

NV

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS FORMER SURFACE IMPOUNDMENTS TRANSWESTERN COMPRESSOR STATION NO. 9 (ROSWELL COMPRESSOR STATION) 6381 NORTH MAIN STREET ROSWELL, CHAVES COUNTY, NEW MEXICO NMOCD GW-052 NMED 1656; EPA ID NMD986676955

PREPARED FOR:

TRANSWESTERN PIPELINE COMPANY, LLC 1300 MAIN HOUSTON, TEXAS 77002

PREPARED BY:

EARTHCON CONSULTANTS, INC. 14405 WALTERS ROAD, SUITE 700 HOUSTON, TEXAS 77014 281.240.5200

EarthCon Project No. 02.20180005.00

June 2021

Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Former Surface Impoundments Transwestern Compressor Station No. 9 (Roswell Compressor Station) 6381 North Main Street Roswell, Chaves County, New Mexico NMOCD GW-052 NMED 1656; EPA ID NMD986676955

Prepared For:

Transwestern Pipeline Company, LLC 1300 Main Houston, TX 77002

June 2021 EarthCon Project No. 02.20180005.00

EarthCon Consultants, Inc. (EarthCon) is submitting to Transwestern Pipeline Company, LLC (Transwestern) this *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* for the Roswell Compressor Station in Roswell, Chaves County, New Mexico. This report has been prepared for the exclusive use of and reliance by Transwestern and may not be relied upon by any other person or entity without the express written authorization of EarthCon.

Any reliance, use, or re-use of this document (or the opinions, findings, conclusions, or recommendations if any represented herein), by parties other than those expressly authorized by EarthCon is at the sole risk of those parties. This report was prepared by or performed under the direction of the EarthCon Professionals listed below and approved by Transwestern.

Signed:

Sofie Weber Senior Professional EarthCon Consultants, Inc.

Steve Diamond

Steve Diamond, PE (AL, GA, LA, MO, SC, MI) Senior Engineer EarthCon Consultants, Inc.

J.D. Haines, LPG (IN) Principal Geologist EarthCon Consultants, Inc.

Date: 6/28/2021

3 | Page Project #: 02.20180005.00 June 2021 Copyright © 2021 EarthCon Consultants, Inc. All Rights Reserved EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS @

EARTHCON°

Environmental Challenges

BUSINESS SOLUTIONS ®

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

TABLE OF CONTENTS

1.0	INTRODUCTION	. 5
2.0	PERCH AQUIFER EVALUATION	.5
2.1	PSH Thickness	. 7
2.2	Groundwater Analytical Results	. 7
3.0	FUTURE CORRECTIVE ACTION RECOMMENDATIONS	7

TABLES

Table 2-1	Summary of Perched Aquifer Well Completion Details
Table 2-2	Summary of Groundwater Surface Elevations for Wells in the Perched Aquifer
Table 2-3	Summary of Groundwater Analytical Results in the Perched Aquifer
FIGURES	
Figure 1-1	Project Area Location Map
Figure 1-2	Project Area Features
Figure 2-2a	Distribution of PSH in the Perched Aquifer, May 2020
Figure 2-2b	Distribution of PSH in the Perched Aquifer, November 2020
Figure 3-1	Distribution of Dissolved BTEX in the Perched Aquifer, November 2020
Figure 3-2	Distribution of Dissolved Benzene in the Perched Aquifer, November 2020
Figure 3-3	Distribution of Dissolved 1,1-DCE in the Perched Aquifer, November 2020

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014



1.0 INTRODUCTION

This *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* was prepared by EarthCon Consultants, Inc. (EarthCon) on behalf of Transwestern Pipeline Company, LLC (Transwestern) to summarize the results of a perched aquifer evaluation and evaluate future corrective actions associated with the Former Surface Impoundments at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property, located at 6381 North Main Street in Roswell, New Mexico (the "Site"). Historic reports indicate the potential for perched aquifer conditions intersecting the soil vapor extraction (SVE) wells and RW-1, all of which are located on the Transwestern site near the former surface impoundments.

The Facility is an active natural gas compressor station, owned and operated by Transwestern, located approximately 8 miles north of the city center of Roswell, New Mexico along the eastern side of U.S. Highway 285. The Facility occupies approximately 77 acres of land in Section 21 (SW¼ of the SW¼) and Section 28 (NW¼ of the NW¼) of Township 9S and Range 24E, Chaves County, New Mexico (**Figure 1-1**). Access is via U.S. Highway 285, and the entire Facility is secured by a chain-link fence with locked gates. The Project Area encompasses a portion of the northeast corner of the Facility and a portion of a 40-acre easement of land to the northeast, leased from the New Mexico State Land Office (SLO) State Trust Land for remediation and monitoring purposes (**Figure 1-2**).

Comment 4 of the NMED's Approval with Modifications Laboratory Results Submittal for SVE and RW-1 Wells and Additional Laboratory Results for SVE and RW-1 Wells, dated February 21, 2020, requires a report that summarizes the results of the perched zone evaluation. Further, Comment 1 of the NMED's Additional Response to Comments 10/14/2020, dated April 9, 2021, requests a standalone report evaluating and recommending corrective action for the perched aquifer.

2.0 PERCH AQUIFER EVALUATION

According to historical groundwater gauging data, field personnel observed the presence of water at depths between 28 feet below ground surface (bgs) and 35 feet bgs in certain soil vapor extraction (SVE) wells, while other SVE wells remained dry. Two of the deepest wells in the perched aquifer, RW-1 and SVE-30, are both over 41 ft BTOC with measurable groundwater. Wells SVE-23 and SVE-28 are each approximately 36 ft BTOC and typically have measurable

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS @

EARTHCON[®]

Environmental Challenges

BUSINESS SOLUTIONS ®

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

groundwater, including the year 2020. Wells SVE-25, SVE-27 and SVE-31, the shallowest wells in the perched aquifer (approximately 33 ft BTOC) often do not have water, and SVE-25 and SVE-27 were dry in 2020.

Boring logs developed for SVE, and the deeper multiphase extraction (MPE) wells were reviewed, which did not note a distinct water bearing zone between the surface and 50 feet bgs. In the MPE wells, groundwater was reported to be approximately 60 feet bgs. Considering the presence and absence (dry) of groundwater in certain SVE wells at various times and the construction depth of these wells, it was suspected that a combination of rainwater and condensate buildup within the SVE piping conveyance network could be back flowing and contributing to the water that was being observed in certain SVE wells. Further investigation was performed in the field to identify the source of the water in the SVE wells.

Further review of the suspected perch aquifer was conducted by recovering water from RW-1 until dry and monitoring rebound over time. Beginning in April 2020, groundwater was extracted from recovery well RW-1 to evaluate the perched aquifer. However, the extraction process was deactivated after a short period due to groundwater volumes unexpectedly reaching the storage tank capacity, and the evaluation was suspended pending further review of the process and results.

The evaluation of the perched aquifer in RW-1 resumed on September 23, 2020, and continued to October 20, 2020. Prior to installing a pump, the groundwater level was measured as 33.55 feet below top of casing (btoc). The pump inlet was lowered to approximately 38 feet btoc and the pump recovered groundwater at an average rate of approximately 0.16 gallons per minute during the evaluation period. Groundwater levels were measured daily in RW-1 to evaluate recharge of the well. According to liquid levels, the groundwater was drawn down to approximately 37.5 feet before stabilizing. The pump was deactivated, and groundwater recharged at a rate of approximately 0.2 feet per day. Based on pump evaluation on RW-1 and historical groundwater gauging data in SVE wells, a perch aquifer may exist in this portion of the site.

Further review of historical documents revealed that an initial field site assessment performed in 1991 reported the presence of a perched aquifer which intersected wells SVE-23, SVE-25, SVE-27, SVE-28, SVE-30, SVE-31, and RW-1. A summary of construction information for wells in the perched aquifer is provided in **Table 2-1**, and groundwater elevations for wells in the perched

aquifer are shown in **Table 2-2**.

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014



2.1 **PSH Thickness**

Liquid levels were measured in SVE wells and RW-1 using an optical interface probe to determine the presence and apparent thickness of PSH (phase separated hydrocarbons). According to historical liquid levels, SVE-23 was the only well to consistently contain PSH; however, recently, PSH has been observed in SVE-25 in November 2020 after 11 years of no detections. The apparent thickness of 3.0 feet and 0.10 foot was measured in SVE-23 and SVE-25 in April 2021, respectively. Distribution of PSH apparent thickness is presented in **Figures 2-2a** and **2-2b**. Further PSH monitoring will continue for SVE-23 and SVE-25 in 2021.

2.2 Groundwater Analytical Results

Groundwater samples were collected and analyzed for BTEX by EPA method 8260 or for VOCs via EPA Method 8260B, and 1,4-dioxane was analyzed by EPA method 8270SIM in accordance with the approved *Sampling and Analysis Plan* (SAP). The analytical results for groundwater samples in the are summarized in **Table 3-1**. Wells in the perched aquifer that had measurable groundwater and did not contain PSH (i.e., RW-1, SVE-28, SVE-30, and SVE-31) were sampled. Wells SVE-23 and SVE-25 contained water and PSH, while SVE-27 was dry and did not have measurable PSH.

In summary, BTEX constituents were detected above laboratory reporting limits in wells SVE-28, SVE-30, and RW-1. Benzene exceeded the Groundwater Concentration Limit (GCL) in both SVE-30 and RW-1, and 1,1-DCA exceeded the GCL in SVE-30. Based on the 2020 analytical data, the areal distribution of BTEX, Benzene, and 1,1-DCA in the Perched Aquifer remains delineated within the Project Area boundaries and within the limits of the plume in the lower water bearing unit; as well as being consistent with the 2019 data for those wells (**Figures 3-1** through **3-3**).

3.0 FUTURE CORRECTIVE ACTION RECOMMENDATIONS

In correspondence dated July 2, 2020, and November 25, 2020, NMED requested that Transwestern suspend PSH recovery activities in SVE-23 and monitor PSH thickness over time. Transwestern recommends that PSH recovery via manual bailing be initiated immediately in SVE-23 and SVE-25 considering the overall corrective action objective for the site. It is apparent that LNAPL is present at recoverable thicknesses and PSH will be monitored for rebound after selected recovery event.

Since SVE-23 and most recently SVE-25 are the only wells in the Perched Aquifer to contain PSH, it is believed that the PSH appearances may be residual product that may have accumulated

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS ®

EARTHO

Environmental Challenges

BUSINESS SOLUTIONS®

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

in those wells after source removal activities. Historical PSH measurements in wells located in the perched aquifer and upper aquifer indicate that the PSH footprint has stabilized or decreased.

Liquid levels and recovery data collected from bailing activities has been evaluated and the current remediation system is effective showing a decrease in BTEX, and 1,1-DCE concentrations. Due to the current results of the PSH plume and dissolved-phase concentrations, additional delineation does not appear warranted at this time.

4.0 **REFERENCES**

Roswell Shallow Subsurface Investigation by Harding Lawson Associates, June 20, 1991

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014

P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS ®

Table 2-1. Summary of Perched Aquifer Well Completion DetailsTranswestern Compressor Station No. 9 - Roswell, NM

Well	Date of Completion	Total Depth of Boring (ft bgs)	Measured Depth of Well (ft from TOC)	Surface Completion Type	Casing Diameter (in.)	Screen Interval (ft bgs)	Top of Sand Pack (ft bgs)
RW-1	06/13/93	42.5	41.47	Flush Mount	4	36.8 - 41.7	34.75
SVE-1A	09/21/96	30	29.65	Flush Mount	2	20-30	19
SVE-2A	09/20/96	30	29.83	Flush Mount	2	20-30	17.5
SVE-22	11/07/02	35	33.20	Flush Mount	2	25-35	23
SVE-23	11/07/02	39	36.70	Flush Mount	2	25-35	22
SVE-24	11/13/02	30	28.85	Flush Mount	2	20-30	18
SVE-25	11/04/02	34	53.30	Flush Mount	2	24-34	21.6
SVE-26	11/05/02	35	32.45	Flush Mount	2	24-34	22
SVE-27	11/01/02	35	33.90	Flush Mount	2	20-35	18
SVE-28	10/29/02	35	36.00	Flush Mount	2	25-35	23
SVE-30	10/25/02	45	44.00	Flush Mount	2	20-45	18
SVE-31	10/28/02	35	33.95	Flush Mount	2	25-35	23

Note:

ft bgs - feet below ground surface TOC - top of casing in. - inches na - not applicable Prepared by: HRB 3/2/21 Checked by: SWS 3/2/21

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below	PSH (ft)	Groundwater Surface Elevation (ft)
SVF-1A	6/24/2019	NA	(a)	drv	(a)	NA
012	1/5/2020	101	(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
SVE-2A	6/24/2019	NA	(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
SVE-22	3/10/2009	NA	33.00	33.20	0.20	NA
	10/8/2009		32.92	33.10	0.18	NA
	1/26/2010		33.05	33.05 (TD)	0.00	NA
	3/22/2010		33.02	33.02 (TD)	0.00	NA
	4/17/2011		32.90	33.00 (TD)	0.10	NA
	12/22/2011		(a)	33.04	(a)	NA
	4/17/2012		(a)	33.00 (TD)	(a)	NA
	10/18/2012		(a)	33.00 (TD)	(a)	NA
	4/15/2013	2616 76 (h)	(a)	32.98	(a)	NA 2 502 60
	F/1/2014	3010.70 (11)	(a)	33.08 dr/	(a)	3,383.08
	0/1/2014 11/21/2014		(a)	dry	(a)	
	11/21/2014		(a)	dry	(a)	
	4/21/2015		(a)	01y 22.11	(a) 0.11	NA 2 502 72
	1/20/2015		32.00	33.00	0.11	3,583,78
	4/29/2010		32.94	32.09	0.13	3,583.04
	5/22/2017		33.00	33.10	0.17	3 583 74
	11/13/2017		33.14	33.10	0.10	3 583 61
	6/1/2018		33.02	33 10	0.08	3 583 72
	11/6/2018		(a)	33.05	(a)	3.583.71
	6/24/2019		32.74	32.75	0.01	3,584.02
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
SVE-23	3/10/2009	NA	32.78	36.75	3.97	NA
	10/8/2009		33.01	33.79	0.78	NA
	1/26/2010		33.12	36.98 (TD)	3.86	NA
	3/22/2010		32.09	33.65	1.56	NA
	4/17/2011		33.00	33.30	0.30	NA
	12/22/2011		33.60	34.05	0.45	NA
	4/17/2012		33.62	34.10	0.48	NA
	10/18/2012		34.11	34.68	0.57	NA
	4/15/2013		33.65	33.92	0.27	NA
	11/3/2013	3612.45 (h)	33.73	36.52	2.79	3,578.05
	5/1/2014		33.78	36.80	3.02	3,577.95
	11/21/2014		32.15	32.84	0.69	3,580.13
	4/21/2015		32.75	33.4	0.65	3,579.54
	11/3/2015		32.74	33.07	0.33	3,579.63
	4/29/2016		33.01	33.33	0.32	3,579.36
	11/16/2016		33.37	33.82	0.45	3,578.97
	5/22/2017		33.60	34.15	0.55	3,578.72
	11/13/2017		32.64	33.28	0.64	3,579.66
	6/1/2018		33.27	33.95	0.68	3,579.02
	11/6/2018		32.55	35.70	3.15	3,579.14
	6/24/2019			Not Gauged - Snake	e Hazard Exist in Vaul	Ĺ
	1/5/2020		33.10	33.75	0.65	3,579.19
	5/13/2020		33.52	36.50	2.98	3,578.21
	11/10/2020		33.70	34.87	1.17	3,578.47
	1/18/2021		33.80	34.88	1.08	3,578.39
	2/10/2021		33.78	34.87	1.09	3,578.41
	3/8/2021		33.85	34.88	1.03	3,578.35
	4/5/2021		34.00	37.00	3.00	3,577.73

				Denth to		Groundwater
Well ID	Date	TOC elevation (ft)	Depth to	Groundwater (ft below	PSH (ft)	Surface
	Duto		PSH (ft below TOC)	TOC)		Elevation (ft)
SVE-24	3/10/2009	NA	(a)	dry	(a)	NA
	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3608 97 (h)	(a)	dry	(a)	NA
	5/1/2014	0000.07 (11)	(a)	dry	(a)	ΝΔ
	11/21/2014		(a)	dry	(a)	NΔ
	//21/2014		(a)	28.61	(a)	3 580 36
	11/3/2015		(a)	20.01	(a)	0,000.00 ΝΔ
	//27/2016		(a)	dry	(a)	NΔ
	11/16/2016		(a)	dry	(a)	ΝΔ
	5/22/2017		(a)	dry	(a)	NA NA
	11/13/2017		(a)	dry	(a)	NΔ
	5/31/2018		(a)	dry	(a)	NΔ
	11/6/2018		(a)	dry	(a)	ΝA
	6/24/2010		(a)	dry	(a)	NA NA
	1/6/2020		(a	dry	(a)	NA NA
	5/12/2020		(a)	dry	(a)	NA NA
	11/0/2020		(a)	dry	(a)	NA NA
S\/E_25	3/10/2000	NΛ	(a)	32.70	(a)	NA NA
071-20	10/8/2009		(a)	32.70	(a)	
	1/26/2010		(a)	31.40 dn/	(a)	NA NA
	3/22/2010		(a)	32.80	(a)	NA NA
	3/22/2010		(a)	32.00	(a)	NA NA
	12/22/2011		(a)	32.25	(a)	
	12/22/2011		(a)	32.05 dn/	(a)	NA NA
	4/11/2012		(a)	32.70	(a)	NA NA
	10/10/2012		(a)	32.70 dn/	(a)	NA NA
	4/13/2013	3617.02 (b)	(a)	32.72	(a)	3 58/ 30
	5/1/2017	3017.02 (II)	(a)	32.72	(a)	3,584,32
	11/21/2014		(a)	dry	(a)	0,004.02 ΝΔ
	4/21/2015		(a)	32.73	(a)	3 584 29
	11/3/2015		(a)	dry	(a)	0,004.20 ΝΔ
	4/29/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	31.88	(a)	3 585 14
	6/1/2018		(a)	32.6	(a)	3 584 42
	11/6/2018		(a)	31 75	(a)	3 585 27
	6/24/2019		(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NΔ
	11/10/2020		32.5	32.69	0 19	3 584 47
	1/18/2021		32.6	32 71	0 11	3 584 39
	2/10/2021		32.57	32.7	0.13	3 584 42
	3/8/2021		32.55	32.82	0.27	3 584 41
	4/5/2021		32.65	32.75	0.1	3 584 35
		1	02.00	00	0.1	0,007.00

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-26	3/10/2009	NA	(a)	dry	(a)	NA
	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3614.43 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	32.6	(a)	3,581.83
	11/3/2015		(a)	dry	(a)	NA
	4/29/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA
	5/22/2017		(a)	drv	(a)	NA
	11/13/2017		(a)	drv	(a)	NA
	6/1/2018		(a)	drv	(a)	NA
	11/6/2018		(a)	drv	(a)	NA
	6/24/2019		(a)	drv	(a)	NA
	1/5/2020		(a)	drv	(a)	NA
	5/13/2020		(a)	drv	(a)	NA
	11/10/2020		(a)	drv	(a)	NA
SVE-27	3/10/2009	NA	(a)	32.92	(a)	NA
	10/8/2009		(a)	33.63	(a)	NA
	1/26/2010		(a)	drv	(a)	NA
	3/22/2010		(a)	33.70	(a)	NA
	4/17/2011		(a)	33 70	(a)	NA
	12/22/2011		(a)	33.83	(a)	NA
	4/17/2012		(a)	drv	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	33.82	(a)	NA
	11/3/2013	3613 19 (h)	(a)	drv	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	33.01	(a)	3.580.18
	4/21/2015		(a)	33.58	(a)	3.579.61
	11/3/2015		(a)	33.54	(a)	3.579.65
	4/29/2016		(a)	33.82	(a)	3 579 37
	11/16/2016		(a)	34.15	(a)	3,579.04
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	33.48	(a)	3,579.71
	6/1/2018		(a)	34.00	(a)	3,579.19
	11/6/2018		(a)	33.31	(a)	3,579.88
	6/24/2019			Not G	auged	
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-28	3/10/2009	NA	(a)	28.60	(a)	NA
	10/8/2009		(a)	28.95	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	29.07	(a)	NA
	4/17/2011		(a)	29.17	(a)	NA
	12/22/2011		(a)	29.65	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	33.58	(a)	NA
	11/3/2013	3607.84 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	28.59	(a)	3,579.25
	4/21/2015		(a)	28.86	(a)	3,578.98
	11/3/2015		(a)	28.75	(a)	3,579.09
	4/27/2016		(a)	28.97	(a)	3,578.87
	11/16/2016		(a)	29.18	(a)	3,578.66
	5/22/2017		(a)	29.44	(a)	3,578.40
	11/13/2017		(a)	28.76	(a)	3,579.08
	6/1/2018		(a)	29.15	(a)	3,578.69
	11/6/2018		(a)	28.53	(a)	3,579.31
	6/24/2019		(a)	28.97	(a)	3,578.87
	1/5/2020		(a)	28.81	(a)	3,579.03
	5/13/2020		(a)	29.05	(a)	3,578.79
	11/10/2020		(a)	29.73	(a)	3,578.11
SVE-30	3/10/2009	NA	(a)	39.32	(a)	NA
	10/8/2009		(a)	39.29	(a)	NA
	3/22/2010		(a)	40.28	(a)	NA
	4/17/2011		(a)	40.11	(a)	NA
	12/22/2011		(a)	41.11	(a)	NA
	4/17/2012		(a)	41.65	(a)	NA
	10/18/2012		(a)	41.42	(a)	NA
	4/15/2013		(a)	41.67	(a)	NA
	11/3/2013	3616.00 (h)	(a)	43.02	(a)	3,572.98
	5/1/2014		(a)	43.35	(a)	3,572.65
	11/21/2014		(a)	43.30	(a)	3,572.70
	4/21/2015		(a)	41.80	(a)	3,574.20
	11/3/2015		(a)	41.60	(a)	3,574.40
	4/28/2016		(a)	41.56	(a)	3,574.44
	11/16/2016		(a)	41.23	(a)	3,574.77
	5/22/2017		NA	NA	NA	NA
	11/13/2017		(a)	42.00	(a)	3,574.00
	6/1/2018		(a)	42.02	(a)	3,573.98
	11/6/2018		(a)	42.46	(a)	3,573.54
	6/24/2019		(a)	42.52	(a)	3,573.48
	1/5/2020		(a)	42.45	(a)	3,573.55
	5/13/2020		(a)	42.55	(a)	3,573.45
	11/10/2020		(a)	43.05	(a)	3,572.95

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-31	3/10/2009	NA	(a)	30.45	(a)	NA
	10/8/2009		(a)	30.43	(a)	NA
	1/26/2010		(a)	30.55	(a)	NA
	3/22/2010		(a)	31.49	(a)	NA
	4/17/2011		(a)	drv	(a)	NA
	12/22/2011		(a)	28.50	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3612.67 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	30.27	(a)	3.582.40
	4/21/2015		(a)	30.97	(a)	3.581.70
	11/3/2015		(a)	30,200	(a)	3 582 47
	4/28/2016		(a)	30.35	(a)	3 582 32
	11/16/2016		(a)	30.73	(a)	3 581 94
	5/22/2017		(a)	drv	(a)	NA
	11/13/2017		(a)	30.48	(a)	3.582.19
	6/1/2018		(a)	drv	(a)	NA
	11/6/2018		(a)	30.24	(a)	3,582.43
	6/24/2019		(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	31.65	(a)	3,581.02
RW-1	3/10/2009	NA	(a)	33.17	(a)	NA
	10/8/2009		(a)	33.48	(a)	NA
	3/22/2010		(a)	33.62	(a)	NA
	4/17/2011		(a)	33.80	(a)	NA
	12/22/2011		(a)	34.26	(a)	NA
	4/17/2012		(a)	34.57	(a)	NA
	10/18/2012		(a)	35.16	(a)	NA
	4/15/2013		(a)	35.77	(a)	NA
	11/3/2013	3612.72 (h)	(a)	34.95	(a)	3,577.77
	4/30/2014		(a)	35.48	(a)	3,577.24
	11/19/2014		(a)	32.46	(a)	3,580.26
	4/21/2015		(a)	33.08	(a)	3,579.64
	11/3/2015		(a)	33.00	(a)	3,579.72
	4/28/2016		(a)	33.32	(a)	3,579.40
	11/16/2016		(a)	33.70	(a)	3,579.02
	5/22/2017		(a)	34.03	(a)	3,578.69
	11/13/2017		(a)	32.96	(a)	3,579.76
	6/1/2018		(a)	33.62	(a)	3,579.10
	11/6/2018		(a)	32.82	(a)	3,579.90
	6/24/2019		(a)	33.57	(a)	3,579.15
	1/5/2020		(a)	33.38	(a)	3,579.34
	5/13/2020		(a)	33.68	(a)	3,579.04
	11/10/2020		(a)	34.55	(a)	3,578.17

Notes:

PSH - Phase separated hydrocarbon

ft - feet

TOC - Top of Casing

Corrections to ground water surface elevation for PSH is calculated assuming a specific gravity of 0.76 (NA) Information not available

(a) Not applicable since no measurable thickness of PSH is present

Historical data before 2009 is presented in previous reports

Historical data for wells that were plugged and abandoned is not shown.

April 2021 Project No. 02.20180005.00 Prepared by: SWS 4/6/21 Checked by: HRB 4/6/21

Table 3-1. Summary of Groundwater Analytical Results in the Perched Aquifer Transwestern Compressor Station No. 9 - Roswell, NM

Well	Sampling Date	Benzene	Toluene	Ethylbenzene	Xylenes (total)	1,1-Dichloroethane	1,1-Dichloroethene	Vinyl Chloride
NMV	VQCC Human Health Standard	10	750	750	620	25	5	1
	USEPA MCL	5	1,000	700	10,000		7	2
	Tap Water (2012)	4.13	2280	14.8	-	24.2	340	0.16
Groundwater Cleanup Level (GCL)		5	750	700	620	25	5	1
SVE-28	11/12/18	14	<1.0	<1.0	<1.5	NA	NA	NA
	06/26/19	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0
	01/08/20	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0
	11/23/20	1.3	<1.0	<1.0	<1.5	1.3	<1.0	<1.0
SVE-30	11/12/18	15	<5.0	41	<7.5	NA	NA	NA
	06/26/19	10	<5.0	24	<7.5	30	<5.0	<5.0
	01/08/20	8.9	<5.0	29	<7.5	32	<5.0	<5.0
	09/10/20	8.6	<5.0	20	<7.5	25	<5.0	<5.0
	11/23/20	5.7	<1.0	8	<1.5	33	NA	NA
SVE-31	11/12/18	<1.0	<1.0	<1.0	<1.5	NA	NA	NA
	11/23/20	<1.0	<1.0	<1.0	<1.5	NA	NA	NA
RW-1	11/12/18	32	<1.0	1.4	<1.5	NA	NA	NA
	06/26/19	51	<1.0	1.4	<1.5	12	<1.0	<1.0
	01/08/20	26	<1.0	1.5	<1.5	4.3	<1.0	<1.0
	09/10/20	25	<1.0	6.2	<1.5	3.1	<1.0	<1.0
	11/23/20	38	<1.0	13	7.9	3.5	<1.0	<1.0

Notes:

Bold indicates that the analytical result exceeds the applicable regulatory limits.

* - Phase separated hydrocarbons (PSH) present in well. Sample collected below PSH.

-- Data not available.

Only constituents detected in one or more groundwater samples are shown in this table

All results reported above the applicable standard are shown in bold type

Results reported in micrograms per liter (μ g/L)

NA - Not analyzed; constituent is not part of the sampling plan

NMWQCC - New Mexico Water Quality Control Commission

NMWQCC Human Health Standards - from New Mexico Administrative Code (NMAC) 20.6.2, Part A, Human Health Standards. Used as GCL for target cleanup if lower than the MCL.

USEPA MCL - United States Environmental Protection Agency's Maximum Concentration Limit. Used as GCL for target cleanup if lower than the NMWQCC Human Health Standard.

Tap Water (2012) - From Table A-1 for the 2012 NMED Risk Assessment Guidance for Site Investigation and Remediation. Used as GCL for target cleanup if WQCC standard nor MCL has been established.

.

Prepared by: SWS 5/20/21

Checked by: HRB 6/6/2021



Received by OCD: 10/21/2022 8:48:57 AM































NV



January 27, 2022

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

EPA ID No. NMD986676955

HWB-TWP-21-002

RE: Response to Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Roswell Compressor Station No. 9 Transwestern Pipeline Company Roswell, Chaves County, New Mexico NMOCD Abatement Plan #AP-125 (formerly #GW-052)

Dear Mr. Shean;

Transwestern Pipeline, LLC (Transwestern) submits this *Response to Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* regarding the comments received from the New Mexico Environment Department (NMED) via the letter titled *Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* 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.

Comment 1

In Section 2.0, Perched Aquifer Evaluation, page 6, the Respondent states, "[b]oring logs developed for SVE, and the deeper multiphase extraction (MPE) wells were reviewed, which did not note a distinct water bearing zone between the surface and 50 feet bgs." The referenced boring logs were not included in the Report. Provide all relevant boring logs and well construction diagrams in the revised Report or reference the previously submitted documents that present the logs and well construction diagrams.

Boring logs are included in Attachment 1 in the revised Report.

Comment 2

In Section 2.2, Groundwater Analytical Results, page 7, the Respondent states, "[g]roundwater samples were collected and analyzed for BTEX by EPA method 8260 or for

January 27, 2022

Page 2 of 5

Response to Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9 Transwestern Pipeline Company, LLC

VOCs via EPA Method 8260B, and 1,4-dioxane was analyzed by EPA method 8270SIM in accordance with the approved Sampling and Analysis Plan (SAP). The analytical results for groundwater samples in the are summarized in Table 2-3." Table 2-3, Summary of Groundwater Analytical Results in the Perched Aquifer did not include analytical results for 1,4-dioxane. Revise the table to include the results of 1,4-dioxaine analysis in the revised Report. In addition, the page number and designation of the table in the footer of Table 2-3 are shown as page 7 of 7 and Table 3-5, respectively. They are incorrect and must be revised to present correct page number (page 1 of 1) and designation of the table (Table 2-3). Correct the page number and designation of the table in the revised Report.

Table 2-3 has been revised to include 1,4-dioxane results. The footer has been updated on Table 2-3.

Comment 3

In Section 2.2, Groundwater Analytical Results, page 7, the Respondent states, "[b]ased on the 2020 analytical data, the areal distribution of BTEX, Benzene, and 1,1-DCA in the Perched Aquifer remains delineated within the Project Area boundaries and within the limits of the plume in the lower water bearing unit; as well as being consistent with the 2019 data for those wells (Figures 3-1 through 3-3).

Section 2.0, Perch[ed] Aquifer Evaluation, pages 5 and 6, states, "[t]wo of the deepest wells in the perched aquifer, RW-1 and SVE-30, are both over 41 ft BTOC and consistently have measurable groundwater. Wells SVE-23 and SVE-28 are each approximately 36 ft BTOC and typically have measurable groundwater, including the year 2020. Wells SVE-22, SVE-25, SVE-27, and SVE-31 (all approximately 33 ft BTOC) often do not have water; SVE-22, SVE-27, and SVE-31 were dry during at least part of 2020. Wells SVE-24 and SVE-26 (28.9 and 32.5 ft BTOC, respectively) have not had measurable water in the past five years."

Section 2.0 indicates that a sufficient number of wells was not completed in the water bearing zone in the perched aquifer. Section 2.2 asserts that the perched aquifer remains delineated, but the assertion is not supported by the data provided by the Report. Many wells advanced to the perched aquifer are too shallow to produce water; therefore, they are not useful to support the assertion and the plumes are not delineated in the perched aquifer. Revise the Report to provide the data that supports the assertion or propose to submit a work plan to install wells to delineate the horizontal and vertical extent of the plumes in the perched aquifer in the revised Report. In addition, referencing depth relative to the top of well casings does not provide useful information since well stickups can vary. Depths relative to ground surface elevations provide useful information.

A work plan will be developed to provide details for delineating the horizontal and vertical extent of the plumes in the perched aquifer. The ground surface elevation is not included within the project files, therefore, the depth from the ground surface cannot be included within the revised

January 27, 2022

Page 3 of 5

Response to Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9 Transwestern Pipeline Company, LLC

Report. Surveying the ground elevations in these locations will be included within the forthcoming work plan.

Comment 4

In Section 3.0, Future Corrective Action Recommendations, page 7, the Respondent states, "Transwestern recommends that PSH recovery via manual bailing be initiated immediately in SVE-23 and SVE-25 considering the overall corrective action objective for the site. It is apparent that LNAPL is present at recoverable thicknesses and PSH will be monitored for rebound after selected recovery event[s]." The proposed interim measure is hereby approved. However, PSH recovery via manual bailing will not prevent PSH from expanding within and possibly beyond the perched aquifer. More effective remedies must be evaluated and proposed as an interim corrective measure in the revised Report.

Comment noted. Information related to PSH recovery in the perched aquifer is provided in the revised Report.

Comment 5

In Section 3.0, Future Corrective Action Recommendations, page 7, the Respondent states, [I]iquid levels and recovery data collected from bailing activities has been evaluated and the current remediation system is effective showing a decrease in BTEX, and 1,1-DCE concentrations. Due to the current results of the PSH plume and dissolved-phase concentrations, additional delineation does not appear warranted at this time." NMED does not agree with the statement. The contaminant concentrations are fluctuating in the groundwater samples collected from the perched aquifer according to Table 2-3. In addition, many wells advanced to the perched aquifer are too shallow to produce water; therefore, they are not useful for delineation. Furthermore, the current SVE wells advanced to the perched aquifer do not extract liquid PSH or contaminated groundwater and are not capable of containing the plumes. The horizontal and vertical extent of the plumes must be delineated, and more effective interim measures must be proposed to contain the plumes in the perched aquifer (see Comments 3 and 4 above). Revise the Report accordingly.

Comment noted. A work plan will be developed to provide details for delineating the horizontal and vertical extent of the plumes in the perched aquifer. This information is provided in the Revised Report.

January 27, 2022

Page 4 of 5

Response to Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9 Transwestern Pipeline Company, LLC

Comment 6

According to Table 2-1, Summary of Perched Aquifer Well Completion Details, the measured depth of well SVE-23 is recorded as 36.70 feet from the TOC. However, depth to groundwater in well SVE-23 is recorded as 37.00 feet below TOC according to Table 2-2, Summary of Groundwater Surface Elevations for Wells in the Perched Aquifer. Resolve the discrepancy in the revised Report. In addition, the page numbers and designation of the tables shown in the footer of the tables are incorrect. Correct the page numbers and designation of the tables in the revised Report (see Comment 2 above).

The footer on the included tables have been corrected. The depth to water collected on 4/5/2021 is a field error measurement, it has been footnoted on Table 2-2.

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,

Soultinghouse

Ms. Stacy Boultinghouse, PG Environmental Manager Transwestern Pipeline Company, LLC <u>Stacy.Boultinghouse@energytransfer.com</u>

Attachment : Revised Report

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



REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS FORMER SURFACE IMPOUNDMENTS TRANSWESTERN COMPRESSOR STATION NO. 9 (ROSWELL COMPRESSOR STATION) 6381 NORTH MAIN STREET ROSWELL, CHAVES COUNTY, NEW MEXICO NMOCD GW-052 NMED 1656; EPA ID NMD986676955

PREPARED FOR:

TRANSWESTERN PIPELINE COMPANY, LLC 1300 MAIN HOUSTON, TEXAS 77002

PREPARED BY:

EARTHCON CONSULTANTS, INC. 14405 WALTERS ROAD, SUITE 700 HOUSTON, TEXAS 77014 281.240.5200

EarthCon Project No. 02.20180005.00

June 2021 (REVISED January 2022)

Released to Imaging: 11/22/2022 9:37:14 AM

•

Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Former Surface Impoundments Transwestern Compressor Station No. 9 (Roswell Compressor Station) 6381 North Main Street Roswell, Chaves County, New Mexico NMOCD GW-052 NMED 1656; EPA ID NMD986676955

Prepared For:

Transwestern Pipeline Company, LLC 1300 Main Houston, TX 77002

June 2021 EarthCon Project No. 02.20180005.00

EarthCon Consultants, Inc. (EarthCon) is submitting to Transwestern Pipeline Company, LLC (Transwestern) this *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* for the Roswell Compressor Station in Roswell, Chaves County, New Mexico. This report has been prepared for the exclusive use of and reliance by Transwestern and may not be relied upon by any other person or entity without the express written authorization of EarthCon.

Any reliance, use, or re-use of this document (or the opinions, findings, conclusions, or recommendations if any represented herein), by parties other than those expressly authorized by EarthCon is at the sole risk of those parties. This report was prepared by or performed under the direction of the EarthCon Professionals listed below and approved by Transwestern.

Signed:

Sofie A. Weber- Srop

Sofie Weber Senior Professional EarthCon Consultants, Inc.

Steve Diamond

Steve Diamond, PE (AL, GA, LA, MO, SC, MI) Senior Engineer EarthCon Consultants, Inc.

J.D. Haines, LPG (IN) Principal Geologist EarthCon Consultants, Inc.

Date: 6/28/2021 (Revised 1/27/22)

3 | Page Project #: 02.20180005.00 June 2021 Copyright © 2021 EarthCon Consultants, Inc. All Rights Reserved EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS @

EARTHCON

Environmental Challenges

BUSINESS SOLUTIONS ®

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

TABLE OF CONTENTS

	5
PERCH AQUIFER EVALUATION	5
PSH Thickness	7
Groundwater Analytical Results	7
FUTURE CORRECTIVE ACTION RECOMMENDATIONS	7
REFERENCES	.8
	INTRODUCTION PERCH AQUIFER EVALUATION PSH Thickness Groundwater Analytical Results FUTURE CORRECTIVE ACTION RECOMMENDATIONS REFERENCES

TABLES

Table 2-1	Summary of Perched Aquifer Well Completion Details
Table 2-2	Summary of Groundwater Surface Elevations for Wells in the Perched Aquifer
Table 2-3	Summary of Groundwater Analytical Results in the Perched Aquifer
FIGURES	
Figure 1-1	Project Area Location Map
Figure 1-2	Project Area Features
Figure 2-2a	Distribution of PSH in the Perched Aquifer, May 2020
Figure 2-2b	Distribution of PSH in the Perched Aquifer, November 2020
Figure 3-1	Distribution of Dissolved BTEX in the Perched Aquifer, November 2020
Figure 3-2	Distribution of Dissolved Benzene in the Perched Aquifer, November 2020
Figure 3-3	Distribution of Dissolved 1,1-DCA in the Perched Aquifer, November 2020
ATTACHMEN	TS

Attachment 1 Perched Aquifer Boring Logs

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014



1.0 INTRODUCTION

This Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations was prepared by EarthCon Consultants, Inc. (EarthCon) on behalf of Transwestern Pipeline Company, LLC (Transwestern) to summarize the results of a perched aquifer evaluation and evaluate future corrective actions associated with the Former Surface Impoundments at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property, located at 6381 North Main Street in Roswell, New Mexico (the "Site"). Historic reports indicate the potential for perched aquifer conditions intersecting the soil vapor extraction (SVE) wells and RW-1, all of which are located on the Transwestern site near the former surface impoundments.

The Facility is an active natural gas compressor station, owned and operated by Transwestern, located approximately 8 miles north of the city center of Roswell, New Mexico along the eastern side of U.S. Highway 285. The Facility occupies approximately 77 acres of land in Section 21 (SW¼ of the SW¼) and Section 28 (NW¼ of the NW¼) of Township 9S and Range 24E, Chaves County, New Mexico (**Figure 1-1**). Access is via U.S. Highway 285, and the entire Facility is secured by a chain-link fence with locked gates. The Project Area encompasses a portion of the northeast corner of the Facility and a portion of a 40-acre easement of land to the northeast, leased from the New Mexico State Land Office (SLO) State Trust Land for remediation and monitoring purposes (**Figure 1-2**).

Comment 4 of the NMED's Approval with Modifications Laboratory Results Submittal for SVE and RW-1 Wells and Additional Laboratory Results for SVE and RW-1 Wells, dated February 21, 2020, requires a report that summarizes the results of the perched zone evaluation. Further, Comment 1 of the NMED's Additional Response to Comments 10/14/2020, dated April 9, 2021, requests a standalone report evaluating and recommending corrective action for the perched aquifer.

2.0 PERCHED AQUIFER EVALUATION

According to historical groundwater gauging data, field personnel observed the presence of water at depths between 28 feet below ground surface (bgs) and 35 feet bgs in certain soil vapor extraction (SVE) wells, while other SVE wells remained dry. Two of the deepest wells in the perched aquifer, RW-1 and SVE-30, are both over 41 ft BTOC and consistently have measurable groundwater. Wells SVE-23 and SVE-28 are each approximately 36 ft BTOC and typically have

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS @

EARTHCON[®]

Environmental Challenges

BUSINESS SOLUTIONS *

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

measurable groundwater, including the year 2020. Wells SVE-22, SVE-25, SVE-27, and SVE-31 (all approximately 33 ft BTOC) often do not have water; SVE-22, SVE-27, and SVE-31 were dry during at least part of 2020. Wells SVE-24 and SVE-26 (28.9 and 32.5 ft BTOC, respectively) have not had measurable water in the past five years.

Boring logs developed for SVE, and the deeper multiphase extraction (MPE) wells were reviewed, which did not note a distinct water bearing zone between the surface and 50 feet bgs (**Attachment**

1, **Perched Aquifer Boring Logs**). In the MPE wells, groundwater was reported to be approximately 60 feet bgs. Considering the presence and absence (dry) of groundwater in certain SVE wells at various times and the construction depth of these wells, it was suspected that a combination of rainwater and condensate buildup within the SVE piping conveyance network could be back flowing and contributing to the water that was being observed in certain SVE wells. Further investigation was performed in the field to identify the source of the water in the SVE wells.

Further review of the suspected perched aquifer was conducted by recovering water from RW-1 until dry and monitoring rebound over time. Beginning in April 2020, groundwater was extracted from recovery well RW-1 to evaluate the perched aquifer. However, the extraction process was deactivated after a short period due to groundwater volumes unexpectedly reaching the storage tank capacity, and the evaluation was suspended pending further review of the process and results.

