NV

TRANSWESTERN PIPELINE COMPANY
An ENERGY TRANSFER Company

October 28, 2022

Mr. Rick Shean
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505

RE: Response to Approval with Modifications
(2022) Operation, Maintenance, And Monitoring (OM&M) Plan
Roswell Compressor Station No. 9
Transwestern Pipeline Company
Roswell, Chaves County, New Mexico
NMOCD Abatement Plan #AP-125 (formerly #GW-052)
EPA ID No. NMD986676955
HWB-TWP-21-002

Dear Mr. Shean;

Transwestern Pipeline, LLC (Transwestern) submits this *Response to Comment* regarding the comments received from the New Mexico Environment Department (NMED) via the letter titled *[Response To] Approval With Modifications (2022) Operation, Maintenance, And Monitoring (OM&M) Plan Transwestern Compressor Station No. 9.* dated September 6, 2022, for the above referenced Site.

<u>Comment 1</u>

Comment 1 of the NMED's July 6, 2021, *Approval with Modifications* states, "[t]he title (OM&M Plan) must specify the year relevant to the document for clarity." This direction was not followed. Include the relevant year in the title of the OM&M Plan and provide a replacement page.

Comment noted, replacement page is attached.

<u>Comment 2</u>

Comment 2 of the NMED's July 6, 2021, *Approval with Modifications* states, "OCD stands for "Oil Conservation Division". Correct the typographical error in future OM&M Plans." However, the same typographical error (i.e., Oil Conservation District) was found in Section 1.0, *Introduction*, page 1. The Respondent must follow the directions provided by NMED. Correct the typographical error and provide replacement pages.

Comment noted, replacement page is attached.

<u>Comment3</u>

In Section 1.0, *Introduction*, page 1, the Respondent states, "[t]his Revised OM&M Plan was developed to reflect changes requested by NMED (Attachment A) and in the following

documents:

- ***Response to Approval with Modifications Comments, Operation, Maintenance, and Monitoring (OM&M) Plan, dated September 8, 2021*"**

NMED issued direction associated with the 2021 OM&M Plan (i.e., the July 6, 2021 *Approval with Modifications* and December 20, 2021 *Response to Approval with Modifications*) in addition to the referenced letter (September 8, 2021 *Response to Approval with Modifications*). Although the changes associated with groundwater monitoring and sampling required by the NMED's July 6 and December 20, 2021 letters were addressed in Section 4.2, *Groundwater Monitoring*, page 9, several directions included in the letters were not incorporated in the 2022 OM&M Plan (e.g., refer to Comments 1 and 2 above). The 2022 OM&M Plan must address every comment provided by the NMED's July 6, September 8, and December 20, 2021, letters. Revise the OM&M Plan accordingly and provide replacement pages.

In addition, Attachment A (Chronological List of Regulatory Documentation) does not list any correspondence after April 29, 2021. Include the correspondence exchanged between NMED and the Respondent throughout the year of 2021 in the revised Attachment A and provide replacement pages.

Comment noted and past correspondence reviewed. Replacement pages are attached.

Comment 4

In Section 3.3, *Groundwater Extraction and Treatment System*, page 4, the Respondent states, "[t]he surge tank, air stripper, bag filters, carbon vessels, and irrigation tank are located outside without an enclosure. During cold weather conditions, the system is deactivated to prevent damage caused by freezing water." The Respondent's October 20, 2021, correspondence states, "Transwestern will install additional cold weather protection as needed to minimize downtime." Furthermore, Section 5.1, *Cold Weather Protection and Procedures*, page 12 through 13, provides discussion regarding the cold weather protection that was installed or will be installed. The text of Section 3.3 must reference the sections where such discussion is provided; otherwise, it is not clear whether or not the NMED's previous direction regarding cold weather protection were incorporated in the OM&M Plan. Revise the text of Section 3.3 for clarity and provide replacement pages.

Comment noted, replacement page is attached.

Comment 5

In Section 4.2, Groundwater Monitoring, page 9, the Respondent states, "[w]ells SVE-1A, SVE- 2A, SVE-3, SVE-22, SVE-23, SVE-25, SVE-26, and SVE-27 will be monitored for presence of groundwater and PSH, and data will be reported in annual groundwater monitoring reports." If groundwater is detected in the referenced SVE wells, propose to

collect groundwater samples and analyze them for the full suite of volatile organic compounds (VOCs) by EPA Method 8260B. Revise the OM&M Plan to include the provisions and provide replacement pages.

Comment noted, replacement page is attached.

Comment 6

Comment 6 of the NMED's July 6, 2021, *Approval with Modifications* states, "[n]ote that all constituents detected above respective detection limits must be reported in annual groundwater monitoring reports." If any constituents other than benzene, toluene, ethylbenzene, xylenes (BTEX) are detected above their respective reporting limits in the groundwater samples collected from wells MW-27, MW-29, and MW-34 during the 2022 second semiannual sampling event where the full suite of VOC analysis is proposed, all detected constituents in addition to the proposed analytes (i.e., BTEX) must be retained as target analytes in the subsequent year of the first semiannual sampling event. Revise the OM&M Plan to include the provisions and provide replacement pages.

Comment noted. In addition to BTEX, other VOC analytes detected above the respective reporting limit during the 2022 second sampling event will be retained and analyzed during the 2023 first semiannual sampling event. Replacement page is attached.

If you have any further questions or comments regarding these responses, please do not hesitate to contact me at (210) 870-2725 or Steve Diamond of WSP USA, Inc. at (770) 973-2100.

Sincerely,

SBoultinghouse

Ms. Stacy Boultinghouse, PG
Environmental Manager
Transwestern Pipeline Company, LLC
Stacy.Boultinghouse@energytransfer.com

Cc: D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
M. Bratcher, NMOCD
B. Billings, NMOCD
L. King, USEPA Region 6
JD Haines, WSP
S. Diamond, WSP

ATTACHMENT 1

Historical Submitall Log

Historical Submittal Summary
Transwestern Compressor Station No. 9 - Roswell, NM

Document	Date	Agency	NMED Document Number
Report of 2012 Groundwater Remediation Activities	March 15, 2013	Transwestern	NA
Amended Investigation Work Plan and Groundwater Monitoring Plan	March 27, 2013	Transwestern	NA
Amended Remediation Work Plan and Amended Final Design	May 22, 2013	Transwestern	NA
Estimated Cost of Work for Corrective Action Financial Assurance	August 30, 2013	Transwestern	NA
Investigation Report	December 19, 2013	Transwestern	NA
Soil Vapor Extraction System Shutdown	February 11, 2014	Transwestern	NA
Approval of Investigation Report	March 7, 2014	NMOCD/NMED	HWB-TWP-14-001
Report of 2013 Groundwater Remediation Activities	March 11, 2014	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 26, 2014	Transwestern	NA
Comments to March 7, 2014 Letter - Approval of Investigation Report	May 12, 2014	Transwestern	HWB-TWP-14-001
Notice of No Changes to the Operation and Maintenance (O&M) and Monitoring Plan	May 22, 2014	Transwestern	NA
Notice of Construction Activities	May 29, 2014	Transwestern	NA
Revised Groundwater/PSH Recovery System Operation and 2014 System Re-Start	June 20, 2014	Transwestern	NA
Approval of Report of 2013 Groundwater Remediation Activities	June 24, 2014	NMED	HWB-TWP-14-002
Response to June 24, 2014 Letter	October 7, 2014	Transwestern	HWB-TWP-14-002
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 7, 2014	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 11, 2015	Transwestern	NA
Report of 2014 Groundwater Remediation Activities	March 23, 2015	Transwestern	NA
Estimated Cost of Work for Corrective Action Financial Assurance	March 26, 2015	NMED	NA
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	May 27, 2015	Transwestern	NA
Approval 2014 Groundwater Remediation Activities for the Former Surface Impoundments	May 29, 2015	NMED	HWB-TWP-15-001
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 6, 2015	Transwestern	NA
Stage 2 Abatement Plan	December 3, 2015	Transwestern	NA
Report of 2015 Groundwater Remediation Activities	February 29, 2016	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 14, 2016	Transwestern	NA
Notice of No Changes to the Operation and Maintenance (O&M) and Monitoring Plan	March 22, 2016	Transwestern	NA
Estimated Cost of Work for Corrective Action Financial Assurance	March 31,2016	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	September 28, 2016	Transwestern	NA
Estimated Cost of Work for Corrective Action Financial Assurance and Form 10-K	January 24, 2017	Transwestern	NA
Report of 2016 Groundwater Remediaion Activities	March 13, 2017	Transwestern	NA
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	March 17, 2017	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 13, 2017	Transwestern	NA
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	April 18, 2017	NMED	HWB-TWP-MISC
Notice of SVE System Deactivation	April 21, 2017	Transwestern	NA
Approval with Moficiations 2016 Groundwater Remediation Activities	April 28, 2017	NMED	HWB-TWP-17-001
Submittal of Revised Operation and Maintenance and Monitoring (O&MM Plan)	May 26, 2017	Transwestern	NA
Response to Comments on 2016 Groundwater Remediation Activities Report	June 5, 2017	Transwestern	HWB-TWP-17-001
Disapproval of Revised Operation and Maintenance and Monitoring (O&MM Plan)	June 26, 2017	NMED	HWB-TWP-17-002
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 10, 2017	Transwestern	NA

