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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:

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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.

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Date: 6/28/2021

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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

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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**.

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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

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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

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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
			PSH (It below TOC)	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
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		(a)	32.98	(a)	NA
	11/3/2013	3616.76 (h)	(a)	33.08	(a)	3,583.68
	5/1/2014		(a)	dry	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	dry	(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	0.17	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
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	5512. 1 5 (II)	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		00.40	Not Gauged - Snake H		
	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

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	1	(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
0VL 20	10/8/2009	IN/A	(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	3017.02 (II)	(a)	32.72	(a)	3,584.32
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	32.73	(a)	3,584.29
	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)	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)	NA
	11/10/2020		32.5	32.69	0.19	3,584.47
	1/18/2021		32.6	32.09	0.19	3,584.39
	2/10/2021		32.57	32.7	0.13	3,584.42
	3/8/2021		32.57	32.82	0.13	3,584.42
	3/8/2021	1	J J/ 00	3/8/	11/1	J 204 4 1

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)	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)	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)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	33.82	(a)	NA
	11/3/2013	3613.19 (h)	(a)	dry	(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 Ga	Ų	N1A
	1/5/2020		(a)	dry	(a)	NA
	5/13/2020 11/10/2020		(a) (a)	dry	(a) (a)	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-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)	dry	(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)	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	(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 NA
	10/18/2012		(a)	35.16	(a)	NA
	4/15/2013 11/3/2013	2612 72 (h)	(a)	35.77 34.95	(a)	3,577.77
	4/30/2014	3612.72 (h)	(a) (a)	35.48	(a) (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) (a)	33.32	(a)	3,579.40
	11/16/2016		(a) (a)	33.32	(a) (a)	3,579.40
	5/22/2017		(a)	33.70	()	3,579.02
	5/22/2017		(a) (a)	34.03	(a) (a)	3,578.69
	6/1/2018		(a) (a)	33.62	(a) (a)	3,579.10
	11/6/2018		(a) (a)	33.62	. ,	3,579.10
	6/24/2019		(a) (a)	32.82	(a) (a)	3,579.90
	1/5/2020		(a) (a)	33.38	(a)	3,579.34
	5/13/2020		(a) (a)	33.68	(a) (a)	3,579.04
	11/10/2020	1	(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
Gro	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
	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.

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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

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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

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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 @

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

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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

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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

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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

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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

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	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:
Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below	PSH (ft)	Groundwater Surface
SVE-1A	6/24/2019	NA	(0)	TOC)	(0)	Elevation (ft) NA
SVE-IA	1/5/2020	INA	(a) (a)	dry dry	(a) (a)	NA
	5/13/2020		(a) (a)	dry	(a) (a)	NA NA
	11/10/2020		(a) (a)	dry	(a) (a)	NA
SVE-2A	6/24/2019	NA	(a) (a)	dry	(a) (a)	NA
SVE-ZA	1/5/2020	INA I	(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
012-22	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)	dry	(a)	NA
	11/21/2014	Ì	(a)	dry	(a)	NA
	4/21/2015		(a)	dry	(a)	NA
	11/3/2015	1	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	0.17	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
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	1	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	l	33.60	34.15	0.55	3,578.72
	11/13/2017	l	32.64	33.28	0.64	3,579.66
	6/1/2018	1	33.27	33.95	0.68	3,579.02
	11/6/2018	1	32.55	35.70	3.15	3,579.14
	6/24/2019	1	02.00	Not Gauged - Snake H		
	1/5/2020	1	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	ļ	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
	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)	dry	(a)	NA
	4/21/2015		(a)	32.73	(a)	3,584.29
	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)	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)	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	I	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		(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)	dry	(a)	NA
SVE-27	3/10/2009	NA	(a)	32.92	(a)	NA
012 21	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)	dry	(a)	NA
	10/18/2012		(a) (a)	dry	(a)	NA
	4/15/2013			33.82	(a)	NA
	11/3/2013	3613.19 (h)	(a)	dry		NA
	5/1/2014	3013.19 (11)	(a)	dry	(a) (a)	NA
	11/21/2014		(a) (a)	33.01	(a)	3,580.18
	4/21/2015		(a) (a)	33.58	(a)	3,579.61
	11/3/2015		(a) (a)	33.54	(a)	3,579.65
	4/29/2016	<u> </u>	(a) (a)	33.82	(a)	3,579.05
	11/16/2016		(a) (a)	34.15	(a)	3,579.04
	5/22/2017	1	(a)	dry	(a)	NA
	11/13/2017	1	(a)	33.48	(a)	3,579.71
	6/1/2018	İ	(a)	34.00	(a)	3,579.19
	11/6/2018		(a)	33.31	(a)	3,579.88
	6/24/2019			Not Ga		
	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			28.97		3,578.87
			(a)	28.81	(a)	3,579.03
	1/5/2020 5/13/2020		(a)	29.05	(a)	3,579.03
	11/10/2020		(a)	29.05	(a)	
SVE-30		NIA	(a)		(a)	3,578.11
SVE-30	3/10/2009	NA	(a)	39.32	(a)	NA
	10/8/2009		(a)	39.29 40.28	(a)	NA NA
	3/22/2010		(a)		(a)	
	4/17/2011		(a)	40.11	(a)	NA NA
	12/22/2011		(a)	41.11	(a)	
	4/17/2012		(a)	41.65	(a)	NA
	10/18/2012		(a)	41.42	(a)	NA
	4/15/2013	0040.00.(1.)	(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
	<u>11/21/2014</u> 4/21/2015		(a)	43.30 41.80	(a)	3,572.70 3,574.20
	11/3/2015		(a)		(a)	
	4/28/2016		(a)	41.60	(a)	3,574.40
			(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	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
	4/17/2012		(a)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013			dry	\sim	NA
	11/3/2013	2612 67 (h)	(a)		(a)	NA
	5/1/2014	3612.67 (h)	(a) (a)	dry dry	(a) (a)	NA
	11/21/2014		(a)	30.27	(a)	3,582.40
	4/21/2015			30.27	(a)	3,581.70
			(a)		()	
	11/3/2015		(a)	30.200	(a)	3,582.47
	4/28/2016		(a)	30.35	<u>(a)</u>	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 11/6/2018		(a) (a)	dry 30.24	(a) (a)	NA 3,582.43
	6/24/2019		(a)	dry	(a)	3,562.45 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

** 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.

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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
NMW	QCC 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	Indwater 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.

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FIGURES



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































ATTACHMENT

Received by OCD:	10/21/202	2 8:48:57 AM				·		Page 54 of 193
Cypress F	nainer	ering Services, I	Inc	F	IELD	BOREH	OLE LOG	
10235 West	-	-		В	OREH	OLE NO.: MP	PE-1	
Suite 256				T	OTAL I	DEPTH: 79'		
_ Uston, Tex	(as 7704))-3229			_			
	CT INFO	RMATION				NG INFORMA		_
PROJECT:		mediation Drilling		LLING C	20.:		ngineering	
SITE LOCATION:	ТМ	VP Roswell Station 9		LLER:		Mort Bat		!
JOB NO.:		202203	_	TYPE:		Mobile D		
LOGGED BY:		Bates					ollow Stem Auger	
1		orge Robinson, PE				DDS: Split Spo		
DATES DRILLED:	12/	06/02	HAN	IMER W	/T./DRC	DP 140 lb., 3	0 in.	
NOTES: 4" SCH	40 PVC M	PE Well				during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	S USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
	~	۱ 			·			
		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'	
-35-		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 Sand Pack 79'-49', Bentonite Seal 49'-46', CLAYEY SAND: Reddish Tan Soft Meist No Odor					Bentonite 46' Top Sand 49' Top Screen 54'	Ĩ
-707575		Tan, Soft, Moist, No Odor or Staining Depth to Water 61.03' BGS 12/07/02					Sump 74'-79' TD 79'	

Receiv	ved by OCD: 10	/21/2022	8:48:57 AM				No tan		Page 55 of 193	
10 Su	235 West Li uite 256	ittle Yorl		Inc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-2		
_ 💌	PROJECT		RMATION		DRILLING INFORMATION					
PROJE	······································		mediation Drilling		LING (gineering	-	
	OCATION:		P Roswell Station 9		LER:		Mort Bat	0		
JOB N			02203		TYPE:			Rand A-300		
LOGGE	ED BY:		A. Barnhill, PG	MET	HOD O	F DRIL	LING: HSA 81/4	" Augers	i	
PROJE		R: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo	n		
DATES	DRILLED:	12/2	21-24/02	НАМ	MER W	/T./DRC	OP 140 lb., 30) in.		
NOTES	: 4" SCH 40	0 PVC M	PE Well				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 -40 -45 -55 -55 -65 -70 -75 -85 -85		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 09-][

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 O_l 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'

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Received by OCD: 10/21/20	22.8:48:57 AM	···· ···		-	·	·	Page 57 of 193
Cypress Engin	ering Services,	Inc.				OLE LOG	
10235 West Little Y	ork Road		1		OLE NO.: MP	E-4	
Suite 256 buston, Texas 770	40 2220			UTAL	DEPTH: 79'		I
PROJECT INF			1	DRILLI	NG INFORMA	TION	
	Remediation Drilling	DRIL	LING			ngineering	-
-	WP Roswell Station 9	DRIL	LER:		Mort Bat		
JOB NO.:	2-202203	RIG	TYPE:		Mobile D	rill B-68	1
LOGGED BY:	C.M. Barnhill	MET	HOD O	F DRIL	LING: 8 1/4'' He	llow Stem Auger	
PROJECT MANAGER: (George Robinson, PE	SAM	PLING	METHO	ODS: Split Spoo) n	
DATES DRILLED: 1	2/18-19/02	HAM	MER W	/T./DRO	OP 140 lb., 30) in.	
NOTES: 4" SCH 40 PVC	MPE Well				during drilling in completed well	Page 1 of 1	
DEPTH SYMBOLS USC	S SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -25 -30 -45 -55 -60 -70 -75 -75 -75 -75 -55 -70 -75 -55 -55 -70 -75 -55 -70 -75 -55 -75 -75 -75 -55 -75 -75	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' TD 79'	
-85-							

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			ring Services, I	nc.	F	IELD	BOREH	OLE LOG	
	235 West Lif				B	OREH	DLE NO.: MP	E-5	
	ite 256				T(DTAL [DEPTH: 79'		
	uston, Texa			- 1					
<u>. </u>	PROJECT	INFOF	RMATION			DRILLING INFORMATION			
PROJE	CT:		nediation Drilling		LING C	:0.:	Atkins En		
SITE LO	OCATION:	TW	P Roswell Station 9	DRILI			Mort Bat		
JOB NO			02203	RIG T			Mobile D		
LOGGE			1. Barnhill					llow Stem Auger	
		R: Geo	orge Robinson, PE				DS: Split Spot		
DATES	DRILLED:	12/1	16/02	HAM		/T./DRC) in.	
NOTES	: 4" SCH 40) PVC M	PE Well				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>	GM		<u> </u>		[]	[]		
-5 -10 -20 -25 -30 -35		Cngl.	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.					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'	

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0/21/2022	2 8:48:57 AM				·		Page 59 of 193
Cypress Engineering Services, In 10235 West Little York Road Suite 256 Juston, Texas 77040-3229					OLE NO.: MP		
	RMATION			DRILLI	NG INFORMA	TION	-
Re	mediation Drilling	DRILI	LING C	20.:	Atkins Er	ngineering	
TW	WP Roswell Station 9	DRILI	LER:		Mort Bat	es	
P-2	202203	RIG T	YPE:		Mobile D	rill B-68	
	A. Barnhill					-	
	0						
12/	16-17/02		·	<u> </u>	·) in.	
) PVC M	IPE Well					Page 1 of 1	
USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
GM Cngl. SC CL SC GC GC	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. GM: Harder Drilling, gravel fragments, yellowish color SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor /staining. CL: Strong Clay SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, @ 74' BGS Clay & Sand:,gravel & Clay lenses, TD 79' Water Level @ 65.55' BGS 12/18/02 GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining, Damp					Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' TD 79'	
	Crugl.	ttle York Road s 77040-3229 FINFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill R: George Robinson, PE 12/16-17/02 D PVC MPE Well USCS SOIL DESCRIPTION GM 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. Congl. CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor /staining. CL SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, @ 74' BGS Clay & Sand:gravel & Clay I/18/02 GC GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining, Damp	Agineering Services, Inc. ttle York Road s 77040-3229 FINFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill R: George Robinson, PE 12/16-17/02 PVC MPE Well S O PVC MPE Well S GM GRAVEL AND SAND: 0'- 5': GM mixed with caliche, withe pink, dry 5'-24':GM: Gravel to 4", Lt. Brown, med. dense, dry. GM CONGLOMERATE: Hard Ordiling, well cemented conglomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor /staining. CL SC: Clayey Sand, tan brown tedish sturated @64' BGS, No odor or staining, @74' BGS Clay & Sand; gravel & Clay & Sand; gravel & Clay & Sand; gravel & Clay & Sand; Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining, Damp	Ingineering Services, Inc. F ttle York Road T s 77040-3229 T INFORMATION DRILLING O Remediation Drilling DRILLING O TWP Roswell Station 9 P-202203 C.M. Barnhill METHOD O R: George Robinson, PE SAMPLING 12/16-17/02 HAMMER W VSCS SOIL DESCRIPTION SAMP. # Blows /ft. GM GRAVEL AND SAND: 0'- S': GM mixed with caliche, white pink, dy 5'-24':GM: Gravel, Sand, Sitt, Mixture, gravel to 4", LL Brown, med. dense, dry. GI CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand Lt. Red/ tan brown to light brown redish saturated @64' BGS, No odor or staining, @74' BGS Clay & Clay Lenses, TD 79' Water Level @ 65.55' BGS SC GC: Gravel 10%, Clay30%, fing gr. sand 60%, No odor or Staining, Damp	Ingineering Services, Inc. FIELD borner BOREH- title York Road DRILLING CO.: s 77040-3229 DRILLING CO.: TWP Roswell Station 9 DRILLER: P-202203 DRILLER: C.M. Barnhill METHOD OF DRIL Receive Robinson, PE 12/16-17/02 12/16-17/02 HAMMER WT./DRO D PVC MPE Well Image: Water level USCS SOIL DESCRIPTION SAMP. # Blows /ft. Blows gravel to 4", Lt. Brown, med. dense, dry. PID ppm GM CANGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand Lt. Red/ tan brown, for and brown, fr. to med grained sand, well solded. strong clay fraction, soft, No odor SC SC: Clayey Sand Lt. Red/ tan brown, for and brown fractions, soft, No odor SC SC: Clayey Sand, tan brown to light brown fraction, soft, No odor istaining, gravel & Clay & Sand; sand stare staining, gravel & Clay & Sand; arevel & Clay & Sand; for bow, to dor or staining, gravel & Clay & Sand; for gravel & Clay & Sand; for gravel & Clay & Sand; for for gravel & Clay & Sand; for gravel & Clay & Sand; fo	FIELD BOREH: BOREHOLE NO.: MP TOTAL DEPTH: 79' FIELD BOREH: BOREHOLE NO.: MP TOTAL DEPTH: 79' S 77040-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill Reference Robinson, PE 12/16-17/02 Atkins En CAM. Barnhill Recorge Robinson, PE 12/16-17/02 Value / Vertice Records and the calishe strain park dry 5'-24'GM. Mite park dry 5'-24'GM	FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' S 77040-3229 INFORMATION REMEMBER OF TOTAL DEPTH: 79' DRILLING INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 P202203 CM. Barnhill RIG TYPE: Mobile Drill B-68 CM. Barnhill R: George Robinson, PE 12/16-17/02 SAMPLING METHODS: Split Spoon HAMMER WT/DROP 140 Ib., 30 in. X Water level during dilling Water level in completed well OPUC MPE Well X Water level during dilling Figurents, 952-97. QRILLING SAMP # Blows /ft PID ppm BORING COMPLETION WELL DESCRIPTION CONSLOMERATE: Hard Condition lays: Const. Commented songiomerate or cemented songiomerate or

Receive	ed by OCD: 10	/21/2022	8:48:57 AM					• <u>•</u>	 Page 60 of 193
Cy	press Er	nginee	ering Services, I	nc.	F	IELC) BOREH	OLE LOG	
-	- 235 West Li	-	•		1		OLE NO.: MP	'E-7	
	ite 256				T	OTAL	DEPTH: 79'		
	uston, Texa								
	PROJECT	···	<u> </u>				NG INFORMA	·····	4
PROJE			mediation Drilling			.0.:		ngineering	
	CATION:		P Roswell Station 9				Mort Bat		
			02203				Mobile D		
			Barnhill				DDS: Split Spo	llow Stem Auger	
1	CT MANAGE DRILLED:		orge Robinson, PE			VT./DRO			1
;		12/	10-13/02					· ····	-
NOTES:	4" SCH 40) PVC M	PE Well				during drilling n completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
		·	L,,,,, J	,,		1	/		1
	0000000	GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM:					Cement Grout	
-10-	0,0,0,0		Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					5 17	
			med. dense, dry.						
	0,0,0,0								
-20	0,0,0,0								
-25-									
-30-									
			CONGLOMERATE: Hard						
-35-			Drilling, well cemented conglomerate or cemented						
-40-		Cngl.	sandstone layer.						
-45-			SC: Clayey Sand Lt. Red/						
-50-			tan brown, to tand brown, fn. to med.grained sand,					Bentonite 47'	
		SC	well sorted, strong clay fraction, soft, No odor and					Top Sand 50'	
-55-			staining.					Top Screen 54'	
-60-	8, 8, 8, 6	SC/GC	GC: Gravel 10%,						
		SC	<u>Clay30%, fine gr_sand</u> SC: Clayey Sand, tan						
-70-		50	brown to light brown reddish saturated @63' BGS, No odor or staining,						
-75-		SC	@ 74' BGS Clay & Sand:& Fat Clay lenses, TD 79' Water Level @ 64.79' BGS 12/14/02					Sump 74'-79'	
			000 12/14/02					TD 79'	
-85		SC							
E 00-									
{	ed to Imaging:	11/22/20							



	<u>1/2022 8:</u>	:48:57 AM					
10235 West Little	e York		Inc.	E	OREH	D BOREH OLE NO.: MI DEPTH: 79'	OLE LOG PE-9
ouston, Texas 7							
PROJECT IN						ING INFORMA	
PROJECT:		ediation Drilling			20.:		ngineering
SITE LOCATION:		PRoswell Station 9				Mort Ba	
JOB NO.:	P-202			TYPE:	יר הסיו	Mobile D	
LOGGED BY:		arnhill				DDS: Split Spo	ollow Stem Auger
PROJECT MANAGER: DATES DRILLED:		ge Robinson, PE				• •	
	12/1/	7-18/02					
NOTES: 4" SCH 40 P	PVC MPH	E Well				during drilling in completed well	Page 1 of 1
DEPTH SYMBOLS U	JSCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
0 -5 -10 -10 -20 -20 -30 -45 -55 -55 -55 -55 -55 -55 -55	Service of the servic	GRAVEL 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 SW: Tan to brown, med.	54'-56' 59'-61'	105/16			Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'