The evaluation of the perched aquifer in RW-1 resumed on September 23, 2020, and continued to October 20, 2020. Prior to installing a pump, the groundwater level was measured as 33.55 feet below top of casing (btoc). The pump inlet was lowered to approximately 38 feet btoc and the pump recovered groundwater at an average rate of approximately 0.16 gallons per minute during the evaluation period. Groundwater levels were measured daily in RW-1 to evaluate recharge of the well. According to liquid levels, the groundwater was drawn down to approximately 37.5 feet before stabilizing. The pump was deactivated, and groundwater recharged at a rate of approximately 0.2 feet per day. Based on pump evaluation on RW-1 and historical groundwater gauging data in SVE wells, a perched aquifer may exist in this portion of the site.

Further review of historical documents revealed that an initial field site assessment performed in 1991 reported the presence of a perched aquifer which intersected wells SVE-23, SVE-25, SVE-27, SVE-28, SVE-30, SVE-31, and RW-1. A summary of construction information for wells in the

BARTHCON

Environmental Challenges

BUSINESS SOLUTIONS

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

perched aquifer is provided in **Table 2-1**, and groundwater elevations for wells in the perched aquifer are shown in **Table 2-2**.

2.1 PSH Thickness

Liquid levels were measured in SVE wells and RW-1 using an optical interface probe to determine the presence and apparent thickness of PSH (phase separated hydrocarbons). According to historical liquid levels, SVE-23 was the only well to consistently contain PSH; however, recently, PSH has been observed in SVE-25 in November 2020 after 11 years of no detections. The apparent thickness of 3.0 feet and 0.10 foot was measured in SVE-23 and SVE-25 in April 2021, respectively. Distribution of PSH apparent thickness is presented in **Figures 2-2a** and **2-2b**. Further PSH monitoring will continue for SVE-23 and SVE-25 in 2022.

2.2 Groundwater Analytical Results

Groundwater samples were collected and analyzed for BTEX by EPA method 8260 or for VOCs via EPA Method 8260B, and 1,4-dioxane was analyzed by EPA method 8270SIM in accordance with the approved *Sampling and Analysis Plan* (SAP). The analytical results for groundwater samples in the are summarized in **Table 2-3**. Wells in the perched aquifer that had measurable groundwater and did not contain PSH (i.e., RW-1, SVE-28, SVE-30, and SVE-31) were sampled. Wells SVE-23 and SVE-25 contained water and PSH, while SVE-24, SVE-26, and SVE-27 were dry and did not have measurable PSH.

In summary, BTEX constituents were detected above laboratory reporting limits in wells SVE-28, SVE-30, and RW-1. Benzene exceeded the Groundwater Concentration Limit (GCL) in both SVE-30 and RW-1, and 1,1-DCA exceeded the GCL in SVE-30. The areal distribution of BTEX, Benzene, and 1,1-DCA in the Perched Aquifer in November 2020 is shown in **Figures 3-1** through **3-3**.

3.0 FUTURE CORRECTIVE ACTION RECOMMENDATIONS

In correspondence dated July 2, 2020, and November 25, 2020, NMED requested that Transwestern suspend PSH recovery activities in SVE-23 and monitor PSH thickness over time. Currently, it is unknown if the recovery rates of the PSH and/or groundwater in the perched aquifer can sustain a more active recovery method such as PSH skimming, or multiphase extraction. Therefore, Transwestern recommends that PSH recovery via manual bailing be initiated immediately in SVE-23 and SVE-25 considering the overall corrective action objective for the site. It is apparent that LNAPL is present at recoverable thicknesses and PSH will be monitored for

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

Environmental Challenges BUSINESS SOLUTIONS *

EARTH

rebound after selected recovery event. Data will be collected from manual bailing events during 2022 to determine feasibility of additional recovery measures or impracticability. Results will be provided in the 2022 Annual Groundwater Remediation Activities Report. Since SVE-23 and most recently SVE-25 are the only wells in the Perched Aquifer to contain PSH, it is believed that the PSH appearances may be residual product that may have accumulated in those wells after source removal activities. Historical PSH measurements in wells located in the perched aquifer and upper aquifer indicate that the PSH footprint has stabilized or decreased. A work plan will be prepared and submitted detailing delineation of the horizontal and vertical extent of the LNAPL plume. Based on the results of perched aquifer delineation evaluation, the apparent extent of LNAPL, and results of bailing recovery, additional measures will be evaluated to identify appropriate and effective action to recover LNAPL in the perched aquifer.

4.0 **REFERENCES**

Roswell Shallow Subsurface Investigation by Harding Lawson Associates, June 20, 1991

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 TABLES

Table 2-1. Summary of Perched Aquifer Well Completion DetailsTranswestern Compressor Station No. 9 - Roswell, NM

		Total Depth	Measured	Surface	Casing	Screen	Top of
Well	Date of	of Boring	Depth of Well	Completion	Diameter	Interval	Sand Pack
	Completion	(ft bgs)	(ft from TOC)	Туре	(in.)	(ft bgs)	(ft bgs)
RW-1	06/13/93	42.5	41.47	Flush Mount	4	36.8 - 41.7	34.75
SVE-1A	09/21/96	30	29.65	Flush Mount	2	20-30	19
SVE-2A	09/20/96	30	29.83	Flush Mount	2	20-30	17.5
SVE-22	11/07/02	35	33.20	Flush Mount	2	25-35	23
SVE-23	11/07/02	39	36.70	Flush Mount	2	25-35	22
SVE-24	11/13/02	30	28.85	Flush Mount	2	20-30	18
SVE-25	11/04/02	34	32.85	Flush Mount	2	24-34	21.6
SVE-26	11/05/02	35	32.45	Flush Mount	2	24-34	22
SVE-27	11/01/02	35	33.90	Flush Mount	2	20-35	18
SVE-28	10/29/02	35	36.00	Flush Mount	2	25-35	23
SVE-30	10/25/02	45	44.00	Flush Mount	2	20-45	18
SVE-31	10/28/02	35	33.95	Flush Mount	2	25-35	23

Note:

ft bgs - feet below ground surface TOC - top of casing in. - inches na - not applicable Prepared by: Checked by:
			Donth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Groundwater (ft below	PSH (ft)	Surface
				TOC)		Elevation (ft)
SVE-1A	6/24/2019	NA	(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA NA
	11/10/2020		(a)	dry	(a)	NA
SVF-2A	6/24/2019	NA	(a)	dry dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
SVE-22	3/10/2009	NA	33.00	33.20	0.20	NA
	10/8/2009		32.92	33.10	0.18	NA
	1/26/2010		33.05	33.05 (TD)	0.00	NA
	3/22/2010		33.02	33.02 (TD)	0.00	ΝΑ ΝΔ
	12/22/2011		(a)	33.04	(a)	NA
	4/17/2012		(a)	33.00 (TD)	(a)	NA
	10/18/2012		(a)	33.00 (TD)	(a)	NA
	4/15/2013		(a)	32.98	(a)	NA
	11/3/2013	3616.76 (h)	(a)	33.08	(a)	3,583.68
	5/1/2014		(a)	dry	<u>(a)</u>	NA
	11/21/2014		(a)	dry	<u>(a)</u>	NA
	4/21/2015		(a)	dry	(a)	NA 0.500.70
	11/3/2015		33.00	33.11	0.11	3,583.73
	4/29/2010		32.94	32.09	0.15	3,583,04
	5/22/2017		33.00	33 10	0.17	3 583 74
	11/13/2017		33.14	33.19	0.05	3.583.61
	6/1/2018		33.02	33.10	0.08	3,583.72
	11/6/2018		(a)	33.05	(a)	3,583.71
	6/24/2019		32.74	32.75	0.01	3,584.02
	1/5/2020		(a)	dry	<u>(a)</u>	NA
	5/13/2020		(a)	dry	(a)	NA
	2/10/2020	NIA	(a)	dry 26.75	(a)	NA
3VE-23	3/10/2009	NA	32.78	30.75	3.97	NA NA
	1/26/2009		33.01		0.76	
	1/20/2010		33.12	30.90 (TD)	3.00	NA NA
	3/22/2010		32.09	33.00	1.00	NA NA
	4/17/2011		33.00	33.30	0.30	
	12/22/2011		33.00	34.05	0.45	NA NA
	4/17/2012		33.02	34.10	0.40	NA NA
	10/10/2012		22.65	22.00	0.37	NA NA
	4/15/2015	2612 15 (b)	33.00	33.92	0.27	2 579 05
	5/1/2013	3012.45 (11)	33.73	30.52	2.79	3,576.05
	11/21/2014		32.15	32.84	0.69	3 580 13
	4/21/2015		32.15	33.4	0.65	3 579 54
	11/3/2015		32.70	33.07	0.33	3 579 63
	4/20/2016		33.01	33.33	0.00	3 570 36
	11/16/2016		33.37	33.82	0.02	3 578 07
	5/22/2017		33.60	34.15	0.55	3.578.72
	11/13/2017		32.64	33.28	0.64	3.579.66
	6/1/2018		33.27	33.95	0.68	3,579.02
	11/6/2018		32.55	35.70	3.15	3,579.14
	6/24/2019		<u> </u>	Not Gauged - Snake	e Hazard Exist in Vaul	t
	1/5/2020		33.10	33.75	0.65	3,579.19
	5/13/2020		33.52	36.50	2.98	3,578.21
	11/10/2020		33.70	34.87	1.17	3,578.47
	1/18/2021		33.80	34.88	1.08	3,578.39
	2/10/2021		33.78	34.87	1.09	3,578.41
	3/8/2021		33.85	34.88	1.03	3,578.35
	4/5/2021		34.00	37.00**	NA	NA

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-24	3/10/2009	NA	(a)	dry	(a)	NA
	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3608.97 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	28.61	(a)	3,580.36
	11/3/2015		(a)	dry	(a)	NA
	4/27/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	dry	(a)	NA
	5/31/2018		(a)	dry	(a)	NA
	11/6/2018		(a)	dry	(a)	NA
	6/24/2019		(a	dry	(a)	NA
	1/6/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/9/2020		(a)	dry	(a)	NA
SVE-25	3/10/2009	NA	(a)	32.70	(a)	NA
	10/8/2009		(a)	31.40	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	32.80	(a)	NA NA
	4/17/2011		(a)	32.23	(a)	NA NA
	12/22/2011		(a)	32.00 dm/	(a)	
	4/17/2012		(a)	ury 22.70	(a)	
	10/16/2012		(a)	32.70	(a)	
	11/3/2013	3617.02 (b)	(a)	32 72	(a)	3 58/ 30
	5/1/2014	3017.02 (II)	(a)	32.72	(a)	3,584,32
	11/21/2014		(a)	drv	(a)	NA
	4/21/2015		(a)	32.73	(a)	3,584.29
	11/3/2015		(a)	dry	(a)	NA
	4/29/2016		(a)	drv	(a)	NA
	11/16/2016		(a)	drv	(a)	NA
	5/22/2017		(a)	drv	(a)	NA
	11/13/2017		(a)	31.88	(a)	3.585.14
	6/1/2018		(a)	32.6	(a)	3.584.42
	11/6/2018		(a)	31.75	(a)	3.585.27
	6/24/2019		(a)	drv	(a)	NA
	1/5/2020		(a)	drv	(a)	NA
	5/13/2020		(a)	drv	(a)	NA
	11/10/2020		32.5	32.69	0.19	3,584.47
	1/18/2021		32.6	32.71	0.11	3,584.39
	2/10/2021		32.57	32.7	0.13	3,584.42
	3/8/2021		32.55	32.82	0.27	3,584.41
	4/5/2021		32.65	32.75	0.1	3,584.35

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-26	3/10/2009	NA	(a)	dry	(a)	NA
	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3614.43 (h)	(a)	dry	(a)	NA
	5/1/2014	, <i>, ,</i>	(a)	dry	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	32.6	(a)	3,581.83
	11/3/2015		(a)	dry	(a)	NA
	4/29/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	dry	(a)	NA
	6/1/2018		(a)	dry	(a)	NA
	11/6/2018		(a)	dry	(a)	NA
	6/24/2019		(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	drv	(a)	NA
SVE-27	3/10/2009	NA	(a)	32.92	(a)	NA
	10/8/2009		(a)	33.63	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	33.70	(a)	NA
	4/17/2011		(a)	33.70	(a)	NA
	12/22/2011		(a)	33.83	(a)	NA
	4/17/2012		(a)	drv	(a)	NA
	10/18/2012		(a)	drv	(a)	NA
	4/15/2013		(a)	33.82	(a)	NA
	11/3/2013	3613.19 (h)	(a)	drv	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	33.01	(a)	3,580.18
	4/21/2015		(a)	33.58	(a)	3,579.61
	11/3/2015		(a)	33.54	(a)	3,579.65
	4/29/2016		(a)	33.82	(a)	3,579.37
	11/16/2016		(a)	34.15	(a)	3,579.04
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	33.48	(a)	3,579.71
	6/1/2018		(a)	34.00	<u>(a)</u>	3,579.19
	11/6/2018		(a)	33.31 Not 0	(a)	3,579.88
	0/24/2019		(2)		augeu (c)	N1A
	I/3/2020 E/12/2020		(a)	ury	(a)	
	5/13/2020		(a)	ary	(a)	NA NA
	11/10/2020		(a)	ary	(a)	NA

			Donth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)	Deptin to PSH (ft below TOC)	Groundwater (ft below	PSH (ft)	Surface
				TOC)		Elevation (ft)
SVE-28	3/10/2009	NA	(a)	28.60	(a)	NA
	10/8/2009		(a)	28.95	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	29.07	(a)	NA
	4/17/2011		(a)	29.17	(a)	NA
	12/22/2011		(a)	29.65	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	33.58	(a)	NA
	11/3/2013	3607.84 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	<u>(a)</u>	NA
	11/21/2014		(a)	28.59	<u>(a)</u>	3,579.25
	4/21/2015		(a)	28.86	(a)	3,578.98
	11/3/2015		(a)	28.75	(a)	3,579.09
	4/27/2016		(a)	28.97	(a)	3,578.87
	11/16/2016		(a)	29.18	(a)	3,578.66
	5/22/2017		(a)	29.44	(a)	3,578.40
	11/13/2017		(a)	28.76	(a)	3,579.08
	6/1/2018		(a)	29.15	(a)	3,578.69
	11/6/2018		(a)	28.53	(a)	3,579.31
	6/24/2019		(a)	28.97	(a)	3,578.87
	1/5/2020		(a)	28.81	(a)	3,579.03
	5/13/2020		(a)	29.05	(a)	3,578.79
	11/10/2020		(a)	29.73	(a)	3,578.11
SVE-30	3/10/2009	NA	(a)	39.32	(a)	NA
	10/8/2009		(a)	39.29	(a)	NA
	3/22/2010		(a)	40.28	(a)	NA
	4/17/2011		(a)	40.11	(a)	NA
	12/22/2011		(a)	41.11	(a)	NA
	4/17/2012		(a)	41.65	(a)	NA
	10/18/2012		(a)	41.42	(a)	NA
	4/15/2013		(a)	41.67	(a)	NA
	11/3/2013	3616.00 (h)	(a)	43.02	(a)	3,572.98
	5/1/2014		(a)	43.35	(a)	3,572.65
	11/21/2014		(a)	43.30	(a)	3,572.70
	4/21/2015		(a)	41.80	(a)	3,574.20
	11/3/2015		(a)	41.60	(a)	3,574.40
	4/28/2016		(a)	41.56	(a)	3,574.44
	11/16/2016		(a)	41.23	(a)	3,574.77
	5/22/2017		NA	NA	NA	NA
	11/13/2017		(a)	42.00	(a)	3,574.00
	6/1/2018		(a)	42.02	(a)	3,573.98
	11/6/2018		(a)	42.46	(a)	3,573.54
	6/24/2019		(a)	42.52	(a)	3,573.48
	1/5/2020		(a)	42.45	(a)	3,573.55
	5/13/2020		(a)	42.55	(a)	3,573.45
	11/10/2020		(a)	43.05	(a)	3,572.95

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
SVE-31	3/10/2009	NA	(a)	30.45	(a)	NA
-	10/8/2009		(a)	30.43	(a)	NA
	1/26/2010		(a)	30.55	(a)	NA
	3/22/2010		(a)	31 49	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	28.50	(a)	NA
	//17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	//15/2012		(a)	dry	(a)	NA
	11/3/2013	3612 67 (b)	(a)	dry	(a)	
	5/1/2014	3012.07 (11)	(a)	dry	(a)	NA
	11/21/2014		(a)	30.27	(a)	3 582 40
	4/21/2015		(a)	30.97	(a)	3.581.70
	11/3/2015		(a)	30,200	(a)	3 582 47
	4/28/2016		(a)	30.35	(a)	3 582 32
	11/16/2016		(a)	30.73	(a)	3.581.94
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	30.48	(a)	3,582.19
	6/1/2018		(a)	dry	(a)	NA
	11/6/2018		(a)	30.24	(a)	3,582.43
	6/24/2019		(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	<u>(a)</u>	NA
	11/10/2020	NIA	(a)	31.65	(a)	3,581.02
RVV-1	3/10/2009	NA	(a)	33.17	<u>(a)</u>	NA NA
	3/22/2010		(a)	33.62	(a)	NA NA
	4/17/2011		(a)	33.80	(a)	NA
	12/22/2011		(a)	34.26	(a)	NA
	4/17/2012		(<u>a</u>)	34.57	(a)	NA
	10/18/2012		(a)	35.16	(a)	NA
	4/15/2013		(a)	35.77	(a)	NA
	11/3/2013	3612.72 (h)	(a)	34.95	(a)	3,577.77
	4/30/2014		(a)	35.48	(a)	3,577.24
	11/19/2014		(a)	32.46	(a)	3,580.26
	4/21/2015		(a)	33.08	(a)	3,579.64
	11/3/2015		(a)	33.00	(a)	3,579.72
	4/28/2016		(a)	33.32	(a)	3,579.40
	11/16/2016		(a)	33.70	(a)	3,579.02
	5/22/2017		(a)	34.03	(a)	3,578.69
	11/13/2017		(a)	32.96	(a)	3,579.76
	6/1/2018		(a)	33.62	(a)	3,579.10
	11/6/2018		(a)	32.82	(a)	3,579.90
	6/24/2019		(a)	33.57	<u>(a)</u>	3,579.15
	1/5/2020	 	(a)	33.38	(a)	3,579.34
	5/13/2020		(a)	33.08	(a)	3,579.04
	11/10/2020		(a)	34.55	(a)	3,5/8.1/

Notes:

PSH - Phase separated hydrocarbon

ft - feet

** field error measurment

TOC - Top of Casing

Corrections to ground water surface elevation for PSH is calculated assuming a specific gravity of 0.76

(NA) Information not available

(a) Not applicable since no measurable thickness of PSH is present

Historical data before 2009 is presented in previous reports

Historical data for wells that were plugged and abandoned is not shown.

Released to Imaging: 11/22/2022 9:37:14 AM

Prepared by: SWS 4/6/21 Checked by: HRB 4/6/21

Table 2-3. Summary of Groundwater Analytical Results in the Perched AquiferTranswestern Compressor Station No. 9 - Roswell, NM

Well	Sampling Date	Benzene	Toluene	Ethylbenzene	Xylenes (total)	1,1-Dichloroethane	1,1-Dichloroethene	Vinyl Chloride	1,4-Dioxane
NMV	VQCC Human Health Standard	10	750	750	620	25	5	1	-
	USEPA MCL	5	1,000	700	10,000		7	2	-
	Tap Water (2012)	4.13	2280	14.8	-	24.2	340	0.16	-
Grou	undwater Cleanup Level (GCL)	5	750	700	620	25	5	1	-
SVE-28	11/12/18	14	<1.0	<1.0	<1.5	NA	NA	NA	NA
	06/26/19	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0	NA
	01/08/20	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0	NA
	09/10/20	NA	NA	NA	NA	NA	NA	NA	<1.0
	11/23/20	1.3	<1.0	<1.0	<1.5	1.3	<1.0	<1.0	NA
SVE-30	11/12/18	15	<5.0	41	<7.5	NA	NA	NA	NA
	06/26/19	10	<5.0	24	<7.5	30	<5.0	<5.0	NA
	01/08/20	8.9	<5.0	29	<7.5	32	<5.0	<5.0	NA
	09/10/20	8.6	<5.0	20	<7.5	25	<5.0	<5.0	5.9
	11/23/20	5.7	<1.0	8	<1.5	33	NA	NA	6.0
SVE-31	11/12/18	<1.0	<1.0	<1.0	<1.5	NA	NA	NA	NA
	11/23/20	<1.0	<1.0	<1.0	<1.5	NA	NA	NA	NA
RW-1	11/12/18	32	<1.0	1.4	<1.5	NA	NA	NA	NA
	06/26/19	51	<1.0	1.4	<1.5	12	<1.0	<1.0	NA
	01/08/20	26	<1.0	1.5	<1.5	4.3	<1.0	<1.0	NA
	09/10/20	25	<1.0	6.2	<1.5	3.1	<1.0	<1.0	<1.0
	11/23/20	38	<1.0	13	7.9	3.5	<1.0	<1.0	<25

Notes:

Bold indicates that the analytical result exceeds the applicable regulatory limits.

Prepared by: SWS Checked by: SSD

 Bold
 indicates that the analytical result exceeds the detection limit

 <25</th>
 indicates that the limit of quantitation (LOQ) value is higher than the applicable GCLs

* - Phase separated hydrocarbons (PSH) present in well. Sample collected below PSH.

-- Data not available.

Only constituents detected in one or more groundwater samples are shown in this table

All results reported above the applicable standard are shown in bold type

Results reported in micrograms per liter (µg/L)

NA - Not analyzed; constituent is not part of the sampling plan

NMWQCC - New Mexico Water Quality Control Commission

NMWQCC Human Health Standards - from New Mexico Administrative Code (NMAC) 20.6.2, Part A, Human Health Standards. Used as GCL for target cleanup if lower than the MCL.

USEPA MCL - United States Environmental Protection Agency's Maximum Concentration Limit. Used as GCL for target cleanup if lower than the NMWQCC Human Health Standard.

Tap Water (2012) - From Table A-1 for the 2012 NMED Risk Assessment Guidance for Site Investigation and Remediation. Used as GCL for target cleanup if WQCC standard nor MCL has been established.

•

FIGURES



Received by OCD: 10/21/2022 8:48:57 AM































ATTACHMENT

Recei	ved by OCD: 1	0/21/202	2 8:48:57 AM					· · · · ·	Page 54 of 193
C	/press Er	nginee	ering Services,	Inc.	F	IELC) BOREH	OLE LOG	
10	235 West Li	ittle Yor	k Road		B	OREH	OLE NO.: MF	PE-1	
Su	ite 256				T	OTAL	DEPTH: 79'		
_	uston, Texa	as 77040	0-3229	<u>p</u>					-
<u></u>	PROJEC	T INFO	RMATION		·	DRILLI	NG INFORMA		_
PROJE	CT:	Re	mediation Drilling	DRI	DRILLING CO.: Atkins Engineering				
SITE LO	DCATION:	TV	P Roswell Station 9	DRI	DRILLER: Mort Bates				
JOB NC).:	P-2	02203	RIG	RIG TYPE: Mobile Drill B-68				
LOGGE	D BY:	М.	Bates	MET	HOD O	F DRIL	LING: 8 1/4" He	Blow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spo	on	
DATES	DRILLED:	12/	06/02	HAN	IMER V	VT./DRC	OP 140 lb., 3	0 in.	
NOTES	OTES: 4" SCH 40 PVC MPE Well				∽ Wa v Wa	iter level (ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 –						·		[]	
-5 -		GM	GRAVEL AND SAND: 0'- 2': Silty clay w/ gravel, 2'-4' caliche, white pink, dry 5'- 32':GM: Gravel, Sand, Silt, Mittheo, gravel to 2" Lt					Cement Grout 3'-46'	
- 10 -			Brown, med. dense, dry. Gravel is cemented 5'- 7',26'-29', hard drilling @32' Sand with clay, red						
-20 -			to brown, soft, slightly plastic, moist						
-30									
-35		SC/CL	CLAY AND SAND: SC: Red Clayey Sand: lean clay with sand, med. stiff, plastic moist						
-40		SP/SC	CLAY AND SAND: SP/SC: 50'-75' Poorly Graded Sand with clay					Bentonite 46'	
-50 -	TELEE TELEE		Reddish / Tan No odor , Saturated @62' BGS TD 79' Riser 79'-74', 0.020					Top Sand 49'	
			Siot Screen 74'-54', 12/20 Sand Pack 79'-49', Bentonite Seal 49'-46',					TOP SCIEGU 24.	
-65-		SC	CLAYEY SAND: Reddish Tan, Soft, Moist, No Odor or Staining Depth to Water 61.03' BGS						
-70 -			12/07/02					Sump 74'-79'	
		SC						TD 79'	

ļ

Į.

Receiv	ved by OCD: 10	/21/2022	8:48:57 AM				No tan		Page 55 of 193	
	ypress Er 235 West Li uite 256		Road	Inc.	F В Т	IELE OREH OTAL I	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-2		
_ 💌			2MATION						_	
PROJE	CT.		mediation Drilling		LING	20 ·	Atkins Er	gineering	-	
SITE L	OCATION:	ТМ	P Roswell Station 9	DRIL	DRILLER: Mort Bates					
JOB N	D.:	P-2	02203	RIG	RIG TYPE: Ingersoll-Rand A-300					
LOGGE	ED BY:	C.N	A. Barnhill, PG	MET	HOD O	F DRIL	LING: HSA 81/4	" Augers	i	
PROJE		R: Geo	orge Robinson, PE	SAM	SAMPLING METHODS: Split Spoon					
DATES	DRILLED:	12/2	21-24/02	НАМ	MER W	/T./DRC	OP 140 lb., 30) in.		
NOTES	: 4" SCH 40	PE Well		z Wa z Wa	ter level o ter level i	during drilling in completed well	Page 1 of 1			
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -10 -20 -25 -30 -35 -40 -45 -55 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75		GM GM Cngl. SC SC SC SW/SP	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard SC: Clayey Sand, tan brown to light brown reddish saturated @60' BGS, No odor or staining, TD 79' Water Level @ 59.95' BGS 01/06/03 SW: Med. to fine grained tan sand, well sorted, saturated @ 60' BGS, No odor or staining. Damp @ TD, Flowing Sands.					Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' 12/20 Sand 0.020 Slot Screen TD 79'		
E E 00-][

Received by OCD: 10/21/2022 8:48:57 AM FIELD BOREHOLE LOG Cypress Engineering Services, Inc. BOREHOLE NO .: MPE-3 10235 West Little York Road TOTAL DEPTH: 79' Suite 256 puston, Texas 77040-3229 DRILLING INFORMATION **PROJECT INFORMATION** PROJECT: DRILLING CO .: **Atkins Engineering Remediation Drilling** SITE LOCATION: DRILLER: Mort Bates **TWP Roswell Station 9** JOB NO .: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: METHOD OF DRILLING: 8 1/4" Hollow Stem Auger C.M. Barnhill, PG PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: HAMMER WT./DROP 140 lb., 30 in. 12/20-21/02 Water level during drilling NOTES: ∇ 4" SCH 40 PVC MPE Well Page 1 of 1 Water level in completed well × PID Blows BORING WELL SOIL DEPTH USCS SOIL DESCRIPTION SAMP. # COMPLETION DESCRIPTION SYMBOLS / ft. ppm 070 GM GRAVEL AND SAND: 0'-5': GM mixed with caliche, Cement Grout 0.00 - 5 white pink, dry 5'-24':GM: 3'-48' :D Gravel, Sand, Silt, Mixture, O. gravel to 4", Lt. Brown, -10 :0 0 med. dense, dry. 0.0 O₀ 0 GM O e .C -20 -25 CONGLOMERATE: Hard Cngl. SW: Sand Layer, brown, -30 SW SC: Clayey Sand, tan brown to light brown -35 SC reddish saturated @62' BGS, No odor or staining, -40 @ 74' BGS TD 79' Water Level @ 63.82' BGS 12/21/02 -45 Bentonite 48' -50 SC Top Sand 51' -55 Top Screen 54' <u>60</u> 12/20 Sand ¥ SW: Med. to fine grained SW/SP -65 tan sand, well sorted, 0.020 Slot saturated @ 62' BGS, No Screen odor or staining. Damp @ -70 TD -75 SW/SP TD 79'

Page 56 of 193

Released to Imaging: 11/22/2022 9:37:14 AM

-85

-90

Received by OCD: 10/21	2022	8:48:57 AM		1	-	··	·	Page 57 of 193
Cypress Eng	inee	ering Services,	Inc.	F	IELC	D BOREH	OLE LOG	
10235 West Little	e Yor	k Road		B	OREH	OLE NO.: MP	E-4	
Suite 256	701	1-3220			UTAL	DEPIN. /9		
PROJECT I		RMATION		l	DRILLI	NG INFORMA	TION	_
PROJECT:	Re	mediation Drilling	DRII	LING (20.:	Atkins Er	ngineering	
SITE LOCATION:	TV	VP Roswell Station 9	DRI	LLER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	C. <i>N</i>	A. Barnhill	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER:	Ge	orge Robinson, PE	SAN	IPLING	METHO	ODS: Split Spoc	n	
DATES DRILLED:	12/	18-19/02	HAN	IMER V	/T./DR(OP 140 lb., 30) in.	
NOTES: 4" SCH 40 H	PE Well		∞ Wa • Wa	ter level ter level	during drilling in completed well	Page 1 of 1		
DEPTH SYMBOLS	scs	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -5 -0 -10 -20 -20 -20 -20 -20 -20 -20 -2	gl. /SP	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard GM: Gravel, pea sized, mixed with sand, silt SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, @ 74' BGS TD 79' Water Level @ 63.82' BGS 12/21/02 SW: Med. to fine grained tan sand, well sorted, saturated @ 64' BGS, No odor or staining.					Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'	
-75- -85- -90	/SW	SC: Sand ,fine gr., well sorted , Clayey, 60% Sand, No odor or Staining, Damp					TD 79'	

T

								· · · ·	
<i>Receiv</i>	Cypress Engineering Services, 10235 West Little York Road				F	IELD	BOREH	OLE LOG	
10	235 West Lif	tle York	Road		B	OREH	DLE NO.: MP	E-5	
Su	ite 256				T(DTAL [DEPTH: 79'		
	uston, Texa	s 77040	-3229	- 1					
<u>. </u>	PROJECT	INFOF	RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Rer	nediation Drilling	DRILI	DRILLING CO.: Atkins Engineering				
SITE LO	OCATION:	TW	P Roswell Station 9	DRILI	DRILLER: Mort Bates				
JOB NO).:	P-2	02203	RIGT	YPE:		Mobile D	rill B-68	
LOGGE	DBY:	C.N	1. Barnhill	METH			LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAMF	SAMPLING METHODS: Split Spoon				
DATES	ATES DRILLED: 12/16/02			HAM	MER W	/T./DRC)P 140 lb., 30) in.	
NOTES	NOTES: 4" SCH 40 PVC MPE Well SOIL USCS SOIL DESCRIPTION				z Wa z Wa	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -	<u></u>	CM		<u> </u>		[]	[]		
-5 -10 -20 -25 -30 -35		Cngl.	CONGLOMERATE: Hard					Cement Grout 3'-53'	
-40- -45- -50-		SC	SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, TD 79' Water Level @ 63.75' BGS 12/17/02						
-55-		SC						Bentonite 53' Top Sand 56' Top Screen 59'	
-65-		SC							
-75-		SC						TD 79'	

Ì

.

Recei	ived by OCD: 1	0/21/2022	2 8:48:57 AM	<u> </u>					Page 59 of 193
C	ypress Er	nginee	ering Services,	Inc.	F B	IELC OREH	D BOREH	OLE LOG E-6	
	uite 256	Ittle Yor	ккоао		Т	OTAL	DEPTH: 79'		
	uston, Texa	as 77040	0-3229						
	PROJEC	T INFO	RMATION		I	DRILLI	NG INFORMA	TION	
PROJE	ECT:	Re	mediation Drilling	DRI	DRILLING CO.: Atkins Engineering				
SITE L	OCATION:	ТМ	VP Roswell Station 9	DRI	LLER:		Mort Bat	es	
JOB N	D.:	P-2	02203	RIG	RIG TYPE: Mobile Drill B-68				
LOGGE	ED BY:	C.N	A. Barnhill	МЕТ	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METH	ODS: Split Spo	0 n	
DATES		12/	16-17/02	HAM	IMER W	/T./DRC	DP 140 lb., 30) in.	
						ter level	during drilling		_
NOTE:	5. 4" SCH 4	PE Well		🛫 Wa	ter level i	in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -		p	1						
-5 -1		GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Cravel Sand Site Mixture					Cement Grout 3'-48'	
-10	0-0-0-0		gravel to 4", Lt. Brown, med. dense, dry.						
	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $								
-25-		Chal	CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented						
-30 -		ciigi.	sandstone layer. GM: Harder Drilling, gravel						
-35 -			fragments, yellowish color						
-40-		SC	tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay						
-40 -			fraction, soft, No odor /staining.			、		Bentonite 48'	
-55 -	([][]]	CL	CL: Strong Clay					Top Sand 51'	
-60 -			SC: Clayey Sand, tan brown to light brown reddish saturated @64'					TOP SCIECT 34	
		SC	@ 74' BGS Clay & Sand:,gravel & Clay lenses, TD 79' Water						
-70 -			Level @ 65.55' BGS 12/18/02						
-75-1	G (G 22 E	GC	GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining,					TD 79'	
-85-	2, 2, 2, 2 , , , , , , , , , , , , , , ,	GC	Damp						
E ₀₀ _	ତ, ଜି, ଜି, ହି]							

I

Receiv	ed by OCD: 10	/21/2022	8:48:57 AM					• -	 Page 60 of 193
Cy 10	/press Er 235 West Li	n ginee ttle Yorl	e <mark>ring Services</mark> , l _{k Road}	Inc.	F B	IELC OREH	D BOREH	OLE LOG E-7	
	ute 256 Juston, Texa	s 77040)-3229						
	PROJEC	T INFOF	RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Rei	mediation Drilling	DRIL	DRILLING CO.: Atkins Engineering				
SITE LO	OCATION:	ТŴ	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	D BY:	C. 1	Barnhill	MET	HOD C	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	orge Robinson, PE	SAM	IPLING	METH	ODS: Split Spoo	n		
DATES	DRILLED:	12/2	10-13/02	HAM	IMER V	VT./DRO	OP 140 lb., 30) in.	
NOTES	: 4" SCH 40) PVC M	PE Well		∞ Wa ∞ Wa	iter level iter level i	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -55 -60 -45 -55 -60 -70 -75 -70 -75 -85 -90		GM Cngl. SC SC/GC SC SC SC	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor and staining. GC: Gravel 10%, Clay30%, fine gr. sand SC: Clayey Sand, tan brown to light brown reddish saturated @63' BGS, No odor or staining, @ 74' BGS Clay & Sand:& Fat Clay lenses, TD 79' Water Level @ 64.79' BGS 12/14/02					Cement Grout 3'-47' Bentonite 47' Top Sand 50' Top Screen 54' Sump 74'-79' TD 79'	
- 90 -									



	<u>1/2022 8:</u>	:48:57 AM					
Cypress Engli 10235 West Little Suite 256	i neer e York	ring Services, _{Road}	Inc.	F E T	IEL OREH OTAL	D BOREH OLE NO.: MI DEPTH: 79'	OLE LOG PE-9
	77040-	3229					
	NFOR	MATION				ING INFORMA	TION
PROJECT:	Rem	ediation Drilling			20.:	Atkins E	ngineering
SHE LOCATION:	TWP	P Roswell Station 9				Mort Ba	tes
JOB NO.:	P-202	2203	RIG		יר הסיו		Prill B-68
	C. Ba	arnhill				$\frac{1}{2} \sum_{i=1}^{n} \frac{1}{2} \sum_{i=1}^{n} \frac{1}$	ollow Stem Auger
PROJECT MANAGER:	Geor	ge Robinson, PE			יחי בויי יסירו דייי	ор. зригэро Ор. 140 ил з	on A in
	12/1/	-18/02					
NOTES: 4" SCH 40 P	-S: 4" SCH 40 PVC MPE Well						
DEPTH SYMBOLS U	JSCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
-5 -10 -10 -10 -20 -20 -25 -30 -45 -55 -55 -55 -55 -55 -55 -55	M C S V C S T T T T T T T T T T T T T T T T T T	SRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, ned. dense, dry. SC: Clayey Sand Lt. Red/ an brown, to tand brown, n. to med.grained sand, vell sorted, strong clay raction, soft, No odor and taining. SW: Sand, med. gr. well SC: Clayey Sand, tan trown to light brown.red	54'-56' 59'-61'	105/16			Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'

L

Receive Y 102 Suit Hou	235 West Lit te 256 uston. Texas	21/2022 8 gineei tle York 77040-	Road	nc.	FI BC TC	ELD DREHO DTAL D	DLE NO.: MIP DEPTH: 79'	DLE L @63 0 E-10
	PROJECT	INFOR	MATION	1	1	RILLI	NG INFORMAT	ION
PROJEC BITE LOO OB NO. OGGEE PROJEC DATES E	T: CATION: D BY: T MANAGER DRILLED:	Ren TW/ P-20 C. E Geo 12/0	nediation Drilling P Roswell Station 9 02203 Barnhill orge Robinson, PE 19/02	DRIL DRIL RIG MET SAM HAM	LING CC LER: TYPE: HOD OF PLING M MER WT	D.: DRILL IETHOI	Atkins Er Mort Bate Mobile Dr ING: 8 1/4" Ho DS: Split Spoo P 140 lb., 30	ngineering es ill B-68 llow Stem Auger n) in.
OTES:	4" SCH 40	PVC MI	PE Well		 Wat Wat 	er level i er level i	during drilling in completed well	Page 1 of 1
EPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
5 10 15 20 25 30 35 40 45		Conglom SC/CL	S. GM Mixed with Calicite, white pink, dry 5'-27''GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 27'-30' Hard cemented Conglomerate 30-50' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic moist. CONGLOMERATE CLAY AND SAND: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.					Cement Grout 3'-47'
50		SW	SAND: SW: 50'-59' Fine gr. Sand, tan brown, well sorted, No odor or staining.	49'-51' 54'-56'	18"/50 12"/50			Top Sand 50' Top Screen 54'
55		SC SW	Clayey Sand Lt. Red/ tan SAND: Tan brown, reddish tan sand, med. to fine gr., well sorted, No Odor. Saturated @ 62' BGS	59'-61' 64'-66' 69'-71'	24"/40 12"/46 18"/50			
15		SC	CLAYEY SAND: Tan Brown / Red tan, Clayey	74'-76'	24"/30			Sump 74'-79'
10		SC/CL	CLAY: Clay & Sand:& Fat Clay lenses, Dry@ 74* BGS	79'-81'	24"/50			10.42.

