

REVIEWED

By Mike Buchanan at 9:09 am, May 29, 2024



ENSOLUM

February 28, 2024

New Mexico Oil Conservation Division

New Mexico Energy, Minerals, and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: Remediation Update Report

Aztec #9
Aztec, New Mexico
Hilcorp Energy Company
NMOCD Incident No: nAPP2307357709

To Whom it May Concern:

Ensolum, LLC (Ensolum), on behalf of Hilcorp Energy Company (Hilcorp), presents this *Remediation Update Report* (Report) for a release at the Aztec #9 natural gas production well (Site). The Site is located on private land in Aztec, New Mexico (Figure 1). This Report summarizes the remediation, well installation, and groundwater sampling activities performed at the Site to address impacted soil and groundwater originating from a release of condensate and produced water. The Site is located in Unit M, Section 9, Township 30 North, Range 11 West, in Aztec, New Mexico.

Review of the
Remediation Update
Report for Aztec #9:
Content Satisfactory
1. Continue to sample
groundwater using
EPA method 8260B on
a quarterly basis.
2. Provide additional
recommendations after
further assessment for
work or closure as
needed.
3. Submit the 2024
Annual Report by April
2025.

SITE BACKGROUND

On February 27, 2023, Hilcorp discovered a release of 8.35 barrels (bbls) of condensate and 3.34 bbls of produced water at the Site. Upon inspection, a hole was discovered near the bottom of the condensate aboveground storage tanks (AST) due to corrosion. The released fluids pooled immediately around the AST and stayed within the secondary containment. No released fluids were recovered; however, the remaining fluids within the AST were immediately removed via vacuum truck and transferred to another well location for storage. Hilcorp reported the release to the New Mexico Oil Conservation Division (NMOCD) on a Form C-141 on March 14, 2023. The NMOCD has assigned the Site Incident Number nAPP2307357709.

Due to the likelihood of shallow groundwater at the Site, Hilcorp conducted initial excavation activities of impacted soil located on the well pad on March 6 and 7, 2023. Delineation activities were also conducted in March of 2023 to delineate the vertical and lateral extent of soil and groundwater impacts at the Site. Initial excavation and delineation sampling activities were summarized in the *Remediation Work Plan* prepared by Ensolum, dated June 8, 2023.

DECEMBER 2023 EXCAVATION ACTIVITIES

Based on the March 2023 delineation results, Hilcorp excavated additional impacted soil from on and off-pad locations beginning on December 4, 2023. Notification to NMOCD was provided at least two business days prior to conducting remediation and sampling work, with correspondences attached in Appendix A. During the excavation, an Ensolum geologist assessed the soil for petroleum hydrocarbon staining and odors. Soil samples were also field screened for the presence of volatile organic compounds (VOCs) using a calibrated photoionization detector

(PID), with results noted in the field book. The excavation was advanced to the elevation of shallow groundwater at the Site, which ranged in depths of 2 to 4 feet below ground surface (bgs).

Once field screening indicated impacted soil had been removed, five-point composite soil samples were collected from the excavation sidewalls (SW01 through SW06) at a frequency of one sample for every 200 square feet. As approved by the NMOCD, samples were submitted to Eurofins Environment Testing (Eurofins) for analysis total petroleum hydrocarbons (TPH) following Environmental Protection Agency (EPA) Method 8015M/D. Based on the analytical results summarized in Table 1, TPH was not detected above the NMOCD Closure Criteria in any of the sidewall samples. Due to the presence of shallow groundwater at the Site, excavation floor samples were not collected. Complete laboratory analytical reports are attached as Appendix B. Photographs taken during excavation activities are presented in Appendix C. In total, 1,294 cubic yards of impacted soil was excavated from the Site and taken to the Envirotech, Inc. Landfarm in San Juan County, New Mexico.

As approved by the NMOCD and to address impacts to groundwater and soils located within the smear and saturated zones at the Site, an amendment of BOS 200® was applied to the open excavation and mixed into the water table and the top 1-foot of saturated soil below the water table prior to backfill. Approximately 1,700 pounds of BOS 200®, 750 pounds of gypsum, and 5 gallons of microbial bacteria were applied at the Site. Once mixed into the subsurface, the excavation was backfilled with clean imported material and the well pad facilities were reset.

WELL INSTALLATION AND GROUNDWATER SAMPLING ACTIVITIES

Based on the grab-groundwater sample results collected during the March 2023 delineation activities (summarized in the June 8, 2023 *Remediation Work Plan*), four permanent groundwater monitoring wells (MW01 through MW04) were installed in the locations indicated on Figure 3 once excavation activities were complete. Permits were obtained from the New Mexico Office of the State Engineer (NMOSE) prior to the start of work and are attached as Appendix D. Wells were constructed with 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to 2 feet above the screened interval, then 2 feet of hydrated bentonite seal, and then bentonite-cement slurry grout to ground surface. The wells were completed with flush mount protective monuments cemented into the ground. After construction, Ensolum surveyed the new groundwater monitoring wells with a Trimble® GeoExplorer® 3000 series Global Positioning System (GPS) to determine the latitude and longitude of each location. Top-of-casing elevations were surveyed using a Dewalt® DW074 Rotary Laser Level to an accuracy of (\pm) 0.01 feet so groundwater flow direction and relative groundwater elevation could be determined. Once the top of well casing was surveyed, the depth to groundwater below top of casing was measured with an oil/water interface probe. The wells were developed by purging a minimum of 10 casing volumes, or until the well was purged dry.

The first round of groundwater sampling at the Site was conducted on February 1, 2024. Prior to purging and sampling, static depth to groundwater and total depth of each monitoring well was measured using a Keck® oil/water interface probe. Depth to groundwater and groundwater elevations are summarized in Table 2. A potentiometric surface map was developed with groundwater elevations and is presented on Figure 3. Groundwater flow direction is to the west at the Site.

Groundwater samples were collected for laboratory analysis from all Site wells. Prior to collecting groundwater samples, Ensolum determined the casing water volume and purged a minimum of three casing volumes. Water quality parameters including pH, electrical conductivity, and temperature were measured in each well using a multi-probe water quality field meter during

purging. Groundwater samples were collected into laboratory provided sample bottles and immediately placed on ice for preservation. Samples were submitted under strict chain-of-custody protocol to Eurofins for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) following EPA Method 8260B.

Based on the analytical results collected in February 2024, BTEX constituents exceeded the New Mexico Water Quality Control Commission (NMWQCC) standards in wells MW01, MW02, and MW03. Groundwater analytical results are summarized in Table 3, with complete laboratory reports included in Appendix B.

CONCLUSIONS AND RECOMMENDATIONS

Site excavation and sampling activities were conducted to address petroleum hydrocarbon impacts to vadose zone soil at the Site. Laboratory analytical results for the excavation confirmation soil samples, collected from the final excavation sidewalls, indicated all COC concentrations were compliant with the NMOCD Closure Criteria and no further soil excavation is required. Additionally, BOS 200[®] amendment was applied to the base of the excavation in order to further treat impacted soil within the saturated and smear zones, as well as to treat groundwater impacted by the release. Permanent groundwater monitoring wells were also installed to monitor groundwater conditions at the Site.

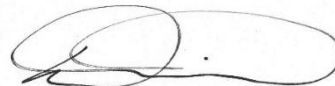
Based on the groundwater analytical results collected in February 2024, Ensolum and Hilcorp propose to monitor groundwater on a quarterly basis for the remainder of 2024 for BTEX following EPA Method 8260B. An annual report will be prepared and submitted to the NMOCD by March 31, 2025 summarizing the quarterly sampling results and providing recommendations for additional work and/or closure of the Site.

We appreciate the opportunity to provide this report to the NMOCD. If you should have any questions or comments regarding this document, please contact the undersigned.

