REMEDIAL ACTION PLAN

PUMP-N-PANTRY #001 PROPERTY

99 GROW AVENUE

BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

PADEP FACILITY ID #58-13092

USTIF CLAIM #2015-0126(I) & #2017-0021(I)

PREPARED FOR

PUMP-N-PANTRY, INC.

754 GROW AVENUE

MONTROSE, PENNSYLVANIA 18801

PREPARED BY

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BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

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1. BACKGROUND

1.1 General

LaBella Associates, P.C. (LaBella), on behalf of the Pump-n-Pantry, Inc. (Pump-N-Pantry), is pleased to submit this Remedial Action Plan (RAP) for the property located at 99 Grow Avenue in Bridgewater Township, Susquehanna County, Pennsylvania (Site). A Site Location Map (**Figure 1**) depicting the location of the Site is included in Appendix A. The activities summarized herein were completed according to the guidelines and standards pursuant to the Pennsylvania Department of Environmental Protection's (PADEP's) *"Land Recycling and Environmental Remediation Standards Act"* (Act 2) of July, 1995, as amended; the Corrective Action Process under the Pennsylvania Storage Tank and Spill Prevention Act (25 PA Code Chapter 245.301 – 245.313, Corrective Action Process); and the PADEP's Groundwater Monitoring Guidance Manual dated December 1, 2001. A Photograph Log is included as Appendix B. LaBella Associates, P.C. representative resumes are included as Appendix C to this report.

1.2 Purpose of this Remedial Action Plan

On January 9, 2018, LaBella submitted a Final Site Characterization Report (FSCR) to PADEP summarizing site characterization activities conducted between October 2015 and December 2017. In a March 15, 2018 letter to Pump-N-Pantry, PADEP approved the FSCR without comment. A copy of the PADEP approval letter is included in Appendix D. The FSCR included a preliminary review of feasible remedial alternatives. Based on this preliminary review, LaBella and the project stakeholders selected oxygen injection as the most viable remedial alternative to remediate groundwater contamination at the subject property.

Between June 1, 2018 and July 31, 2018, LaBella completed an oxygen injection pilot test at the Site. The pilot test activities were completed in accordance with the April 25, 2018 Pilot Test Work Plan that was submitted to USTIF for review. Injection wells and monitoring points were installed on June 11-13, 2018. Oxygen was injected in three (3) injection wells between June 29, 2018 and July 16, 2018. During the pilot test, LaBella monitored dissolved oxygen (DO), oxidation reduction potential (ORP), pH, etc. LaBella collected pre-pilot test and post-pilot test groundwater samples for bioactivity analyses from wells upgradient and within the treatment cell.

The results of the pilot test program indicated oxygen injection was not a viable remedial alternative to mitigate petroleum-related impacts to subject property soil and groundwater. Based on this finding, LaBella prepared a RAPR dated October 5, 2018 to: (1) summarize the site characterizations activities and routine groundwater monitoring activities conducted to date: (2) detail the field activities and findings of the oxygen pilot test; and (3) provide an alternative remedial technology to address the soil and groundwater contamination present at the subject property. As discussed in subsequent sections of this RAP, a soil vapor extraction/air sparging (SVE/AS) pilot test was proposed to evaluate its effectiveness to mitigate petroleum-related impacts to Site soil and groundwater quality. Remedial alternatives were evaluated using the following key considerations.

- Cost-effectiveness
- Proven performance
- Public & environment protectiveness
- Regulatory compliance
- Reliability
- Practical implementation
- Health & safety
- Effects on public health & the environment

As discussed above, oxygen injection was determined to not be a viable remedial alternative to address petroleum-related impacts to soil and groundwater quality at the Site. Based on this conclusion, LaBella submitted a Feasible Remedial Alternative Analysis to PADEP as part of the October 5, 2018 RAPR. As indicated in the RAPR, LaBella and the project stakeholders selected soil vapor extraction/air sparging (SVE/AS) as the remedial alternative to address petroleum-related impacts to soil and groundwater quality at the subject property.

In August 2018, LaBella prepared a Work Plan to complete a combined SVE/AS pilot test at the Site. This Work Plan was submitted to USTIF for review. Comments were received from USTIF on October 25, 2018. The objective of pilot testing was to evaluate the feasibility of SVE/AS as an *in-situ* remedial option, targeting the portions of the site where VOC-impacted soil (i.e. Smear Zone soils) and/or groundwater are above the applicable Act 2 non-residential used aquifer (TDS <2,500 mg/l) SHS MSCs. The SVE/AS test points were installed on November 28-29, 2018. The associated pilot test was conducted on December 18-20, 2018. The results of this pilot test are provided in subsequent sections of this RAP.

1.3 Site Location and Legal Description

The Site is located at 99 Grow Avenue in Bridgewater Township, Susquehanna County, Pennsylvania. The Leighter Corporation currently owns the Site. Refer to Appendix A for a Susquehanna County Tax Map (**Figure 2**) depicting the Site. Refer to Appendix E for a copy of the current deed for the property. The Site consists of one parcel of land, as summarized in Table 1-1:

Table 1-1
Pump-N-Pantry #001 Property
Summary of Parcel Information

Parcel / Map Number	Lot Size	Instrument Number
124.15-1,001.00	5.18 acres	201301311

1.4 Site Description

The 5.18-acre Site is developed with an approximately 3,600-square foot wood-framed office building, a convenience store building (~6,000 square feet), two fuel island dispenser canopies, and five (5) associated UST systems. The Site maintains PADEP Facility ID #58-13092 in association with the current UST systems. The Site is associated with PADEP Incident Numbers #48572 and #50143. USTIF Claim Numbers #2015-0126(I) and #2017-0021(I) apply to these incidents, respectively. The Site is connected to public utilities, which include electricity (Penelec), potable water service (Pennsylvania American Water Company), and sanitary sewer (Montrose Municipal Authority). The convenience store building is heated via electric heat pumps.

The Site is located near a surface water drainage divide. The northernmost portion of the Site drains to the north while the majority of the site drains to the southwest. Review of the United States Geological Survey (U.S.G.S) 7.5-minute series Montrose East, Pennsylvania topographic quadrangle map indicates the average elevation of the Site is 1,650 feet above mean sea level (M.S.L.). Refer to Appendix A for a Site Sketch (**Figure 3**) and a Site Sketch with Aerial Overlay (**Figure 4**) depicting the subject property.

1.5 Storage Tank Investigation

1.5.1 Review of Historical Storage Tank Systems

In 2015, facility-wide upgrade activities were conducted at the Site, which included construction of the current convenience store building and the installation of the five (5) current UST systems. The historical convenience store building was razed and the historical UST systems were removed once the new store and USTs were in operation. A summary of the historical USTs is provided in Table 1-2, as follows:

Table 1-2
Pump-n-Pantry #001 Property
Summary of Historical UST Systems

Tank Number	Capacity (Gallons)	Product	Date of Closure
001	12,000	Gasoline	1996
002	15,000	Gasoline	1996
003	5,000	Kerosene	October 2015
004	5,000	Diesel Fuel	October 2015
005	5,000	Diesel Fuel	October 2015
006	10,000	Gasoline	October 2015
007	15,000	Gasoline	October 2015

As indicated in Table 1-2, Tanks #001 and #002 were closed during 1996. However, review of available documentation did not identify files pertaining to closure of the aforementioned storage tanks.

On October 22, 2015, Datom Products (Datom) of Dunmore, Pennsylvania completed the closure, via removal, of Tank #003 thru Tank #007 at the Site. During UST closure activities, 6,800 gallons of waste flammable liquids (gasoline and kerosene) was pumped from the five (5) tanks and transported to the Giant Resource Recovery facility located in Sumter, South Carolina where it was disposed of as hazardous waste. Following removal, the tanks and piping were transported to Mike's Scrap Yard located in Scranton, Pennsylvania for disposal. During UST closure activities, obvious petroleum contamination was observed in the vicinity of Tanks #004 and #005, which included deep pitting of Tank #004, petroleum-related vapors, a sheen on the groundwater table and stained tank backfill material. As part of UST closure activities, Datom collected twenty-five (25) soil and two (2) groundwater samples for laboratory analysis of selected petroleum constituents. Review of laboratory results indicated soil contamination, at concentrations exceeding applicable standards, was also associated with Tank #003, Tank #006, Tank #007 and the gasoline dispenser island. On October 21, 2015, Datom submitted a Notice of Reportable Release to PADEP and Bridgewater Township. In an October 23, 2015 letter to Pump-N-Pantry, PADEP issued a Notice of Violation (NOV) for the release (Incident #48572) and requested completion of site characterization activities to address the petroleum release at the Site.

1.5.2 Review of Current Storage Tank Systems

The Site maintains PADEP Facility ID #58-13092 for the five (5) UST systems. Tank #008 through Tank #010 are located in a common cavity off the southeastern corner of the convenience store building. Tank #011 and Tank #012 are located in a common cavity to the northeast of the convenience store building. These USTs are reportedly in compliance with respect to corrosion protection, leak detection and spill and overfill prevention. According to PADEP records (www.depreportingsvcs.state.pa.us), the most recent Facility Operations Inspection was conducted on September 21, 2016. A summary of the current UST systems is provided in Table 1-3, as follows:

Table 1-3
Pump-n-Pantry #001 Property
Summary of Current UST Systems

Tank Number	Capacity (Gallons)	Product	Date of Installation
008	20,000	Gasoline	04/16/2015
009	5,000	Gasoline	04/16/2015
010	7,000	Diesel Fuel	04/16/2015
011	20,000	Diesel Fuel	10/29/2015
012	5,000	Diesel Fuel	10/29/2015

1.6 Site Physiography

1.6.1 Regional Bedrock Geology and Hydrogeology

The Site is located in the Glaciated Low Plateau Section of the Appalachian Plateaus Physiographic Province of Pennsylvania. Review of the Bedrock Geologic Map of Pennsylvania (Berg 1980) indicates the Site is underlain by the Devonian-age Catskill Formation. Refer to Appendix A for a Bedrock Geology Map (**Figure 5**) depicting the Site.

The Catskill Formation is a complex geologic unit which has been divided into numerous members. However, for the purpose of this investigation, the Catskill will be addressed as an undifferentiated formation. Characteristically, the Catskill Formation is comprised of dark-grayish-red to reddish-brown shale, claystone, and siltstone; greenish-gray and dark-grayish-red, fine to medium grained sandstone; and yellowish to greenish-gray, medium to coarse grained sandstone and conglomerate (Geyer 1982). Small amounts of grayish-brown calcareous conglomerate and greenish-gray conglomerate mudstone are present locally. Cross-bedding, channeling, and cut-and-fill features are typical of the sandstone and conglomerate units. Siltstone predominates in the lower part of the formation.

Hydrologically, the Catskill contains numerous water-bearing sandstones, which in most localities can be reached by wells of moderate depth. Secondary porosity accounts for the majority of the available groundwater. Joints, fractures, and bedding plane partings provide a conduit through which groundwater flows within the formation. Most of the wells drilled into the Catskill yield from 5- 25 gallons per minute (gpm), with yields up to and in excess of 100 gpm being reported. Groundwater from the upper part of the Catskill formation is very soft and low in dissolved mineral matter. Although groundwater from the lower Catskill Formation is also of good quality, it may in some cases contain greater amounts of dissolved mineral matter. The Catskill Formation is an important source of groundwater throughout Susquehanna County.

As part of site characterization activities, Mr. Martin Gilgallon, P.G. of LaBella evaluated local geological features and collected structural geologic data. Local outcrops of the Catskill Formation were inspected. Structurally, the strike and dip of the bedding features was measured to be 350º / 05ºE. As such, the bedrock is fairly planar, as might be expected in the Appalachian Plateau. Two (2) distinct sets of joints were also observed within the area. The primary joint orientation was measured at 020º / 87ºE, while the secondary joint orientation is 091º / 89Sº. These joint sets are nearly vertical.

1.6.2 Surficial Geology

According to the *Surficial Geology of the Montrose East 7.5 Minute Quadrangle* (Braun 2009), the subject property is underlain by fill. Fill is described as rock fragments and/or soil material; typically in road, railroad, or dam embankments; up to several tens of feet thick. Braun (2009) also identifies an abandoned glacial meltwater

sluiceway traversing roughly north-south in the immediate location of the subject property. The depth to this feature is not noted on the map or in the text. However, erosion caused by this sluiceway could account for the abrupt lateral change from bedrock to glacial till observed at the Site. This sluiceway may also influence the flow of shallow groundwater at the Site. Refer to Appendix A for a Surficial Geology Map (**Figure 6**) depicting the subject property.

1.6.3 Site Soils Discussion

According to the United States Department of Agriculture, Soil Survey of Susquehanna County, Pennsylvania (Reber 1973), the soil types associated with the Site are Cut and Fill land, 0 to 35 percent slopes (Cu); the Lordstown and Oquaga channery silt loam, 12 to 20 percent slopes, moderately eroded (LkC2); and, the Wellsboro channery silt loam, 8 to 15 percent slopes, moderately eroded (WeC2). Refer to Appendix A for a Soil Conservation Survey Map (**Figure 7**) depicting the Site.

Cut and Fill land, 0 to 35 percent slopes, consists of areas that have been deeply excavated or filled. They are generally less than 30 acres in size. The largest areas are along highways where soil material has been cut away from hillsides and used as fill in the adjacent low areas. There are also areas of Cut and Fill land along railroads. A few small areas are in urban developments and in home and industrial building sites. Three small areas of strip mine spoil near Forest City, totaling less than 10 acres, were included in mapping.

The Lordstown Series consists of moderately deep well drained soils on nearly level to very steep uplands. They formed in glacial till derived from erosion of sandstone, siltstone, and shale. Typically, the surface layer is grayish brown channery silt loam approximately 5 inches thick. The subsoil from 5 to 24 inches is yellowish brown friable channery silt loam. The substratum from 26 to 30 inches is grayish brown friable very channery loam. Below 30 inches is thin bedded gray sandstone and siltstone bedrock.

The Wellsboro Series consists of deep, moderately well and somewhat poorly drained soils on uplands. They formed in glacial till derived from sandstone, siltstone and shale. Typically, these soils have a dark brown silt loam surface layer 7 inches thick. The subsoil layers from 7 inches to 22 inches are reddish brown, friable silt loam, loam, and channery loam. From 22 inches to 52 inches is a firm fragipan that is dark reddish brown and dusky red gravelly loam. The substratum from 52 inches to 63 inches is dusky red gravelly loam.

1.6.4 Surface and Subsurface Drainage Discussion

The Site is located within the Susquehanna River Basin. As such, it is anticipated that surface water runoff and groundwater baseflow generated at the Site discharges into the Susquehanna River.

The closest surface water feature to the southwest is an unnamed tributary (UNT) to Pettis Creek, which is located approximately 1,300 feet southwest of the Site. The UNT to Pettis Creek flows west to its confluence with Pettis Creek. Pettis Creek flows northwest to its confluence with the East Branch of the Wyalusing Creek. The East Branch of Wyalusing Creek flows in a westerly direction to its confluence with Wyalusing Creek. Wyalusing Creek flows in a southwesterly direction to its confluence with the Susquehanna River near Wyalusing, Bradford County, Pennsylvania. The Susquehanna River flows in a generally southerly direction to its confluence with the Chesapeake Bay in Havre De Grace, Maryland.

A review of the Special Protection Waters for Susquehanna and Bradford Counties, as listed in the Pennsylvania State Code Title 25 Chapter 93.9, indicates Snake Creek, the UNT to Pettis Creek, Pettis Creek, the East Branch of Wyalusing Creek, Wyalusing Creek, and the Susquehanna River are not classified as High Quality Cold Water Fisheries (HQ-CWF). The HQ-CWF classification protects the listed waterways via the application of a variety of strict water quality standards.

A subsurface storm water detention system is located southwest of the current gasoline dispensers and USTs in the southwestern portion of the Site. Storm water generated at the Site is introduced to the subsurface detention system and allowed to infiltrate into the shallow groundwater aquifer.

1.6.5 Wetlands Discussion

Wetlands are defined in Pennsylvania State Code, Title 25 Chapter 105 *Dam Safety and Waterway Management* rules and regulations as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas. Similarly, the PADEP defines a watercourse as "a channel or conveyance of surface water having defined bed and banks, whether natural or artificial, with perennial or intermittent flow" (as found in PA Code, Title 25 *Environmental Protection*, Chapter 105 *Dam Safety and Waterway Management*).

National Wetlands Inventory (NWI) Maps were reviewed as part of this investigation. NWI Maps are prepared by the U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services for the National Wetlands Inventory Program. Wetland areas are identified on the maps based upon the method specified in the Classification of Wetlands and Deep Water Habitats of the United States (An Operational Draft), Cowardin, et al, 1977. A detailed study of the groundwater and historical analysis may result in the revision of the wetland boundaries identified on the NWI maps, which are developed through photographic interpretation. In addition, some small wetland areas or those obscured by dense forests may not be included on this map. The NWI Map (Montrose East, Pennsylvania Quadrangle) does not identify wetlands at the Site. Refer to Appendix A for a NWI Map (**Figure 8**) depicting the study area.

1.7 Surrounding Land Use Investigation

LaBella conducted a visual reconnaissance of the areas surrounding the Site to identify indications of potential contamination. The Site is located within a well-developed section of Bridgewater Township, Susquehanna County, Pennsylvania. Refer to Appendix A for an Area Map (**Figure 9**) depicting the subject property. The surrounding land usage is as follows:

- **North:** The Site is bordered to the north by PA Route 29 (Grow Avenue) and commercial / industrial properties.

- **South:** The Site is bordered to the south by a PennDOT storm water retention basin and Crossley Road. Commercial properties and a bulk fuel distribution facility are located farther to the south across Crossly Road.

- **East:** The Site is bordered to the east by residential properties.

- **West:** The Site is bordered to the west by PA Route 29 (Grow Avenue). Commercial and industrial properties are located farther to the west across PA Route 29.

The results of the visual reconnaissance did not identify visible evidence of potential environmental impacts from surrounding properties.

2. SITE CHARACTERIZATION ACTIVITIES SUMMARY

2.1 Release History

According to the PADEP, there are two (2) open incidents at the Site. An Incident Identification Map (**Figure 10**) is included in Appendix A. The following summarizes the two incidents associated with the Site:

- **Incident #48572:** In 2015, facility-wide upgrade activities were conducted at the Site, which included construction of the current convenience store building and installation of the five (5) current UST systems. The historical convenience store building was razed once the current store was in operation and the pre-existing UST systems were closed via removal. In October 2015, Datom completed closure, via removal, of Tanks #003 thru Tank #007. Soil and groundwater contamination was detected during the closure of Tank #004. Datom collected twenty-five (25) soil samples and two (2) groundwater samples as part of the tank closure activities. Subsequent to the review of the analytical data, it was determined that soil contamination, at concentrations exceeding applicable Act 2 Medium-Specific Concentrations (MSCs), was also associated with Tank #003, Tank #006, Tank #007 and the gasoline dispenser island. Pennsylvania Underground Storage Tank Indemnification Fund (USTIF) Claim #2015-0126(I) applies to this incident. Note, this RAP has been completed in association with **Incident #48572.**

- **Incident #50143:** On January 31, 2017, approximately 250-300 gallons of unleaded gasoline was released when a passenger vehicle backed over a fuel line during a fuel delivery at the gasoline USTs by Rich Tank Lines. On February 6, 2017, Northridge Group, Incorporated (Northridge) excavated gasoline-impacted soil. Soil samples collected from the resultant excavation indicated that soil contamination has been remediated to applicable Act 2 cleanup standards. However, a groundwater sample collected from the resultant excavation reported benzene, naphthalene, and 1,2,4-trimethylbenzene (1,2,4-TMB) concentrations that exceeded their Act 2 MSCs. USTIF Claim #2017-0021(I) applies to this incident. With the exception of two (2) additional quarterly groundwater monitoring events that are being proposed, this RAP does not include proposed activities that are associated with **Incident #50143.**

The PADEP issued NOVs dated October 23, 2015 and February 7, 2017 for Incidents #48572 and #50143, respectively. The NOVs required completion of site characterization activities in accordance with the regulations promulgated under 25 PA Code Chapter 245 for the two (2) open incidents. In accordance with the PADEP correspondence dated February 28, 2017, it was acceptable to combine the site characterization activities for the two (2) open incidents into a single FSCR.

2.2 Project Parameters

For the purpose of the site characterization activities completed to date, the parameters of concern were limited to a combination of the Unleaded Gasoline, Diesel Fuel / Fuel Oil #2 and Kerosene Parameters specified in the April 1, 1998 PADEP Technical Document: Closure Requirements for Underground Storage Tank Systems, as amended December 15, 2012. The list of the "Project Parameters" is as follows:

- Benzene
- Ethylbenzene
- Cumene (Isopropylbenzene)
- MTBE
- Naphthalene
- Toluene
- Total Xylenes
- 1,2,4-TMB
- 1,3,5-TMB

2.3 Site Characterization Activities and Submittals

In January 9, 2018, LaBella submitted the FSCR to PADEP, which summarized site characterization activities conducted at the Site between October 2015 and December 2017. In a March 15, 2018 letter to Pump-N-Pantry, PADEP approved the FSCR. This report indicated quarterly groundwater monitoring would continue at the Site while a RAP was being prepared and implemented.

The Site Groundwater Investigation was conducted between August 19, 2016 and November 20, 2018. This investigation included: (1) collection and analysis of five (5) groundwater samples from UST excavations, test pits, and remedial excavations; (2) installation of fifteen (15) groundwater monitoring wells (MW-1 through MW-15); (3) completion of eleven (11) full or partial rounds of groundwater sampling; (4) interpretation of groundwater elevation and flow data; (5) transportation and disposal of investigation-derived wastes (IDW); and, (6) completion of aquifer testing. Note, the twelfth round of groundwater monitoring was conducted February 18-19, 2019. The associated analytical data was pending at the time of this RAP.

2.4 Results of Quarterly Groundwater Monitoring Activities

2.4.1 General

As indicated in the FSCR, LaBella has continued quarterly groundwater monitoring activities at the Site. The most recent quarterly groundwater monitoring activities (where analytical data is available) were conducted on November 19-20, 2018. The groundwater monitoring wells sampled as part of these activities are outlined in Table 2-1. Refer to Appendix A for a November 19-20, 2018 Groundwater Contour Map (**Figure 11**) that depicts the monitoring well locations.

Table 2-1
Pump-n-Pantry #001 (Montrose) Property
Groundwater Monitoring Well Locations

Well #	Location
MW-1	Subject Property
MW-2	Subject Property
MW-3	Subject Property
MW-4	Subject Property
MW-5	Subject Property
MW-6	Subject Property
MW-7	Adjacent Property to NW
MW-8	Adjacent Property to NW
MW-9	Adjacent Property to NW
MW-10	Subject Property

Table 2-1 (Continued)
Pump-n-Pantry #001 (Montrose) Property
Groundwater Monitoring Well Locations

Well #	Location
MW-11	Subject Property
MW-12	Subject Property
MW-13	Subject Property
MW-14	Subject Property
MW-15	Subject Property
OW-1	Tank Field Observation Well - Diesel
OW-2	Tank Field Observation Well - Diesel
OW-3	Tank Field Observation Well - Gasoline
OW-4	Tank Field Observation Well - Gasoline
RW-1	Recovery Well - Destroyed

2.4.2 Groundwater Monitoring Well Installations Summary

Between August 19, 2016 and August 24, 2016, LaBella installed groundwater monitoring wells MW-1 through MW-6 at the Site. The monitoring wells were installed by Eichelbergers, Inc. (Eichelbergers) of Mechanicsburg, Pennsylvania, a subcontractor to LaBella. On February 6-9, 2017, Odyssey Environmental Services, Inc. (Odyssey) of Dauphin, Pennsylvania, a subcontractor to LaBella, installed MW-10 at the Site (MW-10) and off-site monitoring wells (MW-7) on the Diaz Manufacturing and MW-8 and MW-9 on the People Security Bank properties. Monitoring wells MW-1 through MW-10 were installed to characterize the shallow groundwater aquifer in association with Incident #48572. On April 19-20, 2017 Odyssey installed monitoring wells MW-11 through MW-14 in the southern portion of the Site to characterize shallow groundwater quality for the petroleum release associated with Incident #50143. On September 13, 2017, Odyssey installed monitoring well MW-15 to determine if an area of groundwater contamination existed in the vicinity of MW-2 in association with Incident #48572. Refer to Appendix A for a Monitoring Well Location Map (**Figure 12**) depicting the locations of groundwater monitoring wells MW-1 through MW-15.

Each groundwater monitoring well was completed using a combination of hollow stem auger and air rotary drilling techniques. Each groundwater monitoring well was constructed by lowering PVC screen (0.010 slot) and PVC riser into the borehole. MW-1 through MW-6 were completed as 4-inch diameter Schedule 40 PVC wells, in anticipation of the presence of SPL. The remaining monitoring wells were completed as 2-inch diameter wells using Schedule 40 well screen and riser pipe. A sand pack consisting of No. 1 Morie sand was placed within the screened interval. A bentonite seal, consisting of hydrated bentonite pellets, was placed above the sand pack. Each well was completed with a flush grade manway with locking inner cap. Refer to Appendix F for copies of the Monitoring Well Logs associated with the well installations and to Appendix G for the Well Construction Details. A summary of the well construction information is included in Table 2-2, as follows:

Table 2-2
Pump-n-Pantry #001 Property
Well Construction Information

Well #	Depth	Screen Size	Screen Interval	Sand Size	Sand Interval
MW-1	21.0'	0.010 slot	20.64' – 3.64'	No. 1 Morie	21.0' – 2.64'
MW-2	21.0'	0.010 Slot	20.66' – 3.66'	No. 1 Morie	21.0' – 2.66'
MW-3	21.0'	0.010 Slot	20.16' – 2.16'	No. 1 Morie	21.0' – 2.16'
MW-4	21.0'	0.010 Slot	15.35' – 3.35'	No. 1 Morie	21.0' – 2.35'
MW-5	21.0'	0.010 Slot	20.32' – 3.32'	No. 1 Morie	21.0' – 2.32'
MW-6	21.0'	0.010 Slot	20.46' – 3.46'	No. 1 Morie	21.0' – 2.46'
MW-7	21.0'	0.010 Slot	20.23' – 3.23'	No. 1 Morie	21.0' – 2.00'
MW-8	20.5'	0.010 Slot	20.41' – 3.14'	No. 1 Morie	20.5' – 2.00'
MW-9	20.5'	0.010 Slot	19.80' – 2.80'	No. 1 Morie	20.5' – 2.00'
MW-10	21.0'	0.010 Slot	19.34' – 2.34'	No. 1 Morie	21.0' – 2.00'
MW-11	21.0'	0.010 Slot	20.56' – 3.56'	No. 1 Morie	21.0' – 2.00'
MW-12	21.0'	0.010 Slot	20.56' – 3.56'	No. 1 Morie	21.0' – 2.00'
MW-13	20.0'	0.010 Slot	19.09' – 3.09'	No. 1 Morie	20.0' – 2.00'
MW-14	20.5'	0.010 Slot	20.12' – 3.12'	No. 1 Morie	20.5' – 2.00'
MW-15	20.0'	0.010 Slot	19.60' – 2.60'	No. 1 Morie	20.0' – 2.00'

2.4.3 Groundwater Monitoring Well Development

Monitoring wells MW-1 through MW-15 were developed using hand-bailing and surge block methods. Development activities included monitoring pH, temperature and specific conductance of the groundwater effluent extracted from the wells. Well development was deemed complete when the pH, temperature and specific conductance had stabilized for a minimum of three (3) consecutive readings. Well development continued after chemical stabilization if field observations indicated the presence of sediment in the groundwater effluent. In accordance with the provisions of the PADEP's *Groundwater Monitoring Guidance Manual* (December 1, 2001 edition), the groundwater effluent generated during the well development activities was containerized onsite pending transportation and disposal considerations.