Historical Submittal Summary
Transwestern Compressor Station No. 9 - Roswell, NM

Document	Date	Agency	NMED Document Number
Response to Comments Revised Operation, Maintenance, and Monitoring Plan	October 18, 2017	NMED	HWB-TWP-17-002
Response to Approval with Modifications Comments	December 11, 2017	NMED	HWB-TWP-17-002
Submittal of 2017 Groundwater Remediation Activities for the Former Surface Impoundments Annual Report	March 14, 2018	Transwestern	NA
Form 10-K	April 3, 2018	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 13, 2018	NMED	NA
Approval with Modifications Report of 2017 Groudwater Remediation Activities	May 7, 2019	Transwestern	HWB-TWP-18-001
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	May 21, 2018	NMOCD/NMED	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 8, 2018	Transwestern	NA
Response to Approval with Modifications Comments	July 26, 2018	Transwestern	HWB-TWP-17-002
Response to Approval with Modification Comments regarding the 2017 Annual Report	August 17, 2018	NMED	HWB-TWP-18-001
Extension Request regarding NMED Second Comment Letter	October 30, 2018	Transwestern	HWB-TWP-17-001
Revised Extension Request regarding NMED Second Comment Letter	October 31, 2018	Transwestern	NWB-TWP-17-001
Second Response to Comments on 2017 Groundwater Remediation Activities Report	January 4, 2019	Transwestern	HWB-TWP-18-001
Disapproval Financial Assurance Submittal	January 19, 2019	NMED	NA
Second Response to Comments 2017 Annual Report	January 30, 2019	NMED	HWB-TWP-18-001
Response to Comments Disapproval Financial Assurance Submittal	February 11, 2019	Transwestern	NA
Third Response to Comments on 2017 Groundwater Remediation Activities Report	February 28, 2019	Transwestern	HWB-TWR-18-001
Disapproval Revised Financial Assurance Submittal and Response to Comments for January 19. 2019	March 19, 2019	NMED	NA
Request for Extension 2019 Financial Assurance Package	March 25, 2019	Transwestern	NA
Third Response to Comments on 2017 Annual Report	March 22, 2019	NMED	HWB-TWP-18-001
Submittal of 2018 Groundwater Remediation Activities for the Former Surface Impoundments Annual Report	March 29, 2019	Transwestern	NA
Approval for Extension Request 2019 Financial Assurance Package	March 29, 2019	NMED	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event Letter	April 5, 2019	Transwestern	NA
Response to Comments regarding Response to Approval with Modification with Comments (March 22, 2019)	April 11, 2019	Transwestern	HWB-TWP-18-001
NMED Approval with Modificaitons Report of 2018 Groundwater Remediation Activities	April 23, 2019	NMED	HWB-TWP-19-001
Estimated Cost of Work for Corrective Action Financial Assurance	May 22, 2019	Transwestern	NA
Response to NMED Approval with Modifications Report of 2018 Groundwater Remediation Activities	May 30, 2019	Transwestern	HWB-TWP-19-001
NMED Approval with Modifications OM&M Plan	June 27, 2019	NMED	HWB-TWP-19-002
Response to Approval with Modifications Comments Revised Operation, Maintenance, and Monitoring Plan	August 28, 2019	Transwestern	HWB-TWP-19-002
Response to Comments regarding Response to Approval with Modification with Comments	September 13, 2019	Transwestern	HWB-TWP-19-001
Response to Comments regarding Response to Approval with Modification with Comments 2018 Annual Rpt	October 2, 2019	Transwestern	HWB-TWP-19-001
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 16, 2019	Transwestern	NA
Laboratory Resuls Submittal for SVE and RW-1 Wells	December 19, 2019	Transwestern	HWB-TWP-19-001
Additional Laboratory Resuls Submittal for SVE and RW-1 Wells	January 30, 2020	Transwestern	HWB-TWP-19-001
Approval with Modifications Laboartory Results Submittal for SVE and RW-1 Wells	February 21, 2020	NMED	HWB-TWP-19-003
Extension Request Regarding the 2019 Annual Report and the 2020 Financial Assurance Package	March 20, 2020	Transwestern	NA
Approval of Extension Request for 2019 Annual Report and Finiancial Assurance Package	March 31, 2020	NMED	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 15, 2020	Transwestern	NA
Response to Comments TWP 2020–HWB–TWP–19–003	April 28, 2020	Transwestern	HWB-TWP-19-003

Historical Submittal Summary
Transwestern Compressor Station No. 9 - Roswell, NM

Document	Date	Agency	NMED Document Number
Report of 2019 Groundwater Remediation Activities for the Former Surface Impoundments Annual Report	May 21, 2020	Transwestern	NA
Response to Comments TWP 2020-HWB-TWP-19-003	May 26, 2020	Transwestern	HWB-TWP-19-003
Estimated Cost of Work for Corrective Action Financial Assurance	May 26, 2020	Transwestern	NA
Submittal of Operation Maintenance and Monitoring (OM&M) Plan with Revisions	May 28, 2020	Transwestern	NA
Approval with Modifications Report of 2019 Groundwater Remediation Activities	July 2, 2020	NMED	HWB-TWP-20-001
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 8, 2020	Transwestern	NA
Response to Comments 2019 Groundwater Remediation Activities Former Surface Impoundments	October 14, 2020	Transwestern	HWB-TWP-20-001
Response to Comments Operation, Maintenance & Monitoring Plan	October 14, 2020	NMED	HWB-TWP-20-002
Response to Approval with Modifications Comments Revised Operation, Maintenance, and Monitoring Plan	November 20, 2020	Transwestern	HWB-TWP-20-002
Approval with Modifications, RTC 10/14/2020 Report of 2019 Groundwater Remediation Activities	November 25, 2020	NMED	HWB-TWP-20-001
Disapproval 2020 Financial Assurance Package	January 25, 2021	NMED	HWB-TWP-MISC
Response to Comments Disapproval of Financial Assurance Submittal	February 22, 2021	Transwestern	HWB-TWP-MISC
Additional Response to Comments 10/14/2020 Approval With Modification	March 16, 2021	Transwestern	HWB-TWP-20-001
Request for Extension & Submittal of Form 10-K	March 19, 2021	Transwestern	NA
Extension Request regarding the 2020 Annual Report	March 25, 2021	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 8, 2021	Transwestern	NA
Additional Response to Comments 10/14/2020, Approval with Modifications, 2019 Groundwater Remediation A	April 9, 2021	NMED	HWB-TWP-20-001
Estimated Cost of Work for Corrective Action Financial Assurance	April 12, 2021	Transwestern	NA
Report of 2020 Groundwater Remediation Activities	April 29, 2021	Transwestern	NA
Extension Request regarding the Report of Perched Aquifer Evaluation	May 26, 2021	Transwestern	NA
Submittal of Operation Maintenance and Monitoring (OM&M) Plan with Revisions	May 26, 2021	Transwestern	NA
Approval for Extension Request regarding the Report of Perched Aquifer Evaluation	June 8, 2021	NMED	NA
Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations	June 29, 2021	Transwestern	HWB-TWP-20-001
Approval with Modifications Operation, Maintenance, and Monitoring (OM&M) Plan	July 6, 2021	NMED	HWB-TWP-21-002
Approval with Modifications Report of 2020 Groundwater Remediation Activities	July 15, 2021	NMED	HWB-TWP-21-001
Response to Approval with Modifications OM&M Plan	August 3, 2021	Transwestern	HWB-TWP-21-002
Fee Assessment - Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations	August 5, 2021	NMED	HWB-TWP-21-003
Response To Approval With Modifications OM&M Plan	September 8, 2021	NMED	HWB-TWP-21-002
Report Of Perched Aquifer Evaluation And Future Corrective Action Recommendations HWB-TWP-21-003	September 8, 2021	NMED	HWB-TWP-21-003
Notification Letter – East Baker Thermal Oxidizer/SVE Unit Malfunction	September 16, 2021	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 4, 2021	Transwestern	NA
Response to Approval with Modifications Report of 2020 Groundwater Remediation Activities	October 14, 2021	Transwestern	HWB-TWP-21-001
Response to Approval with Modifications OM&M Plan	October 20, 2021	Transwestern	HWB-TWP-21-002
Response to Approval with Modifications OM&M Plan	December 20, 2021	NMED	HWB-TWP-21-001
NMED Response to Approval with Modifications Report of 2020 GW Remediation Activities	January 12, 2022	NMED	HWB-TWP-21-001
Recommendation.	January 27, 2022	Transwestern	HWB-TWP-21-002
Recommendations	March 1, 2022	NMED	HWB-TWP-21-003
Corrective Action Recommendations	March 4, 2022	Transwestern	HWB-TWP-21-003
Report	March 30, 2022	Transwestern	NA

