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COMBINED REPORT OF REMEDIAL EXCAVATION OBSERVATIONS AND RBCA RECEPTOR EVALUATION

Barker Dome Crude Oil Release
43.487690°, -103.868450°
Barker Dome Road
Custer County, South Dakota

AET Project No. P-0043194
DANR Spill ID 2025.044

Date:
June 30, 2025

Prepared for:
SD DANR
523 East Capitol Avenue
Pierre, South Dakota 57501

American Engineering Testing
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Rapid City, SD 57702
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Geotechnical • Materials
Forensic • Environmental
Building Technology
Petrography/Chemistry

June 30, 2025

SD Department of Agriculture and Natural Resources
Inspection, Compliance, and Remediation Program
523 East Capitol Avenue
Pierre, South Dakota 57501-3181

Attn: Ms. Trish Kindt
Email: trish.kindt@state.sd.us

Re: Report of Remedial Excavation Observations
and RBCA Receptor Evaluation
Barker Dome Crude Oil Release
43.487690°, -103.868450°, Custer County, South Dakota
AET Project No. P-0043194
DANR Case No. 2025.044

Dear Ms. Kindt:

American Engineering Testing (AET) has completed the enclosed report of Combined Remedial Excavation Observations and RBCA Receptor Evaluation for the Barker Dome Crude Oil Release in Custer County, South Dakota. These services were performed according to our proposal dated April 30, 2025, and signed authorization to proceed on the same date. The attached report of our findings is being submitted as an E-document. If you require hard copies of the report, please let us know and they will be made available.

We appreciate the opportunity to have been of service to you on this project. If you have any questions regarding the information presented in this report or if we can be of additional assistance, please contact me.

Sincerely,
American Engineering Testing

Jeremy J. Huot, CPRR
Environmental Project Manager
jhuot@teamAET.com
Office: (605) 388-0029

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REPORT OF REMEDIAL EXCAVATION OBSERVATIONS AND RBCA RECEPTOR EVALUATION BARKER DOME CRUDE OIL RELEASE CUSTER COUNTY, SOUTH DAKOTA AET PROJECT NO. P-0043194

1.0 INTRODUCTION

1.1 Site Description

The project location is situated approximately 20 miles west of Hot Springs, South Dakota (SD), and 13 miles north of Edgemont, SD, along Barker Dome Road in Custer County, SD (site) (Figure 1, Appendix A). The approximate Public Land Survey System (PLSS) location of the site is described as the SE¼ of the NW¼ of Section 34, Township 6 South, Range 2 East, Black Hills Principal Meridian, SD. The latitude/longitude of the site is 43.487690°, -103.868450° as determined using Google Earth Pro software.

1.2 Background Information

According to information obtained through on-site investigation by AET and/or provided by the SD Department of Agriculture and Natural Resources (DANR), the site formerly operated as a crude oil well pad. Currently, the well pad is no longer in operation; however, multiple aboveground storage tanks (ASTs) and equipment remain at the site associated with its former operations. On April, 28, 2025, the DANR was notified that an unknown volume of crude oil had been released from one of the on-site ASTs. The release was identified by Miles VanUden (current property owner) who observed crude oil accumulation on the ground surface at the site near the ASTs.

Subsequent to the release, the DANR requested cleanup of the free-standing crude oil accumulation from the ground surface along with limited removal of the surface soil in the area of the release. The DANR also requested a risk based corrective action (RBCA) receptor evaluation be conducted to identify any potential receptors or exposure pathways at the site.

1.3 Site Geology and Hydrogeology

The native soil observed at the site area consisted predominantly of yellow/tan silty to sandy lean clay, indicative of weathered soil from the Sundance Formation. This is consistent with the SD Geological Survey “Geologic Map of SD” (Martin, J.E., Sawyer,

J.F., Fahrenbach, M.D., Tomhave, D.W., and Schulz, L.D., 2004) which indicates the site is situated within the Sundance Formation which is described as greenish-gray, yellow, tan, red to orange, and white, variegated, interbedded, fine- to coarse-grained sandstone, siltstone, clay, and limestone with a thickness of 250-350 feet (ft).

According to recent United States Geological Survey (USGS) topographic maps of the area, the nearest perennial surface water relative to the site is Hawkwright Creek which is located approximately 3.5 miles east of the site and flows to the south. Based on visual observations made during AET's visits to the site paired with recent USGS topographic maps, multiple drainages are situated within the site vicinity. However, none of the drainages were observed to have any surface water at the time of AET's visits to the site. It is anticipated that the directional gradient of groundwater flow at the site is to the southeast with groundwater likely at depths of greater than 75 ft below grade (bg).

1.4 Scope of Work

The scope of work we propose to perform for this portion of the project consists of:

1. securing an excavation contractor through a subcontract agreement for all necessary remedial cleanup, excavation, soil transport, and soil disposal;

2. mobilize a licensed petroleum release remediator to the project site to meet with the excavation contractor and landowner and observe the location and extents of the petroleum release areas, document site conditions, and collect a representative composite sample of the petroleum hydrocarbon impacted soils to be analyzed for the presence and concentration of total petroleum hydrocarbons as gasoline (TPH-G), total extractable hydrocarbons (TEH), benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, and Toxicity Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) 8 metals, radium-226, and radium-228 as required for landfill disposal;

3. collect a second representative composite sample of the petroleum hydrocarbon impacted soil to be analyzed for the presence and concentration of radium-226, and radium-228 as required for landfill disposal;

4. mobilize a licensed petroleum release remediator to the project site to meet with the excavation contractor to observe excavation of petroleum impacted soils, screen soil samples for organic vapors, and collect three clearance soil samples to be analyzed for TEH, TPH-G, BTEX, and naphthalene from the excavation zones;

5. coordinate with the excavation contractor proper disposal of the petroleum impacted soils at the Custer-Fall River Landfill;

6. researching available information concerning the presence of any water and sewer lines on and in the area of the site;

7. identifying on-site and adjacent potential petroleum sources, potential transport mechanisms (including hydrogeology), and any potential exposure pathways present on and in the area of the subject site (including subsurface structures, water wells, surface water bodies, and residential or occupied structures); and

8. preparing and submitting a report including site description and past uses of the site, site maps and figures, photos documenting the excavation, our field observations, field screening results, analytical soil sample test results, an evaluation of potential nearby receptors and exposure pathways, a RBCA Site Conceptual Model, and our conclusions and recommendations based on the DANR RBCA guidelines.

2.0 REMEDIAL EXCAVATION

2.1 Field and Excavation Observations

AET personnel mobilized to the site on April 29, 2025, to inspect the crude oil release area and to meet with Barker Construction and the site property owner (Miles VanUden). Upon arrival at the site, AET personnel observed accumulated crude oil on the ground surface covering an approximately 3,000 square ft area with maximum lateral extents of approximately 100 ft long by 45 ft wide. The free-standing crude oil liquid observed on the ground surface was the apparent result of an uncapped exterior pipe extending from near the base of the northeast AST at the site which allowed crude oil to be released from the AST. While on-site, AET observed an intermittent drip of crude oil from the uncapped pipe. The missing pipe cap was observed to be on the ground directly below the pipe. AET re-secured the pipe cap onto the leaking pipe to stop any further release. AET also observed a secondary release area evidenced by staining near a different AST located approximately 75 ft southwest of the AST where the main release was noted. Staining at the secondary release area encompassed an approximately 3 ft by 15 ft area. The secondary release appeared to be recent and the apparent result of a slow leaking fitting located near the base of the AST; although AET did not observe the fitting to be readily leaking while on-site. To hinder additional surface migration of crude oil at the main release area, AET placed absorbent booms along the downgradient (south/southeast)

sides of the main release area. While on-site, AET personnel collected a composite soil sample which included four grab samples from the main release area to be analyzed for TPH-G, TEH, BTEX, naphthalene, TCLP RCRA 8 metals, radium-226, and radium-228. This sample would provide laboratory analysis required for disposal at the Custer-Fall River Landfill. It should also be noted that on May 7, 2025, AET collected an additional composite sample to be analyzed for radium-226, and radium-228 in order to satisfy the requirements of South Dakota Codified Law 34A-6-114 which requires laboratory-measured radioactivity levels of radium-226 and radium-228 for every 100 tons of oil and gas waste brought to the landfill.

AET personnel mobilized to the site on May 6 and 7, 2025, to meet with Barker Construction to observe remedial excavation activities in the vicinity of the petroleum releases. Upon arrival at the site, AET personnel re-evaluated the apparent petroleum release extents and concluded that little to no lateral migration of petroleum products had occurred since the initial site visit was conducted. Barker Construction proceeded to excavate clean soil from a nearby embankment and mix the clean dry soil with the free-standing crude oil which had accumulated on the ground surface. This was done in order to absorb the liquid phase crude oil into the soil so it would be acceptable for disposal at the Custer-Fall River Landfill. Once the liquid crude oil had been absorbed into the soil, the crude oil saturated soil was removed from the site and the lateral area of the main release was excavated to a depth of approximately 0.3 ft bg. AET also directed the excavation of the visibly impacted soil in the area of the smaller secondary release previously noted. The secondary release was excavated to approximately 0.5 ft bg. The approximate lateral extents of the excavations are depicted on Figure 2, Appendix A.

The soil encountered during the excavation activities at the site consisted of yellow/tan silty to sandy lean clay.

Petroleum impacted areas were identified through visual observation, olfactory observations, and by use of a photoionization detector (PID) utilized to detect petroleum organic vapors, using the methods described in Appendix B.

Based on DANR directives and under the direction of on-site AET personnel, Barker Construction excavated the surface soil in the area of the releases. Petroleum impacts were limited to the lateral areas previously discussed and depicted in Figure 2. After removal of the surface soil was completed, Barker Construction backfilled all excavated areas with clean soil and re-graded to match previous surface conditions.

During the excavation process, impacted soil was removed from the release area and hauled to the Custer-Fall River Landfill by Barker Construction. According to the Custer-Fall River Landfill's scale, approximately 165.39 tons of petroleum contaminated soil was transported from the site and disposed of at the Custer-Fall River Landfill. The soil disposal tickets obtained from the Custer-Fall River Landfill are presented in Appendix C.

Photographs taken before, during, and after the remedial excavation activities are presented in Appendix D.

2.2 Soil Sample Analytical Results

One representative composite soil sample was collected from the petroleum release areas prior to excavation activities to provide the laboratory analytical documentation required for disposal at the Custer-Fall River Landfill. The soil was analyzed for the presence and concentration of TEH, TPH-G, BTEX, TCLP RCRA 8 metals, and naphthalene using methods described in Appendix B. AET collected an additional composite sample during the second day of excavation activities and analyzed for radium-226 and radium-228 in order to satisfy the requirements of South Dakota Codified Law 34A-6-114 which requires laboratory-measured radioactivity levels of radium-226 and radium-228 for every 100 tons of oil and gas waste brought to the landfill. A total of three additional grab soil samples (S-1, S-2, and S-3) were collected from the terminal depth of the remedial excavations at locations shown on Figure 2 once excavation activities had concluded. Samples S-1, S-2, and S-3 were submitted as clearance samples to document the residual petroleum impacts at the site at the conclusion of the surface soil removal. The laboratory analytical results for the collected samples are presented in Table 1, below. For comparison, the DANR RBCA Tier 1 Trigger/Action levels are also presented

with the analytical results in Table 1. The analytical laboratory reports are presented in Appendix F.

Review of the analytical results for the composite sample collected for landfill disposal approval indicates that the release had resulted in petroleum impacted soil in exceedance of the respective DANR Tier 1 Trigger Level for TEH.

