3162 (§ 3162.1)
Antiquities, cultural & historic resource permits	Allows for inventory, excavation, or removal of cultural & historic resources from federal lands. Consultation with the State Historic Preservation Officer.	Antiquities Act of 1906 as amended (16 U.S.C. 431-433, June 1906); Archaeological and Historic Data Preservation Act of 1974, as amended (P.L. 93-291, 16 U.S.C. 469-469c); Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-470.11, October 1979), 43 CFR Part 3; Executive Order (EO) 13007 Indian

Issuing Agency/Permit Name or Authorizing Action	Nature of Permit/Approval	Regulatory Authority
		Sacred Sites (61 FR 26671-26672, May, 1996); EO 13175 Consultation and Coordination with Indian Tribal Governments (65 FR 218, November, 2000); National Historic Preservation Act, Section 106
Pesticide Use Permit	Allows for inventory and treatment of noxious weeds on federal lands.	Federal Noxious Weed Act of 1974, as amended 1988 and 1994, January, 1975 (7 U.S.C. 2801-2814, January, 1975); Noxious Weed Control and Eradication Act of 2004 (7 U.S.C. 7781-7786, October 2004)
Initiation of consultation, including Section 7, as appropriate	Obtains concurrence with the determinations.	Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1544, December, 1973); Migratory Bird Treaty Act of 1918, as amended (15 U.S.C. 703-712, et seq., July 1918); Bald Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d, June, 1940); EO 13186-Responsibilities of Federal Agencies To Protect Migratory Birds, January, 2001. (42 FR 26961, 3 CFR 1977, January 2001)
Paleontological Resources	Allows for inventory, excavation, or removal of paleontological resources from federal lands.	Paleontological Resources Preservation Act of 2009 (PL 111-011, Title 4, Subtitle D; 6301-6312, March, 2009)
State of Utah		
Utah Division of Oil, Gas & Mining (UDOGM)	Authorizes permit to drill, deepen, or plug back (APD process).	UDOGM Rules, R649-3-4
Department of Transportation	Permits activities impacting state highways or within highway easements, including road crossings and heavy equipment transport permits.	Administrative Code R930-6
Utah Division of Wildlife Resources	Provides for management of big game and wildlife.	UDWR Rules and Regulations, Rule 657 series; UAC Title 23, Wildlife Resources of Utah
State Historic Preservation Office	Provides for consultation on Section 106 compliance or protection of historic properties; approves cultural resource report clearances;	National Historic Preservation Act of 1906, as amended (30 CFR 800, 16 U.S.C. 470)

Issuing Agency/Permit Name or Authorizing Action	Nature of Permit/Approval	Regulatory Authority
	provides protection of cultural resources.	
Utah Division of Air Quality	Provides compliance with applicable national and Utah ambient air quality standards, as required by Utah Department of Environmental Quality.	Utah Administrative Code R307-101-1; Clean Air Act, 42 U.S.C. 7401 et seq.
Utah Division of Air Quality	Authorizes emissions permits to construct and to operate industrial facilities.	Clean Air Act, as amended (42 U.S.C. 7401 et seq.); Utah Air Rules, R200, R400 series
Utah Division of Air Quality	Authorizes flaring or venting of natural gas.	UDOGM Rules, R649-3-20
Grand County		
Road Department	Authorizes county road use and modification permit/agreement; noxious weed act enforcement; solid waste disposal regulations.	Grand County Ordinances, 2002; Title 12 (roadways and public places); Title 8 (health and safety)
Planning & Engineering	Coordinates for compliance with county zoning.	Grand County Ordinances, 2002; Title 16 (land use)
Weed Department	Provides for noxious weed control.	General order pursuant to the Utah Noxious Weed Act, Section 7 (February 2011)

The Proposed Action is also consistent with the Grand County General Plan (2012) which emphasizes the importance of a diverse, prosperous, and sustainable economy.

Page 39: Goals and Strategies, Goal 1: Make the county attractive for a wide range of economic sectors.

- Strategy G: Encourage businesses to develop solid and fluid mineral resources while using the best technology and mitigation techniques to protect natural amenities and natural resources.

Page 39: Goals and Strategies, Goal 3: Support the development and maintenance of infrastructure necessary for a sustainable economy.

- Strategy F: Support balanced and responsible natural-resource development that benefits the public and generates revenues for public service providers to help pay for public infrastructure improvements needed to achieve economic diversity.

- Public Lands Policy 1: Encourage the expeditious processing of permits for the economic use of public lands that benefit the local economy and are consistent with the policies of this plan, especially permits for the film industry, mineral extraction and recreation.

CHAPTER 2 DESCRIPTION OF ALTERNATIVES

INTRODUCTION

This EA focuses on the Proposed Action and the No Action alternative. The Proposed Action was modified by the Operator to address concerns identified by the BLM at an onsite inspection conducted on August 25, 2016. Subsequent changes to the Proposed Action also occurred in March 2017 following modification to the Government 18-2 access road. Incorporated into the Proposed Action are mitigation measures suggested by the BLM that reduce impacts to affected resources. No issues were identified by the BLM that need resolution through other action alternatives. The Interdisciplinary Team (IDT) Checklist (**Appendix A**) indicates that there are no complex or controversial impacts that need to be addressed.

PROPOSED ACTION

The Operator proposes to drill, produce, and eventually reclaim an oil and gas well, Salt Wash #2, on the existing Government 18-2 well pad. The Operator proposes to expand the surface area of the Government 18-2 well pad by 1.3 acres. The Operator also requested two ROWs for: 1) continued access and maintenance of an existing, off-lease Class D road, and 2) a proposed off-lease surface pipeline. The locations of the proposed facilities are presented in **Table 2-1**. Construction and drilling is planned to commence immediately following permit approval.

Table 2-1: Proposed Well Pad, Access Road, and Pipeline Locations

Facility	Surface Location T23S/R17E, SLB&M	Lease Number	
Salt Wash #2 Well Pad	1017' FNL & 1002' FEL NENE Section 18	UTU12368	
Access Road	Surface Location	Lease Number	Length (feet)
	NENE, SENE Section 18	UTU12368	1,272
	SWNW, SENW, SWNE, SENE Section 17	Off-lease (ROW)	4,925
Total Access Road Length			6,197
Pipeline	Surface Location	Lease Number	Length (feet)
	NENE, SENE Section 18	UTU12368	1,343
	SWNW, SENW, SWNE, SENE Section 17	Off-lease (ROW)	4,953

Total Pipeline Length	6,296
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While implementing the Proposed Action, the Operator would obtain all necessary federal, state, county, and other permits, and comply with all applicable regulatory requirements. The Operator would adhere to the details of construction, drilling, and reclamation operations provided in its APD and the Surface Operating Standards for Oil and Gas Exploration and Development, 4th Edition (Gold Book) (USDI and USDA 2007).

Project Location and Access. The location of the existing Government 18-2 well pad is approximately 12 miles south of Green River, Utah in T23S, R17E, section 18 (See **Topo Map A in Appendix B**). The well pad would be reached by traveling east on I-70 from Green River to Floy Exit 175. From the exit, turn right to unpaved County Road 147 and proceed in a southwest direction for 11.4 miles to the junction of this road and County Road 149 to the northwest. Turn right and travel in a northwest direction along County Road 149 for 0.8 miles to the end of the improved road where it meets an unnamed west-trending Class D road. Continue west on the Class D road for approximately 1.2 miles to the well location on the right (See **Topo Map B in Appendix B**).

Access Road ROW. As shown on **Topo Map B1 in Appendix B**, the Operator has requested a ROW for the off-lease portion of the access road for continued access and maintenance. The length of road outside the lease boundary measures 4,925 feet and would begin at County Road 149 and would end at the lease boundary along the west side of section 17. Maintenance activities would include, but are not limited to blading, ditching, and culvert and/or low water crossing installation within a 14-foot wide travel surface contained within a 20-foot wide ROW corridor. Although not part of the ROW, similar maintenance would also be conducted along approximately 1,272 feet of existing Class D road within the lease boundary.

Pipeline Construction and ROW. The Operator proposes to install 6,296 feet of natural gas pipeline from the well to an existing gas line located in T23S R17E section 17 SENE (See **Topo Map D in Appendix B**). A 3-inch diameter steel pipeline would be placed on the ground surface along the north side of the access road within a 20-foot wide corridor. The 20-foot corridor would not be bladed or stripped of vegetation. The Operator would assemble (i.e., weld) the steel pipeline in the road, lift the assembled pipeline with a side-boom crawler or track hoe, and place it in the existing vegetation with minimal surface disturbance.

As shown on **Topo Map D1 in Appendix B**, the Operator has requested a ROW for the off-lease portion of the pipeline. The length of pipeline outside the lease boundary measures 4,953 feet and would begin at County Road 149 and would end at the lease boundary along the west side of section 17. The pipeline ROW grant would only be issued, and the pipeline installed, if the well is capable of producing natural gas in commercial quantities.

Well Pad Construction Operations. The existing Government 18-2 well pad currently occupies an irregular-shaped area measuring approximately 1.8 acres and contains the original wellhead, a 400-barrel capacity oil storage tank surrounded by a spill containment dike, and a dry and fenced reserve pit measuring approximately 80 x 90 x 5 feet deep (See **Figure 1 in Appendix B**).

The Operator proposes to expand the existing well pad by adding approximately 1.3 acres of additional surface area to the south end of the well pad, for a total working surface area measuring approximately 3.1 acres. Well pad construction would require removal of the upper three inches of topsoil, or whatever is available, and the material would be stockpiled in the northwest corner of the well pad for use during reclamation activities. Subsoil from the well pad would be used as surfacing material for the well pad. The well pad would be leveled by balancing cut and fill areas. Construction operations would be performed in daylight hours over approximately three to five days. Construction materials would be obtained from existing materials located within the proposed disturbance areas and no new material would be imported.

Drilling and Completion Operations. Drilling and completion operations would be conducted 24 hours a day, seven days a week, for ten to fifteen days. The drilling program, including the drilling fluid, casing, cementing, and pressure control specifications, would be evaluated by the BLM for sufficiency prior to APD approval.

The well would be drilled vertically using a Tier II drill rig, thereby reducing rig emissions of nitrogen oxides (NO_x). Water-based mud would be used during drilling operations. The Operator would employ a semi-closed-loop drilling system during the entire drilling operation. Cuttings and drilling fluids would be contained in the existing reserve pit. The existing pit would be lined with a 12 mil impermeable liner prior to drilling operations to prevent discharge to the subsurface. Following installation of the liner, the fencing would be replaced and maintained until reclamation of the pit has occurred. Drilling fluids would be allowed to evaporate until interim reclamation commences, at which time any fluids remaining in the pit would be recovered and transported to a permitted disposal facility. Once drill cuttings have completely dried, the liner would be folded in and the drill cuttings would be buried in-place during interim reclamation. Produced fluids, or flow back of oil and water from completion operations, would be contained in temporary storage tanks until such time as construction of production facilities has been completed. Once permanent oil and produced water storage tanks are installed on location, produced fluids (oil and water) would be separated and transferred to permanent tanks on location.

Fresh water would be used during drilling and completion operations. Water would be obtained from the City of Green River, Utah, and transported to the location via pump truck. The Operator estimates approximately 6,000 barrels of water would be needed during drilling operations with an additional 2,000 barrels for well completion operations.