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10 Su	235 West Li 235 West Li ite 256 ouston, Texas	ttle York		nc.	BC	DREHO	DLE NO.: MP	DLE L@@@ E-10
	PROJECT	INFOR	MATION	1	. [ORILLI	NG INFORMAT	ION
PROJEC	CT:	Rer	nediation Drilling	DRIL	LING CO	D .:	Atkins En	gineering
SITE LC	CATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	s
JOB NO	4.C.	P-20	02203	RIG	TYPE:		Mobile Dr	ill B-68
LOGGE	D BY:	C. I	Barnhill	MET	HOD OF	DRILL	ING: 8 1/4" Ho	llow Stem Auger
PROJEC	CT MANAGER	Geo	orge Robinson, PE	SAM	PLING M	IETHO	DS: Split Spoo	n
DATES	DRILLED:	12/0	09/02	HAM	MER WT	./DROI	P 140 lb., 30) in.
NOTES	4" SCH 4	O PVC M	PE Well				during drilling in completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
	F02:00:00:00	GM		<u> </u>	()		1	
-5 -	0-0-0-0	CIT I	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink dry 5'-27':GM					Cement Grout
1	0101010		white pink, dry 5'-27':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					3'-47'
-10 -	0101010		med. dense, dry. 27'-30' Hard cemented Conglomerate 30-50'					
-15-	000000000000000000000000000000000000000		SM/SP/SC: Poorly graded sand with clay, red to					
-20	0707070		brown, soft, slightly plastic moist.					
-25-	0-0-0-0							
-30 -		Conglon	CONGLOMERATE					
-35 -	-1-1-1-1-1-		CLAY AND SAND: CH: Red Clayey Sand: lean					
	-7-7-7-7-		clay with sand, med. stiff, plastic, moist.					
-40 -	-7=7=7=7=7=	SC/CL						
-45-	-1-1-1-1-1-1-							
-50-	-7-7-7-7-7-	SW		1. A. A. A.				Bentonite 47' Top Sand 50'
-55-		214	SAND: SW: 50'-59' Fine gr. Sand, tan brown, well sorted, No odor or	49'-51'	18"/50			Top Screen 54'
1			staining.	54'-56'	12"/50			rop porcen of
-60- x		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.,	64'-66'	12"/46			
-70			well sorted, No Odor. Saturated @ 62' BGS		13			
-75-			CLAYEY SAND: Tan	69'-71'	18"/50			Sump 74'-79'
1		SC	Brown / Red tan, Clayey	74'-76'	24"/30			TD 79'
		SC/CL	CLAY: Clay & Sand:& Fat Clay lenses, Dry@ 74" BGS	79'-81'	24"/50			10-23-
-80 -	1111111111		1.01.43				11	

10235 West Life Suite 256 Houston, Texas	ttle York		nc.	BC	DREHO	BOREHO	DLE L.@@64 0 E-11
PROJECT		Provide Contractor	1	. [ORILLI	NG INFORMAT	ION
PROJECT: SITE LOCATION: JOB NO.: LOGGED BY: PROJECT MANAGER DATES DRILLED:	Rer TW P-2 C. 1 Geo	nediation Drilling P Roswell Station 9 02203 Barnhill orge Robinson, PE 07/02	DRILL RIG 1 METH SAMF	LING CO	D.: DRILL IETHOL	Atkins En Mort Bate Mobile Dr ING: 8 1/4" Hol OS: Split Spoo	gineering s ill B-68 llow Stem Auger n
NOTES: 4" SCH 40	D PVC M	PE Well				during drilling n completed well	Page 1 of 1
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
-5 -10 -15 -20 -25 -30 -40 -45 -50 -55 -65 -70 -	GM Cngl. SC/CL 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. 24'-32': Hard cemented Conglomerate / Hard drilling CONGLOMERATE: Hard Drilling, well cemented CLAYEY SAND: SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fine to medium grained sand, well sorted, strong clay fraction, soft, Saturated @ 60' BGS Slight odor and staining, strong contamination in capillary fringe 55'-60' BGS, gray black stain to sandy clay with strong hydrocarbon odor. No PSH in well Water @ 60.90' BGS 12/09/02					Cement Grout 3'-47' Bentonite 47' Top Sand 50' Top Screen 54'
-75-	СН	CLAY: Clay & Sand:& Fat Clay lenses, Dry					Sump 74'-79'

10235 West Li Suite 256 Houston, Texas	ttle York s 77040	-3229	inc.	BOTO	OREHO	DLE NO.: MP DEPTH: 79'	
PROJECT PROJECT: SITE LOCATION: JOB NO.: LOGGED BY: PROJECT MANAGER DATES DRILLED:	Rea TW P-2 C. 1 C. 1	MATION mediation Drilling P Roswell Station 9 02203 Barnhill, / M. Bates orge Robinson, PE 03-06/02	DRIL RIG T METH SAMP	LING CO	D.: DRILL METHOD	Mort Bate Mobile Dr ING: 8 1/4" Hol DS: Split Spoo	ngineering es ill B-68 llow Stem Auger n
NOTES: 4" SCH 4	O PVC M	PE Well				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 -30 -35 -40	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'
-45 -50 -55 -60	SP/SC	CLAYEY SAND: SP/SC: 50'-75' Poorly Graded					Bentonite 48' Top Sand 51' Top Screen 54'
-65 -70 -75 -75	SP/SC	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					Sump 74'-79'
-80	CL	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @79' SP/SC Poorly Graded sand with clay					TD 79'

10 Su	of by OCD: 10 Press En 235 West Lif ite 256 uston, Texas	ttle York		nc.	BC	DREHO	BOREHO	DLE L @ 66 0 E-13
	PROJECT	INFOR	MATION	2.00	[ORILLIN	IG INFORMAT	ION
PROJEC	CT:	Ren	mediation Drilling	DRIL	LING CO	D .:	Atkins En	gineering
SITE LC	CATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	s
JOB NO	£	P-2	02203	RIG	TYPE:		Mobile Dr	ill B-68
LOGGE	D BY:	C. I	Barnhill, / R. Marshal	MET	HOD OF	DRILLI	NG: 8 1/4" Ho	llow Stem Auger
PROJEC	CT MANAGER	Geo	orge Robinson, PE	SAM	PLING N	IETHOD	S: Split Spoo	n
DATES	DRILLED:	12/0	02-03/02	HAM	MER WI	/DROF	2 140 lb., 30	in.
NOTES	4" SCH 40	O PVC M	PE Well				during drilling n completed well	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
× ٦	6.6.6.8	GM	GRAVEL AND SAND: 0'-					
-5 -	0707070		5": GM mixed with caliche, white pink, dry 5'-33":GM: Gravel, Sand, Silt, Mixture,				1111 VIII	Cement Grout 3'-46'
-10			gravel to 4". Lt. Brown,					5 10
	0707070		med. dense, dry. 5'-15' SM/SP/SC: Poorly graded sand & Silt @33' Sand					
-15-	0707070		with clay, red to brown, soft, slightly plastic, moist.					
-20-	0707070		40"-49": CL/SC: Lean clay with sand, red, medium stiff, plastic moist.					
-25-			sun, plastic molat.					
-30-								
	0000000	SC/CL	CLAYEY SAND: SC/CL					
-35-	=====		Clayey Sand , Red med- fine gr. well sorted sand					
-40-	1111111		with strong clay fraction CLAY: CH: Red Clayey					
-45			Sand: lean clay with sand, med. stiff, plastic, moist.					2000 Cale 100
-50-			CLAYEY SAND: SP/SC:					Bentonite 46'
1		SP/SC	50'-75' Poorly Graded Sand with clay ,no odor					Top Sand 50.7'
-55-			Saturated @60' BGS TD 79' Riser 79'-74', 0.020					Top Screen 54'
-@-	2222		Slot Screen 74'-54', 12/20 Sand Pack 79'-49', Bentonite Scal 49' 47'					
-65-		SP/SC	Bentonite Seal 49'-47', Cement Grout 47'-3'					
-70-		007.00						· · · · · · · ·
1	C.I.I.I		CALCAREOUS					2 (10 11 10 10
-75-	I:I:I:I	CL	SANDSTONE: Hard					Sump 74'-79'
-80		CL	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @79' SP/SC Poorly Graded sand with clay				Const Lange	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			iter level iter level	-	rilling eted well	Page 1 of 1
DEPTH SYMBOL	s USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm		RING PLETION	WELL DESCRIPTION
0 -5 -10 -20 -20 -30 -40 -45 -55 -60 -75 -75 -75 -75 -75 -75 -75 -75	<u>Rurururururururururururu</u> B	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	ed by OCD: 10/	21/2022	8:48:57 AM							
	Inrose Er	ainoc	ring Services,	Inc	F	IELD) BOREH	OLE LOG		
-	•	0	-	nic.	BOREHOLE NO.: MPE-15					
	235 West Li ite 256	ttle Yori	K ROAD		TOTAL DEPTH: 79'					
	uston, Texa	s 77040)-3229							
	PROJECT	RMATION			DRILLI	NG INFORMA	TION			
PROJE	CT:	Rei	mediation Drilling	DRII	_LING (00.:	Atkins En	igineering		
SITE LO	DCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bat	es		
JOB NO).:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGE	D BY:	Ric	k Smith, PG	MET	HOD C	F DRIL	LING: 8 1/4" Ho	llow Stem Auger		
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spoc) 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				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 7	KZANZAN ZAN					·	·	······		
-5 -10 -10 -10 -10 -10 -10 -10 -10 -10 -10		GM	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					Cement Grout 3'-49'		
-20			moist @ 40' BGS							
-25-										
-30 -										
-35-										
-45		CL	CLAY: CH: Red Clayey Sand: lean clay with sand, mod stiff, plastic, moist							
-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, fragements of sandstone	59'-61'	24"/41			Top Screen 59'		
-65-			as gravel, hard drilling 65'- 71', No odor or staining. TD 79' Saturated @ 60'	64'-66'	14"/50					
-70-			BGS Cement / Bentonite Grout 49'-3' Bentonite 49'-54' 12/20 Sand Pack '	69'-71'	24"/50			Sump 74'-79' TD		
Õ		SP/SC	54'-74' 0.020 Slot Screen 74'-59' Riser 74'-79' No Odor or Staining at TD	74'-76'	20"/70			79'		
-85-			-	79'-81'	24"/74					
E ₀₀₋							L			

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Received by OCD: 10/21/202	2 8:48:57 AM					
Cypress Engine 10235 West Little Yo uite 256 ouston, Texas 7704	rk Road 10-3229	Inc.	B	OREH OTAL I	OLE NO.: MP DEPTH: 79'	
PROJECT INFC	RMATION				NG INFORMA	TION
PROJECT: Re	emediation Drilling	DRIL	LING (:00	Atkins Ei	ngineering
SITE LOCATION: T	WP Roswell Station 9	DRIL	LER:		Mort Bat	es
JOB NO.: P-	202203	RIG	TYPE:		Mobile D	rill B-68
	Barnhill, / R. Marsha					llow Stem Auger
PROJECT MANAGER: Ge	eorge Robinson, PE				DDS: Split Spoo	n
DATES DRILLED: 11	/26-27/02	HAMI	MER W	/T./DRC	DP 140 lb., 30) in.
NOTES: Strong PsH in	Soil Boring				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 -0 -10 -10 -20 -20 -30 -40 -40 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	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.					Cement Grout 3'-47'
-45 - -50 - -55 - -65 - -70 - -75 - -75 - -70 - -75 - -75 - -70 - -75 - -75 - -76 - -76 - -77 - -75 - -76 - -77 - -75 - -76 - -77 - -75 - -75 - -75 - -75 - -76 - -77 - -75 - -76 - -77 br>-77	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown,	54'-56' 59'-61' 64'-66' 69'-71' 74'-76'	41"/18 22"/24 12"/34 12"/34 24"/18 24"/18 24"/32 6"/51			Bentonite 47' Top Sand 49' Top Screen 54' Sump 74'-79' TD 79'

Receiv	ed by OCD: 10	/21/2022	8:48:57 AM						Page 70 of 1
Ċ	ypress Er	nginee	ering Services,	Inc.				OLE LOG	
	235 West Li	-	•				OLE NO.: MP	E-17	
	ite 256					OTAL	DEPTH: 75'		
	ouston, Texa								-
			RMATION				ING INFORMA		-
PROJE		Rei	mediation Drilling		LLING C	0.:		gineering	
	OCATION:	ТМ	P Roswell Station 9		LER:		Mort Bat	es	
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	
LOGGE			k Smith, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJE	CT MANAGE	R: Ge	orge Robinson, PE	SAN	IPLING	METH	ODS: Split Spoo	n	
DATES	DRILLED:	11/2	20/02	HAN	IMER W	/T./DR	OP 140 lb., 30) in.	
NOTES	: PsH@ 61.	75 ' H20@	66.25'(BGS)11/25/0	2			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		[·]	e1	r] []		
-5 -		GM	GRAVEL AND SAND: GM: 0'-4' BGS White Pink					Cement Grout	
-, -, -,			Caliche, Hard, Dry 4'-43' :Gravel, Sand, Silt,					3'-46'	
-10 -	0-0-0-0		Mixture, gravel to 4", Light Brown, medium dense,						
	0,0,0,0		dry, No odor						
-20-	0-0-0-0								
	0,0,0,0								
-25-	0.000000								
-30-	0,0,0,00								
-35-	0,0,0,0								
-40	0707070								
	$\begin{array}{c} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ \end{array}$	SP/SC							
-45-]		51,50	CLAYEY SAND: SP-SC: Poorly graded Sand with					Bentonite 46'	
-50-			clay, red to strong brown, soft moist, slight odor					Top Sand 49'	
-55-		CL	CLAY AND SAND: CL: Lean clay with sand, red,					Top Screen 55'	
-60-			medium stiff, plastic, moist, moderate odor					TOP DOTECH 22	
		SP/SC	CLAYEY SAND: SP-SC:						
- ۲			Poorly graded sand with clay, It. red brown, med to						
-70 -		SP/SC	loose, moist, dense. Mod.odor, increased					aviet to a	
-75 -			drilling rate. TD 75' BGS Strong Odor @ 70' BGS 5'						
			sump 70'-75', 0.020 slot screen 55'-70', 12/20 Sand		[[
			49'-75', Bentonite 46'-49', cement grout 3'-46'						
-85-			11/25/02: PsH@61.75' (BGS)						
E ₋₉₀ -			· · · · · · · · · · · · · · · · · · ·						

Receive	ed by OCD: 10/	/21/2022 8	8:48:57 AM		1			· · ·	Page 71 of 193
10: 	235 West Lit ite 256	ttle Yorl		nc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-18	
	uston, Texa	· · · · ·							
	PROJECT						NG INFORMA	,,,,	-
PROJE			nediation Drilling		LING (20.:		ngineering	
	DCATION:		P Roswell Station 9		LER:		Mort Bat		
JOB NO			02203		TYPE:		Mobile D		
LOGGE			k Smith, PG					llow Stem Auger	
			orge Robinson, PE				DDS: Split Spoo		
DATES	DRILLED:	11/2	21/02	HAM	MER V	VT./DRC	OP 140 Ib., 30) in.	-
NOTES	: 4" SCH 40) PVC M	PE Well				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 -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. reddish -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'-					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'						

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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	
] .	Cypress Engineering Services, II 10235 West Little York Road					BOR	EHOL	.E NO.: MF	PE-19	
Suite 256		lue for	K ROAU		TOTAL DEPTH: 79'					
	louston, Texas 77040-3229									
PRO	PROJECT INFORMATION					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					ng drilling ompleted well	Page 1 of 1	
DEPTH SYMB		USCS	SOIL DESCRIPTION	SAMP. #	# Blow / ft.	vs PII pp		BORING COMPLETION	WELL DESCRIPTION	
م صور م										
	<u>o</u> :0	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							
	0.5.0		brown, soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay with sand, red, medium stiff, plastic moist.							
-25 - 07070 07070 -30 - 07070	⊘ - · OII		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' Top Sand 46'	
-45-									Top Dana 40	
-50		SP/SC	CLAYEY SAND: SP/SC: 50'-75' Poorly Graded	49'-51'	24"/	19			Top Screen 49'	
-55 -			Sand with clay slight odor . TD 79' Saturated @ 54'	54'-56'	18"/	11				
-60 -			BGS No staining or odor at 75'-TD	59'-61'	24"/					
-65-		SP/SC								
-70 -		51/50		64'-66' 69'-71'	24"/	ll l				
-75-	\sum	CL /	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown,	74'-76'	24"/2	6			Sump 74'-79' TD 79'	
10235 West Li Suite 256 Uston, Texa PROJECT: SITE LOCATION: JOB NO.: LOGGED BY: PROJECT MANAGE DATES DRILLED:	ttle York s 77040 INFOF Ren TW P-2 Ric R: Geo 11/2	ering Services, < Road 0-3229 RMATION nediation Drilling /P Roswell Station 9 02203 k Smith, PG orge Robinson, PE 19-20/02	DRIL DRIL RIG MET SAM HAM	LING (LER: TYPE: HOD O PLING	OREH OTAL I DRILLI CO.: F DRIL METHO /T./DRO	OLE NO.: MP DEPTH: 78' NG INFORMA Atkins En Mort Bate Mobile Du LING: 8 1/4" Ho DDS: Split Spoc	TION ogineering es rill B-68 llow Stem Auger on) in.	Page 73 of 193		
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PsH@ 60.0)2' H2O	@ 61.50' BGS		🗶 Wa	ter level i	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 -25 -30 -40 -45 -5 -5 -5 -5 -5 -10 -10 -10 -10 -10 -10 -10 -10	GM SP/SC CL	GRAVEL AND SAND: 0'- 8': GM mixed with caliche, white pink, dry 8'-39':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 39'-42' SP/SC: Poorly graded sand with clay, red to brown,k soft, slightly plastic, moist. 42'-49': CL: Lean clay with sand, red, medium stiff, plastic moist. CLAY AND SAND: CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist.					Cement Grout 3'-39' Bentonite 39' Top Sand 42'			
-50 -55 -65 -70 -75	SP/SC SP/SC CL	Psh : 60.02', H2O 61.50' CLAY AND SAND: Clay & Poorly graded sand, yellow CLAYEY SAND: SP/SC: 54'-75' Poorly Graded Sand with clay , strong odor & staining @ 65'-75'. TD 78' Saturated @ 60' BGS Wet with PsH @65' BGS PsH @ 60.02' H2O @ 61.50 BGS No staining or odor at 75'-TD CLAY: CL: Sandy Lean	69'-71'	24"/51 24"/51 24"/33 24"/51 24"/44 24"/20			Top Screen 48' Sump 73'-78' TD 78'			
-859090	SP/SC	Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @78' SP/SC Poorly Graded sand with clay & gravel, red. med. dense.	79'-81'	6"/51						