2.4.4 Groundwater Monitoring Well Sampling

Between October 2016 and November 2018, LaBella completed eleven (11) full or partial quarterly rounds of groundwater monitoring activities at the Site. The scope of work associated with the completion of groundwater sampling activities included purging groundwater monitoring wells using a combination of low flow / low stress (*ASTM D 6771-02*) and hand bailing methods. Purging activities included monitoring pH, temperature, specific conductance, dissolved oxygen and ORP of the groundwater effluent extracted from the wells. Well purging was deemed complete when pH, temperature and specific conductance had stabilized for a minimum of three (3) consecutive readings. In an attempt to characterize the contamination plume, intrinsic parameters including manganese, ferrous iron, nitrate and sulfate were collected in the field. Data was collected after purging activities were completed. Copies of well purging data generated by LaBella in November 2018 are included in Appendix H of this report.

Groundwater samples were collected and containerized in accordance with standard USEPA and PADEP protocols. Following collection, the groundwater samples and QA/QC field blanks were delivered to a PADEP-certified laboratory for analysis. The samples were analyzed for the Project Parameters specified above. In accordance with the provisions of the PADEP's *Groundwater Monitoring Guidance Manual* (December 1, 2001

edition), the groundwater effluent generated prior to March 22, 2017 was containerized and transported offsite for proper disposal. A summary of the groundwater sampling events is included in Table 2-3, as follows:

Table 2-3
Pump-n-Pantry #001 Property
Site Characterization Activities
Summary of Groundwater Sampling Events

Sample Date	Sample Locations	Parameters
10/19/2016	MW-1 thru MW-6, OW-1 and OW-2	Project Parameters
11/30/2016	MW-1 thru MW-6, OW-1 and OW-2	Project Parameters
2/22/2017	MW-1 thru MW-10, OW-1 and OW-2	Project Parameters
5/01/2017	MW-1 thru MW-14, OW-1 thru OW-4 & RW-1	Project Parameters
7/24/2017	MW-1 thru MW-14, OW-1 thru OW-4 & RW-1	Project Parameters
11/2/2017	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
12/5/2017	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
3/20/18	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
6/8/18	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
9/11/18	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
11/19/18	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters
2/18/19	MW-1 thru MW-15, OW-1 thru OW-4 & RW-1	Project Parameters

2.4.5 Disposition of Drilling and Sampling Wastes

Two (2) distinct waste streams were generated during site characterization activities. These waste streams included drill cuttings and well development / purge water. Drill cuttings that were generated during site characterization activities were either staged in 55-gallon open top steel drums or placed in a roll-off container for disposal under the existing FC-1 permit with Keystone Sanitary Landfill. Well development and purge water generated during quarterly groundwater monitoring events were either staged in 55-gallon closed top steel drums or treated with activated carbon and discharged onsite. Bulk drill cuttings were transported to the Keystone Sanitary Landfill by Diaz Disposal, LLC. Drummed drill cuttings and development / purge water were transported to the Waste Recovery Solutions, Inc. facility located in Myerstown, Pennsylvania for disposal as non-hazardous waste. Refer to Appendix I for copies of the drilling and sampling waste disposal documentation. Three (3) distinct waste transportation and disposal (T&D) events were completed, as summarized in Table 2-4, as follows.

Table 2-4
Pump-n-Pantry #001 Property
Site Characterization Activities
Summary of T&D Events

Transportation Date	Quantity of Drill Cuttings	# Aqueous Drums
August 26, 2016	(5.51) Tons Bulk	(0) Drums
March 22, 2017	(12) Drums	(8) Drums
August 20, 2018	(6) Drums	(0) Drums

2.4.6 Determination of Groundwater Flow

As part of site characterization activities, LaBella constructed groundwater contour maps to determine the principal direction of groundwater flow beneath the Site. LaBella used depth to groundwater elevation data collected during each of the eleven (11) previous quarterly groundwater sampling activities to create contour maps. Kiley Associates, LLC of Lakeville, Pennsylvania determined well casing elevations through a site survey. These elevations were referenced to an arbitrary datum established on the Site. The direction of groundwater flow was determined using EnviroInsite 5.0 software (copyright HydroAnalysis, Incorporated, 2007). A table summarizing historical depth to groundwater data and associated groundwater elevation information is provided in Appendix J. Copies of the groundwater contour maps are included in Appendix K. Site-specific observations are as follows.

- A review of local topography and local drainage patterns indicates the Site lies along a surface water divide. The surface water from the area of MW-1 and the current office building flows to the north-northeast toward Lake Montrose. Surface water from the majority of the Site flows to the south-southwest.

- The most recent groundwater contour map (i.e. November 19, 2018), which included all fifteen (15) monitoring wells, indicates the shallow groundwater beneath the Site flows to the southwest.

- The hydraulic gradient across the Site was determined for each set of data. The hydraulic gradient values ranged from 0.009 feet / foot to 0.018 feet / foot. The average hydraulic gradient was calculated to be 0.016 feet / foot to the southwest.

- One (1) hydraulic gradient was calculated for the November 19, 2018 data set. The hydraulic gradient at the Site was determined to be **0.018 feet / foot** toward the southwest.

    - The hydraulic gradient (i) was determined using the groundwater elevations (h) associated with MW-2 (h_1) and MW-10 (h_2).

    - The distance (d) between these wells is 317 feet.

    - $(i) = (h_1-h_2) / d.$

    - $(i) = (1{,}649.14-1{,}643.45) / 317 =$ **0.018 ft/ft** (based on 11/19/18 data).

- Due to the absence of deep monitoring wells onsite, an evaluation of the vertical component of flow could not be determined.

2.4.7 Determination of Aquifer Parameters

On May 2, 2017, LaBella conducted slug tests on monitoring wells MW-2 through MW-14. In each case, an In-Situ Level Troll 700 data logger was placed in the well and set to record water level data at short-term intervals. Each test was started with the introduction of a solid PVC slug. The water level was then monitored through the data logger with a hand-held data recorder until the water level returned to static or near static (i.e. 95% recovery) levels. A slug-out test was then completed on each well by rapidly removing the slug from the saturated zone. The slug-out data was collected until static or near static levels (i.e. 95% of static) were achieved.

The slug test data generated at the Site was processed using "Aquifer Test" software designed by Waterloo Hydrogeologic (copyright 1996-1999). The Hvorslev Slug Test method was used to evaluate slug test data to estimate the hydraulic conductivity of the shallow groundwater aquifer beneath the Site. The Hvorslev Slug Test is based on the following equation:

$K = [r^2 \ln(L/R)] / 2LT_0$, where:

K = Hydraulic Conductivity
r = radius of well casing
R = Effective Radius
L = Length of Well Screen plus Filter Packing
T_0 = Time to Reach 37% of H_0

With the slug test, the portion of the aquifer "sampled" for hydraulic conductivity is small compared to a pumping test and is limited to a cylindrical area of small radius immediately surrounding the well boring. The Hvorslev Method can be applied to confined and unconfined conditions (Weight and Sonderegger, 2001). The results of the slug test analyses are included in Table 2-5. Refer to Appendix L for copies of the data associated with slug test calculations. The following assumptions were made during the data entry portion of the analyses:

1. Slug tests were completed on thirteen (13) monitoring wells (MW-2 through MW-14) located onsite and at adjoining properties. These wells were chosen to provide data from throughout the subject property. One (1) test was completed on each well. MW-1 was not tested due to very slow recharge and MW-15 had not yet been installed at the subject property.

2. MW-2 through MW-6 were completed as 4-inch diameter PVC wells. The radius of the well casing (r) for these wells is equal to 2" or 0.167 feet. The radius of the well boring (R) is equal to 4" or 0.33 feet. The length of the screened interval (L) equals the actual length of the screened interval. The values for L may vary from well to well depending on construction.

3. MW-7 through MW-14 were completed as 2-inch diameter PVC wells. The radius of the well casing (r) for these wells is equal to 1" or 0.083 feet. The radius of the well boring (R) is equal to 4" or 0.33 feet. The length of the screened interval (L) equals the actual length of the screened interval. The values for L may vary from well to well depending on construction.

4. Calculations of aquifer parameters from aquifer tests can, at best, be considered only estimates of the hydraulic properties of the aquifer near the test well (Davis 1989).

5. The Saturated Aquifer Thickness for each monitoring well was the total depth of the drilled borehole minus the static water level prior to the introduction of the "slug".

6. The water level at t=0 was determined based on the lowest water level recorded in the well subsequent to the removal of the "slug".

7. The slug-in data generated during these activities were not used for calculating the hydraulic conductivity values.

8. Due to the small intervals of groundwater fluctuation being observed, collection of hand-generated data was not feasible during the completion of the slug tests.

LaBella completed one slug-out test on the monitoring wells presented below. The resulting data was used to calculate the hydraulic conductivity of the shallow groundwater aquifer. These results are presented in Table 2-5, as follows:

Table 2-5
Pump-n-Pantry #001 Property
Site Characterization Activities
Hydraulic Conductivity (K) Data – Shallow Aquifer

Well #	K (ft/min)	K (cm/sec)
MW-2	2.64×10^{-2}	1.34×10^{-2}
MW-3	3.12×10^{-2}	1.59×10^{-2}
MW-4	5.23×10^{-2}	2.66×10^{-2}
MW-5	9.41×10^{-3}	4.78×10^{-3}
MW-6	1.18×10^{-3}	5.97×10^{-4}
MW-7	1.00×10^{-2}	5.09×10^{-3}
MW-8	2.08×10^{-3}	1.06×10^{-3}
MW-9	2.55×10^{-3}	1.29×10^{-3}
MW-10	2.40×10^{-4}	1.22×10^{-4}
MW-11	6.71×10^{-3}	3.41×10^{-3}
MW-12	4.71×10^{-3}	2.39×10^{-3}
MW-13	4.45×10^{-3}	2.26×10^{-3}
MW-14	7.25×10^{-3}	3.68×10^{-3}

A review of the hydraulic conductivity data indicates the K values calculated vary across the site by three orders of magnitude (when compared in ft/min) and are consistent with typical values for glacial deposits as presented by Driscoll (1986).

2.4.8 Temporal Trend Analysis

A temporal trend analysis was performed for key compounds in the shallow monitoring wells that have reported Project Parameter concentrations exceeding their Act 2 SHS MSCs. Time-series graphs were prepared for each of the key compounds. These graphs are included in Appendix M. A linear regression best-fit trend line was fit to the time-series data on each graph using the trend line function in MS Excel. The following trends in Table 2-6 have been identified based on a review of the time-series graphs:

Table 2-6
Pump-n-Pantry #001 Property
Groundwater Data – Trend Analysis

Well #	Compound	Trend	Concentration
MW-2	Benzene	Decreasing	Above MSC
	MTBE	Increasing	Below MSC
	1,2,4-TMB	Decreasing	Below MSC
MW-3	Benzene	Decreasing	Above MSC
MW-4	Benzene	Stable	Above MSC
MW-5	Benzene	Decreasing	Above MSC
	MTBE	Decreasing	Below MSC
	1,2,4-TMB	Decreasing	Below MSC
MW-15	Benzene	Decreasing	Above MSC
	Ethylbenzene	Decreasing	Below MSC
	Naphthalene	Decreasing	Below MSC
	Toluene	Decreasing	Below MSC
	1,2,4-TMB	Decreasing	Above MSC
OW-4	Benzene	Stable	Below MSC
	Ethylbenzene	Stable	Below MSC
	Toluene	Decreasing	Below MSC
	1,2,4-TMB	Decreasing	Below MSC
RW-1	Benzene	Decreasing	Below MSC

The groundwater plume has been horizontally delineated to the applicable MSCs. A review of the time-series graphs indicates contaminant concentrations are generally stable or declining. Based on the information provided in this section, no additional site groundwater characterization is required at the Site.

2.5 Review of Site Soil Investigation Activities

2.5.1 General

In October 2015, soil contamination was documented during UST closure activities. Subsequent test boring / soil sampling programs conducted by LaBella have identified soil contamination, in excess of applicable Act 2 Non-Residential SHS MSCs in the Vadose Zone and Smear Zone underlying the Site. Refer to Appendix N for copies of historical soil analytical data summary tables.

2.5.2 Discussion on the Vadose Zone Results

The results of site characterization activities identified soil contamination exceeding Act 2 non-residential MSCs in the Vadose Zone. The Vadose Zone contamination was generally associated with the historical product dispensers. Seven (7) soil exceedances were documented in the Vadose Zone. Five (5) of the seven (7) exceedances were excavated during interim soil interim remedial activities performed in June 2016. As such, two (2) vadose zone exceedances remain at the Site. These two (2) exceedances are associated with Incident #48572. No exceedances are currently association with Incident #50143. Refer to Appendix A for a Soil

Contamination Distribution Map – Vadose Zone (**Figure 13**). A summary of the remaining soil exceedances in the Vadose Zone is provided in Table 2-7, as follows:

Table 2-7
Pump-n-Pantry #001 Property
Soil Sample Analytical Data (mg/kg)
Summary of Soil Exceedances – Vadose Zone

Sample #	Depth	Parameter	Concentration	Act 2 MSC
SS-6	3.0'	Benzene	0.517 mg/kg	0.5 mg/kg
		Naphthalene	60.2 mg/kg	25.0 mg/kg
		1,2,4-TMB	75.0 mg/kg	35.0 mg/kg
		1,3,5-TMB	20.5 mg/kg	9.3 mg/kg
SS-11	3.0'	Naphthalene	27.3 mg/kg	25.0 mg/kg
		1,2,4-TMB	61.9 mg/kg	35.0 mg/kg
		1,3,5-TMB	18.5 mg/kg	9.3 mg/kg

The results of site characterization activities identified soil contamination above Act 2 non-residential MSCs in the Smear Zone. Smear Zone contamination was generally associated with the historical product dispensers. Eleven (11) soil exceedances were documented in the Smear Zone. Seven (7) of the eleven (11) exceedances were excavated during the interim soil remediation activities conducted in June 2016. The four (4) remaining Smear Zone exceedances are associated with Incident #48572. No exceedances are currently associated with Incident #50143. Refer to Appendix A for a Soil Contamination Distribution Map – Smear Zone (**Figure 14**). A summary of the remaining soil exceedances in the Smear Zone is provided in Table 2-8, as follows:

Table 2-8
Pump-n-Pantry #001 Property
Soil Sample Analytical Data (mg/kg)
Summary of Soil Exceedances – Smear Zone

Sample #	Depth	Parameter	Concentration	Act 2 MSC
TB-7B	4.5' – 5.0'	Benzene	2.15 mg/kg	0.5 mg/kg
		Naphthalene	19.9 mg/kg	10.0 mg/kg
		1,2,4-TMB	25.3 mg/kg	6.2 mg/kg
TB-10B	3.0' – 3.5'	Benzene	1.61 mg/kg	0.5 mg/kg
		1,2,4-TMB	28.2 mg/kg	6.2 mg/kg
TB-11B	3.0' – 3.5'	Benzene	1.85 mg/kg	0.5 mg/kg
		1,2,4-TMB	47.5 mg/kg	6.2 mg/kg
MW-8B	4.0' – 4.5'	1,2,4-TMB	9.08 mg/kg	6.2 mg/kg

In summary, the soil contamination present onsite has been horizontally delineated. Sample MW-8B exhibited Smear Zone contamination at concentrations exceeding Act 2 applicable cleanup standards for 1,2,4-TMB. Soil analytical data associated with sample MW-8A reported contamination in the Vadose Zone. Due to the presence of vadose zone contamination at MW-8, LaBella interprets that the smear zone exceedance in sample MW-8B is not related to the Site. Soil contamination has been vertically delineated to the permanently saturated zone.

This RAP has been prepared to address the contaminated groundwater present at the Site. Please note, the Vadose Zone exceedances identified at SS-6 and SS-11 are associated with soil attainment sampling conducted as part of the interim soil remediation activities. A review of the attainment data indicates the 75%-10x Statistical Rule has been satisfied and attainment for the site soils in the vadose zone has been demonstrated. Three (3) residual smear zone exceedances exist outside the June 2016 excavation.

2.6 Review of Vapor Intrusion Evaluation

LaBella completed a Vapor Intrusion Evaluation as part of site characterization activities. Site characterization activities included comparing soil and groundwater contaminant concentrations with applicable screening values and using applicable proximity distances at the Site. The results of this evaluation indicated there is no potentially complete Soil-Vapor Exposure Pathway or Groundwater-Vapor Exposure Pathway present at the Site. Therefore, no additional Vapor Intrusion Evaluation or mitigation is warranted at this time.

2.7 Interim Remedial Activities

2.7.1 Interim Remedial Actions for Soils

Interim soil remedial actions were completed at the Site for Incidents #48572 and #50143. A summary of soil remedial actions conducted for each incident is provided in the following sections.

2.7.1.1 Incident #48572

Two (2) interim soil remediation events were conducted in association with Incident #48572. These interim soil remediation activities were conducted during the October 2015 UST closure activities by Datom and the June 2016 interim soil remediation activities by Labella. The following summary is provided:

- A total of 1,432.82 tons of contaminated soil was generated during the October 2015 UST closure activities. The contaminated soil was transported to Keystone Sanitary Landfill between November 24, 2015 and January 20, 2016.

- In March 2016, LaBella completed twenty-seven (27) test borings and collected fifty (50) soil samples to characterize and delineate the residual soil contamination following the October 2015 UST Closure activities. The results of this investigation were used to determine the extent of the June 2016 interim soil remediation activities conducted by Labella, as summarized in the following bullet.

- A total of 1,580.77 tons of contaminated soil was generated during the June 2016 interim soil remedial activities. The contaminated soil was transported to Keystone Sanitary Landfill between June 17, 2016 and June 27, 2016.

- In all, a total of 3,013.59 tons of impacted soil was transported offsite for proper disposal.

Soil attainment samples were collected following completion of the June 2016 interim soil remediation activities. Attainment sampling was conducted in accordance with the requirements included in 25 PA Code Chapter 250.707 (Statistical Tests). Specifically, the regulations pertaining to "sites" where there is a release resulting in the excavation of up to 3,000 cubic yards of contaminated soil were followed. Twelve (12) soil samples were collected from the remediation area in accordance with the Systematic Random Sampling Procedures set forth in the Act 2 Technical Guidance Manual. No samples were collected from the base of the excavation due to the presence of bedrock and / or groundwater. A review of attainment data indicates the 75%-10x Statistical Rule

has been satisfied and attainment for the site soils in the vadose zone has been demonstrated. Three (3) residual smear zone exceedances exist outside the June 2016 excavation.

2.7.1.2 Incident #50143

One (1) interim soil remediation event was conducted for Incident #50143. These interim soil remediation activities were conducted in February 2017 by Northridge. The following summary is provided:

- A total of 26.06 tons of contaminated soil was excavated by Northridge during the February 2017 interim soil remediation activities.

Upon completion of February 2017 interim soil remediation activities, Northridge collected five (5) biased soil samples from the final excavation. Analytical results from these samples indicated attainment for the site soils has been demonstrated in this area.

2.7.2 Interim Remedial Actions for Groundwater

2.7.2.1 General

Interim groundwater remedial actions have been conducted at the Site. These activities were conducted for Incidents #482572 and #50143. A summary of groundwater remedial actions conducted for each incident is provided in the following sections.

2.7.2.2 Incident #48572

One interim groundwater remediation event was conducted in association with Incident #48572. During the October 2015 UST Closure Activities, a total of 25,300 gallons of petroleum-impacted groundwater was pumped by Datom. This water was treated onsite with activated carbon and discharged to the local POTW under permit from the local sewer authority.

2.7.2.3 Incident #50143

One interim groundwater remediation event was conducted for Incident #50143. Subsurface impacts at observation well OW-4 were identified during previous sampling events at the Site. In response, Labella completed one High Vapor Extraction Event (HVE) at OW-4 on September 13, 2017. Advanced Oil Recovery of Milford, Pennsylvania provided the vacuum truck and disposal services. During the HVE event, depth to water and vacuum readings were collected at OW-4 and the surrounding monitoring / observation wells. Vacuum readings and PID readings of the air effluent from the vacuum truck were also recorded. The following observations are provided:

- A total of 1,622 gallons of water was extracted from OW-4 over a 7.7 hour period.
- Groundwater at OW-4 was drawn down 0.45’ over the 7.7 hour HVE event.
- The vacuum truck operated at an average of 7.6 inches of mercury. This translated to an average of 0.87 inches of mercury at OW-4.
- No vacuum influence was observed in the surrounding monitoring / observations wells.
- PID readings collected form the air effluent of the vacuum truck indicated volatile organic compound (VOC) concentration decreased during the HVE event at OW-4.

- Subsequent sampling of OW-4 indicates groundwater contamination in the vicinity of OW-4 has been remediated to below the statewide health standards.

- Test borings conducted in the vicinity of OW-4 (TB-28 through TB-31) confirmed that soil has not been impacted in the vicinity of OW-4.

3. REVIEW OF REMEDIAL OPTIONS

3.1 General

The following sections provide a summary of the remedial alternatives considered to lower the concentrations of target compounds in the Smear Zone soil and groundwater to demonstrate attainment of the Statewide Health Standard at the Site.

3.1.1 Monitored Natural Attenuation

Natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are allowed to reduce contaminant concentrations to acceptable levels. Monitored natural attenuation (MNA) is not a "technology" per se, and there is significant debate among technical experts about its use at hazardous waste sites. Consideration of this option usually requires modeling and evaluation of contaminant degradation rates and pathways and predicting contaminant concentration at downgradient receptor points, especially when the plume is still expanding / migrating. The primary objective of site modeling is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations below regulatory standards or risk-based levels before potential exposure pathways are completed. In addition, long term monitoring must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with meeting cleanup objectives.

Compared with other remediation technologies, MNA has the following advantages:

- Less generation or transfer of remediation wastes;
- Less intrusive as few surface structures are required;
- May be applied to all or part of a given site, depending on site conditions and cleanup objectives;
- Natural attenuation may be used in conjunction with, or as a follow-up to, other (active) remedial measures; and
- Overall cost will likely be lower than active remediation.

Limitations include:

- Data used as input parameters for modeling need to be collected;
- MNA is not appropriate where imminent site risks are present. For example, it will not immediately address the migration of contaminants beyond the POC;
- Contaminants may migrate before they are degraded;
- Institutional controls may be required, which may not be desirable to the property owner or the owners of adjacent properties;
- Long term monitoring and associated costs;
- Longer time frames may be required to achieve remediation objectives, compared to active remediation;
- The hydrologic and geochemical conditions amenable to natural attenuation may change over time and could result in renewed mobility of previously stabilized contaminants and may adversely impact remedial effectiveness.

The suitability of monitored MNA is low to moderate since groundwater contamination has already migrated to the POC. However, the contaminant plume appears to be stable and groundwater trends for reported contaminants (i.e. BTEX, MTBE, naphthalene, 1,2,4-TMB) appear to be decreasing.

3.1.2 Excavation or Excavation Coupled with Groundwater Remediation

The excavation of contaminated soil is an ex-situ technology that includes the excavation of the contaminated soils with offsite disposal or treatment at a properly permitted facility. In some instances (usually with larger quantities of contaminated soil), the excavated material is treated onsite. The area of excavation is determined via the review of soil analytical data generated during the site characterization activities, in conjunction with the completion of field screening during the actual excavation process. Soil samples, collected in accordance with PADEP guidelines and regulations, are collected for analysis upon the completion of the excavation activities. The soil sample results are utilized to demonstrate the attainment of a selected cleanup standard. The excavation process would remediate the soils in the Vadose Zone and the Smear Zone (i.e. the periodically saturated soils located above the Permanent Zone of Saturation). The open cavity would allow for the pumping of any impacted groundwater or the application of a remedial solution such as bioremediation solutions, ORC® or In-Situ Chemical Oxidation (ISCO). The removal of contaminated soils would also eliminate the contaminant source material, thereby reducing groundwater contamination over time. The removal of contaminated soils would also eliminate any potentially complete soil-vapor exposure pathway, if present.

Compared with other remediation technologies, soil excavation with groundwater remediation has the following advantages:

- Low construction costs as compared to other technologies;
- Soil contamination is removed rapidly and attainment is demonstrated in a short period of time in the form of laboratory analytical results;
- No need to complete additional test boring program to verify the success of the remediation;
- No engineering costs, capital costs or operation and maintenance costs;
- Site disruption limited depending the extent of the work;
- May be applied to all or part of a given site, depending on site conditions and cleanup objectives;
- Will result in the remediation of the soil without the use of other active technologies.

Limitations include:

- Not applicable to larger sites where in-situ remediation of soil and / or groundwater become more cost effective;
- May not immediately remediate the groundwater to levels below the desired cleanup standards;
- Disruption of contaminated soils and groundwater may result in the limited migration of groundwater contamination away from the source.
- Due to the degree and distribution of groundwater contamination identified, the application of remedial solutions into an excavation cavity would not be sufficient to address the entire groundwater contamination issue.

To date, a total of 3,013.59 tons of petroleum-impacted soil has been excavated for offsite disposal. As a result, only three (3) residual Smear Zone exceedances exist. Therefore, the suitability of this remedial alternative is low since the residual soil contamination is limited to the smear zone soils. This remedial alternative alone would not address the contaminated groundwater.

3.1.3 Soil Vapor Extraction (SVE)

SVE is an in-situ vadose zone and smear zone soil remediation technology in which a vacuum is applied to the soil to induce the controlled flow of air and remove volatile and some semi-volatile contaminants from the soil. The gas leaving the soil may be treated to recover or destroy the contaminants, depending on local and state air

discharge regulations. Vertical extraction vents are typically used at depths of 1.5 meters (5 feet) or greater and have been successfully applied as deep as 91 meters (300 feet). Horizontal extraction vents (installed in trenches or horizontal borings) can be used as warranted by contaminant zone geometry, drill rig access, or other site-specific factors.

Compared with other remediation technologies, SVE has the following advantages:

- In-situ remediation, therefore less generation or transfer of remediation wastes (although vapors need to be remediated before discharge to the atmosphere);
- Once the system is installed, little to no disruption of day-to-day site operations;
- May be applied to all or part of a given site, depending on site conditions and cleanup objectives;
- May be used in conjunction with, or as a follow-up to, other remedial measures such as Monitored Natural Attenuation, and;
- May result in the remediation of the shallow groundwater without the use of other active technologies.

