

**SENSITIVE AREA DETERMINATION**  
**LARAMIE ENERGY**  
**CC 0697-15-54 ANNEX CUTTINGS MANAGEMENT FACILITY**

**Prepared for:**



**Laramie Energy, LLC**  
**760 Horizon Drive, Suite 101**  
**Grand Junction, CO 81506**

**Prepared by:**



**WestWater Engineering**

2516 FORESIGHT CIRCLE, #1  
GRAND JUNCTION, COLORADO 81505

**October 2021**

## INTRODUCTION

At the request of Laramie Energy, LLC (Laramie), WestWater Engineering prepared this Sensitive Area Determination for the proposed CC 0697-15-54 Annex Cuttings Management Facility (ACF). The person responsible for completing the Sensitive Area Determination is provided below in Table 1.

**Table 1. Person (s) Conducting Field/Desktop Inspection**

Name/Title	Date
Dean Goebel, Hydrogeologist, WestWater Engineering	July 19, 2021 and Updated October 13, 2021

Sensitive Area: A sensitive area is an area vulnerable to potential significant adverse groundwater impacts, due to factors such as the presences of shallow groundwater or pathways for communication with deeper groundwater; proximity to surface water, including lakes, rivers, perennial or intermittent stream creeks, irrigation canals, and wetlands. Additionally, areas classified for domestic use by the Water Quality Control Commission, Local (water supply) wellhead protection areas, areas within 1/8 mile of a domestic water well, areas within 1/4 mile of a public water supply well, ground water basins designated by the Colorado Ground Water Commission, and source water supply areas are sensitive areas.

## SENSITIVE AREA DETERMINATION

A desktop analysis was completed for this project to determine if the proposed facility would be located within a Sensitive Area as defined above. Factors considered to make this determination are presented below in Table 2.

**Table 2. Sensitive Area Determination Factors**

Sensitive Area Factors	Comments
<b>Surface Water</b>	
Are there any surface water features (i.e. wetlands, rivers, intermittent streams, seeps, springs) within 1/4 mile of the project?	Two intermittent streams are located within 1/4 mile. One in McKay Gulch and the other discharges into the McKay Gulch drainage. One intermittent stream is located 1,073 feet S38° E of proposed facility in McKay Gulch and the other is located 1,185 feet N28°E.
Could a potential release from the facility reach surface water features?	No, the potential for impacts to surface water from a facility release is low.
Will the facility have any liquids stored on-site which contain hydrocarbons and chlorides or other E&P wastes?	No, the facility will manage dry drill cuttings. No liquids will be stored at the facility.
<b>Groundwater</b>	

Sensitive Area Factors	Comments
Will the facility be underlain by an unconfined aquifer or recharge zone?	No
Is the facility located within 1/8 mile of domestic water well or ¼ mile of a public water supply well which would use the same aquifer?	No
Is the facility within 100-year floodplain	No
In the event of a release could the facility potentially impact groundwater?	The potential for a release from the facility to impact groundwater is low.
<b>Sensitive Areas Determination</b>	<b>Not considered a Sensitive Area based on desktop analysis.</b>