Receive Cy 102 Sui Hot	press En 235 West Lif te 256 uston, Texas	21/2022 iginee ttle York	Road	nc.	FI BC TC		DLE NO.: MP	DLE L@@64 E-11
50000	PROJECT	INFOR	MATION	1	- [ORILLI	NG INFORMAT	ION
PROJEC	T:	Rei	mediation Drilling	DRIL	LING CO	D .:	Atkins En	gineering
SITE LO	CATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	s
OB NO.		P-2	02203	RIG 1	TYPE:		Mobile Dr	ill B-68
OGGE	D BY:	C. 1	Barnhill	METH	HOD OF	DRILL	ING: 8 1/4" Ho	llow Stem Auger
ROJEC	TMANAGER	Geo	orge Robinson, PE	SAME	PLING N	ETHO	DS: Split Spoo	n
DATES	DRILLED:	12/0	07/02	HAM	MER WI	./DRO	P 140 lb., 30) in.
NOTES:	4" SCH 4	D PVC M	PE Well		• Wat	ter level ter level i	during drilling in completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
		CM						
-5 -	0101010	CIT .	5': GM mixed with caliche, white pink dry 5'-24' GM				7/12 17/12	Cement Grout
10	0101010		Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					3'-47'
-10 -	0-0-0-0		med. dense, dry. 24'-32': Hard cemented					
-15 -			drilling					
20-	0-0-0-0							
-25-		Cngl.	CONCLOMEDATE: Hard					
20		1000	Drilling, well cemented					
		SC/CL	CLAVEY SAND: SC:					
-35	2222		Clayey Sand Lt. Red/ tan brown, to tand brown, fine					
40-			to medium grained sand, well sorted, strong clay					
45			60' BGS Slight odor and staining strong					
-50	HEE:	-	contamination in capillary fringe 55'-60' BGS, gray					Bentonite 47'
	THE STATE	SC	black stain to sandy clay with strong hydrocarbon					Top Sand 50'
-55 -			Water @ 60.90' BGS 12/09/02					Top Screen 54'
-65		SC						
70								· · · · · · · · · · · · · · · · · · ·
	2727							
/5-		CH	CLAY: Clay & Sand:& Fat Clay lenses, Dry					Sump 74'-79'
80								TD 79'
85		CH						

102 Sui Hou	235 West Lit te 256 uston, Texas	tle York	Road		BO	DREH(DTAL E	DLE NO.: MP DEPTH: 79'	E-12
-	PROJECT	INFOR	MATION		- [DRILLI	NG INFORMAT	ION
PROJEC SITE LO JOB NO. LOGGEI PROJEC DATES I	CATION: CATION: D BY: T MANAGER DRILLED:	Rer TW P-2 C. 1 Geo 12/0	mediation Drilling P Roswell Station 9 02203 Barnhill, / M. Bates orge Robinson, PE 03-06/02	DRIL DRIL RIG MET SAM HAM	LLING CO LLER: TYPE: THOD OF IPLING M IMER W1	D.: DRILL IETHOU T./DROI	Atkins En Mort Bate Mobile Dr ING: 8 1/4" Ho DS: Split Spoo P 140 lb., 30	ngineering es rill B-68 llow Stem Auger on) in.
NOTES:	4" SCH 40	PVC M	PE Well		 Wat Wat 	ter level (ter level i	during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
-10 -15 -20 -25 -30 -35 -40 -45 -50		SC/CL	Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 5'-15' SM/SP/SC: Poorly graded sand & Silt @37' Sand with clay, red to brown, soft, slightly plastic, moist.					Bentonite 48' Top Sand 51'
-65 -70 -75 -80		SP/SC SP/SC SS CL	CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay ,No odor Saturated @62' BGS TD 79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20 Sand Pack 79'-51', Bentonite Seal 51'-48', CALCAREOUS SANDSTONE: Hard CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @79' SP/SC Poorly					Top Screen 54' Sump 74'-79' TD 79'

Receive 102 Sui Hot	235 West Lit ite 256 uston, Texas	ginee ginee tle York	Road	nc.	BC TC		DLE NO.: MP DEPTH: 79'	DLE L @@66 E-13
	PROJECT	INFOR	MATION	1.0	. [ORILLI	NG INFORMAT	ION
PROJEC SITE LO JOB NO.		Rei TW P-2	mediation Drilling P Roswell Station 9 02203	DRIL DRIL RIG	LING CO LER: TYPE:	D.:	Atkins Er Mort Bate Mobile Di	ngineering es rill B-68
LOGGEI PROJEC DATES I	d by: T Manager Drilled:	C. 1 Geo 12/	Barnhill, / R. Marshall orge Robinson, PE 02-03/02	I MET SAM HAM	HOD OF PLING M MER W1	DRILL IETHOU F./DROI	ING: 8 1/4" Ho DS: Split Spoo P 140 lb., 30	llow Stem Auger on) in.
NOTES:	4" SCH 40	D PVC M	PE Well		• Wat	ter level i ter level i	during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows /ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
-5 -10 -15 -20 -25 -30 -35 -40 -45		GM SC/CL	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-33':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 5'-15' SM/SP/SC: Poorly graded sand & Silt @33' Sand with clay, red to brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. CLAYEY SAND: SC/CL Clayey Sand, Red med- fine gr. well sorted sand with strong clay fraction CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.					Cement Grout 3'-46' Bentonite 46'
-50 -55 - 8 -65 -70		SP/SC SP/SC	CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay ,no odor Saturated @60' BGS TD 79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20 Sand Pack 79'-49', Bentonite Seal 49'-47', Cement Grout 47'-3'					Top Sand 50.7' Top Screen 54'
-75		CL	CALCAREOUS SANDSTONE: Hard CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @79' SP/SC Poorly Graded sand with clay					Sump 74'-79' TD 79'

Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

uston, Texas 77040-3229

FIELD BOREHOLE LOG

BOREHOLE NO.: MPE-14 TOTAL DEPTH: 79'

PROJE	CT INFO	RMATION			DRILLI	NG IN	FORMA	TION
PROJECT:	Re	mediation Drilling	DRI	LLING (00.:		Atkins Er	ngineering
SITE LOCATION:	TV	VP Roswell Station 9	DRI	LLER:			Mort Bat	es
JOB NO.:	P-2	202203	RIG	TYPE:			Mobile D	rill B-68
LOGGED BY:	Cla	ayton M Barnhill, PG	MET	THOD O	F DRIL	LING:	8 1/4" Ho	llow Stem Auger
PROJECT MANAG	GER: Ge	orge Robinson, PE	SAN	IPLING	METH	ODS:	Split Spo	0 n
DATES DRILLED:	11/	25/02	HAN	MER V	VT./DRO	ЭР	140 lb., 30) in.
NOTES: 4" SCH	40 PVC N	IPE Well		∞ Wa ≖ Wa	iter level iter level	during d in compl	rilling eted well	Page 1 of 1
DEPTH SYMBOL	s USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BC COM	RING PLETION	WELL DESCRIPTION
0 -5 -10 -20 -20 -30 -40 -45 -55 -60 -75 -75 -75 -75 -75 -75 -75 -75	GM GM GM CH SS CL/CH SC	GRAVEL AND SAND: 0'- 3': GM mixed with caliche, white pink, dry 3'-40':GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: 40'-43': Fat CALCAREOUS CLAYEY SAND: SC/CL/CH: 45'-79' Sandy clay, Clayey sand, red/ brown, med. stiff, moist, moderate odor, no staining. Saturated @ 62 TD 79' Grout 48'-3' Bentonite 48'-51' Sand 51'-79' 0.020 Screen 74'- 54' Riser 74'-79' Water Level @ 61.70' BGS 11/26/02						Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' Sump 74'-79' TD 79'

Receive	d by OCD: 10/	21/2022	8:48:57 AM					
	nross En	ainee	ring Services	Inc	F	IELD) BOREH	OLE LOG
Cy	piess Li	Iginee	Bead	111C.	E	OREH	OLE NO.: MP	E-15
102 	235 VVest Lii ite 256	ttle York	K ROAD		Т	OTAL I	DEPTH: 79'	
	uston, Texa	s 77040)-3229					
	PROJECT	INFO	RMATION			DRILLI	NG INFORMA	TION
PROJE	CT:	Rei	nediation Drilling	DRII	LLING	CO.:	Atkins En	igineering
SITE LC	CATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	es
JOB NC).:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68
LOGGE	D BY:	Ric	k Smith, PG	MET	HOD C		LING: 8 1/4" Ho	llow Stem Auger
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spoo	n
DATES	DRILLED:	11/2	22/02	HAN	IMER V	VT./DRC	OP 140 lb., 30) in.
NOTES	4" SCH 4() PVC M	PE Well		sz Wa ≖ Wa	ater level o ater level i	during drilling in completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 -) 	
-5 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10			4: GM mixed with caliche, white pink, dry 4'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry becoming moist @ 40' BGS					Cement Grout 3'-49'
-20 -								
-30 -								
-40-		CL	CLAY: CH: Red Clayey Sand: lean clay with sand,					
-50			med. stiff, plastic, moist. Water Level 61.13' BGS 11/25/02	49'-51'	24"/33			Bentonite 49.9'
-55-		SP/SC	CLAYEY SAND: SP/SC: 54'-79' Poorly Graded	54'-56'	12"/51			Top Sand 54'
			Sand with clay & gravel, red dense, moist,	59'-61'	24"/41			Top Screen 59'
-65-			fragements of sandstone as gravel, hard drilling 65'-					
-70			71', No odor or staining. TD 79' Saturated @ 60' BGS Cement / Bentonite	69'-71'	14"/50 24"/50			
-75-		SP/SC	49'-54' 12/20 Sand Pack ' 54'-74' 0.020 Slot Screen 74'-59' Riser 74'-79' No	74'-76'	20"/70			Sump 74'-79' TD 79'
-85-			Odor or Staining at TD	79'-81'	24"/74			

i

ł

FIELD BOREHOLE LOG Divide 256 Outston, Texas 77040-3229 PROJECT INFORMATION DRILLING INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION DRILLING INFORMATION DRILLING INFORMATION PROJECT INFORMATION PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/26-27/02	Page 69 of 193				8:48:57 AM	0/21/2022	ved by OCD: 1	Recei
PROJECT INFORMATIONDRILLING INFORMATIONPROJECT:Remediation DrillingDRILLING CO.:Atkins EngineeringSITE LOCATION:TWP Roswell Station 9DRILLER:Mort BatesJOB NO.:P-202203RIG TYPE:Mobile Drill B-68LOGGED BY:C. Barnhill, / R. MarshallMETHOD OF DRILLING: 8 1/4" Hollow Stem AugerPROJECT MANAGER:George Robinson, PESAMPLING METHODS:DATES DRILLED:11/26-27/02HAMMER WT./DROP140 lb., 30 in.NOTES:Strong PsH in Soil BoringZWater level during drilling TWater level in completed wellDEDTUSOILLUCCSSOILDECOMPTIONSAMPL	G	IELD BOREHOLE LOG OREHOLE NO.: MPE-16 DTAL DEPTH: 79'	FIE BOR TOT	Inc.	ring Services, k Road	nginee ittle Yorl	/press Er 235 West L lite 256 puston, Texa	
PROJECT:Remediation DrillingDRILLING CO.:Atkins EngineeringSITE LOCATION:TWP Roswell Station 9DRILLER:Mort BatesJOB NO.:P-202203RIG TYPE:Mobile Drill B-68LOGGED BY:C. Barnhill, / R. MarshallMETHOD OF DRILLING: 8 1/4" Hollow Stem AugerPROJECT MANAGER:George Robinson, PESAMPLING METHODS:DATES DRILLED:11/26-27/02HAMMER WT./DROP140 lb., 30 in.NOTES:Strong PsH in Soil BoringX Water level during drilling Water level in completed wellPEDTUSOILLUCCSSOILBlowsPIDBORINGWELL			DR		RMATION	TINFOR	PROJEC	
SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bates JOB NO.: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: C. Barnhill, / R. Marshall METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/26-27/02 HAMMER WT./DROP 140 lb., 30 in. NOTES: Strong PSH in Soil Boring Water level during drilling Page 1 of 1 SOIL NOR Blows PID BORING WELL		CO.: Atkins Engineering	LING CO.:	DRI	mediation Drilling	Rei	CT:	PROJE
JOB NO.:P-202203RIG TYPE:Mobile Drill B-68LOGGED BY:C. Barnhill, / R. MarshallMETHOD OF DRILLING: 8 1/4" Hollow Stem AugerPROJECT MANAGER:George Robinson, PESAMPLING METHODS:Split SpoonDATES DRILLED:11/26-27/02HAMMER WT./DROP140 lb., 30 in.NOTES:Strong PsH in Soil BoringWater level during drillingPage 1 of 1SOILSOILLICCOSOILBlowsPIDBORINGWELL		Mort Bates	LER:	DRII	P Roswell Station 9	ТМ	DCATION:	SITE L
LOGGED BY: C. Barnhill, / R. Marshall METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/26-27/02 HAMMER WT./DROP 140 lb., 30 in. NOTES: Strong PsH in Soil Boring Water level during drilling Page 1 of 1 SOIL SOIL LICCO SOIL Blows PID BORING WELL		Mobile Drill B-68	TYPE:	RIG	02203	P-2	D.:	JOB NO
PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/26-27/02 HAMMER WT./DROP 140 lb., 30 in. NOTES: Strong PsH in Soil Boring Water level during drilling Page 1 of 1 SOIL SOIL USCOL SOIL Blows PID BORING WELL	ger	F DRILLING: 8 1/4" Hollow Stem Auger	HƠD OF D	all MET	Barnhill, / R. Marsh:	C.]	D BY:	LOGGE
DATES DRILLED: 11/26-27/02 HAMMER WT./DROP 140 lb., 30 in. NOTES: Strong PsH in Soil Boring Water level during drilling Page 1 of 1 SOIL SOIL SOIL Blows PID BORING WELL		METHODS: Split Spoon	PLING ME	SAN	orge Robinson, PE	R: Geo	CT MANAGE	PROJE
NOTES: Strong PsH in Soil Boring Water level during drilling Page 1 of 1 SOIL SOIL SOIL Blows PID BORING WELL		T./DROP 140 lb., 30 in.	MER WT./I	HAN	26-27/02	11/2	DRILLED:	DATES
SOIL USCE SOIL DESCRIPTION SAME # Blows PID BORING WELL	1	er level during drilling er level in completed well	z Water le ■ Water le		oil Boring	sH in S	: Strong P	NOTES
SYMBOLS USUS SUIL DESCRIPTION SAMP. # /ft. ppm COMPLETION DESCRIPTION	10N	PID BORING WELL ppm COMPLETION DESCRIPTION	Blows PI / ft. pp	SAMP. #	SOIL DESCRIPTION	USCS	SOIL SYMBOLS	DEPTH
0 0	t 7' 54'	Cement Grout 3'-47' Bentonite 47' Top Sand 49' Top Screen 54'	41"/18	49'-51' 54'-56'	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-40':GM: Gravel, Sand, Sitt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 15'-40' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. Minor gravel. CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, slight odor Saturated @60' BGS	GM SC/CL SP/SC		0 -5 -10 -20 -25 -25 -30 -35 -40 -45 -55
-50 Strong hydrocarbon -65 Strong hydrocarbon -65 SP/SC SP/SC SP/SC			22 /24 12"/34 12"/34 24"/18	59'-61' 64'-66' 69'-71'	Strong hydrocarbon staining, odor, and PsH at 64'-74' TD 79' Riser 79'- 74', 0.020 Slot Screen 74'- 54', 12/20 Sand Pack 79'- 49', Bentonite Seal 49'-47', Cement Grout 47'-3'	SP/SC		-65-
CL CLAY: CL: Sandy Lean Clay, Lt Reddish brown, MUDSTONE: Marroon Mudstone, with Gypsum and anhydrite lenses, hard drilling, dry, no odor. P0		Sump 74'-79' TD 79'	24"/32 6"/51	74'-76' 79'-81'	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, MUDSTONE: Marroon Mudstone, with Gypsum and anhydrite lenses, hard drilling, dry, no odor.	CL Redbed		-75-7 -85-1 -90-1

· _·

Receiv	ed by OCD: 10	/21/2022	8:48:57 AM						Page 70 o		
С	ypress Er	nginee	ering Services,	Inc.	F	IEL) BOREH	ULE LOG			
10	 0235 West Li	- ittle Yor	k Road		В	OREH	OLE NO.: MP	E-17			
Su	uite 256					TOTAL DEPTH: 75'					
	ouston, Texa	as 7704()-3229								
	PROJEC	T INFO	RMATION			DRILL	ING INFORMA	TION	_		
PROJE	ECT:	Re	mediation Drilling	DRI	LLING (0.:	Atkins Er	gineering			
SITE L	OCATION:	ТМ	P Roswell Station 9	DRI	LLER:		Mort Bat	es			
JOB N	0.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68			
LOGGI	ED BY:	Ric	k Smith, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger			
PROJE	ECT MANAGE	ER: Ge	orge Robinson, PE	SAN	IPLING	METH	ODS: Split Spoo	n			
DATES	S DRILLED:	11/	20/02	HAN	IMER W	/T./DR(OP 140 lb., 30) in.			
NOTES	S: _{PsH@ 61.}	75'H20@	66.25'(BGS)11/25/0	02	sz Wa z Wa	ter level ter level	during drilling in completed well	Page 1 of 1			
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION			
0 –		CM	ıر		ر	ſ <u> </u>] []	·	1		
		GM	GRAVEL AND SAND: GM: 0'-4' BGS White Pink					Cement Grout			
			Caliche, Hard, Dry 4'-43' :Gravel, Sand, Silt,					3'-46'			
-10 -			Mixture, gravel to 4", Light Brown, medium dense,] 		
	0.0.000		dry, No odor								
-20 -	0707070										
	0,0,0,0										
-25-	0.0.0.0.0										
-30 -	0707070										
-35-1	0,0,0,0										
	0,0,0,0										
-40-	0.0.0.0										
-45-		SP/SC	CLAYEY SAND: SP-SC:					Bentonite 46'			
-50			clay, red to strong brown, soft moist, slight odor					Top Sand 49'			
-55-1		CL	CLAY AND SAND: CL:								
	A SELEC		Lean clay with sand, red, medium stiff, plastic,					Top Screen 55'			
-60-		90/90	moist, moderate odor								
- 🛨 -		Sr/SC	CLAYEY SAND: SP-SC: Poorly graded sand with								
-70 -		00/00	clay, It. red brown, med to loose, moist, dense.								
		SP/SC	Mod.odor, increased drilling rate. TD 75' BGS								
- 15 -			Strong Odor @ 70' BGS 5' sump 70'-75', 0.020 slot								
			screen 55'-70', 12/20 Sand 49'-75', Bentonite 46'-49',								
-85-			cement grout 3'-46' 11/25/02: PsH@61.75'								
			(BGS)								

Receive	ed by OCD: 10/	/21/2022 8	8:48:57 AM		1			· · ·	Page 71 of 193
C) 10: Su	/press Er 235 West Lit ite 256	nginee ttle Yorl	ering Services, I « Road	nc.	F В Т	OREH OTAL I	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-18	
	uston, Texa	s 77040)-3229						
	PROJECT	r infof	RMATION			DRILLI	NG INFORMA	TION	-
PROJE	CT:	Rei	nediation Drilling		LING (20.:	Atkins Er	ngineering	
SITE LO	DCATION:	ТМ	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO).: 	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	DBY:	Ric	k Smith, PG	MET	HODO	FDRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CI MANAGE	R: Geo	orge Robinson, PE	SAM	PLING	MEIHO	DDS: Split Spoc)n	
DATES	DRILLED:	11/2	21/02	HAM	MER V	VT./DRC	DP 140 lb., 30) in.	-
NOTES	: 4" SCH 40) PVC M	PE Well		∞ Wa • Wa	iter level (iter level i	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -40 -45 -50 -55 -55 -65 -70 -75		GM GM SP/SC SP/SC	GRAVEL AND SAND: 0'- 4': GM mixed with caliche, white pink, dry 4'-58':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry becoming moist @ 50' BGS Slight Odor to No Odor 58'-72' SP/SC Poorly Graded Sand With Clay, Lt. Reddish-brown, med. dense, moist CLAY AND SAND: SP/SC:Poorly graded sand with clay, Lt. redish -brown, med. dense, moist Water Level 59.87' BGS 11/25/02 Saturated @58' BGS CLAYEY SAND: CL: 72'- 79' Sandy lean clay red/ brown, med. stiff, moist, moderate odor, no					Cement Grout 3'-52' Bentonite 52' Top Sand 55' Top Screen 58' Sump 73'-78' TD 79'	
-85-			3' Bentonite 52'-55' Sand 55'-79' 0.020 Screen 73'- 58' Riser 73'-78'						

Į.

Received by OC	D: 10/.	21/2022	8:48:57 AM	<u> </u>	·				
Cypress	s Fr	ainec	ring Services	Inc		FIE	LD	BOREH	OLE LOG
10225 104			k Pood			BOR	EHOL	.E NO.: MF	PE-19
Suite 256	est Li	lue for	K ROAU			τοτ	AL DE	PTH: 79'	
ouston,	Теха	s 7704	0-3229						
PRO	JECI		RMATION			DRI	ILLING	G INFORMA	TION
PROJECT:		Re	mediation Drilling	DR	ILLING	G CO.:		Atkins E	ngineering
SITE LOCATIO	N:	TW	VP Roswell Station 9	DR	ILLER	:		Mort Ba	tes
JOB NO.:		P-2	02203	RIG	G TYPE	Ξ:		Mobile D	orill B-68
LOGGED BY:		C. 2	Barnhill, / R. Marsh	all ME	THOD	OF D	RILLIN	IG: 81/4" He	ollow Stem Auger
PROJECT MAN	NAGE	R: Ge	orge Robinson, PE	SAI	MPLIN	G ME	THOD	S: Split Spo	on
DATES DRILLE	ED:	11/	26/02	HAI	MMER	WT./[DROP	140 lb., 3	0 in.
NOTES: 4" SO	CH 40) PVC M	PE Well			Water le Nater le	evel duri evel in c	ng drilling ompleted well	Page 1 of 1
DEPTH SYMB		USCS	SOIL DESCRIPTION	SAMP. #	# Blow / ft.	vs PII pp	D om (BORING COMPLETION	WELL DESCRIPTION
0 ~ _									
	00000	GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-31':GM: Gravel, Sand, Silt, Mixture,						Cement Grout 3'-43'
			gravel to 4", Lt. Brown, med. dense, dry. 31'-42' SM/SP/SC: Poorly graded sand with clay, red to						
	00000		brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist.						
-25 - 07070 07070 -30 - 07070			Minor gravel. Slight odor @ 36' and SW moist.						
-35-		SM/SC	CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.						
-40 -		SC/CL							Bentonite 43'
-45-									Top Dana 40
-50		SP/SC	CLAYEY SAND: SP/SC:	49'-51'	24"/	19			Top Screen 49'
-55-			Sand with clay, slight odor	54'-56'	18"/	11			
-60 -			BGS No staining or odor at 75'-TD	59'-61'	24"/	25			
-65-		SP/SC							
-70 -		51/50		64'-66' 69'-71'	24"/	16			
-75-		CL /	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown,	74'-76'	24"/2	6			Sump 74'-79' TD 79'
- Receiv	ved by OCD: 10	9/21/2022	8:48:57 AM	······	_				Page 73 of 193
---------------	--	----------------------	--	---------	----------------	------------------------------	-------------------------------------	---------------------------------------	----------------
C	vpress Er	nginee	ering Services,	Inc.	F	IELC) BOREH	OLE LOG	
10) 235 West L	ittle Yorl	k Road		B	OREH	OLE NO.: MP	PE-20	
SI	uite 256				T	OTAL I	DEPTH: 78'		1
	buston, Texa	as 77040)-3229						-
	PROJEC	T INFOR	RMATION			DRILLI	NG INFORMA	TION	· · ·
PROJE	CT:	Rei	mediation Drilling	DRIL	LING (20.:	Atkins E	ngineering	
SITE L	OCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	tes	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	Ric	k Smith, PG	MET	HOD O	FDRIL	LING: 81/4" He	ollow Stem Auger	
PROJE	CT MANAGE	ER: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spo	0 n	
DATES	DRILLED:	11/2	19-20/02	HAM	IMER V	VT./DRC	DP 140 lb., 3	0 in.	
NOTES	: PsH@ 60.	02' H2O	@ 61.50' BGS		∽ Wa ★ Wa	iter level o iter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -	****) (······		· r		· · · · · · · · · · · · · · · · · · ·	
	0-0-0-0	GM	GRAVEL AND SAND: 0'- 8': GM mixed with caliche,				199 2 - 199 2	Cement Grout	
-5 -			white pink, dry 8'-39':GM: Gravel, Sand, Silt, Mixture,					3'-39'	
-10-	0 - 0 - 0 - 0 0 - 0 - 0 - 0		gravel to 4", Lt. Brown, med. dense, dry. 39'-42'						
	0-0-0-0	2	SP/SC: Poorly graded sand with clay, red to						
- 20 1	0-0-0-0		brown,k soft, slightly plastic, moist. 42'-49': CL:						
-201	0-0-0-0		Lean clay with sand, red, medium stiff, plastic moist.						
-25-									
-30-	0.0.0.0								
-35-	0.0.0.0								
	0.00000								
-40-		SP/SC	CLAY AND SAND:					Bentonite 39'	
-45-	SIIII () () () () () () () () () () () () ()		CLAY: CH: Red Clayey Sand: lean clay with sand,					Top Build 12	
-50-		ap/ac	med. stiff, plastic, moist. Psh : 60.02', H2O 61.50'					Top Screen 48'	
		52/50	CLAY AND SAND: Clay & Poorly graded sand, yellow	49'-51'	24"/51				
			CLAYEY SAND: SP/SC: 54'-75' Poorly Graded	54'-56'	24"/51				
- 2 -			Sand with clay , strong odor & staining @ 65'-75'.	59'-61'	24"/33				
-65-		SP/SC	TD 78' Saturated @ 60' BGS Wet with PsH @65'						
-70 -			BGS PsH @ 60.02' H2O @ 61.50 BGS No staining	64'-66'	24"/51				
			or odor at 75'-TD	69'-71'	24"/44			 מיד '31–78 מיתונ	
-75-	<u>UIIIII</u>	CL	CLAY: CL: Sandy Lean	74'-76'	24"/20			78'	
		SP/SC	stiff, low plasticity, moist,	79'-81'	6"/51))	
-85			Graded sand with clay &		- , • -				
۲ ۲ ۹۰-			gravet, red. med. dense.						1

Received by OCD: 10/21/20	22 8:48:57 AM	_					Page 74 of 193
Cypress Engine 10235 West Little Y	eering Services, ork Road	Inc.	F B(OLE LOG E-21	
Suite 256	10 3000			JIALI	DEPTH: 09		
	0740-3229						- -
PROJECT:	Remediation Drilling	DRILL		:0.:	Atkins Er	gineering	
SITE LOCATION:	WP Roswell Station 9	DRILL	_ER:	•	Mort Bat	es	
JOB NO.:	P-202203	RIG T	YPE:		Mobile D	rill B-68	
LOGGED BY:	Rick Smith, PG	METH		- DRILI	_ING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER: (George Robinson, PE	SAMF	PLING I	METHO	DS: Split Spoo	n	
DATES DRILLED: 1	1/19/02	HAMN	/IER W	T./DRC)P 140 lb., 30) in.	
NOTES: 4" SCH 40 MPE	Well	⊥ ⊥	: Wat : Wat	er level o er level i	luring drilling n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS USC	S SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -20 -25 -30 -40 -45 -50 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75	GRAVEL AND SAND: GM: 0'-5' BGS White Pink Caliche, Hard, Dry 5'-32 GM' :Gravel, Sand, Silt, Mixture, gravel to 4", Light Brown, medium dense, dry, No odor CLAY: Fat Clay, red, medium stiff, plastic, moist CLAYEY SAND: CL: Fat Lean clay with sand, red, medium stiff, low plasticity, moist, no odor, some interbedded with lenses (<1') of SP/SC, starting @ 50' BGS, Poorly graded sand with clay, red to strong brown, soft, slightly plastic, very moist Water @ 55.45' BGS 11/25/02					Cement Grout 3'-37.4' Bentonite 37.4' Top Sand 41.9' Top Screen 44' TD 69'	

ł

Received by OCD: 10/21	/2022 8	8:48:57 AM				·		Page 75 of 193
Cypress Eng 10235 West Littl Suite 256 ouston, Texas	jinee e Yor 7704(ering Services, I k Road 0-3229	nc.	B T	IELC OREHO OTAL I	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-22	
PROJECT	NFO	RMATION		I	DRILLI	NG INFORMA	TION	
PROJECT:	Re	mediation Drilling	DRIL	LING C	20.:	Atkins Er	ngineering	
SITE LOCATION:	ТМ	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG ⁻	TYPE:		Mobile D	rill B-68	
LOGGED BY:	Jin	a Chionis	METI	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER	Ge	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo	on in the second s	
DATES DRILLED:	11/	07/02	HAM	MER W	/T./DRC	OP 140 lb., 30) in.	i
NOTES: 4" SCH 40	PVC M	PE Well	2	z Wa z Wa	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	JSCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -20 -25 -30 -35 -40 -55 -55 -55 -70 -75 -70 -75 -75 -75 -75 -75 -75 -75 -75	м м н н	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAYEY SAND: TD 80' Saturated @ 65' BGS Cement / Bentonite Grout 49'-3' Bentonite 49'-52' 12/20 Sand Pack ' 52'-80' 0.010 Slot Screen 80'-55' CLAY: Red Fat Clay, Water Level @ 65.0' from BGS 11/08/02 No Odor or hydrocarbon staining.					Cement Grout 3'-49' Bentonite 49' Top Sand 52' Top Screen 55' T.D. @80'	

L

Receiv	ved by OCD: 10	/21/2022	8:48:57 AM		<u>-</u>				Page 76 of 193
	ypress Er	nginee	ering Services,	Inc.	F В	IELC	D BOREH	OLE LOG E-23	
	uite 256		K NUAU		T	OTAL	DEPTH: 80'		
	ouston, Texa	as 7704	0-3229						
	PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJE	ECT:	Re	mediation Drilling	DRII	LING C	20.:	Atkins Er	ngineering	
SITE L	OCATION:	TV	VP Roswell Station 9	DRI	LER:		Mort Bat	es	
JOB NO	D.:	P-2	202203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	Jin	n Chionis	MET	HOD O	F DRIL	LING: 8 1/4" Ho	ollow Stem Auger	
PROJE	CT MANAGE	ER: Ge	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spoo	on	
DATES	DRILLED:	11/	06/02	HAN	IMER W	/T./DRC	DP 140 lb., 30	0 in.	
NOTES	3: 4" SCH 40	0 PVC M	IPE Well		∞ Wa ∞ Wa	ter level (ter level i	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -			, <u> </u>	·	· · · · · · · · · · · · · · · · · · ·	F	·		
-5 -	0 - 0 - 0 - 0 0 - 0 - 0 - 0 0 - 0 - 0 - 0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2"					Cement Grout 3'-49'	
-10-									
-20	0,0,0,0								
-25									-
-35 -			SAND AND SILT: Silty, Sand Tan Brown Fine						
-40		CL	CLAYEY SAND: Red Clayey Sand						
-45 - -50 -		СН	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					Bentonite 49'	
-55 -		CL /						Top Sand 52' Top Screen 55'	
		СН	Stained, Hydrocarbon						
-65 -			Saturated @ 65' BGS Cement / Bentonite Grout 49'-3' Bentonite 49'-52'						
-70 -			12/20 Sand Pack ' 52'-80' 0.010 Slot Screen 80'-55'						
-75-		СН	CLAY: Red Fat Clay, Water Level @ 60.0' from BGS 11/07/02 No Odor or hydrocarbon staining.					T.D. @80'	

Recei	<u>ved by OCD: 10</u>)/21/2022	8:48:57 AM						Page 77 of 193
	ypress Er 0235 West Li uite 256 buston, Texa	nginee ttle Yorl is 77040	ering Services, k Road	Inc.	F В Т	IELE OREHI OTAL I	D BOREH OLE NO.: MP DEPTH: 74'	OLE LOG PE-24	
	PROJEC		RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Rei	mediation Drilling	DRII	LLING (20.:	Atkins E	ngineering	-
SITE L	OCATION:	Т₩	P Roswell Station 9	DRI	LER:		Mort Bat	tes	
JOB N	O.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGG	ED BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	ollow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAN	IPLING	METHO	DDS: Split Spo	on	
DATES	DRILLED:	11/	11-13/02	HAN	IMER W	/T./DRC	OP 140 lb., 3	0 in.	
NOTES	S: 4" SCH 40	0 PVC M	PE Well		∞ Wa • Wa	ter level i ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 -10 -20 -25 -30 -40 -45 -40 -45 -40 -45 -55 -60 -65 -70 -75		GM CL CH	COLLUVIUM: Hard White Caliche 0'-4' CLAYEY SAND: Clayey GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CONGLOMERATE: Hard CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Damp @40', Perched Aquifer? Strong Contamination & Odor, Black Streaks in Clayey Sand CLAYEY SAND: TD 79' Saturated @ 58' BGS Cement / Bentonite Grout 43'-3' Bentonite 43'-46' 12/20 Sand Pack ' 46'-74' 0.010 Slot Screen 74'-49' Strong Contamination & Odor, Black Gray Color Water Level 58:27' TOC CALCAREOUS SANDSTONE: Calcareous Cement, White, fine gr., Hard Drilling, Dry, No Odor or Staining	49'-51' 54'-56' 59'-61' 70'-72' 74'-76'	33/24" 39/24" No SPT 80/16" 50/24"			Cement Grout 3'-43' Bentonite 43' Top Sand 46' Top Screen 49' TD 74'	
-85 -		[or Staining	J				L]	

Recei	ved by OCD: 1	0/21/2022	8:48:57 AM					
C 10 St	ypress Er 0235 West Li uite 256	n gine e ittle Yor	ering Services, k Road	lnc.	F В Т	IELC OREHO OTAL I	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG 9E-25
	buston, Texa	as 7704	0-3229	· · · · · · · · · · · · · · · · · · ·				
	PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION
PROJE	CT:	Re	mediation Drilling	DRILI	LING (:00	Atkins Ei	ngineering
SITE L	OCATION:	TV	VP Roswell Station 9	DRILL	_ER:		Mort Bat	es
JOB N	D.:	P-2	202203	RIGT	YPE:		Mobile D	rill B-68
	ED BY:	Jin	1 Chionis	MEIF			LING: 8 1/4" Ho	llow Stem Auger
	CI MANAGE	ER: Ge	orge Robinson, PE	SAMF			DDS: Split Spo	on S
DATES	DRILLED:	11/	04/02		NER M	/1./DRC	ンド 140 lb., 30	J in.
NOTES	5: 4" SCH 4	0 PVC M	PE Well		z Wa z Wa	ter level o ter level i	during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 -][<u> </u>		······	·	·····
-5 -10 -20 -25 -30 -35			GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" Contaminated Pit Soil begins @ 7' BGS Pit Liner @ 17' BGS					Cement Grout 3'-48'
-40 -45 -50 -55 -60		CH CL / CH	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Moist @ 38' CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite Grout 48'-3' Bentonite 48'-51'					Bentonite 48' Top Sand 51' Top Screen 54'
-70 -			12/20 Sand Pack ' 51'-79' 0.010 Slot Screen 79'-54'					
-75-		CL	Level @ 60.20' from BGS 11/05/02 No Odor or hydrocarbon staining.					

Recei	ved by OCD: 1	0/21/2022	8:48:57 AM						Page 79 of 193
C	unress Fr	nainee	ring Services	Inc	F	IELD	D BOREH	OLE LOG	
		iyince	Read	nic.	E	OREH	OLE NO.: MP	E-26	
10 	ite 256	ittle Yori	K ROAD		Т	OTAL	DEPTH: 84'		
	buston, Texa	as 77040)-3229						
	PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	_
PROJE	CT:	Rei	mediation Drilling	DRII	LLING	CO.:	Atkins Ei	ngineering	
SITE LO	OCATION:	ТМ	P Roswell Station 9	DRII	LLER:		Mort Bat	es	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	Jim	Chionis	МЕТ	HOD	OF DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	ER: Geo	orge Robinson, PE	SAN	IPLING	METH	ODS: Split Spo	0 n	
DATES	DRILLED:	11/	05-06/02	HAM	IMER V	VT./DR	OP 140 lb., 30) in.	
NOTES	: 4" SCH 4	0 PVC M	PE Well		sz Wa zz Wa	ater level ater level	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
	0-0-0-0	GM	GRAVEL AND SAND:						
-5 -	0.0.000		GM: Gravel, Sand, Silt, Mixture, gravel to 2" @ 25'					Cement Grout 3'-47'	
-10-	0,0,0,0								
	0,0,0,0							2 7 2	
	0.00000								
-20-									
-25-									
					ŗ				
-30	0-0-0-0								
-35-			CLAY: CH: Red Clavev						
-40-		СН	Sand mixed with Fat Red Clay Lenses Moist Light						
-45-			Hydrocarbon Odor 35'-40' BGS					Postosito 471	
-50 -	SHHH			401 511				Top Sand 49'	
-55-	<u> </u>			Rec. 2'				Top Screen 54'	
- <u>*</u>		CL /	CLAYEY SAND: TD 84' Saturated @ 65' BGS Cement / Bentonite Grout	54'-56' Rec. 2'				-	
-65-		011	47-3 Bentonite 47'-49' 12/20 Sand Pack 49'-85'	Rec. 2'					
			0.010 Slot Screen 84'-54'	64'-66' Rec.1.5'					
- / U -			CLAYEY SAND: Water	69'-71'				9	
-75 -		CL	11/08/02 No Odor or hydrocarbon staining.	74'-76' Rec. 2'	15				
-85 -		СН	CLAY: Red Brown Fat Clay @79' BGS	79'-81' Rec. 2'	28 >50			T.D.084'	
<u> </u>				Rec. 2'					

Received by OCD: 10/21/	2022 8:48:57	7 AM						_Page 80 of 193
Cypress Eng	neering	Services,	Inc.	F			OLE LOG	
10235 West Little	York Roa	ıd			OREN		E-2/	
Suite 256	2010 200	n			UTAL	DEPTH. /9 *		
PROJECT II		а 			ווופח			-
	Pomodia	tion Drilling				Atkins Er	gineering	
SITELOCATION	TWP Do	cwell Station 0			00	Mort Bat		
JOB NO	P_202203	Swell Station 2	BIG	TYPE		Mohile D	rill B-68	
LOGGED BY	CM Bar	, shill PG	MET			1 ING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER		Pahinson PF	SAM	IPLING	METHO	DDS: Split Spor	n stem ruger	
DATES DRILLED	10/31/02	Coomson, 1 E	HAN			DP = 140 lb., 30) in.	
	10/51/02					during drilling		4
NOTES: 4" SCH 40 F	VC MPE We	11		∞ wa	ater level i	in completed well	Page 1 of 1	
DEPTH SYMBOLS U	scs soi		SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
	GRAV GM: G	EL AND SAND: ravel, Sand, Silt,		· · · · · · · · · · · · · · · · · · ·			Cement Grout	
-5 - 0,0,0,0,0 -10 - 0,0,0,0,0 0,0,0,0,0,0 0,0,0,0,0,0 0,0,0,0,	Mixture Srong Begins	e, gravel to 2.5" Contamination @ 12' BGS					3'-40'	
-35 SZ -40 -45 -50 -50 -35 -35 -45 -45 -50 -50 -50 -50 -50 -50 -50 -5	CLAYE Clayey Hydrro Stainin Satura SAND CLAYE Satura	EY SAND: CL: Red Sand Strong carbon Odor & g Gray / Black ted , very wet /stinky AND SILT: 2' Sand EY SAND: ted from 40'-TD Castemination					Bentonite 40' Top Sand 48' Top Screen 54'	
-55	Strong	Contamination	SPT	46 Blows				
-65 - CL								
-75 -								
-								

Released to Imaging: 11/22/2022 9:37:14 AM L

Receiv	ved by OCD: 10)/21/2022	8:48:57 AM						Page 81 of 193
C	voress Er	nainee	erina Services.	Inc.	F	IELD	D BOREH	OLE LOG	
10	235 West Li	ittle Yor	k Road		E	BOREH	OLE NO.: MP	E-28	
Su	lite 256				ד	OTAL	DEPTH: 82'	(Casing 76')	
	ouston, Texa	s 7704(0-3229						_
	PROJEC	T INFOI	RMATION			DRILLI	ING INFORMA	TION	
PROJE	CT:	Re	mediation Drilling	DRII	LLING	CO.:	Atkins E	ngineering	
SITE LO	DCATION:	ТМ	P Roswell Station 9	DRI	LLER:		Mort Bai	es	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	CM	I Barnhill, PG	MEI	HOD		LING: 8 1/4" Ho	bllow Stem Auger	
PROJE		:R: Geo	orge Robinson, PE	SAN			ODS: Split Spo	on 	
DATES	DRILLED:	10/.	30-31/02	HAN			OP 140 lb., 30) in.	-
NOTES	4" SCH 4	0 PVC M	PE Well		∞ Wa ∞ Wa	ater level ater level	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 –		CM]	، ،	r] [
-5 -	0,0,0,0,0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-40'	
-10-	0,0,0,0								
	0,0,0,000								
	0,0,0,0								
-20-	$\bigcirc \bigcirc $								
-25-	0-0-0-0								
-30-	0,0,0,0								
-35-		СН	CLAY: CH: Red Clayey						
	ANN W		Sand mixed with Fat Red Clay Lenses						
-40	LIIII)							Bentonite 40'	
-45-	<u> </u>							Top Sand 43' Top Screen 46'	
-50 -	UUUU							•	
	<u> </u>								
			10% Gravel / 90% Sand	SPT	32 Blows				
-00-			CLAYEY SAND: Hydrocarbon Odor & Stain	SPT	25				
-65-		CL /	@ 56'	SPT	Blows 50				
-70		CH			Blows				
-56-1		GIPSUM	GYPSUM: At 71' -76' White Gypsum	SPT	50 Blows				
		CL	CLAYEY SAND: Saturated		50 Blows				

Receiv	ed by OCD: 10/	/21/2022 8	8:48:57 AM					
С	ypress Er	nginee	ering Services,	Inc.	F B	IELC	D BOREH	OLE LOG E-29
10	ite 256	ittle Yori	k Road		Т	OTAL	DEPTH: 79'	~ ~
	ouston, Texa	as 77040	0-3229					
	PROJEC	T INFOR	RMATION			DRILLI	NG INFORMA	TION
PROJE	CT:	Rei	mediation Drilling	DRI	LLING (20.:	Atkins Ei	ngineering
SITE L	OCATION:	TW	P Roswell Station 9	DRII	LLER:		Mort Bat	es
JOB N	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68
LOGGI	ED BY:	CM	l Barnhill, PG	MET	HOD O	FDRIL	LING: 8 1/4" Ho	llow Stem Auger
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METHO	ODS: Split Spo	0 n
DATES	DRILLED:	11/0	01-02/02	HAN	IMER V	VT./DRC	OP 140 lb., 30) in.
NOTES	3: 4" SCH 40	0 PVC M	PE Well		∽ Wa ∽ Wa	ter level i ter level i	during drilling in completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 –		CN		<u></u>				·····
-5 -10 -1		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2.5" No Contamination Split Spoon at interface between					Cement Grout 3'-48'
			Sampled for Geotechnical Data and also for Heterotropic Bacteria					
-25-								
-30 -		СН	CLAY: CH : Fat Clay	SPT / Lab	42 Blows			
-40			Sand No Contamination		6": 3 Blows 12" 8 Blows			
-45					18" 14 Blows			
-55-		CL / CH	CLAYEY SAND: Saturated from 60'-TD No		24" 17 Blows			Bentonite 48'
		CL	Contamination Split Spoon Sample 58'60' at Capillary Fringe for Geotechnicat and	SPT / Lab	26 Blows			Top Sand 51' Top Screen 54'
-65- -70-			Heterotropic Bacteria		6": 3 Blows 12" 8			
-75-					18" 7 Blows 24" 8 Blows			
		L]]		<u> </u>

Received by OCD: 10/2	21/2022	8:48:57 AM						_Page 83 of 193
Cypress Eng 10235 West Litt Suite 256 Jouston, Texas	ginee tle Yorl s 77040	ering Services, I k Road 0-3229	nc.	F В Т	OREHO	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-30	
PROJECT	INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJECT:	Rei	mediation Drilling	DRIL	LING (20.:	Atkins Er	ngineering	
SITE LOCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	СМ	l Barnhill, PG	METI	HOD O	F DRILI	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGEF	R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spo	Dn	
DATES DRILLED:	10/2	25/02	HAM	MER V	VT./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 40	PVC M	PE Well	2	z Wa	iter level o iter level i	during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -25 -30 -40 -45 -55 -60 -70 -85 -85 -85 -85 -10 -57 -10 -10 -10 -10 -10 -10 -10 -10	GM CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAY: Hydrocarbon Odor 42'-46', Gone @56' CLAY: Decreasing Hydrocarbon Odor CLAY: Water Level @ 63.82' from TOC 10/29/02 CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite 56'-53' 12/20 Sand Pack ' 56'-79' 0.010 Slot Screen 79'-59'					Cement Grout 3'-53' Bentonite -53' Sand 79'-56' Screen 79'- 59'	

_

mound by to the 10	/21/2022	8:48:5/ AM					
Cypress Er	nainee	erina Services. I	nc.	F	IELC	BOREH	OLE LOG
10235 West L	ittle Yor	k Road		B	OREH	OLE NO.: MP	E-31
Suite 256				Т	OTAL I	DEPTH: 80'	
buston, Texa	as 77040	0-3229				· · · · · · · · · · · · · · · · · · ·	<u></u>
PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION
PROJECT:	Re	mediation Drilling	DRILI	LING C	:00	Atkins Er	ngineering
SITE LOCATION:	TW	P Roswell Station 9	DRILI	ER:		Mort Bat	es
JOB NO.:	P-2	02203	RIG T	YPE:		Mobile D	rill B-68
LOGGED BY:	CM	1 Barnhill, PG	METH		F DRIL	LING: 8 1/4" Ho	llow Stem Auger
PROJECT MANAGE	ER: Ge	orge Robinson, PE	SAMF	PLING		DDS: Split Spoo)n
DATES DRILLED:	10/	28/02	HAMN	IER W	/1./DR(ンピー 140 lb., 30) in.
NOTES: 4" SCH 4	0 PVC M	PE Well		Wat Wat	ter level o ter level i	during drilling in completed well	Page 1 of 1
DEPTH SYMBOLS	uscs	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
		۱ <u>(</u>)۲					
-5 - 0101010	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-55'
	1		11	1			
-20 - 0,00,00,00 -25 - 0,00,00,00 -30 - 0,00,00,00,00,00,00,00,00,00,00,00,00,0		GRAVEL AND SAND: Hydrocarbon Odor 23'-33'					
-20 - 0.2000 - 20 - 20 - 0.200	СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red					
-20 - 0.00000000000000000000000000000000	СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					
-20 - 000000000000000000000000000000000	СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					
-20 - 000000000000000000000000000000000	СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					Top Bentonite 55'
-20 - 000000000000000000000000000000000	СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					Top Bentonite 55' Top Sand 58'
-20 - 0.00000000000000000000000000000000	CH	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAY: Water Level @ 60.59' from TOC 10/29/02					Top Bentonite 55' Top Sand 58' Top Screen 59'

Received by OCD:	10/21/2022	8 8:48:57 AM						Page 85 of 193
Cypress E 10235 West I Suite 256	nginee Little Yor	ering Services, k Road	Inc.	F В Т	IELE OREH OTAL	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-32	
PROJEC		RMATION			DRILLI	NG INFORMA	TION	_
PROJECT:	Re	mediation Drilling	DRIL	LING	20.:	Atkins Er	ngineering	-
SITE LOCATION:	TV	VP Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	202203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	Ric	ek Smith, PG	MET	нор о	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAG	ER: Ge	orge Robinson, PE	SAM	PLING	METH	DDS: Split Spoo	o n	
DATES DRILLED:	11/	18-19/02	HAM	MER V	VT./DRO	OP 140 lb., 30) in.	
NOTES: 4" SCH	40 PVC M	MPE Well	2	∞ Wa • Wa	ter level (ter level i	during drilling in completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	i
0 -5 -10 -20 -20 -25 -30 -40 -45 -60 -65 -70 -75 -85 -90	GM GM CH CL/CH	GRAVEL AND SAND: 0'- 3': GM mixed with caliche, white pink, dry 3'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, No Odor CLAY: CH: 42'-54': Fat Clay with Sand, red, medium stiff, plastic, very moist at contact, No odor. Water Level @ 55.20' BGS 11/25/02 CLAYEY SAND: CL: 54'- 79' Sandy lean clay red/ brown, med. stiff, moist, moderate odor, no staining. Trace gravel @ 57', slow drilling, TD 79' Grout 36'-3' Bentonite 36'- 39' Sand 39'-79' 0.020 Screen 74'-44' Riser 74'- 79'					Cement Grout 3'-36.60' Bent. 36.60' Top Sand 39.20' Top Screen 44' Sump 74'-79' TD 79'	

I.