Historical Submittal Summary
Transwestern Compressor Station No. 9 - Roswell, NM

Document	Date	Agency	NMED Document Number
Request for Extensionfor Financial Assurance and Submittal of 10K	March 30, 2022	Transwestern	NA
Estimated Cost of Work for Corrective Action Financial Assurance	April 11, 2022	Transwestern	NA
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 22, 2022	Transwestern	NA
Response to Comment 4 Chloride and Sulfate Communication Summary	May 9, 2022	Transwestern	HWB-TWP-21-001
Approval with Modifications Report of 2021 GW Remediation Activities	May 10, 2022	NMED	HWB-TWP-22-001
Submittal of Operation Maintenance and Monitoring (OM&M) Plan with Revisions	May 26, 2022	Transwestern	NA
Extension Request for Work Plan to Delineate Perched Aquifer	August 25, 2022	Transwestern	NA
Approval for Extension Request regarding the Work Plan to Delineate Perched Aquifer	August 30, 2022	NMED	NA
Approval with Modifications (2022) Operation Maintenance, and Monitoring Plan	September 6, 2022	NMED	HWB-TWP-21-002
Submittal of Work Plan to Delineate Hydrocarbons in the Perched Aquifer	September 19, 2022	Transwestern	NA
Submittal of Response to Approval with Modifications Report of 2021 GW Remediation Activities	October 11, 2022	Transwestern	HWB-TWP-22-001

ATTACHMENT 2

Redline of Replacement Pages

2022 OPERATION, MAINTENANCE, AND MONITORING (OM&M) PLAN

TRANSWESTERN ROSWELL COMPRESSOR STATION NO. 9
ROSWELL, CHAVEZ COUNTY, NEW MEXICO
NMED 1656; NMOCD Case #GW-052
EPA ID NO. NMD986676955

PREPARED FOR:

TRANSWESTERN PIPELINE COMPANY, LLC
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PREPARED BY:

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1880 WEST OAK PARKWAY, SUITE 106
MARIETTA, GA 30066
(770) 973-2100

WSP Project No. EC02.20180005.01

SEPTEMBER 2015
(Revised ~~May~~ September 2022)

CONTENTS

FIGURES

ATTACHMENT

1.0 INTRODUCTION

This *Revised Operating and Maintenance and Monitoring* (OM&M) *Plan* was prepared by WSP USA, Inc. (formally EarthCon Consultants, Inc.) on behalf of Transwestern Pipeline Company, LLC (Transwestern) for the former Surface Impoundment project at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property (the "Site") located at 6381 North Main Street in Roswell, New Mexico (**Figure 1**, **Site Location Map**). On March 13, 2013, the New Mexico Environment Department (NMED) issued a Stipulated Order (SO) that governs on-going environmental response activities associated with the Site. This Revised OM&M Plan was developed in general accordance with Section IV of the SO and the Site's Stage 2 Abatement Plan (AP), dated December 3, 2015, and approved by New Mexico Oil and Conservation ~~District~~ Division (OCD) on March 1, 2016. This Revised OM&M Plan was developed to reflect changes requested by NMED (**Attachment A**) and in the following documents:

- *Response to Approval with Modifications Comments, Operation, Maintenance, and Monitoring (OM&M) Plan, dated September 8, 2021*

This OM&M Plan provides information about the operation, maintenance, and monitoring of the Site's multiphase extraction (MPE) remediation system.

2.0 SAFETY

Prior to operating the system, technical operational and maintenance documents supplied by the original equipment manufacturer (OEM) for each equipment component (i.e., blower, thermal oxidizer, pumps, and air compressor) should be reviewed for safe and proper operation. The emergency shut-off power switch should be clearly marked and identified at the facility to implement emergency procedures. A *Health and Safety Plan* (HASP), including an emergency response plan, should be reviewed and appropriate personal protective equipment (PPE) should be donned and/or acquired prior to performing system operation or maintenance. Only trained personnel should be operating and monitoring the MPE system.

3.0 OPERATION

The MPE remediation system consists of soil vapor extraction (SVE) and vapor treatment, and groundwater/phase-separated hydrocarbons (PSH) recovery and treatment. Operating components of the MPE remediation system (i.e. pneumatic pumps) may be manipulated periodically to optimize recovery system efforts, as described further in Section 3.1 of this document. The layout of the remediation system is presented in **Figure 2** and the equipment compound detail is presented in **Figure 3.** The process and instrumentation diagram of the SVE system and groundwater extraction and treatment (GET) system is presented in **Figure 4** and **Figure 5**, respectively.

3.1 Overall System Operation

The MPE remediation system operation will be optimized in a manner to maximize contaminant removal while minimizing the length of the remediation process. Given that remediation at the Site has been ongoing for over 10 years with measurable thickness of PSH remaining, operations need to be changed to evaluate the effect of differing system operating parameters on mass removal, PSH thickness and radius of influence. During the optimization process, data will be collected that assist in determining what changes may be made to system operations that could increase both the effectiveness and decrease the timeframe for the remediation. The details, data and results of system optimization will be reported in the Annual Report for the Site. Additional details on the system and groundwater monitoring plans are summarized in Sections 4.1 and 4.2 of this document.

3.2 Soil Vapor Extraction and Treatment System

The SVE and treatment system can handle a total airflow rate of approximately 400 standard cubic feet per minute (scfm) with vapor concentrations ranging between 50% Lower Explosive Limits (LEL) and 60% LEL in thermal mode. Soil vapor is extracted from SVE-only wells and MPE wells using two vacuum blowers and routed to two Baker Furnace 200 thermal oxidizer units for treatment prior to being discharged to the atmosphere. A vacuum is applied to each well by two positive-displacement (PD) rotary lobe blowers located on the thermal oxidizers for extracting soil vapor. Extracted vapors from the wells are connected by a common manifold piping system and enter two 55-gallon air water separator drums (also known as knock-out tanks) to separate condensate entrained in the vapor stream. Separated condensate is transferred by pneumatic diaphragm pumps operated on a time sequence and processed through the groundwater treatment system. Separated vapors continue through the PD vacuum blowers and into the thermal oxidizers for treatment. Treated vapors are discharged to the atmosphere.

The Baker Furnace 200 thermal oxidizer is a skid mounted system used for treating vapor-phase volatile organic compounds (VOCs) (destruction efficiency of 99%) of SVE systems. Each thermal oxidizer is capable of processing an air flow rate of 200 scfm and treating VOC concentrations with a LEL ranging between 50% and 60% in thermal mode. The thermal oxidizer is equipped with a 10-horsepower (hp) PD blower capable of 200 cfm at 4 inches of mercury ("Hg), a 12-gallon KO pot with drain ports, air filters, a chart recorder, interlocking controllers and air flow and pressure gauges. Natural gas combined with the influent VOC vapor stream extracted from wells is used to supply fuel to the thermal oxidizer for achieving operating temperature of greater than 1,450-degree Fahrenheit (^{o}F) in the combustion chamber. The thermal oxidizer is capable of operating in catalytic mode to reduce supplemental fuel usage if equipped with catalytic blocks and concentrations are less than 20% LEL.

3.3 Groundwater Extraction and Treatment System

The GET system can handle a water flow rate of 20 gallons per minute (gpm). Groundwater and PSH are recovered by operating pneumatic pumps installed in MPE wells. The MPE wells are connected into four groups, which are labeled as Circuit A, Circuit B, Circuit C, and Circuit D. At each circuit, the recovered fluids are conveyed from pneumatic pumps through a common manifold and deposited in a 200-gallon holding tank. A 15-hp rotary screw air compressor rated for 67 cfm at 100 pounds per square inch (psi) is used to supply compressed air to the pneumatic pumps and the knock-out tank diaphragm pump for the SVE system. Once fluids reach a certain level in the holding tanks, ¾ hp centrifugal transfer pumps deliver the recovered fluids to a 210-barrel (approximately 2,800 gallons) aboveground storage tank that serves as the surge tank and separation unit of PSH and groundwater. Separated PSH in the surge tank is removed manually and sent off-site to a permitted facility for recycling. Separated groundwater is transferred by gravity from the surge tank to a 325-gallon equalization tank and a 100-gallon holding tank that are connected in series. From the holding tank, a 1-hp centrifugal pump is used to process separated groundwater to the air stripper. The air stripper is equipped with a 3-hp regenerative blower to move air within the 7-tray stripper tower for volatilizing hydrocarbons in groundwater. Emissions from the air stripper are treated by two 400-pound vapor-phase granular activated carbon (GAC) vessels prior to discharge to the atmosphere. Once treated, groundwater is pumped by a 1-hp transfer pump through a 10-micron bag filter and two 400-pound liquid-phase GAC vessels and stored in a 1,000-gallon aboveground irrigation water tank. After reaching a certain level in the tank, the treated water is transferred by a 1-hp centrifugal pump through a 10-micron bag filter and disperses the water through an irrigation system consisting of above ground spray nozzles.

The groundwater extraction piping manifolds, 200-gallon holding tanks, transfer pumps, and the air compressor are housed in an enclosed building. The surge tank, air stripper, bag filters, carbon vessels, and irrigation tank are located outside without an enclosure. During extreme cold weather conditions, the system is deactivated periodically to prevent damage caused by freezing water. System operation during cold weather conditions is further discussed in Section 5.1 *Cold Weather Protection and Procedures.*

3.4 Automated Logic Control Description

The SVE and treatment system operates independent of the GET system. Each system consists of logic controllers for automatic operation and deactivation. The following paragraphs provide a description of the logic control schematic of each system.

