



Kerr-McGee Oil & Gas Onshore LP

Geologic Hazard Plan

Alder 23-16HZ Well Pad and Facility
NESW Section 16, 2N 63W

Weld County, CO

August 2023

PROFESSIONAL GEOLOGIST CERTIFICATION

I certify that I am a Professional Geologist, having met the education requirements and professional work experience required by C.R.S. § 23-41-208(b). I certify that the Geologic Hazard Plan described herein is, to the best of my knowledge, accurate and complete.

A handwritten signature in black ink, appearing to read "Rachel Friedman".

Rachel Friedman - Geological Advisor

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Definition of Geologic Hazard:

Pursuant to § 24-65.1-103(8), C.R.S., a “Geologic Hazard” means a geologic phenomenon which is so averse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property. The term includes but is not limited to (a) avalanches, landslides, rock falls, mudflows, and unstable or potentially unstable slopes; (b) seismic effects; (c) radioactivity; and (d) ground subsidence.

Rule 304.c.(21) provides that if the Operator identifies any Geologic Hazards pursuant to Rule 304.b.(7).I, the Operator will submit a Geologic Hazard plan describing proposed mitigation measures.

Section 1: Site Conditions and Development

Kerr-McGee Oil & Gas Onshore LP (KMOG) is proposing the construction and development of an oil/gas well pad and production facility, the Alder 23-16HZ, located in the northeast quarter of the southwest quarter of Section 16, Township 2 North, Range 63 West in Weld County, Colorado. The Alder 23-16HZ project proposes the construction and operation of the well pad and production facility containing infrastructure and operations for 19 wells which will be permitted by Energy and Carbon Management Commission (ECMC) and Weld County. The construction and drilling phases are currently planned for Q2 2026 (subject to change).

Section 2: Site Characterization

As part of this application, a survey of geologic hazards as defined by C.R.S § 24-65.1-103(8) was conducted within 1 mile of the proposed Alder 23-16HZ Location. Additionally, KMOG evaluated the presence of floodplains within 1 mile of the proposed location. Although there are no geologic hazards within 1 mile of the proposed location, there is a floodplain. The 100-year effective floodplain (2016) of the Lost Creek is present. The floodplain is outside the Working Pad Surface (WPS) of the proposed Alder 23-16HZ location. The proposed access road for the Alder 23-16HZ is planned to be within the floodplain.

The attached Geological Hazard Map shows the lack of geologic hazard features and the floodplain that is located within 1 mile of the proposed Alder 23-16HZ surface drilling location. At its closest, the 100-year effective floodplain is approximately 30 feet to the east and 1 foot downgradient of the WPS of the location.

Section 3: Measures taken to avoid, minimize or mitigate impacts of Geologic Hazards and other features

KMOG will employ the following mitigation strategies to ensure the safety of the surrounding area in the unlikely event that a 100-year flood occurs.

- Permanent tanks are all anchored regardless of their location relative to any floodplain.
- Permanent tanks are protected from floodwaters by secondary containment berms.
- Any exposed electrical will be waterproofed and properly anchored to the wellhead.
- The flowlines (3-inch Schedule 80 steel) will be buried an average of 4.0 feet below grade.
- Topsoil stored for final reclamation will be seeded to prevent erosion caused by wind, local storm runoff, and potential flooding of the St. Vrain Creek.
- KMOG’s Integrated Operations Center (IOC) can shut in facilities remotely 24 hours per day, seven days per week.

- As a result of the access road's location within the floodplain, KMOG is working to apply for a floodplain development hazard permit (FHDP) through the Weld County Floodplain Administrator. This is a robust process that requires an evaluation and certification that in the event of a 100 year flood event waters will not rise more than 0.3 feet above the base flood elevation (BFE) due to the construction of the road. To achieve this KMOG will install multiple culverts at the Lost Creek crossing and not elevate the access road any more than six inches through out the floodplain.

Section 4: Summary

This review and the attached Geologic Hazard Map support the conclusion that, based on the results of the geologic hazards survey, there are no geologic hazards within 1 mile of the proposed location and access road. The Alder 23-16HZ WPS is located outside of the 2016 effective 100-year. The access road will cross the 100-year effective floodplain and KMOG has applied for a FHDP, which will detail the BMPS that will be put in place to reduce the impact of flooding related to an event larger than the FEMA predicted 100-year events. Therefore, the identified preliminary floodplain and effective floodplains will not pose a threat to the past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property.

