TRANSWESTERN PIPELINE COMPANY
An ENERGY TRANSFER Company

May 26, 2021

Mr. Kevin Pierard, Bureau Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313

RE: Submittal of Operation Maintenance and Monitoring (OM&M) Plan with Revisions
Transwestern Roswell Compressor Station No. 9
Transwestern Pipeline Company, LLC
Roswell, Chavez County, New Mexico
NMED 1656; NMOCD Case #GW-052
EPA ID NO. NMD986676955

Dear Mr. Pierard:

Transwestern Pipeline Company, LLC (Transwestern), in accordance with *Provision IV.A. Remediation System and Groundwater Monitoring* of the March 2013 *Stipulated Final Order* for Transwestern's Compressor Station No. 9 (Facility), is submitting revisions to the *Recovery System Operation and Maintenance and Monitoring Plan* (OM&M) for the Site. The main revision to the OM&M plan was to include a pulse-pumping plan (Section 4.3) to enhance the recovery of residual LNAPL as requested by New Mexico Environment Department (NMED) in *Additional Response to Comments 10/14/2020 Approval with Modification Comments,* dated April 9, 2021.

Two revised copies and one electronic copy of the OM&M Plan is attached, as well as a copy of pages with revisions (highlighted in yellow) for NMED's review.

If you have any questions or comments regarding this submission, please do not hesitate to contact me at 210.870.2725 (office) or Steve Diamond of EarthCon Consultants, Inc. at (770) 973-2100.

Sincerely,

SBoultinghouse

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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

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EarthCon Project No. 02.20180005.01

SEPTEMBER 2015
(Revised May 2021)

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1.0 INTRODUCTION

This *Revised Operating and Maintenance and Monitoring* (OM&M) *Plan* was prepared by EarthCon Consultants, Inc. (EarthCon) 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 (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 Modification Comments regarding the 2017 Annual Report* dated August 17, 2018,
- *Response to Approval with Modifications Comments, Revised Operation and Maintenance and Monitoring Plan*, dated December 11, 2017, and
- *Additional Response to Comments 10/14/2020, Approval with Modifications, 2019 Groundwater Remediation Activities Surface Impoundments, dated April 19, 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 cold weather conditions, the system is deactivated to prevent damage caused by freezing water.

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

<u>Groundwater Extraction and Treatment System:</u>

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	High-high water level	Close pneumatic actuated valve of surge tank effluent line
	Blower pressure	High water level	Activate transfer pump for air stripper

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System			
Component	**Devices**	**Condition**	**Response**
	switch	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 (°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

Table 4.1-1: SVE System Monitoring Schedule		
Item	**Description**	**Freq.**
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
2.17	Measure liquid level readings of each operating well (ft below top of casing)	Semi-Annual

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
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. Eighteen 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. In a comments letter dated June 27, 2019, NMED requested that monitoring wells MW-10, MW-11, and MW-17 be sampled to confirm that no contaminant migration had occurred to these wells since they were last sampled in 2008. These three wells were sampled during the November 2019/January 2020 sampling event and analyzed for BTEX. All three wells remain non-detect for BTEX constituents. These wells will be removed from the 2020 SAP as the sampling requirements have been met as outlined in the June 27, 2019 OM&M plan approved by NMED. During the 2019 sampling events 12 of the 14 SVE wells and the recovery well (RW-1) were sampled and analyzed for VOCs in keeping with NMEDs Response to Approval with

Modifications Comments dated August 17, 2018. The monitoring requirements were met during the 2019 semiannual sampling events and the SVE wells have been removed from the 2020 SAP. An addition to the SAP in 2020 is the sampling of 1,4-Dioxane in 7 of the 18 groundwater monitoring wells as per NMED requirements. In response to NMEDs Response to Approval with Modifications Comments dated November 20, 2020, the SAP is summarized in the following updated table:

Table 4.2-1: Groundwater Sampling and Analysis Plan

Well ID	1st Semiannual Event Analytical Parameters	2nd Semiannual Event Analytical Parameters
MW-10		BTEX
MW-11		BTEX
MW-13	--	BTEX
MW-14	--	BTEX
MW-16	BTEX	BTEX
MW-17		BTEX
MW-20	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-21	BTEX	BTEX
MW-22	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-24D	--	BTEX
MW-26	VOCs, 1-4 Dioxane	VOCs, 1-4 Dioxane
MW-27	BTEX	BTEX
MW-29	BTEX	BTEX
MW-32	--	BTEX
MW-34	BTEX	BTEX
MW-35	--	BTEX
MW-37	--	BTEX
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		BTEX
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 method 8260

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) [1].

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.

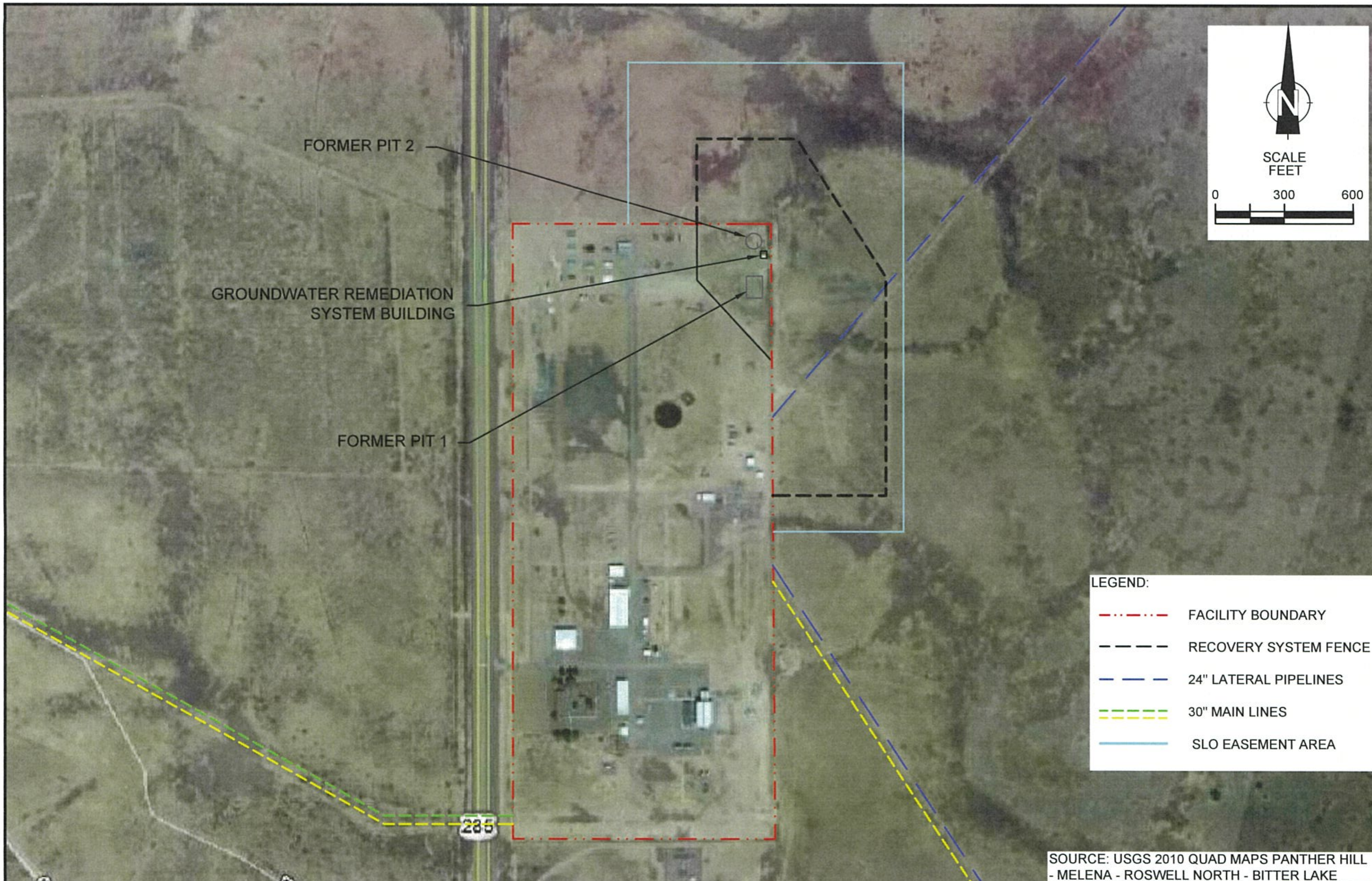
1 Interstate Technology & Regulatory Council (ITRC). 2018. Light Non-Aqueous Phase Liquid (LNAPL) Site Management: LCSM Evolution, Decision Process, and Remedial Technologies. LNAPL-3. Appendix C; Transmissivity,Washington, D.C. https://lnapl-3.itrcweb.org.

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 General Maintenance, Redevelopment, and Repair

Transwestern will conduct monitoring well maintenance and repair activities during 2021. Specifically, for 2021 Transwestern plans to redevelop monitoring wells and MPE wells (approximately ten wells) that have consistent detections of LNAPL. The redevelopment and rehabilitation will be performed to remove residual LNAPL and biosolid buildup that may be trapped in the well's sand pack and improve hydraulic connection between the well and aquifer. The wells will be redeveloped using a clean water, low-pressure jetting tool and bailing techniques. Development water will be recovered and transferred to the existing system for treatment. Development activities will be documented and provided to NMED in the 2021 Annual Monitoring report.

