



TEP Rocky Mountain LLC
1058 County Road 215
Parachute, CO 81635

January 22, 2019

Jeff Robbins
Acting Director
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, CO 80203

RE: 502.b. Variance Request from Rule 907.e.(1) to transport drill cuttings from the DOE 1-M-18 pad (Loc ID # 335744, Lot 4 Sec 17, T6S-R94W) to the DOE 1-M-18 Cutting Cuttings Management Area (Loc ID# 456106, Lot 5 Sec 17, T6S-R94W) and the Clough RWF 44-18 pad (Loc ID# 335146, SESE Sec 18, T6S-R94W).

Dear Mr. Robbins,

TEP Rocky Mountain LLC ("TEP") requests approval of a variance under Rule 502.b. from Rule 907.e.(1) to obtain permission to transport drill cuttings from the DOE 1-M-18 pad (Loc ID # 335744) to the DOE 1-M-18 Cutting Management Area (Loc ID# 456106, Lot 5 Sec 17, T6S-R94W) and the Clough RWF 44-18 pad (Loc ID# 335146, SESE Sec 18, T6S-94W).

Rule 907.e.(1). states that "Oily waste may be treated or disposed as follows:

- A. Disposal at a commercial solid waste disposal facility;
- B. Land treatment onsite; or
- C. Land treatment at a centralized E&P waste management facility permitted in accordance with Rule 908"

TEP is requesting permission to transport approximately 5,000 cubic yards of drill cuttings generated from 15 wells on the DOE 1-M-18 pad to the DOE 1-M-18 Cutting Management Area and the Clough RWF 44-18 pad for disposal. The first well spud on the DOE 1-M-18 is scheduled for the end of March 2019.

This variance request will address Rule 907.e.(1) and demonstrate TEP's good faith effort to comply with the rule. This request is required due to A) the limited size and topographic constraints of the DOE 1-M-18 well pad for land treatment onsite, B) the adverse and unacceptable safety and environmental risks associated with transporting cutting to an off-site commercial disposal facility, and C) to reduce inefficiency and costs associated with transportation-related risks. Additionally, permitting the DOE 1-M-18 Cutting Management Area or the Clough RWF 44-18 pad as a Centralized E&P waste management facility is not reasonable given the location and access of these pads, the time required to permit and construct an E&P facility, and the short-term nature of this project. Please refer to the proposed drill cuttings management plan and layout drawing for additional information.

The DOE 1-M-18 and DOE 1-M-18 Cuttings Management Area are located on Federal surface (U.S. Bureau of Land Management ("BLM")) and the Clough RWF 44-18 is located on fee surface (Clough Sheep Company, LLC); land owner approval letter is attached. The DOE 1-M-18 and Clough RWF 44-

18 are existing oil and gas locations, and the DOE 1-M-18 Cutting Management Area is a new location.

The DOE 1-M-18 is located on a steep side-slope of an unnamed gulch that is directly below East Anvil Points north of Interstate 70. During initial planning of the project TEP consulted with BLM to identify a reasonable pad size and cuttings management plan that would meet requirements. Due to the extremely steep terrain and topography, the size of the DOE 1-M-18 multi-well pad is limited and there is no room for onsite land treatment of cuttings.

The DOE 1-M-18 Cuttings Management Area was planned and permitted to provide a reasonable location to store a portion of the cuttings, and the Clough RWF 44-18 was planned to manage the remaining cuttings. During the planning of the DOE 1-M-18 pad, BLM expressed a strong desire to beneficially re-use cuttings to improve their own reclamation at the DOE 1-M-18 Cuttings Management area, where the former Anvil Points oil shale processing facility was located. BLM completed and issued a Section 390 Categorical Exclusion (SCX) on August 3, 2018 which outlined and approved the cuttings management plan, identifying the DOE 1-M-18 Cuttings Management Area and Clough RWF 44-18 Drilling Pit (see attached an approved APD and the SCX).

The DOE 1-M-18 Cutting Management Area Form 2A (Doc# 401671641) was approved on July 22, 2018 and the Clough RWF 44-18 Form 2A (Doc# 401705291) was placed "ON HOLD" on September 19, 2018 pending additional information. TEP designed and constructed the DOE 1-M-18 pad with the least impact to total surface disturbance adjacent to steep slopes per Rule 1002.d., as well as to limit the amount of disturbance on Federal land. As a result, there is no space available for onsite disposal of cuttings, which is the preferred method to manage and dispose of drill cuttings.

The topographical challenges and steep slopes also present safety and environmental issues with pad access and transporting cuttings to off-site commercial disposal facilities, including impacts related to increased truck traffic and hauling long distance on county roads and highways. Access to the DOE 1M-18 pad is a narrow, single lane dirt road that travels through the bottom of the unnamed gulch along a steep road with blind corners, congestion and limited visibility. TEP estimates a total of 500 total truck trips are required for disposal and identified potential commercial disposal options, including the Garfield County Landfill and Green Leaf Environmental Services. Transporting to the Garfield County Landfill would result in more than 2,500 total vehicle miles; transporting to Green Leaf results in more than 32,250 miles. Additionally, the added miles of disposal add four times the cost to haul and dispose at the Garfield County Landfill and more than five times the cost to haul and dispose at Green Leaf (please see area map attached).

TEP is requesting to transport drill cuttings by truck approximately 0.5 miles to the DOE 1-M-18 Cuttings Management Area and approximately 1 mile to the Clough RWF 44-18 pad where a drilling pit will be constructed, and drill cuttings will be managed as described in the attached Drill Cuttings Management Plan. In both cases TEP is concerned the accumulated number of miles on narrow roads with steep grades exacerbates risks and worker safety associated with transporting cuttings. TEP believes it is critical to minimize the number and distance of truck loads transporting drill cutting for disposal.

In summary, TEP believes that relocating and managing drill cuttings from the DOE 1-M-18 pad to the DOE 1-M-18 Cuttings Management Area and Clough RWF 44-18 pad is the preferred option and requests approval of the variance for the following reasons:

- On-site treatment is impossible due to the physical constraints of existing pads in topographically challenging locations;

- The impacts associated with transporting cuttings to commercial disposal versus nearby off-location disposal pose unacceptable safety risks to workers and the public, and unnecessary costs to the overall project;
- Environmental risk and impacts increase with the longer distances that these cuttings are hauled. Disposal and management of cuttings at the DOE 1-M-18 Cuttings Management Area and the RWF 44-18 drilling pit are the closest options for transportation and management of these drill cuttings. The shorter haul distance will minimize potential spills and related clean-up actions, minimize impacts upon and disturbances to wildlife, and will reduce vehicle emissions associated with trucking longer distances and generation of fugitive dust emissions; and
- Disposal of drill cuttings from these locations at an existing TEP permitted Centralized E&P facility is not practical given the remote and isolated location of the projects.

TEP believes that we have made good faith, diligent efforts to comply with Rule 907.e.(1). and feel that the variance to this rule as described herein allows for the safe, compliant, and most efficient method to manage drill cuttings from these locations.

TEP appreciates your expedited review and consideration of our variance request. If you have any questions or concerns, please contact me directly at 970-263-2736.

Sincerely,



Jeffrey D. Kirtland
Regulatory Lead

Enclosures



TEP Rocky Mountain LLC
1058 County Road 215
Parachute, CO 81635

April 24, 2018

Clough Sheep Company LLC
Attn: Mr. Dan Snyder
PO Box 686
Rifle, Colorado 81650

RE: Frac Pad (RMV 143-18) and Cuttings Trench (RWF 44-18) Letter Agreement
Township 6 South, Range 94 West, 6th P.M.
Section 18: NW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$
Garfield County, Colorado

Dear Mr. Snyder:

TEP Rocky Mountain LLC (TEP) is proposing to drill twenty-eight (28) new wells on the existing DOE 1-M-18 pad located on the BLM tract adjacent to your property. TEP respectfully requests to utilize a new cuttings trench on the existing RWF 44-18 pad for the extra drill cuttings from the DOE 1-M-18 location (Cuttings Trench). To expedite the completion process of those wells, TEP respectfully requests to utilize the existing RMV 143-18 as a frac pad (Frac Pad) for the DOE 1-M-18 wells. The attached Exhibit "A" depicts the location of the Frac Pad and Cuttings Trench. Once TEP is finished utilizing the Frac Pad and Cuttings Trench, TEP shall promptly reclaim the Frac Pad and Cuttings Trench and utilize a seed mix approved by you.

If you have any questions or concerns, please contact Bryan Hotard at (970) 263-2754 (office) or (970) 361-2006 (cell).

Please sign below to document your acceptance of this Frac pad and Cuttings Trench Letter Agreement

Sincerely,

TEP Rocky Mountain LLC

Tiffany C. Pollock
Vice President of Land

AGREED TO AND ACCEPTED THIS 24th DAY OF APRIL 2018.

Clough Sheep Company, LLC

Name: Dan Snyder
Title: Manager

Exhibit "A" (1 of 2)
 Frac Pad (RMV 143-18)



Pad acreage – 2.40 acres

Legend

- Proposed Daylight Line
- Proposed Pad or Pit
- Existing Well
- Proposed Limit of Disturbance
- Parcel Ownership (Garfield County)
- Existing Road
- Existing Pad

TEP Rocky Mountain LLC

RMV 143-18 Frac Pad
Clough Sheep Company, LLC
T6S R94W, Section 18, NWSE

March 22, 2018



Exhibit "A" (2 of 2)
 Cuttings Trench (RWF 44-18)



Pad acreage - 2.04 acres

- Legend**
- Proposed Daylight Line
 - Proposed Pad or Pit
 - Existing Well
 - Existing Production Equipment
 - Existing Fence
 - Parcel Ownership (Garfield County)
 - Existing Road
 - Existing Pad

TEP Rocky Mountain LLC
RWF 44-18 Cuttings Trench
Clough Sheep Company, LLC
T6S R94W, Section 18, SESE

March 22, 2018



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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. COC062160		6. If Indian, Allottee or Tribe Name	
7. If Unit or CA Agreement, Name and No. COC042346		8. Lease Name and Well No. FEDERAL RWF 411-17(1-M-1)	
9. API Well No.		10. Field and Pool, or Exploratory RULISON	
11. Sec., T. R. M. or Blk. and Survey or Area SEC 17 / T6S / R94W / 6PM		12. County or Parish GARFIELD	13. State CO
14. Distance in miles and direction from nearest town or post office* 8 miles	15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 1952 feet	16. No. of acres in lease 2572.99	17. Spacing Unit dedicated to this well 10
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 291 feet	19. Proposed Depth 8953 feet / 8994 feet	20. BLM/BIA Bond No. on file FED: COB000480	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6175 feet	22. Approximate date work will start* 03/01/2019	23. Estimated duration 21 days	

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Vicki Schoeber / Ph: (970)263-2721	Date 06/20/2018
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Title
Regulatory Specialist

Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Gloria A Tibbetts / Ph: (970)876-9004	Date 08/03/2018
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Title
Assistant Field Manager
Office
COLORADO RIVER VALLEY (GLENWOOD)

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)



U.S. Department of the Interior
 Bureau of Land Management
 Colorado River Valley Field Office
 2300 River Frontage Road
 Silt, Colorado 81652

Section 390 Categorical Exclusions for Oil and Gas Development, Exclusion No. 1

NEPA LOG NUMBER: DOI-BLM-CO-N040-2018-0079-CX (390)

A. Background

BUREAU OF LAND MANAGEMENT (BLM) OFFICE: Colorado River Valley Field Office (CRVFO)

CASEFILE/PROJECT NUMBER: Federal Lease COC62160

PROPOSED ACTION TITLE/TYPE: DOE 1-M-18 Project: 15 Federal oil and gas wells on the existing DOE 1-M-18 well pad located on BLM land west of Rifle in Garfield County, Colorado (**Table 1**).

APPLICANT: TEP Rocky Mountain LLC (“TEP”). Contacts: Adam Tankersley and Bryan Hotard, 1085 County Road 215, Parachute, CO 81635.

LOCATION OF THE PROPOSED ACTION: Township 6 South (T6S), Range 94 West (R94W), Section 17, Lot 4 and Section 18, NE¹/₄NE¹/₄, Sixth Principal Meridian. The project area is located 1-1¹/₄ miles north of Garfield County’s Anvil Points landfill and generally situated about 7 miles west of Rifle, Garfield County, Colorado (**Figure 1**).

BACKGROUND: The DOE 1-M-18 pad was initially constructed in 1994 by the Department of Energy for the drilling and completion of two natural gas wells. The DOE 1-M-8 well was spudded in September 1994 and the DOE 1-M-18 well was spudded in November 1994. Production ceased on the DOE 1-M-18 well in 2002 while gas production was sustained on the DOE 1-M-8 well until December 2007, when the gathering line was taken out-of-service to avoid the oil shale tailings remediation project conducted between 2008 and 2012 as part of the DOE land transfer to the BLM. The DOE 1-M-18 well was plugged and abandoned in 2011 while the DOE 1-M-8 well is temporarily abandoned with a requirement for well plugging prior to any new well development work on the pad. The proposed cuttings management area would occur within a portion of the remediated, reclaimed oil shale project in Section 17, Lots 5 and 26, adjacent to the access road about 2/3 mile south of the DOE 1-M-18 pad (**Figure 1**).

