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Second Quarter 2015 Groundwater Monitoring Report NuStar Andover Quail Crossing Andover, Kansas

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Prepared for:
NuStar Pipeline Operating Partnership L.P.

November 6, 2015
1641-08

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GROUNDWATER MONITORING REPORT
Second Quarter 2015
NuStar Pipeline Operating Partnership L.P.
Quail Crossing Neighborhood
Andover, Kansas

Site Name and Location:	Quail Crossing Neighborhood Site	
	West Mountain and North Colt Court	
	Andover, Kansas	
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1.0 Introduction and Site Background

This groundwater monitoring report was prepared by Apex Companies, LLC (Apex) on behalf of NuStar Pipeline Operating Partnership L.P. (NuStar) as part of the continuing response to a gasoline release from a NuStar refined-petroleum pipeline. The activities outlined herein were performed in accordance with the Consent Agreement and Final Order (CAFO) dated May 10, 2013 and in coordination with the Kansas Department of Health and Environment (KDHE) and the Quail Crossing Neighborhood Association. This report summarizes the activities conducted from April 1 through June 30, 2015, as well as an additional irrigation well resampling event on July 7, 2015 (see Section 2.5).

1.1 Background

The pipeline release was discovered in June 2012 after separate-phase hydrocarbons (SPH) were detected in an irrigation well at 2006 N Colt Court, in the Quail Crossing Neighborhood (the Neighborhood) of

Andover, Kansas (the Site; Figure 1). The NuStar pipeline release location was approximately 80 feet north of the affected irrigation well. Upon the discovery of SPH in the irrigation well, NuStar immediately mobilized to the Site and implemented initial response and abatement activities including: repairs to the pipeline, deactivation of the irrigation well at 2006 N Colt Court, and removal of SPH from the well. Following the initial response activities, NuStar: (1) performed a number of interim remedial measures (IRMs); and (2) planned and implemented a Comprehensive Investigation (CI). The initial response, IRMs, and CI activities are described in detail in the *Comprehensive Investigation Report* (Apex, 2014b) submitted in April 2014 and approved by KDHE on May 7, 2014.

Information obtained during the CI indicates that residual gasoline constituents are present in soil in a limited area in the vicinity of the pipeline release location. To evaluate the feasibility of soil vapor extraction (SVE) technology for mitigating subsurface petroleum hydrocarbons, NuStar performed an SVE pilot test during the week of December 9, 2013. The test was completed in accordance with the KDHE-approved *Soil Vapor Extraction Pilot Test Work Plan* (Apex, 2013). An evaluation of the SVE pilot test results indicated SVE to be a likely candidate for effective remedial technology on Site. Accordingly, NuStar: (1) presented the results of the pilot test and a conceptual SVE system design at a Neighborhood meeting on February 17, 2014; and (2) submitted the *Soil Vapor Extraction Evaluation and Soil Investigation Report* in March 2014 (Apex, 2014a). NuStar modified the conceptual design of the SVE system to reflect Neighborhood feedback. Despite proposed modifications to the conceptual SVE design, neighborhood representatives cited a number of reasons for not accepting SVE as a viable mitigation option, including concerns about noise, emissions, and aesthetics.

To further refine the extent of gasoline in soil and evaluate the potential for implementing other remedial alternatives that may be acceptable to the Neighborhood, NuStar implemented a soil investigation in the vicinity of the pipeline release in April 2014. Analytical data from that soil investigation were presented in the *Soil Investigation Report and Proposed Soil Excavation Work Plan* (Apex, 2014c), which was approved by KDHE on August 8, 2014. The work plan described proposed excavation methods and a general excavation design for removing vadose-zone soil affected by petroleum constituents. KDHE approved the work plan and requested a detailed excavation construction plan to documents specific methods and materials for the planned excavation. In addition to the standard permit requirement for this type of project, the City of Andover required preparation of detailed survey documents and engineering designs as a condition of permitting the planned excavation. Once the City of Andover regulatory process was completed and the design plan approved, the Detailed Soil Excavation Plan was prepared and submitted to KDHE (in August 2015). KDHE approved the detailed excavation plan on August 26, 2015.

In June 2013, weekly SPH removal and gauging events were initiated and in August 2013 a quarterly groundwater monitoring program was initiated; this schedule was maintained through February 9, 2015. After February 2015, the SPH program was modified and three additional monitoring wells were installed as part of the approved Groundwater Pilot Test. The current KDHE-approved groundwater monitoring program

consists of: (1) monthly gauging of water levels in monitoring wells MW-1 through MW-19; (2) quarterly collection and analysis of groundwater samples from monitoring wells MW-1 through MW-19; and (3) quarterly collection and analysis of groundwater monitoring samples from selected irrigation wells. The groundwater monitoring programs for monitoring wells and irrigation wells are presented in Tables 1 and 2, respectively.

For the SPH removal program, a vacuum truck was used to extract groundwater and SPH, if present, from the irrigation well at 2006 N Colt Court during the period June 2013 through January 7, 2015. A modified SPH removal program was approved by KDHE on January 9, 2015 and implemented starting on January 14, 2015. The modified SPH program is described in Section 2.2.1.

Since the release was discovered, NuStar has coordinated with property owners within the investigation area to deactivate irrigation wells (nine as of the date of this report), reconfigure the associated irrigation systems to receive municipal water, and reimburse affected property owners for municipal water fees. Irrigation wells were selected for deactivation based on their location within the investigation area, groundwater quality, the potential that pumping on the wells could influence groundwater conditions, and/or well owner concerns. Irrigation wells that have been deactivated are listed in Table 2 and locations are shown on Figure 2. It is noted that the irrigation wells have not been permanently decommissioned; therefore, the well owners will have the option of reactivating the wells at a later date. In addition, it is noted that eight Neighborhood irrigation wells were not deactivated because the homeowners wished to maintain use of the well (2025 N Ruger[1], 2007 N Mountain Court, and 2009 N Mountain Court) or the wells are located outside the investigation area (1009 W Mountain, 1211 W Quail Crossing Court, 1910 W Quail Crossing Court, HOA-1, and HOA-2).

In order to evaluate a groundwater remedial technology that may be appropriate for treating groundwater at the Site, the *Groundwater Pilot Test Work Plan* was developed and submitted in January 2015 (Apex, 2015a). After evaluating several groundwater technologies, the Work Plan proposed a pilot test to evaluate enhanced aerobic bioremediation using oxygen release compounds via injection to the subsurface. KDHE approved the Work Plan on January 26, 2015 and the pilot test was implemented from March 10 through 20, 2015. The methods and initial results of the groundwater pilot test were reported in the *Interim Groundwater Pilot Test Implementation Report*, which was submitted to KDHE on August 26, 2015; this report also includes the dissolved-phase petroleum groundwater data collected for the *Interim Groundwater Pilot Test Implementation Report*. The groundwater pilot test results will be evaluated in more detail in the forthcoming groundwater pilot test report, which is scheduled for submittal in April 2016.

[1] On April 20, 2015, the home at 2025 N Ruger was sold; NuStar is working with the new homeowner regarding irrigation well deactivation at that property.

1.2 Site Description

The Site is located in the northern portion of the City of Andover, in southwest Butler County, Kansas (Figure 1). Land use at the Site and surrounding areas is residential. As shown on Figure 2, a stormwater retention pond is located near the Site, approximately 250 feet south of the NuStar pipeline. The pipeline is constructed of 8-inch-diameter carbon steel and is used to transport liquefied petroleum products. The pipeline was installed to an approximate depth of 3 feet below ground surface (bgs) in agricultural land in 1959. The pipeline remained in agricultural and/or undeveloped land until the late 1990s when development of the Quail Crossing Neighborhood began. As part of the Neighborhood development, the pipeline depth was increased to approximately 6 feet bgs by re-excavating and backfilling with native material. An approximately 50-foot-wide pipeline right of way (ROW) was created along the pipeline pathway for safety purposes during Neighborhood development. The ROW limits development activities near the pipeline. The pipeline location and associated ROW are shown on Figure 2.

2.0 Second Quarter 2015 Groundwater Monitoring and SPH Removal

This section describes the following second quarter 2015 groundwater monitoring and SPH removal activities: (1) monthly groundwater gauging and measurement of stormwater pond stage; (2) monthly SPH gauging and removal of SPH, if any, from the irrigation well at 2006 N Colt Court; and (3) comprehensive groundwater monitoring and sampling of 19 monitoring wells and selected irrigation wells. Groundwater monitoring programs for monitoring and irrigation wells (i.e., schedule and chemical analyses) are shown in Tables 1 and 2, respectively.

2.1 Groundwater and Stormwater Pond Elevations

Depth to water was measured at each monitoring well location and at the irrigation well at 2006 N Colt Court during this reporting period on April 20, May 22, and June 15. Groundwater samples were collected during the June 15 monitoring event. In addition, and as part of the groundwater pilot test, select wells were gauged on June 10.

Groundwater levels were measured to the nearest 0.01 foot using an electronic water interface probe. Stormwater pond elevation was measured using a staff gauge permanently installed in the pond. Groundwater elevation and stormwater pond surface elevation data are listed in Table 3. The groundwater elevations that were measured on June 15, 2015 are shown on Figure 3. Copies of field data sheets are included in Appendix A. Historical groundwater and stormwater retention pond elevations for the period August 2013 through June 2015 are tabulated in Appendix B.

During the second quarter 2015 monitoring event, groundwater levels at the Site ranged between approximately 15 and 38 feet bgs (equivalent to 1,312 and 1,334 feet above mean sea level [MSL]). Groundwater levels during the second quarter 2015 monitoring event increased an average of 1.34 feet relative to the first quarter groundwater monitoring event in March 2015. Groundwater levels were generally consistent with those observed since groundwater monitoring began in July 2013.

The elevation of the stormwater pond surface ranged from 1344.50 to 1344.75 feet MSL between April and June 2015. During the second quarter 2015 monitoring event (June 15), the surface elevation of the stormwater retention pond was 1344.75 feet MSL. The stormwater pond surface elevation was 0.65 feet higher compared to the first quarter 2015 monitoring event (February 2015).

As shown on Figure 3, the groundwater levels measured during the second quarter 2015 event exhibited a pattern similar to previous monitoring events at the Site. That is, groundwater levels were highest in the vicinity of the stormwater retention pond and decreased with distance from the pond. The observed pattern of elevated groundwater levels near the pond is likely the result of localized groundwater recharge from the stormwater retention pond. The localized recharge results in radial flow of groundwater away from the pond. However, with increasing distance from the pond, groundwater exhibits a more easterly flow component and flatter gradient, consistent with regional patterns (O'Connor et al., 1982).

2.2 SPH Occurrence

Consistent with the KDHE-approved *Proposed SPH Removal Modification Plan*, an SPH skimmer was installed in the irrigation well at 2006 N Colt Court on February 9, 2015, and gauging and SPH skimmer O&M events were performed monthly to evaluate the effectiveness of the SPH skimmer in the irrigation well.

The irrigation well at 2006 N Colt Court was gauged for the presence of SPH and to measure depth to water on April 20, May 22, June 10, and June 15. SPH were not detected in the irrigation well at 2006 N Colt Court during any of these gauging events. Accordingly, SPH removal activities were not necessary during the second quarter 2015 monitoring period. Groundwater elevation data, SPH thicknesses, and the estimated volume of SPH removed from the irrigation well at 2006 N Colt Court for the first half of 2015 are listed in Table 4. Historical data are included in Appendix B.

SPH have not been observed in any monitoring wells at the Site, including well MW-1, which is located 30 feet from the irrigation well. With the exception of the irrigation well at 2006 N Colt Court, SPH have not been observed in any irrigation wells at the Site.

2.3 Second Quarter 2015 Groundwater Monitoring Event Scope

The second quarter 2015 groundwater monitoring event was conducted during the week of June 15, 2015 and included the monitoring activities presented below.

- Monitoring wells MW-1 through MW-19 were gauged.
- Groundwater samples were collected from monitoring wells MW-1 through MW-19.
- Groundwater samples were collected from irrigation wells at 17 properties (2001 N Colt Court; 2002 N Colt Court; 2004 N Colt Court; 2005 N Colt Court; 2006 N Colt Court; HOA-1; 2007 N Colt Court; 2019 N Ruger Circle; 2020 N Ruger Circle; 2028 N Ruger Circle; 2032 N Ruger Circle; 2021 N Ruger Court; 2025 N Ruger Court; 1009 W Mountain; 2007 N Mountain Court; 2009 N Mountain Court; and 1211 W Quail Crossing Court).
- Additional groundwater samples were collected for irrigation well HOA-1 on July 7, 2015 due to apparent anomalous June laboratory results for that well. Further detail is presented in Section 2.5.

Groundwater samples were collected from monitoring wells using low-flow sampling techniques. Prior to sampling, each monitoring well was purged using a peristaltic pump while water quality parameters (pH, temperature, specific conductance, dissolved oxygen, and oxidation-reduction potential [ORP]) were recorded (Table 5). Groundwater samples were collected from irrigation wells using disposable bailers. The groundwater analytical data for monitoring wells are presented in Section 2.4. Analytical data for irrigation wells are presented in Section 2.5.

Samples from selected groundwater monitoring wells were additionally analyzed for parameters useful for assessing natural attenuation processes. Consistent with the *Revised Groundwater Pilot Test Work Plan* (Apex, 2015a), the analytical results for natural attenuation parameters were presented in the *Interim Groundwater Pilot Test Implementation Report*, which was submitted to KDHE on August 26, 2015.

2.4 Monitoring Well Analytical Program and Results

Monitoring well groundwater samples were submitted to ALS Environmental (ALS), a Kansas-accredited analytical laboratory, for the following analyses: gasoline-range organics (GRO) by Method IOWA OA-1 and volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method SW846 8260B. Table 6 presents dissolved-phase petroleum constituent data for groundwater samples collected from monitoring wells between August 2013 and June 2015. Figures 4 through 7 present analytical data for the second quarter 2015 monitoring event. Copies of the laboratory reports and a quality assurance/quality control (QA/QC) results summary are included in Appendix D. The monitoring well groundwater data are discussed below.

Petroleum constituents were not detected or were detected at concentrations lower than KDHE Tier 2 Risk-Based Screening Values (RBSVs) in 14 of 19 monitoring wells (MW-2 and MW-4 through MW-16). In the sample collected from well MW-7, GRO was detected at 0.089 mg/L; for comparison, the laboratory reporting limit for GRO is 0.05 mg/L and the KDHE Tier 2 RBSV is 0.5 mg/L.

The sample collected from well MW-1 contained GRO and five VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, naphthalene, and toluene) that exceed the corresponding KDHE Tier 2 RBSVs; the five VOCs were within the range of concentrations observed since August 2013. The GRO concentration in the sample was 140 mg/L, which is slightly higher than the concentration observed in August 2013 (120 mg/L). The sample collected from well MW-3 contained GRO and seven VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, ethylbenzene, naphthalene, and toluene) that exceed the corresponding KDHE Tier 2 RBSVs. Benzene and toluene were present at concentrations within the range observed since August 2013; however, the remaining VOCs were present at concentrations above the range observed during that time period.

Since monitoring began in summer 2013, the maximum benzene concentration detected in samples collected from monitoring wells MW-1 thorough MW-5 was 9.1 milligrams per liter (mg/L). During the June 2015 monitoring event, the maximum benzene concentration was 5.2 mg/L. Analytical results from groundwater samples collected from new wells MW-17 through MW-19, which were installed in the vicinity of the release location in March 2015 as part of the groundwater pilot test, are consistent with these wells. Monitoring well MW-17, which is located closest to well MW-1, exhibited the petroleum constituent concentrations similar to those observed in the sample collected from well MW-1. Groundwater samples collected from wells MW-18 and MW-19 contained lower petroleum constituent concentrations relative to MW-17; however, several constituents were present at concentrations above KDHE Tier 2 RBSVs.

2.5 Irrigation Well Analytical Program and Results

Groundwater samples were collected from irrigation wells at 17 properties (2001 N Colt Court; 2002 N Colt Court; 2004 N Colt Court; 2005 N Colt Court; 2006 N Colt Court; HOA-1; 2007 N Colt Court; 2019 N Ruger Circle; 2020 N Ruger Circle; 2028 N Ruger Circle; 2032 N Ruger Circle; 2021 N Ruger Court; 2025 N Ruger Court; 1009 W Mountain; 2007 N Mountain Court; 2009 N Mountain Court; and 1211 W Quail Crossing Court).

Irrigation well analytical data for the second quarter 2015 monitoring event are listed in Table 7 and shown on Figures 4 through 7. Copies of the laboratory reports are included in Appendix D. The irrigation well groundwater data are discussed below:

- During the second quarter 2015 groundwater monitoring event, dissolved-phase hydrocarbon constituents were not detected or were detected at concentrations less than KDHE Tier 2 RBSVs in 14 irrigation wells (2001 N Colt Court; 2002 N Colt Court; 2004 N Colt Court; 2007 N Colt Court; 2019 N Ruger Circle; 2020 N Ruger Circle; 2028 N Ruger Circle; 2032 N Ruger Circle; 2021 N Ruger Court; 2025 N Ruger Court; 1009 W Mountain; 2007 N Mountain Court; 2009 N Mountain Court; 1211 W Quail Crossing Court, and HOA-1 [7/2015]).

- The June 2015 water sample collected from the irrigation well at HOA-1 contained benzene at a concentration (0.011 mg/L) that exceeded the corresponding KDHE Tier 2 RBSV. Trace concentrations of GRO, 1,2,4-trimethylbenzene, cyclohexane, and total xylenes were detected; those constituents were present at concentrations below the corresponding KDHE Tier 2 RBSV. Neither GRO nor VOCs had been detected in the well prior to the June 2015 monitoring event. Additionally, no constituents were detected in upgradient wells MW-13 and MW-14 or in the nearby irrigation well at 1211 W Quail Crossing Ct. As such, the June data for well HOA-1 appeared anomalous and additional groundwater samples were collected on July 7, 2015. No constituents were detected in the July 2015 sampling event, confirming historical results for this well. Therefore, the June data is considered anomalous and was not used on the figures.

- The groundwater samples collected from two irrigation wells (2005 N Colt Court and 2006 N Colt Court) contained concentrations of dissolved-phase petroleum constituents that exceed the corresponding KDHE Tier 2 RBSVs.
  - The concentrations of GRO, benzene, 1,2,4-trimethylbenzene, and naphthalene in the irrigation well at 2005 N Colt Court exceeded the corresponding KDHE Tier 2 RBSVs. The June 2015 benzene concentration (0.066 mg/L) was consistent with the concentration measured in February 2015 (0.059 mg/L). The concentrations of benzene detected in 2015 are significantly lower than the concentrations detected in that well in October 2014 (0.23 mg/L) and July 2013 (0.47 mg/L). As shown in Table 2, this irrigation well has been deactivated, and the associated irrigation system was reconfigured to receive municipal water.
  - The concentrations of GRO, benzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, naphthalene, and toluene in the irrigation well at 2006 N Colt Court exceeded the corresponding KDHE Tier 2 RBSVs. Measureable SPH were generally present in this well during the period June 2012 through February 2015. The June 2015 benzene concentration in the irrigation well at 2006 N Colt Court (2.1 mg/L) is within the range observed during the period June 2012 through June 2015 (0.98 to 17 mg/L). As shown in Table 2, this irrigation well has been deactivated and the irrigation system was reconfigured to receive municipal water.

3.0 Status Report

Work Completed – Second Quarter 2015:

- Activities performed at the 2006 N Colt Court irrigation well during the second quarter 2015 included: gauging and SPH skimmer O&M on April 20, May 22, June 10, and June 15, 2015.

- The second quarter 2015 comprehensive groundwater monitoring event was performed during the week of June 15.
- The *First Quarter 2015 Groundwater Monitoring Report* (Apex, 2015b) was submitted on April 15, 2015.
- The *Interim Groundwater Pilot Test Implementation Report* was submitted to KDHE on August 26, 2015. The Report detailed methods and results of the pilot test conducted in March 2015 through June 2015.

Work Planned – Third Quarter 2015:

The following activities are planned for third quarter 2015:

- Performance of the third quarter 2015 comprehensive groundwater monitoring event.
- The *Soil Excavation Work Plan* was submitted on August 19, 2015; the Work Plan was approved by KDHE on August 26, 2015. NuStar will implement the Work Plan in October 2015.

4.0 References

Apex Companies, LLC (Apex), 2013. *Soil Vapor Extraction Pilot Test Work Plan. Quail Crossing Neighborhood, Andover, Kansas.* November 15, 2013.

Apex, 2014a. *Soil Vapor Extraction Evaluation and Soil Investigation Report. Quail Crossing Neighborhood, Andover, Kansas.* March 28, 2014.

Apex, 2014b. *Comprehensive Investigation Report. Quail Crossing Neighborhood, Andover, Kansas.* April 30, 2014.

Apex, 2014c. *Soil Investigation Report and Proposed Soil Excavation Work Plan. Quail Crossing Neighborhood, Andover, Kansas.* July 17, 2014.

Apex, 2015a. *Revised Groundwater Pilot Test Work Plan. Quail Crossing Neighborhood, Andover, Kansas.* January 26, 2015.

Apex, 2015b. *First Quarter 2015 Groundwater Monitoring Report. Quail Crossing Neighborhood, Andover, Kansas.* April 15, 2015.

Geosyntec, 2014. *Vapor Intrusion Assessment Work Plan. 1023 West Mountain, Andover, Kansas.* February 21, 2014.

O'Connor, Howard G., Chaffee, Pamela, and Link, Martha, 1982. *Geohydrology of Southwestern Butler County, Kansas: A Preliminary Report.* Kansas Geological Survey Open File Report 82-2. May 1982.

Table 1
Groundwater Monitoring Program – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Gauging	GRO	VOCs
MW-1	M	Q	Q
MW-2	M	Q	Q
MW-3	M	Q	Q
MW-4	M	Q	Q
MW-5	M	Q	Q
MW-6	M	Q	Q
MW-7	M	Q	Q
MW-8	M	Q	Q
MW-9	M	Q	Q
MW-10	M	Q	Q
MW-11	M	Q	Q
MW-12	M	Q	Q
MW-13	M	Q	Q
MW-14	M	Q	Q
MW-15	M	Q	Q
MW-16	M	Q	Q
MW-17	M	Q	Q
MW-18	M	Q	Q
MW-19	M	Q	Q

Notes:

1. GRO = Gasoline-range organics quantified by IOWA OA-1.
2. VOCs = Volatile organic compounds; benzene, toluene, ethylbenzene, xylenes [BTEX], 1,2-dicholoethane, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, and n-propylbenzene by U.S. Environmental Protection Agency Method 8260B.
3. M = Performed monthly.
4. Q = Performed quarterly.
5. Monitoring wells will not be sampled if SPH are present.
6. Well Locations are shown on Figure 2.

Table 2
Groundwater Monitoring Program – Irrigation Wells
Andover Colt Court Release Site
Andover, Kansas

Well Location	Well Status	Gauging	GRO	VOCs
2001 N Colt Ct	Currently in Use	--	Q	Q
2002 N Colt Ct	Deactivated	Q	Q	Q
2004 N Colt Ct	Deactivated	Q	Q	Q
2005 N Colt Ct	Deactivated	--	Q	Q
2006 N Colt Ct	Deactivated	Q	Q	Q
HOA-1	Currently in Use	--	Q	Q
2007 N Colt Ct	Deactivated	Q	Q	Q
2019 N Ruger Cir	Deactivated	Q	Q	Q
2020 N Ruger Cir	Deactivated	Q	Q	Q
2028 N Ruger Cir	Deactivated	--	Q	Q
2032 N Ruger Cir	Deactivated	--	Q	Q
2021 N Ruger Ct	Deactivated	--	Q	Q
2025 N Ruger Ct	Currently in Use	--	Q	Q
1009 W Mountain	Currently in Use	--	Q	Q
2007 N Mountain Ct	Currently in Use	--	Q	Q
2009 N Mountain Ct	Currently in Use	--	Q	Q
1211 W Quail Crossing Ct	Currently in Use	--	Q	Q

Notes:

1. GRO = Gasoline-Range Organics quantified by IOWA OA-1.
2. VOCs = Volatile organic compounds; benzene, toluene, ethylbenzene, xylenes [BTEX], 1,2-dicholoethane, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, and n-propylbenzene by U.S. Environmental Protection Agency Method 8260B.
3. Deactivation includes plumbing the irrigation system to the municipal water system. The irrigation well is not permanently decommissioned.
4. Q = Performed quarterly.
5. -- = Well not gauged.
6. Well locations are shown on Figure 2.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-1	1/7/2015	4.0	1352.13	35.0	20-35	31.75	--	--	1320.38
	1/14/2015					31.44	--	--	1320.69
	1/20/2015					31.45	--	--	1320.68
	1/28/2015					31.42	--	--	1320.71
	2/4/2015					31.44	--	--	1320.69
	2/9/2015					31.62	--	--	1320.51
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/20/2015					31.38	--	--	1320.75
	3/25/2015					NM	--	--	NM
	4/20/2015					31.39	--	--	1320.74
	5/22/2015					31.20	--	--	1320.93
	6/10/2015					31.23	--	--	1320.90
	6/15/2015					31.31	--	--	1320.82
MW-2	1/7/2015	2.0	1353.17	44.0	29-44	NM	--	--	NM
	1/14/2015					32.90	--	--	1320.27
	1/20/2015					32.93	--	--	1320.24
	1/28/2015					32.89	--	--	1320.28
	2/4/2015					32.92	--	--	1320.25
	2/9/2015					33.15	--	--	1320.02
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					32.87	--	--	1320.30
	3/25/2015					NM	--	--	NM
	4/20/2015					36.43	--	--	1316.74
	5/22/2015					35.23	--	--	1317.94
	6/10/2015					NM	--	--	NM
	6/15/2015					34.83	--	--	1318.34
MW-3	1/7/2015	2.0	1350.47	60.0	40-60	NM	--	--	NM
	1/14/2015					41.35	--	--	1309.12
	1/20/2015					41.36	--	--	1309.11
	1/28/2015					42.22	--	--	1308.25
	2/4/2015					41.12	--	--	1309.35
	2/9/2015					40.60	--	--	1309.87
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					41.02	--	--	1309.45
	3/25/2015					NM	--	--	NM
	4/20/2015					45.61	--	--	1304.86
	5/22/2015					40.21	--	--	1310.26
	6/10/2015					NM	--	--	NM
	6/15/2015					38.21	--	--	1312.26

Please refer to notes at end of table.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-4	1/7/2015	2.0	1350.73	41.0	26-41	NM	--	--	NM
	1/14/2015					31.52	--	--	1319.21
	1/20/2015					31.55	--	--	1319.18
	1/28/2015					31.66	--	--	1319.07
	2/4/2015					31.70	--	--	1319.03
	2/9/2015					31.75	--	--	1318.98
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					31.22	--	--	1319.51
	3/25/2015					NM	--	--	NM
	4/20/2015					34.10	--	--	1316.63
	5/22/2015					31.25	--	--	1319.48
	6/10/2015					29.28	--	--	1321.45
	6/15/2015					29.02	--	--	1321.71
MW-5	1/7/2015	2.0	1352.77	30.0	15-30	NM	--	--	NM
	1/14/2015					20.56	--	--	1332.21
	1/20/2015					20.55	--	--	1332.22
	1/28/2015					20.58	--	--	1332.19
	2/4/2015					20.69	--	--	1332.08
	2/9/2015					20.58	--	--	1332.19
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					20.80	--	--	1331.97
	3/25/2015					NM	--	--	NM
	4/20/2015					21.01	--	--	1331.76
	5/22/2015					20.25	--	--	1332.52
	6/10/2015					19.44	--	--	1333.33
	6/15/2015					19.60	--	--	1333.17
MW-6	1/7/2015	2.0	1349.76	41.0	26-41	NM	--	--	NM
	1/14/2015					22.59	--	--	1327.17
	1/20/2015					22.45	--	--	1327.31
	1/28/2015					22.54	--	--	1327.22
	2/4/2015					22.59	--	--	1327.17
	2/9/2015					22.77	--	--	1326.99
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					22.62	--	--	1327.14
	3/25/2015					NM	--	--	NM
	4/20/2015					23.05	--	--	1326.71
	5/22/2015					22.25	--	--	1327.51
	6/10/2015					NM	--	--	'NM
	6/15/2015					20.45	--	--	1329.31

Please refer to notes at end of table.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-7	1/7/2015	2.0	1348.98	24.0	9-24	NM	--	--	NM
	1/14/2015					16.49	--	--	1332.49
	1/20/2015					16.55	--	--	1332.43
	1/28/2015					16.56	--	--	1332.42
	2/4/2015					16.56	--	--	1332.42
	2/9/2015					16.58	--	--	1332.40
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					16.63	--	--	1332.35
	3/25/2015					NM	--	--	NM
	4/20/2015					16.10	--	--	1332.88
	5/22/2015					15.23	--	--	1333.75
	6/10/2015					NM	--	--	NM
	6/15/2015					14.91	--	--	1334.07
MW-8	1/7/2015	2.0	1353.38	30.0	15-30	NM	--	--	NM
	1/14/2015					21.64	--	--	1331.74
	1/20/2015					21.70	--	--	1331.68
	1/28/2015					21.72	--	--	1331.66
	2/4/2015					21.92	--	--	1331.46
	2/9/2015					21.88	--	--	1331.50
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					21.96	--	--	1331.42
	3/25/2015					NM	--	--	NM
	4/20/2015					22.25	--	--	1331.13
	5/22/2015					20.93	--	--	1332.45
	6/10/2015					NM	--	--	NM
	6/15/2015					19.93	--	--	1333.45
MW-9	1/7/2015	2.0	1349.48	34.0	19-34	NM	--	--	NM
	1/14/2015					NM	--	--	NM
	1/20/2015					NM	--	--	NM
	1/28/2015					31.81	--	--	1317.67
	2/4/2015					31.90	--	--	1317.58
	2/9/2015					31.78	--	--	1317.70
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					31.59	--	--	1317.89
	3/25/2015					NM	--	--	NM
	4/20/2015					33.25	--	--	1316.23
	5/22/2015					31.55	--	--	1317.93
	6/10/2015					NM	--	--	'NM
	6/15/2015					29.83	--	--	1319.65

Please refer to notes at end of table.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-10	1/7/2015	2.0	1348.79	34.0	19-34	NM	--	--	NM
	1/14/2015					28.45	--	--	1320.34
	1/20/2015					28.42	--	--	1320.37
	1/28/2015					28.44	--	--	1320.35
	2/4/2015					28.49	--	--	1320.30
	2/9/2015					28.54	--	--	1320.25
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					28.42	--	--	1320.37
	3/25/2015					NM	--	--	NM
	4/20/2015					28.53	--	--	1320.26
	5/22/2015					28.27	--	--	1320.52
	6/10/2015					NM	--	--	NM
	6/15/2015					28.30	--	--	1320.49
MW-11	1/7/2015	2.0	1351.34	42.0	22-42	NM	--	--	NM
	1/14/2015					28.88	--	--	1322.46
	1/20/2015					28.88	--	--	1322.46
	1/28/2015					28.97	--	--	1322.37
	2/4/2015					28.94	--	--	1322.40
	2/9/2015					29.26	--	--	1322.08
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/19/2015					29.84	--	--	1321.50
	3/25/2015					NM	--	--	NM
	4/20/2015					30.39	--	--	1320.95
	5/22/2015					29.88	--	--	1321.46
	6/10/2015					NM	--	--	'NM
	6/15/2015					28.31	--	--	1323.03
MW-12	1/7/2015	2.0	1349.74	43.0	23-43	NM	--	--	NM
	1/14/2015					NM	--	--	NM
	1/20/2015					31.04	--	--	1318.70
	1/28/2015					31.05	--	--	1318.69
	2/4/2015					31.07	--	--	1318.67
	2/9/2015					31.06	--	--	1318.68
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					30.95	--	--	1318.79
	3/25/2015					NM	--	--	NM
	4/20/2015					31.09	--	--	1318.65
	5/22/2015					30.33	--	--	1319.41
	6/10/2015					NM	--	--	'NM
	6/15/2015					30.86	--	--	1318.88

Please refer to notes at end of table.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-13	1/7/2015	2.0	1354.58	45.0	25-45	NM	--	--	NM
	1/14/2015					33.06	--	--	1321.52
	1/20/2015					32.93	--	--	1321.65
	1/28/2015					32.85	--	--	1321.73
	2/4/2015					33.07	--	--	1321.51
	2/9/2015					32.81	--	--	1321.77
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					33.16	--	--	1321.42
	3/25/2015					NM	--	--	NM
	4/20/2015					33.34	--	--	1321.24
	5/22/2015					32.56	--	--	1322.02
	6/10/2015					NM	--	--	'NM
	6/15/2015					31.94	--	--	1322.64
MW-14	1/7/2015	2.0	1354.99	45.0	25-45	NM	--	--	NM
	1/14/2015					33.51	--	--	1321.48
	1/20/2015					33.59	--	--	1321.40
	1/28/2015					33.65	--	--	1321.34
	2/4/2015					33.88	--	--	1321.11
	2/9/2015					34.00	--	--	1320.99
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					33.94	--	--	1321.05
	3/25/2015					NM	--	--	NM
	4/20/2015					34.93	--	--	1320.06
	5/22/2015					33.53	--	--	1321.46
	6/10/2015					NM	--	--	'NM
	6/15/2015					31.70	--	--	1323.29
MW-15	1/7/2015	2.0	1351.79	45.0	25-45	NM	--	--	NM
	1/14/2015					NM	--	--	NM
	1/20/2015					34.93	--	--	1316.86
	1/28/2015					34.98	--	--	1316.81
	2/4/2015					35.12	--	--	1316.67
	2/9/2015					35.02	--	--	1316.77
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					35.04	--	--	1316.75
	3/25/2015					NM	--	--	NM
	4/20/2015					36.50	--	--	1315.29
	5/22/2015					34.53	--	--	1317.26
	6/10/2015					NM	--	--	'NM
	6/15/2015					32.34	--	--	1319.45

Please refer to notes at end of table.

Table 3
Groundwater Gauging Data – Monitoring Wells
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-16	1/7/2015	2.0	1352.13	45.0	25-45	NM	--	--	NM
	1/14/2015					NM	--	--	NM
	1/20/2015					30.71	--	--	1321.42
	1/28/2015					20.13	--	--	1332.00
	2/4/2015					30.76	--	--	1321.37
	2/9/2015					31.09	--	--	1321.04
	2/18/2015					NM	--	--	NM
	2/25/2015					NM	--	--	NM
	3/4/2015					NM	--	--	NM
	3/11/2015					NM	--	--	NM
	3/18/2015					31.80	--	--	1320.33
	3/25/2015					NM	--	--	NM
	4/20/2015					33.03	--	--	1319.10
	5/22/2015					31.56	--	--	1320.57
	6/10/2015					NM	--	--	'NM
	6/15/2015					29.48	--	--	1322.65
MW-17	3/18/2015	2.0	1351.69	42	27-42	NM	--	--	NM
	4/20/2015					33.91	--	--	1317.78
	5/22/2015					32.55	--	--	1319.14
	6/10/2015					31.15	--	--	1320.54
	6/15/2015					31.28	--	--	1320.41
MW-18	3/18/2015	2.0	1351.11	42	27-42	27.93	--	--	1323.18
	4/20/2015					33.51	--	--	1317.60
	5/22/2015					31.54	--	--	1319.57
	6/10/2015					30.50	--	--	1320.61
	6/15/2015					30.64	--	--	1320.47
MW-19	3/18/2015	2.0	1351.13	42	27-42	35.19	--	--	1315.94
	4/20/2015					33.70	--	--	1317.43
	5/22/2015					31.67	--	--	1319.46
	6/10/2015					30.24	--	--	1320.89
	6/15/2015					30.60	--	--	1320.53
Stormwater Pond (Pond Stage [feet MSL])	1/7/2015	NA	NA	NA	NA	NA	NA	NA	NM
	1/14/2015								NM
	1/20/2015								1344.00
	1/28/2015								1343.80
	2/4/2015								1344.15
	2/9/2015								1344.10
	2/18/2015								NM
	2/25/2015								NM
	3/4/2015								NM
	3/11/2015								NM
	3/18/2015								1343.60
	3/25/2015								NM
	4/20/2015								1344.75
	5/22/2015								1344.50
	6/15/2015								1344.75

Notes:

1. feet MSL = Feet above mean sea level (NAVD88).
2. -- = No SPH
3. NM = Not measured.
4. Pond elevation is measured directly from a staff gauge in the pond (in 0.25-foot increments). The top of the staff gauge is 1347.59 feet above mean sea level.
5. NA = Not applicable.

Table 4
Separate- and Dissolved-Phase Recovery Data – 2015
Andover Colt Court Release Site
Andover, Kansas

Date	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	Product Thickness (feet)	Minimum SPH Recovered (gallons)	Total Fluids Recovered (SPH and Water; gallons)	SPH Thickness After Removal Event	Fluid Removal Technology
1/7/2015	46.87	46.78	0.09	0.2	50.0	0.01	Mobile vacuum truck
1/14/2015	46.32	46.29	0.03	0.0	0.0	0.03	None
1/20/2015	46.27	--	--	0.0	0.0	0.00	None
1/28/2015	47.34	47.27	0.07	0.0	0.0	0.07	None
2/4/2015	45.92	45.84	0.08	0.0	0.0	0.08	None
2/9/2015	45.59	45.55	0.04	0.1	50.0	0.01	Mobile vacuum truck
3/18/2015	45.55	--	--	0.3	0.3	0.00	SPH Skimmer
4/20/2015	44.93	--	--	0.0	0.0	0.00	SPH Skimmer
5/22/2015	45.13	--	--	0.0	0.0	0.00	SPH Skimmer
6/10/2015	45.43	--	--	0.0	0.0	0.00	SPH Skimmer
6/15/2015	42.38	--	--	0.0	0.0	0.00	SPH Skimmer
			Total Fluids Recovered	**0.6**	**100**		

Notes:

1. SPH = Separate-phase hydrocarbons.
2. The SPH volume removed using vacuum technology was calculated by measuring the SPH thicknesses in the well before and after each event and estimating the volume of SPH in the corresponding gravel pack interva
3. NM = Not measured.
4. -- = No SPH.
5. Separate- and Dissolved-Phase Recovery Data performed prior to 2015 is presented in Appendix B.