Review of the analytical results for the samples collected at the terminal depth of the remedial excavation indicate that petroleum impacted soil in exceedance of the respective DANR RBCA Tier 1 Trigger Level for TEH remains at the site; however, at significantly reduced concentrations.

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS[1]

Sample ID (Date Collected)	Depth[2]	Benzene	Ethyl Benzene	Naphthalene	Toluene	Xylenes	TPH-G	TEH
Composite (4 Loc) (04/29/2025)	0.0	<0.050[3]	0.124	0.994	< 0.100	<0.200	33.0	***17400***
S-1 (05/06/2025)	0.3	<0.050	<0.100	<0.200	<0.100	<0.200	<10.0	44.6
S-2 (05/06/2025)	0.3	<0.050	<0.100	<0.200	<0.100	<0.200	<10.0	***1200***
S-3 (05/06/2025)	0.5	<0.050	<0.100	0.251	<0.100	<0.200	11.7	***529***
Tier 1 Action/Trigger Levels		**0.2**	**10**	**25**	**15**	**300**	**500[5]**	**500[5]**

[1] All values are in mg/kg, which is equivalent to parts per million, unless otherwise noted.
[2] Depths measured in feet below ground surface.
[3] "<" denotes analyte not detected at or above the practical quantitation limit following the "less than" symbol.
[4] Concentrations in ***bold italics*** exceed Tier 1 Action/Trigger Level.
[5] Total hydrocarbon concentration is considered a "trigger level" to require a more thorough evaluation of the site and is not intended to be a Tier 1 cleanup goal.

2.3 Additional Site Observations

It should be noted that crude oil appeared to have migrated beneath a larger diameter AST located directly south of the main source release AST (Figure 3). This impacted area was not accessible for remedial excavation due to the presence of the overlying AST. Therefore, AET directed Barker Construction to place soil around the base of the AST in

an attempt to hinder any future lateral surface migration of the petroleum impacts which remain underneath the AST.

While on-site AET observed there to be visible surface soil staining at other site ASTs that were not part of the scope of work performed during this excavation and assessment (Photo Log – Photo 13). In addition, the soil foundation beneath the AST at which the main release associated with this investigation occurred, appeared to be significantly weathered with soil eroding to the point of undercutting the base of the AST (Photo Log – Photo 14). The ASTs and associated valves appeared to be in varying conditions ranging from fair to poor with many of the ASTs seeming to still be holding unknown liquid volumes.

3.0 RBCA RECEPTOR EVALUATION

3.1 Receptor Evaluation Site Information

As part of this assessment, the DANR requested a RBCA receptor evaluation be conducted to determine if there are any potential receptors or exposure pathways at the site associated with this release. In the process of evaluating potential receptors and exposure pathways, information was obtained from Miles VanUden (current property owner), and research was conducted on the DANR Water Rights database. Information was collected regarding utility and building infrastructure present at and in the area of the site and groundwater usage in the area of the site. This information was then utilized to assess for potential completed exposure pathways that may result from the petroleum impacts identified at the site.

3.2 Primary Sources

To evaluate potential receptors on and in the vicinity of the site, a DANR RBCA Site Conceptual Model Sheet was completed for the site (Appendix E). As defined by the RBCA Conceptual Model, and based on information collected by AET, the following primary source of exposure was identified:

- Petroleum contaminated soil in exceedance of the DANR Tier 1 Trigger Level for TEH was identified within the composite soil sample which was initially collected for landfill soil disposal. Petroleum impacts identified in this sample are likely similar to those which remain in the soil beneath the AST at the site which was not accessible for removal. Furthermore, TEH concentrations within the samples collected from the surface soil interval at sample locations S-2 and S-3 also had TEH concentrations in exceedance of the Tier 1 Trigger Level. As the petroleum impacted soil is the result of leaking ASTs, it is AET's opinion that the ASTs at the site can be considered the primary source of contamination at this time.

As defined by the RBCA Conceptual Model, AET investigated potential exposure pathways with potential to be completed as a result of the identified primary source.

3.3 Exposure Pathway Screening

3.3.1 Surface Water

The nearest perennial surface water identified within the regional vicinity of the site consists of Hawkwright Creek which is located approximately 3.5 miles east of the site.

Due to significant distance to any viable surface water bodies in relation to the site, affected surface water can likely be eliminated as a potential exposure pathway, and further investigation is not warranted at this time.

3.3.2 Surface Soil

At the conclusion of the remedial excavation activities at the site, no exposed (i.e. not covered by an existing AST) soil within the surface soil interval (<3.2 ft bg) was identified as having elevated organic vapor field screening concentrations (>50 parts per million [ppm]) in the target release areas. Soil samples collected at the terminal depths of the remedial excavations within the surface soil interval (0.3 - 0.5 ft bg) did not exhibit petroleum constituent concentrations in excess of the surface soil inhalation, ingestion, and dermal contact lookup table values published within the DANR "Handbook for Investigation and Corrective Action Requirements for Discharges from Storage Tanks,

Piping Systems, and Other Releases" (DANR Handbook). In addition, the composite soil sample collected at the site which was representative of the most significantly impacted soil prior to remedial excavation activities also did not have any petroleum constituent concentrations in excess of the surface soil inhalation, ingestion, and dermal contact lookup table values published within the DANR Handbook. Therefore, the remaining petroleum impacted soil located beneath one of the ASTs at the site likely does not have petroleum impacts in exceedance of the DANR surface soil lookup table values. Based on this data, it is AETs opinion that surface soil inhalation, ingestion, and dermal contact can be discounted as a potential exposure pathway, and further investigation is not warranted at this time.

3.3.3 Underground Utilities

Information obtained through correspondence with the current property owner during the site visit indicates no underground utilities (including water lines, storm sewer lines, or sanitary sewer lines) are present at or adjacent to the site. Based on the lack of utility lines in the site vicinity, utilities in contact with impacted soil and groundwater can be discounted as potential exposure pathways, and further investigation is not warranted at this time.

3.3.4 Indoor Air

Information gathered during the site visit indicates that no structures exist at the site other than an abandoned shed that had been formerly utilized in association with crude oil pumping activities (Figure 2). Based on the lack of nearby occupied structures at the site, inhalation of vapor exposure pathway can be discounted, and further investigation is not warranted at this time.

3.3.5 Potable Water Use

The DANR Water Rights Division online water well completion log database contains well logs on file with the DANR. AET performed an online search of the DANR Water Rights database for water wells within a 0.25-mile radius of the site. No wells were identified within the 0.25-mile radius of the site. However, the search did reveal one well completion

report dated 1955 with the location indicated as being approximately 0.3-mile south of the site. Information, reported on the well completion log indicates that the well was most likely oil/gas related and not for water use as the log indicates “Gas Show with Water” and “Oil” at the deeper intervals of the well log (730-1400 ft deep). Furthermore, the property owner indicated that there are no water wells within the immediate vicinity of the site. Therefore, it is AET’s opinion that the potential for impacts to nearby wells can be discounted as a possible exposure pathway, and further investigation is not warranted at this time.

3.4 Exposure Pathway Screening Results

As defined by the RBCA Conceptual Model and based on the rational outlined within the Exposure Pathway Screening section of this report, no potential exposure pathways requiring additional investigation were identified.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Upon review of the excavation field observations, organic vapor screening results, and clearance sample analytical results, it is AET’s opinion that excavation activities at the site were successful in removing the majority of significantly impacted soil and free-standing crude oil associated with DANR Spill Case No. 2025.044.

Based on the observed lack of completed exposure pathways as detailed within Section 3.3 of this report, it is AET’s opinion that the petroleum impacted soil remaining at the conclusion of the remedial excavation activities associated with DANR Spill Case No. 2025.044 does not currently pose a significant risk to human health or the environment. Therefore, AET recommends the DANR consider Spill Case No. 2025.044 for No Further Action.

However, during work on this project, AET observed multiple on-site ASTs which likely still contain oil waste liquids. AET also observed visual evidence of surface soil impacts that were not addressed as part of the scope of this remedial activity and assessment. In addition, at least one of the AST soil foundations was observed to be severely compromised through soil erosion and undercutting. Therefore, AET recommends that

any remaining liquid within the ASTs at the site be pumped out and properly disposed of and that all ASTs at the site be removed in order to eliminate the future potential for a release at the site. AET further recommends that during AST removal activities, closure soil samples be collected from beneath each of the ASTs to assess if additional remedial measures are warranted.

5.0 STANDARD OF CARE

Recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by:



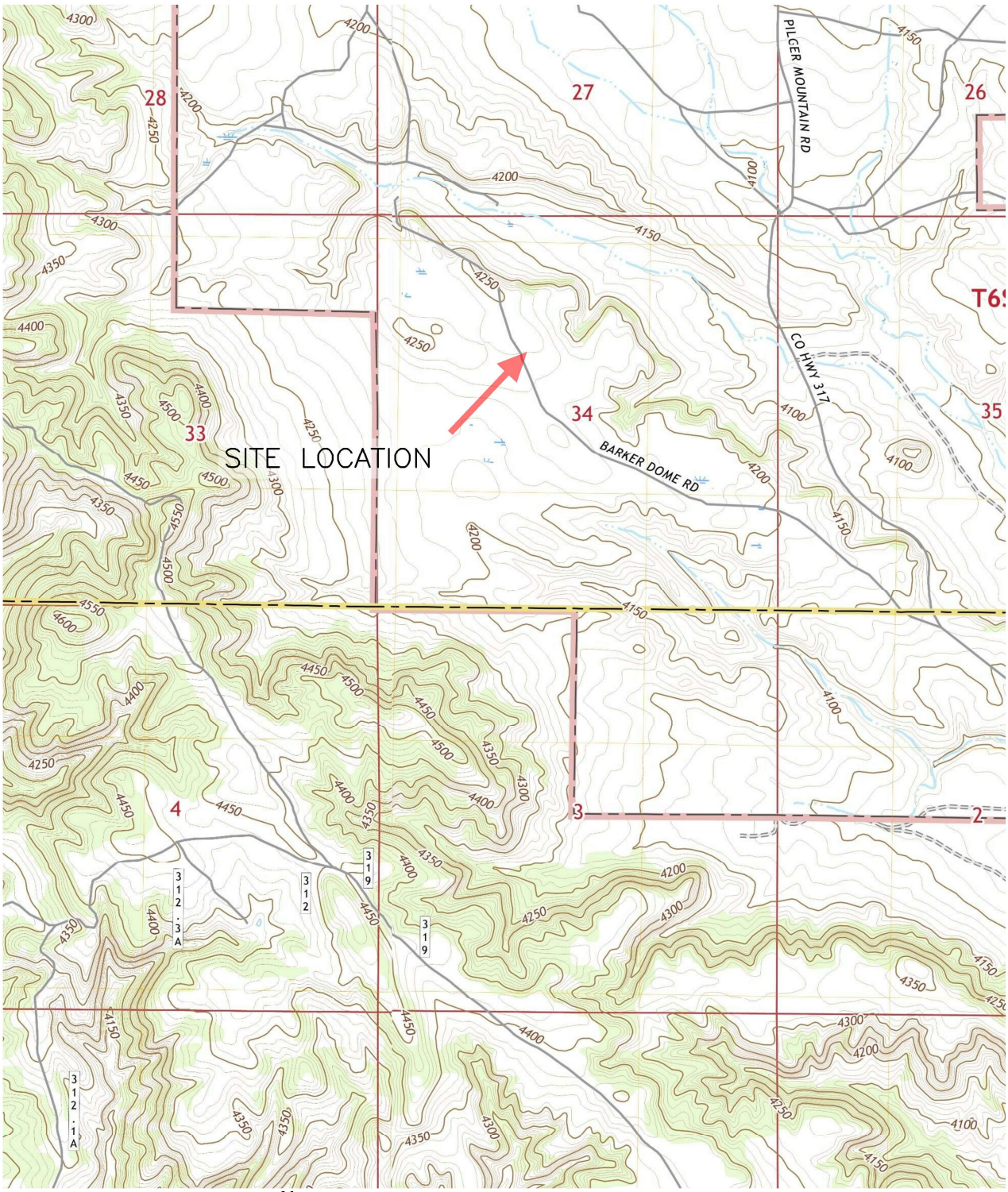
Jeremy J. Huot, CPRR
Environmental Geologist