Sincerely,
Ensolum, LLC



Stuart Hyde, PG
Senior Geologist
(970) 903-1607
shyde@ensolum.com



Daniel R. Moir, PG
Senior Managing Geologist
(303) 887-2946
dmoir@ensolum.com

Attachments:

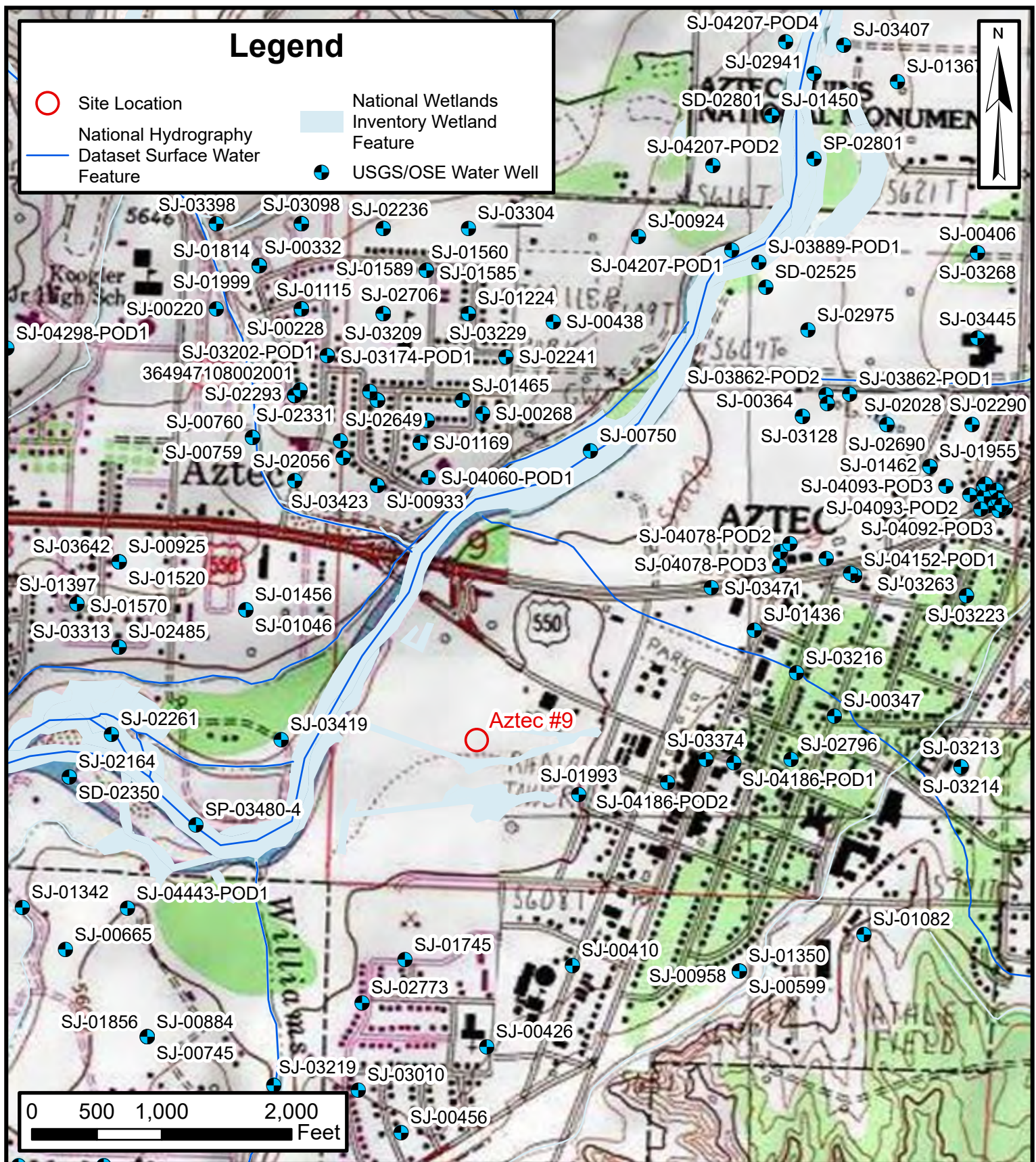
Figure 1: Site Location Map
Figure 2: Excavation Soil Analytical Locations
Figure 3: Groundwater Elevation and Analytical Results (February 2024)

Table 1: Excavation Soil Sample Analytical Results
Table 2: Groundwater Elevations
Table 3: Groundwater Analytical Results

Appendix A: NMOCD Correspondence
Appendix B: Laboratory Analytical Reports
Appendix C: Photographic Log
Appendix D: NMOSE Well Permits