FIGURES



TRANSWESTERN PIPELINE COMPANY, LLC
ROSWELL COMPRESSOR STATION
ROSWELL, CHAVES COUNTY, NEW MEXICO

PROJECT NO. 02.20120037.00

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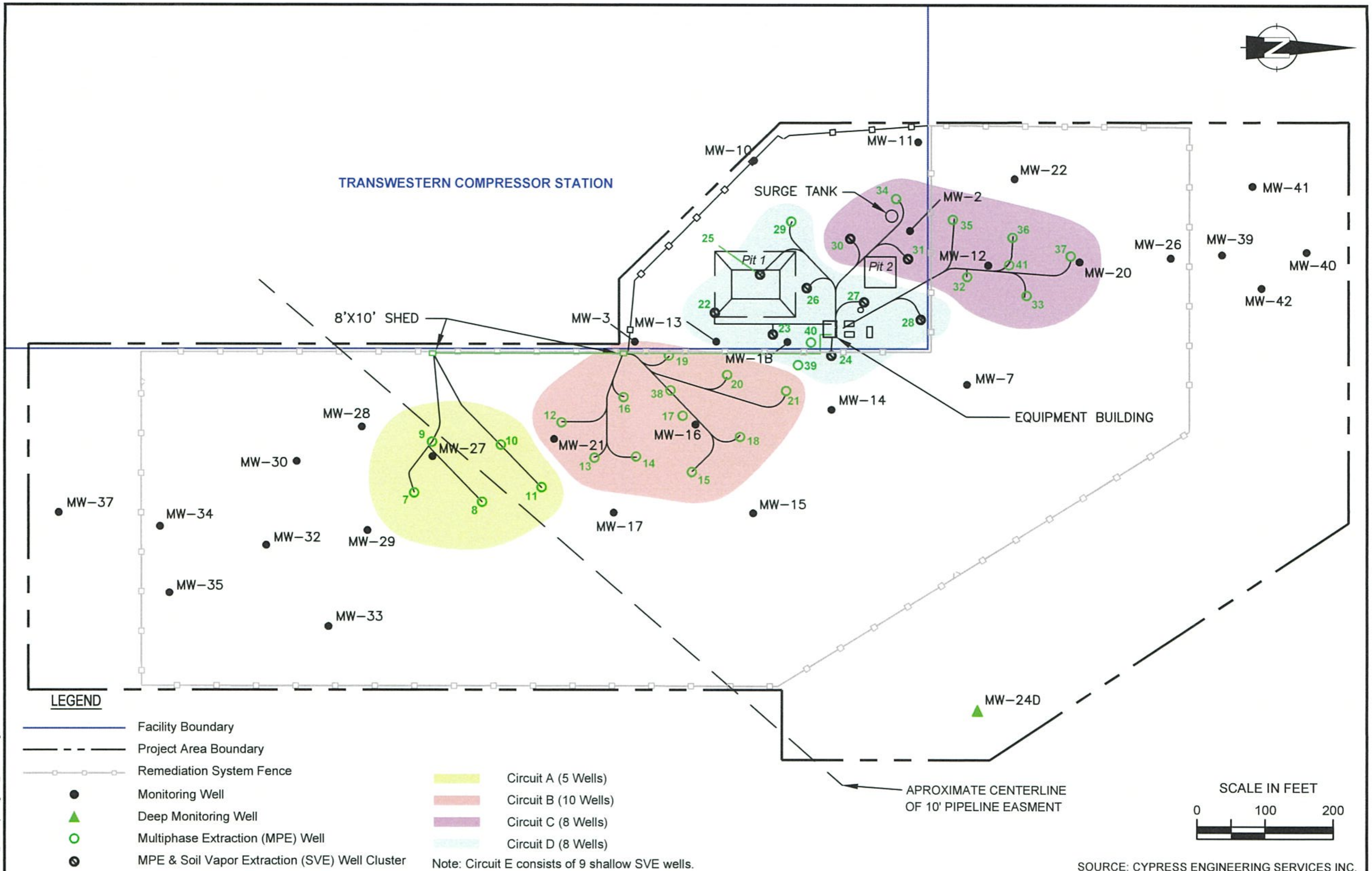
SITE LOCATION MAP

DRAWN:	CHECKED:	DATE:	FIGURE:
SSW	SD	9/25/2015	1

FILENAME: figure 1.dwg



REPORT OF 2017 GROUNDWATER REMEDIATION ACTIVITIES
TRANSWESTERN PIPELINE COMPANY, LLC
TRANSWESTERN COMPRESSOR STATION No. 9
(ROSWELL COMPRESSOR STATION)
ROSWELL, CHAVES COUNTY, NEW MEXICO

PROJECT NO. 02.20120037

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EarthCon Consultants, Inc.

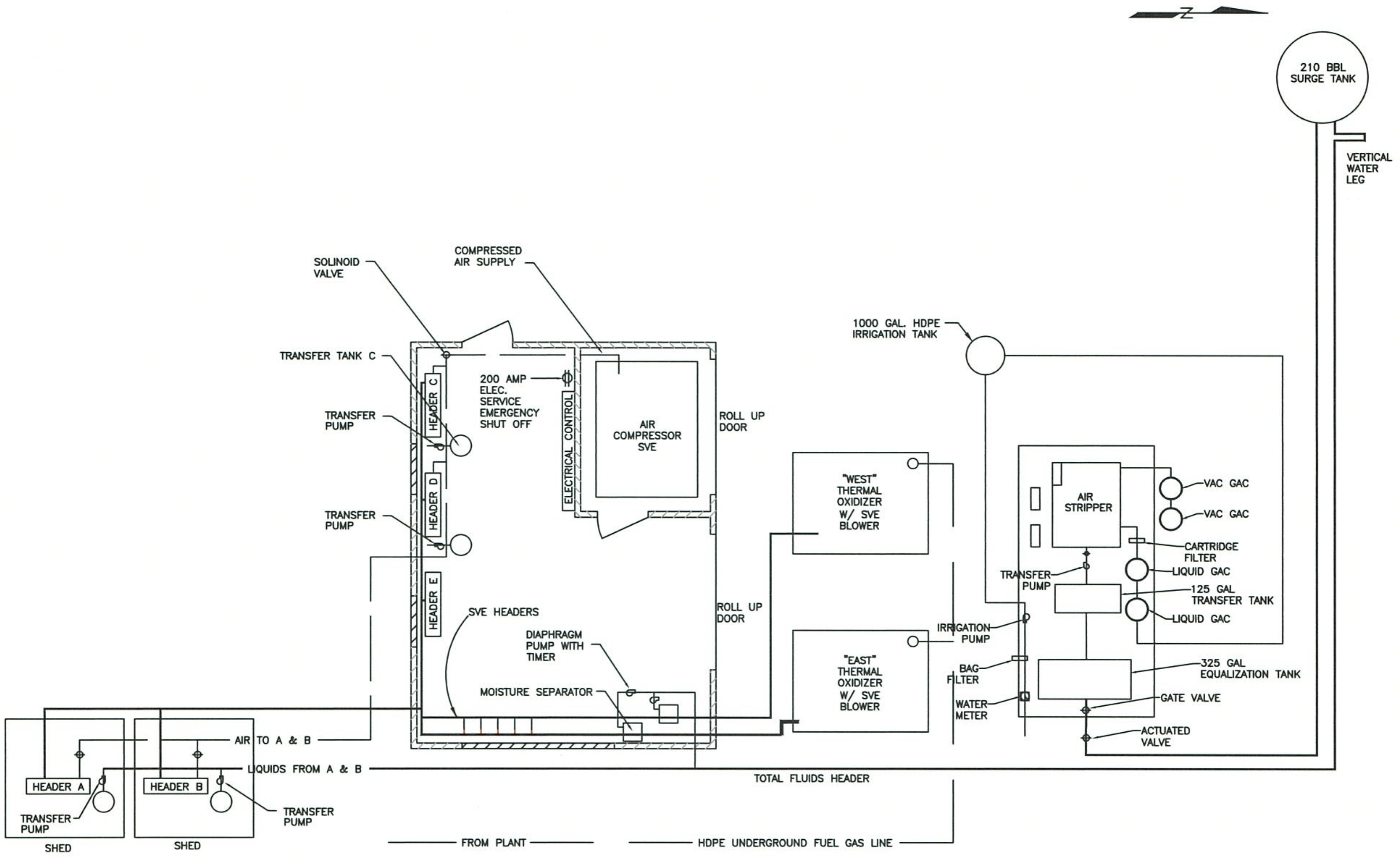
1880 WEST OAK PKWY, BLDG 100, STE 106, MARIETTA, GA, 30062

REMEDIATION SYSTEM LAYOUT

DRAWN:	CHECKED:	DATE:	FIGURE:
HVP	JDH	11/30/2017	2

FILENAME: transwestern energy transfer_roswell_2017 report figures_recover.dwg

S:\Premier\Projects\Clients\Energy Transfer\Transwestern-Roswell\2017 Report Files\Figures\CAD\Transwestern Energy Transfer_Roswell_2017 Report Figures_recover.dwg (1-3) 12/01/17 10:17 - hpham



(NOT TO SCALE)

TRANSWESTERN PIPELINE COMPANY, LLC

ROSWELL COMPRESSOR STATION

ROSWELL, CHAVES COUNTY, NEW MEXICO

PROJECT NO. 02.20120037.00

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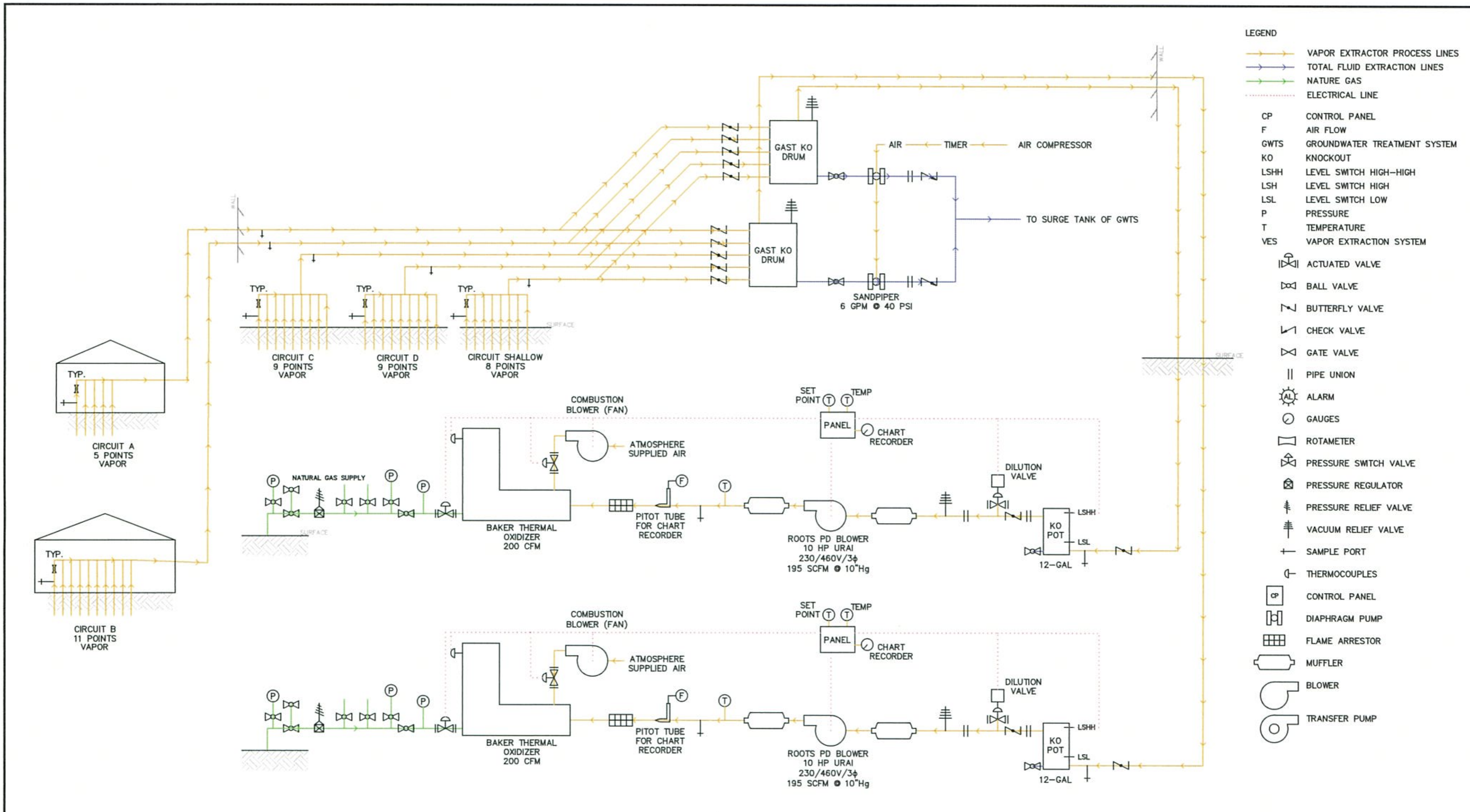
EQUIPMENT COMPOUND DETAIL