Drilling of 10 directional wells on the DOE 1-M-18 pad was previously analyzed in the Wheeler to Webster Geographic Area Plan and Environmental Assessment (#CO140-2005-047) approved May 2005.

Table 1. Existing and Proposed DOE 1-M-18 Wells						
<i>Pad Name</i>	<i>Lease Number</i>	<i>CA</i>	<i>Well Name</i>			
DOI 1-M-18	COC62160 Proposed Wells	NA	RWF 43-7	RWF443-7	RWF 513-8	RWF 514-8
			RWF 414-8	RWF 343-8	RWF 314-8	RWF 442-18
		COC42346	RWF 511-17	RWF 411-17	RWF 311-17	RWF11-17
			RWF 512-17	RWF 412-17	RWF 14-17	RWF
COC62160 Existing Wells	NA	DOE 1-M-18 (P&A)				

TEP Rocky Mountain LLC
 15 Federal Wells on Existing DOE 1-M-18 BLM Pad
 DOI-BLM-CO-N040-2018-0079-SCX1

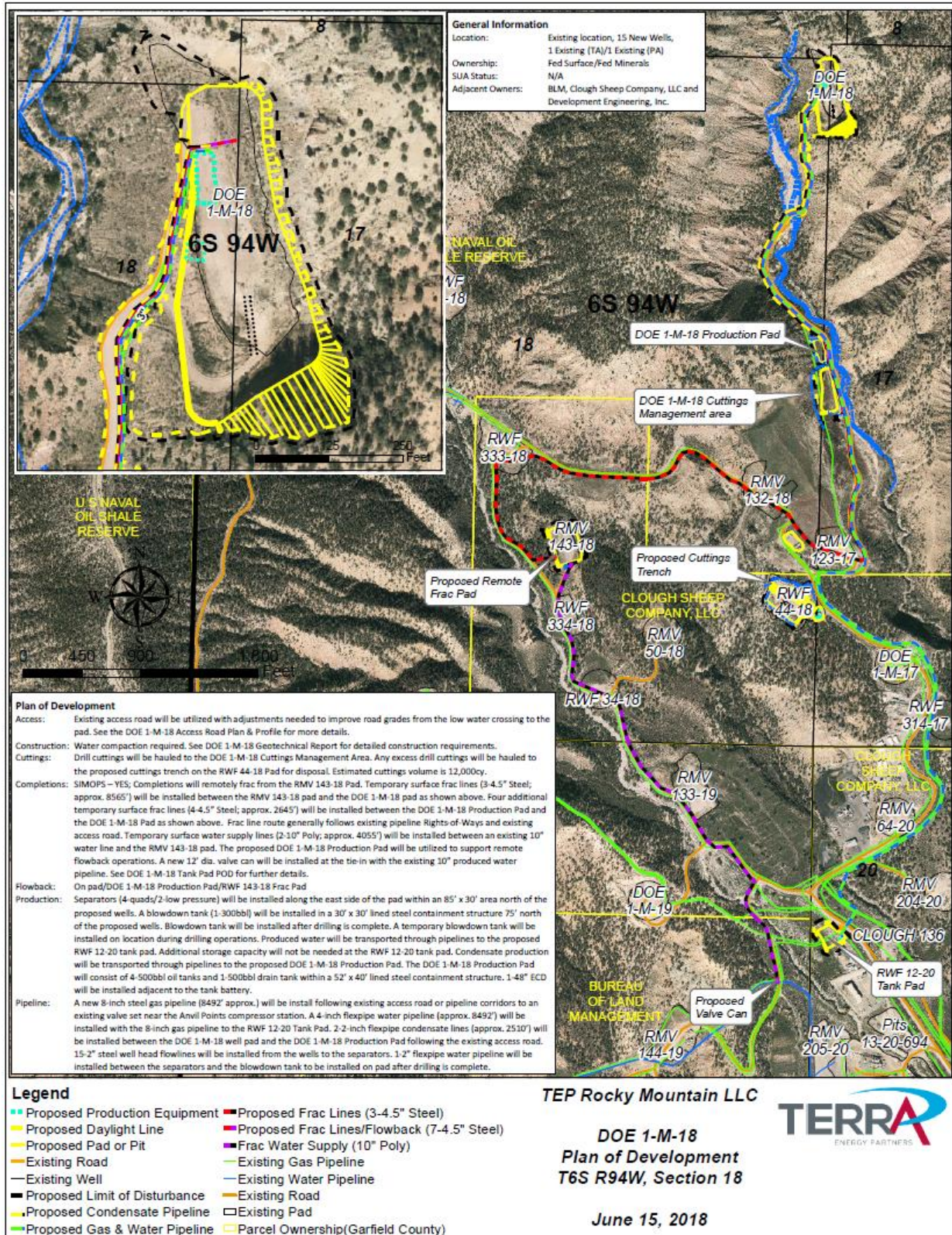


Figure 1. DOE 1-M-18 Plan of Development

DESCRIPTION OF PROPOSED ACTION: Fifteen new Federal directional wells would be drilled, completed, and produced on the existing DOE 1-M-18 pad, which would disturb approximately 4.83 acres, including 0.75 acre of new disturbance at the southern edge of the site (**Figure 2 and Table 2**).

The pad sets on a sideslope of the relatively narrow Sharrard Creek canyon, typified with continuous sandstone bands protruding from steep shale deposits typically found at the base of the Roan Plateau. The pad was initially constructed using common cut-and-fill excavation techniques that created a tall (100+ foot) yet stable cutslope anchored by sandstone cliffs and long sparsely vegetated fills that trail downslope to the drainage. The eastern and northern faces of the existing pad would remain undisturbed except for rockfall mitigation involving removal of boulders with a trackhoe or explosives. The boulders are perched precariously along the basal slope of the cutslope. A rocky precipice located above the northeastern pad corner would be removed with explosives to ensure safe development operations on the pad site. The western and southern edges of the pad would be re-disturbed and designed to create additional space for drilling as noted on **Figures 1 and 2**. An engineered 0.25:1 fillslope would be constructed along most of the western edge using geogrid materials and shallow compaction lifts; a geotechnical engineer would inspect the fillslope construction regularly during construction. The southern face of the pad would be laid back to a 1:1 slope. None of the pad expansion would be visible from any vantage other than the site itself or from the Roan Plateau overlooks.

The access road to the site originates at a junction with the paved Garfield County Road 246 north of the new RWF 12-20 Tank Pad. The private access road winds northward past the oil shale remediation site to gain elevation and to access the private and Federal well sites included in this project. A low-water crossing of the ephemeral drainage is located approximately 0.25 mile southwest of the DOE 1-M-18 pad. Efforts to maintain a culvert crossing have failed due to repeated debris flows from periodic localized high-intensity summer thunderstorms. The access road would undergo improvements, including minor realignment and culvert/storm water structure installations on BLM land for approximately 4,393 feet resulting in disturbance (1.85 acres) within the existing road corridor. Including another 20 feet on BLM land and 340 feet on private land, the total road disturbance would be 2.01 acres (**Table 2**).

Buried pipelines (an 8-inch-diameter welded steel natural gas line, a 4-inch-diameter flanged Flexpipe produced water line, and two 2-inch-diameter Flexpipe condensate lines) would be collocated in the same trench and installed at the same time between the DOE 1-M-18 pad and the new DOE 1-M-18 Production Pad for a length of 2,510 feet on BLM land. The condensate (oil) lines would terminate at the storage tanks on the production pad, with oil being hauled after sales via truck to market. Collocated gas and water lines would be buried within and alongside existing roads to the RWF 12-20 Tank Pad on private land near the valley floor. Total pipeline length would be 8,493 feet, resulting in 5.19 acres of disturbance, with 1.72 acres being on BLM land (**Table 2**).

To support remote well completions for the 15 directional wells, TEP would install three 4.5-inch-diameter welded steel surface frac (hydraulic fracturing) delivery lines (8,565 feet in length) between the RMV 143-18 remote frac pad and the DOE 1-M-18 Production Pad where remote flowback equipment would be staged. Four 4.5-inch-diameter welded steel surface lines (2,645 feet in length) would be laid alongside the existing access road between the production pad and the DOE 1-M-18 pad to further collect and deliver fluids supporting the frac stages of the new wells. No surface disturbance would be allocated for the use of these surface lines.

Two 10-inch-diameter fused poly water delivery lines (4,055 feet in length) would be laid on the surface between an existing water line connection in the SE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 19 and the RMV 143-18 pad (**Figure 1**). A BLM Temporary Use Permit (TUP) would be issued for the installation and use of these surface water lines across 554 feet of BLM land in T6S, R94W, Section 19, SE $\frac{1}{4}$ NE $\frac{1}{4}$.