FIGURES



Site Location Map

Aztec #9

Hilcorp Energy Company

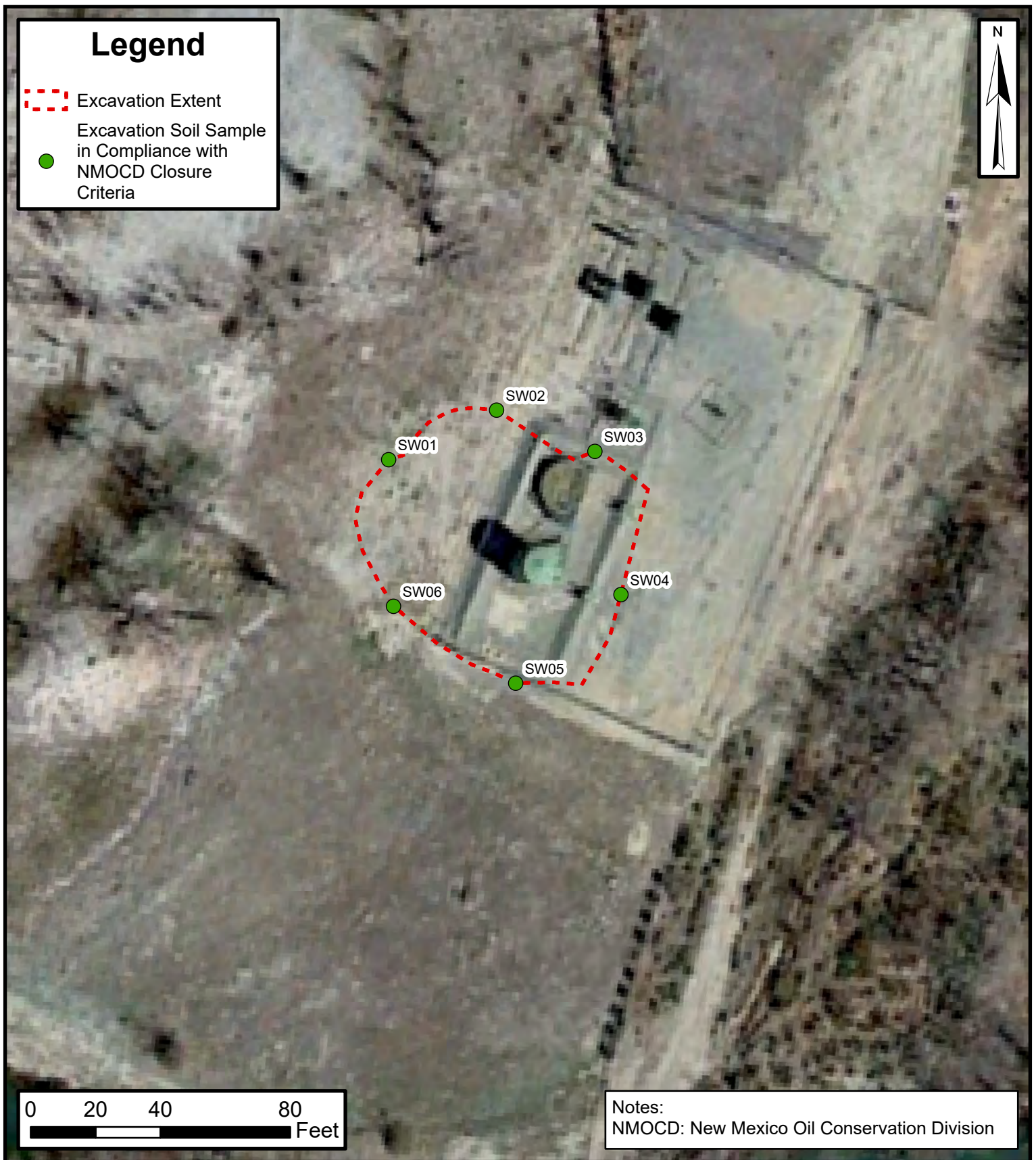
36.82245, -108.00108

San Juan County, New Mexico

FIGURE

1

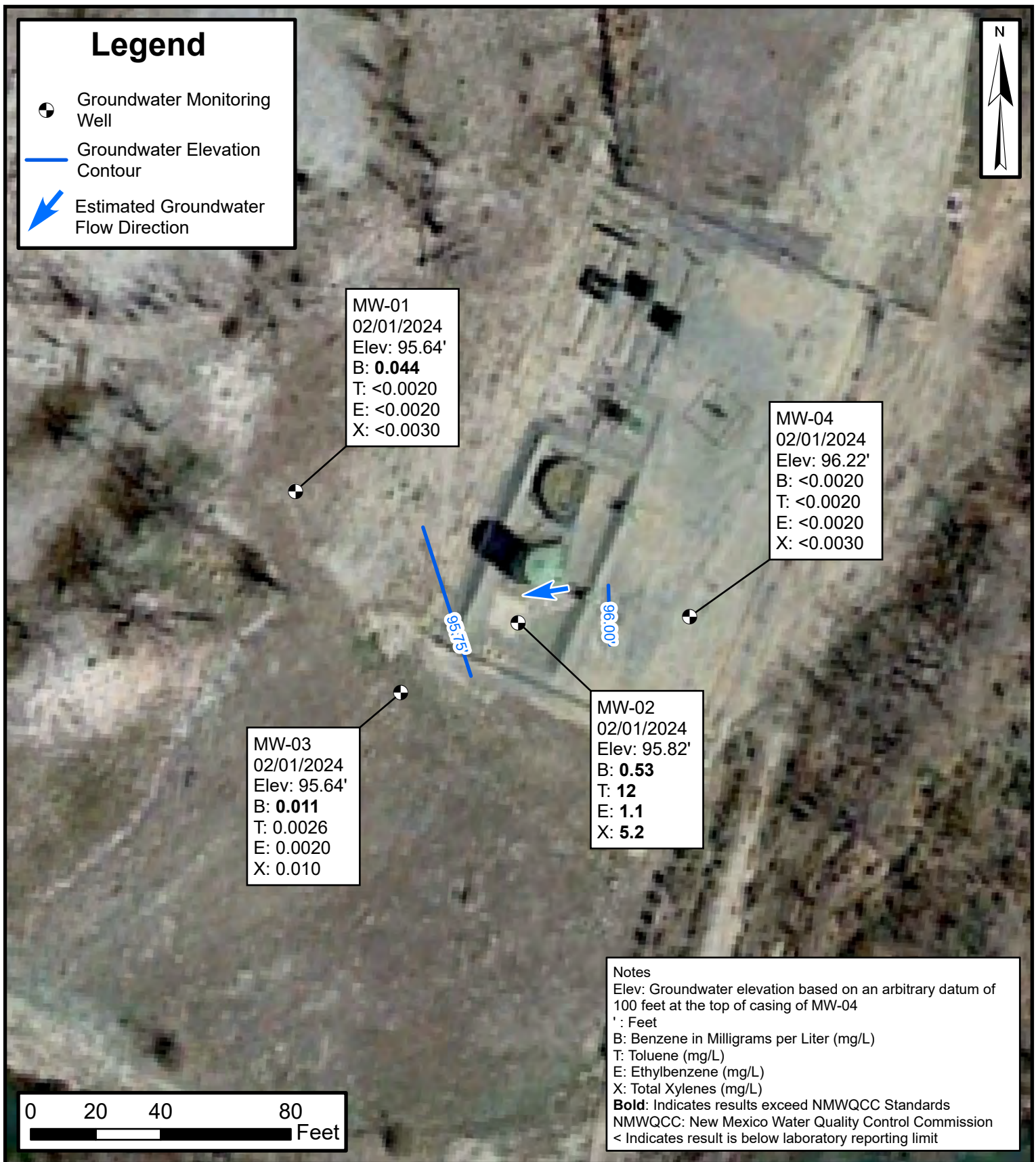




Excavation Soil Sample Locations

Aztec #9
Hilcorp Energy Company
36.82245, -108.00108
San Juan County, New Mexico

FIGURE
2





TABLES



TABLE 1 EXCAVATION SOIL SAMPLE ANALYTICAL RESULTS Aztec #9 Hilcorp Energy Company Aztec, New Mexico						
Sample Designation	Date	Depth (feet)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH MRO (mg/kg)	Total TPH (mg/kg)
NMOCD Closure Criteria for Soils Impacted by a Release			NE	NE	NE	100
SW01	12/5/2023	0 - 2	<4.9	<9.6	<48	<48
SW02	12/5/2023	0 - 3	<4.9	<9.3	<47	<47
SW03	12/5/2023	0 - 4	<5.0	<8.5	<42	<42
SW04	12/5/2023	0 - 4	<4.8	<8.6	<43	<43
SW05	12/5/2023	0 - 4	<5.0	<8.4	<42	<42
SW06	12/5/2023	0 - 4	<4.8	<9.7	<49	<49

Notes:*bgs: below ground surface**DRO: Diesel Range Organics**GRO: Gasoline Range Organics**mg/kg: milligrams per kilogram**MRO: Motor Oil/Lube Oil Range Organics**NE: Not Established**NMOCD: New Mexico Oil Conservation Division**TPH: Total Petroleum Hydrocarbon**<: indicates result less than the stated laboratory reporting limit (RL)*



TABLE 2 GROUNDWATER ELEVATIONS Aztec #9 Hilcorp Energy Company Aztec, New Mexico							
Well ID	Top of Casing Elevation (feet)*	Total Depth (feet)	Date	Depth to Groundwater (feet BTOC)	Depth to Product (feet BTOC)	Product Thickness (feet)	Groundwater Elevation (feet)
MW-01	97.69	9.95	2/1/2024	2.05	--	--	95.64
MW-02	99.90	12.89	2/1/2024	4.08	--	--	95.82
MW-03	99.05	12.48	2/1/2024	3.41	--	--	95.64
MW-04	100.00	9.36	2/1/2024	3.78	--	--	96.22

Notes:

**: elevations based on an arbitrary datum of 100 feet at the top of casing of MW04*

BTOC: below top of casing

--: indicates no GWEL or PSH measured



TABLE 3 GROUNDWATER ANALYTICAL RESULTS Aztec #9 Hilcorp Energy Company Aztec, New Mexico					
Well Identification	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
NMWQCC Standards		0.005	1.0	0.70	0.62
MW-01	2/1/2024	0.044	<0.0020	<0.0020	<0.0030
MW-02	2/1/2024	0.53	12	1.1	5.2
MW-03	2/1/2024	0.011	0.0026	0.0020	0.010
MW-04	2/1/2024	<0.0020	<0.0020	<0.0020	<0.0030

Notes:
mg/L: milligrams per liter
NMWQCC: New Mexico Water Quality Control Commission
< : indicates result less than the stated laboratory reporting limit (RL)
Concentrations in **bold** and shaded exceed the New Mexico Water Quality Control Commission Standards, 20.6.2 of the New Mexico Administrative Code



APPENDIX A

NMOCD Correspondence

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Chad Perkins](#); [Devin Hencmann](#); [Reece Hanson](#)
Subject: Re: [EXTERNAL] nAPP2307357709 - Aztec 9 Excavation and Sampling Notification
Date: Thursday, November 30, 2023 7:26:06 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-pmdwvbh5.png](#)

[**EXTERNAL EMAIL**]

Good morning Stuart,

Thank you for the notice.