Received by OCD: 1	0/21/2022	8:48:57 AM					- LLV	Page 86 of 193
Cypress Er 10235 West L Suite 256	nginee ittle Yorl	ring Services, I « Road	nc.	FI BC TC	DREHO	DIE NO.: MP	DLE LOG E-33	
ouston, Texa	as 77040)-3229				, - 100 10 - 10 - 11 - 11 - 12 - 12 - 12		
PROJEC	T INFOR	RMATION	_	[DRILLI	NG INFORMAT	FION	
PROJECT:	Rei	nediation Drilling	DRIL	LING C	0.:	Atkins En	gineering	!
SITE LOCATION:	ТМ	P Roswell Station 9	DRIL	LER:		Mort Bate	S	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile Dr	-ill B-68	
LOGGED BY:	Ric	k Smith, PG	MET	HOD OI	= DRILI	LING: 8 1/4" Hol	llow Stem Auger	
PROJECT MANAGE	ER: Geo	orge Robinson, PE	SAM	PLING	METHO	DS: Split Spoo	n	
DATES DRILLED:	11/	18/02	НАМ	MER W	T./DRC	OP 140 lb., 30	in.	
NOTES: 4" SCH 4	0 PVC M	PE Well		∞ Wat v Wat	er level o er level i	during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -40 -45 -55 -60 -65 -70 -85 -90	GM GM CH CL/CH	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, No Odor CLAY: CH: 42'-54': Fat Clay with Sand, red, medium stiff, plastic, very moist at contact, No odor. Water Level @ 51.75' CLAYEY SAND: CL:53'- 79' Sandy lean clay red/ brown, med. stiff, moist, wet @ 53', moderate odor, no staining. TD 79' Grout 36'-3' Bentonite 36'-41' Sand 41'-79' 0.020 Screen 79'-44'					Cement Grout 3'-36.40' Bent. 36.40' Top Sand 41.6' Top Screen 44' TD 79'	

I.

Released to Imaging: 11/22/2022 9:37:14 AM

1

Receive	ed by OCD: 10	/21/2022	8:48:57 AM		<u>[</u>		-		Page 87 of 193
C	ypress Er	nginee	ering Services,	Inc.	F	IELC) BOREH	OLE LOG	
10	235 West Li	ittle Yor	k Road		В	OREH	OLE NO.: MP	PE-34	
Su	iite 256				Т	OTALI	DEPTH: 80'		
	puston, Texa	as 7704	0-3229						-
	PROJEC	TINFO	RMATION				NG INFORMA	TION	_
PROJE		Re	mediation Drilling			30.:	Atkins E	ngineering	
SHEL	OCATION:	TV	P Roswell Station 9	DRI			Mort Bai	tes	
JOB NO		P-2	02203	RIG			Mobile D	rill B-68	
			I Barnhill, PG				$LING \otimes I/4'' H(C)$	bllow Stem Auger	
		:K: Ge	orge Kobinson, PE	SAN			Split Spo	o n	i
DATES		10/	24/02				ノビ 140 lb., 3	U IN.	
NOTES	3: 4" SCH 4	0 PVC M	PE Well		sz Wa ┳ Wa	iter level (iter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -			,						
-5 -		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-53'	
-10-									
-20 -									
-25									
-35 -	0.00000	сн	CLAY: CH: Red Clayey						
-40-			Sand mixed with Fat Red Clay Lenses						
-45 - -50 -			CLAY: Decreasing Hydrocarbon Odor						
				50'-52'	30			Bentonite -53'	
-55-			CLAY: Water Level @ 63.49' from TOC 10/29/02	55'-57'	BLOWS 37 Blows			Sand 79'-56'	
— 65 –	<u> </u>	CL /		60'-62'	36 Blows			Screen 79'- 59'	
-70-		СН	Saturated @ 65' BGS Cement / Bentonite Grout	65'-67'	56 Blows				
-75-			12/20 Sand Pack ' 56'-79' 0.010 Slot Screen 79'-59'	75'-77'	Blows				

Receive Cy 10 Su	<i>ed by OCD: 10</i> ypress Er 235 West Li uite 256 puston, Texa	/21/2022 nginee ttle Yor is 77040	8:48:57 AM ering Services, k Road 0-3229	Inc.	F В Т	IELC OREH OTAL	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG PE-35	Page 88 of 19
	PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	_
PROJE		Rei	mediation Drilling	DRILL	ING (20.:	Atkins E	ngineering	
	JCATION:	TW	P Roswell Station 9				Mort Bat	res	
		P-2	02203			וסח		ГШ B-08	
			Barnnill, PG				$DS^{-} Subt Such$	onow Stem Auger	
		.r. Gei 11/	15/02				$OP = 140 \text{ lb} \cdot 30$) in.	
		11/.	15/02		\/s		during drilling		-
NULES	4" SCH 4	D PVC M	PE Well		Wa	ter level i	in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -40 -45		GM CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Water Level 56.75' BGS 11/16/02					Cement Grout 3'-48' Bentonite 48'	
-55 -60 -65 -70 -75		CL / CH	GRAVEL AND SAND: CLAYEY SAND: TD 79' Saturated @ 58' BGS Cement / Bentonite Grout 38'-3' Bentonite 48'-51' 12/20 Sand Pack ' 51'-74' 0.020 Slot Screen 74'-54' Riser 74'-79' No Odor or Staining Fat Clay lenses layered 50'-74' Dry at 74' CLAY: Red Fat Clay, Dry, No Odor or Staining					Top Sand 51' Top Screen 54' Sump 74'-79' TD 79'	

Released to Imaging: 11/22/2022 9:37:14 AM

I.

Received by OCD: 10 Cypress E 10235 West L Suite 256 NOUSTON, Texe PROJECT: SITE LOCATION: JOB NO.: LOGGED BY: PROJECT MANAGE DATES DRILLED: NOTES:	nginee ittle Yor as 77040 T INFOI Ref TW P-2 CM ER: Gee 11/	8:48:57 AM ering Services, k Road D-3229 RMATION mediation Drilling VP Roswell Station 9 202203 I Barnhill, PG orge Robinson, PE 14/02	Inc. DRII DRII RIG MET SAM HAN	HOD O ILLING (LLER: TYPE: THOD O IPLING IPLING	IELE OREH OTAL DTAL DRILLI CO.: F DRIL METH(VT./DR(ter level	D BOREH OLE NO.: MP DEPTH: 74' NG INFORMA Atkins En Mort Bat Mobile Di LING: 8 1/4'' Ho DDS: Split Spoo DP 140 lb., 30 during drilling	OLE LOG E-36 TION Igineering es rill B-68 llow Stem Auger on) in.	Page 89 of 19.
4" SCH 4	O PVC M	PE Well	1	포 Wa	ter level i	in completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -25 -30 -40 -45 -55 -60 -70 -75 -75 -75 -75 -75 -75 -75 -75	GM CH CL / CH CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAYEY SAND: TD 74' Saturated @ 51' BGS Cement / Bentonite Grout 38'-3' Bentonite 38'-41' 12/20 Sand Pack ' 41'-74' 0.020 Slot Screen 74'-44' No Odor or Staining Fat Clay & Sandy Clay lenses layered 50'-70' Dry at 70' BGS CLAY: Red Fat Clay, Dry, No Odor or Staining	49'-51' 54'-56' 59'-61' 74'-76'	50/24" 50/24" 25/24" 23/24"			Cement Grout 3'-38' Bentonite 38' Top Sand 41' Top Screen 44'	

į.

i

ļ

ļ

Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

louston, Texas 77040-3229

FIELD BOREHOLE LOG

Page 90 of 193

BOREHOLE NO.: MPE-37 TOTAL DEPTH: 74'

	PROJEC	INFO	RMATION				NGIN	IFURINA	TION
PROJE	CT:	Rei	mediation Drilling		LING	:0:		Atkins Er	ngineering
SITE L	OCATION:	TW	P Roswell Station 9	DRIL	LER:			Mort Bat	es
JOB NO	0.:	P-2	02203	RIG	TYPE:			Mobile D	rill B-68
LOGGE	ED BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING:	8 1/4" Ho	llow Stem Auger
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS:	Split Spoo	0 n
DATES	DRILLED:	11/2	15/02	НАМ	MER W	/T./DRC	OP	140 lb., 30	0 in.
NOTES	S: <u>4</u> " SCH 40) PVC M	PE Well		∞ Wa z Wa	ter level (ter level i	during d n compl	rilling leted well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BC COM	DRING PLETION	WELL DESCRIPTION
0		GM	GRAVEL AND SAND: GM: 0'-4' BGS White Tan Brown Caliche, Hard, 4'-						Cement Grout 3'-38'
-10 -20 -25 -30 -35		СН	Mixture, gravel to 4",						
-40			Sand mixed with Fat Red Clay Lenses						Bentonite 38' Top Sand 41' Top Screen 44'
-55-		CL / CH	CLAYEY SAND: TD 74' Saturated @ 50' BGS Cement / Bentonite Grout 38'.3' Bentonite 38'.41'						
-60 -65 -70			12/20 Sand Pack ' 41'-74' 0.020 Slot Screen 74'-44' No Odor or Staining Fat Clay & Sandy Clay lenses layered 50'-70' Dry at 70' BGS Water Level 49.4'						
-75-		СН	BGS 11/16/02 CLAY: Red Fat Clay, Dry, No Odor or Staining						

Cypress Eng 10235 West Litt Suite 256 Houston, Texas PROJECT PROJECT: SITE LOCATION: JOB NO.: LOGGED BY:	ginee le York 7704(INFOF Rer TW P-2 C.M	ering Services, k Road D-3229 RMATION nediation Drilling /P Roswell Station 9 02203 (I. Barnhill, PG	Inc. DRIL DRIL RIG METI	LING C LER: TYPE: HOD O	F DRILL	DLE NO.: MW DEPTH: 68' NG INFORMA Atkins El Mort Bat Mobile D LING: HSA 81/4	OLE LOG V-38 TION ngineering es rill B-58 " Augers
DATES DRILLED:		30/03	HAM	MER W	/T./DRO	OP 140 lb., 30) in.
NOTES: 2" SCH 40	PVC M	onitor Well		z Wa z Wa	ter level ter level i	during drilling in completed well	Page 1 of 1
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
$ \begin{array}{c} 0 \\ -5 \\ -10 \\ -10 \\ -20 \\ -25 \\ -30 \\ -35 \\ -40 \\ -45 \\ -50 \\ -55 \\ -60 \\ -65 \\ -70 \\ -75 \\ -85 \\ -$	5M 5C 5C 5C 5C 5C 5C 5C 5C 5C 5C	GM: 0'-5': GM mixed with caliche, white pink, dry 5'- 18':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. SC: Clayey Sand, tan brown to light brown reddish SP: Fine gr. sand, reddish SC: Clayey Sand, fine gr. well sorted, no odor or staining. Reddish Brown to yellowish color. Saturated at 55' feet below ground surface. DTW=43.27' BGS Total Depth 68' BGS.	<pre>@55' BGS Sampled 2 x 4/oz. Jars @08:32hr 8260 VOC / TPH Mod. 8015 8270 SVOC Total</pre>	67/20" 52/24" 15/24" 20/24" 19/24" 36/24"	9'- 11' 19'- 21' 29'- 31' 39'- 41' 49'- 51' 59'- 61'		Cement Grout 0'-41' Top Bentonite 45' Top Sand 46' 12/20 Sand Top Screen 48' 0.010 Slot Screen TD 68'

Page 91 of 193

Released to Imaging: 11/22/2022 9:37:14 AM

Received by OCD: 10/21/2022 8:48:57 AM

Recei	ved by OCD · 1	0/21/2023	2 8·48·57 AM					
Cy	/press Er	nginee	ering Services,	Inc.	F			OLE LOG
10	235 West Li	ittle Yor	k Road					E-22
	lite 256	- 770 40	2000			UTALI	DEPTH: 33'	
								TION
							Atline E	
		Kel	mediation Drifting				Atkins E Mont Po	ngineering
	JUATION:	1 M D 2	P Roswell Station 9					
	יעם ח.	P-2				יויסח א		
		Jim Di C	I UNIONIS				$\Box \Pi \Theta = 0 I/4^{-1} H($	on stem Auger
		.rt. Geo	orge Kodinson, PE				סטל. эрш эро 140 гр	UU 20 TNI
DATE5		11/	J//U2					JU IN.
NOTES	: Water @ 1	20' (BG	S)? Strong Odor		vz Wa nz Wa	ater level o ater level i	during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 -			[,,,,,,,	·		r
		GM	COLLUVIUM: Backfill / Colluvium				2 2	Concrete seal:
-5 -								13'-3'
-			GRAVEL AND SAND:					
-15-			Mixture, 2" Gravel, Sand, Silt Mixture, 2" Gravel Perched Aquifer @ 20' BGS ??					
-57	$\begin{array}{c} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 &$							Bentonite: 18'-
-207	0.0.0.0							13
-25-		СН	CLAY: CH: Red Sandy					Top Sand 23'
	0.0.0.000		GRAVEL AND SAND:	251-271	100			2" 0.010 Slot Screen 35' -
-30 -	000000000000000000000000000000000000000		Silty Gravel, gray with Hydrocarbon Odor	25 27	100			25'
	0.0.0.0							
-35 -								TD 35'
ł	0000				LJ	۱ا	L	L

i

. 1

i

ĺ

ł

- Receive	ed by OCD: 10	/21/2022	8:48:57 AM	,		,,,			Page 93 of 193
C۱	voress Er	nainee	ring Services	nc	F	IELC) BOREH	OLE LOG	
10	225 Most Li	ttlo Vorl	A Road		В	OREH	OLE NO.: SV	E-23	
Su	ite 256		(NUau		Т	OTAL I	DEPTH: 39'		÷
	uston, Texa	s 77040)-3229						(i
	PROJECT		RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Rei	nediation Drilling	DRIL	LING (CO.:	Atkins E	ngineering	
SITE LC	DCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	tes	
JOB NC).:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	D BY:	Jim	Chionis	MET	HOD O	FDRIL	LING: 6 1/4" Ho	ollow Stem Auger	
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spo	0 n	
DATES	DRILLED:	11/(07/02	НАМ	MER V	VT./DRC	OP 140 LB.,	30 IN.	
NOTES	•			2	z Wa	iter level o	during drilling	······	
	° 2" SVE ₩€	ell		3	z Wa	iter level i	n completed well	Page 1 of 1	
	SOIL				Blows	PID	BORING	WELL	
DEPTH	SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	/ ft.	ppm	COMPLETION	DESCRIPTION	
0 -	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		·····	······································		·	·		
		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt						
-5 -			Mixture Gravel to 2"					Concrete seal: 17'-3'	1
	0707070								1
-15_								Bentonite: 22'-	I
10	0,0,0,0							17'	1
20	0707070								
-20-	0-0-0-0			1				Top Sand 22'	
	$\begin{array}{c} 0 - 0 - 0 - 0 \\ 0 - 0 - 0 \\ 0 - 0 - 0 \\ 0 - 0 \\ 0 - 0 \\ 0 - 0 \\ 0 \\$							2" 0.010 Slot	
-25-	0-0-0-0	GM						Screen 35' -	
	0-0-0-0							20	
-30-	0-0-0-0								
-35-	0,0,0,0	GM						TD 39'	
	0,0,0,0								
-40-1 L				/L_			المحمد المشينية المسلم الم		

- Recei	ved by OCD: 10	/21/2022	8:48:57 AM	<u> </u>				DEU	
С	ypress Er	nginee	ering Services,	Inc.	F		J BC	KEH	
1(0235 West Li	ttle Yorl	< Road		B	OREH		0.: SV	E-25
	uite 256	7704				OTALI	DENI	1: 34'	
	buston, Lexa	s //040)-3229						
	PROJEC		RMATION				NG IN	FORMA	
PROJ		Rei	nediation Drilling			.0.:		Afkins El	ngineering
SILE	OCATION:	TW	P Roswell Station 9					Mort Bai	
JOR N		P-2	02203			ייסת		(VIODHE D	FIII B-08
		Jim Di C	Chionis Del D					0 1/4" H(onow Stem Auger
		.rt: Ge(orge Kobinson, PE				נטע. : י סר	5pm 5p0 140 1 15	011 20 YN
		11/	J4/U2					140 LB.,	JU 11N.
NOTE	S: 2" SVE We	ell		2	z Wa z Wa	ter level (ter level i	during dr n comple	illing eted well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BO COMI	RING PLETION	WELL DESCRIPTION
			La, , , ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,				l		
-5		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Strong Hydrocarbon odor Pit liner @ 17'						Concrete seal: 14'-3'
-15-									Bentonite: 21'- 14'
20									Top Sand 21.6'
-25-	0100000								2" 0.010 Slot Screen 34' - 24'
-30-		СН							
-35-			CLAY: CH: Red Sandy Clay to Fat Clay						TD 34'
40 1				Í_	[L		

Ì

İ.

Cypress Engineering Services, Inc. 10235 West Little York Road Suite 256 buston, Texas 77040-3229 PROJECT INFORMATION PROJECT INFORMATION PROJECT INFORMATION DRILLING INFORMA PROJECT INFORMATION DRILLING CO.: Atkins E DRILLER: Mort Ba: JOB NO.: P-202203 LOGGED BY: Jim Chionis PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05/02 NOTES: 2" SVE Well DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Diows PID SYMBOLS USCS SOIL DESCRIPTION SAMP. # Diows PID SYMBOLS USCS SOIL DESCRIPTION SAMP. # Diows PID DATES C:	Cypress Engineering Services, Inc.FIEL0235 West Little York RoadBOREuite 256TOTAbuston, Texas 77040-3229DRILPROJECT INFORMATIONDRILECT:Remediation Drilling.OCATION:TWP Roswell Station 9IO:PROJECT INFORMATION	D BOREHOLE LOG OLE NO.: SVE-26 DEPTH: 35' 'NG INFORMATION
10235 West Little York Road BOREHOLE NO.: SV TOTAL DEPTH: 35' Suite 256 Duston, Texas 77040-3229 PROJECT INFORMATION DRILLING INFORMA PROJECT: Remediation Drilling SITE LOCATION: TWP Roswell Station 9 JOB NO.: P-202203 LOGGED BY: Jim Chionis PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05/02 NOTES: 2" SVE Well Z" SVE Well Z Water level during drilling DEPTH SOIL DSOL SOIL DESCRIPTION SAMP # Blows PID BORING OTIONIC DATE GRAVEL AND SAND: OTIONIC DATE GRAVEL	0235 West Little York RoadBORE0235 West Little York RoadTOTA0100 Uite 256TOTA0110 DescriptionDRIL0110 DescriptionDRIL0110 DescriptionDRILLING CO.:0110 DescriptionDRILLER:0110 DescriptionDEscription0110 DescriptionDescription0110 DescriptionDescription0110 DescriptionDescription0110 DescriptionDescription0110 DescriptionDescription0110 Description	OLE NO.: SVE-26 DEPTH: 35' ING INFORMATION
Suite 256 TOTAL DEPTH: 35' PROJECT INFORMATION DRILLING INFORMAT PROJECT: Remediation Drilling DRILLING CO.: Atkins E SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bai JOB NO.: P-202203 RIG TYPE: Mobile D LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well Z Water level during drilling Z SOIL USCS SOIL DESCRIPTION SAMP. # PID BORING O	uite 256TOTAbuston, Texas 77040-3229PROJECT INFORMATIONDRILECT:Remediation DrillingDRILLING CO.:LOCATION:TWP Roswell Station 9DRILLER:IO :P-202203RIG TYPE:	DEPTH: 35'
Duston, Texas 77040-3229 PROJECT INFORMATION DRILLING INFORMAT PROJECT: Remediation Drilling DRILLING CO.: Atkins E SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bar JOB NO.: P-202203 RIG TYPE: Mobile D LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB, NOTES: 2" SVE Well Z Water level during drilling Z SOIL USCS SOIL DESCRIPTION SAMP. # PID pm BORING proceed well 0 SOIL USCS SOIL DESCRIPTION SAMP. # PID pm BORING proceed well 0 SOUL GRAVEL AND SAND:: Vater level in completed well Mixture Gravel to 2" Immunol for the second completed well 0 SOUL GRAVEL AND SAND:: Immunol for the second completed well Immunol for the second completed well Immunol for the second completed well -15 SOURC completed	Duston, Texas 77040-3229PROJECT INFORMATIONDRILECT:Remediation DrillingLOCATION:TWP Roswell Station 9DRILLER:DRILLER:IO :P-202203RIG TYPE:	ING INFORMATION
PROJECT INFORMATION DRILLING INFORMATION PROJECT: Remediation Drilling DRILLING CO.: Atkins E SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Baz JOB NO.: P-202203 RIG TYPE: Mobile E LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well x Water level during drilling Z" SVE Well x Water level in completed well DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID ppm BORING COMPLETION 0 Completed well GRAVEL AND SAND: Mixture Gravel to 2" x Image: Completed well 0 Completed well GRAVEL AND SAND: x Image: Completed well Image: Completed well 0 Completed well GRAVEL AND SAND: X Image: Completed well Image: Completed well 1 Completed well GRAVEL AND SAND: X Image: Completed well Image: Completed well -5 Completed well Completed well Image: Completed well Image: Completed well Image: Completed wel	PROJECT INFORMATION DRIL ECT: Remediation Drilling DRILLING CO.: _OCATION: TWP Roswell Station 9 DRILLER: IO : P-202203 RIG TYPE:	ING INFORMATION
PROJECT: Remediation Drilling DRILLING CO.: Atkins E SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bai JOB NO.: P-202203 RIG TYPE: Mobile D LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE MAMMER WT./DROP 140 LB, DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB, NOTES: 2" SVE Well x Water level during drilling DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # PID Ppm BORING COMPLETION 0 0 0 0 0 0 0 0 0 0 0 -5 0 0 0 0 0 0 0 0 0 0 -5 0	ECT:Remediation DrillingDRILLING CO.:.OCATION:TWP Roswell Station 9DRILLER:IO :P-202203RIG TYPE:	
SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bar JOB NO.: P-202203 RIG TYPE: Mobile D LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE MAMMER WT./DROP 140 LB, DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB, NOTES: 2" SVE Well X Water level during drilling Z Water level in completed well EORING DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # PID BORING 0 O <td>LOCATION: TWP Roswell Station 9 DRILLER:</td> <td>Atkins Engineering</td>	LOCATION: TWP Roswell Station 9 DRILLER:	Atkins Engineering
JOB NO.: P-202203 RIG TYPE: Mobile E LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well Image: Water level during drilling Image: Water level in completed well DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows // ft. PID ppm BORING COMPLETION 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 0 Image: Water level in completed well Image: Water level in completed well Image: Water level in completed well 1 Image: Water level in completed well Image: Water level in completed well Image: Water level	P_{202203} RIG TYPE	Mort Bates
LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" He PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well Image: Water level during drilling DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID BORING 0 Image: Water level during drilling Image: Water level during drilling Image: Water level during drilling 0 Image: Water level during drilling Image: Water level during drilling 0 Image: Water level during drilling 1 Image: Water level during drilling <		Mobile Drill B-68
PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spo DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well Image: Water level during drilling DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows / ft. PID ppm BORING COMPLETION 0 Image: Water level during drilling Image: Water level during drilling Image: Water level during drilling -5 SOIL USCS SOIL DESCRIPTION SAMP. # Blows / ft. PID ppm BORING COMPLETION -5 Image: Water level during drilling Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during drilling -5 Image: Water level during drilling Image: Water level during Image:	ED BY: Jim Chionis METHOD OF DR	LING: 6 1/4" Hollow Stem Auger
DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., NOTES: 2" SVE Well Image: Water level during drilling Image: Depth Soll SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID Ppm COMPLETION 0 Image: Depth SymBol Soll Description SAMP. # Blows PID Ppm COMPLETION BORING COMPLETION 0 Image: Depth SymBol Soll Description GRAVEL AND SAND: Image: Depth Soll Description Image: Depth Soll Description SAMP. # Image: Depth Soll Description 0 Image: Depth Soll Description GRAVEL AND SAND: Image: Depth Soll Description Image: Depth Soll Description SAMP. # Image: Depth Soll Description -5 Image: Depth Soll Description GRAVEL AND SAND: Image: Depth Soll Description Image: Depth Soll Description Image: Depth Soll Description -5 Image: Depth Soll Description GRAVEL AND SAND: Image: Depth Soll Description Image: Depth Soll Description -5 Image: Depth Soll Description GRAVEL AND Soll Description Image: Depth Soll Description Image: Depth Soll Description -5 Image: Depth Soll Description Image: Depth Soll Description Image: Depth Soll Description Image: Depth Soll Description -5 Image: Depth Soll Description Image: Depth Soll Description Image: Depth Soll Description <td>ECT MANAGER: George Robinson, PE SAMPLING MET</td> <td>ODS: Split Spoon</td>	ECT MANAGER: George Robinson, PE SAMPLING MET	ODS: Split Spoon
NOTES: 2" SVE Well DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows /ft. PID ppm BORING COMPLETION 0 0 0 0 0 0 0 0 0 -5 0 0 0 0 0 0 0 0 -5 0 0 0 0 0 0 0 0 -15 0 0 0 0 0 0 0 0 -15 0 0 0 0 0 0 0 0 -20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S DRILLED: 11/05/02 HAMMER WT./D	OP 140 LB., 30 IN.
DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows /ft. PID ppm BORING COMPLETION 0 Image: Complete co	S: 2" SVE Well Water lev	during drilling Page 1 of 1 in completed well
0 -5 -15 -20 -20 -20 -20 -20 -20 -20 -20	SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID ppn	BORING WELL COMPLETION DESCRIPTION
-25 - 0707070 GM -30 - 0707070 070707070 070707070 070707070	GRAVEL AND SAND: GRAVEL AN	Concrete seal: 17'-3' Bentonite: 22'- 17' Top Sand 22' 2" 0.010 Slot Screen 34' - 24' TD 35'

Receiv	ved by OCD: 10	0/21/2022	2 8:48:57 AM						
Cy	ypress Er	ngine	ering Services, I	nc.	The arrest terms of the second				
10235 West Little York Road					T	OTAL [DEPTH: 35'	/	
	buston, Texa	as 7704	0-3229		-				
_	PROJEC	T INFO	RMATION		I	DRILLI	NG INFORMA	TION	
PROJE	CT:	Re	mediation Drilling	DRIL	LING C	:00	Atkins E	ngineering	
SITE LO	OCATION:	Т١	WP Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO	D.:	P- 2	202203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	CN	M Barnhill, PG	MET	HOD O	F DRILI	_ING: 6 1/4" He	llow Stem Auger	
PROJE	CT MANAGE	ER: Ge	eorge Robinson, PE	SAM	PLING	METHC	DS: Split Spo	0 n	
DATES	DRILLED:	11,	/01/02	HAM	MER W	/T./DRC)P 140 LB., 3	30 IN.	
NOTES	: No Fat C	lay See	en in Well	2	z Wa z Wa	ler level c ler level i	luring drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 –							······	F	
-5 -		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Gravel 2"-4" Contaminated at 10' BGS No Fat Clay Seen in well. Very Strong Contamination Srtong/ Odor/ Staining Black Color					Concrete seal: 13'-3'	
-15-		GM	to sand/silt					Bentonite: 18'- 13'	
-20 -		GM						2" 0.010 Slot Screen 35' - 20'	
-30 -									
1	0707070								

Receiv	ved by OCD: 10)/21/2022	8:48:57 AM					
C	Cypress Engineering Services, Inc				FI			IOLE LOG
10	235 West Lit	ttle Yorl	< Road					E-20
	ite 256	- 77040	2000				JEPTH: 33	
_								
								ATION Zacincovinc
PRUJE		Kei	neglation Drilling			J	Atkins I Mont D	stag
		1 M n A	r Roswell Station 9				Mahila	1103 De:11 D 69
		r-2	V44UJ Pornhill DC		רב. חר חב	י חפח	ING: 61/4" 1	allow Stem Auger
			Darinni, ru				-1130. 01/4 II 100: Enliten	oon
TRUJE		10"	orge Koomson, PE		-пчС м =р \лл		יטט. зригэр D 1401 סט	30 IN
		10/2	<u> </u>					, JU 111.
NOTES	: Water @ 3	35' (BG	S)? Strong Odor	∑ ▼	Wate Wate	er level o er level ir	n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. # B	lows ft.	PID ppm	BORING COMPLETIO	WELL DESCRIPTION
0 -								
-5 -		GM	GRAVEL AND SAND; GM: Gravel, Sand, Silt Mixture					Concrete seal: 13'-3'
-15 -								Bentonite: 18'-
-20-	0-0-0-0							
-25-								Top Sand 23' 2" 0.010 Slot Screen 35' -
-30 -								25'
-23-		СН	CLAY: CH: Red Sandy Clay to Fat Clay Wet with					
-40			Strong Hydrocarbon Odor					TD 35'

i

I

İ

ļ.

Received by OCD: 10/	21/2022	8:48:57 AM						Page 99 of 193	
Cypress En	ainee	erina Services.	Inc.	FIELD BOREHOLE LOG					
10235 West Lit	ttle Yor	k Road		BOREHOLE NO .: SVE-30A					
		A NOOD		(T	OTAL I	DEPTH: 45'			
buston, Texa	s 77040	0-3229							
PROJEC1	INFO	RMATION			DRILLI	NG INFORMA	TION	_	
PROJECT:	Re	mediation Drilling	DRIL	LING	0.:	Atkins E	ngineering		
SITE LOCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	es		
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGED BY:	CM	1 Barnhill, PG	MET	HOD O	F DRIL	LING: 6 1/4" Ho	ollow Stem Auger		
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAM	PLING	METHO	ODS: Split Spo	0 n		
DATES DRILLED:	10/2	25/02	HAM	MER V	/T./DRC	OP 140 LB., 3	30 IN.		
NOTES: 2" PVC S	SVE Wel	1	3	∞ Wa • Wa	ter level o ter level i	during drilling in completed well	Page 1 of 1		
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -15 -15 -15 -20 -20 -20 -20 -20 -20 -20 -20	GМ СН	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture	50 Blows 22 Blows 20 Blows	+50 22 20			Concrete seal: 13'-3' Bentonite 13' 2" Slot Screen 45' - 20' Top Sand 18'		

_Receiv	ved by OCD: 10	/21/2022 8	8:48:57 AM						
С	Cypress Engineering Services, I				F			OLE LOG	
1(235 West Li	ttle Yorl	< Road		Т	οται ι	DEPTH: 351	L-31	
	uite 256 huston: Teva	s 77040	1-3029		'		JEI 111. J J		
_									
PROJE			nediation Drilling	DRI		20.	Atkins E	ngineering	
SITE		TU	P Roswell Station 9				Mort Bat		
	\cap	יינ		BIG	DRILLER: Mort Bates				
1066		1-4 CM	Barnhill PC		- ייי ביי ח מחרי		HNG: 6 1/4" H	llow Stem Auger	
			rae Robinson PF		ETHOD OF DRILLING: 6 1/4" Hollow Stem Auger				
DATES	B DRILLED:	10/2	28/02	HAN	IMER V	VT./DRC	DP 140 LB., 1	BOREHOLE LOG NO.: SVE-31 PTH: 35' INFORMATION Atkins Engineering Mort Bates Mobile Drill B-68 G: 6 1/4" Hollow Stem Auger S: Split Spoon 140 LB., 30 IN. Ig drilling mpleted well BORING OMPLETION Concrete seal: 13'-3' Bentonite: 18' 13' Top Sand 23' 2" 0.010 Slot Screen 35' - 25'	
NOTES	5: Poor reco	overy i	n Split Spoon .		∞ Wa ∞ Wa	iter level o iter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0]	0000	GM	GRAVEL AND SAND						
-5 -			GM: Gravel, Sand, Silt Mixture					Concrete seal: 13'-3'	
-15 -								Bentonite: 18'-	
-20-	0,0,0,0							13'	
-25-				SPT	+50			Top Sand 23' 2" 0.010 Slot Screen 35' -	
- 30 -				Sample 24'-26'				25'	
-35	<u> </u>	СН	CLAY: CH: Red Sandy Clay to Fat Clay						

Received	d by OCD: 10/.	21/2022 8	3:48:57 AM				· · · · · ·	·	<u>Page 101 of 193</u>	
Cypress Engineering Services, Ir 10235 West Little York Road Suite 256 Ouston, Texas 77040-3229					IC. FIELD BOREHOLE LOG BOREHOLE NO.: MW-34 TOTAL DEPTH: 79'					
							Adding F		-	
PROJE		Kei	mediation Drilling			00	ATKINS EI Mout Dat	ngineering		
		1 M D D	P Roswell Station 9		TVDE:		Mobile D	es 		
	י ח פעי	r-2	A Rornhill DC	MET	יייר. החחר (ING: HSA 81/4	III D-30		
	CT MANAGE	B. Ca	n. Darmini, r G	SAM			ODS^{-} Sulit Snot	on augus		
DATES	DRILLED:	01/	06/03	HAN	MER V	NT./DR	OP 140 lb., 30	0 in.		
NOTES: 2" SCH 40 PVC Monitor Well					∞ W • W	ater level ater level	during drilling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
-10 -25 -30 -35 -40 -45 -40 -45 -60 -65 -70 -75 -80		GM GM SC SC SW SC CH SW SW	SC: Clayey Sand, tan brown to light brown reddish saturated @55' BGS, No odor or staining, Water Level @ 57.74' BGS 01/07/03 SW: Med. to fine grained tan sand, well sorted, SC: Clayey Saturated CH: Fat Brown Silty Clay, SW: Tan, Reddish, Brown Sand, Fine Gr., Well Sorted, Saturated, Flowing Sand, No Odor Or SP: Tan, Reddish Brown	<pre>@55' BGS Sampled 2 x 4/oz. Jars @11:10hr. 8260 VOC / TPH Mod. 8015 8270</pre>	42/24 46/24 51/24 56/24 61/24 66/24 71/24 76/24	40- 42' 44- 46' 49- 51' 54- 56' 59- 61' 64- 66' 69- 71' 74- 76' 79-		Bentonite 42' Top Sand 46' Top Screen 49' 12/20 Sand 0.010 Slot Screen TD 79'		
-85		SP/SW	SP: Tan, Reddish Brown Sand, Fn. Gr., Well Sorted, Saturated, mixed with angular to subrounded gravel to 1/2", No odor or staining.	8270 SVOC Total Metals	81/24'	79- 81'				

L

NV



March 4, 2022

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

RE: Response to Approval with Modifications [Revised] Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations

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-21-003

Dear Mr. Shean;

Transwestern Pipeline, LLC (Transwestern) submits this *Response to Approval with Modifications [Revised] Report of Perched Aquifer Evaluation And Future Corrective Action Recommendations* regarding the comments received from the New Mexico Environment Department (NMED) via the letter titled *Approval with Modifications [Revised] Report of Perched Aquifer Evaluation And Future Corrective Action Recommendations* for the above referenced Site. To respond specifically to each of the Agency's comments, dated March 1, 2022, 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 response to NMED's Disapproval Comment 1 states, " [b]oring logs are included in Attachment 1 in the revised Report." The referenced "Attachment 1" is not included in the Report. Provide the required boring logs with the response letter.

Boring logs are included in Attachment 1 to this letter.

Comment 2

The response to NMED's Disapproval Comment 3 states, "[a] work plan will be developed to provide details for delineating the horizontal and vertical extent of the plumes in the perched aquifer [and] surveying the ground elevations in these locations will be included within the forthcoming work plan." NMED concurs; however, a proposed schedule for

Response to Approval with Modifications [Revised] Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9 Transwestern Pipeline Company, LLC March 3, 2022

Page 2 of 3

submittal of the work plan was not included with the response. Submit the referenced work plan no later than August 31, 2022.

Comment noted.

Comment 3

The response to NMED's Disapproval Comment 4 states, "[i]nformation related to PSH recovery in the perched aquifer is provided in the revised Report." Although the Report was revised to address the NMED's Disapproval Comment 4, the response does not identify the sections of the Report where text was revised. Identify all sections of the Report where text was revised based on the comment in the response letter.

Section 3 (Future Corrective Action Recommendations) states, "[d]ata will be collected from manual bailing events during 2022 to determine feasibility of additional recovery measures or impracticability. Results will be provided in the 2022 Annual Groundwater Remediation Activities Report." NMED acknowledges that remedies for phase separate hydrocarbons (PSH) in the perched aquifer will be evaluated based on the data collected in 2022 in the 2022 Annual Groundwater Remediation Activities Report.

Red-line pages are included in Attachment 2 to this letter.

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 WSP USA, Inc. at (317) 450-6126.

Sincerely,

Soultinghouse

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

Attachment: Attachment 1: Boring Logs Attachment 2: Revised Report

March 3, 2022

Page 3 of 3

Response to Approval with Modifications [Revised] Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9 Transwestern Pipeline Company, LLC

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

ATTACHMENT 1 BORING LOGS

Released to Imaging: 11/22/2022 9:37:14 AM

•

Recei	ved by OCD: 1	0/21/202	2 8:48:57 AM				·		Page 106
C	/press Er	nainee	ering Services, I	nc.	F	IELC) BOREH	OLE LOG	
10:	235 West Li	k Road		В	OREH	OLE NO.: MP	PE-1		
Su	Suite 256					OTAL I	DEPTH: 79'		
_)-3229	- <u> </u>					_		
	PROJEC	T INFOI	RMATION			DRILLI	NG INFORMA	TION	_
PROJE	CT:	Re	mediation Drilling	DRI	_LING C	0.:	Atkins E	ngineering	
SITE LC	DCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Ba	tes	
JOB NC).:	P-2	02203	RIG	TYPE:		Mobile D	orill B-68	
LOGGE	DBY:	М.	Bates	MET	HOD O	F DRIL	LING: 8 1/4'' He	ollow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spø	on	
DATES	DRILLED:	12/	06/02	HAM	IMER W	/T./DRC	DP 140 lb., 3	0 in.	4
NOTES	: 4" SCH 4() PVC M	PE Well		sz Wa ≖ Wa	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 – 1							/		
-5 -10 -20 -25 -		GM	GRAVEL AND SAND: 0'- 2': Silty clay w/ gravel, 2'-4' caliche, white pink, dry 5'- 32':GM: Gravel, Sand, Silt, Mixture, gravel to 2", Lt. Brown, med. dense, dry. Gravel is cemented 5'- 7',26'-29', hard drilling @32' Sand with clay, red to brown, soft, slightly plastic, moist					Cement Grout 3'-46'	
-30-1 -35-1 -40-1		SC/CL	CLAY AND SAND: SC: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.						
-45- -50- -55-		SP/SC	CLAY AND SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, Reddish / Tan No odor, Saturated @62' BGS TD 79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20					Bentonite 46' Top Sand 49' Top Screen 54'	
-55		SC	Sand Pack 79'-49', Bentonite Seal 49'-46', CLAYEY SAND: Reddish Tan, Soft, Moist, No Odor or Staining Depth to Water 61.03' BGS 12/07/02					Sump 74'-79'	

ļ

İ.

Į.