This report was reviewed by:



Bradley P. Bishop, CPRR
Senior Environmental Project Manager

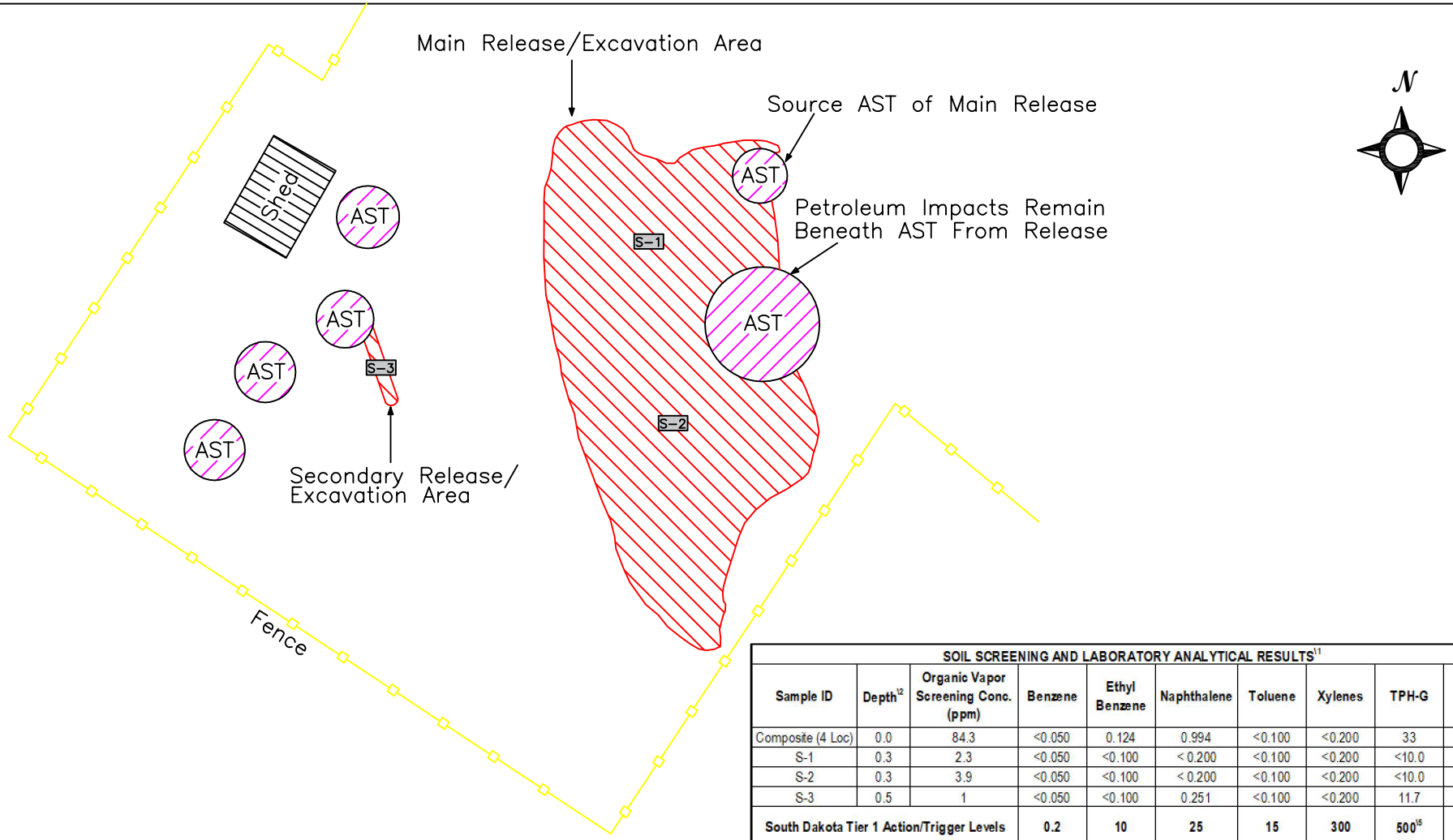
APPENDIX A
Figures



USGS TOPOGRAPHIC MAP
PROVIDED BY USGS DATABASE
DATED: 2021 SCALE: 1:24,000

AMERICAN
ENGINEERING TESTING

PROJECT: BARKER DOME CRUDE OIL RELEASE BARKER DOME ROAD, CUSTER COUNTY, SD		PROJECT NO.: P–0043194
SUBJECT: SITE LOCATION TOPO MAP	DRAWN BY: JJH	DATE: MAY 5, 2025
SCALE: 1 INCH = 2,000 FEET	REVIEWED BY: BPB	FIGURE: 1



SOIL SCREENING AND LABORATORY ANALYTICAL RESULTS[1]

Sample ID	Depth[2]	Organic Vapor Screening Conc. (ppm)	Benzene	Ethyl Benzene	Naphthalene	Toluene	Xylenes	TPH-G	TEH
Composite (4 Loc)	0.0	84.3	<0.050	0.124	0.994	<0.100	<0.200	33	***17400***
S-1	0.3	2.3	<0.050	<0.100	< 0.200	<0.100	<0.200	<10.0	44.6
S-2	0.3	3.9	<0.050	<0.100	< 0.200	<0.100	<0.200	<10.0	***1200***
S-3	0.5	1	<0.050	<0.100	0.251	<0.100	<0.200	11.7	***529***
South Dakota Tier 1 Action/Trigger Levels			**0.2**	**10**	**25**	**15**	**300**	**500[5]**	**500[5]**

[1] All values are in mg/kg, which is equivalent to parts per million, unless otherwise noted.
[2] Depths measured in feet below ground surface.
[3] "<" denotes analyte not detected at or above the laboratory reporting limit following the "less than" symbol.
[4] Values listed in ***bold italics*** indicate concentration exceeded Tier 1 Trigger or Action Levels.
[5] Total hydrocarbon concentration is considered a "trigger level" to require a more thorough evaluation of the site and is not intended to be a Tier 1 cleanup goal.

SCALE (FEET)
0 30

AMERICAN ENGINEERING TESTING

PROJECT: BARKER DOME CRUDE OIL RELEASE CUSTER COUNTY, SOUTH DAKOTA		PROJECT NO. P-0043194
SUBJECT: SITE SKETCH WITH ASTs, EXCAVATION EXTENTS, AND SAMPLE INFORMATION	DRAWN BY: JJH	DATE: JUNE 5, 2025
SCALE: 1 INCH = 30 FEET	REVIEWED BY: BPB	FIGURE: 2

APPENDIX B
Methodologies

METHODOLOGIES

Soil Sample Screening

Soil screening and sampling activities included the collection of soil samples from the AST area, loading rack, and underground piping. The soils are visually examined during the sample collection for discoloration and other indications of petroleum impacts. Organic vapor headspace analysis is conducted according to Standard Operating Procedures detailed in Appendix C, Section 1 of the DANR "Handbook for Investigation and Corrective Action Requirements for Discharges from Storage Tanks, Piping Systems, and Other Releases".

The soil samples are screened for the presence of organic vapors as indications of hydrocarbon contamination using an Ion Science PhoCheck TIGER photoionization detector (PID). This instrument provides readings in parts per million (ppm) equivalents of the calibration gas. The lower detectable limit is approximately 1 ppm. Erratic responses are discounted as a result of high organic vapor concentrations or conditions of elevated headspace moisture. Occasionally, vapor interference may also be encountered from the plastic sample bags utilized for headspace analysis. The PID is calibrated on-site using the concentration (as recommended by the manufacturer) of Isobutylene gas with a 10.6 eV lamp source. Headspace vapor readings are obtained by partially filling a sealable plastic sample bag. The sample bag is agitated, and the soil is allowed to warm within the sealed container. The probe of the PID is inserted through the top of the sample container to obtain a headspace reading. Concentrations are recorded as the maximum level reached after insertion of the probe.

Soil Sample Collection

Select soil samples are collected in 4-ounce glass soil jars with Teflon-lined lids or are placed in appropriate containers as pertaining to the contaminant(s) to be analyzed by the chemistry laboratory. The samples are shipped or transported to a qualified laboratory in a cooler chilled with ice or ice packs.

Chemical Analysis

The soil samples are analyzed in a certified laboratory for the presence and concentration of TPH-G, TEH, BTEX, naphthalene, TCLP 8 RCRA metals, Radium-226, and Radium-228 as appropriate to the sampling analysis scheme. The samples are analyzed according to the appropriate Environmental Protection Agency (EPA) and/or California/United States Geological Survey (USGS) methods.

Chain of Custody

Upon collection of a sample to be analyzed in the laboratory, a chain of custody log is initiated. The chain of custody log includes the following information: project name, project number, shipped by, shipped to, project manager, sampling point, location, field identification number, date taken, sample type, number of containers, analysis required and sampler's signature. The chain of custody log is shipped with the samples to the laboratory. On arrival at the laboratory, the samples are checked in and signed over to the appropriate laboratory personnel. A copy of the chain of custody log is maintained by the project manager.

Reporting

Reports are prepared that 1) present and summarize the results of the work conducted, 2) include site location and study area maps, 3) give our opinion regarding the presence of petroleum hydrocarbons and the necessity for additional work, and 4) if the results of the study warrant additional work, recommend the scope of additional work.

APPENDIX C
Landfill Soil Disposal Tickets

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15033

CUSTOMER'S NAME _____

ADDRESS _____

COMMODITY _____

5 6 25 12:55 PM

74780 lb GR
31480 lb*TA
43300 lb NT

21.65 T

115

SHIPPER _____

WEIGHER HP

31480 Patrick

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15036

CUSTOMER'S NAME _____

ADDRESS _____

COMMODITY _____

5 6 25 02:54 PM

76980 lb GR
31480 lb*TA
45500 lb NT

22.75T

115

SHIPPER _____

WEIGHER _____

31480 Patrick

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15031

CUSTOMER'S NAME _____

ADDRESS _____

COMMODITY _____

5 6 25 11:59 AM

86860 lb GR
40780 lb*TA
46080 lb NT

23.04T

109
TR 24

SHIPPER _____

WEIGHER _____

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15035

CUSTOMER'S NAME _____

ADDRESS Bopker Concrete

COMMODITY _____

26.71T

5 6 25 02:09 PM

94200 lb GR
40780 lb*TA
53420 lb NT

109/TR24

SHIPPER _____

WEIGHER _____

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15040

CUSTOMER'S NAME _____

ADDRESS American Energy

COMMODITY _____

5 7 25 09:24 AM

99960 lb GR
40780 lb*TA
59180 lb NT

29.59T

109
TR24

SHIPPER _____

WEIGHER HP
Tim

Ranchers Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15047

CUSTOMER'S NAME _____

ADDRESS _____

COMMODITY Cont. Soil

5 7 25 12:07 PM

75460 lb GR
40780 lb*TA
34680 lb NT

17.34T

109
TR24

SHIPPER _____

WEIGHER HP
40780 Josh

Ranchers
Feed & Supply, Inc.
Edgemont, Lusk, Newcastle

TICKET NUMBER 15059

CUSTOMER'S NAME _____

ADDRESS _____

COMMODITY _____

31480

5 7 25 03:43 PM

80100 lb GR
31480 lb*TA
48620 lb NT

15

24.31T

SHIPPER _____

WEIGHER _____

APPENDIX D
Photograph Log

PHOTOGRAPHS



Photo 1:	**View of release source from AST.**
Photo 2:	**View of main release area prior to remedial excavation activities.**