If an OCD representative is not on-site on the date &/or time given, please sample per 19.15.29 NMAC or from an OCD pre-approved sampling plan. For whatever reason, if the sampling timeframe is altered, please notify the OCD as soon as possible so we may adjust our schedule(s). Failure to notify the OCD of this change may result in the closure sample(s) not being accepted.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Wednesday, November 29, 2023 4:25 PM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Chad Perkins <cperkins@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>; Reece Hanson <rhanson@ensolum.com>
Subject: [EXTERNAL] nAPP2307357709 - Aztec 9 Excavation and Sampling Notification

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, Ensolum is submitting this sampling notification to the NMOCD for work at the Aztec 9 well pad located in Aztec, NM, coordinates 36.8225021, -108.0012741. Work is scheduled to begin on Monday December 4, 2023 beginning at 10 AM. Please reach out with any questions regarding the site. Thanks.



Stuart Hyde, PG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 

From: [Velez, Nelson, EMNRD](#)
To: [Stuart Hyde](#)
Cc: [Mitch Killough](#); [Devin Hencmann](#); [Bratcher, Michael, EMNRD](#)
Subject: Re: [EXTERNAL] nAPP2307357709 - Aztec 9 Extension Request
Date: Friday, January 5, 2024 8:10:14 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)
[Outlook-xzfdcxsn.png](#)

[**EXTERNAL EMAIL**]

Good morning Stuart,

Your 60-day time extension request is approved. Remediation Due date has been updated to March 4, 2024.

Please keep a copy of this communication for inclusion within the appropriate report submittal.

The OCD requires a copy of all correspondence relative to remedial activities be included in all proposals and/or final closure reports. Correspondence required to be included in reports may include, but not limited to, notifications for liner inspections, sample events, spill/release/fire, and request for time extensions or variances.

Regards,

Nelson Velez • Environmental Specialist - Adv
Environmental Bureau | EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
(505) 469-6146 | nelson.velez@emnrd.nm.gov
<http://www.emnrd.state.nm.us/OCD/>



From: Stuart Hyde <shyde@ensolum.com>
Sent: Thursday, January 4, 2024 7:46 AM
To: Velez, Nelson, EMNRD <Nelson.Velez@emnrd.nm.gov>
Cc: Mitch Killough <mkillough@hilcorp.com>; Devin Hencmann <dhencmann@ensolum.com>
Subject: [EXTERNAL] nAPP2307357709 - Aztec 9 Extension Request

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Nelson,

On behalf of Hilcorp Energy Company, we wanted to give you an update for the Aztec #9 site located in Aztec, NM. Hilcorp was able to complete the excavation activities on December 4 and 5, 2023. Confirmation sidewall samples collected by Ensolum indicate that the impacted soil was successfully removed from the site. As such, Hilcorp proceeded with the application of the BOS200 bioremediation amendment and backfill the site on December 21, 2023. Once landowner permission was received, well permits were submitted to the NMOSE and the driller was scheduled.

At this time, we are still waiting on the NMOSE well permits to be approved. However, we have scheduled the driller to install the new groundwater monitoring wells, which is anticipated to begin the week of January 15th. Once the wells are installed, initial groundwater samples will be collected and submitted for laboratory analysis. Given this estimated timeframe, Hilcorp and Ensolum are requesting a 60-day extension to the reporting deadline, from January 4, 2024 to March 4, 2024. This report will include a summary of remediation and well installation activities, as well as the analytical results from the excavation soil sampling and first round of groundwater sampling conducted at the site.

Please reach out with any questions regarding this request or activities performed at the site.



Stuart Hyde, PG

Senior Geologist

970-903-1607

Ensolum, LLC

in f 



APPENDIX B

Laboratory Analytical Reports



Environment Testing

Eurofins Environment Testing South
Central, LLC
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 13, 2023

Mitch Killough

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Aztec 9

OrderNo.: 2312252

Dear Mitch Killough:

Eurofins Environment Testing South Central, LLC received 6 sample(s) on 12/6/2023 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please do not hesitate to contact Eurofins Albuquerque for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", with a stylized flourish at the end.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order 2312252
Date Reported: 12/13/2023

CLIENT: HILCORP ENERGY Client Sample ID: SW02
Project: Aztec 9 Collection Date: 12/5/2023 12:30:00 PM
Lab ID: 2312252-002 Matrix: SOIL Received Date: 12/6/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: DGH
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	12/8/2023 12:53:37 PM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/8/2023 12:53:37 PM
Surr: DNOP	74.9	69-147		%Rec	1	12/8/2023 12:53:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/7/2023 7:22:22 PM
Surr: BFB	94.3	15-244		%Rec	1	12/7/2023 7:22:22 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

CLIENT: HILCORP ENERGY

Client Sample ID: SW03

Project: Aztec 9

Collection Date: 12/5/2023 1:10:00 PM

Lab ID: 2312252-003

Matrix: SOIL

Received Date: 12/6/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: DGH
Diesel Range Organics (DRO)	ND	8.5		mg/Kg	1	12/8/2023 1:04:18 PM
Motor Oil Range Organics (MRO)	ND	42		mg/Kg	1	12/8/2023 1:04:18 PM
Surr: DNOP	77.6	69-147		%Rec	1	12/8/2023 1:04:18 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/7/2023 7:45:47 PM
Surr: BFB	95.2	15-244		%Rec	1	12/7/2023 7:45:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

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Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order 2312252
Date Reported: 12/13/2023

CLIENT: HILCORP ENERGY Client Sample ID: SW04
Project: Aztec 9 Collection Date: 12/5/2023 1:50:00 PM
Lab ID: 2312252-004 Matrix: SOIL Received Date: 12/6/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: DGH
Diesel Range Organics (DRO)	ND	8.6		mg/Kg	1	12/8/2023 1:15:01 PM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	12/8/2023 1:15:01 PM
Surr: DNOP	78.7	69-147		%Rec	1	12/8/2023 1:15:01 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/7/2023 8:09:13 PM
Surr: BFB	93.0	15-244		%Rec	1	12/7/2023 8:09:13 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order 2312252
Date Reported: 12/13/2023

CLIENT: HILCORP ENERGY Client Sample ID: SW06
Project: Aztec 9 Collection Date: 12/5/2023 3:00:00 PM
Lab ID: 2312252-006 Matrix: SOIL Received Date: 12/6/2023 6:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: DGH
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	12/8/2023 1:36:29 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/8/2023 1:36:29 PM
Surr: DNOP	86.9	69-147		%Rec	1	12/8/2023 1:36:29 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: JJP
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/7/2023 9:42:54 PM
Surr: BFB	95.3	15-244		%Rec	1	12/7/2023 9:42:54 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2312252

13-Dec-23

Client: HILCORP ENERGY
Project: Aztec 9

Sample ID: LCS-79188	SampType: LCS	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: LCSS	Batch ID: 79188	RunNo: 101710								
Prep Date: 12/6/2023	Analysis Date: 12/8/2023	SeqNo: 3747476	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	93.7	61.9	130			
Surr: DNOP	4.4		5.000		89.0	69	147			