Limitations include:

- May not completely remediate shallow groundwater resulting in the need for additional groundwater remediation activities or a site-specific closure on the groundwater, which is not desired;
- Engineering costs, construction costs, capital costs and operation and maintenance (O&M) costs are generally high;
- Due to the extent of the groundwater contaminant plume at the Site, the high engineering costs, construction costs, capital costs and O&M costs may result in a high unit cost for remediation;
- Need to complete additional test boring program to verify the success of the remediation in soil;
- Longer time frames to achieve remediation objectives for soil, as compared to the excavation option.

The suitability of SVE alone is low since soil contamination is limited to the smear zone soils. It is probable that SVE alone will not adequately remediate the contaminated groundwater present at the site.

3.1.4 Air Sparging Coupled with Soil Vapor Extraction

Air sparging, which would involve the injection of air to expedite the volatilization of the contaminants, is often associated with soil vapor extraction. In general, the SVE system is designed as indicated above. The air sparge points would be installed into the shallow groundwater table, resulting in the injection of air and remediation of shallow groundwater contamination in concert with the soil contamination.

Compared with other remediation technologies, air sparging coupled with soil vapor extraction has the following advantages:

- In-situ remediation, therefore less generation or transfer of remediation wastes (although vapors need to be remediated before discharge to the atmosphere);
- Once the system is installed, little to no disruption of day-to-day site operations;
- May be applied to all or part of a given site, depending on site conditions and cleanup objectives;

Limitations include:

- May not completely remediate the shallow groundwater resulting in the need for additional groundwater remediation activities or a site-specific closure on the groundwater, which is not desired;
- Engineering costs, construction costs, capital costs and operation and maintenance (O&M) costs are generally high;
- Due to the extent of the groundwater contaminant plume at the Site, the relatively high engineering costs, construction costs, capital costs and O&M costs will result in a high unit cost for remediation;
- Longer time frames to achieve remediation objectives, as compared to the excavation option.

The suitability of SVE/AS to address soil and groundwater contamination at the Site is moderate to high. This technology would address both soil and groundwater contamination concurrently. In addition, the operation of this system would be feasible despite the presence of physical restrictions such as the USTs, lines and dispensers which may limit or prohibit the use of other technologies such as ISCO and soil excavation. A pilot test would be required to further evaluate the suitability of this remedial technology.

3.1.5 Groundwater Pump and Treat

Aboveground treatment of groundwater is generally accomplished by bringing the groundwater to the surface where it can be treated (i.e., pump and treat). Groundwater is then either disposed or discharged into the subsurface. Prior to the discharge into the subsurface, groundwater must be run through an activated carbon treatment system or air stripper capable of removing petroleum compounds to regulatory levels.

In addition, remediation by pump and treat is a slow process and cleanup times are often very long. System design, such as pumping rate, is one factor to consider when estimating cleanup times. A system pumping at very low rates may have a very long predicted cleanup time, while one operating at higher rates may have a shorter predicted cleanup time. Also, estimating the cleanup time is difficult and is subject to a large number of uncertainties; typical methods used to calculate cleanup time often result in underestimates because they neglect processes that can add years to the cleanup.

Groundwater pump and treat is generally not suited to geological formations with moderate to low permeability. In general, groundwater pump and treat is generally an inefficient method of groundwater remediation and today is used more as a means to hydraulically control migration of the contaminant plume as opposed to serving as a primary means of remediation. Therefore, the suitability of groundwater pump and treat as a remedial option is low at the Site.

3.1.6 Chemical Oxidation

The chemical oxidation process involves free radical generation and direct oxidation. Contaminants are treated in-situ and are converted to innocuous and/or naturally occurring compounds (i.e. H_2O, CO_2, O_2, halide ions). As a side benefit, aerobic biodegradation of contaminants can benefit from the increase in dissolved oxygen released through peroxide degradation. Oxidation of contaminants involves a variety of competing reactions as follows (where RH is the contaminant of concern):

$$H_2O_2 + OH\bullet \rightarrow H_2O + HO_2\bullet$$
$$RH + OH\bullet \rightarrow H_2O + R\bullet$$

Typically, a 5% hydrogen peroxide solution would effectively reduce the contaminant concentrations to levels below Act 2 non-residential used aquifer SHS. In-situ chemical oxidation (ISCO) involves addition of chemical reagents into groundwater via injection wells. The reagents attack petroleum contamination by chemical oxidation which breaks the organic compounds down into smaller molecules that are innocuous in nature. The reagents may be hydrogen peroxide or permanganate which are effective oxidizing agents. The process involves free radical generation and direct oxidation. The oxidation process is fast acting, taking several days to a few weeks. Contaminants are treated in situ and are converted to innocuous and/or naturally occurring compounds (i.e. H_2O, CO_2, O_2, halide ions).

The effectiveness of ISCO may be limited by low soil permeability, subsurface heterogeneities, and highly alkaline soils where carbonate ions are free radical scavengers. Low soil permeability may be overcome with the use of hydraulic fracturing of the subsurface geology or an increase in injection point density. The reagent may also be consumed by natural organic matter or by reduced inorganics before effectively treating the contamination of concern. To perform the chemical oxidation, a pH between 2 and 4 is preferable, but not necessary. If necessary, the pH of the groundwater may be lowered by using acetic acid to achieve the desired range.

The potential side effects of ISCO remediation include evolution of gas, increase in temperature, resolubilization of reduced metals and reduction in biomass. Due to a possible increase in pressure, there is a potential for an explosion if the peroxide is added at a concentration greater than 10% by weight. Since there are active USTs at the site, the risks associated with the evolution of gas and increased temperature are unacceptable. Therefore, ISCO is not a suitable technology for subject property.

3.1.7 Enhanced Aerobic Biodegradation - Injection of Oxygen Release Compounds (ORC)

Via the collection of in-situ groundwater data (i.e. DO and ORP), as well as the analysis of intrinsic parameters such as Manganese, Ferrous Iron, Nitrate and Sulfate, LaBella has demonstrated that natural aerobic and anaerobic biodegradation is occurring at the subject property. Aerobic biodegradation will dominate until such time that dissolved oxygen levels are reduced, at which point anaerobic degradation takes over. Enhanced aerobic biodegradation involves adding oxygen (an electron acceptor) to groundwater and/or soil to increase the number and vitality of indigenous microorganisms performing biodegradation. Regenesis of San Clemente, California has developed a proprietary calcium oxy-hydroxide based material, ORC-Advanced™, which releases up to 17% of its weight as molecular oxygen. This release of oxygen is used to accelerate naturally occurring in-situ bioremediation of petroleum hydrocarbons, and certain fuel oxygenates such as MTBE, by indigenous microorganisms in the subsurface. This use of this remedial technique is advantageous for the following reasons:

- Low capital costs when compared to other remedial alternatives since there are no large scale capital equipment costs, no engineering costs and no O&M costs.

- There are no costs associated with completion of bench-scale or pilot-scale testing, nor are any costs associated with the evaluation of system performance such as with groundwater extraction wells or vapor extraction systems.

- Site disruption is minimal. ORC Advanced™ injection points can be completed within one (1) week, with the release of oxygen occurring over a 9- to 12-month period.

- The use of ORC Advanced™ and enhanced bioremediation has a proven track record in the remediation of hydrocarbon-based contamination.

- There are no ongoing waste streams associated with the use of ORC Advanced™, thereby reducing overall project costs.

- There are no limiting factors associated with the use of ORC Advanced™ in proximity to USTs, product feed lines or dispensers.

The suitability of enhanced aerobic biodegradation is low to moderate at the subject property. Generally, LaBella has experienced limited success with this technology at sites under the same geographical and hydrogeological conditions.

3.1.8 Oxygen Injection

The injection of pure oxygen into groundwater using oxygen generators is a patented groundwater remediation process (U.S. Patent No. 5,874,001) developed by Matrix Environmental Technologies, Inc. (Matrix). It is a proven remediation technique for sites in which physical remediation processes (such as air sparging) are no longer effective or efficient, thus a biological process is more favorable. Oxygen injection rapidly enhances the biodegradation of organic contaminants such as petroleum hydrocarbons and most chlorinated solvents biodegradable under aerobic conditions. The system produces 95% oxygen, which is injected at flow rates and pressures to achieve breakout only. The primary mechanisms of oxygen transport are advection and dispersion, the same mechanisms that facilitated contaminant migration. The dissolution of nearly pure oxygen at a controlled rate has resulted in measured dissolved oxygen concentrations up to 40 mg/L. Oxygen injection is suitable for shallow groundwater conditions since there is no generation of hazardous vapors eliminating the need for vapor control. Biodegradation of MTBE and TBA, fuel additives that degrade slowly or not at all under anaerobic conditions, has been optimized at many sites.

Oxygen injection provides a very efficient process to stimulate the aerobic biodegradation of groundwater contaminants and may be applicable to the site. In addition, the use of oxygen injection will not adversely impact the groundwater or nearby surface waters. The suitability of this technology was believed to be moderate to high to address the groundwater and soil contamination. However, the results of a pilot test conducted in June and July 2018 indicated oxygen injection is not a suitable remedial technology for the subject property. Details of the oxygen injection pilot test are provided in Section 4.0 of this RAP.

3.2 Chosen Remedial Alternative for Smear Zone Soils and Groundwater

Based on the comparison of potential remedial technologies, LaBella and the project stakeholders selected SVE/AS as the optimal remedial approach subject. A pilot test was conducted (see Section 5.0) to evaluate the effectiveness of this remedial approach at the subject property.

4. OXYGEN INJECTION PILOT TESTING

4.1 General

As indicated above, oxygen injection was selected as a potential remedial technology based on a review of available remedial technologies. In April 2018, LaBella prepared a Work Plan to complete an oxygen injection pilot test at the Montrose Pump-n-Pantry #001 Property. The objective of pilot testing was to evaluate the feasibility of Oxygen Injection as an *in-situ* remedial option, targeting the portions of the site where VOC-impacted soil (i.e. smear zone soils) and/or groundwater are above the applicable Act 2 Non-Residential, Used Aquifer (TDS <2,500 mg/l) SHS. The results of the oxygen injection pilot test indicated this technology was not suitable to address the soil and groundwater contamination at the subject property. A summary of the pilot test results was provided in a RAPR dated October 5, 2018. Details associated with the oxygen injection pilot test are provided in Section 4.2, Section 4.3 and Section 4.4 of this RAP.

4.2 Installation of Pilot Test Injection & Monitoring Points

Between June 11, 2018 and June 13, 2018, Odyssey installed three oxygen injection points (designated IP-1 through IP-3) and three monitoring points (MP-1 through MP-3) at the Site. The injection and monitoring points were installed within the footprint of the historical gasoline dispensers. Refer to Appendix A for a Pilot Test Point Location Map (**Figure 15)** depicting the locations of these points.

Prior to the installing the injection and monitoring points, each proposed installation was cleared via air-knife excavation (i.e. soft dig) technology. Each test point was subsequently installed using a combination of hollow stem auger and air-rotary drilling techniques. Each pilot test point was constructed by lowering one-inch PVC screen and PVC riser into the borehole. A sand pack consisting of #1 silica sand was placed within the screened interval. A bentonite seal, consisting of hydrated bentonite pellets, was placed above the sand pack. Each point was completed with a flush grade manway with locking inner cap. Refer to Appendix O for copies of the Test Boring Logs associated with the test point installations and to Appendix P for well construction details. A summary of the well construction information is included in Table 4-1, as follows:

Table 4-1
Pump-n-Pantry #001 Property
Summary of Oxygen Injection Pilot Test Point Construction Details

Well ID	Diameter	Screen Size	Screen Interval	Sand Interval
IP-1	1”	0.010 Slot	8.0’ – 9.0’	7.0’ – 10.0’
IP-2	1”	0.010 Slot	8.0’ – 9.0’	7.0’ – 10.0’
IP-3	1”	0.010 Slot	8.0’ – 9.0’	7.0’ – 10.0’
MP-1	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’
MP-2	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’
MP-3	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’

In addition to the three (3) newly installed monitoring points, existing monitoring wells MW-2, MW-3, MW-4 and MW-15 were also used as observation points during pilot testing. MW-6 was used as the background well. The wells that were monitored range in distance from approximately 10 feet to 150 feet from the injection points.

The pilot test was designed to address groundwater contamination and Smear Zone soil contamination documented in the vicinity of the historical gasoline and diesel fuel dispensers at the subject property. The test points were located as follows:

- Injection points IP-1 through IP-3 were installed approximately 15 to 20 feet northeast of MW-2 within the groundwater plume. The injection points were installed along a line roughly perpendicular to Grow Avenue with a spacing of 12 feet.

- MP-1 was installed 10 feet northeast of the injections points within the groundwater plume. This monitoring point was used to document influence hydraulically upgradient of the injection points.

- MP-2 and MP-3 were installed 12 feet and 24 feet southwest of the injection points within the groundwater plume, respectively. These monitoring points were installed to document influences hydraulically downgradient of the injection points.

- Injection and monitoring points were completed into the zone of saturation. The scope of work associated with completing pilot test point development activities included developing the injection and monitoring points using hand-bailing methods. Refer to Appendix Q for field notes preparing during development of the pilot test monitoring points. In accordance with the provisions of the PADEP's *Groundwater Monitoring Guidance Manual* (December 1, 2001 edition), drill cuttings were containerized onsite pending transportation and disposal considerations. Groundwater effluent generated during the point test point development was treated on-site with granular activated carbon (GAC) and discharged to the pavement at the subject property.

4.3 Completion of the Oxygen Injection Pilot Test

4.3.1 General

In accordance with the Work Plan dated April 25, 2018, LaBella completed pilot testing at the site between June 29, 2018 and July 31, 2018. Pilot testing was performed to evaluate whether oxygen injection was an effective remedial measure to mitigate groundwater and Smear Zone soil contamination at the Site.

4.3.2 Baseline Monitoring

On June 29, 2018, LaBella collected baseline monitoring data from injection points IP-1 through IP-3, monitoring points MP-1 through MP-3, and monitoring wells MW-2, MW-3, MW-4, MW-6 and MW-15. Baseline monitoring included measuring DO, ORP, pH, specific conductance, temperature, and water levels in the aforementioned injection/monitoring points, and monitoring wells. Baseline data was tabulated and is included in **Table R-1** in Appendix R.

In addition to baseline monitoring data, LaBella collected two (2) bacteria samples on June 28, 2018 to document bioactivity upgradient and within the treatment cell prior to the test. Following collection, the two (2) bacteria samples were submitted to Microbial Insights located in Knoxville, Tennessee for analysis of Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase, and Total Eubacteria. These samples were collected to document bioactivity upgradient and within the treatment cell. A sample log is included in Table 4-2, as follows:

Table 4-2
Pump-n-Pantry #001 Property
Sample Log – Pre-Pilot Test Bioactivity

Sample ID	Location	Parameters
1845-0628-MW6	MW-6	Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase and Total Eubacteria
1845-0628-MP2	MP-2	Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase and Total Eubacteria

4.3.3 Oxygen Injection Pilot Testing

Oxygen injection pilot testing was conducted between June 29, 2018 and July 16, 2018. During this period, oxygen was injected into injection points IP-1 through IP-3. The injection cycle included injecting oxygen for 10 minutes at IP-1 followed by a 2-hour recharge period. Oxygen was then simultaneously injected into IP-2 and IP-3 for 10 minutes followed by a 2-hour recharge period prior to restarting the cycle at IP-1. Pilot test activities and results are summarized below:

- Prior to startup, LaBella collected background field data. This data is tabulated and included in **Table R-1** in Appendix R.

- Active oxygen injection was initiated on June 29, 2018. LaBella collected DO and ORP twice per week during operation. This data is tabulated and included in **Table R-1** in Appendix R.

- System O&M was performed routinely. These activities included documenting system pressures, flow rates and oxygen purity. System O&M also included refueling the generator and checking the system for leaks. System O&M notes are summarized in **Table S-1** in Appendix S. On average, IP-1 through IP-3 were injected at 30.5 SCFH, 32.0 SCFH and 26.3 SCFH, respectively. The average oxygen purity was 78.7%.

4.3.4 Oxygen Injection System Shutdown

The oxygen injection system was shut down on July 16, 2018. LaBella continued the collection of DO and ORP data following shutdown. DO and ORP data was collected twice during the week the system was shut down and once per week for the following two (2) weeks. This data is tabulated and included in **Table R-1** in Appendix R. On July 18, 2018, LaBella collected two (2) bacteria samples to document bioactivity upgradient and within the treatment cell following the oxygen injection activities. The two (2) bacteria samples were sent to Microbial Insights in Knoxville, Tennessee and were analyzed for Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase and Total Eubacteria. A sample log is included in Table 4-3, as follows:

Table 4-3
Pump-n-Pantry #001 Property
Sample Log – Post-Pilot Test Bioactivity

Sample ID	Location	Parameters
1845-0718-MW6	MW-6	Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase and Total Eubacteria
1845-0718-MP2	MP-2	Toluene Dioxygenase, Phenol Hydroxylase, Toluene Monoxygenase and Total Eubacteria

The bioactivity data was reviewed following the completion of the oxygen injection pilot test. This data is presented in Table 4-4. The laboratory analytical data sheets are included in Appendix T.

Table 4-4
Pump-n-Pantry #001 Property
Pilot Test Bioactivity Analytical Results

Sample Location	Parameter	Pre-Pilot	Post Pilot
MW-6	Toluene Dioxygenase	<1.28E+01	3.15E+02
(Background)	Phenol Hydroxylase	1.54E+02	8.16E+02
	Toluene Monoxygenase	2.33E+02	9.65E+02
	Total Eubacteria	2.80E+05	6.56E+05
MP-2	Toluene Dioxygenase	<3.23E+01	<5.00E+00
(GW Plume)	Phenol Hydroxylase	2.18E+04	5.64E+04
	Toluene Monoxygenase	8.70E+03	3.42E+04
	Total Eubacteria	1.15E+06	2.53E+06

4.4 Summary

The results of the Oxygen Injection pilot test suggest Oxygen Injection is not a viable remedial option for the subject property. The pilot test failed to increase dissolved oxygen within the treatment cell to the target concentration of 5-10 mg/l. In addition, the samples collected for bioactivity did not strongly indicate increased microbial utilization in the treatment area.

5. SVE/AS PILOT TESTING

5.1 General

As discussed above, oxygen injection was determined to not be a viable remedial alternative to address petroleum-related impacts to soil and groundwater quality at the Site. Based on this conclusion, LaBella submitted a Feasible Remedial Alternative Analysis (FRAA) Report to PADEP. As indicated in the FRAA dated October 5, 2018, LaBella and the project stakeholders selected soil vapor extraction/air sparging (SVE/AS) as the remedial alternative to address petroleum-related impacts to soil and groundwater quality at the subject property.

In August 2018, LaBella prepared a Work Plan to complete a combined SVE/AS pilot test at the Site. This Work Plan was submitted to USTIF for review; comments were received on October 25, 2018. The objective of pilot testing was to evaluate the feasibility of SVE/AS as an *in-situ* remedial option, targeting the portions of the site where VOC-impacted soil (i.e. Smear Zone soils) and/or groundwater are above the applicable Act 2 non-residential used aquifer (TDS <2,500 mg/l) SHS MSCs.

5.2 Installation of Pilot Test Extraction, Injection & Monitoring Points

On November 28-29, 2018, LaBella Environmental, LLC of Rochester, New York installed three SVE monitoring points (SVE-1 through SVE-3) at the Site. Injection Points IP-2 and IP-2, installed during the previous oxygen injection pilot test, were utilized as sparge wells. Monitoring Points MP-1 through MP-3, installed during the previous oxygen injection pilot test, were utilized to monitor SVE/AS influences. Refer to Appendix A for a SVE/AS Pilot Test Point Location Map (**Figure 16**) depicting the locations of these points.

Prior to initiating installing the SVE points, each proposed drilling location was cleared via air-knife excavation (i.e. soft dig) technology. Each test point was completed using hollow stem auger drilling techniques. After advancing the test point to total depth, each test point installation was constructed by lowering two-inch PVC screen and PVC riser into the borehole. A sand pack consisting of #00N silica sand was placed within the screened interval. A bentonite seal, consisting of hydrated bentonite pellets, was placed above the sand pack. All points were completed with a flush grade manway with locking inner cap. Injection points IP-2 and IP-3 were used as sparge points during the pilot test. Refer to Appendix U for copies of the test boring logs associated with the test point installations and to Appendix V for the Test Point Construction Details. A photograph log compiled as part of the field activities is presented in Appendix B. A summary of well construction information is included in Table 5-1, as follows:

Table 5-1
Pump-N-Pantry #001 Property
Summary of SVE/AS Pilot Test Point Construction Details

Well ID	Diameter	Screen Size	Screen Interval	Sand Interval
MP-1	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’
MP-2	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’
MP-3	1”	0.010 Slot	5.0’ – 10.0’	4.0’ – 10.0’
SVE-1	2”	0.010 Slot	2.0’ – 5.0’	1.5’ – 5.0’
SVE-2	2”	0.010 Slot	2.0’ – 5.0’	1.5’ – 5.0’
SVE-3	2”	0.010 Slot	2.0’ – 5.0’	1.5’ – 5.0’
IP-2	1”	0.010 Slot	8.0’ – 9.0’	7.0’ – 10.0’
IP-3	1”	0.010 Slot	8.0’ – 9.0’	7.0’ – 10.0’

The pilot test was designed to address soil and groundwater contamination documented in the northwestern portion of the Site. All the SVE/AS pilot test monitoring locations were located within and adjacent to the footprint of the historical gasoline USTs.

5.3 Completion of SVE/AS Pilot Test

5.3.1 General

In accordance with the Work Plan, LaBella completed pilot testing at the site on December 18-20, 2018. The purpose for the testing was to evaluate SVE/ AS as a combined remedial option to address petroleum-related impacts to soil and groundwater quality at the Site.

5.3.2 Baseline Monitoring

Prior to initiating the pilot test, baseline data monitoring was performed which included collecting readings from each of the soil vapor extraction wells (designated SVE-1 through SVE-3), monitoring points MP-1 through MP-3, injection points IP-1 through IP-3 and monitoring wells MW-2, MW-3, MW-5 and MW-6. These activities were conducted on December 18, 2018. Baseline monitoring included measuring temperature, DO, vacuum, water levels and PID readings. Baseline data is tabulated and presented as **Table W-1** in Appendix W. As indicated in **Table W-1**, elevated PID screening results (> 100 ppm) were recorded at SVE-1 (428.7 ppm), SVE-2 (1181.0 ppm), MW-5 (104.6 ppm) and MW-15 (236.3 ppm).

5.3.3 Completion of Soil Vapor Extraction Testing

The SVE system pilot test was operated to assess air flow rates achieved and approximate removal rates for VOCs. Separate pilot tests were completed at SVE-1, SVE-2, and SVE-3, which consisted of operating for 30-60 minutes at two (2) to three (3) different set points (i.e. steps). These activities were conducted on December 19, 2018. The soil vapor extraction pilot test results are tabulated and provided in **Table W-2**, **Table W-3** and **Table W-4** in Appendix W. The pilot test activities and results are summarized below:

SVE Pilot Test - SVE-1

- The first step was conducted between 0910 and 0940. During this time, the SVE blower operated at a vacuum of 2 inches of mercury and an air flow rate of 130 cubic feet per minute (SCFM). The PID reading at SVE-1 was 18.4 ppm. During this phase of the pilot test, notable influences (based on vacuum readings) were not observed.

- During the second step (0940-1156), the vacuum was increased to 2.6 inches of mercury and the air flow rate increased to 152 SCFM. The PID reading at SVE-1 increased to 42.5 ppm. During the second step of the pilot test of SVE-1, a noticeable influence was recorded at MP-2 (10.9 feet from SVE-1).

- During the third step (1156-1238), the vacuum was increased to 7 inches of mercury and the air flow rate decreased to 50 SCFM. The PID reading at SVE-1 increased to 95.6 ppm. During the third step of the SVE-1 pilot test, notable influences were recorded at SVE-2 (13.8 feet from SVE-1) and MW-15 (18 feet from SVE-1).

SVE Pilot Test - SVE-2

A two-step pilot test was completed at SVE-2.

- During the initial step test (1310-1407), the SVE system operated at a vacuum of 3.4 inches of mercury and an air flow rate of 147 SCFM. The PID reading at SVE-2 was recorded at 948 ppm. Notable influences were recorded at MW-15 (6.0 feet from SVE-2).

- During the second step of the SVE-2 pilot test (1407-1500), the vacuum was increased to 7 inches of mercury and the air flow rate was reduced to 50 SCFM. The PID reading at SVE-2 was recorded at 664 ppm. Notable influences were recorded at SVE-1 (13.8 feet from SVE-2), IP-3 (12.0 feet from SVE-2) and MW-15 (6.0 feet from SVE-2).

SVE Pilot Test - SVE-3

A two-step pilot test was conducted on SVE-3.

- During the initial step test (1505-1600), the SVE system operated at a vacuum of 3.7 inches of mercury and an air flow rate of 142 SCFM. The PID reading at SVE-3 was recorded at 1.1 ppm. Notable influences were recorded at MP-2 (15.0 feet from SVE-3), MW-2 (10.2 feet from SVE-3) and MW-3 (77.0 feet from SVE-3).

- During the second step of the SVE-3 pilot test (1500-1705), the SVE system operated at a vacuum of 6.8 inches of mercury and an air flow rate of 70 SCFM. The PID reading at SVE was recorded at 0.5 ppm. Notable influences were recorded at IP-3 (10.0 feet from SVE-3), MP-2 (15.0 feet from SVE-3), MW-2 (10.2 feet from SVE-3), MW-3 (77.0 feet from SVE-3) and MW-15 (22.0 feet from SVE-3).

5.3.4 Air Sparge Pilot Testing

The air sparge system pilot test was operated to evaluate air injection pressures, flow rates and approximate additional removal rates for VOCs (i.e. beyond the SVE only). Two (2) air sparge with soil vapor extraction pilot test were conducted. The first test utilized IP-3 as the sparge well while vapor was recovered at SVE-1 and SVE-3. The second test utilized IP-2 and IP-3 as sparge wells while vapor was recovered from SVE-1, SVE-2 and SVE-3. The air sparge with soil vapor extraction pilot test results are tabulated in Table W-5 through W-6 in Appendix W. Pilot test activities and results are summarized below:

Test 1 – Sparge at IP-3

The IP-3 air sparge pilot test was completed in three (3) steps with vapors recovered at SVE-1 and SVE-3, as follows:

- Step 1: 0910 hrs. to 1050 hrs.
- Step 2: 1050 hrs. to 1155 hrs.
- Step 3: 1155 hrs. to 1230 hrs.

- **Step 1:** Initially the air sparge system was operated at a pressure of 2 psi and a flow rate of 3.25 CFM. During this period, the SVE system operating at 6 inches of mercury and an air flow rate of 100 SCFM. PID readings of 167.3 ppm and 3.2 ppm were recorded at SVE-1 and SVE-3, respectively. During this phase of the test, measurable vacuum was recorded at MW-2 (15 feet from SVE-3), MW-2 (10.2 feet from SVE-3), MW-3 (77.0 feet from SVE-3) and MW-15

(18.0 feet from SVE-1). Measurable pressure from the air sparge system was recorded at MP-1 (9.0 feet from IP-3) and MP-3 (29.0 feet from IP-3).