DRAWN:	CHECKED:	DATE:	FIGURE:
SSW	SD	9/25/2015	3

FILENAME: system layout.dwg



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
Combustion Blower	Actuated Valve	Startup and Reset	Activate Combustion Blower

TRANSWESTERN PIPELINE COMPANY, LLC
ROSWELL COMPRESSOR STATION
ROSWELL, CHAVES COUNTY, NEW MEXICO
PROJECT NO. 02.20120037.00

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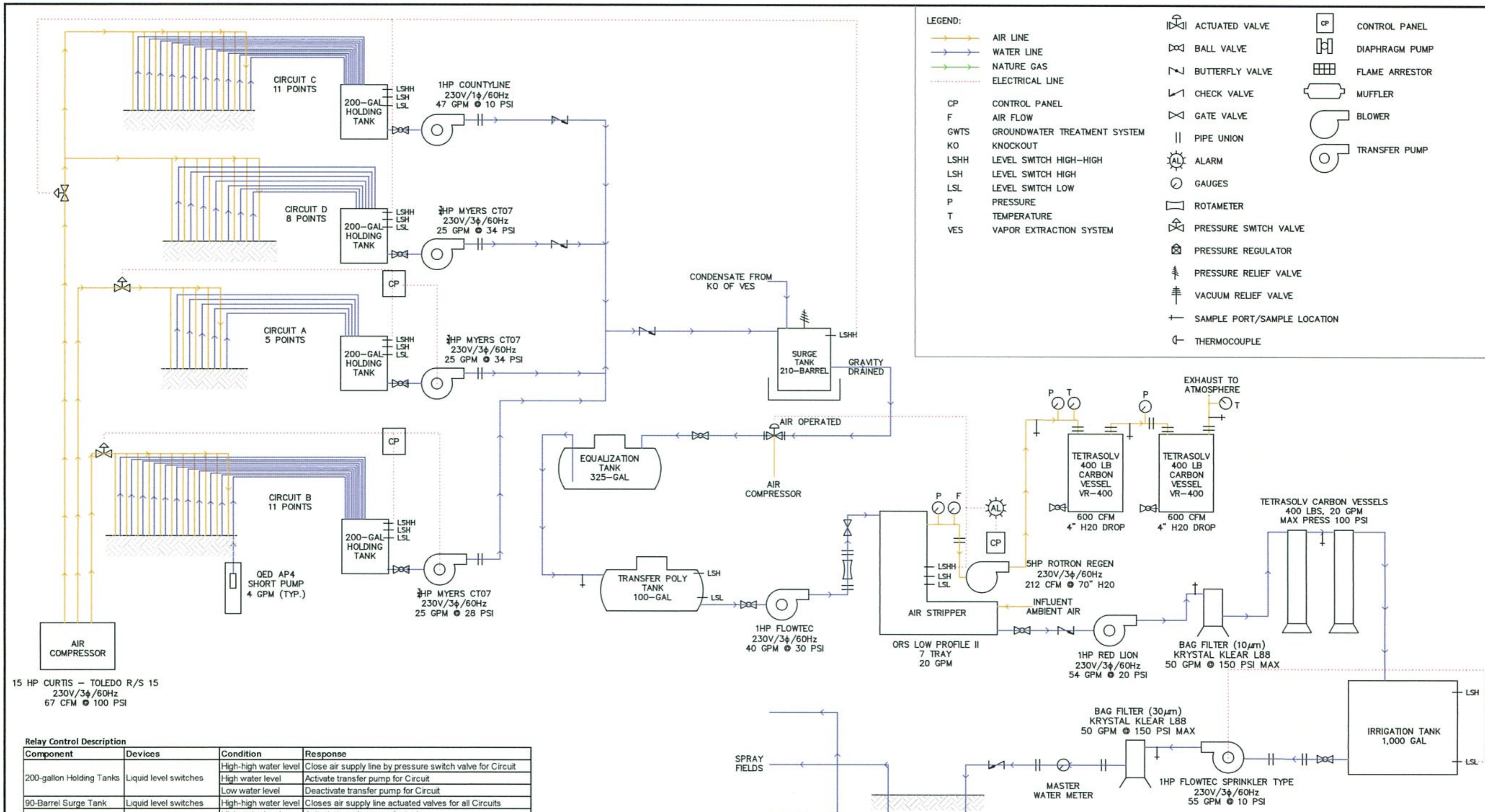
PROCESS AND INSTRUMENTATION DIAGRAM FOR SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM

DRAWN: JMW | CHECKED: SD | DATE: 10/03/17 | FIGURE: 4



Relay Control Description

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
90-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	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
	Blower pressure switch	Low air pressure	Close pneumatic actuated valve of surge tank effluent line
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

TRANSWESTERN PIPELINE COMPANY, LLC
ROSWELL COMPRESSOR STATION
ROSWELL, CHAVES COUNTY, NEW MEXICO
PROJECT NO. 02.20120037.00

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PROCESS AND INSTRUMENTATION DIAGRAM FOR GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

DRAWN	CHECKED	DATE	FIGURE
JMW	SD	08/03/17	5

FILENAME

ATTACHMENT A

Attachment A
Chronological List of Regulatory Documentation

Document	Date	Agency
Report of 2012 Groundwater Remediation Activities	March 15, 2013	NMOCD/NMED
Amended Investigation Work Plan and Groundwater Monitoring Plan	March 27, 2013	NMOCD/NMED
Amended Remediation Work Plan and Amended Final Design	May 22, 2013	NMED
Estimated Cost of Work for Corrective Action Financial Assurance	August 30, 2013	NMED
Investigation Report	December 19, 2013	NMOCD/NMED
Soil Vapor Extraction System Shutdown	February 11, 2014	NMOCD
Report of 2013 Groundwater Remediation Activities	March 11, 2014	NMOCD/NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 26, 2014	NMED
Comments to March 7, 2014 Letter - Approval of Investigation Report	May 12, 2014	NMED
Notice of No Changes to the Operation and Maintenance (O&M) and Monitoring Plan	May 22, 2014	NMED
Notice of Construction Activities	May 29, 2014	NMED
Revised Groundwater/PSH Recovery System Operation and 2014 System Re-Start	June 20, 2014	NMED
Response to June 24, 2014 Letter	October 7, 2014	NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 7, 2014	NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 11, 2015	NMED
Report of 2014 Groundwater Remediation Activities	March 23, 2015	NMOCD/NMED
Estimated Cost of Work for Corrective Action Financial Assurance	March 26, 2015	NMED
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	May 27, 2015	NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 6, 2015	NMED
Stage 2 Abatement Plan	December 3, 2015	NMOCD
Report of 2015 Groundwater Remediation Activities	February 29, 2016	NMOCD/NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	March 14, 2016	MNED
Notice of No Changes to the Operation and Maintenance (O&M) and Monitoring Plan	March 22, 2016	NMOCD/NMED
Report of 2016 Groundwater Remediaion Activities	March 13, 2017	NMOCD/NMED
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	March 17, 2017	NMOCD/NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 13, 2017	NMED
Notice of SVE System Deactivation	April 21, 2017	NMED
Submittal of Revised Operation and Maintenance and Monitoring (O&MM Plan)	May 26, 2017	NMED
Response to Comments on 2016 Groundwater Remediation Activities Report	June 5, 2017	NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 10, 2017	NMED
Response to Comments Revised Operation, Maintenance, and Monitoring Plan	October 18, 2017	NMED
Response to Approval with Modifications Comments	December 11, 2017	NMED
Report of 2017 Groundwater Remediation Activites	March 14, 2018	NMOCD/NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 13, 2018	NMED
Notice of Revisions to the Operation and Maintenance (O&M) and Monitoring Plan	May 21, 2018	NMOCD/NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 8, 2018	NMED
Response to Approval with Modifications Comments	July 26, 2018	NMED
Response to Approval with Modification Comments regarding the 2017 Annual Report	August 17, 2018	Transwestern
Extension Request regarding NMED Second Comment Letter	October 31, 2018	NMED
Second Response to Comments on 2017 Groundwater Remediation Activities Report	January 4, 2019	NMED
Third Response to Comments on 2017 Groundwater Remediation Activities Report	February 28, 2019	NMED
Request for Extension 2019 Financial Assurance Package	March 25, 2019	NMED
Report of 2018 Groundwater Remediation Activities	March 29, 2019	NMOCD/NMED
Approval with Modifications Report of 2018 Groundwater Remediation Activities	April 23, 2019	Transwestern
Notice of Scheduled Semi-Annual Groundwater Sampling Event Letter	April 5, 2019	NMED
Response to Comments regarding Response to Approval with Modification with Comments (March 22, 2019)	April 11, 2019	NMED
Response to NMED Approval with Modifications Report of 2018 Groundwater Remediation Activities	June 27, 2019	Transwestern
Response to Approval with Modifications Comments Revised Operation, Maintenance, and Monitoring Plan	September 20, 2019	Transwestern
Response to Comments regarding Response to Approval with Modification with Comments	October 2, 2019	Transwestern
Approval with Modifications Laboartory Results Submittal for SVE and RW-1 Wells	February 21, 2020	Transwestern
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 15, 2020	NMED
Response to Comments TWP 2020–HWB–TWP–19–003	April 28, 2020	NMED
Approval of Extension Request for 2019 Annual Report and Finiancial Assurance Package	March 31, 2020	Transwestern
Report of 2019 Groundwater Remediation Activities	May 18, 2020	NMED
Estimated Cost of Work for Corrective Action Financial Assurance	May 22, 2020	NMED
Response to Comments TWP 2020-HWB-TWP-19-003	May 26, 2020	Transwestern
Submittal of Operation Maintenance and Monitoring (OM&M) Plan with Revisions	May 28, 2020	NMED
Approval with Modifications Report of 2019 Groundwater Remediation Activities	July 2, 2020	Transwestern
Notice of Scheduled Semi-Annual Groundwater Sampling Event	October 8, 2020	NMED
Response to Comments 2019 Groundwater Remediation Activities Former Surface Impoundments (HWB-TWP-20-001)	October 14, 2020	NMED
Response to Comments Operation, Maintenance & Monitoring Plan (HWB-TWP-20-002)	October 14, 2020	NMED
Response to Approval with Modifications Comments Revised Operation, Maintenance, and Monitoring Plan	November 20, 2020	Transwestern
Additional Response to Comments 10/14/2020 Approval With Modification	March 16, 2021	NMED
Extension Request regarding the 2020 Annual Report	March 25, 2021	NMED
Notice of Scheduled Semi-Annual Groundwater Sampling Event	April 8, 2021	NMED
Estimated Cost of Work for Corrective Action Financial Assurance	April 12, 2021	NMED
Additional Response to Comments 10/14/2020, Approval with Modifications, 2019 Groundwater Remediation Activities Surface Impoundments	April 19, 2021	Transwestern
Report of 2020 Groundwater Remediation Activities	April 29, 2021	NMED