A variety of chemicals, including lubricants, paints, and solvents would be temporarily kept in limited quantities on site for use during drilling and completion operations. No chemicals subject to reporting under SARA Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of in association with the drilling or testing of the well. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with the drilling or completion of the well.

Solid Waste Management. All solid wastes from drilling operations would be collected by the drilling crew and transported to an approved disposal facility at the end of drilling and completion operations. Sewage would be contained in a portable chemical toilet during operations.

Facilities and Maintenance. If the well is productive, production facilities would be installed on the well pad and would consist of the Salt Wash #2 wellhead and pumping unit, two 400-barrel water storage tanks, two 400-barrel oil storage tanks, and an oil/water separator (See **Figure 4 in Appendix B**). The pumping unit would initially be powered by wellhead gas until a power line could be installed from the pumping unit to an existing power line located approximately 149 feet northwest of the well location, as shown on **Topo Map E in Appendix B**. The proposed power line would be located within the lease boundary, owned by the Operator, and installed by Rocky Mountain Power under an agreement between the Operator and the owner of the existing power line, Ruby Ranch. The Operator proposes to install up to two power poles along this segment of the power line.

Storage tanks would be surrounded by a dike of sufficient capacity to contain 110 percent of the volume of the largest tank. Within six months of installation, all permanent surface structures would be painted Covert Green, a flat, non-reflective color specified by the BLM in order to blend with the surrounding environment. Facilities that are required to comply with the Occupational Safety and Health Act would be excluded from this painting requirement.

The well location would typically be visited by a pumper daily. Produced water contained in the storage tanks would be hauled to a permitted disposal facility on a monthly basis. Oil contained in the storage tanks would be stored onsite until it is sold. Periodic workover operations may be needed to maintain production capacity and/or replace equipment, requiring the use of a workover rig. Workover operations would be temporary and typically last up to 10 days.

The well pad and access road would be maintained to prevent erosion and accommodate safe working conditions. Periodic maintenance would be performed to ensure that drainages maintain free-flowing conditions and fugitive dust is kept at a minimum. The Operator would control noxious weeds by spraying or mechanical removal. The Operator would submit a Pesticide Use Proposal for BLM approval prior to applying herbicides.

Reclamation. The objective of interim reclamation is to rehabilitate surfaces not needed for long-term production operations. In accordance with Onshore Oil and Gas Order No. 1, earthwork for interim and/or final reclamation shall be completed within six months of well completion or abandonment. The Operator would remove equipment from the well pad not needed for production operations. As shown on **Figure 4 in Appendix B**, the Operator proposes to reclaim approximately 1.3 acres during interim reclamation, leaving approximately 1.8 acres of surface area for long-term production operations. As previously stated, once fluids in the reserve pit have evaporated, the pit would be covered with fill. The reclaimed portion of the well pad would be contoured to be consistent with the original topography, after which 50 percent of the topsoil would be spread. The previously disturbed areas would be scarified and left with a rough surface prior to seeding.

During final reclamation, all production equipment, including the surface pipeline, would be removed and the entire well pad surface would re-contoured consistent with the original

topography, including the 170-foot long road between the well pad and the Class D road. Topsoil would be spread on the previously disturbed areas and seeded. Reclamation of the pre-existing Class D road, located on- and off-lease, would not be required as no new surface disturbance is proposed. Additionally, since the pipeline route would not be bladed and would receive only negligible disturbance during installation and removal, reclamation of the pipeline corridor is not anticipated.

Surface Disturbance Summary. The surface disturbance estimate summarized in **Table 2-2** includes the expanded well pad and the 170-foot long road between the well pad and the Class D road.

Table 2-2: Estimated Surface Disturbance

Facility	Initial Disturbance (acres)	Interim Reclamation (acres)	Long-term Disturbance (acres)
Government 18-2 / Salt Wash #2 Well Pad	3.1	1.3	1.8

Interim reclamation of the well pad would result in approximately 1.3 acres of reclaimed surface area, leaving approximately 1.8 acres of bare ground as long-term disturbance for the life of the well. Long-term disturbance was calculated to estimate the amount of bare ground that would remain for the life of the well.

Applicant-Committed Environmental Protection Measures. In addition to the environmental protection measures contained in the Proposed Action, the Operator has proposed the following environmental protection measures.

General

- The Operator would contact the BLM at least 24 hours prior to beginning construction, drilling, and reclamation activities at the location.
- A copy of the approved APD, including conditions of approval, would be kept at the well site for reference during construction and drilling phases.
- Prior to moving any equipment for the purpose of construction, drilling or completion, all equipment would be power-washed prior to entering public lands to avoid the spread of noxious weeds.
- If dust control is needed during drilling and completion operations, water from a local municipal source would be applied to the Class D access road and well pad.
- Vehicular travel would be limited to “designated” roads and the well pad.
- If archaeological, historical, or vertebrate fossil materials are discovered during construction activities, the Operator would suspend all operations that further disturb such materials and immediately contact the BLM. Operations in the area of discovery would not resume until written authorization to proceed has been issued by the BLM.

Production and Maintenance Operations

- The Class D access road would be maintained in the same or better condition as existed prior to commencement of operations. Maintenance would include, but is not limited to,

blading, ditching, culvert and/or low water crossing installation, and would continue until final abandonment and reclamation of the well location.

- The Class D access road, borrow ditches, cuts, fills, cattle guards and fences would be kept in a safe and usable manner and be maintained to good standards.
- Erosion control methods would include, but are not limited to, revegetating disturbed areas as soon as practical, placement of straw wattles, hay bales, silt fences, water bars, or wing ditches as needed.
- All drainage ditches would be kept clear and free-flowing and would be maintained to good standards. All culverts would be kept free of trash, free-flowing, and serviceable.
- No blading or clearing of vegetation would be conducted along the pipeline route.
- Rights-of way would be kept free of trash.
- All permanent above ground structures located at the well site, not subject to safety requirements, would be painted Covert Green according to the BLM environmental color chart. Painting would be completed within six months of installation unless winter weather conditions exist.
- Storage tanks, drums, and containers would be surrounded by a containment berm capable of holding at least 110% of the volume of the largest vessel. Storage tank load out lines would end inside the containment berm.
- All undesirable events (fires, accidents, blowouts, spills, discharges) would be reported in accordance with NTL-3A.
- All open-vent exhaust stacks on production equipment would be designed to prevent entry by birds and bats and to discourage nesting or perching.
- A weed monitoring and control program would be implemented beginning the first growing season following construction. Noxious weeds identified during monitoring would be promptly treated and controlled.

Construction and Reclamation

- Any remaining topsoil not utilized during interim reclamation would be stockpiled and seeded with the approved seed mix.
- Excess subsoil (spoil) generated during construction of the pad would be segregated and stockpiled separately from topsoil.
- Three feet of overburden would be placed over the reserve pit to allow for subsidence.
- All disturbed areas will be ripped on the contour, one-foot deep, using ripper teeth set on one-foot centers.
- Final seedbed preparation would consist of spreading topsoil and cultivating along the contours to a depth of 4 to 6 inches. Seeding would be conducted no more than 24 hours following completion of final seedbed preparation.
- As specified by the BLM, the native species mixture identified in **Table 2-3** would be used on all reclaimed areas.

Table 2-3: Seed Mix

Species	Application Rate
Curly Grass (<i>Hilaria jamesii</i>)	1 lb./acre
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	1 lb./acre
Globemallow (<i>Sphaeralcea coccinea</i>)	1 lb./acre

Shadscale (<i>Atriplex confertifolia</i>)	1 lb./acre
Castle valley clover (<i>Atriplex corrugate</i>)	1 lb./acre
Morman Tea (<i>Ehpedra nevadensis</i>)	1 lb./acre
Total	6 lb./acre

- The seed would be certified, pure-live and weed-free. Seed would be broadcast or drilled between September 15 and April 15. In areas that would not be drill-seeded, the seed mix would be broadcast-seeded at twice the application rate shown in the table above. If the seed is broadcast, a harrow or some other similar implement would be dragged over the seeded area to assure coverage.
- Seed would be drilled on the contour with a seed drill equipped with a depth regulator in order to ensure even depths of planting. Seeding depth would be maintained between ¼ and ½-inch deep.
- Final abandonment of pipelines and flow lines would involve flushing and properly disposing of any fluids in the lines. All surface lines would be removed.

NO ACTION ALTERNATIVE

The No Action alternative is considered and analyzed to provide a baseline for comparison of impacts to those impacts of the Proposed Action. The No Action alternative is a denial of the APD and/or ROWs, i.e., the Proposed Action. The BLM can deny a Proposed Action if it would violate lease stipulations, applicable laws/regulations, or result in undue or unnecessary degradation.

The No Action alternative does not serve the purpose and need of the Proposed Action given the Operator's contractual rights to develop its mineral lease. Under terms of federal oil and gas leases, the BLM cannot deny the right to drill and develop the leasehold but can require relocation of the well by up to 200 meters (656 feet). The lessee/mineral owner has the right to use reasonable amount of the surface to develop the underlying minerals (43 CFR 3101.1-2). An oil and gas lease grants the lessee the "right to drill for, extract, remove and dispose of all oil and gas deposits" from the leased lands, subject to the terms and conditions of the respective leases.

By deciding upon the No Action alternative, the proposed construction and operation of the well and/or the pipeline to transport gas, as described in the Proposed Action, would not occur on federal lands. If BLM were to deny the proposal, the applicant could attempt to reverse BLM's decision through administrative appeals, seek to exchange its lease for leases in other locations, or seek compensation from the federal government. The outcome of these actions is beyond the scope of this EA as they cannot be projected or meaningfully analyzed at this time.

CHAPTER 3 AFFECTED ENVIRONMENT

INTRODUCTION AND GENERAL SETTING

The affected environment was considered and analyzed by the IDT as documented in the IDT Checklist (**Appendix A**). The checklist indicates which resources of concern are either not present in the project area or would not be impacted to a degree that requires detailed analysis. Resources

that could be impacted to a level requiring further analysis are described in this chapter. The project area, as used in this EA, refers to the site-specific location that would be affected by the Proposed Action.

The project area is located in the Green River Desert section of the Colorado Plateau physiographic region (Stokes 1988). Land use in the project area includes livestock grazing, limited recreational use, wildlife habitat, and limited oil and gas development. Soil in the project area is classified as a moderately deep, well-drained, silty loam derived from shale (USDA 1981). Vegetation consists of sparsely populated, short shrubs and bunchgrasses. The elevation of the well pad is 4,200 feet above mean sea level. The project area drains to the southwest, towards the Green River west of the site. Based on recorded climatological data gathered by the Western Regional Climate Center (WRCC) at the Green River Aviation, Utah (#423418) station between July 1948 and May 2009, this desert area has an annual average maximum temperature of 69.6 degrees Fahrenheit (°F) with an annual average precipitation of 6.45 inches. **Table 3-1** below provides the Monthly Climate Summary data from this station.

Table 3-1: Monthly Climate Summary, Green River Aviation, Utah

Month	Average Low and High Temperatures (°F)		Average Precipitation (inches)	Average Snowfall (inches)
January	10.0	38.2	0.42	3.4
February	18.8	48.4	0.43	0.9
March	27.8	60.3	0.49	0.4
April	36.0	70.5	0.51	0.0
May	44.9	80.7	0.64	0.0
June	52.5	91.5	0.33	0.0
July	60.4	97.7	0.54	0.0
August	58.2	94.8	0.81	0.0
September	47.4	85.7	0.70	0.0
October	35.1	71.5	0.79	0.0
November	22.4	55.0	0.44	0.4
December	13.3	41.3	0.36	2.5
Annual Average	35.6	69.6	6.45	7.7

Source: WRCC 2010

AIR QUALITY

Located in the heart of the Colorado Plateau, the Moab Field Office encompasses 1.8 million acres of scenic canyon country. Carved by the Colorado and Green Rivers, Moab's public lands include a vast variety of arches, natural bridges, mesas, and spires.