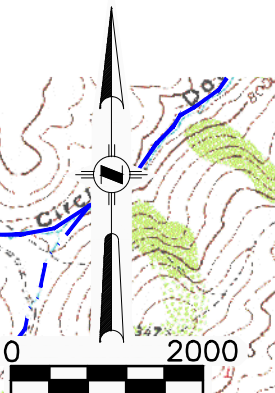
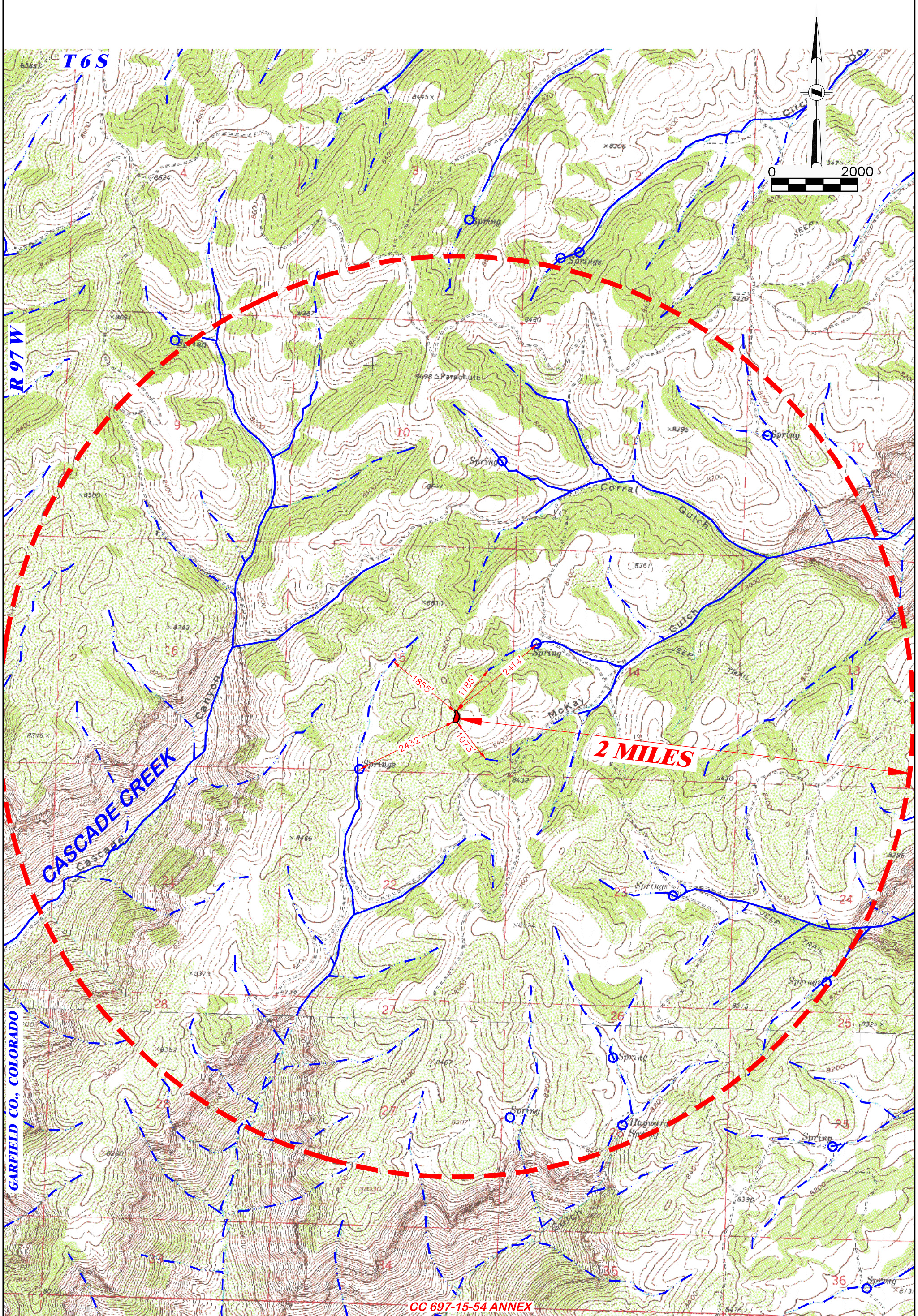
Surface Water: The potential for impacts on surface water quality is low for this sensitive area determination. The nearest intermittent stream is located 1,073 feet S38°E of the proposed drill cuttings management facility in McKay Gulch. There are two springs supplying base flow to the intermittent drainages located within a ½ mile of the site. The nearest spring, located 2,414 feet N46°E of the proposed facility, is also very unlikely to be impacted. The other spring, located 2,432 feet S63°W, is physically isolated from proposed facility in a separate watershed due to a topographic divide to the east.

The facility will handle drill cuttings from three other proposed surrounding well pads. The potential for releases from the stabilized cuttings is low as long as the cuttings remain solid without exposure to water sources capable of creating a slurry. Best Management Practices (BMPs) during facility construction will further diminish the release potential along the graded edge of fill slopes in the form of perimeter soil berms, diversion ditches, and other control measures. Monitoring and maintenance of proposed BMPs and mass wasting control measures will provide additional safety containment protocols in the event of a potential release.