Table 5
Groundwater Quality Parameters
NuStar Pipeline Release Site
Arkansas City, Kansas

Sample Location	Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	pH	ORP
MW-1	1/30/2014	15.79	0.00	1,060	7.25	-52
	4/9/2014	19.22	5.52	979	6.98	-130
	7/23/2014	19.98	5.35	1,251	7.49	-110
	10/29/2014	15.81	3.21	1,369	6.97	-60
	2/12/2015	11.33	1.43	1,250	6.77	-57
	6/16/2015	16.50	0.95	1,311	7.01	-52
MW-2	1/30/2014	15.50	0.00	843	6.22	99
	4/8/2014	15.29	4.05	752	6.77	7
	7/22/2014	21.74	4.79	852	4.79	55
	10/30/2014	19.07	4.87	813	7.21	130
	2/10/2015	14.90	3.16	816	5.77	129
	6/16/2015	18.89	2.75	805	7.28	40
MW-3	1/30/2014	11.91	0.00	853	4.05	18
	4/8/2014	17.25	8.41	740	6.96	-11
	7/24/2014	25.79	2.89	971	7.18	-95
	10/30/2014	18.47	0.96	901	7.07	-236
	2/10/2015	16.27	0.93	940	6.68	-85
	6/17/2015	18.87	0.46	947	7.04	-83
MW-4	1/30/2014	14.01	2.78	1,130	5.46	158
	4/9/2014	14.99	2.54	968	6.95	132
	7/24/2014	20.53	0.57	1,135	7.24	-9
	10/30/2014	16.98	0.54	1,083	7.03	-146
	2/10/2015	16.62	1.07	1,044	6.54	-48
	6/16/2015	19.74	3.82	1,101	7.24	26
MW-5	1/30/2014	15.57	0.00	1,300	6.96	57
	4/8/2014	15.99	1.09	1,190	6.92	189
	7/23/2014	20.70	2.28	1,458	7.17	64
	10/29/2014	19.39	0.49	1,453	6.98	127
	2/10/2015	15.98	1.38	1,444	6.47	93
	6/16/2015	17.90	1.49	1,429	6.96	149
MW- 6	1/30/2014	15.54	0.63	986	7.11	146
	4/9/2014	16.58	9.16	797	7.00	201
	7/24/2014	19.56	5.64	1,303	7.27	17
	10/29/2014	18.08	4.29	1,137	7.09	160
	2/11/2015	13.07	4.06	893	6.91	100
	6/17/2015	17.60	3.88	1,280	7.15	15
MW-7	1/30/2014	16.13	0.00	667	7.21	-37
	4/9/2014	15.78	9.43	566	7.08	23
	7/24/2014	18.24	0.66	740	7.38	-11
	10/29/2014	17.47	0.22	754	7.25	-33
	2/11/2015	15.25	0.80	662	6.93	18
	6/17/2015	17.16	0.60	868	7.27	-31

Please refer to notes at end of table.

Table 5
Groundwater Quality Parameters
NuStar Pipeline Release Site
Arkansas City, Kansas

Sample Location	Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	pH	ORP
MW-8	1/30/2014	16.94	1.56	1,120	7.00	109
	4/8/2014	16.42	9.18	976	6.80	170
	7/22/2014	19.71	4.88	1,156	7.27	70
	10/29/2014	20.01	3.92	1,051	7.19	138
	2/10/2015	16.90	2.66	1,178	6.44	100
	6/17/2015	19.26	3.16	1,209	7.18	110
MW-9	1/30/2014	12.13	0.00	760	4.50	8
	4/8/2014	16.65	4.05	725	7.07	192
	7/24/2014	23.24	3.59	1,080	7.11	48
	10/30/2014	16.72	5.61	977	7.08	98
	2/11/2015	15.06	3.13	884	7.05	91
	6/16/2015	19.40	0.67	1,247	7.16	61
MW-10	1/30/2014	14.31	0.00	1,340	4.90	-44
	4/8/2014	17.01	0.18	982	6.79	-105
	8/1/2014	21.23	9.61	1,236	7.59	77
	10/29/2014	19.71	1.80	1,302	6.90	88
	2/11/2015	13.84	1.67	984	6.88	99
	6/16/2015	19.13	0.55	1,439	7.28	47
MW-11	1/30/2014	16.22	6.91	1,320	6.54	185
	4/8/2014	16.61	6.09	1,140	7.05	199
	7/23/2014	20.17	2.45	1,438	7.24	100
	10/30/2014	18.55	4.02	1,404	7.11	91
	2/10/2015	16.66	4.01	1,314	6.61	72
	6/17/2015	18.94	1.78	1,463	7.12	120
MW-12	1/30/2014	14.13	0.00	927	5.44	66
	4/9/2014	19.96	8.58	774	7.01	30
	7/22/2014	24.34	0.85	1,067	7.11	-5
	10/29/2014	18.73	0.63	967	7.13	-67
	2/12/2015	15.09	1.11	906	6.78	45
	6/16/2015	20.24	2.43	1,014	7.15	50
MW-13	1/30/2014	15.00	6.53	774	7.04	158
	4/8/2014	15.35	7.03	674	6.93	109
	7/22/2014	23.53	8.10	790	7.31	76
	10/29/2014	19.97	6.70	767	7.19	135
	2/10/2015	15.74	4.85	759	6.25	110
	6/17/2015	18.95	5.22	673	7.27	102
MW-14	1/30/2014	15.31	3.53	724	7.00	183
	4/9/2014	18.75	5.62	608	7.06	181
	7/22/2014	22.63	4.81	683	7.32	66
	10/29/2014	17.09	5.49	703	7.29	101
	2/12/2015	14.50	4.17	687	6.73	94
	6/17/2015	18.90	3.42	698	7.20	97

Please refer to notes at end of table.

Table 5
Groundwater Quality Parameters
NuStar Pipeline Release Site
Arkansas City, Kansas

Sample Location	Sample Date	Temperature (°C)	Dissolved Oxygen (mg/L)	Specific Conductivity (µS/cm)	pH	ORP
MW-15	1/30/2014	12.24	0.00	732	5.65	218
	4/8/2014	15.84	9.96	653	6.93	180
	7/23/2014	18.11	4.78	734	7.31	92
	10/29/2014	20.21	4.49	728	7.16	147
	2/10/2015	16.94	3.79	732	6.56	75
	6/17/2015	18.85	3.58	744	7.08	113
MW-16	1/30/2014	12.34	2.39	929	5.79	191
	4/8/2014	15.65	8.32	713	6.91	181
	7/23/2014	21.58	4.60	981	7.28	87
	10/29/2014	20.13	4.36	972	7.09	156
	2/10/2015	16.70	3.25	924	6.73	97
	6/17/2015	20.30	3.66	889	7.16	120
MW-17	3/20/2015	18.15	0.61	1057	6.81	42
	4/20/2015	16.87	0.83	1,012	6.70	-46
	6/16/2015	17.43	0.92	1,047	7.00	-10
MW-18	3/20/2015	17.43	0.68	990	6.89	-13
	4/20/2015	17.38	0.79	880	6.17	62
	6/16/2015	18.90	0.93	899	7.12	-18
MW-19	3/20/2015	17.83	1.57	905	7.09	50
	4/20/2015	17.11	1.36	841	6.62	-61
	6/16/2015	18.83	0.49	827	7.25	-82

Notes:

1. °C = Degrees Celsius.
2. mg/L = Milligrams per liter.
3. ORP = Oxidation-reduction potential.
4. Specific Conductivity was documented as mS/cm (millisiemens per centimeter) on the field sampling sheets. The value is reported in this table as microsiemens/centimeter.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-1	8/9/2013	**120**	**0.86**	<0.05	**0.22**	<0.1	**9.1**	0.37	**1.9**	<0.05	6.3	0.1	**0.23**	<0.05	0.068	2.8	**26**	9.1
	10/24/2013	**39**	**0.69**	<0.010	**0.19**	0.050	**7.8**	0.26	**2.0**	0.031	4.9	0.043	**0.14**	0.011	0.084	2.2	**18**	7.1
	1/30/2014	**44**	**1.0**	<0.025	**0.30**	<0.05	**3.1**	0.45	**1.4**	0.045	3.5	0.076	**0.29**	0.030	0.14	1.6	**9.3**	5.2
	4/9/2014	**20**	**0.49**	<0.010	**0.18**	<0.020	**1.1**	<0.01	0.2	0.011	--	0.023	**0.069**	0.018	0.016	--	**3.1**	2.5
	7/23/2014	**49**	**0.39**	<0.001	**0.11**	0.023	**3.1**	0.059	0.61	0.011	2.2	<0.010	**0.044**	<0.010	0.019	1.2	**6.4**	3.4
	10/29/2014	**45**	**0.47**	<0.010	**0.19**	<0.020	**5.0**	0.051	0.50	<0.010	3.4	0.015	**0.043**	<0.010	<0.010	2.2	**12**	5.5
	2/12/2015	**5.8**	<0.010	<0.010	<0.010	<0.020	**0.26**	<0.010	0.077	<0.010	0.64	0.016	**0.022**	<0.010	<0.010	0.36	0.99	0.99
	6/16/2015	**140**	**0.32**	<0.010	**0.30**	<0.020	**5.2**	0.12	0.47	0.011	5.3	<0.010	**0.11**	<0.010	0.012	2.8	**11**	8.1
MW-2	8/8/2013	**2.3**	<0.005	<0.005	<0.005	0.13	**0.12**	0.099	<0.005	<0.005	0.017	0.02	<0.005	<0.005	<0.005	<0.005	0.027	0.021
DUP	8/8/2013	**2.2**	<0.005	<0.005	<0.005	0.13	**0.15**	0.11	<0.005	<0.005	0.021	0.021	<0.005	<0.005	<0.005	<0.005	0.031	0.026
	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/22/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	0.11	**0.0085**	<0.001	0.0030	<0.002	0.0034	0.0038	0.018	<0.001	0.010	0.0013	**0.0024**	<0.001	0.0014	0.0097	0.0095	0.020
	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	0.089	<0.001	<0.001	<0.001	<0.002	0.0013	<0.001	<0.001	<0.001	0.0052	<0.001	<0.001	<0.001	<0.001	0.0026	0.0089	0.0078
MW-3	8/9/2013	**6**	**0.054**	<0.005	0.010	0.016	**1.2**	0.070	0.12	<0.005	0.086	0.014	**0.011**	<0.005	0.0074	0.12	0.4	0.21
	10/24/2013	**1.7**	**0.075**	<0.001	0.012	0.0057	**1.1**	0.082	0.12	0.0061	0.065	0.011	**0.017**	0.010	0.010	0.011	0.051	0.077
DUP	10/24/2013	**2.0**	**0.073**	<0.001	0.012	0.0059	**1.1**	0.077	0.11	0.0058	0.063	0.011	**0.018**	0.001	0.010	0.011	0.051	0.075
	1/28/2014	**2.8**	**0.038**	<0.001	<0.001	0.0069	**0.76**	0.072	0.07	0.0062	0.0098	0.0061	**0.0081**	<0.001	0.0079	<0.001	0.0081	0.011
	4/8/2014	**3.0**	**0.048**	<0.005	0.010	<0.01	**0.64**	<0.005	0.058	0.0061	--	0.0075	**0.014**	<0.005	0.011	--	0.1	0.053
	7/24/2014	**9.8**	**0.16**	<0.010	0.037	<0.020	**1.8**	0.081	0.51	<0.010	0.32	<0.010	**0.028**	<0.010	0.023	0.51	**1.6**	0.83
	10/30/2014	**6.1**	**0.12**	<0.010	0.025	<0.020	**1.1**	0.085	0.36	<0.010	0.17	0.019	**0.029**	<0.010	0.018	0.18	0.15	0.35
	2/10/2015	**7.9**	**0.19**	<0.010	**0.047**	<0.020	**1.4**	0.15	0.52	0.014	0.41	0.034	**0.054**	<0.010	0.032	0.32	0.93	0.73
	6/17/2015	**21**	**0.46**	<0.005	**0.11**	<0.01	**1.6**	0.016	**0.95**	0.030	0.92	0.029	**0.10**	0.031	0.078	0.57	**1.5**	1.5

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-4	8/8/2013	0.48	0.0013	<0.001	0.0013	<0.002	**0.035**	0.012	0.0075	0.0013	0.027	0.0027	**0.0027**	<0.001	0.0022	0.011	0.056	0.038
	10/23/2013	**1.0**	**0.0096**	<0.001	0.016	0.0046	**0.083**	0.050	0.017	<0.0010	0.0071	0.0085	**0.0036**	<0.001	0.0013	0.034	0.034	0.041
	1/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	**2.5**	**0.054**	<0.001	0.027	0.0043	**0.23**	0.070	0.15	0.0039	--	0.0071	**0.016**	0.0022	0.0084	--	0.2	0.14
	7/24/2014	**0.75**	**0.047**	<0.001	0.017	<0.002	**0.11**	0.022	0.049	0.0029	0.043	0.0027	**0.0092**	<0.001	0.0070	0.028	0.015	0.070
DUP	7/24/2014	**0.79**	**0.054**	<0.001	0.019	<0.002	**0.11**	0.025	0.057	0.0033	0.050	0.0031	**0.0098**	0.0017	0.0080	0.032	0.017	0.083
	10/30/2014	**4.8**	**0.20**	<0.001	**0.089**	<0.002	**0.49**	0.097	0.40	0.014	0.20	0.017	**0.062**	0.0078	0.039	0.24	0.33	0.44
	2/10/2015	**1.6**	**0.12**	<0.001	**0.058**	<0.002	**0.17**	0.052	0.12	0.0042	0.022	0.0092	**0.019**	0.0058	0.0077	0.081	0.042	0.10
	6/16/2015	0.14	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	0.0013	<0.001	0.0046	<0.001	<0.001	<0.001	<0.001	0.003	0.0059	0.0077
MW-5	8/8/2013	**0.94**	**0.015**	<0.001	**0.15**	<0.002	**0.038**	0.24	0.002	0.0018	0.11	0.0046	**0.0084**	<0.001	0.0023	0.0068	0.05	0.17
	10/24/2013	**2.1**	**0.098**	<0.001	0.028	<0.002	**0.081**	0.039	0.063	0.0051	0.20	0.0075	**0.023**	0.0026	0.011	0.12	0.10	0.32
	1/30/2014	**0.61**	**0.038**	0.0012	0.011	<0.002	**0.05**	0.018	0.034	0.0022	0.041	0.0017	**0.0086**	<0.001	0.0046	0.033	0.009	0.075
	4/8/2014	0.35 J	0.0051 J	<0.001	0.0013 J	0.0021 J	**0.025 J**	<0.001	0.0018 J	0.0021 J	--	0.0015 J	**0.0085 J**	<0.001	<0.001	--	0.0024 J	0.041 J
DUP	4/8/2014	**0.52 J**	**0.012 J**	<0.001	0.0035 J	0.0033 J	**0.037 J**	<0.001	0.0058 J	0.003 J	--	0.0019 J	**0.013 J**	0.001	0.0014 J	--	0.0061 J	0.06 J
	7/23/2014	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	**0.0014**	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	7/23/2014	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	**0.0013**	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	<0.050	<0.001	<0.001	<0.001	<0.002	0.0018	<0.001	<0.001	<0.001	0.0048	<0.001	<0.001	<0.001	<0.001	0.0027	0.010	0.0075
	2/10/2015	0.27	**0.0092**	<0.001	0.0024	<0.002	**0.040**	0.016	0.0071	0.0020	0.0068	0.0030	**0.0069**	0.0016	0.0021	0.011	0.0092	0.018
	6/16/2015	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
MW-6	8/9/2013	<0.05	<0.001	<0.001	<0.001	0.0029	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.0026**	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/24/2014	<0.05	<0.001	<0.001	<0.001	<0.002	0.0031	<0.001	0.0032	<0.001	0.0027	<0.001	<0.001	<0.001	<0.001	0.0031	0.0083	0.0059
	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.0028	<0.001	<0.001	<0.001	<0.001	0.0014	0.0052	0.0042
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-7	8/9/2013	<0.05	<0.001	<0.001	<0.001	<0.002	0.0012	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0014	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/24/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	<0.003
	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0024	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	0.089	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
MW-8	8/8/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	0.16	0.0026	<0.001	0.001	<0.002	0.0030	<0.001	0.0049	<0.001	0.013	<0.001	**0.0041**	<0.001	<0.001	0.0056	0.02	0.018
DUP	1/30/2014	0.15	0.0031	<0.001	0.001	<0.002	0.0038	<0.001	0.0056	0.0011	0.014	<0.001	**0.0040**	<0.001	<0.001	0.0064	0.025	0.021
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/22/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	0.0014	<0.001	<0.001	<0.001	0.0041	<0.001	<0.001	<0.001	<0.001	0.0024	0.0082	0.0065
DUP	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	0.0013	<0.001	<0.001	<0.001	0.0041	<0.001	<0.001	<0.001	<0.001	0.0021	0.0081	0.0063
	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0017	<0.003

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-9	8/9/2013	**36**	**0.82**	<0.001	**0.23**	0.23	**0.99**	0.21	0.65	0.025	2.8	0.048	**0.17**	0.014	0.068	1.3	**4.4**	4.1
	10/23/2013	0.054	<0.001	<0.001	<0.001	<0.002	0.0026	0.0011	<0.001	<0.001	<0.002	0.0025	**0.001**	<0.001	<0.001	<0.001	<0.001	<0.003
	11/25/2013	**0.57**	**0.022**	<0.010	0.013	0.004	**0.058**	0.017	0.0019	<0.001	0.019	0.0028	**0.0084**	<0.001	<0.001	0.018	0.005	0.037
	1/28/2014	0.058	<0.001	<0.001	<0.001	<0.002	0.0046	0.0015	<0.001	<0.001	<0.002	<0.001	**0.0033**	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
DUP	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/24/2014	<0.05	<0.001	<0.001	<0.001	<0.002	0.0017	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0034	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0026	<0.003
DUP	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0023	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0053	<0.003
MW-10	8/9/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/23/2013	**2.6**	**0.033**	<0.001	0.029	0.014	**0.051**	0.069	0.0034	<0.001	0.27	0.021	**0.0013**	0.0014	<0.001	0.15	0.14	0.42
	11/25/2013	**3.7**	**0.22**	<0.001	**0.072**	0.019	**0.016**	0.081	0.027	0.0065	0.26	0.016	**0.023**	<0.001	0.025	0.12	0.048	0.38
	1/28/2014	**1.1**	**0.12**	<0.001	0.039	0.0023	**0.026**	0.0081	0.036	0.0049	0.073	0.0036	**0.014**	0.0064	0.015	0.05	0.048	0.12
	4/8/2014	**8.8**	**0.56**	<0.005	**0.23**	<0.01	**0.12**	<0.005	0.11	0.011	--	0.026	**0.035**	<0.005	<0.005	--	0.3	1.1
	8/1/2014	0.091	<0.001	<0.001	<0.001	0.0066	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	0.066	<0.001	<0.001	<0.001	<0.002	0.0021	<0.001	<0.001	<0.001	0.0058	<0.001	<0.001	<0.001	<0.001	0.0034	0.013	0.0092
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	0.35	<0.001	<0.001	<0.001	0.0029	0.0024	0.0032	<0.001	<0.001	0.0040	0.0045	<0.001	<0.001	<0.001	0.0021	0.0068	0.0062

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-11	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	0.25	0.016	<0.001	0.0058	<0.02	**0.012**	0.0078	0.038	0.0011	0.021	0.0014	**0.0059**	<0.001	0.0024	0.023	0.023	0.044
	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	0.0010	<0.001	<0.002	<0.001	**0.0034**	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0032	<0.003
DUP	6/17/2015	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0035	<0.003
MW-12	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/9/2014	0.081	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/22/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	0.12	0.0011	<0.001	<0.001	<0.002	**0.0050**	<0.001	0.0017	<0.001	0.010	<0.001	<0.001	<0.001	<0.001	0.0063	0.027	0.016
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.0054	<0.001	<0.001	<0.001	<0.001	0.0029	0.0064	0.0083
	6/16/2015	0.061	<0.001	<0.001	<0.001	<0.002	0.0014	<0.001	0.0013	<0.001	0.0058	<0.001	<0.001	<0.001	<0.001	0.0028	0.011	0.0086
MW-13	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0032	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	0.072	0.0014	<0.001	<0.001	<0.002	0.0011	<0.001	0.0024	<0.001	0.0063	<0.001	**0.0038**	<0.001	<0.001	0.0026	0.0083	0.0089
	4/8/2014	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/22/2014	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	0.056	<0.001	<0.001	<0.001	<0.002	0.0028	<0.001	0.0011	<0.001	0.0065	<0.001	<0.001	<0.001	<0.001	0.0040	0.015	0.011
	2/10/2015	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0019	<0.003
MW-14	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	<0.05	0.0011	<0.001	<0.001	<0.002	<0.001	<0.001	0.0016	<0.001	0.0043	<0.001	<0.001	<0.001	<0.001	0.0017	0.0059	0.0061
	4/9/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/22/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	**0.54**	0.0029	<0.001	0.0013	<0.002	**0.021**	<0.001	0.0049	<0.001	0.036	<0.001	<0.001	<0.001	<0.001	0.022	0.10	0.058
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0016	<0.003

Please refer to notes at end of table.

Table 6
Groundwater Analytical Results – Monitoring Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Sample Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
MW-15	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	0.0012	<0.001	<0.001	<0.001	0.0030	<0.001	<0.001	<0.001	<0.001	0.0018	0.0072	0.0048
	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0043	<0.003
MW-16	10/23/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.0027	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	1/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/8/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.0026	<0.001	<0.001	<0.001	<0.001	0.0014	0.0050	0.0040
	2/10/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0029	<0.003
MW-17	6/16/2015	**95**	**0.19**	<0.001	**0.31**	0.044	**2.0**	0.37	**1.5**	0.044	3.4	0.038	**0.14**	0.015	0.10	1.8	**6.8**	5.2
MW-18	6/16/2015	**6.3**	**0.021**	<0.001	0.021	<0.002	**0.26**	0.036	0.12	0.0041	0.24	0.0035	**0.015**	0.0016	0.0089	0.17	0.59	0.41
MW-19	6/16/2015	**0.99 J**	**0.024 J**	<0.001	0.0074	<0.002	**0.11**	0.013	0.045	0.0015	0.16	<0.001	**0.0029 J**	<0.001	0.0031	0.068	0.30	0.23
DUP	6/16/2015	**2.5 J**	0.0071 J	<0.001	0.0062	<0.002	**0.11**	0.012	0.046	0.0016	0.13	<0.001	**0.0051 J**	<0.001	0.0027	0.067	0.30	0.19
KDHE Tier 2 Values		**0.5**	**0.00844**	**0.005**	**0.044**	**4.92**	**0.005**	**7.02**	**0.7**	**0.45**	**--**	**--**	**0.00111**	**0.169**	**0.66**	**--**	**1**	**10**

Notes:

1. GRO = Gasoline-range organics quantified by IOWA OA-1.
2. Volatile organic compounds by U.S. Environmental Protection Agency (EPA) Method 8260B.
3. mg/L (ppm) = Milligrams per liter (parts per million).
4. **Bold** indicates detected concentration above the KDHE screening value.
5. < = Not detected above the method reporting limit (MRL).
6. -- = Not analyzed or not established.
7. KDHE Tier 2 Screening Values from the *Risk-Based Standards for Kansas, 5th Edition* , October 2010.
8. J = Estimated concentration. See Appendix D for more information. A field duplicate was collected from monitoring well MW-19 on June 16, 2015; analytes detected were within relative percent difference limits (30 percent) with the exceptions of GRO, 1,2,4 trimethylbenzene, and naphthalene. Accordingly, those data are flagged in the Report with a "J" qualifier to indicate an estimated concentration based on analysis of the primary sample and a field duplicate.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
2001 N Colt Ct	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
2004 N Colt Ct	6/16/2015	0.056	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
2005 N Colt Ct	7/26/2013	**6.6**	**0.16**	<0.005	**0.045**	0.019	**0.47**	0.09	0.13	<0.005	0.27	0.014	**0.027**	<0.005	0.013	0.17	0.34	0.44
	10/24/2013	**4.2**	**0.14**	<0.001	0.022	<0.002	**0.31**	0.073	0.19	0.0055	0.27	0.012	**0.023**	0.0039	0.017	0.15	0.35	0.42
	1/31/2014	**3.7**	**0.13**	0.0041	0.029	<0.002	**0.15**	0.07	0.17	0.0057	0.26	0.01	**0.017**	0.0034	0.018	0.14	0.33	0.40
	4/10/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/23/2014	0.39	**0.018**	<0.001	0.0039	<0.002	**0.027**	0.011	0.023	<0.001	0.025	0.0019	**0.0025**	<0.001	0.0022	0.019	0.043	0.044
	10/30/2014	**2.2**	**0.077**	<0.001	0.0094	<0.002	**0.23**	0.055	0.19	0.0043	0.078	0.0091	**0.017**	0.0013	0.014	0.043	0.21	0.12
	2/12/2015	**1.4**	**0.039**	<0.001	0.0091	<0.002	**0.059**	0.022	0.041	0.0013	0.053	0.0039	**0.0045**	<0.001	0.0044	0.034	0.11	0.088
	6/16/2015	**2.3**	**0.012**	<0.001	0.013	<0.002	**0.066**	0.027	0.066	0.0027	0.081	0.0039	**0.0095**	<0.001	0.0069	0.087	0.18	0.17
2002 N Colt Ct	7/26/2013	<0.05	<0.001	<0.001	<0.001	<0.002	0.0047	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.0010	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.0010	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/31/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.0010		<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
HOA-1	8/20/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/25/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	0.076	0.0018	<0.001	<0.001	<0.002	**0.011**	0.0019	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.0067	<0.001	0.0067
	7/7/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
HOA-2	10/31/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/24/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
2006 N Colt Ct	6/12/2012	--	--	<0.005	--	<0.0020	**17**	3.0	**14**	**0.64**	46	1.1	**5.2**	--	--	19	**91**	**65**
	4/10/2014	**23**	**0.75**	<0.005	**0.28**	0.026	**0.98**	0.16	0.36	0.016	--	0.038	**0.076**	<0.005	0.048	--	**2**	2.1
	6/16/2015	**140**	**1.8**	<0.025	**0.55**	<0.05	**2.1**	0.42	**2.2**	0.073	6.0	0.063	**0.19**	0.046	0.24	3.0	**9.9**	9.0
2007 N Colt Ct	7/26/2013	**0.71**	**0.018**	<0.001	0.0061	<0.002	**0.14**	0.018	0.01	0.0014	0.025	0.002	**0.0052**	<0.001	0.002	0.024	0.045	0.048
	10/25/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/29/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/10/2014	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	0.40	**0.025**	<0.001	<0.001	<0.002	**0.052**	0.019	0.027	<0.001	0.023	0.0018	**0.0039**	<0.001	0.0025	0.0025	0.022	0.025
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
2019 N Ruger Cir	8/9/2013	0.42	<0.001	<0.001	<0.001	<0.002	**0.085**	0.026	0.0034	0.0013	0.0046	0.0035	**0.0021**	<0.001	0.0016	0.0034	0.017	0.0081
	10/25/2013	0.28	**0.015**	<0.001	<0.001	<0.002	**0.13**	0.0084	0.0062	<0.0010	<0.0020	0.0030	0.0010	<0.001	<0.001	<0.001	0.0011	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.050	<0.001	<0.001	<0.001	0.0032	0.0048	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	0.17	0.0018	<0.001	<0.001	<0.002	**0.069**	0.0051	<0.001	<0.001	--	<0.001	**0.0016**	<0.001	<0.001	0.0048	0.002	0.0055
	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	0.12	<0.001	<0.001	<0.001	<0.002	**0.053**	0.0054	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
2020 N Ruger Cir	7/26/2013	<0.05	<0.001	<0.001	<0.001	<0.002	0.0015	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/25/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/20/2014	0.075	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	0.38	<0.001	<0.001	<0.001	0.16	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	0.059	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
2028 N Ruger Cir	8/20/2013	0.47	<0.001	<0.001	<0.001	<0.002	**0.011**	0.042	<0.001	<0.001	<0.002	0.0051	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/25/2013	<0.05	<0.001	<0.001	<0.001	0.015	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/30/2014	<0.05	<0.001	<0.001	<0.001	0.015	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
DUP	4/10/2014	0.066	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	7/23/2014	<0.05	<0.001	<0.001	<0.001	0.0037	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
DUP	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
2032 N Ruger Cir	8/20/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/25/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03
	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
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Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
2021 N Ruger Ct	8/28/2013	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	10/25/2013	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	1/29/2014	<0.05	<0.001	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
2025 N Ruger Ct	8/28/2013	<0.050	0.0028	<0.0010	0.0012	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	10/25/2013	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	1/31/2014	<0.050	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030
	4/10/2014	<0.050	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.0020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0030
1009 W Mountain	8/20/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/31/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
Andover Colt Court Release Site
Andover, Kansas

Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
2007 N Mountain Ct	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/31/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.0010	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.0010	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	<0.05	<0.0010	<0.001	<0.001	0.014	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.0010	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.0012	0.0013	<0.003
2009 N Mountain Ct	8/20/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/29/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/28/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/11/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/16/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
1211 W Quail Crossing Ct	8/20/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/25/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	1/31/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
DUP	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/23/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	6/17/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003

Please refer to notes at end of table.

Table 7
Groundwater Analytical Results – Irrigation Wells – GRO and VOCs
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Well Location	Sample Date	GRO	1,2,4 Trimethylbenzene	1,2 Dichloroethane	1,3,5- Trimethylbenzene	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methylcyclohexane	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	Toluene	Total Xylenes
		Concentrations in mg/L (ppm)																
1910 N Quail Crossing	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/24/2013	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	4/10/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.003
	7/24/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	10/30/2014	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
	2/12/2015	<0.05	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003
KDHE Tier 2 Values		**0.5**	**0.00844**	**0.005**	**0.044**	**4.92**	**0.005**	**7.02**	**0.7**	**0.45**	**NE**	**NE**	**0.00111**	**0.169**	**0.66**	**NE**	**1**	**10**

Notes:

1. GRO = Gasoline-range organics quantified by IOWA OA-1.
2. Volatile organic compounds by U.S. Environmental Protection Agency (EPA) Method 8260B.
3. mg/L (ppm) = Milligrams per liter (parts per million).
4. **Bold** indicates detected concentration above the KDHE screening value.
5. < = Not detected above the method reporting limit (MRL).
6. NE = A KDHE Tier 2 Risk Based Screening Value has not been established.
7. KDHE Tier 2 Screening Values from the *Risk-Based Standards for Kansas, 5th Edition* , October 2010.
8. Well locations are shown on Figure 2.
9. NS = No sample collected.
10. -- = Not analyzed.

N

Legend:

- MW-1 Monitoring Well Location
- Irrigation Well
- VP-1 Soil Vapor Monitoring Point
- B-1 Boring Location
- Property Line
- Pipeline
- Pipeline Easement Boundary
- HOA Lot Owned by Quail Crossing Homeowner's Association
- Deactivated Irrigation Well
- Excavation Area

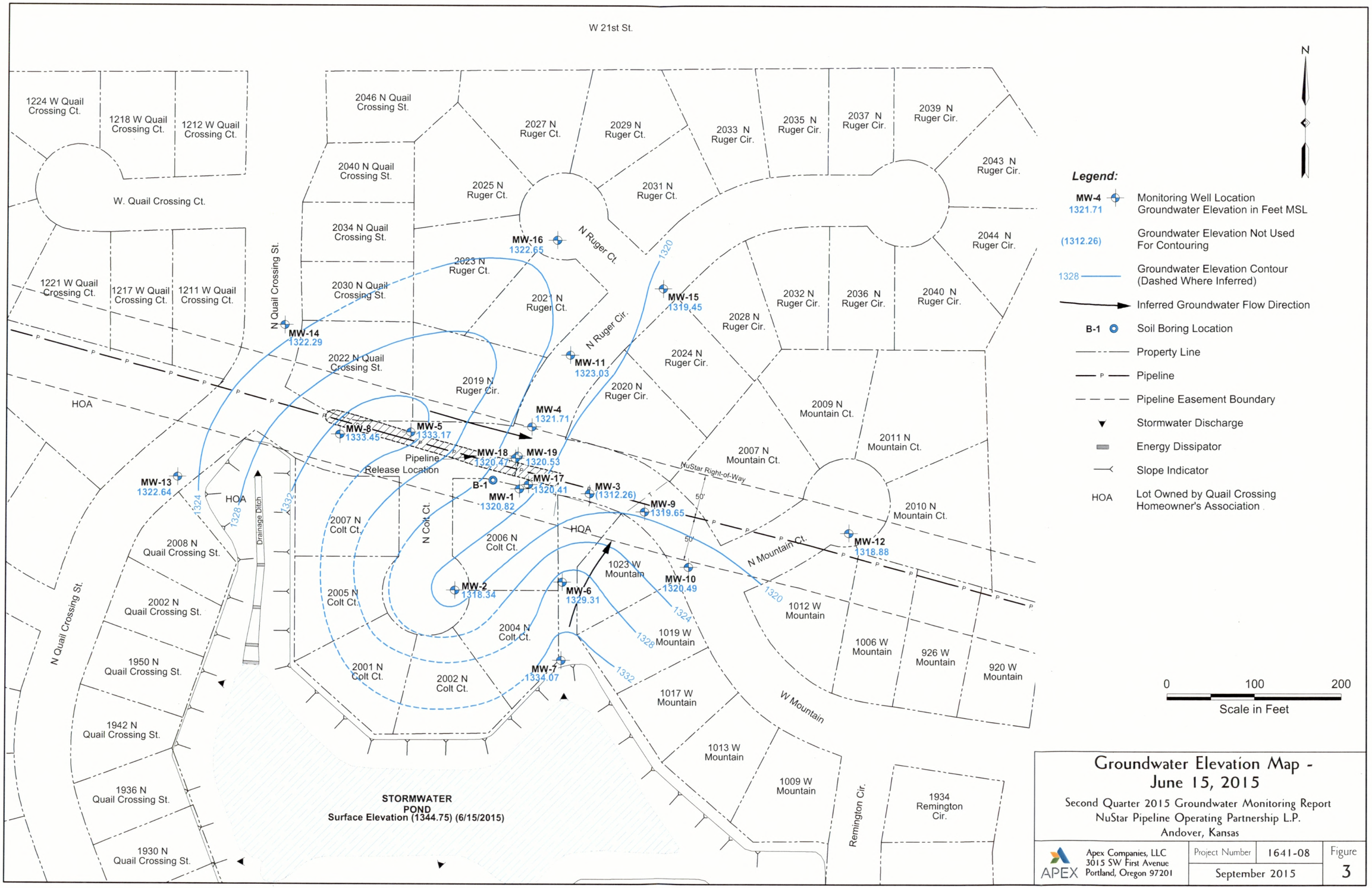
0 100 200

Scale in Feet

Site Plan and Sampling Location Map

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

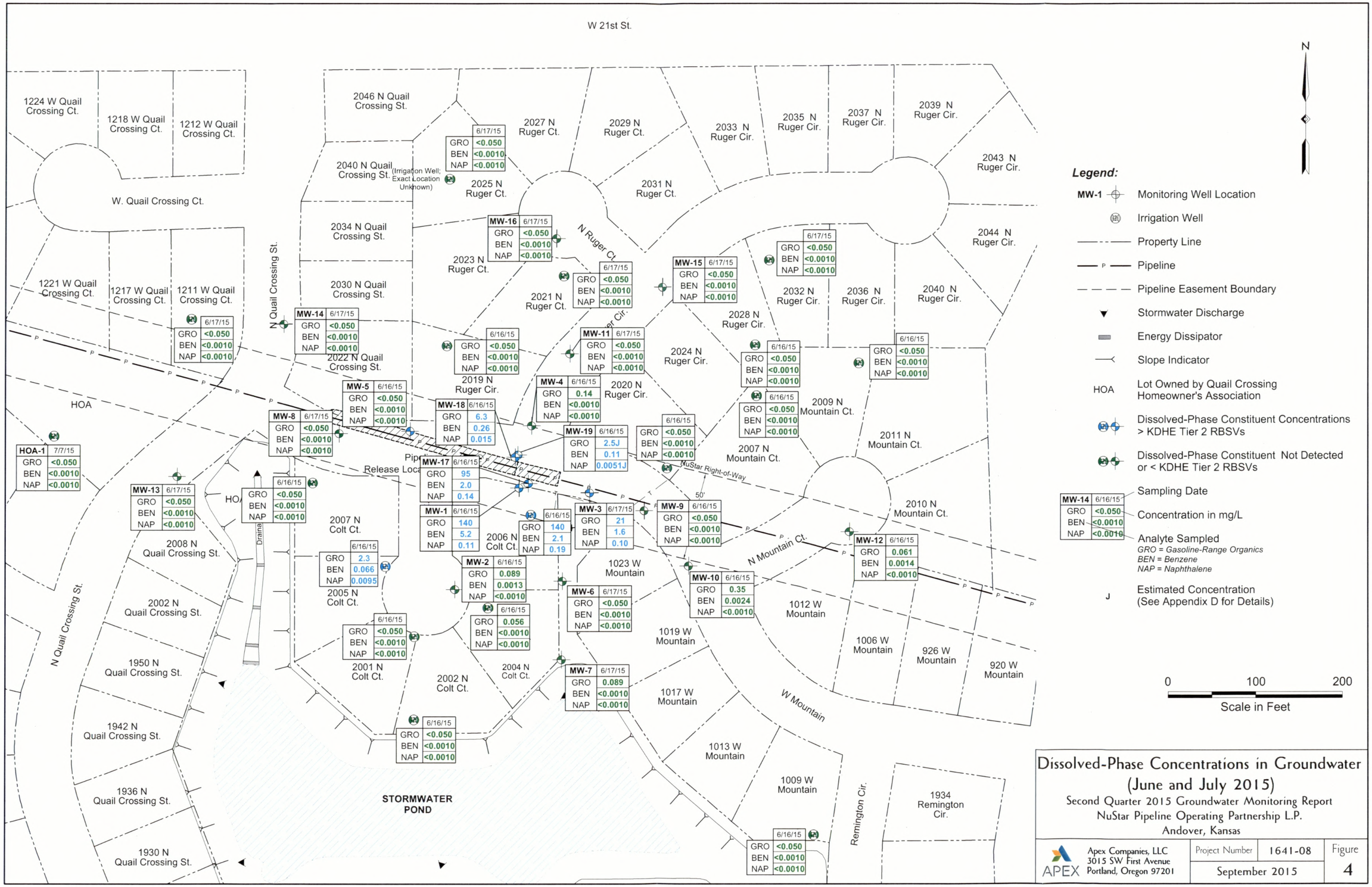
APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		2