Major land uses include a wide array of private and commercial recreation uses, oil and gas production, mining, and livestock grazing. Recreational use of BLM-administered lands, with two million annual site visits, supports hundreds of local jobs and the bulk of the business community.

Existing Sources of Pollution

The Canyon Country District has existing sources of pollution that contribute to regional ozone (O₃) and airborne particulate matter. Regional O₃ is typical in the western states as forest fires, transport from shipping lanes, electric power generation and a conglomerate of other sources

combine under certain meteorological conditions. Particulate matter is another issue during dust storms or kicked up from other activities in this dry region.

Air quality is affected by various natural and anthropogenic factors. Industrial sources such as power plants, mines, and oil and gas extraction activities within Northern Utah contribute to local and regional air pollution. Urbanization and tourism create emissions that affect air quality over a wide area. Air pollutants generated by motor vehicles include tailpipe emissions and dust from travel over dry, unpaved road surfaces. Strong winds can generate substantial amounts of windblown dust.

Air pollution emissions are characterized as point, area, or mobile. Point sources are large, stationary facilities such as power plants and manufacturing facilities and are accounted for on a facility-by-facility basis. Area sources are smaller stationary sources and, due to their greater number, are accounted for by classes. Production emissions from an oil and gas well and dust from construction of a well pad would be considered area source emissions. Mobile sources consist of non-stationary sources such as cars and trucks. Mobile emissions are further divided into on-road and off-road sources. Engine exhaust from truck traffic to and from oil and gas locations would be considered on-road mobile emissions. Engine exhaust from drilling operations would be considered off-road mobile emissions.

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Utah Division of Air Quality (UDAQ) is responsible to ensure compliance with the NAAQS within the state of Utah. **Table 3-1** shows NAAQS for the EPA designated criteria pollutants (EPA 2011).

Table 3-1: National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m ³ (1)	Not to be exceeded
Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 years
		primary and secondary	Annual	53 ppb (2)	Annual Mean
Ozone [73 FR 16436, Mar 27, 2008]		primary and secondary	8-hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution [71 FR 61144, Oct 17, 2006]	PM _{2.5}	primary and secondary	Annual	15 µg/m ³	annual mean, averaged over 3 years
			24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

as of October 2011

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 O₃ standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour O₃ standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour O₃ standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO₂ standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Prevention of Significant Deterioration

Under the Prevention of Significant Deterioration (PSD) provisions of the CAA, incremental increases of specific pollutant concentrations are limited above a legally defined baseline level. Many national parks and wilderness areas are designated as PSD Class I. The PSD program protects air quality within Class I areas by allowing only slight incremental increases in pollutant concentrations. Areas of Utah not designated as PSD Class I are classified as Class II. For Class II areas, greater incremental increases in ambient pollutant concentrations are allowed as a result of controlled growth (See Table 3-2).

Table 3-2: Prevention of Significant Deterioration (PSD) Increments

Pollutant	Maximum allowable increase (micrograms per cubic meter)*
Class I	
Particulate matter:	
PM-10, annual arithmetic mean.....	4
PM-10, 24-hr maximum.....	8
Sulfur dioxide:	
Annual arithmetic mean.....	2
24-hr maximum.....	5
3-hr maximum.....	25
Nitrogen dioxide:	
Annual arithmetic mean.....	2.5
Class II	
Particulate matter:	
PM-10, annual arithmetic mean.....	17
PM-10, 24-hr maximum.....	30
Sulfur dioxide:	
Annual arithmetic mean.....	20
24-hr maximum.....	91
3-hr maximum.....	512
Nitrogen dioxide:	
Annual arithmetic mean.....	25
Class III	
Particulate matter:	
PM-10, annual arithmetic mean.....	34
PM-10, 24-hr maximum.....	60
Sulfur dioxide:	
Annual arithmetic mean.....	40
24-hr maximum.....	182
3-hr maximum.....	700
Nitrogen dioxide:	
Annual arithmetic mean.....	50
*For any period other than an annual period, the applicable maximum allowable increase may be exceeded during one such period per year at any one location.	

Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental impacts. The EPA has classified 187 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethylbenzene, isomers of xylene (BTEX) compounds, and normal-hexane (n-hexane).

The CAA requires the EPA to regulate emissions of toxic air pollutants from a published list of industrial sources referred to as "source categories." The EPA has developed a list of source categories that must meet control technology requirements for these toxic air pollutants. Under Section 112(d) of the CAA, the EPA is required to develop regulations establishing national emission standards for hazardous air pollutants (NESHAP) for all industries that emit one or more

of the pollutants in major source quantities. These standards are established to reflect the maximum degree of reduction in HAP emissions through application of maximum achievable control technology (MACT). Source categories for which MACT standards have been implemented include oil and natural gas production and natural gas transmission and storage.

There are no applicable federal or State of Utah ambient air quality standards for assessing potential HAP impacts to human health, and monitored background concentrations are rarely available. Therefore, reference concentrations (RfC) for chronic inhalation exposures and reference exposure levels (REL) for acute inhalation exposures are applied as significance criteria. Table 3-3 below provides the RfCs and RELs. RfCs represent an estimate of the continuous (i.e., annual average) inhalation exposure rate to the human population (including sensitive subgroups such as children and the elderly) without an appreciable risk of harmful effects. The RELs represent the acute (i.e., 1-hour average) concentration at or below which no adverse health effects are expected. Both the RfC and REL guideline values are for non-cancer effects.

Table 3-3: Hazardous Air Pollutants (HAP), Reference Exposure Levels (REL), and Reference Concentrations (RfCs)

HAP	Reference Exposure Level (REL 1-hour Average) ($\mu\text{g}/\text{m}^3$)	Reference Concentration ^a (RfC Annual Average) ($\mu\text{g}/\text{m}^3$)
Benzene	1,300 ^{b, c}	30
	160,000 ^d	-
Toluene	37,000 ^b	5,000
Ethylbenzene	350,000 ^d	1,000
Xylenes	22,000 ^b	100
n-Hexane	390,000 ^d	700
Formaldehyde	94 ^b	9.8

^a EPA Air Toxics Database, Table 1 (EPA 2007a)

^b EPA Air Toxics Database, Table 2 (EPA 2007a) REL from California EPA (most conservative level in Table 2)

^c REL for benzene is for a 6-hour average.

^d Immediately Dangerous to Life or Health/10, EPA Air Toxics Database, Table 2 (EPA 2007a) because no REL is available.

National Ambient Air Quality Standards (Six Criteria Pollutants)

Particulate Matter (PM_{10} AND $PM_{2.5}$)

Airborne particulate matter consists of tiny coarse-mode (PM_{10}) or fine-mode ($PM_{2.5}$) particles or aerosols combined with dust, dirt, smoke, and liquid droplets. $PM_{2.5}$ is derived primarily from the incomplete combustion of fuel sources and secondarily formed aerosols. PM_{10} is derived primarily from crushing, grinding, or abrasion of surfaces. Sources of particulate matter include industrial processes, power plants, mobile sources (vehicle exhaust and road dust), construction activities, home heating, and fires. Particulate matter causes a variety of health and environmental impacts. Many scientific studies have linked breathing particulate matter to serious health problems, including aggravated asthma, increased respiratory symptoms (e.g., coughing), difficult or painful breathing, chronic bronchitis, decreased lung function, and premature death. Particulate matter is the major cause of reduced visibility. It can stain and damage stone and other materials, including culturally important objects, such as monuments and statues (EPA 2015).

Ozone (O₃)

Ground-level O₃ is a secondary pollutant. It is formed by a chemical reaction between nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight (photochemical oxidation). Precursor sources of NO_x and VOCs include motor vehicle exhaust, industrial emissions, gasoline vapors, vegetation emissions (i.e., terpenes), wood burning, and chemical solvents. The abundant sunlight during the summer months drives the photochemical process and creates ground-level O₃; therefore, O₃ is generally considered a summertime air pollutant (EPA 2015).

Ozone is a regional air quality issue because, along with its precursors, it can transport hundreds of miles from its origins, and maximum O₃ levels can occur at locations many miles downwind from the sources. Primary health effects from O₃ exposure range from breathing difficulty to permanent lung damage. Significant ground-level O₃ also contributes to plant and ecosystem damage (EPA 2015).

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas emitted from combustion processes. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources. Carbon dioxide can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death (EPA 2015).

Nitrogen Oxides

Nitrogen dioxide (NO₂) is one of a group of highly reactive gasses known as "oxides of nitrogen," or "nitrogen oxides (NO_x)." Other nitrogen oxides include nitrous acid and nitric acid. While EPA's National Ambient Air Quality Standard covers this entire group of NO_x, NO is the component of greatest interest and the indicator for the larger group of nitrogen oxides. Nitrogen oxide forms quickly from emissions from cars, trucks and buses, power plants, and off-road equipment. In addition to contributing to the formation of ground-level O₃, and fine particle pollution, NO₂ is linked with a number of adverse effects on the respiratory system (EPA 2015).

Lead

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been from fuels in on-road motor vehicles (such as cars and trucks) and industrial sources. As a result of EPA's regulatory efforts to remove lead from on-road motor vehicle gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions to the air today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline (EPA 2015).

Sulfur Dioxide

Sulfur dioxide (SO₂) is one of a group of highly reactive gasses known as "oxides of sulfur." The largest sources of SO₂ emissions are from fossil fuel combustion at power plants (73 percent) and other industrial facilities (20 percent). Smaller sources of SO₂ emissions include industrial

processes such as extracting metal from ore, and the burning of high sulfur containing fuels by locomotives, large ships, and non-road equipment. Sulfur dioxide is linked with a number of adverse effects on the respiratory system (EPA 2015).

Less Significant Pollutants

In many regions, certain NAAQS are unlikely to apply to project specifics for BLM permitted activities. Sulfur dioxide, carbon monoxide, and lead typically fall into this category for oil and gas activity. Sulfur dioxide is a typical pollutant released from electric energy production with coal-fired power plants. Carbon monoxide is a deadly gas with large releases from mobile sources such as vehicles. On oil and gas fields, engines and drill rigs are commonplace; however, carbon monoxide disperses extremely rapidly and we have not seen issues in any of our regions. Carbon monoxide is a danger in enclosed spaces, such as an engine running in a sealed garage or measured directly at a tailpipe. Lead was found primarily in gasoline and was a major polluter in the past, but EPA determinations have controlled lead, this is now a negligible pollutant in the entire state of Utah as a whole, and just about zero on any BLM permitted activity within the state.

National Ambient Air Quality Standards Values

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. *Primary standards* provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. The criteria pollutants are listed in **Table 3-1**. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$).

Climate Change

Ongoing scientific research has identified the potential impacts of man-made greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon fuels have caused GHG concentrations (represented as carbon dioxide (CO_2) or carbon dioxide equivalents (CO_2e) to increase dramatically and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007).

