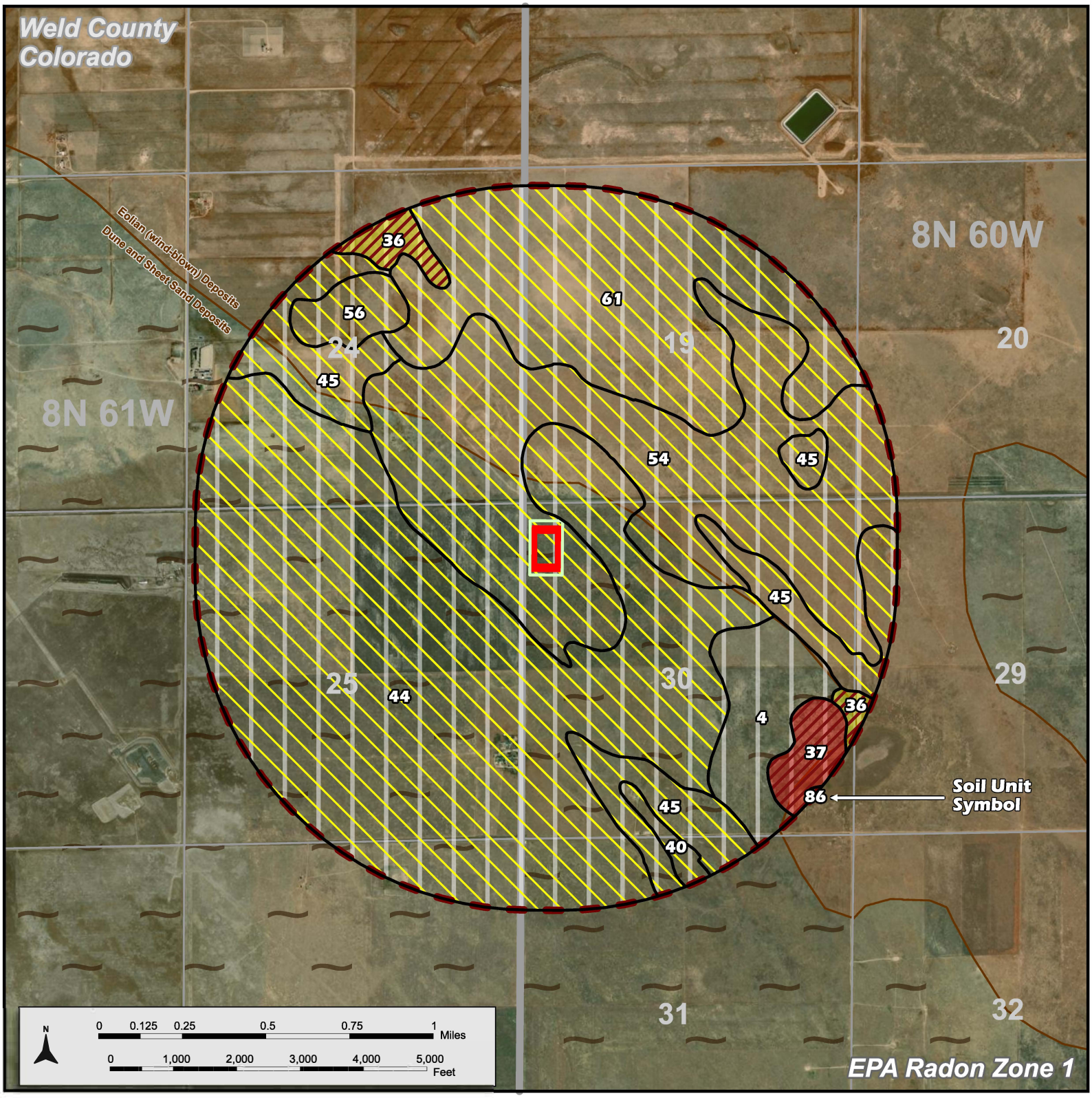
Hill 2527 PAD
GEOLOGIC HAZARD MAP



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Drawn by: **VG**

Checked by: **JAB**

Drawing Date: **08-07-23**

Data Source: Esri, Maxar, GeoEye, AeroGRID, Earthstar Geographics, CGS Services Mines CNES/Airbus DS, USDA, USGS, IGN, GIS User Community

Site Name: **Hill 2527**

Surface Location: **SEC 34,26,27 T 08-N, R 61-W Weld County, Colorado**

Entire map area is within: **EPA Radon Zone 1**

Legend:
- 5280' Radius from WPS
- Working Pad Surface

Collapsible Soils:
- EG-14 Dune and sheet sand deposits
- EG-14 Eolian (wind-blown) deposits

Settlement can occur where gypsum and/or appreciable clay and silt concentration are present

Expansive Soils:
Plastic Index: ***Low***
Liquid Index: ***Low***
Entire Map Area

Landslide, Coal Mines, Floodplain:
Not Present

Corrosion of Concrete

	Soil Unit Symbol #	Soil Rating
High	37	High
Moderate	36	Moderate

Corrosion of Steel

	Soil Unit Symbol #	Soil Rating
High	36, 37	High
Moderate	40, 44, 45, 54, 56, 61	Moderate

Compressible Soils
Unified Soil Classification (Surface)

Moderate

Soil Unit Symbol #
CL - 36, 37, 40, 54, 61
SC - 44, 45, 56
SC-SM - 4

Geologic Hazards Summary for Hill 2527

Location: NW ¼ NW ¼ Section 30, T08N-R60W 6th P.M.