Sample ID: MB-79188	SampType: MBLK	TestCode: EPA Method 8015M/D: Diesel Range Organics								
Client ID: PBS	Batch ID: 79188	RunNo: 101710								
Prep Date: 12/6/2023	Analysis Date: 12/8/2023	SeqNo: 3747477	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		102	69	147			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

Page 7 of 8

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2312252

13-Dec-23

Client: HILCORP ENERGY
Project: Aztec 9

Sample ID: ics-79180	SampType: LCS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: LCSS	Batch ID: 79180	RunNo: 101668								
Prep Date: 12/6/2023	Analysis Date: 12/7/2023	SeqNo: 3745710			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	87.4	70	130			
Surr: BFB	2000		1000		199	15	244			

Sample ID: mb-79180	SampType: MBLK	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PBS	Batch ID: 79180	RunNo: 101668								
Prep Date: 12/6/2023	Analysis Date: 12/7/2023	SeqNo: 3746757			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		95.4	15	244			

Sample ID: 2312252-001ams	SampType: MS	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: SW01	Batch ID: 79180	RunNo: 101668								
Prep Date: 12/6/2023	Analysis Date: 12/7/2023	SeqNo: 3746770			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	4.8	24.06	0	102	70	130			
Surr: BFB	2100		962.5		221	15	244			

Sample ID: 2312252-001amsd	SampType: MSD	TestCode: EPA Method 8015D: Gasoline Range								
Client ID: SW01	Batch ID: 79180	RunNo: 101668								
Prep Date: 12/6/2023	Analysis Date: 12/7/2023	SeqNo: 3746772			Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.8	24.15	0	93.6	70	130	8.13	20	
Surr: BFB	2000		966.2		208	15	244	0	0	

Qualifiers:

- *

Value exceeds Maximum Contaminant Level.
- D

Sample Diluted Due to Matrix
- H

Holding times for preparation or analysis exceeded
- ND

Not Detected at the Reporting Limit
- PQL

Practical Quantitative Limit
- S

% Recovery outside of standard limits. If undiluted results may be estimated.
- B

Analyte detected in the associated Method Blank
- E

Above Quantitation Range/Estimated Value
- J

Analyte detected below quantitation limits
- P

Sample pH Not In Range
- RL

Reporting Limit



Environment Testin™

Eurofins Environment Testing South
Central, LLC4901 Hawkins NE
Albuquerque, NM 87109

TEL: 505-345-3975 FAX: 505-345-4107

Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2312252

RcptNo: 1

Received By: Tracy Casarrubias

12/6/2023 6:30:00 AM

Completed By: Tracy Casarrubias

12/6/2023 7:34:04 AM

Reviewed By: *JA* 12-6-23Chain of Custody

1. Is Chain of Custody complete? Yes ☐ No ☒ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☒
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: *JA* 12/6/23Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

Mailing address and phone number are missing on COC - TMC 12/6/23

16. Additional remarks:

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.7	Good	Yes	Morty		



Environment Testing

Eurofins Environment Testing South
Central, LLC
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 14, 2024

Mitch Killough

HILCORP ENERGY

PO Box 4700

Farmington, NM 87499

TEL: (505) 564-0733

FAX:

RE: Aztec 9

OrderNo.: 2402168

Dear Mitch Killough:

Eurofins Environment Testing South Central, LLC received 4 sample(s) on 2/3/2024 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please do not hesitate to contact Eurofins Albuquerque for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", with a stylized flourish at the end.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

CLIENT: HILCORP ENERGY

Client Sample ID: MW-02

Project: Aztec 9

Collection Date: 2/1/2024 12:37:00 PM

Lab ID: 2402168-002

Matrix: AQUEOUS

Received Date: 2/3/2024 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: CCM
Benzene	530	50	P	µg/L	50	2/9/2024 6:33:00 PM
Toluene	12000	500	P	µg/L	500	2/9/2024 6:08:00 PM
Ethylbenzene	1100	50	P	µg/L	50	2/9/2024 6:33:00 PM
Xylenes, Total	5200	75	P	µg/L	50	2/9/2024 6:33:00 PM
Surr: 1,2-Dichloroethane-d4	97.0	70-130	P	%Rec	50	2/9/2024 6:33:00 PM
Surr: 4-Bromofluorobenzene	104	70-130	P	%Rec	50	2/9/2024 6:33:00 PM
Surr: Dibromofluoromethane	93.4	70-130	P	%Rec	50	2/9/2024 6:33:00 PM
Surr: Toluene-d8	123	70-130	P	%Rec	50	2/9/2024 6:33:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

CLIENT: HILCORP ENERGY

Client Sample ID: MW-03

Project: Aztec 9

Collection Date: 2/1/2024 11:57:00 AM

Lab ID: 2402168-003

Matrix: AQUEOUS

Received Date: 2/3/2024 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: CCM
Benzene	11	2.0		µg/L	2	2/9/2024 5:19:00 PM
Toluene	2.6	2.0		µg/L	2	2/9/2024 5:19:00 PM
Ethylbenzene	2.0	2.0		µg/L	2	2/9/2024 5:19:00 PM
Xylenes, Total	10	3.0		µg/L	2	2/9/2024 5:19:00 PM
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	2	2/9/2024 5:19:00 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	2	2/9/2024 5:19:00 PM
Surr: Dibromofluoromethane	99.4	70-130		%Rec	2	2/9/2024 5:19:00 PM
Surr: Toluene-d8	107	70-130		%Rec	2	2/9/2024 5:19:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2402168
14-Feb-24

Client: HILCORP ENERGY
Project: Aztec 9

Sample ID: 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: LCSW	Batch ID: SL102973	RunNo: 102973								
Prep Date:	Analysis Date: 2/8/2024	SeqNo: 3805704 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	91.4	70	130			
Toluene	18	1.0	20.00	0	89.0	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.6		10.00		95.7	70	130			

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBW	Batch ID: SL102973	RunNo: 102973								
Prep Date:	Analysis Date: 2/8/2024	SeqNo: 3805705 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	9.4		10.00		93.5	70	130			

Sample ID: 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: LCSW	Batch ID: R103008	RunNo: 103008								
Prep Date:	Analysis Date: 2/9/2024	SeqNo: 3808062 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	89.5	70	130			
Toluene	18	1.0	20.00	0	91.9	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.6		10.00		95.9	70	130			

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBW	Batch ID: R103008	RunNo: 103008								
Prep Date:	Analysis Date: 2/9/2024	SeqNo: 3808063 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								

Qualifiers:

* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D Sample Diluted Due to Matrix	E Above Quantitation Range/Estimated Value
H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL Practical Quantitative Limit	RL Reporting Limit
S % Recovery outside of standard limits. If undiluted results may be estimated.	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 2402168

14-Feb-24

Client: HILCORP ENERGY

Project: Aztec 9

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260B: Volatiles Short List								
Client ID: PBW	Batch ID: R103008	RunNo: 103008								
Prep Date:	Analysis Date: 2/9/2024	SeqNo: 3808063 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.9	70	130			
Surr: Toluene-d8	9.6		10.00		95.5	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quantitative Limit

S % Recovery outside of standard limits. If undiluted results may be estimated.