The IPCC further concluded that these changes in atmospheric composition are almost entirely the result of human activity, not the result of changes in natural processes that produce or remove these

gases (IPCC 2007). Greenhouse gases are often presented using the unit of Metric Tons of CO₂ equivalent (MT CO₂e) or Million Metric Tons of CO₂ equivalent (MMT CO₂e), a metric to express the impact of each different greenhouse gas in terms of the amount of CO₂ making it possible to express greenhouse gases as a single number. For example, one ton of methane would be equal to 25 tons of CO₂e, because it has a global warming potential (GWP) 25 times that of CO₂.

As defined by the EPA, the GWP provides “a ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of CO₂.” The GWP of greenhouse gas is used to compare global impacts of different gases and used specifically to measure how much energy the emissions of one ton of gas will absorb over a given period of time (e.g. 100 years), relative to the emissions of one ton of CO₂. The GWP accounts for the intensity of each GHG’s heat trapping effect and its longevity in the atmosphere. The GWP provides a method to quantify the cumulative effects of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent for the GHGs.

CHAPTER 4

ENVIRONMENTAL IMPACTS

DIRECT AND INDIRECT IMPACTS

This section analyses the impacts of the Proposed Action to those potentially impacted resources described in the affected environment Chapter 3.

PROPOSED ACTION

AIR QUALITY

Air quality impacts resulting from the Proposed Action could extend beyond the boundary defined above. Air quality-related emissions would include PM₁₀, SO₂, NO₂, CO, and VOCs. Ozone, which is created by chemical reactions between NO_x and VOCs in the presence of sunlight, is a cumulative air quality impact. These emissions would result primarily from construction, drilling, and completion activities; from handling of produced oil (product flashing and tank truck loading); and from emissions from gas engines used to operate well pumping equipment.

Grand County is currently considered to be in attainment with National and State of Utah Ambient Air Quality Standards. The additional air quality related emissions (primarily NO_x, CO, SO₂, and VOCs) originating from the additional wells and associated gas powered production equipment are not substantially different than air quality impacts from current oil and gas production. If mitigation measures specified in the NEPA analyses for the project are implemented, the cumulative air quality impacts from the Proposed Action would not result in violations of air quality standards.

An oil or gas well, including the act of drilling, is considered to be a minor source under the Clean Air Act. Minor sources are not controlled by regulatory agencies responsible for implementing the Clean Air Act. In addition, control technology is not required by regulatory agencies at this point, since the Proposed Action occurs in NAAQS attainment areas. Different emission sources would result from the two site-specific development phases: well development and well production.

Well development includes emissions from earth-moving equipment, vehicle traffic, drilling, and completion activities. NO_x, SO₂, and CO would be emitted from vehicle tailpipes. Fugitive dust concentrations would increase with additional vehicle traffic on unpaved roads and from wind erosion in areas of soil disturbance. Drill rig and fracturing engine operations would result mainly in NO_x and CO emissions, with lesser amounts of SO₂. These temporary emissions would be short-term during the drilling and completion times.

During well production, there are continuous emissions from separators, condensate storage tanks, and daily tailpipe and fugitive dust emissions from operations traffic. During the operational phase of the Proposed Action, NO_x, CO, VOC, and HAP emissions would result from the long-term operation of condensate storage tank vents, and well pad separators. Additionally, road dust (PM₁₀ and PM_{2.5}) would be produced by vehicles servicing the wells.

Project emissions of O₃ precursors, whether generated by construction and drilling operations or by production operations, would be dispersed and/or diluted to the extent where any local O₃ impacts from the Proposed Action would be indistinguishable from background or cumulative conditions. The primary sources of HAPs are from oil storage tanks and smaller amounts from other production equipment. Small amounts of HAPs are emitted by construction equipment. However, these emissions are estimated to be less than one ton per year. Based on the negligible amount of project-specific emissions, the Proposed Action is not likely to violate, or otherwise contribute to any violation of any applicable air quality standard, and may only contribute a small amount to any projected future potential exceedance of any applicable air quality standards.

The construction, drilling, completion, testing, and production of an oil and gas well could result in various emissions that affect air quality. Construction activities result in emissions of PM₁₀. Well drilling activities result in engine exhaust emissions of NO_x, CO, and VOC. Completion and testing of the well result in emissions of VOC, NO_x, and CO. Ongoing production results in the emission of NO_x, CO, VOC, and PM₁₀.

If exploration occurs, short-term impacts would be stabilized or managed rapidly (within two to five years), and long-term impacts are those that would substantially remain for more than five years.

Table 4-1: Emissions Estimate

Emissions Source	Pollutant	Estimated Emissions (tons)
Drilling Rig	NO _x	3.81*
Drilling Rig	PM	0.12*
Storage Tanks	VOCs	0.39

* Using Tier II drilling rig

Emission factors for activities of the Proposed Action were based on information contained in the EPA's *Emission Factors & AP 42*, Volume I, Fifth Edition (EPA 1995). The production emissions from oil storage tanks was estimated based on the emission factor contained in the Colorado Department of Public Health and Environment PS Memo 05-01, *Oil & Gas Atmospheric Condensate Storage Tank Batteries Regulatory Definitions and Permitting Guidance* (CDPHE 2009).

Based on the emissions estimates contained in **Table 4-1** and considering the location of the Proposed Action relative to population centers and Class 1 areas, substantial air resource impacts are not anticipated as a result of this action, and no further analysis or modeling is warranted. Emissions resulting from the Proposed Action are not likely to result in major impacts to air quality nor are they likely to cause a violation of the NAAQS.

Greenhouse Gas Emissions

In order to estimate the emissions that might be produced from the proposed well, the expected production volumes would have to be established. Production volumes for the proposed well were estimated using production values from the three producing wells that are nearest to the proposed well. The wells, and their cumulative production volumes, are as follows:

Well Name/No.	API No.	Location	Cumulative Oil Prod	Cumulative Gas Prod
Smoot 17-2	43-019-16048	Sec 17, T23S, R17E	28,472 barrels	7,667 Mcf
Smoot 18-2	43-019-30679	Sec 17, T23S, R17E	2,024 barrels	629 Mcf
Federal 28-11	43-019-31503	Sec 28, T22S, R17E	83,491 barrels	319,101 Mcf

Although some wells produce for a much longer period than twenty years, in the case of two of the above wells, Smoot 17-2 and Smoot 18-2, nearly all of their cumulative production occurred in the first twenty years of production. Because of this, total cumulative production was averaged over a twenty-year period to determine the average production per year. This method results in an average annual production value that is closer to that of a well that is produced to its economic limit. These wells have been produced beyond their economic limit, which has the effect of reducing the average annual production value.

By contrast, Federal 28-11 has produced for less than ten years, and remains capable of significant production. To account for a well's normal production decline over time, it was assumed that, to date, the well had produced two-thirds of its economic production volume, and that it would produce the remaining one-third over the next ten years. The cumulative production to date was multiplied by 150 percent: 100% of the cumulative production to date represents two-thirds of the well's estimated cumulative economic production volume; and 50% of the cumulative production to date represents one-third of the well's estimated cumulative economic production volume that would be produced over the next ten years. The cumulative economic production volume was averaged over twenty years. The *cumulative* and *average annual* production volumes for the three wells are shown on the table below:

Well Name/No.	Cumulative		Average Annual	
	Oil Prod	Gas Prod	Oil Prod	Gas Prod
Smoot 17-2	28,472 barrels	7667 Mcf	1423 barrels	383 Mcf
Smoot 18-2	2024 barrels	629 Mcf	101 barrels	31 Mcf
Federal 28-11	83,491 barrels	319,101 Mcf	<u>3131 barrels</u>	<u>23,933 Mcf</u>
	Averaged for all three wells-		1552 barrels	8116 Mcf

The combined average annual production values from the three wells are used in the Indirect GHG Emissions Estimate calculations below.

Indirect GHG emissions in **Table 4-2** are presented as low, average, and high production scenarios estimated from current oil and gas production from other wells in the same field. It is impossible to know which of these scenarios (if any) will actually occur, so emissions numbers are presented to estimate the range of possible indirect emissions that could result from the well. Indirect GHG emissions are calculated only for carbon dioxide based on combustion of the product.

Table 4-2: Indirect GHG Emissions Estimate

Indirect GHG Emissions (MT CO ₂ per year)	Oil ⁴	Gas ⁵
Low ¹	0	0
Average ²	667	444
High ³	1346	1309

1. Assumes well is non-productive
2. Average of production from selected wells currently in operation. Data from Utah Division of Oil, Gas, and Mining (UDOGM 2017), *LiveData* search
3. Average annual production from the Federal 28-11 well which has the highest production rate of the 3 producing wells nearest the proposed well
4. Oil well GHG indirect emission factor: 0.43 MT CO₂ per barrel (EIA 2006)
5. Gas well indirect emission factor: 0.054717 MT CO₂ per million cubic feet (EPA 2016)

As it is not possible to assign a “significance” value or impact to these numbers, the emissions estimates themselves are presented as a proxy for impact.

MITIGATION MEASURES

Air Quality

To address oil and gas development emissions that may have impact on regional O₃ formation, the following BMPs must be attached as conditions of approval:

1. All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NO_x per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower.
2. All new and replacement internal combustion gas field engines of greater than 300 design-rated horsepower must not emit more than 1.0 gram of NO_x per horsepower-hour.

NO ACTION ALTERNATIVE

Under this alternative, oil and gas exploration/development may occur in the future in the general vicinity of the proposed new well on leased federal lands under the authority of the RMP, state lands, and private lands as a result of other proposals consistent with valid lease rights. Existing oil and gas wells in the vicinity would continue to be produced under this alternative.

AIR QUALITY

Emissions from construction equipment, drilling equipment, and production equipment would not be released to the atmosphere. Fugitive dust would not be generated by construction operations.

CUMULATIVE IMPACTS

Cumulative effects were analyzed in relation to past, current, and reasonably foreseeable actions. Because there would be no impacts resulting from the No Action alternative, there would be no cumulative impacts from its implementation.

AIR QUALITY

The Cumulative Impact Area (CIA) for air quality is Grand County. The time frame for the cumulative impacts analysis corresponds to the expected life of the oil well, which is approximately 30 years. In the CIA, past, present, and reasonably foreseeable activities include oil and gas exploration and development, mining operations, recreational use, and additional development of recreational facilities.

In the BLM Moab Field Office 2005 Reasonably Foreseeable Development Scenario for Oil and Gas, the BLM predicted that an average of 26 wells per year would be drilled over the next 15 years in the Moab Field Office, which encompasses Grand County (BLM 2005). In the next five years, approximately 130 wells would be drilled in the Moab Field Office. Motorized and non-motorized recreational use is expected to increase.

Cumulative air quality impacts resulting from the Proposed Action could extend beyond the boundary defined above. Cumulative air quality-related emissions would include PM₁₀, SO₂, NO₂, CO, and VOCs. Ozone, which is created by chemical reactions between NO_x and VOCs in the presence of sunlight, is a cumulative air quality impact. These emissions would result primarily from construction, drilling, and completion activities; from handling of produced oil (product flashing and tank truck loading); and from emissions from gas engines used to operate well pumping equipment.