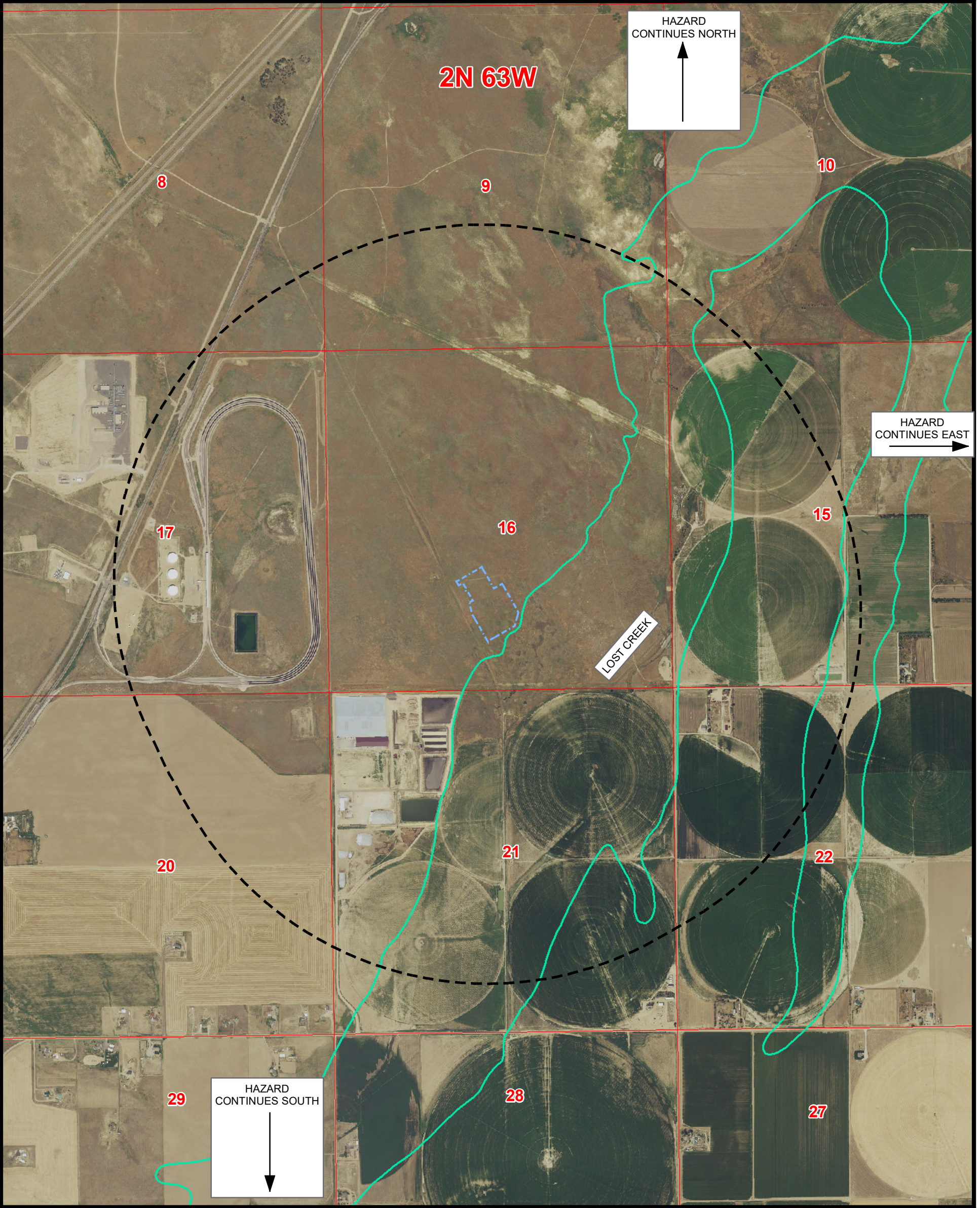
Section 5: References

- Floodplain
 - ECMC Floodplains (FEMA) <https://ecmc.state.co.us/maps.html#/gisonline>
 - National Flood Hazard Layer (NFHL) <https://hazards-fema.maps.arcgis.com/apps/webappviewer/>
 - Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning/Floodplain-Management>
- Surface Mines
 - ECMC DRMS Mine: <https://ecmc.state.co.us/maps.html#/gisonline>
 - Weld County: <https://www.weldgov.com/Government/Departments/Planning-and-Zoning>
- Earthquakes:
 - USGS: <https://www.usgs.gov/natural-hazards/earthquake-hazards/science/>
 - USGS: <https://earthquake.usgs.gov/earthquakes/map/>
- Landslides
 - CGS: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/>
- Sub-Surface Mines
 - ECMC Coal Mine: <https://ecmc.state.co.us/maps.html#/gisonline>
 - Roberts, S.B., Hynes, J.L., and Woodward, C.L. Maps Showing the Extent of Mining, Locations of Mine Shafts, Adits, Air Shafts, and Bedrock Faults, and Thickness of Overburden above Abandoned Coal Mines in the Boulder-Weld Coal Field, Boulder, Weld and Adams Counties, Colorado. 1:48:000. Denver, CO: US Geological Survey: 2001

- Ivery, J.B., and Hynes, J.L., Subsidence Hazard Map Boulder-Weld Coal Field Boulder and Weld Counties, Colorado. Map No. 7361-6 1:24,000. Colorado Geological Survey: 1974