Groundwater Elevation Map - June 15, 2015

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

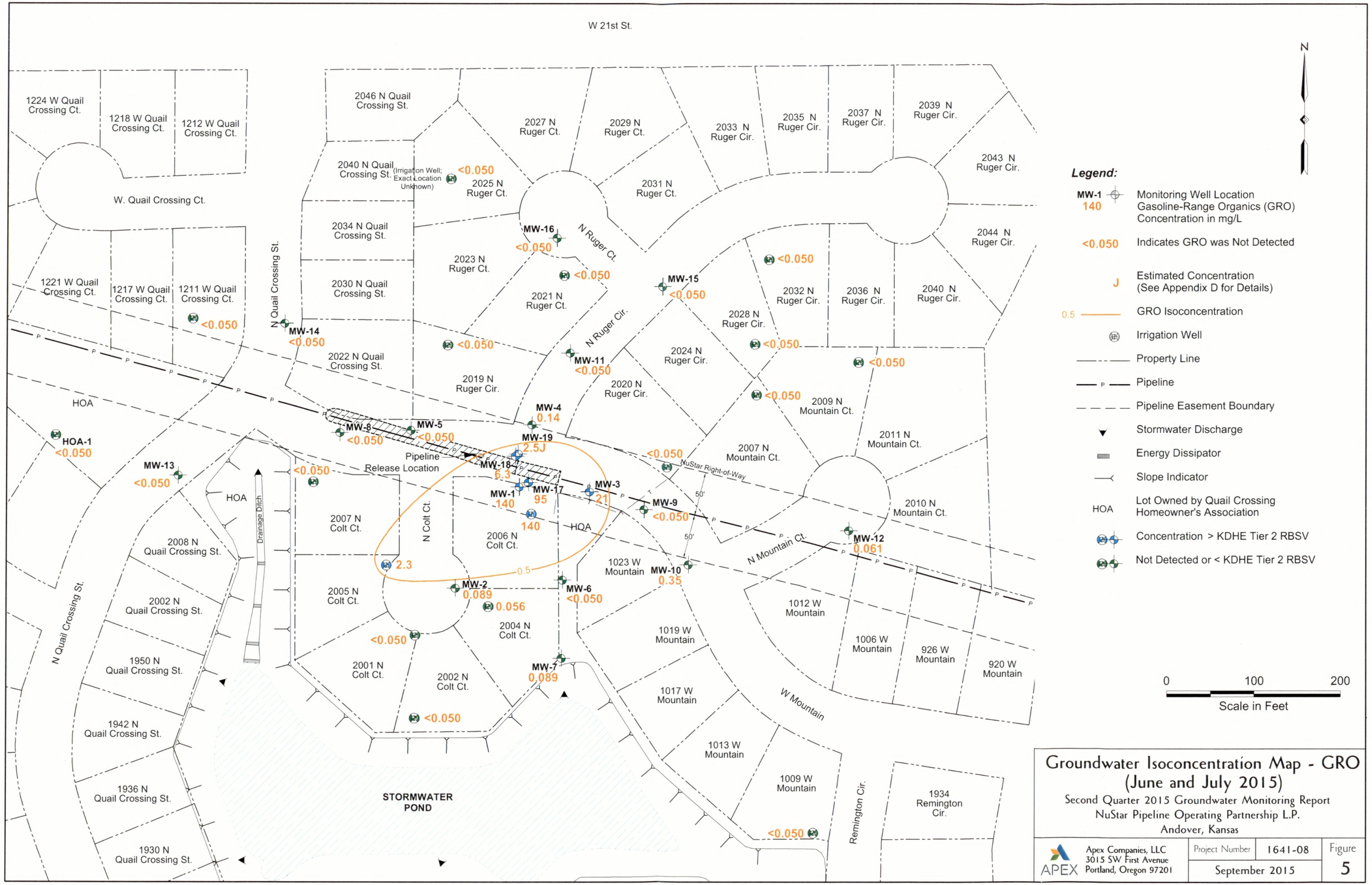
Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		3



Dissolved-Phase Concentrations in Groundwater (June and July 2015)

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

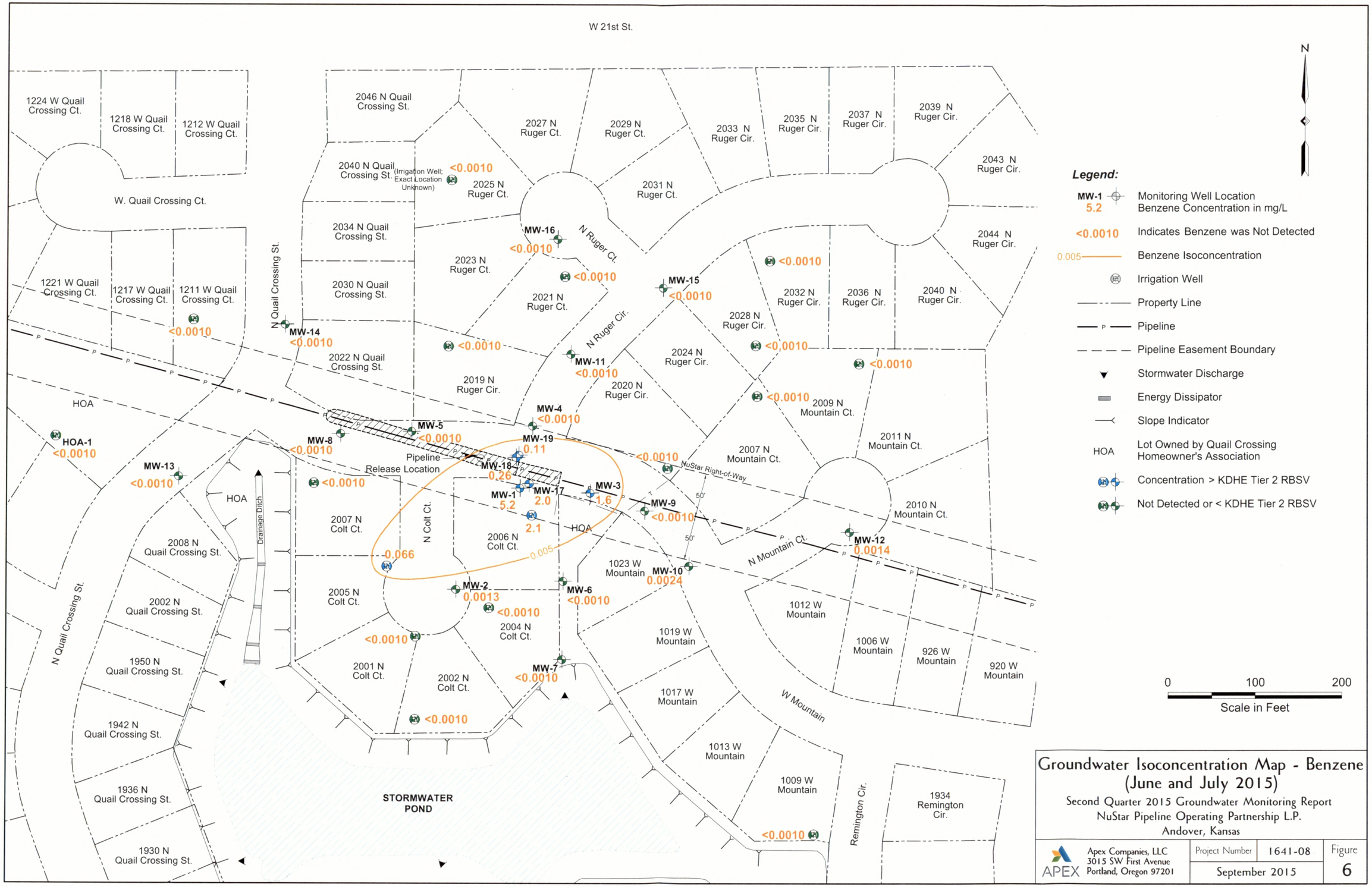
APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		4



Groundwater Isoconcentration Map - GRO (June and July 2015)

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

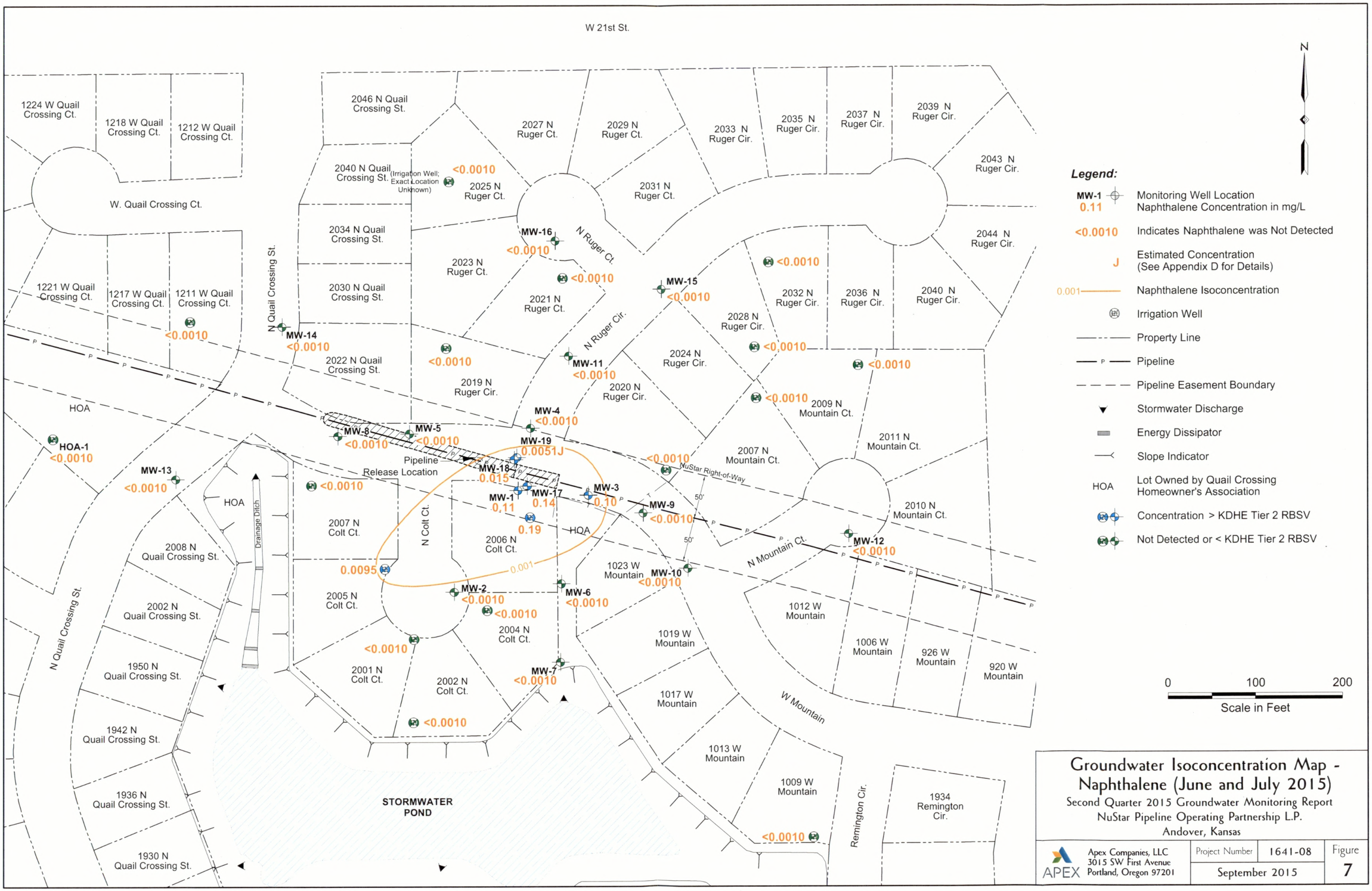
APEX	Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number 1641-08 September 2015	Figure 5



Groundwater Isoconcentration Map - Benzene (June and July 2015)

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

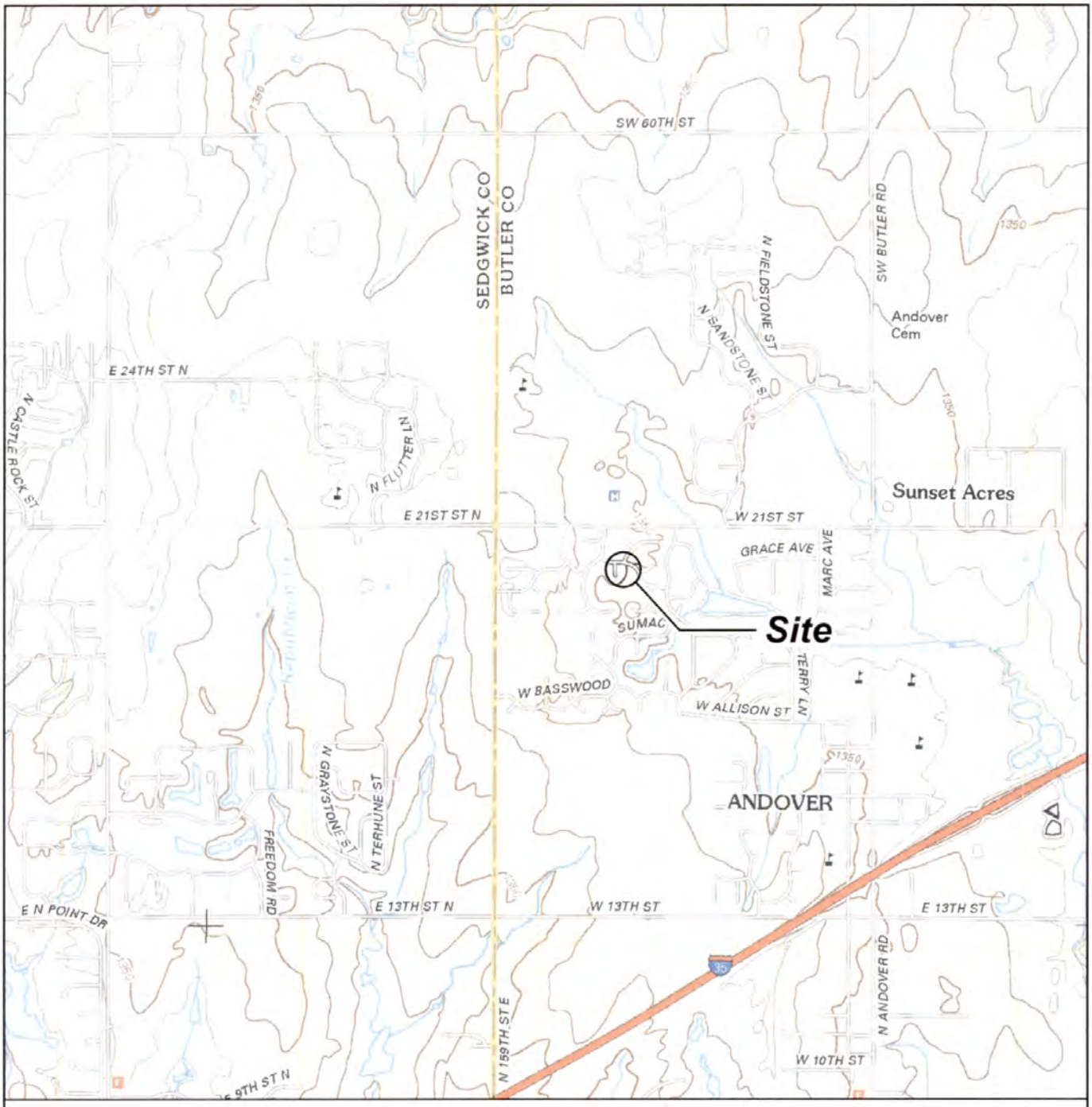
APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		6



Groundwater Isoconcentration Map - Naphthalene (June and July 2015)

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		7



Note: Base map prepared from USGS 7.5-minute quadrangles of Andover, KS, dated 2012 as provided by USGS.gov.

0 2,000 4,000

Approximate Scale in Feet

N

Site Location Map

Second Quarter 2015 Groundwater Monitoring Report
NuStar Pipeline Operating Partnership L.P.
Andover, Kansas

APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Number	1641-08	Figure
	September 2015		1

Appendix A

Field Data Sheets

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING NUSTAR
Project Number: 1641-08

Boring Number: MW-18
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE DRILLING
Drilling Equipment: MINI-SONIC
Sampler Type: CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1030-1345
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery TOTAL	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT CONCRETE ROAD SURFACE (6 - INCHES)
			2.3	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF TO HARD, HIGHLY PLASTIC,
	48"				
5			1.0	NS	BECOMES LIGHT GREENISH BROWN, TRACE SILT
	24"		2.4	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, STIFF TO V. STIFF, HIGHLY PLASTIC.
10			0.0	NS	LENS OF CALCITE/GYPSUM FRAGMENTS (4-INCH)
	64"		0.0	NS	~~BECOMES~~ TRACE GRAVEL MW 03-11-15
					BECOMES V. SILTY
			0.0	NS	CLAYEY GRAVEL (GP); LIGHT BROWN, V. DENSE, S. MOIST, ANGULAR FINE-COARSE GRAVEL IN CLAY MATRIX
15			0.1	NS	CLAYEY SILT ~~SILTY CLAY~~ WITH GRAVEL (ML); MEDIUM GRAY-GREENISH GRAY, MW 03-11-15 S. MOIST, V. STIFF, FINE TO COARSE ANGULAR GRAVEL.
	82"		0.2	NS	BECOMES V. LIGHT BROWN
			0.1	NS	STRINGERS OF CALCITE (CRYSTALLINE) INTERBEDDED WITH PARTIALLY LITHIFIED SILTS AND CLAY (SHALE)
20			0.0	NS	SILTY CLAY (CH); V. LIGHT GRAYISH BROWN, S. MOIST, V. STIFF WITH TRACE ANGULAR GRAVEL, HIGH PLASTICITY
					BECOMES HARD - V. HARD, LITHIFIED (SHALE)
			0.1	NS	BECOMES M. STIFF, MOIST
	136"				BECOMES HARD - V. HARD, LITHIFIED (SHALE)
25					
MW-18 (26.5) 1315		X	0.0	NS	
			72.2	NS	BECOMES M. STIFF, MOIST, GRAVELLY (CALCITE [CRYSTALLINE])
					BECOMES DARK BROWN, HARD
					BECOMES VERY LIGHT BROWN, MOIST TO WET, M STIFF
30			44.2	NS	
MW-18 (31.5) 1325		X	142.3	NS	SILT W/ GRAVEL (ML); LIGHT BROWN, DRY, STIFF, MOSTLY LITHIFIED, BROKEN UP BY DRILLING.
	120"		3.1	NS	CLAYEY SILT (ML); MED REDDISH BROWN, DRY, HARD,
35					BECOMES MOSTLY LITHIFIED (SHALE)
			0.1	NS	BECOMES MOIST, M. STIFF
					BECOMES DRY HARD, LITHIFIED (SHALE)
			0.0	NS	SAME AS ABOVE BECOMES PALE BROWN, DRY

NOTE: PARTIALLY LITHIFIED

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING NUSTAR
Project Number: 1641-08

Boring Number: MW-18
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1030-1345

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description Fine-Grained Soils type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations Coarse-Grained Soils type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations	Well Construction Details and Notes
			0.0	NS		
	72"				BECOMES LITHIFIED (SHALE)	
			0.0	NS	BECOMES M. STIFF TO STIFF	
45					BOTTOM OF BORING @ 45.0' BGS	45
50						50
55						55
60						60
65						65
70						70
75						75

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING NVSTAR
Project Number: 1611-08

Boring Number: MW-19
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1500 -
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT-CONCRETE ROAD SURFACE (6- INCHES)
			0.1	NS	CLAY (CH); DARK BROWN, S. MOIST, M. STIFF TO STIFF, TRACE ASPH-CONC DEBRIS AT SURFACE
	108"				
5			0.0	NS	SILTY CLAY (CH); MEDIUM BROWN, S. MOIST, V. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	CLAYEY SILT (ML); LIGHT BROWN, MOTTLED BROWN, S. MOIST, M. STIFF, LOW-MOD PLASTICITY
					BECOMES GREENISH GRAY, V. HARD
10			0.0	NS	BECOMES M. STIFF, W CALCITE (CRYSTALLINE) GRAVELS (VEIN)
			0.2	NS	
	120"				SHALE; LIGHT BROWN TO M. GREENISH GRAY, DRY, HARD, LITHIFIED
15			0.3	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, V. STIFF, TRACE CALCITE/GYPSUM LENSES/GRAVEL
			0.3	NS	
					BECOMES M. STIFF, REDDISH BROWN, MOIST
20			0.2	NS	
	120"		0.0	NS	CLAY W/ SILT (CH); GREENISH GRAY, DRY, V. HARD, ~~MOSTLY~~ PARTIALLY LITHIFIED, W/ TRACE CRYSTALLINE CALCITE VEINS. MW 03-11-15
25					
					BECOMES GREENISH BROWN, WAXY
MW-19 (28) 1710		X	0.2	NS	BECOMES LITHIFIED (SHALE) WITH CALCITE VEINS
					BECOMES PALE BROWN, M. STIFF, MOIST
30			6.8	NS	
MW-19 (32) 1720	84"	X	43.0	NS	BECOMES LITHIFIED (SHALE)
					BECOMES V. STIFF TO HARD
35			0.4	NS	
	72"		1.2	NS	
			1.2	NS	BECOMES MOSTLY LITHIFIED WITH CALCITE (CRYSTALLINE)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: MW-19
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
			1.3	NS		
			11.5	NS	BECOMES M. STIFF, S. MOIST	
MW-19 (45) 1800 45		X	2.6	NS		45
					BOTTOM OF BORING @ 45.0' BGS	
50						50
55						55
60						60
65						65
70						70
75						75

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING NUSTAR Project Number: 1641-08	Boring Number: MW-17 Logged By: M. WHITSON Date: 03-12-2015 Site Conditions: GRASS LAWN Drilling Contractor: LAYNE Drilling Equipment: MINI SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD) Surface Elevation: NOT MEASURED 0830 - 1115

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS LAWN SURFACE
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF TO HARD, TRACE ORGANICS, ROOTLETS
5	120"				BECOMES LIGHTBROWN, WITH TRACE SILT
			0.0	NS	
10					BECOMES LIGHT GRAY, TRACE FINE GRAVEL
			0.0	NS	CLAYEY SILT (ML); LIGHT BROWN, S. MOIST, V. STIFF, MOD. PLASTICITY, TRACE GRAVEL
	60"				
			0.0	NS	CLAYEY SILT W/ GRAVEL (ML); V. LIGHT BROWN, S. MOIST, V. STIFF-HARD, F-COARSE ANG. GRAVEL
15					
			0.0	NS	PARTIALLY LITHIFIED (SHALE)
	60"				
MW-17 (19) 1005		X	0.0	NS	CLAY W/ GRAVEL (CH); V. LIGHT BROWNISH GRAY, S. MOIST, V. STIFF-HARD, FINE TO COARSE ANGULAR GRAVEL (PARTIALLY LITHIFIED (SHALE))
20			95.8	NS	BECOMES MOIST, SOFT TO M. STIFF
MW-17 (22) 1015		X	960.7	NS	
25	120"		4.0	NS	BECOMES V. STIFF-HARD, S. MOIST
					BECOMES LITHIFIED (SHALE)
			1.2	NS	
30			1.2	NS	
			187.3	NS	SILTY CLAY W/ GRAVEL (CH); BROWNISH GRAY, MOIST, SOFT, FINE TO COARSE ANGULAR GRAVEL
	72"		6.0	NS	BECOMES LIGHT GRAY
35			0.8	NS	SHALE/LIMESTONE, WHITE TO MED BROWN, V. HARD, INTERBEDDED
MW-17 (37) 1100	72"	X	0.0	NS	CLAY (CH); LIGHT BROWN, S. MOIST, HARD, WAXY, HIGH PLASTICITY

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: MW-1

Logged By: M. WHITSON
Date: 03-12-2015
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
			0.0	N	SHALE/LIMESTONE; V. LIGHT GRAY, DRY, V. HARD, LITHIFIED	
	36"				SILTY CLAY (CH); V. LIGHT BROWN, S. MOIST, HARD, PARTIALLY LITHIFIED (SHALE)	
45					BOTTOM OF BORING @ 45.0' BGS	45
50						50
55						55
60						60
65						65
70						70
75						75

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 16011-08

Boring Number: IB-1
Logged By: M. WHITSON
Date: 03-14-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD): 31'
Surface Elevation: NOT MEASURED
1515-1700 1015-1115
Well Construction Details and Notes

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT CONCRETE AT SURFACE (6-INCHES)
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, M. STIFF-STIFF HIGH PLASTICITY
5	120"		0.0	NS	CLAYEY SILT (ML); V. LIGHT BROWN, DRY-S. MOIST, V. STIFF, LOW TO MOD PLASTICITY
10			0.0	NS	CLAY (CH); V. DARK BROWN, MOTTLED BROWN, S. MOIST, V. STIFF TO HARD, TRACE SILT, HIGH PLASTICITY
			0.0	NS	
			0.4	NS	CLAYEY SILT (ML); LIGHT BROWN, S. MOIST, V. STIFF TO HARD, LOW-MOD PLASTICITY,
15	120"				BECOMES LIGHT GREENISH GRAY
IB-1 (18.0) 1650		X	0.0	NS	BECOMES PARTIALLY LITHIFIED, CRYSTALLINE CALCITE VEINS.
20			4.5	NS	GRAVELLY CLAY (CH); MED BROWN, MOIST, SOFT-M. STIFF, F-COARSE ANG. GRAVEL
					BECOMES STIFF
IB-1 (24.0) 1700		X	31.9	NS	
25			0.0	NS	
			0.4	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, HARD, PARTIALLY LITHIFIED, CALCITE (CRYSTALLINE)
30		MW	15-17-15		NOTE 1700 STOP FOR DAY (03-14) 1015 RESUME (03-15)
			29.0	NS	BECOMES WET, SOFT
	72"				BECOMES HARD
			0.7	NS	
35			1.4	NS	
					CALCITE VEINS, BECOMES PARTIALLY LITHIFIED (SHALE)
	60"		7.1	NS	
			25.3	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING Project Number: 1641-08	Boring Number: 1B-2 Logged By: M WHITSON Date: 03-15-2015 Site Condition: ROAD SURFACE Drilling Contractor: LAYNE Drilling Equipment: MINI-SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD): Surface Elevation: NOT MEASURED 1115-1330 Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description Fine-Grained Soils: type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations Coarse-Grained Soils: type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations
					ASPHALT-CONCRETE ROAD SURFACE (6-INCHES)
			0.0	NS	CLAY (CH); V. DARK BROWN TO BLACK, S. MOIST, V. STIFF, HIGH PLASTICITY
5	120"				
			0.0	NS	SILTY CLAY (CH); LIGHT YELLOWISH BROWN, S. MOIST, STIFF, MOD-HIGH PLASTICITY
					BECOMES V. STIFF
10			0.0	NS	
					BECOMES LIGHT GRAY
	60"		0.0	NS	~~CLAYEY~~ MW 03-15-15 GRAVELLY CLAY (CH); BROWNISH GRAY, MOIST, SOFT-M. STIFF, FINE ANG GRAVEL
					BECOMES LITHIFIED (SHALE), VERY HARD.
15					BECOMES STIFF TO V. STIFF
	60"		0.0	NS	SILTY CLAY (CH); GRAYISH BROWN, MOIST, M. STIFF TO STIFF TRACE FINE GRAVEL
			0.0	NS	BECOMES HARD, PARTIALLY LITHIFIED
			0.0	NS	3-INCH LENS OF WET MW 03-15-15
20					
			0.0	NS	
	60"		0.0	NS	CLAY W/ GRAVEL (CH); MEDIUM BROWN, MOIST, SOFT-M. STIFF, F-M GRAVEL ANGULAR, HIGH PLASTICITY.
			0.0	NS	SILTY CLAY (CH); MED GRAY, S. MOIST, V. STIFF-HARD, HIGHLY PLASTIC, PARTIALLY LITHIFIED
25					
			0.0	NS	
30	108"				BECOMES LITHIFIED (SHALE)
1B-2 (32) 1320		X	0.0	NS	2-INCH LENS (WET)
35			38.8	NS	BECOMES MOIST, M. STIFF
	72"				
1B-2 (38) 1330		X	45.3	NS	BECOMES HARD

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING Project Number: 1641-08	Boring Number: IB-3 Logged By: M. WHITSON Date: 03-15-2015 Site Conditions: ROAD SURFACE Drilling Contractor: LAYNE Drilling Equipment: MINI SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD): Surface Elevation: NOT MEASURED

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

1330 - 1600

Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT-CONCRETE (6 - INCHES)
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF, HIGH PLASTICITY
5	120"				
			0.0	NS	SILTY CLAY (CH); LIGHT YELLOWISH BROWN, S. MOIST, MOD PLASTIC
10					
			0.0	NS	BECOMES GRAYISH BROWN, MOIST, W/TRACE GRAVEL
15	160"				
			0.0	NS	
20					YELLOWISH BROWN, MOIST-ALMOST WET
	60"		12.8	NS	
IB-3 (24) 1530		X	0.0	NS	
25					CLAY (CH): YELLOWISH GRAY, S. MOIST - MOIST, V. STIFF TO HARD, HIGH PLASTICITY, TRACE SILT, PARTIALLY LITHIFIED
			111.2	NS	
	~~84"~~ 36"	WN 03-15-15			
IB-3 (30) 1540		X	392.1	NS	
					SILTY CLAY (CH); GRAY BROWN, S. MOIST, HARD, HIGH PLASTICITY, PARTIALLY LITHIFIED.
			5.7	NS	1-FOOT LENS (WET)
35					
IB-3 (36) 1600	48"	X	0.0	NS	BECOMES LITHIFIED
			0.0	NS	

1415-1430 RIG DOWN (HYDRAULIC LINE)

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-7
Logged By: M. WHITSON
Date: 03-18-15
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
0800 - 0940

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS LAWN SURFACE
			0.0	NS	SILTY CLAY (CH); MED BROWN, MOIST, M. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, STIFF, HIGH PLASTICITY
5	120"		0.0	NS	BECOMES REDDISH BROWN, V. STIFF
10			0.0	NS	~~SILTY CLAY (SM)~~ MH 03-18-15; TAN, S. MOIST, V. STIFF, MOTTLED WHITE
			0.0	NS	CLAYEY SILT (ML)
					SILTY CLAY (CH); LIGHT BROWN, S. MOIST, V. STIFF, MOD-H PLASTICITY
			0.0	NS	BECOMES V. SILTY CLAY
15	120"		0.0	NS	CLAYEY SILT (MH); MED GRAY, S. MOIST, V. STIFF-HARD, M. PLASTICITY
					BECOMES PARTIALLY LITHIFIED, BROKEN UP INTO GRAVEL SIZE PARTICLES (SEE PHOTOGRAPH)
			0.0	NS	CLAY W/ SILT (CH); GRAY, S. MOIST, HARD TO V. HARD, H. PLASTICITY
IB-7(19) 0900 20		X	0.3	NS	GRAVELLY CLAY W/ SILT (CH); YELLOWISH GRAY, S. MOIST, M. STIFF, F-C ANGULAR GRAVEL
			23.5	LS	CLAYEY SILT (MH); YELLOWISH BROWN, WET, SOFT-M. STIFF, HIGH PLASTICITY
IB-7(24) 0915		X	447.3	NS	
25	120"		0.2	NS	V. SILTY CLAY (CH); GRAYISH BROWN, S. MOIST, HARD, MOD-HIGH PLASTICITY
			63.3	NS	BECOMES WET
30			31.3	NS	BECOMES SILTY CLAY
			14.1	NS	
35	120"		16.0	NS	BECOMES V. STIFF, MOTTLED
IB-7(39) 0930		X	0.9	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: 1B-8
Logged By: M. WHITSON
Date: 03-18-2015
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sample: Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1045 -
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS LAWN SURFACE
					CLAY (CH); V. DARK BROWN, S. MOIST, STIFF, HIGH PLASTICITY
			0.0	NS	
5	120"				
			0.0	NS	SILTY CLAY (CH); YELLOWISH BROWN, S. MOIST, STIFF HIGH PLASTICITY
			0.0	NS	
10					
					CLAYEY SILT (ML); LIGHT BROWN, MOIST, M. STIFF LOW PLASTIC
					SILTY CLAY (CH); LIGHT BROWN, S. MOIST, STIFF M-H PLASTIC
15	120"				BECOMES GRAY
1B-8(18) 1130		X	0.0	NS	BECOMES V. HARD
					BECOMES M. LITHIFIED (SHALE: SEE PHOTO)
20					
			4.3	NS	SILTY CLAY (CH)
			6.9	NS	YELLOW BROWN, WET, SOFT, TRACE BECOMES HARD, S. MOIST
25	120"				
			3.4	NS	3-INCH LENS SOFT, MOIST
			0.3	NS	1-INCH LENS SOFT WET
30					TRACE GRAVEL, F-C ANGULAR, CALCITE (CRYSTALLINE)
			6.2	NS	BECOMES M. STIFF, MOIST
1B-8(32.5) 1200		X	132.3	NS	BECOMES V. SOFT, WET
			98.7	NS	BECOMES HARD, BROWNISH GRAY
35	120"				
			5.3	NS	BECOMES V. HARD GREENISH GRAY, S. MOIST PARTIALLY LITHIFIED.
1B-8(39) 1205	X		1.7	NS	

BOTTOM OF BORING @ 40' BGS

GRAVEL

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1041-08

Boring Number: 1B-4
Logged By: M. WHITSON
Date: 03-18-15
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1300 -

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS LAWN SURFACE
			0.0	NS	SILTY CLAY (CH); DARK BROWN, MOIST, SOFT-M. STIFF, HIGH PLASTICITY, ORGANIC MATERIAL, ROOTLETS.
			0.0	NS	CLAY (CH); V. DARK BROWN, S. MOIST, HARD, HIGHLY PLASTIC
5	120"				
1B-4(6) 1330		X	0.8	NS	
10					
			0.8	NS	SILT CLAY (CH); LIGHT BROWN, S. MOIST, M. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	TRACE FINE ANGULAR GRAVEL
15	120"				BECOMES HARD, CEMENTED
			1.8	NS	BECOMES SOFT, MOIST
					BECOMES V. HARD, MOSTLY LITHIFIED (SEE PHOTOGRAPH), GREENISH GRAY
1B-4(19.5) 1345		X	875.3	NS	GRAVELLY CLAY (CH); YELLOWISH BROWN, WET, SOFT, F-MEDIUM ANGULAR GRAVEL.
20					BECOMES DARK GRAY
			260.4	NS	
			6.7	NS	CLAYEY SILT (ML); REDDISH BROWN, S. MOIST TO MOIST, M. STIFF, LOW-MOD PLASTICITY, TRACE M ANG GRAVEL
25	120"				CLAY (CH); MEDIUM GRAY, S. MOIST, V. HARD, HIGHLY PLASTIC
			7.0	NS	6-INCH LENS OF M. STIFF MATERIAL
30					BECOMES VERY SOFT, SATURATED
1B-4(31) 1400		X	1,426	NS	
					BECOMES M. STIFF WITH TRACE GRAVEL
			41.5	NS	
35	120"				BECOMES V. LIGHT GRAY
					BECOMES PARTIALLY LITHIFIED
			3.3	NS	BECOMES SHALE (12-INCHES; SEE PHOTO)
1B-4(39) 1415		X	0.1	NS	BECOMES V. HARD, RED BROWN

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING Project Number: 1641-08	Boring Number: IB-5 Logged By: M. WHITSON Date: 03-18-15 Site Conditions: LAWN Drilling Contractor: LAYNE Drilling Equipment: MINI SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD): Surface Elevation: NOT MEASURED