Based on the relatively minor levels of emissions associated with this proposed development, and the application of best management practices, it is unlikely emissions from any subsequent development of the Proposed Action would contribute to regional O₃ formation in the project area, nor is it likely to contribute or cause exceedances of any NAAQS. Grand County is currently considered to be in attainment with National and State of Utah Ambient Air Quality Standards. The additional air quality related emissions (primarily NO_x, CO, SO₂ and VOCs) originating from the additional well and associated gas powered production equipment are not substantially different than air quality impacts from past or present oil and gas production. If mitigation measures specified in the NEPA analyses for the project are implemented, the cumulative air quality impacts from the Proposed Action would not result in violations of air quality standards.

CHAPTER 5

PERSONS, GROUPS, AND AGENCIES CONSULTED

During preparation of the EA, the public was notified of the Proposed Action by a posting on the BLM's ePlanning website on February 3, 2017. The BLM has not been contacted by the public in response to the notice. A public comment period was not offered because public interest in the proposal has not been expressed. Persons, agencies, and organizations consulted during preparation of the EA are listed in **Table 5-1**.

Table 5-1: List of Persons, Agencies and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Utah State Historic Preservation Office (SHPO)	Consultation for undertakings, as required by the National Historic Preservation Act (NHPA) (16 U.S.C. 470). Section 106 of the NHPA requires the BLM to account for the effects of its undertakings on historic properties. The procedures in 36 CFR Part 800 define how the BLM meets these statutory responsibilities. The National Register Criteria for Evaluation of Significance and procedures for nominating cultural resources to the National Register of Historic Places are outlined in 36 CFR 60.4.	The SHPO was notified of the finding of "no historic properties affected" in a BLM letter dated January 12, 2017. On January 18, 2017, the SHPO concurred with the BLM's determination of eligibility and effect for this undertaking.
Hopi Tribe, Jemez Pueblo Tribe, Navajo Nation, Paiute Tribe, Southern Ute Tribe, Ute Indian Tribe, Ute Mountain Ute Tribe, White Mesa Ute Tribe, Zuni Pueblo Tribe	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 U.S.C. 1531) and NHPA (16 U.S.C. 470)	The BLM sent certified letters on February 27, 2017, to those tribes who historically used this region and/or continue to use the area. The letters explained that no historic properties would be affected. As of the date of this report, the Tribes have not responded with any concerns. Lack of response is interpreted by BLM to indicate that Tribes have no concerns relative to the Proposed Action.

The IDT checklist (**Appendix A**) identifies the BLM staff specialists who reviewed the Proposed Action and contributed to the analysis. BLM staff specialists responsible for resources analyzed in the EA are listed in **Table 5-2**.

Table 5-2: List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Doug Rowles	Team Lead	Technical coordination and quality control, EA preparation, Air Quality
Marie McGann	Planning and Environmental Coordinator	NEPA review

CHAPTER 6

REFERENCES

Bureau of Land Management (BLM). October 2008. Record of Decision and Final Resource Management Plan. Moab Field Office. Moab, Utah.

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APPENDIX A

INTERDISCIPLINARY TEAM CHECKLIST

INTERDISCIPLINARY TEAM CHECKLIST

Project Title: Stronex Salt Wash 2 Application for Permit to Drill

NEPA Log Number: DOI-BLM-UT-Y010-2017-0113-EA

Project Leader: Doug Rowles

DETERMINATION OF STAFF: *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA



The following elements are not present in the Moab Field Office and have been removed from the checklist:
Farmlands (Prime or Unique), Wild Horses and Burros.

Determi- nation	Resource	Rationale for Determination*	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
PI	Air Quality Greenhouse Gas Emissions	Emissions inventory evaluated by BLM Utah State Office.	Doug Rowles	2/14/17
NP	Floodplains	Floodplains are not present in the project area.	David Pals	2/14/17
NI	Soils	Soil loss would not be at a level that requires analysis.	Jordan Davis	2/14/17
NI	Water Resources/Quality (drinking/surface/ground)	Surface water is not present in the project area. Impacts resulting from stormwater runoff would be negligible as proponent has committed to following Gold Book construction standards. Impacts to groundwater are not expected with adherence to Federal and State well construction regulations and best management practices proposed in the drilling plan.	David Pals	2/14/17
NP	Wetlands/Riparian Zones	Resource not present in the project area.	Jordan Davis	2/14/17
NP	Areas of Critical Environmental Concern	See 2008 RMP, Map 21	Katie Stevens	2/14/17
NI	Recreation	Some motorized recreation occurs in the area; the project would result in negligible impacts to that recreation use.	Katie Stevens	2/14/17
NP	Wild and Scenic Rivers	See 2008 RMP, Map 22	Katie Stevens	2/14/17
NI	Visual Resources	Project is located in VRM class IV.	Katie Stevens	2/14/17
NP	National Historic Trails - Old Spanish National Historic Trail (OSNHT)	Not in the vicinity of the OSNHT.	Katie Stevens	2/14/17
NP	BLM Natural Areas	See 2008 RMP, Map 16	Bill Stevens	2/14/17
NI	Socio-Economics	Project size is too small for socio-economic impacts.	Bill Stevens	2/14/17
NP	Wilderness/WSA	See 2008 RMP, Map 15	Bill Stevens	2/14/17
NP	Lands with Wilderness Characteristics	See 2008 RMP, Map 15	Bill Stevens	2/14/17

Determination	Resource	Rationale for Determination*	Signature	Date
NP	Cultural Resources	Field survey revealed that resource is not present in the project area.	Don Montoya	2/14/17
NP	Native American Religious Concerns	Cultural resources are not present in the project area. Native American tribes have not expressed concerns.	Don Montoya	2/14/17
NI	Environmental Justice	No EJ populations impacted.	Bill Stevens	2/14/17
NP	Wastes (hazardous or solid)	Applicant-committed measures and best management practices incorporated into the proposed action adequately mitigate concerns regarding hazardous and solid wastes.	David Pals	2/14/17
NP	Threatened, Endangered or Candidate Animal Species	No habitat in the project area.	Pam Riddle	2/14/17
NI	Migratory Birds	During the 8/25/2016 onsite it was determined that the proposed expansion area offers minimal potential for bird nesting opportunity due to the sparse vegetation in the vicinity of the proposed pad expansion. It was also determined, due to that lacking topography and suitable structures in the area that no suitable raptor nesting habitat exists within 0.5 miles and no suitable owl nesting habitat existed within 0.25 miles of the proposed well pad; therefore, no impacts will occur to nesting migratory birds or raptors. Foraging and wintering birds and raptors that may utilize this areas can easily avoid any future disturbances that may occur on or near this proposed well site. Loss of this sparsely vegetated and previous disturbed habitat will not impact individuals or known populations of birds and raptors in the area, therefore detailed analysis is not required.	Pam Riddle	2/23/17
NI	Utah BLM Sensitive Species	Onsite inspection conducted 8/25/2016 indicated that the proposed project is in an area with low or no potential habitat for all Utah BLM Sensitive Species. Minimal potential for impacts to these species exists due to minimal habitat potential; therefore, detailed analysis is not required.	Pam Riddle	2/23/17
NI	Fish and Wildlife Excluding USFW Designated Species	The operator would avoid construction activities during antelope fawning season (May 1 to June 15). Construction activities outside of the fawning season time may result in displacement of resident antelope that can readily occupy nearby suitable habitats without incurring additional stress. These impacts are not expected to affected antelope populations or individuals to a degree that detailed analysis is required	Pam Riddle	2/23/17
NI	Invasive Species/Noxious Weeds	The proponent is proposing to wash equipment to remove any weed seed and will perform interim and final reclamation of the site.	Jordan Davis	2/14/17
NI	Threatened, Endangered or Candidate Plant Species	The proposed project is in low potential habitat for Jones Cycladenia. Survey was done for Jones Cycladenia and no plants were found.	Dave Williams	2/14/17
NI	Livestock Grazing	No impacts to grazing are expected.	Jordan Davis	2/14/17
NI	Rangeland Health Standards	Reclamation is part of the proposed action.	Jordan Davis	2/14/17
NI	Vegetation Excluding USFW Designated Species	Restoration of the disturbance would restore the vegetative community.	Jordan Davis	2/14/17
NP	Woodland / Forestry	Not present in the project area.	Jordan Davis	2/14/17

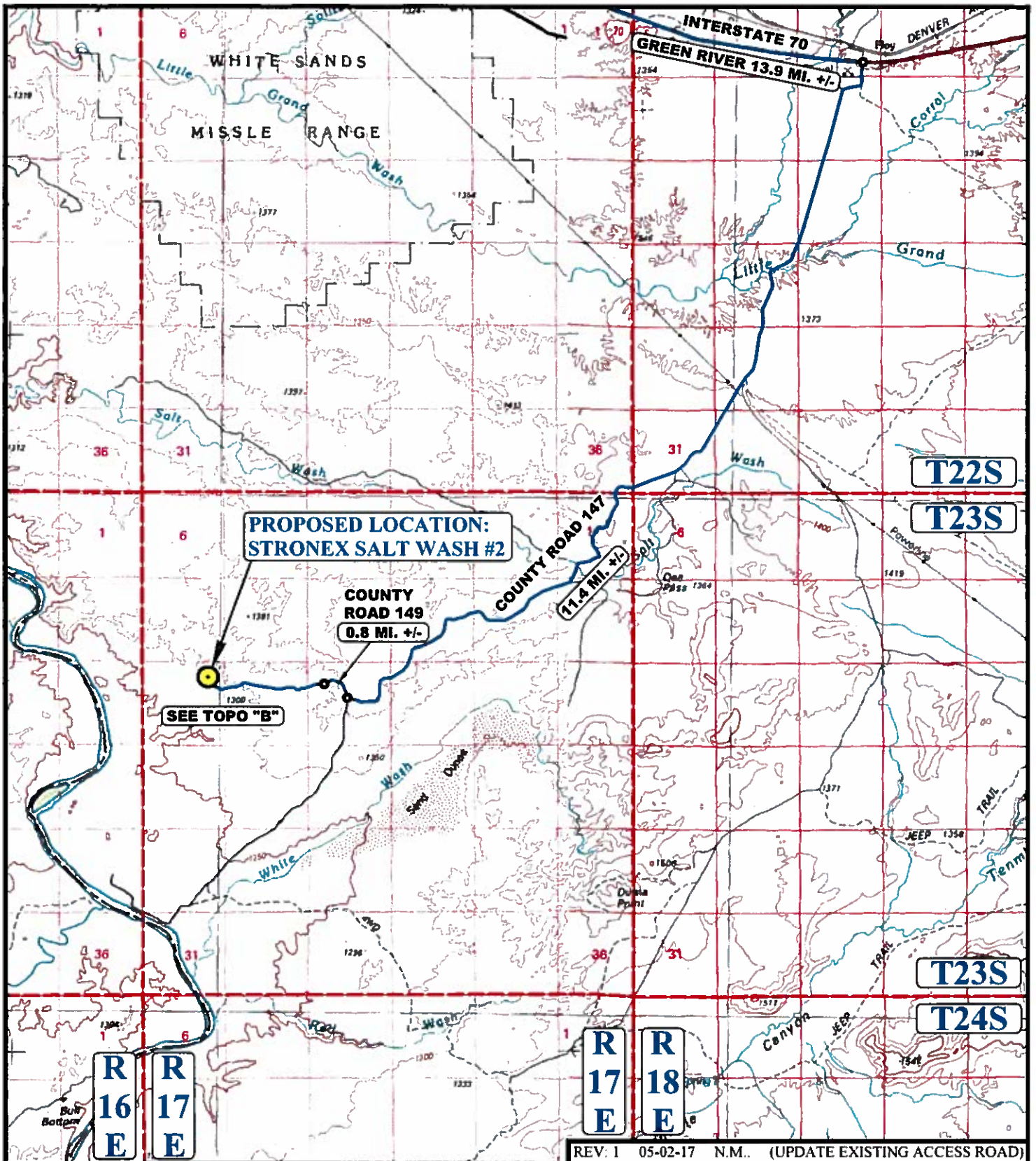
Determination	Resource	Rationale for Determination*	Signature	Date
NI	Fuels/Fire Management	Impacts to fire and fuels are not anticipated. No further detailed analysis needed.	Josh Relph	2/14/17
NI	Geology / Mineral Resources/Energy Production	Impacts to geology and mineral resources are not expected with adherence to Federal and State well construction regulations and best management practices proposed in the drilling plan. Conflicts with other energy production technologies are not expected.	David Pals	2/14/17
NI	Lands	Rights-of way required for the off-lease portions of the pipeline and access road. Project is subject to valid existing rights.	Jan Denney	2/14/17
NP	Paleontology	Paleo survey conducted. No paleo resources identified.	Becky Doolittle	3/15/17