- **Step 2:** The air sparge system was operated at a pressure of 2.6 psi and a flow rate of 4.40 CFM During this period, the SVE system operating at 5.8 inches of mercury and an air flow rate of 105 SCFM. PID readings of 181.0 ppm and 39.9 ppm were recorded at SVE-1 and SVE-3, respectively. This represents a slight increase in VOC recovery compared to Step 1. During this phase of the test, measurable vacuum was recorded at IP-1 (17.0 feet from SVE-3), MW-2 (10.2 feet from SVE-3) and MW-3 (77.0 feet from SVE-3). Measurable pressure from the air sparge system was recorded at SVE-2 (14.2 from IP-3), MP-1 (9.0 feet from IP-3), MP-2 (15.0 feet from IP-3), MP-3 (29.0 feet from IP-3) and MW-15 (17.0 feet from IP-3). During this step, a notable increase is DO was also observed at MW-15 (17.0 feet from IP-3).

- **Step 3:** The air sparge system was operated at a pressure of 4.4 psi and 9.43 CFM. During this period, the SVE system operating at 5.8 inches of mercury and an air flow rate of 105 CFM. PID readings of 164 ppm and 139.8 ppm were recorded for SVE-1 and SVE-3, respectively. During this phase of the test, measurable vacuum was recorded at MP-2 (15 feet from SVE-3), MW-2 (10.2 feet from SVE-3) and MW-3 (77.0 feet from SVE-3). Measurable pressure from the air sparge system was recorded at SVE-2 (14.2 from IP-3), IP-1 (24.0 feet from IP-3), IP-2 (12.0 feet from IP-3), MP-1 (9.0 feet from IP-3), MP-3 (29.0 feet from IP-3) and MW-15 (17.0 feet from IP-3). During this step, a notable increase is DO was also observed at MW-15 (17.0 feet from IP-3).

Test 2 – Sparge at IP-2 and IP-2

The IP-2/IP-3 air sparge test was completed in two steps with vapor recovered at SVE-1, SVE-2 and SVE-3 as follows:

- Step 1: 1300 hrs. to 1415 hrs.
- Step 2: 1415 hrs. to 1500 hrs.

- **Step 1:** Initially the air sparge system was operated at a pressure of 2.2 psi and 1.65 CFM at IP-2 and a pressure of 2.7 psi and 6.15 CFM at IP-3. During this period the SVE system operating at 4.9 inches of mercury and an air flow rate of 123 SCFM. PID readings of 191.2 ppm, 54.6 ppm and 393.6 ppm were recorded for SVE-1, SVE-2, and SVE-3, respectively. During this phase of the test, measurable vacuum was recorded at MP-2 (15 feet from SVE-3), MW-2 (10.2 feet from SVE-3), MW-3 (77.0 feet from SVE-3) and MW-15 (6.0 feet from SVE-2). Measurable pressure from the air sparge system was recorded at MP-1 (9.0 feet from IP-3) and MP-3 (25.0 feet from IP-3).

- **Step 2:** The air sparge system was operated at a pressure of 3.0 psi and 5.39 CFM at IP-2 and a pressure of 3.2 psi and 7.88 CFM at IP-3. During this period the SVE system operating at 5.0 inches of mercury and an air flow rate of 125 SCFM. PID readings of 184.9 ppm, 289.0 ppm and 138.5 ppm were recorded for SVE-1, SVE-2, and SVE-3, respectively. During this phase of the test, measurable vacuum was recorded at MP-2 (15 feet from SVE-3), MW-2 (10.2 feet from SVE-3), MW-3 (77.0 feet from SVE-3) and MW-15 (6.0 feet from SVE-2). Measurable pressure from the air sparge system was recorded at IP-1 (12.0 from IP-2), MP-1 (9.0 feet from IP-3) and MP-3 (25.0 feet from IP-3).

5.3.5 Summary of Findings

The following summarizes the findings of the SVE/AS Pilot Test:

- The vertical SVE system points identified adequate influence for monitoring locations within approximately 15 feet of the SVE points.

- Although the air sparge pilot test was only operated for a limited timeframe, DO concentrations in monitoring points within the impacted areas (specifically SVE-1 and SVE-3) increased from a background DO of 3.52 mg/l (MW-6) to 9.14 mg/l and 31.04 mg/l in SVE-1 and SVE-3, respectively. This increase in DO concentrations will also help increase natural biological processes in the groundwater and Smear Zone soils.

- During operation of the air sparge system, static water levels were measured in SVE-2, IP-2, IP-3, MP-1 through MP-3, MW-2, MW-3, MW-6, and MW-15. Depth to water level measurements were typically 0.1 to 0.2 feet lower than baseline groundwater levels.

- The PID readings from the SVE only test indicated total VOC concentrations ranged between 1.1 ppm (SVE-3) to 948 ppm (SVE-2). These PID readings are low and would be an issue for an SVE-only remediation system.

- One vapor sample was collected following the completion of the SVE-1, SVE-2, SVE-3 and IP-2/IP-3 pilot tests for laboratory analysis of TO-15 VOCs. This data will be used to refine the estimated time for cleanup.

- During the three (3) SVE pilot tests, PID readings ranged from 0.5 ppm (SVE-3 pilot test) to 948.0 ppm (SVE-2 pilot test). A maximum PID reading of 393.6 ppm was recorded during the two (2) air sparging tests. Although these concentrations and thus mass removal rates will decrease over time, the mass removal rate of the SVE/AS system based on the TO-15 analysis of the sample collected during the second AS pilot test (injecting at IP-2 and IP-3 while recovering vapor at SVE-1, SVE-2 and SVE-3) indicates a mass removal rate of 0.22 lbs. VOCs / day. This mass removal rate was based on an estimate of 61,077 $\mu g/m^3$ total VOCs extracted from each of the three (3) soil vapor extraction wells during the second SVE / AS test at an average air flow rate of 40 CFM per point, as follows:

  61,077 $\mu g/m^3$ * 1 g / 1,000,000 ug * 0.002205 lbs. / g * 1 m^3 / 35.3147 ft^3 * 40 ft^3 / min =

  0.00015 lbs. / min * 60 min / hr * 24 hrs / day = 0.22 lbs. / day

5.3.6 Conclusion

Based on the information provided above in association with the completion of the SVE/AS pilot testing, the following conclusions are provided:

- A full-scale SVE/AS system is feasible for this site.

- Vertical SVE points will require maximum spacing of 30.0 feet (15.0 foot radius of influence) based on a review of the SVE pilot test data.

- Air sparging appears to have excellent influence and a maximum spacing of 40 feet would be achievable. However, to be conservative, air sparge point spacing of 30 feet is recommended to ensure complete coverage of the system.

- Treatment of the SVE system discharge will be necessary and all applicable PADEP regulations and guidance will be followed.

Based on the results of the pilot study, it is recommended that the full scale system provide some contingency points to be added after the initial system installation is complete and actual, sustainable radius of influence is measured. Thus areas of SVE influence or AS influence that may be limited due to porous media can be addressed through additional points in select locations. The total number of SVE/AS points presented in the following section of this RAP may be expanded upon. Contingency statements are provided.

6. REMEDIAL ACTION PLAN - SCOPE OF WORK

6.1 Purpose

In response to the presence of soil and groundwater contamination at the Site, and in conjunction with 25 PA Code Chapter 245.301-313 regulations, LaBella has prepared this RAP to initiate active soil and groundwater remediation activities at the Site. Please note, in accordance with PADEP and USTIF guidelines, a pilot test must be completed prior to the implementation of the full-scale remedial system. The pilot test has been completed and the results of the SVE/AS Pilot Test are included in Section 5.0.

6.2 Project Parameters

For the purpose of this RAP, the parameters of concern are limited to a combination of the Unleaded Gasoline Parameters and the Diesel Fuel / Fuel Oil #2 Parameters specified in the April 1, 1998 PADEP Technical Document: Closure Requirements for Underground Storage Tank Systems, as amended December 12, 2012. The list of the "Project Parameters" is as follows:

- Benzene
- Cumene
- Ethylbenzene
- MTBE
- Naphthalene
- Toluene
- Total Xylenes
- 1,2,4-TMB
- 1,3,5-TMB

6.3 Proposed Cleanup Standards

According to Act 2, a remediation cleanup standard can be selected for each media of concern and furthermore for each compound of concern. The four standards provided in Act 2 include the SHS, site-specific standard (SSS), background standard and special industrial area provision. Since no onsite migration of contaminants from an offsite source has been confirmed, the background standard cannot be attained. In addition, the site does not qualify as a special industrial area. Therefore, the SHS and SSS are viable options for the site.

To demonstrate attainment of the SHS, site soil and groundwater must be remediated to concentrations equivalent to the EPA drinking water standards. However, the selection of the SSs requires elimination of risks associated with elevated target compounds. The elimination of risks cannot be completed without institutional and/or engineering controls placed on the site. Therefore, the project stakeholders have chosen to demonstrate attainment of the Non-Residential, Used Aquifer (TDS<2500 mg/l), SHS for the target compounds for the site soil and groundwater. Refer to Table 6-1 for a summary of the respective Act 2 Non-Residential, Used Aquifer (TDS <2,500 mg/l) SHS MSCs. The standards are reflective of the August 27, 2016 revisions to the regulations.

Table 6-1
Pump-N-Pantry #001 Property
Summary of Applicable Soil & Groundwater MSCs

Parameter	Soil MSCs (mg/kg)*	Groundwater MSCs (ug/l)
Benzene	0.5 / 0.5	5
Cumene	2,500 / 350	3,500
Ethylbenzene	70 / 70	700
MTBE	2 / 2	20
Naphthalene	25 / 10	100
Toluene	100 / 100	1,000
Total Xylenes	1,000 / 1,000	10,000
1,2,4-TMB	35 / 6.2	62
1,3,5-TMB	210 / 120	1,200

(*) Soil MSCs for unsaturated / saturated conditions

6.4 Offsite Access Issues

Access to two (2) offsite properties was required for completion of site characterization activities. For the purpose of the proposed scope of work provided below, ongoing access to the offsite properties will be required for completing quarterly groundwater monitoring activities at off-site wells MW-7 through MW-9. Information associated with the offsite properties is as follows:

Diaz Manufacturing
747 Grow Avenue
Montrose, PA 18801
Monitoring Well: MW-7

People Security & Trust Property
695 Grow Avenue
Montrose, PA 18801
Monitoring Wells: MW-8 and MW-9

6.5 Quarterly Groundwater Monitoring

LaBella will complete full rounds of groundwater monitoring while the RAP is being reviewed by the PADEP and while the chosen remedial alternative is being implemented. A summary of the scope of work associated with quarterly groundwater and surface water monitoring activities is provided below under Task 2.0. The most recent monitoring event was conducted on February 18-19, 2019 and served as the 1st Quarter of 2019 event. The analytical data associated with this sampling event was pending at the time of this RAP. A RAPR will be submitted subsequent to the receipt of this analytical data. The next scheduled monitoring event will be completed in May 2019 and will serve as the 2nd Quarter of 2019 event. It is anticipated that this 2nd Quarter 2019 event will also serve as a baseline monitoring event prior to the implementation of the active remediation activities.

6.6 Proposed Scope of Work Summary – Implementation of the Active Remedial Action

The following scope of work summary has been prepared based on the results of the SVE/AS Pilot Test summarized above.

Task 1.0 – Project Planning / Project Management

Task 1.1: Preparation of Scope of Work & Project Guidance Documents

This task includes the preparation of this Scope of Work and the associated Cost Summary. This scope of work was prepared in accordance with the guidelines and standards pursuant to the Pennsylvania Department of Environmental Protection's (PADEP's) *"Land Recycling and Environmental Remediation Standards Act"* (Act 2) of July, 1995, as amended; the Corrective Action Process under the Pennsylvania Storage Tank and Spill Prevention Act (25 PA Code Chapter 245.301 – 245.313, Corrective Action Process); and the PADEP's Groundwater Monitoring Guidance Manual dated December 1, 2001, as applicable.

Task 1.2: Project Management

LaBella will complete necessary, reasonable and appropriate project management activities for the duration of the contract period. These activities would be expected to include client communications and updates, meetings, permitting, record keeping, subcontracting, personnel / subcontractor management, quality assurance / quality control, scheduling and other activities consistent with remediation projects such as this.

Task 2.0 – Baseline Groundwater Monitoring Activities

Prior to startup of the full scale remediation system, LaBella proposes to complete a full round of quarterly groundwater monitoring to establish baseline conditions. Groundwater samples will be collected from monitoring wells MW-1 through MW-15 and observation wells OW-1 through OW-4. Each of the monitoring and observation wells will be sampled in accordance with the "*Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations"* (ASTM D16771-02), as applicable. Those monitoring wells not suited to low flow sampling will be purged and sampled via hand-bailing methods. All groundwater effluent generated during well purging activities will be treated onsite as indicated below (Task 6.0). The nineteen (19) groundwater samples and the two (2) QA/QC field blank will be submitted to ALS Environmental and analyzed for the Project Parameters. All sampling activities (including sample collection, equipment decontamination, preservation, shipment and chain-of-custody) will be conducted in strict accordance with standard USEPA and PADEP protocols.

In accordance with 25 Pennsylvania Code §245.312(b), LaBella will prepare and submit Remedial Action Progress Reports (RAPRs) to update the Client, PADEP and USTIF as to the progress of the project. The RAPRs will include, but may not be limited to, a summary of current groundwater data (including field and intrinsic data), historical groundwater data tables (including field and intrinsic data), a summary of field methodology, groundwater isopleth maps (for each compound exceeding SHS), groundwater elevation data, and groundwater contour maps.

Task 3.0 - Permits

LaBella will submit a request for any permits that may be required by the United States Environmental Protection Agency (USEPA) and PADEP regarding the implementation of the remedial technology. Although USEPA must be notified of e proposed activities, a permit is generally not required under the Underground Injection Control (UIC) Program. LaBella will prepare and submit to PADEP a Request for Determination of Changes of

Minor Significance and Exemption from Plan Approval / Operating Permit under 25 PA Code §127.14 and §127.449.

Task 4.0 – Design, Installation and Operation of the SVE/AS Remediation System

General

Based on the results of the SVE/AS Pilot Test summarized above, the general components of the conceptual system design, installation, and operation of the full scale remedial system are provided below.

System Design & Installation

For the purpose of the system design, LaBella is using a radius of influence of 15.0 feet for both the SVE points and the air sparge points. The resulting grid will include a total of twenty-two (22) SVE / sparge points placed in the area of the known soil and groundwater contamination. Refer to Appendix A for a Conceptual SVE/AS Point Location Map (**Figure 17**). This design assumes that the radius of influence is uniform in all directions from the SVE / sparge points. The system components will be installed as follows:

- The twenty-two (22) SVE extraction wells will be installed to a depth of 5.0 feet below ground surface (bgs) and constructed of 3.0 feet of 2-inch ID PVC well screen with 0.010-inch slot threaded to 2.0 feet of solid PVC riser. A sand pack consisting of #00N silica sand will be placed to a depth of 1.5 feet bgs, followed by a cement-bentonite grout seal extending to 1.0 foot bgs. All points will be equipped with individual control values to permit adjustments to ensure the air flow can be adjusted and controlled.

- The AS points will be constructed of 1-inch ID PVC and screened from 8.0' – 9.0' bgs with 0.010 slot well screen threaded to 7.0 feet of solid PVC riser. A 1.0-foot solid PVC well sump will be constructed at the bottom of each sparge point. A sand pack consisting of #00N silica sand will be placed to a depth of 10.0' – 7.0' bgs followed by a cement-bentonite grout seal extending to 2.0 feet bgs.

- As indicated above in Section 5.3.6, this RAP provides contingency points to be added after the initial system installation is complete and actual, sustainable radius of influence is measured. Thus areas of SVE influence or AS influence that are limited due to porous media can be addressed through these additional points in select locations, as necessary.

- The major components of the SVE/AS system will include the following.

    - Soil Vent Blower: Based on the results of the pilot test, the SVE portion of the system will operate at a vacuum of 4.9-inches of mercury and an air flow rate of 40 cubic feet per minute (CFM) per SVE well. Twenty-two (22) SVE wells are proposed (880 CFM). The soil vent blower will be sized to match these requirements.

    - Air Sparge Blower: Based on the results of the pilot test, the AS portion of the system will operated at a pressure of 2.5 psi and an air flow rate of 4 cubic feet per minute (CFM). Twenty-two (22) air sparge points have been proposed. The air sparge blower will be sized to match these requirements.

- Water Separator: A water separator will be used to remove water from the air stream extracted from the soil vent pump. No water was generated during the pilot test.

- Air Emission Control: The air emission control will be provided via a large carbon canister. Based on the results of the Pilot Test, A Carbonair GPC 20R vapor phase carbon vessel has been specified. This vessel is capable of handling up to 2,000 CFM and contains 2,000 pounds of GAC. LaBella will prepare and submit to the PADEP a Request for Determination of Changes of Minor Significance and Exemption from Plan Approval / Operating Permit under 25 PA Code §127.14 and §127.449 prior to bringing the system online.

- All piping will be installed in subsurface trenching and connected to the system components, which will be housed in a secured trailer or shed to the south of the onsite building. Note, no engineering drawings have been prepared at this time. As-built drawings will be prepared following the system installation activities. These drawings will be provided in future reports to document the final system design and the treatment areas.

System Operation and Maintenance Schedule

The results of the Pilot Test provided the data required to estimate the time required for cleanup. For the purpose of this RAP, the O&M schedule and completion time estimates are as follows:

- **System Startup:** Once the system has been installed, authorization to start the system will be sought from PADEP.

- **Groundwater:** A baseline groundwater and surface water monitoring event (Task 2.0) will be completed prior to system startup. Quarterly groundwater monitoring (Task 5.0) will be initiated following system startup. Once the groundwater remediation goals have been met, the remediation system will be shut down and quarterly groundwater attainment monitoring will be initiated.

- **Air Monitoring & System O&M:** A general schedule for air monitoring and system O&M is as follows:

  - PID readings will be collected from the vapor extraction sampling port (prior to the carbon canisters) on an hourly basis for the first day of operation. One (1) vapor sample will be collected for laboratory analysis at the end of Day 1. This sample will be analyzed for the Project Parameters via EPA Method TO-15. Flow rates will be checked and adjusted as necessary during the first day of operation.

  - PID readings will be collected from the vapor extraction sampling port daily for the first week of operation. In addition, system flow rates will also be monitored and adjusted as necessary. One (1) vapor sample will be collected for laboratory analysis at the end of Week 1.

  - PID readings and system O&M will be completed twice weekly for Week 2 through Week 4. PID readings will also be collected from the vapor extraction point following

the air effluent treat system to monitor for breakthrough. One (1) vapor sample will be collected for laboratory analysis at the end of Week 2, Week 3 and Week 4.

- PID readings from the vapor extraction sampling port and from the vapor extraction point following the air effluent treat system will be collected monthly starting with Month 2. System O&M will also be conducted at this time. The collection of PID readings and the completion of O&M activities will also be conducted during of any other onsite activities (e.g. quarterly groundwater monitoring). One (1) vapor sample will be collected for laboratory analysis at the end of each month starting at the end of Month 2.

- **Contaminant Mass Calculations:** LaBella completed contaminant mass calculations based review of existing soil and groundwater data. Refer to **Appendix W** for a summary of these calculations. The following is noted:

  - A worst case soil contaminant mass of 207.3 lbs. was determined based on the smear zone data collected from TB-11B. Based on all of the soil data collected within the smear zone plume, an average soil mass of 130.2 lbs. was calculated.

  - The groundwater contaminant mass was determined based on contamination concentrations present in MW-2, MW-3, MW-4, MW-5 and MW-15, with the plume geometry estimated via a review of the November 2018 groundwater isopleths. An average groundwater contaminant mass of 4.06 lbs. was calculated based on groundwater concentrations reported in monitoring wells listed above for the period March 2018 through November 2018 (i.e. the 4 most recent quarters).

- **SVE Removal Rate Evaluation:** Process and performance monitoring data will be utilized to track VOC vapor mass removal rates, as follows:

  - As the SVE/AS treatment progresses, VOC mass removal rates may decline to a slow and steady level. This is usually attributed to equilibrium between the air being flushed through the soils and a mass-transfer-limited condition of the remaining contaminants.

  - At some point, the mass removal will reach an asymptotic condition and the continued operation of the SVE/AS system will be of little value. A potential asymptotic condition will be based on the observation that the VOC vapor mass removal rate is less than 10% of the observed baseline for greater than 30 consecutive days. This evaluation will be based on TO-15 data and not PID data.

  - Reductions in mass removal due to saturated soils / high water tables will not be considered an asymptotic condition, but will be noted and evaluated.

  - Soil and groundwater attainment will be demonstrated as outlined under Task 5.0 and Task 7.0, below. In the event asymptotic conditions are met prior to achieving soil and groundwater attainment, evaluations of alternative remedial approaches vs. site-specific closure will be made.

- **Estimated Time for Completion:** Based on the results of the pilot test in conjunction with the contaminant mass calculations made, the following time estimates for the completion of the remediation are provided:

    - For the purpose of this evaluation, an estimated 61,077 µg/m^3 total VOCs recovery rate from the pilot test will be utilized in conjunction with the worst case calculated soil and groundwater contaminant mass of **215.29 lbs**.

    - Based on the pilot test, the optimal flow rate of 120 CFM at 4.9" of mercury was determined. At this rate, the average flow in the three (3) active pilot tests wells was 40 CFM.

    - The full scale system calls for twenty-two (22) SVE extraction points, times 40 CFM per point, equals 880 total CFM. The following calculation is provided:

      8,325 µg/m^3 * 1 g / 1,000,000 ug * 0.002205 lbs. / g * 1 m^3 / 35.3147 ft^3 * **880 ft^3 /**

      min = 0.0005 lbs. / min * 60 min / hr * 24 hrs / day = 0.72 lbs. / day

    - Note, the extraction rate of 8,325 µg/m^3 was based on the total extraction rate of 183,230 µg/m^3 as determined by the pilot test divided by the twenty-two (22) proposed SVE points. This is justified, as the pilot test was conducted in a hotspot portion of the groundwater plume. LaBella is of the opinion that the actual future extraction rates will be more represented by this average concentration.

    - Total Worst Case Contaminant Mass of 215.29 lbs. ÷ 0.72 lbs. / day = 299 days or roughly less than 1 year from system startup.

    - This estimate may be overly conservative and may possibly be of a shorter duration. This argument is made given that the recovery rate is estimated and the vast majority of the contaminant mass is in the smear zone soils.

    - For the purpose of the project schedule provided in Section 5.0, LaBella assumes one year of quarterly monitoring prior to attainment of the Act 2 MSCs.

Handling of System Discharges and Waste Materials

The operation of the remedial system outlined above will result in the following system discharges and waste materials.

- **Air Discharges**: Air emissions will be controlled under a Request for Determination of Changes of Minor Significance and Exemption from Plan Approval / Operating Permit under 25 PA Code §127.14 and §127.449. Air discharges will be treated onsite with activated carbon. The spent activated carbon will be transported offsite for proper disposal. A sample of the carbon matrix will be collected and analyzed for TCLP Benzene prior to the initiation of the T&D activities. The results of this analysis will determine hazardous vs. non-hazardous waste for the purpose of T&D.

- **Aqueous Waste**: A small amount of aqueous waste from the water separator is anticipated. An estimate of the quantity of waste will be determined following the completion of the pilot

test and the determination of the final system flow rates. This aqueous waste will be placed in 55-gallon drums, as necessary and staged onsite pending transportation and disposal. A sample of the aqueous waste will be collected and analyzed for TCLP Benzene prior to the initiation of the T&D activities. The results of this analysis will determine hazardous vs. non-hazardous waste for the purpose of T&D.

Task 5.0 – Quarterly Groundwater Monitoring Activities

Note, this RAP generally applies to the remediation of the soil and groundwater contamination associated with Incident #48572. However, the completion of two (2) additional rounds of groundwater attainment monitoring is required to demonstrate groundwater attainment for Incident #50143. Therefore, the quarterly groundwater monitoring activities will be conducted as follows:

- **2nd Quarter 2019 & 3rd Quarter 2019:** The groundwater monitoring for these two (2) quarters will include all fifteen (15) groundwater monitoring wells and all four (4) observation wells. These sampling events will address Incident #48572 and Incident #50143.

- **4th Quarter 2019 & Beyond:** In the event groundwater attainment is demonstrated for Incident #50143, the groundwater monitoring activities beginning with the 4th Quarter 2019 sampling event will include ten (10) monitoring wells (MW-1 thru MW-9, MW-15) and observation wells OW-1 and OW-2.

The general scope of work for the groundwater monitoring activities is as follows. Each of the groundwater monitoring and observation wells will be sampled in accordance with the "*Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations"* (ASTM D16771-02), as applicable. Those monitoring wells not suited to low flow sampling will be purged and sampled via hand-bailing methods. All groundwater effluent generated during the well purging activities will be treated onsite as indicated below (Task 6.0). The groundwater samples and two (2) QA/QC field blanks will be submitted to ALS Environmental and analyzed for the Project Parameters. All sampling activities (including sample collection, equipment decontamination, preservation, shipment and chain-of-custody) will be conducted in strict accordance with standard USEPA and PADEP protocols. The completion of these activities will serve to monitor the success of the SVE/AS system while the system is operational. Once the groundwater remedial goals have been achieved, the Task 5.0 activities will be utilized toward the demonstration of groundwater attainment.

In accordance with 25 Pennsylvania Code §245.312(b), LaBella will prepare and submit RAPRs on a quarterly basis to update the Client, the PADEP and USTIF as to the progress of the project. The RAPRs will be submitted following the receipt of the groundwater sampling results from the laboratory. Each RAPR will include, but may not be limited to, a summary of current groundwater and surface water data (including field and intrinsic data); historical groundwater and surface water data tables (including field and intrinsic data); a summary of field methodology; groundwater isopleth maps (for each compound exceeding SHS); groundwater elevation data; and, groundwater contour maps.

Task 6.0 - Waste Material Handling

Waste materials generated as part of this investigation will include monitoring well purge water, drill cuttings associated with the installation of the proposed SVE/AS injection points, extraction points and observation points, system waste water, and spent carbon drums. Waste materials will be handled as follows:

- All groundwater monitoring purge water will be treated onsite using activated charcoal, with the treated effluent discharged to the surface. No effluent sampling is included as part of these treatment activities. This method of waste handling was previously approved for use by the PADEP on this site.

- Drill cuttings will be staged in 55-gallon drums and transported offsite for proper disposal.

- System waste water will be containerized onsite, characterized as haz or non-haz and shipped offsite for disposal.

- Spent air effluent carbon will be containerized onsite, characterized as haz or non-haz and shipped offsite for disposal.

Task 7.0 – Demonstration of Soil Attainment

The review of background information indicates Smear Zone contamination exists in two (2) distinct locations on the Site. LaBella proposes to complete soil attainment sampling following completion of groundwater remediation activities.