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

GRASS SURFACE

1435-1545
Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
			0.0	NS	CLAY (CH); V. DARK BROWN, MOIST, V. STIFF, HIGH PLASTICITY
5	120"		0.2	NS	
			0.3	NS	SILTY CLAY (CH); REDDISH BROWN, S. MOIST, V. STIFF, MOD-HIGH PLASTICITY
10			1.1	NS	
15	120"		1.2	NS	TRACE GRAVEL
			0.0	NS	BECOMES MOSTLY LITHIFIED, GRAY (SHALE)
20					BECOMES LIGHT BROWN.
			3.5	NS	
			16.5	NS	LENS OF CALCITE (CRYSTALLINE, VEIN, 1-INCH)
25	120"				BECOMES HARD-V.HARD
			0.6	NS	BECOMES GRAY
30					GRAVELLY CLAY (CH); LIGHT TAN, SATURATED, SOFT, M-COARSE ANG GRAVEL.
			3.6	NS	
			8.9	NS	
35					SILTY CLAY, GRAYISH BROWN, S. MOIST, V. STIFF - HEATED PARTIALLY LITHIFIED IN PLACE.
			0.0	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-9
Logged By: MW
Date: 03-19-15
Site Conditions: LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD): 30'
Surface Elevation: NOT MEASURED

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
					CLAY (CH): V. PALE BROWN, S. MOIST, M. STIFF - STIFF	
					BECOMES V. STIFF	
5	1.5'					5
					CLAYEY SILT (ML); REDDISH BROWN, S. MOIST, M. STIFF, LOW-MOD PLASTICITY	
10						10
					TRACE GRAVEL	
15	1.0'					15
					SILTY CLAY (CH); MED BROWN, S. MOIST, V. STIFF, HIGH PLASTICITY	
					BECOMES MOSTLY LITHIFIED (SHALE)	
					CRYSTALLINE CALCITE VEINS	
20			723.1	MS		20
					CLAY W/ GRAVEL (CH); PALE BROWN, WET, SOFT TO M. STIFF, F-C ANG GRAVEL, TRACE SILT	
			13.8	NS	BECOMES M. STIFF-STIFF	
25	1.26'					25
			1.8	NS	ROCK (LIMESTONE); GRAYISH WHITE, V. HARD, LITHIFIED	
			5.2	NS	SILTY CLAY (CH); REDDISH BROWN, S. MOIST, V. STIFF HIGH PLASTICITY.	
30						30
			9.2	NS	SILTY CLAY (CH); MED LIGHT BROWN, S. MOIST, STIFF TO V. STIFF	
35	[illegible]		0.1	NS	BECOMES GREENISH GRAY, HARD - V. HARD	35
			0.2	NS		

30 TO 40 MW 03-19-15

ACTUALLY 20-30 MW 03-19-15

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-6
Logged By: M. WHITSON
Date: 03-19-2015
Site Conditions: LAWN / GRASS
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					CLAY (CH); V. DARK BROWN, S. MOIST, STIFF - V. STIFF HIGH PLASTICITY
			0.0	NS	
5	120"				
			0.0	NS	CLAYEY SILT (ML); PALE BROWN, S. MOIST, STIFF, LOW-MOD PLASTICITY
10					SILTY CLAY (CH); MED BROWN, S. MOIST, STIFF - V. STIFF HIGH PLASTICITY
			0.1	NS	
15	120"				BECOMES HARD, GRAYISH BROWN
			0.3	NS	
			23.0	NS	BECOMES REDDISH BROWN
20					BECOMES V. STIFF, GRAYISH BROWN
			0.3	NS	
					BECOMES HARD
25	120"		0.5	NS	
			15.3	NS	GRAVELLY CLAY (CH); LIGHT BROWN, PALE BROWN, MOIST TO ALMOST WET, M. STIFF, F-M ANG GRAVEL
30					
			0.5	NS	SILTY CLAY (CH); MED BROWN, S. MOIST, STIFF HIGH PLASTICITY
35	120"				BECOMES MOSTLY LITHIFIED, GREENISH GRAY (SHALE) HARD
			0.0	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

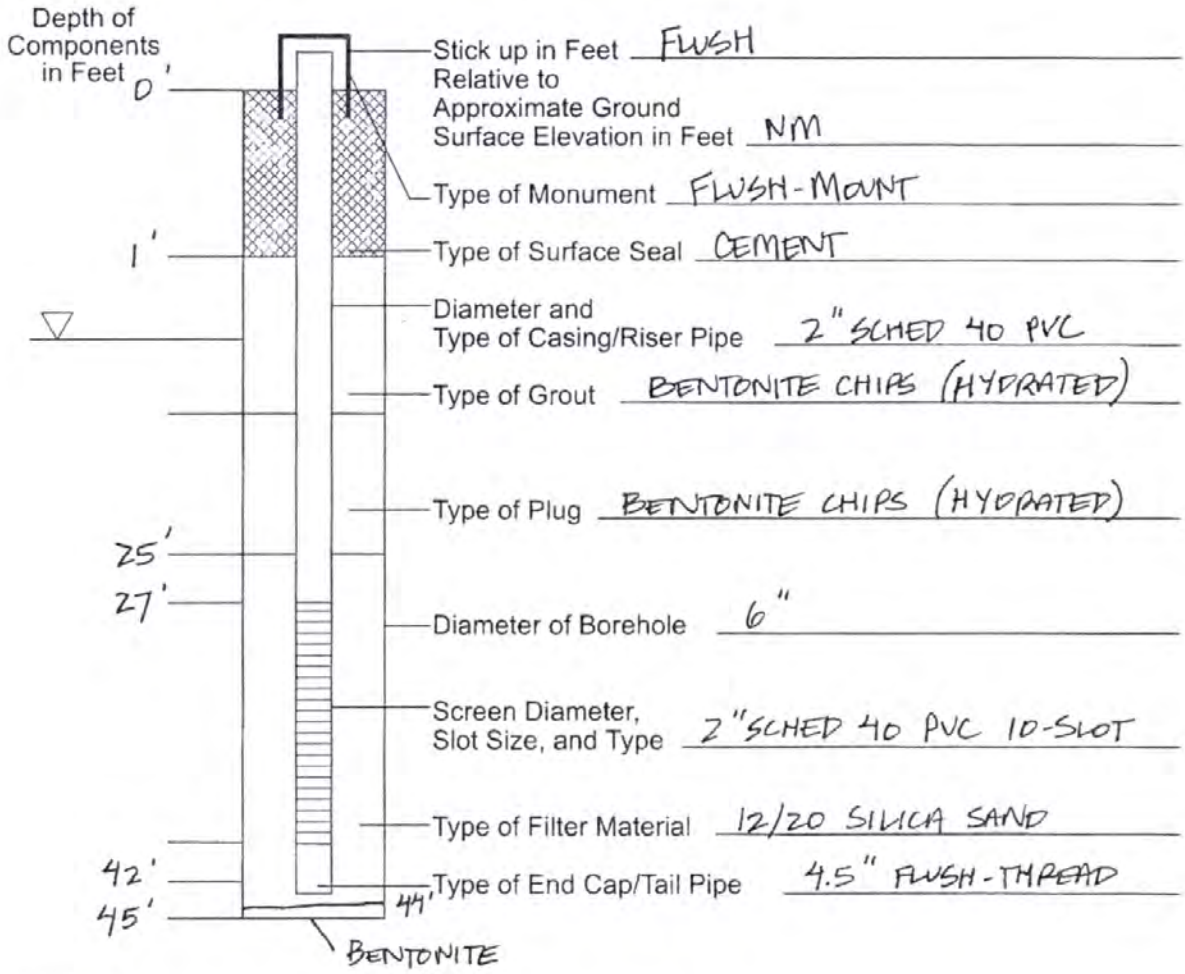
Well Installation Report

Project Name QUAIL CROSSING Well ID No. MW-17

Project No. 320001641-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed 03-16-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING



Material Tally:

Sand 12/20 SILICA (~~HH~~ 11) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (1111) Other

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

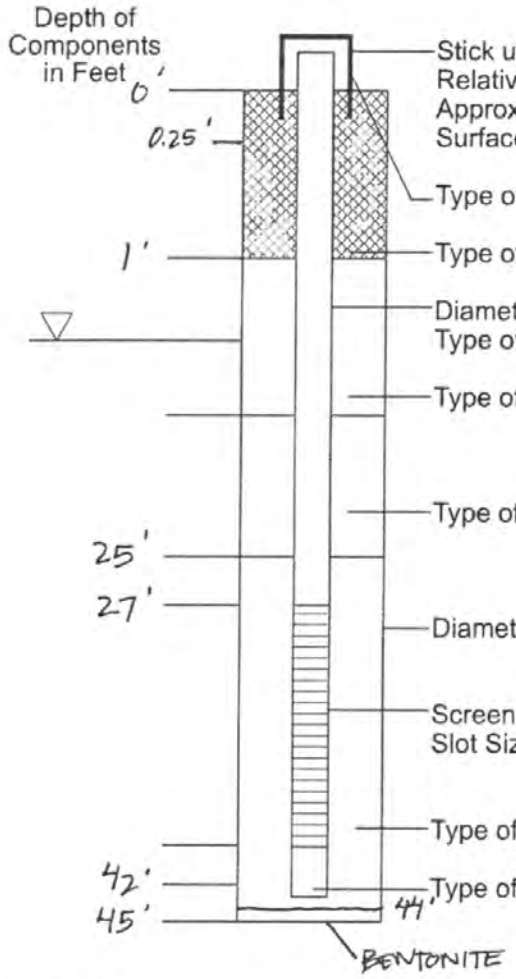
Well Installation Report

Project Name QUAIL CROSSING Well ID No. MW-19

Project No. 320001641-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed 03-16-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING WELL



Stick up in Feet Relative to Approximate Ground Surface Elevation in Feet FLUSH / NM

Type of Monument FLUSH-MOUNT

Type of Surface Seal CEMENT/ASPHALT COLD PATCH

Diameter and Type of Casing/Riser Pipe 2" SCHED 40 PVC

Type of Grout BENTONITE CHIPS (HYDRATED)

Type of Plug BENTONITE CHIPS (HYDRATED)

Diameter of Borehole 6"

Screen Diameter, Slot Size, and Type 2" SCHED 40 PVC 10-SLOT

Type of Filter Material 12/20 SILICA SAND

Type of End Cap/Tail Pipe 4.5" FT END CAP

Material Tally:

Sand 12/20 SILICA (HHT 11) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (1111) Other

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

APEX

Well Installation Report

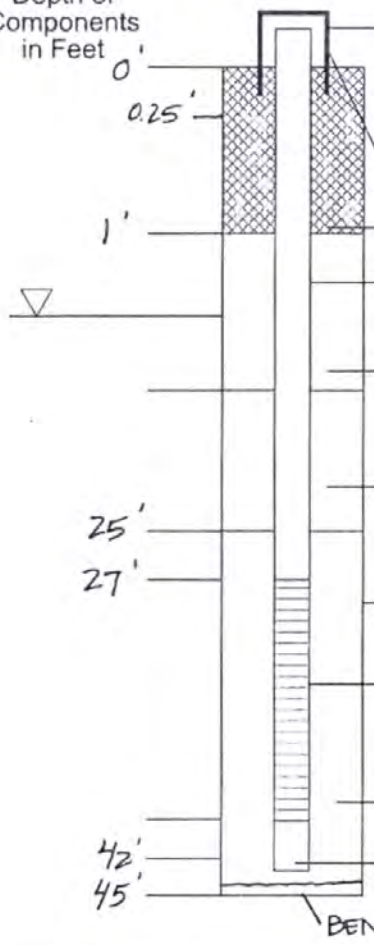
Project Name QUAIL CROSSING Well ID No. MW-18

Project No. 32000164 1-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed ~~03-16-2015~~ MW 03-17-2015 03-17-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING WELL

Depth of Components in Feet



Stick up in Feet Relative to Approximate Ground Surface Elevation in Feet FLUSH

Type of Monument NM

Type of Surface Seal FLUSH-MOUNT

Diameter and Type of Casing/Riser Pipe CEMENT/COLD PATCH ASPHALT

Type of Grout 2" SCHED 40 PVC

Type of Plug BENTONITE CHIPS (HYDRATED)

Diameter of Borehole BENTONITE CHIPS (HYDRATED)

Screen Diameter, Slot Size, and Type 6"

Type of Filter Material 2" SCHED 40 PVC 10-SLOT

Type of End Cap/Tail Pipe 12/20 SILICA SAND

4.5" FT CAP

Material Tally:

Sand 12/20 SILICA (~~HH~~ II) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (IIII) Other

Remarks:

WELL GAGING DATA SHEET

APEX

		Job Number:	32000441-08.003
Client:	NVSM	Date:	2015 03 18
Project:	Ambersbe / coltCart	Sampler:	
Weather:	Cloudy	Time In/Out:	

WATER LEVEL DATA

	Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
	2006	15:49	—	45.55	—	—	—	
	MW-18	16:05	—	27.93	41.09	—	—	16:09 Began Development
	MW-19	16:20	—	—	—	—	—	16:20 Dry
	MW-19	16:30	—	35.19	42.85	—	—	16:32 Began Development
	MW-19	16:33	water	Clear	16:34 Back to Cloudy			dry at 16:35
03-19	MW-11	13:56	—	29.84	—	—	—	
	MW-14	14:07	—	33.94	—	—	—	
	MW-13	14:14	—	33.16	—	—	—	
	MW-8	14:17	—	21.96	—	—	—	
	MW-5	14:19	—	20.80	—	—	—	
	MW-2	14:22	—	32.87	—	—	—	
	MW3	14:25	—	41.02	—	—	—	
	MW-6	14:28	—	22.62	—	—	—	
	MW-7	14:31	—	16.63	—	—	—	
	Pond	14:33	—	—	—	—	—	1343.6
	MW9	14:36	—	31.59	—	—	—	
	MW-10	14:39	—	28.42	—	—	—	
	MW12	14:42	—	30.95	—	—	—	
	MW-4	14:45	—	31.22	—	—	—	
16	MW-16	14:48	—	31.80	—	—	—	
	MW-15	14:54	—	35.04	—	—	—	
3-20	MW-1	10:55	—	31.38	—	—	—	

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-4	Job Number:	32000164108-003
Client:	NUSTAT	Date:	3-20-2015
Project:	Andover / Colt Court	Sampler:	PN
Weather:	cool, sunny	Time In/Out:	0930 / 1015

WELL DATA

Well Depth:	—	Well Diameter:	2	Water Height	—
Depth to Water:	31.22	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PN	Pump Intake Depth:	35	Comments	
Sampling Method:	PN	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0945	0.3	0.3	31.28	0.3	6.45	14.83	1.047	11.48	5.2	/	CL
0948	0.9	1.2	31.58	0.3	6.44	15.46	1.051	1.69	-16.7	—	CL
0951	0.9	2.1	31.85	0.3	6.50	15.51	1.050	1.24	-24.3	—	SC
0954	0.9	3.0	32.07	0.3	6.51	15.44	1.050	0.44	-28.3	—	AC
0957	0.9	3.9	32.33	0.3	6.52	15.77	1.050	0.86	-30.2	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-4	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS
Sample Time:	0959	Final Depth to Water:	33.46	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-5	Job Number:	320016418B-004
Client:	NUSTAR	Date:	3-20-2015
Project:	Arbuckle Colt Court	Sampler:	PN
Weather:	cool, sunny	Time In/Out:	1020/1050

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	20.80	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PN	Pump Intake Depth:	23	Comments	
Sampling Method:	PN	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1026	0.3	0.3	21.06	0.3	6.85	16.37	1.449	2.42	28.9	—	C
1029	0.9	1.2	21.29	0.3	6.78	16.45	1.457	1.07	[illegible]	—	C
1032	0.9	2.1	21.43	0.3	6.75	16.45	1.452	1.13	31.3	—	C
1035	0.9	3.0	21.53	0.3	6.73	16.44	1.451	1.07	35.2	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS		
Sample Time:	1037	Final Depth to Water:	21.59	Did Well Dewater?	NO		
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
			yes no				
			yes no				
			yes no				
			yes no				
			yes no				
			yes no				

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-1	Job Number:	320201641-08.003
Client:	NV STAT	Date:	3-20-2015
Project:	Andrew Lott Court	Sampler:	PW
Weather:	NICE, sunny	Time In/Out:	11:10

WELL DATA

Well Depth:	—	Well Diameter:	4"	Water Height	—
Depth to Water:	31.38	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PW	Pump Intake Depth:	34
Sampling Method:	PW	Tubing Type:	Poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1116	0.3	0.3	31.52	0.3	7.06	16.87	1.391	6.07	-71.9	—	CL
1119	0.9	1.2	31.64	0.3	6.84	16.80	1.391	2.08	-67.9	—	CL
1122	0.9	2.1	31.77	0.3	6.78	16.87	1.389	1.41	-63.7	—	CL
1125	0.9	3.0	31.81	0.3	6.76	16.70	1.388	1.21	-54.0	—	CL
1128	0.9	3.9	32.02	0.3	6.75	16.77	1.388	1.16	-46.0	—	CL

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS
Sample Time:	1130	Final Depth to Water:	32.55	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-17	Job Number:	32012/641-08004
Client:	NV Star	Date:	3-20-2015
Project:	Anderson Volt Test	Sampler:	PN
Weather:	Nice/sunny	Time In/Out:	11:50

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	31.45	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PN	Pump Intake Depth:	42	Comments	
Sampling Method:	PN	Tubing Type:	Poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1155	0.3	0.3	35.95	0.3	6.45	18.01	1,051	3.63	30.1		VC
1158	0.9	1.2	36.35	0.3	6.88	16.28	1056	1.28	38.8		VC
1201	0.9	2.1	36.81	0.3	6.84	18.18	1,053	0.87	43.3		VC
1204	0.9	3.0	37.30	0.3	6.82	18.07	1,055	0.70	43.2		VC
1207	0.9	3.9	37.85	0.3	6.81	18.15	1,057	0.61	42.0		VC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-17	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS
Sample Time:	1209	Final Depth to Water:	40.32	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-18	Job Number:	32001641-08.005
Client:	NUSTAR	Date:	3-20-2015
Project:	Anderson Joint Court	Sampler:	PN
Weather:	nice, sunny	Time In/Out:	12:45

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	~~21.46~~ 27.93	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PN	Pump Intake Depth:	~~30~~ 36
Sampling Method:	PN	Tubing Type:	poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1248	0.3	0.3	31.00	0.3	7.05	17.89	0.993	2.03	~~100~~ 3.5	/	VC
1251	0.9	1.2	31.52	0.3	6.97	17.78	1.009	1.03	-18.8	/	VC
1254	0.9	2.1	31.92	0.3	6.90	17.52	0.999	0.78	-9.2	/	VC
1257	0.9	3.0	32.19	0.3	6.89	17.43	0.990	0.68	-12.6	/	VC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS
Sample Time:	1259	Final Depth to Water:	33.17	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

APEX

Well I.D.	MW-19	Job Number:	32020/241-08.003
Client:	NVSTAT	Date:	3-20-2015
Project:	Anderson / Lott Court	Sampler:	PN
Weather:	nice, sunny	Time In/Out:	13:14

WELL DATA

Well Depth:	—	Well Diameter:	2"	Water Height	—
Depth to Water:	35.19	Screened Interval:	—	x Multiplier	—
Water Column Length:	—	Depth to Free Product:	—	x Casing Volumes	—
Purge Volume:	—	Free Product Thickness:	—	= Purge Volume	—
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	—

PURGING DATA

Purge Method:	PN	Pump Intake Depth:	39	Comments	
Sampling Method:	PN	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1318	0.3	0.3	34.26	0.3	7.24	18.18	0.909	6.54	53.9	✓	CL
1321	0.9	1.2	34.55	0.3	7.13	17.99	0.906	1.90	43.8	✓	CL
1324	0.9	2.1	34.89	0.3	7.09	17.91	0.906	1.55	43.7	✓	CL
1327	0.9	3.0	35.22	0.3	7.09	17.83	0.905	1.57	49.7	✓	CL

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate	0.3	Analytical Laboratory:	ALS
Sample Time:	1329	Final Depth to Water:	~~36.7~~ 35.36	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168
Everett, WA +1 425 356 2600 | Holland, MI +1 616 399 6070 | Middletown, PA +1 717 944 5541 | Salt Lake City, UT +1 801 266 7700 | York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 118685

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	E3CE-0065 Andover Release Site	A	300_W (Sulfate, nitrate, O-Phos)
Work Order		Project Number		B	8260_LL_W (Colt Court GW List)
Company Name	Apex Companies	Bill To Company	Apex Companies	C	ALK_W 2320B
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	ICP_DISS (Dissolved Iron)
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	ICP_TW (Potassium only)
				F	NIT_AMM_W_ISE
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	RSK175 (Methane)
Phone	(503) 924-4704	Phone	(503) 924-4704	H	VPH OA-1_W (HYD-5)
Fax		Fax		I	XXX SUB (SUB CO2 (Simi Valley))
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-4	3-20-2011	0959	GW	VARIOS	15	X	X	X	X	X	X	X	X	X		
2	MW-5		1037	GW	VARIOS	15	X	X	X	X	X	X	X	X	X		
3	MW-1		1130	GW	VARIOS	15	X	X	X	X	X	X	X	X	X		
4	MW-17		1209	GW	VARIOS	15	X	X	X	X	X	X	X	X	X		
5	MW-18	1259	~~1326~~	GW	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
6	MW-19		1329	GW	↓	↓	↓	↓	↓	↓		↓	↓	↓	↓		
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: [illegible] | Shipment Method: FEDEX | Required Turnaround Time: (Check Box) TAT 7 days Other | Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Notes: (E3CE-0065 Andover Release Site)
[illegible]	[illegible]	17:25		
Relinquished by:	Date:	Time:	Received by (Laboratory):	Cooler ID / Cooler Temp.
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	QC Package: (Check One Box Below) QC Level STD Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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PROJECT NUMBER 320001641-07/08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-10-2015

PROJECT	QUAIL CROSSING PILOT TEST	ARRIVAL TIME	0845
LOCATION	ANDOVER, KANSAS	DEPARTURE TIME	1630
CLIENT	NUSTAR	WEATHER	FOG (40'S) AM / CLEAR (70'S) PM
PURPOSE OF OBSERVATIONS	WELL INSTALLATION / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	—
CONTRACTOR REP.	CHAD AND MARK	H&S REVIEW	✓

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0845 APEX (M. WHITSON) ARRIVES ON SITE, DRILLERS (CHAD AND MARK; LAYNE) HAVE STAGED EQUIPMENT AND LEFT TO OBTAIN WATER USE PERMIT AND TOTALIZER FROM CITY.
WELL LOCATIONS HAVE BEEN CLEARED, UTILITY LOCATES APPEAR TO HAVE BEEN COMPLETED.
PID AND INTERFACE PROBE SHIPMENT WAS DELAYED, WILL ARRIVE AT FEDEX FACILITY BY NOON TODAY.
0945 LAYNE ON SITE, MOVE PORTA POTTY INSIDE OF DELINEATION ZONE
WALK SITE WITH LAYNE, GO OVER SCOPE OF WORK
1015 START MOVING EQUIPMENT, JACE AND JASON (APEX) ARRIVE ON SITE.
APEX FINISHES CLEARING MW-17 LOC.
LAYNE SETUP ON MW-18 LOC.
H+S REVIEW
1100 JACE AND JASON HEAD TO EASTER ADDITION TO CLEAR LOCATIONS
LAYNE EXPERIENCING RIG DIFFICULTIES / TROUBLESHOOT
APEX MOBS TO FEDEX TO PICKUP PID / INTERFACE PROBE AND SAMPLE JARS / COOLERS
RETURN TO SITE, FEDEX WILL DELIVER TOMORROW MORNING
MOB TO EASTER ADDITION
1515 START ABANDONING WELLS AT EASTER ADDITION, AS-1 - AS-3, MC-1 - MC-3, MW-1, MW-F.
1600 SURFACE MONUMENTS REMOVED, PROTECT HOLES
CLEAN UP
1630 DEPART SITE

BY

APEX REPRESENTATIVE

REVIEWED BY

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-11-2015

PROJECT	QUAIL CROSSING PILOT TEST	ARRIVAL TIME	1010
LOCATION	ANDOVER, KS	DEPARTURE TIME	1830
CLIENT	NUSTAR	WEATHER	CLEAR (50'S-70'S) CALM
PURPOSE OF OBSERVATIONS	WELL INSTALLATION / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	–
CONTRACTOR REP.	CHAD AND MARK	H&S REVIEW	✓

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1010 APEX ARRIVES ON SITE AFTER PICKING UP EQUIP/BOTTLES AT FEDEX, LAYNE ON SITE
1015 H+S PLAN REVIEW WITH CHAD AND MARK, LAYNE DOES NOT HAVE FR, OKAY (PM)
1030 START CORING MW-18 LOCATION (SEE LOG), PAMELA (KDHE) ON SITE
1130 KDHE DEPARTS, PHOTOGRAPH MW-6 AND MW-7 MON.S FOR FIX
1345 FINISH WITH MW-18 (CASED TO 19' BGS)
MOVE TO MW-19 LOCATION AND SET UP
1500 START CORING MW-19 (SEE LOG), DRILLERS ASK ABOUT LANDFARM
1800 DOWN TO 45' BGS IN MW-19 (CASED TO 19' BGS)
CLEAN UP, TALK TO DRILLERS ABOUT LANDFARM HOURS (8-5 PM)
1830 DEPART SITE

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PROJECT NUMBER 320001641-08/07
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-12-2015

PROJECT	QUAIL CROSSING PILOT TEST	ARRIVAL TIME	0800
LOCATION	ANDOVER, KS	DEPARTURE TIME	1815
CLIENT	NUSTAR	WEATHER	CLEAR (40's-70's) CALM
PURPOSE OF OBSERVATIONS	WELL INSTALLATION/PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	–
CONTRACTOR REP.	CHAD AND MARK	H&S REVIEW	✓

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0800 APEX ARRIVES ON SITE, LAYNE ON SITE, H+S REVIEW
LAYNE SETS UP ON MW-17 LOCATION USING MUD MATS FOR TRACK RIG
0830 GAUGE WATER IN MW-18 AND MW-19
0830 START CORING MW-17 LOCATION (SEE LOG)
1115 FINISH CORING MW-17 (CASED TO 19' BGS)
1200 GAUGE OPEN BOREHOLE
LAYNE CLEANS UP AND MOBS TO EASTER ADDITION
SETUP ON MW-1R LOCATION
1430 START CORING MW-1R (SEE LOG)
1640 FINISH CORING MW-1R LOCATION
INSTALL MW-1R WELL FROM 25-40' (SCREENED) (SEE INSTALLATION LOG)
MOVE RIG OFF MW-1R
CLEAN UP
1815 DEPART SITE

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PROJECT NUMBER 320001641-07
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-13-2015

PROJECT	EASTER ADDITION	ARRIVAL TIME	0845
LOCATION	ANDOVER, KS	DEPARTURE TIME	1915
CLIENT	NUSTAR	WEATHER	CLEAR (40'S-70'S) CALM
PURPOSE OF OBSERVATIONS	WELL INSTALLATION / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	–
CONTRACTOR REP.	MARK AND CHAD	H&S REVIEW	✓

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0845 APEX ARRIVES ON SITE, H+S REVIEW
0915 LAYNE SAYS RIG IS NOT STARTING UP, THEY ARE TROUBLESHOOTING AND, MAKING PHONE CALLS TO FIX IT. CALL S. JACKSON
LAYNE CALLS JOHN DEERE MECHANIC
1015 GAUGE WELLS AT QUAIL CROSSING
LAYNE TROUBLESHOOTING RIG
CLEAN UP SITE, LOAD UP SOIL
1120 LAYNE TAKES LOAD TO EL DORADO
1300 LAYNE RETURNS FROM EL DORADO
MECHANIC ON SITE
WORK ON RIG
1445 RIG UP AND RUNNING MECHANIC DEPARTS
SENSOR, FUEL FILTER, COMBINATION OF OTHER ISSUES
WITH RIG IN VICINITY OF WELLS TO BE ABANDONED, SET UP TREMIE AND INJECT GROUT IN WELLS TO ABANDON, MOVE RIG TO F-1R LOC.
1550 SETUP ON F-1R LOC.
1605 START CORING F-1R LOCATION (SEE LOG)
1900 FINISH CORING F-1R
1915 CLEAN UP, DEPART SITE

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PROJECT NUMBER 320001641-07/08
FIELD REPORT NUMBER
PAGE 1 OF
DATE 03-14-15

PROJECT	EASTER ADDITION / QUAIL CROSSING	ARRIVAL TIME	0800
LOCATION	ANDOVER, KS	DEPARTURE TIME	1730
CLIENT	NUSTAR	WEATHER	CLEAR (70'S) CALM
PURPOSE OF OBSERVATIONS	WELL REPLACEMENT / INSTALLATION / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	–
CONTRACTOR REP.	MARK AND CHAD	H&S REVIEW	✓

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0800 APEX ARRIVES ON SITE, H+S REVIEW
RUN CASING IN F-1R LOCATION, START INSTALLING WELL (25-40')
0915 WELL INSTALLED, START CLEANUP DEMOB OFF WELL LOCATION
SETUP OVER F-1 TO ABANDON, MOVE EQUIPMENT
0930 START ABANDONMENT OF F-1
CHIP MONUMENT
0945 PLUG WELL WITH GROUT THROUGH TREMIE
CUT CASING 3' BGS, TALK WITH OWNER ABOUT RUTS IN DRIVEWAY, THEY SUGGEST GRAVEL FILL
1020 LAYNE TO MENARDS FOR TOP SOIL
PLACE TOP SOIL, COMPLETE SURFACE ON F-1R AND MW-1R
1300 ALL ABANDONMENTS COMPLETE
CLEAN UP AND MOVE TO QUAIL CROSSING
1330 GAUGE WELLS AT QUAIL CROSSING
MOVE EQUIPMENT
1430 START SETTING UP ON INJECTION LOCATION IB-1
1515 START CORING IB-1 LOC. (SEE LOG)
1700 GET TO 29' BGS, STOP FOR DAY
CLEAN UP
1730 DEPART SITE

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-15-2015

PROJECT	QUAIL CROSSING	ARRIVAL TIME	0930
LOCATION	ANDOVER, KS	DEPARTURE TIME	1800
CLIENT	NUSTAR	WEATHER	CLEAR (40'S/60'S) CALM
PURPOSE OF OBSERVATIONS	WELL INSTALL/PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE	PERMIT NO.	–
CONTRACTOR REP.	MARK/CHAD	H&S REVIEW	✓

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0930 APEX ARRIVES ON SITE, LAYNE ON SITE, H+S REVIEW
SETUP ON IB-1 LOCATION
1015 RESUME CORING IB-1 (SEE LOG)
1115 COMPLETE IB-1 (CASED TO 20' BGS)
MOVE TO IB-2 AND SETUP
1115 CORE IB-2 (SEE LOG)
1330 IB-2 COMPLETE (CASED TO 20' BGS)
MOVE TO IB-3 AND SETUP
1330 CORE IB-3 (SEE LOG)
1600 COMPLETE IB-3 (CASED TO 20' BGS
1600 GAUGE WELLS ON SITE (SEE GAUGING SHEET)
CLEAN UP
SETUP ON IB WELLS FOR INJECTION, DISCUSS WITH S. JACKSON
WILL START WITH WELL INSTALLATIONS TOMORROW
CLEAN UP
1800 DEPART SITE

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PROJECT NUMBER 32000164I-08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-16-15

PROJECT	NUSTAR QUAIL CROSSING	ARRIVAL TIME	0830
LOCATION	ANDOVER, KS	DEPARTURE TIME	~~1630~~ MW 03-16-15 1700
CLIENT	NUSTAR	WEATHER	CLEAR
PURPOSE OF OBSERVATIONS	WELL INSTALLATION / PILOT STUDY / TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE DRILLING	PERMIT NO.	–
CONTRACTOR REP.	MARK AND CHAD	H&S REVIEW	✓

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0830 APEX ARRIVES ON SITE, LAYNE ON SITE, H+S REVIEW
MOVE RIG TO SETUP ON MW-17 FOR INSTALLATION
RIG SETUP OVER MW-17
RUN CASING DOWN TO 42'
CASING DOWN TO DEPTH
START INSTALLING WELL MW-17 FROM 27-42' (SCREENED)
1310 WELL INSTALLED (MW-17)
MOVE RIG, SETUP ON MW-19 TO CONSTRUCT WELL
RIG SETUP, POSITION CASING
1340 START SENDING CASING DOWN TO 42'
CASING DOWN TO DEPTH
1510 INSTALL WELL COMPONENTS ON MW-19 FROM 27-42' (SCREENED)
1550 FINISH INSTALL ON MW-19
PULL CASING
PULL RIG OFF OF MW-19 LOCATION
(620)245-7847 - JAY HAWK LANDSCAPING
SETUP ON MW-18 LOCATION
CLEAN UP
1700 DEPART SITE

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-17-2015

PROJECT	QUAIL CROSSING	ARRIVAL TIME	0815
LOCATION	ANDOVER, KS	DEPARTURE TIME	1745
CLIENT	NUSTAR	WEATHER	M.CLEAR (40S) WINDY
PURPOSE OF OBSERVATIONS	WELL INSTALLATION/PILOT TEST		
APEX REPRESENTATIVE	M.WHITSON	APEX PROJECT MANAGER	S.JACKSON
CONTRACTOR	LAYNE	PERMIT NO.	–
CONTRACTOR REP.	MARK AND CHAD	H&S REVIEW	✓

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0815 APEX ARRIVES ON SITE, LAYNE ON SITE, RIG IS DOWN
HYDRAULIC CYLINDER/ACTUATOR ON DRILL HEAD BROKE THIS MORNING
CALL S.JACKSON, LAYNE HAS SOMEONE FROM TEXAS DRIVING UP REPLACEMENT
COMPLETE SURFACE OF MW-17 MONITORING WELL
EXTEND PAD ON MW-7 LOC. (PER S. JACKSON)
PART COMES IN FOR DRILL RIG, INSTALL ON DRILL HEAD
1515 SAMPLES SHIPPED TO LABORATORY
WORK ON DRILL RIG
RIG BACK UP AND RUNNING, START PUSHING CASING TO 42' BGS
CASING DOWN TO DEPTH
1625 START INSTALLING MONITORING WELL MW-18
WELL MW-18 INSTALL, SCREEN FROM 27-42' BGS
1645 APEX (PAUL AND RYAN) DEPART SITE
1700 WELL INSTALLED, PULL RIG OFF HOLE.
BENTONITE IN SURFACE
MOVE EQUIPMENT AROUND
CLEAN UP SITE
1745 DEPART

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 1 OF 2
DATE 03-18-2015

PROJECT	QUAIL CROSSING	ARRIVAL TIME	0800
LOCATION	ANDOVER, KS	DEPARTURE TIME	1700
CLIENT	NUSTAR	WEATHER	OVERCAST, LIGHT RAIN (40's)
PURPOSE OF OBSERVATIONS	WELL INSTALL / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE	PERMIT NO.	—
CONTRACTOR REP.	MARK/CHAD	H&S REVIEW	✓

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0800 APEX ARRIVES ON SITE, LAYNE ON SITE, H+S REVIEW
SETUP ON IB-7 LOCATION WITH MUD MATS FOR TRACKS
0815 CORE IB-7 LOCATION (SEE LOG)
0940 COMPLETE IB-7 LOCATION
SETUP EQUIPMENT FOR INJECTION
0950 MIX FIRST 40-GALLON BATCH OF ORC ADVANCED, 2 x 40 LB BAGS ORC, 36 GALLONS OF WATER, 40-GALLON SLURRY, PLAN TO INJECT THROUGH 4-4.5" CASING (CORE BARREL) (4-INCH OD CORE BARREL AND 3.5" OD TOOLING/RODS)
(SEE INJECTION LOG
MIX SECOND BATCH OF ORC, INJECT
1030 INJECTION IB-7 COMPLETE 80-GALLONS OF SLURRY INJECTED
PULL RIG OFF IB-7 LOCATION, CALL S. JACKSON, ASK DRILLER TO REDUCE INJECTION PRESSURE TO 50 PSI, PER INJECTION PERMIT (VIC PERMIT DOES NOT ALLOW GREATER THAN 50 PSI FOR INJECTIONS)
SETUP ON IB-8 LOCATION
1045 CORE IB-8
1155 IB-8 COMPLETED TO 40' BGS
1200 INJECT AT IB-8 LOCATION (SEE INJECTION LOG)
SETUP ON IB-4 LOCATION
1300 CORE IB-4
1415 IB-4 COMPLETED TO 40' BGS
1418 INJECT AT IB-4 LOCATION (SEE INJECTION LOG)
SETUP ON IB-5 LOCATION
1435 CORE IB-5

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 2 OF 2
DATE 03-18-2015

1545 IB-5 CORED TO 40' BGS
1~~5~~5 INJECT AT IB-5 LOC. (SEE INJECTION LOG)
1610 COMPLETE INJECTION
CLEAN UP
1700 DEPART SITE

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PROJECT NUMBER 320001641-08
FIELD REPORT NUMBER
PAGE 1 OF 1
DATE 03-19-2015

PROJECT	QUAIL CROSSING	ARRIVAL TIME	0815
LOCATION	ANDOVER, KS	DEPARTURE TIME	1215
CLIENT	NUSTAR	WEATHER	LT RAIN (40's-50's)
PURPOSE OF OBSERVATIONS	WELL INSTALLATION / PILOT TEST		
APEX REPRESENTATIVE	M. WHITSON	APEX PROJECT MANAGER	S. JACKSON
CONTRACTOR	LAYNE	PERMIT NO.	–
CONTRACTOR REP.	(MARK AND CHAD)	H&S REVIEW	✓

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0815 APEX ON SITE, LAYNE ON SITE, H+S REVIEW
CORE IB-9 LOCATION TO 40' BGS
0910 INJECT AT IB-9 LOCATION (SEE INJECTION LOG)
MOVE TO IB-6
CORE IB-6 LOCATION TO 40' BGS
1120 INJECT AT IB-6 LOCATION (SEE INJECTION LOG)
CLEAN UP
LEAVE APEX TULSA WITH INJECTION LOG AND INSTRUCTIONS
1215 DEPART SITE FOR FEDEX AND KANSAS CITY AIRPORT