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator		10/27/17	
Authorized Officer		10/27/17	

APPENDIX B

MAPS



REV: 1 05-02-17 N.M. (UPDATE EXISTING ACCESS ROAD)

LEGEND:



PROPOSED LOCATION



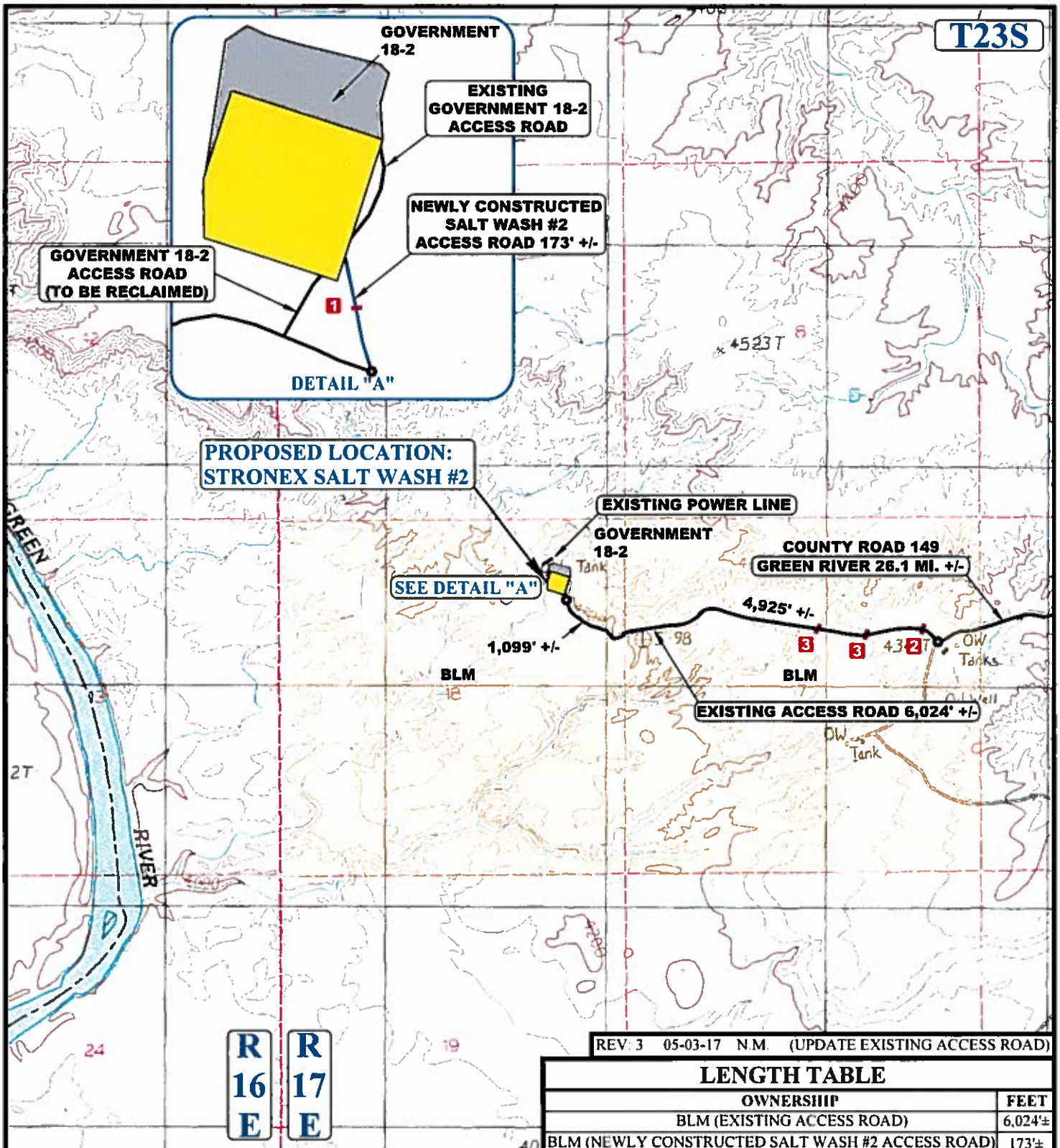
UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



STRONEX RESOURCES, LLC

STRONEX SALT WASH #2
1017' FNL 1002' FEL
NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
GRAND COUNTY, UTAH

SURVEYED BY	B.H.	05-02-17	SCALE
DRAWN BY	N.M.	05-02-17	1 : 100,000
ACCESS ROAD MAP			TOPO A



NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- NEWLY CONSTRUCTED ACCESS ROAD
- EXISTING ROAD
- EXISTING POWER LINE
- 1 EXISTING 36" CULVERT
- 2 EXISTING 24" CULVERT
- 3 EXISTING LOW WATER CROSSING



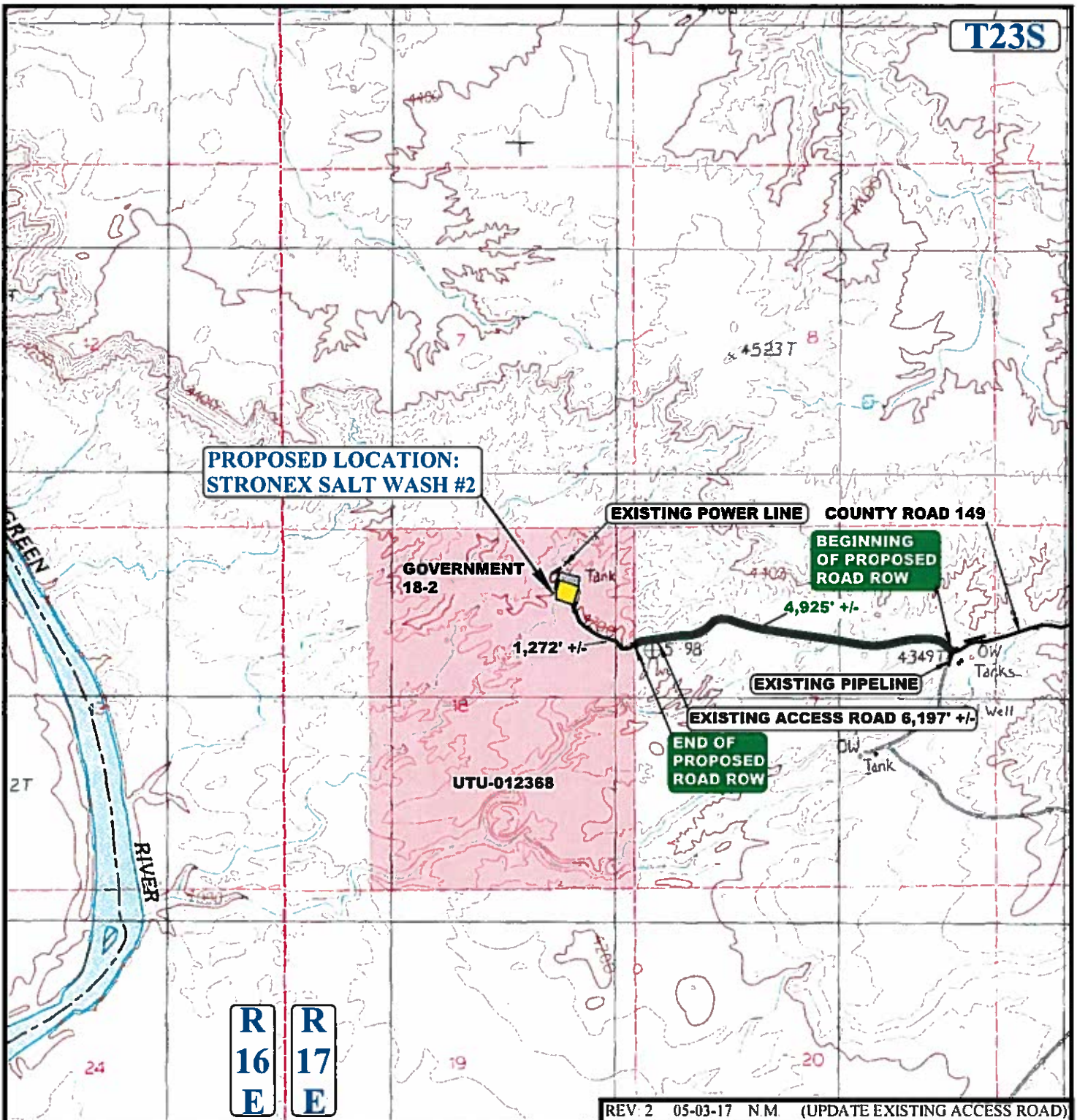
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Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



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STRONEX SALT WASH #2
1017' FNL 1002' FEL
NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
GRAND COUNTY, UTAH