Received by OCD: 10/	/21/2022	8:48:57 AM		1.				Page 107 of 193
Cypress En 10235 West Lit Suite 256	ering Services, I k Road	Inc.	nc. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-2 TOTAL DEPTH: 79'					
Duston, Texas	D-3229	1					-	
PROJECT	PROJECT INFORMATION							
PROJECT.	Kei	mediation Drilling			,0	Atkins Er Mont Dot	igineering	
SHE LOCATION:	10	P Roswell Station 9				MOFT Bat		
	P-2	02203	RIG					
DRO JECT MANACE	C.N	A. Barnnill, PG				LING. HSA 81/4	Augers	
	π. Ge(orge Kodinson, PE				D = 140 m 30):-	
	12/2						, III.	4
NOTES: 4" SCH 40) PVC M	PE Well	2	z Wat z Wat	ter level i ter level i	during drilling in completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	4
0 -5 -10 -20 -25 -30 -35 -40 -65 -70 -85 -85 -85 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0	GM GM Cngl. SC SC SC SW/SP SW/SP	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard SC: Clayey Sand, tan brown to light brown reddish saturated @60' BGS, No odor or staining, TD 79' Water Level @ 59.95' BGS 01/06/03 SW: Med. to fine grained tan sand, well sorted, saturated @ 60' BGS, No odor or staining. Damp @ TD, Flowing Sands.					Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' 12/20 Sand 0.020 Slot Screen TD 79'	

Received by OCD: 10/21/2022 8:48:57 AM *P*₁*age* 108 *of* 193 FIELD BOREHOLE LOG Cypress Engineering Services, Inc. BOREHOLE NO .: MPE-3 10235 West Little York Road TOTAL DEPTH: 79' Suite 256 puston, Texas 77040-3229 DRILLING INFORMATION **PROJECT INFORMATION** PROJECT: DRILLING CO .: **Atkins Engineering Remediation Drilling** SITE LOCATION: DRILLER: **Mort Bates TWP Roswell Station 9** JOB NO .: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: METHOD OF DRILLING: 8 1/4" Hollow Stem Auger C.M. Barnhill, PG PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: HAMMER WT./DROP 140 lb., 30 in. 12/20-21/02 Water level during drilling NOTES: ∇ 4" SCH 40 PVC MPE Well Page 1 of 1 Water level in completed well ¥ PID Blows BORING WELL SOIL DEPTH USCS SOIL DESCRIPTION SAMP. # COMPLETION DESCRIPTION SYMBOLS / ft. ppm 0 0.00 GM GRAVEL AND SAND: 0'-5': GM mixed with caliche, Cement Grout 070 - 5 white pink, dry 5'-24':GM: 3'-48' :0 Gravel, Sand, Silt, Mixture, O_l gravel to 4", Lt. Brown, -10 :0 med. dense, dry. 0.0 00 0 GM O_l .C -20 0.00 -25 CONGLOMERATE: Hard Cngl. SW: Sand Layer, brown, -30 SW SC: Clayey Sand, tan brown to light brown -35 SC reddish saturated @62' BGS, No odor or staining, -40 @ 74' BGS TD 79' Water Level @ 63.82' BGS 12/21/02 -45 Bentonite 48' -50 SC Top Sand 51' -55 Top Screen 54' 60 12/20 Sand ¥ SW: Med. to fine grained SW/SP -65 tan sand, well sorted, 0.020 Slot saturated @ 62' BGS, No Screen odor or staining. Damp @ -70 TD -75 SW/SP TD 79' -85

Released to Imaging: 11/22/2022 9:37:14 AM

-90
Т

Released to Imaging: 11/22/2022 9:37:14 AM

	11 000 10	101/0000	0 40 57 436						
Kecen	unress En	ainee	ring Services I	nc	FI	IELD	BOREHO	OLE LOG	
	Abress En	the Verl	Read	110.	BOREHOLE NO.: MPE-5				
10	235 West Lii iite 256	lie for	Rudu		TOTAL DEPTH: 79'				
	uston, Texa	s 77040	-3229						
	PROJECT	INFOF	RMATION]	DRILLI	NG INFORMA	ΓΙΟΝ	
PROJE	CT:	Rer	nediation Drilling	DRILL	ING C	:0.:	Atkins En	gineering	
SITE LO	DCATION:	TW	P Roswell Station 9	DRILL	ER:		Mort Bate	es	
JOB NO	D.:	P-2	02203	RIG T	YPE:		Mobile Di	rill B-68	
LOGGE	D BY:	C.N	1. Barnhill	METH	IOD OI	F DRILI	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAMF	LING	METHO	DS: Split Spoo	n	
DATES	DRILLED:	12/1	16/02	HAMN	/IER W	/T./DRC	OP 140 lb., 30) in	
NOTES	3: 4" SCH 40) PVC M	PE Well	\ ▼	: Wat	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -		r		<u> </u>		·	[]		
-5 -10 -20 -25 -30 -35		Cngl. SC	GRAVEL AND SAND: 0- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard SC: Clayey Sand, tan brown to light brown					Cement Grout 3'-53'	
-40 -45 -50 -55 -60 -65 -70		sc	reddish saturated @64' BGS, No odor or staining, TD 79' Water Level @ 63.75' BGS 12/17/02					Bentonite 53' Top Sand 56' Top Screen 59'	
-75-		SC						TD 79'	

Ì

.

Recei	ved by OCD: 1	0/21/2022	2 8:48:57 AM						Page 111 of 193	
	ypress Er 235 West Li	nginee ittle Yor	ering Services,	Inc.	F B	IELC OREH	D BOREH	OLE LOG E-6		
	uite 256		in noud		T	OTAL	DEPTH: 79'			
	uston, Texa	as 77040	0-3229							
	PROJEC	T INFO	RMATION		DRILLING INFORMATION					
PROJE	ECT:	Re	mediation Drilling	DRI	LLING (CO.:	Atkins E	ngineering	_	
SITE L	OCATION:	TW	WP Roswell Station 9	DRI	LLER:		Mort Bat	es		
JOB NO	D.:	P-2	202203	RIG	TYPE:		Mobile D	rill B-68		
LOGGE	ED BY:	C.N	A. Barnhill	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger		
PROJE	CT MANAGE	ER: Ge	orge Robinson, PE	SAM	IPLING	METH	ODS: Split Spo	on		
DATES	DRILLED:	12/	16-17/02	HAN	IMER V	VT./DRO	OP 140 lb., 30) in.		
NOTES	S: 4" SCH 4	0 PVC M	IPE Well		∽ Wa ▼ Wa	iter level iter level	during drilling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
							, <u></u> ,			
-5		GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel Sand Silt Mixture					Cement Grout 3'-48'		
-10			gravel to 4", Lt. Brown, med. dense, dry.							
-20 -	0.0.0.0									
-25-		Cngl.	Conglomerate or cemented sandstone layer.							
-30-			GM: Harder Drilling, gravel fragments, yellowish color							
-40		SC	SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn to med grained sand							
-45-1			well sorted, strong clay fraction, soft, No odor /staining.			X		Bentonite 48'		
-201	IIIA	CL	CL: Strong Clay					Top Sand 51'		
-55-			SC: Clayey Sand, tan brown to light brown reddish saturated @64'					Top Screen 54'		
		SC	BGS, No odor or staining, @ 74' BGS Clay & Sand:,gravel & Clay							
-70 -			Level @ 65.55' BGS 12/18/02							
-75-1	8 8 8 8 8	GC	GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining,					тр 79'		
-85-	2,8,8,8 ,6,8,8 ,6,8,8	GC	Damp							
E ₀₉ -	8, 8, 8, 8 (1)]					

Received by OCD: 10	/21/2022	8:48:57 AM					· · ·	 Page 112 of 193
Cypress Er 10235 West Li Suite 256	n ginee Ittle Yorl	ering Services, i k Road	Inc.	F В Т	IELE OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-7	
buston, Texa	is 77040)-3229						
PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	_
PROJECT:	Rei	mediation Drilling	DRIL	LING (0.:	Atkins Er	ngineering	
SITE LOCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	C . 1	Barnhill	MET	HOD O		LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGE	R: Geo	orge Robinson, PE	SAM		METHO	DDS: Split Spot)n	
DATES DRILLED:	12/.	10-13/02				JP 140 lb., 30) in.	
NOTES: 4" SCH 4	0 PVC M	PE Well	2	z Wa z Wa	ter level (ter level i	during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -55 -60 -55 -60 -75 -85 -90 -20 -25 -85 -90 -20 -25 -20 -25 -25 -20 -20 -25 -20 -25 -20 -20 -25 -20 -20 -20 -20 -20 -20 -20 -20	GM Cngl. SC SC/GC SC SC SC	GRAVEL AND SAND: 0'- 5: GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor and staining. GC: Gravel 10%, Clay30%, fine gr sand SC: Clayey Sand, tan brown to light brown reddish saturated @63' BGS, No odor or staining, @ 74' BGS Clay & Sand:& Fat Clay lenses, TD 79' Water Level @ 64.79' BGS 12/14/02					Cement Grout 3'-47' Bentonite 47' Top Sand 50' Top Screen 54' Sump 74'-79' TD 79'	



L

Receive	press En	/21/2022 8 ginee	ning Services, I	nc.	F	IELC	BO	REHO	DLE Lag 15 of	
102 Sui	235 West Lit ite 256 uston Texas	ttle York	Road		B T		DEPTH:).: MP 79'	E-10	
	PROJECT	INFOR	MATION		DRILLING INFORMATION					
ROJEC	CT:	Ren	nediation Drilling	DRIL	LING C	0.:	ł	Atkins En	gineering	
SITE LO	CATION:	TW	P Roswell Station 9	DRIL	LER:		N	fort Bate	s	
IOB NO.	2	P-20	02203	RIG	TYPE:		N	fobile Dr	ill B-68	
OGGE	D BY:	C. E	Barnhill	MET	HOD OF		ING: 8	1/4" Hol	llow Stem Auger	
ROJEC	T MANAGER	Geo	orge Robinson, PE	SAM	PLING N	NETHOL	DS: S	plit Spoo	n	
DATES	DRILLED:	12/0	9/02	HAM	MER W	T./DRO	P 1	40 lb., 30) in.	
NOTES:	4" SCH 40	D PVC M	PE Well		= Wa = Wa	ter level ter level i	during dri in comple	lling ted well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	SAMP.	Blows / ft.	PID ppm	BO	RING PLETION	WELL DESCRIPTION			
-5		GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-27':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 27'-30' Hard cemented						Cement Grout 3'-47'	
20			Conglomerate 30-50' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic moist.							
-30	1014001	Conglon	CONGLOMERATE							
35	-1-1-1-1-1-1 -1-1-1-1-1-1-1		CLAY AND SAND: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.							
40	-1-7-7-7-7-7-7 -7-7-7-7-7-7-7-7-7-7-7-7-	SC/CL								
50-	-7-7-7-7-7-7	5381							Bentonite 47'	
55		SW	SAND: SW: 50'-59' Fine gr. Sand, tan brown, well sorted, No odor or	49'-51'	18"/50				Top Sand 50' Top Screen 54'	
60		SC	CLAYEY SAND: SC: Clayey Sand Lt. Red/ tan	59'-61'	24"/40					
65		SW	SAND: Tan brown, reddish tan sand, med. to fine gr., well sorted No Odor	64'-66'	12"/46					
70 -			Saturated @ 62' BGS	69'-71'	18"/50					
75		SC	CLAYEY SAND: Tan Brown / Red tan, Clayey	74'-76'	24"/30				Sump 74'-79'	
-80 - -85 -		SC/CL	CLAY: Clay & Sand:& Fat Clay lenses, Dry@ 74" BGS	79'-81'	24"/50				10.19.	
00 J										

ſ

Т

Receiv	press En	/21/2022 iginee	^{8:48:57} dervices, I	nc.	FI	ELD	BOREH	OLE Lag 16 of		
10 Su Ho	235 West Lit ite 256 juston, Texas	ttle York	Road		TC	TAL E	DEPTH: 79'	E-11		
	PROJECT	INFOR	MATION		DRILLING INFORMATION					
ROJE	CT:	Re	mediation Drilling	DRIL	LING CO	D.:	Atkins E	ngineering		
	CATION:	TW	P Roswell Station 9	DRILL	LER:		Mort Bat	es		
IOB NO		P-2	02203	RIG T	TYPE:		Mobile D	rill B-68		
OGGE	D BY:	C. 1	Barnhill	METH	HOD OF	DRILL	ING: 8 1/4" Ho	llow Stem Auger		
ROJE	CT MANAGER	Ge	orge Robinson, PE	SAME	PLING N	IETHOD	OS: Split Spoo	m		
DATES	DRILLED:	12/	07/02	HAMM	MER WI	./DROI	P 140 lb., 3	0 in.		
NOTES	4" SCH 4	O PVC M	PE Well		≠ Wat • Wat	ter level (ter level i	during drilling n completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION			
۲ v	TO-TO-TO-TO	GM				Ê	Ĩ			
-5 -	0101010		5': GM mixed with caliche, white pink dry 5'-24' GM				7//2 7//2	Cement Grout		
	0707070		Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					3'-47'		
-10 -	0,0,0,0,0		med. dense, dry. 24'-32': Hard cemented							
-15 -			drilling							
-20 -	0707070									
-25 -		Cngl.	CONCLOMERATE: Hard							
		10	Drilling, well cemented							
-30 -		SC/CL	CLAVEY SAND: SC.							
-35 -	2222		Clayey Sand Lt. Red/ tan brown, to tand brown, fine							
40			to medium grained sand, well sorted, strong clay							
-45 -	EEEE		60' BGS Slight odor and							
-	====		contamination in capillary fringe 55'-60' BGS, grav					Bentonite 47'		
-50 -	EFER	SC	black stain to sandy clay with strong hydrocarbon					Top Sand 50'		
-55 -	EEEE		odor. No PsH in well Water @ 60.90' BGS					Top Screen 54'		
·			12100102							
-65 -		SC								
70		50								
-75 -		CH	CLAY: Clay & Sand:& Fat Clay lenses, Dry					Sump 74'-79'		
-80								TD 79'		
-85		CH								

Receiv	press En	/21/2022 ginee	ring Services, I	nc.	F	ELD	BC	REHO	DLE Lag 17 of 1	
10. Su	235 West Lit ite 256	ttle York	Road		BO	OREHO	DLE N	0.: MP t: 79'	E-12	
Но	uston, Texas	77040	-3229							
	PROJECT	INFOR	MATION	2	DRILLING INFORMATION					
PROJEC	CT:	Rei	nediation Drilling	DRIL	LING CO	D.:		Atkins En	gineering	
SITE LO	CATION:	TW	P Roswell Station 9	DRIL	LER:			Mort Bate	es	
JOB NO	(C)	P-2	02203	RIG 1	TYPE:			Mobile Dr	ill B-68	
LOGGE	D BY:	C. I	Barnhill, / M. Bates	METH	HOD OF	DRILL	ING:	8 1/4" Ho	llow Stem Auger	
PROJEC	CT MANAGER	Geo	orge Robinson, PE	SAM	PLING N		DS:	Split Spoo	n	
DATES	DRILLED:	12/0	03-06/02	HAM	MER W	L./DROI	P	140 lb., 30) in.	
NOTES:	4" SCH 40	D PVC M	PE Well		≠ Wat	ter level (ter level i	during d in comp	Irilling leted well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BO	ORING IPLETION	WELL DESCRIPTION	
1723 - 45414 - 4		10 (S			68	105				
-5 -10 -15 -20 -25 -30 -35 -40 -45 -50 -55		GM SC/CL	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-37':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 5'-15' SM/SP/SC: Poorly graded sand & Silt @37' Sand with clay, red to brown, soft, slightly plastic, moist.						Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'	
-60 -65 -70 -75 -75 -80 -85		SP/SC SS CL	CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, No odor Saturated @62' BGS TD 79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20 Sand Pack 79'-51', Bentonite Scal 51'-48', CALCAREOUS SANDSTONE: Hard CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @79' SP/SC Poorly Graded sand with clay						Sump 74'-79' ID 79'	

Receiv	press En	/21/2022 Iginee ttle Vork	ring Services, I	nc.	FI BC		BORE	HOLE Lace 18 of PE-13		
Su	uite 256 ouston, Texas	s 77040	-3229		ТС	DTAL E	DEPTH: 79	,		
	PROJECT	INFOR	MATION		DRILLING INFORMATION					
PROJE	CT:	Rei	mediation Drilling	DRIL	LING CO	D.:	Atkins	Engineering		
	CATION:	TW	P Roswell Station 9	DRIL	LER:		Mort B	ates		
JOB NO).: .:	P-2	02203	RIG	TYPE:		Mobile	Drill B-68		
OGGE	D BY:	C. 1	Barnhill, / R. Marshal	MET	HOD OF	DRILL	ING: 81/4"]	Hollow Stem Auger		
PROJEC	CT MANAGER	Ge	orge Robinson, PE	SAM	PLING M	IETHO	DS: Split Sp	oon		
DATES	DRILLED:	12/	02-03/02	HAM		./DROI	P 140 lb.,	30 in.		
NOTES	4" SCH 4	D PVC M	PE Well		= Wat	ter level (ter level i	during drilling n completed we	Page 1 of 1		
DEPTH SYMBOLS USCS SOIL DESCRIPTION S				SAMP.	Blows / ft.	PID ppm	BORING COMPLETIO	WELL DESCRIPTION		
۲ آ	0000000	GM	GRAVEL AND SAND: 0'-			<u> </u>				
-5 -	0101010		white pink, dry 5'-33':GM: Gravel, Sand, Silt, Mixture,					Cement Grout 3'-46'		
-10-	0707070		gravel to 4", Lt. Brown, med. dense, dry. 5'-15'							
-15-	0-0-0-0		sand & Silt @33' Sand							
20	0-0-0-0		soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay							
	0-0-0-0-0		stiff, plastic moist.							
-25 -	10110110110 0707070									
-30 -	0-0-0-0									
-35 -		SC/CL	CLAYEY SAND: SC/CL							
40			fine gr. well sorted sand							
10			CLAY: CH: Red Clayey Sand: lean clay with sand							
-45 -			med. stiff, plastic, moist.					Bentonite 46'		
-50		SP/SC	CLAYEY SAND: SP/SC:					Top Sand 50 71		
-55 -			50'-75' Poorly Graded Sand with clay ,no odor Saturated @60' BOS TO					Top Screen 54'		
	EEEE		79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20							
			Sand Pack 79'-49', Bentonite Seal 49'-47',							
-65 -	EEEE	SP/SC	Cement Grout 47'-3'							
-70	ETE:									
-75		CT	CALCAREOUS SANDSTONE: Hard					Sump 74'-79'		
-80		CL	CLAY: CL: Sandy Lean					TD 79'		
		CIP IN .	stiff, low plasticity, moist,					A STATISTICS		
-85 -			Graded sand with clay							
Enn							ا			

г

Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

uston, Texas 77040-3229

FIELD BOREHOLE LOG

BOREHOLE NO.: MPE-14 TOTAL DEPTH: 79'

F	PROJEC1	INFO	RMATION		DRILLING INFORMATION					
PROJECT	:	Rei	mediation Drilling	DRI	LLING (CO.:		Atkins Er	Atkins Engineering	
SITE LOC	ATION:	Т₩	P Roswell Station 9	DRI	DRILLER: Mort Bates			es		
JOB NO.:		P-2	02203	RIG	RIG TYPE: Mobile Drill B-68					
LOGGED E	BY:	Cla	yton M Barnhill, PG	ME	THOD C	F DRIL	LING:	8 1/4" Ho	llow Stem Auger	
PROJECT	MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METHO	ODS:	Split Spo	0 n	
DATES DR	RILLED:	11/2	25/02	HAN	MER V	VT./DRO	ЭР	140 lb., 30) in.	
NOTES:	4" SCH 40) PVC M	PE Well		sz Wa ▼ Wa	ater level ater level	during c in comp	Irilling leted well	Page 1 of 1	
DEPTH S	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	B(COM	ORING IPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -25 -40 -45 -55 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75		GM CH SS CL/CH SC	GRAVEL AND SAND: 0'- 3': GM mixed with caliche, white pink, dry 3'-40':GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: 40'-43': Fat CALCAREOUS CLAYEY SAND: SC/CL/CH: 45'-79' Sandy clay, Clayey sand, red/ brown, med. stiff, moist, moderate odor, no staining. Saturated @ 62 TD 79' Grout 48'-3' Bentonite 48'-51' Sand 51'-79' 0.020 Screen 74'- 54' Riser 74'-79' Water Level @ 61.70' BGS 11/26/02						Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' Sump 74'-79' TD 79'	

Received Cy 102 Sui PROJEC SITE LO JOB NO LOGGEI PROJEC DATES	<i>d by OCD: 10/</i> press En 235 West Lifte 256 uston, Texa PROJECT CT: CATION: .: D BY: CT MANAGE DRILLED:	entre former s 77040 TINFOF Ren TW P-2 Ric R: Geo 11/2	R:48:57 AM Pring Services, Record 0-3229 RMATION Inediation Drilling (P Roswell Station 9 02203 k Smith, PG Prige Robinson, PE 22/02	Inc. DRII DRII RIG MET SAN HAN	FIELD BOREHOLE LOG BOREHOLE NO.: MPE-15 TOTAL DEPTH: 79' DRILLING INFORMATION DRILLING CO.: Atkins Engineering DRILLER: Mort Bates RIG TYPE: Mobile Drill B-68 METHOD OF DRILLING: 8 1/4" Hollow Stem Auger SAMPLING METHODS: Split Spoon HAMMER WT./DROP 140 lb., 30 in.					
	4" SCH 4() PVC M	PE Well		🛫 Wa	ter level i	n completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -10 -20 -25 -30 -35 -40 -45 -50 -55		GM CL SP/SC	GRAVEL AND SAND: 0'- 4': GM mixed with caliche, white pink, dry 4'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry becoming moist @ 40' BGS CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. Water Level 61.13' BGS 11/25/02 CLAYEY SAND: SP/SC:	49'-51'	24"/33			Cement Grout 3'-49' Bentonite 49.9' Top Sand 54'		
-65 -70 -75 -85 -90		SP/SC	54'-79' Poorly Graded Sand with clay & gravel, red dense, moist, fragements of sandstone as gravel, hard drilling 65'- 71', No odor or staining. TD 79' Saturated @ 60' BGS Cement / Bentonite Grout 49'-3' Bentonite 49'-54' 12/20 Sand Pack ' 54'-74' 0.020 Slot Screen 74'-59' Riser 74'-79' No Odor or Staining at TD	54'-56' 59'-61' 64'-66' 69'-71' 74'-76' 79'-81'	12"/51 24"/41 14"/50 24"/50 20"/70 24"/74			Top Screen 59' Sump 74'-79' TD 79'		

i

ł

L

ainee									
tle York	Road	Inc.	FIELD BOREHOLE LOGBOREHOLE NO.: MPE-16TOTAL DEPTH: 79'						
\$ 77040)-3229								
INFOF	RMATION			DRILLI	ING INFORMA	TION	_		
Rer	nediation Drilling	DRII	LING	CO.:	Atkins E	ngineering			
TW	P Roswell Station 9	DRI	LER:		Mort Bat	es			
P-2	02203	RIG	TYPE	•	Mobile D	rill B-68			
C. I	Barnhill, / R. Marsha	ш МЕТ	HOD	OF DRIL	LING: 8 1/4" Ho	llow Stem Auger			
R: Geo	orge Robinson, PE	SAM	IPLINC	G METHO	ODS: Split Spo	on			
11/2	26-27/02	HAN	IMER '	WT./DR(OP 140 lb., 30) in.			
H in So	oil Boring		52 W x W	/ater level /ater level	during drilling in completed well	Page 1 of 1			
USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	s PID ppm	BORING COMPLETION	WELL DESCRIPTION			
GM SC/CL SP/SC SP/SC CL Redbed	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-40':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 15'-40' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. Minor gravel. CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, slight odor Saturated @60' BGS Strong hydrocarbon staining, odor, and PsH at 64'-74' TD 79' Riser 79'- 74', 0.020 Slot Screen 74'- 54', 12/20 Sand Pack 79'- 49', Bentonite Seal 49'-47', Cerment Grout 47'-3' CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, MUDSTONE: Marroon Mudstone, with Gypsum and anhydrite lenses, hard drilling, dry, no odor.	49'-51' 54'-56' 59'-61' 64'-66' 69'-71' 74'-76' 79'-81'	41"/1 22"/2 12"/3 12"/3 24"/1 24"/1 6"/51	Baaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa		Cement Grout 3'-47' Bentonite 47' Top Sand 49' Top Screen 54' Sump 74'-79' TD 79'			
	77040 INFOF Rer TW P-2 C.I : Geo 11/2 : in S USCS	 77040-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C. Barnhill, / R. Marsha George Robinson, PE 11/26-27/02 in Soil Boring USCS SOIL DESCRIPTION M GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-40':GM: Gravel, Sand, Sit, Mixture, gravel ot 4", Lt. Brown, med. dense, dry. 15'-40' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. Minor gravel. C/CL CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. P/SC CLAYEY SAND: SP/SC: 50'75' Poorly Graded Sand with clay, slight odor Saturated @60' BGS Strong hydrocarbon staining, odor, and PSH at 64'-74' TD 79' Riser 79'- 74', 0.020 Slot Screen 74'- 54', 12/20 Sand Pack 79'- 49', Bentonite Seal 49'-47', Cerment Grout 47'-3' CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, MUDSTONE: Marroon MuDSTONE: Marroon MuDSTONE: Marroon Mudstone, with Gypsum and anhydrite lenses, hard drilling, dry, no odor. 	77040-3229 INFORMATION Remediation Drilling DRII TWP Roswell Station 9 DRII P-202203 RIG C. Barnhill, / R. Marshall MET : George Robinson, PE SAW 11/26-27/02 HAN : in Soil Boring SAMP. # M GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-40':GM: Gravel, Sand, Sitt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 15'-40' SAMP. # M GRAVEL CAND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-40':GM: Gravel, Sand, Sitt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 15'-40' SAMP. # M GRAVEL POORY graded sand with clay, red to brown, soft, slightty plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. Minor gravel. 49'-51' C/CL CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. 49'-51' P/SC CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, slight odor Saturated @60' BGS Strong hydrocarbon staining, odor, and PSH at 64'-64' 41'-56' Strong hydrocarbon staining, odor, and PSH at 64'-64' 64'-66' 9'-61' P/SC CLAY: CL: Sandy Lean Clay. It. Reddish brown, MUDSTONE: Marroon Mudstone, with Gypsum and anhydrite lenses, hard drilling, dry, no odor. 71'-61'	77040-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C. Barnhill, / R. Marshall : George Robinson, PE 11/26-27/02 : in Soil Boring Z< W	T7040-3229 INFORMATION DRILLI Remediation Drilling TWP Roswell Station 9 P-202203 DRILLING CO.: DRILLER: RIG TYPE: Roswell Station 9 P-202203 DRILLING METHO RILLER: RIG TYPE: George Robinson, PE 11/26-27/02 Marshall Soil Boring z Water level water level JSCS SOIL DESCRIPTION SAMP. # Blows fravel, Sand, Sit, Mixture, gravel to 4", Lt Brown, med. dense, dry. 15'-40' SM/SP/SC: Poorly graded sand with calay.red to brown, soft, sightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic, moist. 49' - 51' P/SC CLAYE: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. 49' - 51' 41"/18 54' - 56' P/SC CLAYE: SAND: SP/SC: 50'75' Poorly Graded sand with clay. slight door statining, odor, and PSH at 64' - 56' 49' - 51' 41"/18 54' - 56' P/SC CLAYE: Sand VER 79- 74', 0.020 Sht Screen 74- 54', 1220 Sand Pack 49' - 71' 41"/18 64' - 66' 12"/34 64' - 66' P/SC CLAY: CL: Sandy Lean redued with clay.slight door staining, odor, and PSH at 64' - 66' 12"/34 64' - 66' P/SC GRAYEL AMD 74'' - 76' P/SC GLAY: CL: Sandy Lean redued dilling, dry, no odor. 74'' - 76' P/SC CLAY: CL: Sandy Lean redued dilling, dry, no odor. 74'' - 76' P/SC CLAY: CL: Sandy Lean redued dilling, dry, no odor.	77040-3229 INFORMATION DRILLING INFORMA Remediation Drilling TWP Roswell Station 9 P-202203 DRILLING CO.: Atkins End DRILLER: Mort Bat RIG TYPE: Mobile D C. Barnhill, / R. Marshall METHOD OF DRILLING: 8 1/4" He SAMPLING METHODS: Split Spot HAMMER WT./DROP 140 Ib., 30 in Soil Boring z: Water level during drilling Twe Value level during drilling In Soil Boring z: Water level in completed well JSCS SOIL DESCRIPTION SAMP. # Blows Soft dems, dy 5-40' SMSP/SC: Pooly graded sand with clay, red to staming, odor, and Pel at dist, flatence moist. Minor gravel. Blows fit 1/26 C/CL CLAYE SAND: SP/SC: GV-75 Pooly Graded sand with clay, red to staming, odor, and Pel at dist, flatence moist. Minor gravel. 49' - 51' 41"/18 59' - 51' 59' - 51' 59' - 51' 41"/18 59' - 51' 59' TYD40-3229 INFORMATION DRILLING INFORMATION Remediation Drilling TWP Roswell Station 9 P-20203 DRILLING CO.: Atkins Engineering DRILLER: Mort Bates George Robinson, PE 11/26-27/02 DRILLING: 8 1/4" Hollow Stem Auger SAMPLING METHOD OF DRILLING: 8 1/4" Hollow Stem Auger SAMPLING METHOD S: Split Spoon HAMMER WT JDROP 140 lb., 30 in. in Soil Boring zw Water level during drilling water level in completed well Page 1 of 1 JSCS SOIL DESCRIPTION SAMP. # If. Blows PID BORING COMPLETION BORING COMPLETION Matter level and the state of a st			

· --- -----

- - - - ----

Recei	ved by OCD: 10	/21/2022-	8:48:57 AM						Page 122 of
C	ypress Er	nginee	ering Services,	Inc.	IC. FIELD BOREHOLE LOG				
11	0235 West Li	ittle Yorl	k Road		В	OREH	OLE NO.: MP	E-17	
S	uite 256				TOTAL DEPTH: 75'				
	buston, Texa	as 77040	0-3229						
	PROJEC	T INFO	RMATION		DRILLING INFORMATION				_
PROJ	ECT:	Rei	mediation Drilling	DRI	LLING (0.:	Atkins Er	igineering	
SITE L	OCATION:	TW	P Roswell Station 9	DRI	LER:		Mort Bat	es	
JOB N	0.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGG	ED BY:	Ric	k Smith, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJ	ECT MANAGE	ER: Geo	orge Robinson, PE	SAN	IPLING	METH	ODS: Split Spoo	n	
DATES	S DRILLED:	11/2	20/02	HAN	IMER W	/T./DR(OP 140 lb., 30) in.	
NOTE	S: _{PsH@ 61.}	75 ' H20@	66.25'(BGS)11/25/0	02	sz Wa sz Wa	ter level ter level	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 –		CM	ار		۲۱	·] [
			GRAVEL AND SAND: GM: 0'-4' BGS White Pink					Cement Grout	
-, -, -, -, -, -, -, -, -, -, -, -, -, -	0-0-0-0		Caliche, Hard, Dry 4'-43' :Gravel, Sand, Silt,					3'-46'	
-10 -			Mixture, gravel to 4", Light Brown, medium dense,						
			dry, No odor						
-20 -									
	0,0,0,0								
-25-	0.0.0.0								
-30 -	0.0.0.0								
-35-	0,0,0,0					j			
	0,0,0,0								
-40-	0.0.0.0		(
-45-1		SP/SC	CLAYEY SAND: SP-SC:					Bentonite 46'	
-50 -			clay, red to strong brown, soft moist, slight odor					Top Sand 49'	
-55-		CL	CLAY AND SAND: CL:						
	SEPERTS		medium stiff, plastic,					Top Screen 55'	
-60-		SP/SC							
- 🛨 -		SE/ DC	CLAYEY SAND: SP-SC: Poorly graded sand with						
-70-		ep/ec	clay, It. red brown, med to loose, moist, dense.						
_75		20120	drilling rate. TD 75' BGS						
			Strong Odor @ 70' BGS 5' sump 70'-75', 0.020 slot						
			49'-75', Bentonite 46'-49',						
-85 -			cement grout 3 -46 11/25/02: PsH@61.75'						
			(862)						

Received by OCD: 10/21/2	022 8:48:57 AM						Page 123 of 193
Cypress Engir 10235 West Little Suite 256	neering Services, I York Road	nc.	F В(Т(IELC OREHO DTAL I	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-18	
ouston, Texas 77	7040-3229						
PROJECT IN	FORMATION				NG INFORMA	TION .	
	Remediation Drilling	DRILI		:0.:	Atkins Er	igineering	
SITE LOCATION:	TWP Roswell Station 9	DRILI			Mort Bat	es	
JOB NO.:	P-202203	RIGI	YPE:		Mobile D	rill B-68	
	Rick Smith, PG	MEIF			LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER:	George Robinson, PE	SAME			DDS: Split Spoo	on	
DATES DRILLED:	11/21/02			/T./DRC)P 140 lb., 30) in.	
NOTES: 4" SCH 40 PV	C MPE Well	2	z Wat z Wat	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS US	CS SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -20 -20 -25 -30 -40 -45 -65 -65 -65 -65 -5 -5 -5 -5 -5 -5 -5 -5 -5 -	SC CLAY AND SAND: 0'- 4': GM mixed with caliche, white pink, dry 4'-58':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry becoming moist @ 50' BGS Slight Odor to No Odor 58'-72' SP/SC Poorly Graded Sand With Clay, Lt. Reddish-brown, med. dense, moist					Cement Grout 3'-52' Bentonite 52' Top Sand 55' Top Screen 58'	
-70 - -75 - -85 - -90 -	-brown, med. dense, moist Water Level 59.87' BGS 11/25/02 Saturated @58' BGS CLAYEY SAND: CL: 72'- 79' Sandy lean clay red/ brown, med. stiff, moist, moderate odor, no staining. TD 79' Grout 52'- 3' Bentonite 52'-55' Sand 55'-79' 0.020 Screen 73'- 58' Riser 73'-78'					Sump 73'-78' TD 79'	

Į.

LOGGED BY: C. Barnbill, / R. Marshall PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/26/02 MATES al data and the state of the state o	Received by OCD: 10/21/2 Cypress Engi 10235 West Little Suite 256 ouston, Texas 7 PROJECT IN PROJECT: SITE LOCATION: JOB NO.:	neering Services, York Road 7040-3229 IFORMATION Remediation Drilling TWP Roswell Station 9 P-202203	DRILLI DRILLE BIG TY	FIELC BOREH TOTAL DRILLI NG CO.: :R: PE:	D BOREH OLE NO.: MP DEPTH: 79' NG INFORMA Atkins En Mort Bat Mobile D	OLE LOG PE-19 TION ngineering res rill B-68	Page 124 of
PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/26/02 HAMMER WT./DROP 140 lb., 30 in. NOTES: 4" SCH 40 PVC MPE Well Image: Second and seco	LOGGED BY:	C. Barnhill, / R. Marsh	all METHC	D OF DRIL	LING: 81/4" Ho	ollow Stem Auger	
DATES DRILLED: 11/26/02 HAMMER WT/DROP 140 lb., 30 in. NOTES: 4" SCH 40 FVC MFE Well Image: Water level uning drilling Image: Water level in completed well Page 1 of 1 DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows /ft. PID ppm BORING COMPLETION WELL DESCRIPTION 0 5 6 5 6 6 6 6 6 -10 0 0 5 6 6 6 6 6 -10 0 0 5 6 </td <td>PROJECT MANAGER:</td> <td>George Robinson, PE</td> <td>SAMPL</td> <td>ING METH</td> <td>ODS: Split Spo</td> <td>on</td> <td></td>	PROJECT MANAGER:	George Robinson, PE	SAMPL	ING METH	ODS: Split Spo	on	
NOTES: 4" SCH 40 PVC MPE Well x Water level during drilling Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # PID /ft BORING ppm COMPLETION DESCRIPTION 0 -5 -5 -5 -6 -6 -7	DATES DRILLED:	11/26/02	HAMME	ER WT./DRO	OP 140 lb., 30	0 in.	
DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows /ft PID pm BORING COMPLETION WELL DESCRIPTION 0	NOTES: 4" SCH 40 P	VC MPE Well	∑ ▼	Water level Water level	during drilling in completed well	Page 1 of 1	
0 0	DEPTH SYMBOLS US	SCS SOIL DESCRIPTION	SAMP. # BI	ows PID ft. ppm	BORING COMPLETION	WELL DESCRIPTION	
SP/SC SP/SC CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay, slight odor . TD 79' Saturated @ 54' BGS No staining or odor at 75'-TD 49'-51' 24"/19 -60 -60 54'-56' 18"/41 -60 59'-61' 24"/25 -65 -67 -70	-5 -1 0 -10 -10 -10 -10 -10 -10 -10 -10 -1	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-31':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 31'-42' SM/SP/SC: Poorly graded sand with clay, red to brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist. Minor gravel. Slight odor @ 36' and SW moist. CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.				Cement Grout 3'-43' Bentonite 43' Top Sand 46' Top Screen 49'	
-75 - CL CL CL Sondular 74'-79'	-60 -60 -65 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75 -75 -75	SC CLAYEY SAND: SP/SC: 50'-75' Poorly Graded Sand with clay ,slight odor . TD 79' Saturated @ 54' BGS No staining or odor at 75'-TD SC	49'-51' 24' 54'-56' 18' 59'-61' 24' 64'-66' 24' 69'-71' 24''	'/19 '/41 '/25 '/46 '/42		Sump 74'-79'	

o imaging. 11/22/2022 9:57:14 AM

Recei	ved by OCD: 10)/21/2022	8:48:57 AM		I				Page 125 of 19	
С	ypress Er	nginee	ering Services,	Inc.	F	IELC) BOREH	OLE LOG		
10	0235 West Li	ittle Yor	k Road		B	OREH		'E-20		
S	uite 256	7704			TOTAL DEPTH: 78					
	buston, Texa	as //040								
									-	
		Ke	mediation Drilling				Atkins El	ugineering		
	OCATION:	1 1	VP Roswell Station 9				Mobile D	.es 		
		P-2	102203	MET	илге. Чоп о			I III D-08		
	DJECT MANAGER: George Robinson, PE						2005 Solit Soc	on Stell Auger		
		IN. Ge	orge Kodinson, rE				P = 140 lb - 30	0 in		
				IVILI \ V \				-		
JOTES	S: PsH@ 60.	02' H2C	00 61.50' BGS		∞ wa ∞ Wa	ter level i	auring aniling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
)					ŋ	r	· /	F	1	
		GM	GRAVEL AND SAND: 0'- 8': GM mixed with caliche,				TAL TAL	Cement Grout		
-5 -			white pink, dry 8'-39':GM: Gravel, Sand, Silt, Mixture,					3'-39'		
-10-	0-0-0-0		gravel to 4", Lt. Brown, med. dense, dry. 39'-42'							
	0-0-0-0	5	SP/SC: Poorly graded sand with clay, red to							
20-	0.0.0.0		brown,k soft, slightly plastic, moist. 42'-49': CL:							
	0,0,0,0		Lean clay with sand, red, medium stiff, plastic moist.							
-25 -	0.0.000									
-30 -	0,0,0,0									
-35 -	0-0-0-0	ļ								
	0.0.0.000	CD / CC			1			Portorito 201	5	
-40		CL	CLAY AND SAND:					Top Sand 42'		
45-			Sand: lean clay with sand,							
50 -		SP/SC	Psh : 60.02', H2O 61.50'	401 511	0.4.11/5.1			Top Screen 48'		
55 -		,	Poorly graded sand, yellow	49'-51'	24"/51					
			54'-75' Poorly Graded	54'-56'	24"/51					
*			odor & staining @ 65'-75'.	59'-61'	24"/33					
65 -		SP/SC	BGS Wet with PsH @65'	64'-66'	24"/51					
.70 -			@ 61.50 BGS No staining		71 / 71	2				
7 - 1				69'-71'	24"/44			Sump 73'-78' TD		
	<u>()))))))</u>	CL	CLAY: CL: Sandy Lean	74'-76'	24"/20			78'		
85		SP/SC	stiff, low plasticity, moist, blocky @78' SP/SC Poorly Graded sand with clav &	79'-81'	6"/51					
			gravel, ted. med. dense.							
L 09	07777777	L]					L			

Received by OCD: 10/21	/2022	8:48:57 AM		 				<u>Page 126 of 193</u>
Cypress Eng 10235 West Little	inee Ə Yorl	ering Services, k Road	Inc.	F	IELC OREH	DEPTH: 60'	OLE LOG E-21	
Suite 256	77040	1-3229						
PROJECT I		RMATION		i	DRILLI	NG INFORMA	TION	-
PROJECT:	Rei	mediation Drilling	DRIL	LING C	:00	Atkins Er	ngineering	-
SITE LOCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	Ric	k Smith, PG	MET	HOD O	F DRILI	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER:	Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo)n	
DATES DRILLED:	11/2	19/02	HAM	IMER W	/T./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 40 M	1PE W	ell		∞ Wat • Wat	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	ISCS	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -25 -30 -40 -45 -50 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75	I J/CH	GRAVEL AND SAND: GM: 0'-5' BGS White Pink Caliche, Hard, Dry 5'-32 GM':Gravel, Sand, Silt, Mixture, gravel to 4", Light Brown, medium dense, dry, No odor CLAY: Fat Clay, red, medium stiff, plastic, moist CLAYEY SAND: CL: Fat Lean clay with sand, red, medium stiff, low plasticity, moist, no odor, some interbedded with lenses (<1') of SP/SC, starting @ 50' BGS, Poorly graded sand with clay, red to strong brown, soft, slightly plastic, very moist Water @ 55.45' BGS 11/25/02					Cement Grout 3'-37.4' Bentonite 37.4' Top Sand 41.9' Top Screen 44' TD 69'	