PHOTOGRAPHS



Photo 3:	**View of main release area prior to remedial excavation activities.**
Photo 4:	**View of secondary release area prior to remedial excavation activities.**



PHOTOGRAPHS



Photo 5:	**View of fiberglass tank/debris removal in progress.**
Photo 6:	**View of excavation and soil/crude oil mixing in progress.**



PHOTOGRAPHS



Photo 7:	**View of excavation and soil/crude oil mixing in progress.**
Photo 8:	**View of excavation and soil/crude oil mixing in progress.**



PHOTOGRAPHS



Photo 9:	**View of main release area after excavation and backfilling had been completed.**
Photo 10:	**View of main release area after excavation and backfilling had been completed.**



PHOTOGRAPHS

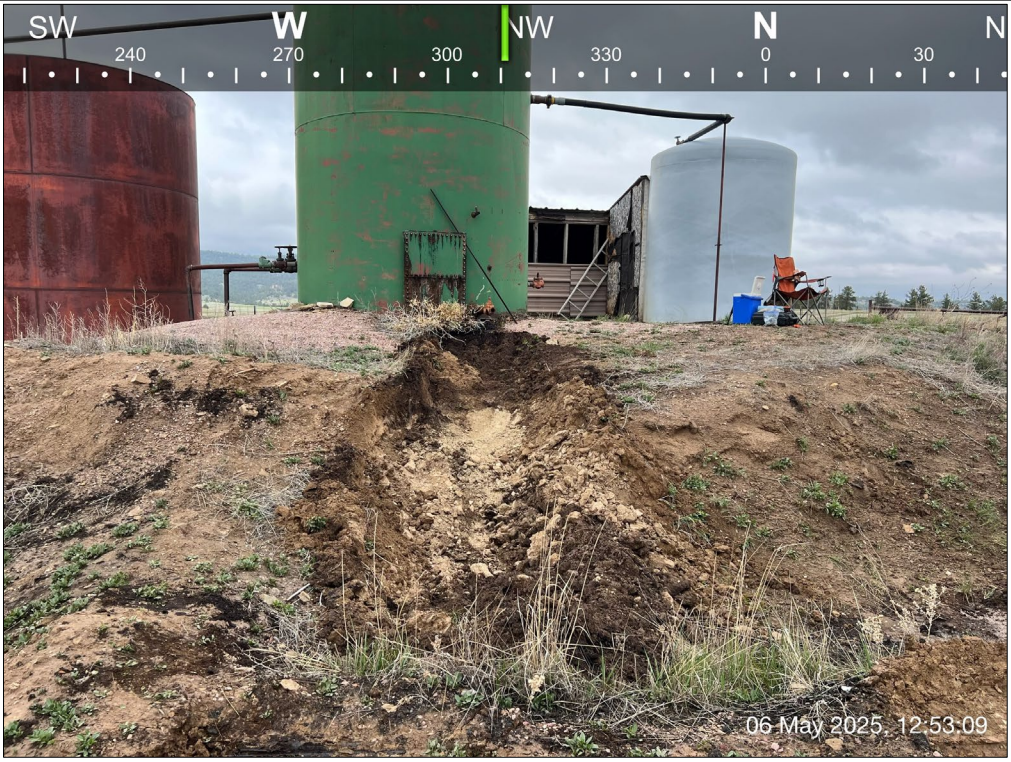


Photo 11:	**View of secondary release area excavation.**
Photo 12:	**View of secondary release area after excavation and backfilling had been completed.**



PHOTOGRAPHS



Photo 13:	**Surface soil staining observed at one of the ASTs at the site.**
Photo 14:	**Foundation erosion beneath the AST at which the main release occurred.**



APPENDIX E
RBCA Site Conceptual Model

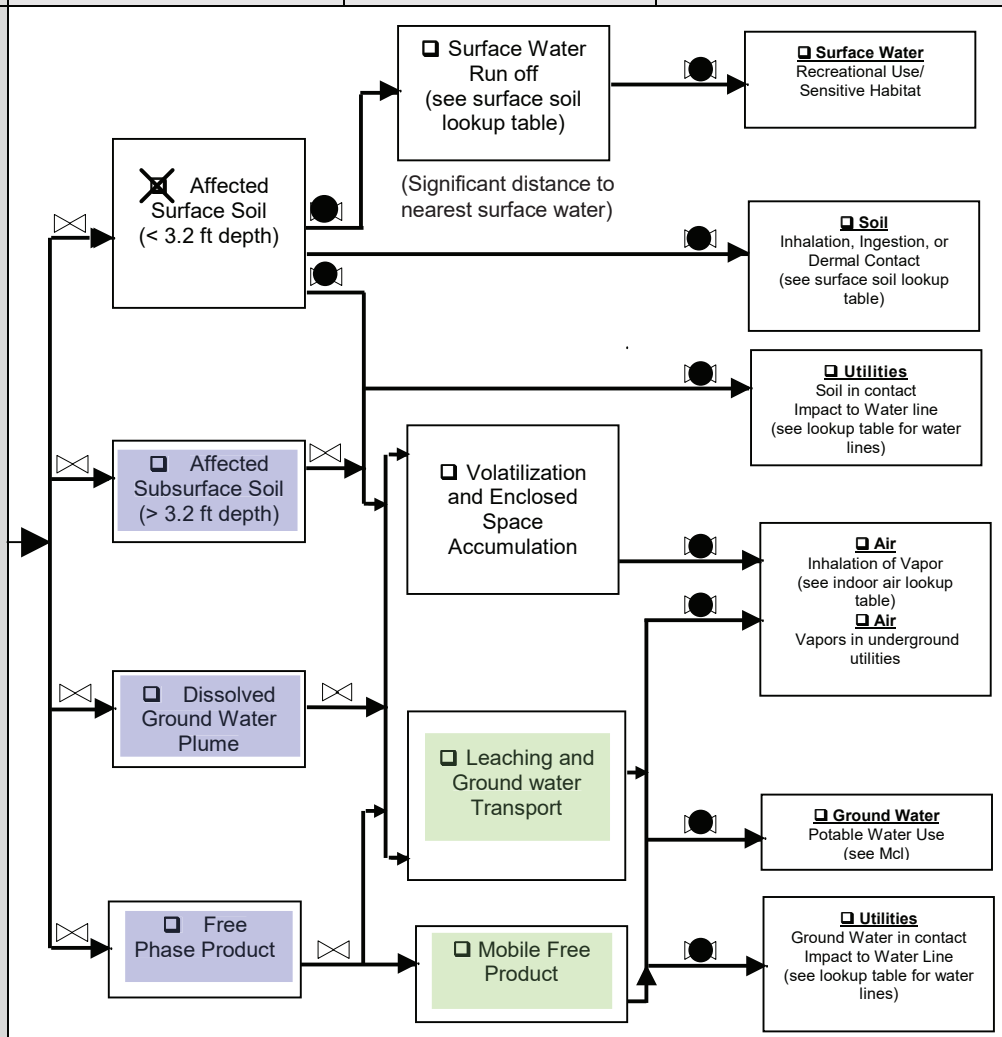
SOUTH DAKOTA DANR
RBCA SITE CONCEPTUAL MODEL SHEET

SITE NAME	Barker Dome Crude Oil Release	**DATE COMPLETED**	June, 2025	**DANR SPILL #**
SITE LOCATION	43.487690°, -103.868450°, Custer County, South Dakota	**COMPLETED BY**	Jeremy Huot - American Engineering Testing, Inc.	2025.044

Step 1 – *Baseline Exposure*: Fill in Box (☐) to identify applicable sources, transport mechanisms, and receptors.
Step 2 – *Remedial Measures*: Fill in shut-off valves (⋈) to indicate removal / remedial action, containment measure, or institutional controls to be used to "shut off" exposure pathway.

PRIMARY SOURCES

- ☒ **Storage Tanks**
- ☐ **Piping/ Pump Island**
- ☐ **Handling**
- ☐ **Transportation Accident**
- ☐ **Vandalism**
- ☐ **Transformer**
- ☐ **Sump Waste**
- ☐ **Drums**
- ☐ **Other**



POTENTIAL RECEPTORS

On-Site ☐ Residential ☒ Commercial ☐ Construction worker

On-Site ☐ Residential ☒ Commercial

Off-Site ☒ Residential ☐ Commercial

Secondary Sources: Petroleum Hydrocarbon impacts and extents are not known and additional information would be required to determine if secondary source exist at the site.

Transport Mechanisms: Remain unknown and additional information would be required to determine if transport mechanisms are in place at the site.

APPENDIX F
Analytical Laboratory Reports

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

REVIEWED
By Jeremy Huot at 2:00 pm, Jun 27, 2025

AET
1745 SAMCO ROAD
RAPID CITY, SD 57702

Sample Site:	Composite (4 Loc)
Project Name:	Barker Dome Release
Project Number:	P-0043194
Sampled:	04/29/25 at 10:00 AM by Jeremy Huot
Sample Matrix:	Soil
Lab ID#:	20250429541
Received:	04/29/25 at 03:47 PM by Josh Bucknall
Account:	W1202 - AET - Rapid City

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Metals - TCLP								
Arsenic (As)	< 0.005	mg/L	10	0.00036	0.005	EPA SW846 6020	TNA	05/02/25
Barium (Ba)	0.534	mg/L	10	0.00073	0.005	EPA SW846 6020	TNA	05/02/25
Cadmium (Cd)	0.002	mg/L	10	0.000303	0.001	EPA SW846 6020	TNA	05/02/25
Chromium (Cr)	< 0.001	mg/L	10	0.000109	0.001	EPA SW846 6020 DRC	TNA	05/02/25
Lead (Pb)	< 0.001	mg/L	10	0.00015	0.001	EPA SW846 6020	TNA	05/02/25
Mercury (Hg)	< 0.0002	mg/L	1	0.000045	0.0002	EPA SW846 7471B	GRT	05/02/25
Selenium (Se)	< 0.005	mg/L	10	0.001	0.005	EPA SW846 6020	TNA	05/02/25
Silver (Ag)	< 0.001	mg/L	10	0.00014	0.001	EPA SW846 6020	TNA	05/02/25
Volatile								
Benzene	< 0.050	mg/kg	1	0.018	0.050	SW846 8021B-S	SAC	05/07/25
Ethylbenzene	0.124	mg/kg	1	0.016	0.100	SW846 8021B-S	SAC	05/07/25
Methyl tertiary-Butyl Ether	< 0.100	mg/kg	1	0.023	0.100	SW846 8021B-S	SAC	05/07/25
Naphthalene	0.994	mg/kg	1	0.025	0.200	SW846 8021B-S	SAC	05/07/25
Toluene	< 0.100	mg/kg	1	0.015	0.100	SW846 8021B-S	SAC	05/07/25
Xylenes(o,m,p)	< 0.200	mg/kg	1	0.060	0.200	SW846 8021B-S	SAC	05/07/25
Total Volatile Hydrocarbons								
TPH as Gasoline	33.0	mg/kg	1	0.689	10.0	SW846 8015B-S	SAC	05/07/25
Semi-Volatile								
TPH Diesel	17400	mg/kg	200	260	2000	SW846 8015B-S	SAC	05/01/25
Extraction								
Extraction TPH/SOC	1.00	none	1			SW846 3550	SAC	04/29/25
Radiological								
Radium-226	0.7050	pCi/g	1			EPA 901.1m	SYS	05/29/25
Radium-228	0.8720	pCi/g	1			EPA 901.1m	SYS	05/29/25
Precision Data								
Radium-226 precision	± 0.131	pCi/g	1			SC-Radium 226 precision	SYS	05/29/25
Radium-228 precision	± 0.275	pCi/g	1			SC-Radium 228 precision	SYS	05/29/25

Report of Analysis for: **AET - Rapid City** Sample Site: **Composite (4 Loc)**

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst/Date
MDA Data							
Radium-226 MDA	0.113	pCi/g	1			SC - Radium 226 MDA	SYS 05/29/25
Radium-228 MDA	0.460	pCi/g	1			SC - Radium 228 MDA	SYS 05/29/25

Quality Control Data

Parameter	Result	Limits	DF	Method	Analyst/Date
Surrogate Recovery-SV					
Ortho-Terphenyl	D-Surrogate not calculated due to dilution				
Surrogate Recovery-Volatile					
4-Bromofluorobenzene	120.9 %	(85.08) - (122.8)	1	SW846 8021B QC	SAC 05/07/25

Notes:
Radium 226 and 228 analyzed by Pace Labs. Report attached.