B Analyte detected in the associated Method Blank

E Above Quantitation Range/Estimated Value

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit



Environment Testin

Eurofins Environment Testing South
Central, LLC

4901 Hawkins NE

Albuquerque, NM 87109

TEL: 505-345-3975 FAX: 505-345-4107

Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2402168

RcptNo: 1

Received By: Tracy Casarrubias 2/3/2024 9:40:00 AM

Completed By: Tracy Casarrubias 2/3/2024 11:27:25 AM

Reviewed By: 2/5/24

Chain of Custody

1. Is Chain of Custody complete? Yes ☐ No ☒ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4$ " for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: TMC 2/3/24Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: Mailing address and phone number are missing on COC- TMC 2/3/24

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.8	Good	Yes	Morty		

Chain-of-Custody Record

Client: Hilcorp
 Attn: Mitch Killough
 Mailing Address:

Phone #:
 email or Fax#: MKillough@Hilcorp.com
 QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
 Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Date	Time	Matrix	Sample Name
2-1-24	1332	AQ	MW01
1	1237	↓	MW02
1	1157	↓	MW03
1	1120	↓	MW04

Turn-Around Time:
☒ Standard ☐ Rush
 Project Name:
Artec 9

Project #:

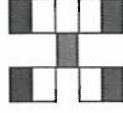
Project Manager:
S. Hyde
 Sampler: PA
 On Ice: ☒ Yes ☐ No
 # of Coolers: 1

Cooler Temp (including CP): 3.8 ± 0.38 (°C)

Container Type and #
3, VOA
 Preservative Type
HCL
 HEAL No.
2402169

Received by: [Signature] Date: 2/2/24 Time: 9:45
 Relinquished by: [Signature]
 Received by: [Signature] Date: 2/3/24 Time: 9:40

HALL ENVIRONMENTAL ANALYSIS LABORATORY



www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAH's by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO ₃ , NO ₂ , PO ₄ , SO ₄	8260 (VOA) <u>BTEX ONLY</u>	8270 (Semi-VOA)	Total Coliform (Present/Absent)
							X		
							X		
							X		
							X		

Remarks: CC: Panderson@ensolum.com



APPENDIX C

Photographic Log

PROJECT PHOTOGRAPHS
Aztec #9
San Juan County, New Mexico
Hilcorp Energy Company

Photograph 1

View of the excavation, looking west.



Photograph 2

View of the excavation, looking east.





APPENDIX D

NMOSE Well Permits



STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
AZTEC

Mike A. Hamman, P.E.
State Engineer

100 Gossett Drive, Suite A
Aztec, New Mexico 87410

January 4, 2024

Hilcorp Energy Company
1111 Travis Street
Houston, TX 77002

RE: Permit Approval for Monitoring Wells, SJ-4603 POD1-4; Hilcorp Energy Company; Aztec #9 Site Investigation, San Juan County, New Mexico

Greetings:

On December 12, 2023, the New Mexico Office of the State Engineer received an application for a permit for the drilling and use of four proposed new monitoring wells at the above referenced location. Enclosed is a copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page and in the attached Conditions of Approval. A receipt for the fees paid is also attached.

Please be aware that there are deadlines to submit a well record for the newly installed monitoring wells. These deadlines can be found in the attached Conditions of Approval. A standardized plugging method has also been included in the Conditions of Approval for the future abandonment of the well covered by this permit. This eliminates the need to submit a separate Well Plugging Plan of Operations for approval by the NMOSE prior to plugging, unless an alternate plugging method is proposed, required by a separate oversight agency, necessary due to incompatibility with actual conditions, or artesian conditions are encountered. The well and plugging records should be sent to the NMOSE District V, 100 Gossett Drive, Suite A, Aztec, NM, 87410.

If you have any questions regarding this permitting action, please contact me at (505) 383-4571.

Sincerely,

Miles Juett
San Juan Basin Watermaster
Water Rights Division – District V

Enclosures

cc: Aztec Reading (w/o enclosures)
SJ-4603 File
WATERS
Stuart Hyde, Ensolum, LLC via email: shyde@ensolum.com

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – AZTEC OFFICE

OFFICIAL RECEIPT NUMBER: 5 - **7371** DATE: 12-12-2023 FILE NO.: 7371 55-4603

TOTAL: 20.00 RECEIVED: twenty DOLLARS CASH: ☒ CHECK NO.: 391

PAYOR: Smart Hyde ADDRESS: 401 Thrasher Ave. NE

CITY: North Bend STATE: WA ZIP: 98045 RECEIVED BY: MJ

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; **yellow** copy remains in district office; and **goldenrod** copy to accompany application being filed. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of the daily deposit.

A. Ground Water Filing Fees

1.	Change of Ownership of Water Right	\$ 2.00
2.	Application to Appropriate or Supplement Domestic 72-12-1 Well	\$ 125.00
3.	Application to Repair or Deepen 72-12-1 Well	\$ 75.00
4.	Application for Replacement 72-12-1 Well	\$ 75.00
5.	Application to Change Purpose of Use 72-12-1 Well	\$ 75.00
6.	Application for Stock Well/Temp. Use	\$ 5.00
7.	Application to Appropriate Irrigation, Municipal, or Commercial Use	\$ 25.00
8.	Declaration of Water Right	\$ 1.00
9.	Application for Supplemental Non 72-12-1 Well	\$ 25.00
10.	Application to Change Place or Purpose of Use Non 72-12-1 Well	\$ 25.00
11.	Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water	\$ 50.00
12.	Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Ground Water	\$ 50.00
13.	Application to Change Point of Diversion of Non 72-12-1 Well	\$ 25.00
14.	Application to Repair or Deepen Non 72-12-1 Well	\$ 5.00

B. Surface Water Filing Fees

1.	Change of Ownership of a Water Right	\$ 5.00
2.	Declaration of Water Right	\$ 10.00
3.	Amended Declaration	\$ 25.00
4.	Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Surface Water	\$ 200.00
5.	Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water	\$ 200.00
6.	Application to Change Point of Diversion	\$ 100.00
7.	Application to Change Place and/or Purpose of Use	\$ 100.00
8.	Application to Appropriate Notice of Intent to Appropriate	\$ 25.00
9.	Notice of Intent to Appropriate	\$ 25.00
10.	Application for Extension of Time	\$ 50.00
11.	Supplemental Well to a Surface Right	\$ 100.00
12.	Return Flow Credit	\$ 100.00
13.	Proof of Completion of Works	\$ 25.00
14.	Proof of Application of Water to Beneficial Use	\$ 25.00
15.	Water Development Plan	\$ 100.00
16.	Declaration of Livestock Water Impoundment	\$ 10.00
17.	Application for Livestock Water Impoundment	\$ 10.00

C. Well Driller Fees

1.	Application for Well Driller's License	\$ 50.00
2.	Application for Renewal of Well Driller's License	\$ 50.00

D. Reproduction of Documents

—	@ 25¢/copy	\$ —
—	Map(s)	\$ —

E. Certification

—		\$ —
---	--	------

F. *Credit Card Convenience Fee

—		\$ —
---	--	------

G. Other

—		\$ —
---	--	------

Comments:

Hilcorp via ENSOLVM

Aztec # 9 site

All fees are non-refundable.

4

15.	Application for Test, Expl. Observ. Well	\$ 5.00
16.	Application for Extension of Time	\$ 25.00
17.	Proof of Application to Beneficial Use	\$ 25.00
18.	Notice of Intent to Appropriate	\$ 25.00

NEW MEXICO OFFICE OF THE STATE ENGINEER



WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: <http://www.ose.state.nm.us/>

Purpose:

- | | | |
|---|--|--|
| <input type="checkbox"/> Exploratory Well*(Pump test) | <input type="checkbox"/> Pollution Control And/Or Recovery | <input type="checkbox"/> Ground Source Heat Pump |
| <input checked="" type="checkbox"/> Monitoring Well | <input type="checkbox"/> Construction Site/Public Works Dewatering | <input type="checkbox"/> Other(Describe): |
| | <input type="checkbox"/> Mine Dewatering | |

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

*New Mexico Environment Department-Drinking Water Bureau (NMED-DWB) will be notified if a proposed exploratory well is used for public water supply.