LaBella identified Smear Zone soil contamination in two (2) locations at the Site. Based on a review of existing soil data, the total area of the Smear Zone contamination has been determined to be equivalent to the following:

- Area #1 (defined by TB-10 and TB-11 data): 110 cubic yards

- Area #2 (defined by TB-7 data): 118 cubic yards

LaBella will complete soil attainment sampling in accordance with the requirements included in 25 PA Code Chapter 250.707 (Statistical Tests). Accordingly, the regulations pertaining to "sites" where there is a release resulting in the remediation of less than 125 cubic yards will be followed. As such, eight (8) soil samples will be collected from each of the remediated areas in accordance with the Systematic Random Sampling Procedures set forth in the Act 2 Technical Guidance Manual.

Eight (8) test borings will be completed in each area. All proposed test borings will be pre-cleared via soft-dig technologies. The test borings will be completed to a maximum depth of 6.0 feet below grade (the Smear Zone has been identified at ~3.5 feet to ~6.0 feet below grade) utilizing a track-mounted Geoprobe®. Soil samples will be collected from each boring on a continuous basis from grade to the termination of the boring. Each soil sample will be visually inspected and field screened utilizing a Photoionization Detector (PID). A total of eight (8) soil samples will be collected for laboratory analysis as part of this investigation. All test borings drilled as part of this investigation will be backfilled with hydrated bentonite pellets and completed with an asphalt (cold patch) or concrete patch, as necessary.

The sixteen (16) soil samples will be submitted to ALS Environmental and analyzed for the Project Parameters. All sampling activities (including sample collection, equipment decontamination, preservation, shipment and chain-of-custody) will be conducted in strict accordance with standard US EPA and PADEP protocols

Task 8.0 – Preparation of the Remedial Action Completion Report

Subsequent to the completion of the soil and groundwater remediation activities, LaBella will prepare and submit a Remedial Action Completion Report (RACR) summarizing all of the work completed to date at the Site. This report will be completed in accordance with the requirements set forth in 25 Pennsylvania Code §245.313. This

report will include, but may not be limited to, a summary of site history, a summary of the activities and findings associated with the site characterization and a summary of the soil and groundwater attainment activities. The RACR will include a request that the PADEP provide Relief of Liability for the site in accordance with the Non-Residential, Used Aquifer (TDS <2,500 mg/l) Statewide Health Standards. The RACR shall be signed and sealed by a Professional Geologist registered in the Commonwealth of Pennsylvania.

Note, LaBella will complete a Vapor Intrusion Evaluation as part of the site closure activities. This evaluation will be conducted in accordance with the PADEP's *"Land Recycling Program Technical Guidance Manual for Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2"* (Document Number 253-0300-101) dated January 18, 2017.

Task 9.0 – Site Closure

LaBella will properly abandon all existing groundwater monitoring wells, SVE and AS points, oxygen injection, points, and SVE monitoring points following RACR approval from PADEP. Well abandonment activities will be conducted in accordance with the regulations and guidelines presented in Chapter 7 of the PADEP's *Groundwater Monitoring Guidance Manual* dated December 1, 2001. This task will also include the completion of the proper well abandonment forms and a compilation of photo documentation. In addition, the following site closure activities will be completed as necessary:

- Proper closure of soil-vapor monitoring points;
- Proper closure of existing MWs, RWs, SVE extraction points and sparge points;
- Well head removals and re-paving, as applicable.

7. ANTICIPATED PROJECT SCHEDULE

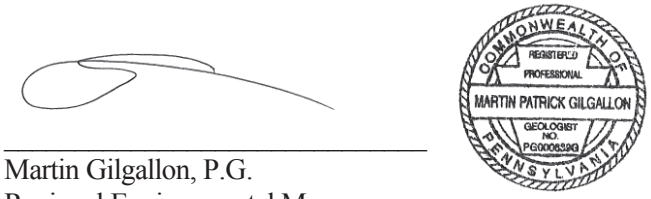
LaBella will schedule project activities with Pump-N-Pantry to commence at mutually agreeable times. The anticipated schedule for the implementation of soil and groundwater remediation is summarized in Table 7-1, as follows.

Table 7-1
Project Schedule
Proposed Soil & Groundwater Remediation Project Schedule
Pump-N-Pantry #001 Property

Task #	Description	Timeframe
	Submit Revised RAP	Month 1
	Obtain RAP Approval From PADEP	Month 3
1.0	Project Planning / Project Management	
1.1	Scope of Work & Project Guidance Documents	Month 4
1.2	Project Management	Ongoing
2.0	Baseline Groundwater Monitoring Activities	Month 4
3.0	Permits	Month 4
4.0	Installation of Full Scale System	Month 5
	Initiate SVE/AS System Operation	Month 6
5.0	Quarterly Groundwater Monitoring Activities	
5.1	Round 1 – Remediation	Month 9
5.2	Round 2 – Remediation	Month 12
5.2	Round 3 – Remediation	Month 15
5.4	Round 4 – Remediation	Month 18
5.5	Round 5 – Attainment	Month 21
5.6	Round 6 – Attainment	Month 24
5.7	Round 7 – Attainment	Month 27
5.8	Round 8 – Attainment	Month 30
5.9	Round 9 – Attainment	Month 33
5.10	Round 10 – Attainment	Month 36
5.11	Round 11 – Attainment	Month 39
5.12	Round 12 – Attainment	Month 42
6.0	Waste Material Handling – Disposal of Soil Cuttings	As Necessary
	Waste Material Handling – Disposal of Spent Carbon	As Necessary
	Waste Material Handling – Disposal of System Water	As Necessary
7.0	Demonstration of Soil Attainment	Month 42
8.0	Preparation of the RACR	Month 44
9.0	Site Closure	TBD

8. SIGNATURES

This Act 32 – Remedial Action Plan was prepared by:



Martin Gilgallon, P.G.
Regional Environmental Manager
LaBella Associates, P.C.
Pennsylvania Registered Professional
Geologist No. 000639-G

"By affixing my seal to this document, I am certifying that the information contained herein is true and correct. I further certify that I am licensed to practice geology in the Commonwealth of Pennsylvania and that it is within my professional area of expertise to verify the correctness of this information".

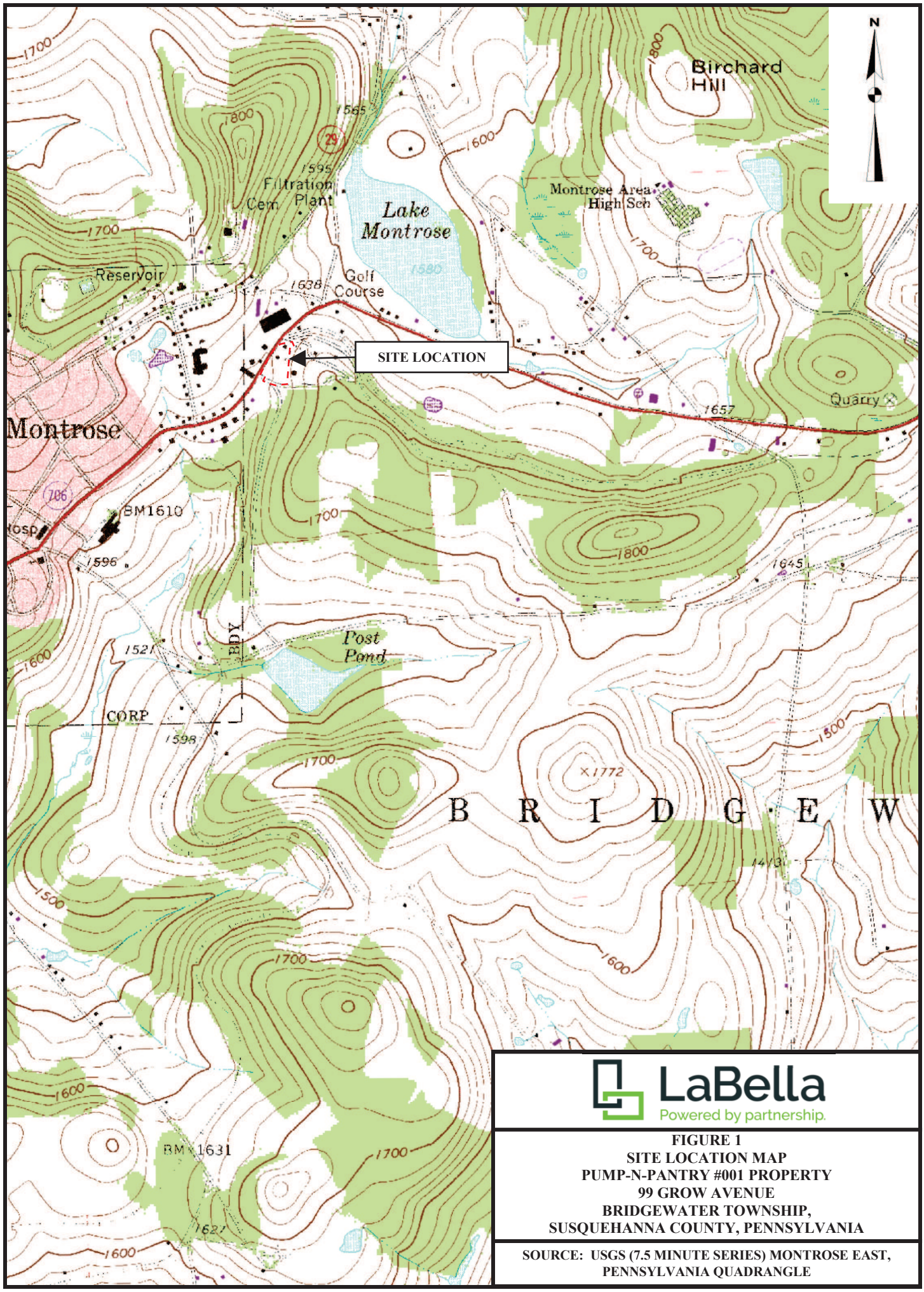


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FIGURE 1
SITE LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: USGS (7.5 MINUTE SERIES) MONTROSE EAST, PENNSYLVANIA QUADRANGLE

References

The following references were utilized in the preparation of this document:

Braun, D.D., *Surficial Geology of the Scranton 7.5-Minute Quadrangle, Lackawanna County, Pennsylvania*: Pennsylvania Geological Survey, 4th Series, Open-File Report OFSM 06-07.0, 15 p. 2006.

Eckenrode, Joseph J., *Soil Survey of Lackawanna and Wyoming Counties, Pennsylvania*, United States Department of Agriculture, March 1982.

Geyer, A.R., and Wilshusen, J.P., 1982, *Engineering Characteristics of the Rocks of Pennsylvania*, Pennsylvania Topographic and Geologic Survey, Harrisburg, Environmental Geology Report EG 1, 300 p., (2nd Edition).

Lohman, S.W., 1957, *Groundwater in Northeastern Pennsylvania*, Pennsylvania Topographic and Geologic Survey, Harrisburg, Bulletin W-4, 312 p., 1 Map (2nd Printing).

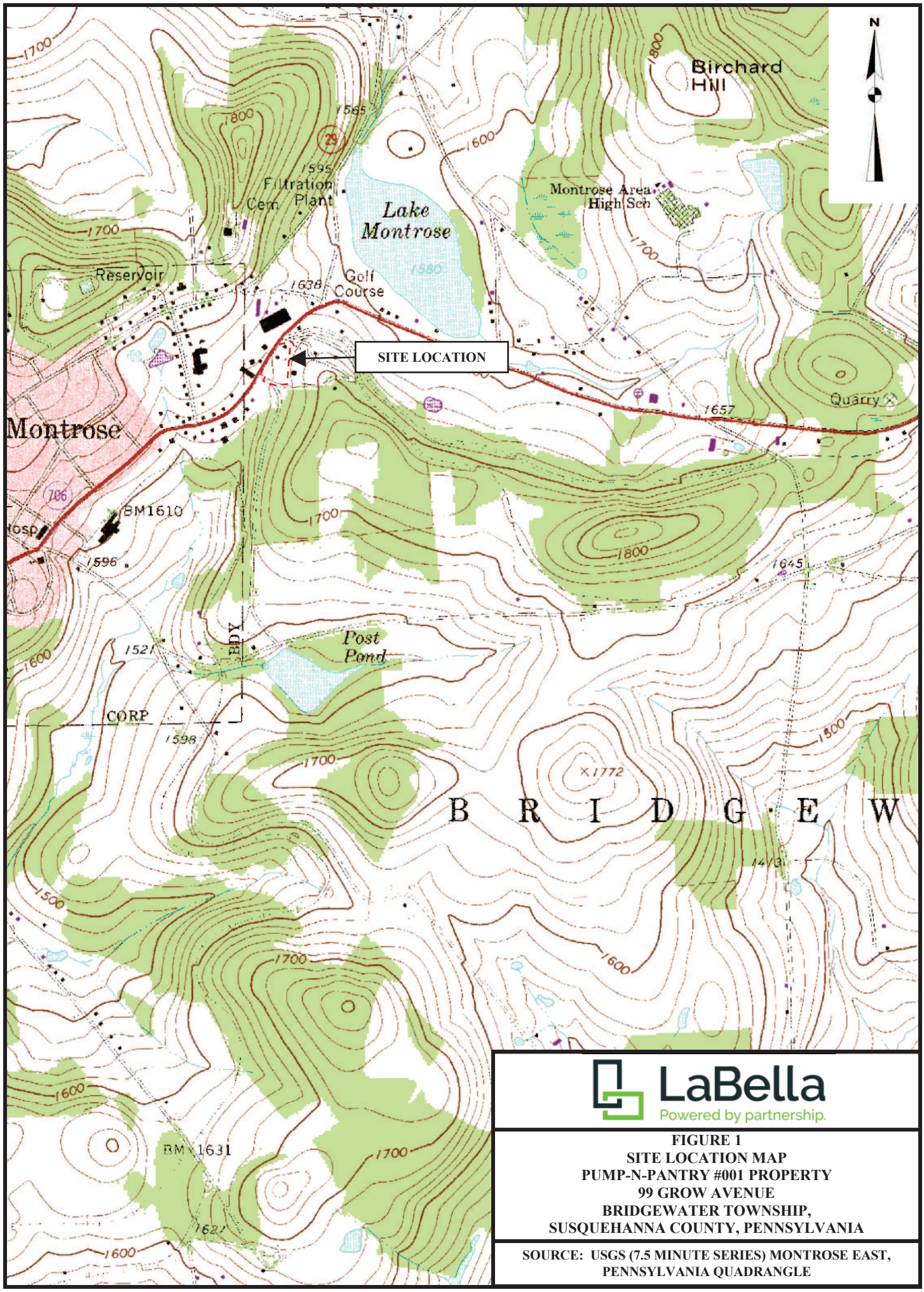
United States Department of the Interior, Fish and Wildlife Services, National Wetlands Inventory Maps, 7.5-Minute Series, Scranton, Pennsylvania Quadrangle.

United States Geological Survey, 7.5-Minute Series, Scranton, Pennsylvania Quadrangles.

25 Pennsylvania Code, Chapter 105, Dam Safety and Waterway Management, January, 1997.

APPENDIX A

Site Maps and Figures



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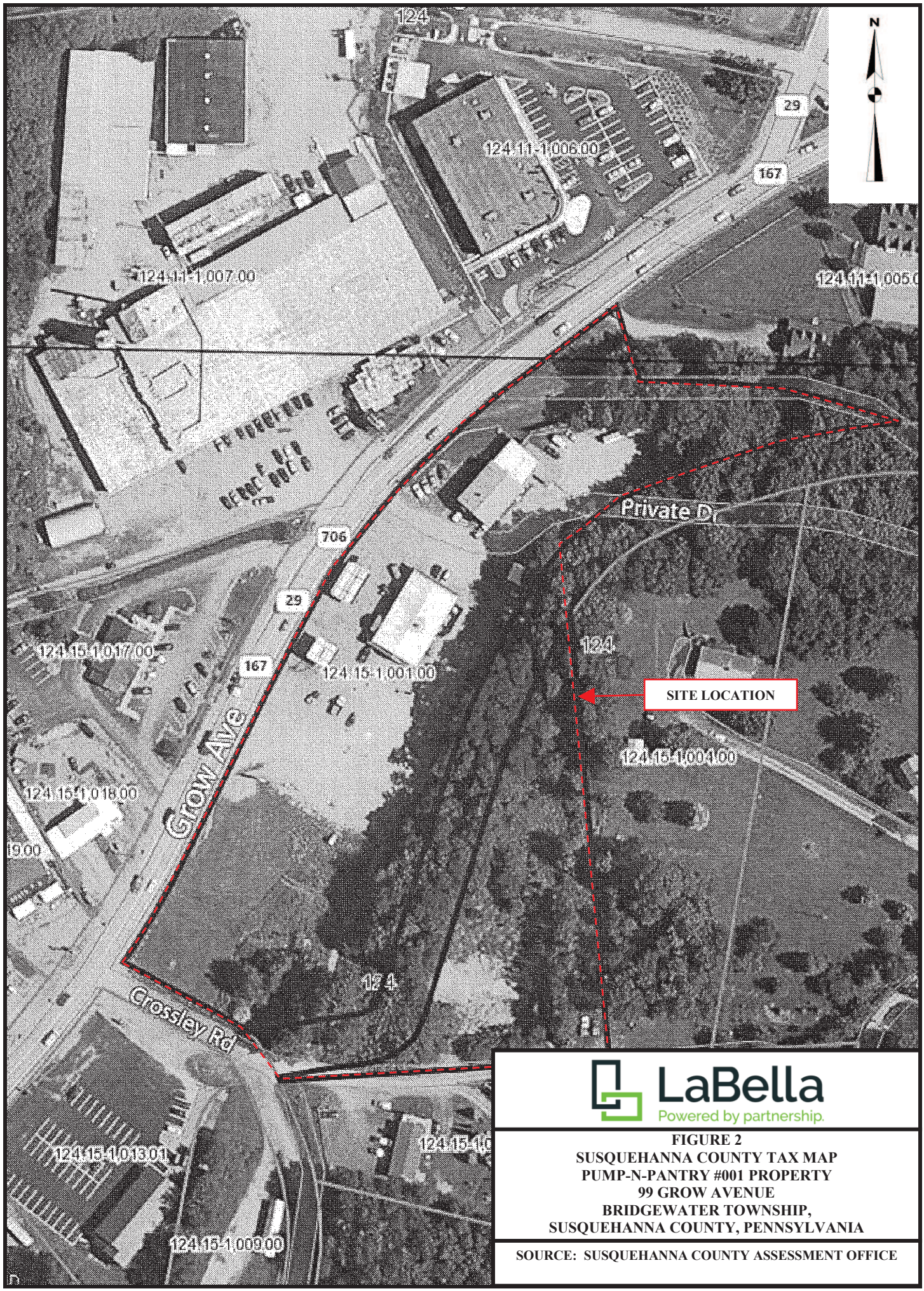
Powered by partnership.

FIGURE 1
SITE LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: USGS (7.5 MINUTE SERIES) MONTROSE EAST, PENNSYLVANIA QUADRANGLE



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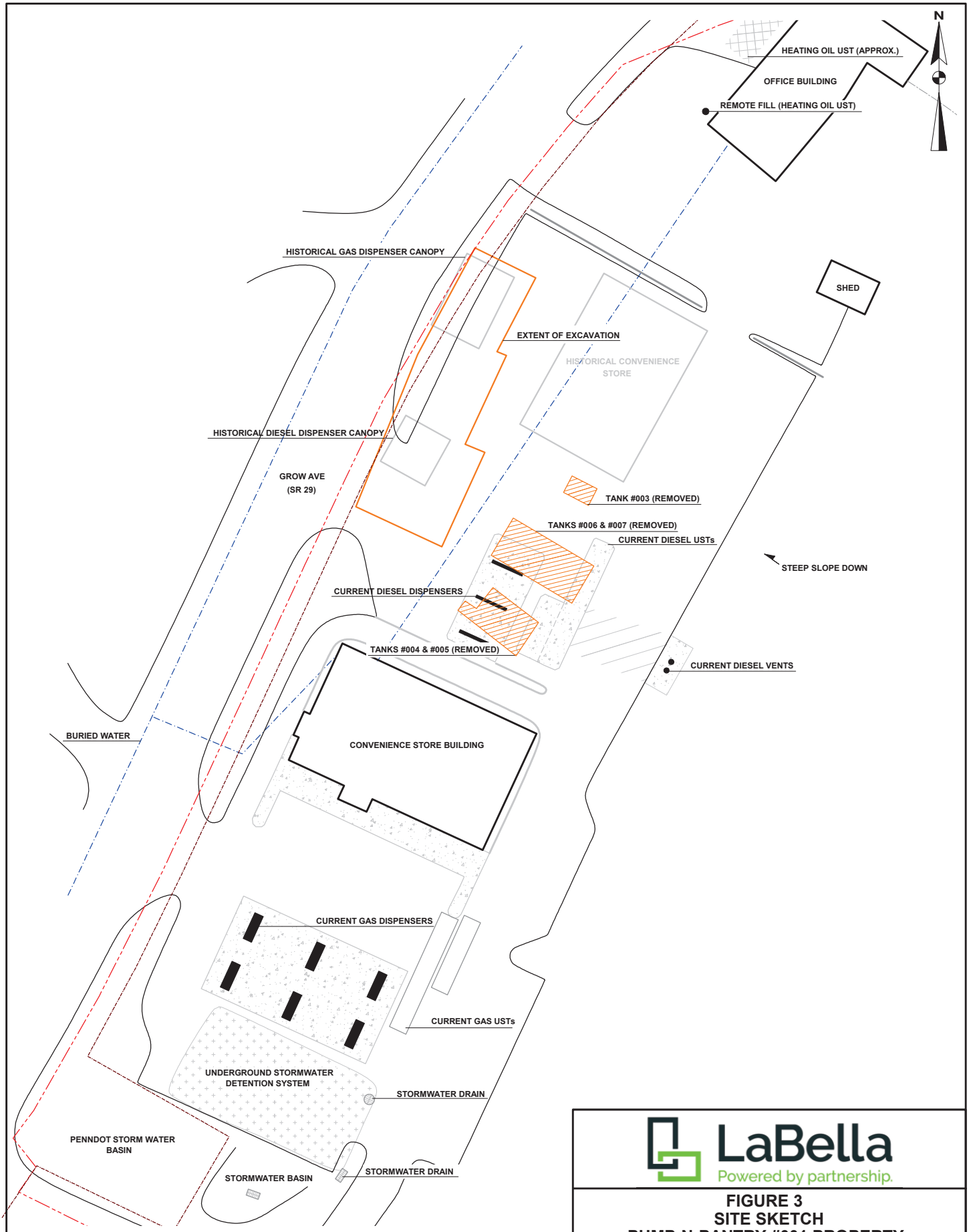
Powered by partnership.

FIGURE 2
SUSQUEHANNA COUNTY TAX MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: SUSQUEHANNA COUNTY ASSESSMENT OFFICE



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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FIGURE 3
SITE SKETCH
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 03/29/2017

SCALE: 1" = 60'

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FIGURE 4
SITE SKETCH WITH AERIAL OVERLAY
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 03/23/2016
SCALE: 1" = 60'

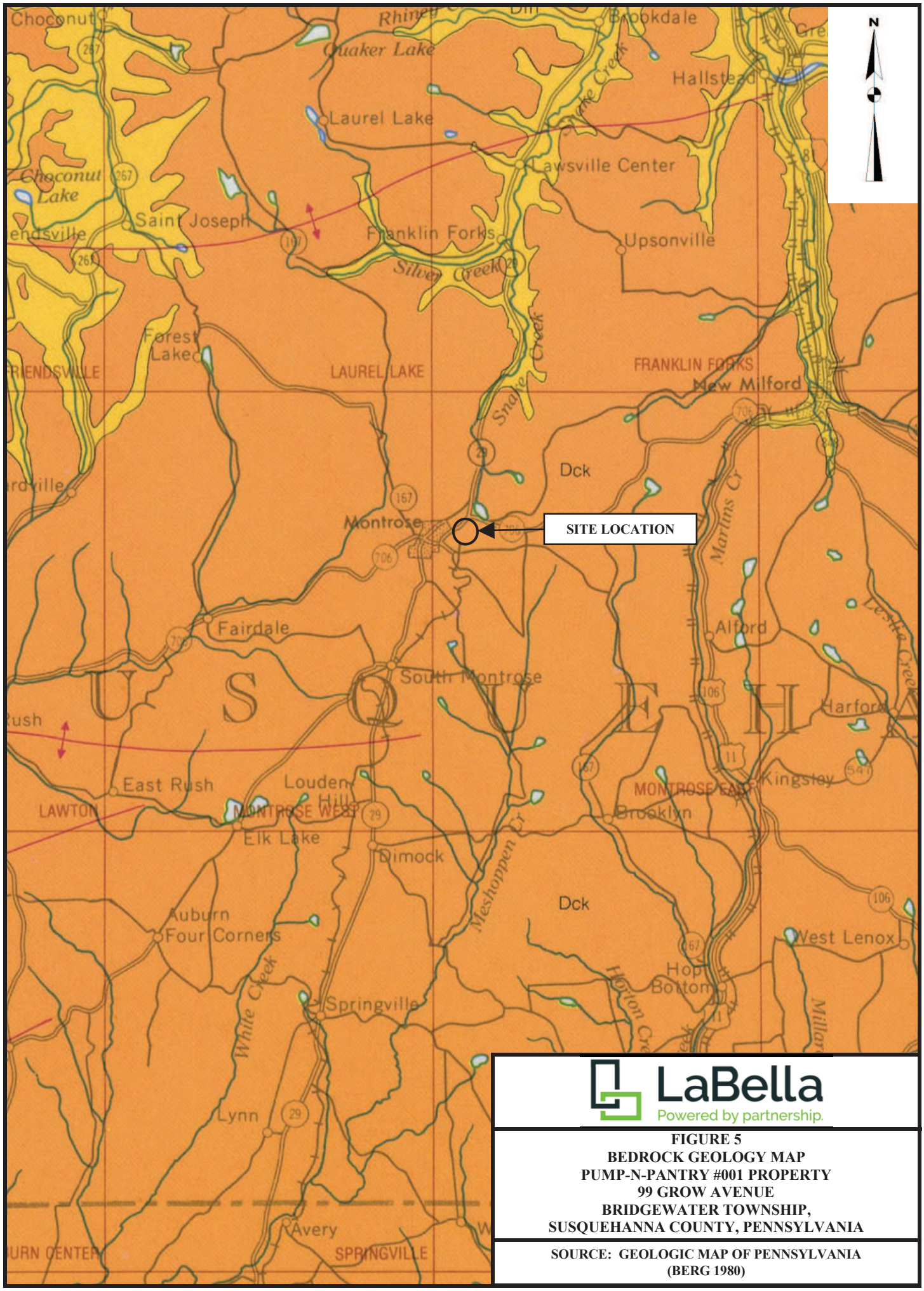

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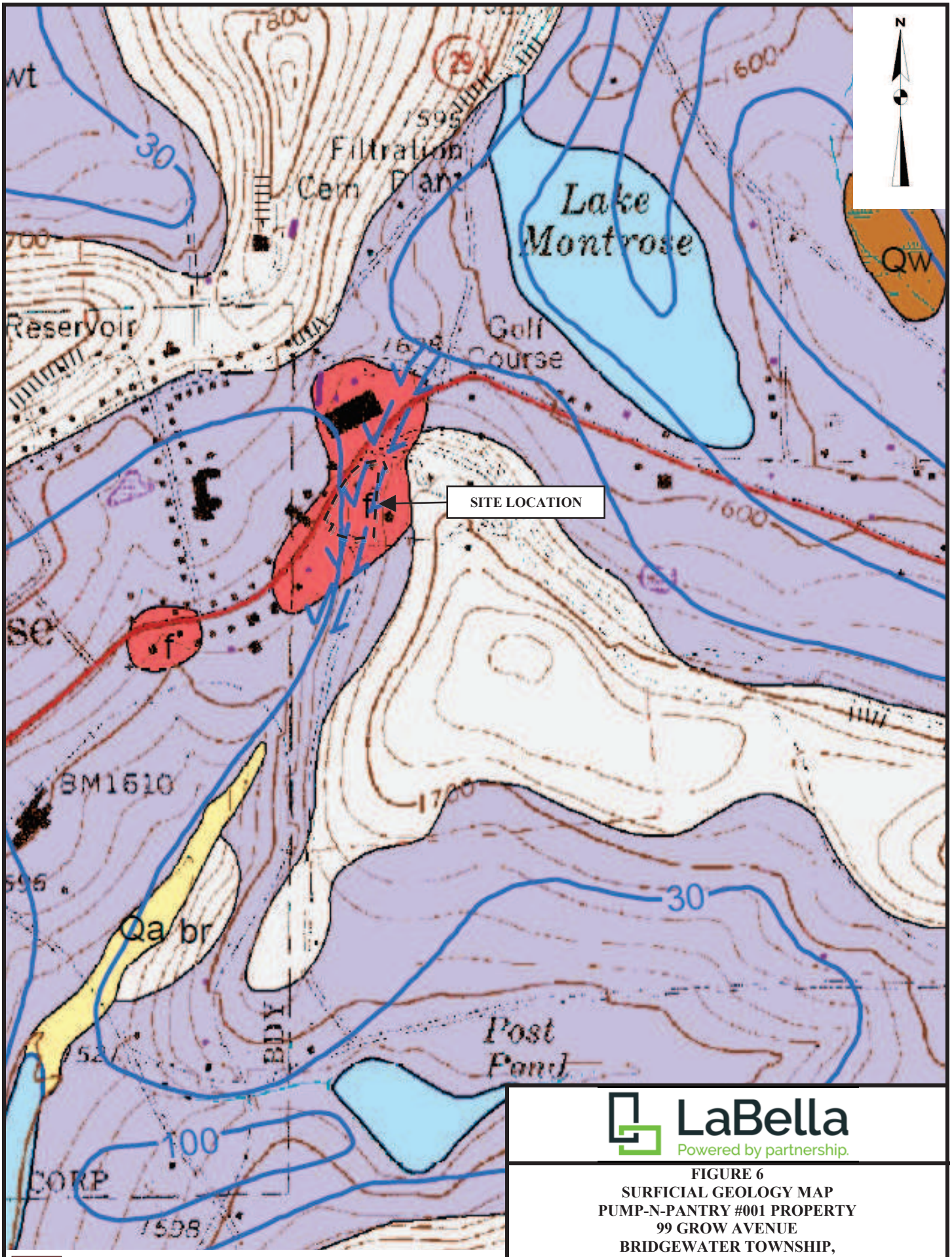
FIGURE 5
BEDROCK GEOLOGY MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: GEOLOGIC MAP OF PENNSYLVANIA (BERG 1980)



f — **Fill**

Rock fragments and/or soil material; typically in road, railroad, or dam embankments; up to several tens of feet thick.