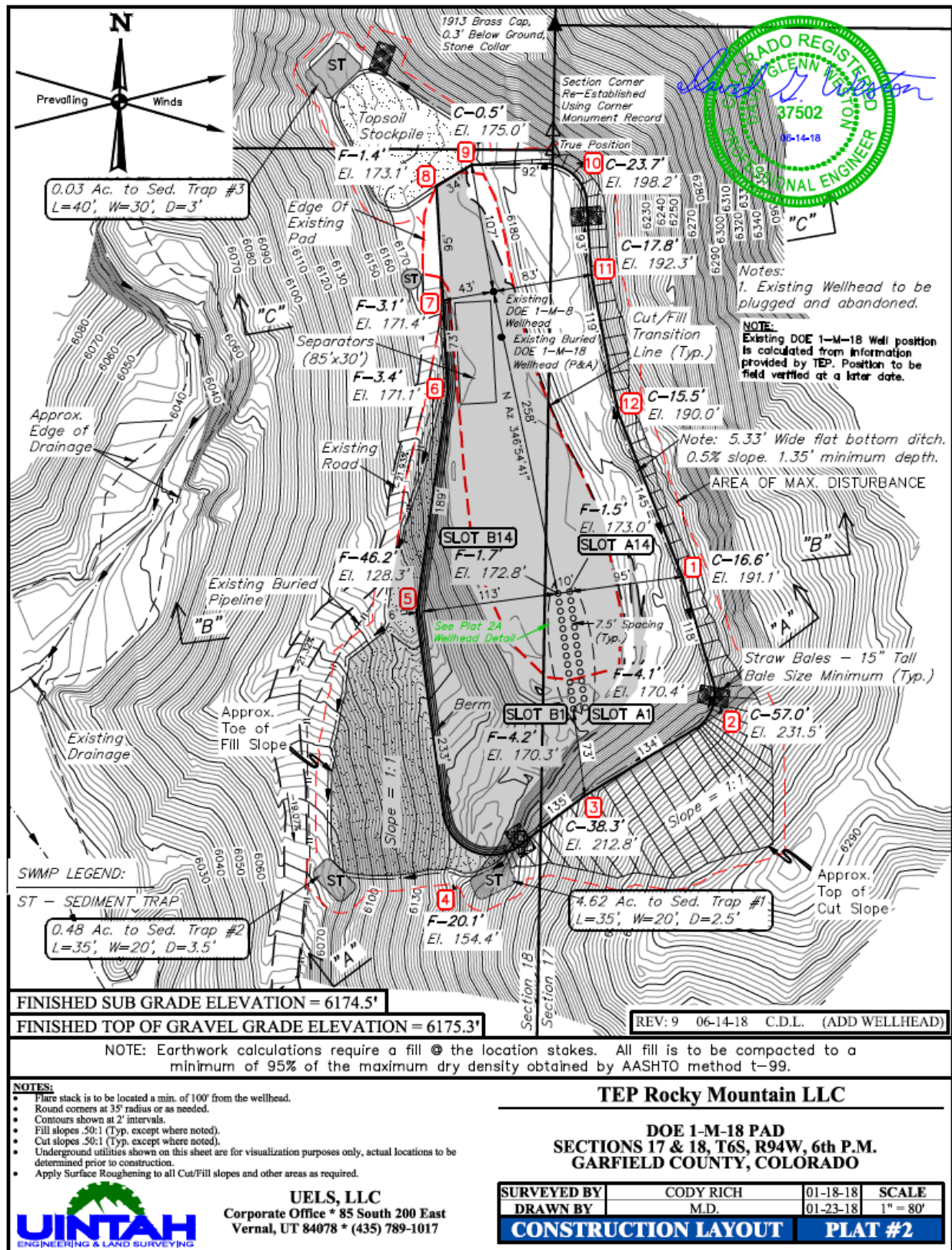


Figure 2. DOE 1-M-18 Construction Layout on BLM Land

Table 2. Proposed Disturbance Resulting from Project Components

<i>Well Pad</i>	<i>Surface Ownership</i>	<i>Length (feet) Fed/Pvt</i>	<i>Existing Disturbance (acres) Fed/Pvt</i>	<i>Re-disturbance (acres)</i>	<i>New Disturbance (acre) Fed/Pvt</i>	<i>Total Short-term (acres) Fed/Pvt</i>	<i>Total Long-term (acres)</i>
Well Pad/Support Pads ¹							
DOE 1-M-18 Pad	Federal	NA	0.78/0	3.30/0	0.75/0	4.83/0	1.34
DOE 1-M-18 Production Pad	Federal	NA	0/0	0.56/0	0/0	0.56/0	0.30
DOE 1-M-18 Cuttings Area	Federal	NA	0/0	1.65/0	0/0	1.65/0	0/0
RWF 44-18 Cuttings Trench	Private	NA	0/0.56	0/2.08	0/0	0/2.64	0/0.56
RMV 143-18 Frac Pad	Private	NA	0/0.34	0/1.71	0/0.08	0/2.13	0/0.34
RWF 12-20 Tank Pad ²	Private	NA	0/0	0/0	0/1.17	0/1.17	0/0.48
Subtotal			0.78/0.90 (= 1.68)	5.51/3.79 (= 9.30)	0.75/1.25 (= 2.00)	7.04/5.94 (= 12.98)	1.64/1.38 (= 3.02)
Access Roads^{0.75/}							
DOE 1-M-18 Pad (existing)	Federal	4,393/0	1.85/0	0/0	0/0	1.85/0	1.85/0
DOE 1-M-18 Production Pad	Federal	20/0	0/0	0.01/0	0/0	0.1/0	0.1/0
RWF 44-18 Cuttings Trench (existing)	Private	0/35	0/0.04	0/0	0/0	0/0.04	0/0.04
RMV 143-18 Frac Pad (existing)	Private	0/255	0/0.09	0/0	0/0	0/0.09	0/0.09
RWF 12-20 Tank Pad ²	Private	0/50	0/0	0/0	0.0.02	0/0.02	0/0.02
Subtotal		4,413/340 (= 4,753)	1.85/0.13 (= 1.98)	0.01/0 (= 0.01)	0/0.02 (= 0.02)	1.86/0.15 (= 2.01)	1.86/0.15 (= 2.01)
Pipelines ³							
DOE 1-M-18 Pad DOE 1-M-18 Production Pad ⁴ DOE 1-M-18 Cuttings Area ⁴	Federal/ Private	4,643/3,850 (= 8,493)	0.19/0.27 (= 0.46)	1.53/2.90 (= 4.43)	0/0.30 (= 0.30)	1.72/3.47 (= 5.19)	0.19/0.27 (= 0.46)
Subtotal		4,643/3,850 (= 8,493)	0.19/0.27 (= 0.46)	1.53/2.90 (= 4.43)	0/0.30 (= 0.30)	1.72/3.47 (= 5.19)	0.19/0.27 (= 0.46)
GRAND TOTAL (FED/PVT)		See Footnote 3	2.82/1.30 (= 4.12)	7.05/6.69 (= 13.74)	0.75/1.57 (2.32)	10.62/9.56 (= 20.18)	3.69/1.80 (= 5.49)

¹ Approximately 84% of the disturbance footprint for well pads would be on land previously disturbed and reclaimed.

² Disturbance of the RWF 12-20 Tank Pad is included in the Balzac Gulch 2 Master Development Plan.

³ Road lengths and pipeline lengths cannot be added for a grand total because they are collocated along most of their lengths.

⁴ Includes collocated 8-inch gas line and 4-inch produced water line, and two 2-inch condensate lines (2,510 feet, Fed only), installed at the same time.

Along with the expanded DOE 1-M-18 drilling pad platform, TEP proposes to use five (5) ancillary facilities to support the development of the 15 Federal wells (**Figure 1**):

- (1) The new DOE 1-M-18 Production Pad would be constructed along the pad access road on BLM land for remote flowback operations during well completions and long-term storage of condensate (**Figure 3**). The production pad would re-disturb 0.56 acre on BLM land.
- (2) The DOE 1-M-18 Cuttings Management Area would be constructed on BLM land adjacent to the DOE 1-M-18 Production Pad (**Figure 4**); the area would be utilized for long-term drill cuttings storage and re-disturb approximately 1.65 acres. The cuttings storage area would be built entirely within the previously disturbed shale remediation area. Final reclamation would be required after the cuttings are mixed with excess material, tested, and satisfy Conservation Oil and Gas Conversation Commission's (COGCC)'s Table 910-1 standards.
- (3) The existing RWF 44-18 pad would be reconstructed and re-disturbed to serve as a secondary location for drill cuttings disposal and storage (**Figure 5**). Approximately 2.64 acres would be re-disturbed on private land.
- (4) The existing RMV 143-18 pad would be reconstructed and re-used as the remote frac pad for the DOE 1-M-18 well completions (**Figure 6**). On private land, the frac pad would re-disturb 2.05 acres and create 0.08 acre of new disturbance.
- (5) The new RWF 12-20 Tank Pad would be constructed on private land for long-term storage of produced water for the DOE 1-M-18 project and Balzac Gulch Phase 2 project (**Figure 7**). The tank pad, with construction already in progress under COGCC permit, involves 1.17 acres of new disturbance. This auxiliary pad would also serve as the fluid storage farm for the pending Balzac Gulch 2 well developments.

The project components would create 2.32 acres of new disturbance with 0.75 acre on BLM land and 1.57 acres on private land. The total short-term disturbance would amount to 20.18 acres with nearly an even split between BLM (10.62 acres) and private land (9.56 acres). After final reclamation of pipeline corridors, cutting storage areas, and minor road improvements, 5.49 acres of total long-term disturbance would remain with 3.69 acres occurring on BLM land (**Table 2**). Overall, 88% of the disturbance created with the implementation of the DOE 1-M-18 project would fall within previously disturbed areas.

A road maintenance program would be required during the production phase of the wells. This program would include, but not be limited to, blading, ditching, culvert installation and cleanout, weed control, and gravel surfacing where excessive rutting or erosion occur. Roads would be maintained in a safe and usable condition.

The Proposed Action would be implemented consistent with the Federal oil and gas lease, Federal regulations (43 CFR 3100), and measures included in the Applications for Permit to Drill (APDs). **Appendix A** lists specific Conditions of Approval (COAs) to be implemented as mitigation measures for the project. The operator would be responsible for inspection and maintenance of the access roads, pads, and pipelines.

The cultural resource inventory for the DOE 1-M-18 project was completed in June 2018. No sites or cultural values were identified that could be impacted by the Proposed Action.

Biological resource surveys were completed by WestWater Engineering (WWE) in June 2018. Three separate populations of DeBeque milkvetch (*Astragalus debequaeus*) were found within 30 meters of existing roads and proposed pipelines (surface and buried) planned for use in the project area (WWE 2018). The planned pipeline improvements within 30 meters of DeBeque milkvetch plants would be conducted within the existing roadway disturbance to avoid direct impacts to the BLM-listed sensitive plants (**Appendix A**).