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APEX PROJECT MANAGER

WELL GAGING DATA SHEET

APEX

		Job Number:	1641
Client:	NUSTAR	Date:	03-12-2015
Project:	QUAIL CROSSING	Sampler:	M. WHITSON
Weather:	CLEAR (70'S) CALM	Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-19	0835	–	45.0	45.7'	–	0.7'	
MW-18	0845	–	43.2'	44'	–	0.8'	
MW-17	1200	–	–	45.0'	–	–	
	03-13						
MW-19	1030	–	42.6'	44.8'	–	2.2'	
MW-18	1035	–	40.0'	43.3'	–	3.3'	
MW-17	1040	–	42.8	44.0'	–	1.2'	
	03-14						
MW-19	1335	–	40.1'	44.6	–	4.5'	
MW-18	1340	–	36.3'	41.5	–	5.2'	
MW-17	1345	–	38.7'	41.3	–	2.6'	
	03-15						
MW-17	1600	–	35.4	39.4	–	4.0'	
MW-19	1605	–	38.5	41.1	–	2.6'	
MW-18	1610	–	33.5	39.8	–	6.3'	

WELL GAGING DATA SHEET

APEX

		Job Number:	
Client:	NUSTAR	Date:	03-18-15
Project:	QUAIL CROSSING	Sampler:	M. WHITSON
Weather:	CLOUDY (40'S)	Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	~~Depth to Free Product (feet)~~	~~Depth to Water (feet)~~	~~Depth to Well Bottom (feet)~~	~~Product Thickness (feet)~~	~~Water Column Height (feet)~~	Notes/Other Remarks		
WELL ID	TIME START	SLURRY GALLONS	BOTTOM DEPTH	TOP DEPTH	TIME FINISH	PRESSURE	SLURRY MIX TIME	ORC LBS	WATER GALLONS
IB-7	~~07~~ 1000	~~40~~ 80	40	30	1015	100	0950	80	36
	1015	~~40~~ 80	30	20	1030	100	1015	80	36
IB-8	1200	~40	40	30	1207	40	1155	~75	36
	1209	~40	30	20	1215	40	1208	~75	36
IB-4	1418	~40	40	30	1421	35	1415	~75	36
	1424	~40	30	20	1430	35	1422	~75	36
IB-5	1555	~40	40	30	1600	40	1550	~75	36
	1605	~40	30	20	1610	40	1601	~75	36

WELL GAGING DATA SHEET

APEX

		Job Number:	
Client:		Date:	03-19-15
Project:		Sampler:	M. WHITSON
Weather:		Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks		
WELL ID	TIME SINK	SLURRY GAL	BOTTOM DEPTH	TOP DEPTH	TIME FINISH	PRESS	SLURRY MIX TIME	ORC	WATER
IB-9	0910	40	40	30	0915	35	0907	75	36
	0918	40	30	20	0925	35	0916	75	36
IB-6	1120	40	40	30	1125	40	1116	75	36
	1130	40	30	20	1135	40	1128	75	36

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING NUSTAR
Project Number: 1641-08

Boring Number: MW-18
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE DRILLING
Drilling Equipment: MINI-SONIC
Sampler Type: CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1030-1345
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery TOTAL	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT CONCRETE ROAD SURFACE (6 - INCHES)
			2.3	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF TO HARD, HIGHLY PLASTIC,
	48"				
5			1.0	NS	BECOMES LIGHT GREENISH BROWN, TRACE SILT
	24"		2.4	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, STIFF TO V. STIFF, HIGHLY PLASTIC.
10			0.0	NS	LENS OF CALCITE/GYPSUM FRAGMENTS (4-INCH)
	64"		0.0	NS	~~BECOMES~~ TRACE GRAVEL MW 03-11-15 BECOMES V. SILTY
			0.0	NS	CLAYEY GRAVEL (GC); LIGHT BROWN, V. DENSE, S. MOIST, ANGULAR FINE-COARSE GRAVEL IN CLAY MATRIX
15			0.1	NS	CLAYEY SILT ~~SILTY CLAY~~ WITH GRAVEL (ML); MEDIUM GRAY-GREENISH GRAY, MW 03-11-15 S. MOIST, V. STIFF, FINE TO COARSE ANGULAR GRAVEL.
	82"		0.2	NS	BECOMES V. LIGHT BROWN
			0.1	NS	STRINGERS OF CALCITE (CRYSTALLINE) INTERBEDDED WITH PARTIALLY LITHIFIED SILTS AND CLAY (SHALE)
20			0.0	NS	SILTY CLAY (CH); V. LIGHT GRAYISH BROWN, S. MOIST, V. STIFF WITH TRACE ANGULAR GRAVEL, HIGH PLASTICITY BECOMES HARD - V. HARD, LITHIFIED (SHALE)
	136"		0.1	NS	BECOMES M. STIFF, MOIST BECOMES HARD - V. HARD, LITHIFIED (SHALE)
25					
MW-18 (26.5) 1315		X	0.0	NS	
			72.2	NS	BECOMES M. STIFF, MOIST, GRAVELLY (CALCITE [CRYSTALLINE])
					BECOMES DARK BROWN, HARD
					BECOMES VERY LIGHT BROWN, MOIST TO WET, M STIFF
30			44.2	NS	
MW-18 (31.5) 1325		X	142.3	NS	SILT W/ GRAVEL (ML); LIGHT BROWN, DRY, STIFF, MOSTLY LITHIFIED, BROKEN UP BY DRILLING.
	120"		3.1	NS	CLAYEY SILT (ML); MED REDDISH BROWN, DRY, HARD,
35					BECOMES MOSTLY LITHIFIED (SHALE)
			0.1	NS	BECOMES MOIST, M. STIFF BECOMES DRY HARD, LITHIFIED (SHALE)
			0.0	NS	SAME AS ABOVE BECOMES PALE BROWN, DRY

NOTE: PARTIALLY LITHIFIED

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING NUSTAR
Project Number: 1691-08

Boring Number: MW-18
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1030-1345

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
			0.0	NS		
	72"				BECOMES LITHIFIED (SHALE)	
			0.0	NS	BECOMES M. STIFF TO STIFF	
45					BOTTOM OF BORING @ 45.0' BGS	45
50						50
55						55
60						60
65						65
70						70
75						75

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING NVSTAL
Project Number: 1611-08

Boring Number: MW-19
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1500 -
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT-CONCRETE ROAD SURFACE (6- INCHES)
			0.1	NS	CLAY (CH); DARK BROWN, S. MOIST, M. STIFF TO STIFF, TRACE ASPH-CONC DEBRIS AT SURFACE
	108"				
5			0.0	NS	SILTY CLAY (CH); MEDIUM BROWN, S. MOIST, V. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	CLAYEY SILT (ML); LIGHT BROWN, MOTTLED BROWN, S. MOIST, M. STIFF, LOW-MOD PLASTICITY
					BECOMES GREENISH GRAY, V. HARD
10			0.0	NS	BECOMES M. STIFF, W CALCITE (CRYSTALLINE) GRAVELS (VEIN)
			0.2	NS	
	120"				SHALE; LIGHT BROWN TO M. GREENISH GRAY, DRY, HARD, LITHIFIED
15			0.3	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, V. STIFF, TRACE CALCITE/GYPSUM LENSES/GRAVEL
			0.3	NS	
					BECOMES M. STIFF, REDDISH BROWN, MOIST
20			0.2	NS	
	120"		0.0	NS	CLAY W/ SILT (CH); GREENISH GRAY, DRY, V. HARD, ~~MOSTLY~~ PARTIALLY LITHIFIED, W/ TRACE CRYSTALLINE CALCITE VEINS. MW 03-11-15
25					BECOMES GREENISH BROWN, WAXY
MW-19 (28) 1710		X	0.2	NS	BECOMES LITHIFIED (SHALE) WITH CALCITE VEINS
					BECOMES PALE BROWN, M. STIFF, MOIST
30			6.8	NS	
MW-19 (32) 1720	84"	X	43.0	NS	BECOMES LITHIFIED (SHALE)
					BECOMES V. STIFF TO HARD
35			0.4	NS	
			1.2	NS	
	72"				
			1.2	NS	BECOMES MOSTLY LITHIFIED WITH CALCITE (CRYSTALLINE)

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: MW-19
Logged By: M. WHITSON
Date: 03-11-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
			1.3	M		
			11.5	NS	BECOMES M. STIFF, S. MOIST	
MW-19 (45) 1800 45		X	2.6	NS		45
					BOTTOM OF BORING @ 45.0' BGS	
50						50
55						55
60						60
65						65
70						70
75						75

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING NUSTAR Project Number: 1611-08	Boring Number: MW-17 Logged By: M. WHITSON Date: 03-12-2015 Site Conditions: GRASS LAWN Drilling Contractor: LAYNE Drilling Equipment: MINI SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD): Surface Elevation: NOT MEASURED 0830 - 1115

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description Fine-Grained Soils: type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations Coarse-Grained Soils: type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations	Well Construction Details and Notes
					GRASS LAWN SURFACE	
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF TO HARD, TRACE ORGANICS, ROOTLETS	
5	120"				BECOMES LIGHT BROWN, WITH TRACE SILT	5
			0.0	NS		
10					BECOMES LIGHT GRAY, TRACE FINE GRAVEL	10
			0.0	NS	CLAYEY SILT (ML); LIGHT BROWN, S. MOIST, V. STIFF, MOD. PLASTICITY, TRACE GRAVEL	
	60"					
			0.0	NS	CLAYEY SILT W/ GRAVEL (ML); V. LIGHT BROWN, S. MOIST, V. STIFF-HARD, F-COARSE ANG. GRAVEL	
15						15
			0.0	NS	PARTIALLY LITHIFIED (SHALE)	
	60"					
MW-17 (19) 1005		X	0.0	NS	CLAY W/ GRAVEL (CH); V. LIGHT BROWNISH GRAY, S. MOIST, V. STIFF-HARD, FINE TO COARSE ANGULAR GRAVEL (PARTIALLY LITHIFIED (SHALE))	
20						20
			95.6	NS	BECOMES MOIST, SOFT TO M. STIFF	
MW-17 (22) 1015		X	360.7	NS		
25	120"		7.0	NS	BECOMES V. STIFF-HARD, S. MOIST	25
					BECOMES LITHIFIED (SHALE)	
			1.2	NS		
30			1.2	NS		30
			187.3	NS	SILTY CLAY W/ GRAVEL (CH); BROWNISH GRAY, MOIST, SOFT, FINE TO COARSE ANGULAR GRAVEL	
	72"		6.0	NS	BECOMES LIGHT GRAY	
35			0.8	NS	SHALE/LIMESTONE, WHITE TO MED BROWN, V. HARD, INTERBEDDED	35
MW-17 (37) 1100	72"	X	0.0	NS	CLAY (CH); LIGHT BROWN, S. MOIST, HARD, WAXY, HIGH PLASTICITY	

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: MW-1

Logged By: M. WHITSON
Date: 03-12-2015
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD)
Surface Elevation: NOT MEASURED

Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
			0.0	M	SHALE/LIMESTONE; V. LIGHT GRAY, DRY, V. HARD, LITHIFIED
	36"				SILTY CLAY (CH); V. LIGHT BROWN, S. MOIST, HARD, PARTIALLY LITHIFIED (SHALE)
45					BOTTOM OF BORING @ 45.0' BGS
50					
55					
60					
65					
70					
75					

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: EASTER ADDITION NUSTAR
Project Number: 1641-07

Boring Number: MW-1R
Logged By: M. WHITSON
Date: 08-12-15
Site Conditions: GRASS YARD
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1430 - 1640
Well Construction Details and Notes.

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

GRASS YARD AT SURFACE

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
	29"	0	0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, M. STIFF, HIGH PLASTICITY, TRACE ROOTLETS, LARGER GRAINS
					BECOMES STIFF TO V. STIFF
			0.0	NS	BECOMES MED BROWN, WITH TRACE SILT, DRY
5	90"				BECOMES V. STIFF TO HARD, REDDISH BROWN, S. MOIST MOTTLED ORANGE-RED AND BLACK
			0.0	NS	
10					SILTY CLAY (CH); MEDIUM BROWN, S. MOIST, V. STIFF, MOD-HIGH PLASTICITY, MOTTLED RED/BLACK
			0.0	NS	
15	120"		0.0	NS	
					CLAY (CH); MEDIUM BROWN, S. MOIST, HARD, HIGH PLASTICITY
					CALCITE/GYPSUM VEINS
MW-1R (19.5) 1550		X	0.0	NS	
20					CLAY W/GRAVEL (CH); MED BROWN, MOIST, SOFT - M. STIFF, HIGH PLASTICITY, F-M ANGULAR GRAVEL
MW-1R (22) 1600		X	592.0	NS	
25	120"		206.5	NS	
			310.6	NS	SILTY CLAY (CH); MED BROWN, S. MOIST, V. STIFF, MOD. PLASTIC
					BECOMES HARD
			50.6	NS	
30					BECOMES M. STIFF TO STIFF, LIGHT BROWN
			7.8	NS	
MW1R (33) 1630	X		0.0	NS	BECOMES PARTIALLY LITHIFIED/FRACTURED, WET
35					
			0.0	NS	CLAY (CH); PALE BROWN, DRY - S. MOIST, HARD, HIGH PLASTICITY

33.5'

BOTTOM OF BORING @ 40.0' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING NUSTAR
Project Number: 1641-07

Boring Number: F-1R
Logged By: M. WHITSON
Date: 03-13-15
Site Conditions: GRASS DRIVEWAY
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1615-

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS DRIVEWAY
	36"		0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, STIFF TO V. STIFF, HIGH PLASTICITY, TRACE ROOTLETS/ORGANIC MAT.
					BECOMES V. HARD
5	84"		0.0	NS	
			0.0	NS	
10			0.0	NS	
					SILTY CLAY (CH); MED TO DARK BROWN, S. MOIST, HARD, HIGH PLASTICITY, MOTTED RUSTY ORANGE AND BLACK
15	120"		0.0	NS	
					BECOMES LIGHT GRAY, PARTIALLY LITHIFIED (SHALE)
			0.0	NS	LIMESTONE, WHITE TO LIGHT GRAY, DRY, V. HARD
20					GRAVELLY CLAY (CH); MED LIGHT BROWN, MOIST TO ALMOST WET, F-M ANG GRAVEL
			0.0	NS	
			0.0	NS	
25	120"		0.0	NS	SILTY CLAY (CH); LIGHT GRAY, S. MOIST, HARD, PARTIALLY LITHIFIED
F-1R(26) 1750		X	0.0	NS	
			0.4	NS	BECOMES LITHIFIED SHALE, WITH CALCITE/GYPSUM VEINS
			30.2	NS	
30					
F-1R(30) 1830		X	280.2	NS	CLAYEY SAND (SC); GRAY, MOIST, M. DENSE, V. FINE GRAINED SAND, POTENTIALLY GROUND UP (DRILLING)
	60"				LIMESTONE, WHITE, V. HARD
			0.1	NS	
35					
F-1R(36) 1845		X	0.0	NS	SANDY SILT (ML); LIGHT TAN, S. MOIST, M. STIFF-STIFF, VERY FINE GRAINED SAND.
	60"				BECOMES GRAY
			0.0	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-1
Logged By: M. WHITSON
Date: 03-14-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD): 31'
Surface Elevation: NOT MEASURED
1515-1700 1015-1115
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT CONCRETE AT SURFACE (6-INCHES)
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, M. STIFF-STIFF HIGH PLASTICITY
5	120"		0.0	NS	CLAYEY SILTY (ML); V. LIGHT BROWN, DRY-S. MOIST, V. STIFF, LOW TO MOD PLASTICITY
10			0.0	NS	CLAY (CH); V. DARK BROWN, MOTTLED BROWN, S. MOIST, V. STIFF TO HARD, TRACE SILT, HIGH PLASTICITY
			0.0	NS	
			0.4	NS	CLAYEY SILT (ML); LIGHT BROWN, S. MOIST, V. STIFF TO HARD, LOW-MOD PLASTICITY,
15	120"				BECOMES LIGHT GREENISH GRAY
IB-1 (18.0) 1650		X	0.0	NS	BECOMES PARTIALLY LITHIFIED, CRYSTALLINE CALCITE VEINS.
20			4.5	NS	GRAVELLY CLAY (CH); MED BROWN, MOIST, SOFT-M. STIFF, F-COARSE ANG. GRAVEL
					BECOMES STIFF
IB-1 (24.0) 1700		X	31.9	NS	
25			0.0	NS	
			0.4	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, HARD, PARTIALLY LITHIFIED, CALCITE (CRYSTALLINE)
					NOTE 1700 STOP FOR DAY (03-14) 1015 RESUME (03-15)
30	X	MW	03-17-15		
			29.0	NS	BECOMES WET, SOFT
	72"				BECOMES HARD
			0.7	NS	
			1.4	NS	
35					CALCITE VEINS, BECOMES PARTIALLY LITHIFIED (SHALE)
	60"		7.1	NS	
			25.3	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-2
Logged By: M. WHITSON
Date: 03-15-2015
Site Condition: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI-SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

1115-1330
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					ASPHALT-CONCRETE ROAD SURFACE (6-INCHES)
					CLAY (CH); V. DARK BROWN TO BLACK, S. MOIST, V. STIFF, HIGH PLASTICITY
			0.0	NS	
5	120"				
			0.0	NS	SILTY CLAY (CH); LIGHT YELLOWISH BROWN, S. MOIST, STIFF, MOD-HIGH PLASTICITY
					BECOMES V. STIFF
10			0.0	NS	
					BECOMES LIGHT GRAY
	60"		0.0	NS	~~CLAYEY~~ MW 03-15-15 GRAVELLY CLAY (CH); BROWNISH GRAY, MOIST, SOFT-M. STIFF, FINE ANG GRAVEL
					BECOMES LITHIFIED (SHALE), VERY HARD.
15					BECOMES STIFF TO V. STIFF
	60"		0.0	NS	SILTY CLAY (CH); GRAYISH BROWN, MOIST, M. STIFF TO STIFF TRACE FINE GRAVEL
			0.0	NS	BECOMES HARD, PARTIALLY LITHIFIED
			0.0	NS	3-INCH LENS ~~OF~~ WET MW 03-15-15
20					
			0.0	NS	
	60"		0.0	NS	CLAY W/ GRAVEL (CH); MEDIUM BROWN, MOIST, SOFT-M. STIFF, F-M GRAVEL ANGULAR, HIGH PLASTICITY,
			0.0	NS	SILTY CLAY (CH); MED GRAY, S. MOIST, V. STIFF-HARD, HIGHLY PLASTIC, PARTIALLY LITHIFIED
25					
			0.0	NS	
30	108"				BECOMES LITHIFIED (SHALE)
IB-2 (32) 1320		X	0.0	NS	2-INCH LENS (WET)
35			38.8	NS	BECOMES MOIST, M. STIFF
	72"				
IB-2 (38) 1330		X	45.3	NS	BECOMES HARD

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-3
Logged By: M. WHITSON
Date: 03-15-2015
Site Conditions: ROAD SURFACE
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1330 - 1600

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description	Well Construction Details and Notes
					ASPHALT-CONCRETE (6 - INCHES)	
			0.0	NS	CLAY (CH); DARK BROWN, S. MOIST, V. STIFF, HIGH PLASTICITY	
5	120"					5
			0.0	NS	SILTY CLAY (CH); LIGHT YELLOWISH BROWN, S. MOIST, MOD PLASTIC	
10						10
			0.0	NS	BECOMES GRAYISH BROWN, MOIST, W/TRACE GRAVEL	
15	120"					15
			0.0	NS		
20					YELLOWISH BROWN, MOIST-ALMOST WET	20 1415-1430 RIG DOWN (HYDRAULIC LINE)
	60"		12.8	NS		
IB-3 (24) 1530		X	0.0	NS		
25					CLAY (CH): YELLOWISH GRAY, S. MOIST - MOIST, V. STIFF TO HARD, HIGH PLASTICITY, TRACE SILT, PARTIALLY LITHIFIED	25
			111.2	NS		
	36"	MW 03-15-15				
IB-3 (30) 1540		X	342.1	NS		30
			5.7	NS	SILTY CLAY (CH); GRAY BROWN, S. MOIST, HARD, HIGH PLASTICITY, PARTIALLY LITHIFIED. 1-FOOT LENS (WET)	
IB-3 (36) 1600	48"	X	0.0	NS	BECOMES LITHIFIED	35
			0.0	NS		

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201	Project Name: QUAIL CROSSING Project Number: 1641-08	Boring Number: IB-7 Logged By: M. WHITSON Date: 02-18-15 Site Conditions: GRASS LAWN Drilling Contractor: LAYNE Drilling Equipment: MINI-SONIC Sampler Type: 10' CORE BARREL Depth to Water (ATD): Surface Elevation: NOT MEASURED 0800 - 0940 Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description Fine-Grained Soils: type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations Coarse-Grained Soils: type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations
					GRASS LAWN SURFACE
			0.0	NS	SILTY CLAY (CH); MED BROWN, MOIST, M. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	CLAY (CH); DARK BROWN S. MOIST, STIFF, HIGH PLASTICITY
5	120"		0.0	NS	BECOMES REDDISH BROWN, V. STIFF
			0.0	NS	~~SILTY CLAY (CH)~~ MW 02-18-15; TAN, S. MOIST, V. STIFF, MOTTLED WHITE
10			0.0	NS	CLAYEY SILT (ML)
					SILTY CLAY (CH): LIGHT BROWN, S. MOIST, V. STIFF, MOD-H PLASTICITY
			0.0	NS	BECOMES V. SILTY CLAY
15	120"		0.0	NS	CLAYEY SILT (MH): MED GRAY, S. MOIST, V. STIFF-HARD, M. PLASTICITY
					BECOMES PARTIALLY LITHIFIED, BROKEN UP INTO GRAVEL SIZE PARTICLES (SEE PHOTOGRAPH)
			0.0	NS	CLAY W/ SILT (CH): GRAY, S. MOIST, HARD TO V. HARD, H. PLASTICITY
IB-7(19) 0900		X	0.3	NS	GRAVELLY CLAY W/ SILT (CH): YELLOWISH GRAY, S. MOIST M. STIFF, F-C ANGULAR GRAVEL
20			23.5	LS	CLAYEY SILT (MH); YELLOWISH BROWN, WET, SOFT-M. STIFF, HIGH PLASTICITY
IB-7(24) 0915		X	447.3	NS	
25	120"		0.2	NS	V. SILTY CLAY (CH): GRAYISH BROWN, S. MOIST, HARD, MOD-HIGH PLASTICITY
			63.3	NS	BECOMES WET
30			31.3	NS	BECOMES SILTY CLAY
			14.1	NS	
35	120"		16.0	NS	BECOMES V. STIFF, MOIST
IB-7(39) 0930		X	0.9	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-8
Logged By: M. WHITSON
Date: 03-18-2015
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1045 -
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

GRASS LAWN SURFACE

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					CLAY (CH); V. DARK BROWN, S. MOIST, STIFF, HIGH PLASTICITY
			0.0	NS	
5	120"				
			0.0	NS	SILTY CLAY (CH); YELLOWISH BROWN, S. MOIST, STIFF HIGH PLASTICITY
			0.0	NS	
10					
					CLAYEY SILT (ML); LIGHT BROWN, MOIST, M. STIFF L-M PLASTIC
					SILTY CLAY (CH); LIGHT BROWN, S. MOIST, STIFF M-H PLASTIC
15	120"				BECOMES GRAY
IB-8(18) 1130		X	0.0	NS	BECOMES V. HARD
					BECOMES M. LITHIFIED (SHALE: SEE PHOTO)
20					
			4.3	NS	SILTY CLAY (CH)
			6.9	NS	YELLOW BROWN, WET, SOFT, TRACE GRAVEL BECOMES HARD, S. MOIST
25	120"				
			3.4	NS	3-INCH LENS SOFT, MOIST
			0.3	NS	1-INCH LENS SOFT WET
30					TRACE GRAVEL, F-C ANGULAR, CALCITE (CRYSTALLINE)
			6.2	NS	BECOMES M. STIFF, MOIST
IB-8(32.5) 1200		X	132.3	NS	BECOMES V. SOFT, WET
			98.7	NS	BECOMES HARD, BROWNISH GRAY
35	120"				
			5.3	NS	BECOMES V. HARD GREENISH GRAY, S. MOIST PARTIALLY LITHIFIED.
IB-8(39) 1205	X		1.7	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: 1B-4
Logged By: M. WHITSON
Date: 03-18-15
Site Conditions: GRASS LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sample Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1300 -

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS LAWN SURFACE
			0.0	NS	SILTY CLAY (CH); DARK BROWN, MOIST, SOFT-M. STIFF, HIGH PLASTICITY, ORGANIC MATERIAL, ROOTLETS.
			0.0	NS	CLAY (CH); V. DARK BROWN, S. MOIST, HARD, HIGHLY PLASTIC
5	120"				
1B-4(6) 1330		X	0.9	NS	
10					
			0.8	NS	SILTY CLAY (CH); LIGHT BROWN, S. MOIST, M. STIFF, MOD-HIGH PLASTICITY
			0.0	NS	TRACE FINE ANGULAR GRAVEL
15	120"				BECOMES HARD, CEMENTED
			1.8	NS	BECOMES SOFT, MOIST
					BECOMES V. HARD, MOSTLY LITHIFIED (SEE PHOTOGRAPH), GREENISH GRAY
1B-4(19.5) 1345		X	875.3	NS	GRAVELLY CLAY (CH); YELLOWISH BROWN, WET, SOFT, F-MEDIUM ANGULAR GRAVEL.
20					BECOMES DARK GRAY
			260.4	NS	
			6.7	NS	CLAYEY SILT (ML); REDDISH BROWN, S. MOIST TO MOIST, M. STIFF, LOW-MOD PLASTICITY, TRACE M ANG GRAVEL
25	120"				CLAY (CH); MEDIUM GRAY, S. MOIST, V. HARD, HIGHLY PLASTIC
			7.0	NS	6-INCH LENS OF M. STIFF MATERIAL
30					BECOMES VERY SOFT, SATURATED
1B-4(31) 1400		X	1,426	NS	
					BECOMES M. STIFF WITH TRACE GRAVEL
			41.5	NS	
35	120"				BECOMES V. LIGHT GRAY
					BECOMES PARTIALLY LITHIFIED
			3.3	NS	BECOMES SHALE (12-INCHES; SEE PHOTO)
1B-4(39) 1415		X	0.1	NS	BECOMES V. HARD, RED BROWN

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

APEX

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-5
Logged By: M. WHITSON
Date: 03-18-15
Site Conditions: LAWN
Drilling Contractor: LAVINE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED
1435-1545
Well Construction Details and Notes:

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					GRASS SURFACE
			0.0	NS	CLAY (CH); V. DARK BROWN, MOIST, V. STIFF, HIGH PLASTICITY
5	120"		0.2	NS	
			0.3	NS	SILTY CLAY (CM); REDDISH BROWN, S. MOIST, V. STIFF, MOD-HIGH PLASTICITY
10			1.1	NS	
15	120"		1.2	NS	TRACE GRAVEL
			0.0	NS	BECOMES MOSTLY LITHIFIED, GRAY (SHALE)
20					BECOMES LIGHT BROWN.
			3.5	NS	
			16.5	NS	LENS OF CALCITE (CRYSTALLINE, VEIN, 1-INCH)
25	120"				BECOMES HARD-V.HARD
			0.6	NS	BECOMES GRAY
30					GRAVELLY CLAY (CH); LIGHT TAN, SATURATED, SOFT, M-COARSE ANG GRAVEL.
			3.6	NS	
			8.7	NS	
35					SILTY CLAY, GRAYISH BROWN, S. MOIST, V. STIFF - PARTIALLY LITHIFIED IN PLACE.
			0.0	NS	

BOTTOM OF BORING @ 40' BGS.

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-9
Logged By: MW
Date: 03-19-15
Site Conditions: LAWN
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD): 30'
Surface Elevation: NOT MEASURED

Lithologic Description

Fine-Grained Soils
type, (group symbol), color, moisture content, degree of plasticity, consistency, description w/ approximate percentage, notes/observations

Coarse-Grained Soils
type, (group symbol), color, moisture content, grading, density, description w/ approximate percentage, notes/observations

Well Construction Details and Notes:

Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					CLAY (CH); V. PALE BROWN, S. MOIST, M. STIFF - STIFF
					BECOMES V. STIFF
5	120"				
					CLAYEY SILT (ML); REDDISH BROWN, S. MOIST, M. STIFF, LOW-MOD PLASTICITY
10					
					TRACE GRAVEL
15	110"				
					SILTY CLAY (CH); MED BROWN, S. MOIST, V. STIFF, HIGH PLASTICITY
					BECOMES MOSTLY LITHIFIED (SHALE)
					CRYSTALLINE CALCITE VEINS
20			723.1	NS	CLAY W/ GRAVEL (CH); PALE BROWN, WET, SOFT TO M. STIFF, F-C ANG GRAVEL, TRACE SILT
			13.8	NS	BECOMES M. STIFF-STIFF
25	120"				
			1.8	NS	ROCK (LIMESTONE); GRAYISH WHITE, V. HARD, LITHIFIED
			5.2	NS	SILTY CLAY (CH); REDDISH BROWN, S. MOIST, V. STIFF HIGH PLASTICITY.
30					SILTY CLAY (CH); MED LIGHT BROWN, S. MOIST, STIFF TO V. STIFF
			9.2	NS	
35	[illegible]"		0.1	NS	BECOMES GREENISH GRAY, HARD - V. HARD
			0.2	NS	

30 or 40 MW 03-19-15

ACTUALLY 20-30 MW 03-19-15

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

APEX

Project Name: QUAIL CROSSING
Project Number: 1641-08

Boring Number: IB-6
Logged By: M. WHITSON
Date: 03-19-2015
Site Conditions: LAWN / GRASS
Drilling Contractor: LAYNE
Drilling Equipment: MINI SONIC
Sampler Type: 10' CORE BARREL
Depth to Water (ATD):
Surface Elevation: NOT MEASURED

Well Construction Details and Notes:

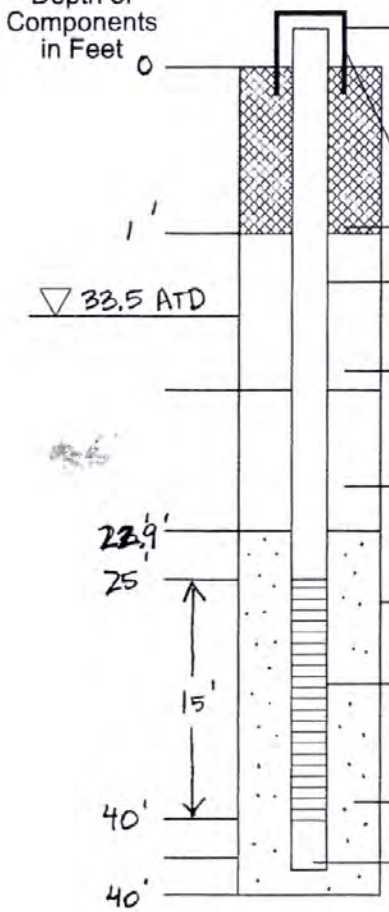
Depth, feet	Core Interval/Recovery	Laboratory Sample ID	PID	Sheen/Blow Counts	Lithologic Description
					CLAY (CH); V. DARK BROWN, S. MOIST, STIFF - V. STIFF HIGH PLASTICITY
			0.0	NS	
5	120"				
			0.0	NS	CLAYEY SILT (ML); PALE BROWN, S. MOIST, STIFF, LOW-MOD PLASTICITY
10					SILTY CLAY (CH); MED BROWN, S. MOIST, STIFF - V. STIFF HIGH PLASTICITY
			0.1	NS	
15	120"				BECOMES HARD, GRAYISH BROWN
			0.3	NS	
			23.0	NS	BECOMES REDDISH BROWN
20					BECOMES V. STIFF, GRAYISH BROWN
			0.3	NS	
					BECOMES HARD
25	120"		0.5	NS	
			16.3	NS	GRAVELLY CLAY (CH); LIGHT BROWN, PALE BROWN, MOIST TO ALMOST WET, M. STIFF, F-M ANG GRAVEL
30					
			0.5	NS	SILTY CLAY (CH); MED BROWN, S. MOIST, STIFF HIGH PLASTICITY
35	120"				BECOMES MOSTLY LITHIFIED, GREENISH GRAY (SHALE) HARD
			0.0	NS	

BOTTOM OF BORING @ 40' BGS

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Well Installation Report

Project Name: EASTER ADDITION
Well ID No.: MW-1R
Project No.: 1641
Observer: M. WHITSON
Driller Contractor: LAYNE DRILLING
Date(s) Installed: 03-12-2015
Well Type (e.g., monitoring, extraction, etc.): MONITORING WELL



Stick up in Feet Relative to Approximate Ground Surface Elevation in Feet: FLUSH / NOT MEASURED
Type of Monument: FLUSH MOUNT MONUMENT
Type of Surface Seal: TYPE I/II CEMENT
Diameter and Type of Casing/Riser Pipe: 2.0" SCHED 40 FT PVC
Type of Grout: MEDIUM BENTONITE CHIPS (CETCO PUREGOLD) - HYDRATED
Type of Plug: MEDIUM BENTONITE CHIPS (CETCO PUREGOLD) - HYDRATED
Diameter of Borehole: 6" CASED
Screen Diameter, Slot Size, and Type: 2.0" SCHED 40 10-SLOT SCREEN (FT)
Type of Filter Material: 12/20 SILICA SAND (UNIMIN FILTERSIL)
Type of End Cap/Tail Pipe: 4.5" FLUSH-THREAD

Material Tally:

Sand: 12/20 SILICA (HT 1)
Monument: 1
Cement: 1
PVC: 25' BLANK 15' SCREEN
Bentonite: MEDIUM CHIPS (111)
Other:

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

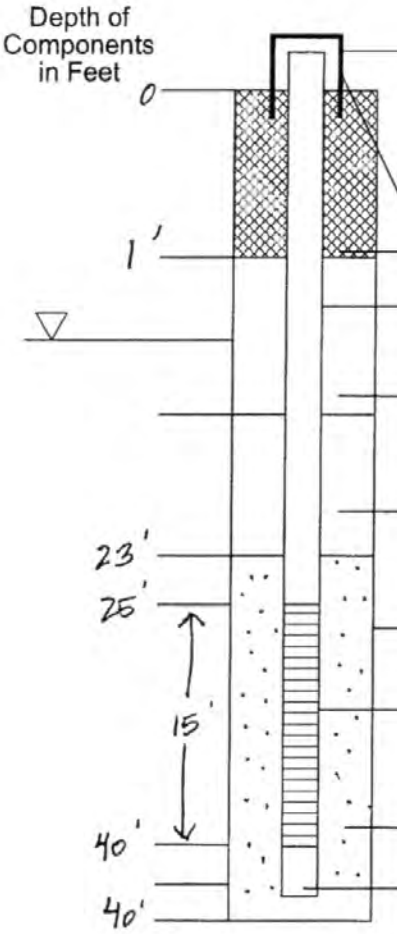
Well Installation Report

Project Name EASTER ADDITION Well ID No. F-1R

Project No. 1641 Observer M. WHITSON

Driller Contractor LAYNE Date(s) Installed 03-14-15

Well Type (e.g., monitoring, extraction, etc.) MONITORING WELL



Stick up in Feet MW 03-14-15 ~~NOT MEASURED~~/FLUSH

Relative to Approximate Ground Surface Elevation in Feet NOT MEASURED

Type of Monument FLUSH-MOUNT

Type of Surface Seal CEMENT

Diameter and Type of Casing/Riser Pipe 2" SCHED 40 PVC

Type of Grout BENTONITE CHIPS (HYDRATED)

Type of Plug BENTONITE CHIPS (HYDRATED)

Diameter of Borehole 6"

Screen Diameter, Slot Size, and Type 2" SCHED 4 PVC 10-SLOT

Type of Filter Material 12/20 SILICA SAND

Type of End Cap/Tail Pipe 4.5" FT END-CAP

Material Tally:

Sand 12/20 SILICA (HHT 1) Monument 1

Cement 1 PVC 25' BLANK 15' SCREEN

Bentonite MED. CHIPS (111) Other

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

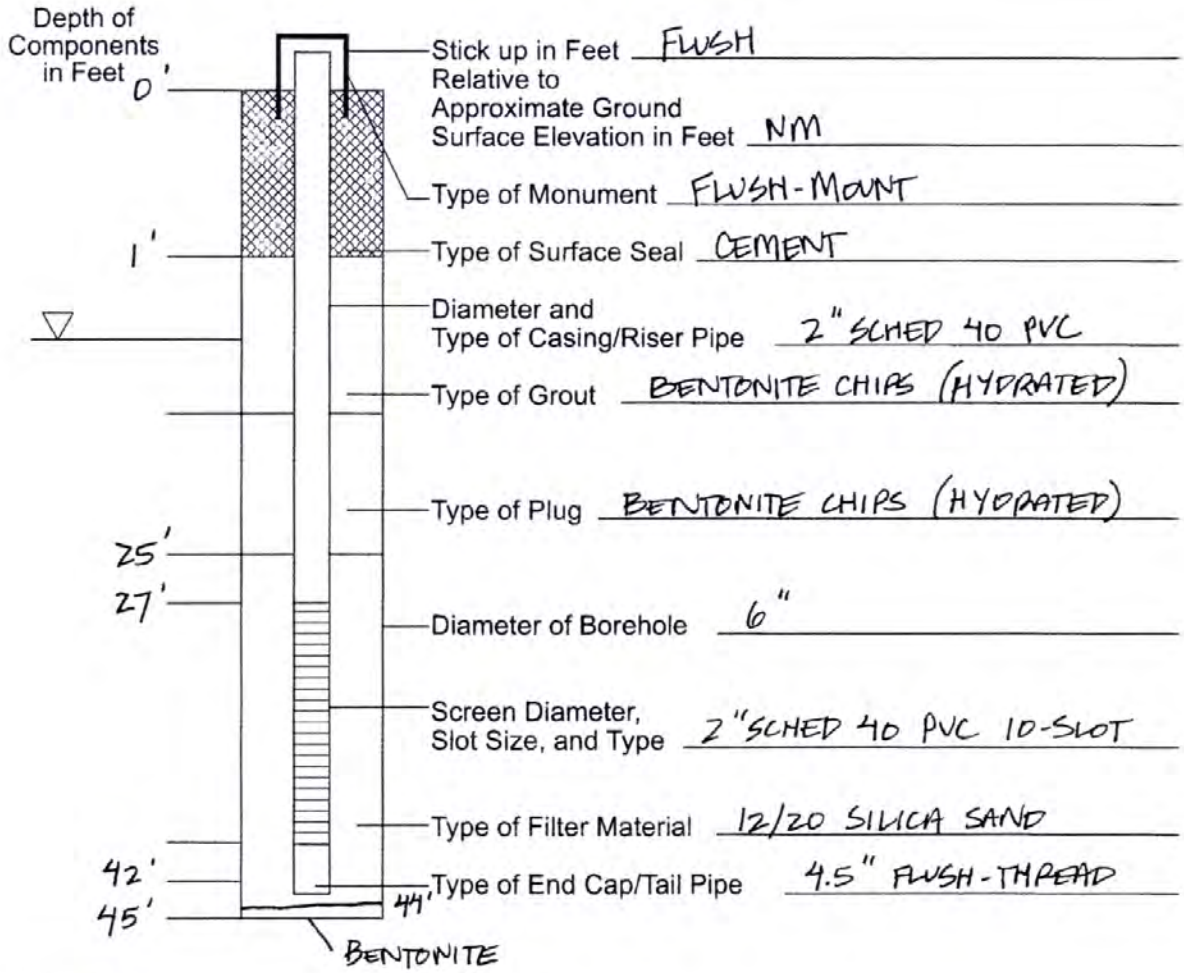
Well Installation Report

Project Name QUAIL CROSSING Well ID No. MW-17

Project No. 320001641-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed 03-16-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING



Material Tally:

Sand 12/20 SILICA (HHT 11) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (1111) Other

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Well Installation Report

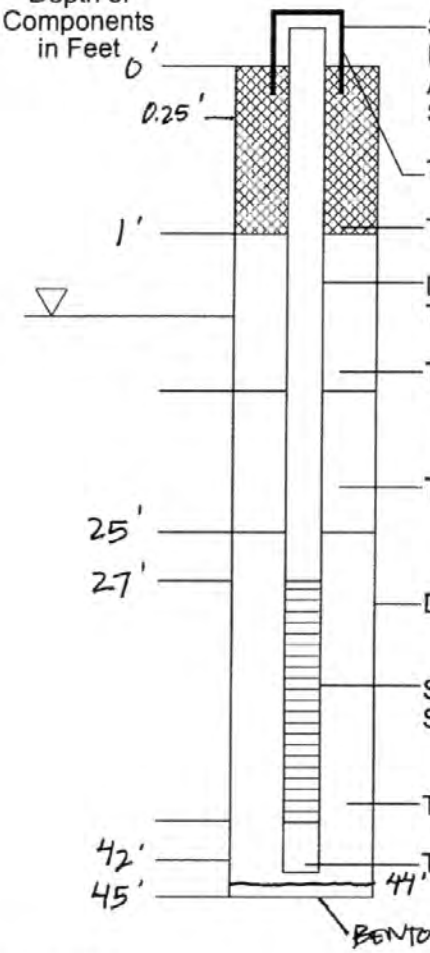
Project Name QUAIL CROSSING Well ID No. MW-19

Project No. 320001641-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed 03-16-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING WELL

Depth of Components in Feet



Stick up in Feet FLUSH

Relative to Approximate Ground Surface Elevation in Feet NM

Type of Monument FLUSH-MOUNT

Type of Surface Seal CEMENT/ASPHALT COLD PATCH

Diameter and Type of Casing/Riser Pipe 2" SCHED 40 PVC

Type of Grout BENTONITE CHIPS (HYDRATED)

Type of Plug BENTONITE CHIPS (HYDRATED)

Diameter of Borehole 6"

Screen Diameter, Slot Size, and Type 2" SCHED 40 PVC 10-SLOT

Type of Filter Material 12/20 SILICA SAND

Type of End Cap/Tail Pipe 4.5" FT END CAP

Material Tally:

Sand 12/20 SILICA (HHT 11) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (IIII) Other

Remarks:

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

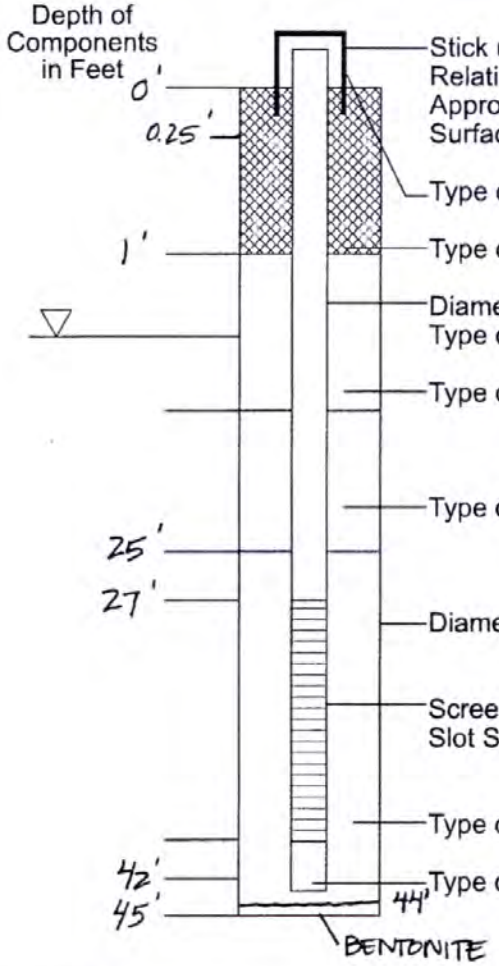
Well Installation Report

Project Name QUAIL CROSSING Well ID No. MW-18

Project No. 32000164 1-08 Observer M. WHITSON

Driller Contractor LAYNE DRILLING Date(s) Installed ~~03-16-2015~~ MW 03-17-2015 03-17-2015

Well Type (e.g., monitoring, extraction, etc.) MONITORING WELL



Stick up in Feet Relative to Approximate Ground Surface Elevation in Feet FLUSH / NM

Type of Monument FLUSH-MOUNT

Type of Surface Seal CEMENT/COLD PATCH ASPHALT

Diameter and Type of Casing/Riser Pipe 2" SCHED 40 PVC

Type of Grout BENTONITE CHIPS (HYDRATED)

Type of Plug BENTONITE CHIPS (HYDRATED)

Diameter of Borehole 6"

Screen Diameter, Slot Size, and Type 2" SCHED 40 PVC 10-SLOT

Type of Filter Material 12/20 SILICA SAND

Type of End Cap/Tail Pipe 4.5" FT CAP

Material Tally:

Sand 12/20 SILICA (~~IIII~~ II) Monument 1

Cement 1 PVC 30' BLANK 15' SCREEN

Bentonite MEDIUM CHIPS (IIII) Other

Remarks:

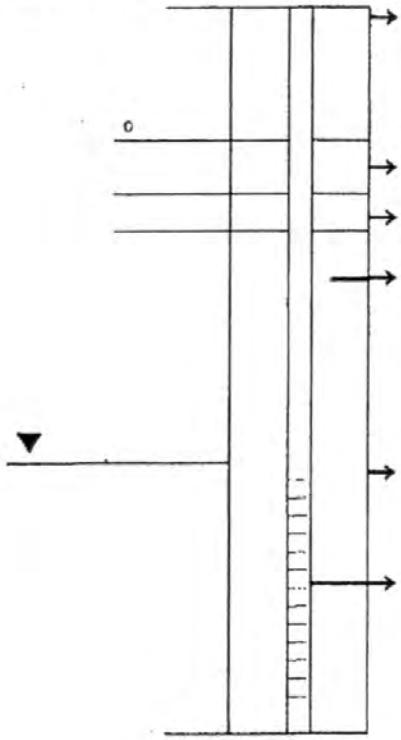
WELL ABANDONMENT LOG

APEX

Well Number:	A51	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	M. WHITSON
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? (Yes) No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL (PLACED)

Surface Seal: BENTONITE GROUT

Type of Plug: BENTONITE GROUT

Chips: –

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes (No))

Type: PVC / Pre-Pack N/A

Diameter: 1" SCHEDULE 40 PVC

COMMENTS

BENT GROUT

REMOVE MON.

CUT PVC 3' BGS

WELL ABANDONMENT LOG

APEX

Well Number:	AS2	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE

Type of Monument (Removed? Yes / No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT. GROUT

Type of Plug: BENT GROUT

Chips: –

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes / No)

Type: PVC / Pre-Pack N/A

Diameter: 1" SCHED 40 PVC

COMMENTS

REMOVE MON.

BENT GROUT

CUT PVC 3' BGS

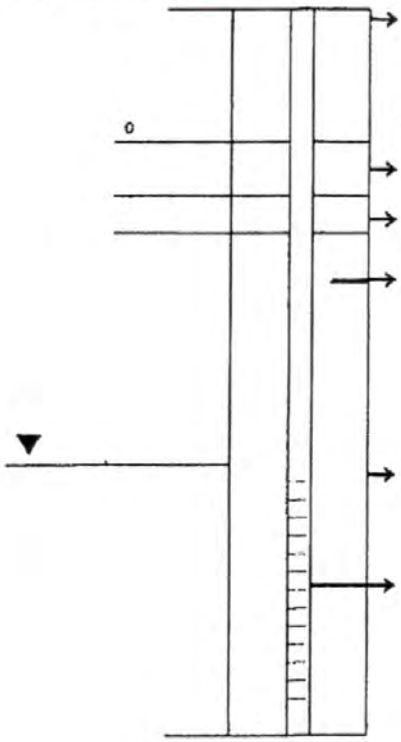
WELL ABANDONMENT LOG

APEX

Well Number:	AS3	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? Yes / No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT. GROUT

Type of Plug: BENT. GROUT

Chips: –

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes / No)

Type: PVC / Pre-Pack N/A

Diameter: 1" SCHED 40 PVC

COMMENTS

REMOVE MON.

GROUT

CUT PVC 3' BGS

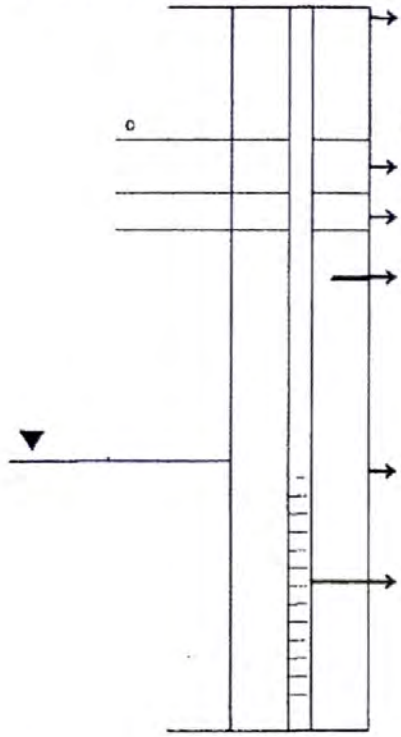
WELL ABANDONMENT LOG

APEX

Well Number:	MC1	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? (Yes) No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT. GROUT

Type of Plug: BENT. GROUT

Chips: —

Bags: —

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes (No))

Type: PVC / Pre-Pack N/A

Diameter: 2" SCHED 40 PVC

COMMENTS

REMOVE MON.

GROUT

CUT PVC 3' BGS

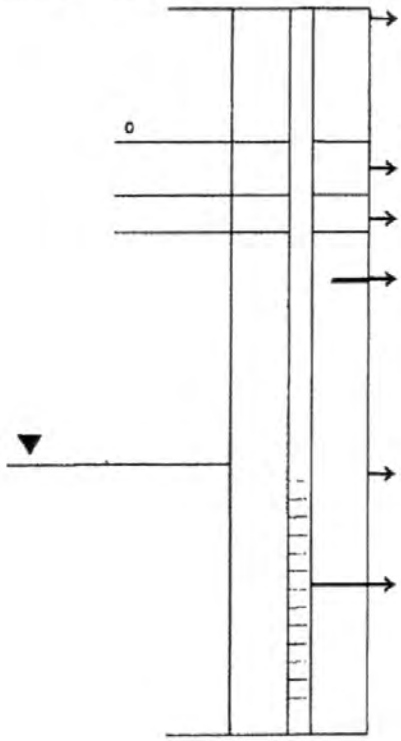
WELL ABANDONMENT LOG

APEX

Well Number:	MC2	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? (Yes) No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT. GROUT

Type of Plug: BENT. GROUT

Chips: N/A

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes (No))

Type: PVC / Pre-Pack N/A

Diameter: 2" SCHED 40 PVC

COMMENTS

REMOVE MON

GROUT

CUT PVC 3' BGS

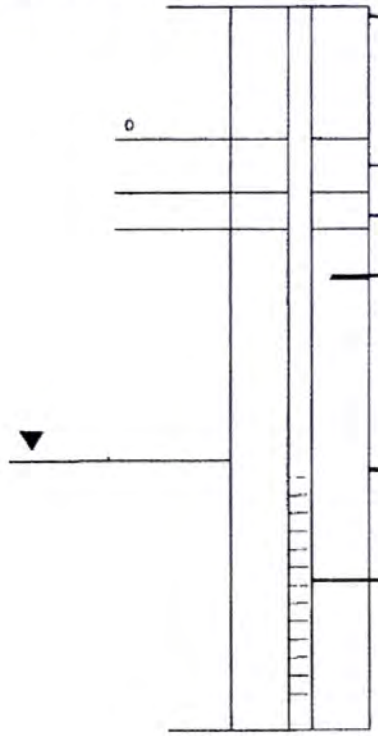
WELL ABANDONMENT LOG

APEX

Well Number:	MC3	Job Number:	1641-07
Client:	NUSTAR	Date:	03-10-15
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	1515

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? Yes / No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT GROUT

Type of Plug: BENT. GROUT

Chips: –

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes / No)

Type: PVC / Pre-Pack N/A

Diameter: 2" SCHED 40 PVC

COMMENTS

REMOVE MON.

GROUT

CUT PVC 3' BGS

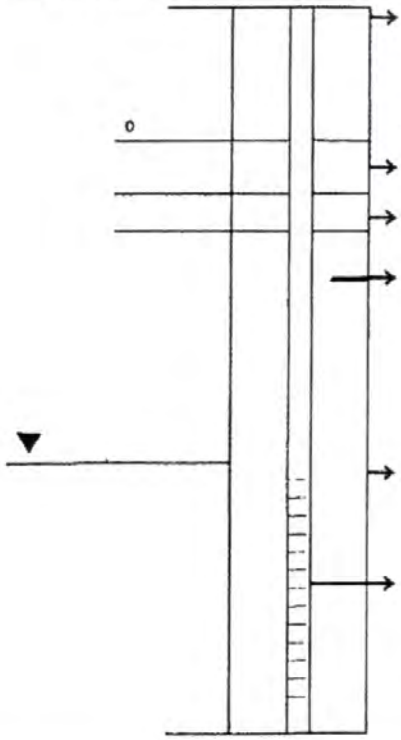
WELL ABANDONMENT LOG

APEX

Well Number:	MW-1	Job Number:	1641
Client:	NUSTAR	Date:	03-10-2015
Project:	EASTER ADDITION	Field Rep:	M.WHITSON
Weather:	CLEAR (70's)	Time In/Out:	1515 -

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? (Yes) No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT GROUT

Type of Plug: BENT GROUT

Chips: –

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes (No))

Type: PVC / Pre-Pack N/A

Diameter: 2" SCHED. 40 PVC

COMMENTS

CHIP IN PLACE W/ BENTONITE GROUT, CUT PVC 3' BGS, REMOVE MON.

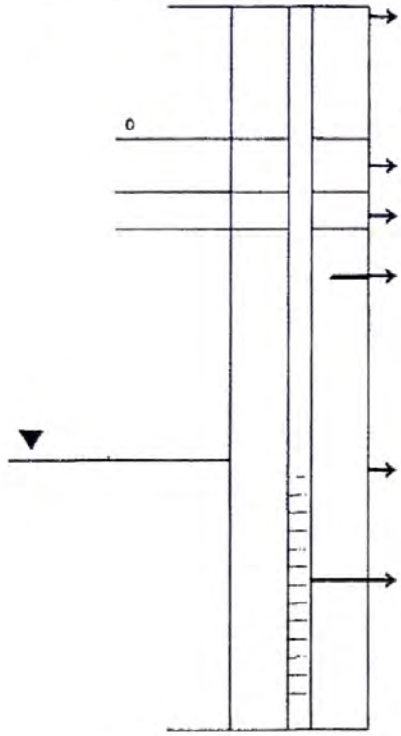
WELL ABANDONMENT LOG

APEX

Well Number:	F-1	Job Number:	1641-07
Client:	NUSTAR	Date:	03-14-15
Project:	EASTER ADDITION	Field Rep:	MW
Weather:	CLEAR	Time In/Out:	0930

OBSERVATIONS

Start Card Number: _____ Well Log ID: _____ Driller: LAYNE



Type of Monument (Removed? (Yes) / No) Drill Rig: N/A

Flush: ✓

Above Ground: N/A # Bollards: N/A

Surface Finish: TOP SOIL

Surface Seal: BENT GROUT

Type of Plug: BENT GROUT

Chips: +

Bags: –

Overdrill: N/A

Diameter of Borehole: N/A

Well Screen (Removed? Yes (No))

Type: PVC / Pre-Pack N/A

Diameter: 2" SCHED 40 PVC

COMMENTS

REMOVE MON.

GROUT

CUT PVC 3' BGS

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ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) 14 compound Select List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	H= HOLD FOR INSTRUCTIONS FROM PM
				F	(NOT ALL SAMPLES WILL BE RUN FOR ANALYSIS)
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-19 (28)	03-11	1710	S	-	2	H	H									
2	MW-19 (32)	03-11	1720	S	-	2	H	H									
3	MW-19 (45)	03-11	1800	S	-	2	H	H									
4	MW-18 (26.5)	03-11	1315	S	-	2	H	H									
5	MW-18 (31.5)	03-11	1325	S	-	2	H	H									
6	MW-17 (19)	03-12	1005	S	-	2	H	H									
7	MW-17 (22)	03-12	1015	S	-	2	H	H									
8	MW-17 (37)	03-12	1100	S	-	2	H	H									
9	IB-1 (18.0)	03-14	1650	S	-	2	H	H									
10	IB-1 (24.0)	03-14	1700	S	-	2	H	H									

Sampler(s) Please Print & Sign: MICHAEL WHITSON

Shipment Method: FEDEX

Required Turnaround Time: (Check Box) [X] Std 10 Wk days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
	03-17	1530	
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Andover Quail Crossing Soil Investigation

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
[X] Level 2 Std QC
[ ] Level 3 Std QC/Row da
[ ] Level 4 SW846/CLP
[ ] Other/EDD
[ ] TRRP ChkList
[ ] TRRP Level 4

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) 14 compound Select List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	H = HOLD FOR INSTRUCTIONS FROM PM
				F	(NOT ALL SAMPLES RUN FOR ANALYSIS)
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	IB-2 (32)	03-15	1320	S	–	2	H	H									
2	IB-2 (38)	03-15	1330	S	–	2	H	H									
3	IB-3 (24)	03-15	1530	S	–	2	H	H									
4	IB-3 (30)	03-15	1540	S	–	2	H	H									
5	IB-3 (36)	03-15	1600	S	–	2	H	H									
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: MICHAEL WHITSON

Shipment Method: FEDEX

Required Turnaround Time: (Check Box): ☒ Std 10 Wk days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: | Date: 03-17 | Time: 1530 | Received by:

Relinquished by: | Date: | Time: | Received by (Laboratory):

Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory):

Notes: Andover Quad Crossing Soil Investigation

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

☒ Level 2 Std QC ☐ TRRP ChkList
☐ Level 3 Std QC/Row da ☐ TRRP Level 4
☐ Level 4 SW846/CLP
☐ Other/EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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Apex Companies, LLC- Portland, OR

3015 SW First Avenue
Portland, OR 97201-4707

Billing Information:
Accounts Payable- Rachelle Vanderzanden
3015 SW First Avenue
Portland, OR 97201-4707

Report to: Ian Maguire-/ Sam Jackson

Email To: IMaguire@apexcos.com; SJackson@apexcos.com

Project Description: Andover Release Site

City/State Collected: ANDOVER, KS

Phone: 503-924-4704
Fax: 503-943-6357

Client Project # E3CE-0065

Lab Project # ASHCREPOR-NUSTAR

Collected by (print): MICHAEL WHITSON

Site/Facility ID # EASTER ADDITION

P.O. #

Collected by (signature): [signature]
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L#

Table #

Acctnum: ASHCREPOR
Template: T100693
Prelogin: P500936
TSR: 358 - Jarred Willis
PB: 03/17/15 JWW
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	OA1(GRO) / V8260 2ozClr-NoPres	OA2 4ozClr-NoPres	V8260- Trip Blank 40mlAmb-HCl-Blk							Rem./Contaminant	Sample # (lab only)
MW-1R (19.5)	G	SS	19.5	03-12	1550	2	H	H									
MW-1R (22)	G	SS	22	03-12	1600	2	H	H									
MW-1R (33)	G	SS	33	03-12	1630	2	H	H									
F1R (26)	G	SS	26	03-13	1750	2	H	H									
F-1R (30)	G	SS	30	03-13	1830	2	H	H									
F-1R (36)	G	SS	36	03-13	1845	2	H	H									
TRIP BLANK	–	~~SS~~	–	–	–	~~2~~	~~X~~	~~X~~	X MW	03-17-15							
		SS				~~2~~	~~X~~	~~X~~	MW	03-17-15							
		SS				~~2~~	~~X~~	~~X~~	MW	03-17-15							
		SS				~~2~~	~~X~~	~~X~~	MW	03-17-15							

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: H = HOLD FOR INSTRUCTIONS FROM PM
(NOT ALL SAMPLES WILL BE RUN FOR ANALYSIS)

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____	Condition: (lab use only)
[signature]					
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	COC Seal Intact: ___Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	pH Checked: NCF:

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ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) 14 compound Select List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	H = HOLD FOR INSTRUCTIONS FROM PM
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	(NOT ALL SAMPLES WILL BE RUN FOR
Phone	(503) 924-4704	Phone	(503) 924-4704	H	ANALYSIS)
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	IB-7 (19)	03-18-15	0900	S	–	2	H	H									
2	IB-7 (24)	03-18-15	0915	S	–	2	H	H									
3	IB-7 (39)	03-18-15	0930	S	–	2	H	H									
4	IB-8 (18)	03-18-15	1130	S	–	2	H	H									
5	IB-8 (32.5)	03-18-15	1200	S	–	2	H	H									
6	IB-8 (39)	03-18-15	1205	S	–	2	H	H									
7	IB-4 (6)	03-18-15	1330	S	–	2	H	H									
8	IB-4 (19.5)	03-18-15	1345	S	–	2	H	H									
9	IB-4 (31)	03-18-15	1400	S	–	2	H	H									
10	IB-4 (39)	03-18-15	1415	S	–	2	H	H									

Sampler(s) Please Print & Sign: MIKE WHITSON

Shipment Method: FEDEX OVERNIGHT

Required Turnaround Time: (Check Box) ☒ Std 10 Wk days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by: | Date: 03-19 | Time: 1700 | Received by:

Relinquished by: | Date: | Time: | Received by (Laboratory):

Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory):

Notes: Andover Quail Crossing Spill Investigation

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

☒ Level 2 Std QC ☐ TRRP ChkList
☐ Level 3 Std QC/Raw data ☐ TRRP Level 4
☐ Level 4 SW846/CLP
☐ Other/EDD

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) 14 compound Select List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	TRIP BLANK	—	—	W	1	2	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: MIKE MATTSON

Shipment Method: FEDEX OVERNIGHT

Required Turnaround Time: (Check Box) [X] Std 10 Wk days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by:	Date:	Time: 1700	Received by:
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: Andover Quail Crossing Soil Investigation

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

- [X] Level 2 Std QC
- [ ] Level 3 Std QC/Row da
- [ ] Level 4 SW846/CLP
- [ ] Other/EDD
- [ ] TRRP ChkList
- [ ] TRRP Level 4

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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FIELD OBSERVATION FORM

SITE: Andover Quail Crossing	DATE: 4/20/15
WEATHER: wind 55°F	ESTIMATED DURATION OF EVENT: 1 day
EVENT TYPE: Gauge + Sample 6 wells	PTW #:
FIELD STAFF / COMPANY NAME: Jace Harris Ted Alfred	

OBJECTIVE OF FIELD WORK: Gauge all wells + Sample 6 new wells for MNA parameters

LIST APPLICABLE SOPs: Gauge wells + Sample

WERE SOPs FOLLOWED?	YES	NO	N/A
ARE THE WELLS IN GOOD CONDITION?	YES	NO	N/A
WERE WATER LEVELS CONSISTENT WITH PREVIOUS EVENTS?	YES	NO	N/A
WERE NAPL LEVELS CONSISTENT WITH PREVIOUS EVENTS (if applicable)?	YES	NO	N/A
ARE OFF-SITE ACTIVITIES/RECEPTORS NEAR SITE THE SAME AS DURING PREVIOUS EVENTS?	YES	NO	N/A
NUMBER OF DRUMS ONSITE UPON ARRIVAL: ___ ARE DRUMS LABELED:	YES	NO	N/A

(PROVIDE EXPLANATION BELOW FOR ALL "NO" ANSWERS. ATTACH ADDITIONAL DOCUMENTATION TO FORM IF NECESSARY)

NOTES/COMMENTS:

WELL GAGING DATA SHEET

APEX

		Job Number:	N/A
Client:	NuStar	Date:	4/20/15
Project:	Andover Quarl Xing	Sampler:	JH + TA
Weather:	wind 55°F	Time In/Out:	

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-1	10:41	—	31.39				
MW-2	10:44	—	36.43				
MW-3	10:29	—	45.61				
MW-4	11:13	—	34.10				
MW-5	10:51	—	21.01				
MW-6	10:34	—	23.05				
MW-7	10:32	—	16.10				
MW-8	10:50	—	22.25				
MW-9	10:27	—	33.25				
MW-10	10:24	—	28.53				
MW-11	11:11	—	30.39				
MW-12	10:20	—	31.09				
MW-13	10:48	—	33.34				
MW-14	10:46	—	34.93				
MW-15	11:06	—	36.50				
MW-16	11:02	—	33.03				
MW-17	10:39	—	33.91 ~~34.91~~				
MW-18	11:18	—	33.51				
MW-19	11:19	—	33.70				
Pond	10:31	—	1344.75'				

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-1	Job Number:	
Client:	Nu Star	Date:	4/20/15
Project:	Andrews Quail Crossing	Sampler:	TA, JH
Weather:	Sunny / cloudy	Time In/Out:	1455 / 1535

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	31.39	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	0.5' ft from bottom
Sampling Method:	bladder	Tubing Type:	poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
15:06			31.45	.2	6.81	16.72	1.186	1.03	-72.2		SC
15:09			31.49	.2	6.73	17.42	1.208	0.59	-75.6		SC
15:12			31.53	.2	6.71	16.94	1.214	0.89	-77.7		SC
15:15			31.60	.2	6.67	16.67	1.203	0.75	-78.4		SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	.2	Analytical Laboratory:	ALS
Sample Time:	1522	Final Depth to Water:	31.82	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOAs	9 HCl / 3 Neat	See	yes (no)			
1 250 Plastic	H_2SO_4		yes no			
1 250 Plastic	HNO_3	COC	yes no			
3 250 Plastic	Neat		yes no			
			yes no			
			yes no			

COMMENTS

Variations in cloud cover causing large swings in temp readings due to sun exposure (YSI vessel + tubing)

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-4	Job Number:	
Client:	Nu Star	Date:	4/20/15
Project:	Andover Quail Crossing	Sampler:	TA, JH
Weather:	Sunny / cloudy	Time In/Out:	1540 / 1615

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	34.10	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	4' from bottom
Sampling Method:	bladder	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
15:45			34.19	.15	7.09	18.01	0.722	3.10	-25.3		SC
15:48			34.34	.15	7.04	17.41	0.724	2.83	-29.0		SC
15:51			34.57	.15	6.99	17.07	0.722	2.69	-27.9		SC
15:53			34.64	.125 ~~.15~~	7.00	17.31	0.719	2.54	-25.3		SC
15:56			34.69	.125	7.02	17.43	0.719	2.71	-24.9		SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-4	Sampling Flow Rate	.125	Analytical Laboratory:	ALS
Sample Time:	16:04	Final Depth to Water:	34.80	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOAs	9 HCl / 3 heat	see	yes (no)			
1 250 PL	H_2SO_4	C.O.C.	yes no			
1 250 PL	HNO_3		yes no			
3 250 PL	Neat		yes no			
			yes no			
			yes no			

COMMENTS

fluctuations in cloud cover causing temperature variances due to sun exposure to vessel / tubing

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-5	Job Number:	
Client:	NuStar	Date:	4/20/15
Project:	Andrews Quail Crossing	Sampler:	TA/JM
Weather:	Sunny / Cloudy	Time In/Out:	16 /

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	21.01	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:			Comments
Sampling Method:	bladder	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1624			21.12	.2	6.99	17.63	1.337	1.71	1.6		AC
1627			21.25	.2	6.85	17.12	1.358	1.27	10.5		AC
1630			21.34	.2	6.84	17.04	1.356	1.27	14.2		C
1633			21.56	.2	6.82	17.01	1.357	1.30	20.1		C
1636			21.71	.2	6.80	16.80	1.360	1.10	20.2		

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	.2	Analytical Laboratory:	ALS
Sample Time:	1647	Final Depth to Water:	27.87	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOAs	9 HCl / 3 Neat		yes (no)			
1 250 PL	H_2SO_4	See	yes no			
1 250 PL	HNO_3	L.O.C	yes no			
3 250 PL	Neat		yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-17	Job Number:	
Client:	NuStar	Date:	4/20/15
Project:	Andrews Quail Crossing	Sampler:	TA, JH
Weather:	Sunny / cloudy	Time In/Out:	1416

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	~~34.91~~ 33.91	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	2.5' from bottom
Sampling Method:	bladder	Tubing Type:	poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (mS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1421			34.10	.2	7.08	17.40	1.020	2.60	-44.8		SC
1424			34.31	.2	6.81	17.16	1.014	1.04	-42.9		SC
1427			34.47	.15	6.74	16.89	1.014	1.25	-44.3		SC
1430			34.69	.15	6.68	16.63	1.004	0.87	-44.1		SC
1433			34.83	.15	6.70	16.87	1.012	0.83	-45.6		SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-17	Sampling Flow Rate	.15	Analytical Laboratory:	ALS
Sample Time:	14:40	Final Depth to Water:	35.31	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOAs	9 HCl / 3 neat	See CoC	yes (no)			
1 250ml Plastic	H_2SO_4		yes no			
1 250ml Plastic	HNO_3		yes no			
3 250ml Plastic	Neat		yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-18	Job Number:	
Client:	NuStar	Date:	4/20/15
Project:	Andover Release	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1205/1235

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	33.51	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	5' from bottom		Comments
Sampling Method:	Bladder	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond mS/cm	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
12:13			33.71	.15	5.93	17.07	.951	1.03	62.4	—	Cl
12:16			34.07	.15	6.03	17.18	.885	0.89	64.0	—	Cl
12:19			34.36	.15	6.10	17.17	.880	0.84	62.4	—	Cl
12:22			34.45	.10	6.17	17.38	.880	0.79	62.1	—	Cl

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18	Sampling Flow Rate	.100	Analytical Laboratory:	ALS	
Sample Time:	12:27	Final Depth to Water:	34.97	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOCs	HCl	See CoC.	yes (no)			
2 Sulf 1 Pl, H_2SO_4			yes no			
" 1 Pl, HNO_3			yes no			
" 3 Neat			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-19	Job Number:	
Client:	NuStar	Date:	4/20/15
Project:	Andrews Quail X'ing	Sampler:	TA/JH
Weather:	Sunny	Time In/Out:	12:40/1325

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	33.70	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	Comments
Sampling Method:	Bladder	Tubing Type:	Poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (mS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
12:53			33.90	.15	6.91	17.74	.896	7.44	-14.3		SC
12:56			33.99	.15	6.74	17.34	.863	3.01	-45.9		SC
12:59			34.04	.15	6.63	17.16	.851	1.61	-59.5		SC
13:02			34.17	.15	6.62	17.10	.845	1.40	-61.6		SC
13:05			34.28	.15	6.62	17.11	.841	1.36	-61.2		SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate	.15	Analytical Laboratory:	ALS
Sample Time:	13:15	Final Depth to Water:	35.03	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
12 VOA's	9 HCl / 3 Neat	See COC	yes (no)			
250 mL Plastic	H_2SO_4		yes no			
250 mL Plastic	HNO_3		yes no			
250 mL Plastic	Neat		yes no			
			yes no			
			yes no			

COMMENTS

ALS Environmental

Cincinnati, OH +1 513 733 5336 | Fort Collins, CO +1 970 490 1511 | Houston, TX +1 281 530 5656 | Spring City, PA +1 610 948 4903 | South Charleston, WV +1 304 356 3168

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Chain of Custody Form

Page 1 of 1

COC ID: 124872

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	E3CE-0065 Andover Release Site	A	300_W (Sulfate, nitrate, O-Phos)
Work Order		Project Number		B	8260_LL_W (Colt Court GW List)
Company Name	Apex Companies	Bill To Company	Apex Companies	C	ALK_W 2320B
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	ICP_DISS (Dissolved Iron)
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	ICP_TW (Potassium only)
				F	NIT_AMM_W_ISE
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	RSK175 (Methane)
Phone	(503) 924-4704	Phone	(503) 924-4704	H	VPH OA-1_W (HYD-5)
Fax		Fax		I	XXX SUB (SUB CO2 (Simi Valley))
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-18	4/20/15	1227	W	HCl, NaOH, H_2SO_4, HNO_3	17	X	X	X	X	X	X	X	X	X		
2	MW-19		1315														
3	MW-17		1440														
4	MW-1		1522														
5	MW-4		1604														
6	MW-5		1647														
7					1,2,3 Preserved												
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Ted Alfred

Shipment Method:

Required Turnaround Time: (Check Box) TAT 7 days Other:

Results Due Date:

Relinquished by:	Date: 4/20/15	Time: 1830	Received by:
Relinquished by:	Date:	Time:	Received by (Laboratory):
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):

Notes: (E3CE-0065 Andover Release Site)

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

QC Level STD

Other:

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

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				Weather:	Sunny	Time In/Out:	12:00

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	Product Thickness (feet)	Water Column Height (feet)	Notes/Other Remarks
MW-1	10:42	—	31.23				
MW-4	12:32	—	29.28				
MW-5	12:27		19.44				
~~MW-17~~	~~12:27~~	~~12:39~~	~~19.44~~	~~31.15~~			
MW-18	12:35	—	30.50				
MW-19	12:34	—	30.34				
2006 L.A. irrigation	10:45	—	45.43				Passive skimmer - no product. lowered to 1/2 of screen in water
MW-17	12:39	—	31.15				

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-5	Job Number:	1641-08.002
Client:	Nustar	Date:	6/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Rainy	Time In/Out:	0815

WELL DATA

Well Depth:	30.00	Well Diameter:	2"	Water Height	
Depth to Water:	19.60	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	25'	Comments	
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
8:41	.400	.400	19.65	.200	6.96	18.16	1412	2.10	158.5	—	AC
8:44	.600	1.000	19.68	.200	6.96	18.00	1420	1.86	157.1	—	C
8:47	.600	1.600	19.72	.200	6.95	17.88	1418	1.44	155.2	—	C
8:50	.600	2.200	19.76	.200	6.95	17.88	1426	1.48	152.6	—	C
8:53	.600	2.800	19.80	.200	6.96	17.90	1429	1.49	148.7	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-5	Sampling Flow Rate	.200	Analytical Laboratory:	ALS	
Sample Time:	08:59	Final Depth to Water:	19.87	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOA's	HCl	C.O.C.	yes no			
3 VOA's	Neat		yes no			
(3) 250 mL pl	Neat		yes no			
1 H_2SO_4 pl-250mL	H_2SO_4		yes no			
1 HNO_3 pl-250mL	HNO_3		yes no			
			yes no			

COMMENTS

Full MNA parameters ran

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-17	Job Number:	1641-08.002
Client:	NuStar	Date:	6/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Rainy	Time In/Out:	0915