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FIGURE 6
SURFICIAL GEOLOGY MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: SURFICIAL GEOLOGY OF THE MONTROSE EAST QUADRANGLE (BRAUN 2009)

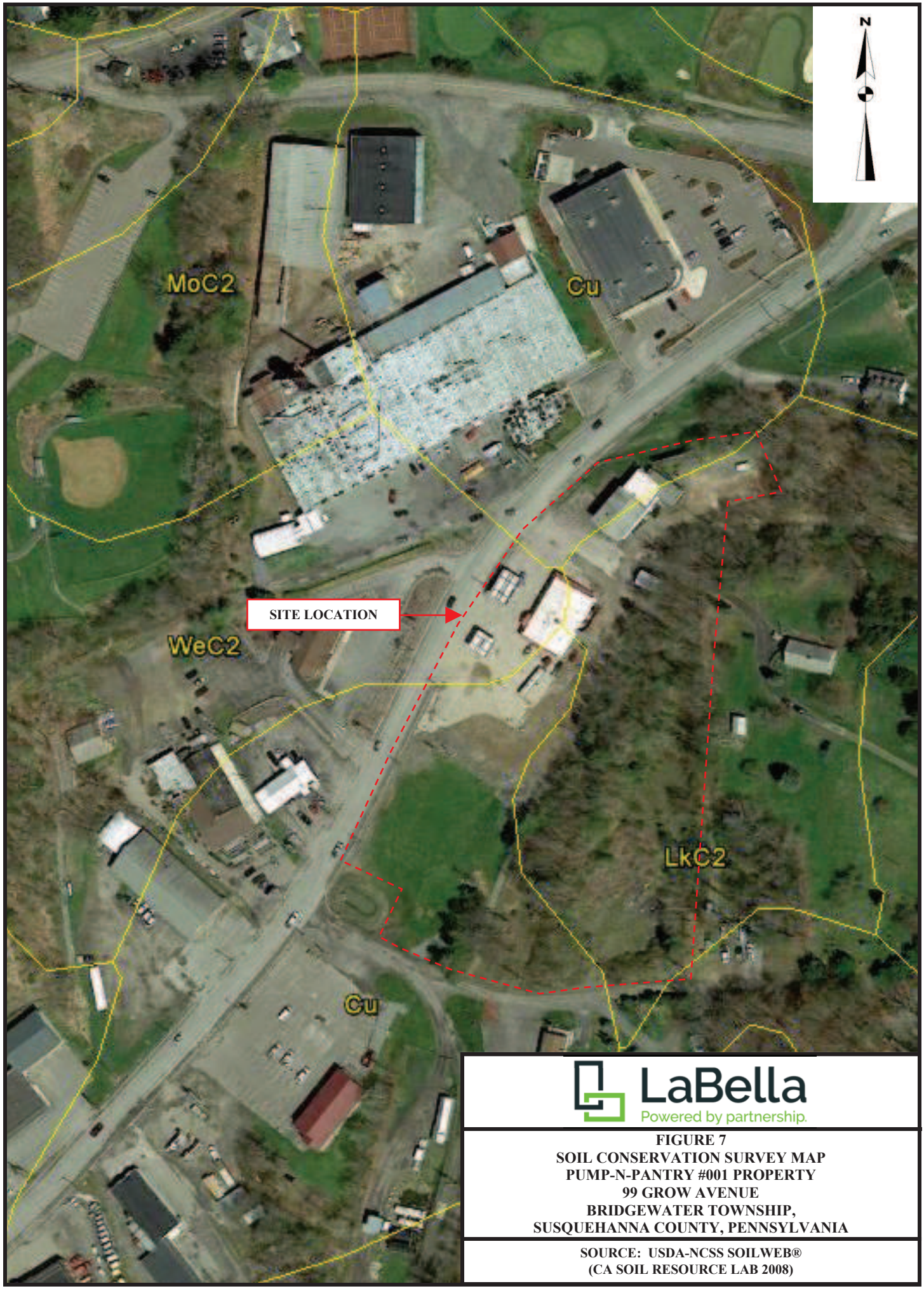

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FIGURE 7
SOIL CONSERVATION SURVEY MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: USDA-NCSS SOILWEB®
(CA SOIL RESOURCE LAB 2008)

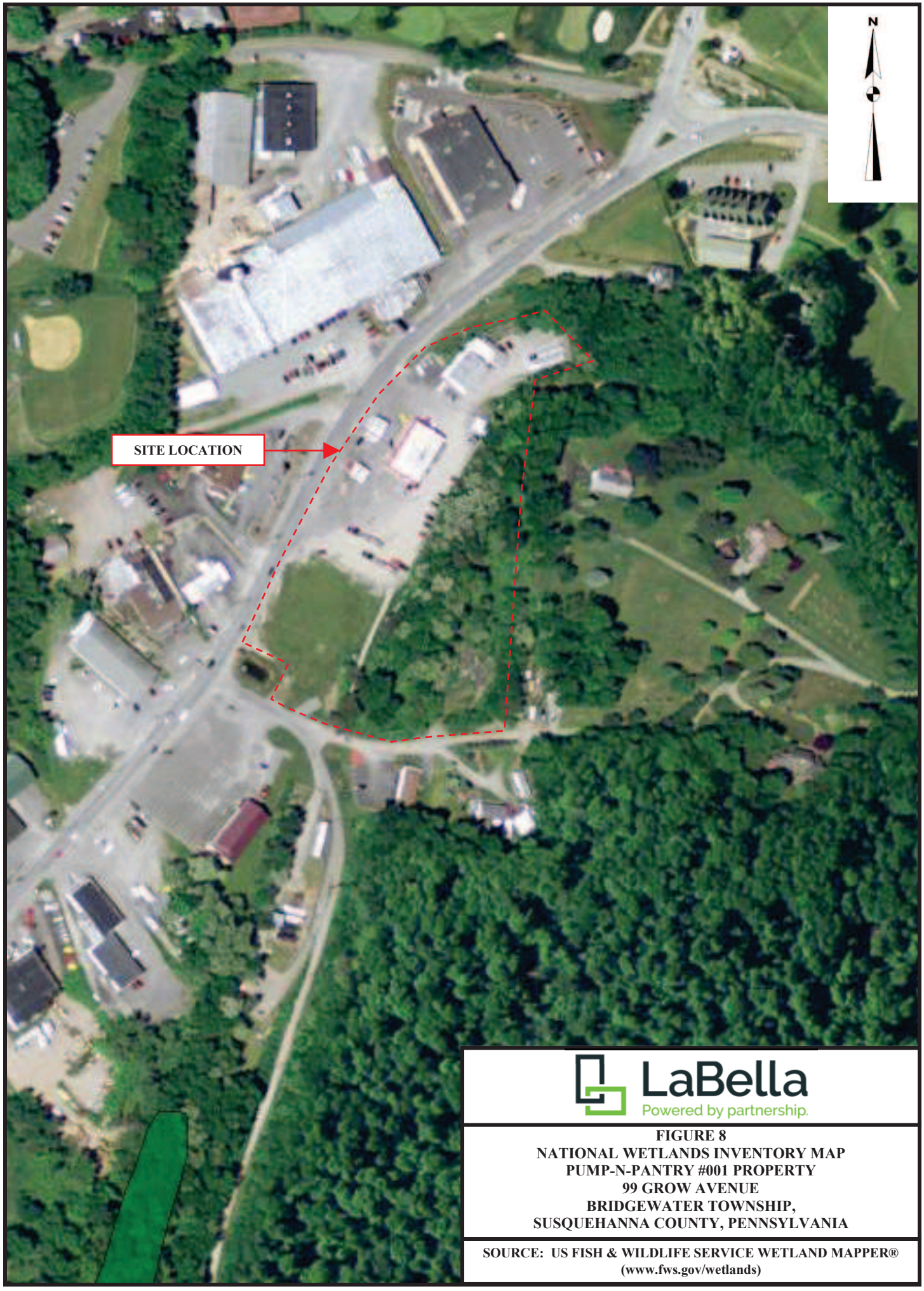

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FIGURE 8
NATIONAL WETLANDS INVENTORY MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: US FISH & WILDLIFE SERVICE WETLAND MAPPER®
(www.fws.gov/wetlands)

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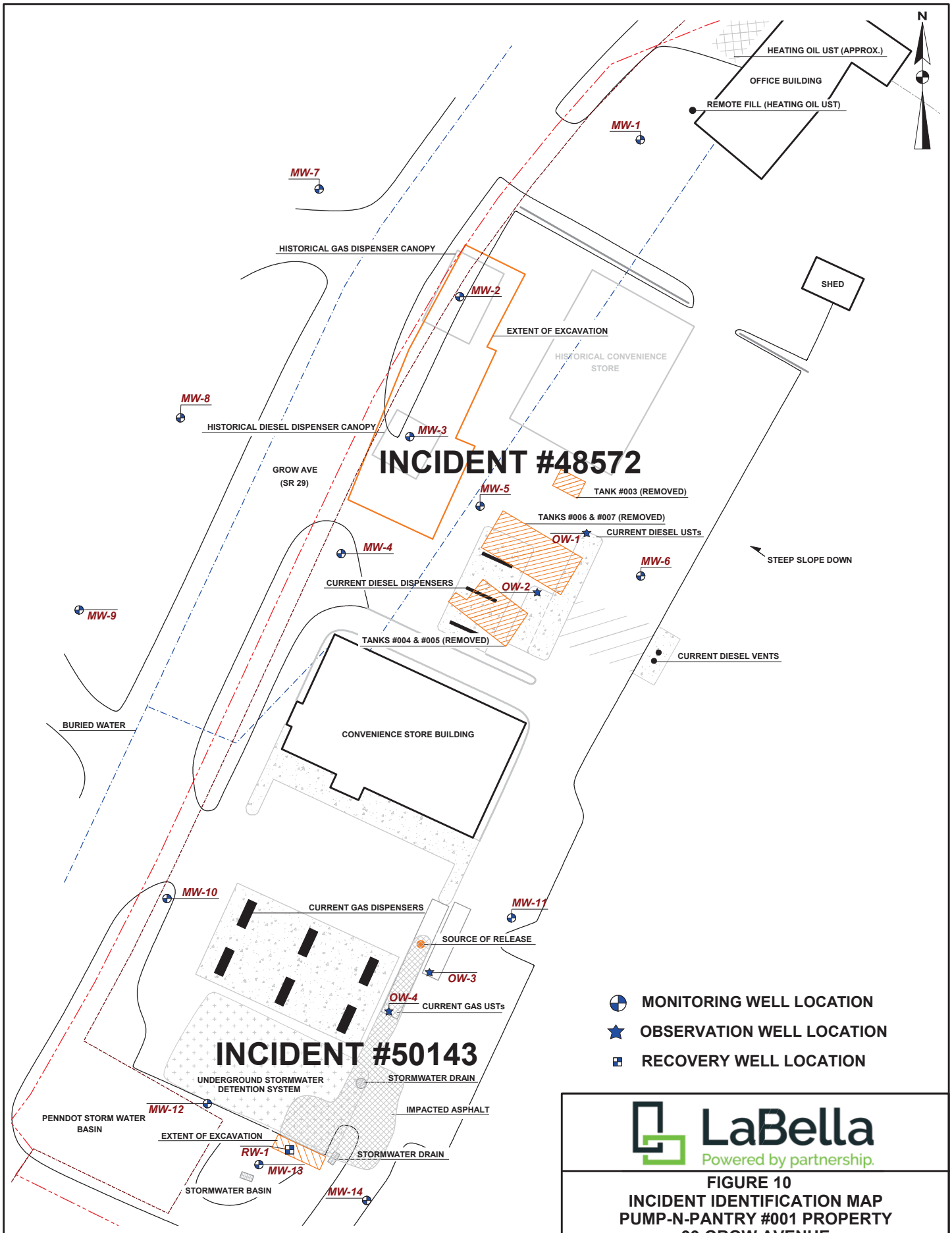
FIGURE 9
AREA MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

SOURCE: GOOGLE EARTH®
(www.google.com/earth)



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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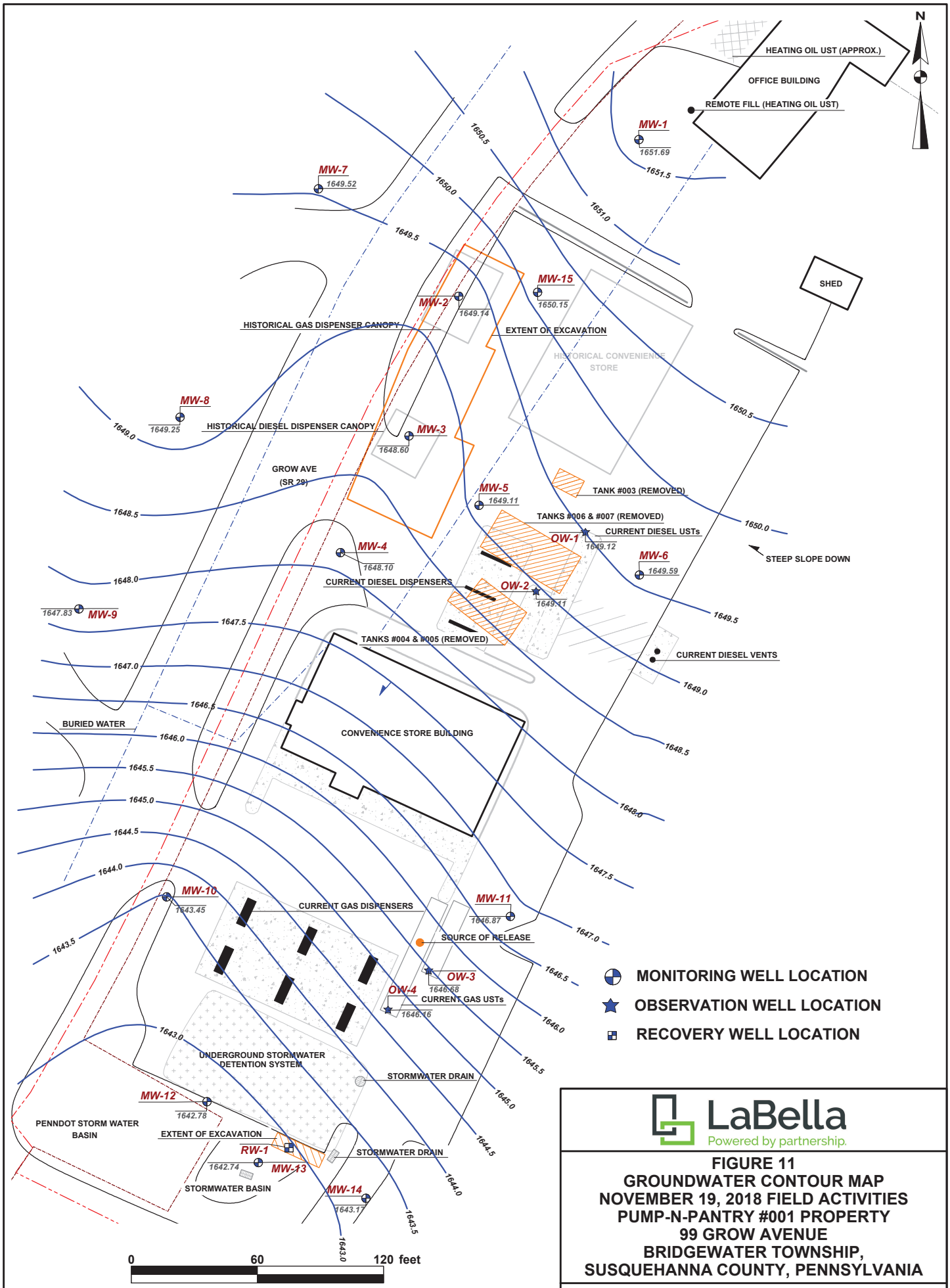
FIGURE 10
INCIDENT IDENTIFICATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 06/26/2017

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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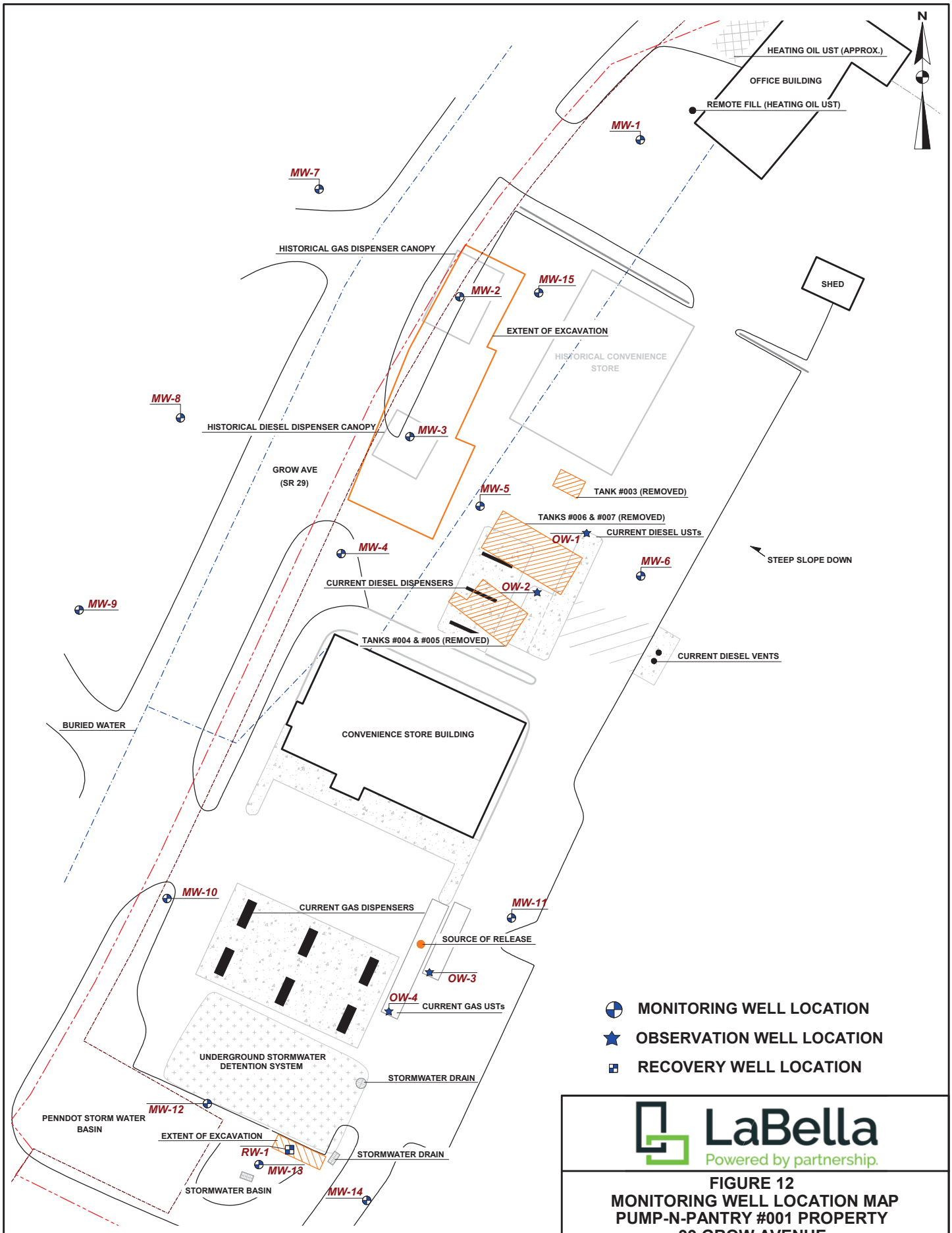
FIGURE 11
GROUNDWATER CONTOUR MAP
NOVEMBER 19, 2018 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 02/15/2019

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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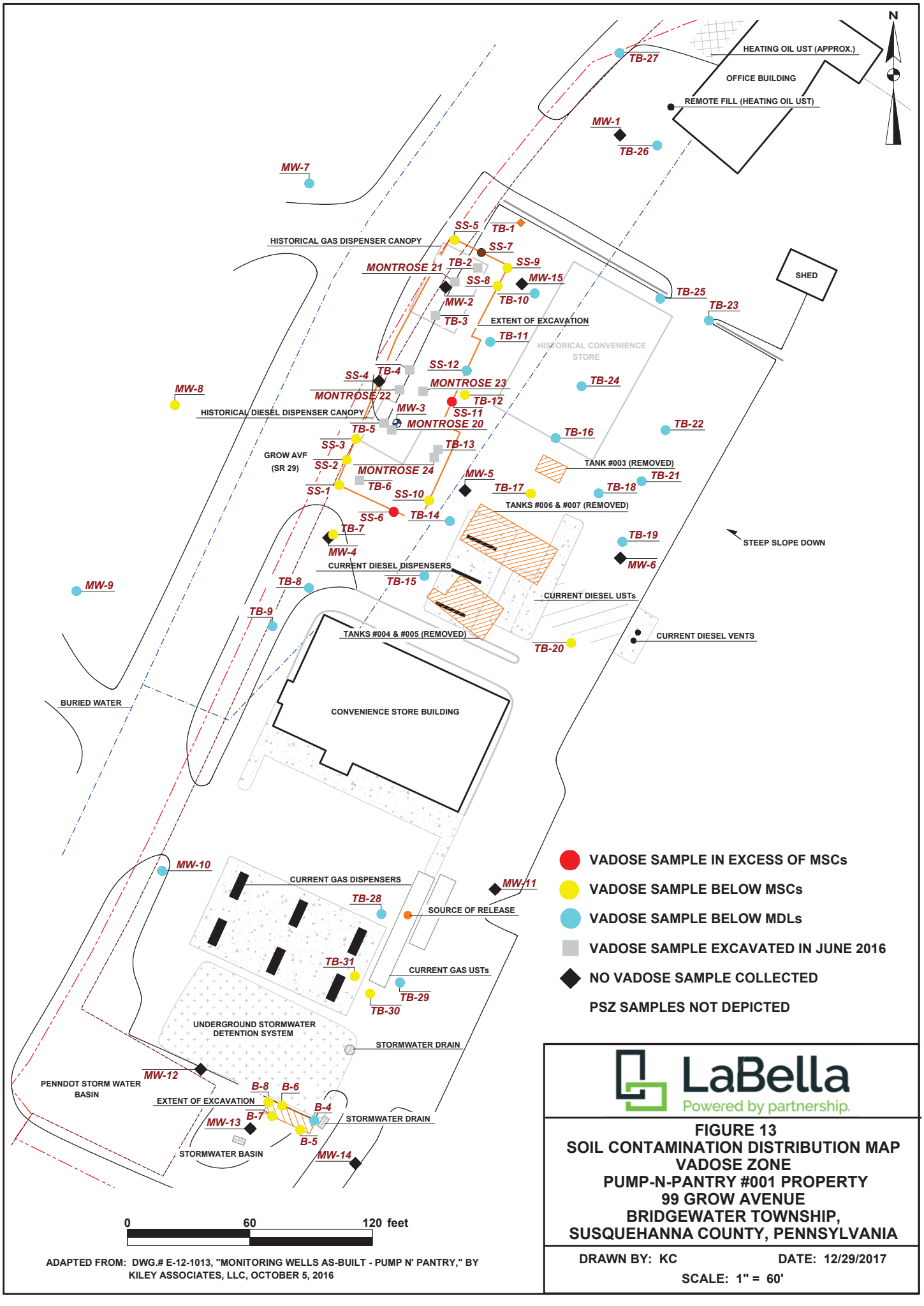
FIGURE 12
MONITORING WELL LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 11/21/2017