ATTACHMENT B

SVE SYSTEM MONITORING DATA SHEET
Daily and Weekly Inspections
Soil Vapor Extraction and Treatment System
Transwestern Roswell Compressor No. 9
Roswell, New Mexico

Field Operator Name: ______________________ **Date:** ______________

Data Collection

Item	Description	Freq.	Input						Comments
				Mon	Tue	Wed	Th	Fr	
1.0	Provide the operational status of each SVE system upon arrival (On, Off)	Daily	West						
			East						
1.1	Provide the operational status of each SVE system upon departure (On, Off)	Daily	West						
			East						
1.2	Record the hour meter reading of each thermal oxidizer (hrs).	Weekly	West=		East=				
1.3	Measure the vacuum of each PD blower ("H_2O).	Weekly	West=		East=				
1.4	Measure the air flow rate of each PD blower (feet per minute [fpm]).	Weekly	West=		East=				
1.5	Record the temperature of each PD blower (°F).	Weekly	West=		East=				
1.6	Measure vapor concentration using PID of PD Blower (ppmV)	Weekly	West=		East=				
1.7	Record the air flow rate of each thermal oxidizer (scfm)	Weekly	West=		East=				
1.8	Record the temperature of each thermal oxidizer (°F).	Weekly	West=		East=				
1.9	Record the temperature high set point of each thermal oxidizer (°F).	Weekly	West=		East=				
1.10	Record the pressure of the natural gas supply line to the oxidizer (psig).	Weekly	West=		East=				
1.11	Record the pressure of the main natural gas supply line (psig).	Weekly	West=		East=				
1.12	Measure the vacuum of each 55-gallon KO drum ("H_2O).	Weekly	West=		East=				
1.13	Record butterfly valve position for Circuit manifold (½, ¾, fully open).	Weekly	A- B- C-		D- Shallow-				
1.14	Measure the air flow rate of each manifold Circuit (fpm).	Weekly	A- B- C-		D- Shallow-				
1.15	Measure the vacuum of each manifold Circuit ("H_2O).	Weekly	A- B- C-		D- Shallow-				
1.16	Record the idnetification of operation vapor extraction wells	Qrtly	See SVE Well Monitoring Data Sheet form						
1.17	Measure the air flow rate of each operating well (fpm)	Qrtly	See SVE Well Monitoring Data Sheet form						
1.18	Measure the vacuum of each operating well ("H_2O).	Qrtly	See SVE Well Monitoring Data Sheet form						
1.19	Measure the vapor concentration using a PID for each operating SVE well (ppmV).	Qrtly	See SVE Well Monitoring Data Sheet form						
Equipment Inspections			**✓ = good condition, no action X = required action**						
1.20	Inspect and record condition of air filters on the dilution valve.	Weekly							
1.21	Inspect and record the condition of pressure gauges.	Weekly							
1.22	Inspect and record the condition of temperature gauges.	Weekly							
1.23	Inspect and record the condition of blower belts.	Weekly							
1.24	Inspect and record air and water leaks.	Weekly							
1.25	Inspect and record condition of check valves.	Weekly							
1.26	Drain condensate from KO pots.	Weekly							
1.27	Perform routine maintenance as required by original equipment manufacturer	Per OEM							
Sampling			**Enter date of Activity or "- -" if not performed during period.**						
1.28	Collect influent air sample for VOC and submit for Total VOC analysis	Qrtly							
1.29	Perform Leak Dection and Repair Monitoring	Qrtly							

Note: Quarterly - Jan-Mar, Apr-Jun, July-Sept,Oct-Dec

SVE WELL MONITORING DATA SHEET

Quarterly Inspections
Soil Vapor Extraction and Treatment System
Transwestern Roswell Compressor No. 9
Roswell, New Mexico

Field Operator Name: ______________________________ **Date:** ______________

Items:

1.16 Record the identification of operating vapor extraction wells
1.17 Measure the air flow rate of each operating well (fpm)
1.18 Measure the vacuum of each operating well ("H_2O).
1.19 Measure vapor concentration using PID of each operating well (ppmV)

Quarterly Data Collection Form

Well ID	Air Flow (fpm)	Vacuum ("H2O)	PID Reading (ppmV)	Comments (1/2 open, 3/4 open, fully Open)

Equipment Used/Calibration Date: ______________________________

GROUNDWATER SYSTEM MONITORING DATA SHEET

Daily and Weekly Inspections
Groundwater Extraction and Treatment System
Transwestern Roswell Compressor No. 9
Roswell, New Mexico

Field Operator Name: ______________________ **Date:** ______________

Data Collection

Item	Description	Freq.	Input: Mon	Tue	Wed	Th	Fr	Comments
2.0	Provide the operational status of GW system upon arrival (On, Off, Alarm Condition)	Daily						
2.1	Provide the operational status of GW 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 vessels temperature (^oF) - In.	Weekly	In=	Out=				
2.8	Record Water Meter Reading (gallons).	Weekly						
2.9	Record air compressor sump tank presssure (psi)	Weekly						
2.10	Record air compressor discharge presssure (psi)	Weekly						
2.11	Record air compressor hour meter (hr)	Weekly						
2.12	Measure PSH and water level in Surge Tank (feet)	Weekly	PSH =	Water=				
2.13	Measure vapor concentration with PID prior to vapor-phase carbon vessel 1 (ppmV)	Bi-Monthly		enter concentration or "- -" if not performed during period.				
2.14	Measure vapor concentration with PID between vapor-phase carbon vessels (ppmV)	Bi-Monthly		enter concentration or "- -" if not performed during period.				
2.15	Measure vapor concentration with PID after vapor-phase carbon vessel 2 (ppmV)	Bi-Monthly		enter concentration or "- -" if not performed during period.				
2.16	Measure (bucket test) the water flow rate of each operating well (gpm)	Quarterly		see Groundwater Well Data Sheet form, check if performed or "- - " if not performed during period				
2.17	Measure liquid level readings of each operating well (ft below top of casing)	Semi-Annl		see Groundwater Well Data Sheet form, check if performed or "- - " if not performed during period				
Equipment Inspections			**✓ = good condition, no action X = required action**					
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 equilization 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			**Enter date of Activity or "- -" if not performed during period.**					
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 in between liquid-phase carbon vessels	Monthly						

Note: Bi-monthly = Jan,Mar, May, July,Sept, Nov, Qrtly = Jan-March, Apr-June, July-Sept, Oct-Dec

GROUNDWATER WELL DATA SHEET
Quarterly and Semi-Annual Inspections
Groundwater Extraction and Treatment System
Transwestern Roswell Compressor No. 9
Roswell, New Mexico

Field Operator Name: ______________________________ **Date:** ____________________

Items:

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-Annually]

Quarterly Data Collection Form

Well ID	Water Flow Rate (gpm)	Liquid Level (ft)	Comments (1/2 open, 3/4 open, fully Open)

Equipment Used/Calibration Date: ______________________________

NV

TRANSWESTERN PIPELINE COMPANY
An ENERGY TRANSFER Company

August 3, 2021

Mr. Ricardo Maestas
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
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. Maestas;

Transwestern Pipeline, LLC (Transwestern) submits this *Response to Approval with Modifications* (RTC) regarding the comments received from the New Mexico Environment Department (NMED) via the letter titled *Approval with Modifications Operation, Maintenance, and Monitoring (OM&M) Plan* for the above referenced Site. To respond specifically to each of the Agency's comments, dated July 6, 2021, the original comment included within the NMED letter is in **bold**, with the Transwestern response included in plain text immediately following the item requiring a response.

Comment 1

The title (OM&M Plan) must specify the year relevant to the document for clarity. For example, this OM&M Plan should have been titled as the 2021 OM&M Plan. Include the relevant year in the title of the OM&M Plan in the future.

Comment noted.

Comment 2

In Section 1.0, Introduction, page 1, the Respondent states, "[t]his 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 (OCD) on March 1, 2016." OCD stands for "Oil Conservation Division". Correct the typographical error in future OM&M Plans.

Comment noted.