Received by OCD: 10/21/20	22 8:48:57 AM	_					_Page 74 of 193
Cypress Engine 10235 West Little Y	eering Services,	Inc.	В	OREH	DLE NO.: MP	OLE LOG E-21	
Suite 256	10 3000			JIALI	DEPTH: 69'		
PROJECT INF	· · · · · · · · · · · · · · · · · · ·		I Г		NG INFORMA		- -
	Remediation Drilling	DRILL				igineering	
	WP Roswell Station 9	DRILL		•	Mort Bat	0 0	
	P-202203	RIG T			Mobile D		
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	\ ▼			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'	

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Received by OCD: 10/21	/2022 8	8:48:57 AM				·		Page 75 of 193
	ginee e Yorl	ering Services, I ^{k Road}	nc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-22	
PROJECT		······			DRILLI	NG INFORMA	TION	1
PROJECT:		mediation Drilling	DRIL	LING (20.:	Atkins Er	ngineering	
SITE LOCATION:		P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG ⁻	TYPE:		Mobile D	rill B-68	
LOGGED BY:	Jim	a Chionis	METH	HOD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger	
PROJECT MANAGER	Gee	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spo	on in the second s	
DATES DRILLED:	11/	07/02	HAM	MER W	/T./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 40	PVC M	PE Well				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 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -		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'	

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Receiv	ved by OCD: 10	/21/2022	8:48:57 AM						Page 76 of 193
	ypress Er 235 West Li	-	ering Services,	Inc.			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				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 /	CLAYEY SAND: Dark					Top Sand 52' Top Screen 55'	
		СН	CLAYEY SAND: Dark Stained, Hydrocarbon CLAYEY SAND: TD 80'						
-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'	

Receiv	<u>ed by OCD: 10</u>	/21/2022	8:48:57 AM			·	· ··· ···	
Cy	press Er	nginee	ering Services,	Inc.				OLE LOG
	235 West Li	ttle Yorl	< Road				OLE NO.: MP DEPTH: 74'	E-24
	ite 256	- 770 <i>40</i>	2220			UTAL	UEFIN, /¥	
	PROJECT					ווופח	ING INFORMA	
					LLING (ngineering
PROJE	DCATION:		nediation Drilling /P Roswell Station 9		LLER:		Mort Bat	2 2
JOB NO					TYPE:		Mobile D	
LOGGE			02203					ollow Stem Auger
	CT MANAGE		l Barnhill, PG				DDS: Split Spo	_
	DRILLED:		orge Robinson, PE		MER V			
		11/.	11-13/02				·	
NOTES	: 4" SCH 4() PVC M	PE Well				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 -1		GM]		
-5 -			COLLUVIUM: Hard White Caliche 0'-4'					Cement Grout
-10		CL	CLAYEY SAND: Clayey GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					3'-43'
-20-								
-25 -								
-30-		СН	CONGLOMERATE: Hard					
-35 -			CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Damp @40', Perched Aquifer? Strong					
-40-	ANN 18		Contamination & Odor, Black Streaks in Clayey					
-45-			Sand					Bentonite 43' Top Sand 46'
-50-	UIIIII)			49'-51'				Top Screen 49'
-55		CL /	CLAYEY SAND: TD 79'		33/24"			
-60 -		СН	Saturated @ 58' BGS Cement / Bentonite Grout 43'-3' Bentonite 43'-46'	54'-56' 59'-61'	39/24" No			
-65			12/20 Sand Pack ' 46'-74' 0.010 Slot Screen 74'-49' Strong Contamination & Odor, Black Gray Color		SPT			
-70-			Water Level 58.27' TOC	70'-72'	80/16"			TD 74'
-75-			CALCAREOUS SANDSTONE: Calcareous Cement, White, fine gr., Hard Drilling, Dry, No Odor or Staining	74'-76'	50/24"			

Received by OCD: 10/2	21/2022	8:48:57 AM					
10235 West Litt	le Yorl		Inc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-25
buston, Texas			· · · · · · · · · · · · · · · · · · ·				
PROJECT						NG INFORMA	
PROJECT:		nediation Drilling	DRILL		:0.:		ngineering
SITE LOCATION:		P Roswell Station 9	DRILL			Mort Bat	
JOB NO.:		02203	RIGT			Mobile D	
LOGGED BY:		Chionis					llow Stem Auger
PROJECT MANAGER						DDS: Split Spoo	
DATES DRILLED:	11/0	04/02			/T./DRC	· · · · · · · · · · · · · · · · · · ·	J in.
NOTES: 4" SCH 40	PVC M	PE Well	x			during drilling n completed well	Page 1 of 1
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION		Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
					·····	·	
	GM	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 - 455055	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' 12/20 Sand Pack ' 51'-79'					Bentonite 48' Top Sand 51' Top Screen 54'
-7075		0.010 Slot Screen 79-54' CLAYEY SAND: Water Level @ 60.20' from BGS 11/05/02 No Odor or hydrocarbon staining.					

Received by OCD: 10/	21/2022	8:48:57 AM					-	- Page 79 of 19
Cypress Eng 10235 West Littl	-	ring Services,	Inc.	В	OREH	OLE NO.: MP	OLE LOG PE-26	
Suite 256				T	OTAL I	DEPTH: 84'		
buston, Texas								-
PROJECT				tu		NG INFORMA		
PROJECT:		nediation Drilling			20.:		ngineering	
SITE LOCATION:		P Roswell Station 9				Mort Bat		
JOB NO.: LOGGED BY:		02203		TYPE:		Mobile D	ollow Stem Auger	
PROJECT MANAGER		Chionis orge Robinson, PE				DDS: Split Spo		
DATES DRILLED:)5-06/02						
	11/(JJ-00/02			<u> </u>	during drilling		
NOTES: 4" SCH 40	PVC M	PE Well				n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 -10 -10 -10 -10 -10 -10 -10 -10	ЭМ	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2" @ 25' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Moist Light Hydrocarbon Odor 35'-40' BGS	49'-51' Rec. 2' 54'-56'				Cement Grout 3'-47' Bentonite 47' Top Sand 49' Top Screen 54'	
-657075 -	л / лн	Saturated @ 65' BGS Cement / Bentonite Grout 47'-3' Bentonite 47'-49' 12/20 Sand Pack 49'-85' 0.010 Slot Screen 84'-54' CLAYEY SAND: Water Level @ 61.20' from BGS 11/08/02 No Odor or hydrocarbon staining. CLAY: Red Brown Fat	Rec. 2' 59'-61' Rec. 2' 64'-66' Rec.1.5' 69'-71' Rec. 2' 74'-76' Rec. 2' 79'-81'	15 28				
-85 - -90	Ή		Rec. 2' 84'-86' Rec. 2'	>50			T.D.084'	

Received by OCD: 10/21/	2022 8:48:57	7 AM						_Page 80 of 193
Cypress Eng	neering	Services,	Inc.				OLE LOG	
10235 West Little	York Roa	ıd					E-2/	
Suite 256	2010 200	n			UTAL	DEPTH: 79'		
PROJECT II					ווופח	NG INFORMA		-
PROJECT:	· · · · · · · · · · · · · · · · · · ·	tion Drilling		LLING			igineering	
SITE LOCATION:		swell Station 9		LLER:	00	Mort Bat		
JOB NO.:	P-202203			TYPE:		Mobile D		
LOGGED BY:	CM Bari						llow Stem Auger	
PROJECT MANAGER:		Robinson, PE				DDS: Split Spot	-	
DATES DRILLED:	10/31/02	Coomson, 1 E			VT./DRO			
	10/51/02				· · · · ·	during drilling		4
NOTES: 4" SCH 40 F	VC MPE We	11				in completed well	Page 1 of 1	
DEPTH SYMBOLS U	scs soi		SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
	GM: G	EL AND SAND: ravel, Sand, Silt,		· · · · · · · · · · · · · · · · · · ·			Cement Grout	
-5 -10 -10 -20 -30 -30 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	Mixture Srong	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 Hydro 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 Contamination					Bentonite 40' Top Sand 48' Top Screen 54'	
-55	Strong	Contamination	SPT	46 Blows				
-65 - CL								
-75								
-								

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10235 West Litt	-	ring Services, « Road	Inc.	B	OREH	DEPTH: 821	E-28	
Suite 256	\$ 77040	1-3229			UTAL	DEFTH. 02	(Casing 76')	1
PROJECT					DRILLI	NG INFORMAT	ΓΙΟΝ	
PROJECT:		nediation Drilling	DRII	LING C	20.:	Atkins En	gineering	-
SITE LOCATION:	ТW	P Roswell Station 9	DRI	LER:		Mort Bate	es	
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile Dr	-ill B-68	
LOGGED BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4'' Hol	llow Stem Auger	
PROJECT MANAGEF	R: Geo	orge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spoo	n	
DATES DRILLED:	10/3	30-31/02	HAN	IMER W	/T./DRC	OP 140 lb., 30	in.	
NOTES: 4" SCH 40	PVC M	PE Well				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 -5 -10 -10 -20 -20 -20 -25 -30 -40 -45 -50 -10 -25 -25 -25 -25 -25 -25 -25 -25	CH CL / CH GYPSUM CL	@ 56'	SPT SPT SPT SPT	32 Blows 25 Blows 50 Blows 50 Blows 50 Blows			Cement Grout 3'-40' Bentonite 40' Top Sand 43' Top Screen 46'	

Cypress Engineering Services, Inc.	HOLE LOG PE-29
10235 West Little York Road Suite 256 TOTAL DEPTH: 79	
ouston, Texas 77040-3229	
PROJECT INFORMATION DRILLING INFORM	ATION
PROJECT: Remediation Drilling DRILLING CO.: Atkins	Engineering
SITE LOCATION: TWP Roswell Station 9 DRILLER: Mort B	ates
JOB NO.: P-202203 RIG TYPE: Mobile	Drill B-68
LOGGED BY: CM Barnhill, PG METHOD OF DRILLING: 8 1/4" I	Iollow Stem Auger
PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Sp	00n
DATES DRILLED: 11/01-02/02 HAMMER WT./DROP 140 Ib.,	30 in.
NOTES: 4" SCH 40 PVC MPE Well well Water level during drilling Water level in completed well	Page 1 of 1
DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING COMPLETIO	WELL DESCRIPTION
-5 -10 -10 -10 -10 -10 -10 -10 -10	Cement Grout 3'-48'
-20 Data and also for Discossioned Disco	
-35 - CH CLAY: CH : Fat Clay Mixes with Red Clayey Sand No Contamination Blows Blows	
12" 8 Blows	
-45	
-55 CL / CLAYEY SAND: CH CLAYEY SAND: Saturated from 60'-TD No	Bentonite 48'
Contamination Split Spoon Sample 58'–60' at CL CL Capillary Fringe for	Top Sand 51' Top Screen 54'
-65 - Geotechnical and Heterotropic Bacteria Blows 6": 3 Blows	
-70 - 12" 8 Blows 18" 7	
-75 - Blows 24" 8 Blows	

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Cypress Eng 10235 West Litt Suite 256 Jouston, Texas	tle Yorl		nc.	В	OREH	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				during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 -10 -10 -10 -20 -20 -25 -30 -40 -45 -55 -60 -55 -60 -55 -65 -55 -55 -65 -55 -55 -55	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'	

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mound by to the 10	/21/2022	8:48:57 AM					
Cypress Er	nainee	ering Services, I	nc.	F	IELC	BOREH	OLE LOG
10235 West L	•	•		B	OREH	OLE NO.: MP	E-31
Suite 256				Т	OTAL I	DEPTH: 80'	
buston, Texa						· · · · · · · · · · · · · · · · · · ·	<u></u>
		RMATION			· -•·	NG INFORMA	
PROJECT:		mediation Drilling		LING C	:00		ngineering
SITE LOCATION:		VP Roswell Station 9	DRILI			Mort Bat	
JOB NO.:		02203	RIG T			Mobile D	
LOGGED BY:		1 Barnhill, PG					llow Stem Auger
PROJECT MANAGE		orge Robinson, PE				DDS: Split Spoo	
DATES DRILLED:	10/	28/02	HAMN	·	/T./DRC) in.
NOTES: 4" SCH 4	0 PVC M	PE Well				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	1		
		GRAVEL AND SAND: Hydrocarbon Odor 23'-33'					
	СН						
-25 - 0.200 200 -30 - 0.200 200 -35	СН	Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey					
-25 - 0.2000 -30 - 0.2000 -3535 -	СН	Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red					
-25 - 0.2000 -30 - 0.2000 -354045	СН	Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red					Top Bentonite 55'
-25 - 0.200 2.00 -30 - 0.200 2.00 -35	СН	Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses					55' Top Sand 58'
-25 - 0.200 200 -30 - 0.200 200 -35	CH	Hydrocarbon Odor 23'-33' CLAY: CH: Red Clayey Sand mixed with Fat Red					55'

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Cypress End	ainee	ering Services,	Inc.	F	IELC	BOREH	OLE LOG	
10235 West Litt	•	•		B	OREH	OLE NO.: MP	E-32	
Suite 256				T	OTAL	DEPTH: 79'		
buston, Texas								-
PROJECT						NG INFORMA	- <u>-</u>	
PROJECT:		mediation Drilling			20.:		ngineering	· · · · ·
SITE LOCATION: JOB NO.:		VP Roswell Station 9		LER: TYPE:		Mort Bat Mobile D		
LOGGED BY:		02203			וופס א		llow Stem Auger	
PROJECT MANAGER		k Smith, PG orge Robinson, PE				DDS: Split Spo		
DATES DRILLED:		18-19/02			VT./DR	• •		1
NOTES:	11/					during drilling		
NOTES. 4" SCH 40	PVC M	PE Well				in completed well	Page 1 of 1	1
DEPTH SYMBOLS	uscs	SOIL DESCRIPTION	Samp. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	i
			······			·		
	SM	GRAVEL AND SAND: 0'- 3': GM mixed with caliche, white pink, dry 3'-42':GM:					Cement Grout 3'-36.60'	
		Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, No Odor						
		med. dense, No Odor						
							[
-30 - 0.00000								
							Bent. 36.60'	
	M						Top Sand 39.20'	
-45-	н	CLAY: CH: 42'-54': Fat Clay with Sand, red, medium stiff, plastic, very					Top Screen 44'	
-50 -		moist at contact, No odor. Water Level @ 55.20'		1				
- 3	L/CH	BGS 11/25/02 CLAYEY SAND: CL: 54'-						
-60		79' Sandy lean clay red/ brown, med. stiff, moist,		3				
		moderate odor, no staining. Trace gravel @						
-65		57', slow drilling, TD 79' Grout 36'-3' Bentonite 36'-						
-70 -		39' Sand 39'-79' 0.020 Screen 74'-44' Riser 74'- 79'					Sump 741 701	
							Sump 74'-79' TD 79'	
-85								
					i	۱ ا		I

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-	/ press Er 235 West Li	-	ring Services, I	nc.			D BOREHO			
	ite 256		(NOAG		TOTAL DEPTH: 79'					
	ouston, Texa	s 77040)-3229							
	PROJECT	T INFOF	RMATION	_		DRILLI	NG INFORMAT		_	
PROJE	CT:	Rer	nediation Drilling	DRIL	LING C	:0	Atkins En	gineering		
SITE LO	DCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	es		
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile Dr	·ill B-68		
LOGGE	ED BY:	Ric	k Smith, 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:	11/2	18/02	НАМ	IMER W	/T./DRC	OP 140 lb., 30	in.		
NOTES	: 4" SCH 4	0 PVC M	PE Well				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 -55 -60 -65 -70 -75 -85 -85			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'		
-75-1		11/22/20	22.0.27.14.444					TD 79'		

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Cypress Er	nginee	ering Services,	Inc.				OLE LOG	
10235 West Li	ttle Yor	k Road			OREH			
Suite 256		_		Т	OTAL I	DEPTH: 80'		
Ouston, Texa			<u> </u>					
		RMATION				NG INFORMA		-
PROJECT:		mediation Drilling		LLING (20.:		ngineering	
SITE LOCATION:	ТМ	P Roswell Station 9		LLER:		Mort Bat		i i
JOB NO.:	P-2	02203	RIG	TYPE:		Mobile D	rill B-68	1
LOGGED BY:		l Barnhill, PG	1				ollow Stem Auger	
PROJECT MANAGE	R: Geo	orge Robinson, PE	SAN	NPLING	METHO	DDS: Split Spo	0 n	
DATES DRILLED:	10/2	24/02	HAN	MER W	VT./DRC	OP 140 lb., 3	0 in.	
NOTES: 4" SCH 40) PVC M	PE Well				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, gravel to 4"					Cement Grout 3'-53'	
-20 - 0.107100 0.107100 -25 - 0.200200 -30 - 0.100200000 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.100200 0.10000000000	сн	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses						
-45 -								
-50 -		CLAY: Decreasing Hydrocarbon Odor	50'-52'	30				
-55 -		CLAV: Materia and @		30 Blows			Bentonite -53'	
-60 -		CLAY: Water Level @ 63.49' from TOC 10/29/02	55'-57'	37 Blows			Sand 79'-56'	
			60'-62'	36 Blows			Screen 79'- 59'	
-70	CL / CH	CLAYEY SAND: TD 79' Saturated @ 65' BGS Cement / Bentonite Grout	65'-67'	56 Blows				
-75-		53'-3' Bentonite 56'-53' 12/20 Sand Pack ' 56'-79'	70'-72'	36 Blows				
		0.010 Slot Screen 79'-59'	75'-77'	46				

Cy 10 Su	235 West Li uite 256 ouston, Texa	ering Services, k Road D-3229	Inc.	B	OREH OTAL I	OLE NO.: MP DEPTH: 79'		Page 88 of 19	
			RMATION				NG INFORMA	· · · · · · · · · · · · · · · · · · ·	_
PROJE	•		mediation Drilling	DRILL		20.:		ngineering	
	DCATION:		P Roswell Station 9	DRILL			Mort Bat		
JOB NO			02203			וסח	Mobile D	rill B-08 ollow Stem Auger	
-	CT MANAGE		l Barnhill, PG				DDS: Split Spo	-	
	DRILLED:		orge Robinson, PE 15/02			VT./DRC			
		11/.	15/02				during drilling		-
NOTES	4" SCH 4	D PVC M	PE Well				in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION		Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -20 -25 -30 -35 -40 -45 -45 -50		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 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'	

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10235 West L Suite 256 Jouston, Texa	nginee ittle Yori as 77040 T INFOI Rei TW P-2 CW ER: Geo	ering Services, k Road	DRI DRI RIG MET SAM HAM	H LLING (LLER: TYPE: THOD O IPLING IPLING	OREH OTAL DRILLI CO.: F DRIL METHO	OLE NO.: MP DEPTH: 74' NG INFORMA Atkins Er Mort Bat Mobile D LING: 8 1/4'' Ho DDS: Split Spoo	TION ngineering es rill B-68 Illow Stem Auger on	Page 89 of 193
4" SCH 4	0 PVC M	PE Well				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 \\ -20 \\ -20 \\ -25 \\ -30 \\ -35 \\ -40 \\ -45 \\ -55 \\ -60 \\ -65 \\ -70 \\ -75 \\ -75 \\ -75 \\ -75 \\ -75 \\ -70 \\ -75 \\ -75 \\ -70 \\ -75 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -70 \\ -75 \\ -70 \\ -$	GM CH CL / CH	GRAVEL AND SAND: GM: Gravel, Sand, Sitt, 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'	