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	31.28	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	36'		Comments
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0920	.500	.500	31.42	.250	7.14	18.16	1035	1.40	-17.1	–	AC
923	.750	1.250	31.48	.250	7.06	18.27	1033	1.11	-13.8	–	AC
926	.750	2.000	31.48	.250	7.03	17.70	1035	1.06	-11.5	–	C
929	.750	2.750	31.49	.250	7.01	17.51	1036	0.96	-10.6	–	C
0932	.750	3.500	31.49	.250	7.00	17.43	1047	0.92	-9.9	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-17	Sampling Flow Rate	.250	Analytical Laboratory:	ALS
Sample Time:	0940	Final Depth to Water:	31.52	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOA's	HCl	C.O	yes no			
3 VOA's	Neat		yes no			
3 250mL Pl	Neat	C.	yes no			
1 250mL Pl	H_2SO_4		yes no			
1 250mL Pl	HNO_3		yes no			
			yes no			

COMMENTS

Full MNA Pan

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-1	Job Number:	1641-05.00
Client:	Nustar	Date:	6/16/15
Project:	Andover Q.L.	Sampler:	TA JH
Weather:	Rainy/misty	Time In/Out:	0945

WELL DATA

Well Depth:		Well Diameter:	4"	Water Height	
Depth to Water:	31.31	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	4' from bottom	Comments	
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0951	.600	.600	31.31	.300	7.08	16.86	1318	1.50	-50.6	–	AC
0954	.400	1.500	31.39	.300	7.05	16.65	1315	1.18	-51.0	–	AC
0957	.900	2.400	31.46	.300	7.02	16.59	1312	1.01	-51.6	–	C
1000	.900	3.300	31.55	.300	7.01	16.50	1311	0.95	-51.7	–	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-1	Sampling Flow Rate	.300	Analytical Laboratory:	ALS
Sample Time:	1010	Final Depth to Water:	31.58	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOA's	HCl	C.O.C	yes no			
3 VOA's	Neat		yes no			
3 250-PI	Neat		yes no			
1 250-PI	H_2SO_4		yes no			
1 250-PI	HNO_3		yes no			
			yes no			

COMMENTS

Full MNA run

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-18	Job Number:	1641-08.02
Client:	NuStar	Date:	6/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Rainy / Misty	Time In/Out:	1015

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	30.64	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	35'
Sampling Method:	same	Tubing Type:	poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1022	.500	.500	30.79	.250	7.24	19.17	902	1.90	-34.5	—	Cl
1025	.750	1.250	30.89	.250	7.19	20.00	894	1.31	-30.0	—	Cl
1028	.750	2.000	31.05	.250	7.17	19.21	897	1.24	-26.8	—	Cl
1031	.750	2.750	31.21	.250	7.15	18.99	895	0.95	-22.7	—	SC
1034	.750	3.500	31.33	.250	7.13	18.99	895	0.89	-19.8	—	SC
1037	.750	4.250	31.41	.250	7.12	18.90	899	0.93	-17.6	—	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-18	Sampling Flow Rate	.250	Analytical Laboratory:	AES
Sample Time:	10:45	Final Depth to Water:	31.51	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOAs	HCl	C	yes ~~no~~			
3 VOAs	Neat	O	yes ~~no~~			
3 250-PI	Neat	C	yes ~~no~~			
1 250-PI	H_2SO_4		yes ~~no~~			
1 250-PI	HNO_3		yes ~~no~~			
			yes no			

COMMENTS

Full MNA

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-19	Job Number:	1641-08.002
Client:	NuStar	Date:	6/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Rainy/Misty	Time In/Out:	1055

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	30.60	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	34'	Comments	
Sampling Method:	Same	Tubing Type:	Poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
10:59	.500	.500	30.59	.250	7.45	20.13	820	1.94	-21.8	–	Cl
11:02	.750	1.250	30.70	.250	7.38	19.66	825	1.28	-39.8	–	Cl
1105	.750	2.000	30.40	.250	7.32	18.77	825	0.66	-62.6	–	SC
1108	.750	2.750	31.15	.250	7.27	18.65	825	0.57	-72.9	–	SC
1111	.450	3.200	31.40	.150	7.25	18.83	827	0.49	-81.6	–	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-19	Sampling Flow Rate	.200	Analytical Laboratory:	ALS	
Sample Time:	11:18	Final Depth to Water:	31.86	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOAs	HCl	C.	yes no			DUP-1
3 VOAs	Neat	O.	yes no			
3 250-Pl	Neat	C.	yes no			
1 250-Pl	H_2SO_4		yes no			
1 250-Pl	HNO_3		yes no			
			yes no			

COMMENTS

Full MNA

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-4	Job Number:	1641-08.002
Client:	NuStar	Date:	6/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	29.02	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	33'
Sampling Method:	same	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1156	.500	.500	29.21	.250	7.50	19.46	1084	5.04	15.2	-	AC
1159	.600	1.100	29.34	.200	7.33	19.48	1090	3.88	22.8	—	AC
1202	.450	1.550	29.49	.150	7.27	19.52	1097	3.88	25.7	-	AC
1205	.450	2.000 ~~1.00~~	29.53	.150	7.24	19.74	1101	3.82	26.1	-	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-4	Sampling Flow Rate	.150	Analytical Laboratory:	ALS
Sample Time:	1210	Final Depth to Water:	29.76	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
9 VOAs	HCl	C.	yes no			
3 VOAs	Neat	O.	yes no			
3 250-Pl	Neat	C.	yes no			
1 250-Pl	H_2SO_4		yes no			
1 250-Pl	HNO_3		yes no			
			yes no			

COMMENTS

Full MNA

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-2	Job Number:	1641-08.002
Client:	NuStar	Date:	8-16-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1340

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	34.83	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	38'		Comments
Sampling Method:	sample	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
13:45	.400	.400	34.94	.200	7.70	21.76	820	4.21	29.7	—	AC
13:48	.600	1.000	34.88	.200	7.42	20.17	816	3.25	36.7	—	C
1351	.600	1.600	34.96	.200	7.36	19.20	799	2.77	47.1	—	C
1354	.600	2.200	35.15	.200	7.30	19.22	803	2.69	42.8	—	C
1357	.600	2.800	35.23	.200	7.29	19.01	806	2.73	40.4	—	C
1400	.600	3.400	35.28	.200	7.28	18.89	805	2.75	40.1	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-2	Sampling Flow Rate	.200	Analytical Laboratory:	ACS
Sample Time:	14:02	Final Depth to Water:	35.34	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	GRO/VOCs	yes (no)			
			yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-12	Job Number:	
Client:	NuStar	Date:	6-16-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1455

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	30.86	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	35'	Comments	
Sampling Method:	same	Tubing Type:	poly		

	Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
						+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
sunny	1503	.600	.600	30.87	.300	7.26	21.89	1028	3.61	48.5	—	SC
	1506	.750	1.350	30.90	.250	7.06	21.28	1019	2.49	54.3	—	SC
	1509	.750	2.100	30.91	.250	7.15	20.46	1018	2.47	51.1	—	SC
cloud	1512	.750	2.850	30.91	.250	7.15	19.91	1017	2.45	50.6	—	SC
	1515	.750	3.600	30.91	.250	7.16	19.69	1014	2.42	50.5	—	SC
sunny	1518	.750	4.350	30.91	.250	7.15	20.24	1014	2.43	49.8	—	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-12	Sampling Flow Rate	.200	Analytical Laboratory:	ALS	
Sample Time:	15:22	Final Depth to Water:	30.91	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAS	HCl	C.O.C.	yes no			
		VOCs/GRO	yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Cloud cover affecting YSI chamber & tubing – intermittent & causing temp fluctuations.

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-10	Job Number:	1641-08.003
Client:	NuStar	Date:	6-16-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1555

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	28.30	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	1.5' from bottom	Comments	
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
16:02	.600	.600	28.35	.300	7.36	21.30	1466	5.21	47.4	–	AC
16:05	.900	1.500	28.39	.300	7.24	19.73	1452	1.08	54.5	–	AC
16:08	.900	2.400	28.42	.300	7.17	19.02	1447	0.74	52.2	–	AC
16:11	.900	3.300	28.45	.300	7.29	19.30	1447	0.64	49.5	–	AC
16:14	.900	4.200	28.46	.300	7.28	19.13	1439	0.55	47.1	–	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-10	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	16:17	Final Depth to Water:	28.47	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-9	Job Number:	1641-08.002
Client:	NuStar	Date:	8/16/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	16:32

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	29.83	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	32'	Comments	
Sampling Method:	same	Tubing Type:	poly		

	Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
						+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
	16:33	.500	.500	29.84	.250	7.23	20.70	1263	2.61	60.8	—	SC
	16:36	.750	1.250	30.01	.250	7.07	19.15	1249	1.06	66.8	—	SC
1639	16:39	.750	2.000	30.12	.250	7.04	19.03	1247	0.92	65.9	—	SC
1642	16:42	.600	2.600	30.19	.200	7.10	19.35	1247	0.79	62.5	—	AC
1645		.600	3.200	30.28	.200	7.16	19.40	1247	0.67	60.5	-	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-9	Sampling Flow Rate	.200	Analytical Laboratory:	ALS	
Sample Time:	16:49	Final Depth to Water:	30.33	Did Well Dewater?	No	
# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-15	Job Number:	1641-08.002
Client:	NuStar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	0845

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	32.34	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	35.5'
Sampling Method:	Same	Tubing Type:	poly

Comments

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0850	.400	.400	32.50	.200	7.12	19.76	748	4.58	116.9	—	AC
0853	.450	.850	32.55	.150	7.08	19.28	744	3.72	113.6	—	AC
0856	.450	1.300	32.62	.150	7.08	19.16	745	3.63	113.2	—	AC
859	.450	1.750	32.66	.150	7.08	18.82	744	3.60	113.1	—	C
0902	.450	1.200	32.70	.150	7.08	18.87	744	3.58	113.0	—	C
0905	.450	1.650	32.73	.150	7.08	18.85	744	3.58	112.8	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-15	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	0910	Final Depth to Water:	32.75	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes ~~no~~			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-16	Job Number:	1641-08.002
Client:	NuStar	Date:	6/17/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	0927

WELL DATA

Well Depth:		Well Diameter:		Water Height	
Depth to Water:	29.48	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	Bladder	Pump Intake Depth:	33'
Sampling Method:	same	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
0930	.500	.500	28.52	.250	7.41	20.20	886	5.04	119.3	—	~~A~~SC
933	.750	1.250	28.48	.250	7.24	19.42	882	4.05	124.4	—	SC
936	.450	1.700	29.21	.150	7.16	20.16	884	3.71	123.9	—	AC
939	.300	2.000	29.30	.100	7.14	20.22	888	3.70	123.2	—	AC
0942	.300	2.300	29.35	.100	7.16	20.30	889	3.66	120.2	—	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-16	Sampling Flow Rate	.150	Analytical Laboratory:	ALS
Sample Time:	9:45	Final Depth to Water:	29.40	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-11	Job Number:	1641-08.002
Client:	NuStar	Date:	6/17/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	10:01

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	30.86 6/16	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	34'
Sampling Method:	same	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
10:06	.600	.600	28.45	.300	7.29	19.51	1466	2.01	121.8	–	AC
10:09	.750	1.300	28.87	.250	7.14	18.91	1467	1.75	125.4	–	AC
10:12	.450	1.750	28.97	.150	7.12	18.98	1465	1.73	124.1	–	AC
10:15	.450	1.200	29.08	.150	7.12	18.94	1463	1.78	120.3	–	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-11	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	10:19	Final Depth to Water:	29.20	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.o.c.	yes (no)			DUP 2
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-8	Job Number:	1641-08.002
Client:	NiSTar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	1038

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	19.93	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	23'	Comments	
Sampling Method:	same	Tubing Type:	poly		

	Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
						+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
Sunny	1041	.400	.400	20.08	.200	7.49	20.46	1217	7.85	110.8	—	AC
cloudy	1044	.600	1.000	20.30	.200	7.32	18.82	1202	3.71	115.7	—	AC
Cloudy	1047	.450	1.450	20.26	.150	7.22	18.91	1202	3.38	118.3	—	AC
cloudy	1050	.600	2.050	20.30	.200	7.20	19.10	1201	3.24	115.6	—	C
sunny	1053	.600	2.650	20.30	.200	7.19	19.42	1207	3.19	112.4	—	C
	1056	.600	3.250	20.31	.200	7.18	19.26	1209	3.16	109.8	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-8	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	11:00	Final Depth to Water:	20.31	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	~~AA~~ C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-13	Job Number:	1641-08.002
Client:	Nustar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, SH
Weather:	Sunny	Time In/Out:	1104

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	31.94	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	35'	Comments	
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
11:13	.500	.500	31.46	.250	7.53	21.08	685	6.55	99.5	—	SC
11:16	.750	1.250	32.34	.250	7.36	18.54	672	5.47	109.1	—	SC
11:19	.450	1.700	32.46	.150	7.31	18.71	672	5.31	106.9	—	SC
11:22	.450	2.150	32.55	.150	7.30	18.89	673	5.26	105.4	—	SC
11:25	.450	2.600	32.64	.150	7.28	18.91	673	5.19	103.6	—	SC
11:27	.300	2.900	32.73	.150	7.27	18.95	673	5.22	101.9	—	SC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-13	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	11:30	Final Depth to Water:	32.79	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-14	Job Number:	1641-08.002
Client:	NuStar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny/Cloudy	Time In/Out:	1138

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	31.70	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	34'	Comments	
Sampling Method:	bladder	Tubing Type:	poly		

	Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
						+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
	11:41	.500	.500	31.80	.250	7.48	20.11	700	4.37	95.1	–	AC
cloudy	11:44	.750	1.250	32.30	.250	7.24	18.37	693	3.72	102.0	–	AC
cloudy	11:47	.300	1.550	32.50	.100	7.20	18.56	697	3.59	101.0	–	AC
cloudy	11:50	.300	1.850	32.63	.100	7.20	18.63	696	3.49	99.8	–	AC
partly sunny	11:53	.300	2.150	32.71	.100	7.20	18.90	698	3.42	97.3	–	AC

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-14	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	11:57	Final Depth to Water:	32.83	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-3	Job Number:	1641-08.002
Client:	NuStar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1320

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	38.21	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	bladder	Pump Intake Depth:	42'	Comments	
Sampling Method:	same	Tubing Type:	poly		

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
1327	.500	.500	38.10	.250	7.30	22.77	920	1.91	-56.1	—	C
1330	.750	1.250	38.12	.250	7.20	20.60	939	0.85	-61.7	—	C
1333	.750	2.000	38.14	.250	7.12	19.97	934	0.68	-68.2	—	C
1336	.750	2.750	38.15	.250	7.08	19.33	944	0.62	-74.2	—	C
1339	.750	3.500	38.15	.250	7.05	18.97	946	0.50	-80.1	—	C
1342	.750	4.250	38.16	.250	7.04	18.87	947	0.46	-83.3	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-3	Sampling Flow Rate	.200	Analytical Laboratory:	ACS
Sample Time:	13:45	Final Depth to Water:	38.16	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C	yes no			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

tubing + YSI cylinder exposed to intermittent sunshine - temp variances experienced, as well as higher than avg. temps.

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-7	Job Number:	1641-08.002
Client:	NuStar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1350

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	14.91	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	~~Bladder~~ peri	Pump Intake Depth:	19'
Sampling Method:	same - peri	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<-- Stabilization Criteria
1357	.600	.600	15.01	.200	7.41	17.75	866	2.26	-43.2	—	C
1400	.600	1.200	15.15	.200	7.32	17.30	897	1.13	-37.2	—	C
1403	.600	1.800	15.18	.200	7.27	17.20	879	0.90	-34.1	—	C
1406	.600	2.400	15.21	.200	7.26	17.32	881	0.78	-32.4	—	C
1409	.600	3.000	15.22	.200	7.26	17.28	876	0.64	-31.9	—	C
1411	.600	3.600	15.23	.200	7.27	17.16	868	0.60	-31.2	—	C

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-7	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	1414	Final Depth to Water:	15.23	Did Well Dewater?	NO

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	C.O.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

WELL MONITORING DATA SHEET

Ash Creek Associates, Inc.

Well I.D.	MW-6	Job Number:	164f-08.002
Client:	Nustar	Date:	6-17-15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Sunny	Time In/Out:	1416

WELL DATA

Well Depth:		Well Diameter:	2"	Water Height	
Depth to Water:	20.45	Screened Interval:		x Multiplier	
Water Column Length:		Depth to Free Product:		x Casing Volumes	
Purge Volume:		Free Product Thickness:		= Purge Volume	
Water Height Multipliers (gal)	1-inch = 0.041	2-inch = 0.162	4-inch = 0.653	1 gallon = 3.785 liters	

PURGING DATA

Purge Method:	peristaltic	Pump Intake Depth:	24'
Sampling Method:	same	Tubing Type:	poly

Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Turbidity (NTUs)	Clarity/Color Other Remarks
					+/-0.2	+/-0.5° C	+/-5%	+/- 0.5 ppm	+/-20mV	+/-10%	<- Stabilization Criteria
14:20	.400	.400	20.71	.200	7.38	17.51	1294	4.56	-1.7	—	C
1423	.600	1.000	20.93	.200	7.25	17.49	1297	3.95	4.9	—	C
1426	.600	1.600	21.11	.200	7.19	17.45	1292	3.96	10.3	—	C
1429	.600	2.200	21.25	.200	7.17	17.62	1288	3.94	13.0	—	C
1432	.600	2.800	21.37	.200	7.15	17.60	1280	3.88	14.9	—	C

Comments

Clarity: VC = very cloudy, Cl = Cloudy, SC = slightly cloudy, AC = almost clear, C = clear

SAMPLING DATA

Sample ID:	MW-6	Sampling Flow Rate	.200	Analytical Laboratory:	ALS
Sample Time:	1434	Final Depth to Water:	21.43	Did Well Dewater?	No

# Containers/Type	Preservative	Analysis/Method	Field Filtered	Filter Size	MS/MSD	Duplicate ID
6 VOAs	HCl	6.0.C.	yes (no)			
			yes no			
			yes no			
			yes no			
			yes no			
			yes no			

COMMENTS

Tubing bringing up small, intermittent bubbles - possibly affecting YSI cylinder DO reading

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Chain of Custody Form

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COC ID: 126222

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) Colt Court GW List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address	sjackson@apexcos.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-2	6-16-15	1402	W	1	6	X	X									
2	2002 N Colt Ct		1410														
3	2004 N Colt Ct		1355														
4	2001 N Colt Ct		1436														
5	2005 N Colt Ct		1433														
6	2007 N Colt Ct		1443														
7	2007 N Mountain Ct		1508														
8	2009 N Mountain Ct		1530														
9	MW-12		1522														
10	1009 W Mountain		1545														

Sampler(s) Please Print & Sign: Ted Alfred

Shipment Method

Required Turnaround Time: (Check Box) [X] Std 10 WK days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other _____

Results Due Date:

Relinquished by: Date: 6-18-15 Time: 16:50

Received by:

Relinquished by: Date: Time:

Received by (Laboratory):

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Colt Court 3Q2014 GW Mon Wells

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
- [X] Level 2 Std QC
- [ ] Level 3 Std QC/Row da
- [ ] Level 4 SW846/CLP
- [ ] Other/EDD _____
- [ ] TRRP ChkList
- [ ] TRRP Level 4

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

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Chain of Custody Form

COC ID: 126221

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) Colt Court GW List
Work Order		Project Number	E3CE-0065	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address	sjackson@apexcos.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-10	6-16-15	1617	W	1	6	X	X									
2	2020 N Ruger Cir		1640														
3	MW-9		1649														
4	2006 N Colt Ct		1655														
5	2028 N Ruger Cir	6-17-15	0900														
6	MW-15		0910														
7	2032 N Ruger Cir		0914														
8	2021 N Ruger Ct		0933														
9	MW-16		0945														
10	2019 N Ruger Cir		1014														

Sampler(s) Please Print & Sign: Ted Alfred

Shipment Method:

Required Turnaround Time: (Check Box) [X] Std 10 WK days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: Date: 6-18-15 Time: 1650 Received by:

Relinquished by: Date: Time: Received by (Laboratory):

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: Colt Court 3Q2014 GW Mon Wells

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)
[X] Level 2 Std QC
[ ] Level 3 Std QC/Row de
[ ] TRRP ChkList
[ ] TRRP Level 4

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Chain of Custody Form

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COC ID: 126220

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) Colt Court GW List
Work Order		Project Number	E3CE-0085	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address	sjackson@apexcos.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	MW-11	6-17-15	1019	W	1	6	X	X									
2	MW-8		1100														
3	HOA-1		1116														
4	MW-13		1130														
5	1211 W Quail Crossing Ct		1147														
6	MW-14		1157														
7	MW-3		1345														
8	MW-7		1414														
9	MW-6		1434														
10																	

Sampler(s) Please Print & Sign: Ted Alfred

Shipment Method:

Required Turnaround Time: (Check Box) [X] Std 10 WK days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other _____

Results Due Date:

Relinquished by: Date: 6-18-15 Time: 1650

Relinquished by: Date: Time:

Received by:

Received by (Laboratory):

Checked by (Laboratory):

Notes: Colt Court 3Q2014 GW Mon Wells

Cooler ID	Cooler Temp.

QC Package: (Check One Box Below)

[X] Level 2 Std QC [ ] TRRP ChkList

[ ] Level 3 Std QC/Row ds [ ] TRRP Level 4

[ ] Level 4 SW846/CLP

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Chain of Custody Form

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COC ID: 126223

ALS Project Manager: | ALS Work Order #:

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Andover Release Site	A	VOCs (8260) Colt Court GW List
Work Order		Project Number	E3CE-0085	B	GRO - VPH OA-1
Company Name	Apex Companies	Bill To Company	Apex Companies	C	
Send Report To	Samuel Jackson	Invoice Attn	Samuel Jackson	D	
Address	3015 SW First Avenue	Address	3015 SW First Avenue	E	
				F	
City/State/Zip	Portland, OR 97201	City/State/Zip	Portland, OR 97201	G	
Phone	(503) 924-4704	Phone	(503) 924-4704	H	
Fax		Fax		I	
e-Mail Address	sjackson@apexcos.com	e-Mail Address	sjackson@apexcos.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	DUP-2	6-17-15	—	W	1	6	X	X									
2	DUP-3	6-17-15	—	W	1	6	X	X									
3	Trip Blank																
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Ted Alford

Shipment Method:

Required Turnaround Time: (Check Box) [X] Std 10 WK days [ ] 5 WK Days [ ] 2 WK Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: Date: 6-18-15 Time: 1650

Received by:

Relinquished by: Date: Time:

Received by (Laboratory):

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: Colt Court 3Q2014 GW Mon Wells

Cooler ID | Cooler Temp.

QC Package (Check One Box Below)
[X] Level 2 Std QC
[ ] Level 3 Std QC/Raw Da
[ ] Level 4 SW846/CLP
[ ] Other/EDD
[ ] TRRP Chk List
[ ] TRRP Level 4

1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4°C 9-5035

WELL GAGING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

		Job Number:	1641-08.002
Client:	NuStar	Date:	6/15/15
Project:	Andover Q.C.	Sampler:	TA, JH
Weather:	Cloudy	Time In/Out:	11:00

WATER LEVEL DATA

Well I.D.	Time	Depth to Free Product (feet)	Depth to Water (feet)	Depth to Well Bottom (feet)	~~Product Thickness (feet)~~ Sheen Pres.?	Water Column Height (feet)	Notes/Other Remarks
• MW-1	1228	—	31.31		Y		
• MW-2	1117	—	34.83		Y		
X MW-3	11:42	—	38.21		Y		
• MW-4	11:52	—	29.02		Y		
• MW-5	11:56	—	19.60		Y		
MW-6	12:35	—	20.45		Y		
MW-7	1240	—	14.91		Y		
MW-8	1158	—	19.93		Y		
MW-9	1140	—	29.83		Y		
MW-10	1138	—	28.30		Y		
DUP-2 • MW-11	1150	—	28.31		Y		
MW-12	1234	—	30.86		Y		
MW-13	12:04	—	31.94		Y		
MW-14	12:07	—	31.70		Y		
• MW-15	1145	—	32.34		Y		
MW-16	12:07	—	~~41.08~~ 5	29.48	Y		
• MW-17	1229	—	31.28		Y		
• MW-18	1155	—	30.64		Y		
• MW-19	1154	—	30.60		Y		
2002 N Colt Court	12:18	—	~~1449~~ 41.05		Y		
2004 N Colt Court	12:15	—	45.82		Y		
~~2006~~ N Colt Court	12:22	—	44.10		Y		2007 N Colt Ct
~~2007~~ N Colt Court	12:30	—	42.38		Y		2006 N Colt Ct
2019 N Ruger Circle	1245	—	~~4843~~ 43.09		Y		
2020 N Ruger Circle	1249	—	39.95		Y		
Pond	1344.75'	—	—	—	N —	—	1344.75' AMSL

Ted Alfred
6/16 + 6/17 Sample times

Table 2
Groundwater Monitoring Program – Irrigation Wells
Andover Colt Court Release Site
Andover, Kansas

	Well Location	Well Status	Gauging	GRO	VOCs	
	2001 N Colt Ct	Currently in Use	--	Q	Q	✓ 14:36-16-6
	2002 N Colt Ct	Deactivated	Q	Q	Q	✓ 1410-16-6
	2004 N Colt Ct	Deactivated	Q	Q	Q	✓ 13:55-16-6
	2005 N Colt Ct	Deactivated	--	Q	Q	✓ 14:33-16-6
	2006 N Colt Ct	Deactivated	Q	Q	Q	✓ 1655-16-6
	HOA-1	Currently in Use	--	Q	? Q	1116-6/17
	2007 N Colt Ct	Deactivated	Q	Q	Q	✓ 1443-16-6
Dup-3	2019 N Ruger Cir	Deactivated	Q	Q Dup-3	Q	✓ 1014-6/17
	2020 N Ruger Cir	Deactivated	Q	Q	Q	✓ 1640-16-6
	2028 N Ruger Cir	Deactivated	--	Q	Q	✓ 9:00-6/17
	2032 N Ruger Cir	Deactivated	--	Q	Q	✓ 9:14-6/17
	2021 N Ruger Ct	Deactivated	--	Q	Q	✓ 9:33-6/17
	2025 N Ruger Ct	Currently in Use	--	Q	Q	✓ 0940-6/17
	1009 W Mountain	Currently in Use	--	Q	Q	✓ 1545-16-6
	2007 N Mountain Ct	Currently in Use	--	Q	Q	✓ 1509-16-6
N.W. 10	2009 N Mountain Ct	Currently in Use	--	Q	Q	✓ 15:30 (16)
	1211 W Quail Crossing Ct	Currently in Use	--	Q	Q	✓ 1147-6-17

Notes:

1. GRO = Gasoline-Range Organics quantified by IOWA OA-1.
2. VOCs = Volatile organic compounds; benzene, toluene, ethylbenzene, xylenes [BTEX], 1,2-dicholoethane, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-butylbenzene, and n-propylbenzene by U.S. Environmental Protection Agency Method 8260B.
3. Deactivation includes plumbing the irrigation system to the municipal water system. The irrigation well is not permanently decommissioned.
4. Q = Performed quarterly.
5. Well locations are shown on Figure 2.

Appendix B

Historical Groundwater Elevations and SPH Removal Data

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	8/8/2013					24.64	--	--	1327.49
	8/13/2013					24.36	--	--	1327.77
	8/21/2013					23.79	--	--	1328.34
	8/28/2013					25.21	--	--	1326.92
	9/5/2013					27.19	--	--	1324.94
	9/11/2013					25.93	--	--	1326.20
	9/17/2013					25.92	--	--	1326.21
	9/23/2013					28.49	--	--	1323.64
	9/30/2013					23.00	--	--	1329.13
	10/10/2013					25.28	--	--	1326.85
	10/17/2013					26.21	--	--	1325.92
	10/23/2013					23.55	--	--	1328.58
	10/31/2013					24.28	--	--	1327.85
	11/6/2013					NM	--	--	NM
	11/13/2013					23.04	--	--	1329.09
	11/20/2013					22.84	--	--	1329.29
	11/26/2013					24.88	--	--	1327.25
	12/3/2013					30.19	--	--	1321.94
	12/11/2013					31.12	--	--	1321.01
	12/19/2013					31.38	--	--	1320.75
	12/27/2013					31.50	--	--	1320.63
	1/3/2014					NM	--	--	NM
	1/10/2014					31.41	--	--	1320.72
MW-1	1/16/2014	4.0	1352.13	35.0	20-35	31.01	--	--	1321.12
	1/21/2014					31.31	--	--	1320.82
	1/27/2014					30.78	--	--	1321.35
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					31.75	--	--	1320.38
	2/26/2014					31.70	--	--	1320.43
	3/4/2014					31.62	--	--	1320.51
	3/13/2014					31.44	--	--	1320.69
	3/18/2014					31.41	--	--	1320.72
	3/27/2014					31.55	--	--	1320.58
	4/3/2014					31.69	--	--	1320.44
	4/7/2014					31.44	--	--	1320.69
	4/17/2014					31.44	--	--	1320.69
	4/22/2014					31.45	--	--	1320.68
	4/29/2014					31.80	--	--	1320.33
	5/8/2014					31.75	--	--	1320.38
	5/13/2014					31.49	--	--	1320.64
	5/20/2014					31.50	--	--	1320.63
	5/29/2014					30.49	--	--	1321.64
	6/3/2014					31.64	--	--	1320.49
	6/10/2014					31.65	--	--	1320.48
	6/18/2014					31.50	--	--	1320.63
	6/24/2014					31.15	--	--	1320.98

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-1 (cont.)	7/1/2014	4.0	1352.13	35.0	20-35	31.66	--	--	1320.47
	7/10/2014					31.79	--	--	1320.34
	7/15/2014					31.82	--	--	1320.31
	7/22/2014					31.31	--	--	1320.82
	7/31/2014					31.65	--	--	1320.48
	8/5/2014					31.78	--	--	1320.35
	8/14/2014					31.73	--	--	1320.40
	8/20/2014					31.68	--	--	1320.45
	8/26/2014					31.79	--	--	1320.34
	9/3/2014					31.79	--	--	1320.34
	9/10/2014					31.71	--	--	1320.42
	9/17/2014					31.72	--	--	1320.41
	9/24/2014					31.75	--	--	1320.38
	10/1/2014					31.65	--	--	1320.48
	10/8/2014					31.89	--	--	1320.24
	10/16/2014					29.99	--	--	1322.14
	10/21/2014					31.35	--	--	1320.78
	10/28/2014					31.39	--	--	1320.74
	11/4/2014					31.72	--	--	1320.41
	11/11/2014					31.71	--	--	1320.42
	11/18/2014					31.71	--	--	1320.42
	11/25/2014					31.44	--	--	1320.69
	12/3/2014					31.67	--	--	1320.46
	12/9/2014					31.48	--	--	1320.65
	12/17/2014					31.77	--	--	1320.36
	12/23/2014					31.81	--	--	1320.32
	12/31/2014					31.44	--	--	1320.69
	1/7/2015					31.75	--	--	1320.38
	1/14/2015					31.44	--	--	1320.69
	1/20/2015					31.45	--	--	1320.68
	1/28/2015					31.42	--	--	1320.71
	2/4/2015					31.44	--	--	1320.69
	2/9/2015					31.62	--	--	1320.51
	3/20/2015					31.38	--	--	1320.75
	4/20/2015					31.39	--	--	1320.74
	5/22/2015					31.20	--	--	1320.93
	6/10/2015					31.23	--	--	1320.90
	6/15/2015					31.31	--	--	1320.82
MW-2	8/8/2013	2.0	1353.17	44	29-44	31.93	--	--	1321.24
	8/13/2013					31.27	--	--	1321.90
	8/21/2013					30.85	--	--	1322.32
	8/28/2013					31.45	--	--	1321.72
	9/5/2013					31.45	--	--	1321.72
	9/11/2013					32.18	--	--	1320.99
	9/17/2013					32.10	--	--	1321.07
	9/23/2013					31.66	--	--	1321.51
	9/30/2013					32.55	--	--	1320.62
	10/10/2013					29.11	--	--	1324.06
	10/17/2013					31.91	--	--	1321.26
	10/23/2013					32.47	--	--	1320.70
	10/31/2013					32.19	--	--	1320.98
	11/6/2013					31.46	--	--	1321.71
	11/13/2013					31.96	--	--	1321.21
	11/20/2013					31.19	--	--	1321.98
	11/26/2013					31.38	--	--	1321.79
	12/3/2013					30.94	--	--	1322.23
	12/11/2013					NM	--	--	NM
	12/19/2013					31.45	--	--	1321.72
	12/27/2013					NM	--	--	NM

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-2 (cont.)	1/3/2014	2.0	1353.17	44	29-44	NM	--	--	NM
	1/10/2014					NM	--	--	NM
	1/16/2014					31.21	--	--	1321.96
	1/21/2014					31.49	--	--	1321.68
	1/27/2014					31.90	--	--	1321.27
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					32.06	--	--	1321.11
	2/26/2014					31.96	--	--	1321.21
	3/4/2014					32.41	--	--	1320.76
	3/13/2014					32.09	--	--	1321.08
	3/18/2014					31.86	--	--	1321.31
	3/27/2014					32.09	--	--	1321.08
	4/3/2014					32.16	--	--	1321.01
	4/7/2014					32.53	--	--	1320.64
	4/17/2014					32.73	--	--	1320.44
	4/22/2014					32.99	--	--	1320.18
	4/29/2014					33.08	--	--	1320.09
	5/8/2014					33.06	--	--	1320.11
	5/13/2014					33.90	--	--	1319.27
	5/20/2014					33.77	--	--	1319.40
	5/29/2014					33.15	--	--	1320.02
	6/3/2014					33.64	--	--	1319.53
	6/10/2014					33.00	--	--	1320.17
	6/18/2014					32.56	--	--	1320.61
	6/24/2014					31.89	--	--	1321.28
	7/1/2014					32.31	--	--	1320.86
	7/10/2014					31.60	--	--	1321.57
	7/15/2014					31.86	--	--	1321.31
	7/22/2014					32.41	--	--	1320.76
	7/31/2014					31.91	--	--	1321.26
	8/5/2014					32.25	--	--	1320.92
	8/14/2014					32.88	--	--	1320.29
	8/20/2014					32.54	--	--	1320.63
	8/26/2014					33.00	--	--	1320.17
	9/3/2014					32.96	--	--	1320.21
	9/10/2014					32.70	--	--	1320.47
	9/17/2014					32.58	--	--	1320.59
	9/24/2014					33.38	--	--	1319.79
	10/1/2014					32.78	--	--	1320.39
	10/8/2014					32.81	--	--	1320.36
	10/16/2014					33.04	--	--	1320.13
	10/21/2014					33.07	--	--	1320.10
	10/28/2014					33.06	--	--	1320.11

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-2 (cont.)	11/4/2014	2.0	1353.17	44	29-44	33.48	--	--	1319.69
	11/11/2014					33.07	--	--	1320.10
	11/25/2014					32.88	--	--	1320.29
	12/3/2014					33.39	--	--	1319.78
	12/9/2014					33.25	--	--	1319.92
	12/17/2014					33.24	--	--	1319.93
	12/23/2014					33.10	--	--	1320.07
	12/31/2014					32.87	--	--	1320.30
	1/7/2015					NM	--	--	NM
	1/14/2015					32.90	--	--	1320.27
	1/20/2015					32.93	--	--	1320.24
	1/28/2015					32.89	--	--	1320.28
	2/4/2015					32.92	--	--	1320.25
	2/9/2015					33.15	--	--	1320.02
	3/18/2015					32.87	--	--	1320.30
	4/20/2015					36.43	--	--	1316.74
	5/22/2015					35.23	--	--	1317.94
	6/15/2015					34.83	--	--	1318.34
MW-3	8/8/2013	2.0	1350.47	60	40-60	36.94	--	--	1313.53
	8/13/2013					34.71	--	--	1315.76
	8/21/2013					33.30	--	--	1317.17
	8/28/2013					39.26	--	--	1311.21
	9/5/2013					42.54	--	--	1307.93
	9/11/2013					45.19	--	--	1305.28
	9/17/2013					43.52	--	--	1306.95
	9/23/2013					43.34	--	--	1307.13
	9/30/2013					43.40	--	--	1307.07
	10/10/2013					43.18	--	--	1307.29
	10/17/2013					41.23	--	--	1309.24
	10/23/2013					41.43	--	--	1309.04
	10/31/2013					41.58	--	--	1308.89
	11/6/2013					41.19	--	--	1309.28
	11/13/2013					35.98	--	--	1314.49
	11/20/2013					35.27	--	--	1315.20
	11/26/2013					34.56	--	--	1315.91
	12/3/2013					33.77	--	--	1316.70
	12/11/2013					34.04	--	--	1316.43
	12/19/2013					33.72	--	--	1316.75
	12/27/2013					33.89	--	--	1316.58
	1/3/2014					NM	--	--	NM
	1/10/2014					33.47	--	--	1317.00
	1/16/2014					33.68	--	--	1316.79
	1/21/2014					33.84	--	--	1316.63
	1/27/2014					34.04	--	--	1316.43
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					34.00	--	--	1316.47
	2/26/2014					34.24	--	--	1316.23
	3/4/2014					34.36	--	--	1316.11
	3/13/2014					34.42	--	--	1316.05
	3/18/2014					34.35	--	--	1316.12
	3/27/2014					34.68	--	--	1315.79
	4/3/2014					35.39	--	--	1315.08
	4/7/2014					36.20	--	--	1314.27
	4/17/2014					37.95	--	--	1312.52
	4/22/2014					39.94	--	--	1310.53
	4/29/2014					41.00	--	--	1309.47