Comment 3

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." An enclosure must be provided for the equipment to protect them from freezing temperatures, as appropriate. The Report of 2020 Groundwater Remediation Activities, Former Surface Impoundments, Transwestern Compressor Station No.9 (Report), dated April 2021, states, "[a]s during prior years of operation, the groundwater portion of the system was manually deactivated in January, February, March, November, and December of 2020 due to freezing temperatures. To protect the groundwater treatment system and minimize deactivation periods during future operations, heat tape and pipe insulation have since been installed throughout the process. Additional weather protection will be added as needed to minimize downtime during winter months." Comment 2 of the NMED's Additional Response to Comments 10/14/2020 Approval with Modification 2019 Groundwater Remediation Activities Former Surface Impoundments, dated April 9, 2021, states, "[t]he deactivation period is approximately six months and unusually long for southern New Mexico. The Respondent must resolve the issue to minimize the deactivation period before the coldest winter months in late 2021." The mean temperatures during the months of January, February, March, November, and December in Roswell, New Mexico are reportedly above the freezing point and the weather is relatively mild. Therefore, it may not be necessary to deactivate the system for the winter months even without additional weather protection. Discuss the measures to be or that have been, implemented to minimize the deactivation period in the 2022 OM&M Plan. No revision required.

Comment noted. Furthermore, according to U.S. Climate Data[1] for New Mexico, the average low temperatures for January, February, March, November, and December are at or below freezing with an average snowfall between 1 to 4 inches for the aforementioned months. Due to variable weather temperatures, the risk of damage to process equipment and underground piping increases while operating the system during the winter months. Also, operating the system while freezing temperature fluctuate will require additional field time for winterizing and de-winterizing the system to protect components from damage. Therefore, Transwestern will install additional cold weather protection as needed to minimize downtime; however, the system may be deactivated for periods of extreme freezing conditions. Historically and as noted via trends, the protective deactivation of the system during winter months has not negatively affected the overall goals of the remediation.

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[1] https://www.usclimatedata.com/climate/roswell/new-mexico/united-states/usnm0267

Comment 4

In Section 4.2, Groundwater Monitoring, page 9, the Respondent states, "[t]hese three wells [MW-10, MW-11, and MW-17) were sampled during the November 2019/January 2020 sampling event and analyzed for BTEX. All three wells remain non-detect for BTEX constituents. These wells will be removed from the 2020 SAP as the sampling requirements have been met as outlined in the June 27, 2019 OM&M plan approved by NMED." The proposed changes regarding the sampling and analysis plan (SAP) discussed in this OM&M Plan are pertinent to 2021 rather than 2020. Correct the typographical error. In addition, the statement appears to be contradictory to Table 4.2-1, Groundwater Sampling and Analysis Plan, page 10. According to Table 4.2-1, wells MW-10, MW-11, and MW-17 are proposed to be sampled for BTEX during the second semi-annual sampling event in 2021, which is appropriate. Comment 2, item c of the NMED's July 2, 2020, Approval with Modifications, states, "groundwater samples must continue to be collected from wells MW-10, MW-11, and MW-17 for BTEX analysis in order to demonstrate that the plumes are contained at the site." Since wells MW-10, MW-11, and MW- 17 are located downgradient of the plumes, the comment remains valid and these wells must not be removed from the SAP and continue to be sampled annually. Revise the OM&M Plan accordingly and provide replacement pages.

The OM&M Plan has been updated to reflect this comment. Replacement pages are attached.

Comment 5

In Section 4.2, Groundwater Monitoring, page 9 through 10, the Respondent states, "[d]uring the 2019 sampling events 12 of the 14 SVE wells [SVE-1A, SVE-2A, SVE-3, SVE-22, SVE-23, SVE- 24, SVE-25, SVE-26, SVE-27, SVE-28, SVE-30, and SVE-31] and the recovery well (RW-1) were sampled and analyzed for VOCs in keeping with NMEDs Response to Approval with Modifications Comments dated August 17, 2018. The monitoring requirements were met during the 2019 semiannual sampling events and the SVE wells have been removed from the 2020 SAP." According to Table 4.2-1, wells SVE-28, SVE-30, SVE-31, and RW-1 are proposed to be sampled in 2021, which is appropriate. Propose to collect groundwater samples from wells SVE-28, SVE-30, SVE-31, and RW-1 in 2021, as indicated in Table 4.2-1. Wells SVE-1A, SVE-2A, SVE-3, SVE-22, SVE-24, SVE-26, and SVE-27 were dry and phase separate hydrocarbons (PSH) were detected in wells SVE-23 and SVE-25 in 2020; therefore, these wells were not sampled; however, these wells must continue to be monitored for the presence of groundwater and PSH and the gauging data must be reported in the 2021annual groundwater monitoring report. Revise the OM&M Plan accordingly and provide replacement pages.

All wells (GW, SVE, RW, etc.) are gauged every sampling event. Table 4.2-1 is meant to present the COC parameters.

Comment 6

In Section 4.2, Groundwater Monitoring, page 10, footnote 3 of Table 4.2-1states, "BTEX and VOCs will be analyzed by EPA method 8260." Since the list of VOCs analyzed by EPA method 8260 includes BTEX constituents, it is not clear why analytes are separately listed as BTEX and VOCs. Note that all constituents detected above respective detection limits must be reported in annual groundwater monitoring reports. Provide a clarification in a response letter or revise Table 4.2-1to replace BTEX with VOCs.

The 2004 Report of Groundwater Remediation Activities modified the routine groundwater sampling plan so that laboratory analytical requirements were limited to BTEX constituents for most wells and additional VOCs for monitoring wells where VOCs other than BTEX had previously been detected. The reasoning stated in the report was that historical groundwater sampling data from the site indicated that constituents apart from BTEX were either: 1) not present at detectable concentrations; 2) present at detectable concentrations but below NMWQCC standards; or 3) present at background water quality concentrations.

The Stipulated Final Order was executed in March 2013. Further, the *Report of 2013 Groundwater Remediation Activities* noted the list of constituents to be sampled and frequency in Table 4-3; which was also referenced in the May 22, 2014 *Notice of No Changes to the Operation and Maintenance (O&M) and Monitoring Plans*. As such, the approved continuation of sampling frequency and specific constituents of concern (COCs) remains consistent due to the long history of sampling and analytical results. Site monitoring dates back to 1993, there are no new sources of impacts and thus there is no reasonable reason to suspect the reoccurrence of detectable concentrations which have previously not been present.

Comment 7

In Section 4.3, Pulse-Pumping Program, page 12, the Respondent states, "Transwestern will provide a summary of the pulse-pumping program and future recommendations in the forthcoming Annual Monitoring Report to NMED." NMED hereby approves implementation of the proposed pulse-pumping program. No response required.

Comment noted.

Transwestern appreciates the opportunity to continue to work with NMED and NMOCD to continue to bring this site to closure. If you have any further questions or comments regarding these responses, please do not hesitate to contact me at (210) 870-2725 or JD Haines of EarthCon Consultants, Inc. at (317) 450-6126.

Sincerely,

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, EarthCon
S. Diamond, EarthCon

Attachment:

Attachment A: 2021 Operation, Maintenance, And Monitoring (OM&M) Plan

Attachment B: 2021 Operation, Maintenance, And Monitoring (OM&M) Plan, with highlighted edits

ATTACHMENT A

2021 Operation, Maintenance, And Monitoring (OM&M) Plan

2021 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
800 EAST SONTERA BLVD., SUITE 400
SAN ANTONIO, TX 78258

PREPARED BY:

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EarthCon Project No. 02.20180005.01

SEPTEMBER 2015
(Revised May 2021; July 2021)

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FIGURES

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1.0 INTRODUCTION

This *Revised Operating and Maintenance and Monitoring* (OM&M) *Plan* was prepared by EarthCon Consultants, Inc. (EarthCon) 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 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 Modification Comments regarding the 2017 Annual Report* dated August 17, 2018,
- *Response to Approval with Modifications Comments, Revised Operation and Maintenance and Monitoring Plan*, dated December 11, 2017, and
- *Additional Response to Comments 10/14/2020, Approval with Modifications, 2019 Groundwater Remediation Activities Surface Impoundments, dated April 19, 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 cold weather conditions, the system is deactivated to prevent damage caused by freezing water.

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

<u>Groundwater Extraction and Treatment System:</u>

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	High-high water level	Close pneumatic actuated valve of surge tank effluent line
	Blower pressure	High water level	Activate transfer pump for air stripper

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System			
Component	**Devices**	**Condition**	**Response**
	switch	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 (°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

Table 4.1-1: SVE System Monitoring Schedule		
Item	**Description**	**Freq.**
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 (°F).	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

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
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. All wells are gauged during each semi-annual sampling event. 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. In a comments letter dated June 27, 2019, NMED requested that monitoring wells MW-10, MW-11, and MW-17 be sampled to confirm that no contaminant migration had occurred to these wells since they were last sampled in 2008. These three wells were sampled during the November 2019/January 2020 sampling event and analyzed for BTEX. All three wells remain non-detect for BTEX constituents. These wells will remain on the 2021 SAP as they are located downgradient of the plumes and will show plume containment. During the 2019 sampling events 12 of the 14 SVE wells and the recovery well (RW-1) were sampled and analyzed for VOCs in keeping with NMEDs

Response to Approval with Modifications Comments dated August 17, 2018. An addition to the SAP in 2020 is the sampling of 1,4-Dioxane in 7 of the 18 groundwater monitoring wells as per NMED requirements. In response to NMEDs Response to Approval with Modifications Comments dated November 20, 2020, the SAP is summarized in the following updated table:

Table 4.2-1: Groundwater Sampling and Analysis Plan

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

Notes:
1. BTEX – benzene, toluene, ethylbenzene, xylenes
2. VOCs – volatile organic compounds
3. BTEX & VOCs will be analyzed by EPA method 8260

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 ft2/day to 0.8 ft2/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) 1.

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.
3.4	Clean and/or replace vacuum blower air filter	Every 6 mos.

1 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.**
3.5	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 General Maintenance, Redevelopment, and Repair

Transwestern will conduct monitoring well maintenance and repair activities during 2021. Specifically, for 2021 Transwestern plans to redevelop monitoring wells and MPE wells (approximately ten wells) that have consistent detections of LNAPL. The redevelopment and rehabilitation will be performed to remove residual LNAPL and biosolid buildup that may be trapped in the well's sand pack and improve hydraulic connection between the well and aquifer. The wells will be redeveloped using a clean water, low-pressure jetting tool and bailing techniques. Development water will be recovered and transferred to the existing system for treatment. Development activities will be documented and provided to NMED in the 2021 Annual Monitoring report.

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SEPTEMBER 2015
(Revised May 2021; July 2021)

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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 cold weather conditions, the system is deactivated to prevent damage caused by freezing water.