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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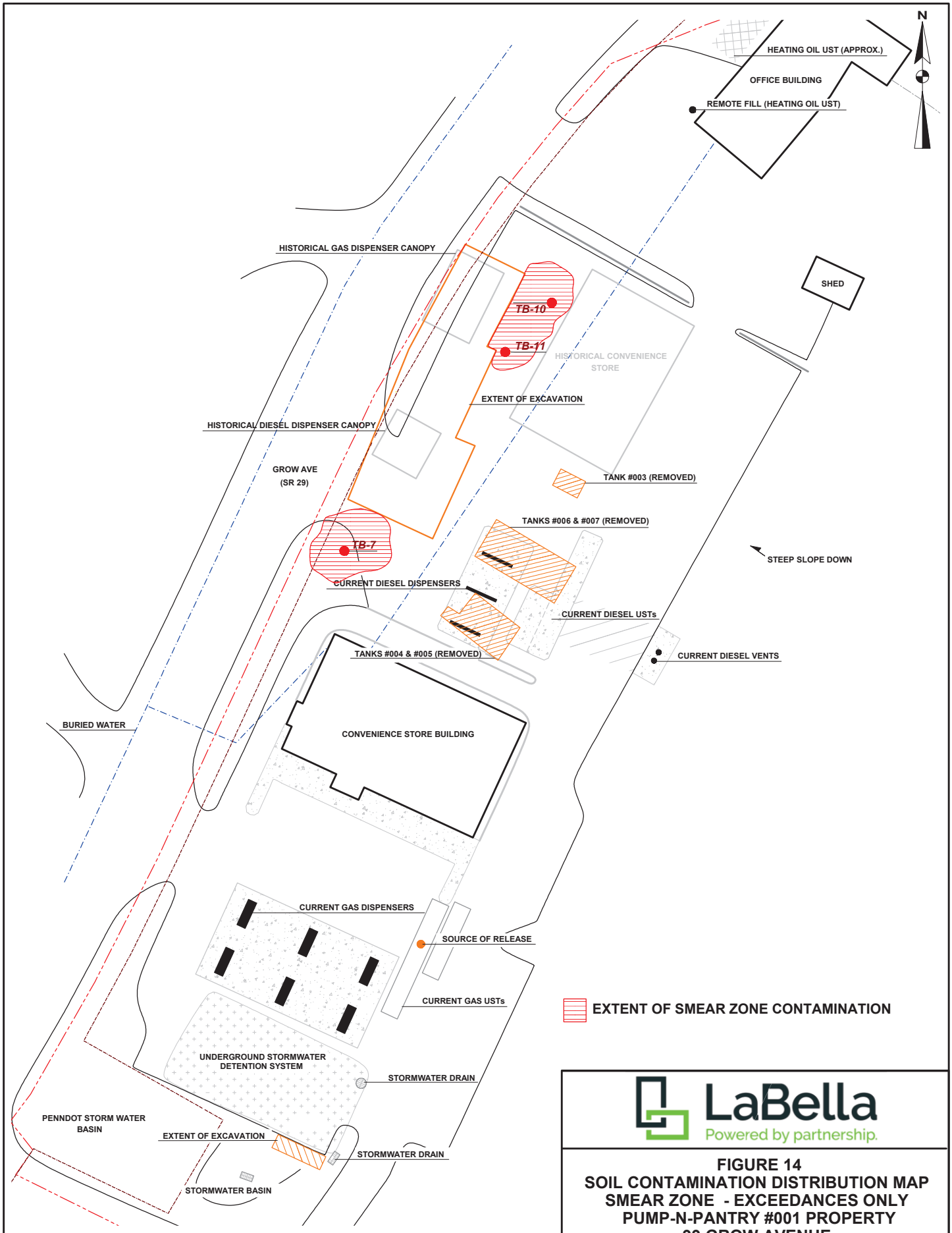
FIGURE 13
SOIL CONTAMINATION DISTRIBUTION MAP
VADOSE ZONE
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 12/29/2017

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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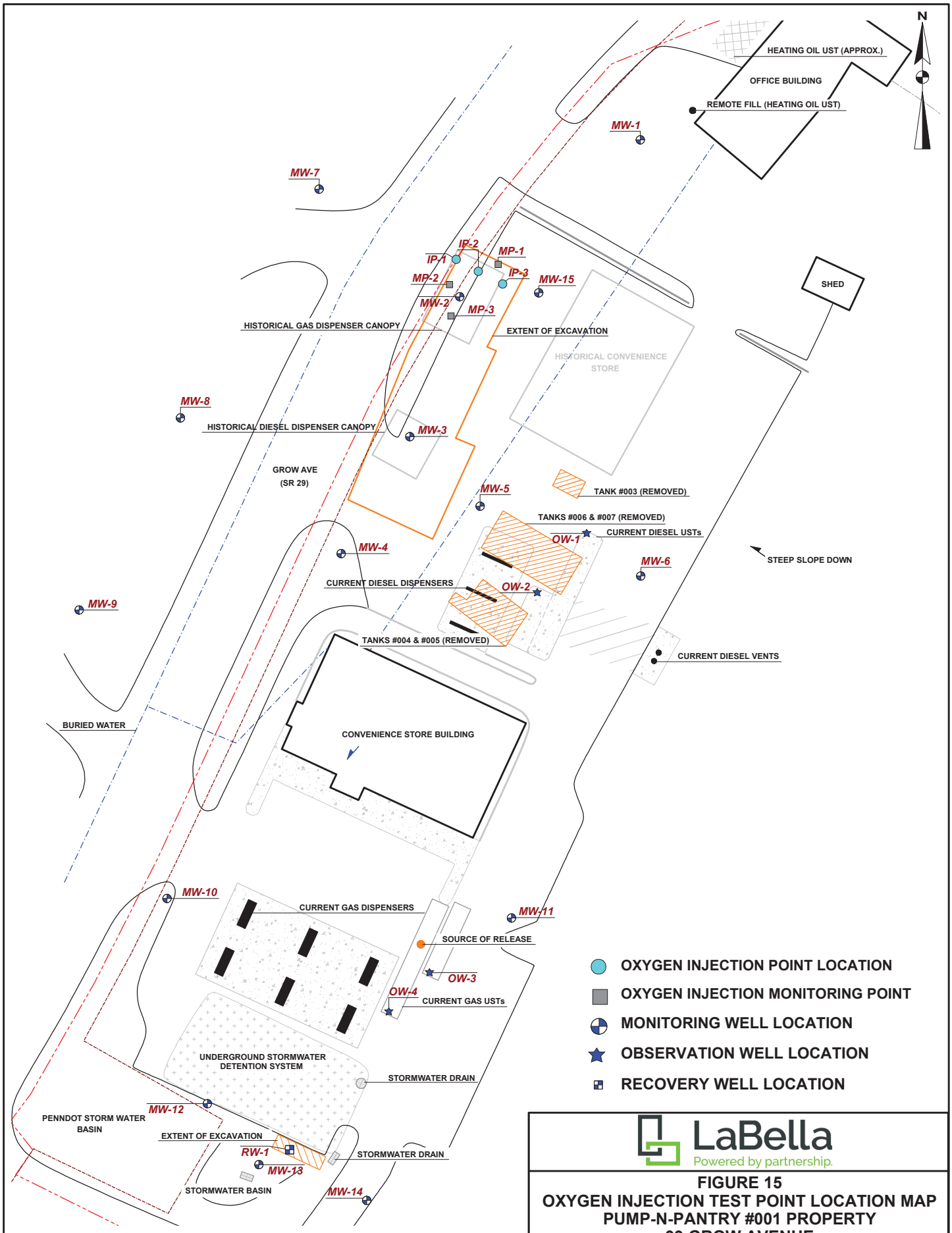
FIGURE 14
SOIL CONTAMINATION DISTRIBUTION MAP
SMEAR ZONE - EXCEEDANCES ONLY
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 12/28/2017

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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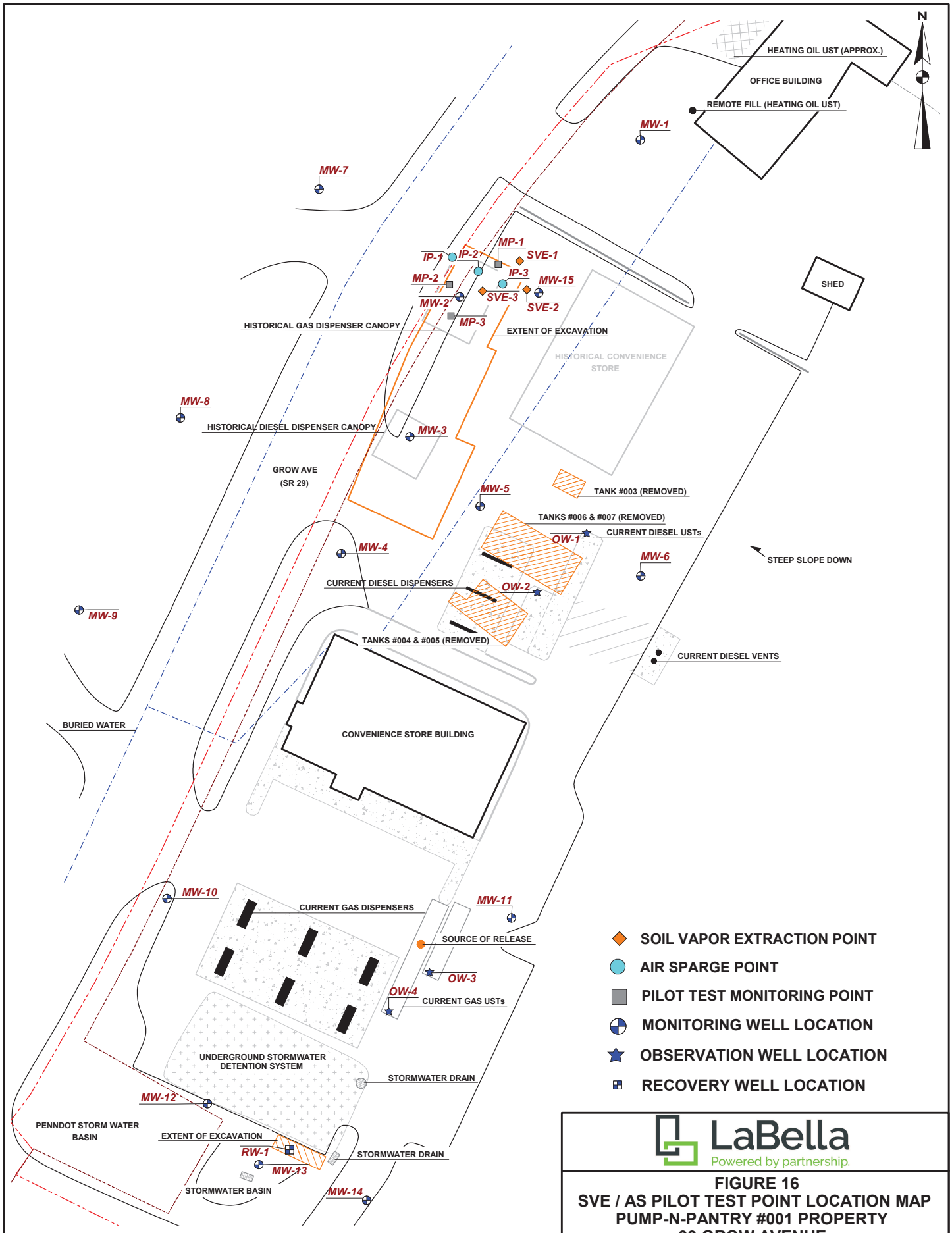
FIGURE 15
OXYGEN INJECTION TEST POINT LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC

DATE: 06/27/2018

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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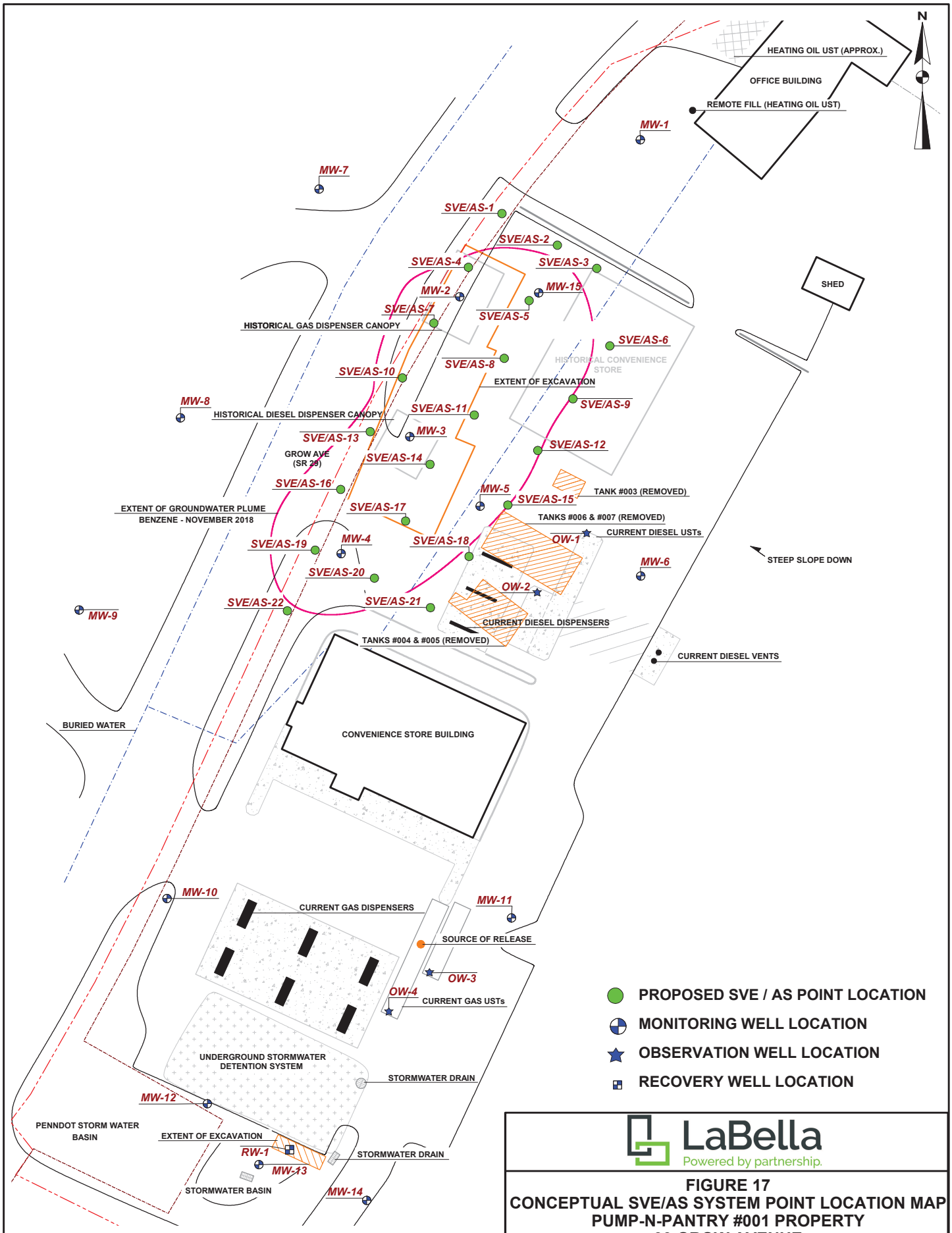
FIGURE 16
SVE / AS PILOT TEST POINT LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 02/15/2019

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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FIGURE 17
CONCEPTUAL SVE/AS SYSTEM POINT LOCATION MAP
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC

DATE: 02/22/2019

SCALE: 1" = 60'

APPENDIX B

Photograph Log

Table B-1

Photograph Log

Photo	Description	Date
1.	Typical view of the setup during the SVE pilot test.	12/19/18
2.	Typical view of the setup during the SVE / AS pilot test.	12/20/18
3.	Typical view of the SVE blower.	12/20/18
4.	Typical view of the setup during the SVE/AS pilot test.	12/20/18
5.	Typical view of the air sparge setup.	12/20/18
6.	View of the carbon drum utilized to treat the SVE effluent.	12/20/18

Photo #1
12/19/18
Typical view of the setup during the SVE pilot test.

Photo #2
12/20/18
Typical view of the setup during the SVE / AS pilot test.

Photo #3
12/20/18
Typical view of the SVE blower.

Photo #4
12/20/18
Typical view of the setup during the SVE/AS pilot test.

Photo #5
12/20/18
Typical view of the air sparge setup.

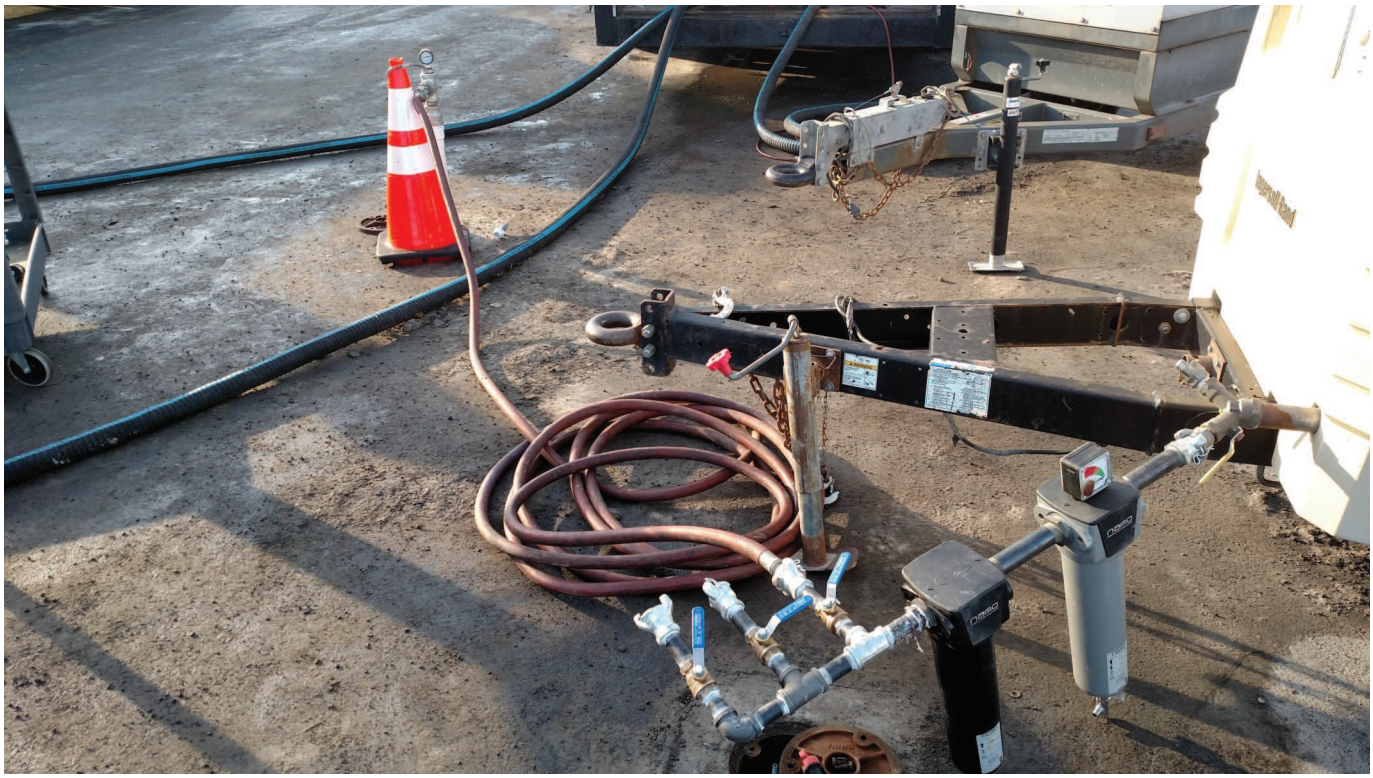

Photo #6
12/20/18
View of the carbon drum utilized to treat the SVE effluent.

APPENDIX C

LaBella Associates Representative Resumes

KEVIN CUCURA

Environmental Analyst

Kevin has twelve years of experience in site assessments, site remediation, water quality and natural resource monitoring and management. He has worked on numerous environmental remediation/restoration projects. He has also served as Site Supervisor for underground storage tank removals, assessments, soil boring/ monitoring well installations and sampling programs.

EDUCATION

B.A. – Environmental Geology, Lock Haven University

CERTIFICATIONS/ REGISTRATIONS

ASTM: Phase I and Phase II Environmental Site Assessments for Commercial Real Estate

Pennsylvania Department of Environmental Protection Certified UST Installer

OSHA 1910.120 Hazardous Waste Site Training: 40 Hour

Lackawanna River 2000 Program - Lackawanna River Basin in Northeast PA

Kevin was Project Manager for this project which was an EPA funded watershed reclamation project involving acid mine drainage (AMD) and combined sewer overflows (CSO) identification and remediation, non-point source pollution control method applications, riverbank restoration, and water quality monitoring.

US Army Corps of Engineer: Lackawanna River watershed - Northeast PA

Kevin was Project Manager for a US Army Corps of Engineers funded project, aimed at assessing tributaries and their confluences in the upper Lackawanna River watershed in Northeast Pennsylvania. The project involved quantifying metal concentrations (Aluminum, Total Iron, Ferrous Iron and Manganese) versus flow and monitoring water quality in the Lackawanna River and its tributaries.

Additional experience includes:

Hazardous Waste Characterization And Remediation

Phase I And Phase II

Environmental Site Assessment

Test Borings And Monitoring

Well Installation Oversight And Sampling

Underground Storage Tank Compliance

Closure, Release Investigations

Watershed Monitoring

Remote And Real-Time Field Instrumentation Operation And Data Acquisition

GPS Surveying

Environmental Data Collection And Management

Scott Fuel Stop, Inc: Scott Fuel Stop Property - Scott Township, PA

Served as PADEP Certified Tank Handler (PADEP UMR 5585) during the removal of the diesel fuel supply lines and dispensers at the site. Roles included project planning, PADEP coordination, oversight of field activities, sample collection, determining applicable cleanup standards and final report preparation.

Pump-n-Pantry, Inc.: Pump-n-Pantry #002 Property - Great Bend Township, PA

Currently serving as project manager during ongoing site characterization and interim remedial activities

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at the site. Roles include client coordination, PADEP coordination, subcontractor coordination, obtaining access to off-site properties, mapping/ data presentation and report preparation.

Community Bank, NA: Phillips Road Property - Springville, PA

Served as project manager and site supervisor during the removal of a buried oil-water separator at the site. Roles included project planning, subcontractor coordination, oversight of field activities, sample collection, determining applicable cleanup standards, contaminated soil disposal and final report preparation.

MARTIN GILGALLON

Regional Environmental Manager

Marty is our Regional Manager in Scranton, PA and has 28 years of experience in the environmental field, specializing in environmental assessment, water quality and waste stream treatment evaluation, site characterization, subsurface investigations, and remedial design/action. Marty has worked with a variety of clients including energy and utility clients, development corporations, and commercial and residential developers throughout the Mid-Atlantic region.

PG

Professional Geologist, PA

EDUCATION

B.S. - Geosciences, Penn State University, 1987

ORGANIZATIONS

Association of Groundwater Scientists and Engineers.

National Groundwater Association

The Geological Society of America

Lackawanna River Corridor Association

CERTIFICATIONS/ REGISTRATIONS

Commonwealth of Pennsylvania Registered Professional Geologist

Pennsylvania Department of Environmental Protection Certified UST Installer

OSHA 1910.120 Hazardous Waste Site Training: 40 Hour and Annual 8 Hour

Lackawanna Watershed 2000 Program - Lackawanna River Basin in Northeastern PA

Marty served as Project Manager for this program on the Lackawanna River Basin in Northeastern Pennsylvania. He previously served as Project Manager under the Strategic Environmental Research and Development Program (SERDP) in conjunction with the completion of watershed studies on the Lackawanna River Basin and the Winters Run River Basin at the Aberdeen Proving Ground in Harford County, Maryland. The associated Scopes of Work included:

Completion of the mapping of each basin utilizing GPS and GIS technologies.

Generation of channel morphology data utilizing traditional surveying methods.

Collection of wet chemistries to determine baseline chemical characteristics of each river system.

Collection of water quality data utilizing in-situ real-time data collection equipment pursuant to the development of the prototypes.

Pilot demonstrations for an environmental Monitoring and Management System (EMMS) under SERDP.

In each investigation, the real-time data was collected from the field stations utilizing cellular telephone technologies and downloaded, via modem, to a central data collection laboratory at the National Institute for Environmental Renewal (NIER) located in Mayfield, Lackawanna County, Pennsylvania.

As Project Manager, his responsibilities also included coordination with officials of the Army Environmental Center at the Aberdeen Proving Ground; completion of the collection of atmospheric data with field representatives of the Waterways Experimental Station (WES) in Vicksburg, Mississippi; and coordination with local, county and state regulators and authorities.

Site Characterization

Marty conducted evaluations of Publicly Owned Treatment Works (POTW) effluent characterization protocols relative to compliance with PA Clean Streams and US EPA Clean Water Act requirements, as they apply

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to receiving water limitations on quantities, rates, and concentrations of chemical and physical constituents.

Dye Tracer Studies

Marty also designed and implemented Dye Tracer studies for a variety of commercial and industrial clients, in order to determine the configuration of both sanitary and industrial piping systems. As part of a Design Study relative to a Groundwater Pump and Treat System, he evaluated the capability of a private Sewage Treatment Plant to process treated discharges from a hydrocarbon-contaminated wastestream. In support of Permit Applications for encroachments into wetlands, he prepared environmental assessment documentation regarding wetland aerial extent, value, function, adverse impacts and adverse environmental effect.

Project Hydrogeologist

As Project Hydrogeologist, Marty was responsible for the assessment of hydrologic and geologic conditions pertaining to project performance. Projects of note include the initiation and supervision of release investigations in conjunction with failed underground storage tank (UST) systems at numerous sites and UST Closures. These projects typically include the development of test boring and monitoring well networks and soil and groundwater sampling programs in order to discern migration pathways and the extent of potential contamination present at a facility. Marty's responsibilities included the design and implementation of remedial action plans to address soil and groundwater contamination; associated coordination with regulatory agencies; and the preparation of UST Closure Reports. Remedial action projects include: the design and implementation of vacuum extraction and remediation systems to address petroleum contaminated soil and groundwater; and pump and treat remedial systems to address petroleum impacted groundwater in deep, bedrock aquifers.

Environmental Assessments

As Project Manager for environmental assessments and site characterizations, responsibilities included the preparation of and adherence to site specific health and safety plans, performance of background reviews and field investigations, oversight of field technicians, data review, and reporting. Projects of note include: the remedial investigation/feasibility study of a 120 acre industrial facility contaminated with various petroleum hydrocarbons, volatile organics and PCBs; hydrogeological study and quarterly monitoring of an abandoned industrial site contaminated with 1,1,1 Trichloroethane; geophysical documents review; and Phase I and Phase II environmental site assessments of commercial and industrial facilities.