Report Approved By:



Report Approved On: 6/6/2025 4:31:40 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Lab Numbers: 20250429541 - 20250429541

QC Sample Report

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method	
Spike									
Arsenic - T	0501836	0.283	0.006	0.025	10	110.7 %	(85.70) - (115.7)	EPA 200.8	
Barium - T	0501836	0.534	0.278	0.025	10	102.5 %	(80.59) - (119.2)	EPA 200.8	
Cadmium - T	0501836	0.256	< 0.001	0.025	10	102.4 %	(86.45) - (110.6)	EPA 200.8	
Chromium - T	0501836	0.251	< 0.001	0.025	10	100.4 %	(83.44) - (114.8)	EPA 200.8 DRC	
Lead - T	0501836	0.2616	0.0019	0.025	10	103.9 %	(93.57) - (112.2)	EPA 200.8	
Mercury - T	0430103	0.0021	< 0.0002	0.002	1	106.0 %	(88.02) - (114.0)	EPA 245.1	
Selenium - T	0501836	1.25	< 0.005	0.125	10	99.65%	(82.85) - (113.5)	EPA 200.8	
Arsenic - TR	0502106	0.248	< 0.005	0.025	10	99.0 %	(88.17) - (107.5)	EPA 200.8	
Arsenic - TR	0502209	0.254	< 0.005	0.025	10	101.6 %	(88.17) - (107.5)	EPA 200.8	
Barium - TR	0502106	0.301	0.054	0.025	10	98.8 %	(87.21) - (104.1)	EPA 200.8	
Barium - TR	0502209	0.266	0.021	0.025	10	98.4 %	(87.21) - (104.1)	EPA 200.8	
Cadmium - TR	0502106	0.247	< 0.001	0.025	10	98.9 %	(90.20) - (106.7)	EPA 200.8	
Cadmium - TR	0502209	0.254	< 0.001	0.025	10	101.5 %	(90.20) - (106.7)	EPA 200.8	
Chromium - TR	0502106	0.2446	< 0.0010	0.025	10	97.8 %	(83.63) - (110.7)	EPA 200.8 DRC	
Chromium - TR	0502209	0.2506	< 0.0010	0.025	10	100.2 %	(83.63) - (110.7)	EPA 200.8 DRC	
Lead - TR	0502209	0.2477	< 0.0010	0.025	10	99.1 %	(91.39) - (105.8)	EPA 200.8	
Lead - TR	0502106	0.2446	< 0.0010	0.025	10	97.8 %	(91.39) - (105.8)	EPA 200.8	
Selenium - TR	0502209	1.22	< 0.005	0.125	10	97.5 %	(84.58) - (105.9)	EPA 200.8	
Selenium - TR	0502106	1.22	0.017	0.125	10	96.3 %	(84.58) - (105.9)	EPA 200.8	
Silver - TR	0502209	0.2512	< 0.0010	0.025	10	100.5 %	(84.11) - (108.5)	EPA 200.8	
Silver - TR	0502106	0.2448	< 0.0010	0.025	10	97.9 %	(84.11) - (108.5)	EPA 200.8	
Benzene	0508541	1.20	< 0.050	1.00	1	119.6 %	(67.26) - (115.3)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
Ethylbenzene	0508541	1.20	< 0.100	1.00	1	120.0 %	(80.98) - (111.1)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
MTBE	0508541	1.18	< 0.100	1.00	1	117.9 %	(64.47) - (111.9)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
Naphthalene	0508541	0.909	< 0.200	1.00	1	90.9 %	(61.30) - (143.1)	SW846 8021B-S	
Toluene	0508541	1.25	< 0.100	1.00	1	125.3 %	(73.57) - (113.9)	SW846 8021B-S	X
- Result is within QC guidelines of 70 - 130%									
Xylenes(o,m,p)	0508541	3.79	< 0.200	3.00	1	126.3 %	(74.86) - (117.9)	SW846 8021B-S	X
- Result is within QC guidelines of 70 - 130%									
TPH Gas	0508541	103	< 10.0	100	1	103.3 %	(54.52) - (130.0)	SW846 8015B-S	
TPH-Diesel	0409542	164	< 10.0	200	1	82.0 %	(55.43) - (103.4)	SW846 8015B-S	
Matrix Spike Duplicate									
Arsenic - T	0501836	0.269	0.283		10	-4.82%	(-13.67) - (12.50)	EPA 200.8	
Barium - T	0501836	0.515	0.534		10	-3.63%	(-11.79) - (10.85)	EPA 200.8	

Lab Numbers: **20250429541 - 20250429541**

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method	
Matrix Spike Duplicate									
Cadmium - T	0501836	0.247	0.256		10	-3.44%	(-11.95) - (10.24)	EPA 200.8	
Chromium - T	0501836	0.246	0.251		10	-1.80%	(-10.83) - (11.68)	EPA 200.8 DRC	
Lead - T	0501836	0.2507	0.2616		10	-4.28%	(-11.28) - (10.63)	EPA 200.8	
Mercury - T	0430103	0.0021	0.0021		1	-1.90%	(-9.530) - (7.396)	EPA 245.1	
Selenium - T	0501836	1.20	1.25		10	-3.78%	(-13.26) - (11.80)	EPA 200.8	
Arsenic - TR	0502209	0.249	0.254	0.025	10	-1.90%	(-5.795) - (6.589)	EPA 200.8	
Arsenic - TR	0502106	0.248	0.248		10	0.149%	(-5.795) - (6.589)	EPA 200.8	
Barium - TR	0502209	0.266	0.266	0.025	10	-0.154%	(-4.277) - (5.142)	EPA 200.8	
Barium - TR	0502106	0.298	0.301		10	-0.879%	(-4.277) - (5.142)	EPA 200.8	
Cadmium - TR	0502106	0.249	0.247		10	0.774%	(-4.597) - (4.856)	EPA 200.8	
Cadmium - TR	0502209	0.246	0.254	0.025	10	-3.19%	(-4.597) - (4.856)	EPA 200.8	
Chromium - TR	0502209	0.2671	0.2506	0.025	10	6.39%	(-6.643) - (7.257)	EPA 200.8 DRC	
Chromium - TR	0502106	0.2440	0.2446		10	-0.237%	(-6.643) - (7.257)	EPA 200.8 DRC	
Lead - TR	0502106	0.2442	0.2446		10	-0.155%	(-3.881) - (4.017)	EPA 200.8	
Lead - TR	0502209	0.2463	0.2477	0.025	10	-0.587%	(-3.881) - (4.017)	EPA 200.8	
Selenium - TR	0502209	1.22	1.22	0.125	10	-0.214%	(-6.510) - (6.495)	EPA 200.8	
Selenium - TR	0502106	1.22	1.22		10	0.303%	(-6.510) - (6.495)	EPA 200.8	
Silver - TR	0502106	0.2445	0.2448		10	-0.110%	(-5.094) - (6.436)	EPA 200.8	
Silver - TR	0502209	0.2449	0.2512	0.025	10	-2.54%	(-5.094) - (6.436)	EPA 200.8	
Benzene	0508541	1.17	1.20		1	-2.03%	(-16.06) - (12.84)	SW846 8021B-S	
Ethylbenzene	0508541	1.24	1.20		1	3.28%	(-17.45) - (14.80)	SW846 8021B-S	
MTBE	0508541	1.14	1.18		1	-3.28%	(-14.54) - (12.12)	SW846 8021B-S	
Naphthalene	0508541	1.11	0.909		1	20.3 %	(-30.37) - (27.56)	SW846 8021B-S	
Toluene	0508541	1.28	1.25		1	1.90%	(-15.74) - (13.44)	SW846 8021B-S	
Xylenes(o,m,p)	0508541	3.72	3.79		1	-1.87%	(-17.18) - (14.95)	SW846 8021B-S	
TPH Gas	0508541	101	103		1	-2.39%	(-18.87) - (14.22)	SW846 8015B-S	
TPH-Diesel	0409542	175	164		1	6.55%	(-26.05) - (25.32)	SW846 8015B-S	
Initial Calibration Verification									
Arsenic - D		0.052	0.050		1	3.04%	(-4.696) - (4.118)	EPA 200.8	
Barium - D		0.052	0.050		1	3.64%	(-6.160) - (7.692)	EPA 200.8	
Cadmium - D		0.051	0.050		1	2.40%	(-4.820) - (4.226)	EPA 200.8	
Chromium - D		0.052	0.050		1	3.18%	(-13.89) - (12.01)	EPA 200.8 DRC	
Lead - D		0.0509	0.0500		1	1.72%	(-4.819) - (6.739)	EPA 200.8	
Selenium - D		0.250	0.250		1	0.112%	(-5.214) - (3.198)	EPA 200.8	
Silver - D		0.051	0.050		1	2.10%	(-4.064) - (5.522)	EPA 200.8	
Mercury - T		0.0031	0.0030		1	3.33%	(-5.016) - (11.78)	EPA 245.1	
TPH-Diesel		998	1000		1	-0.200%	(-24.60) - (30.28)	SW846 8015B-S	
Continuing Calibration Verification									
Arsenic - D		0.051	0.050		1	1.10%	(-10.29) - (0.7200)	EPA 200.8	X
- Recovery was within 10% of expected value									
Arsenic - D		0.049	0.050		1	-1.60%	(-10.29) - (0.7200)	EPA 200.8	
Arsenic - D		0.051	0.050		1	2.22%	(-10.29) - (0.7200)	EPA 200.8	X
- Recovery was within 10% of expected value									
Arsenic - D		0.050	0.050		1	0.820%	(-10.29) - (0.7200)	EPA 200.8	X
- Recovery was within 10% of expected value									