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Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

iouston, Texas 77040-3229

FIELD BOREHOLE LOG

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

PROJECT INFORMATION		DRILLING INFORMATION						
PROJECT: Remediation		LLING CO.:		ngineering				
SITE LOCATION: TWP Roswell	e l	LLER:	tes					
JOB NO.: P-202203	RIG	TYPE:	Mobile D	rill B-68				
LOGGED BY: CM Barnhill,	, PG ME	THOD OF DRI	LLING: 8 1/4" Ho	ollow Stem Auger				
PROJECT MANAGER: George Robin	ison, PE SAI	MPLING METH	ODS: Split Spo	on				
DATES DRILLED: 11/15/02	HAI	MMER WT./DR	OP 140 lb., 3	0 in.				
NOTES: 4" SCH 40 PVC MPE Well			during drilling in completed well	Page 1 of 1				
DEPTH SOIL SYMBOLS USCS SOIL DES	SCRIPTION SAMP. #	Blows PID / ft. ppm	BORING COMPLETION	WELL DESCRIPTION				
0 0	S White Tan te, Hard, 4'- Sand, Silt, el to 4", el to 4", ted Clayey with Fat Red ND: TD 74' 50' BGS tonite Grout nite 38'-41' 'ack ' 41'-74' trining Fat ' Clay lenses 0' Dry at 70' evel 49.4' 2 at Clay, Dry,			Cement Grout 3'-38' Bentonite 38' Top Sand 41' Top Screen 44'				
-75 - BGS 11/16/02 -75 - CH CLAY: Red Fa	2 at Clay, Dry,							

10235 West Litt Suite 256 Houston, Texas PROJECT: PROJECT: SITE LOCATION: JOB NO.: LOGGED BY:	tle York 3 77040 INFOF Rer TW P-2 C.M	D-3229 RMATION mediation Drilling /P Roswell Station 9 02203 /I. Barnhill, PG	DRIL DRIL RIG METI	B T T LING C LER: TYPE: HOD O	DREHO DTAL I DRILLI DRILLI	OLE NO.: MW DEPTH: 68' <u>NG INFORMA</u> Atkins Ei Mort Bat Mobile D LING: HSA 81/4	TION ngineering es rill B-58 '' Augers
PROJECT MANAGEF DATES DRILLED:		orge Robinson, PE 30/03		MER W		ODS: Split Spoo OP 140 lb., 30	
		onitor Well	2	∞ Wa	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
-5 -10 -25 -25 -30 -40 -55 -60 -65 -70 -	GM SC SC SC SC SC SC SC SC SC	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, 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.	055' BGS Sampled 2 x 4/oz. Jars 008:32hr. 8260 VOC / TPH Mod. 8015 8270 SVOC Total	67/20" 52/24" 15/24" 20/24" 19/24" 36/24"	11' 19'- 21' 29'- 31' 39'- 41' 49'- 51'		Cement Grout 0'-41' Top Bentonite 45' Top Sand 46' 12/20 Sand Top Screen 48' 0.010 Slot Screen TD 68'

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	8:48:57 AM						Page 92 of 193
Cypress Enginee		nc	F	IELD	BOREH	OLE LOG	
	-	110.	В	OREH	DLE NO.: SV	E-22	
10235 West Little York	Road		Т	OTAL [DEPTH: 35'		
uston, Texas 77040	-3229						
PROJECT INFOR			,-l	DRILLI	NG INFORMA	TION	-
PROJECT: Ren	nediation Drilling	DRIL	LING	CO.:	Atkins E	ngineering	
SITE LOCATION: TW	P Roswell Station 9	DRIL	LER:		Mort Bat	tes	
JOB NO.: P-20	02203	RIG 1	TYPE:		Mobile D	rill B-68	
LOGGED BY: Jim	Chionis	METH		F DRILL	_ING: 6 1/4" Ho	llow Stem Auger	
PROJECT MANAGER: Geo	rge Robinson, PE	SAM	PLING	METHO	DS: Split Spo	0 n	
DATES DRILLED: 11/0	07/02	НАМ	MER V	VT./DRC)P 140 LB., 3	30 IN.	
NOTES: Water @ 20' (BGS	5)? Strong Odor	2			luring drilling n completed well	Page 1 of 1	i
DEPTH SOIL SYMBOLS USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-15 - 0.202020 0.20202020 0.20202020 0.20202020	COLLUVIUM: Backfill / Colluvium GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture, 2" Gravel Perched Aquifer @ 20' BGS ?? CLAY: CH: Red Sandy Clay to Fat Clay Lense GRAVEL AND SAND: Silty Gravel, gray with Hydrocarbon Odor	25'-27'	100			Concrete seal: 13'-3' Bentonite: 18'- 13' Top Sand 23' 2" 0.010 Slot Screen 35' - 25' TD 35'	

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C۱	voress Er	nainee	ring Services, I	nc	F	IELC) BOREH	OLE LOG		
-	235 West Li	•	•		В	OREH	OLE NO.: SV	E-23		
	ite 256		(NUau		Т	OTAL I	DEPTH: 39'		÷	
	uston, Texa	s 77040)-3229							
	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		
	DRILLED:		07/02	НАМ	MER V	VT./DRC	OP 140 LB.,	30 IN.		
NOTES	•			2	z Wa	iter level o	during drilling	······		
	. 2" SVE We	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 -	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		·····	······································		·	·			
	0,0,0,0	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt							
-5 -			Mixture Gravel to 2"					Concrete seal: 17'-3'	1	
	0707070								1	
								Bentonite: 22'-	I	
10	0,0,0,0							17'	1	
-20-										
-20-				1				Top Sand 22'		
-25-	0-0-0-0							2" 0.010 slot		
	$O_0 O_0 O_0 O_0$	GM						Screen 35' - 25'		
								20		
-30-	0-0-0-0									
-35-	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	GM						TD 39'		
-40 - 1				/L_			المحمد المشينية المسلم الم			

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С	ypress Er	nginee	ering Services,	Inc.					OLE LOG
1(0235 West Li	ttle Yorl	< Road		1			0.: SV	E-25
	uite 256	7704				OTALI	DENI	H: 34'	
	buston, Texa		·····						
	PROJECT					······		FORMA	
PROJ			mediation Drilling		LING (.0.:			ngineering
	OCATION:		P Roswell Station 9					Mort Bai	
			02203	1	TYPE:	ייסת			rill B-68
			Chionis De Linne DE						ollow Stem Auger
			orge Robinson, PE					Split Spo 140 LB., 1	
	S DRILLED:	11/	04/02			/T./DR(······	JU 11N.
NOTE	S: 2" SVE We	ell				ter level (ter level i	-	-	Page 1 of 1
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	-	RING PLETION	WELL DESCRIPTION
			La, , , , ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,				l		
0		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 _				Í_	[L		

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-30 - 070700 0707070 0707000000	Receive	ed by OCD: 10	/21/2022	8:48:57 AM						Page 96 of 193	
TOTAL DEPTH: 35' DUSTON VEST LINE YOR ROad SUITE 256 DISTEL COATION DRULET: Remediation Drilling DRILLING CO.: Atkins Engineering DRILLER: Mort Bates JOB NO.: P-202203 DRILLER: Mort Bates Advise of the system Auger SAMPLING CO.: Atkins Engineering DRILLER: Mort Bates RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05/02 HAMMER WT./DROP ATTES DRILLED: 11/05/02 Mater level uring drilling Value level in completed well Page 1 of 1 Water level uring drilling SYME WELL OTTEL DESCRIPTION SAMP. # Dio SOL DESCRIPTION SAMP. # Dio SOL DESCRIPTION SAMP. # Dio SOL DESCRIPTION SAMP. # Dio DOTES: 2" SVE Well Top Sand 22' 20	Су	/press Er	nginee	ering Services,	Inc.						
Distor, Texas 77040-3229 PROJECT INFORMATION DRILLING INFORMATION PROJECT: Remediation Drilling SITE LOCATION: TWP Roswell Station 9 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: SVE Well DEPTH SOIL DEST SOIL DESCRIPTION SAMP.# Blows PID BORING Water level in completed well PETH SOIL DESCRIPTION SAMP.# Blows PID BORING COMPLETION SAMP.# Biows PID BOORING WELL DEPTH SOIL SOIL DESCRIPTION SAMP.# Biows PID Biows PID </td <td></td> <td></td> <td>ittle Yorl</td> <td>< Road</td> <td></td> <td></td> <td></td> <td>E-20</td> <td></td>			ittle Yorl	< Road				E-20			
PROJECT INFORMATION DRILLING INFORMATION 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 2" SVE Well x Water level during drilling DEPTH SOIL DSOL USCS SOIL DESCRIPTION SAMP. # BOWS PID DORING WELL DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING DESCRIPTION SAMP. # PID BORING DESCRIPTION SAMP. # DESCRIPTION SAMP. # <td></td> <td></td> <td>ac 77040</td> <td>1 3000</td> <td></td> <td colspan="6">TOTAL DEFTH. 35</td>			ac 77040	1 3000		TOTAL DEFTH. 35					
PROJECT: Remediation Drilling DRILLING CO.: Atkins Engineering SITE LOCATION: TWP Roswell Station 9 DRILLING CO.: Atkins Engineering JOB NO.: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis RIG TYPE: Mobile Drill B-68 PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., 30 IN. NOTES: 2" SVE Well Z Water level during drilling Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # BORING WELL 0 CONCORE OF OF OF OF OF OF OF OF OF OF OF OF OF	_				1					_	
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 DEPTH SOIL DEPTH SOIL 0 0 0 0 0 0 0 0 0 0 0 0 0	PRO.IF				DRII					-	
JOB NO.: P-202203 RIG TYPE: Mobile Drill B-68 LOGGED BY: Jim Chionis METHOD OF DRILLING: 6 1/4" Hollow Stem Auger PROJECT MANAGER: George Robinson, PE SAMPLING METHODS: Split Spoon DATES DRILLED: 11/05/02 HAMMER WT./DROP 140 LB., 30 IN. NOTES: 2" SVE Well Z Water level during drilling Page 1 of 1 DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID BORING WELL DEPTH SOIL USCS SOIL DESCRIPTION SAMP. # PID BORING WELL 0 0 0 0 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 10 0				8							
LOGGED BY: Jim Chionis PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05/02 NOTES: 2" SVE Well DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Dio BORING WELL DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Dio BORING WELL OF COMPLETION DESCRIPTION SAMP. # Dio BORING WELL OF COMPLETION DESCRIPTION SAMP. # J'tt. ppm COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION SWEED OF COMPLETION DESCRIPTION SAMP. # J'tt. ppm COMPLETION DESCRIPTION OF COMPLETION DESCRIPTION SAMP. # J'tt. ppm COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION OF COMPLETION DESCRIPTION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF COMPLETION OF											
PROJECT MANAGER: George Robinson, PE DATES DRILLED: 11/05/02 NOTES: 2" SVE Well DEPTH SOIL DEPTH SUBJOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING WELL DEPTH SUBJOLS USCS SOIL DESCRIPTION SAMP. # Completed well Completed well							FDRIL				
DATES DRILLED: 11/05/02 HAMMER WT/DROP 140 LB, 30 IN. NOTES: 2" SVE Well Z' Water level unicompleted well Page 1 of 1 DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING WELL DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID COMPLETION DESCRIPTION GM GRAVEL AND SAND: Concrete seal: 17'-3' Concrete seal: 17'-3' Concrete seal: 17'-3' Bentonite: 22'- 17' Concrete seal: 17'-3' Bentonite: 22'- 17' Concrete seal: 17'-3' Deptide of 0 Concrete seal: 17'-3'									6		
NOTES: 2" SVE Well DEPTH SOIL SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID BORING WELL DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING COMPLETION Well DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # Blows PID BORING COMPLETION DESCRIPTION GM GRAVEL AND SAND: GM-Gravel, Sand, Silt Mixture Gravel to 2" Image: Image: Concrete seal: 17'-3' Page: Image: 201 Concrete seal: 17'-3' Bentonite: 22'- 17' Top Sand 22' 2'' 0.010 Slot CONTROL CHAY: CH: Red Sandy								· ·			
Average 2" syze Well DEPTH SOIL SYMBOLS USCS SOIL DESCRIPTION SAMP. # PID /ft. BORING ppm WELL DESCRIPTION 0 Directory of the two states of the two states of the two states of the two states of two stwo states of two states of two states of two stwo states of					_						
DEPTH SYMBOLS USCS SOIL DESCRIPTION SAMP. # /ft. ppm COMPLETION DESCRIPTION 0 <td>NUIES</td> <td>2" SVE W</td> <td>ell</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Page 1 of 1</td> <td></td>	NUIES	2" SVE W	ell						Page 1 of 1		
-5 -6 GRAVELAND SAND: GM: Gravel, Sand, Silt Mixture Gravel to 2" Concrete seal: 17'-3' -5 -6 -7 -7 -15 -7 -7 -7 -15 -7 -7 -7 -15 -7 -7 -7 -15 -7 -7 -7 -15 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -20 -7 -7 -7 -21 -7 -7 -7 -22 -7 -7 -7 -23 -7 -7 -7 -30 -7 -7 -7 -30 -7 -7 -7 -30 -7 -7 -7 -30 -7 -7	DEPTH		USCS	SOIL DESCRIPTION	Samp. #		1				
$1 \text{ NeX} X \text{ NX} X(\mathbf{N}) $ $\{1, \dots, 1\}$ $\{1, \dots, 1\}$ $\{1, \dots, N, X(\mathbf{N}) \}$	-5		GM	GM: Gravel, Sand, Silt Mixture Gravel to 2" CLAY: CH: Red Sandy			7		17'-3' Bentonite: 22'- 17' Top Sand 22' 2" 0.010 Slot Screen 34' - 24'		

Received by OCD: 10/21/2022 8:48:57 AM									
•		•	ering Services, I	nc.	nc. FIELD BOREHOLE LOG BOREHOLE NO.: SVE-27				
	235 West L iite 256	rk Road		TOTAL DEPTH: 35'					
	buston, Texa	as 7704	0-3229		-				
_			RMATION		I	DRILLI	NG INFORMA	TION	
PROJE	CT:	Re	mediation Drilling	DRIL	LING C	:00	Atkins E	ngineering	
SITE LO	OCATION:		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	ollow Stem Auger	
PROJE	CT MANAGE	ER: Ge	eorge Robinson, PE	SAM	PLING	METHC	DS: Split Spo	0 n	
DATES	DRILLED:		/01/02	HAM	MER W	/T./DRC)P 140 LB., 3	30 IN.	
NOTES	NOTES: No Fat Clay Seen in Well						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 –							ر ۔۔۔۔ ،	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-			to sand/silt					Bentonite: 18'- 13'	
-20 -								Top Sand 18' 2" 0.010 Slot Screen 35' - 20'	
-30 -									
1	0707070								

Received by OCD: 10	0/21/2022	8:48:57 AM						Page 9
Cypress Er	nainee	ering Services,	Inc.	FI	ELD	BOREH	OLE LOG	
10235 West Li	•	•		BC	REH	DLE NO.: ${ m SV}$	E-28	
Luite 256		i i i i i i i i i i i i i i i i i i i		ТС	TAL [DEPTH: 35'		
uston, Texa	IS 7704(0-3229	·····					
PROJEC	T INFO	RMATION		C	RILLI	NG INFORMA	TION	4
PROJECT:	Re	mediation Drilling	DRILL	ING C	0.:	Atkins E	ngineering	
SITE LOCATION:	TW	P Roswell Station 9	DRILLI	ER:		Mort Bat	tes	
JOB NO.:	P-2	02203	RIG T			Mobile D		
LOGGED BY:	CM	1 Barnhill, PG					bllow Stem Auger	1
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAMPI	LING	NETHC	DS: Split Spo	on	
DATES DRILLED:	10/2	29/02	HAMM	ER W	T./DRC	P 140 LB.,	30 IN.	
NOTES: Water @	35' (BG	S)? Strong Odor	∑ ▼			luring drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION		Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 7 (27 77 77 77							,	
	GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture					Concrete seal: 13'-3'	
							Bentonite: 18'- 13'	
-25 - 0707070 0707070 0707070 0707070							Top Sand 23' 2" 0.010 Slot Screen 35' - 25'	
	СН						23	
-22 //////////////////////////////////		CLAY: CH: Red Sandy Clay to Fat Clay Wet with						

Received by OCD: 10/	21/2022	8:48:57 AM						Page 99 of 193	
Cypress En	ainee	ering Services,	Inc.	nc FIELD BOREHOLE LOG					
10235 West Lit	-	-		BOREHOLE NO.: SVE-30A					
	A HOUG		(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	llow Stem Auger		
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAM	PLING	METHO	DDS: 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				during drilling n completed well	Page 1 of 1		
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
	СН	CLAY: CH: Red Clayey Sand, Strong Hydrocarbon	Blows 22 Blows	+50 22 20			Concrete seal: 13'-3' Bentonite 13' 2" Slot Screen 45' - 20' Top Sand 18' TD		

_Recei	ved by OCD: 10	/21/2022 8	8:48:57 AM							
С	Cypress Engineering Services, I 10235 West Little York Road						D BOREH	OLE LOG		
		ttle Yorl	< Road				DEPTH: 35'	L-31		
	uite 256 buston, Texa	s 77040	1-3229		'		JEI 111. JJ			
	PROJECT				l	DRILLI	NG INFORMA	TION		
PROJ			nediation Drilling	DRI	LLING (ngineering		
	OCATION:		P Roswell Station 9		LLER:		Mort Bat	0 0		
JOB N			02203		TYPE:		Mobile D	rill B-68		
LOGG	ED BY:		Barnhill, PG	MET	THOD C	FDRIL	LING: 61/4" Ho	ollow Stem Auger		
PROJE	ECT MANAGE		orge Robinson, PE					-		
DATES	S DRILLED:		28/02			VT./DRC	HODS: Split Spoon ROP 140 LB., 30 IN.			
NOTE	5: Poor reco	overy i	n Split Spoon .				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 7	0000	GM	GRAVEL AND SAND:			[]				
-5 -			GM: Gravel, Sand, Silt Mixture					Concrete seal: 13'-3'		
-15 -							m m	Bentonite: 18'-		
-20-								13'		
-25-				SPT	+50			Top Sand 23' 2" 0.010 Slot Screen 35' -		
-30 -				Sample 24'-26'				25'		
-35-	<u>IIIII</u>	СН	CLAY: CH: Red Sandy Clay to Fat Clay							