SURVEYED BY	B.H.	05-02-17	SCALE
DRAWN BY	N.M.	05-02-17	1" = 24,000'
ACCESS ROAD MAP		TOPO B	



APPROXIMATE TOTAL ROAD ROW DISTANCE = 4,925' +/-

NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

— EXISTING ROAD
 — PROPOSED ROAD ROW
 - - - EXISTING POWER LINE

BLM LEASE
 UTU-012368



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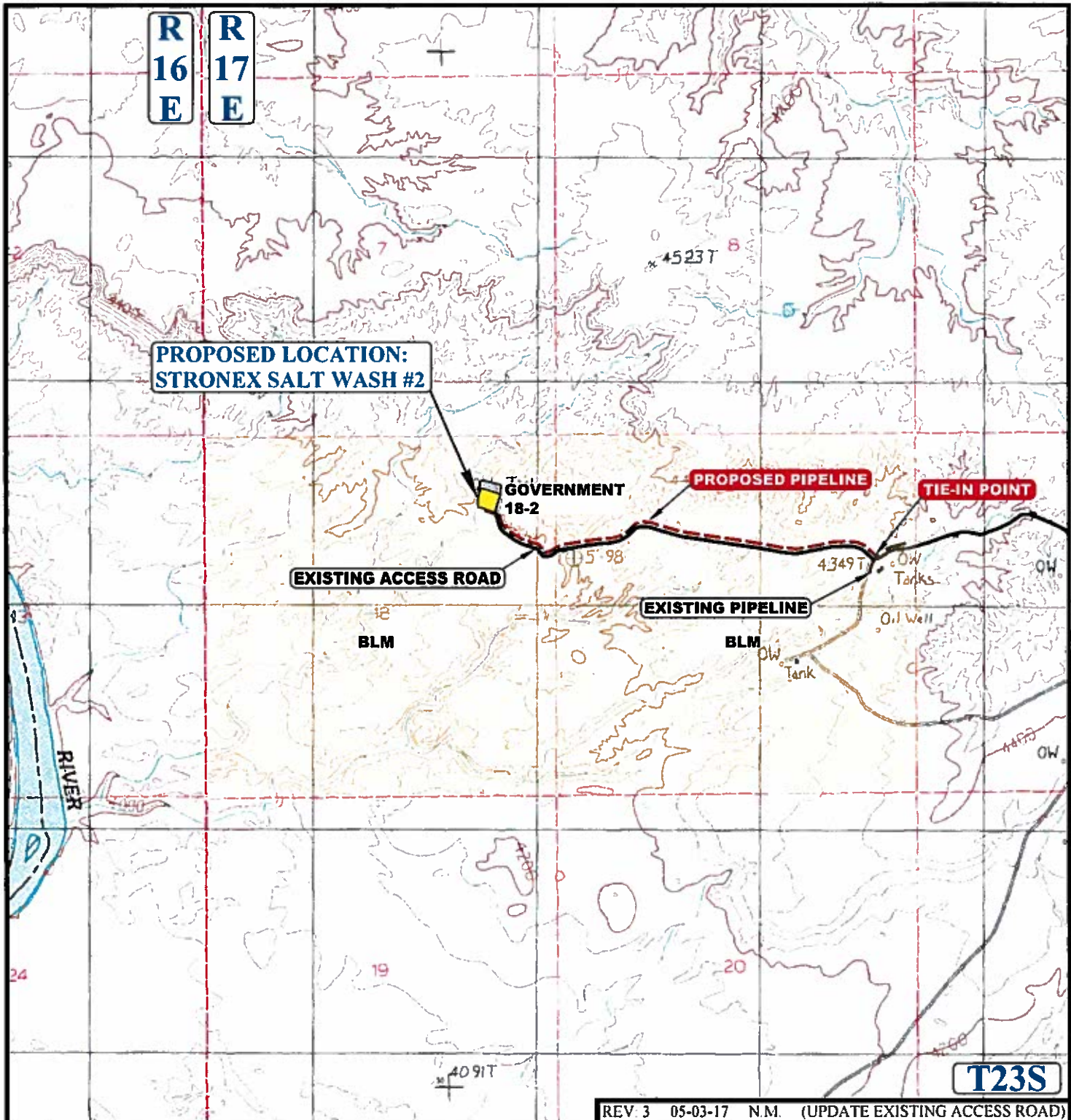
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 1017' FNL 1002' FEL
 NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
 GRAND COUNTY, UTAH

SURVEYED BY	BH, GM	07-12-16	SCALE
DRAWN BY	JLG	11-30-16	1" = 24,000'
BLM ACCESS ROAD ROW MAP			TOPO B1



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 Vernal, UT 84078 * (435) 789-1017

REV 2 05-03-17 N M (UPDATE EXISTING ACCESS ROAD)



APPROXIMATE TOTAL PIPELINE DISTANCE = 6,296' +/-

NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- EXISTING ROAD
- - - PROPOSED PIPELINE
- - - EXISTING PIPELINE



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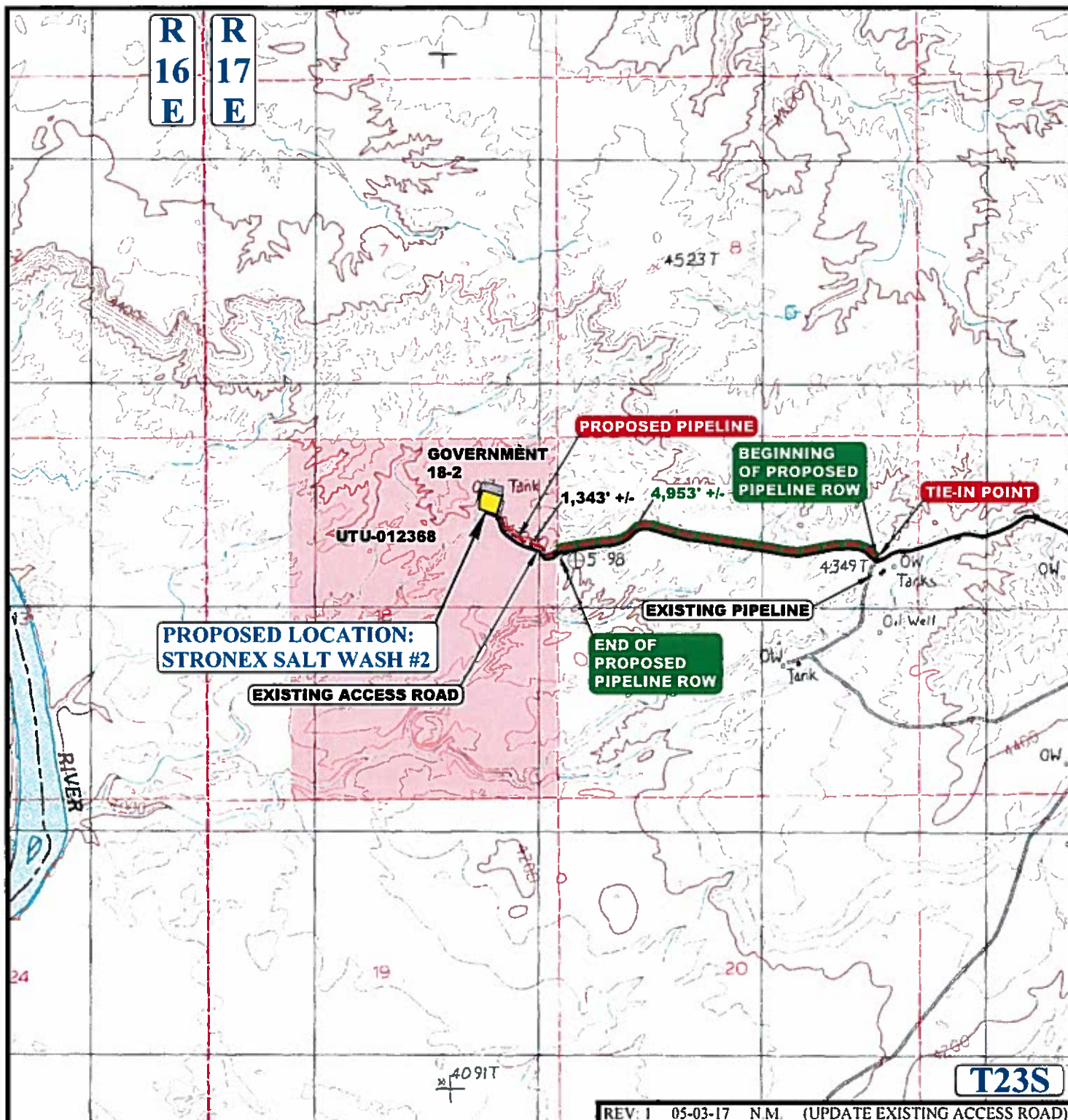
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1017' FNL 1002' FEL
NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
GRAND COUNTY, UTAH

SURVEYED BY	B.H. G.M.	07-12-16	SCALE
DRAWN BY	C.D.L.	09-08-16	1" = 24,000'

PIPELINE MAP

TOPO D



REV: I 05-03-17 N.M. (UPDATE EXISTING ACCESS ROAD)

APPROXIMATE TOTAL PROPOSED PIPELINE ROW DISTANCE = 4,953' +/-

NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- EXISTING ROAD
- PROPOSED PIPELINE ROW
- PROPOSED PIPELINE
- EXISTING PIPELINE

BLM LEASE
UTU-012368



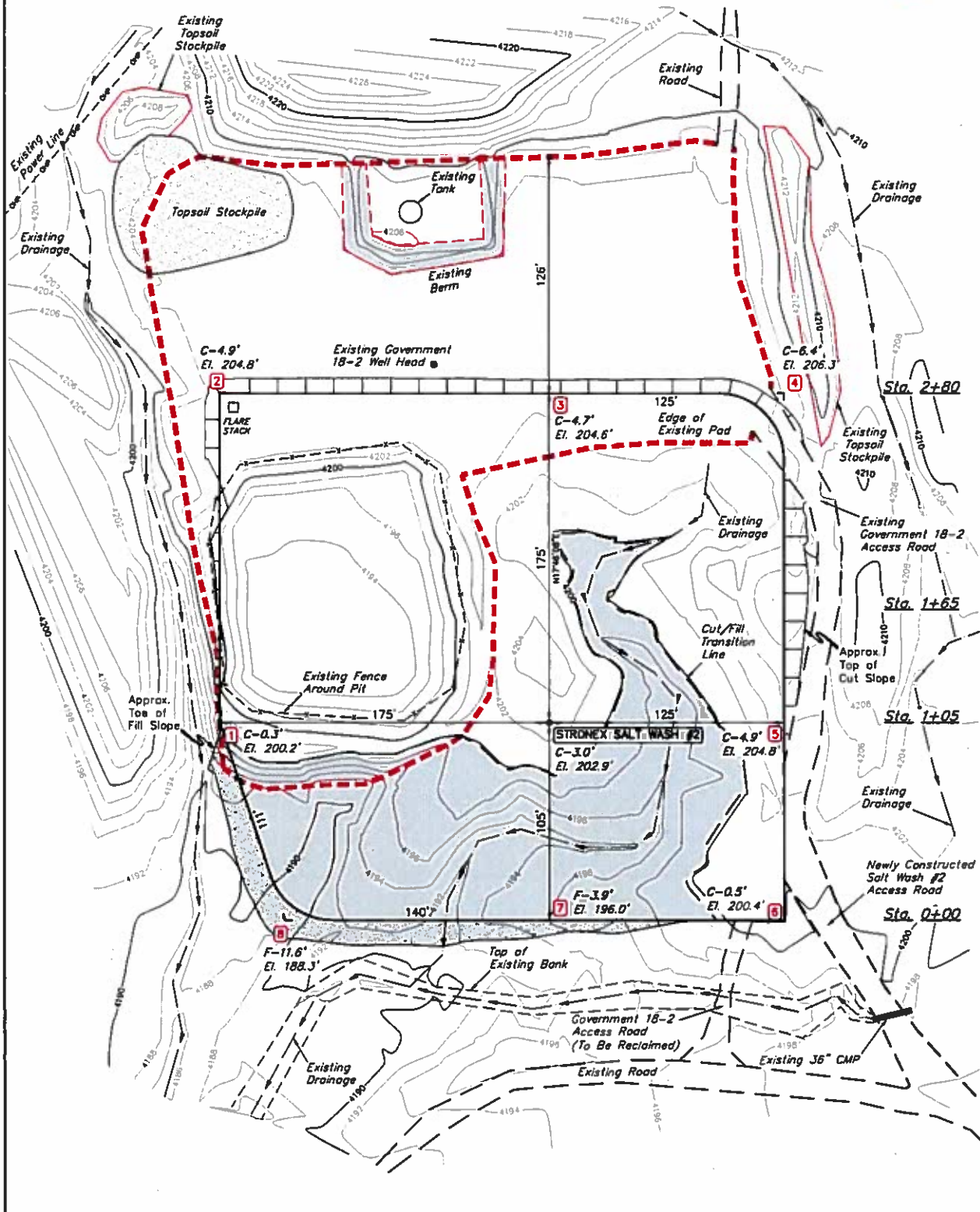
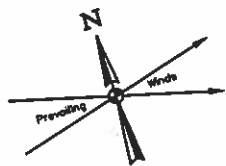
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GRAND COUNTY, UTAH