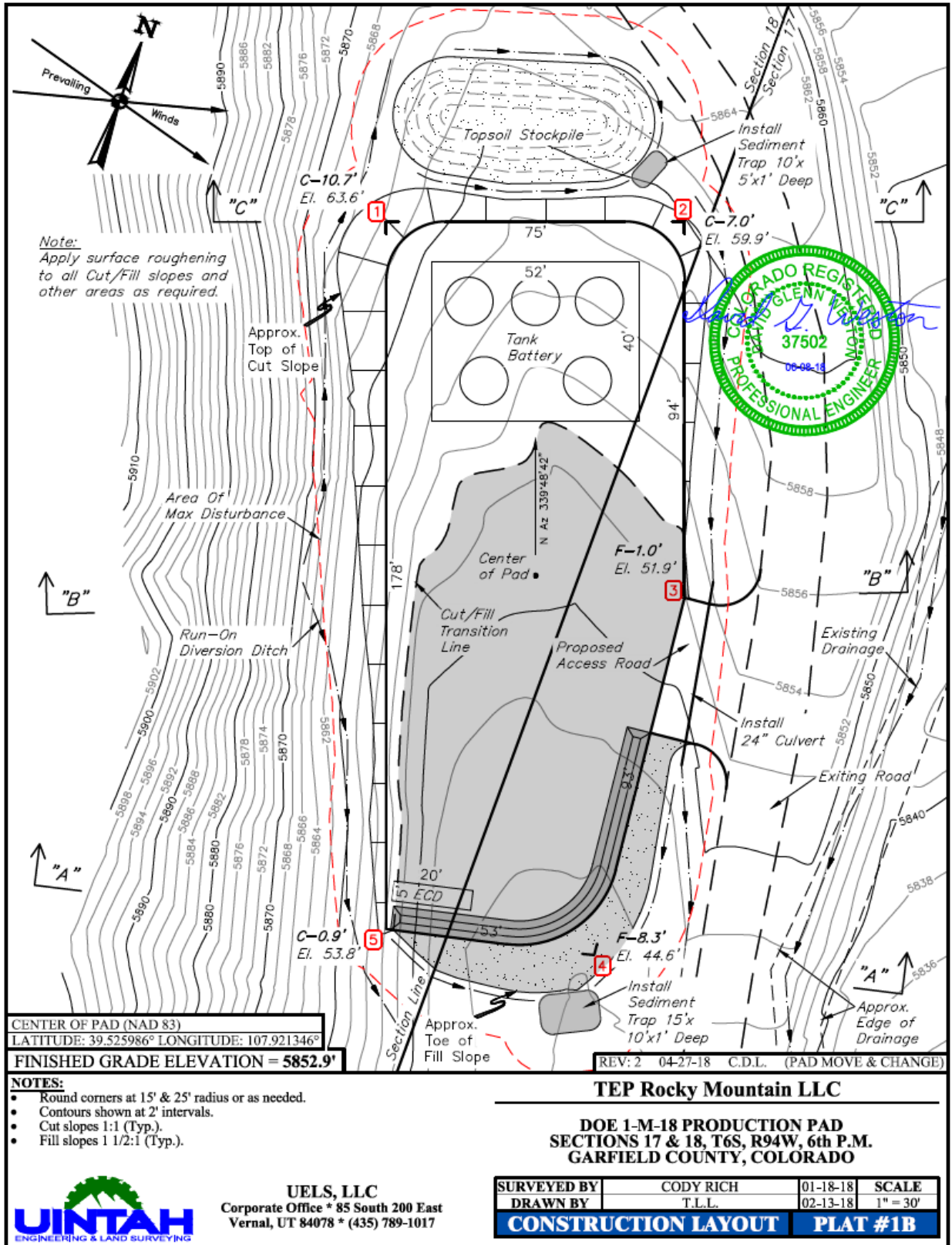


Figure 3. DOE 1-M-18 Production Pad Construction Layout on BLM Land

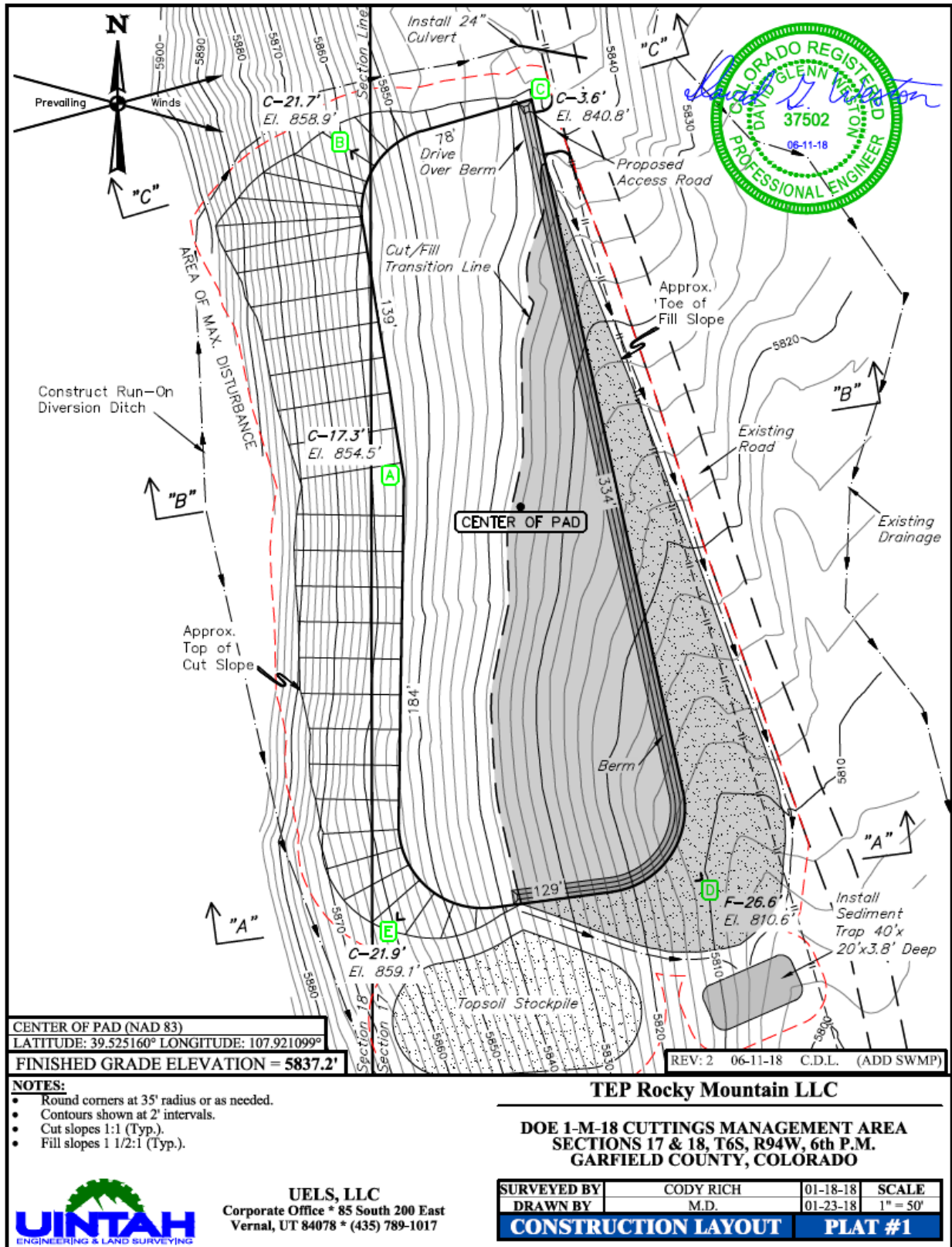


Figure 4. DOE 1-M-18 Cuttings Management Area Construction Layout on BLM Land

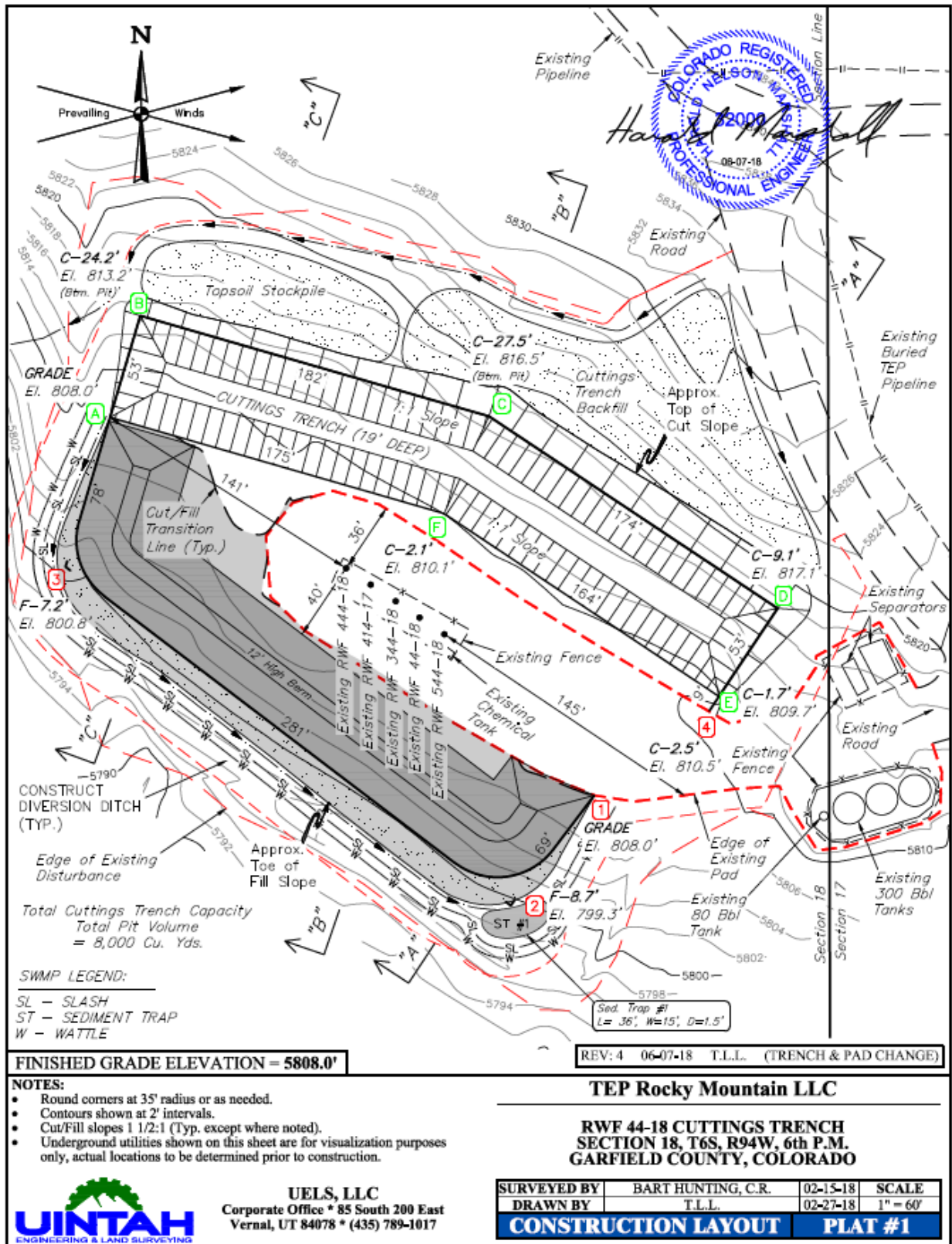


Figure 5. RWF 44-18 Cuttings Trench Construction Layout on Private Land

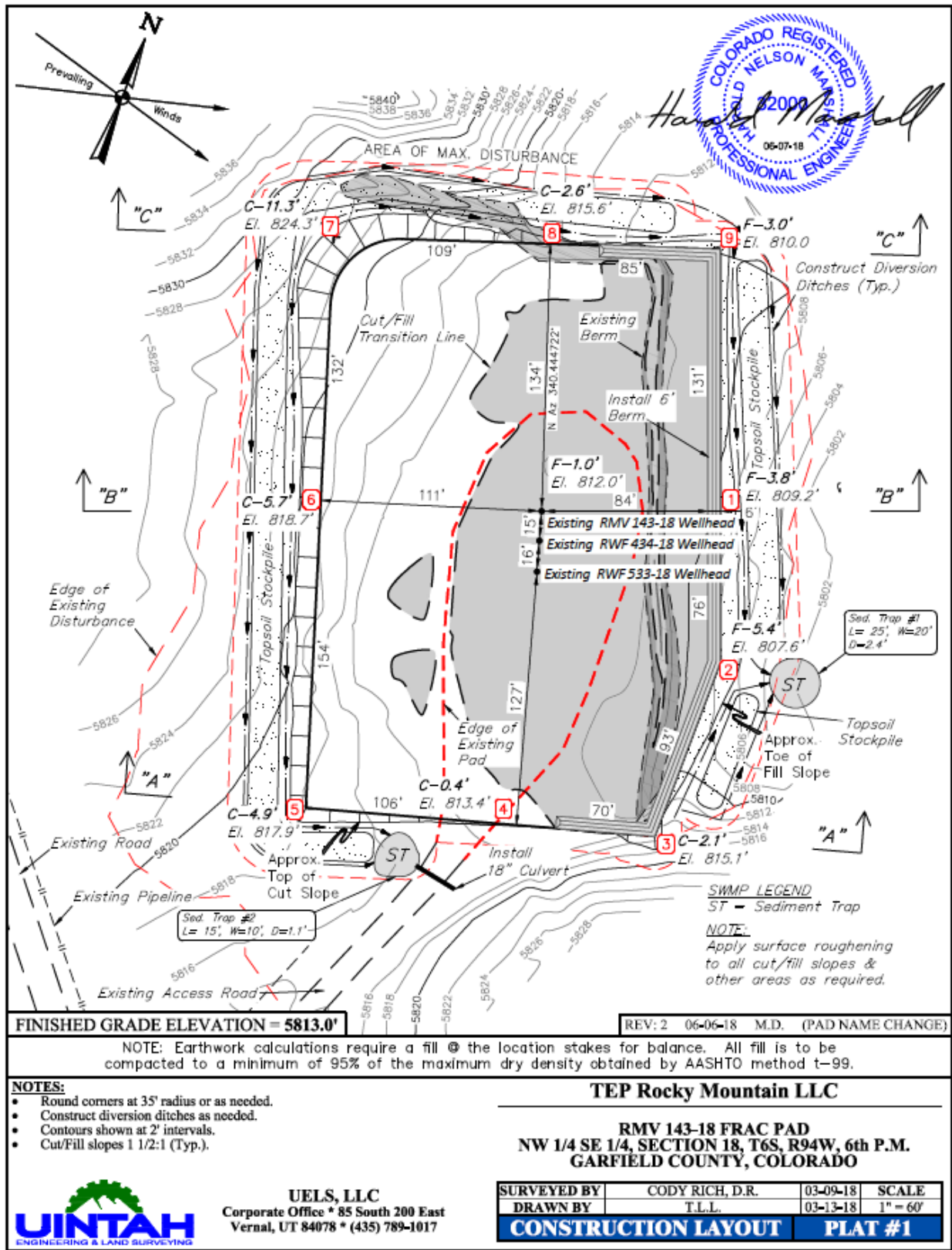


Figure 6. RMV 143-18 Frac Pad Construction Layout on Private Land

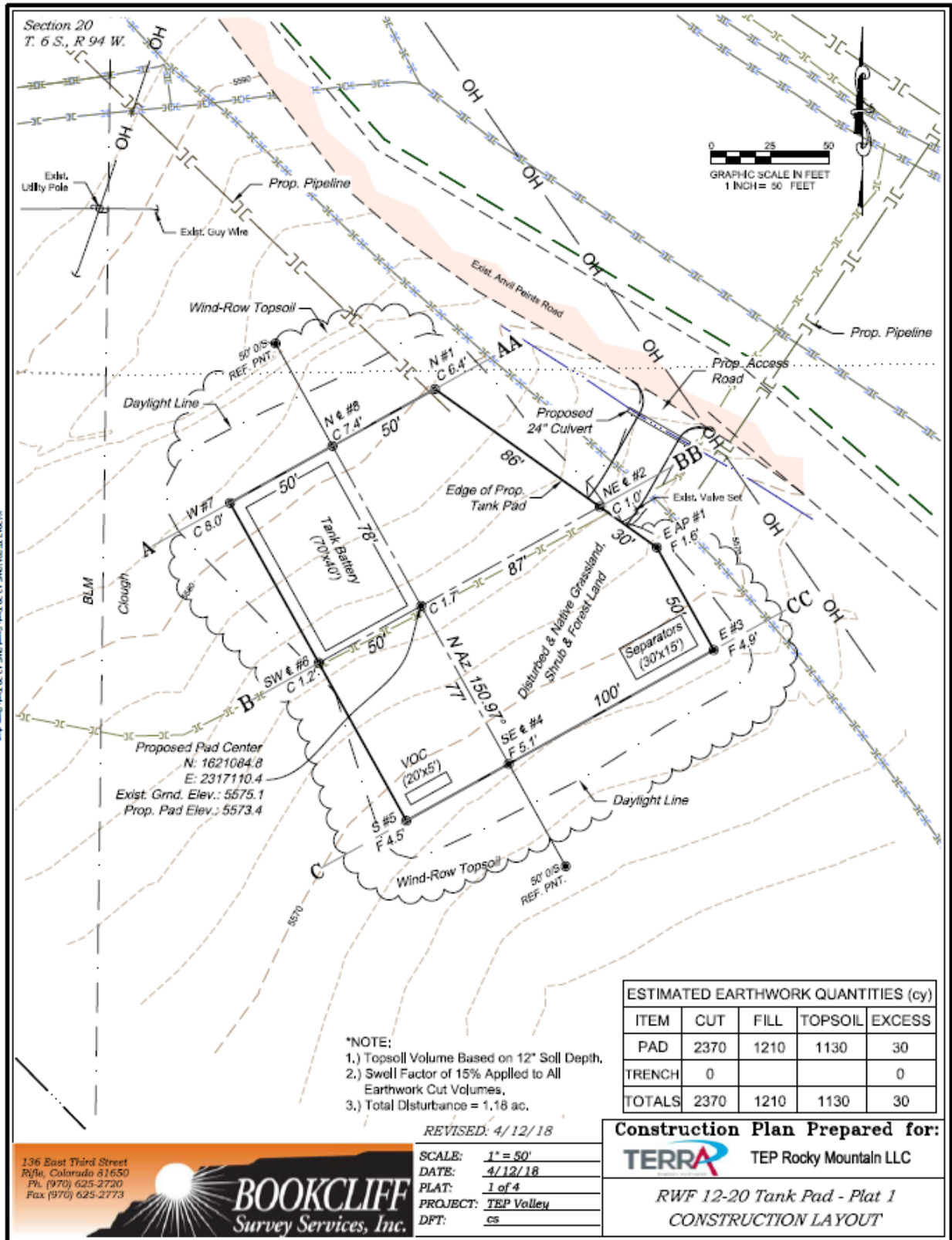


Figure 7. RWF 12-20 Tank Pad Construction Layout on Private Land

No raptor nests were observed within the woodland nesting raptor survey area. Before commencing construction or drilling activities during the raptor nesting season, TEP would conduct a raptor survey of the surface disturbing components for the DOE 1-M-18 project.