Thermal Oxidizer and Vacuum Blowers:

The thermal oxidizer and vacuum extraction blower are integrated as one operating unit. At initial startup, a 60 second purge (five air changes) cycle of the combustion chamber is performed with ambient air using the combustion blower prior to ignition of the pilot. According to the OEM manual, the oxidizer has a 15 second ignition trial which lights the pilot. If the pilot does not light in 15 seconds, the supplemental fuel line is closed to reduce the potential for an explosion. The main gas valve in the supplemental fuel train will not open until the pilot is lit. The thermal oxidizer must be reset, and the initial startup procedure repeated until activation is achieved. The process line of the thermal oxidizer consists of actuated three-way valves that are used to supply clean air and to restrict VOC vapors provided by the vacuum extraction blower. The VOC vapor line is closed from entering the thermal oxidizer by the three-way valve until the set operating temperature (1,450° F) is reached. In addition, two actuated valves are linked to oxygen and LEL sensors to prevent levels from exceeding set points and to add dilution air to the process stream to maintain levels below the set points. If the LEL is exceeded, the valve is closed and temporarily shuts down the combustion burner until the LEL is below the set point. If the combustion or vacuum extraction blower fails to operate, the control system will close the supplemental fuel line and close the VOC vapor line to the oxidizer. The thermal oxidizer is equipped with a high temperature limit controller. If a high temperature condition exists, the thermal oxidizer will close the supplemental fuel line and the VOC vapor line. The vacuum blower is equipped with a KO pot. The KO pot consists of level switches to monitor liquids in the KO pot. If liquid levels reach a certain level in the KO pot, the thermal oxidizer and vacuum blower will be deactivated. The following table includes a list of relay control sequences for automatic operation and deactivation of the SVE system:

Table 3.3-1: Relay Control Systems for the SVE System

Component	Devices	Condition	Response
12-gal KO POT	Liquid level switches	High-high water level	Deactivate SVE blower and Thermal Oxidizer
Thermal Oxidizer	Temperature Transducer	High temperature	Deactivate SVE blower and Thermal Oxidizer
			Closes Supply Gas valve
			Open Dilution Valve
Thermal Oxidizer	LEL Transducer	High LEL concentration	Deactivate SVE blower and Thermal Oxidizer
			Closes Supply Gas valve
			Open Dilution Valve
Combustion Blower	Actuated Valve	Startup and Reset	Activate Combustion Blower

Groundwater Extraction and Treatment System:

The GET system is integrated using electrical relays, actuated valves, pressure sensors, and liquid level switches. The following table includes a list of relay control sequences for automatic operation and deactivation of the GET system:

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System

Component	Devices	Condition	Response
200-gallon Holding Tanks	Liquid level switches	High-high water level	Close air supply line by pressure switch valve for Circuit
		High water level	Activate transfer pump for Circuit
		Low water level	Deactivate transfer pump for Circuit
210-Barrel Surge Tank	Liquid level switches	High-high water level	Closes air supply line actuated valves for all Circuits
100-gallon Transfer Tank	Liquid level switches	High water level	Activate transfer pump for tank
		Low water level	Deactivate transfer pump for tank

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System			
Component	**Devices**	**Condition**	**Response**
Air Stripper	Liquid level switches Blower pressure switch	High-high water level	Close pneumatic actuated valve of surge tank effluent line
		High water level	Activate transfer pump for air stripper
		Low water level	Deactivate transfer pump for air stripper
		Low air pressure	Close pneumatic actuated valve of surge tank effluent line
1000-gallon Irrigation Tank	Liquid level switches	High water level	Activate transfer pump for irrigation tank
		Low water level	Deactivate transfer pump for irrigation tank
Air Compressor	Temperature switch	High temperature	Deactivate air compressor

STARTUP SEQUENCE

1. Confirm all switches are in “off” position
2. Close valves for SVE wells
3. Energize main breaker switch
4. Activate Thermal Oxidizer/SVE Blower– East
5. Activate Thermal Oxidizer/SVE Blower – West
6. Open valves for SVE wells
7. Activate Air Stripper
8. Activate Transfer Pumps
9. Activate Air Compressor
10. Perform operation monitoring

SHUTDOWN SEQUENCE

1. Perform operation monitoring
2. Deactivate Air Compressor
3. Deactivate Transfer Pumps
4. Deactivate Thermal Oxidizer/SVE Blower – East
5. Deactivate Thermal Oxidizer/SVE Blower – West
6. Close valves for SVE wells
7. De-energize main breaker switch

MALFUNCTION SEQUENCE

1. Identify alarm condition
2. Resolve alarm condition
3. Reset button to clear alarm condition
4. Reactivate system following Start-up Sequence
5. Document alarm condition and resolution

4.0 MONITORING

4.1 System Monitoring

Routine monitoring of the system will be performed to maintain the operation of the system. In conjunction with system operations, the monitoring schedule may be adjusted based on system performance over time. The equipment, meters, gauges, and/or instruments used to collect the monitoring data shall be in good condition and calibrated as needed. For identification purposes, the thermal oxidizers, blowers, and knock-out tanks should be referred to as "East" and "West". Vapor extraction manifolds will be identified by each "Circuit". The system monitoring activities will be documented on the field forms provided in **Attachment B**. The following tables summarize the monitoring activities and frequency for the SVE and GET systems, respectively:

Table 4.1-1: SVE System Monitoring Schedule

Item	Description	Freq.
1.0	Record operational status of each system upon arrival (On, Off, Alarm Condition)	Daily
1.1	Record operational status of each system upon departure (On, Off)	Daily
1.2	Record the hour meter reading of each thermal oxidizer (hrs).	Weekly
1.3	Measure the vacuum of each PD blower ("H_2O).	Weekly
1.4	Measure the air flow rate of each PD blower (feet per minute [fpm]).	Weekly
1.5	Record the temperature of each PD blower (ºF).	Weekly
1.6	Measure vapor concentration using PID of PD Blower (ppmV)	Weekly
1.7	Record the air flow rate of each thermal oxidizer (scfm)	Weekly
1.8	Record the temperature of each thermal oxidizer (ºF).	Weekly
1.9	Record the temperature high set point of each thermal oxidizer (ºF).	Weekly
1.10	Record the %LEL reading for each thermal oxidizer (%LEL).	Weekly
1.11	Record the %O_2 reading for each thermal oxidizer (%O_2).	Weekly
1.12	Record the pressure of the natural gas supply line to the oxidizer (psig).	Weekly
1.13	Record the pressure of the main natural gas supply line (psig).	Weekly
1.14	Measure the vacuum of each 55-gallon KO drum ("H_2O).	Weekly
1.15	Record butterfly valve position for Circuit manifold (½, ¾, fully open).	Weekly
1.16	Measure the air flow rate of each manifold Circuit (fpm).	Weekly
1.17	Measure the vacuum of each manifold Circuit ("H_2O).	Weekly
1.18	Record the identification of operating vapor extraction wells	Quarterly
1.19	Measure the air flow rate of each operating well (fpm)	Quarterly

Table 4.1-1: SVE System Monitoring Schedule		
Item	**Description**	**Freq.**
1.20	Measure the vacuum of each operating well (“H_2O).	Quarterly
1.21	Measure vapor concentration of each operating well (ppmV)	Quarterly
Equipment Inspections		
1.22	Inspect and record condition of air filters on the dilution valve.	Weekly
1.23	Inspect and record the condition of pressure gauges.	Weekly
1.24	Inspect and record the condition of temperature gauges.	Weekly
1.25	Inspect and record the condition of blower belts.	Weekly
1.26	Inspect and record air and water leaks.	Weekly
1.27	Inspect and record condition of check valves.	Weekly
1.28	Drain condensate from KO pots.	Weekly
1.29	Perform routine maintenance as required by the OEM.	Per OEM
Sampling		
1.30	Collect influent air sample for VOC after PD blowers and submit to laboratory for analysis of Total VOC by EPA Method TO-15.	Quarterly
1.31	Leak Detection and Repair Monitoring (after 2 consecutive months of non-detect, monitoring can be done quarterly)	Quarterly

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
2.0	Provide the operational status of system upon arrival (On, Off, Alarm Condition)	Daily
2.1	Provide the operational status of system upon departure (On, Off, Alarm Condition)	Daily
2.2	Record air stripper blower static pressure (“H_2O).	Weekly
2.3	Record air stripper blower air flow (cfm).	Weekly
2.4	Record the air stripper rotameter (gpm).	Weekly
2.5	Record vapor-phase carbon vessel pressure 1 (“H_2O).	Weekly
2.6	Record vapor-phase carbon vessel pressure 2 (“H_2O).	Weekly
2.7	Record vapor-phase carbon vessel temperature (^oF).	Weekly
2.8	Record Water Meter Reading (gallons).	Weekly
2.9	Record air compressor sump tank pressure (psi)	Weekly
2.10	Record air compressor discharge pressure (psi)	Weekly
2.11	Record air compressor hour meter (hr)	Weekly
2.12	Measure PSH and water level in Surge Tank (feet)	Weekly
2.13	Measure vapor concentration prior to carbon vessel 1 (ppmV)	Bi-Monthly
2.14	Measure vapor concentration between carbon vessel 1 and 2 (ppmV)	Bi-Monthly
2.15	Measure vapor concentration after carbon vessel 2 (ppmV)	Bi-Monthly
2.16	Measure (bucket test) the water flow rate of each operating well (gpm)	Quarterly