Received by OCD: 10/21/	2022 8:48:57 AM			-		· – –
Cypress Eng 10235 West Little Suite 256 ouston, Texas	В	FIELD BOREHOLE LOG BOREHOLE NO.: MW-34 TOTAL DEPTH: 79'				
	NFORMATION			DRILL		TION
PROJECT:	Remediation Drilling	DRILL			· · · · · · · · · · · · · · · · · · ·	ngineering
SITE LOCATION:	TWP Roswell Station 9	DRILL	-ER:		Mort Ba	2 2
JOB NO.:	P-202203	RIG T	YPE:		Mobile D	rill B-58
OGGED BY:	C.M. Barnhill, PG	METH			LING: HSA 81/4	f" Augers
PROJECT MANAGER:		SAMF	LING	METH	ODS: Split Spo	on
DATES DRILLED:	01/06/03	HAMN	/IER V	VT./DR	OP 140 lb., 3	0 in.
NOTES: 2" SCH 40 H	VC Monitor Well	 ▼			during drilling in completed well	Page 1 of 1
DEPTH SYMBOLS	SCS SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
						Cement Grout 3'-42'
-35	SC: Clayey Sand, tan brown to light brown reddish saturated @55' BGS, No odor or staining, Water Level @ 57.74' BGS 01/07/03	@55' 5	12/24 " 16/24" 51/24"	42' 44- 46' 49-		Bentonite 42' Top Sand 46' Top Screen 49'
55 • 60 - Sw	SW: Med. to fine grained tan sand, well sorted,	2 x	6/24"	56'		
-65 -	SC: Clayey Saturated	Jars	51/24"	61'		12/20 Sand
-70 – CH		8260	6/24"	64- 66'		0.010 Slot Screen
	SW: Tan, Reddish, Brown Sand, Fine Gr., Well	TPH	1/24" 6/24"	69- 71' 74-		
-75 - -80 -	I Cantan Castanata a Flavilian I	8015 /	0, 2 1	76'		TD 79'

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

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C	/press Er	nainee	ering Services, I	nc	F	IELC	BOREH	OLE LOG	
-	235 West Li	-	110.	В	OREH	OLE NO.: MP	PE-1		
	ite 256				T	OTAL I	DEPTH: 79'		
_	uston, Texa	s 77040)-3229	···					
	PROJECT	T INFOF	RMATION			DRILLI	NG INFORMA	TION	_
PROJE	CT:	Rei	mediation Drilling	DRIL	LING C	:00	Atkins E	ngineering	
SITE LC	DCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO		P-2	02203	_	TYPE:		Mobile D		
LOGGE			Bates					llow Stem Auger	
		R: Geo	orge Robinson, PE				DDS: Split Spo		
DATES	DRILLED:	12/0	06/02	HAM	IMER V	/T./DRC	OP 140 lb., 3	0 in.	
NOTES:	: 4" SCH 40) PVC M	PE Well	:			during drilling	Page 1 of 1	
T			·····	:	wat	ter level i	n completed well		4
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 – 0									
-5		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 - -35 - -40 -		SC/CL SP/SC	CLAY AND SAND: SC: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. CLAY AND SAND:						
-45 -50 -55 -55			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 Sand Pack 79'-49', Bentonite Seal 49'-46',					Bentonite 46' Top Sand 49' Top Screen 54'	
-65707070		SC	CLAYEY SAND: Reddish Tan, Soft, Moist, No Odor or Staining Depth to Water 61.03' BGS 12/07/02						
-75-		SC						Sump 74'-79' TD 79'	

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10235 West Lit		Inc.	nc. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-2 TOTAL DEPTH: 79'					
			1					-
PROJECT				LING C		NG INFORMA		
PROJECT:		mediation Drilling			,0		gineering	
SITE LOCATION: JOB NO.:		P Roswell Station 9		.LER: TYPE:		Mort Bat		
		02203				-	Rand A-300	
LOGGED BY: PROJECT MANAGE		A. Barnhill, PG				LING: HSA 81/4 DDS: Split Spoo	-	
DATES DRILLED:		orge Robinson, PE		MER W				
	12/2	21-24/02					, III.	4
NOTES: 4" SCH 40) PVC M	PE Well				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
-35 -40 -45 -50 -55 -65 -70	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

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	ite 256	lie for	Rudu		то	OTAL E	DEPTH: 79'	
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	PROJECT	INFOF	RMATION	DRILLING INFORMATION				
PROJE	ROJECT: Remediation Drilling		DRILL	ING C	:0.:	Atkins En	gineering	
SITE LO	TE LOCATION: TWP 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	DP 140 lb., 30) in
NOTES: 4" SCH 40 PVC MPE Well			T T			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 7		r		<u> </u>		·	[]	
-5 -10 -20 -25 -30 -35		GM 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'

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ttle Yor	k Road	Inc.	В	OREH	OLE NO.: MP		
INFO	RMATION			DRILLI	NG INFORMA	TION	
Re	mediation Drilling	DRILL	ING C	20.:	Atkins Er	ngineering	
TW	WP Roswell Station 9	DRILL	ER:		Mort Bat	es	
P-2	02203	RIGT	YPE:	rill B-68			
	A. Barnhill					C	
						1	
				<u> </u>	· · · · · · · · · · · · · · · · · · ·) in.	- -
NOTES: 4" SCH 40 PVC MPE Well						Page 1 of 1	
USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
GM Cngl. SC CL SC GC GC	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. GM: Harder Drilling, gravel fragments, yellowish color SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft, No odor /staining. CL: Strong Clay SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, @ 74' BGS Clay & Sand:,gravel & Clay lenses, TD 79' Water Level @ 65.55' BGS 12/18/02 GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining, Damp					Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54' TD 79'	
	cngl.	ttle York Road s 77040-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill R: George Robinson, PE 12/16-17/02 D PVC MPE Well USCS SOIL DESCRIPTION GM 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. Cngl. CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand, well sorted, strong clay fraction, soft. No odor /staining. CL SC: Clayey Sand, tan brown to light brown reddish saturated @64' BGS, No odor or staining, @ 74' BGS Clay & Sand.gravel & Clay lenses, TD 79' Water Level @ 65.55' BGS 12/18/02 GC GC: Gravel 10%, Clay30%, fine gr. sand 60%, No odor or Staining, Damp	agineering Services, Inc. ttle York Road s 77040-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill RE George Robinson, PE 12/16-17/02 PVC MPE Well USCS SOIL DESCRIPTION SAMP. #	Progineering Services, Inc. F ttle York Road T s 77040-3229 T INFORMATION DRILLING O Remediation Drilling DRILLING O TWP Roswell Station 9 DRILLER: P-202203 RIG TYPE: C.M. Barnhill METHOD O R: George Robinson, PE SAMPLING 12/16-17/02 HAMMER W USCS SOIL DESCRIPTION SAMP. # Blows /ft. GM GRAVEL AND SAND: 0'- 5: GM mixed with caliche, white pink, dy 5'-24':GM: Gravel, Sand, Sit, Mixture, gravel to 4", LL Brown, med. dense, dry. Cng1. CONGLOMERATE: Hard Drilling, well cemented congiomerate or cemented sandstone layer. GM: Harder Drilling, gravel fragments, yellowish color SC SC: Clayey Sand LL Red/ tan brown, to light brown me dight saturated @64' BGS, No odor or staining, @74* BGS Clay & SC SC Clay30%, fine gr. sand G0%, No odor or Staining, @74* BGS Clay & SC SC GC: Gravel 10%, Clay30%, fine gr. sand G0%, No odor or Staining, Damp	FIELD Ingenering Services, Inc. FIELD BOREH: TOTA0-3229 INFORMATION Remediation Drilling TWP Roswell Station 9 P-202203 C.M. Barnhill RETYPE: C.M. Barnhill RETYPE: C.M. Barnhill RETYPE: C.M. Barnhill RETYPE: METHOD OF DRIL Z Water Ievel Z Water Ievel Z Water Ievel Z USCS SOIL DESCRIPTION SAMP. # Blows PID OPD CONGLOMERATE: Hard CONGLOMERATE: Hard CONGLOMERATE: Hard CONGLOMERATE: Hard SC: Clayed Sand Lt, Red/ SC: Clayed Sand Lt, Red/ Sand; and brown, </td <td>rgineering Services, Inc. FIELD BOREH/I s 77040-3229 INFORMATION DRILLING INFORMA Remediation Drilling DRILLING CO.: Atkins End TWP Roswell Station 9 P-202203 C.M. Barnhill C.M. Barnhill DRILLING CO.: Atkins End R: George Robinson, PE DRILLING MORTHON: Mort Bat 12/16-17/02 HAMMER WT./DROP 140 lb., 30 PVC MPE Well Image: Water level during drilling Water level during drilling USCS SOIL DESCRIPTION SAMP. # Blows PID BORING CM GRAVEL AND SAND: 0'- 5': CM mixed with colliche, gravel to 4'. LL Brown, med. dense, dry. Field with colliche, gravel to 4'. LL Brown, med. dense, dry. Blows PID BORING Cmg1. CONGLOMERATE: Hard Ording gravel to dense dand, well sorted, strong clay tradition, sott, No odor / Italing, gravel to 6'. LL Brown, med. dense, dry. The dense dand, well sorted, strong clay tradition, sott, No odor / Italing, well cemented conglomerate or cemented sond, well sorted, strong clay tradition, sott, No odor / Italing, Gravel fragments, yellowish color SC SC: Clayey Sand, tan brown, to light brown redgestrade and, well sorted, strong clay tradition, sott, No odor / Italing, Gravel at Clay terses, TD 79 Water Level (G 555 TBCS) SC GC ordinavet of Clay & Bor or straing, Borbo</td> <td>FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' ST7040-3229 INFORMATION REMEMBING CO:: Atkins Engineering DRILLING CO:: Atkins Engineering MORT Bates P-202203 C.M. Barahill R: George Robinson, PE SAMPLING METHODS: Split Spoon 12/16-17/02 Water level during drilling Water level in completed well Page 1 of 1 Constantial Reveal and the calche, with</td>	rgineering Services, Inc. FIELD BOREH/I s 77040-3229 INFORMATION DRILLING INFORMA Remediation Drilling DRILLING CO.: Atkins End TWP Roswell Station 9 P-202203 C.M. Barnhill C.M. Barnhill DRILLING CO.: Atkins End R: George Robinson, PE DRILLING MORTHON: Mort Bat 12/16-17/02 HAMMER WT./DROP 140 lb., 30 PVC MPE Well Image: Water level during drilling Water level during drilling USCS SOIL DESCRIPTION SAMP. # Blows PID BORING CM GRAVEL AND SAND: 0'- 5': CM mixed with colliche, gravel to 4'. LL Brown, med. dense, dry. Field with colliche, gravel to 4'. LL Brown, med. dense, dry. Blows PID BORING Cmg1. CONGLOMERATE: Hard Ording gravel to dense dand, well sorted, strong clay tradition, sott, No odor / Italing, gravel to 6'. LL Brown, med. dense, dry. The dense dand, well sorted, strong clay tradition, sott, No odor / Italing, well cemented conglomerate or cemented sond, well sorted, strong clay tradition, sott, No odor / Italing, Gravel fragments, yellowish color SC SC: Clayey Sand, tan brown, to light brown redgestrade and, well sorted, strong clay tradition, sott, No odor / Italing, Gravel at Clay terses, TD 79 Water Level (G 555 TBCS) SC GC ordinavet of Clay & Bor or straing, Borbo	FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' FIELD BOREHOLE LOG BOREHOLE NO.: MPE-6 TOTAL DEPTH: 79' ST7040-3229 INFORMATION REMEMBING CO:: Atkins Engineering DRILLING CO:: Atkins Engineering MORT Bates P-202203 C.M. Barahill R: George Robinson, PE SAMPLING METHODS: Split Spoon 12/16-17/02 Water level during drilling Water level in completed well Page 1 of 1 Constantial Reveal and the calche, with

Receive	ed by OCD: 10	/21/2022	8:48:57 AM					· .	Page 112 of 193
-	•	-	ering Services, I	nc.			D BOREH	OLE LOG E-7	
	235 West Li ite 256	ttie vori	K ROAD		т	OTAL	DEPTH: 79'		
	uston, Texa	s 77040)-3229						
	PROJECT	T INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJE	CT:	Re	mediation Drilling	DRIL	LING	NG CO.: Atkins Engineering ER: Mort Bates			
SITE LC	CATION:	ТЙ	P Roswell Station 9	DRIL	LER:				
JOB NC		P-2	P-202203 RIG TYP				Mobile D		
LOGGE								llow Stem Auger	i
1	CT MANAGE	R: Ge	orge Robinson, PE				DDS: Split Spo		1
DATES	DATES DRILLED: 12/10-13/02			HAM	MER V	VT./DR(OP 140 lb., 30	0 in.	-
NOTES: 4" SCH 40 PVC MPE Well						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	~~~~~~~		J			1	_ 		1
-5 -		GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture,					Cement Grout 3'-47'	
-10-			gravel to 4", Lt. Brown, med. dense, dry.						
-20 -									
-25-	0,0,0,0								
-30-	0								
-35-			CONGLOMERATE: Hard Drilling, well cemented conglomerate or cemented						
-40-		Cngl.	sandstone layer.						
-45-			SC: Clayey Sand Lt. Red/ tan brown, to tand brown, fn. to med.grained sand,					Bentonite 47'	
-50-		SC	well sorted, strong clay fraction, soft, No odor and					Top Sand 50'	
-55-			staining.					Top Screen 54'	
-60-	E 2 8 8	SC/GC	GC: Gravel 10%,						
		SC	Clay30%, fine gr. sand SC: Clayey Sand, tan						
-70-			brown to light brown reddish saturated @63' BGS, No odor or staining, @ 74' BGS Clay & Sand:&						
-75-		SC	Fat Clay lenses, TD 79' Water Level @ 64.79' BGS 12/14/02					Sump 74'-79' TD 79'	
-85-		SC							
									ı
Palaas	ed to Imaging:	11/22/20		1L-		L	L		



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Received by OCD:10 Cypress Er 10235 West Li Suite 256 Houston, Texas	ttle York		nc.	B	OREHO	DLE NO.: MP DEPTH: 79'	OLE L@G15 of 193 E-10		
PROJEC	TINFOR	MATION	-	DRILLING INFORMATION					
PROJECT:	Ren	nediation Drilling	DRIL	LING CO	D.:	Atkins Er	ngineering		
SITE LOCATION:	TW	P Roswell Station 9	DRIL	LER:		Mort Bate	es		
JOB NO .:	P-20	02203	RIG	TYPE:		Mobile D	rill B-68		
LOGGED BY:	C. I	Barnhill	METH	HOD OF	DRILL	ING: 8 1/4" Ho	llow Stem Auger		
PROJECT MANAGER	C Geo	orge Robinson, PE	SAM	PLING N	THO	m			
DATES DRILLED:	RILLED: 12/09/02		HAMI	MER WI	r./DROI	P 140 lb., 30) in.		
NOTES: 4" SCH 4	O PVC M	PE Well				during drilling n completed well	Page 1 of 1		
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION		
-5 -10 -15 -10 -15 -20 -25 -30 -35 -40 -45 -55 -60 -55 -60 -70 -75 -80 -85 -85	GM Conglom SC/CL SW SC SW SC SC/CL	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 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. SAND: SW: 50'-59' Fine gr. Sand, tan brown, well sorted, No odor or staining. CLAYEY SAND: SC: Clayey Sand Lt. Red/ tan SAND: Tan brown, reddish tan sand, med. to fine gr., well sorted, No Odor. Saturated @ 62' BGS CLAYEY SAND: Tan Brown / Red tan, Clayey CLAY: Clay & Sand:& Fat Clay lenses, Dry@ 74' BGS	49'-51' 54'-56' 59'-61' 64'-66' 69'-71' 74'-76' 79'-81'	18"/50 12"/50 24"/40 12"/46 18"/50 24"/30 24"/50			Cement Grout 3'-47' Bentonite 47' Top Sand 50' Top Screen 54' Sump 74'-79' TD 79'		
Released to Imaging:	11/22/202	22 9·37·14 AM	<u> </u>			JI			
-65 -70 -75 -80 -85 -85	SW SC SC/CL	SAND: Tan brown, reddish tan sand, med. to fine gr., well sorted, No Odor. Saturated @ 62' BGS CLAYEY SAND: Tan Brown / Red tan, Clayey CLAY: Clay & Sand: & Fat Clay lenses, Dry@ 74' BGS	64'-66' 69'-71' 74'-76'	12"/46 18"/50 24"/30					

10 Su	235 West Lit 235 West Lit 256 Duston, Texas	tle York		nc.	B	OREHO	BOREHO	DLE L@@16 of 193 E-11	
	PROJECT	INFOR	MATION	8	. [ORILLIN	NG INFORMAT	10N	
PROJEC	CT:	Rei	nediation Drilling	DRILLI	NG CO	D.:	Atkins Er	igineering	
SITE LC	CATION:	TW	P Roswell Station 9	DRILL	ER:		Mort Bate	es	
JOB NO	0.2	P-2	02203	RIG TY	PE:		Mobile Dr	rill B-68	
LOGGE	D BY:	C. I	Barnhill	METHO	DD OF	DRILLI	NG: 8 1/4" Ho	llow Stem Auger	
PROJEC	CT MANAGER	Geo	orge Robinson, PE	SAMPL	SAMPLING METHODS: Split Spoon				
DATES	DRILLED:	12/0	07/02	HAMM		r./drof	^o 140 lb., 30) in.	
NOTES	4" SCH 40	D PVC M	PE Well	 Water level during drilling Water level in completed well 		Page 1 of 1			
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
v –	For Press Press Press	Laur		· · · ·					
-5	0101010	GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche,				210. 210.	Cement Grout	
	0707070		white pink, dry 5'-24':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					3'-47'	
-10-	0707070		med. dense, dry. 24'-32': Hard cemented						
-15-	0707070		Conglomerate / Hard drilling						
-20	000000000000000000000000000000000000000								
-25-		Cngl.	CONGLOMERATE: Hard						
-30	10, PXO		Drilling, well cemented						
		SC/CL	CLAYEY SAND: SC:						
-35 -	EEEE		Clayey Sand Lt. Red/ tan brown, to tand brown, fine						
-40-			to medium grained sand, well sorted, strong clay fraction, soft, Saturated @						
-45 -			60' BGS Slight odor and staining, strong						
-50 -		SC	contamination in capillary fringe 55'-60' BGS, gray black stain to sandy clay with strong hydrocarbon					Bentonite 47' Top Sand 50'	
-55-			odor. No PsH in well Water @ 60.90' BGS					Top Screen 54'	
-9			12/09/02						
-65 -		SC							
-70	HEHE!								
-75		CH	CLAY: Clay & Sand:& Fat					Sump 74'-79'	
-80			Clay lenses, Dry					TD 79'	
-85		СН							
Roloas	sed to Imaging:	11/22/20	22 9·37·14 AM				ļ		