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	High-high water level	Close pneumatic actuated valve of surge tank effluent line
	Blower pressure	High water level	Activate transfer pump for air stripper

Table 3.3-2: Relay Control Systems for the Groundwater Extraction System			
Component	**Devices**	**Condition**	**Response**
	switch	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 (°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

Table 4.1-1: SVE System Monitoring Schedule		
Item	**Description**	**Freq.**
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 (^{o}F).	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

Table 4.1-2: Groundwater Extraction System Monitoring Schedule		
Item	**Description**	**Freq.**
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. All wells are gauged during each semi-annual sampling event. 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. In a comments letter dated June 27, 2019, NMED requested that monitoring wells MW-10, MW-11, and MW-17 be sampled to confirm that no contaminant migration had occurred to these wells since they were last sampled in 2008. These three wells were sampled during the November 2019/January 2020 sampling event and analyzed for BTEX. All three wells remain non-detect for BTEX constituents. These wells will remain on the 2021 SAP as they are located downgradient of the plumes and will show plume containment. ~~the sampling requirements have been met as outlined in the June 27, 2019 OM&M plan approved by NMED.~~ During the 2019 sampling events 12 of the

14 SVE wells and the recovery well (RW-1) were sampled and analyzed for VOCs in keeping with NMEDs Response to Approval with Modifications Comments dated August 17, 2018. ~~The monitoring requirements were met during the 2019 semiannual sampling events and the SVE wells have been removed from the 2020 SAP.~~ An addition to the SAP in 2020 is the sampling of 1,4-Dioxane in 7 of the 18 groundwater monitoring wells as per NMED requirements. In response to NMEDs Response to Approval with Modifications Comments dated November 20, 2020, the SAP is summarized in the following updated table:

Table 4.2-1: Groundwater Sampling and Analysis Plan

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

Notes:

1. BTEX – benzene, toluene, ethylbenzene, xylenes
2. VOCs – volatile organic compounds
3. BTEX & VOCs will be analyzed by EPA method 8260

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) [1].

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:

1 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.**
3.1	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 General Maintenance, Redevelopment, and Repair

Transwestern will conduct monitoring well maintenance and repair activities during 2021. Specifically, for 2021 Transwestern plans to redevelop monitoring wells and MPE wells (approximately ten wells) that have consistent detections of LNAPL. The redevelopment and rehabilitation will be performed to remove residual LNAPL and biosolid buildup that may be trapped in the well's sand pack and improve hydraulic connection between the well and aquifer. The wells will be redeveloped using a clean water, low-pressure jetting tool and bailing techniques. Development water will be recovered and transferred to the existing system for treatment. Development activities will be documented and provided to NMED in the 2021 Annual Monitoring report.

Received by OCD: 10/21/2022 7:58:03 AM

Accepted for the record
11/22/2022

NV

TRANSWESTERN PIPELINE COMPANY
An ENERGY TRANSFER Company

October 20, 2021

Mr. Ricardo Maestas
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
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. Maestas;

Transwestern Pipeline, LLC (Transwestern) submits this *Response to Approval with Modifications* (RTC) regarding the comments received from the New Mexico Environment Department (NMED) via the letter titled *Approval with Modifications Operation, Maintenance, and Monitoring (OM&M) Plan* for the above referenced Site. To respond specifically to each of the Agency's comments, dated September 8, 2021, the original comment included within the NMED letter is in **bold**, with the Transwestern response included in plain text immediately following the item requiring a response.

<u>Comment 1</u>

In the response to NMED's Approval with Modifications Comment 3, the Respondent states, "according to U.S. Climate Data for New Mexico, the average lo w temperatures for January, February, March, November, and December are at or below freezing with an average snowfall between 1 to 4 inches for the aforementioned months." According to the referenced climate data for Roswell, New Mexico, the average low temperatures for March and November are recorded as 37 °F and 34 °F, respectively, which is above freezing. Therefore, the statement is not accurate. The average low and high temperatures for January, February, and December are recorded as 26 °F, 31 °F, 26 °F, and 55 °F, 61 °F, 55 °F, respectively. While the temperatures can reach below freezing in January, February, and December, freezing temperatures are unlikely to persist for extended periods sufficient to damage the remediation system because average high temperatures indicate that the temperatures rise above freezing during the daytime.

Regardless, there may be a few days, if not a few weeks during the winter months, when

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cold weather could damage the remediation system during winter months in New Mexico. NMED agrees that the remedial operations may be discontinued during such cold weather periods; however, it is not necessary to continuously shut down the remedial operations from November through March. The NMED's Approval with Modifications Comment 3 directs the Permittee to discuss the measures to be or that have been, implemented to minimize the deactivation period in the 2022 OM&M Plan. This direction must still be addressed.

In addition, the Respondent further states, "Transwestern will install additional cold weather protection as needed to minimize downtime; however, the system may be deactivated for periods of extreme freezing conditions." An additional cold weather protection must be installed to minimize downtime, as stated. Insulating aboveground pipes may be adequate to provide cold weather protection because freezing temperatures are unlikely to persist for extended periods in Roswell, New Mexico. Groundwater temperatures are above freezing and warmer than atmospheric temperatures in winter. Regardless, the Respondent must discuss the measures to minimize downtime in the 2022 OM&M Plan.

Furthermore, the Respondent states, "[h]istorically and as noted via trends, the protective deactivation of the system during winter months has not negatively affected the overall goals of the remediation." The statement is not supported by historical data. Provide the data demonstrating that the winter deactivation period did not negatively affect the overall goals of the remediation, as necessary. NMED disagrees with the statement because the remediation system has been effectively extracting liquid and vapor phase hydrocarbons while it is in operation and a longer period of operation would likely increase the recovery volume proportionally.

Comment noted. Furthermore, according to the National Weather Service (NOW)[1] for the Roswell Area of New Mexico, freezing temperatures appear to occur starting in November thru February. See attached Temperature Graphs for the past 5 years.

Due to variable weather temperatures, the risk of damage to process equipment (pumps, valves, level sensors, fitting connections, spray field nozzles, etc.) and underground piping (from recovery wells to holding tanks to treatment equipment) increases while operating the system intermittently during the winter months. Also, operating the system while freezing temperature fluctuate will require additional field time for winterizing and de-winterizing the system to protect components from damage. Transwestern will monitor the cold weather periods of daily consistent freezing temperatures and will deactivate the system appropriately to protect system components while minimizing downtime. In addition, Transwestern will install additional cold weather protection as

[1] https://www.weather.gov/wrh/climate?wfo=abq

needed to minimize downtime.

The LNAPL footprint has not increased over the years, but the footprint and thickness of LNAPL has rather decreased. After winterization LNAPL has not been detected in any new wells, indicating that the LNAPL plume is not migrating. The overall goal with the system is to reduce free product, which continues to be accomplished.

Comment 2

In the response to NMED's Approval with Modifications Comment 5, the Respondent states, "Table 4.2-1 is meant to present the COC parameters." Table 4.2-1 is titled as "Groundwater Sampling and Analysis Plan." To clarify, Table 4.2-1is presented to provide information regarding (1) proposed sampling frequency and (2) proposed analytes for each well in 2021. No response required.

Comment noted.

Comment 3

In the response to NMED's Approval with Modifications Comment 6, the Respondent states, "[t]he reasoning stated in the report was that historical groundwater sampling data from the site indicated that constituents apart from BTEX were either: 1) not present at detectable concentrations; 2) present at detectable concentrations but below NMWQCC standards; or 3) present at background water quality concentrations." Note that volatile organic compounds (VOCs) are not naturally present in groundwater; therefore, there are no background concentrations to compare for VOCs. Even if VOCs other than BTEX have not been detected previously, it would be appropriate to evaluate and report all detected VOCs in future annual groundwater monitoring reports. Accordingly, revise Table 4.2-1 to propose to report all analytes listed in the analytical method (EPA Method 8260) for wells where only BTEX are listed as analytes and provide a replacement table.

The Respondent further states, "the approved continuation of sampling frequency and specific constituents of concern (COCs) remains consistent due to the long history of sampling and analytical results." Since the plumes are not stationary, current sampling frequency and required analyses for the samples must be re-evaluated frequently. The most appropriate sampling frequency and analytical suite for each well must be evaluated and proposed in annual OM&M Plan updates.

Comment noted. Transwestern is implementing the approved sampling analysis plan and will evaluate inclusions of other analyte from EPA Method 8260 based on trends of groundwater data from existing wells where VOCs are being analyzed. Historical and current data does not indicate VOCs in the BTEX wells, BTEX is decreasing which could be an indicator that VOCs maybe decreasing in the wells if present. However, Transwestern is proposing to analyze for the full suite of VOC by EPA Method 8260 during even years (i.e. 2022, 2024, 2026, etc.) during the 2nd semi-annual event to validate the continued dissolved phase plume stability.

Transwestern appreciates the opportunity to continue to work with NMED and NMOCD to continue to bring this site to closure. If you have any further questions or comments regarding these responses, please do not hesitate to contact me at (210) 870-2725 or JD Haines of EarthCon Consultants, Inc. at (317) 450-6126.