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
2.17	Measure liquid level readings of each operating well (ft below top of casing)	Semi-Annual
Equipment Inspections		
2.18	Inspect and record the condition of air stripper rotameter.	Daily
2.19	Inspect and record condition of 200 gallon holding tanks (Circuit A, B, C, and D).	Daily
2.20	Inspect and record condition of 325 gallon equalization tank and 100 gallon holding tank.	Daily
2.21	Inspect and record the condition of air flow, and pressure gauges.	Daily
2.22	Inspect and record the condition of bag filters.	Daily
2.23	Inspect and record the condition of water meter.	Daily
2.24	Inspect air compressor for air leaks.	Daily
2.25	Inspect and record air compressor oil level in site tube.	Daily
2.26	Inspect air compressor oil return line.	Daily
2.27	Drain air receiver and condensate from air compressor filter separator.	Daily
2.28	Inspect for water leaks.	Daily
2.29	Inspect bag filters and replace as needed.	Daily
2.30	Inspect sprinkler heads on the irrigation system.	Daily
2.31	Inspect pneumatic pumps.	As needed
Sampling		
2.32	Collect influent water sample prior to air stripper	Monthly
2.33	Collect effluent water sample after air stripper	Monthly
2.34	Collect effluent water sample after liquid-phase carbon vessels	Monthly

4.2 Groundwater Monitoring

Groundwater sampling will be conducted semi-annually in accordance with the SO and the Stage 2 AP to monitor system effectiveness and the extent of the plume. The groundwater monitoring network at the Site consists of thirty monitoring wells. Twenty-five of these wells are included in the sampling and analysis plan (SAP), which lists the sampling frequency and laboratory analytical results for each monitoring well. Monitoring wells MW-10, MW-11, and MW-17 will be sampled annually to confirm that the plumes are contained at the site[1.] Groundwater samples will be collected from wells SVE-28, SVE-30, SVE-31, and RW-1, per NMED. In addition, wells SVE-1A, SVE-2A, SVE-3, SVE-22, SVE-23, SVE-25, SVE-26, and SVE-27 will be monitored for presence of groundwater and PSH, and data will be reported in annual groundwater monitoring reports.[2] If

1 NMED Approval with Modifications Operation, Maintenance, and Monitoring Plan dated July 6, 2021
2 NMED Approval with Modifications Operation, Maintenance, and Monitoring Plan dated July 6, 2021

groundwater is encountered in these wells, they will be sampled and analyzed for a full suite of VOC by EPA Method 8260B. Sampling of 1,4-Dioxane in 10 of the 25 groundwater monitoring wells as per NMED requirements will continue. Samples collected during the 2nd Semiannual Sampling event will be analyzed for the full suite of VOCs by EPA Method 8260B during even years (2022, 2024, 2026, etc.) to validate the continued dissolved phase plume stability[3]. If any constituents other than BTEX are detected above their respective reporting limits in the samples collected from MW-27, MW-29, and MW-34 during the 2022 second semi-annual sampling event, all detected constituents in addition to the proposed analytes will be retained as target analytes in the subsequent year (2023) of the first semi-annual sampling event[4]. The SAP is summarized in the following updated table:

Table 4.2-1: Groundwater Sampling and Analysis Plan - 2022

Well ID	1st Semiannual Event Analytical Parameters	2nd Semiannual Event Analytical Parameters
MW-10	BTEX	VOCs
MW-11	BTEX	VOCs
MW-13	--	VOCs
MW-14	--	VOCs
MW-16	BTEX	VOCs
MW-17	BTEX	VOCs
MW-20	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-21	BTEX	VOCs
MW-22	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-24D	--	VOCs
MW-26	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-27	BTEX	VOCs
MW-29	BTEX	VOCs
MW-32	--	VOCs
MW-34	BTEX	VOCs
MW-35	--	VOCs
MW-37	--	VOCs
MW-39	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-40	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-41	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane

3 NMED Response to Approval with Modifications Operations, Maintenance, and Monitoring Plan dated December 20, 2021

4 NMED Approval with Modifications Operation, Maintenance, and Monitoring Plan dated July 6, 2021

Table 4.2-1: Groundwater Sampling and Analysis Plan - 2022		
Well ID	**1st Semiannual Event Analytical Parameters**	**2nd Semiannual Event Analytical Parameters**
MW-42	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-28	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-30	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-31	VOCs	VOCs
RW-1	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane

Notes:
1. BTEX – benzene, toluene, ethylbenzene, xylenes
2. VOCs – volatile organic compounds
3. BTEX and VOCs will be analyzed by EPA methods 8260 and 8260B, respectively.
4. 1,4–Dioxane samples will be analyzed by EPA method 8270C SIM
5. VOC sampling for all wells listed in table will be performed on even years during the 2nd Semiannual Event.

The remediation system (including GET and SVE systems) shall be deactivated for 48 to 72 hours prior to the start of each sampling event. Depth to PSH, if present, and depth to groundwater will be measured in each groundwater monitoring well, MPE well, recovery well, and SVE well using an optical sensor probe capable of distinguishing between PSH and groundwater prior to purging and sampling activities. Fluid measurements should be completed within 48 hours.

Prior to sampling, the monitoring, recovery, and SVE wells will be purged and monitored for stabilization of water quality parameters, including pH, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), and temperature using a calibrated YSI 556 Meter, or equivalent. Purging will be considered complete when the measured parameters of the purge water stabilize to within 10 percent for three consecutive measurements. In addition to the samples collected from the monitoring, recovery, and SVE wells, the following data quality control samples will be collected and analyzed for either BTEX or VOCs, as required: field duplicates, field blanks, equipment rinsate blanks. The groundwater monitoring data will be summarized in an annual monitoring report, which will be submitted to NMED by March 31 of the following year.

4.3 Pulse-Pumping Program

Based on field observations and groundwater liquid level data, a pulse-pumping program will be performed for the groundwater extraction pumps in attempt to improve recovery of residual LNAPL that may be present at the site. An evaluation will be performed for each MPE well to develop the pulse-pumping schedule which will be based on the observed rebound of LNAPL.

LNAPL Evacuation and Rebound Evaluation:

The MPE wells are connected into four groups: Circuit A, Circuit B, Circuit C, and Circuit D. At each circuit, the recovered fluids are conveyed from pneumatic pumps through a common manifold and deposited in a 200-gallon holding tank. Starting at Circuit A, the system operator will deactivate the MPE wells that contain LNAPL historically and measure the LNAPL thickness to obtain a baseline thickness. Afterwards, each MPE well will be reactivated and evaluated by visually monitoring the discharge line of the specific MPE well into the 200-gallon holding tank and evaluate the time needed for evacuating LNAPL from the MPE well. Once the LNAPL has been removed from the well by visual observation, the pump in the MPE well will be deactivated and the system operator will measure the LNAPL thickness and record the amount of time needed for LNAPL to rebound in the MPE well to near pre-pumping conditions. These steps will be repeated for select MPE wells in Circuit B, Circuit C, and Circuit D.

Pulsing-Pumping Program:

Once the LNAPL evacuation rate and rebound rate is evaluated, the specific MPE well with LNAPL will be placed on a pulsing schedule and operate accordingly. Each pump will operate (time on, time off, etc.) via manually or automated (if cost effective) on a sequence determined by using the information obtained during the LNAPL evacuation and rebound evaluation. The data collected during the pulse-pumping program will also be used to help understand the LNAPL transmissivity and to evaluate whether the recovery of LNAPL has reached the maximum extent practicable (MEP). A LNAPL transmissivity ranging between 0.1 ft^2/day to 0.8 ft^2/day (approximately 1 gallon of LNAPL per day bailed) may suggest that recovery of LNAPL is below the practical limit of hydraulic or pneumatic recovery systems (ITRC, 2018) [5].

Transwestern will provide a summary of the pulse-pumping program and future recommendations in the forthcoming Annual Monitoring Report to NMED.

5 Interstate Technology & Regulatory Council (ITRC). 2018. Light Non-Aqueous Phase Liquid (LNAPL) Site Management: LCSM Evolution, Decision Process, and Remedial Technologies. LNAPL-3. Appendix C; Transmissivity, Washington, D.C. https://lnapl-3.itrcweb.org.

5.0 MAINTENANCE

Routine maintenance will be conducted while operating the system to minimize excessive wear and major failures of equipment components and building structures. Maintenance requirements for specific equipment components is provided in the technical operation and maintenance manuals provided by the OEM. Only trained personnel should be maintaining the system. General maintenance activities for the SVE system and GET system equipment components are provided in the following table:

Table 5-1: General Maintenance

Item	Description	Freq.
3.1	Grease bearings on vacuum blower	Monthly
3.2	Replace Oil	Every 6 mos.
3.3	Clean and/or replace KO pot air filter	Every 6 mos.
3.4	Clean and/or replace vacuum blower air filter	Every 6 mos.
3.5	Replace vacuum blower belts	Every 6 mos.
3.6	Replace bag filters	Weekly
3.7	Check air compressor belt tension	Weekly
3.8	Check air compressor inlet filter element	Weekly
3.9	Change air compressor filter	Every 6 mos.
3.10	Change air compressor lubricant filter	Every 6 mos.
3.11	Check and tighten fittings	Weekly
3.12	Clean check valves	Every 6 mos.
3.13	Clean air stripper trays	Every 6 mos.
3.14	Clean air stripper rotameter	Monthly

5.1 Cold Weather Protection and Procedures

Cold Weather protection wasere installed by Transwestern that included insulating the above-ground pipes, manifolds, irrigation tanks, water lines on the carbon vessels, and the water treatment system. Additionally, heat tape was added around the air stripper blower, discharge pumps, and power supply equipment. Additional weather protection devices will be added as needed to minimize downtime during the winter months.