ł

Received by OCD: 10	21/2022	8:48:57 AM						Page 127 of 193
Cypress Er 10235 West Li Suite 256 ouston, Texa	nginee ttle Yor is 77040	ering Services, I k Road D-3229	nc.	B T	IELE OREH OTAL	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-22	Luge 127 0J 175
PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJECT:	Re	mediation Drilling	DRIL	LING C	CO.:	Atkins Er	ngineering	
SITE LOCATION:	ТМ	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG 1	YPE:		Mobile D	rill B-68	
LOGGED BY:	Jin	n Chionis	METH	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAMF	PLING	METHO	DDS: Split Spoo)n	
DATES DRILLED:	11/	07/02	HAM	MER W	/T./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 4	0 PVC M	PE Well	2	z Wa z Wa	ter level o ter level i	during drilling in completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -20 -30 -35 -50 -70 -75 -85 -85 -85 -85 -55 -85 -85 -8	GM GM CH CL / CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAYEY SAND: TD 80' Saturated @ 65' BGS Cement / Bentonite Grout 49'-3' Bentonite 49'-52' 12/20 Sand Pack ' 52'-80' 0.010 Slot Screen 80'-55' CLAY: Red Fat Clay, Water Level @ 65.0' from BGS 11/08/02 No Odor or hydrocarbon staining.					Cement Grout 3'-49' Bentonite 49' Top Sand 52' Top Screen 55' T.D. @80'	

L

Receiv	ved by OCD: 10	/21/2022	8:48:57 AM						Page 128 of 193
C	voress Fr	nainee	ering Services	Inc	F	IELD	D BOREH	OLE LOG	
10	235 Moet Li	ittle Vor	k Road		В	OREH	OLE NO.: MF	PE-23	
S	uite 256		K NOAU				DEPTH: 80'		
	ouston, Texa	as 7704	0-3229					:	
	PROJEC	T INFO	RMATION			DRILLI	ING INFORMA	TION	
PROJE	ECT:	Re	mediation Drilling	DRII	LING C	0.:	Atkins E	ngineering	
SITE L	OCATION:	TV	VP Roswell Station 9	DRII	LER:		Mort Ba	tes	
JOB N	D.:	P-2	202203	RIG	TYPE:		Mobile D	rill B-68	
LOGG	ED BY:	Jin	n Chionis	MET	HOD O	F DRIL	LING: 8 1/4" He	ollow Stem Auger	
PROJE	CT MANAGE	ER: Ge	orge Robinson, PE	SAM	IPLING	METH	ODS: Split Spo	on	
DATES	DRILLED:	11/	06/02	HAM	IMER W	/T./DR(OP 140 lb., 3	0 in.	
NOTES	3: 4" SCH 40	0 PVC M	IPE Well		∞ Wa ∞ Wa	ter level ter level	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -									
	0-0-0-0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt,				1	Cement Grout	
-5 -	0.0.0.0		Mixture, gravel to 2"					3'-49'	
-10-	0,0,0,0								
	0,0,0,0								
-20	0707070								
20 -	0.0.0.0								
-25-	0,0,0,0								
-30									1
-35-	000		SAND AND SILT Sity						
		CL	SAND AND SIET. Silly, Sand, Tan Brown Fine						
-40-			Clayey Sand						
-45-	<u> </u>	СН	CLAY: CH: Red Clayey						
-50 -			Clay Lenses					Bentonite 49'	
-55-	<u>IIIIII</u>							Top Sand 52'	
		CL /	CLAYEY SAND: Dark Stained, Hydrocarbon					Top Screen 55'	
00 			CLAYEY SAND: TD 80'						
-65-			Cement / Bentonite Grout						
-70-			12/20 Sand Pack ' 52'-80'						
-75									
		СН	CLAY: Red Fat Clay, Water Level @ 60.0' from						
			BGS 11/07/02 No Odor or hydrocarbon staining.					T.D. @80'	
-85 년									

<u>Received by OCD: 10/</u>	21/2022	8:48:57 AM						Page 129 of 193
Cypress Eng 10235 West Litt Suite 256 buston, Texas	ginee le Yorl	Road	Inc.	F В Т	IELE OREH OTAL I	D BOREH OLE NO.: MP DEPTH: 74'	OLE LOG E-24	
PROJECT	INFOF	RMATION		I	DRILLI	NG INFORMA	TION	
PROJECT:	Rei	nediation Drilling	DRIL	LING (20.:	Atkins Er	ngineering	-
SITE LOCATION:	ТМ	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER	R: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spo	n	
DATES DRILLED:	11/	11-13/02	HAM	IMER V	VT./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 40	PVC M	PE Well		∞ Wa • Wa	iter level i iter level i	during drilling in completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -20 -25 -30 -35 -40 -45 -55 -60 -65 -70 -75 -75 -75 -75 -75 -75 -75 -75	GM CL CH CH	COLLUVIUM: Hard White Caliche 0'-4' CLAYEY SAND: Clayey GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CONGLOMERATE: Hard CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Damp @40', Perched Aquifer? Strong Contamination & Odor, Black Streaks in Clayey Sand CLAYEY SAND: TD 79' Saturated @ 58' BGS Cement / Bentonite Grout 43'-3' Bentonite 43'-46' 12/20 Sand Pack ' 46'-74' 0.010 Slot Screen 74'-49' Strong Contamination & Odor, Black Gray Color Water Level 58.27' TOC CALCAREOUS SANDSTONE: Calcareous Cement, White, fine gr., Hard Drilling, Dry, No Odor or Staining	49'-51' 54'-56' 59'-61' 70'-72' 74'-76'	33/24" 39/24" No SPT 80/16" 50/24"			Cement Grout 3'-43' Bentonite 43' Top Sand 46' Top Screen 49' TD 74'	

Received by OCD: 10/21/2	022 8:48:57 AM		-1 ·····-				
Cypress Engin 10235 West Little N	eering Services, I ^{/ork Road}	nc.	FIELI BOREH TOTAL	D BOREH HOLE NO.: MP DEPTH: 80'	OLE LOG 2E-25		
buston, Texas 77	040-3229						
PROJECT IN	ORMATION		DRILL	ING INFORMA	TION		
PROJECT:	Remediation Drilling	DRILLI	NG CO.:	Atkins Er	ngineering		
SITE LOCATION:	TWP Roswell Station 9	DRILLE	ER:	Mort Bat	es		
JOB NO.:	P-202203	RIG TY	PE:	Mobile D	rill B-68		
LOGGED BY:	Jim Chionis	METHO		LING: 8 1/4" Ho	llow Stem Auger		
PROJECT MANAGER:	George Robinson, PE	SAMPL	ING METH	ODS: Split Spo	on		
DATES DRILLED:	11/04/02	HAMME	ER WT./DR	OP 140 lb., 30) in.		
NOTES: 4" SCH 40 PV	C MPE Well	∑ ¥	Water level Water level	during drilling in completed well	Page 1 of 1		
DEPTH SYMBOLS US	CS SOIL DESCRIPTION	SAMP. # B	lows PID ft. ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -10 -10 -20 -20 -20 -25 -30 -40 -45 -50 -55 -55 -55 -55 -55 -70 -70 -70 -70 -70 -70 -70 -70	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" Contaminated Pit Soil begins @ 7' BGS Pit Liner @ 17' BGS CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Moist @ 38' CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite Grout 48'-3' Bentonite 48'-51' 12/20 Sand Pack '51'-79' 0.010 Slot Screen 79'-54'				Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'		

Cypress Engineering Services, Inc. 10235 West Little York Road Suite 256 FIELD BOREHOLE LOG BOREHOLE NO: MIPE-26 TOTAL DEPTH: 84' PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING SUITE PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION PROJECT Autor Base More Base LOGGED BY: Jim Chionis PROJECT MARGER: George Robinson, PF. DATES DRILLED: JI/US-06/02 HAME THOD OF DRILLING: 8 JJ#" Hollow Stem Auger SOUL SOL DESCRIPTION SOUL SOL DESCRIPTION SOUL SOL DESCRIPTION SOUL GRAVID AND DAND GRAVID AN	<u> </u>	ved by OCD: 1	0/21/2022	2 8:48:57 AM						Page 131 of 193
BOREHOLE NO: MPE-26 TOTAL DEPTH Subscription Subscription PROJECT INFORMATION PROJECT MARAGER: Corper Column PROJECT MARAGER: Gorge Robinson, PE DATES DRILLED: JUDS SOIL UECS SOIL DECT SOIL DECS	C	voress Fr	nainee	ring Services.	Inc.	F	IELD) BOREH	OLE LOG	
TOTAL DEPTH: 84' TOTAL DEPTH: 84' TOTAL DEPTH: 84' PROJECT INFORMATION DRILLING INFORMATION DRILLING INFORMATION DRILLING CO::::::::::::::::::::::::::::::::::::	10	235 West Li	ttle Vor	k Road		В	OREH	OLE NO.: MP	E-26	
Duston, Taxas 77040-3229 PROJECT INFORMATION DRILLING INFORMATION PROJECT INFORMATION DRILLING CO: Atkins Engineering STE LOCATION: TWP Rewell Station 9 DRILLER: Mort Bates JOB NO: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis METHOD OF DRILLING: 8 1/4" Hollow Stem Auger SAMPLING METHODS: Split spoon PATES DRILLED: I/W5-06/02 NOTES: 4" SCH 40 FVC MPB Well 2" SCH 40 FVC MPB Well 2" Water level during dilling SWMare, graved to 2" (g 25) 4" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 2" Water level in completed well 2" SCH 40 FVC MPB Well 3" 4" 1" 2" SCH 40 FVC MPB Well 3" 4" 1" 2" SCH 40 FVC MPB Well 3" 4" 1" 2" SCH 40 FVC MPB Well 3" 4" 1" 2" SCH 40 FVC MPB Well 3" 4" 1" 2" SCH 40 FVC MPB Well 3" 4" 1" 3" 4" 1" SCH 40 FVC MPB Well 3" 4" 1" <td>Su</td> <td>lite 256</td> <td></td> <td>K KOAG</td> <td></td> <td> T</td> <td>OTAL I</td> <td>DEPTH: 84'</td> <td></td> <td></td>	Su	lite 256		K KOAG		T	OTAL I	DEPTH: 84'		
PROJECT INFORMATION DRILLING INFORMATION PROJECT: Remediation Drilling DRILLING INFORMATION PROJECT: Remediation Drilling DRILLING CO:: Atias Engineering SITE LOCATION: TWP Rowell Station 9 DRILLER: Mont Bates JOB NO: P-202203 RIG TYPE: Mohile Drill B-68 LOGGED BY: Jim Chionis METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: George Rabinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/05-06/02 HAMMER WT./DROP Hollow, 30 in. NOTES: 4* SCR 40 FVC MPE Well * Water level in completed well Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows PD BORING WELL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PD BORING WELL COMPLETION OFAWEL AND SAND: Midding, gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arrow of a gavet to 2*@ 25 Immanti Arro		ouston, Texa	is 77040)-3229						
PROJECT: Remediation Drilling DRILLING CO.: Atkins Engineering STE LOCATION: TWP Roswell Station 9 DRILLER: Mort Bates JOB NO.: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis METHOD OF DRILLING: S14" Hollow Sten Auger PROJECT MANAGER: George Robinson, PE SAMPLING METHOD S: Split Spoon DATES DRILLED: 11/05-06/02 HAMMER WT/DROP 140 Ib., 30 in. NOTES: 4" SCH 40 PVC MPE Well x: Water level in completed will Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DORNKO 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DORNKO 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DORNKO 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DORNKO 10 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. Pilows [Ppm] DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # //ft. <t< td=""><td>i</td><td>PROJEC</td><td>T INFOI</td><td>RMATION</td><td></td><td></td><td>DRILLI</td><td>NG INFORMA</td><td>TION</td><td></td></t<>	i	PROJEC	T INFOI	RMATION			DRILLI	NG INFORMA	TION	
SITE LOCATION: TWP Roswell Station 9 DRILLER: Mont Bates JOB NO: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/05-06/02 HAMMER WT.DROP 140 h.o., 0 in. NOTES: 4" SCH 40 PVC MPE Rel1 X Water level during driling Page 1 of 1 SOIL SOIL USCS SOIL DESCRIPTION SAMP. # Blows PD BORING WELL DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows PD BORING WELL 0 GEORGEO CONCOLUMENT GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: 0 GEORGEO CONCOLUMENT GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: 0 GEORGEO CONCOLUMENT GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: GRAVELAND SAND: 0 GEORGEO CONCOLUMENT GRAVELAND SAND: GRAVELAND SAND: <td< td=""><td>PROJE</td><td>CT:</td><td>Re</td><td>mediation Drilling</td><td>DRII</td><td>LLING (</td><td>20.:</td><td>Atkins Er</td><td>ıgineering</td><td></td></td<>	PROJE	CT:	Re	mediation Drilling	DRII	LLING (20.:	Atkins Er	ıgineering	
JOB NO: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED PY: Jim Chionis METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: Corge Robinson, PE SAMPLING METHODS: Spin Spoon DATES DRILLED: 11/05-06/02 HAMMER WT/DROP 140 lb, 30 in. NOTES: 4" SCH 40 PVC MPE Well * Water level auror during drilling Page 1 of 1 DEPTH SOIL SOIL DESCRIPTION SAMP # Blows PDD BORING Well: 0 -5 SYMBOLS USCS SOIL DESCRIPTION SAMP # Blows PDD BORING Well: 0 -5 GR CG CG CG CG GM Gravel Sand Blows PDD BORING Well: 0 CCC CG CG CG CG CG CG CG CG CG CG CG CG	SITE L	OCATION:	TW	P Roswell Station 9	DRII	LLER:		Mort Bat	es	
LOGGED BY: Jim Chionis METHOD OF DRILLING: 8 1/4" Hollow Stem Auger PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05-06/02 HAMMER WT/DROP 140 Ib., 30 in. NOTES: 4" SCH 40 FVC MPE Well 2" Water level during drilling 4" SCH 40 FVC MPE Well DEPTH SOUL DEPTH SOUL DEPTH SOUL DEPTH SOUL DEPTH SOUL CONTRACTOR OF AND CONTRACTOR OF AND CONT	JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/05-06/02 HAMMER WT/DROP 140 fb., 30 in. NOTES: 4" SCH 40 PVC MPE Well x Water level during drilling Page 1 of 1 EFTH SOIL SOIL DESCRIPTION SAMP, # Blows PID BORING WELL DEFTH SVMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID CORNIG WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP, # Blows PID Bornig Bornig -10 CLAYCY SAND TO 64 Blows Blows	LOGGE	ED BY:	Jin	n Chionis	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
DATES DRILLED: 11/05-06/02 HAMMER WT/DROP 140 bs. 30 in. NOTES: 4" SCR 40 PVC MEE Well * Water level during drilling * Water level during drilling Page 1 of 1 DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # BIOWS /ft PID BORING COMPLETION WELL DESCRIPTION 0 -5 -5 -5 -6 -7 -6 -6 -6 -6 -6 -6 -6 -7 -7 10 -6 -6 -6 -6 -6 -6 -7 10 -6<	PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAN	IPLING	METHO	DDS: Split Spoo	n	
NOTES: 4" SCH 40 PVC MFE Well x Water level during drilling Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Piows PiD BORING WELL 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows PiD BORING DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows Pio BORING DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows Pio BORING DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows Pio BORING DESCRIPTION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows Pio BORING COMPLETION 0 SYMBOLS USCS SOIL DESCRIPTION SAMP. # Piows Pio BORING COMPLETION 10 CONCERCION GAVEL AND SAND: Maker, gravel to 2" @ 25' SMARANDE Boring Concercion SMARANDE -20 CONCERCION CAVE CH Red Clayey SMARANDE Boring Boring Boring Boring -21 CONCERCION CLAY CH: Red Clayey SMA	DATES	DRILLED:	11/	05-06/02	HAM	IMER V	VT./DRC	OP 140 lb., 30) in.	
DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows /ft PID ppm BORING COMPLETION WELL DESCRIPTION 0 0 0 0 0 0 0 0 0 0 -5 0 0 0 0 0 0 0 0 0 -6 0 0 0 0 0 0 0 0 0 -0 0 0 0 0 0 0 0 0 0 -0 0 0 0 0 0 0 0 0 0 -0 0 0 0 0 0 0 0 0 0 -0 0 0 0 0 0 0 0 0 0 -0 0 0 0 0 0 0 0 0 0 -10 0 0 0 0 0 0 0 0 0 0 -20 0 0 0 0 0 0 0 0 0 0 -21 0 0 0 0 0 0 <	NOTES	: 4" SCH 4	0 PVC M	PE Well		sz Wa ⊻ Wa	iter level o iter level i	during drilling n completed well	Page 1 of 1	
0 -5 -5 -5 -6 -6 -6 -6 -7 -6 -7	DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 CRAVEL AND SAND: GM.CELAND SAND SAND: GM.CELAND 0 -)/ .	r		IL	۱ ۲ ۴	r		
-10 -10 -10 -20 -25 -25 -25 -25 -25 -25 -25 -25	-5 -1		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2" @ 25'					Cement Grout 3'-47'	
-20 -	-10-	0-0-0-0								
-20 CF0:50:50 -25 CF0:50:50 -36 CF0:50:50 -37 CF0:50:50 -38 CLAY: CH: Red Clayey Sand mixed with Fat Red Bas -45 CLAY: CH: Red Clayey -45 CLAY: Lenses Moist Light Hydrocarbon Odor 35:40 BGS -50 CLAY: SAND: TD 84' Saturated @ 65' BGS Cent // Bastwared @ 65' BGS CH CLAYEY SAND: TD 84' Saturated @ 65' BGS Cent // Bastwared @ 65' BGS CH CLAYEY SAND: Water -65 CH CLAYEY SAND: Water Level @ 6120' form BGS 1100' for Corb of hydrocarbon staining. CH CLAY: Red Brown Fat CH										
-20 - 05 05 05 05 0 -25 05 05 05 0 -26 05 05 05 0 -26 05 05 05 0 -26 05 05 05 05 0 -26 05 05 05 05 05 05 05 05 05 05 05 05 05	Ţ	0-0-0-0								
-25 -30 -30 -35 -35 -35 -45 -45 -50 -45 -50 -55 -55 -55 -55 -55 -55 -5	-20-	0,0,0,0								
-30 0:10:10:10:10 0:10:10:10:10 0:10:10:10:10:10 0:10:10:10:10:10:10:10:10:10:10:10:10:10	-25 -	0-0-0-0								
-35 -35 -40 -40 -40 -40 -45 -40 -45 -50 -50 -65 -50 -65 -65 -70 -71 -71 -72 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -75 -71 -72 -71 -74 -76 -75 -71 -74 -76 -75 -71 -74 -76 -75	-30 -	0,0,0,0								
-35 -40 -45 -45 -50 -45 -50 -50 -50 -50 -50 -50 -50 -5		0,0,0,0								
-40 -	-35-	<u> </u>		CLAY: CH: Red Clayey						
-45 -50 -50 -50 -50 -50 -50 -50 -5	-40-	<u> </u>	Сн	Clay Lenses Moist Light						
-50 -50 -50 -50 -50 -50 -50 -50	-45-	SINN)		BGS						
-52 CL // CLAYEY SAND: TD 84' Saturated @ 65' BGS Cement / Bentonite Grout 47'-3' Bentonite 47'-49' 12/20 Sand Pack 49-85' 0.010 Siot Screen 84'-54' 54'-56' Rec. 2' Top Screen 54' -65 -70 -75 - </td <td>-50 -</td> <td>SI IIII</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Bentonite 47' Top Sand 49'</td> <td></td>	-50 -	SI IIII							Bentonite 47' Top Sand 49'	
CL CLAYEY SAND: TD 84' Saturated @ 65 'BGS Cement / Bentonite Grout 47'-3' Bentonite 47'-49' 12/20 Sand Pack 49'-85' 0.010 Slot Screen 84'-54' 54'-56' Rec. 2' 59'-61' Rec. 2' -65 CLAYEY SAND: Water Level @ 61.20' from BGS 11/08/02 No Odor or hydrocarbon staining. 54'-56' Rec. 2' -75 CLAYEY SAND: Water Level @ 61.20' from BGS 11/08/02 No Odor or hydrocarbon staining. 69'-71' Rec. 2' -85 CH CLAY: Red Brown Fat Clay @79' BGS 79'-81' Rec. 2' -85 CH CLAY: Red Brown Fat Clay @79' BGS 79'-81' Rec. 2'		SHHH)			49'-51' Rec. 2'					
CL CL / Clurated @ 69 BGS Rec. 2' -65 Cement / Bentonite Grout 47-3' Bentonite 47'-49' 59'-61' -70 12/20 Sand Pack 49'-85' 0.010 Slot Screen 84'-54' 64'-66' -70 CL CLAYEY SAND: Water 69'-71' Level @ 61.20' from BGS 11/08/02 No Odor or 69'-71' nydrocarbon staining. CLAY: Red Brown Fat 79'-81' -85 CH CLAY: Red Brown Fat 79'-81' -90 CH CLAY: Red Brown Fat 79'-81' -85 CH CLAY: Red Brown Fat 79'-81'	-52-			CLAYEY SAND: TD 84'	54'-56' Dar 31				Top Screen 54'	
-65 -65 12/20 Sand Pack 49'-85' Rec. 2' -70 12/20 Sand Pack 49'-85' 64'-66' -70 CLAYEY SAND: Water 69'-71' Level @ 61.20' from BGS 11/08/02 No Odor or 69'-71' -75 CLAY: Red Brown Fat 79'-81' 28 -85 CH CLAY: Red Brown Fat 79'-81' 28 -90 CH CH State Constraints 79'-81' 28			CL / CH	Cement / Bentonite Grout	Rec. 2'					
-70 -75 -75 -75 -85 -90 -70 -75 -75 -75 -75 -75 -75 -75 -75	-65-			12/20 Sand Pack 49'-85'	Rec. 2'					
-75- CL CLAYEY SAND: Water Level @ 61.20' from BGS 11/08/02 No Odor or hydrocarbon staining. 69'-71' Rec. 2' -85- -85- CLAY: Red Brown Fat Clay @79' BGS 74'-76' Rec. 2' 15 -85- -90 CLAY: Red Brown Fat Clay @79' BGS 79'-81' Rec. 2' 28 -85- -90 CLAY: Red Brown Fat Clay @79' BGS 79'-81' Rec. 2' 28 -85- -90 -90 -90 -90 -90 -90	-70-			0.010 Slot Screen 64-54	64'-66' Rec.1.5'					
-75- -75- -75- -75- -85- -85- -90- CL CL CL 11/08/02 No Odor or hydrocarbon staining. CLAY: Red Brown Fat Clay @79' BGS 74'-76' Rec. 2' 84'-86' Rec. 2' 84'-86' Rec. 2' S50 Rec. 2' S15 T.D.@84'	, , , , , , , , , , , , , , , , , , ,			CLAYEY SAND: Water Level @ 61.20' from BGS	69'-71' Rec. 2'					
-85 -85 <td>-75-</td> <td></td> <td>CL</td> <td>11/08/02 No Odor or hydrocarbon staining.</td> <td>74'-76'</td> <td>15</td> <td></td> <td></td> <td></td> <td></td>	-75-		CL	11/08/02 No Odor or hydrocarbon staining.	74'-76'	15				
-85 - -90 - CH Clay @79' BGS Rec. 2' 84'-86' Rec. 2' >50 T.D.@84'	- 🌱	111111		CLAY: Red Brown Fat	Rec. 2'	28				
-90	-85 -		СН	Clay @79' BGS	Rec. 2'	>50			T.D.@84'	
	<u>ل</u> ل ₉₀				84'-86' Rec. 2'					

1

Receive	ed by OCD: 10/	21/2022	8:48:57 AM							Page 132 of 193
Cy	/press Er	nginee	ering Services,	Inc) .	F			OLE LOG	
10	235 West Li	ttle Yor	k Road					DEDTH 70	E-2/	
Su	lite 256 Nuston Teva	s 7704	7-3220				UTAL	DEFIN. 79		
	PROJECT		RMATION				DRILLI	ING INFORMA	TION	
PROJE	CT:	Re	mediation Drilling		DRI	LLING	CO.:	Atkins Er	gineering	
SITE LC		TV	VP Roswell Station 9		DRI	LLER:		Mort Bat	es	
JOB NC).:	P-2	202203		RIG	TYPE:		Mobile D	rill B-68	
LOGGE	D BY:	CN	1 Barnhill, PG		MET	HOD C		LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE		SAM	IPLING	METHO	ODS: Split Spoo	on	
DATES	DRILLED:	10/	31/0 2		HAN	MER V	VT./DRO	OP 140 lb., 30) in.	
NOTES	: 4" SCH 40) PVC M	PE Well			∞ Wa ∞ Wa	ater level i ater level i	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SA	MP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2.5" Srong Contamination Begins @ 12' BGS						Cement Grout 3'-40'	
-35 -40 -45 -50 -55 -65 -70 -75		CL CL	CLAYEY SAND: CL: Red Clayey Sand Strong Hydrocarbon Odor & Staining Gray / Black Saturated , very wet /stinky SAND AND SILT: 2' Sand CLAYEY SAND: Saturated from 40'-TD Strong Contamination	SPT		46 Blows			Bentonite 40' Top Sand 48' Top Screen 54'	

Receiv	ed by OCD: 10)/21/2022	8:48:57 AM						Page 133 of 19
C) 10 Su	/press Er 235 West Li ite 256	nginee ttle Yor	k Road	Inc.	F ד ד	IEL[BOREH OTAL	D BOREH OLE NO.: MP DEPTH: 82'	OLE LOG E-28 (Casing 76')	
	PROJEC					DRILL	ING INFORMA	TION	-
PROJE		Re	mediation Drilling	DRII	LING	CO.:	Atkins E	ngineering	
SITE LO	DCATION:	ТМ	P Roswell Station 9	DRII	LER:		Mort Bat	res and a second s	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	D BY:	CM	I Barnhill, PG	MET	HOD	OF DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METH	ODS: Split Spo	on	
DATES	DRILLED:	10/.	30-31/02	HAN		VT./DR	OP 140 lb., 30) in.	
NOTES	: 4" SCH 40	0 PVC M	PE Well		∞ Wa ∞ Wa	ater level ater level	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -50 -50 -50 -50 -50 -50 -50 -5		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses GRAVEL AND SAND: 10% Gravel / 90% Sand	SPT	32 Blows			Cement Grout 3'-40' Bentonite 40' Top Sand 43' Top Screen 46'	
-60		CL / CH	CLAYEY SAND: Hydrocarbon Odor & Stain @ 56'	SPT SPT	25 Blows 50 Blows				
-76-1		GYPSUM	GYPSUM: At 71' -76' White Gypsum	SPT	50 Blows 50				
		CL	Saturated		Blows				

Receive	ed by OCD: 10	/21/2022 8	8:48:57 AM						Page 134 o	
	unross Er	nainee	ring Services	Inc	F	IELC	BOREH	OLE LOG		
		iyinee waxaa	Parad	me.	В	OREH	OLE NO.: MP	°E-29		
-Si	izso vvest Li lite 256	ttie Yori	K ROAD		Т	OTAL	DEPTH: 79'			
	ouston, Texa	is 77040)-3229							
	PROJEC	T INFOR	RMATION		DRILLING INFORMATION					
PROJE	CT:	Rei	mediation Drilling	DRI	LLING (CO.:	Atkins E	ngineering		
SITE LO	OCATION:	TW	P Roswell Station 9	DRI	LLER:		Mort Bat	es		
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGE	ED BY:	CM	l Barnhill, PG	MET	HOD C	F DRIL	LING: 8 1/4" Ho	llow Stem Auger		
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METHO	DDS: Split Spo	0 n		
DATES	DRILLED:	11/	01-02/02	HAN	IMER V	VT./DRC	OP 140 lb., 30) in.		
NOTES): 				∽ Wa	ater level (during drilling			
	4" SCH 4	U PVC M	LF MEIT		🛫 Wa	iter level i	n completed well	rage 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
0 –			J			, <u> </u>	·····	·····		
	0-0-0-0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt,				and the second second second second second second second second second second second second second second second	Cement Grout		
-5 -			Mixture, gravel to 2.5" No Contamination Split Spoon					3'-48'		
-10-	0-0-0-0		at interface between gravel and clay 30'-32'							
	0-0-0-0		Sampled for Geotechnical Data and also for							
-20-	0-0-0-0		Heterotropic Bacteria							
	0-0-0-0									
-25-	0,0,0,0									
-30-	0,0,0,0									
-35 -	<u> </u>	СН	CLAY: CH : Fat Clay	SPT / Lab	42 Blows					
	UUUU		Sand No Contamination		6": 3 Blows					
-40-	AUUUU				12″8 Blows					
-45-	<u>()))))))</u>				18" 14					
-50 -	<u>UIIIII</u>				Blows 24"					
-55-		CL / CH	CLAYEY SAND:		17 Blows			Bentonite 48'		
			Contamination Split Spoon					Top Sand 51'		
		CL	Capillary Fringe for	SPT / Lab	26 Blows			Top Screen 54'		
-65-			Heterotropic Bacteria		6": 3 Blowe					
-70-					12" 8					
7 6					18" 7					
					24" 8 Blows					
]]	51043					

Received by OCD: 10/21/2	0022 8:48:57 AM						Page 135 of 193
Cypress Engin 10235 West Little Suite 256	neering Services, I York Road	nc.	FI BC TC	ELD DREHO DTAL [DLE NO.: MP DEPTH: 80'	OLE LOG E-30	
	1040-3229						- .
	Remediation Drilling	DRILL			Atkins Fr	ngineering	
SITE LOCATION	TWP Roswell Station 9	DRILL	FR [.]	0	Mort Bat	es	
JOB NO.:	P-202203	RIGT	YPE:		Mobile D	rill B-68	
LOGGED BY:	CM Barnhill, PG	METH	IOD OF		.ING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER:	George Robinson, PE	SAMF		ЛЕТНС	DS: Split Spoo	on	
DATES DRILLED:	10/25/02	HAMN	IER W	T./DRC	P 140 lb., 30) in.	
NOTES: 4" SCH 40 PV	/C MPE Well		wate Wate	er level d er level ir	luring drilling	Page 1 of 1	
DEPTH SOIL SYMBOLS US	SCS SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -25 -30 -35 -40 -45 -55 -60 -55 -60 -55 -60 -55 -60 -70 -85 -85 -85 -85 -85 -85 -85 -85	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAY: Hydrocarbon Odor 42:46', Gone @56' CLAY: Decreasing Hydrocarbon Odor CLAY: Water Level @ 63.82' from TOC 10/29/02 CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite 56'-53' 12/20 Sand Pack ' 56'-79' 0.010 Slot Screen 79'-59'					Cement Grout 3'-53' Bentonite -53' Sand 79'-56' Screen 79'- 59'	

Receive	d by OCD: 10	/21/2022	8:48:57 AM			_ _			_Page 136 a	
См	oress Fr	nainee	ring Services 1	nc	F	IELC	BOREH	OLE LOG		
- y 102	235 West Li	ttle Yorl	k Road		В	OREH	OLE NO.: MP	E-31		
<u>S</u> ui	ite 256				T	OTAL	DEPTH: 80'			
	uston, Texa	s 77040)-3229						_	
	PROJECT	INFO	RMATION		DRILLING INFORMATION					
PROJE	CT:	Rei	mediation Drilling	DRIL	LING C	:00	Atkins Er	ngineering		
SITE LC	CATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es		
JOB NO).:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGE	D BY:	CM	1 Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger		
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo	n		
DATES	DRILLED:	10/2	28/02	HAM	MER W	/T./DR(DP 140 lb., 30) in.		
NOTES:	4" SCH 4() PVC M	PE Well		∞ Wa • Wa	ter level (ter level i	during drilling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
	0101010	GM	GRAVEL AND SAND: GM: Gravel Sand, Silt,				8-8-8-10 T. 7-8-10	Cement Grout		
-1020			Mixture, gravel to 4"					3'-55'		
-25-		СН	GRAVEL AND SAND: Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey							
-40 -			Sand mixed with Fat Red Clay Lenses							
-50 -								Top Bentonite 55'		
			CLAY: Water Level @			-		Top Sand 58'		
-65		CL /	60.59' from TOC 10/29/02					Top Screen 59'		
-70 -		СН	CLAYEY SAND: 1D /9' Saturated @ 65' BGS Cement / Bentonite Grout 55'-3' Bentonite 55'-58' 12/20 Sand Pack ' 58'-79' 0.010 Slot Screen 79'-59'							

Receive	ed by OCD: 10	0/21/2022	8:48:57 AM				·		_Page 137 of 193
Cy 102 Suit	press Er 35 West Li te 256 uston, Texa	n ginee ttle Yor	ering Services, l k Road 0-3229	Inc.	F В Т	OREH OTAL	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-32	
	PROJEC		RMATION		[DRILLI	NG INFORMA	TION	_
PROJEC	CT:	Rei	mediation Drilling	DRIL	LING (20.:	Atkins Er	ngineering	1
SITE LO	CATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.	.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED	OBY:	Ric	k Smith, PG	MET	HOD C	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJEC	T MANAGE	R: Ge	orge Robinson, PE	SAM	PLING	METHO	ODS: Split Spo	on	
DATES D	ORILLED:	11/	18-19/02	HAM	MER V	VT./DRC	OP 140 lb., 30) in.	
NOTES:	4" SCH 40	0 PVC M	PE Well	2	∞ Wa ∎ Wa	iter level o iter level i	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	uscs	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	-
0 -5 -10 -20 -25 -30 -40 -45 -40 -45 -60 -65 -70 -75 -85 -90		GM GM CH CL/CH	GRAVEL AND SAND: 0'- 3': GM mixed with caliche, white pink, dry 3'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, No Odor CLAY: CH: 42'-54': Fat Clay with Sand, red, medium stiff, plastic, very moist at contact, No odor. Water Level @ 55.20' BGS 11/25/02 CLAYEY SAND: CL: 54'- 79' Sandy lean clay red/ brown, med. stiff, moist, moderate odor, no staining. Trace gravel @ 57', slow drilling, TD 79' Grout 36'-3' Bentonite 36'- 39' Sand 39'-79' 0.020 Screen 74'-44' Riser 74'- 79'					Cement Grout 3'-36.60' Bent. 36.60' Top Sand 39.20' Top Screen 44' Sump 74'-79' TD 79'	

I.

Received by OCD: 10	/21/2022	8:48:57 AM		1				Page 138 of 193
Cypress Er 10235 West Li Suite 256	nginee ttle York	ring Services, I	nc.	FI BC TC	DREHO	DEPTH: 79'	DLE LOG E-33	
ouston, Texa	is 77040)-3229				, - 100 10 - 10 - 11 - 11 - 12 - 12 - 12		
PROJEC	T INFOF	RMATION		[DRILLI	NG INFORMAT	ΓΙΟΝ	_
PROJECT:	Rer	nediation Drilling	DRIL	LING C	O.:	Atkins En	gineering	!
SITE LOCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile Dr	-ill B-68	
LOGGED BY:	Ric	k Smith, PG	MET	HOD OI	= DRILI	LING: 8 1/4" Hol	llow Stem Auger	
PROJECT MANAGE	ER: Geo	orge Robinson, PE	SAM	PLING I	METHO	DS: Split Spoo	n	
DATES DRILLED:	11/	18/02	HAM	MER W	T./DRC	OP 140 lb., 30	in.	
NOTES: 4" SCH 4	0 PVC M	PE Well		∞ Wat v Wat	er level o er level i	during drilling n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -40 -45 -55 -60 -65 -70 -85 -90	GM CH CL/CH	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-42':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, No Odor CLAY: CH: 42'-54': Fat Clay with Sand, red, medium stiff, plastic, very moist at contact, No odor. Water Level @ 51.75' CLAYEY SAND: CL:53'- 79' Sandy lean clay red/ brown, med. stiff, moist, wet @ 53', moderate odor, no staining. TD 79' Grout 36'-3' Bentonite 36'-41' Sand 41'-79' 0.020 Screen 79'-44'					Cement Grout 3'-36.40' Bent. 36.40' Top Sand 41.6' Top Screen 44' TD 79'	

I.

Released to Imaging: 11/22/2022 9:37:14 AM

1

Receive	d by OCD: 10/	/21/2022	8:48:57 AM						Page 139 of 1	
Cy 102	/press Er 235 West Li ite 256	nginee ttle Yor	ering Services, k Road	Inc.	F в т	OREH	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG PE-34	0	
	uston, Texa	s 7704	0-3229							
	PROJEC	T INFO	RMATION		DRILLING INFORMATION					
PROJE	CT:	Rei	mediation Drilling	DRI	LLING (CO.:	Atkins E	ngineering		
SITE LC	CATION:	Т₩	P Roswell Station 9	DRI	LLER:		Mort Bat	es		
JOB NO).:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGE	D BY:	CM	l Barnhill, PG	MET	THOD O	F DRIL	LING: 8 1/4" Ho	ollow Stem Auger		
PROJEC	CT MANAGE	R: Gee	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spo	0 n		
DATES	DRILLED:	10/2	24/02	HAN	MER V	VT./DRC	OP 140 lb., 30	0 in.		
NOTES:	4" SCH 40	O PVC M	PE Well		sz Wa ≖ Wa	iter level (iter level i	during drilling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
-5 -10 -20 -25 -30		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-53'		
-40			CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAY: Decreasing							
-55				50'-52'	30 Blows			Bentonite -53'		
-60			63.49' from TOC 10/29/02	55'-57' 60'-62'	37 Blows 36			Sand 79'-56' Screen 79'- 59'		
-70 -75 -75 -75 -75 -75 -75 -75 -75 -75 -75		CL / CH	CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite Grout 53'-3' Bentonite 56'-53' 12/20 Sand Pack ' 56'-79' 0.010 Stat Server 57' 55'	65'-67' 70'-72'	Blows 56 Blows 36 Blows					
			0.010 SIDE SCREEN 79-59	75'-77'	46					

i I

Receive C) 10 Su	<i>ed by OCD: 10</i> ypress Er 235 West Li uite 256 puston, Texa	8:48:57 AM ering Services, < Road 0-3229	Inc.	F в т	IELE OREHI OTAL	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-35	Page 140 of 193		
	PROJECT		RMATION		DRILLING INFORMATION					
PROJE	CT:	Re	nediation Drilling	DRIL	DRILLING CO.: Atkins Engineering					
SITE LO	DCATION:	ТМ	P Roswell Station 9	DRIL	DRILLER: Mort Bates					
JOB NO	D.:	P-2	02203	RIG	RIG TYPE: Mobile Drill B-68					
LOGGE	D BY:	CM	l Barnhill, PG	MET	METHOD OF DRILLING: 8 1/4" Hollow Stem Auger					
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	SAMPLING METHODS: Split Spoon					
DATES	DRILLED:	11/	15/02	HAM	IMER V	/T./DRC	OP 140 lb., 30) in.		
NOTES	: 4" SCH 40) PVC M	PE Well		∞ Wa • Wa	ter level (ter level i	during drilling in completed well	Page 1 of 1		
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -10 -20 -25 -30 -35 -40		GM СН	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Water Level 56.75' BGS 11/16/02					Cement Grout 3'-48'		
-45 -50 -55 -60 -65 -70 -75		CL / CH	GRAVEL AND SAND: CLAYEY SAND: TD 79' Saturated @ 58' BGS Cement / Bentonite Grout 38'-3' Bentonite 48'-51' 12/20 Sand Pack '51'-74' 0.020 Slot Screen 74'-54' Riser 74'-79' No Odor or Staining Fat Clay lenses layered 50'-74' Dry at 74' CLAY: Red Fat Clay, Dry, No Odor or Staining					Bentonite 48' Top Sand 51' Top Screen 54' Sump 74'-79' TD 79'		

1

Received by OCD: 10, Cypress Er 10235 West Li Suite 256 NOJECT: PROJECT: SITE LOCATION: JOB NO.: LOGGED BY: PROJECT MANAGE DATES DRILLED:	nginee ttle Yorl s 77040 F INFOF Rei TW P-2 CM R: Geo 11/2	8:48:57 AM ering Services, k Road D-3229 RMATION mediation Drilling /P Roswell Station 9 02203 I Barnhill, PG orge Robinson, PE 14/02	Inc. DRILL DRILL RIG T METH SAMP HAMM	F B T T LING C LING C LING O PLING MER W	IELC OREHO OTAL I DRILLI CO.: F DRILLI METHO /T./DRO	DEPTH: 74' DEPTH: 74' NG INFORMA Atkins Er Mort Bat Mobile Di LING: 8 1/4'' Ho DDS: Split Spot DP 140 lb., 30	OLE LOG E-36 TION agineering es rill B-68 llow Stem Auger on) in.	Page 141 of 193
4" SCH 4) PVC M	PE Well		Wa	ter level i	n completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -20 -20 -25 -30 -40 -45 -55 -60 -75 -75 -75 -75 -75 -75 -75 -75	GM CH CL / CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4" CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses CLAYEY SAND: TD 74' Saturated @ 51' BGS Cement / Bentonite Grout 38'-3' Bentonite 38'-41' 12/20 Sand Pack ' 41'-74' 0.020 Slot Screen 74'-44' No Odor or Staining Fat Clay & Sandy Clay lenses layered 50'-70' Dry at 70' BGS CLAY: Red Fat Clay, Dry,	49'-51' 5 54'-56' 5 59'-61' 2	0/24" 0/24" 5/24"			Cement Grout 3'-38' Bentonite 38' Top Sand 41' Top Screen 44'	

į.

i

ļ

ļ

Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

louston, Texas 77040-3229

FIELD BOREHOLE LOG

Page 142 of 193

BOREHOLE NO.: MPE-37 TOTAL DEPTH: 74'

louot									
FF	PROJEC	T INFOI	RMATION			DRILLI	NG INFOR	RMA	TION
PROJECT:		Rei	mediation Drilling	DRII	LING	0.:	Atkir	ns Er	ngineering
SITE LOCA	ATION:	TW	P Roswell Station 9	DRIL	LER:		Mort	t Bat	es
JOB NO.:		P-2	02203	RIG	TYPE:		Mobi	ile D	rill B-68
LOGGED E	BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING: 81/4	" Но	llow Stem Auger
PROJECT	MANAGE	R: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split	Spoc)n
DATES DR	RILLED:	11/2	15/02	HAM	IMER V	/T./DRC	OP 140 II	b., 3() in.
NOTES: 2	" SCH 40) PVC M	PE Well		sz Wa ≖ Wa	ter level o ter level i	during drilling n completed w	vell	Page 1 of 1
DEPTH S	SOIL YMBOLS	USCS	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLET) ION	WELL DESCRIPTION
		GM	GRAVEL AND SAND: GM: 0'-4' BGS White Tan Brown Caliche, Hard, 4'- 34' :Gravel, Sand, Silt, Mixture, gravel to 4",						Cement Grout 3'-38'
-20 -25 -30									
-35 -40 -45		СН	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses						Bentonite 38' Top Sand 41' Top Screen 44'
-556065		CL / CH	CLAYEY SAND: TD 74' Saturated @ 50' BGS Cement / Bentonite Grout 38'-3' Bentonite 38'-41' 12/20 Sand Pack ' 41'-74' 0.020 Slot Screen 74'-44' No Odor or Staining Fat						
-707575 -			layered 50'-70' Dry at 70' BGS Water Level 49.4' BGS 11/16/02						
		СН	No Odor or Staining						

Cypress Engi	neering Services	Inc	FIELD	BOREH	OLE LOG
10235 Wost Little	Vork Road		BOREH	OLE NO.: MV	V-38
Suite 256	TUIK KUdu		TOTAL I	DEPTH: 68'	
Houston, Texas 7	7040-3229				
PROJECT IN	FORMATION		DRILLI	NG INFORMA	TION
PROJECT:	Remediation Drilling	DRILLI	NG CO.:	Atkins E	ngineering
SITE LOCATION:	TWP Roswell Station 9	DRILLE	ER:	Mort Bat	es
JOB NO.:	P-202203	RIG TY	PE:	Mobile D	rill B-58
LOGGED BY:	C.M. Barnhill, PG	METHO	D OF DRIL	LING: HSA 81/4	" Augers
PROJECT MANAGER:	George Robinson, PE	SAMPL	ING METHO	ODS: Split Spo	0 n
DATES DRILLED:	09/30/03	HAMM	ER WT./DRO	OP 140 lb., 30) in.
NOTES: 2" SCH 40 P	VC Monitor Well	\ ▼ ▼	Water level Water level	during drilling in completed well	Page 1 of 1
DEPTH SOIL U	SCS SOIL DESCRIPTION	SAMP. #	lows PID ft. ppm	BORING COMPLETION	WELL DESCRIPTION
0 -5 -10 -10 -10 -10 -10 -10 -10 -10	GM: 0'-5': GM mixed with caliche, white pink, dry 5'- 18':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. SC: Clayey Sand, tan brown to light brown reddish SC: Clayey Sand, tan sorwn to light brown reddish SC: Clayey Sand, fine gr. well sorted, no odor or staining. Reddish Brown to yellowish color. Saturated at 55' feet below ground surface. DTW=43.27' BGS Total Depth 68' BGS.	(67) (55) (15) (20) (255) (15) (20) (255) (15) (20) (255) (20) (255) (20) (255) (20)	9'-20" 9'- 11' 9/24" 19'- 21' 9/24" 29'- 31' 9/24" 39'- 41' 9/24" 49'- 51' 59'- 61'		Cement Grout 0'-41' Top Bentonite 45' Top Sand 46' 12/20 Sand Top Screen 48' 0.010 Slot Screen TD 68'
-85		SVOC Total Metals			

Page 143 of 193

Released to Imaging: 11/22/2022 9:37:14 AM

Received by OCD: 10/21/2022 8:48:57 AM

Recei	ved by OCD: 1	0/21/202	2 8:48:57 AM	·····					_Page 144 of 1
C	vpress Er	nainee	ering Services.	Inc.	F	IELD) BOREH	OLE LOG	
10	235 Meet L	ittle Vor	k Road		E	BOREH	OLE NO.: \mathbf{SV}	E-22	
	ite 256		K NOAU		ר	TOTAL I	DEPTH: 35'		
	uston, Texa	as 77040	0-3229						
	PROJEC	T INFOI	RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Re	mediation Drilling	DRII	LING	CO.:	Atkins E	ngineering	
SITE LO	OCATION:	ТМ	P Roswell Station 9	DRI	LER:		Mort Ba	tes	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	orill B-68	
LOGGE	D BY:	Jin	1 Chionis	MET	HOD (OF DRIL	LING: 6 1/4" H	ollow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METHC	DDS: Split Spo	on	
DATES	DRILLED:	11/	07/02	HAN		NT./DRC	OP 140 LB.,	30 IN.	
NOTES	: Water @ .	20' (BG	S)? Strong Odor		sz W z W	ater level o ater level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0		GM	COLLUVIUM: Backfill / Colluvium					Concrete seal: 13'-3'	
-15-			GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture, 2" Gravel Perched Aquifer @ 20' BGS ??					Bentonite: 18'- 13'	
-25 -		СН	CLAY: CH: Red Sandy Clay to Fat Clay Lense GRAVEL AND SAND:	25'-27'	100			Top Sand 23' 2" 0.010 Slot Screen 35' -	
-30 - -30 -			Silty Gravel, gray with Hydrocarbon Odor					25'	
-35 -								TD 35'	

i.