SURVEYED BY	B.H. G.M.	07-12-16	SCALE
DRAWN BY	C.D.L.	09-08-16	1" = 24,000'
BLM PIPELINE ROW MAP			TOPO D1



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FINISHED GRADE ELEVATION = 4199.9'

REV. 3 05-02-17 D.P. (UPDATED ACCESS ROAD)

- NOTES:
- Flare stack is to be located a min. of 125' from the wellhead
 - Round corners at 35' radius or as needed
 - Construct diversion ditches as needed
 - Contours shown at 2' intervals
 - Cut/Fill slopes 1:2 (typ. except where noted)
 - Unrighted utilities shown on this sheet are for visualization purposes only; actual locations to be determined prior to construction

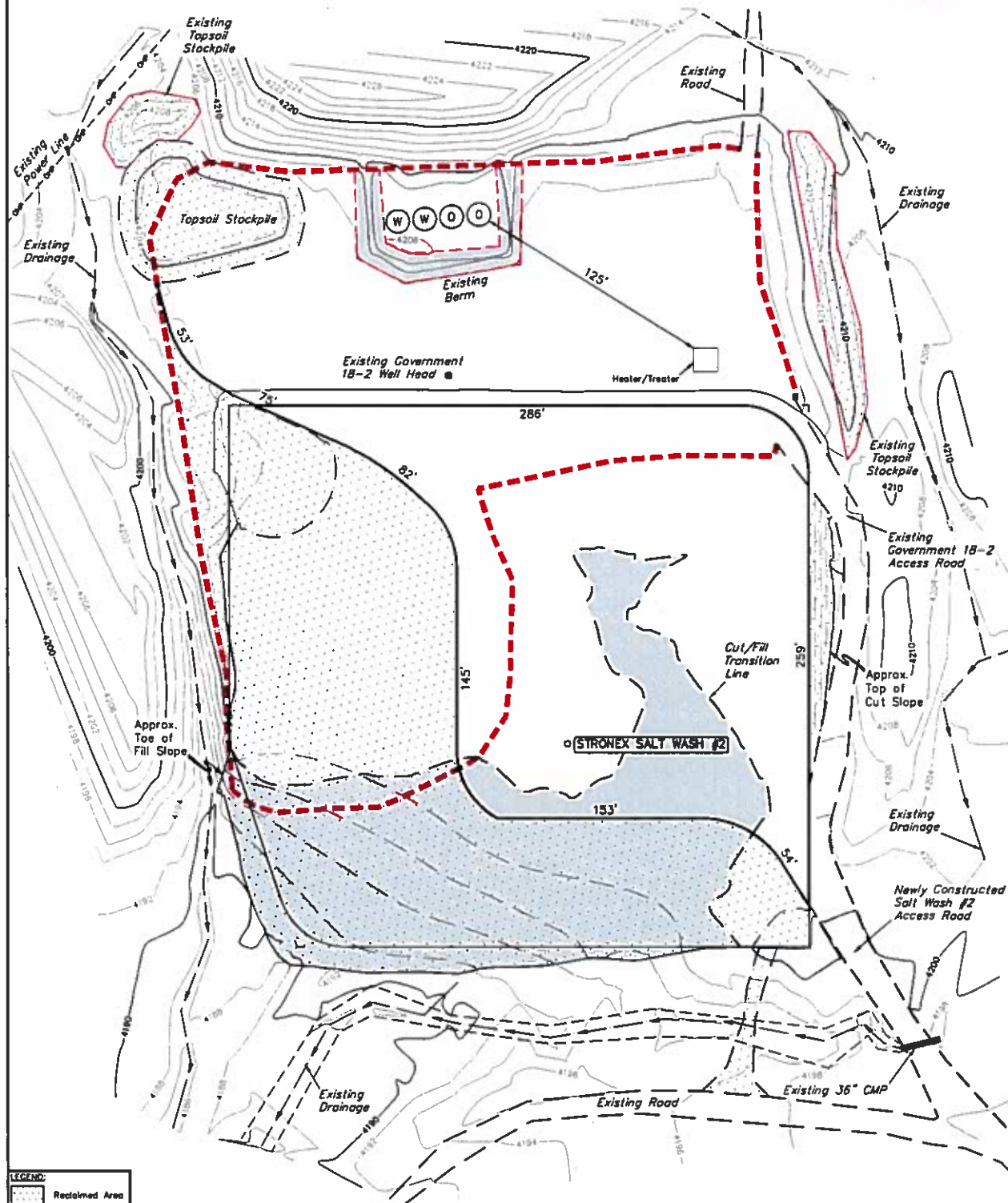
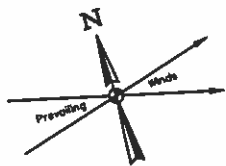


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NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
GRAND COUNTY, UTAH

SURVEYED BY	B.H. G.M.	07-12-16	SCALE
DRAWN BY	S.P.	07-13-16	1" = 50'
LOCATION LAYOUT		FIGURE #1	



LEGEND:
 Reclaimed Area

APPROXIMATE PRODUCTION PAD ACREAGE
 (EXISTING CONSTRUCTION) = ±1.151 ACRES
 APPROXIMATE RECLAIMED AREA ACREAGE
 (EXISTING CONSTRUCTION) = ±0.640 ACRES
 TOTAL ACREAGE = ±1.791 ACRES

APPROXIMATE PRODUCTION PAD ACREAGE
 (NEW CONSTRUCTION) = ±0.698 ACRES
 APPROXIMATE RECLAIMED AREA ACREAGE
 (NEW CONSTRUCTION) = ±0.574 ACRES
 TOTAL ACREAGE = ±1.272 ACRES

APPROXIMATE RECLAIMED
 ROAD ACREAGE = ±0.020

REV 2 05-02-17 D.P. (UPDATED ACCESS ROAD)

NOTES:

• Contours shown at 2' intervals.



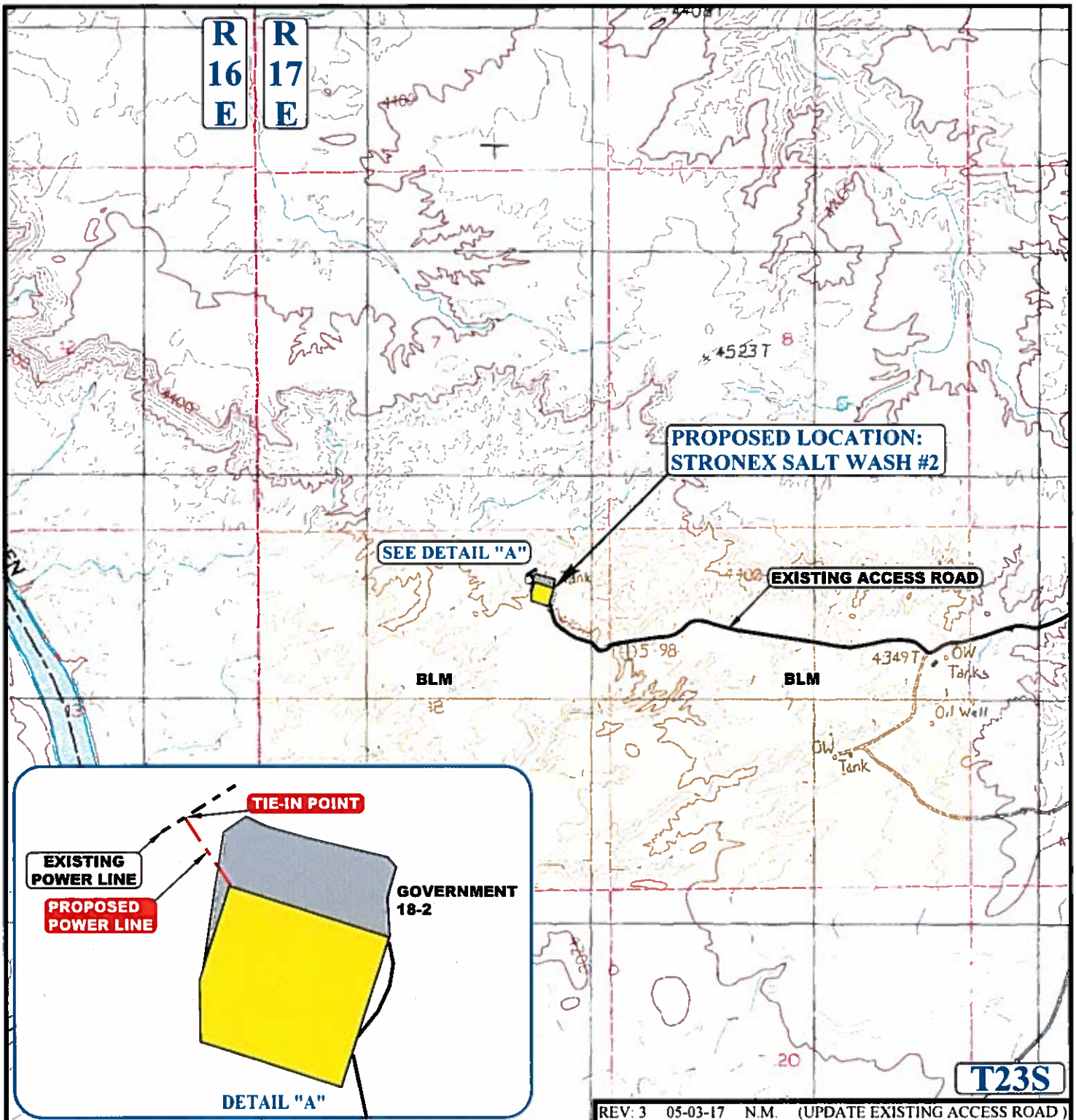
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 GRAND COUNTY, UTAH

SURVEYED BY	J.H. G.M.	07-12-16	SCALE
DRAWN BY	S.P.	09-20-16	1" = 50'

PRODUCTION FACILITY LAYOUT FIGURE #4



APPROXIMATE TOTAL POWER LINE DISTANCE = 149' +/-

NOTE: PARCEL DATA SHOWN HAS BEEN OBTAINED FROM VARIOUS SOURCES AND SHOULD BE USED FOR MAPPING, GRAPHIC AND PLANNING PURPOSES ONLY. NO WARRANTY IS MADE BY UINTAH ENGINEERING AND LAND SURVEYING (UELS) FOR ACCURACY OF THE PARCEL DATA.

LEGEND:

- EXISTING ROAD
- PROPOSED POWER LINE
- EXISTING POWER LINE



UELS, LLC
Corporate Office * 85 South 200 East
Vernal, UT 84078 * (435) 789-1017



STRONEX RESOURCES, LLC

STRONEX SALT WASH #2
1017' FNL 1002' FEL
NE 1/4 NE 1/4, SECTION 18, T23S, R17E, S.L.B.&M.
GRAND COUNTY, UTAH

SURVEYED BY	B.H. G.M.	07-12-16	SCALE
DRAWN BY	C.D.L.	07-18-16	1" = 24,000'
POWER LINE MAP			TOPO E