☒ Temporary Request - Requested Start Date: 1/8/2024

Requested End Date: TBD

Plugging Plan of Operations Submitted? ☒ Yes ☐ No

1. APPLICANT(S)

Name: Hilcorp Energy Company		Name: Stuart Hyde	
Contact or Agent: Mitch Killough	check here if Agent <input type="checkbox"/>	Contact or Agent: Ensolum LLC	check here if Agent <input type="checkbox"/>
Mailing Address: 1111 Travis Street		Mailing Address: 776 East 2nd Ave	
City: Houston		City: Durango	
State: TX	Zip Code: 77002	State: CO	Zip Code: 81301
Phone: 713-209-2400 Phone (Work):	<input type="checkbox"/> Home <input type="checkbox"/> Cell	Phone: 9709031607 Phone (Work):	<input type="checkbox"/> Home <input checked="" type="checkbox"/> Cell
E-mail (optional): mkillough@hilcorp.com		E-mail (optional): shyde@ensolum.com	

FOR OSE INTERNAL USE

Application for Permit, Form WR-07, Rev 07/12/22

90 6 HW 21 033007

File No. SJ-4603 POD1-4	Trn. No.:	Receipt No.: 5-7371
Trans Description (optional):		
Sub-Basin:	PCW/LOG Due Date: 1-4-2025	

2. **WELL(S)** Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
 ☐ UTM (NAD83) (Meters)
 ☒ Lat/Long (WGS84) (to the nearest 1/10th of second)

☐ NM West Zone
 ☐ Zone 12N

☐ NM East Zone
 ☐ Zone 13N

☐ NM Central Zone

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (Quarters or Halves, Section, Township, Range) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
(SJ-4603 POD1) MW01	-108.001256	36.822440	SWSW, S09, T30N, R11W
(SJ-4603 POD2) MW02	-108.001081	36.822428	SWSW, S09, T30N, R11W
(SJ-4603 POD3) MW03	-108.001457	36.822333	SWSW, S09, T30N, R11W
(SJ-4603 POD4) MW04	-108.001531	36.822569	SWSW, S09, T30N, R11W

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
 Additional well descriptions are attached: ☐ Yes ☒ No If yes, how many _____

Other description relating well to common landmarks, streets, or other:

Hilcorp Aztec #9 Site

Well is on land owned by: Old and Bold LLC, WD, B1548, P647 Attn: Gordon Crane

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? ☒ Yes ☐ No
 If yes, how many _____ 1 _____

Approximate depth of well (feet): 15 Outside diameter of well casing (inches): 2

Driller Name: Enviro-Drill Driller License Number: WD-1210

3. **ADDITIONAL STATEMENTS OR EXPLANATIONS**

Monitoring wells will be installed after completion of excavation to monitor groundwater for one year.

See attached well construction diagram

Figure attached.

2023 DEC 12 AM 9 06
 STATE ENGINEER'S OFFICE
 AZTEC, NEW MEXICO

FOR OSE INTERNAL USE

Application for Permit, Form WR-07 Version 07/12/22

File No.: SJ-4063 POD1-4

Trn No.:

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory: Is proposed well a future public water supply well? <input type="checkbox"/> Yes <input type="checkbox"/> NO If Yes, an application must be filed with NMED-DWB, concurrently. <input type="checkbox"/> Include a description of the requested pump test if applicable.	Pollution Control and/or Recovery: <input type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for the pollution control or recovery operation. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The annual diversion amount. <input type="checkbox"/> The annual consumptive use amount. <input type="checkbox"/> The maximum amount of water to be diverted and injected for the duration of the operation. <input type="checkbox"/> The method and place of discharge. <input type="checkbox"/> The method of measurement of water produced and discharged. <input type="checkbox"/> The source of water to be injected. <input type="checkbox"/> The method of measurement of water injected. <input type="checkbox"/> The characteristics of the aquifer. <input type="checkbox"/> The method of determining the resulting annual consumptive use of water and depletion from any related stream system. <input type="checkbox"/> Proof of any permit required from the New Mexico Environment Department. <input type="checkbox"/> An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	Construction De-Watering: <input type="checkbox"/> Include a description of the proposed dewatering operation, <input type="checkbox"/> The estimated duration of the operation, <input type="checkbox"/> The maximum amount of water to be diverted, <input type="checkbox"/> A description of the need for the dewatering operation, and, <input type="checkbox"/> A description of how the diverted water will be disposed of. Ground Source Heat Pump: <input type="checkbox"/> Include a description of the geothermal heat exchange project, <input type="checkbox"/> The number of boreholes for the completed project and required depths. <input type="checkbox"/> The time frame for constructing the geothermal heat exchange project, and, <input type="checkbox"/> The duration of the project. <input type="checkbox"/> Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	Mine De-Watering: <input type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for mine dewatering. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The source(s) of the water to be diverted. <input type="checkbox"/> The geohydrologic characteristics of the aquifer(s). <input type="checkbox"/> The maximum amount of water to be diverted per annum. <input type="checkbox"/> The maximum amount of water to be diverted for the duration of the operation. <input type="checkbox"/> The quality of the water. <input type="checkbox"/> The method of measurement of water diverted. <input type="checkbox"/> The recharge of water to the aquifer. <input type="checkbox"/> Description of the estimated area of hydrologic effect of the project. <input type="checkbox"/> The method and place of discharge. <input type="checkbox"/> An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. <input type="checkbox"/> A description of the methods employed to estimate effects on surface water rights and underground water rights. <input type="checkbox"/> Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
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ACKNOWLEDGEMENT

I, We (name of applicant(s)), Stuart Hyde

Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 4 day of January 20 24, for the State Engineer,

Mike A. Hamman, P.E.

State Engineer

By: Miles Juett
Signature

Miles Juett
Print

Title: Watermaster
Print

FOR OSE INTERNAL USE

Application for Permit, Form WR-07 Version 07/12/22

File No.: SJ-4603 POD1-4

Trn No.:

NMOSE Permit to Drill a Well(s) With No Water Right - Conditions of Approval SJ-4603 POD1-4

The New Mexico Office of the State Engineer (NMOSE) has determined that existing water rights will not be impaired by this activity. This application is approved without publication provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state. This application approval (i.e., permit) is further subject to the following conditions of approval.

1. This permit is approved as follows:

Permittee(s):	Hilcorp Energy Company Attn: Mitch Killough 1111 Travis Street Houston, TX 77002
Permit Number:	SJ-4603
Application File Date:	December 12, 2023
Priority:	N/A
Source:	Groundwater
Point(s) of Diversion:	Four points of diversion (POD), SJ-4603 POD1-4, is proposed. The PODs consist of four proposed monitoring wells (Table 1) that will be used for periodic groundwater sampling. The wells will be located at the Hilcorp Energy Company Aztec #9 site, on land owned by Old and Bold LLC in Aztec, New Mexico. The PODs will be located within the NE/4 SW/4 SW/4 of Section 9, Township 30 North, Range 11 West, NMPM, at the following approximate point locations (Long/Lat, WGS84).