. 1

i

ĺ
Receiv	ed by OCD: 10	/21/2022	8:48:57 AM						Page 145 of 193
C	voress Er	erina Services. I	nc.	FIELD BOREHOLE LOG					
 10	10235 West Little Vork Road				В	OREH	OLE NO.: SV	E-23	
S	Suite 256				T	OTAL	DEPTH: 39'		:
	ouston, Texa	s 77040	0-3229						
	PROJECT		RMATION			DRILLI	NG INFORMA	TION	
PROJE	ECT:	Re	mediation Drilling	DRIL	LING	0.:	Atkins E	ngineering	
SITE L	OCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB N(D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE	ED BY:	Jin	ı Chionis	MET	HOD O	F DRIL	LING: 6 1/4" Ho	ollow Stem Auger	i
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spo	0 n	
DATES	DRILLED:	11/	07/02	HAM	MER W	/T./DRC	OP 140 LB.,	30 IN.	
NOTES	<u>}</u> :		<u> </u>		∞ Wa	ter level (during drilling		1
	2" SVE We	el1			🛫 Wa	ter level i	n completed well	Page 1 of 1	
	SOIL				Blows	PID	BORING	WELL	
DEPTH	SYMBOLS		SOIL DESCRIPTION	SAMP. #	/ ft.	ppm	COMPLETION	DESCRIPTION	
0 -	N24 N24 N24 N24 N24 N24 N24 N24 N24 N24		ر				· · · · · · · · · · · · · · · · · · ·		1
-	0-0-0-0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt						
-5 -			Mixture Gravel to 2"	ļ				Concrete seal: 17'-3'	
-	0707070								
	0707070								
-15_	0,0,0,0							Bentonite: 22'-	
- 10	0,0,0,0							17'	
20	0707070								
-20 -	0-0-0-0			1				Top Sand 22'	
	0-0-0-0							2" 0.010 Slot	
-25-	0-0-0-0	GM						Screen 35' -	
20	0-0-0-0							20	
-30-	0-0-0-0				:				
-35-		GM						TD 39'	
	0,0,0,0								
-40 -			<u> </u>	IIa	J(ر <u>بر المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد المحمد ا</u>	······	

Released to Imaging: 11/22/2022 9:37:14 AM

-Received by O	CD: 10/21/2	2022 8:48:57 AM					
Cypres	s Engir	neering Services,	Inc.	FI	ELD	BOREH	OLE LOG
10235 W	/est Little `	York Road		BO	REHO	DLE NO.: SV]	E-24
Suite 256	6			ТО	TAL C	DEPTH: 30'	
buston,	Texas 77	7040-3229					TION
	JJECT IN	FORMATION					
		Remediation Drilling	DRILL).:	Atkins El	ngineering
SHE LOCATI	JN:	I WP Roswell Station 9				Mabila D	
		r-202203			ווקח	ING: 61/4" 114	Maw Stem Auger
DRA IECT MA		Coorgo Dobinson DE			ETHO	DS' Salit Saa	on Sicili Auger
	ED.	11/13/07				יטס, איז איז איז איז איז איז איז איז איז איז	90 30 IN
	. L L.J . 	11/13/04				urino drillino	
NOTES:				Water Water	· level d	n completed well	Page 1 of 1
DEPTH SYM	DIL BOLS US	CS SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID opm	BORING COMPLETION	WELL DESCRIPTION
0 7						······	
		GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Gravel to 2"					Concrete seal: 13'-3'
-15-00000							Bentonite 18'- 13'
	00000						Top Sand 18'
	00000						2" 0.010 Slot Screen 30' - 20'
-30 -	СН	CLAY: CH: Red Sandy Clay to Fat Clay					TD 30'
	N N N N		1 11			1	

- Receiv	ved by OCD: 10	/21/2022	8:48:57 AM					
С	ypress Er	nginee	ering Services,	Inc.	F	IELL	D BOKE	HOLE LOG
10	235 West Li		B	OREH	OLE NO.: S	VE-25		
S	uite 256				T	OTAL	DEPTH: 3	4'
	buston, Texa	is 7704()-3229					
	PROJEC	T INFO	RMATION			DRILLI	NG INFORM	MATION
PROJE	ECT:	Rei	mediation Drilling	DRI	_LING (CO.:	Atkins	s Engineering
SITE L	OCATION:	ТМ	P Roswell Station 9	DRII	LER:		Mort]	Bates
JOB N	0.:	P-2	02203	RIG	TYPE:		Mobil	e Drill B-68
LOGGI	ED BY:	Jim	Chionis	MET	HOD O	F DRIL	LING: 61/4"	Hollow Stem Auger
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METHO	DDS: Split S	poon
DATES	DRILLED:	11/	04/0 2	HAM	IMER V	/T./DRC	DP 140 LI	8., 30 IN.
NOTES	S: 2" SVE We	ell			∞ Wa ∞ Wa	ter level (ter level i	during drilling n completed we	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETIC	WELL DN DESCRIPTION
0								
-5 -		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Strong Hydrocarbon odor Pit liner @ 17'					Concrete seal: 14'-3'
-15-								Bentonite: 21'- 14'
20								Top Sand 21.6'
-25-								2" 0.010 Slot Screen 34' - 24'
-30 -		СН						
-35 -			CLAY: CH: Red Sandy Clay to Fat Clay					TD 34'
101	V7777775		l				L <u></u>	

Ì

İ.

2022 8:48:57 AM					Page 149 of 193
neering Services, Ir York Road	nc.	FIELC BOREHO TOTAL I	DEPTH: 35'	OLE LOG E-27	
	l	DRILLI	NG INFORMA		_
Remediation Drilling	DRILLING	GCO.:	Atkins E	agineering	-
TWP Roswell Station 9	DRILLER		Mort Bat	es	
P-202203	RIG TYPE	:	Mobile D	rill B-68	
CM Barnhill, PG	METHOD	OF DRILI	LING: 6 1/4" Ho	llow Stem Auger	
George Robinson, PE	SAMPLIN	G METHO	DDS: Split Spo	on	
11/01/02	HAMMER	WT./DRC	OP 140 LB., 3	30 IN.	
Seen in Well	∞ V ∞ V	Vater level c Vater level i	during drilling n completed well	Page 1 of 1	
SCS SOIL DESCRIPTION	SAMP. # Blow / ft.	vs PID ppm	BORING COMPLETION	WELL DESCRIPTION	
GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Gravel 2"-4" Contaminated at 10' BGS No Fat Clay Seen in well. Very Strong Contamination Srtong/ Odor/ Staining Black Color to sand/silt				Concrete seal: 13'-3' Bentonite: 18'- 13' Top Sand 18' 2" 0.010 Slot Screen 35' - 20'	
	2022 8:48:57 AM neering Services, In York Road 7040-3229 IFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 CM Barnhill, PG George Robinson, PE 11/01/02 Seen in Well SCS SOIL DESCRIPTION GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Gravel 2"-4" Contaminated at 10' BGS No Fat Clay Seen in well. Very Strong Contamination Srtong/ Odor/ Staining Black Color to sand/silt	2022 8:48:57 AM neering Services, Inc. York Road 7040-3229 IFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 CM Barnhill, PG George Robinson, PE SAMPLIN 11/01/02 Seen in Well ScS SOIL DESCRIPTION SAMP. # Blow, ft. Mixture Gravel 2"-4" Contamination Strong/ Odor/Staining Black Color to sand/silt	2022 8:48:57 AM FIELD Peering Services, Inc. BOREHA York Road TOTAL 0 7040-3229 DRILLING CO.: JFORMATION DRILLING CO.: Remediation Drilling DRILLER: TWP Roswell Station 9 P-202203 CM Barnhill, PG METHOD OF DRILL George Robinson, PE I1/01/02 Seen in Well x SCS SOIL DESCRIPTION SAMP. # Blows Mixture Gravel 2*4" Contaminated at 10° BGS No Fat Clay Seen in well. Very Stong Contamination Stong/ Odor/Staming Black Color b sand/silt	2022 8:48:57 AM Preering Services, Inc. York Road 7040-3229 IFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 CM Barnhill, PG George Robinson, PE 11/01/02 Seen in Well SCS SOIL DESCRIPTION SAMP. # Blows Prid Brink GRAVEL AND SAND: Off Gravel, Sand, Sit Miture Gravel 2"-4" Contaminated at 10 BGS No Factoria Order Stating Index Color CHARVEL AND SAND: Off Gravel, Sand, Sit Miture Gravel 2"-4" Contaminated at 10 BGS No Fat Clay Seen in well	2022 8:48:57.4W neering Services, Inc. York Road York Road 7040-3229 FORMATION Remediation Drilling TWP Roswell Station 9 P-202203 CM Barnhill, PG George Robinson, PE 11/01/02 Seen in Well Sc SOIL DESCRIPTION SAMP.# Biows Pinder Invell Water level during chiling Contamination Strong? Outraining Black Color Wery Strong Contamination Strong? Oddr/J Staining Black Color Weis send in well

Receiv	ved by OCD: 10	/21/2022	8:48:57 AM					Page 150 of 19
Cy	press Er	nginee	ering Services,	Inc.			OLE LOG	
10	235 West Li	ttle Yorl	k Road		TOTAL	DEPTH: 351	6-20	
	lite 256	e 77040	2220		IUIALI	DEI III. 33		
							TION	_
						Atkins E	nginaaring	-
		Kel	mediation Drilling			Mort Bo	ngmeet mg	
	DCATION.		P Roswell Station 9			Mobile D		
	י אפ ח.	P-2	U22U3				How Stom Amor	
		CM	i Barnnill, PG			$\mathbf{L}_{\mathbf{I}} \mathbf{N} \mathbf{G}_{\mathbf{I}} 0 1 1 1 1 1 0$	now Stem Auger	
PRUJE		K: Geo	orge Robinson, PE	SAMPLI		Split Spo		}
DATES	DRILLED:	10/2	29/02	HAMME		ノア 140 LB.,	30 IN.	
NOTES	: Water 0 3	35' (BG	S)? Strong Odor	▽ ▼	Water level o	during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. # Blo	ows PID ft. ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -15 -20 -25 -30		GM CH	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture				Concrete seal: 13'-3' Bentonite: 18'- 13' Top Sand 23' 2" 0.010 Slot Screen 35' - 25'	
-40 -40			Clay to Fat Clay Wet with Strong Hydrocarbon Odor				TD 35'	

i

I

İ

Recei	ved by OCD: 10	/21/2022	8:48:57 AM						Page 151 of 19
C	Cypress Er	nginee	ering Services,	Inc.	F	IELD	OLE LOG		
1	0235 West Li	ttle Yor	k Road		В	BOREHOLE NO.: SVE-30A			
	Suite 256					OTAL [DEPTH: 45'		
	buston, Texa	is 7704(0-3229						
	PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	_
PROJ	ECT:	Rei	mediation Drilling	DRIL	LING (CO.:	Atkins Er	ngineering	
SITE	LOCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB N	10.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGG	SED BY:	CM.	l Barnhill, PG	MET	HODC		LING: 6 1/4" Ho	llow Stem Auger	
PROJ	ECT MANAGE	R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo	D n	
DATE	S DRILLED:	10/2	25/02	HAM	MER V	/T./DRC)P 140 LB., 3	30 LN.	_
NOTE	S: 2" PVC S	SVE Wel	1	2	vz Wa ∎ Wa	ter level o ter level i	during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture				20 50	Concrete seal.	
-5 -								13'-3'	
-15 -								Bentonite 13' 2" Slot Screen 45' - 20'	
-25-								Top Sand 18'	
-30 -				50 Blows	+50				
-35 -				22 Blove	22				
-40-1		СН	CLAY: CH: Red Clayey Sand, Strong Hydrocarbon Odor, Moist Fat Clay	20 Blows	20				
-45-								TD	

Released to Imaging: 11/22/2022 9:37:14 AM

_Receiv	ed by OCD: 10/	21/2022 8	8:48:57 AM					
C	ypress Er	nginee	ring Services,	Inc.	F			
10	235 West Li	< Road					L-31	
	lite 256 Nuston Teva	e 77040	1-3000				JEFIN. 33	
_								TION
PROJE	CT.	Rer	nediation Drilling	DRI	LING	20.	Atkins Er	ngineering
SITE L	OCATION:	ТИ	P Roswell Station 9	DRI	LER:		Mort Bat	es
JOB N	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68
LOGGE	ED BY:	CM	Barnhill, PG	MET	HOD O	F DRILI	LING: 6 1/4" Ho	llow Stem Auger
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METHO	DDS: Split Spo	on
DATES	DRILLED:	10/2	28/02	HAN	IMER V	VT./DRC	OP 140 LB., 3	30 IN.
NOTES	Poor reco	overy in	n Split Spoon .		∞ Wa ∞ Wa	iter level o iter level i	during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 -15 -1 -20 -1 -25 -1 -		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture	SPT Sample	+50			Concrete seal: 13'-3' Bentonite: 18'- 13' Top Sand 23' 2" 0.010 Slot Screen 35' -
-30 -		СН	CLAY: CH: Red Sandy Clay to Fat Clay	24'-26'				2.5

Received	d by OCD: 10/	21/2022 8	3:48:57 AM				· · · · ·	·	Page 153 of 193
Cypress Engineering Services, I 10235 West Little York Road Suite 256 Ouston, Texas 77040-3229					F	FIELD BOREH FOTAL	D BOREH OLE NO.: MV DEPTH: 79'	OLE LOG V-34	
								110N	-
PROJE		Kei	mediation Drilling			60	ATKINS EI	ngineering	
SHELU	DCATION:	1 M D 2	P Roswell Station 9		TVDE		Mort Bat	es 	
	ייי ח פעי	P-2	A Parabill DC	MET		וופת אר		III D-30	
	CT MANAGE	R. Co	n. Darinini, r.G.	SAN			$DS^{-} Snlit Snot$	n	
DATES		.1X. Get 01/	06/03	HAN			OP 140 lb., 30) in	
NOTES					v W	ater level	during drilling		-
	2" SCH 4	O PVC M	onitor Well		🗶 W	ater level	in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	uscs	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 -10 -25 -30 -35 -40 -45 -40 -45 -40 -45 -60 -65 -70 -70		GM GM SC SW SC CH SW	S. Clayey Sand, tan brown to light brown reddish saturated @55' BGS, No odor or staining, Water Level @ 57.74' BGS 01/07/03 SW: Med. to fine grained tan sand, well sorted, SC: Clayey Saturated CH: Fat Brown Silty Clay, SW: Tan, Reddish, Brown Sand, Fine Gr., Well	<pre>@55' BGS Sampled 2 x 4/oz. Jars @11:10hr. 8260 VOC / TPH</pre>	42/24 46/24 51/24 56/24 61/24 66/24 71/24	40 - 42' 42' 44 - 46' 49 - 51' 54 - 56' 59 - 61' 64 - 66' 69 - 71'		Bentonite 42' Top Sand 46' Top Screen 49' 12/20 Sand 0.010 Slot Screen	
-75- -80- -85- 		SW SP/SW	Sorted, Saturated, Flowing Sand, No Odor Or SP: Tan, Reddish Brown Sand, Fn. Gr., Well Sorted, Saturated, mixed with angular to subrounded gravel to 1/2", No odor or staining.	Mod. 8015 8270 SVOC Total Metals	76/24' 81/24'	74- 76' 79- 81'		TD 79'	

L

Released to Imaging: 11/22/2022 9:37:14 AM

ATTACHMENT 2 RED-LINE REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS



REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS FORMER SURFACE IMPOUNDMENTS TRANSWESTERN COMPRESSOR STATION NO. 9 (ROSWELL COMPRESSOR STATION) 6381 NORTH MAIN STREET ROSWELL, CHAVES COUNTY, NEW MEXICO NMOCD GW-052 NMED 1656; EPA ID NMD986676955

PREPARED FOR:

TRANSWESTERN PIPELINE COMPANY, LLC 1300 MAIN HOUSTON, TEXAS 77002

PREPARED BY:

EARTHCON CONSULTANTS, INC. 14405 WALTERS ROAD, SUITE 700 HOUSTON, TEXAS 77014 281.240.5200

EarthCon Project No. 02.20180005.00

June 2021 (REVISED January 2022)

Released to Imaging: 11/22/2022 9:37:14 AM

•

Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Former Surface Impoundments Transwestern Compressor Station No. 9 (Roswell Compressor Station) 6381 North Main Street Roswell, Chaves County, New Mexico NMOCD GW-052 NMED 1656; EPA ID NMD986676955

Prepared For:

Transwestern Pipeline Company, LLC 1300 Main Houston, TX 77002

June 2021 EarthCon Project No. 02.20180005.00

EarthCon Consultants, Inc. (EarthCon) is submitting to Transwestern Pipeline Company, LLC (Transwestern) this *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* for the Roswell Compressor Station in Roswell, Chaves County, New Mexico. This report has been prepared for the exclusive use of and reliance by Transwestern and may not be relied upon by any other person or entity without the express written authorization of EarthCon.

Any reliance, use, or re-use of this document (or the opinions, findings, conclusions, or recommendations if any represented herein), by parties other than those expressly authorized by EarthCon is at the sole risk of those parties. This report was prepared by or performed under the direction of the EarthCon Professionals listed below and approved by Transwestern.

Signed:

Sofie A. Weber- Srop

Sofie Weber Senior Professional EarthCon Consultants, Inc.

Steve Diamond

Steve Diamond, PE (AL, GA, LA, MO, SC, MI) Senior Engineer EarthCon Consultants, Inc.

J.D. Haines, LPG (IN) Principal Geologist EarthCon Consultants, Inc.

Date: 6/28/2021 (Revised 1/27/22)

3 | Page Project #: 02.20180005.00 June 2021 Copyright © 2021 EarthCon Consultants, Inc. All Rights Reserved EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS ®

EARTHCON

Environmental Challenges

BUSINESS SOLUTIONS®

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

TABLE OF CONTENTS

1.0	INTRODUCTION	. 5
2.0	PERCHED AQUIFER EVALUATION	. 5
2.1	PSH Thickness	.7
2.2	Groundwater Analytical Results	.7
3.0	FUTURE CORRECTIVE ACTION RECOMMENDATIONS	.7
4.0	REFERENCES	. 8

TABLES

Table 2-1	Summary of Perched Aquifer Well Completion Details
Table 2-2	Summary of Groundwater Surface Elevations for Wells in the Perched Aquifer
Table 2-3	Summary of Groundwater Analytical Results in the Perched Aquifer
FIGURES	
Figure 1-1	Project Area Location Map
Figure 1-2	Project Area Features
Figure 2-2a	Distribution of PSH in the Perched Aquifer, May 2020
Figure 2-2b	Distribution of PSH in the Perched Aquifer, November 2020
Figure 3-1	Distribution of Dissolved BTEX in the Perched Aquifer, November 2020
Figure 3-2	Distribution of Dissolved Benzene in the Perched Aquifer, November 2020
Figure 3-3	Distribution of Dissolved 1,1-DCE in the Perched Aquifer, November 2020
ATTACHMEN	<u>TS</u>

Attachment 1 Perched Aquifer Boring Logs

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014



1.0 INTRODUCTION

This Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations was prepared by EarthCon Consultants, Inc. (EarthCon) on behalf of Transwestern Pipeline Company, LLC (Transwestern) to summarize the results of a perched aquifer evaluation and evaluate future corrective actions associated with the Former Surface Impoundments at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property, located at 6381 North Main Street in Roswell, New Mexico (the "Site"). Historic reports indicate the potential for perched aquifer conditions intersecting the soil vapor extraction (SVE) wells and RW-1, all of which are located on the Transwestern site near the former surface impoundments.

The Facility is an active natural gas compressor station, owned and operated by Transwestern, located approximately 8 miles north of the city center of Roswell, New Mexico along the eastern side of U.S. Highway 285. The Facility occupies approximately 77 acres of land in Section 21 (SW¼ of the SW¼) and Section 28 (NW¼ of the NW¼) of Township 9S and Range 24E, Chaves County, New Mexico (**Figure 1-1**). Access is via U.S. Highway 285, and the entire Facility is secured by a chain-link fence with locked gates. The Project Area encompasses a portion of the northeast corner of the Facility and a portion of a 40-acre easement of land to the northeast, leased from the New Mexico State Land Office (SLO) State Trust Land for remediation and monitoring purposes (**Figure 1-2**).

Comment 4 of the NMED's Approval with Modifications Laboratory Results Submittal for SVE and RW-1 Wells and Additional Laboratory Results for SVE and RW-1 Wells, dated February 21, 2020, requires a report that summarizes the results of the perched zone evaluation. Further, Comment 1 of the NMED's Additional Response to Comments 10/14/2020, dated April 9, 2021, requests a standalone report evaluating and recommending corrective action for the perched aquifer.

2.0 PERCHED AQUIFER EVALUATION

According to historical groundwater gauging data, field personnel observed the presence of water at depths between 28 feet below ground surface (bgs) and 35 feet bgs in certain soil vapor extraction (SVE) wells, while other SVE wells remained dry. Two of the deepest wells in the perched aquifer, RW-1 and SVE-30, are both over 41 ft BTOC and consistently have measurable groundwater. Wells SVE-23 and SVE-28 are each approximately 36 ft BTOC and typically have

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 P: 281-240-5200 www.earthcon.com Environmental Challenges BUSINESS SOLUTIONS ® REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

Environmental Challenges BUSINESS SOLUTIONS ®

DEARTHCON

measurable groundwater, including the year 2020. Wells SVE-22, SVE-25, SVE-27, and SVE-31 (all approximately 33 ft BTOC) often do not have water; SVE-22, SVE-27, and SVE-31 were dry during at least part of 2020. Wells SVE-24 and SVE-26 (28.9 and 32.5 ft BTOC, respectively) have not had measurable water in the past five years.

Boring logs developed for SVE, and the deeper multiphase extraction (MPE) wells were reviewed, which did not note a distinct water bearing zone between the surface and 50 feet bgs (Attachment 1, Perched Aquifer Boring Logs). In the MPE wells, groundwater was reported to be approximately 60 feet bgs. Considering the presence and absence (dry) of groundwater in certain SVE wells at various times and the construction depth of these wells, it was suspected that a combination of rainwater and condensate buildup within the SVE piping conveyance network could be back flowing and contributing to the water that was being observed in certain SVE wells. Further investigation was performed in the field to identify the source of the water in the SVE wells.

Further review of the suspected perch<u>ed</u> aquifer was conducted by recovering water from RW-1 until dry and monitoring rebound over time. Beginning in April 2020, groundwater was extracted from recovery well RW-1 to evaluate the perched aquifer. However, the extraction process was deactivated after a short period due to groundwater volumes unexpectedly reaching the storage tank capacity, and the evaluation was suspended pending further review of the process and results.

The evaluation of the perched aquifer in RW-1 resumed on September 23, 2020, and continued to October 20, 2020. Prior to installing a pump, the groundwater level was measured as 33.55 feet below top of casing (btoc). The pump inlet was lowered to approximately 38 feet btoc and the pump recovered groundwater at an average rate of approximately 0.16 gallons per minute during the evaluation period. Groundwater levels were measured daily in RW-1 to evaluate recharge of the well. According to liquid levels, the groundwater was drawn down to approximately 37.5 feet before stabilizing. The pump was deactivated, and groundwater recharged at a rate of approximately 0.2 feet per day. Based on pump evaluation on RW-1 and historical groundwater gauging data in SVE wells, a perched aquifer may exist in this portion of the site.

Further review of historical documents revealed that an initial field site assessment performed in 1991 reported the presence of a perched aquifer which intersected wells SVE-23, SVE-25, SVE-27, SVE-28, SVE-30, SVE-31, and RW-1. A summary of construction information for wells in the

REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

Environmental Challenges BUSINESS SOLUTIONS ®

EARTHCON

perched aquifer is provided in **Table 2-1**, and groundwater elevations for wells in the perched aquifer are shown in **Table 2-2**.

2.1 **PSH Thickness**

Liquid levels were measured in SVE wells and RW-1 using an optical interface probe to determine the presence and apparent thickness of PSH (phase separated hydrocarbons). According to historical liquid levels, SVE-23 was the only well to consistently contain PSH; however, recently, PSH has been observed in SVE-25 in November 2020 after 11 years of no detections. The apparent thickness of 3.0 feet and 0.10 foot was measured in SVE-23 and SVE-25 in April 2021, respectively. Distribution of PSH apparent thickness is presented in **Figures 2-2a** and **2-2b**. Further PSH monitoring will continue for SVE-23 and SVE-25 in 202<u>2</u>4.

2.2 Groundwater Analytical Results

Groundwater samples were collected and analyzed for BTEX by EPA method 8260 or for VOCs via EPA Method 8260B, and 1,4-dioxane was analyzed by EPA method 8270SIM in accordance with the approved *Sampling and Analysis Plan* (SAP). The analytical results for groundwater samples in the are summarized in **Table 2-3**. Wells in the perched aquifer that had measurable groundwater and did not contain PSH (i.e., RW-1, SVE-28, SVE-30, and SVE-31) were sampled. Wells SVE-23 and SVE-25 contained water and PSH, while SVE-24, SVE-26, and SVE-27 were dry and did not have measurable PSH.

In summary, BTEX constituents were detected above laboratory reporting limits in wells SVE-28, SVE-30, and RW-1. Benzene exceeded the Groundwater Concentration Limit (GCL) in both SVE-30 and RW-1, and 1,1-DCA exceeded the GCL in SVE-30. The areal distribution of BTEX, Benzene, and 1,1-DCA in the Perched Aquifer in November 2020 remains delineated within the Project Area boundaries and within the limits of the plume in the lower water bearing unit; as well as being consistent with the 2019 data for those wells shown in (Figures 3-1 through 3-3).

3.0 FUTURE CORRECTIVE ACTION RECOMMENDATIONS

In correspondence dated July 2, 2020, and November 25, 2020, NMED requested that Transwestern suspend PSH recovery activities in SVE-23 and monitor PSH thickness over time. Currently, it is unknown if the recovery rates of the PSH and/or groundwater in the perched aquifer can sustain a more active recovery method such as PSH skimming, or multiphase extraction. Therefore, Transwestern recommends that PSH recovery via manual bailing be initiated immediately in SVE-23 and SVE-25 considering the overall corrective action objective for the site.

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014 REPORT OF PERCHED AQUIFER EVALUATION AND FUTURE CORRECTIVE ACTION RECOMMENDATIONS Roswell Compressor Station – Roswell, NM

Environmental Challenges BUSINESS SOLUTIONS ®

EARTHCON

It is apparent that LNAPL is present at recoverable thicknesses and PSH will be monitored for rebound after selected recovery event. Data will be collected from manual bailing events during 2022 to determine feasibility of additional recovery measures or impracticability. Results will be provided in the 2022 Annual Groundwater Remediation Activities Report.

Since SVE-23 and most recently SVE-25 are the only wells in the Perched Aquifer to contain PSH, it is believed that the PSH appearances may be residual product that may have accumulated in those wells after source removal activities. Historical PSH measurements in wells located in the perched aquifer and upper aquifer indicate that the PSH footprint has stabilized or decreased. A work plan will be prepared and submitted detailing delineation of the horizontal and vertical extent of the LNAPL plume. Based on the results of perched aquifer delineation evaluation, the apparent extent of LNAPL, and results of bailing recovery, additional measures will be evaluated to identify appropriate and effective action to recover LNAPL in the perched aquifer.

Liquid levels and recovery data collected from bailing activities has been evaluated and the current remediation system is effective showing a decrease in BTEX, and 1,1-DCE concentrations. Due to the current results of the PSH plume and dissolved-phase concentrations, additional delineation does not appear warranted at this time.

4.0 **REFERENCES**

Roswell Shallow Subsurface Investigation by Harding Lawson Associates, June 20, 1991

EarthCon Consultants, Inc. 14405 Walters Road Suite 700 Houston, TX 77014

NV

An ENERGY TRANSFER Company

September 19, 2022

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

RE: Submittal of Work Plan to Delineate Hydrocarbons in the Perched Aquifer Roswell Compressor Station No. 9 Transwestern Pipeline Company, LLC Roswell, Chavez County, New Mexico NMOCD Case #GW-052/EPA ID NO. NMD986676955

Dear Mr. Shean:

Transwestern Pipeline Company, LLC's (Transwestern) is submitting a *Work Plan to Delineate Hydrocarbons in the Perched Aquifer* at the Roswell Compressor Station No. 9.

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 WSP USA, Inc. at 770-973-2100, ext. 2876.

Sincerely,

Soultinghouse

Stacy Boultinghouse, PG_(TX4889/LA73) Environmental Manager Transwestern Pipeline Company, LLC Stacy.Boultinghouse@energytransfer.com

Attachment: Work Plan to Delineate Hydrocarbons in the Perched Aquifer – (two hard copies and one electronic copy)

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

****\$P

WORK PLAN TO DELINEATE HYDROCARBONS IN THE PERCHED AQUIFER

TRANSWESTERN COMPRESSOR STATION NO. 9 ROSWELL, CHAVES COUNTY, NEW MEXICO NMED 1656; EPA ID NMD986676955

PREPARED FOR TRANSWESTERN PIPELINE COMPANY, LLC 1300 MAIN HOUSTON, TX 77002

PROJECT NO. EC02.20180005.01 DATE: SEPTEMBER 2022 REVISED:

WSP USA 1880 WEST OAK PARKWAY BUILDING 100, SUITE 106 MARIETTA, GEORGIA 30062

TEL.: +1 770-973-2100 WSP.COM Received by OCD: 10/21/2022 8:48:57 AM

wsp

TABLE OF CONTENTS

1	INTRODUCTION	1
2	BACKGROUND	2
2.1	DELINEATION OF PSH PLUME	3
2.2	DELINEATION OF DISSOLVED-PHASE HYDROCARBON PLUME	3
3	PROCEDURES	5
3.1	ELECTRICAL RESISTIVITY STUDY	5
3.2	MONITORING WELL INSTALLATION	5
3.3	GROUNDWATER SAMPLING	6
3.4	LABORATORY ANALYSES	6
3.5	FIELD DECONTAMINATION	7
4	REPORTING	8
5	SCHEDULE	9
6	REFERENCES	10

Work Plan to Delineate Perched Aquifer Project No. TRANSWESTERN PIPELINE COMPANY, LLC



FIGURES

FIGURE 1	SITE LOCATION
FIGURE 2	SITE MAP
FIGURE 3	PROPOSED MONITORING WELLS AND
	ELECTRIC RESISTIVITY SURVEY LAYOUT
	PSH PLUME DELINEATION
FIGURE 4	PROPOSED MONITORING WELLS AND
	ELECTRIC RESISTIVITY SURVEY LAYOUT
	DISSOLVED-PHASE HYDROCARBON
	PLUME DELINEATION

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01

Received by OCD: 10/21/2022 8:48:57 AM



TABLE 1	SUMMARY OF WELL COMPLETION DETAILS TRANSWESTERN COMPRESSOR STATION NO. 9 - ROSWELL, NM
TABLE 2	SUMMARY OF GROUNDWATER SURFACE ELEVATIONS TRANSWESTERN COMPRESSOR STATION NO. 9 - ROSWELL, NM
TABLE 3	SUMMARY OF GROUNDWATER ANALYTICAL RESULTS TRANSWESTERN COMPRESSOR STATION NO. 9 - ROSWELL, NM
TABLE 4	SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - OTHER CONSTITUENTS DETECTED TRANSWESTERN COMPRESSOR STATION NO. 9 - ROSWELL, NM

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01

WSP August 2022

1 INTRODUCTION

This *Work Plan to Delineate Hydrocarbons in the Perched Aquifer* (Work Plan) was prepared by WSP USA Inc. (WSP) on behalf of Transwestern Pipeline Company, LLC (Transwestern) to summarize the proposed methods to further delineate the hydrocarbons detected in the perched aquifer at the Transwestern Compressor Station No. 9 (also known as the Roswell Compressor Station) property, located at 6381 North Main Street in Roswell, New Mexico (the "Site").

The Site is an active natural gas compressor station, owned and operated by Transwestern, located approximately 8 miles north of the city center of Roswell, New Mexico along the eastern side of U.S. Highway 285. The site occupies approximately 77 acres of land in Section 21 (SW¼ of the SW¼) and Section 28 (NW¼ of the NW¼) of Township 9S and Range 24E, Chaves County, New Mexico (**Figure 1**). Access is via U.S. Highway 285, and the entire Facility is secured by a chain-link fence with locked gates. The Project Area encompasses a portion of the northeast corner of the Facility and a portion of an adjacent 40-acre easement of land to the northeast, leased from the New Mexico State Land Office (SLO) State Trust Land for remediation and monitoring purposes (**Figure 2**).

The two former surface impoundments were historically used to dispose of waste hydrocarbons, including pipeline condensate, pigging wastes, spent solvents, and other wastes and debris from pipeline maintenance activities conducted at the Roswell Compressor Station. The wastes were removed from the former surface impoundments and the area was backfilled with clean soil in 2001. The water bearing unit at the Site has been reported as two aquifers within the area of the former surface impoundments, an upper aquifer within which most of the monitoring and remedial activities currently take place, and the deeper San Andres Formation Aquifer. The upper aquifer system also includes a perched aquifer under the former surface impoundments that exhibited phase-separated and dissolved hydrocarbons.

A soil and groundwater remediation system were subsequently designed and installed to address adsorbed-phase hydrocarbons in the vadose zone and dissolved-phase and phase separated hydrocarbons (PSH) detected in groundwater in the upper aquifer. The remediation system also includes twelve shallow soil vapor extraction (SVE) wells and RW-1 (average total depth of the wells is approximately 35 feet bgs) that are connected to vacuum blowers for recovering volatile organic compounds (VOC) adsorbed to soils in the vadose zone within the surface impoundments. In addition, the remediation system includes 35 deep multiphase extraction (MPE) wells (average total depth MPE wells is approximately 75 feet bgs) which are connected to the vacuum blowers but are also equipped with down-well pneumatic fluid recovery pumps to recover vapor-phase VOCs, dissolved-phase VOCs and PSH in the upper aquifer in the vicinity and downgradient of the surface impoundments.

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC WSP August 2022 Page 1

2 BACKGROUND

In correspondence (HWB-TWP-19-001) dated on April 23, 2019, *Approval with Modifications Report of 2018 Groundwater Remediation Activities*, the New Mexico Environment Department (NMED) requested the perched aquifer zone that was identified in the report be separated from the upper aquifer in future reports. Additionally, the NMED noted that Benzene concentrations exceeded the screening level in the groundwater samples collected from wells SVE-28, SVE-30, and RW-1, and that the extent of contamination in the perched zone is not delineated due to the limited number of wells screened to the perched zone. The NMED requested that Transwestern submit a work plan to investigate the extent of the contamination in the perched aquifer or, provide justification for not proposing to investigate the perched aquifer. In correspondence dated May 30, 2019, Transwestern indicated that the benzene concentrations were low in the perch aquifer and most likely not beyond the current known extent. Furthermore, and as previously requested by the NMED, Tranwestern planned to collect additional data during two groundwater sampling events in 2019 and 2020 from twelve of the SVE wells and RW-1 for VOC analysis and discuss results of the investigation with the NMED. Approval was received by the NMED on June 27, 2019 (HWB-TWP-19-001).

Transwestern submitted letter reports titled *Laboratory Results Submittal for SVE wells and RW-1 (Report 1)* and *Additional Laboratory Results Submittal for SVE and RW-1 Wells (Report 2)* on December 19, 2019, and January 30, 2020, respectively. Transwestern stated in the January 2020 letter report that the residual water observed in the SVE wells may be associated with condensation build-up from the existing SVE system. Transwestern proposed to evaluate the residual water by performing pumping tests and present the results of the evaluation to the NMED. In correspondence titled *Approval with Modifications Laboratory Results Submittal for SVE and RW-1 Wells and Additional Laboratory Results for SVE and RW-1 Wells from NMED dated February 21, 2020 (HWB-TP-19-003), the NMED approved the proposed evaluation and stated that contaminant concentrations in the samples collected from well SVE-30 and RW-1 exceeded applicable screening levels, and the NMED requested a perched zone investigation and work plan be submitted by Transwestern.*

On June 28, 2021, the *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* (Report) was submitted to the NMED for review. The report stated that based on historical information dating back to 1991, the perched aquifer appears to intersect shallow wells SVE-23, SVE-25, SVE-27, SVE-28, SVE-31, and RW-1. Groundwater elevations range between 3,577 feet to approximately 3,380 feet (reference to North American Vertical Datum (NAVD)) in the perched aquifer. The report also stated that based on most recent groundwater data, PSH thicknesses above 0.5 foot was observed in SVE-23 and dissolved-phase hydrocarbons in groundwater were observed in SVE-28, SVE-30, and RW-1. Wells SVE-23 and SVE-25 contained water and PSH, while SVE-24, SVE-26, and SVE-27 were dry and did not have measurable PSH. The location of SVE wells and RW-1 are presented in **Figure 3**. The PSH observations are shown in **Figure 3** and dissolved-phase hydrocarbons detections are shown in **Figure 4**. A summary of well completion details is presented in **Table 1**. Historical groundwater/PSH levels and dissolved-phase hydrocarbon data for the perched aquifer is presented in **Tables 2** and **3**, respectively.

Based on the Report, Transwestern believed that the PSH appearances may be residual product that may have accumulated after source removal activities since SVE-23 and SVE-25 are the only wells in the perched aquifer to contain PSH and are located nearby the former surface impoundments. In addition, over ten years of historical PSH measurements in wells located in the perched aquifer and upper aquifer

indicated that the PSH footprint has stabilized or decreased. Based on historical laboratory data, it was also believed that the areal distribution of BTEX, Benzene, and 1,1-DCE in the Perched Aquifer has remained delineated within the project area boundaries and within the limits of the existing plume and that the current remediation system was effectively showing a decrease in BTEX and 1,1-DCE concentrations. In addition, the current remediation dual-phase extraction system encompasses the area of the former surface impoundments. Due to the results presented in the *Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations*, Transwestern did not recommend additional delineation efforts in the perch aquifer.