Consecutive days of severe freezing temperatures (32° Fahrenheit and below) increases the risk of failures and major damage to the equipment components, piping system, spray field, and can lead to uncontrolled discharges and/or safety hazards. Therefore, cold weather conditions will be monitored during the winter months (November through February) and the remediation system will be deactivated when freezing temperatures maintain for consecutive days and non-freezing temperatures exist for short extended durations[6].

6 NMED Response to Approval with Modifications Operation, Maintenance, and Monitoring dated September 8, 2021.

ATTACHMENT 3

Final Replacement Pages

2022 OPERATION, MAINTENANCE, AND MONITORING (OM&M) PLAN

TRANSWESTERN ROSWELL COMPRESSOR STATION NO. 9
ROSWELL, CHAVEZ COUNTY, NEW MEXICO
NMED 1656; NMOCD Case #GW-052
EPA ID NO. NMD986676955

PREPARED FOR:

TRANSWESTERN PIPELINE COMPANY, LLC
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WSP Project No. EC02.20180005.01

SEPTEMBER 2015
(Revised September 2022)

CONTENTS

FIGURES

ATTACHMENT

1.0 INTRODUCTION

This *Revised Operating and Maintenance and Monitoring* (OM&M) *Plan* was prepared by WSP USA, Inc. (formally EarthCon Consultants, Inc.) on behalf of Transwestern Pipeline Company, LLC (Transwestern) for the former Surface Impoundment project at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property (the “Site”) located at 6381 North Main Street in Roswell, New Mexico (**Figure 1**, **Site Location Map**). On March 13, 2013, the New Mexico Environment Department (NMED) issued a Stipulated Order (SO) that governs on-going environmental response activities associated with the Site. This Revised OM&M Plan was developed in general accordance with Section IV of the SO and the Site’s Stage 2 Abatement Plan (AP), dated December 3, 2015, and approved by New Mexico Oil and Conservation Division (OCD) on March 1, 2016. This Revised OM&M Plan was developed to reflect changes requested by NMED (**Attachment A**) and in the following documents:

- *Response to Approval with Modifications Comments, Operation, Maintenance, and Monitoring (OM&M) Plan, dated September 8, 2021*

This OM&M Plan provides information about the operation, maintenance, and monitoring of the Site’s multiphase extraction (MPE) remediation system.

2.0 SAFETY

Prior to operating the system, technical operational and maintenance documents supplied by the original equipment manufacturer (OEM) for each equipment component (i.e., blower, thermal oxidizer, pumps, and air compressor) should be reviewed for safe and proper operation. The emergency shut-off power switch should be clearly marked and identified at the facility to implement emergency procedures. A *Health and Safety Plan* (HASP), including an emergency response plan, should be reviewed and appropriate personal protective equipment (PPE) should be donned and/or acquired prior to performing system operation or maintenance. Only trained personnel should be operating and monitoring the MPE system.

3.0 OPERATION

The MPE remediation system consists of soil vapor extraction (SVE) and vapor treatment, and groundwater/phase-separated hydrocarbons (PSH) recovery and treatment. Operating components of the MPE remediation system (i.e. pneumatic pumps) may be manipulated periodically to optimize recovery system efforts, as described further in Section 3.1 of this document. The layout of the remediation system is presented in **Figure 2** and the equipment compound detail is presented in **Figure 3.** The process and instrumentation diagram of the SVE system and groundwater extraction and treatment (GET) system is presented in **Figure 4** and **Figure 5**, respectively.

3.1 Overall System Operation

The MPE remediation system operation will be optimized in a manner to maximize contaminant removal while minimizing the length of the remediation process. Given that remediation at the Site has been ongoing for over 10 years with measurable thickness of PSH remaining, operations need to be changed to evaluate the effect of differing system operating parameters on mass removal, PSH thickness and radius of influence. During the optimization process, data will be collected that assist in determining what changes may be made to system operations that could increase both the effectiveness and decrease the timeframe for the remediation. The details, data and results of system optimization will be reported in the Annual Report for the Site. Additional details on the system and groundwater monitoring plans are summarized in Sections 4.1 and 4.2 of this document.

3.2 Soil Vapor Extraction and Treatment System

The SVE and treatment system can handle a total airflow rate of approximately 400 standard cubic feet per minute (scfm) with vapor concentrations ranging between 50% Lower Explosive Limits (LEL) and 60% LEL in thermal mode. Soil vapor is extracted from SVE-only wells and MPE wells using two vacuum blowers and routed to two Baker Furnace 200 thermal oxidizer units for treatment prior to being discharged to the atmosphere. A vacuum is applied to each well by two positive-displacement (PD) rotary lobe blowers located on the thermal oxidizers for extracting soil vapor. Extracted vapors from the wells are connected by a common manifold piping system and enter two 55-gallon air water separator drums (also known as knock-out tanks) to separate condensate entrained in the vapor stream. Separated condensate is transferred by pneumatic diaphragm pumps operated on a time sequence and processed through the groundwater treatment system. Separated vapors continue through the PD vacuum blowers and into the thermal oxidizers for treatment. Treated vapors are discharged to the atmosphere.

The Baker Furnace 200 thermal oxidizer is a skid mounted system used for treating vapor-phase volatile organic compounds (VOCs) (destruction efficiency of 99%) of SVE systems. Each thermal oxidizer is capable of processing an air flow rate of 200 scfm and treating VOC concentrations with a LEL ranging between 50% and 60% in thermal mode. The thermal oxidizer is equipped with a 10-horsepower (hp) PD blower capable of 200 cfm at 4 inches of mercury ("Hg), a 12-gallon KO pot with drain ports, air filters, a chart recorder, interlocking controllers and air flow and pressure gauges. Natural gas combined with the influent VOC vapor stream extracted from wells is used to supply fuel to the thermal oxidizer for achieving operating temperature of greater than 1,450-degree Fahrenheit (°F) in the combustion chamber. The thermal oxidizer is capable of operating in catalytic mode to reduce supplemental fuel usage if equipped with catalytic blocks and concentrations are less than 20% LEL.

3.3 Groundwater Extraction and Treatment System

The GET system can handle a water flow rate of 20 gallons per minute (gpm). Groundwater and PSH are recovered by operating pneumatic pumps installed in MPE wells. The MPE wells are connected into four groups, which are labeled as Circuit A, Circuit B, Circuit C, and Circuit D. At each circuit, the recovered fluids are conveyed from pneumatic pumps through a common manifold and deposited in a 200-gallon holding tank. A 15-hp rotary screw air compressor rated for 67 cfm at 100 pounds per square inch (psi) is used to supply compressed air to the pneumatic pumps and the knock-out tank diaphragm pump for the SVE system. Once fluids reach a certain level in the holding tanks, ¾ hp centrifugal transfer pumps deliver the recovered fluids to a 210-barrel (approximately 2,800 gallons) aboveground storage tank that serves as the surge tank and separation unit of PSH and groundwater. Separated PSH in the surge tank is removed manually and sent off-site to a permitted facility for recycling. Separated groundwater is transferred by gravity from the surge tank to a 325-gallon equalization tank and a 100-gallon holding tank that are connected in series. From the holding tank, a 1-hp centrifugal pump is used to process separated groundwater to the air stripper. The air stripper is equipped with a 3-hp regenerative blower to move air within the 7-tray stripper tower for volatilizing hydrocarbons in groundwater. Emissions from the air stripper are treated by two 400-pound vapor-phase granular activated carbon (GAC) vessels prior to discharge to the atmosphere. Once treated, groundwater is pumped by a 1-hp transfer pump through a 10-micron bag filter and two 400-pound liquid-phase GAC vessels and stored in a 1,000-gallon aboveground irrigation water tank. After reaching a certain level in the tank, the treated water is transferred by a 1-hp centrifugal pump through a 10-micron bag filter and disperses the water through an irrigation system consisting of above ground spray nozzles.

The groundwater extraction piping manifolds, 200-gallon holding tanks, transfer pumps, and the air compressor are housed in an enclosed building. The surge tank, air stripper, bag filters, carbon vessels, and irrigation tank are located outside without an enclosure. During extreme cold weather conditions, the system is deactivated periodically to prevent damage caused by freezing water. System operation during cold weather conditions is further discussed in Section 5.1 *Cold Weather Protection and Procedures.*

3.4 Automated Logic Control Description

The SVE and treatment system operates independent of the GET system. Each system consists of logic controllers for automatic operation and deactivation. The following paragraphs provide a description of the logic control schematic of each system.

<u>Thermal Oxidizer and Vacuum Blowers:</u>

The thermal oxidizer and vacuum extraction blower are integrated as one operating unit. At initial startup, a 60 second purge (five air changes) cycle of the combustion chamber is performed with ambient air using the combustion blower prior to ignition of the pilot. According to the OEM manual, the oxidizer has a 15 second ignition trial which lights the pilot. If the pilot does not light in 15 seconds, the supplemental fuel line is closed to reduce the potential for an explosion. The main gas valve in the supplemental fuel train will not open until the pilot is lit. The thermal oxidizer must be reset, and the initial startup procedure repeated until activation is achieved. The process line of the thermal oxidizer consists of actuated three-way valves that are used to supply clean air and to restrict VOC vapors provided by the vacuum extraction blower. The VOC vapor line is closed from entering the thermal oxidizer by the three-way valve until the set operating temperature (1,450° F) is reached. In addition, two actuated valves are linked to oxygen and LEL sensors to prevent levels from exceeding set points and to add dilution air to the process stream to maintain levels below the set points. If the LEL is exceeded, the valve is closed and temporarily shuts down the combustion burner until the LEL is below the set point. If the combustion or vacuum extraction blower fails to operate, the control system will close the supplemental fuel line and close the VOC vapor line to the oxidizer. The thermal oxidizer is equipped with a high temperature limit controller.