Table 1: Proposed New Monitoring Wells

POD Number and Owner's Well Name	Casing: Diameter (inches) and Depth (feet)		Longitude (Decimal Degrees)	Latitude (Decimal Degrees)
SJ-4603 POD1 (MW-1)	2	15	108.001256° W	36.822440° N
SJ-4603 POD2 (MW-2)	2	15	108.001081° W	36.822428° N
SJ-4603 POD3 (MW-3)	2	15	108.001457° W	36.822333° N
SJ-4603 POD4 (MW-4)	2	15	108.001531° W	36.822569° N

Purpose of Use:	Groundwater sampling
Place of Use:	N/A
Amount of Water:	N/A

2. No water shall be appropriated and beneficially used from any wells or borings approved under this permit.

3. No water shall be diverted from the well(s) except for initial well development and periodic sampling purposes. Upon completion of monitoring activities the well(s) shall be plugged in accordance with 19.27.4 NMAC, unless a permit to use water is acquired from the NMOSE.
4. The well(s) may continue to be used indefinitely for groundwater sampling or monitoring required for the current site investigation and any associated remediation, so long as they remain in good repair. **A new permit shall be obtained from the NMOSE prior to replacing a well(s) or for any change in use as approved herein.**
5. Water well drilling and well drilling activities, including well plugging, are regulated under NMOSE Regulations 19.27.4 NMAC. These regulations apply, and provide both general and specific direction regarding the drilling of wells in New Mexico. Note that the construction of any well that allows groundwater to flow uncontrolled to the land surface or to move appreciably between geologic units is prohibited.
6. In accordance with Subsection A of 19.27.4.29 NMAC, on-site supervision of well drilling/plugging is required by the holder of a New Mexico Well Driller License or a NMOSE-registered Drill Rig Supervisor. The New Mexico licensed Well Driller shall ensure that well drilling activities are completed in accordance with 19.27.4.29, 19.27.4.30 and 19.27.4.31 NMAC. However, pursuant to 72-12-12 NMSA 1978 and 19.27.4.8 NMAC, a driller's license is not required for the construction of a driven well with an outside casing diameter of 2 $\frac{3}{8}$ inches or less and that does not require the use of a drill rig (e.g., auger) for installation. This exemption is not applicable to well plugging.
7. The permittee has not stated whether artesian conditions are likely to be encountered at the proposed well/borehole location(s). However, if artesian conditions are encountered during drilling, all rules and regulations pertaining to the drilling and casing and plugging of artesian wells shall be followed.
8. A Well Record documenting the as-built well construction and materials used shall be filed for each of the new wells in accordance with Subsection N of 19.27.4.29 NMAC. **Well Records shall be filed with the State Engineer (NMOSE District V, 100 Gossett Drive, Suite A, Aztec, NM, 87410) within 30 days after completion of the well(s).** Well installation(s) shall be complete and the well record(s) filed no later than one year from the date of approval of this permit.
9. If the required Well Record documentation is not received within one year of the date of permit approval, this permit will automatically expire.
10. When the permittee receives approval or direction to permanently abandon the well(s)/borehole(s) covered by this permit, plugging shall be performed by a New Mexico licensed well driller. The well(s)/borehole(s) shall be plugged pursuant to Subsection C of 19.27.4.30 NMAC using the following method, unless an alternate plugging method has been proposed by or on behalf of the well owner and approved by the NMOSE. If a well/borehole has encountered artesian conditions, a Well Plugging Plan of Operations shall be submitted and NMOSE approval obtained *prior* to the initiation of *any* well plugging activities concerning artesian wells. Additionally, if the following standardized plugging sealant is not appropriate for use due to incompatibility with the water quality or any soil and water contaminants encountered,

a Well Plugging Plan of Operations shall be submitted and NMOSE approval obtained *prior* to the initiation of *any* well plugging activities.

- a. Obstructions in a well/borehole shall be identified and removed if possible. If an obstruction cannot be removed, the method used to grout below and around the obstruction shall be described in detail in the plugging record.
- b. Prior to plugging, calculate the theoretical volume of sealant needed for abandonment of the well/borehole based on the actual measured pluggable depth of the well/borehole and the volume factor for the casing/borehole diameter. Compare the actual volume of sealant placed in the well/borehole with the theoretical volume to verify the actual volume of sealant is equal to or exceeds the theoretical volume.
- c. Portland Type I/II cement shall be used for the plugging sealant. The water mixed with the cement to create the plugging sealant shall be potable water or of similar quality. Portland cement has a fundamental water demand of 5.2 gallons of water per 94-lb sack of cement. Up to a maximum of 6.0 gallons per 94-lb sack is acceptable to allow for greater pumpability.

Pure bentonite powder ("90 barrel yield") is allowed as a cement additive by NMOSE and American Water Works Association (AWWA) guidelines. If a bentonite additive is used, the following rates and mixing guidelines shall be followed. For a rate or a mixing procedure other than that provided below, the NMOSE District V office must be contacted for pre-approval. Neither granular bentonite nor extended-yield bentonite shall be mixed with cement for the purpose of this plugging activity. When supplementing a cement slurry with bentonite powder, water demand for the mix increases at a rate of approximately 0.65 gallon of water for each 1% increment of bentonite bdwc (by dry weight cement) above the stated base water demand of 5.2 gallons water per 94-lb sack of cement for neat cement. Bentonite powder must be hydrated separately with its required increment of water before being mixed into the wet neat cement. If water is otherwise added to the combination of dry ingredients or the dry bentonite is blended into wet cement, the alkalinity of the cement will restrict the yield of the bentonite powder, resulting in excess free water in the slurry and excessive cement shrinkage upon curing.

- d. Placement of the sealant within the well/borehole shall be by pumping through a tremie pipe extended to near the bottom of the well/borehole and kept below the top of the slurry column (i.e., immersed in the slurry) as the well/borehole is plugged from bottom upwards in a manner that displaces the standing water column.
- e. Prior to, or upon completion of plugging, the well casing may be cut-off below grade as necessary to allow for approved construction onsite, provided a minimum six-inch thickness of reinforced abandonment plugging sealant or concrete completely covers the top of the cut-off casing. Any remaining void to the surface may be filled with native soil, concrete, or asphalt as needed to match the surrounding surface material and blended with the surface topography to prevent ponding.
- f. **Within 30 days after completion of well/borehole plugging, a complete Plugging Record shall be filed with the State Engineer** in accordance with Paragraph (3) of Subsection C of 19.27.4.30 NMAC for each well/boring plugged. The Well Plugging Record(s) shall be filed with the State Engineer at the NMOSE District V Office, 100 Gossett Drive, Suite A, Aztec, NM 87410. The required well plugging record form is available at <https://www.ose.state.nm.us/Statewide/wdForms.php>.

NMOSE Permit to Drill a Well(s) With No Water Right
Conditions of Approval

SJ-4603 POD1-4
Page 4 of 5
January 4, 2024

11. In accordance with Subsection C of 19.27.4.30 NMAC, a well/borehole that does not encounter groundwater may be immediately plugged by filling with drill cuttings or clean native fill to within 10 feet of land surface and by plugging the remaining 10 feet to the land surface with a sealant approved by the Office of the State Engineer. A Plugging Record shall be filed with the State Engineer as described above.
12. Should another regulatory agency sharing jurisdiction of the project authorize, or by regulation require, more stringent requirements than stated herein, the more stringent procedure should be followed. These, among others, may include provisions regarding pre-authorization to proceed, type of methods and materials used, inspection, or prohibition of free discharge of any fluid or other material to or from the well that is related to the drilling and/or monitoring process.
13. Pursuant to 72-12-3 NMSA 1978, the applicant may or may not have provided written documentation with the application, which the applicant claims as confirmation that access has been granted for the aforementioned well(s) to be located on property owned by someone other than the well owner/applicant. NMOSE approval of this permit in no way infers the right of access to land not owned by the well owner/applicant.
14. The State Engineer retains jurisdiction of this permit.

The application for drilling well(s) SJ-4603 POD1-4 without a water right, submitted on December 12, 2023, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and seal this 4th day of January, A.D. 2024.
Mike A. Hamman, P.E., State Engineer

By:



Miles Juett, Watermaster
District V Office, Water Rights Division



District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 319501

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 319501
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the Remediation Update Report for Aztec #9: Content Satisfactory 1. Continue to sample groundwater using EPA method 8260B on a quarterly basis. 2. Provide additional recommendations after further assessment for work or closure as needed. 3. Submit the 2024 Annual Report by April 2025.	5/29/2024