On September 8, 2021, the NMED issued a *Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations* (HWP-TW-21-003) to Transwestern. In this correspondence, the NMED did not agree with the statement that additional delineation is not warranted. Instead, the NMED stated that many of the wells advanced to the perched aquifer are too shallow to produce water and therefore are not useful for delineation. Additionally, the NMED stated that the contaminant concentrations are fluctuating in the groundwater samples collected from the perched aquifer according to the tables, and the current SVE wells in the perched aquifer do not extract liquid PSH or groundwater and are not capable of containing the plumes. The NMED requested a work plan for delineating the horizontal and vertical extent of the phase separated hydrocarbon (PSH) and dissolved-phase hydrocarbon plumes in the perched aquifer portion of the upper aquifer system.

On January 27, 2022, Transwestern provided a response to the NMED's disapproval correspondence dated September 8, 2021, which proposed to develop a work plan with details for delineating the horizontal and vertical extent of the plume in the perched aquifer. Subsequently, the NMED concurred with the development of the work plan in correspondence dated March 1, 2022 "Approval with Modifications" (HWB-TW-21-003).

2.1 DELINEATION OF PSH PLUME

Since 2018, a PSH thickness has been detected in SVE-23 with thicknesses averaging 1.35 feet. Most recently, a PSH thickness of 0.47 foot was measured in August 2022. Sporadic detections of PSH were also observed in SVE-22 and SVE-25 since 2018. The average PSH thicknesses for SVE-22 and SVE-25 was 0.15 foot since 2018. Since December 2021, PSH detections were not observed in SVE-22 and SVE-25.

Based on historical groundwater/PSH liquid levels, the PSH plume in the perch aquifer is delineated towards the south, west, and north by SVE-22, SVE-25, and SVE-27 respectively. Therefore, future investigations to delineate the PSH plume extent in the perched aquifer is proposed towards the southwest and southeast of SVE-23. The proposed locations of monitoring wells (PMW-1A and PMW-2A) are shown on **Figure 3**.

2.2 DELINEATION OF DISSOLVED-PHASE HYDROCARBON PLUME

Based on historical and current groundwater laboratory data, dissolved-phase hydrocarbons in the perched aquifer are observed in SVE-28, SVE-30, and RW-1. Currently, these three wells and SVE-31, which intersect the perch aquifer, are the only wells included in the 2022 sampling analysis plan (SAP). Four existing wells, SVE-22, SVE-25, and SVE-27 are proposed to be added to the 2022 SAP to delineate the

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC plume extent towards the south of SVE-28 and RW-1. Groundwater samples will also be collected from proposed monitoring wells PMW-1A and PMW-2A to delineate the extent of the plume towards the southeast. Two additional wells (PMW-3A and PMW-4A) are proposed for installation to delineate the dissolved-phase hydrocarbon plume extend towards the east and north of RW-1. One additional well (PMW-5A) is proposed to delineate the plume extent of SVE-30. The proposed locations of monitoring wells (PMW-3A through PMW-5A) are shown on **Figure 4**.

Due to the complex geology at the site, the perched aquifer horizontal extent may vary and installation of monitoring wells to delineate PSH and dissolved-phase hydrocarbons without understanding the perched aquifer extent could result in "dry" wells and be very costly. Therefore, the investigative approach to delineate the hydrocarbon plumes is recommended to begin with delineating the extent of the perched aquifer using electric resistivity (ER) technology. Once the extent of the perch aquifer is understood, the actual number of proposed monitoring wells may be adjusted and will be presented for prior approval from the NMED. This work plan provides details of the investigative approach.

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC

3 PROCEDURES

3.1 ELECTRICAL RESISTIVITY STUDY

WSP will conduct an electrical resistivity imaging survey to identify depth to groundwater and delineate the lateral and vertical extent of the perched aquifer at the site. Electrical resistivity (ER) is a geophysical technique based on the flow of electrical current through the underlying media, creating measurements and producing a two-dimensional (2D) and three-dimensional (3D) model of the subsurface. Resistivity measurements are correlated to the amount of water saturation and the connectivity of pore spaces between sediments. With an increase in saturation, the measured resistivity is decreased; inversely, with a decrease in saturation, the measured resistivity is increased. This allows geoscientists to determine the depth of groundwater, based on the measurements produced through electrical resistivity surveying.

Three electrical resistivity lines will be placed at the surface near the wells that encounter the perched aquifer. The proposed location of the electrical resistivity lines is shown in **Figure 4**. Line 1 will be oriented from north to south and electrodes will be spaced with 5-10 ft spacing between each. Line 2 will be oriented from east to west and will be spaced with 5-10 ft spacing. Line 3 will be oriented north to south on a diagonal and electrodes will be spaced with 5-10 ft spacing.

The data will be consolidated to develop a cross section visualization of the perch aquifer along the lines of evaluation. Based on the extent of the perched aquifer and historical groundwater data, monitoring well locations will be proposed for the perched aquifer to delineate the hydrocarbon plumes. A summary report will be prepared to document the ER study and present the locations of the proposed monitoring wells. The summary report will be submitted to the NMED for approval of the proposed monitoring well locations.

3.2 MONITORING WELL INSTALLATION

Based on the results of the electrical resistivity study, it is anticipated that potentially five groundwater monitoring wells may be installed within the perched aquifer in general accordance with the NMED Groundwater Quality Bureau Monitoring Well Construction and Abandonment Guidelines (March 2011). Well drilling activities will be performed by a licensed well driller with appropriate permits issued by the New Mexico Office of State Engineer (NMOSE).

A pilot borehole will be advanced prior to installation of each well to provide cores for logging of soils. Each boring will be cleared by excavating with a hand auger to a target depth of at least 5 feet below ground surface (bgs) prior to commencing drilling operations. Soil borings will be advanced using hollowstem auger drilling methods to the specified depth. Soil cores will be continuously collected to the total boring depth for logging by field personnel. Each soil core will be characterized for soil type, color, grain size, moisture, and will be field screened for organic vapors potentially indicative of the presence of volatile organic compounds (VOCs) using a photoionization detector (PID). One soil sample with the highest PID reading in the vadose zone from each boring location will be submitted to the laboratory for VOC analysis by EPA Method 8260C under chain of custody procedures. The soil borings will be completed as groundwater monitoring wells within the hollow-stem augers.

The monitoring wells will be constructed with 2-inch diameter, flush-threaded, schedule 40 PVC riser and 15-feet of schedule 40 PVC 0.010-inch slotted screen to a maximum depth between 40 to 50 feet bgs or at the time of encountering the aquitard. Filter sand will be placed around the well screen and brought to approximately 2 feet above the top of the screen followed by a 2 to 3-foot bentonite seal. The bentonite seal will be allowed to hydrate for a minimum of 8 hours or the manufacturer's recommended hydration time, whichever is longer. The remaining borehole will be grouted to the surface. The grout will be allowed to set for a minimum of 24 hours before the surface pad and protective casing are installed. The monitoring wells will be completed with a lockable expandable monitoring well cap and a flush mounted well vault at ground surface installed in a concrete pad. Each well will be properly developed at least 48 hours after the surface pad and outer protective casing are installed. Once wells are installed, the monitoring wells top of casing as well as surveying surface elevations (new and existing SVE wells) will be surveyed by a professional and licensed surveyor.

Soil cuttings, development and decontamination water will be collected in dedicated 55-gallon drums during field activities. Development and decontamination water will be transferred to the surge tank for on-site treatment. Drums of soil cuttings will be characterized for proper disposal.

3.3 GROUNDWATER SAMPLING

The new groundwater monitoring wells in addition to the existing SVE wells and RW-1 will be sampled after development using low-flow sampling methods. Prior to sampling, the monitoring wells will be gauged for the presence of PSH and determine the depth to groundwater. Subsequently, the monitoring 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 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. Stable water quality parameter (temperature, pH, and specific conductance) measurements indicate representative sampling is obtainable.

Bladder pumps with dedicated tubing will be used to purge and collect groundwater samples from monitoring wells. Samples will be collected in clean, laboratory supplied containers and analyzed for quality assurance/quality control (QA/QC) purposes. The QA/QC samples will include duplicates, MS/MSD, equipment blanks, and trip blanks.

Purged groundwater will be collected in a dedicated 55-gallon drum during sampling and then transferred to the surge tank for on-site treatment and disposal

3.4 LABORATORY ANALYSES

Each soil sample collected will be assigned a unique identification number. Each groundwater sample will be assigned to the well name for which it is sampled. For each soil and groundwater sample container, a sample label will be affixed to the outside with the date, time of sample collection, project name, sample

identification number, and analysis required. Each sample container will be placed in a Ziploc[®] bag (or equivalent) and placed in laboratory-supplied coolers with ice.

The groundwater and soil samples will be transported under chain-of-custody protocols to ALS Laboratory in Albuquerque, New Mexico for analysis. Soil samples will be submitted to the laboratory for VOC analysis by EPA Method 8260C under chain of custody procedures. Groundwater samples will be analyzed for VOC via EPA Method 8260C, and for 1,4-Dioxane via EPA Method 8270D SIM

3.5 FIELD DECONTAMINATION

Reusable sampling equipment will be decontaminated before and immediately after each use. The equipment will be cleaned with a phosphate-free detergent such as Liquinox[®] (or equivalent) and deionized water using a brush or scrub pad to remove any particulate matter or surface film. The equipment will be rinsed with deionized water and allowed to air dry. Equipment decontamination water will be collected in a dedicated 55-gallon drum during sampling and then transferred to the surge tank for on-site treatment and disposal

4 **REPORTING**

The results of the evaluation will be provided to the NMED in a *Perched Aquifer Delineation Report*. The Report will also include a summary of the field activities, summary tables, field sampling records, boring logs, well construction diagrams, site figure, PSH and groundwater quality figure and the laboratory analytical reports.

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC WSP August 2022 Page 8

5 SCHEDULE

Implementation of this project will begin upon approval of this Work Plan, according to the following proposed schedule for completing the work:

<u>Task</u>	Estimated Schedule
Electric Resistivity (ER)	2 months (after the NMED approval)
ER Summary/Proposed Well Location Report	2 months
Well Installation PermitApproval (NMOSE)	2 months
Well Installation	1 month
Groundwater Sampling and Lab Analysis	1 month
Perch Aquifer Delineation Report	2 months

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC

6 **REFERENCES**

EarthCon, March 2013. Amended Investigation Work Plan and Groundwater Monitoring Plan.

New Mexico Environment Department, April 2019. Approval with Modifications Report of 2018 Groundwater Remediation Activities Transwestern Compressor Station No. 9

New Mexico Environment Department, February 2020. Approval with Modifications Laboratory Results Submittal for SVE and RW-1 Wells and Additional Laboratory Results for SVE and RW-1 Wells Transwestern Compressor Station No. 9

New Mexico Environment Department, June 2019. Response to NMED Approval with Modifications Correspondence Report of 2018 Groundwater Remediation Activities Transwestern Compressor Station No. 9

New Mexico Environment Department, March 2020. Approval with Modifications [Revised] Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9

New Mexico Environment Department, September 2021. Disapproval Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9

Transwestern Pipeline Company, December 2019. Laboratory Results Submittal for SVE wells and RW-1 (Report 1) Transwestern Compressor Station No. 9

Transwestern Pipeline Company, January 2020. Additional Laboratory Results Submittal for SVE and RW-1 Wells (Report 2) Transwestern Compressor Station No. 9

Transwestern Pipeline Company, January 2022. [Revised] Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9

Transwestern Pipeline Company, June 2021. Report of Perched Aquifer Evaluation and Future Corrective Action Recommendations Transwestern Compressor Station No. 9

Transwestern Pipeline Company, May 2019. Response to NMED Approval with Modifications Correspondence Report of 2018 Groundwater Remediation Activities Transwestern Compressor Station No. 9 Roswell Shallow Subsurface Investigation by Harding Lawson Associates, June 20, 1991

Work Plan to Delineate Hydrocarbons in the Perched Aquifer Project No. EC02.20180005.01 TRANSWESTERN PIPELINE COMPANY, LLC WSP August 2022 Page 11

FIGURES



Copyright © 2022 WSP USA, Inc. All Rights Reserved

Received by OCD: 10/21/2022 8:48:57 AM






	Legend
	 Proposed Perched Monitoring Well Location
	Recovery Well Location
	 Soil Vapor Extraction Location
	Proposed Electric Resistivity Line
	PSH Contour
	Server Fence Line
	Building
	Facility Boundary
	Station Pipeline
	Site Boundary
06	Proposed Monitoring Wells and Electric Resistivity Survey Layout PSH Plume Delineation

SWS CHECKED DATE AUG 2022 FIGURE 3





		Legend	k	
		Pro Mo	posed Perched nitoring Well Locatic	on
		⇔ Re	covery Well Location	ı
		* Soi	I Vapor Extraction L	ocation
		Pro	posed Electric Resi	stivity Line
		Iso	-Contour	
		E Fei	nce Line	
		Bui	lding	
		—— Fac	cility Boundary	
		– –– · Sta	tion Pipeline	
		Site	Boundary	
06	Pro Elec Dissolved-pł	posed Monito tric Resistivity nase Hydrocar	ing Wells and Survey Layou bon Plume De	t lineation
	SWS	CHECKED	AUG 2022	FIGURE 4

•

TABLES

Released to Imaging: 11/22/2022 9:37:14 AM

Table 1. Summary of Well Completion DetailsTranswestern Compressor Station No. 9 - Roswell, NM

		Tatal Dauth	Manan		0	0	T
	Date of	i otai Depth	measured	Surface	Casing	Screen	i op of
Well	Completion	of Boring	Depth of Well	Completion	Diameter	Interval	Sand Pack
	Completion	(ft bgs)	(ft from TOC)	Туре	(in.)	(ft bgs)	(ft bgs)
RW-1	06/13/93	42.5	41.47	Flush Mount	4	36.8 - 41.7	34.75
SVE-1A	09/21/96	30	29.65	Flush Mount	2	20-30	19
SVE-2A	09/20/96	30	29.83	Flush Mount	2	20-30	17.5
SVE-3	09/16/96	62.3	61.90	Flush Mount	2	32.0-62.3	29.5
SVE-22	11/07/02	35	33.20	Flush Mount	2	25-35	23
SVE-23	11/07/02	39	36.70	Flush Mount	2	25-35	22
SVE-24	11/13/02	30	28.85	Flush Mount	2	20-30	18
SVE-25	11/04/02	34	32.85	Flush Mount	2	24-34	21.6
SVE-26	11/05/02	35	32.45	Flush Mount	2	24-34	22
SVE-27	11/01/02	35	33.90	Flush Mount	2	20-35	18
SVE-28	10/29/02	35	36.00	Flush Mount	2	25-35	23
SVE-30	10/25/02	45	44.00	Flush Mount	2	20-45	18
SVE-31	10/28/02	35	33.95	Flush Mount	2	25-35	23
N.L. 4							

Note:

ft bgs - feet below ground surface TOC - top of casing in. - inches Prepared by: SWS 8/19/2022 Checked by:

			Denth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)	PSH (ft below TOC)	Groundwater (ft below	PSH (ft)	Surface
				TOC)		Elevation (ft)
SVE-1A	6/24/2019	NA	(a)	dry	(a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
	5/7/2021		(a)	dry dry	(a)	NA NA
	F/1/10/2021		(a)	diy	(a)	NA NA
	5/14/2022	NIA	(a)	dry	(a)	NA NA
SVE-ZA	0/24/2019	NA	(a)	diy diy	(a)	NA NA
	5/13/2020		(a)	dry	(a)	NA NA
	11/10/2020		(a) (a)	dry	(a)	
	5/7/2020		(a) (a)	dry	(a)	NA
	11/10/2021		(a)	29.42	(a)	NA
	5/14/2022		(a)	drv	(a)	NA
SVE-3	6/24/2019	NA	(a)	dry	(a)	NA
0.20	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry dry	(a)	
	F/7/2020		(a)	diy	(a)	NA NA
	5/7/2021		(a)	dry	(a)	NA NA
	11/10/2021		(a)	dry	(a)	NA
	5/14/2022		(a)	dry	(a)	NA
SVE-22	3/10/2009	NA	33.00	33.20	0.20	NA
	10/8/2009		32.92	33.10	0.18	NA
	1/26/2010		33.05	33.05 (TD)	0.00	NA
	3/22/2010		33.02	33.02 (TD)	0.00	NA
	4/17/2011		32.90	33.00 (TD)	0.10	NA
	12/22/2011		(a)	33.04	(a)	NA
	4/17/2012		(a)	33.00 (TD)	(a)	NA
	10/18/2012		(a)	33.00 (TD)	(a)	NA
	4/15/2013		(a)	32.98	(a)	NA
	11/3/2013	3616 76 (h)	(a)	33.08	(a)	3 583 68
	5/1/2014		(a)	drv	(a)	NA
	11/21/2014		(a)	drv	(a)	NA
	4/21/2015		(a)	drv	(a)	NA
	11/3/2015		33.00	33 11	0 11	3 583 73
	4/29/2016		32.94	33.09	0.15	3 583 78
	11/16/2016		32.78	32.95	0.10	3 583 94
	5/22/2017		33.00	33.10	0.10	3 583 74
	11/13/2017		33.14	33.19	0.05	3.583.61
	6/1/2018		33.02	33.10	0.08	3,583.72
	11/6/2018		(a)	33.05	(a)	3,583.71
	6/24/2019		32.74	32.75	0.01	3,584.02
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry	(a)	NA
	5/7/2021		(a)	drv	(a)	NA
	11/10/2021		33.10	33.20	0.10	3.583.64
	4/4/2022		(a)	33.00	(a)	3 583 71
	5/14/2022		(a)	33 32	(a)	3 583 44
	6/1/2022		(a)	33.10	(a)	3 583 66
	7/18/2022		(a)	dry	(a)	NA
	8/10/2022		(a)	33.20	(a)	3 583 56
SV/E 23	2/10/2022	NIA	(a)	35.20	(a)	5,565.56
3VL-23	3/10/2009	INA	32.70	30.75	0.70	NA NA
	10/0/2009		00.01	33.19 20.00 (TD)	υ./δ	NA NA
	1/26/2010		33.1Z	36.98 (TD)	3.80	NA
	3/22/2010		32.09	33.65	1.56	NA
	4/17/2011		33.00	33.30	0.30	NA
	12/22/2011		33.60	34.05	0.45	NA
	4/17/2012		33.62	34.10	0.48	NA
	10/18/2012		34.11	34.68	0.57	NA
SVE-23	4/15/2013		33.65	33.92	0.27	NA
	11/3/2013	3612.45 (h)	33.73	36.52	2.79	3,578.05
	5/1/2014		33.78	36.80	3.02	3,577.95

	6		Depth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)	PSH (ft below TOC)	Groundwater (ft below	PSH (ft)	Surface
	11/01/0014		20.45	100)	0.60	
	11/21/2014		32.13	32.04	0.69	3,300.13
	4/21/2015		32.73	33.4	0.03	3,579.54
	11/3/2015		32.74	33.07	0.33	3,579.05
	4/29/2016		33.01	33.33	0.32	3,579.30
	5/22/2017		33.60	33.02	0.45	3,578,72
	11/13/2017		32.64	33.28	0.55	3 579 66
	6/1/2018		33.27	33.95	0.68	3.579.02
	11/6/2018		32.55	35.70	3.15	3,579.14
	6/24/2019			Not Gauged - Snake	e Hazard Exist in Vault	, , , , , , , , , , , , , , , , , , ,
	1/5/2020		33.10	33.75	0.65	3,579.19
	5/13/2020		33.52	36.50	2.98	3,578.21
	11/10/2020		33.70	34.87	1.17	3,578.47
	1/18/2021		33.80	34.88	1.08	3,578.39
	2/10/2021		33.78	34.87	1.09	3,578.41
	3/8/2021		33.85	34.88	1.03	3,578.35
	4/5/2021		34.00	37.00	3.00	3,577.73
	5/7/2021		33.10	33.75	0.65	3,579.19
	6/9/2021		34.06	36.80	2.74	3,577.73
	7/10/2021		33.33	34.66	1.33	3,578.80
	8/2/2021		32.65	34.20	1.55	3,579.43
	9/1/2021		32.72	34.35	1.63	3,579.34
	10/5/2021		32.85	34.15	1.30	3,579,29
	11/3/2021		32.89	34.36	1.47	3.579.21
	11/10/2021		02.00	Not (Gauged	0,010121
	12/2/2021		32.89	34 35	1 46	3579 21
	1/10/2022		33 15	34 30	1 15	3579.02
	2/11/2022		33.22	34 10	0.88	3579.02
	3/1/2022		33.00	34 10	1 10	3579 19
	4/4/2022		33 23	34 50	1 27	3578.92
	5/14/2022		33.30	33.89	0.59	3579.01
	6/1/2022		33 35	34.05	0.00	3578.93
	7/18/2022		32.95	33.00	0.05	3579.49
	8/10/2022		33.00	33.47	0.00	3579.34
SVE-24	3/10/2022	NΔ	(a)	dry	(a)	NA
01221	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	//17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	dry	(a)	
	10/18/2012		(a)	dry	(a)	NA
	4/15/2012		(a)	dry	(a)	ΝΔ
	11/3/2013	3608 97 (h)	(a)	dry	(a)	NΔ
	5/1/2014	0000.07 (11)	(a)	dry	(a)	NA
	11/21/2014		(a)	drv	(a)	NA
	4/21/2015		(a)	28.61	(a)	3,580.36
	11/3/2015		(a)	drv	(a)	NA
	4/27/2016		(a)	drv	(a)	NA
	11/16/2016		(a)	drv	(a)	NA
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	dry	(a)	NA
	5/31/2018		(a)	dry	(a)	NA
	11/6/2018		(a)	dry	(a)	NA
	6/24/2019		(a	dry	(a)	NA
	1/6/2020		(a)	dry	(a)	NA
5VE-24	5/13/2020		(a)	ary	(a)	NA
	11/9/2020		(a)	dry 	(a)	NA
	5/7/2021		(a)	dty	(a)	NA
	11/10/2021		(a)	dry	(a)	NA
0.45.05	5/11/2022		(a)	dry	(a)	NA
SVE-25	3/10/2009	NA	(a)	32.70	(a)	NA

Well ID	Date	TOC elevation (ft)	Depth to	Depth to Groundwater (ft below		Groundwater
Weirid	Date		PSH (ft below TOC)	TOC)	F STT (III)	Elevation (ft)
	10/8/2009		(a)	31.40	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	32.80	(a)	NA
	4/17/2011		(a)	32.23	(a)	NA
	12/22/2011		(a)	32.65	(a)	NA
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	32.70	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3617.02 (h)	(a)	32.72	(a)	3,584.30
	5/1/2014		(a)	32.70	(a)	3,584.32
	11/21/2014		(a)	ury 32.73	(a)	3 584 20
	4/21/2015		(a)	52.75 dn/	(a)	5,504.29 NA
	//20/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	31.88	(a)	3 585 14
	6/1/2018		(a)	32.6	(a)	3 584 42
	11/6/2018		(a)	31 75	(a)	3 585 27
	6/24/2019		(a)	drv	(4) (a)	NA
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		32.5	32.69	0.19	3,584.47
	1/18/2021		32.6	32.71	0.11	3,584.39
	2/10/2021		32.57	32.7	0.13	3,584.42
	3/8/2021		32.55	32.82	0.27	3,584.41
	4/5/2021		32.65	32.75	0.1	3,584.35
	5/7/2021		(a)	dry	(a)	NA
	6/9/2021		32.85	32.9	0.05	3,584.16
	7/10/2021		32.67	32.71	0.04	3,584.34
	8/2/2021		32.3	32.8	0.5	3,584.60
	9/1/2021		31.35	31.65	0.3	3,585.60
	10/5/2021		31.12	31.14	0.02	3,585.90
	11/3/2021		(a)	32.2	(a)	3,304.02
	12/2/2021		(a)	32.24	(a)	3,584.70
	1/10/2022		(a)	32.25	(a)	3,584,67
	2/11/2022		(a)	32.00	(a)	3 584 62
	3/1/2022		(a)	32.35	(a)	3,584.67
	4/4/2022		(a)	32.45	(a)	3.584.57
	5/14/2022		(a)	32.81	(a)	3,584.21
	6/1/2022		(a)	32.5	(a)	3,584.52
	7/18/2022		(a)	dry	(a)	NA
	8/10/2022		(a)	32.55	(a)	3,584.47
SVE-26	3/10/2009	NA	(a)	dry	(a)	NA
	10/8/2009		(a)	dry	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	dry	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	diy diy	(a)	NA NA
	10/18/2012		(a)	dry	(a)	ΝΔ
SVE-26	4/15/2013		(a)	drv	(a)	NA
	11/3/2013	3614.43 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	32.6	(a)	3,581.83
	11/3/2015		(a)	dry	(a)	NA
	4/29/2016		(a)	dry	(a)	NA
	11/16/2016		(a)	dry	(a)	NA

			Depth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)	PSH (ft below TOC)	Groundwater (ft below	PSH (ft)	Surface
				TOC)		Elevation (ft)
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	dry	(a)	NA
	6/1/2018		(a)	dry	(a)	NA
	11/6/2018		(a)	dry	(a)	NA
	6/24/2019		(a)	drv	(a)	NA
	1/5/2020		(a)	drv	(a)	NA
	5/13/2020		(a)	dry	(a)	NA
	11/10/2020		(a)	dry dry	(a)	NA
	F/7/2020		(a)	dry dry	(a)	
	5/7/2021		(a)	dry	(a)	INA NIA
	T1/10/2021		(a)	dry	(a)	NA
	5/14/2022		(a)	dry	(a)	NA
SVE-27	3/10/2009	NA	(a)	32.92	(a)	NA
	10/8/2009		(a)	33.63	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	33.70	(a)	NA
	4/17/2011		(a)	33.70	(a)	NA
	12/22/2011		(a)	33.83	(a)	NA
	4/17/2012		(a)	drv	(a)	NA
	10/18/2012		(a)	drv	(a)	NA
	4/15/2013		(a)	33.82	(a)	NA
	11/3/2013	3613 10 (h)	(a)	dry	(a)	NA
	5/1/2014	3013.13 (1)	(a)	dry	(a)	NΔ
	11/21/2014		(a)	33.01	(a)	3 580 18
	1/21/2015		(a) (a)	22.59	(a)	3,500.10
	4/21/2015		(a)	33.30	(a)	3,579.01
	11/3/2015		(a)	33.54	(a)	3,579.05
	4/29/2016		(a)	33.82	(a)	3,579.37
	11/16/2016		(a)	34.15	(a)	3,579.04
	5/22/2017		(a)	01y	(a)	NA 2 570 71
	6/1/2018		(a)	34.00	(a)	3,579.71
	11/6/2018		(a) (a)	33 31	(a)	3 579 88
	6/24/2019		(u)	Not C	Gauged	0,070.00
	1/5/2020		(a)	dry	(a)	NΔ
	5/13/2020		(a)	dry	(a)	NA NA
	11/10/2020		(a)	dry dry	(a)	
	F/7/2020		(a)	ury dm/	(a)	NA NA
	5/7/2021		(a)	dry	(a)	INA NA
	11/10/2021		(a)	dry	(a)	NA
	5/14/2022		(a)	dry	(a)	NA
SVE-28	3/10/2009	NA	(a)	28.60	(a)	NA
	10/8/2009		(a)	28.95	(a)	NA
	1/26/2010		(a)	dry	(a)	NA
	3/22/2010		(a)	29.07	(a)	NA
	4/17/2011		(a)	29.17	(a)	NA
	12/22/2011		(a)	29.65	(a)	NA
	4/17/2012		(a)	drv	(a)	NA
	10/18/2012		(a)	drv	(a)	NA
	4/15/2013		(a)	33.58	(a)	NA
	11/3/2013	3607 84 (b)	(4)	dry	(~) (a)	NΔ
	5/1/2014	(II) - (II)	(a)	dry	(a)	NΔ
	11/21/2014		(a) (a)	28 59	(a)	3 579 25
	4/21/2015		(a)	28.86	(a)	3 578 98
S//E 28	11/2/2015		(a)	20.00	(a)	3 570 00
3VE-20	11/3/2015		(a)	28.75	(a)	3,579.09
	4/27/2016		(a)	28.97	(a)	3,5/8.8/
	11/16/2016		(a)	29.18	(a)	3,578.66
	5/22/2017		(a)	29.44	(a)	3,578.40
	11/13/2017		(a)	28.76	(a)	3,579.08
	6/1/2018		(a)	29.15	(a)	3,578.69
	11/6/2018		(a)	28.53	(a)	3,579.31
	6/24/2019		(a)	28.97	(a)	3.578.87
	1/5/2020		(2)	28.81	(a)	3 579 03
	5/13/2020	<u> </u>	(a)	20.01	(a)	3 570 70
I	0/10/2020	L	(a)	29.00	(d)	3,570.79

•

			Depth to	Depth to		Groundwater
Well ID	Date	TOC elevation (ft)		Groundwater (ft below	PSH (ft)	Surface
			PSH (IL DEIOW TUC)	TOC)		Elevation (ft)
	11/10/2020		(a)	29.73	(a)	3,578.11
	5/7/2021		(a)	31.37	(a)	3.576.47
	11/10/2021		(a)	30.63	(a)	3.577.21
	5/14/2022		(a)	29.1	(a)	3 578 74
SVE-30	3/10/2009	ΝΔ	(a)	30.32	(a)	NA
012 00	10/8/2009	INA	(a)	20.20	(a)	
	10/8/2009		(a)	39.29	(a)	NA NA
	3/22/2010		(a)	40.28	(a)	NA
	4/1//2011		(a)	40.11	(a)	NA
	12/22/2011		(a)	41.11	(a)	NA
	4/17/2012		(a)	41.65	(a)	NA
	10/18/2012		(a)	41.42	(a)	NA
	4/15/2013		(a)	41.67	(a)	NA
	11/3/2013	3616.00 (h)	(a)	43.02	(a)	3,572.98
	5/1/2014		(a)	43.35	(a)	3,572.65
	11/21/2014		(a)	43.30	(a)	3,572.70
	4/21/2015		(a)	41.80	(a)	3,574.20
	11/3/2015		(a)	41.60	(a)	3,574.40
	4/28/2016		(a)	41.56	(a)	3,574.44
	11/16/2016		(a)	41 23	(a)	3 574 77
	5/22/2017		NΔ	NΔ	NA	NA
	11/12/2017		(0)	42.00	(0)	2 574 00
	6/1/2017		(a)	42.00	(a)	3,572.00
	0/1/2010		(a)	42.02	(a)	3,573.96
	11/6/2018		(a)	42.46	(a)	3,573.54
	6/24/2019		(a)	42.52	(a)	3,573.48
	1/5/2020		(a)	42.45	(a)	3,573.55
	5/13/2020		(a)	42.55	(a)	3,573.45
	11/10/2020		(a)	43.05	(a)	3,572.95
	5/7/2021		(a)	43.22	(a)	3,572.78
	11/10/2021		(a)	43.25	(a)	3,572.75
	5/14/2022		(a)	43.01	(a)	3,572.99
SVE-31	3/10/2009	NA	(a)	30.45	(a)	NA
	10/8/2009		(a)	30.43	(a)	NA
	1/26/2010		(a)	30.55	(a)	NA
	3/22/2010		(a)	31 49	(a)	NA
	4/17/2011		(a)	dry	(a)	NA
	12/22/2011		(a)	28.50	(a)	NA
	12/22/2011		(a)	20.00	(a)	
	4/17/2012		(a)	diy	(a)	NA NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	dry	(a)	NA
	11/3/2013	3612.67 (h)	(a)	dry	(a)	NA
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	30.27	(a)	3,582.40
	4/21/2015		(a)	30.97	(a)	3,581.70
	11/3/2015		(a)	30.200	(a)	3,582.47
	4/28/2016		(a)	30.35	(a)	3,582.32
	11/16/2016		(a)	30.73	(a)	3,581.94
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	30.48	(a)	3,582.19
	6/1/2018		(a)	ary	(a)	NA 2.500.40
SVE-31	6/24/2010		(a)	30.24 dry	(a)	3,302.43
	1/5/2020		(a)	dry dry	(a)	
	1/5/2020		(a)	ary	(a)	NA NA
	5/13/2020		(a)	ary	(a)	NA 0.501.00
	11/10/2020		(a)	31.65	(a)	3,581.02
	5/7/2021		(a)	dry	(a)	NA
	11/10/2021		(a)	30.63	(a)	3,582.04
	5/14/2022		(a)	dry	(a)	NA
RW-1	3/10/2009	NA	(a)	33.17	(a)	NA
	10/8/2009		(a)	33.48	(a)	NA
	3/22/2010		(a)	33.62	(a)	NA
	4/17/2011		(a)	33.80	(a)	NA
•	▶ <u> </u>	L	\/		1.7	L

•

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
	12/22/2011		(a)	34.26	(a)	NA
	4/17/2012		(a)	34.57	(a)	NA
	10/18/2012		(a)	35.16	(a)	NA
	4/15/2013		(a)	35.77	(a)	NA
	11/3/2013	3612.72 (h)	(a)	34.95	(a)	3,577.77
	4/30/2014		(a)	35.48	(a)	3,577.24
	11/19/2014		(a)	32.46	(a)	3,580.26
	4/21/2015		(a)	33.08	(a)	3,579.64
	11/3/2015		(a)	33.00	(a)	3,579.72
	4/28/2016		(a)	33.32	(a)	3,579.40
	11/16/2016		(a)	33.70	(a)	3,579.02
	5/22/2017		(a)	34.03	(a)	3,578.69
	11/13/2017		(a)	32.96	(a)	3,579.76
	6/1/2018		(a)	33.62	(a)	3,579.10
	11/6/2018		(a)	32.82	(a)	3,579.90
	6/24/2019		(a)	33.57	(a)	3,579.15
	1/5/2020		(a)	33.38	(a)	3,579.34
	5/13/2020		(a)	33.68	(a)	3,579.04
	11/10/2020		(a)	34.55	(a)	3,578.17
	5/7/2021		(a)	36.85	(a)	3,575.87
	11/10/2021		(a)	33.40	(a)	3,579.32
	5/14/2022		(a)	33.60	(a)	3,579.12

Notes:

PSH - Phase separated hydrocarbon

ft - feet TOC - Top of Casing

Corrections to ground water surface elevation for PSH is calculated assuming a specific gravity of 0.76

(NA) Information not available

(a) Not applicable since no measurable thickness of PSH is present

(b) Elevation based on survey by Wagener Engineering dated 5/6/98

(c) Elevation based on survey by Wagener Engineering dated 9/17/98(d) Elevation based on survey by Wagener Engineering dated 11/29/00

(e) Elevation based on survey by Wagener Engineering dated 10/03/01

(f) Elevation based on survey by Cypress Engineering dated 03/14/03

(g) Elevation based on survey by Cypress Engineering dated 06/23/07

(h) Elevation based on survey by PR Patton & Associates dated 10/01/13

Historical data before 2009 is presented in previous reports

Historical data for wells that were plugged and abandoned is not shown.

Prepared by: SWS 8/19/2022 Checked by:

Table 3. Summary of Groundwater Analytical Results Transwestern Compressor Station No. 9 - Roswell, NM

Well	Sampling Date	Benzene	Toluene	Ethylbenzene	Xylenes (total)	1,1-Dichloroethane	1,1-Dichloroethene	Vinyl Chloride
NMW	QCC Human Health Standard	5	1,000	700	620	25	7	2
	USEPA MCL	5	1,000	700	10,000		7	2
	Tap Water (2022)	4.55		15.0		27.5		0.32
Groundw	vater Cleanup Level (GCL) (see notes)	5	1,000	700	620	25	7	2
SVE-28	11/12/18	14	<1.0	<1.0	<1.5	NA	NA	NA
	06/26/19	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0
	01/08/20	1.5	<1.0	<1.0	<1.5	2.2	<1.0	<1.0
	11/23/20	1.3	<1.0	<1.0	<1.5	1.3	<1.0	<1.0
	05/11/21	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0
	11/15/21	4.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0
	05/14/22	2.7	<0.20	<0.30	<0.30	<0.20	<0.20	<0.20
SVE-30	11/12/18	15	<5.0	41	<7.5	NA	NA	NA
	06/26/19	10	<5.0	24	<7.5	30	<5.0	<5.0
	01/08/20	8.9	<5.0	29	<7.5	32	<5.0	<5.0
	09/10/20	8.6	<5.0	20	<7.5	25	<5.0	<5.0
	11/23/20	5.7	<1.0	8	<1.5	33	NA	NA
	05/11/21	6.4	<1.0	3.5	<1.5	37	<1.0	<1.0
	11/14/21	<5.0	<5.0	<5.0	<1.5	35	<5.0	<5.0
	05/14/22	6.5	2.4	5.2	12	<0.20	<0.20	<0.20
SVE-31	11/12/18	<1.0	<1.0	<1.0	<1.5	NA	NA	NA
	11/23/20	<1.0	<1.0	<1.0	<1.5	NA	NA	NA
	05/11/21				dry			
	11/15/21	<1.0	<1.0	<1.0	<1.5	<1.0	<1.0	<1.0
	05/14/22				dry			
RW-1	11/12/18	32	<1.0	1.4	<1.5	NA	NA	NA
	06/26/19	51	<1.0	1.4	<1.5	12	<1.0	<1.0
	01/08/20	26	<1.0	1.5	<1.5	4.3	<1.0	<1.0
	09/10/20	25	<1.0	6.2	<1.5	3.1	<1.0	<1.0
	11/23/20	38	<1.0	13	7.9	3.5	<1.0	<1.0
	05/11/21	46	<5.0	10	<7.5	5.6	<5.0	<5.0
	11/15/21	17	<1.0	3.8	<1.5	2.1	<1.0	<1.0
	05/14/22	9.9	<0.20	1.8	<0.30	<0.20	<0.20	<0.20

Notes:

Bold indicates that the analytical result exceeds the applicable regulatory limits.

* - Phase separated hydrocarbons (PSH) present in well. Sample collected below PSH.

-- Data not available.

Only constituents detected in one or more groundwater samples are shown in this table

All results reported above the applicable standard are shown in bold type

Historical data before 2009 is presented in previous reports

Results reported in micrograms per liter (μ g/L)

NA - Not analyzed; constituent is not part of the sampling plan

NMWQCC - New Mexico Water Quality Control Commission

NMWQCC Human Health Standards - from New Mexico Administrative Code (NMAC) 20.6.2, Part A, Human Health Standards. Used as GCL for target cleanup if lower than the MCL.

USEPA MCL - United States Environmental Protection Agency's Maximum Concentration Limit. Used as GCL for target cleanup if lower than the NMWQCC Human Health Standard.

Tap Water (2022) - Tap Water, Cancer From Table A-1 for the 2022 NMED Risk Assessment Guidance for Site Investigation and Remediation. Used as GCL for target cleanup if WQCC standard nor MCL have not been established.

Prepared by: SWS 8/19/2022

Checked by: SSD 8/22/22

Well	Sampling Date	Chloroethane	Isopropyl benzene	n-Propylbenzene	1,2,4-T richlorobenzene	Napthalene	cis-1,2-Dichloroethene	Acetone	1,4-Dioxane
NMWQCC Hur	nan Health Standard				70	-	70		-
USI	EPA MCL				70		70		
Tap W	/ater (2022)				11.5	1.17			4.59
Groundwater 0	Cleanup Level (GCL)				70	1.17	70		4.59
SVE-28	09/10/20	NA	NA	NA	NA	NA	NA	NA	<1.0
	05/11/21	<2.0	<1.0	<1.0	<1.0	<u><2.0</u>	<1.0	14	<10
	11/15/21	<2.0	<1.0	<1.0	<1.0	<0.10	<1.0	<10	<1.0
	05/14/22	<0.30	<0.30	-	<0.50	0.029J	<0.20	<2.0	0.27
SVE-30	09/10/20	10	6	2	<1.0	6.0	1.0	<50	5.9
	11/23/20	4	4.1	3.1	3.3	<u><2.0</u>	<1.0	<10	6
	05/11/21	3.3	2.4	1.8	3.2	<2.0	<1.0	<10	<10
	11/14/21	<10	<5.0	<5.0	<5.0	<u><0.1</u>	<5.0	<50	4.2
	05/14/22	<0.30	<0.30	-	<0.50	0.23	<0.20	<2.0	2.5
SVW-31	11/15/21	<1.0	<1.0	<1.0	<1.0	<u><2.0</u>	<1.0	<10	-
RW-1	09/10/20	<2.0	3	<5.0	<5.0	<u><10</u>	<5.0	<10	<1.0
	11/23/20	<2.0	3.9	3.2	<1.0	4.0	3.6	<10	<25
	05/11/21	<10	<5.0	<5.0	<5.0	<10	6	<50	<50
	11/15/21	<2.0	<1.0	<1.0	<1.0	0.5	1.7	<10	<1.0
	05/14/22	<0.30	<0.30	-	<0.50	0.4	<0.20	<2.0	0.058J

Notes:

Results only shown for other detected constituents in wells. All other constituents for wells not shown are below laboratory detection limits.

Results reported in micrograms per liter (µg/L)

NMWQCC - New Mexico Water Quality Control Commission Standard

NMWQCC Human Health Standards - from New Mexico Administrative Code (NMAC) 20.6.2, Part A, Human Health Standards. Used as GCL for target cleanup if lower than the MCL. USEPA MCL - United States Environmental Protection Agency's Maximum Concentration Limit. Used as GCL for target cleanup if lower than the NMWQCC Human Health Standard. Tap Water (2022) - Tap Water Cancer From Table A-1 for the 2022 NMED Risk Assessment Guidance for Site Investigation and Remediation. Used as GCL for target cleanup if WQCC standard nor MCL have not been established.



indicates that the analytical result exceeds the applicable regulatory limits.

Bold indicates that the analytical result exceeds the detection limit

25 indicates that the limit of quantitation (LOQ) value is higher than the applicable GCLs

Prepared by: SWS 8/19/2022 Checked by: SSD 8/22/22

District I 1625 N. French Dr., Hobbs, NM 88240 Phone:(575) 393-6161 Fax:(575) 393-0720 District II

811 S. First St., Artesia, NM 88210 Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410 Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505 Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 152562

CONDITIONS Operator: OGRID: Transwestern Pipeline Company, LLC 329750 8501 Jefferson NE Ave Action Number: Albuquerque, NM 87113 152562 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