Federal Lease Stipulations. The Timing Limitation (TL) and Controlled Surface Use (CSU) stipulations listed on lease COC62160 and that apply to the project include:

- TL to protect big game winter habitat (December 1 through April 30)
- CSU to protect BLM sensitive plant species
- CSU to protect erosive soil and slopes greater than 30%
- CSU to protect scenic values of Class II VRM areas

B. Land Use Plan Conformance

The Proposed Action is subject to, has been reviewed for, and is in conformance with (43 CFR §1610.5 and § 2800, BLM 1617.3) the following plan:

Land Use Plan (LUP) Name: The current LUP is the *Colorado River Valley Field Office and White River Field Office Roan Plateau Planning Area including Naval Oil Shale Reserves Numbers 1 & 3 Record of Decision /Approved Resource Management Plan Amendment (RMPA)*, approved November 17, 2016

Decision Language: The following excerpts from the 2016 Roan Plateau Approved RMPA are germane to the Proposed Action:

Page 2-25, Lands and Realty (LRT)-GOAL-01: *“Provide for compatible land use authorizations within the framework of laws and regulations.”*

Page 2-32, Fluid Minerals (FMI)-GOAL-01: *“Make lands available, as appropriate for oil and gas leasing in an environmentally sound manner, under multiple use mandates. Conduct oil and gas leasing on leasable lands in accordance with the Transfer Act, Mineral Leasing Act, and the Federal Onshore Oil and Gas Reform Act of 1987 and applicable regulations under 43 CFR 3100 and in accordance with the decisions made through application of FLPMA and other laws applicable to public lands. Regulations governing onshore oil and gas operations can be found at 43 CFR 3160.”* Lease COC62160 was issued in April 1999, under the authority of Glenwood Springs Resource Area Oil & Gas Leasing & Development Record of Decision and Resource Management Plan Amendment approved in March 1999.

Page 2-32, Fluid Minerals (FMI)-OBJECTIVE-01: *“Open lands below the rim of the plateau to oil and gas leasing and development. All leases would be subject to lease notices, stipulations, and standard lease terms and conditions.”*

Page 2-33, FMI-Management Action (MA)-03: *“For leases below the rim, prior to exploration and/or lease development, the operator shall submit a proposed MDP identifying its projected activities. Prior to submitting the MDP, the operator shall consult with the CPW and BLM to develop terms that minimize impacts to wildlife and other resources.”* The Wheeler to Webster Geographic Area Plan and Environmental Assessment (#CO140-2005-047) approved in May 2005 is the existing Master Development Plan for the DOE 1-M-18 project area.

Determination: The Proposed Action is in conformance with the LUP cited above because (1) the issuance of ROW grants, including temporary use permit, would provide for compatible land use authorizations within the framework of laws and regulations, and would meet ROW and utility needs in the public interest and within the constraints for other resources, and (2) the issuance of APDs to the operator on Federal well pads below the rim of the plateau would facilitate the development of the Federal fluid mineral lease in an environmentally sound manner under multiple use mandates.

C. Compliance with NEPA

Consistency with CX Category #1: Individual surface disturbances of less than 5 acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to NEPA has been previously completed. All questions listed in **Table 3** must be answered “Yes” to use this Section 390 CX.

Table 3. Project Screening Questions	Yes	No
1. Would the Proposed Action disturb less than 5 acres?	<u>Yes</u>	
2. Is the current amount of surface disturbance on the entire leasehold, plus the proposed action, less than 150 acres? (see Figure 8)	<u>Yes</u>	
3. Was the Proposed Action adequately analyzed in an existing site-specific National Environmental Policy Act (NEPA) document?	<u>Yes</u>	

NEPA Document Name: The Wheeler to Webster Geographic Area Plan [= Master Development Plan] for Gas Wells/Environmental Assessment (CO140-2005-047 approved on 5/4/2005) identified the ten new directional wells to be developed from the existing DOE 1-M-18 well pad. This EA satisfies the criteria of being an activity-level or project-level EIS or EA that is applicable to the Proposed Action.

Persons and/or Agencies Consulted:

TEP – Adam Tankersley, Bryan Hotard
 Colorado Parks and Wildlife (CPW): Taylor Elm
 COGCC: Dave Kubezkco
 Geotechnical Engineering Group: John Withers

Interdisciplinary Review: BLM staff listed in **Table 4** participated in the preparation of this Section 390 CX, including review of resource survey results submitted by the operator’s consultants, evaluation of potential impacts of the Proposed Action, and identification of appropriate COAs. **Appendix B** presents the project-specific air emissions inventory analysis.

Table 4. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Jim Byers	Natural Resource Specialist	Project Lead, Access & Transportation, Invasive Non-native Species, Socioeconomics, Special Status Plants, Visual Resources, Vegetation, Hazardous or Solid Wastes
Vanessa Caranese	Geologist	Geology and Minerals, Groundwater, Paleontology
Allen Crockett, Ph.D., J.D.	Supervisory NRS	NEPA Review
Stephen Garcia	Petroleum Engineer	Downhole Reviews and COAs
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status Animals, Wildlife
Carmia Woolley	Physical Scientist	Air Quality, Noise, Soils, Surface Water

Mitigation: COAs to be attached to approved APDs for the 15 Federal directional wells on the DOE 1-M-18 well pad are listed in **Appendix A**.

COC 062160

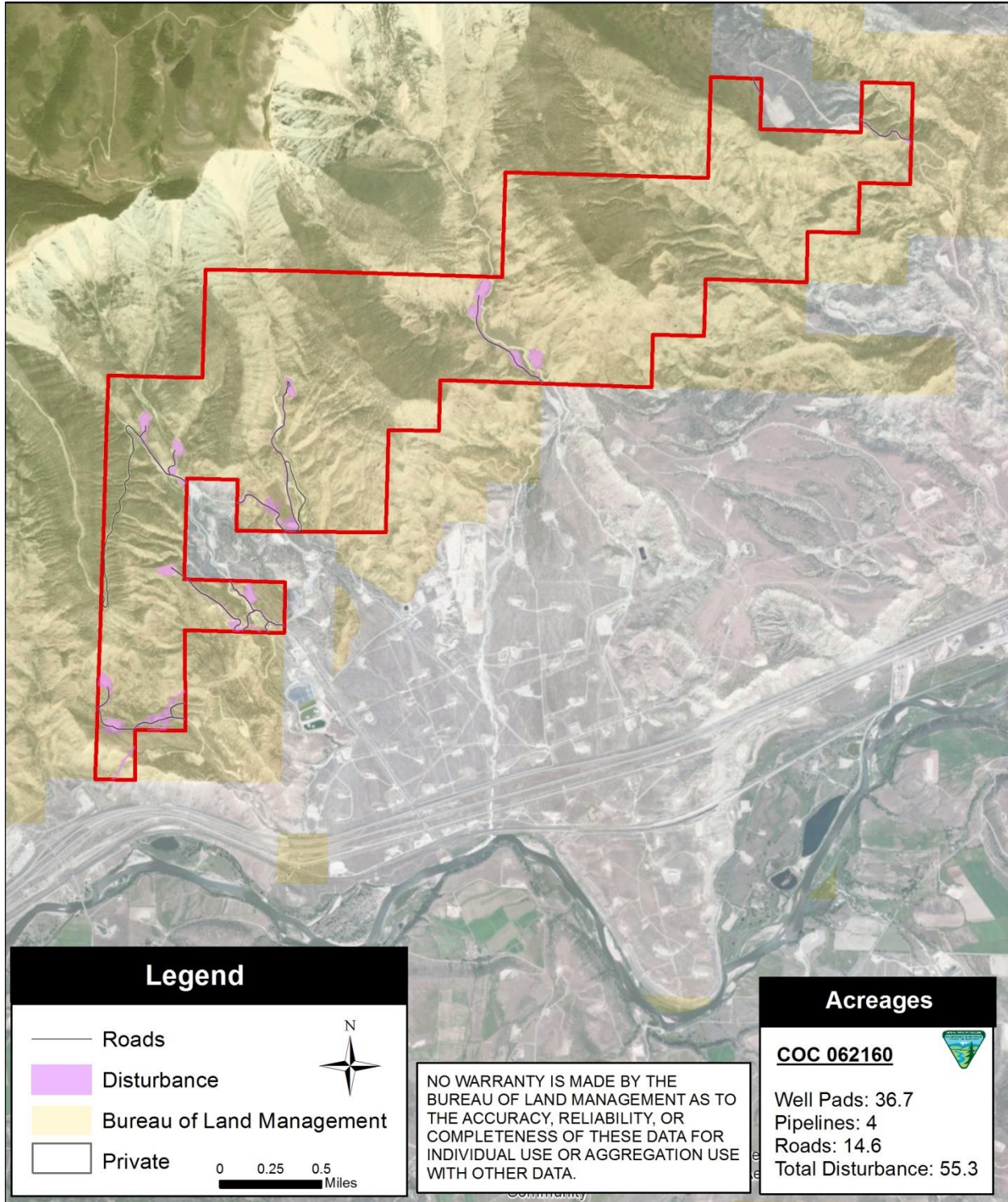


Figure 8. Surface Disturbance Map for Federal Lease COC 62160

Name of Preparer: Jim Byers, Natural Resource Specialist

Date Prepared: July 3, 2018

D. Signature

The Proposed Action is statutorily categorically excluded from further NEPA documentation in accordance with Section 390 (b)(1) of the Energy Policy Act of 2005, Category 1, which provides for such exclusion of individual surface disturbances of less than 5 acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to NEPA has been previously completed. Both of these criteria are met by the Proposed Action, which would result in less than 2.3 acres of new surface disturbance (on BLM and private lands), and would occur on Federal oil and gas lease (COC62160), which currently has less than 56 acres of surface disturbance attributed to Federal oil and gas development.

Authorizing Official: 

Date: 8/3/18

E. Decision and Rationale for Action

I have decided to approve the BLM APDs and temporary use permit for the surface water lines, authorizing the drilling, completion, and development of 15 Federal directional wells on the DOE I-M-18 well pad with the attached Surface Use and Downhole COAs. The COAs are required by this decision, and variance from these COAs during project implementation may require further NEPA review.

I have reviewed Section B, Land Use Plan Conformance, and Section C, Compliance with NEPA, and have determined that the proposed activity is in conformance with the applicable LUP and referenced NEPA document. I have also evaluated the proposal to ensure the appropriate exclusion category as described in Section 390 of the Energy Policy Act of 2005 has been correctly applied and that no further environmental analysis is required.



Allen B. Crockett, Ph.D., J.D.
Supervisory Natural Resource Specialist

8/3/18
Date

F. Administrative Review or Appeal Opportunities

Applications for Permit to Drill and Sundry Notices

In accordance with 43 CFR 3165.3, any adversely affected party contesting this decision may request an administrative review of this decision, before the State Director, either with or without oral presentation. This request, including all supporting documentation, shall be submitted in writing within 20 business days of the date this decision was received, or considered to have been received, by the party and shall be sent to the Colorado State Director, 2850 Youngfield Street, Lakewood, Colorado 80215-7076. The decision of the State Director may then be appealed to the Interior Board of Land Appeals in accordance with 43 CFR 3165.4. BLM Colorado will not accept a request for State Director Review or a notice of appeal transmitted electronically (e.g., by email, facsimile, or social media means).

G. Reference Cited

WestWater Engineering (WWE). 2018. Biological Survey Report - DOE I-M-18 Well Pad. June 2018. Grand Junction, CO.

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APPENDIX A

Surface-Use and Drilling Conditions of Approval

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SURFACE-USE CONDITIONS OF APPROVAL
Fifteen New Federal Wells on the Existing DOE 1-M-18 Pad
DOI-BLM-CO-N040-2018-0079-SCX1

GENERAL COAS APPLICABLE TO ALL ACTIVITIES ASSOCIATED WITH the DOE 1-M-18 Pad.

The following surface-use COAs shall be implemented, where applicable and feasible, to reduce impacts from project activities. These COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads, presented following these general COAs. Wording and numbering of these COAs may differ from those included in Wheeler to Webster GAP/EA. In cases of discrepancies, the following COAs supersede earlier versions.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.
2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, constructed, and maintained to road standards submitted with APDs and described in BLM's *Gold Book*. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM. (*Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition—Revised 2007, BLM/WO/ST-06/021+3071/REV 07*)
3. Drill Cuttings Management. Cuttings generated from the numerous planned well bores shall be worked through a shaker system on the drill rig, mixed with a drying agent, if necessary, and deposited in the planned off-site cuttings management area or piled on location against the cut slope for later burial during the interim reclamation earthwork. The cuttings shall be remediated per COGCC regulations (Table 910-1 standards) prior to earthwork reshaping related to well pad interim reclamation.
4. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
5. Drainage Crossings and Culverts. Construction activities at intermittent and ephemeral drainage crossings (e.g., burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed jurisdictional Waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.

Pipelines installed beneath stream crossings shall be buried at a minimum depth of 4 feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, the channel grade and substrate composition shall be returned to pre-construction conditions.

6. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the USACE prior to discharging fill material into Waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as intermittent and ephemeral streams. Permanent impacts to jurisdictional waters may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199.
7. Reclamation. Specific measures to follow during interim reclamation are described below.
 - a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plans, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
 - b. Deadline for Interim Reclamation Earthwork and Seeding. Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned to be drilled on that pad as part of a continuous operation. If a period of greater than one year is expected to occur between drilling episodes, BLM may require implementation of all or part of the interim reclamation program.

Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines, and of topsoil piles and berms, shall be completed within 30 days following completion of construction. Any such area on which construction is completed prior to December 1 shall be seeded during the remainder of the early winter season instead of during the following spring, unless BLM approves otherwise based on weather. If road or pipeline construction occurs discontinuously (e.g., new segments installed as new pads are built) or continuously but with a total duration greater than 30 days, reclamation, including seeding, shall be phased such that no portion of the temporarily disturbed area remains in an unreclaimed condition for longer than 30 days. BLM may authorize deviation from this requirement based on the season and the amount of work remaining on the entirety of the road or pipeline when the 30-day period has expired.

If requested by the project lead NRS for a specific pad or group of pads, the operator shall contact the NRS by telephone or email approximately 72 hours before reclamation and reseeding begin. This will allow the NRS to schedule a pre-reclamation field visit if needed to ensure that all parties are in agreement and provide time for adjustments to the plan before work is initiated.

The deadlines for seeding described above are subject to extension upon approval of the BLM based on season, timing limitations, or other constraints on a case-by-case basis. If the BLM approves an extension for seeding, the operator may be required to stabilize the reclaimed surfaces using hydromulch, erosion matting, or other method until seeding is implemented.

- c. Topsoil Stripping, Storage, and Replacement. All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from

subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil shall be implemented for well pad construction whenever topography allows.

- d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

If directed by the BLM, the operator shall implement measures following seedbed preparation (when broadcast-seeding or hydroseeding is to be used) to create small depressions to enhance capture of moisture and establishment of seeded species. Depressions (pocking) shall be no deeper than 1 to 2 inches and shall not result in piles or mounds of displaced soil. Excavated depressions shall not be used unless approved by the BLM for the purpose of erosion control on slopes. Where excavated depressions are approved by the BLM, the excavated soil shall be placed only on the downslope side of the depression.

If directed by the BLM, the operator shall conduct soil testing prior to reseeding to identify if and what type of soil amendments may be required to enhance revegetation success. At a minimum, the soil tests shall include texture, pH, organic matter, sodium adsorption ratio (SAR), cation exchange capacity (CEC), alkalinity/salinity, and basic nutrients (nitrogen, phosphorus, potassium [NPK]). Depending on the outcome of the soil testing, the BLM may require the operator to submit a plan for soil amendment. Any requests to use soil amendments not directed by the BLM shall be submitted to the CRVFO for approval.

- e. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (see Attachment 1 of the letter provided to operators dated September 9, 2014).

For private surfaces, the operator shall use a BLM-approved native seed mix unless specified otherwise by the private landowner.

The seed shall contain no prohibited or restricted noxious weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. Seed tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

- f. Seeding Procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation.

Where practicable, seed shall be installed by drill-seeding to a depth of 0.25 to 0.5 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover or by hydroseeding and hydromulching. Hydroseeding and hydromulching shall be conducted in two separate applications to ensure adequate contact of seeds with the soil.

An exception to these seeding requirements shall be made for seeding of sagebrush. Sagebrush seeding shall occur prior to winter snowfall, or on top of snow. Sagebrush may be sown either by broadcast seeding, or, if not on snowpack, by placing the seed in the fluffy seed box of a seed drill, with the drop tube left open to allow seed to fall out on the ground surface.

If interim revegetation is unsuccessful, the operator shall implement subsequent reseeding until interim reclamation standards are met.

- g. Mulch. Mulch shall be applied within 24 hours following completion of seeding in project areas within pinyon-juniper, sagebrush shrubland, and/or salt-desert shrub habitat types. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil. Mulch shall not be used within mountain shrub or spruce-fir forest habitat types, unless requested or approved by the BLM.

NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other BMPs approved by the BLM. Additional BMPs such as biodegradable wattles, weed-free straw bales, or silt fences shall have be employed as necessary to reduce transport of sediments into the drainages. The BLM may require use of hydromulch or biodegradable blankets or matting in areas with high erosion potential to ensure adequate protection from slope erosion and offsite transport of sediments and to improve reclamation success.
- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.
- j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites, including a description of the monitoring methods used, to the BLM by **December 31** of each year. The annual monitoring report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports and Pesticide Application Records (PARs), including GPS data in accordance with the February 27, 2014, letter to operators, shall be submitted to the BLM by **December 1**.
9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **December 1 to April 30 annually**.
10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities

planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead, BLM wildlife biologist, and the USFWS representative to the BLM Field Office at 970-243-2778 x28.

11. Raptor Nesting. To protect nesting raptors, a survey shall be conducted prior to construction, drilling, or completion activities that are to begin during the raptor nesting season (**February 1 to August 15**). The survey shall include all potential nesting habitat within 0.25 mile of a well pad, access road, pipeline, or other surface facility. Results of the survey shall be submitted to the BLM. If a raptor nest is located within the buffer widths specified above, a 60-day raptor nesting TL will be applied by the BLM to preclude initiation of construction, drilling, and completion activities during the appropriate nesting season. The operator is responsible for complying with the Migratory Bird Treaty Act (MBTA), which prohibits the “take” of birds or of active nests (those containing eggs or young), including nest failure caused by human activity (see COA for Migratory Birds below).
12. Migratory Birds – Nesting Habitat. Pursuant to BLM Instruction Memorandum 2008-050, all vegetation removal or surface disturbance in previously undisturbed lands providing potential nesting habitat for migratory birds is prohibited from **May 15 to July 15**. An exception to this TL may be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no migratory bird species are nesting within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an audial survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying migratory birds. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 15 and continue into the 60-day period at the same location.
13. Migratory Birds – General. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species, which includes injury and direct mortality resulting from human actions not intended to have such result. To minimize the potential for the take of a migratory bird, the operator shall take reasonable steps to prevent use by birds of fluid-containing pits associated with oil or gas operations, including but not limited to reserve pits, produced-water pits, hydraulic fracturing flowback pits, evaporation pits, and cuttings trenches. Liquids in these pits—whether placed or accumulating from precipitation—may pose a risk to birds as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation.

Based on low effectiveness of brightly colored flagging or spheres suspended over a pit, the operator shall install netting with a mesh size of 1 to 1.5 inches, and suspended at least 4 feet above the fluid surface, on all pits into which fluids are placed, except for storage of fresh water in a pit that contains no other material. The netting shall be installed within 24 hours of placement of fluids into a pit. The requirement for netting does not apply to pits during periods of continuous, intensive human activity at the pad, such as drilling and hydraulic fracturing phases or, as pertains to cuttings trenches, during periods of active manipulation for cuttings management, remediation of contaminated materials, or other purposes.

In addition to netting of pits, oil slicks and oil sheens shall be promptly skimmed off the fluid surface. The requirement for prompt skimming of oil slicks and oil sheens also applies to cuttings trenches in which precipitation has accumulated. All mortality or injury to birds shall be reported immediately to the BLM project lead and to the USFWS representative to the BLM Field Office at 970-243-2778 x28 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.

14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery shall be protected until notified to proceed by the BLM.
16. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons would be subject to prosecution.

If subsurface cultural values are uncovered during operations, all work in proximity to the resource will cease and the Authorized Officer with the BLM notified immediately. The operator shall take any additional measures requested by the BLM to protect discoveries until they can be adequately evaluated by the permitted archaeologist. Within 48 hours of the discovery, the SHPO and consulting parties will be notified of the discovery and consultation will begin to determine an appropriate mitigation measure. BLM in cooperation with the operator will ensure that the discovery is protected from further disturbance until mitigation is completed. Operations may resume at the discovery site upon receipt of written instructions and authorization by the authorized officer.

Pursuant to 43 CFR 10.4(g), the holder shall notify the authorized officer, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony on Federal land. Further, pursuant to 43 CFR 10.4 (c) and (d), the holder shall stop activities in proximity to the discovery that could adversely affect the discovery. The holder shall make a reasonable effort to protect the human remains, funerary items, sacred objects, or objects of cultural patrimony for a period of thirty days after written notice is provided to the authorized officer, or until the authorized officer has issued a written notice to proceed, whichever occurs first.

Antiquities, historic ruins, prehistoric ruins, and other cultural or paleontological objects of scientific interest that are outside the authorization boundaries but potentially affected, either directly or indirectly, by the Proposed Action shall also be included in this evaluation or mitigation. Impacts that occur to such resources as a result of the authorized activities shall be mitigated at the operator's cost, including the cost of consultation with Native American groups.

Any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361).

17. Visual Resources. Production facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by the BLM, to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The BLM may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.

Aboveground facilities shall be painted **Shadow Gray** selected to minimize contrast with adjacent vegetation or rock outcrops.

18. Escape Ramps (Open Pits and Cellars, Tanks, and Trenches). The operator shall construct and maintain pits, cellars, open-top tanks, and trenches to exclude livestock, wildlife, and humans (except authorized personnel) and, in the event of inadvertent entry, to escape from these below-grade areas. At a minimum, the operator shall construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape from each pit, cellar, open-top tank, and trench. Ramps shall be secured and properly positioned to allow wildlife to escape.
19. Noise Abatement for Compressors, Generators, and Pumps. Any production equipment operated for extended periods on a Federal oil and gas lease and/or BLM-administered public land shall adhere to the Residential/Agricultural/Rural Zone standard established in Colorado Oil and Gas Conservation Commission (COGCC) Regulation No. 802, Noise Abatement. Under this provision, the noise level shall not exceed 50 A-weighted decibels (dBA) between 7:00 p.m. and 7:00 a.m. (nighttime) and 55 dBA between 7:00 a.m. and 7:00 p.m. (daytime) at a distance of 350 feet from the noise source. This standard shall apply even in remote locations where the COGCC would consider the Light Industrial to be sufficient (i.e., no residences in proximity to the noise source). BLM's objective for noise abatement is to reduce noise impacts to the existing solitude that is typical on BLM-leased lands, and particularly to reduce impacts that could have an adverse impact on wildlife.

Noise control techniques to be considered for such production-related equipment shall include, but not be limited to, enclosure within a sound-insulated structure, installation of an improved muffler system, some combination of these, or potentially the use of electrical power. Methods for safe ventilation of sound-insulated buildings shall be a key consideration in building design to avoid open doors or windows that defeat the intended noise controls. Any noise-abating structure shall use the same BLM-approved color as used on other production facilities on the pad.

If the BLM determines that the required Residential/Agricultural/Rural noise standard is not being met under normal conditions, the operator may be required to suspend use of the compressor or implement additional noise abatement measures.

Site-Specific-Surface Use COAs related to the DOE 1-M-18 Project

Pad Expansion Considerations. All pad reconstruction and expansion work shall adhere to the specifications, conclusions, and recommendations outlined in the Geotechnical Investigation Report for TEP's Drill Pad DOE 1-M-18 prepared by Geotechnical Engineering Group.

The large rock spire at the northeastern edge of the pad (proximity to Corner 10) shall be removed with use of explosives to reduce the danger of rockfall impacts during drilling and completion operations. Furthermore, rock fall mitigation shall also be accomplished with track hoe machinery along the base of the cutslope to remove precarious boulders and rocks that have settled into the soil at the base of the cut face. Such rockfall mitigation work shall be conducted and completed during the pad construction work. Pioneering a safe working route across the base material below the cutslope is permissible to access the hazardous boulders.

Plant Protections Related to Pipeline Installations. The pipelines, buried or surface lines, between the DOE 1-M-18 pad and the DOE 1-M-18 Production Pad shall be installed within the existing roadway (between the existing top of cutslope and the lower edge of fillslope) to avoid direct impacts to nearby DeBeque milkvetch plants (BLM-listed sensitive plant species).

Buried Pipeline Installation Details. The proposed 8-inch-diameter welded steel gas gathering pipeline, 4-inch-diameter Flexpipe water line, and the double 2-inch diameter Flexpipe condensate lines serving the DOE 1-M-18 pad shall be collocated in the same trench and buried within the new access road corridor between the DOE 1-M-18 pad and the Doe 1-M-18 Production Pad. Between the DOE 1-M-18 Production Pad and the RWF 12-20 Tank Pad, the 8-inch gas line and 4-inch water line shall be collocated in same trench.

The limits of the pipeline disturbance corridor shall generally adhere to the existing disturbance limits of the improved access roadway (generally not to exceed 35 feet in width) except as noted on Plan of Development and Uintah Engineering and Land Surveying's Road Design package submitted with the APD package. The pipeline installation work shall adhere to the following standard procedures:

- **Administrative Notification.** The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities.
- **Pipeline Construction and Maintenance.** The pipelines (natural gas, condensate, and water for production) shall be installed to industry and BLM *Gold Book* standards.

All pipeline(s) shall be buried with a minimum depth of 48 inches from the top of the pipe to the surface. Where the alignments are shared, the gas gathering line and the water collection line shall be installed concurrently in the same trench. The centerline and disturbance limits of the proposed pipeline(s) shall be clearly staked and/or flagged prior to any commencement of operations. No equipment or vehicle use shall be allowed outside the staked disturbance corridor of the pipeline ROW unless authorized by BLM personnel.

- **Welding of Pipeline.** Visual inspections shall be performed on 100% of all pipeline welds. All welders shall be appropriately certified. (43 CFR 192.227, *Qualification of welders and welding operators*, 49 CFR 192.241, *Inspection and testing of welds*).