Lab Numbers: **20250429541 - 20250429541**

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method	
Continuing Calibration Verification									
Arsenic - D		0.051	0.050		1	2.02%	(-10.29) - (0.7200)	EPA 200.8	X
- Recovery was within 10% of expected value									
Barium - D		0.049	0.050		1	-1.22%	(-7.713) - (1.673)	EPA 200.8	
Barium - D		0.050	0.050		1	-1.06%	(-7.713) - (1.673)	EPA 200.8	
Barium - D		0.052	0.050		1	3.98%	(-7.713) - (1.673)	EPA 200.8	X
- Recovery was within 10% of expected value									
Barium - D		0.050	0.050		1	0.720%	(-7.713) - (1.673)	EPA 200.8	
Barium - D		0.050	0.050		1	-1.08%	(-7.713) - (1.673)	EPA 200.8	
Cadmium - D		0.051	0.050		1	1.32%	(-8.275) - (3.327)	EPA 200.8	
Cadmium - D		0.050	0.050		1	0.260%	(-8.275) - (3.327)	EPA 200.8	
Cadmium - D		0.049	0.050		1	-1.18%	(-8.275) - (3.327)	EPA 200.8	
Cadmium - D		0.050	0.050		1	0.320%	(-8.275) - (3.327)	EPA 200.8	
Cadmium - D		0.050	0.050		1	-0.940%	(-8.275) - (3.327)	EPA 200.8	
Chromium - D		0.051	0.050		1	2.72%	(-7.492) - (10.18)	EPA 200.8 DRC	
Chromium - D		0.052	0.050		1	4.26%	(-7.492) - (10.18)	EPA 200.8 DRC	
Chromium - D		0.051	0.050		1	2.10%	(-7.492) - (10.18)	EPA 200.8 DRC	
Chromium - D		0.052	0.050		1	3.52%	(-7.492) - (10.18)	EPA 200.8 DRC	
Chromium - D		0.050	0.050		1	-0.940%	(-7.492) - (10.18)	EPA 200.8 DRC	
Lead - D		0.0508	0.0500		1	1.50%	(-6.131) - (3.757)	EPA 200.8	
Lead - D		0.0500	0.0500		1	0.080%	(-6.131) - (3.757)	EPA 200.8	
Lead - D		0.0502	0.0500		1	0.400%	(-6.131) - (3.757)	EPA 200.8	
Lead - D		0.0499	0.0500		1	-0.220%	(-6.131) - (3.757)	EPA 200.8	
Lead - D		0.0508	0.0500		1	1.58%	(-6.131) - (3.757)	EPA 200.8	
Selenium - D		0.246	0.250		1	-1.47%	(-11.31) - (0.8166)	EPA 200.8	
Selenium - D		0.245	0.250		1	-2.04%	(-11.31) - (0.8166)	EPA 200.8	
Selenium - D		0.252	0.250		1	0.720%	(-11.31) - (0.8166)	EPA 200.8	
Selenium - D		0.254	0.250		1	1.62%	(-11.31) - (0.8166)	EPA 200.8	X
- Recovery was within 10% of expected value									
Selenium - D		0.247	0.250		1	-1.05%	(-11.31) - (0.8166)	EPA 200.8	
Silver - D		0.050	0.050		1	0.620%	(-6.467) - (4.749)	EPA 200.8	
Silver - D		0.050	0.050		1	0.880%	(-6.467) - (4.749)	EPA 200.8	
Silver - D		0.054	0.050		1	7.48%	(-6.467) - (4.749)	EPA 200.8	X
- Recovery was within 10% of expected value									
Silver - D		0.050	0.050		1	-0.380%	(-6.467) - (4.749)	EPA 200.8	
Silver - D		0.045	0.050		1	-9.72%	(-6.467) - (4.749)	EPA 200.8	X
- Recovery was within 10% of expected value									
Mercury - T		0.0020	0.0020		1	-1.50%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0010	0.0010		1	-2.00%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0020	0.0020		1	-0.500%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0020	0.0020		1	1.00%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0021	0.0020		1	3.00%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0050	0.0050		1	0.600%	(-11.12) - (7.856)	EPA 245.1	
Mercury - T		0.0020	0.0020		1	1.00%	(-11.12) - (7.856)	EPA 245.1	
Benzene		27.1	25.0		1	8.45%	(-3.994) - (12.15)	SW846 8021B	
Benzene		27.1	25.0		1	8.43%	(-3.994) - (12.15)	SW846 8021B	
Ethylbenzene		26.7	25.0		1	6.62%	(-7.381) - (12.87)	SW846 8021B	

Lab Numbers: **20250429541 - 20250429541**

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method
Continuing Calibration Verification								
Ethylbenzene		26.6	25.0		1	6.30%	(-7.381) - (12.87)	SW846 8021B
MTBE		28.3	25.0		1	13.4 %	(-13.19) - (20.39)	SW846 8021B
MTBE		27.6	25.0		1	10.5 %	(-13.19) - (20.39)	SW846 8021B
Naphthalene		28.7	25.0		1	14.8 %	(-41.35) - (27.12)	SW846 8021B
Naphthalene		25.2	25.0		1	0.952%	(-41.35) - (27.12)	SW846 8021B
Toluene		28.1	25.0		1	12.2 %	(-2.637) - (18.29)	SW846 8021B
Toluene		28.1	25.0		1	12.3 %	(-2.637) - (18.29)	SW846 8021B
Xylenes(o,m,p)		82.9	75.0		1	10.6 %	(-5.886) - (17.46)	SW846 8021B
Xylenes(o,m,p)		83.0	75.0		1	10.7 %	(-5.886) - (17.46)	SW846 8021B
TPH Gas		1750	2000		1	-12.4 %	(-21.46) - (4.653)	SW846 8015B
TPH Gas		1850	2000		1	-7.38%	(-21.46) - (4.653)	SW846 8015B
TPH-Diesel		1140	1000		1	13.8 %	(-13.69) - (27.60)	SW846 8015B-S
TPH-Diesel		1170	1000		1	16.9 %	(-13.89) - (28.09)	SW846 8015B-S
Lab Control Spike								
Benzene		1.12	0.00	1.00	1	111.6 %	(76.03) - (127.3)	SW846 8021B-S
Ethylbenzene		1.12	0.00	1.00	1	112.2 %	(84.58) - (125.6)	SW846 8021B-S
MTBE		1.14	0.00	1.00	1	113.5 %	(73.87) - (130.1)	SW846 8021B-S
Naphthalene		0.698	0.00	1.00	1	69.8 %	(34.04) - (163.6)	SW846 8021B-S
Toluene		1.18	0.00	1.00	1	117.8 %	(79.43) - (131.7)	SW846 8021B-S
Xylenes(o,m,p)		3.48	0.00	3.00	1	116.1 %	(81.30) - (132.0)	SW846 8021B-S
TPH Gas		89.7	0.00	100	1	89.7 %	(67.09) - (112.1)	SW846 8015B-S
TPH-Diesel		163	0.00	200	1	81.7 %	(57.40) - (109.8)	SW846 8015B-S
Initial Calibration Blank								
Mercury - T		0.0000	0.000		1	-0.00001	(-0.0001) - (0.0001)	EPA 245.1
Continuing Calibration Blank								
Arsenic - D		0.000	0.00		1	-0.00002	(-0.0003) - (0.0002)	EPA 200.8
Barium - D		0.00	0.00		1	0	(0.0000) - (0.0000)	EPA 200.8
Cadmium - D		0.000	0.00		1	0.00001	(0.0000) - (0.0001)	EPA 200.8
Chromium - D		0.000	0.00		1	0.00001	(0.0000) - (0.0001)	EPA 200.8 DRC
Lead - D		0.000	0.000		1	0	(0.0000) - (0.0000)	EPA 200.8
Selenium - D		0.000	0.00		1	0.00006	(-0.0002) - (0.0005)	EPA 200.8
Silver - D		0.00	0.00		1	0	(0.0000) - (0.0001)	EPA 200.8
Mercury - T		-0.0001	0.000		1	-0.00005	(-0.0001) - (0.0001)	EPA 245.1
Mercury - T		0.0000	0.000		1	-0.00002	(-0.0001) - (0.0001)	EPA 245.1
Mercury - T		0.0000	0.000		1	-0.00002	(-0.0001) - (0.0001)	EPA 245.1
Mercury - T		0.0000	0.000		1	-0.00001	(-0.0001) - (0.0001)	EPA 245.1
Lab Reagent Blank								
Benzene		0.00	0.00		1	0	(0.000) - (0.000)	SW846 8021B-S
Ethylbenzene		0.00	0.00		1	0	(0.000) - (0.000)	SW846 8021B-S
MTBE		0.068	0.00		1	0.0683	(-0.0351) - (0.0909)	SW846 8021B-S
Naphthalene		0.00	0.00		1	0	(-0.0527) - (0.0712)	SW846 8021B-S
Toluene		0.00	0.00		1	0	(-0.0310) - (0.0419)	SW846 8021B-S

Lab Numbers: **20250429541 - 20250429541**

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method
Lab Reagent Blank								
Xylenes(o,m,p)		0.066	0.00		1	0.0655	(-0.0760) - (0.1478)	SW846 8021B-S
TPH Gas		0.362	0.00		1	0.36244	(-0.7855) - (1.266)	SW846 8015B-S
TPH-Diesel		1.33	0.00		1	1.33	(-6.985) - (9.426)	SW846 8015B-S

Approved By: 

Approved On: 05/23/2025 04:05 PM

AMERICAN ENGINEERING TESTING, INC.

☐ St. Paul Office
550 Cleveland Ave. N.
St. Paul, MN 55114
651-659-9001
651-659-1379 (fax)

☒ OTHER Rapid City Office
ADDRESS: 1745 Samco Rd
Rapid City, SD
PHONE: 605-388-0029

16269

PAGE 1 OF 1

AET PROJECT NUMBER P-0043194 P.O. # 18-1136
PROJECT NAME/LOCATION Barker Dome Release
AET PROJECT MANAGER Jeremy Huot
SEND REPORT TO Jeremy Huot & Brad Bishop
SAMPLED BY (PRINT) Jeremy Huot
SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH
DATE NEEDED BY:

ITEM#	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: TEH, Naphthalene	TPH-G, BTEX, MTBE	TCLP RCRA & metals	Radium-226	Radium-228	REMARKS
1	Composite (4 Loc)	4/29/25	10:00	Soil	3	X					N	X	X	X	X	X	2 Jars & 1 Ziplock lab # 2025012954

NOTE:
on ice
13.0°C

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
1	AET		4/29/25	3:47pm

MIDCONTINENT TESTING LABORATORIES

SAMPLE RECEIPT CHECKLIST

Company Name: AET

Date/Time Received: 4/29/25 (Date) / 1547 (Time)

Project: Barker Dome Release

Received by: Josh

Lab Number(s): 2025042954I

Carrier Name: Hand Delivered

UNPACKING

Yes	No		Initials
☑	☐	1. Shipping container in good condition?	
☐	☑	2. Custody seals present on shipping container? Condition: Intact ☐ Broken ☐	
☑	☐	3. (Ice) / Blue Ice (circle one) present in shipping container? Container(s) Temp. 1. 13.0°C 2. _____ 3. _____ 4. _____	
☐	☑	4. Bottles broken and/or leaking? (Photograph broken bottles.)	
☐	☑	5. Custody seals on sample bottles? Condition: Intact ☐ Broken ☐	

LABELING

Yes	No		Initials
☑	☐	6. Chain of custody Present?	
☑	☐	7. Chain of custody includes signatures, dates, and times when relinquished and received?	
☑	☐	8. Chain of custody agrees with bottle count?	
☑	☐	9. Chain of custody agrees with labels?	
☑	☐	10. Samples received within holding times?	
☑	☐	11. Samples in proper container?	
☑	☐	12. Sufficient sample volume for indicated tests?	

PRESERVATIVE

Yes	No		Initials	Yes	No		Initials
☐	☐	13. Metals bottle(s) pH < 2?		☐	☐	17. TOC bottle(s) pH < 2?	
☐	☐	14. Nutrient bottle(s) pH < 2?		☐	☐	18. Oil & Grease bottle(s) pH < 2?	
☐	☐	15. Cyanide bottle(s) pH > 12?		☐	☐	19. Volatiles pH < 2?	
☐	☐	16. Sulfide bottle(s) pH > 9?					