10235 Suite 2	i West Lit	tle York		nc.	BC	OREHO	DLE NO.: MP	DLE [_@G17 of 193 E-12
P	ROJECT	INFOR	MATION		1	RILLI	NG INFORMAT	ION
PROJECT:		Ren	nediation Drilling	DRILL	NG CC) .:	Atkins En	gineering
SITE LOCA	TION:	TW	P Roswell Station 9	DRILL	ER:		Mort Bate	s
JOB NO .:		P-20	02203	RIG TY	PE:		Mobile Dr	ill B-68
LOGGED B	Y:	C. I	Barnhill, / M. Bates	METHO	DD OF	DRILL	ING: 8 1/4" Hol	low Stem Auger
PROJECT N	ANAGER	Geo	orge Robinson, PE	SAMPI	ING N	ETHO	OS: Split Spoo	n
DATES DRI	LLED:	12/0	03-06/02	HAMM	ER WT	./DROI	P 140 lb., 30	in.
NOTES: 4	I" SCH 40	PVC M	PE Well	-			during drilling n completed well	Page 1 of 1
DEPTH S	SOIL YMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
V 7 F77=				r				
-5 -	07070	GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche,				7772 7772	Cement Grout
	07070		white pink, dry 5'-37':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown,					3'-48'
	0000		med. dense, dry. 5'-15' SM/SP/SC: Poorly graded					
-15	00000		sand & Silt @37' Sand with clay, red to brown.					
-20 - 07	01010		soft, slightly plastic, moist.					
-25 - 0	07070							
	01000							
-30 -	01010							
-35 -	07070							
-40-		SC/CL	CLAY: CH: Red Clayey Sand: lean clay with sand,					
-45			med. stiff, plastic, moist.					
								Pentonite (8)
-50 -								Bentonite 48' Top Sand 51'
-55								Top Screen 54'
-60		SP/SC	CLAYEY SAND: SP/SC:					
-65		and the second	50'-75' Poorly Graded Sand with clay ,No odor Saturated @62' BGS TD					
		SP/SC	79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20					
-70			Sand Pack 79'-51', Bentonite Scal 51'-48',					
		SS	CALCAREOUS SANDSTONE: Hard					Sump 74'-79'
-80		CL	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown,					TD 79'
-85			stiff, low plasticity, moist, blocky @79' SP/SC Poorly Graded sand with clay					
			22 9:37:14 AM				JLJ	

10 Su	235 West Lif iite 256 ouston, Texas	tle York	-3229	nc.	BOTO	OREHO	DLE NO.: M DEPTH: 79	,	
	PROJECT	C STRUCTURE DO		2 <u>100</u> 040000	10	1999 - 1999 - 1999 1997 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	NG INFORMA		
PROJE			nediation Drilling	DRILLI		D.:		Engineering	
1100100000000	CATION:		P Roswell Station 9	DRILL			Mort B		
JOB NO			02203	RIG TY				Drill B-68	
LOGGE			Barnhill, / R. Marshall			DRILL		Hollow Stem Auger	
Contraction Contraction	CT MANAGER		orge Robinson, PE		SAMPLING METHODS: Split Spoon				
DATES	DRILLED:	12/0)2-03/02	HAMM	ER W	r./DRO	P 140 lb.,	30 in.	
NOTES	4" SCH 40	D PVC M	PE Well	-			during drilling n completed we	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP.	Blows /ft.	PID ppm	BORING COMPLETIO	WELL DESCRIPTION	
	0000000	GM	GRAVEL AND SAND: 0'- 5': GM mixed with caliche,						
-5 -	0707070		white pink, dry 5'-33':GM: Gravel, Sand, Silt, Mixture,					Cement Grout 3'-46'	
-10-	0707070		gravel to 4", Lt. Brown, med. dense. drv. 5'-15'						
-15-	0-0-0-0		SM/SP/SC: Poorly graded sand & Silt @33' Sand with clay, red to brown.						
-20	0-0-0-0-0		soft, slightly plastic, moist. 40'-49': CL/SC: Lean clay						
	0-0-0-0-0		with sand, red, medium stiff, plastic moist.						
-25-	0707070								
-30-	0707070								
-35 -	<u>-0-0-0-0</u>	SC/CL	CLAYEY SAND: SC/CL						
	====		Clayey Sand , Red med- fine gr. well sorted sand						
-40 -			with strong clay fraction CLAY: CH: Red Clayey Sand: lean clay with sand,						
-45-			med. stiff, plastic, moist.					Bentonite 46'	
-50		SP/SC	CLAYEY SAND: SP/SC:						
-55-			50'-75' Poorly Graded Sand with clay ,no odor					Top Sand 50.7' Top Screen 54'	
-@			Saturated @60' BGS TD 79' Riser 79'-74', 0.020 Slot Screen 74'-54', 12/20 Sand Pack 79'-49', Bentonite Seal 49'-47',						
-65-	====	SP/SC	Cement Grout 47'-3'						
-70-	EEE:								
			CALCAREOUS						
-75-		CL	SANDSTONE: Hard					Sump 74'-79'	
-80-		CL	CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist,					TD 79'	
-85			blocky @79' SP/SC Poorly Graded sand with clay						
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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'

PROJECT INFORMATION		RMATION		DRILLING INFORMATION					
PROJECT:	Re	mediation Drilling	DRII	LING (CO.:		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:	Cla	yton M Barnhill, PG	MET	HOD O	F DRIL	LING:	8 1/4" Ho	llow Stem Auger	
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAM	IPLING	METHO	DDS:	Split Spo	on	
DATES DRILLED:	11/2	25/02	HAM	IMER V	VT./DRC	DР	140 lb., 30) in.	
NOTES: 4" SCH 40 PVC MPE Well					iter level iter level i	-	trilling leted well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm		ORING IPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -20 -25 -30 -40 -45 -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'	

Cypress Engineering Services, I10235 West Little York RoadSuite 256ouston, Texas 77040-3229PROJECT INFORMATIONPROJECT MANAGER: Project Manager: Project Manager: George Robinson, PEDATES DRILLED: 11/22/02NOTES:4" SCH 40 PVC MPE Well				DRII DRII RIG MET SAN HAM	LLING (LLER: TYPE: THOD O IPLING	OREHO OTAL I DRILLI CO.: F DRIL METHO VT./DRO	DDS: Split Spoc	DLE LOG E-15 TION agineering es rill B-68 llow Stem Auger on) in.	Page 120 of 1
	4" SCH 40) PVC M	PE Well				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 -55 -55 -55 -55 -55 -55 -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: 54'-79' Poorly Graded Sand with clay & gravel, red dense, moist	49'-51' 54'-56'	24"/33 12"/51			Cement Grout 3'-49' Bentonite 49.9' Top Sand 54' Top Screen 59'	
-65 -70 -75 -85 -90		SP/SC	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	59'-61' 64'-66' 69'-71' 74'-76' 79'-81'	24"/41 14"/50 24"/50 20"/70 24"/74			Sump 74'-79' TD 79'	

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Received by OCD: 10/21/2022	8:48:57 AM					
Cypress Enginee 10235 West Little York uite 256 ouston, Texas 77040	k Road	Inc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-16
PROJECT INFOR				DRILLI	NG INFORMA	TION
PROJECT: Ren				CO.:	Atkins Er	ngineering
SITE LOCATION: TW	TWP Roswell Station 9		LER:		Mort Bat	es
OB NO.: P-2	02203	RIG	TYPE:		Mobile D	rill B-68
OGGED BY: C. I	Barnhill, / R. Marsha	Ш МЕТ	HƠD O	F DRIL	LING: 8 1/4" Ho	llow Stem Auger
ROJECT MANAGER: Geo	orge Robinson, PE	SAM	PLING	METHO	DDS: Split Spoo	n
ATES DRILLED: 11/2	26-27/02	HAM	IMER V	/T./DRC	OP 140 lb., 30) in.
IOTES: Strong PsH in So	oil Boring				during drilling n completed well	Page 1 of 1
EPTH SOIL SYMBOLS USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION
5 - 0200200 10 - 0200200 20 - 02000 20 - 0200	74', 0.020 Slot Screen 74'- 54', 12/20 Sand Pack 79'- 49', Bentonite Seal 49'-47', Cement Grout 47'-3'	54'-56' 59'-61' 64'-66' 69'-71'	41"/18 22"/24 12"/34 12"/34 24"/18 24"/32			Bentonite 47' Top Sand 49' Top Screen 54' Sump 74'-79' TD 79'

Recei	ved by OCD: 10	/21/2022-	8:48:57 AM						Page 122 of	
C	ypress Er	nginee	ering Services,	Inc.	TIELD BOREHOLE LOG					
	0235 West Li	-	-		}		OLE NO.: MP	E-17		
	uite 256				TOTAL DEPTH: 75'					
	buston, Texa		· · · · · · · · · · · · · · · · · · ·							
			RMATION			<u>-</u>	ING INFORMA		_	
PROJ			mediation Drilling		LLING C	0.:		gineering		
	OCATION:	TW	P Roswell Station 9		LER:		Mort Bat			
JOB N		P-2	02203	1	TYPE:		Mobile D			
	ED BY:		k Smith, PG					llow Stem Auger		
		ER: Geo	orge Robinson, PE				ODS: Split Spoo			
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			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	·] [
-5 -		GM	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 -	0.0.0.0		Mixture, gravel to 4", Light Brown, medium dense,							
			dry, No odor							
-20-										
	0,0,0,0									
-25-	0.0.0.0									
-30 -										
-35-	0,0,0,0					j				
	0,0,0,0									
-40-1	0.0.0.0		(
-45-		SP/SC	CLAYEY SAND: SP-SC: Poorly graded Sand with					Bentonite 46'		
-50 -			clay, red to strong brown, soft moist, slight odor					Top Sand 49'		
-55-		CL	CLAY AND SAND: CL:							
	SEPERTS		Lean clay with sand, red, medium stiff, plastic,					Top Screen 55'		
-60-		SP/SC	moist, moderate odor							
- <u>£</u> -		SE/ DC	CLAYEY SAND: SP-SC: Poorly graded sand with							
-70-		SP/SC	clay, lt. red brown, med to loose, moist, dense.							
-75-		20120	Mod.odor, increased drilling rate. TD 75' BGS							
			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'							
- ₉₀ -			(BGS)							

Received by OCD: 10/21/2	022 8:48:57 AM						Page 123 of 193
10235 West Little ` Suite 256		nc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG E-18	
ouston, Texas 77							
PROJECT IN					NG INFORMA		
	Remediation Drilling			:0.:		ngineering	
	TWP Roswell Station 9	DRIL			Mort Bat		
	P-202203	RIGT			Mobile D		
	Rick Smith, PG					llow Stem Auger	
PROJECT MANAGER:					DS: Split Spoo		
DATES DRILLED:	11/21/02			/T./DRC	·) in.	
NOTES: 4" SCH 40 PV	C MPE Well	2			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 -	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 -	Water Level 59.87' BGS 11/25/02 Saturated @58' BGS CLAYEY SAND: CL: 72'-					Sump 73'-78' TD 79'	

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Cypress En 10235 West Lit Suite 256 Ouston, Texas PROJECT PROJECT: SITE LOCATION:	Ouston, Texas 77040-3229PROJECT INFORMATIONPROJECT:Remediation DrillingPROJECT:TWP Roswell Station 9SITE LOCATION:P-202203					OLE NO.: MP DEPTH: 79' NG INFORMA	TION ngineering es	Page 124 o
LOGGED BY:					OF DRIL	LING: 81/4" Ho	ollow Stem Auger	
	ROJECT MANAGER:George Robinson, PEATES DRILLED:11/26/02					DDS: Split Spo		
DATES DRILLED:	11/2	26/02	HAN		WT./DRC		0 in.	_
NOTES: 4" SCH 40	PVC M	PE Well				during drilling in completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blow / ft.	s PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-40 - -45 -	SM/SC SC/CL	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'	
-55 -60 -65 -65 -70 -75	SP/SC SP/SC CL CL /	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 CLAY: CL: Sandy Lean Clay, Lt. Reddish brown,		24"/1 18"/4 24"/2 24"/4 24"/4 24"/1	1 5 6 2		Sump 74'-79' TD 79'	

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Cypres 10235 V Suite 25 Duston PROJECT: SITE LOCATH JOB NO.: LOGGED BY: PROJECT MA	ITE LOCATION:TWP Roswell Station 9DB NO.:P-202203DGGED BY:Rick Smith, PGROJECT MANAGER:George Robinson, PEATES DRILLED:11/19-20/02					C. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-20 TOTAL DEPTH: 78' 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.					
NOTES: PSH	0 60.0	02' H2O	@ 61.50' BGS				during drilling n completed well	Page 1 of 1			
	DIL BOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION			
		GM SP/SC CL SP/SC	GRAVEL AND SAND: 0'- 8': GM mixed with caliche, white pink, dry 8'-39':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry. 39'-42' SP/SC: Poorly graded sand with clay, red to brown,k soft, slightly plastic, moist. 42'-49': CL: Lean clay with sand, red, medium stiff, plastic moist. CLAY AND SAND: CLAY: CH: Red Clayey Sand: lean clay with sand, med. stiff, plastic, moist. Psh: 60.02', H2O 61.50' CLAY AND SAND: Clay & Poorly graded sand, yellow. CLAYEY SAND: SP/SC: 54'-75' Poorly Graded Sand with clay, strong odor & staining @ 65'-75'.	49'-51' 54'-56' 59'-61'	24"/51 24"/51 24"/33			Cement Grout 3'-39' Bentonite 39' Top Sand 42' Top Screen 48'			
-65 -70 -75 -75 -85 -90		SP/SC CL SP/SC	TD 78' Saturated @ 60' BGS Wet with PsH @65' BGS PsH @ 60.02' H2O @ 61.50 BGS No staining or odor at 75'-TD CLAY: CL: Sandy Lean Clay, Lt. Reddish brown, stiff, low plasticity, moist, blocky @78' SP/SC Poorly Graded sand with clay & gravel, red. med. dense.	64'-66' 69'-71'	24"/51 24"/44 24"/20 6"/51			Sump 73'-78' TD 78'			

Received by OCD: 10/21	/2022	8:48:57 AM		 				<u>Page 126 of 193</u>
10235 West Little		ering Services, k Road	Inc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 69'	OLE LOG E-21	
Suite 256 Ouston, Texas	77040	1-3229						
PROJECT I				i	DRILLI		TION	-
PROJECT:		mediation Drilling	DRIL	LING C	:00	Atkins Er	ngineering	-
SITE LOCATION:		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				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		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'	

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Received by OCD: 10/	21/2022	8:48:57 AM						Page 127 of 193
	n ginee ttle Yorl	ering Services, I k Road	nc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-22	Luge 12/ 0/ 193
PROJEC	T INFO	RMATION			DRILLI	NG INFORMA	TION	
PROJECT:	Rei	mediation Drilling	DRIL	LING	CO.:	Atkins Er	ngineering	1
SITE LOCATION:	Т₩	P Roswell Station 9	DRIL	LER:		Mort Bat	es	
JOB NO.:	P-2	02203	RIG 1	TYPE:		Mobile D	rill B-68	
LOGGED BY:		1 Chionis					llow Stem Auger	
PROJECT MANAGE	R: Ge	orge Robinson, PE	SAME	PLING	METHO	DDS: Split Spoo)n	
DATES DRILLED:	11/	07/02	HAM	MER W	/T./DRC	DP 140 lb., 30) in.	
NOTES: 4" SCH 4	0 PVC M	PE Well				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 -40 -45 -70 -85 -85 -85 -85 -55 -85 -85 -85	GM GM CH CL / CH 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 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'	

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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	
)235 West Li	-	-		В	OREH	OLE NO.: MF	PE-23	
	uite 256		K NOAU		T	OTAL	DEPTH: 80'		
	ouston, Texa	as 7704	0-3229						:
	PROJEC	T INFO	RMATION		DRILLING INFORMATION				
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				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								
1	0.0.0.0								
-25-	0,0,0,0								
-30									1
-35-	000		SAND AND SILT: Silty,						
		CL	Sand, Tan Brown Fine						
-40-			Clayey Sand						
-45-	<u> </u>	СН	CLAY: CH: Red Clayey Sand mixed with Fat Red						
-50 -			Clay Lenses					Bentonite 49'	
-55-	<u>IIIIII</u>							Top Sand 52'	
		CL / CH	CLAYEY SAND: Dark Stained, Hydrocarbon					Top Screen 55'	
			CLAYEY SAND: TD 80'						
-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'	
-85 년									

Receiv	<u>ved by OCD: 10</u>)/21/2022	8:48:57 AM				· · · ·			
	•	•	ring Services,	Inc.			D BOREH	OLE LOG PE-24		
	235 West Lit iite 256	ttle Yorl	< Road				DEPTH: 74'			
	ouston, Texa	s 77040)-3229							
-	PROJEC1				I	DRILLI	ING INFORMA	TION		
PROJE	CT:	Rei	nediation Drilling	DRII	LING (CO.:	Atkins E	ngineering		
SITE LO	OCATION:	Т₩	P Roswell Station 9	DRI	LER:		Mort Ba	tes		
JOB NO	D.:	P-2	02203	RIG	TYPE:		Mobile D	orill B-68		
LOGGE	ED BY:	CM	l Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	ollow Stem Auger		
PROJE	CT MANAGE	R: Geo	orge Robinson, PE	SAN	IPLING	METH	ODS: Split Spo	on		
DATES	DRILLED:	11/	11-13/02	HAN	IMER V	VT./DR(OP 140 lb., 3	0 in.		
NOTES	: 4" SCH 40) PVC M	PE Well				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				J 			·			
		GM	COLLUVIUM: Hard White Caliche 0'-4'				1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Cement Grout		
-5 -	0-0-0-0	CL	CLAYEY SAND: Clayey GRAVEL AND SAND:					3'-43'		
-10 -	0101010		GM: Gravel, Sand, Silt, Mixture, gravel to 4"							
	0,0,0,0									
-20-										
-25-	0,0,0,0									
			CONGLOMERATE: Hard							
-30-1	<u> </u>	СН	CLAY: CH: Red Clayey Sand mixed with Fat Red							
-35-			Clay Lenses Damp @40', Perched Aguifer? Strong							
-40-			Contamination & Odor, Black Streaks in Clayey							
-45-	UUUU		Sand					Bentonite 43'		
-50	<u> </u>							Top Sand 46' Top Screen 49'		
-55	<u>UIIIII</u>			49'-51'	33/24"					
-55-		CL / CH	CLAYEY SAND: TD 79' Saturated @ 58' BGS	54'-56'	39/24"					
-60 -			Cement / Bentonite Grout 43'-3' Bentonite 43'-46'	59'-61'	No					
-65			12/20 Sand Pack ' 46'-74' 0.010 Slot Screen 74'-49'		SPT					
-70-			Strong Contamination & Odor, Black Gray Color					TD 74'		
-75			Water Level 58.27' TOC	70'-72'	80/16"					
			CALCAREOUS SANDSTONE: Calcareous Cement, White, fine gr., Hard Drilling, Dry, No Odor	74'-76'	50/24"					
-85 J			or Staining					[]		