Groundwater: State Engineer’s Office and USGS records were reviewed to gather additional information pertaining to the occurrence and depth of shallow groundwater. The closest permitted water well (permit no. 233234) is 2,732 feet S72°E from the proposed facility. Three monitoring wells, locations ranging from 844 to 1,388 feet southeast of proposed facility, have been abandoned, thus are no longer relevant to this sensitive area determination. Shallow groundwater occurrence is limited to alluvial aquifers adjacent to surface water and is not representative of the thick sequence of hard rock hydrogeology of the proposed site. The facility is not underlain by an unconfined aquifer or recharge zone. Visual observations of the site based on aerial photography indicates mountain shrubland vegetation and sagebrush shrublands. Depth to shallow groundwater residing in the local flow system is greater than 80 inches (6.67 feet) based on NRCS soil properties and qualities for mapped soil units identified as Northwater-Adel complex and Parachute-Irigul-Rhone association soils. Typical soil profiles for these soils indicate bedrock subcrops 25 to 60 inches below ground surface.

The proposed facility would not be located within 1/8 mile of a domestic water well nor would it be located within 1/4 mile of a public water supply which would use the same aquifer. The facility would not be located within 100-year floodplain.

Based on the information evaluated for the desktop analysis, the release potential of the proposed facility is very low due to the solid nature of stabilized drill cuttings managed at the site. Therefore, by COGCC rule, the facility should not be classified as sensitive area for water resources.



**2 MILES**

**CC 697-15-54 ANNEX**

**QUADRANGLE**  
**CIRCLE DOT GULCH**  
**LONG POINT**  
**MOUNT BLAINE**  
**RED PINNACLE**  
**DEBEQUE**  
**WAGON TRACK RIDGE**

**DRG** RIFFIN & ASSOCIATES, INC.  
 (307) 362-5028 1414 ELK ST., ROCK SPRINGS, WY 82901

DRAWN: 6/29/2020 - DEH SCALE: 1" = 2000'  
 REVISED: 10/12/2021 - DEH DRG JOB No. 21379  
 MISCELLANEOUS EDITS SURF HYDRO