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-3 (cont.)	5/8/2014	2.0	1350.47	60	40-60	45.96	--	--	1304.51
	5/13/2014					47.00	--	--	1303.47
	5/20/2014					49.95	--	--	1300.52
	5/29/2014					47.07	--	--	1303.40
	6/3/2014					47.89	--	--	1302.58
	6/10/2014					44.14	--	--	1306.33
	6/18/2014					42.60	--	--	1307.87
	6/24/2014					41.62	--	--	1308.85
	7/1/2014					39.58	--	--	1310.89
	7/10/2014					40.35	--	--	1310.12
	7/15/2014					42.02	--	--	1308.45
	7/22/2014					42.80	--	--	1307.67
	7/31/2014					43.14	--	--	1307.33
	8/5/2014					47.55	--	--	1302.92
	8/14/2014					45.85	--	--	1304.62
	8/20/2014					49.15	--	--	1301.32
	8/26/2014					51.32	--	--	1299.15
	9/3/2014					51.10	--	--	1299.37
	9/10/2014					51.71	--	--	1298.76
	9/17/2014					51.84	--	--	1298.63
	9/24/2014					52.93	--	--	1297.54
	10/1/2014					53.93	--	--	1296.54
	10/8/2014					53.91	--	--	1296.56
	10/16/2014					50.41	--	--	1300.06
	10/21/2014					51.06	--	--	1299.41
	10/28/2014					50.29	--	--	1300.18
	11/4/2014					51.00	--	--	1299.47
	11/11/2014					49.17	--	--	1301.30
	11/25/2014					45.30	--	--	1305.17
	12/3/2014					44.10	--	--	1306.37
	12/9/2014					43.67	--	--	1306.80
	12/17/2014					42.83	--	--	1307.64
	12/23/2014					47.12	--	--	1303.35
	12/31/2014					29.37	--	--	1321.10
	1/7/2015					NM	--	--	NM
	1/14/2015					41.35	--	--	1309.12
	1/20/2015					41.36	--	--	1309.11
	1/28/2015					42.22	--	--	1308.25
	2/4/2015					41.12	--	--	1309.35
	2/9/2015					40.60	--	--	1309.87
	3/18/2015					41.02	--	--	1309.45
	4/20/2015					45.61	--	--	1304.86
	5/22/2015					40.21	--	--	1310.26
	6/15/2015					38.21	--	--	1312.26
MW-4	8/8/2013	2.0	1350.73	41	26-41	28.89	--	--	1321.84
	8/13/2013					28.85	--	--	1321.88
	8/21/2013					28.18	--	--	1322.55
	8/28/2013					28.56	--	--	1322.17
	9/5/2013					29.16	--	--	1321.57
	9/11/2013					29.55	--	--	1321.18
	9/17/2013					30.06	--	--	1320.67
	9/23/2013					30.32	--	--	1320.41
	9/30/2013					30.11	--	--	1320.62
	10/10/2013					30.45	--	--	1320.28
	10/17/2013					30.43	--	--	1320.30
	10/23/2013					30.36	--	--	1320.37
	10/31/2013					30.14	--	--	1320.59

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	11/6/2013					29.78	--	--	1320.95
	11/13/2013					30.21	--	--	1320.52
	11/20/2013					29.81	--	--	1320.92
	11/26/2013					30.34	--	--	1320.39
	12/3/2013					30.64	--	--	1320.09
	12/11/2013					30.19	--	--	1320.54
	12/19/2013					30.47	--	--	1320.26
	12/27/2013					30.43	--	--	1320.30
	1/3/2014					NM	--	--	NM
	1/10/2014					29.44	--	--	1321.29
	1/16/2014					29.38	--	--	1321.35
	1/21/2014					29.53	--	--	1321.20
	1/27/2014					30.36	--	--	1320.37
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					30.61	--	--	1320.12
	2/26/2014					31.56	--	--	1319.17
	3/4/2014					30.54	--	--	1320.19
	3/13/2014					30.56	--	--	1320.17
	3/18/2014					30.80	--	--	1319.93
	3/27/2014					30.72	--	--	1320.01
	4/3/2014					30.49	--	--	1320.24
	4/7/2014					30.53	--	--	1320.20
MW-4 (cont.)	4/17/2014	2.0	1350.73	41	26-41	30.54	--	--	1320.19
	4/22/2014					31.02	--	--	1319.71
	4/29/2014					31.25	--	--	1319.48
	5/8/2014					31.59	--	--	1319.14
	5/13/2014					31.30	--	--	1319.43
	5/20/2014					31.73	--	--	1319.00
	5/29/2014					31.63	--	--	1319.10
	6/3/2014					32.68	--	--	1318.05
	6/10/2014					32.52	--	--	1318.21
	6/18/2014					31.71	--	--	1319.02
	6/24/2014					30.73	--	--	1320.00
	7/1/2014					30.60	--	--	1320.13
	7/10/2014					30.39	--	--	1320.34
	7/15/2014					30.56	--	--	1320.17
	7/22/2014					30.34	--	--	1320.39
	7/31/2014					30.52	--	--	1320.21
	8/5/2014					30.69	--	--	1320.04
	8/14/2014					30.61	--	--	1320.12
	8/20/2014					30.81	--	--	1319.92
	8/26/2014					30.73	--	--	1320.00
	9/3/2014					30.91	--	--	1319.82
	9/10/2014					30.82	--	--	1319.91
	9/17/2014					30.91	--	--	1319.82
	9/24/2014					29.98	--	--	1320.75

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-4 (cont.)	10/1/2014	2.0	1350.73	41	26-41	31.26	--	--	1319.47
	10/8/2014					31.29	--	--	1319.44
	10/16/2014					31.20	--	--	1319.53
	10/21/2014					31.11	--	--	1319.62
	10/28/2014					30.94	--	--	1319.79
	11/4/2014					31.13	--	--	1319.60
	11/11/2014					31.03	--	--	1319.70
	11/25/2014					31.35	--	--	1319.38
	12/3/2014					31.41	--	--	1319.32
	12/9/2014					31.43	--	--	1319.30
	12/17/2014					31.44	--	--	1319.29
	12/23/2014					31.52	--	--	1319.21
	12/31/2014					31.71	--	--	1319.02
	1/7/2015					NM	--	--	NM
	1/14/2015					31.52	--	--	1319.21
	1/20/2015					31.55	--	--	1319.18
	1/28/2015					31.66	--	--	1319.07
	2/4/2015					31.70	--	--	1319.03
	2/9/2015					31.75	--	--	1318.98
	3/18/2015					31.22	--	--	1319.51
	4/20/2015					34.10	--	--	1316.63
	5/22/2015					31.25	--	--	1319.48
	6/10/2015					29.28	--	--	1321.45
	6/15/2015					29.02	--	--	1321.71
MW-5	8/8/2013	2.0	1352.77	30	15-30	19.61	--	--	1333.16
	8/13/2013					19.39	--	--	1333.38
	8/21/2013					19.66	--	--	1333.11
	8/28/2013					20.02	--	--	1332.75
	9/5/2013					20.54	--	--	1332.23
	9/11/2013					20.81	--	--	1331.96
	9/17/2013					21.03	--	--	1331.74
	9/23/2013					21.00	--	--	1331.77
	9/30/2013					21.17	--	--	1331.60
	10/10/2013					21.45	--	--	1331.32
	10/17/2013					21.18	--	--	1331.59
	10/23/2013					21.20	--	--	1331.57
	10/31/2013					21.19	--	--	1331.58
	11/6/2013					20.91	--	--	1331.86
	11/13/2013					20.79	--	--	1331.98
	11/20/2013					20.18	--	--	1332.59
	11/26/2013					21.29	--	--	1331.48
	12/3/2013					20.84	--	--	1331.93
	12/11/2013					20.96	--	--	1331.81
	12/19/2013					20.54	--	--	1332.23
	12/27/2013					20.82	--	--	1331.95
	1/3/2014					NM	--	--	NM
	1/10/2014					20.19	--	--	1332.58
	1/16/2014					20.90	--	--	1331.87
	1/21/2014					21.04	--	--	1331.73
	1/27/2014					20.84	--	--	1331.93
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					21.23	--	--	1331.54
	2/26/2014					21.02	--	--	1331.75
	3/4/2014					21.05	--	--	1331.72
	3/13/2014					20.98	--	--	1331.79
	3/18/2014					20.86	--	--	1331.91
	3/27/2014					20.97	--	--	1331.80

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-5 (cont.)	4/3/2014	2.0	1352.77	30	15-30	21.70	--	--	1331.07
	4/7/2014					21.05	--	--	1331.72
	4/17/2014					21.10	--	--	1331.67
	4/22/2014					21.30	--	--	1331.47
	4/29/2014					21.15	--	--	1331.62
	5/8/2014					21.33	--	--	1331.44
	5/13/2014					21.17	--	--	1331.60
	5/20/2014					21.48	--	--	1331.29
	5/29/2014					21.41	--	--	1331.36
	6/3/2014					21.16	--	--	1331.61
	6/10/2014					20.65	--	--	1332.12
	6/18/2014					20.30	--	--	1332.47
	6/24/2014					19.96	--	--	1332.81
	7/1/2014					19.74	--	--	1333.03
	7/10/2014					19.91	--	--	1332.86
	7/15/2014					20.10	--	--	1332.67
	7/22/2014					20.04	--	--	1332.73
	7/31/2014					20.26	--	--	1332.51
	8/5/2014					20.29	--	--	1332.48
	8/14/2014					20.23	--	--	1332.54
	8/20/2014					20.24	--	--	1332.53
	8/26/2014					20.37	--	--	1332.40
	9/3/2014					20.44	--	--	1332.33
	9/10/2014					20.43	--	--	1332.34
	9/17/2014					20.54	--	--	1332.23
	9/24/2014					20.66	--	--	1332.11
	10/1/2014					20.59	--	--	1332.18
	10/8/2014					20.58	--	--	1332.19
	10/16/2014					20.39	--	--	1332.38
	10/21/2014					22.90	--	--	1329.87
	10/28/2014					20.14	--	--	1332.63
	11/4/2014					20.33	--	--	1332.44
	11/11/2014					20.39	--	--	1332.38
	11/25/2014					20.44	--	--	1332.33
	12/3/2014					20.59	--	--	1332.18
	12/9/2014					20.78	--	--	1331.99
	12/17/2014					20.68	--	--	1332.09
	12/23/2014					20.60	--	--	1332.17
	12/31/2014					20.61	--	--	1332.16
	1/7/2015					NM	--	--	NM
	1/14/2015					20.56	--	--	1332.21
	1/20/2015					20.55	--	--	1332.22
	1/28/2015					20.58	--	--	1332.19
	2/4/2015					20.69	--	--	1332.08
	2/9/2015					20.58	--	--	1332.19
	3/18/2015					20.80	--	--	1331.97
	4/20/2015					21.01	--	--	1331.76
	5/22/2015					20.25	--	--	1332.52
	6/10/2015					19.44	--	--	1333.33
	6/15/2015					19.60	--	--	1333.17
MW-6	8/8/2013	2.0	1349.76	41	26-41	15.67	--	--	1334.09
	8/13/2013					18.34	--	--	1331.42
	8/21/2013					17.40	--	--	1332.36
	8/28/2013					17.95	--	--	1331.81
	9/5/2013					18.32	--	--	1331.44
	9/11/2013					18.21	--	--	1331.55
	9/17/2013					18.44	--	--	1331.32

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	9/23/2013					18.30	--	--	1331.46
	9/30/2013					18.69	--	--	1331.07
	10/10/2013					18.84	--	--	1330.92
	10/17/2013					18.76	--	--	1331.00
	10/23/2013					18.69	--	--	1331.07
	10/31/2013					18.57	--	--	1331.19
	11/6/2013					18.01	--	--	1331.75
	11/13/2013					19.42	--	--	1330.34
	11/20/2013					19.02	--	--	1330.74
	11/26/2013					19.84	--	--	1329.92
	12/3/2013					19.63	--	--	1330.13
	12/11/2013					20.45	--	--	1329.31
	12/19/2013					21.21	--	--	1328.55
	12/27/2013					21.67	--	--	1328.09
	1/3/2014					NM	--	--	NM
	1/10/2014					21.51	--	--	1328.25
	1/16/2014					21.48	--	--	1328.28
	1/21/2014					21.84	--	--	1327.92
	1/27/2014					22.26	--	--	1327.50
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					22.00	--	--	1327.76
	2/26/2014					22.32	--	--	1327.44
MW-6 (cont.	3/4/2014	2.0	1349.76	41	26-41	22.06	--	--	1327.70
	3/13/2014					22.30	--	--	1327.46
	3/18/2014					22.14	--	--	1327.62
	3/27/2014					21.89	--	--	1327.87
	4/3/2014					21.92	--	--	1327.84
	4/7/2014					22.37	--	--	1327.39
	4/17/2014					22.33	--	--	1327.43
	4/22/2014					22.41	--	--	1327.35
	4/29/2014					22.16	--	--	1327.60
	5/8/2014					22.02	--	--	1327.74
	5/13/2014					21.95	--	--	1327.81
	5/20/2014					22.46	--	--	1327.30
	5/29/2014					22.32	--	--	1327.44
	6/3/2014					22.09	--	--	1327.67
	6/10/2014					21.00	--	--	1328.76
	6/18/2014					20.54	--	--	1329.22
	6/24/2014					19.89	--	--	1329.87
	7/1/2014					19.46	--	--	1330.30
	7/10/2014					19.82	--	--	1329.94
	7/15/2014					19.86	--	--	1329.90
	7/22/2014					19.88	--	--	1329.88
	7/31/2014					20.00	--	--	1329.76
	8/5/2014					20.28	--	--	1329.48
	8/14/2014					20.42	--	--	1329.34

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	8/20/2014					20.56	--	--	1329.20
	8/26/2014					20.72	--	--	1329.04
	9/3/2014					20.98	--	--	1328.78
	9/10/2014					21.02	--	--	1328.74
	9/17/2014					21.49	--	--	1328.27
	9/24/2014					21.50	--	--	1328.26
	10/1/2014					21.57	--	--	1328.19
	10/8/2014					21.59	--	--	1328.17
	10/16/2014					20.74	--	--	1329.02
	10/21/2014					20.66	--	--	1329.10
	10/28/2014					20.79	--	--	1328.97
	11/4/2014					21.21	--	--	1328.55
	11/11/2014					21.68	--	--	1328.08
	11/25/2014					21.93	--	--	1327.83
MW-6 (cont	12/3/2014	2.0	1349.76	41	26-41	22.06	--	--	1327.70
	12/9/2014					22.32	--	--	1327.44
	12/17/2014					22.20	--	--	1327.56
	12/23/2014					21.96	--	--	1327.80
	12/31/2014					20.61	--	--	1329.15
	1/7/2015					NM	--	--	NM
	1/14/2015					22.59	--	--	1327.17
	1/20/2015					22.45	--	--	1327.31
	1/28/2015					22.54	--	--	1327.22
	2/4/2015					22.59	--	--	1327.17
	2/9/2015					22.77	--	--	1326.99
	3/18/2015					22.62	--	--	1327.14
	4/20/2015					23.05	--	--	1326.71
	5/22/2015					22.25	--	--	1327.51
	6/15/2015					20.45	--	--	1329.31
	8/8/2013					13.32	--	--	1335.66
	8/13/2013					13.68	--	--	1335.30
	8/21/2013					14.03	--	--	1334.95
	8/28/2013					14.76	--	--	1334.22
	9/5/2013					15.44	--	--	1333.54
	9/11/2013					15.66	--	--	1333.32
	9/17/2013					15.78	--	--	1333.20
	9/23/2013					15.54	--	--	1333.44
	9/30/2013					15.39	--	--	1333.59
	10/10/2013					15.65	--	--	1333.33
	10/17/2013					15.68	--	--	1333.30
	10/23/2013					15.64	--	--	1333.34
MW-7	10/31/2013	2.0	1348.98	24	9-24	15.66	--	--	1333.32
	11/6/2013					15.11	--	--	1333.87
	11/13/2013					15.21	--	--	1333.77
	11/20/2013					15.62	--	--	1333.36
	11/26/2013					15.89	--	--	1333.09
	12/3/2013					16.03	--	--	1332.95
	12/11/2013					16.45	--	--	1332.53
	12/19/2013					16.41	--	--	1332.57
	12/27/2013					16.59	--	--	1332.39
	1/3/2014					NM	--	--	NM
	1/10/2014					16.47	--	--	1332.51
	1/16/2014					16.45	--	--	1332.53
	1/21/2014					16.66	--	--	1332.32
	1/27/2014					16.68	--	--	1332.30

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					16.61	--	--	1332.37
	2/26/2014					16.64	--	--	1332.34
	3/4/2014					16.65	--	--	1332.33
	3/13/2014					16.73	--	--	1332.25
	3/18/2014					16.68	--	--	1332.30
	3/27/2014					16.56	--	--	1332.42
	4/3/2014					16.64	--	--	1332.34
	4/7/2014					16.60	--	--	1332.38
	4/17/2014					16.66	--	--	1332.32
	4/22/2014					16.70	--	--	1332.28
	4/29/2014					16.70	--	--	1332.28
	5/6/2014					16.95	--	--	1332.03
	5/13/2014					16.80	--	--	1332.18
	5/20/2014					15.69	--	--	1333.29
	5/29/2014					17.44	--	--	1331.54
	6/3/2014					16.13	--	--	1332.85
	6/10/2014					14.85	--	--	1334.13
	6/18/2014					15.52	--	--	1333.46
	6/24/2014					14.78	--	--	1334.20
	7/1/2014					14.74	--	--	1334.24
	7/10/2014					15.10	--	--	1333.88
	7/15/2014					15.31	--	--	1333.67
	7/22/2014					15.39	--	--	1333.59
	7/31/2014					15.72	--	--	1333.26
	8/5/2014					15.82	--	--	1333.16
	8/14/2014					15.59	--	--	1333.39
MW-7 (cont.)	8/20/2014	2.0	1348.98	24	9-24	15.73	--	--	1333.25
	8/26/2014					15.90	--	--	1333.08
	9/3/2014					15.99	--	--	1332.99
	9/10/2014					16.03	--	--	1332.95
	9/17/2014					16.14	--	--	1332.84
	9/24/2014					16.24	--	--	1332.74
	10/1/2014					16.16	--	--	1332.82
	10/8/2014					16.17	--	--	1332.81
	10/16/2014					15.50	--	--	1333.48
	10/21/2014					15.65	--	--	1333.33
	10/28/2014					15.64	--	--	1333.34
	11/4/2014					16.02	--	--	1332.96
	11/11/2014					16.04	--	--	1332.94
	11/25/2014					16.37	--	--	1332.61
	12/3/2014					16.46	--	--	1332.52
	12/9/2014					16.54	--	--	1332.44
	12/17/2014					16.52	--	--	1332.46
	12/23/2014					16.41	--	--	1332.57
	12/31/2014					16.48	--	--	1332.50
	1/7/2015					NM	--	--	NM
	1/14/2015					16.49	--	--	1332.49
	1/20/2015					16.55	--	--	1332.43
	1/28/2015					16.56	--	--	1332.42
	2/4/2015					16.56	--	--	1332.42
	2/9/2015					16.58	--	--	1332.40
	3/18/2015					16.63	--	--	1332.35
	4/20/2015					16.10	--	--	1332.88
	5/22/2015					15.23	--	--	1333.75
	6/15/2015					14.91	--	--	1334.07

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
	8/8/2013					18.62	--	--	1334.76
	8/13/2013					18.13	--	--	1335.25
	8/21/2013					18.32	--	--	1335.06
	8/28/2013					19.21	--	--	1334.17
	9/5/2013					20.00	--	--	1333.38
	9/11/2013					20.35	--	--	1333.03
	9/17/2013					20.54	--	--	1332.84
	9/23/2013					20.59	--	--	1332.79
	9/30/2013					20.70	--	--	1332.68
	10/10/2013					20.82	--	--	1332.56
	10/17/2013					20.92	--	--	1332.46
	10/23/2013					20.85	--	--	1332.53
	10/31/2013					20.89	--	--	1332.49
	11/6/2013					19.21	--	--	1334.17
	11/13/2013					19.38	--	--	1334.00
	11/20/2013					18.86	--	--	1334.52
	11/26/2013					20.30	--	--	1333.08
	12/3/2013					20.54	--	--	1332.84
	12/11/2013					21.09	--	--	1332.29
	12/19/2013					21.11	--	--	1332.27
	12/27/2013					21.54	--	--	1331.84
	1/3/2014					NM	--	--	NM
	1/10/2014					21.24	--	--	1332.14
MW-8	1/16/2014	2.0	1353.38	30	15-30	21.70	--	--	1331.68
	1/21/2014					21.80	--	--	1331.58
	1/27/2014					21.88	--	--	1331.50
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					22.15	--	--	1331.23
	2/26/2014					21.46	--	--	1331.92
	3/4/2014					21.84	--	--	1331.54
	3/13/2014					21.90	--	--	1331.48
	3/18/2014					21.70	--	--	1331.68
	3/27/2014					21.79	--	--	1331.59
	4/3/2014					21.95	--	--	1331.43
	4/7/2014					22.06	--	--	1331.32
	4/17/2014					22.29	--	--	1331.09
	4/22/2014					22.26	--	--	1331.12
	4/29/2014					22.20	--	--	1331.18
	5/8/2014					22.23	--	--	1331.15
	5/13/2014					22.42	--	--	1330.96
	5/20/2014					22.27	--	--	1331.11
	5/29/2014					22.43	--	--	1330.95
	6/3/2014					22.32	--	--	1331.06
	6/10/2014					21.73	--	--	1331.65
	6/18/2014					20.64	--	--	1332.74
	6/24/2014					20.00	--	--	1333.38

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-8 (cont.)	7/1/2014	2.0	1353.38	30	15-30	20.22	--	--	1333.16
	7/10/2014					20.24	--	--	1333.14
	7/15/2014					20.47	--	--	1332.91
	7/22/2014					20.64	--	--	1332.74
	7/31/2014					20.89	--	--	1332.49
	8/5/2014					20.96	--	--	1332.42
	8/14/2014					21.09	--	--	1332.29
	8/20/2014					21.06	--	--	1332.32
	8/26/2014					21.24	--	--	1332.14
	9/3/2014					21.36	--	--	1332.02
	9/10/2014					21.44	--	--	1331.94
	9/17/2014					21.56	--	--	1331.82
	9/24/2014					21.69	--	--	1331.69
	10/1/2014					21.65	--	--	1331.73
	10/8/2014					21.70	--	--	1331.68
	10/16/2014					21.53	--	--	1331.85
	10/21/2014					21.32	--	--	1332.06
	10/28/2014					20.98	--	--	1332.40
	11/4/2014					21.09	--	--	1332.29
	11/11/2014					21.09	--	--	1332.29
	11/25/2014					21.21	--	--	1332.17
	12/3/2014					21.48	--	--	1331.90
	12/9/2014					21.69	--	--	1331.69
	12/17/2014					21.74	--	--	1331.64
	12/23/2014					21.61	--	--	1331.77
	12/31/2014					21.73	--	--	1331.65
	1/7/2015					NM	--	--	NM
	1/14/2015					21.64	--	--	1331.74
	1/20/2015					21.70	--	--	1331.68
	1/28/2015					21.72	--	--	1331.66
	2/4/2015					21.92	--	--	1331.46
	2/9/2015					21.88	--	--	1331.50
	3/18/2015					21.96	--	--	1331.42
	4/20/2015					22.25	--	--	1331.13
	5/22/2015					20.93	--	--	1332.45
	6/15/2015					19.93	--	--	1333.45
MW-9	8/8/2013	2.0	1349.48	34	19-34	28.61	--	--	1320.87
	8/13/2013					27.58	--	--	1321.90
	8/21/2013					27.52	--	--	1321.96
	8/28/2013					27.60	--	--	1321.88
	9/5/2013					28.28	--	--	1321.20
	9/11/2013					30.57	--	--	1318.91
	9/17/2013					30.05	--	--	1319.43
	9/23/2013					30.25	--	--	1319.23
	9/30/2013					30.45	--	--	1319.03
	10/10/2013					30.76	--	--	1318.72
	10/17/2013					30.69	--	--	1318.79
	10/23/2013					30.73	--	--	1318.75
	10/31/2013					30.11	--	--	1319.37
	11/6/2013					30.03	--	--	1319.45
	11/13/2013					29.54	--	--	1319.94
	11/20/2013					28.66	--	--	1320.82
	11/26/2013					28.67	--	--	1320.81
	12/3/2013					28.40	--	--	1321.08
	12/11/2013					28.55	--	--	1320.93
	12/19/2013					28.55	--	--	1320.93
	12/27/2013					NM	--	--	NM

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-9 (cont.)	1/3/2014	2.0	1349.48	34	19-34	NM	--	--	NM
	1/10/2014					28.65	--	--	1320.83
	1/16/2014					28.75	--	--	1320.73
	1/21/2014					28.91	--	--	1320.57
	1/27/2014					28.93	--	--	1320.55
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					29.09	--	--	1320.39
	2/26/2014					29.16	--	--	1320.32
	3/4/2014					NM	--	--	NM
	3/13/2014					29.31	--	--	1320.17
	3/18/2014					29.17	--	--	1320.31
	3/27/2014					28.59	--	--	1320.89
	4/3/2014					30.00	--	--	1319.48
	4/7/2014					30.25	--	--	1319.23
	4/17/2014					30.81	--	--	1318.67
	4/22/2014					31.06	--	--	1318.42
	4/29/2014					31.50	--	--	1317.98
	5/8/2014					31.81	--	--	1317.67
	5/13/2014					32.96	--	--	1316.52
	5/20/2014					33.39	--	--	1316.09
	5/29/2014					33.56	--	--	1315.92
	6/3/2014					33.61	--	--	1315.87
	6/10/2014					32.83	--	--	1316.65
	6/18/2014					31.25	--	--	1318.23
	6/24/2014					30.60	--	--	1318.88
	7/1/2014					30.14	--	--	1319.34
	7/10/2014					30.21	--	--	1319.27
	7/15/2014					30.46	--	--	1319.02
	7/22/2014					30.56	--	--	1318.92
	7/31/2014					NM	--	--	NM
	8/5/2014					NM	--	--	NM
	8/14/2014					31.44	--	--	1318.04
	8/20/2014					NM	--	--	NM
	8/26/2014					NM	--	--	NM
	9/3/2014					NM	--	--	NM
	9/10/2014					32.21	--	--	NM
	9/17/2014					NM	--	--	NM
	9/24/2014					32.98	--	--	1316.50
	10/1/2014					32.50	--	--	1316.98
	10/8/2014					32.52	--	--	1316.96
	10/16/2014					32.24	--	--	1317.24
	10/21/2014					NM	--	--	#VALUE!
	10/28/2014					31.87	--	--	1317.61

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-9 (cont.)	11/4/2014	2.0	1349.48	34	19-34	32.09	--	--	1317.39
	11/11/2014					31.84	--	--	1317.64
	11/25/2014					32.01	--	--	1317.47
	12/3/2014					32.18	--	--	1317.30
	12/9/2014					31.97	--	--	1317.51
	12/17/2014					32.04	--	--	1317.44
	12/23/2014					31.96	--	--	1317.52
	12/31/2014					31.11	--	--	1318.37
	1/7/2015					NM	--	--	NM
	1/14/2015					NM	--	--	NM
	1/20/2015					NM	--	--	NM
	1/28/2015					31.81	--	--	1317.67
	2/4/2015					31.90	--	--	1317.58
	2/9/2015					31.78	--	--	1317.70
	3/18/2015					31.59	--	--	1317.89
	4/20/2015					33.25	--	--	1316.23
	5/22/2015					31.55	--	--	1317.93
	6/15/2015					29.83	--	--	1319.65
MW-10	8/6/2013	2.0	1348.79	34	19-34	26.72	--	--	1322.07
	8/13/2013					25.39	--	--	1323.40
	8/21/2013					24.94	--	--	1323.85
	8/28/2013					25.94	--	--	1322.85
	9/5/2013					28.21	--	--	1320.58
	9/11/2013					28.42	--	--	1320.37
	9/17/2013					28.49	--	--	1320.30
	9/23/2013					28.46	--	--	1320.33
	9/30/2013					28.32	--	--	1320.47
	10/10/2013					28.30	--	--	1320.49
	10/17/2013					28.45	--	--	1320.34
	10/23/2013					28.33	--	--	1320.46
	10/31/2013					28.40	--	--	1320.39
	11/6/2013					27.87	--	--	1320.92
	11/13/2013					28.25	--	--	1320.54
	11/20/2013					27.53	--	--	1321.26
	11/26/2013					27.30	--	--	1321.49
	12/3/2013					26.81	--	--	1321.98
	12/11/2013					27.14	--	--	1321.65
	12/19/2013					27.10	--	--	1321.69
	12/27/2013					27.42	--	--	1321.37
	1/3/2014					NM	--	--	NM
	1/10/2014					27.35	--	--	1321.44
	1/16/2014					27.51	--	--	1321.28
	1/21/2014					27.77	--	--	1321.02
	1/27/2014					27.47	--	--	1321.32
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					27.53	--	--	1321.26
	2/26/2014					27.58	--	--	1321.21
	3/4/2014					27.66	--	--	1321.13
	3/13/2014					27.78	--	--	1321.01
	3/18/2014					27.65	--	--	1321.14
	3/27/2014					28.12	--	--	1320.67
	4/3/2014					28.36	--	--	1320.43
	4/7/2014					28.43	--	--	1320.36
	4/17/2014					28.41	--	--	1320.38
	4/22/2014					28.48	--	--	1320.31
	4/29/2014					28.50	--	--	1320.29

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-10 (cont.)	5/8/2014	2.0	1348.79	34	19-34	29.01	--	--	1319.78
	5/13/2014					29.08	--	--	1319.71
	5/20/2014					29.21	--	--	1319.58
	5/29/2014					28.95	--	--	1319.84
	6/3/2014					28.46	--	--	1320.33
	6/10/2014					28.25	--	--	1320.54
	6/18/2014					27.25	--	--	1321.54
	6/24/2014					NM	--	--	NM
	7/1/2014					28.44	--	--	1320.35
	7/10/2014					28.28	--	--	1320.51
	7/15/2014					28.32	--	--	1320.47
	7/22/2014					28.28	--	--	1320.51
	7/31/2014					28.50	--	--	1320.29
	8/5/2014					28.47	--	--	1320.32
	8/14/2014					28.41	--	--	1320.38
	8/20/2014					28.40	--	--	1320.39
	8/26/2014					28.44	--	--	1320.35
	9/3/2014					29.46	--	--	1319.33
	9/10/2014					28.44	--	--	1320.35
	9/17/2014					28.46	--	--	1320.33
	9/24/2014					28.47	--	--	1320.32
	10/1/2014					28.45	--	--	1320.34
	10/8/2014					28.44	--	--	1320.35
	10/16/2014					28.39	--	--	1320.40
	10/21/2014					28.45	--	--	1320.34
	10/28/2014					28.42	--	--	1320.37
	11/4/2014					28.46	--	--	1320.33
	11/11/2014					28.52	--	--	1320.27
	11/25/2014					28.65	--	--	1320.14
	12/3/2014					28.69	--	--	1320.10
	12/9/2014					28.65	--	--	1320.14
	12/17/2014					28.61	--	--	1320.18
	12/23/2014					NM	--	--	NM
	12/31/2014					29.36	--	--	1319.43
	1/7/2015					NM	--	--	NM
	1/14/2015					28.45	--	--	1320.34
	1/20/2015					28.42	--	--	1320.37
	1/28/2015					28.44	--	--	1320.35
	2/4/2015					28.49	--	--	1320.30
	2/9/2015					28.54	--	--	1320.25
	3/18/2015					28.42	--	--	1320.37
	4/20/2015					28.53	--	--	1320.26
	5/22/2015					28.27	--	--	1320.52
	6/15/2015					28.30	--	--	1320.49
MW-11	9/30/2013	2.0	1351.34	42	22-42	29.03	--	--	1322.31
	10/10/2013					28.08	--	--	1323.26
	10/17/2013					28.26	--	--	1323.08
	10/23/2013					29.36	--	--	1321.98
	10/31/2013					28.92	--	--	1322.42
	11/6/2013					28.14	--	--	1323.20
	11/13/2013					28.16	--	--	1323.18
	11/20/2013					27.70	--	--	1323.64
	11/26/2013					28.03	--	--	1323.31
	12/3/2013					28.03	--	--	1323.31
	12/11/2013					28.54	--	--	1322.80
	12/19/2013					28.53	--	--	1322.81
	12/27/2013					28.80	--	--	1322.54

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-11 (cont.)	1/3/2014	2.0	1351.34	42	22-42	NM	--	--	NM
	1/10/2014					29.60	--	--	1321.74
	1/16/2014					28.89	--	--	1322.45
	1/21/2014					28.99	--	--	1322.35
	1/27/2014					28.91	--	--	1322.43
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					28.52	--	--	1322.82
	2/26/2014					28.71	--	--	1322.63
	3/4/2014					28.61	--	--	1322.73
	3/13/2014					28.77	--	--	1322.57
	3/18/2014					28.51	--	--	1322.83
	3/27/2014					28.68	--	--	1322.66
	4/3/2014					28.77	--	--	1322.57
	4/7/2014					28.75	--	--	1322.59
	4/17/2014					28.79	--	--	1322.55
	4/22/2014					28.92	--	--	1322.42
	4/29/2014					28.90	--	--	1322.44
	5/8/2014					29.84	--	--	1321.50
	5/13/2014					29.91	--	--	1321.43
	5/20/2014					28.52	--	--	1322.82
	5/29/2014					30.09	--	--	1321.25
	6/3/2014					29.34	--	--	1322.00
	6/10/2014					28.71	--	--	1322.63
	6/18/2014					28.44	--	--	1322.90
	6/24/2014					28.09	--	--	1323.25
	7/1/2014					27.76	--	--	1323.58
	7/10/2014					27.85	--	--	1323.49
	7/15/2014					29.83	--	--	1321.51
	7/22/2014					28.13	--	--	1323.21
	7/31/2014					28.49	--	--	1322.85
	8/5/2014					28.49	--	--	1322.85
	8/14/2014					28.46	--	--	1322.88
	8/20/2014					28.54	--	--	1322.80
	8/26/2014					28.53	--	--	1322.81
	9/3/2014					28.60	--	--	1322.74
	9/10/2014					28.65	--	--	1322.69
	9/17/2014					28.69	--	--	1322.65
	9/24/2014					23.69	--	--	1327.65
	10/1/2014					28.58	--	--	1322.76
	10/8/2014					28.62	--	--	1322.72
	10/16/2014					28.59	--	--	1322.75
	10/21/2014					28.65	--	--	1322.69
	10/28/2014					29.75	--	--	1321.59
	11/4/2014					28.57	--	--	1322.77
	11/11/2014					28.70	--	--	1322.64

Please refer to notes at end of table.

Table B-1
Groundwater Gauging Data
Andover Colt Court Release Site
Andover, Kansas

Well ID	Measurement Date	Casing Diameter (inches)	Top of Casing Elevation (feet)[1]	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet bgs)	Depth to SPH (feet)	SPH Thickness (feet)	Groundwater Elevation (feet MSL)
MW-11 (cont.)	11/25/2014	2.0	1351.34	42	22-42	28.93	--	--	1322.41
	12/3/2014					29.00	--	--	1322.34
	12/9/2014					28.94	--	--	1322.40
	12/17/2014					28.93	--	--	1322.41
	12/23/2014					28.96	--	--	1322.38
	12/31/2014					29.03	--	--	1322.31
	1/7/2015					NM	--	--	NM
	1/14/2015					28.88	--	--	1322.46
	1/20/2015					28.88	--	--	1322.46
	1/28/2015					28.97	--	--	1322.37
	2/4/2015					28.94	--	--	1322.40
	2/9/2015					29.26	--	--	1322.08
	3/19/2015					29.84	--	--	1321.50
	4/20/2015					30.39	--	--	1320.95
	5/22/2015					29.88	--	--	1320.59
	6/15/2015					28.31	--	--	1323.03
MW-12	9/30/2013	2.0	1349.74	43	23-43	30.15	--	--	1319.59
	10/10/2013					30.55	--	--	1319.19
	10/17/2013					30.49	--	--	1319.25
	10/23/2013					30.40	--	--	1319.34
	10/31/2013					30.45	--	--	1319.29
	11/6/2013					29.91	--	--	1319.83
	11/13/2013					29.32	--	--	1320.42
	11/20/2013					28.16	--	--	1321.58
	11/26/2013					27.91	--	--	1321.83
	12/3/2013					27.41	--	--	1322.33
	12/11/2013					27.83	--	--	1321.91
	12/19/2013					27.74	--	--	1322.00
	12/27/2013					NM	--	--	NM
	1/3/2014					NM	--	--	NM
	1/10/2014					28.25	--	--	1321.49
	1/16/2014					28.28	--	--	1321.46
	1/21/2014					28.61	--	--	1321.13
	1/27/2014					28.40	--	--	1321.34
	2/5/2014					NM	--	--	NM
	2/12/2014					NM	--	--	NM
	2/19/2014					28.46	--	--	1321.28
	2/26/2014					28.49	--	--	1321.25
	3/4/2014					NM	--	--	NM
	3/13/2014					28.77	--	--	1320.97
	3/18/2014					28.70	--	--	1321.04
	3/27/2014					29.25	--	--	1320.49
	4/3/2014					29.70	--	--	1320.04
	4/7/2014					29.83	--	--	1319.91
	4/17/2014					30.45	--	--	1319.29
	4/22/2014					30.85	--	--	1318.89
	4/29/2014					31.10	--	--	1318.64
	5/8/2014					31.29	--	--	1318.45
	5/13/2014					31.21	--	--	1318.53
	5/20/2014					31.13	--	--	1318.61
	5/29/2014					31.16	--	--	1318.58
	6/3/2014					31.14	--	--	1318.60
	6/10/2014					31.15	--	--	1318.59
	6/18/2014					31.01	--	--	1318.73
	6/24/2014					30.79	--	--	1318.95
	7/1/2014					30.42	--	--	1319.32
	7/10/2014					30.48	--	--	1319.26

Please refer to notes at end of table.