If a high temperature condition exists, the thermal oxidizer will close the supplemental fuel line and the VOC vapor line. The vacuum blower is equipped with a KO pot. The KO pot consists of level switches to monitor liquids in the KO pot. If liquid levels reach a certain level in the KO pot, the thermal oxidizer and vacuum blower will be deactivated. The following table includes a list of relay control sequences for automatic operation and deactivation of the SVE system:

Table 3.3-1: Relay Control Systems for the SVE System

Component	Devices	Condition	Response
12-gal KO POT	Liquid level switches	High-high water level	Deactivate SVE blower and Thermal Oxidizer
Thermal Oxidizer	Temperature Transducer	High temperature	Deactivate SVE blower and Thermal Oxidizer
			Closes Supply Gas valve
			Open Dilution Valve
Thermal Oxidizer	LEL Transducer	High LEL concentration	Deactivate SVE blower and Thermal Oxidizer
			Closes Supply Gas valve
			Open Dilution Valve
Combustion Blower	Actuated Valve	Startup and Reset	Activate Combustion Blower

Groundwater Extraction and Treatment System:

The GET system is integrated using electrical relays, actuated valves, pressure sensors, and liquid level switches. The following table includes a list of relay control sequences for automatic operation and deactivation of the GET system:

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System

Component	Devices	Condition	Response
200-gallon Holding Tanks	Liquid level switches	High-high water level	Close air supply line by pressure switch valve for Circuit
		High water level	Activate transfer pump for Circuit
		Low water level	Deactivate transfer pump for Circuit
210-Barrel Surge Tank	Liquid level switches	High-high water level	Closes air supply line actuated valves for all Circuits
100-gallon Transfer Tank	Liquid level switches	High water level	Activate transfer pump for tank
		Low water level	Deactivate transfer pump for tank
Air Stripper	Liquid level switches Blower pressure switch	High-high water level	Close pneumatic actuated valve of surge tank effluent line
		High water level	Activate transfer pump for air stripper
		Low water level	Deactivate transfer pump for air

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System			
Component	**Devices**	**Condition**	**Response**
			stripper
		Low air pressure	Close pneumatic actuated valve of surge tank effluent line
1000-gallon Irrigation Tank	Liquid level switches	High water level	Activate transfer pump for irrigation tank
		Low water level	Deactivate transfer pump for irrigation tank
Air Compressor	Temperature switch	High temperature	Deactivate air compressor

STARTUP SEQUENCE

1. Confirm all switches are in “off” position
2. Close valves for SVE wells
3. Energize main breaker switch
4. Activate Thermal Oxidizer/SVE Blower– East
5. Activate Thermal Oxidizer/SVE Blower – West
6. Open valves for SVE wells
7. Activate Air Stripper
8. Activate Transfer Pumps
9. Activate Air Compressor
10. Perform operation monitoring

SHUTDOWN SEQUENCE

1. Perform operation monitoring
2. Deactivate Air Compressor
3. Deactivate Transfer Pumps
4. Deactivate Thermal Oxidizer/SVE Blower – East
5. Deactivate Thermal Oxidizer/SVE Blower – West
6. Close valves for SVE wells
7. De-energize main breaker switch

MALFUNCTION SEQUENCE

1. Identify alarm condition
2. Resolve alarm condition
3. Reset button to clear alarm condition
4. Reactivate system following Start-up Sequence
5. Document alarm condition and resolution

4.0 MONITORING

4.1 System Monitoring

Routine monitoring of the system will be performed to maintain the operation of the system. In conjunction with system operations, the monitoring schedule may be adjusted based on system performance over time. The equipment, meters, gauges, and/or instruments used to collect the monitoring data shall be in good condition and calibrated as needed. For identification purposes, the thermal oxidizers, blowers, and knock-out tanks should be referred to as "East" and "West". Vapor extraction manifolds will be identified by each "Circuit". The system monitoring activities will be documented on the field forms provided in **Attachment B**. The following tables summarize the monitoring activities and frequency for the SVE and GET systems, respectively:

Table 4.1-1: SVE System Monitoring Schedule

Item	Description	Freq.
1.0	Record operational status of each system upon arrival (On, Off, Alarm Condition)	Daily
1.1	Record operational status of each system upon departure (On, Off)	Daily
1.2	Record the hour meter reading of each thermal oxidizer (hrs).	Weekly
1.3	Measure the vacuum of each PD blower ("H_2O).	Weekly
1.4	Measure the air flow rate of each PD blower (feet per minute [fpm]).	Weekly
1.5	Record the temperature of each PD blower (°F).	Weekly
1.6	Measure vapor concentration using PID of PD Blower (ppmV)	Weekly
1.7	Record the air flow rate of each thermal oxidizer (scfm)	Weekly
1.8	Record the temperature of each thermal oxidizer (°F).	Weekly
1.9	Record the temperature high set point of each thermal oxidizer (°F).	Weekly
1.10	Record the %LEL reading for each thermal oxidizer (%LEL).	Weekly
1.11	Record the %O_2 reading for each thermal oxidizer (%O_2).	Weekly
1.12	Record the pressure of the natural gas supply line to the oxidizer (psig).	Weekly
1.13	Record the pressure of the main natural gas supply line (psig).	Weekly
1.14	Measure the vacuum of each 55-gallon KO drum ("H_2O).	Weekly
1.15	Record butterfly valve position for Circuit manifold (½, ¾, fully open).	Weekly
1.16	Measure the air flow rate of each manifold Circuit (fpm).	Weekly
1.17	Measure the vacuum of each manifold Circuit ("H_2O).	Weekly
1.18	Record the identification of operating vapor extraction wells	Quarterly
1.19	Measure the air flow rate of each operating well (fpm)	Quarterly
1.20	Measure the vacuum of each operating well ("H_2O).	Quarterly
1.21	Measure vapor concentration of each operating well (ppmV)	Quarterly

Table 4.1-1: SVE System Monitoring Schedule		
Item	**Description**	**Freq.**
Equipment Inspections		
1.22	Inspect and record condition of air filters on the dilution valve.	Weekly
1.23	Inspect and record the condition of pressure gauges.	Weekly
1.24	Inspect and record the condition of temperature gauges.	Weekly
1.25	Inspect and record the condition of blower belts.	Weekly
1.26	Inspect and record air and water leaks.	Weekly
1.27	Inspect and record condition of check valves.	Weekly
1.28	Drain condensate from KO pots.	Weekly
1.29	Perform routine maintenance as required by the OEM.	Per OEM
Sampling		
1.30	Collect influent air sample for VOC after PD blowers and submit to laboratory for analysis of Total VOC by EPA Method TO-15.	Quarterly
1.31	Leak Detection and Repair Monitoring (after 2 consecutive months of non-detect, monitoring can be done quarterly)	Quarterly

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
2.0	Provide the operational status of system upon arrival (On, Off, Alarm Condition)	Daily
2.1	Provide the operational status of system upon departure (On, Off, Alarm Condition)	Daily
2.2	Record air stripper blower static pressure (“H_2O).	Weekly
2.3	Record air stripper blower air flow (cfm).	Weekly
2.4	Record the air stripper rotameter (gpm).	Weekly
2.5	Record vapor-phase carbon vessel pressure 1 (“H_2O).	Weekly
2.6	Record vapor-phase carbon vessel pressure 2 (“H_2O).	Weekly
2.7	Record vapor-phase carbon vessel temperature (^oF).	Weekly
2.8	Record Water Meter Reading (gallons).	Weekly
2.9	Record air compressor sump tank pressure (psi)	Weekly
2.10	Record air compressor discharge pressure (psi)	Weekly
2.11	Record air compressor hour meter (hr)	Weekly
2.12	Measure PSH and water level in Surge Tank (feet)	Weekly
2.13	Measure vapor concentration prior to carbon vessel 1 (ppmV)	Bi-Monthly
2.14	Measure vapor concentration between carbon vessel 1 and 2 (ppmV)	Bi-Monthly
2.15	Measure vapor concentration after carbon vessel 2 (ppmV)	Bi-Monthly
2.16	Measure (bucket test) the water flow rate of each operating well (gpm)	Quarterly
2.17	Measure liquid level readings of each operating well (ft below top of casing)	Semi-Annual
Equipment Inspections		
2.18	Inspect and record the condition of air stripper rotameter.	Daily

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
2.19	Inspect and record condition of 200 gallon holding tanks (Circuit A, B, C, and D).	Daily
2.20	Inspect and record condition of 325 gallon equalization tank and 100 gallon holding tank.	Daily
2.21	Inspect and record the condition of air flow, and pressure gauges.	Daily
2.22	Inspect and record the condition of bag filters.	Daily
2.23	Inspect and record the condition of water meter.	Daily
2.24	Inspect air compressor for air leaks.	Daily
2.25	Inspect and record air compressor oil level in site tube.	Daily
2.26	Inspect air compressor oil return line.	Daily
2.27	Drain air receiver and condensate from air compressor filter separator.	Daily
2.28	Inspect for water leaks.	Daily
2.29	Inspect bag filters and replace as needed.	Daily
2.30	Inspect sprinkler heads on the irrigation system.	Daily
2.31	Inspect pneumatic pumps.	As needed
Sampling		
2.32	Collect influent water sample prior to air stripper	Monthly
2.33	Collect effluent water sample after air stripper	Monthly
2.34	Collect effluent water sample after liquid-phase carbon vessels	Monthly