Welding must be performed by a qualified welder in accordance with welding procedures qualified under section 5 of API 1104 (incorporated by reference, see §192.7) or section IX of the ASME Boiler and Pressure Vessel Code "Welding and Brazing Qualifications" (incorporated by reference, see §192.7) to produce welds meeting the requirements of this subpart. The quality of the test welds used to qualify welding procedures shall be determined by destructive testing in accordance with the applicable welding standard(s).

- **Pipeline Testing.** The entire pipeline shall be tested in compliance with United States Department of Transportation (DOT) Code of Federal Regulations (CFR) (49 CFR Part 192). (Ref. 49 CFR 192.500.Subpart J entitled "Test Requirements"). (49 CFR 192.225, *Welding Procedures*.)
- **Fire Suppression.** Welding with acetylene or other open-flame torch shall be operated in an area barren or cleared of all flammable materials at least ten feet on all sides of equipment. Internal combustion engines must be equipped with approved spark arrestors which meet either (a) Department of Agriculture, Forest Service Standard 5100-1a, or (b) Society of Automotive Engineers (SAE) recommended practices J335(b) and J350(a).
- **Saturated Soil Conditions.** When saturated soil conditions exist on or along the proposed right-of-way, construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils.
- **Warning Signs.** Pipeline warning signs shall be installed within 5 days of completion of construction and prior to use of the pipeline for transportation of product. Pipeline warning shall be installed at all road crossings and shall be visible from sign to sign along the ROW. For safety

purposes, each sign shall be permanently marked with the operator's name and shall clearly identify the owner (emergency contact) and purpose (product) of the pipeline.

Surface Pipeline Installation Details related to Temporary Use Permit. The two 10-inch-diameter fused poly water delivery lines (544 feet in length across BLM land in Section 19, SE $\frac{1}{4}$ NE $\frac{1}{4}$.) shall be laid on the surface between an existing water line connection in SE $\frac{1}{4}$ NE $\frac{1}{4}$, Section 19 and the RMV 143-18 pad within the alignment shown on Plan of Development submitted with the APD and the SF-299 application.

Surface Pipeline Decommissioning. When the temporary surface steel frac lines and water supply pipeline for the planned developments related to the DOE 1-M-18 project are no longer necessary, the surface lines shall be pigged and blown dry to ensure all fluid has been purged from the lines. Once all fluid has been removed from the lines, the lines shall be cut and pulled to the existing pad(s) or the existing road. Removal of temporary surface lines shall occur in a manner that minimizes disturbance to native ground cover. Should surface disturbance occur during surface line removal that warrants reclamation work, appropriate reclamation practices shall be implemented per BLM direction.

BUREAU OF LAND MANAGEMENT

Colorado River Valley Field Office
2300 River Frontage Road
Silt, CO 81652

Downhole Drilling Conditions of Approval Applications for Permit to Drill

Operator: TEP Rocky Mountain LLC
Lease Numbers: COC62160
Pad: DOE 1-M-18
Surface Location: Garfield County, Lot 4, Section 17, T6S, R94W, 6th PM

List of Wells	
<i>Proposed Pad</i>	<i>Proposed Wells</i>
DOE 1-M-18	Federal RWF 11-17
	Federal RWF 14-17
	Federal RWF 43-7
	Federal RWF 311-17
	Federal RWF 314-8
	Federal RWF 324-8
	Federal RWF 411-17
	Federal RWF 412-17
	Federal RWF 414-8
	Federal RWF 442-18
	Federal RWF 443-7
	Federal RWF 511-17
	Federal RWF 512-17
	Federal RWF 513-8
Federal RWF 514-8	

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within 24 hours *after* spudding please leave message on the following contact number: 970-876-9064. **The BLM CRVFO inspectors are Marlan Deaton, Ed Fancher, Greg Rios, Alex Provstgaard, Brandon Jamison, and Jennifer Robinson.**

Please contact one of the following petroleum engineers with emergency, drilling or completion issues: Bob Hartman at (970) 589-6735, bhartman@blm.gov, or Stephen Garcia at (970) 456-2138, sbgarcia@blm.gov

2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, sidetracking operations, plugging operations on newly drilled boreholes, changes within the drilling plan, changes to the well design, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact the petroleum engineer for verbal approvals (contact information above).

3. If a well control issue or failed test (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, the petroleum engineer shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) shall be forwarded to CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a 3M system and recorded in the IADC/Driller's log.
5. Air and/or mist drilling requires BLM petroleum engineer's notification and approval.
6. Flexible choke lines shall meet or exceed the API SPEC 16C requirements. Flexible choke lines shall have flanged connections and configured to the manufacturer's specifications. The flexible choke lines shall be anchored in a safe and workmanlike manner. At minimum, all connections shall be effectively anchored in place for safety of the personal on location. Manufacturer specifications shall be kept with the drilling rig at all times and immediately supplied to the Authorized Officer (AO) or inspector upon request. Specifications at a minimum shall include acceptable bend radius, heat range, anchoring, and the working pressure. All flexible choke lines shall be free of gouges, deformations, and as straight/short as possible.
7. Chronologic drilling progress reports must be emailed directly to the BLM Colorado River Valley Field Office petroleum engineers on a daily basis. Reports shall include daily mud reports, details of casing that has been run and its cementing, water flows, lost circulation zones, hydrocarbon shows and other information that describes drilling conditions.
8. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a pit volume totalizer, stroke counter, and flow sensor.
9. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the wellhead and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
10. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface and from TD to bottom of surface casing shoe. This log shall be submitted within 48 hours in .las and .pdf format to: CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652. Contact 970-876-9000 for clarification.
11. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CFR 3160-9 (a).
12. Notify the BLM Petroleum Engineer two weeks prior to commencing completion operations.
13. Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted not later than 30 days after completion of the well or after completion of operations being performed, in accordance with 43 CFR 3164. In accordance with 43-CFR 3162.4(b) submit a complete set of electrical/mechanical logs in .LAS format with standard Form 3160-4, Well Completion or Recompletion Report and Log.
14. Not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been

off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160–5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed. If the well is completed for production, the AO will be notified when the well is placed in a producing status. Such notification may be sent by telegram or other written communication, not later than five (5) days following the date on which the well is placed on production.

15. A schematic facilities diagram as required by 43 CFR 3162.7-5 (b.9. d.), and shall be submitted to the appropriate District Office within sixty (60) days of installation or first production, whichever occurs first. All site security regulations as specified in Onshore Oil & Gas Order No. 3 shall be adhered to. All product lines entering and leaving hydrocarbon storage tanks will be effectively sealed in accordance with 43 CFR 3162.7-5 (b. 4).
16. All off-lease storage, off-lease measurement, or commingling on-lease or off-lease will have prior written approval from the AO.
17. "Sundry Notice and Report on Wells" (Form 3160-5) will be filed for approval for all changes of plans and other operations in accordance with 43 CFR 3162.3-2.
18. **Water Use.** The purpose of this COA is to assist the BLM in ensuring that water depletions associated with Federal oil and gas development activities are adequately covered by the USFWS Programmatic Biological Opinion for the four endangered Colorado River fishes. The Operator shall provide the volumes of fresh water and reused/recycled water used during project development using the following table.

Well Name/No.:		API No.:			
County:		Well Pad:			
Operator:					
Activity	Water Use (barrels)				
	Construction	Drilling		Completion	
	Fresh	Fresh	Reused/ Recycled	Fresh	Reused/ Recycled
Road/Pipeline/Pad Dust Abatement					
Pipeline Hydrostatic Testing					
Cementing					
Mud					
Acid Wash/ Hydraulic Fracturing					

The volumes per well shall be identified by each development phase (construction, drilling, and completion) and by activity (e.g., dust abatement, pipeline hydrostatic testing, drilling, and completion operations). The water volumes shall be identified in an attachment to the BLM Form 3160-4, "Well Completion or Recompletion Report and Log" (completion report) submitted to the BLM Field Office. All volumes are to be reported in barrels per well.

The Operator shall submit the total volume of water used during construction of a pad with the first well completion report of the pad. Volumes of water used for subsequent activities (drilling and completing an additional well on the pad, dust abatement) shall be included in completion reports.

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APPENDIX B

Air Emissions Inventory and Analysis

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Air Emissions Inventory and Analysis

TEP Rocky Mountain LLC 15 Federal Wells on the Existing DOE 1-M-18 Pad

An air emissions inventory was compiled for the proposed development of 15 Federal wells on the existing DOE 1-M-18 pad (**Table AQA-1**). The emissions inventory includes emissions from development (construction, drilling, and completion activities) and production activities. The following pollutants were inventoried where an appropriate basis, methodology, and sufficient data exist: carbon monoxide (CO), nitrogen oxides (NO_x, including nitrogen dioxide [NO₂]), particulate matter less than 2.5 microns in effective diameter (PM_{2.5}), particulate matter less than 10 microns in effective diameter (PM₁₀), sulfur oxides (SO_x, including sulfur dioxide [SO₂]), volatile organic compounds (VOCs), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and hazardous air pollutants (HAPs).

Table AQA-1. Estimated Air Emissions for 15 Federal Wells on the DOE 1-M-18 Pad										
<i>Parameter</i>	<i>Criteria Pollutants or Precursors</i>						<i>Greenhouse Gases (GHGs)</i>			<i>HAPs</i>
	<i>PM₁₀</i>	<i>PM_{2.5}</i>	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>SO_x</i>	<i>CO₂</i>	<i>CH₄</i>	<i>N₂O</i>	
Development Emissions (tons/year)	1.27	0.662	15.9	22.2	30.6	0.234	3,580	36.1	1.32	0.001
Production Emissions (ton/year)	0.205	0.057	4.10	0.671	0.613	0.023	451	60.5	0.119	0.412

Lead and ozone are noticeably absent from the emissions inventory. Emissions of lead from oil and gas activities are extremely low in western Colorado and are therefore not analyzed. Ozone precursors are shown in the emissions inventory instead of ozone. Ozone is not directly emitted like other criteria pollutants. Ozone formation and prediction is complex, generally results from a combination of significant quantities of VOCs and NO_x emissions from various sources within a region, and has the potential to be transported across long ranges. Therefore, it is typically not appropriate to assess (i.e., model) potential ozone impacts of the proposed developments on potential regional ozone formation and transport. However, BLM Colorado performed a regional modeling study (Colorado Air Resource Management Modeling Study [CARMMS]) to assess potential ozone formation and impacts on a cumulative basis. The CARMMS is discussed after the predicted development-specific emissions inventory and near-field screening results.

The emissions inventory was developed using reasonable but conservative scenarios for each activity. Production emissions were calculated based on full production activity of the wells. Potential emissions were calculated assuming the minimum/basic legally required control measures, site-specific voluntary operator controls, operational parameters, and equipment configurations data provided by the operator.

In general, the proposed developments would have a temporary localized impact to air quality and would mostly occur during well drilling and completion. Road use, drilling, well completion, and equipment operation would affect air quality. Air quality would be impacted by emissions associated with the transportation of drilling and completion equipment. Fugitive dust and vehicle emissions would be generated from the mobilization of equipment necessary for well drilling and completion and erecting the drill rig. During drilling and completions work, air quality would be affected by emissions from generators and engines to run equipment, onsite and offsite vehicle traffic, and fugitive gases. This phase would also produce short-term emissions of other criteria pollutants, HAPs, and GHGs from vehicle and

equipment exhausts. For instance, the drill rig and completion engines are a major contributor of the estimated emissions.

Once well drilling is complete, the daily activities at the site would reduce to operational and maintenance checks, which may be as frequent as daily visits. Emissions would result from process heaters and vehicle exhausts from the maintenance and process technician visits.

In addition, the well pad would likely produce fugitive emissions of well gas, which contains mostly methane and a minor fraction of VOCs and HAPs. Fugitive emissions may result from pressure relief valves and breathing losses from any flanges, seals, valves, or other infrastructure connections. Most operations would be subject to portions of the current pollution control regulations. Thus, control equipment may be installed to mitigate fugitive emissions. Some control equipment would produce emissions of criteria pollutants, HAPs, and GHGs via combustion.

A near-field ambient air quality impact assessment was performed to quantify and evaluate maximum potential pollutant impacts (**Table AQA-2**). The BLM Colorado near-field modeling tool with a 10-kilometer radius domain was applied since the nearest ambient receptor is more than 2,000 feet south of the proposed development area. The BLM Colorado near-field modeling tool is based on CARMMS 2.0, using a photo-chemical 4-kilometer-spaced grid to predict Year 2025 concentrations for three fluid mineral development scenarios in Colorado – low, medium, and high. Future development estimates are based on either projecting the past 5-year average development pace forward (low) or applying the most recent BLM Field Office’s reasonably foreseeable development (medium and high). The medium scenario applies the same well count projections as the high, but assumes additional emissions restrictions. The high scenario assumes current development practices, emissions controls, and regulations. The modeled cumulative near-field air quality of the development area is captured by the CARMMS 2.0 low scenario. In other words, the total Federal oil and gas emissions of the low scenario across the near-field domain are large enough to account for the proposed developments, as well as other foreseeable future Federal fluid mineral development in the area through 2025. As shown in **Table AQA-2**, in the low scenario, the maximum emission concentrations from all sources across the near-field domain are less than the National Ambient Air Quality Standards (NAAQS).