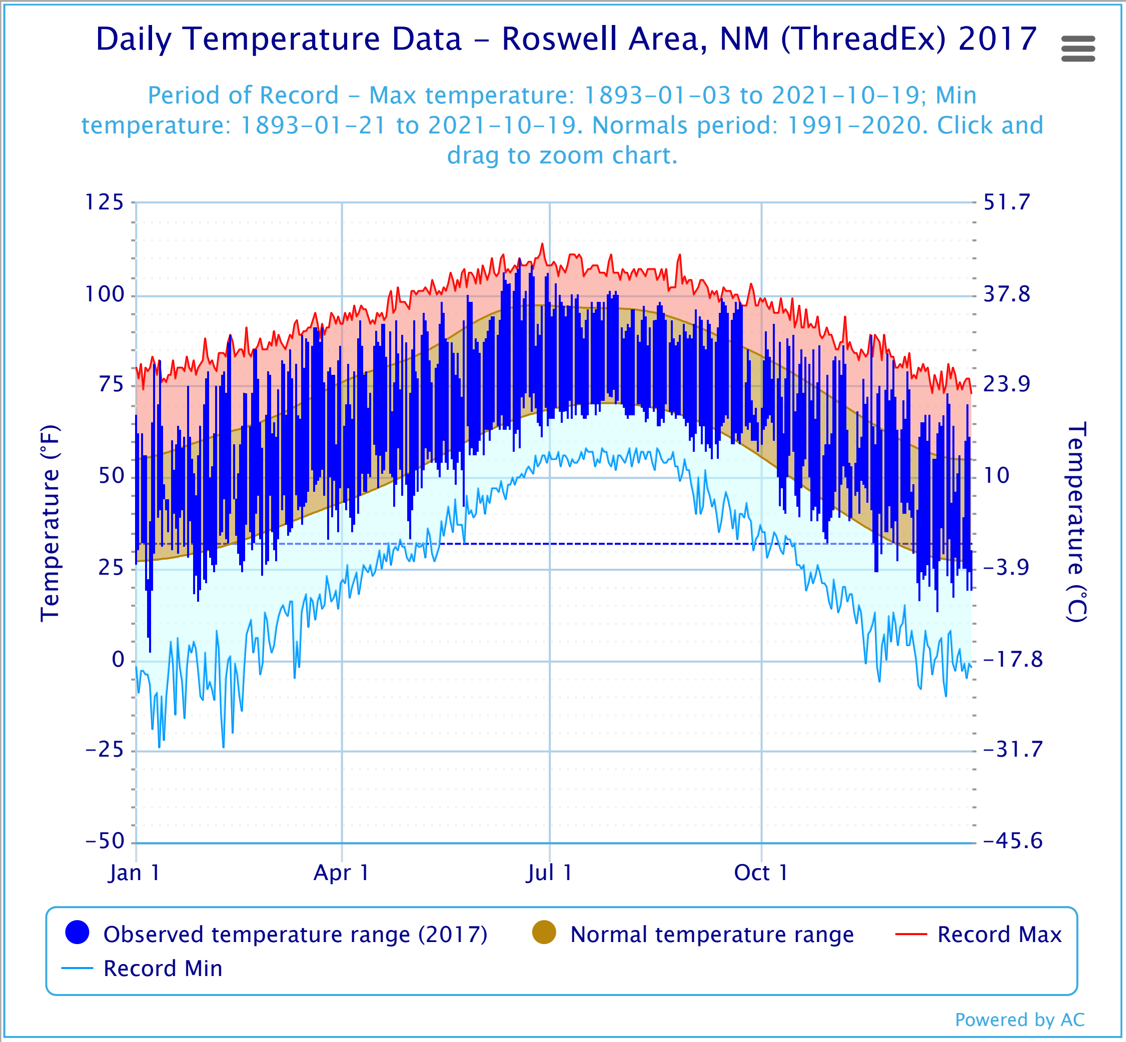
Sincerely,

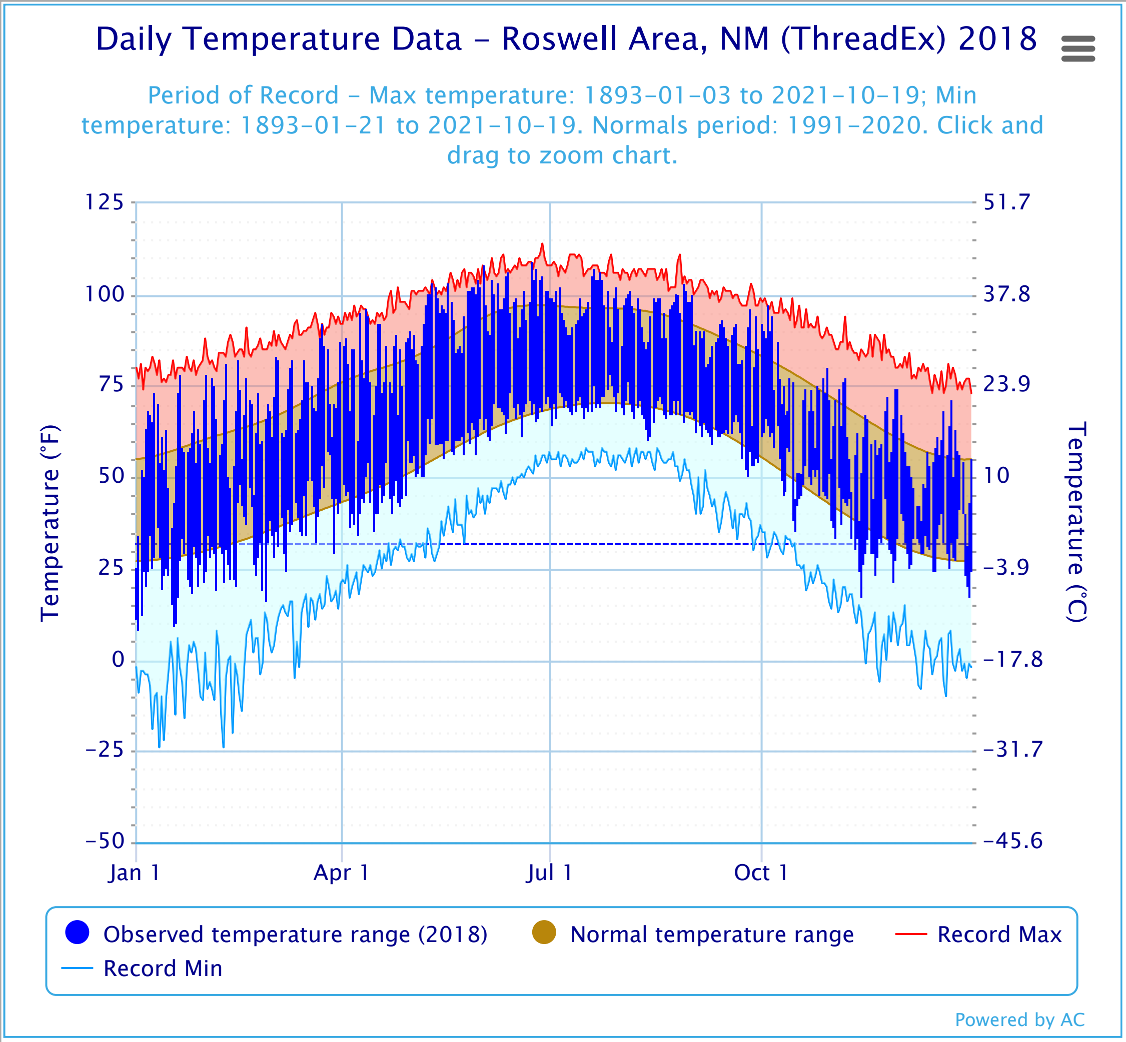
SBoultinghouse

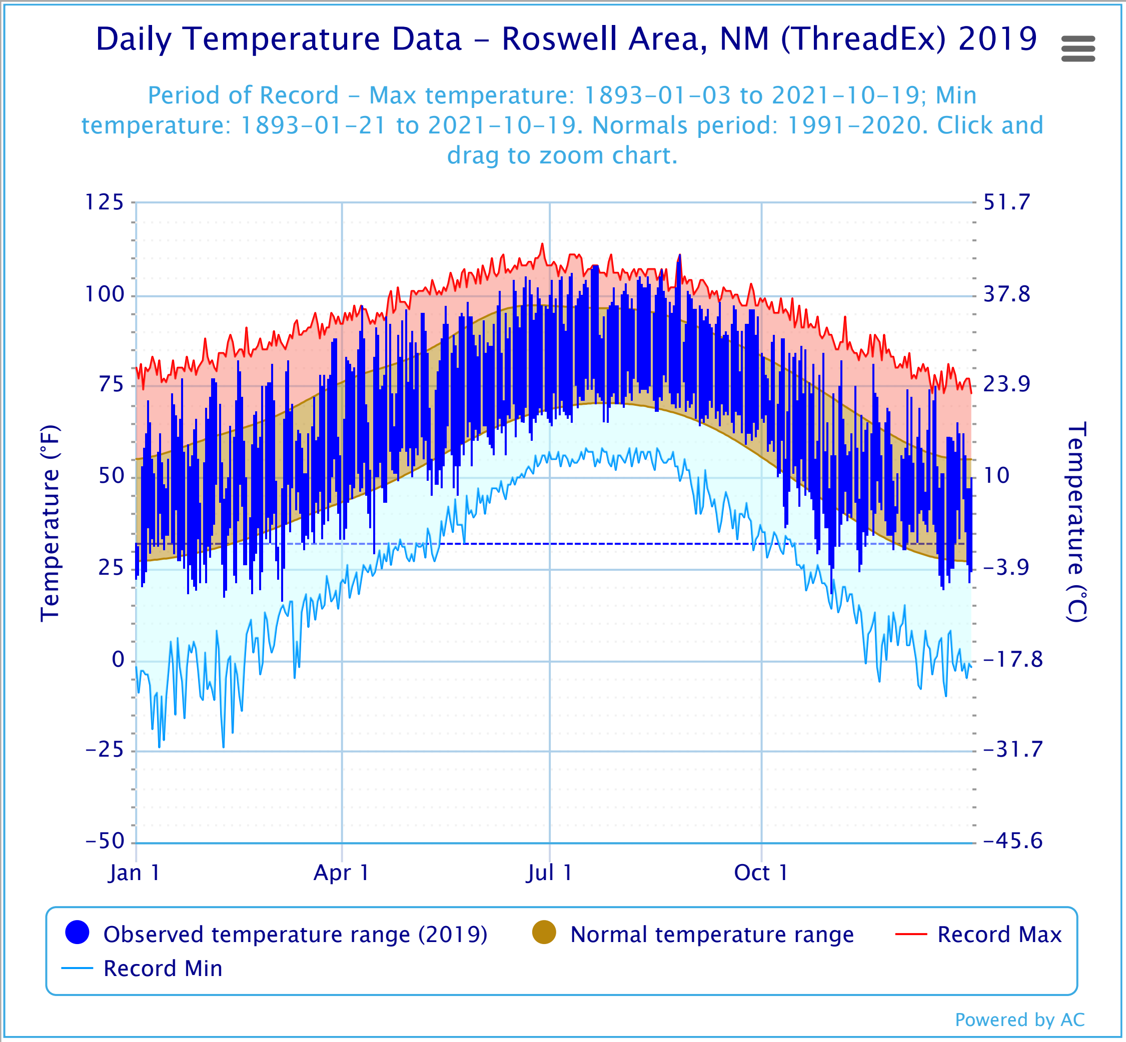
Ms. Stacy Boultinghouse, PG
Environmental Manager
Transwestern Pipeline Company, LLC
Stacy.Boultinghouse@energytransfer.com