Received by OCD: 10/21/2	022 8:48:57 AM						
	eering Services, I	nc.	nc. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-25 TOTAL DEPTH: 80'				
buston, Texas 77	040-3229						
PROJECT INF			DRIL	LING INFORMA	TION		
PROJECT:	Remediation Drilling	DRILLI	NG CO.:	Atkins E	ngineering		
SITE LOCATION:	FWP 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	DD OF DR	ILLING: 8 1/4" Ho	llow Stem Auger		
PROJECT MANAGER:	George Robinson, PE	SAMPL	ING METH	HODS: Split Spo	on		
DATES DRILLED:	1/04/02	HAMM	HAMMER WT./DROP 140 lb., 30 in.				
NOTES: 4" SCH 40 PVC	C MPE Well	\\ \\ \\ \\ \\		el during drilling el in completed well	Page 1 of 1		
DEPTH SYMBOLS USC	SOIL DESCRIPTION		lows PID ′ft. ppm	BORING COMPLETION	WELL DESCRIPTION		
0 -5 -10 -10 -20 -20 -30 -35 -55 -55 -55 -55 -55 -55 -70 -70 -75 -75 -75 -75 -75 -75 -75 -55 -75 -7	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' CLAYEY SAND: Water Level @ 60.20' from BGS 11/05/02 No Cdor or hydrocarbon staining.				Cement Grout 3'-48' Bentonite 48' Top Sand 51' Top Screen 54'		

Receiv	ved by OCD: 1	0/21/2022	2 8:48:57 AM				-		
Cv	/press Er	nginee	ering Services,	Inc.	F	IELD	BOREH	OLE LOG	
-	235 West Li	•	-			BOREHOLE NO.: MPE-26			
	ite 256				TOTAL DEPTH: 84'				
_	uston, Texa					וווחח			
	PROJECT		· · · · · · · · · · · · · · · · · · ·		LLING		NG INFORMA	ngineering	
PROJE	DCATION:		mediation Drilling VP Roswell Station 9		LLER:	00	Mort Bat		
			02203		TYPE:		Mohile D		
LOGGE			n Chionis					llow Stem Auger	
			orge Robinson, PE				DDS: Split Spor	_	
	DRILLED:		05-06/02			VT./DRC	• •		
NOTES	: 4" SCH 4() PVC M	PE Well				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 7	K74(74(74))					ال	· [r · · · · · · · · · · · ·	
-5 -		GM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2" @ 25'					Cement Grout 3'-47'	
-10-									
Ţ	0,0,0,0								
-20-	0101010								
-25-	0.0.0.00								
-30 -	0,0,0,0								
-35-	0707070								
-40-	<u> </u>	СН	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses Moist Light						
-45-	<u> </u>		Hydrocarbon Odor 35'-40' BGS						
-								Bentonite 47'	
-50-				49'-51' Rec. 2'				Top Sand 49'	
-52-			CLAYEY SAND: TD 84'	54'-56'				Top Screen 54'	
		CL / CH	Saturated @ 65' BGS Cement / Bentonite Grout	Rec. 2' 59'-61'					
-65-		UII	47'-3' Bentonite 47'-49' 12/20 Sand Pack 49'-85' 0.010 Slot Screen 84'-54'	Rec. 2'					
-70-				64'-66' Rec.1.5'					
-75-				69'-71' Rec. 2'					
		CL	11/08/02 No Odor or hydrocarbon staining.	74'-76' Rec. 2'	15				
-	IIIIII		CLAY: Red Brown Fat	79'-81' Rec. 2'	28				
-85-		СН		84'-86'	>50			T.D.084'	
-90 J L				Rec. 2'					

Received by OCD: 10/2	1/2022	8:48:57 AM							Page 132 of 19.
Cypress En	ginee	ering Services,	Inc					OLE LOG	
10235 West Lit	tle Yor	k Road			1		OLE NO.: MP DEPTH: 79'	E-2/	
Suite 256	77040	0 2000				UTALI	DEPTH. /9 *		
PROJECT						ווופח	NG INFORMA		
PROJECT:	·········			ווסח	LING			igineering	
SITE LOCATION:		mediation Drilling			LER:	00	Mort Bat	0 0	
JOB NO.:		VP Roswell Station 9			TYPE:		Mort Bat		
LOGGED BY:		202203						llow Stem Auger	
PROJECT MANAGER		1 Barnhill, PG					DDS: Split Spor	-	
		orge Robinson, PE							
DATES DRILLED:	10/	31/02		HAM	· · · ·	VT./DRO	· · · · · · · · · · · · · · · · · · · ·	/ in.	_
NOTES: 4" SCH 40	PVC M	IPE Well					during drilling in completed well	Page 1 of 1	
DEPTH SYMBOLS	USCS	SOIL DESCRIPTION	SAI	MP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-5 -5 -10 -10 -20 -20 -20 -20 -20 -20 -20 -2	GM CL SM	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 2.5" Srong Contamination Begins @ 12' BGS CLAYEY SAND: CL: Red Clayey Sand Strong Hydrrocarbon Odor & Staining Gray / Black Saturated , very wet /stinky SAND AND SILT: 2' Sand CLAYEY SAND: Saturated from 40'-TD Strong Contamination	SPT	1	46 Blows			Cement Grout 3'-40' Bentonite 40' Top Sand 48' Top Screen 54'	
-7075	CL								

Receiv	ed by OCD: 10)/21/2022	8:48:57 AM						Page 133 of 19
10 	/press Er 235 West Li ite 256 ouston, Texa	ttle Yor		Inc.	E	BOREH	OLE NO.: MP	OLE LOG E-28 (Casing 76')	
			RMATION			DRILL	ING INFORMA	TION	-
PROJE			mediation Drilling	DRII	LING			ngineering	
	DCATION:		P Roswell Station 9		LER:		Mort Bat		
JOB NO					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	
	DRILLED:	30-31/02	HAN		VT./DR	OP 140 lb., 30) in.		
NOTES	: 4" SCH 40	0 PVC M	PE Well				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 -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 - -65 - -70 -		CL / CH	CLAYEY SAND: Hydrocarbon Odor & Stain @ 56'	SPT	25 Blows 50 Blows				
-75-1		GYPSUM	GYPSUM: At 71' -76' White Gypsum CLAYEY SAND:		50 Blows 50				
		CL	Saturated		Blows				

Receive	ed by OCD: 10	/21/2022 8	8:48:57 AM						Page 134 o		
	unross Er	nainee	ering Services,	Inc	FIELD BOREHOLE LOG						
		•	me.	BOREHOLE NO.: MPE-29							
	235 West Li iite 256	ttle Yori	K ROAD		Т	OTAL	DEPTH: 79'				
	ouston, Texa)-3229									
	PROJEC	RMATION			DRILLI	NG INFORMA	TION				
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	Page 1 of 1			
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION			
0 –			J			,	·····	·····			
-	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 -	0,0,0,0		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-											
-30-	0,0,0,0										
-35 -	<u> </u>	СН	CLAY: CH : Fat Clay Mixes with Red Clayey	SPT / Lab	42 Blows						
-	UUUU		Sand No Contamination		6": 3 Blows						
-40-	AIIIIII				12" 8 Blows						
-45-	<u>()))))))</u>				18" 14						
-50 -	<u>UIIIII</u>				Blows 24"						
-55-		CL / CH	CLAYEY SAND:		17 Blows			Bentonite 48'			
			Saturated from 60'-TD No Contamination Split Spoon					Top Sand 51'			
		CL	Sample 58'60' at Capillary Fringe for	SPT / Lab	26 Blows			Top Screen 54'			
-65-			Geotechnical and Heterotropic Bacteria		6": 3 Blows						
-70-					12" 8 Blows						
-					18" 7 Blows						
-75 -					24" 8 Blows						
]]	51043						

Received by OCD: 10/21	/2022 8	8:48:57 AM						Page 135 of 193
Cypress Eng 10235 West Little Suite 256 ouston, Texas	e Yorl		nc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 80'	OLE LOG E-30	
PROJECT I	INFOF	RMATION			DRILLI	NG INFORMA	TION	
PROJECT:	Rer	nediation Drilling	DRIL	LING C	0.:	Atkins Er	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:	СМ	l Barnhill, 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 Spo	0 n	
DATES DRILLED:	10/2	25/02	HAM	MER V	/T./DRC	OP 140 lb., 30) in.	
NOTES: 4" SCH 40	PVC M	PE Well				during drilling n completed well	Page 1 of 1	
DEPTH SYMBOLS	JSCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
0 -5 -10 -10 -20 -20 -20 -25 -30 -30 -40 -45 -55 -60 -55 -60 -55 -60 -70 -25 -70 -25 -25 -25 -25 -25 -25 -25 -25	H	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 Grout 53'-3' 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 o
Cv	press Fr	nainee	ering Services, I	nc.	F	IELC	BOREH	OLE LOG	
-	235 West Li	•	•		BOREHOLE NO.: MPE-31				
	te 256				T	OTAL	DEPTH: 80'		
D	uston, Texa			- <u>T</u>					
	PROJECT					· -· ·	NG INFORMA		_
PROJEC			mediation Drilling	}	LING C	:00		ngineering	
	CATION:		PRoswell Station 9		LER:		Mort Bat		
			02203		TYPE:		Mobile D		
			1 Barnhill, PG					llow Stem Auger	
	CT MANAGE		orge Robinson, PE				DDS: Split Spoo		
	DRILLED:	10/2	28/02	HAM	MER W		· · · · · · · · · · · · · · · · · · ·) m.	_
NOTES:	4" SCH 4() PVC M	PE Well				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:						
-5 - {	0-0-0-0		GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-55'	
-10									
	0.00000			[
-20 - K	000000								
-25-			GRAVEL AND SAND: Hydrocarbon Odor 23'-33'						
-30 -									
35		СН	CLAY: CH: Red Clayey						
40 -	<u>IIIIII</u>		Sand mixed with Fat Red Clay Lenses						
-45									
-50 -									
-55 -								Top Bentonite 55'	
	<u> []]]]]]</u>							Top Sand 58'	
	HHHH		CLAY: Water Level @ 60.59' from TOC 10/29/02					Top Screen 59'	
-65-		CL / CH	CLAYEY SAND: TD 79'						
-70 -			Saturated @ 65' BGS Cement / Bentonite Grout 55'-3' Bentonite 55'-58'						
-75			12/20 Sand Pack ' 58'-79' 0.010 Slot Screen 79'-59'						Ì

Received by OCD: 10	/21/2022	8:48:57 AM				· •	·	Page 137 of 193
Cypress En 10235 West Lit	•	ering Services, ^{k Road}	Inc.	В	OREH	D BOREH OLE NO.: MP DEPTH: 79'	OLE LOG PE-32	
buston, Texas	s 7704	0-3229						-
PROJECT	INFO	RMATION				NG INFORMA	TION	
PROJECT:		mediation Drilling		LING (CO.:		ngineering	
SITE LOCATION:	TV	VP Roswell Station 9		LER:		Mort Bat		
JOB NO.:		202203		TYPE:		Mobile D		
LOGGED BY:		ek Smith, PG					ollow Stem Auger	
PROJECT MANAGE		orge Robinson, PE				DDS: Split Spo		
DATES DRILLED:	11/	18-19/02			VT./DRO	· · · · · · · · · · · · · · · · · · ·) in.	
NOTES: 4" SCH 40	PVC M	IPE Well	ł			during drilling in completed well	Page 1 of 1	
DEPTH SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	i
-45-	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'	

Received by OCD: 10	/21/2022	8:48:57 AM		1				Page 138 of 193			
	Cypress Engineering Services, Ir 10235 West Little York Road Suite 256					C. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-33 TOTAL DEPTH: 79'					
ouston, Texa	is 77040)-3229									
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				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		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'				

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	22 8:48:57 AM						Page 139 of 193
ess Engine	eering Services, I	Inc.				OLE LOG	
	ork Road						
256 257 Texas 770	040 0000		1	JIALL	JEPTH: BU		
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	-						1
				<u> </u>	·		-
SCH 40 PVC	MPE Well					Page 1 of 1	
SOIL YMBOLS USCS	S SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
		k.					1
	GRAVEL AND SAND: GM: Gravel, Sand, Silt, Mixture, gravel to 4"					Cement Grout 3'-53'	
	CLAY: CH: Red Clayey Sand mixed with Fat Red Clay Lenses						
	CLAY: Decreasing Hydrocarbon Odor			1 '			i
			30	1		Bentonite -53'	
	CLAY: Water Level @ 63.49' from TOC 10/29/02	55'-57'	Blows 37 Blows			Sand 79'-56'	
	- r	60'-62'	36	,		Screen 79'- 59'	1
CL / CH	Cement / Bentonite Grout	65'-67' <u>5</u>	Blows 56 Blows				
	53'-3' Bentonite 56'-53' 7 12/20 Sand Pack ' 56'-79' 0.010 Slot Screen 79'-59'	H	36 Blows 46				
	Vest Little Yo 56 n, Texas 770 COJECT INFO COJECT INFO R 10N: I P C CANAGER: G LED: 10 SCH 40 PVC COIL WBOLS USC CH 2001000000 200100000 200100000 2001000000 2001000000 2001000000 2001000000 2001000000 2001000000 2001000000 2001000000 2001000000 20010000000 20010000000 2001000000 20010000000 20010000000 CH	West Little York Road 56 n, Texas 77040-3229 ROJECT INFORMATION Remediation Drilling 10N: TWP Roswell Station 9 P-202203 CM Barnhill, PG ANAGER: George Robinson, PE LED: 10/24/02 SCH 40 PVC MPE Well SOIL DESCRIPTION SOIL USCS SOIL DESCRIPTION SOIL USCS SOIL DESCRIPTION SCH 40 PVC MPE Well GM GM GRAVEL AND SAND: MBOLS USCS SOIL DESCRIPTION SCH 40 PVC MPE Well GM GM GRAVEL AND SAND: MBOLS USCS SOIL DESCRIPTION SCH 40 PVC MPE Well GM GM GRAVEL AND SAND: GM GRAVEL	56 n, Texas 77040-3229 ROJECT INFORMATION Remediation Drilling 10N: TWP Roswell Station 9 P-202203 RIG 10N: CM Barnhill, PG ANAGER: George Robinson, PE ANAGER: George Robinson, PE LED: 10/24/02 SOIL DESCRIPTION MBOLS USCS SOIL DESCRIPTION SAMP. # GM GRAVEL AND SAND: GM GLAY:	West Little York Road Bit 56 Td n, Texas 77040-3229 Color Col	West Little York Road BOREHC TOTAL I S6 n, Texas 77040-3229 DRILLING CO.: Remediation Drilling ION: DRILLING CO.: P-202203 RIG TYPE: : CM Barnhill, PG ANAGER: George Robinson, PE LED: 10/24/02 SCH 40 PVC MPE Well SaMPLING METHOD HAMMER WT./DRC SCH 40 PVC MPE Well SUBS SOIL DESCRIPTION SOIL USCS SOIL DESCRIPTION SAMP. # Blows PID ppm CH CLAY: CH: Red Clayey Sand mixed win Fat Red Clay Lenses CH CLAY: Water Level @ G3.49' from TOC 10/29/02 CLAY: Water Level @ G3.49' from TOC 10/29/02 50'-52' So'-62' Blows Blows CH CLAY: Water Level @ G3.49' from TOC 10/29/02 CH CLAY: Water Level @ G3.49' from TOC 10/29/02 CH CLAY: Water Level @ G3.49' from TOC 10/29/02 CH CLAY: SAND: TD 79' Saturated @ 65 BG Cement / Bentonite Groat 53'-57' CH CLAY: SAND: TD 79' Saturated @ 65.93' 10/20 Sol Sot Soren 79.95	West Little York Road BOREHOLE NO.: MP TOTAL DEPTH: 80' 36 n, Texas 77040-3229 DRILLING INFORMATION Remediation Drilling ION: DRILLING CO.: Atkins En DRILLING	West Little York Road BOREHOLE NO.: MPE-34 TOTAL DEPTH: 80' Sold Decision of the second sec

Cy 10 Su	<i>ed by OCD: 10</i> ypress Er 235 West Li uite 256 puston, Texa	ering Services, < Road	Inc.	NC. FIELD BOREHOLE LOG BOREHOLE NO.: MPE-35 TOTAL DEPTH: 79'					
	PROJECT	RMATION			DRILLI	NG INFORMA	TION		
PROJE	CT:	Re	nediation Drilling	DRIL	LING (0.:	Atkins Er	ngineering	
	DCATION:	ТМ	P Roswell Station 9		LER:		Mort Bat		
JOB NO			02203		TYPE:		Mobile D		
LOGGE			l Barnhill, PG	}				llow Stem Auger	
	CT MANAGE		orge Robinson, PE				ODS: Split Spoo		
DATES	DRILLED:	11/	15/02	HAM	IMER V	/T./DRC	OP 140 lb., 30) in.	
NOTES	: 4" SCH 40) PVC M	PE Well				during drilling in completed well	Page 1 of 1	
DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMP. #	Blows / ft.	PID ppm	BORING COMPLETION	WELL DESCRIPTION	
-35-		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'	

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10235 West Li Suite 256 Iouston, Texa	ering Services, k Road D-3229 RMATION mediation Drilling VP Roswell Station 9 02203 I Barnhill, PG	DRILL DRILL RIG T METH SAMP HAMM	BOREHOLE NO.: MPE-36 TOTAL DEPTH: 74' 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.					
NOTES. 4" SCH 4) PVC M	PE Well				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 -30 -40 -45 -60 -70 -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,	54'-56' 5 59'-61' 2	0/24" 0/24" 5/24" 3/24"			Cement Grout 3'-38' Bentonite 38' Top Sand 41' Top Screen 44'	

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Cypress Engineering Services, Inc.