Table AQA-2. Modeled Cumulative Near-Field Air Quality				
<i>Parameter</i>	<i>Total Project Maximum Federal Emissions</i>	<i>Total Federal Emissions across the Near-field Domain, Low Scenario</i>	<i>Maximum Concentrations from All Sources across the Entire Near-field Domain, Low Scenario</i>	<i>NAAQS</i>
1-hour NO ₂	22.9 tpy	31.4 tpy	30.7 ppb	100 ppb
8-hour O ₃	42.9 tpy	45.5 tpy	67.4 ppb	70 ppb
24-hour PM ₁₀	1.47 tpy	2.49 tpy	11.0 µg/m ³	150 µg/m ³
24-hour PM _{2.5}	0.719 tpy	0.720 tpy	4.31 µg/m ³	35 µg/m ³
Annual PM _{2.5}	0.719 tpy	0.720 tpy	2.81 µg/m ³	12 µg/m ³
ppb = parts per billion µg/m ³ = micrograms per cubic meter tpy = tons per year				

When apportioning the proposed development emissions to cumulative emissions in the modeling domain, a single cell in the 4-kilometer-spaced grid of the CARMMS 2.0 is selected with modeled emissions that most closely resemble those of the proposed developments (**Table AQA-3**). As the difference in the modeled emissions decreases between the selected grid cell and the developments, the

influence of other factors (e.g., other Federal development in the area) is also assumed to decrease, thereby isolating the developments' emissions from other emissions in the area in order to determine reasonable estimates of the developments' contribution concentrations. The modeled development's concentration contributions are less than their respective Significant Impact Levels (SILs). The total emissions from all sources in the grid cell are less than the NAAQS.

Table AQA-3. Concentration Contributions Relative to Overall Emissions						
<i>Parameter</i>	<i>Total Development Maximum Federal Emissions</i>	<i>Federal Emissions from Grid Cell Similar to Project</i>	<i>Project's Concentration Contribution</i>	<i>Significant Impact Level</i>	<i>Total Emissions from All Sources in Grid Cell</i>	<i>National Ambient Air Quality Standard</i>
1-hour NO ₂	22.9 tpy	23.3 tpy	2.43 ppb	4 ppb	7.26 ppb	100 ppb
8-hour O ₃	42.9 tpy	45.5 tpy	0.291 ppb	1 ppb	66.0 ppb	70 ppb
24-hour PM ₁₀	1.47 tpy	1.49 tpy	0.234 µg/m ³	5 µg/m ³	56.6 µg/m ³	150 µg/m ³
24-hour PM _{2.5}	0.719 tpy	0.720 tpy	0.052 µg/m ³	1.2 µg/m ³	2.73 µg/m ³	35 µg/m ³
Annual PM _{2.5}	0.719 tpy	0.720 tpy	0.071 µg/m ³	0.2 µg/m ³	1.62 µg/m ³	12 µg/m ³

Cumulative Impacts. The CARMMS assesses statewide impacts of projected oil and gas development (both Federal and fee [i.e., private]) to year 2025. Each field office was modeled with the source apportionment option, meaning that incremental impacts to regional ozone and air quality related values (AQRVs) from Federal oil and gas development in these areas are essentially tracked to better understand the significance of such development on impacted resources and populations. The CARMMS leverages the work completed by the WestJumpAQMS, and the base model platform and model performance metrics are based on those products.

Based on the CARMMS projections, the BLM continually tracks emissions changes and air quality conditions to determine which projection path (low, medium, high) would be most appropriate to estimate air quality impact correlations based on the cumulative development (i.e., net emissions changes) that has occurred since the base emissions inventory year. Although the predicted impacts are based on future modeling results (2025), the relative changes in the impacts between the scenarios provides insight into understanding how mass emissions impact the atmosphere on a relative basis.

The CARMMS incremental modeling changes / results for each source group (i.e., Colorado River Valley Field Office [CRVFO]) are applicable to the amount of new air pollutant emissions that were modeled in the CARMMS. Annual oil and gas completions / development inventories are routinely compiled by the BLM to track current oil and gas development with regard to CARMMS-modeled "budgets" (oil and gas development / emissions rates). The following summarizes oil and gas development that has occurred for the CRVFO with CARMMS projection information.

In the CRVFO, 429 new Federal wells were completed from 2012 through 2015 at an annual average development rate of 107 wells, which approximates the rate analyzed in the low CARMMS scenario. The majority of the development occurred in the western portion of the CRVFO, adjacent to the Interstate 70 corridor and extending north toward the Piceance Basin.

Several air quality monitors are within the CRVFO boundaries, measuring PM₁₀, PM_{2.5}, O₃, and NO₂ concentrations. The monitoring data have trends that comply with the current NAAQS. Although the trends for ground level ozone are very close to the 70 ppb standard.

The CRVFO is flanked on three sides by Class I areas, including the Flat Tops, Eagles Nest, and Maroon Bells-Snowmass Wilderness areas. Due to their proximity, these areas would be the most likely impacted by any future Federal oil and gas development in the CRVFO. Only the Flat Tops and Maroon Bells-Snowmass Wilderness areas have visibility monitoring data. The data show significant improvements in visibility trends for both the clearest and haziest days at the Maroon Bells-Snowmass Wilderness Area. The Flat Tops data are limited and a long-term trend is not discernable. A nearby CASTNET monitoring site measures total nitrogen deposition. The data trends suggest that the mean deposition flux is stable at approximately 2.02 kilograms per hectare per year (kg/ha-yr). A National Atmospheric Deposition Program (NADP) site monitors wet chemistry deposition within the CRVFO at Sunlight Peak; the monitoring data's trend appears to be stable with an annual average wet nitrogen deposition of approximately 1.7 kg/ha-yr. The Flat Tops Wilderness Area NADP monitor has been inactive since 2010, but the available data have an overall flat wet deposition trend. Absent additional site-specific data, nitrogen deposition in the CRVFO is below the defined critical loading levels.

The CARMMS analysis does not predict any significant impacts to visibility at nearby Class I areas for any of the scenarios or reporting-year emissions levels. The two biggest issues resulting from the analysis are the estimated impacts from deposition at the Flat Tops Wilderness Area and the estimated regional ozone formation potential.

The report-year metrics for deposition impacts suggest that on a quasi-cumulative basis, the CRVFO may be contributing to deposition at the Flat Tops Wilderness Area at rates that are above the deposition analysis threshold (DAT). The DAT is an individual project-level threshold that is not applicable to cumulative field office development. No such threshold currently exists for aggregated projects within a given area. The monitoring data suggest that cumulative deposition at nearby Class I areas is currently below the critical load levels. However, the monitoring for the Flat Tops Class I area was discontinued several years ago and may be too dated to be reliable.

The CARMMS analysis shows that the CRVFO has the highest ozone formation potential of any field office or planning area in BLM Colorado. Even under the low CARMMS scenario, the CRVFO is showing much greater ozone potential relative to other field offices with similar emissions levels. The reason for this is not apparent in the CARMMS, although recent performance metrics for the 2011 Intermountain West Data Warehouse (IWDW) modeling platform show that the model tends to over-predict ozone formation in western Colorado. Unmonitored Area Analysis plots for both the CARMMS and the 2011 IWDW platform show high ozone in the same region of Colorado, just south of the Roan Plateau. CARMMS 1.0 is based on the 2008 platform and, as such, area monitors did not exist in Rifle, Rangely, and Meeker to provide for a relative response factor adjustment to account for these higher modeled impacts as the 2011 platform does. Given the similarity in the platforms and the emissions analyzed in the base case future year, the CARMMS is likely trending high for modeled ozone predictions.

Oil and gas development is expected to remain on the current track (i.e., tracking low relative to the CARMMS low scenario) for the foreseeable future in Colorado. There are currently no foreseeable significant shifts in petroleum market dynamics (supply, demand, etc.), changes or advancements in development / recovery technologies, newly discovered resources / plays, or political influences (tax or regulatory incentives) that would significantly affect the rates of development occurring in Colorado. Thus, CARMMS 1.0 remains an applicable and appropriate tool for describing impacts for future oil and gas projects within all of the Colorado planning areas.

Continued field development, operation of well site equipment, and associated vehicle traffic would result in minor cumulative contributions to atmospheric GHGs. Natural gas and condensate produced from the 15 Federal wells on the DOE 1-M-18 pad would be refined to produce a wide range of fuel products for

consumer or commercial use. The combustion of these fuels would generate GHGs, which would be controlled through applicable GHG emission control regulations (emissions standards) or by applicable air permit requirements.

Other industrial operations in the area would also contribute to GHG emissions through use of carbon fuels (liquefied petroleum gas, oil, and diesel), and through use of electricity produced using carbon fuels. Other anthropogenic activities such as residential wood and open burning, as well as biogenic sources, also contribute GHGs to the atmosphere. These would be more dispersed, but also more sustained, than the emissions from this oil and gas development, which has a finite lifespan.

While significance levels exist to determine Prevention of Significant Deterioration (PSD) applicability and emissions control requirements for GHGs, policies regulating specific GHG concentration levels and their potential for significance with respect to regional or global impacts have not been established for GHGs. On the DOE 1-M-18 pad, the maximum estimated GHG emissions resulting from well development and production activities are approximately 5,271 tpy (4,782 metric tpy) as CO₂ equivalent (CO₂e) and 2,665 tpy (2,417 metric tpy) as CO₂e, respectively (**Table AQA-4**). To place the GHG emissions from the pad in context, the calculated GHG emissions in year 2015 from oil and gas production in Garfield County, State of Colorado, and U.S. were approximately 5.98 million metric tons (MMT), 145 MMT, and 3,280 MMT of CO₂e, respectively (Colorado Oil and Gas Conservation Commission [COGCC] 2018, Office of Natural Resources Revenue [ONRR] 2017, U.S. Environmental Protection Agency [EPA] 2014, Intergovernmental Panel on Climate Change [IPCC] 2013). The pad's maximum GHG emissions from development and production would be approximately 0.12 percent of Garfield County's 2015 oil and gas production emissions.

Table AQA-4. Maximum GHG Emissions from 15 Federal Wells on the DOE 1-M-18 Pad				
<i>Project Phase</i>	<i>Pollutants (metric tons per year)</i>			
	<i>Carbon dioxide (CO₂)</i>	<i>Methane (CH₄)</i>	<i>Nitrous oxide (N₂O)</i>	<i>CO₂ equivalent</i>
Development	3,246.79	32.77	1.193	4,782
Production	409.53	54.88	0.108	2,417
<i>Subtotal – Upstream / Midstream</i>	<i>3,656.32</i>	<i>87.65</i>	<i>1.301</i>	<i>7,199</i>
<i>Subtotal – Downstream Combustion</i>	<i>1,735.51</i>	<i>12.86</i>	<i>1.918</i>	<i>2,770</i>
Total Federal GHG Emissions	5,391.83	100.51	3.219	9,969

The maximum annual downstream CO₂e emissions are estimated at approximately 2,770 metric tons per year. These maximum annual downstream emissions combined would be comparable to 0.05% of Garfield County's 2015 oil and gas production emissions.

According to ONRR's U.S. Department of the Interior data, the country's total Federal (onshore) oil and gas production in 2015 was approximately 191 million bbl of oil and 3,482,000 MMCF of natural gas, which accounted for 5.6 percent and 10.6 percent of the nation's total production (combined Federal and non-Federal), respectively (ONRR 2017). Similarly, Colorado's Federal oil and gas production represented 0.66 percent and 13.7 percent of the nation's Federal oil and gas production, and 0.15 percent and 2.0 percent of the nation's total (onshore and offshore) production (Federal and non-Federal). It is reasonable to assume that all of the oil and gas produced in the U.S. is combusted in some way, shape, or form and most likely within the broader parts of the economy (electricity generation, transportation, industry).

The U.S. produced 6,587 MMT of CO₂e emissions in 2015 according to EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks (2017). The calculated CO₂e emissions from Federal oil and gas development in Colorado (38.4 MMT) and across the nation (273 MMT onshore and 592 MMT onshore and offshore combined) represent 0.58 percent, 4.1 percent (onshore), and 9.0 percent (onshore and offshore), respectively, of the nation's total GHG emissions (ONRR 2017, EPA 2014, IPCC 2013).

At a global scale, the U.S. and the world produced 6,344 MMT and 53,530 MMT, respectively, of CO₂e emissions in 2012 (The World Bank Group 2017). In other words, the U.S. produced 12 percent of the global GHG emissions.

All climate model projections indicate future warming in Colorado (BLM 2017). The Statewide average annual temperatures are projected to warm by +2.5 °F to +5 °F by 2050 relative to a 1971 to 2000 baseline under Representative Concentration Pathway (RCP) 4.5. Summer temperatures are projected to warm slightly more than winter temperatures, where the maximums would be similar to the hottest summers that have occurred in the past 100 years. Precipitation projections are less clear. Nearly all of the models predict an increase in winter precipitation by 2050, although most projections of snowpack (April 1 snow-water equivalent measurements) show declines by mid-century due to projected warming. Late-summer flows are projected to decrease as the peak shifts earlier in the season, although the changes in the timing of runoff are more certain than changes in the amount of runoff. In general, the majority of published research indicates a tendency towards future decreases in annual streamflow for all of Colorado's river basins. Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, will continue to increase wildfire risks and impacts to people and ecosystems.

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