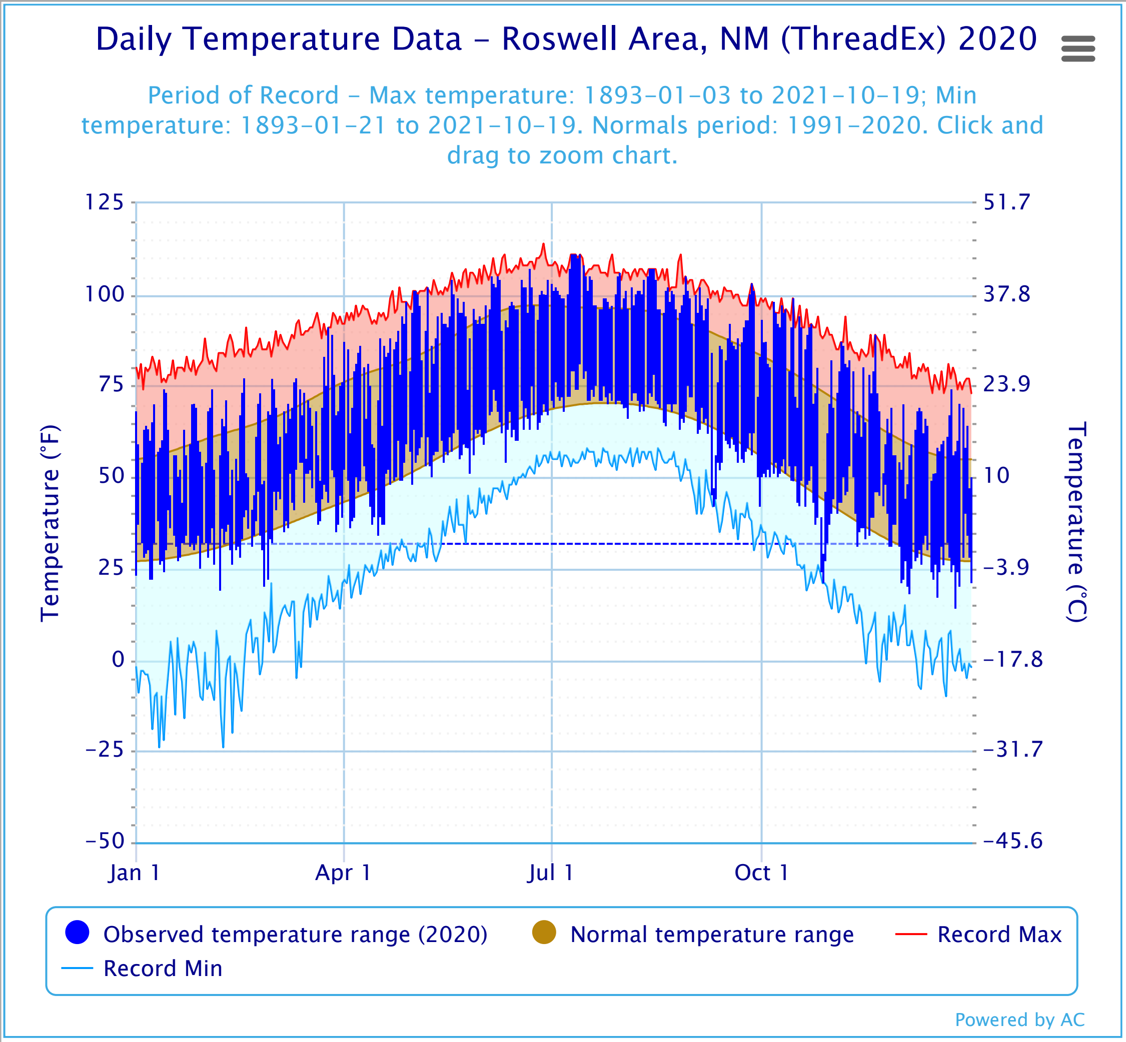
Attachment: Temperature Graphs 2017-2021 for Roswell, NM

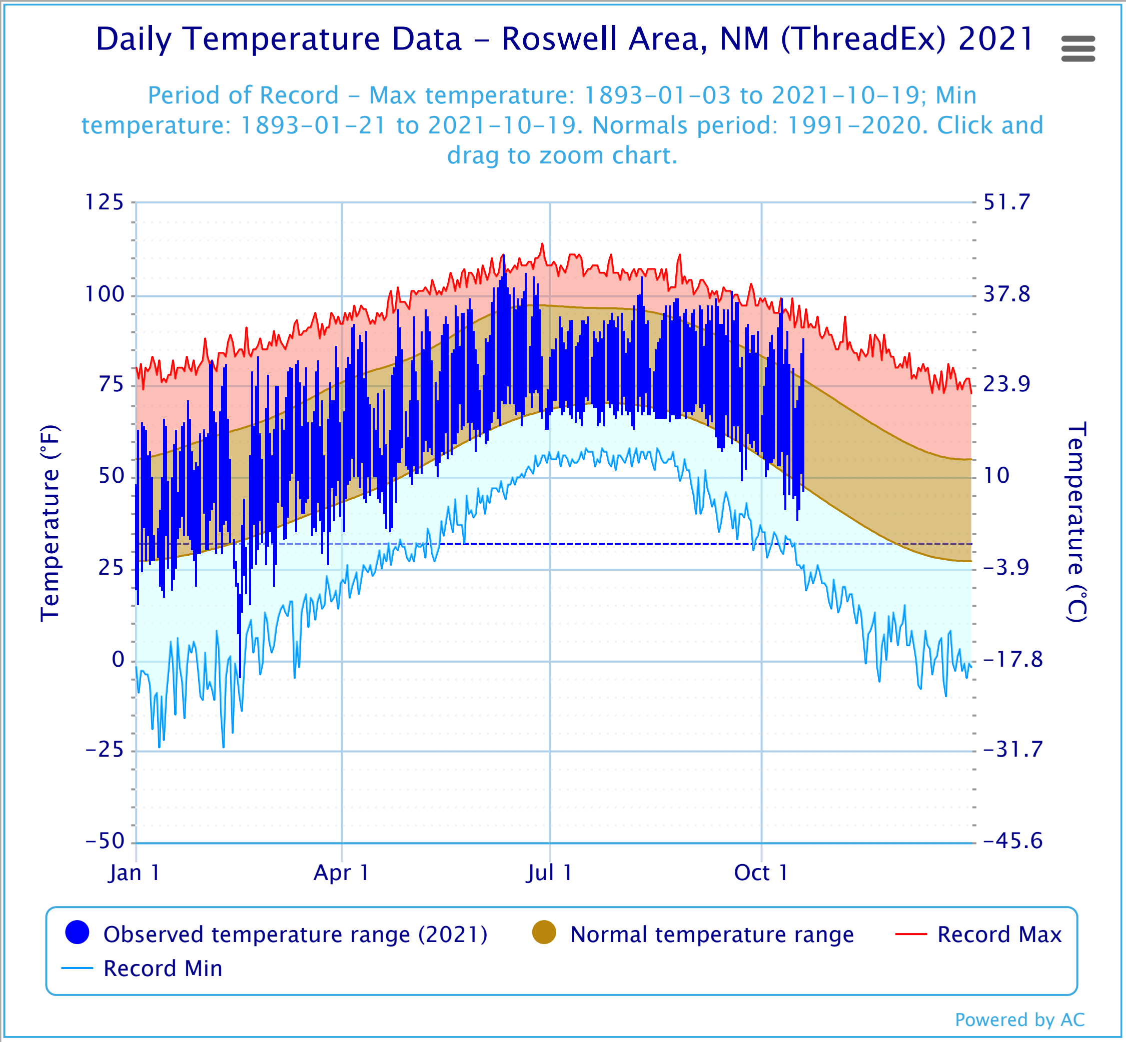
Cc: D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
M. Bratcher, NMOCD
B. Billings, NMOCD
L. King, USEPA Region 6
JD Haines, EarthCon
S. Diamond, EarthCon


Daily Temperature Data - Roswell Area, NM (ThreadEx) 2017
Period of Record - Max temperature: 1893-01-03 to 2021-10-19; Min temperature: 1893-01-21 to 2021-10-19. Normals period: 1991-2020. Click and drag to zoom chart.
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Temperature (°F)
Temperature (°C)
Jan 1
Apr 1
Jul 1
Oct 1
Observed temperature range (2017)
Normal temperature range
Record Max
Record Min
Powered by AC


Daily Temperature Data - Roswell Area, NM (ThreadEx) 2018
Period of Record - Max temperature: 1893-01-03 to 2021-10-19; Min temperature: 1893-01-21 to 2021-10-19. Normals period: 1991-2020. Click and drag to zoom chart.
Temperature (°F)
Temperature (°C)
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Jan 1
Apr 1
Jul 1
Oct 1
Observed temperature range (2018)
Normal temperature range
Record Max
Record Min
Powered by AC


Daily Temperature Data - Roswell Area, NM (ThreadEx) 2019
Period of Record - Max temperature: 1893-01-03 to 2021-10-19; Min temperature: 1893-01-21 to 2021-10-19. Normals period: 1991-2020. Click and drag to zoom chart.
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Temperature (°F)
Temperature (°C)
Jan 1
Apr 1
Jul 1
Oct 1
Observed temperature range (2019)
Normal temperature range
Record Max
Record Min
Powered by AC


Daily Temperature Data - Roswell Area, NM (ThreadEx) 2020
Period of Record - Max temperature: 1893-01-03 to 2021-10-19; Min temperature: 1893-01-21 to 2021-10-19. Normals period: 1991-2020. Click and drag to zoom chart.
Temperature (°F)
Temperature (°C)
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Jan 1
Apr 1
Jul 1
Oct 1
Observed temperature range (2020)
Normal temperature range
Record Max
Record Min
Powered by AC


Daily Temperature Data - Roswell Area, NM (ThreadEx) 2021
Period of Record - Max temperature: 1893-01-03 to 2021-10-19; Min temperature: 1893-01-21 to 2021-10-19. Normals period: 1991-2020. Click and drag to zoom chart.
Temperature (°F)
Temperature (°C)
125
100
75
50
25
0
-25
-50
51.7
37.8
23.9
10
-3.9
-17.8
-31.7
-45.6
Jan 1
Apr 1
Jul 1
Oct 1
Observed temperature range (2021)
Normal temperature range
Record Max
Record Min
Powered by AC

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District IV
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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 152528

CONDITIONS

Operator:	
Transwestern Pipeline Company, LLC 8501 Jefferson NE Ave Albuquerque, NM 87113	OGRID: 329750
	Action Number: 152528
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Accepted for the record. See app ID 154725 for most updated status.	11/22/2022