COMMENTS:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 20250429541
Pace Project No.: 30776560

Sample: 20250429541 **Lab ID: 30776560001** Collected: 04/29/25 10:00 Received: 05/06/25 11:05 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 901.1	**0.705 ± 0.131 (0.113) C:NA T:NA**	pCi/g	05/29/25 07:45	13982-63-3	Ra
Radium-228	EPA 901.1	**0.872 ± 0.275 (0.460) C:NA T:NA**	pCi/g	05/29/25 07:45	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 20250429541
Pace Project No.: 30776560

QC Batch: 746226
QC Batch Method: EPA 901.1
Analysis Method: EPA 901.1
Analysis Description: 901.1 Gamma Spec Ingrowth
Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30776560001

METHOD BLANK: 3634086 Matrix: Solid

Associated Lab Samples: 30776560001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.005 ± 0.078 (0.093) C:NA T:NA	pCi/g	05/26/25 19:22	Ra
Radium-228	0.011 ± 0.088 (0.122) C:NA T:NA	pCi/g	05/26/25 19:22	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 20250429541
Pace Project No.: 30776560

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Ra	The reported Ra-226 results were determined by hermetically sealing the dried, processed sample in an appropriate-sized can. Each sample was stored for a minimum of 21 days to ensure that equilibrium between Ra-226 and daughters Bi-214 and Pb-214 was achieved. Reported Ra-226 results were inferred from gamma peaks attributable to Bi-214 and Pb-214.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 20250429541
Pace Project No.: 30776560

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30776560001	**20250429541**	EPA 901.1	746226		

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MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

REVIEWED
By Jeremy Huot at 11:44 am, Jun 05, 2025

AET
1745 SAMCO ROAD
RAPID CITY, SD 57702

Sample Site:	S-1
Project Name:	Barker Dome Release
Project Number:	P-0043194
Sampled:	05/06/25 at 12:00 PM by Jeremy Huot
Sample Matrix:	Soil
Lab ID#:	20250508541
Received:	05/08/25 at 01:15 PM by Shela Carpenter
Account:	W1202 - AET - Rapid City

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Volatile								
Benzene	< 0.050	mg/kg	1	0.018	0.050	SW846 8021B-S	SAC	05/14/25
Ethylbenzene	< 0.100	mg/kg	1	0.016	0.100	SW846 8021B-S	SAC	05/14/25
Methyl tertiary-Butyl Ether	< 0.100	mg/kg	1	0.023	0.100	SW846 8021B-S	SAC	05/14/25
Naphthalene	< 0.200	mg/kg	1	0.025	0.200	SW846 8021B-S	SAC	05/14/25
Toluene	< 0.100	mg/kg	1	0.015	0.100	SW846 8021B-S	SAC	05/14/25
Xylenes(o,m,p)	< 0.200	mg/kg	1	0.060	0.200	SW846 8021B-S	SAC	05/14/25
Total Volatile Hydrocarbons								
TPH as Gasoline	< 10.0	mg/kg	1	0.689	10.0	SW846 8015B-S	SAC	05/14/25
Semi-Volatile								
TPH(Total Extractable Hydrocarbons)	44.6	mg/kg	1	1.29	10.0	SW846 8015B-S	SAC	05/21/25
Extraction								
Extraction TPH/SOC	1.00	none	1			SW846 3550	SAC	05/19/25

Quality Control Data

Parameter	Result	Limits	DF	Method	Analyst	Date
Surrogate Recovery-Volatile						
4-Bromofluorobenzene	104.7 %	(90.63) - (126.1)	1	SW846 8021B QC	SAC	05/14/25
Surrogate Recovery-SV						
Ortho-Terphenyl	103.4 %	(73.68) - (135.8)	1	SW846 8015-S QC	SAC	05/21/25

Report Approved By:

Report Approved On: 5/23/2025 4:14:13 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: S-2
Project Name: Barker Dome Release
Project Number: P-0043194
Sampled: 05/07/25 at 09:30 AM
by Jeremy Huot
Sample Matrix: Soil

AET
1745 SAMCO ROAD
RAPID CITY, SD 57702

Lab ID#: 20250508542
Received: 05/08/25 at 01:15 PM
by Shela Carpenter
Account: W1202 - AET - Rapid City

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Volatile								
Benzene	< 0.050	mg/kg	1	0.018	0.050	SW846 8021B-S	SAC	05/14/25
Ethylbenzene	< 0.100	mg/kg	1	0.016	0.100	SW846 8021B-S	SAC	05/14/25
Methyl tertiary-Butyl Ether	< 0.100	mg/kg	1	0.023	0.100	SW846 8021B-S	SAC	05/14/25
Naphthalene	< 0.200	mg/kg	1	0.025	0.200	SW846 8021B-S	SAC	05/14/25
Toluene	< 0.100	mg/kg	1	0.015	0.100	SW846 8021B-S	SAC	05/14/25
Xylenes(o,m,p)	< 0.200	mg/kg	1	0.060	0.200	SW846 8021B-S	SAC	05/14/25
Total Volatile Hydrocarbons								
TPH as Gasoline	< 10.0	mg/kg	1	0.689	10.0	SW846 8015B-S	SAC	05/14/25
Semi-Volatile								
TPH(Total Extractable Hydrocarbons)	1200	mg/kg	20	25.8	200	SW846 8015B-S	SAC	05/21/25
Extraction								
Extraction TPH/SOC	1.00	none	1			SW846 3550	SAC	05/19/25

Quality Control Data

Parameter	Result	Limits	DF	Method	Analyst	Date
Surrogate Recovery-Volatile						
4-Bromofluorobenzene	109.7 %	(90.63) - (126.1)	1	SW846 8021B QC	SAC	05/14/25
Surrogate Recovery-SV						
Ortho-Terphenyl	D-Surrogate not calculated due to dilution.					

Report Approved By:



Report Approved On: 5/23/2025 4:14:13 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: S-3
Project Name: Barker Dome Release
Project Number: P-0043194
Sampled: 05/06/25 at 01:00 PM
by Jeremy Huot
Sample Matrix: Soil

AET
1745 SAMCO ROAD
RAPID CITY, SD 57702

Lab ID#: 20250508543
Received: 05/08/25 at 01:15 PM
by Shela Carpenter
Account: W1202 - AET - Rapid City

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Volatile								
Benzene	< 0.050	mg/kg	1	0.018	0.050	SW846 8021B-S	SAC	05/14/25
Ethylbenzene	< 0.100	mg/kg	1	0.016	0.100	SW846 8021B-S	SAC	05/14/25
Methyl tertiary-Butyl Ether	< 0.100	mg/kg	1	0.023	0.100	SW846 8021B-S	SAC	05/14/25
Naphthalene	0.251	mg/kg	1	0.025	0.200	SW846 8021B-S	SAC	05/14/25
Toluene	< 0.100	mg/kg	1	0.015	0.100	SW846 8021B-S	SAC	05/14/25
Xylenes(o,m,p)	< 0.200	mg/kg	1	0.060	0.200	SW846 8021B-S	SAC	05/14/25
Total Volatile Hydrocarbons								
TPH as Gasoline	11.7	mg/kg	1	0.689	10.0	SW846 8015B-S	SAC	05/14/25
Semi-Volatile								
TPH(Total Extractable Hydrocarbons)	529	mg/kg	20	25.8	200	SW846 8015B-S	SAC	05/21/25
Extraction								
Extraction TPH/SOC	1.00	none	1			SW846 3550	SAC	05/19/25

Quality Control Data

Parameter	Result	Limits	DF	Method	Analyst	Date
Surrogate Recovery-Volatile						
4-Bromofluorobenzene	106.8 %	(90.63) - (126.1)	1	SW846 8021B QC	SAC	05/14/25
Surrogate Recovery-SV						
Ortho-Terphenyl	D-Surrogate not calculated due to dilution.					

Report Approved By:



Report Approved On: 5/23/2025 4:14:13 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Lab Numbers: 20250508541 - 20250508543

QC Sample Report

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method	
Spike									
Benzene	0508541	1.20	< 0.050	1.00	1	119.6 %	(67.26) - (115.3)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
Ethylbenzene	0508541	1.20	< 0.100	1.00	1	120.0 %	(80.98) - (111.1)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
MTBE	0508541	1.18	< 0.100	1.00	1	117.9 %	(64.47) - (111.9)	SW846 8021B-S	X
- Result is within QC guidelines of 80 - 120%									
Naphthalene	0508541	0.909	< 0.200	1.00	1	90.9 %	(61.30) - (143.1)	SW846 8021B-S	
Toluene	0508541	1.25	< 0.100	1.00	1	125.3 %	(73.57) - (113.9)	SW846 8021B-S	X
- Result is within QC guidelines of 70 - 130%									
Xylenes(o,m,p)	0508541	3.79	< 0.200	3.00	1	126.3 %	(74.86) - (117.9)	SW846 8021B-S	X
- Result is within QC guidelines of 70 - 130%									
TPH Gas	0508541	103	< 10.0	100	1	103.3 %	(54.52) - (130.0)	SW846 8015B-S	
Matrix Spike Duplicate									
Benzene	0508541	1.17	1.20		1	-2.03%	(-16.06) - (12.84)	SW846 8021B-S	
Ethylbenzene	0508541	1.24	1.20		1	3.28%	(-17.45) - (14.80)	SW846 8021B-S	
MTBE	0508541	1.14	1.18		1	-3.28%	(-14.54) - (12.12)	SW846 8021B-S	
Naphthalene	0508541	1.11	0.909		1	20.3 %	(-30.37) - (27.56)	SW846 8021B-S	
Toluene	0508541	1.28	1.25		1	1.90%	(-15.74) - (13.44)	SW846 8021B-S	
Xylenes(o,m,p)	0508541	3.72	3.79		1	-1.87%	(-17.18) - (14.95)	SW846 8021B-S	
TPH Gas	0508541	101	103		1	-2.39%	(-18.87) - (14.22)	SW846 8015B-S	
Initial Calibration Verification									
TPH-Diesel		734	1000		1	-26.6 %	(-22.89) - (29.48)	SW846 8015B-S	X
- Recovery within QC limits of 70-130%.									
Continuing Calibration Verification									
Benzene		25.9	25.0		1	3.60%	(-0.0151) - (12.11)	SW846 8021B	
Benzene		25.6	25.0		1	2.24%	(-0.0151) - (12.11)	SW846 8021B	
Ethylbenzene		25.4	25.0		1	1.66%	(-0.7634) - (11.40)	SW846 8021B	
Ethylbenzene		26.0	25.0		1	3.97%	(-0.7634) - (11.40)	SW846 8021B	
MTBE		26.3	25.0		1	5.30%	(-13.13) - (24.33)	SW846 8021B	
MTBE		26.2	25.0		1	4.68%	(-13.13) - (24.33)	SW846 8021B	
Naphthalene		22.9	25.0		1	-8.33%	(-43.48) - (31.12)	SW846 8021B	
Naphthalene		24.3	25.0		1	-2.74%	(-43.48) - (31.12)	SW846 8021B	
Toluene		26.7	25.0		1	6.88%	(3.907) - (16.98)	SW846 8021B	
Toluene		27.2	25.0		1	8.66%	(3.907) - (16.98)	SW846 8021B	
Xylenes(o,m,p)		79.1	75.0		1	5.46%	(2.426) - (15.15)	SW846 8021B	