**GEOLOGIC HAZARD MAP
ALDER 23-16HZ**

SECTION 16, TOWNSHIP 2 NORTH, RANGE 63 WEST, 6TH P.M., WELD COUNTY, COLORADO



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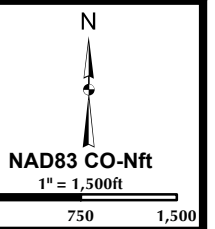
- PROPOSED WORKING PAD SURFACE
- 1 MILE BUFFER - WORKING PAD SURFACE
- 100-YEAR FLOODPLAIN (EFFECTIVE, 2016)
- 100-YEAR FLOODWAY (PRELIMINARY, 2020)
- 100-YEAR FLOODPLAIN (PRELIMINARY, 2020)

NOTE:
THIS MAP IS A COMPILATION OF PUBLICLY AVAILABLE DATA. THE ACCURACY AND COMPLETENESS OF SAID DATA HAS NOT BEEN VERIFIED BY 609 CONSULTING, LLC. EXISTING CONDITIONS MAY DIFFER FROM WHAT IS SHOWN.

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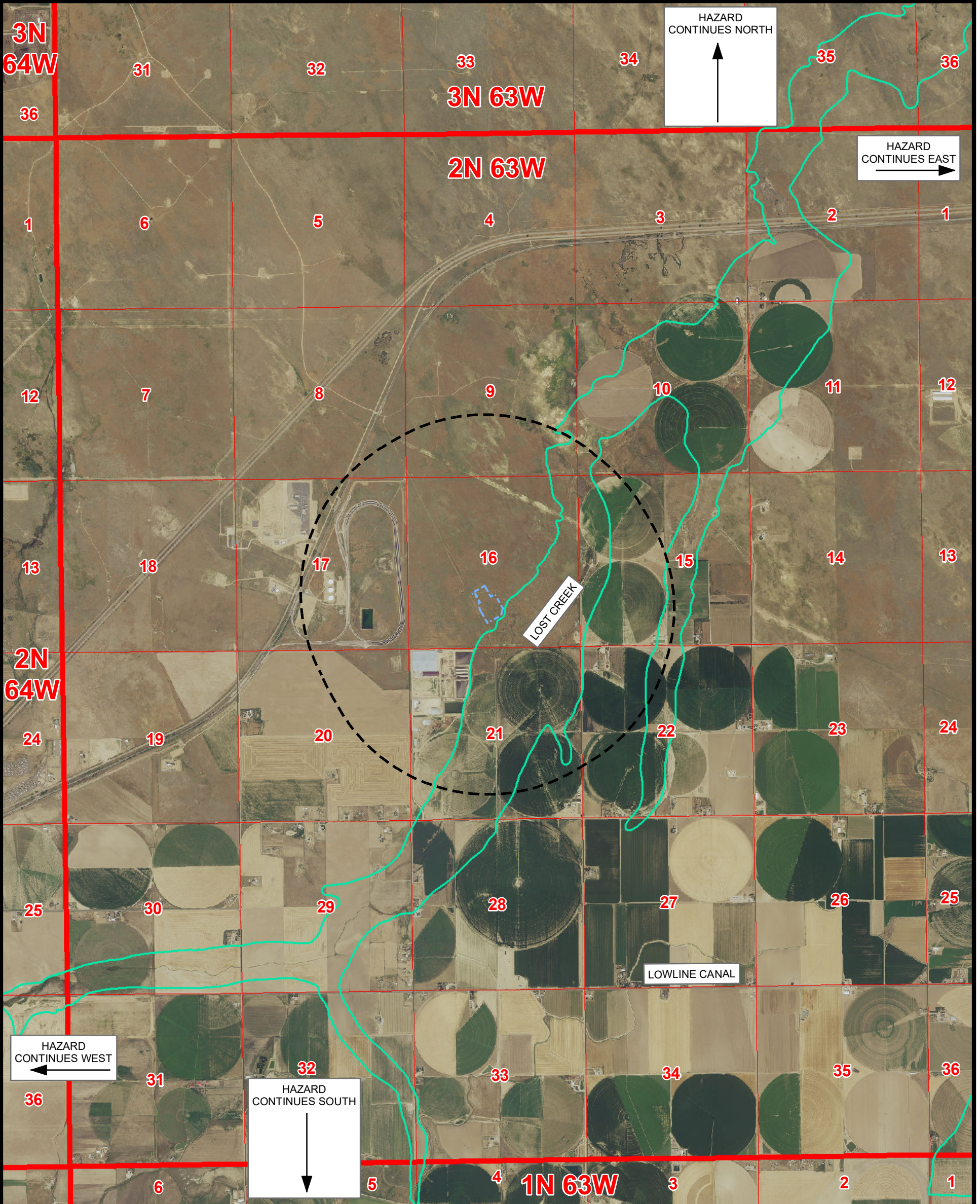


Drawn by: AK
Revised:

Date: 30 Jun 2023
Date:

**GEOLOGIC HAZARD MAP
ALDER 23-16HZ**

SECTION 16, TOWNSHIP 2 NORTH, RANGE 63 WEST, 6TH P.M., WELD COUNTY, COLORADO



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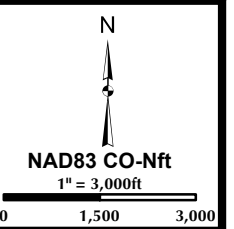
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