4.2 Groundwater Monitoring

Groundwater sampling will be conducted semi-annually in accordance with the SO and the Stage 2 AP to monitor system effectiveness and the extent of the plume. The groundwater monitoring network at the Site consists of thirty monitoring wells. Twenty-five of these wells are included in the sampling and analysis plan (SAP), which lists the sampling frequency and laboratory analytical results for each monitoring well. Monitoring wells MW-10, MW-11, and MW-17 will be sampled annually to confirm that the plumes are contained at the site[1.] Groundwater samples will be collected from wells SVE-28, SVE-30, SVE-31, and RW-1, per NMED. In addition, wells SVE-1A, SVE-2A, SVE-3, SVE-22, SVE-23, SVE-25, SVE-26, and SVE-27 will be monitored for presence of groundwater and PSH, and data will be reported in annual groundwater monitoring reports.[2] If groundwater is encountered in these wells, they will be sampled and analyzed for a full suite of VOC by EPA Method 8260B. Sampling of 1,4-Dioxane in 10 of the 25 groundwater monitoring wells as per NMED requirements will continue. Samples collected during the 2nd Semiannual Sampling event will be analyzed for the full suite of VOCs by EPA Method 8260B during even years (2022, 2024,

1 NMED Approval with Modifications Operation, Maintenance, and Monitoring Plan dated July 6, 2021
2 NMED Approval with Modifications Operation, Maintenance, and Monitoring Plan dated July 6, 2021

2026, etc.) to validate the continued dissolved phase plume stability[3]. If any constituents other than BTEX are detected above their respective reporting limits in the samples collected from MW-27, MW-29, and MW-34 during the 2022 second semi-annual sampling event, all detected constituents in addition to the proposed analytes will be retained as target analytes in the subsequent year (2023) of the first semi-annual sampling event[4]. The SAP is summarized in the following updated table:

Table 4.2-1: Groundwater Sampling and Analysis Plan - 2022

Well ID	1st Semiannual Event Analytical Parameters	2nd Semiannual Event Analytical Parameters
MW-10	BTEX	VOCs
MW-11	BTEX	VOCs
MW-13	--	VOCs
MW-14	--	VOCs
MW-16	BTEX	VOCs
MW-17	BTEX	VOCs
MW-20	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-21	BTEX	VOCs
MW-22	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-24D	--	VOCs
MW-26	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-27	BTEX	VOCs
MW-29	BTEX	VOCs
MW-32	--	VOCs
MW-34	BTEX	VOCs
MW-35	--	VOCs
MW-37	--	VOCs
MW-39	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-40	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-41	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-42	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-28	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-30	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
SVE-31	VOCs	VOCs
RW-1	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane

Notes:
1. BTEX – benzene, toluene, ethylbenzene, xylenes

3 NMED Response to Approval with Modifications Operations, Maintenance, and Monitoring Plan dated December 20, 2021

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2. VOCs – volatile organic compounds
3. BTEX and VOCs will be analyzed by EPA methods 8260 and 8260B, respectively.
4. 1,4–Dioxane samples will be analyzed by EPA method 8270C SIM
5. VOC sampling for all wells listed in table will be performed on even years during the 2nd Semiannual Event.

The remediation system (including GET and SVE systems) shall be deactivated for 48 to 72 hours prior to the start of each sampling event. Depth to PSH, if present, and depth to groundwater will be measured in each groundwater monitoring well, MPE well, recovery well, and SVE well using an optical sensor probe capable of distinguishing between PSH and groundwater prior to purging and sampling activities. Fluid measurements should be completed within 48 hours.

Prior to sampling, the monitoring, recovery, and SVE wells will be purged and monitored for stabilization of water quality parameters, including pH, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), and temperature using a calibrated YSI 556 Meter, or equivalent. Purging will be considered complete when the measured parameters of the purge water stabilize to within 10 percent for three consecutive measurements. In addition to the samples collected from the monitoring, recovery, and SVE wells, the following data quality control samples will be collected and analyzed for either BTEX or VOCs, as required: field duplicates, field blanks, equipment rinsate blanks. The groundwater monitoring data will be summarized in an annual monitoring report, which will be submitted to NMED by March 31 of the following year.

4.3 Pulse-Pumping Program

Based on field observations and groundwater liquid level data, a pulse-pumping program will be performed for the groundwater extraction pumps in attempt to improve recovery of residual LNAPL that may be present at the site. An evaluation will be performed for each MPE well to develop the pulse-pumping schedule which will be based on the observed rebound of LNAPL.

<u>LNAPL Evacuation and Rebound Evaluation:</u>

The MPE wells are connected into four groups: Circuit A, Circuit B, Circuit C, and Circuit D. At each circuit, the recovered fluids are conveyed from pneumatic pumps through a common manifold and deposited in a 200-gallon holding tank. Starting at Circuit A, the system operator will deactivate the MPE wells that contain LNAPL historically and measure the LNAPL thickness to obtain a baseline thickness. Afterwards, each MPE well will be reactivated and evaluated by visually monitoring the discharge line of the specific MPE well into the 200-gallon holding tank and evaluate the time needed for evacuating LNAPL from the MPE well. Once the LNAPL has been removed from the well by visual observation, the pump in the MPE well will be deactivated and the system operator will measure the LNAPL thickness and record the amount of time needed for LNAPL to rebound in the MPE well to near pre-pumping conditions. These steps will be repeated for select MPE wells in Circuit B, Circuit C, and Circuit D.

Pulsing-Pumping Program:

Once the LNAPL evacuation rate and rebound rate is evaluated, the specific MPE well with LNAPL will be placed on a pulsing schedule and operate accordingly. Each pump will operate (time on, time off, etc.) via manually or automated (if cost effective) on a sequence determined by using the information obtained during the LNAPL evacuation and rebound evaluation. The data collected during the pulse-pumping program will also be used to help understand the LNAPL transmissivity and to evaluate whether the recovery of LNAPL has reached the maximum extent practicable (MEP). A LNAPL transmissivity ranging between 0.1 ft^2/day to 0.8 ft^2/day (approximately 1 gallon of LNAPL per day bailed) may suggest that recovery of LNAPL is below the practical limit of hydraulic or pneumatic recovery systems (ITRC, 2018) [5].

Transwestern will provide a summary of the pulse-pumping program and future recommendations in the forthcoming Annual Monitoring Report to NMED.

5.0 MAINTENANCE

Routine maintenance will be conducted while operating the system to minimize excessive wear and major failures of equipment components and building structures. Maintenance requirements for specific equipment components is provided in the technical operation and maintenance manuals provided by the OEM. Only trained personnel should be maintaining the system. General maintenance activities for the SVE system and GET system equipment components are provided in the following table:

Table 5-1: General Maintenance

Item	Description	Freq.
3.1	Grease bearings on vacuum blower	Monthly
3.2	Replace Oil	Every 6 mos.
3.3	Clean and/or replace KO pot air filter	Every 6 mos.

5 Interstate Technology & Regulatory Council (ITRC). 2018. Light Non-Aqueous Phase Liquid (LNAPL) Site Management: LCSM Evolution, Decision Process, and Remedial Technologies. LNAPL-3. Appendix C; Transmissivity, Washington, D.C. https://lnapl-3.itrcweb.org.

Table 5-1: General Maintenance		
Item	**Description**	**Freq.**
3.4	Clean and/or replace vacuum blower air filter	Every 6 mos.
3.5	Replace vacuum blower belts	Every 6 mos.
3.6	Replace bag filters	Weekly
3.7	Check air compressor belt tension	Weekly
3.8	Check air compressor inlet filter element	Weekly
3.9	Change air compressor filter	Every 6 mos.
3.10	Change air compressor lubricant filter	Every 6 mos.
3.11	Check and tighten fittings	Weekly
3.12	Clean check valves	Every 6 mos.
3.13	Clean air stripper trays	Every 6 mos.
3.14	Clean air stripper rotameter	Monthly

5.1 Cold Weather Protection and Procedures

Cold Weather protection was installed by Transwestern that included insulating the above-ground pipes, manifolds, irrigation tanks, water lines on the carbon vessels, and the water treatment system. Additionally, heat tape was added around the air stripper blower, discharge pumps, and power supply equipment. Additional weather protection devices will be added as needed to minimize downtime during the winter months.

Consecutive days of severe freezing temperatures (32° Fahrenheit and below) increases the risk of failures and major damage to the equipment components, piping system, spray field, and can lead to uncontrolled discharges and/or safety hazards. Therefore, cold weather conditions will be monitored during the winter months (November through February) and the remediation system will be deactivated when freezing temperatures maintain for consecutive days and non-freezing temperatures exist for short extended durations[6].

6 NMED Response to Approval with Modifications Operation, Maintenance, and Monitoring dated September 8, 2021.

FIGURES

ATTACHMENT A

ATTACHMENT B

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 154725

CONDITIONS

Operator: Transwestern Pipeline Company, LLC 8501 Jefferson NE Ave Albuquerque, NM 87113	OGRID: 329750
	Action Number: 154725
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. NMED lead regulatory body.	11/22/2022