Lab Numbers: **20250508541 - 20250508543**

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method
Continuing Calibration Verification								
Xylenes(o,m,p)		80.3	75.0		1	7.00%	(2.426) - (15.15)	SW846 8021B
TPH Gas		2030	2000		1	1.34%	(-20.80) - (4.582)	SW846 8015B
TPH Gas		1800	2000		1	-9.98%	(-20.80) - (4.582)	SW846 8015B
TPH-Diesel		969	1000		1	-3.10%	(-14.49) - (29.37)	SW846 8015B-S
TPH-Diesel		1100	1000		1	9.80%	(-14.49) - (29.37)	SW846 8015B-S
Lab Control Spike								
Benzene		0.971	0.00	1.00	1	97.1 %	(76.92) - (128.3)	SW846 8021B-S
Ethylbenzene		0.942	0.00	1.00	1	94.2 %	(84.66) - (126.5)	SW846 8021B-S
MTBE		0.923	0.00	1.00	1	92.3 %	(74.48) - (131.4)	SW846 8021B-S
Naphthalene		0.595	0.00	1.00	1	59.5 %	(30.56) - (162.1)	SW846 8021B-S
Toluene		1.02	0.00	1.00	1	101.5 %	(79.14) - (133.6)	SW846 8021B-S
Xylenes(o,m,p)		2.92	0.00	3.00	1	97.2 %	(81.76) - (133.1)	SW846 8021B-S
TPH Gas		94.1	0.00	100	1	94.1 %	(67.45) - (110.9)	SW846 8015B-S
TPH-Diesel		163	0.00	200	1	81.7 %	(59.55) - (105.7)	SW846 8015B-S
Lab Reagent Blank								
Benzene		0.00	0.00		1	0	(0.000) - (0.000)	SW846 8021B-S
Ethylbenzene		0.00	0.00		1	0	(0.000) - (0.000)	SW846 8021B-S
MTBE		0.057	0.00		1	0.05726	(-0.0339) - (0.0966)	SW846 8021B-S
Naphthalene		0.00	0.00		1	0	(-0.0527) - (0.0712)	SW846 8021B-S
Toluene		0.00	0.00		1	0	(-0.0310) - (0.0419)	SW846 8021B-S
Xylenes(o,m,p)		0.072	0.00		1	0.07175	(-0.0714) - (0.1497)	SW846 8021B-S
TPH Gas		0.424	0.00		1	0.42412	(-0.7559) - (1.273)	SW846 8015B-S
TPH-Diesel		1.92	0.00		1	1.92	(-6.979) - (9.434)	SW846 8015B-S

Approved By: 

Approved On: 05/23/2025 04:14 PM

AMERICAN ENGINEERING TESTING, INC.

☐ St. Paul Office
550 Cleveland Ave. N.
St. Paul, MN 55114
651-659-9001
651-659-1379 (fax)

☒ OTHER Rapid City Office

ADDRESS: 1745 Samco Rd
Rapid City, SD

PHONE: 605-388-0029

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PAGE 1 OF 1

AET PROJECT NUMBER P-0043194 P.O. # 18-1139

PROJECT NAME/LOCATION Barker Dome Release

AET PROJECT MANAGER Jeremy Huot

SEND REPORT TO J. Huot & B. Bishop

SAMPLED BY (PRINT) Jeremy Huot

SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY:

ITEM#	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: TEH, Naphthalene	TPH-G, BTEX, MTBE	REMARKS
1	S-1	5/6/25	12:00	Soil	2	X					N	X	X	20250508541
2	S-2	5/7/25	9:30	Soil	2	X					N	X	X	542
3	S-3	5/6/25	13:00	Soil	2	X					N	X	X	543

NOTE: 1.8°C Blue Ice

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
1-3	AET		5/8/25	13:15

MIDCONTINENT TESTING LABORATORIES

SAMPLE RECEIPT CHECKLIST

Company Name: AET
Date/Time Received: 5/8/25 (Date) / 1315 (Time)
Project: Barker Dome Release
Received by: Shela
Lab Number(s): 20250508541-543
Carrier Name: Hand Delivered

UNPACKING

Yes	No		Initials
☑	☐	1. Shipping container in good condition?	
☐	☑	2. Custody seals present on shipping container? Condition: Intact ☐ Broken ☐	
☑	☐	3. Ice / Blue Ice (circle one) present in shipping container? Container(s) Temp. 1. 1.3°C 2. _____ 3. _____ 4. _____	
☐	☑	4. Bottles broken and/or leaking? (Photograph broken bottles.)	
☐	☑	5. Custody seals on sample bottles? Condition: Intact ☐ Broken ☐	

LABELING

Yes	No		Initials
☑	☐	6. Chain of custody Present?	
☑	☐	7. Chain of custody includes signatures, dates, and times when relinquished and received?	
☑	☐	8. Chain of custody agrees with bottle count?	
☑	☐	9. Chain of custody agrees with labels?	
☑	☐	10. Samples received within holding times?	
☑	☐	11. Samples in proper container?	
☑	☐	12. Sufficient sample volume for indicated tests?	

PRESERVATIVE

Yes	No		Initials	Yes	No		Initials
☐	☐	13. Metals bottle(s) pH < 2?		☐	☐	17. TOC bottle(s) pH < 2?	
☐	☐	14. Nutrient bottle(s) pH < 2?		☐	☐	18. Oil & Grease bottle(s) pH < 2?	
☐	☐	15. Cyanide bottle(s) pH > 12?		☐	☐	19. Volatiles pH < 2?	
☐	☐	16. Sulfide bottle(s) pH > 9?					

COMMENTS:

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

REVIEWED
By Jeremy Huot at 2:01 pm, Jun 27, 2025

AET
1745 SAMCO ROAD
RAPID CITY, SD 57702

Sample Site:	Composite 2
Project Name:	Barker Dome Release
Project Number:	P-0043194
Sampled:	05/07/25 at 10:15 AM by Jeremy Huot
Sample Matrix:	Soil
Lab ID#:	20250508581
Received:	05/08/25 at 08:52 AM by Shela Carpenter
Account:	W1202 - AET - Rapid City

Parameter	Result	Units	DF	Method	Analyst	Date
Radiological						
Radium-226	0.6650	pCi/g	1	EPA 901.1m	SYS	06/11/25
Radium-228	0.7650	pCi/g	1	EPA 901.1m	SYS	06/11/25
Precision Data						
Radium-226 precision	± 0.080	pCi/L	1	SC-Radium 226 precision	SYS	06/11/25
Radium-228 precision	± 0.139	pCi/L	1	SC-Radium 228 precision	SYS	06/11/25
MDA Data						
Radium-226 MDA	0.078	pCi/L	1	SC - Radium 226 MDA	SYS	06/11/25
Radium-228 MDA	0.139	pCi/L	1	SC - Radium 228 MDA	SYS	06/11/25

Notes:
Radium 226 and 228 analyzed by Pace Labs. Report attached.

Report Approved By:



Report Approved On: 6/16/2025 12:09:30 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Lab Numbers: 20250508581 - 20250508581

QC Sample Report

Parameter	Lab#	QC Value	Smp Value	Spike	DF	Result	Limits	Method

Approved By: 

Approved On: 06/16/2025 12:09 PM

AMERICAN ENGINEERING TESTING, INC.

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St. Paul, MN 55114
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☒ OTHER Rapid City Office

ADDRESS: 1745 Samco Rd
Rapid City, SD

PHONE: 605-388-0029

16271

PAGE 1 OF 1

AET PROJECT NUMBER P-0043194 P.O.# 18-1138

PROJECT NAME/LOCATION Barker Dome Release

AET PROJECT MANAGER Jeremy Huot

SEND REPORT TO J. Huot & B. Bishop

SAMPLED BY (PRINT) Jeremy Huot

SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY:

ITEM#	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	PRESERVATIVES: MeOH	PRESERVATIVES: HCL	PRESERVATIVES: H_2SO_4	PRESERVATIVES: HNO_3	FIELD FILTERED Y/N	ANALYSIS: Radium 226	ANALYSIS: Radium 228	REMARKS
1	Composite 2	5/7/25	10:15	Soil	1	X					N	X	X	202505085 81

NOTE:

11.4°C
BlueIce

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
1	AET		5/8/25	0852

MIDCONTINENT

SAMPLE RECEIPT CHECKLIST

Company Name: AET
Date/Time Received: 5/8/25 (Date) / 0852 (Time)
Project: Barker Dam Release
Received by: Shela
Lab Number(s): 202505085 81
Carrier Name: Hand Delivered

UNPACKING

Yes	No		Initials
☑	☐	1. Shipping container in good condition?	
☐	☑	2. Custody seals present on shipping container? Condition: Intact ☐ Broken ☐	
☑	☐	3. Ice / Blue Ice (circle one) present in shipping container? Container(s) Temp. 1. 11.4°C 2. _____ 3. _____ 4. _____	
☐	☑	4. Bottles broken and/or leaking? (Photograph broken bottles.)	
☐	☑	5. Custody seals on sample bottles? Condition: Intact ☐ Broken ☐	

LABELING

Yes	No		Initials
☑	☐	6. Chain of custody Present?	
☑	☐	7. Chain of custody includes signatures, dates, and times when relinquished and received?	
☑	☐	8. Chain of custody agrees with bottle count?	
☑	☐	9. Chain of custody agrees with labels?	
☑	☐	10. Samples received within holding times?	
☑	☐	11. Samples in proper container?	
☑	☐	12. Sufficient sample volume for indicated tests?	

PRESERVATIVE

Yes	No		Initials	Yes	No		Initials
☐	☐	13. Metals bottle(s) pH < 2?		☐	☐	17. TOC bottle(s) pH < 2?	
☐	☐	14. Nutrient bottle(s) pH < 2?		☐	☐	18. Oil & Grease bottle(s) pH < 2?	
☐	☐	15. Cyanide bottle(s) pH > 12?		☐	☐	19. Volatiles pH < 2?	
☐	☐	16. Sulfide bottle(s) pH > 9?					

COMMENTS:

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 20250508581
Pace Project No.: 30779796

Sample: 20250508581 **Lab ID: 30779796001** Collected: 05/07/25 10:15 Received: 05/15/25 10:10 Matrix: Solid
PWS: Site ID: Sample Type:

Results reported on a "dry-weight" basis
Comments: • The sampler's name and signature were not listed on the COC.
• Sample ID on Ziploc bag = 0508581; logged per client COC; notified via SAF.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 901.1	**0.665 ± 0.080 (0.078) C:NA T:NA**	pCi/g	06/11/25 12:37	13982-63-3	Ra
Radium-228	EPA 901.1	**0.765 ± 0.139 (0.139) C:NA T:NA**	pCi/g	06/11/25 12:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 20250508581
Pace Project No.: 30779796

QC Batch: 748389
QC Batch Method: EPA 901.1
Analysis Method: EPA 901.1
Analysis Description: 901.1 Gamma Spec Ingrowth
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30779796001

METHOD BLANK: 3645200 Matrix: Solid
Associated Lab Samples: 30779796001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.021 (0.256) C:NA T:NA	pCi/g	06/04/25 11:16	Ra
Radium-228	0.068 ± 0.130 (0.230) C:NA T:NA	pCi/g	06/04/25 11:16	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 20250508581
Pace Project No.: 30779796

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

Ra	The reported Ra-226 results were determined by hermetically sealing the dried, processed sample in an appropriate-sized can. Each sample was stored for a minimum of 21 days to ensure that equilibrium between Ra-226 and daughters Bi-214 and Pb-214 was achieved. Reported Ra-226 results were inferred from gamma peaks attributable to Bi-214 and Pb-214.

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 20250508581
Pace Project No.: 30779796

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30779796001	20250508581	EPA 901.1	748389		

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