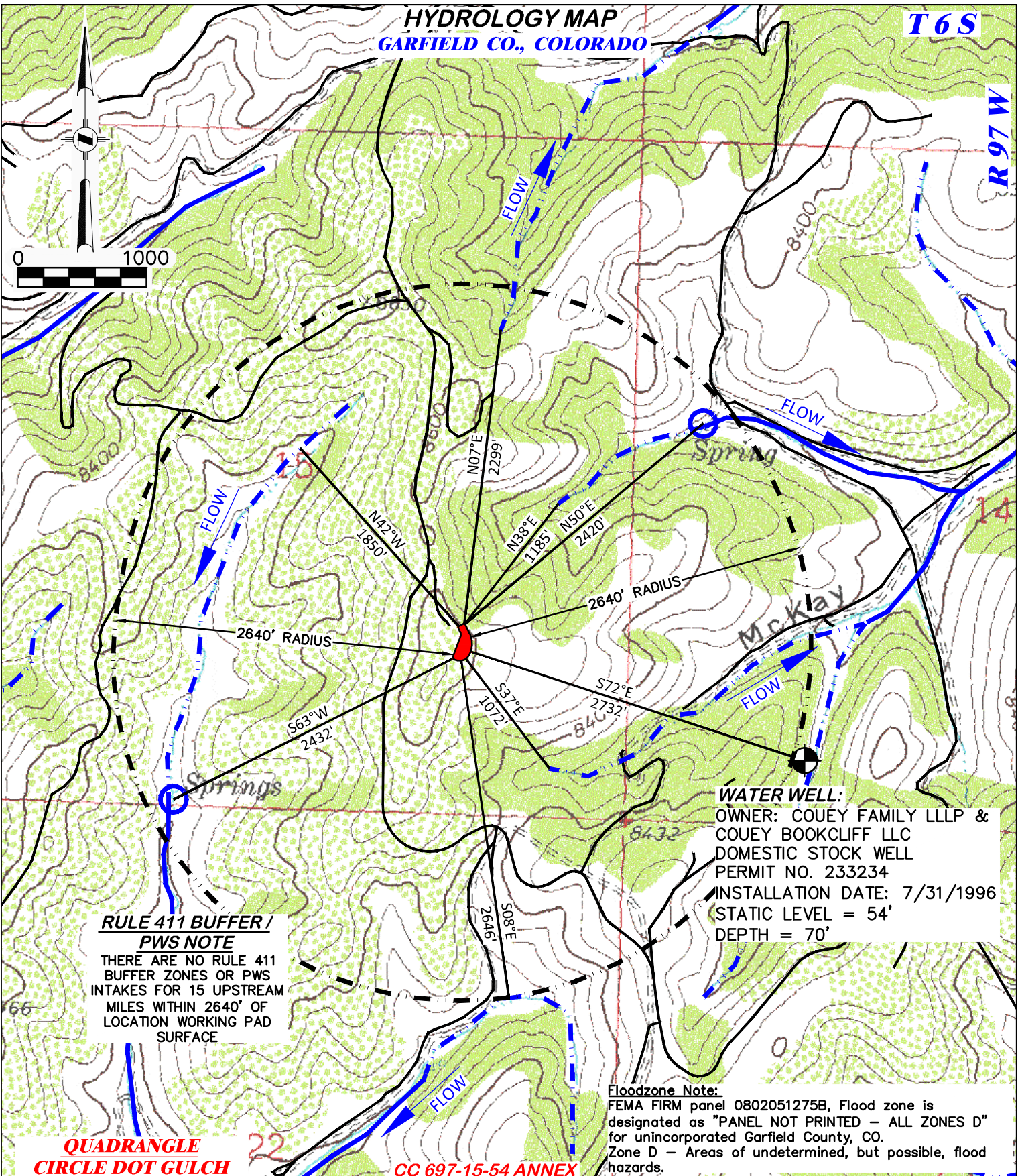
**SURFACE HYDROLOGY MAP**  
**LARAMIE ENERGY, LLC.**  
**CC 697-15-54 ANNEX**  
**SESE, SECTION 15, T. 6 S., R. 97 W., 6th P.M.,**  
**GARFIELD COUNTY, COLORADO**

HISTORIC SPRING PERENNIAL FLOW   
 INTERMITTENT FLOW WORKING PAD SURFACE

**HYDROLOGY MAP**  
**GARFIELD CO., COLORADO**

**T 6 S**

**R 97 W**



**RULE 411 BUFFER / PWS NOTE**

THERE ARE NO RULE 411 BUFFER ZONES OR PWS INTAKES FOR 15 UPSTREAM MILES WITHIN 2640' OF LOCATION WORKING PAD SURFACE

**WATER WELL:**

OWNER: COUEY FAMILY LLLP & COUEY BOOKCLIFF LLC  
 DOMESTIC STOCK WELL  
 PERMIT NO. 233234  
 INSTALLATION DATE: 7/31/1996  
 STATIC LEVEL = 54'  
 DEPTH = 70'

**Floodzone Note:**

FEMA FIRM panel 0802051275B, Flood zone is designated as "PANEL NOT PRINTED - ALL ZONES D" for unincorporated Garfield County, CO. Zone D - Areas of undetermined, but possible, flood hazards.

**QUADRANGLE**  
**CIRCLE DOT GULCH**

**CC 697-15-54 ANNEX**



**DRIFIN & ASSOCIATES, INC.**

(307) 362-5028

1414 ELK ST., ROCK SPRINGS, WY 82901

**HYDROLOGY MAP**

**LARAMIE ENERGY, LLC.**

**CC 697-15-54 ANNEX**

**SESE, SECTION 15, T. 6 S., R. 97 W., 6th P.M., GARFIELD COUNTY, COLORADO**



**PROPOSED WORKING PAD SURFACE**

**DRAWN: 6/2/2021 - DEH**

**SCALE: 1" = 1000'**

**REVISED: 10/12/2021 - DEH**

**DRG JOB No. 21379**

**MISCELLANEOUS EDITS**

**304b(7)E HYDRO**

**HISTORIC SPRING**

**PERENNIAL FLOW**

**INTERMITTENT FLOW**

**EXISTING ROAD**