Summary:

My name is Jason Burris, and I am currently employed as Senior Development Geologist for Verdad Resources LLC ("Verdad"). I certify that I am a Professional Geologist, satisfying the requirements of C.R.S. 23-41-208 (b). The matters described herein were devised under my direction and control. To the best of my knowledge and belief, all the matters set forth herein, my testimony and the supporting exhibits, are true, correct, and accurate.

Based on this review of available geologic data comprised of experience, measurements, and published reports, I determine that the following hazards are present at the proposed location: soil corrosion of concrete [1], soil corrosion of steel [1], collapsible soils [1,2], and Radon (NORM) [8]. Other absent, or very low, hazards examined at the proposed location are expansive soils [1,3,4], landslides [1,6], 100-year floodplain [7], NORM & TENORM [9], induced seismicity [10], natural rate seismicity [11], and coal mine subsidence [12]. A map summary of these findings is attached.

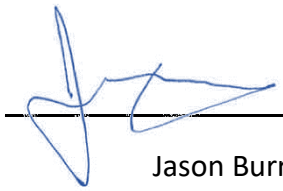
Corrosion to concrete is identified as a potential hazard. The concrete on location will serve as a combustor base. Considering the soil composition, and Verdad's facility design and management, I determine the soil corrosion to concrete hazard is insignificant.

Corrosion to steel is identified as a potential hazard at the proposed location. No steel at the proposed location will be exposed to the soil because 1) all steel equipment on location will have impervious liners, 2) steel flowlines will have protective lining, and 3) imported gravel or road base will separate the natural soil from steel. Considering the primary soil on the location, and facility design and management, I determine the steel corrosion hazard from soil at the proposed location is insignificant.

Collapsible soils are identified as a potential hazard. Prior to construction at the proposed location, topsoil is removed. During the cut and fill process, the ground is wetted and compacted. A cap of about 4-6" of road base provides additional protection from differential compaction. The grade and ditches promote flow from the proposed location to further mitigate the risk of water saturating soils. Considering the soil composition, and Verdad's facility design and management, I determine the collapsible soil hazard is low.

Radon hazard is identified as a potential geo hazard on the map. However, there are no inhabited structures, or structures occupied throughout the working day, planned at the location. Considering the EPA radon zone, and the lack of inhabited structures, the radon hazard at the proposed location, I determine the radon hazard at the proposed location is insignificant.

Based on this review of available geologic data comprised of experience, measurements, and published reports, I determine that there are no known geologic hazards of significance at the proposed location.



Jason Burris

References:

[1] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: http://websoilsurvey.sc.egov.usda.gov/. [Accessed 27 July 2023].

[2] White, Jonathan L., and Celia Greenman (2008). Collapsible Soils in Colorado. Colorado Geological Survey, Department of Natural Resources, Denver, CO, USA.

[3] Snethen, Donald R. et al. (1977). An Evaluation of Expedient Methodology for Identification of Potentially Expansive Soils.

[4] Fay L, Akin M, Shi X (2012) Cost-effective and sustainable road slope stabilization and erosion control. The National Academies Press, Washington DC, USA

[5] USDA–NRCS. 2006. NSSH Part 618 (23–41): Soil properties and qualities. Available online at https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=41981.wba [Accessed 27 July 2023].

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[9] Colorado Oil and Gas Conservation Commission. (2014). Analysis of Naturally Occurring Radioactive Materials in Drill Cuttings, Greater Wattenberg Field, Weld County, Colorado (COGCC Special Project 2136).

[10] Petersen, M.D., Mueller, C.S., Moschetti, M.P., Hoover, S.M., Rukstales, K.S., McNamara, D.E., Williams, R.A., Shumway, A.M., Powers, P.M., Earle, P.S., Llenos, A.L., Michael, A.J., Rubinstein, J.L., Norbeck, J.H., and Cochran, E.S., 2018, 2018 One Year Seismic Hazard Forecast for the Central and Eastern United States from Induced and Natural Earthquakes: Seismological Research Letters, Volume 89, Number 3.

[11] "Unified Hazard Tool". USGS, https://earthquake.usgs.gov/hazards/interactive/ [Accessed 2 August 2023].

[12] Colorado Historical Coal Mines. Colorado Geologic Survey, https://www.arcgis.com/apps/webappviewer/index.html?id=1891e3149eda44af9dc8af81c4dc58a8 [Accessed 24 June 2023].