10235 West Little York Road Suite 256

louston, Texas 77040-3229

FIELD BOREHOLE LOG

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

iouston, rexas rro	······································						
PROJECT INF	ORMATION				NG INFORMA	TION	
PROJECT: F	emediation Drilling	DRII	LLING (0.:	Atkins Engineering		
SITE LOCATION: 1	WP Roswell Station 9	DRI	LER:		Mort Bat	tes	
JOB NO.: P	-202203	RIG	TYPE:		Mobile D	rill B-68	
LOGGED BY: C	'M Barnhill, PG	MET	HOD O	F DRIL	LING: 8 1/4" Ho	ollow Stem Auger	
PROJECT MANAGER:	eorge Robinson, PE	SAM	IPLING	METHO	DDS: Split Spo	on	
DATES DRILLED: 1	1/15/02	HAN	IMER V	/T./DRC	OP 140 lb., 3	0 in.	
NOTES: 4" SCH 40 PVC	MPE Well				during drilling in 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 -20 -30 -35 -35 -35 -35 -0 -10 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	GRAVEL AND SAND: GM: 0'-4' BGS White Tan Brown Caliche, Hard, 4'- 34' :Gravel, Sand, Silt, Mixture, gravel to 4", CLAY: CH: Red Clayey					Cement Grout 3'-38'	
-40 - -45 -	Sand mixed with Fat Red Clay Lenses					Bentonite 38' Top Sand 41' Top Screen 44'	
-55 - CL / -55 - CL / -60	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 Clay & Sandy Clay lenses layered 50'-70' Dry at 70' BGS Water Level 49.4' BGS 11/16/02						
СН	CLAY: Red Fat Clay, Dry, No Odor or Staining						

Cypress Engi	neering Services,	Inc	FIELD	BOREH	OLE LOG			
10235 West Little	•		BOREH	OLE NO.: MV	V-38			
Suite 256	TUIK KUdu		TOTAL 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	\ ▼ ▼		during drilling in completed well	Page 1 of 1			
DEPTH SOIL U	SCS SOIL DESCRIPTION		lows PID ft. ppm	BORING COMPLETION	WELL DESCRIPTION			
0 -5 -10 -10 -10 -10 -10 -10 -10 -10	SP: Fine gr. sand, reddish SC: Clayey Sand, tan brown to light brown reddish SC: Clayey Sand, tan brown 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.	(55' BGS 19 Sampled 2 x 4/oz.	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								

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Received by OCD: 10/21.	/2022 8:48:57 AM						Page 144 of 193		
Cypress Engli	neering Services, I	nc	FIEL	D BORE	HOLE	LOG	0		
10235 West Little	-	110.	BORE		SVE-22				
Suite 256	TOR NOAU		TOTA	L DEPTH: 3	5'				
uston, Texas 7	7040-3229						1		
PROJECT IN	FORMATION		DRII	LING INFOR	MATION				
PROJECT:	Remediation Drilling	DRILLI	NG CO.:	Atkin	is Engineeri	ng	:		
SITE LOCATION:	TWP Roswell Station 9	DRILLE	ER:	Mort	Bates		4		
JOB NO.:	P-202203	RIG TY	PE:	Mobi	le Drill B-68	3			
LOGGED BY:	Jim Chionis	METHO	D OF DF	RILLING: 6 1/4'	' Hollow Ste	em Auger			
PROJECT MANAGER:	George Robinson, PE	SAMPL	ING MET	HODS: Split	Spoon				
DATES DRILLED:	11/07/02	HAMME	ER WT./D	ROP 140 L	B., 30 IN.				
NOTES: Water @ 20'	(BGS)? Strong Odor	∑ ▼		vel during drilling vel in completed w	Pa	ige 1 of 1	i i		
DEPTH SOIL SYMBOLS US	SCS SOIL DESCRIPTION		lows PID ft. ppn		-	NELL CRIPTION	:		
0 -5 -15 -25 -30 -35 -35 -35 -35 -35 -5 -5 -5 -5 -5 -5 -5 -5 -5 -	COLLUVIUM: Backfill / Colluvium GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture, 2" Gravel Perched Aquifer @ 20' BGS ?? CLAY: CH: Red Sandy Clay to Fat Clay Lense GRAVEL AND SAND: Silty Gravel, gray with Hydrocarbon Odor	25'-27' 10	0		Benton 13' Top Sa	ite: 18'- nd 23' 10 Slot 35' -			
Receiv	ed by OCD: 10	/21/2022	8:48:57 AM						Page 145 of 193
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C	voress Er	ering Services, I	nc.	FIELD BOREHOLE LOG					
)235 West Li	-	•		В				
	uite 256		i i i i i i i i i i i i i i i i i i i		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> :				∞ Wa	ter level (during drilling		1
	2" SVE We	ell			🛫 Wa	ter 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 -	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								
	0.0.000								
	0707070								
-15-	0,0,0,0							Bentonite: 22'-	
- 10	0,0,0,0							17'	
-20 -									
-20 -								Top Sand 22'	
-25-	0000000							2" 0.010 slot	
-25-	0000000	GM						Screen 35' - 25'	
20	0,0,0,0							20	
-30-									
	0,0,0,0								
-35-	0-0-0-0	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>	······	

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Cypres	s Engir	neering Services,	Inc.				OLE LOG
10235 W	/est Little `	York Road				DLE NO.: SV	E-24
Suite 256				ТО	TAL C	DEPTH: 30'	
-		7040-3229					TION
		FORMATION				NG INFORMA	· · · · · · · · · · · · · · · · · · ·
PROJECT:		Remediation Drilling).:		ngineering
SITE LOCATIO		TWP Roswell Station 9				Mort Bat Mabila D	
JOB NO.: LOGGED BY:		P-202203			ווקח	Mobile D	ollow Stem Auger
		CM Barnhill, PG				DS: Split Spo	0
DATES DRILL		George Robinson, PE 11/13/02				• •	
	. L L./ . 	11/13/04					
NOTES:						luring drilling n completed well	Page 1 of 1
	DIL BOLS US	CS SOIL DESCRIPTION			PID opm	BORING COMPLETION	WELL DESCRIPTION
0 7						······	
		GRAVEL AND SAND: GM: Gravel, Sand, Silt Mixture Gravel to 2"					Concrete seal: 13'-3'
-15 - 00 - 00 - 00 - 00 - 00 - 00 - 00 -	00						Bentonite 18'- 13'
	0000						Top Sand 18'
-25 - 0.200	0-0						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.				HOLE LOG
10	235 West Li	ittle Yor	k Road				OLE NO.: S	
	uite 256				T	OTAL	DEPTH: 3	4'
	buston, Texa							
	PROJEC	T INFO	RMATION				NG INFORM	
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					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								
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'
-40 J	V7777775		l				L <u></u>	

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York Road	nc.	BOREH	OLE NO.: \mathbf{SV}		
······		DRILLI	NG INFORMA	TION	
	DRILLIN				
TWP Roswell Station 9	DRILLE	२:	Mort Bat	es	
P-202203	RIG TYP	ΡE:	Mobile D	rill B-68	
CM Barnhill, PG	METHO		LING: 6 1/4" Ho	llow Stem Auger	
George Robinson, PE	SAMPLI	NG METHO	DDS: Split Spo	0 n	
11/01/02	HAMME	R WT./DRC	OP 140 LB., 3	30 IN.	
Seen in Well	\ \ \ \ \ \ \			Page 1 of 1	
SCS SOIL DESCRIPTION			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'	
	Peering Services, In 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 CS 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	7040-3229 FORMATION Remediation Drilling DRILLIN TWP Roswell Station 9 DRILLER P-202203 RIG TYF CM Barnhill, PG METHON George Robinson, PE SAMPLIN 11/01/02 HAMMEN Seen in Well Image: CS 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	FIELD York Road BOREHU York Road TOTAL I 7040-3229 DRILLI FORMATION DRILLI Remediation Drilling DRILLING CO.: TWP Roswell Station 9 DRILLER: P-202203 RIG TYPE: CM Barnhill, PG METHOD OF DRIL George Robinson, PE SAMPLING METHOD 11/01/02 X Water level of Seen in Well X Water level of GRAVEL AND SAND: SAMP. # GRAVEL AND SAND: SAMP. # GRAVEL AND SAND: SAMP. # Mixture Gravel 2"-4" Contaminated at 10' BGS No Fat Clay Seen in well. Very Strong Contamination Strong/ Odor/ Staining Black Color	Preering Services, Inc. FIELD BOREH York Road BOREHOLE NO.: SVI TOTAL DEPTH: 35' 7040-3229 DRILLING INFORMA FORMATION DRILLING CO.: Atkins End Remediation Drilling DRILLER: Mort Bat TWP Roswell Station 9 DRILLER: Mort Bat P-202203 RIG TYPE: Mobile D CM Barnhill, PG METHOD OF DRILLING: 6 1/4" Hotodilling George Robinson, PE SAMPLING METHODS: Split Sponting 11/01/02 HAMMER WT./DROP 140 LB., 1 Seen in Well X Water level during drilling CS SOIL DESCRIPTION SAMP. # Blows PID ppm COMPLETION GRAVEL AND SAND: Blows Atter level in completed well COMPLETION	Preering Services, Inc. FIELD BOREHOLE LOG York Road BOREHOLE NO.: SVE-27 7040-3229 TOTAL DEPTH: 35' FORMATION DRILLING INFORMATION Remediation Drilling DRILLING CO.: Atkins Engineering TWP Roswell Station 9 DRILLER: Mort Bates P-202203 RIG TYPE: Mobile Drill B-68 CM Barnhill, PG METHOD OF DRILLING: 6 1/4" Hollow Stem Auger George Robinson, PE SAMPLING METHODS: Split Spoon 11/01/02 HAMMER WT./DROP 140 LB., 30 IN. Seen in Well XZ< Water level during drilling

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C	Cypress Er	nginee	ering Services,	Inc.	F	IELD	BOREH	OLE LOG	
	0235 West Li	-	-		В	OREH	OLE NO.: SV	E-30A	
	uite 256				Т	OTAL [DEPTH: 45'		
	buston, Texa								
			RMATION				NG INFORMA		_
PROJ			mediation Drilling		LING (CO.:		ngineering	
	LOCATION:		P Roswell Station 9		LER:		Mort Bat		
JOB N			02203		TYPE:		Mobile D		
	SED BY:		I Barnhill, PG	í				llow Stem Auger	
			orge Robinson, PE				DDS: Split Spo		
DATE	S DRILLED:	10/2	25/02	HAM		VT./DRC		30 LN.	_
NOTE	S: 2" PVC S	SVE Wel	1				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				2 2	Concrete seal:	
-5 -								13'-3'	
-15								Bentonite 13' 2" Slot Screen 45' - 20'	
-25-								Top Sand 18'	
-30-				50 Blows	+50				
-35-					22				
-40-		СН		[20				
-45-				ł				TD	

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C	ypress Er	nginee	ring Services,	Inc.				
	235 West Li	ttle York	< Road				DLE NO.: \mathbf{SV}] DEPTH: $\mathbf{35'}$	L-31
	iite 256 ouston, Texa	e 77040	1-3000				JEFIN. 33	
_	PROJECT						NG INFORMA	TION
PROJE			nediation Drilling	DRI	LING (ngineering
	OCATION:		P Roswell Station 9				Mort Bat	0 0
JOB N			02203		TYPE:		Mobile D	
LOGGE			Barnhill, PG			F DRILI		llow Stem Auger
	CT MANAGE		orge Robinson, PE				DDS: Split Spo	2
DATES	DRILLED:		28/02	HAN	IMER V	VT./DRC	OP 140 LB., 3	30 IN.
NOTES	Poor reco	overy in	n Split Spoon .				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		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' - 25'
-30 -		СН	CLAY: CH: Red Sandy Clay to Fat Clay	24'-26'				2.5

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10	235 West Li	•	ering Services, ^{k Road}	Inc.	E	FIELD BOREHOLE LOG BOREHOLE NO.: MW-34			
	uite 256 ouston, Texa	c 7704(1-3220			IUTAL	DEPTH: 79'		
	PROJEC ⁻					DRILL	ING INFORMA	TION	-
PROJE			mediation Drilling	DRI	LLING		· · · · · · · · · · · · · · · · · · ·	ngineering	
	OCATION:		VP Roswell Station 9		LLER:		Mort Bat	0 0	
JOB NO	D.:		02203		TYPE:		Mobile D	orill B-58	
LOGGE	ED BY:	C.N	A. Barnhill, PG	MET			LING: HSA 81/4	" Augers	
PROJE	CT MANAGE		orge Robinson, PE	SAN	/PLING	METH	ODS: Split Spo	on	
DATES	DRILLED:		06/03	HAN	MER V	NT./DR	OP 140 lb., 3	0 in.	
NOTES	: 2" SCH 40) PVC M	onitor Well				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		GM GM SC	GRAVEL AND SAND: 0'- 5': GM mixed with caliche, white pink, dry 0'-32':GM: Gravel, Sand, Silt, Mixture, gravel to 4", Lt. Brown, med. dense, dry.					Cement Grout 3'-42'	
-35		sc	SC: Clayey Sand, tan brown to light brown reddish saturated @55' BGS, No odor or staining, Water Level @ 57.74' BGS 01/07/03	@ 55 '	42/24' 46/24' 51/24'	42' 44- 46'		Bentonite 42' Top Sand 46' Top Screen 49'	
-60 -		SW	SW: Med. to fine grained tan sand, well sorted,	BGS Sampled 2 x 4/oz.	56/24'	51' 54- 56'		12/20 Sand	
-65 -		SC	SC: Clayey Saturated	Jars @11:10hr.		61'		0.010 Slot	
-70		CH SW	CH: Fat Brown Silty Clay, SW: Tan, Reddish, Brown	8260 VOC /	71/24	66'		Screen	
.75		SW	Sw: Tan, Reddish, Brown Sand, Fine Gr., Well Sorted, Saturated, Flowing Sand, No Odor Or	VOC 7 TPH Mod. 8015	76/24	71'		TD 79'	
-80 -		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'			

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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)

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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 ®

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

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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

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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

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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

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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

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Work Plan to Delineate Perched Aquifer Project No. TRANSWESTERN PIPELINE COMPANY, LLC Page 164 of 193

WSP August 2022



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

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	TABLE 1 TABLE 2 TABLE 3

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.

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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.

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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 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 hollow-stem 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.

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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

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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

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FIGURES

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

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		Legend	b						
			pposed Perched nitoring Well Location						
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		* Soi	il Vapor Extraction Location						
		Pro	posed Electric Resistivity Line						
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TABLES

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

	Date of	Total Depth	Measured	Surface	Casing	Screen	Top 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

Note:

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

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Groundwater (ft below TOC)	PSH (ft)	Surface 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	(a)	NA
	11/10/2021		(a)	dry	(a)	NA
	5/14/2022		(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
	5/7/2021		(a)	dry	(a)	NA
	11/10/2021		(a)	29.42	(a)	NA
	5/14/2022	NIA	(a)	dry	(a)	NA
SVE-3	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	(a)	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	1	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
				()		NA NA
	4/17/2011		32.90	33.00 (TD)	0.10	
	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	(a)	NA
	11/21/2014		(a)	dry	(a)	NA
	4/21/2015		(a)	dry	(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)	dry	(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
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	34.05	0.45	NA 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

Well ID	Date	TOC elevation (ft)	Depth to PSH (ft below TOC)	Depth to Groundwater (ft below TOC)	PSH (ft)	Groundwater Surface Elevation (ft)
	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	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					
	9/1/2021		32.65 32.72	34.20 34.35	1.55 1.63	3,579.43 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			Not Ga	•	
	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	0.70	3578.93
	7/18/2022		32.95	33.00	0.05	3579.49
	8/10/2022		33.00	33.47	0.47	3579.34
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)	NA
	12/22/2011		(a)	dry dry	. ,	NA
			(a)	dry	(a)	NA NA
	4/17/2012		(a)	dry	(a)	
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013	0000.07 (1)	(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 dry	(a)	NA NA
	5/31/2018 11/6/2018		(a)	dry dry	(a)	NA NA
	6/24/2019		(a) (a	dry	(a) (a)	NA NA
	1/6/2020		(a (a)			NA NA
SVE-24	5/13/2020			dry dry	(a)	NA
0 V L-24			(a)	dry dry	(a)	
	11/9/2020		(a)	dry	(a)	NA
	5/7/2021		(a)	dty	(a)	NA NA
			(0)	dn/	(a)	NIΛ
	11/10/2021 5/11/2022		(a) (a)	dry dry	(a) (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)
	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)	dry	(a)	NA
	4/21/2015		(a)	32.73	(a)	3,584.29
	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)	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)	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)	3,584.82
	11/10/2021		(a)	32.24	(a)	3,584.78
	12/2/2021		(a)	32.25	(a)	3,584.77
	1/10/2022		(a)	32.35	(a)	3,584.67
	2/11/2022		(a)	32.4	(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 8/10/2022		(a)	dry 32.55	(a)	NA 2 594 47
SVE-26	3/10/2022	NA	(a)		(a)	3,584.47
3vL-20	10/8/2009	INA	(a)	dry dry	(a) (a)	NA NA
	1/26/2010		(a) (a)	dry dry	(a) (a)	NA
	3/22/2010			dry	(a) (a)	NA
	4/17/2011		(a) (a)		(a) (a)	NA
	12/22/2011		(a) (a)	dry dry	(a) (a)	NA NA
	4/17/2012		(a) (a)		(a) (a)	NA NA
	10/18/2012		(a) (a)	dry dry	(a) (a)	NA
SVE-26	4/15/2012		(a) (a)	dry dry	(a) (a)	NA
3vE-20	4/15/2013	3614.43 (h)	(a) (a)	dry dry	(a) (a)	NA NA
	5/1/2014	5014.45 (11)	(a) (a)	dry	(a) (a)	NA NA
	11/21/2014		(a) (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	1	(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)
	5/22/2017		(a)	dry	(a)	NA
	11/13/2017		(a)	dry	(a)	NA
				-		NA
	6/1/2018		(a)	dry	(a)	
	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)	dry	(a)	NA
	5/7/2021		(a)	dry	(a)	NA
	11/10/2021		(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)	dry	(a)	NA
	10/18/2012		(a)	dry	(a)	NA
	4/15/2013		(a)	33.82	(a)	NA
	11/3/2013	3613.19 (h)	(a)	dry	(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 Ga	auged	
	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	(a)	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) (a)	29.65	(a)	NA
	4/17/2012			dry		NA
	10/18/2012		(a) (a)	dry	(a)	NA
	4/15/2012			33.58	(a)	NA
		2607.04 /b)	(a)		(a)	
	11/3/2013 5/1/2014	3607.84 (h)	(a)	dry dry	(a)	NA NA
	11/21/2014		(a)	dry 28.59	(a)	3,579.25
	4/21/2015		(a) (a)	28.86	(a) (a)	3,579.25
SVE-28						
SVE-ZÖ	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
				20.01	(9)	0,010.00

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Well ID	Date	TOC elevation (ft)	Depth to	Depth to Groundwater (ft below	PSH (ft)	Groundwater Surface
Weinib	Duic		PSH (ft below TOC)	TOC)	1 011 (it)	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	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
	5/7/2021		(a)	43.22	(a)	3,572.78
	11/10/2021		(a)	43.25	(a)	3,572.75
0.45 0.4	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 12/22/2011		(a)	dry 28.50	(a)	NA NA
	4/17/2012		(a) (a)	dry	(a) (a)	NA
	10/18/2012		(a) (a)	dry	(a) (a)	NA
	4/15/2013		(a)	dry	(a) (a)	NA
	11/3/2013	3612.67 (h)	(a)	dry	(a)	NA
	5/1/2014	0012.07 (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
SVE-31	11/6/2018 6/24/2019		(a) (a)	30.24 dry	(a) (a)	3,582.43 NA
	1/5/2020		(a) (a)	dry	(a) (a)	NA
	5/13/2020		(a)	dry	(a) (a)	NA
	11/10/2020		(a)	31.65	(a) (a)	3,581.02
	5/7/2021		(a)	dry	(a)	
	11/10/2021		(a)	30.63	(a)	3,582.04
	5/14/2022		(a)	dry	(a)	0,002.04 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	<u> </u>	(a)	33.80	(a)	NA

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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
NMV	WQCC 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
Groundv	water 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
	uman Health Standard				70	-	70		-
	SEPA MCL				70		70		
	Water (2022)				11.5	1.17			4.59
Groundwate	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	<2.0	<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	<10	<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	<u><50</u>
	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

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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

CONDITIONS			
C E		Condition	Condition Date
	nvelez	Accepted for the record. See app ID 154725 for most updated status.	11/22/2022