Geologist

As Staff Geologist, Marty's duties included the design of groundwater monitoring systems for landfills and UST systems. Marty was responsible for the installation of test borings and construction of groundwater monitoring wells, and the development and implementation of soil and aqueous sampling programs. He was also responsible for environmental site assessments and geotechnical investigations in conjunction with building design and construction, and report preparation. Projects of note include the hydrogeological investigation including project and client coordination for a US Environmental Protection Agency Superfund Site in New Jersey; and numerous geologic investigations for both government agencies and private corporations.

APPENDIX D

PADEP FSCR Approval Letter Dated March 15, 2018

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

March 15, 2018

Pump-N-Pantry Inc.
c/o Mr. Scott Quigg
100 Grow Avenue
Montrose, PA 18801

Re: ECB-Storage Tanks Program
SCR Approval Letter
Pump-n-Pantry #001
Facility ID #:58-13092
Incident#(s): 48572 and 50143
99 Grow Ave.
Bridgewater Township, Susquehanna County

Dear Mr. Quigg:

The Department of Environmental Protection (Department) has reviewed the January 9, 2018 document titled "Final Site Characterization Report" for the release incident(s) referenced above. This document was prepared by LaBella Associates PC and submitted as a Site Characterization Report (SCR) as required by 25 Pa. Code § 245.310(a). You selected the Non-Residential Statewide Health standard as the remediation standard for soil and groundwater.

The Department approves the SCR, in accordance with 25 Pa. Code § 245.310(c)(1).

A Remedial Action Plan (RAP) conforming to the requirements of Section 245.311(b) of the Department's Corrective Action Regulations, shall be submitted to the Department for review. Section 245.311(a) requires that the RAP be submitted within 45 days of this letter, or submitted within an alternative time frame as determined by the Department. **Your RAP is due no later than April 30, 2018.**

Failure to submit a complete RAP within the alternative timeframe as determined by the Department may result in enforcement action.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

The technical review of this document was conducted under the responsible charge of a Pennsylvania Licensed Professional Geologist. If you have any questions or desire clarification regarding the above, then please contact Rebecca Albert, PG who can be reached either by telephone at 570.830.3028 or through e-mail to realbert@pa.gov.

Sincerely,

Eric Supey
Environmental Program Manager
Environmental Cleanup & Brownfields Program

cc: Bridgewater Township/Susquehanna County
LaBella Associates PC
USTIF

APPENDIX E

Current Property Deed

MARY F. EVANS
Register of Wills - Recorder of Deeds
Clerk of Orphans' Court Division
Court of Common Pleas of Susquehanna County
PO BOX 218
MONTROSE, PA 18801-0218

(570) 278-4600

SUSQUEHANNA COUNTY COURT HOUSE
MONTROSE, PENNSYLVANIA

Instrument Number - 201301311
Recorded On 1/28/2013 At 11:58:48 AM *** Total Pages - 7**
*** Instrument Type - DEED**
Invoice Number - 137933
*** Grantor - LEIGHTER CORPORATION**
*** Grantee - LEIGHTER CORPORATION**
*** Customer - NOGI, APPLETON, WEINBERGER & WREN**
*** FEES**

STATE WRIT TAX	$0.50
STATE JCS/ACCESS TO JUSTICE	$23.50
RECORDING FEES - RECORDER OF DEEDS	$17.50
AFFORDABLE HOUSING	$13.00
COUNTY IMPROVEMENT FEE	$2.00
RECORDER IMPROVEMENT FEE	$3.00
MONTROSE AREA SCHOOL REALTY TAX	$0.00
BRIDGEWATER TOWNSHIP	$0.00
TOTAL PAID	$59.50

This is a certification page

DO NOT DETACH

This page is now part of this legal document.

RETURN DOCUMENT TO:
NOGI, APPLETON, WEINBERGER & WREN
415 WYOMING AVE
SCRANTON, PA 18503

I hereby CERTIFY that this document is recorded in the Recorder's Office of Susquehanna County, Pennsylvania.

RECORDER'S OFFICE SUSQUEHANNA COUNTY, PA

Mary F. Evans
MARY F. EVANS
RECORDER OF DEEDS

* - Information denoted by an asterisk may change during the verification process and may not be reflected on this page.

002I4G

THIS DEED,

MADE this 18 day of January, 2013,

BETWEEN LEIGHTER CORPORATION, a Pennsylvania business corporation with its principal office located at 754 Grow Avenue, Montrose, Pennsylvania, 18801 (hereinafter referred to as "Grantor") and

LEIGHTER CORPORATION, a Pennsylvania business corporation with its principal office located at 754 Grow Avenue, Montrose, Pennsylvania, 18801 (hereinafter referred to as "Grantee")

WITNESSETH that in consideration of One Dollar ($1.00) in hand paid, the receipt whereof is hereby acknowledged, the said Grantor does hereby grant and convey to the said Grantee, its successors and/or assigns:

Parcel One:

ALL THAT LOT, piece, or parcel of land situate lying and being in the Township of Bridgewater, County of Susquehanna and State of Pennsylvania consisting of approximately 4.15 acres, as further described in Exhibit "A", attached hereto and incorporated herein by reference.

BEING the same parcel that was conveyed by T.C.O., Inc. to Leighter Corporation by Deed, dated September 14, 2012 and recorded in Susquehanna County on October 9, 2012 as Instrument No. 201212235.

Parcel Two:

ALL THAT PIECE, parcel or lot of land situate lying and being in the Township of Bridgewater, County of Susquehanna and State of Pennsylvania consisting of approximately 1.21 acres, as follows:

BEING the same parcel as we conveyed by Pump N' Pantry, Inc. to Leighter Corporation by deed dated September 14, 2012 and recorded in Susquehanna County on October 9, 2012 as Instrument No. 201212236.

The parcels described above have been re-surveyed and consolidated into a single parcel designated as Lot 1R on a plan entitled "Lot Consolidation Plan of Lands

to be Conveyed to Leighter Corp", prepared by Robert Kiley, P.L.S., dated 06/27/2012, Final Lot 1R is further bounded and described as follows:

Final Lot 1R:

BEGINNING at a point on the Right-of-way of State Route 706 also known as Grow Avenue, the property herein described;

THEN running on the line of lands now or formerly of the Susquehanna Humane Society, N 83°58'53" E, 38.60 ft. to a point being a common corner of lands now or formerly of the Susquehanna Humane Society and Final Lot 1R;

THEN running along the same, on a tangent curve to the right with a radius of 584.64 ft, a distance of 129.84 ft. (with a Chord of S 89°39'24" E, 129.57 ft) to a point;

THEN running on the same, N6°42'20" E, 5.00ft to a point;

THEN running along the same, on a tangent curve to the right with a radius of 589.64 ft, a distance of 99.29 ft. (with a Chord of S 78°28'14" E, 99.17 ft) to common corner of Final Lot 1R and the lands now or formerly of the Rail-Trail Council;

THEN running on the common line of Final Lot 1R and the lands now or formerly of the Rail-Trail Council, S18°19'51" W, 84.00ft to a common corner of Final Lot 1R and the lands now or formerly of the Rail-Trail Council;

THEN running on the same, N79°25'55" W, 89.34 ft. to a common corner of lands now or formerly the Rail-Trail Council and Final Lot 1R;

THEN running on the same, S13°12'17" W, 540.00 ft. to a point;

THEN running on the same, S9°46'54" W, 35.38 ft. to a point;

THEN running on the common line of Final Lot 1R and the lands now or formerly of Lewis, N76°38'08" W, 263.06ft to a common corner of Final Lot 1R and the lands now or formerly of Lewis;

THEN running on the same, N60°16'09" W, 117.93 ft. to a point in the center of Township Road T-650 also known as Crossley Road;

THEN running on the center of said Crossley Road the following courses and distances:

N22°28'07" W, 16.59 ft.;

N43°19'28" W, 57.29 ft.;

N46°29'55" W, 54.46 ft. to a point on the right-of way of State Route 706;

Then along said State Route Right-of-way the following courses and distances:.

N50°13'04" E, 14.07 ft.;

N21°54'11" W, 15.85 ft.;

THEN running along the same, on a curve to the left with a radius of 1117.32 ft, a distance of 142.14 ft. (with a Chord of N 45°27'53" E, 142.05 ft) to a point;

THEN running along the same, N41°49'13" E, 209.72 ft. to a point;

THEN running along the same, on a tangent curve to the right with a radius of 708.75 ft, a distance of 226.71 ft. (with a Chord of N 50°59'02" E, 225.75 ft) to the point and place of beginning;

COMPRISING 5.18 Acres, more or less, and being Final Lot 1R as shown on the above-referenced plan.

The combination of Lots 1 and 2, into Final Lot 1R does not relieve the owner, his/her heirs and/or assigns from any development easements, rights-of-way, or setbacks that were in effect prior to this lot combination. The grantees further agree that the single parcel designated as Lot 1R shall not be further subdivided without the approval of the Bridgewater Township Board of Supervisors.

AND this parcel is subject to any and all rights of ways, easements or agreements that may be over and across and/or under the same, whether visible or invisible, or that may be of record for said premises.

AND the Grantor does hereby specially warrant the premises herein conveyed.

IN WITNESS WHEREOF, the said Grantor, has hereunto set its hand and seal, the day and year first above written.

Leighter Corporation

By: Scott Quigg, President
Scott Quigg

STATE OF PENNSYLVANIA :

SS:

COUNTY OF Susquehanna :

On this 18th day of January, 2013 before me, the undersigned officer, personally appeared SCOTT QUIGG who acknowledged himself to be the PRESIDENT of LEIGHTER CORPORATION, and that he as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as such officer.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal this date and year first above mentioned.

NOTARIAL SEAL
MARY KINNEY
Notary Public
BRIDGEWATER TWP., SUSQUEHANNA CNTY
My Commission Expires May 14, 2016

Mary Kinney
Notary Public

I hereby certify that the precise address of the Grantee is: 754 Grow Avenue, Montrose, PA 18801.

Ann Lavelle Odell, Esq.
Attorney for Grantee

REV-183 EX (04-10)

pennsylvania
DEPARTMENT OF REVENUE
Bureau of Individual Taxes
PO BOX 280603
Harrisburg, PA 17128-0603

REALTY TRANSFER TAX STATEMENT OF VALUE

See reverse for instructions.

RECORDER'S USE ONLY	
State Tax Paid	0
Book Number	
Page Number	201301311
Date Recorded	1-28-13

Complete each section and file in duplicate with Recorder of Deeds when (1) the full value/consideration is not set forth in the deed, (2) the deed is without consideration or by gift, or (3) a tax exemption is claimed. A Statement of Value is not required if the transfer is wholly exempt from tax based on family relationship or public utility easement. If more space is needed, attach additional sheets.

A. CORRESPONDENT – All inquiries may be directed to the following person:

Name	Telephone Number:		
Ann Lavelle Powell, Esquire	(570) 963-8880		
Mailing Address	**City**	**State**	**ZIP Code**
415 Wyoming Avenue	Scranton	PA	18503

B. TRANSFER DATA

C. Date of Acceptance of Document

Grantor(s)/Lessor(s)			Grantee(s)/Lessee(s)		
Leighter Corporation			Leighter Corporation		
Mailing Address			**Mailing Address**		
754 Grow Avenue			754 Grow Avenue		
City	**State**	**ZIP Code**	**City**	**State**	**ZIP Code**
Montrose	PA	18801	Montrose	PA	18801

D. REAL ESTATE LOCATION

Street Address	City, Township, Borough	
Grow Avenue	Bridgewater	
County	**School District**	**Tax Parcel Number**
Susquehanna	Montrose	(a) 124.15-1.001.00/(b) 124.15-1.014.00.000

E. VALUATION DATA - WAS TRANSACTION PART OF AN ASSIGNMENT OR RELOCATION? ☐ Y ☒ N

1. Actual Cash Consideration	2. Other Consideration	3. Total Consideration
1.00	+0.00	= 1.00
4. County Assessed Value	**5. Common Level Ratio Factor**	**6. Fair Market Value**
(a)100,100.00 (b)103,000	X 3.06	=(a) 315,180 (b) 306,306

F. EXEMPTION DATA

1a. Amount of Exemption Claimed	1b. Percentage of Grantor's Interest in Real Estate	1c. Percentage of Grantor's Interest Conveyed
100.00	100%	100%

Check Appropriate Box Below for Exemption Claimed.

☐ Will or Intestate succession. _____
(Name of Decedent) (Estate File Number)

☐ Transfer to a trust. (Attach complete copy of trust agreement identifying all beneficiaries.)

☐ Transfer from a trust. Date of transfer into the trust _____
If trust was amended attach a copy of original and amended trust.

☐ Transfer between principal and agent/straw party. (Attach complete copy of agency/straw party agreement.)

☐ Transfers to the commonwealth, the U.S. and instrumentalities by gift, dedication, condemnation or in lieu of condemnation. (If condemnation or in lieu of condemnation, attach copy of resolution.)

☐ Transfer from mortgagor to a holder of a mortgage in default. (Attach copy of mortgage and note/assignment.)

☐ Corrective or confirmatory deed. (Attach complete copy of the deed to be corrected or confirmed.)

☐ Statutory corporate consolidation, merger or division. (Attach copy of articles.)

☒ Other (Please explain exemption claimed.) Deed of Consolidation of two parcels; there is no actual conveyance.

Under penalties of law, I declare that I have examined this statement, including accompanying information, and to the best of my knowledge and belief, it is true, correct and complete.

Signature of Correspondent or Responsible Party	Date
Ann Lavelle Powell	1/25/2013

FAILURE TO COMPLETE THIS FORM PROPERLY OR ATTACH REQUESTED DOCUMENTATION MAY RESULT IN THE RECORDER'S REFUSAL TO RECORD THE DEED.

APPENDIX F

Monitoring Well Logs

LaBella Associates, P.C.	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: August 19, 2016	
Client:	Pump-n-Pantry, Inc.	Date Finished: August 19, 2016	
Purpose:	Site Characterization Activities		
Contractor:	Eichelbergers	Boring Number: MW-1	
Driller:	Tim Westover	Job Number: 25112	
Inspector:	Kevin Cucura	Sheet: 1of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
	7:50	8:40	21.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Asphalt Surface
1---				Dark brown and medium brown sand and silt with sub-rounded pebbles and cobbles	

2---					

3---					

4---					

5---		0.0		5.0' - 10.0'	Hard / Steady 5.0'-8.0'
---				Medium dark gray (N4), well sorted fine-medium grained sandstone	
6---					

7---					

8---					Soft / Steady 8.0'-9.0'

9---					

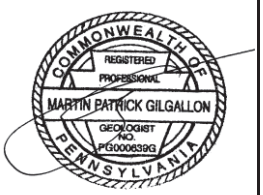
10---		0.0		10.0' - 11.0'	Soft / Steady 10.0'-11.0'
---				Dark brown weathered sandstone (fracture)	Weathered
11---					
---				11.0' - 14.5'	Hard / Steady 11'-14.5'
12---				Medium dark gray (N4) well sorted medium-fine grained sandstone	

13---					

14---					
---				14.5' - 17.0'	Soft / Choppy 14.5'-17.0'
15---		0.0		Dark gray (N3) well sorted medium-fine grained sandstone with interbedded dark brown weathered sandstone (fractures)	Weathered
---					
16---					

17---					
---				17.0' - 21.0'	
18---				Grayish green (SG 5/2) well sorted fine grained sandstone	Hard 18.0'-21.0'

19---					
---				Log Approved By: Martin Gilgallon, P.G.	
		0.0			



LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: August 23, 2016	
Client:	Pump-n-Pantry, Inc.				Date Finished: August 23, 2016	
Purpose:	Site Characterization Activities					
Contractor:	Eichelbergers				Boring Number: MW-2	
Driller:	Tim Westover				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		13:20	14:00	21.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					0.0' - 5.0'	Mulch Surface
1---					Pulverized sandstone fill material (shot rock)	

2---						

3---						

4---						

5---		31.1			5.0' - 7.0'	Wet at 5.0'
---					Dark brown sand and silt with	
6---					sub-angular pebbles and	
---					cobbles	
7---					7.0' - 11.5'	Bedrock at 7.0'
---					Medium gray (N5), fine to	Hard / Steady 7.0'-11.5'
8---					medium grained sandstone	
---					(well sorted)	
9---						

10---		0.0				

11---						
---					11.5' - 12.0'	Choppy / Fracture
12---					Dark brown weathered	11.5'-12.0'
---					sandstone	
13---					12.0' - 12.5'	Hard/Steady 12.0'-12.5'
---					Medium gray (N5), fine-	
14---					medium grained sandstone	
---					12.5 - 13.0'	Choppy / Fracture
15---		0.0			Dark brown weathered	12.5'-13.0'
---					sandstone	
16---					13.0' - 19.5'	Hard/Steady 13.0'-19.5'
---					Grayish green (SG 5/2) well	
17---					sorted fine grained sandstone	
---					19.5' - 21.0'	
18---					Dark brown weathered	
---					sandstone	
19---						
---					Log Approved By:	Choppy / Fracture
		0.0			Martin Gilgallon, P.G.	19.5'-21.0'

LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: August 23, 2016	
Client:	Pump-n-Pantry, Inc.				Date Finished: August 23, 2016	
Purpose:	Site Characterization Activities					
Contractor:	Eichelbergers				Boring Number: MW-3	
Driller:	Tim Westover				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		7:55	9:15	21.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					0.0' - 6.0'	Asphalt Surface
1---					Pulverized rocky fill material	
---					(shot rock)	
2---						

3---						

4---						

5---		0.0				Wet at 5.0'

6---		29.4	Odors at 6.0'		6.0' - 10.0'	
---					Dark brown sand and silt	
7---					with angular and sub-angular	
---					pebbles and cobbles	
8---						

9---						

10---		25.6			10.0' - 21.0'	Rock at 10.0'
---					Medium dark gray (N4) well	Hard / Steady 10.0'-21.0'
11---					sorted, fine grained sandstone	

12---						

13---						

14---						

15---		0.0				Note: Well collapsed at 7.0'. Installed 15.0' temporary casing. Well constructed as casing was removed.

16---						

17---						

18---						

19---						
---					Log Approved By:	
		0.0			Martin Gilgallon, P.G.	

LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: August 22, 2016	
Client:	Pump-n-Pantry, Inc.				Date Finished: August 22, 2016	
Purpose:	Site Characterization Activities					
Contractor:	Eichelbergers				Boring Number: MW-4	
Driller:	Tim Westover				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		11:45	12:20	21.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					0.0' - 2.0'	Mulch Surface
1---					Modified fill materials	

2---		31.3	Odors at 2.0'		2.0' - 9.5'	
---					Medium brown and dark brown	
3---					sand and silt with abundant	
---					sub-angular pebbles and	
4---					cobbles	

5---		56.8				Wet at 5.0'

6---						

7---						

8---						

9---						
---					9.5' - 15.5'	Bedrock at 9.5'
10---		0.0			Medium dark gray (N4) well	Hard / Steady 9.5'-21.0'
---					sorted, fine grained sandstone	
11---						

12---						

13---						

14---						

15---		0.0				Note: Hole collapsed at
---					15.5' - 21.0'	~15.0'. Well set at
16---					Grayish green (SG 5/2) well	15.35' below grade
---					sorted, fine-medium grained	
17---					sandstone	

18---						

19---						
---					Log Approved By:	
		0.0			Martin Gilgallon, P.G.	

LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: August 24, 2016	
Client:	Pump-n-Pantry, Inc.				Date Finished: August 24, 2016	
Purpose:	Site Characterization Activities					
Contractor:	Eichelbergers				Boring Number: MW-5	
Driller:	Tim Westover				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		7:45	9:30	21.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					0.0' - 8.0'	Asphalt Surface
1---					Dark brown sand and silt with abundant sub-angular pebbles and cobbles	

2---		85.0	Odors at 2.0'			

3---						

4---						Wet at 4.0'

5---		116.0				

6---						

7---						

8---					8.0' - 18.0'	Bedrock at 8.0'
---					Medium dark gray (N4) well sorted, fine grained sandstone	Hard / Steady 8.0'-18.0'
9---						

10---		20.7				

11---						

12---						

13---						Note: Hole collapsed at 6.0'. Installed 21' temporary casing, well constructed as casing was pulled)

14---						

15---		0.0				

16---						

17---						

18---					18.0' - 21.0'	Choppy / Fracture 18.0'-20.0'
---					Broken weathered sandstone	
19---						Hard / Steady
---					Log Approved By:	20.0'-21.0'
		0.0			Martin Gilgallon, P.G.	

LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: August 19, 2016	
Client:	Pump-n-Pantry, Inc.				Date Finished: August 19, 2016	
Purpose:	Site Characterization Activities					
Contractor:	Eichelbergers				Boring Number: MW-6	
Driller:	Tim Westover				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		9:45	10:15	21.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					0.0' - 3.0'	Asphalt Surface
1---					Dark brown and medium brown sand and silt with sub-rounded pebbles and cobbles	

2---						

3---					3.0' - 5.5'	Top of Rock at 3.0'
---					Medium dark gray (N4) well	Rod Change at 3.0'
4---					sorted, fine-medium grained	Hard / Steady 3.0'-5.0'
---					sandstone, change to dark	Very Hard / Steady
5---		0.0			brown weathered sandstone	5.0'-5.5'
---					(fracture) at 5.5'	
6---					5.5' - 10.5'	Choppy / Weathered
---					Medium dark gray (N4) well	at 5.5'
7---		15.3	Slight Odor at 7.0'		sorted, fine-medium grained	Very Hard / Steady
---					sandstone	5.5' - 8.0'
8---						Choppy / Softer
---						8.0'-9.0'
9---						Hard / Steady 9.0'-10.5'

10---		0.0				Choppy / Softer /
---					10.5' - 11.5'	Weathered 10.5'-11.5'
11---					Dark brown weathered	
---					sandstone (fractured)	
12---					11.5' - 15.5'	Choppy / Weathered
---					Medium dark gray (N4) well	11.5'-16.0'
13---					sorted, fine-medium grained	
---					sandstone	
14---					15.5' - 16.0'	Hard / Steady 16.0'-20.0'
---					Dark brown weathered	
15---		0.0			sandstone (fractured)	
---					16.0' - 20.0'	
16---					Medium dark gray (N4) well	
---					sorted, fine-medium grained	
17---					sandstone	
---					20.0' - 20.5'	Choppy / Weathered
18---					Dark brown weathered	20.0'-20.5'
---					sandstone (fractured)	
19---					20.5' - 21.0'	Hard / Steady 20.5'-21.0'
---					Medium gray (N4) well sorted,	
		0.0			fine-medium grained sandstone	

LaBella Associates, P.C	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: Soft Dig: 02.06.17 / Drilling: 02.09.17	
Client:	Pump-n-Pantry, Inc.	Date Finished: Soft Dig: 02.06.17 / Drilling: 02.09.17	
Purpose:	Site Characterization Activities		
Contractor:	Odyssey Environmental	Boring Number: MW-7	
Driller:	Jeff Zelko	Job Number: 25112	
Inspectors:	Chris Herman (Soft) / Kevin Cucura (Drilling)	Sheet: 1of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:50	12:15	3.0'	Elevation TOC	Surface
Drilling	9:30	11:13	21.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 3.0'	Gravel Surface
---			Moist 0.0' - 3.0'	Dark brown sand and silt with	Soft Dig 0.0' - 3.0'
1---		0.0		sub-angular pebbles and	
---				trace amounts of wood chips	Auger 10" Diameter
2---		0.0		and slag; sandstone at 3.0'	Borehole 3.0 ' - 10.0'

3---		0.0	Wet 3.0' - 10.0'	3.0' - 10.0'	Drill 6" diameter air-
---				Weathered gray sandstone	rotary 10.0' - 21.0'
4---		0.0			

5---		0.0			

6---		0.0			

7---		0.0			

8---		0.0			

9---		0.0			

10---		0.0		10.0' - 21.0'	Competent bedrock
---				Gray to medium gray, fine to	
11---				medium grained sandstone	

12---					

13---					**Sample Log:**
---					Sample ID #:
14---					112-0206-MW7A
---					Sample Depth:
15---					2.0' - 3.0'
---					Sample Time: 1232
16---			Wet @ rod change		

17---					

18---					

19---				Log Approved By:	
---			Fracture @ 20.0'	Martin Gilgallon, P.G.	

LaBella Associates, P.C	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property				Date Started: Soft Dig: 02.06.17 / Drilling: 02.08.17	
Client:	Pump-n-Pantry, Inc.				Date Finished: Soft Dig: 02.06.17 / Drilling: 02.08.17	
Purpose:	Site Characterization Activities					
Contractor:	Odyssey Environmental				Boring Number: MW-8	
Driller:	Jeff Zelko				Job Number: 25112	
Inspector:	Chris Herman (Soft) / Kevin Cucura (Drilling)				Sheet: 1of 1	
TIME	LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
	Soft Dig	9:15	10:43	5.0'	Elevation TOC	Surface
	Drilling	10:54	12:41	20.5'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 3.0'	Asphalt Surface
---			Moist 0.0' - 4.0'	Medium brown sand and silt	Soft Dig 0.0' - 5.0'
1---		0.0		with rounded pebbles to 1.5',	
---				change to dark gray sand and	Auger 10" Diameter
2---		0.0		silt with abundant and	Borehole 5.0 ' - 15.5'
---				sub-angular pebbles / cobbles	
3---		0.0			Drill 6" diameter air-
---		3.0		3.0' - 5.0'	rotary 15.5' - 20.5'
4---		9.0	Wet 4.0' - 15.5'	Dark gray sand and silt with	
---				abundant angular and	
5---		13.0		sub-angular pebbles and	
---				cobbles	
6---					
---				5.0' - 6.0'	
7---				Boulder	
---				6.0' - 8.0'	
8---				Brown silt and clay with some	
---				pebbles	
9---				8.0' - 15.5'	
---				Weathered gray sandstone	
10---					
---					**Sample Log:**
11---					Sample ID #:
---					112-0206-MW8A
12---					Sample Depth:
---					2.0' - 3.0'
13---					Sample Time: 0953

14---					Sample ID #:
---					112-0206-MW8B
15---					Sample Depth:
---				15.5' - 20.5'	4.0' - 4.5'
16---			Wet @ rod change	Gray to medium gray, medium	Sample Time: 1023
---				grained sandstone with few	
17---				shale interbeds	

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: Soft Dig: 02.06.17 / Drilling: 02.08.17	
Client:	Pump-n-Pantry, Inc.	Date Finished: Soft Dig: 02.06.17 / Drilling: 02.08.17	
Purpose:	Site Characterization Activities		
Contractor:	Odyssey Environmental	Boring Number: MW-9	
Driller:	Jeff Zelko	Job Number: 25112	
Inspector:	Chris Herman (Soft) / Kevin Cucura (Drilling)	Sheet: 1of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:18	11:54	5.0'	Elevation TOC	Surface
Drilling	15:10	16:30	20.5'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 4.0'	Asphalt Surface
			Moist 0.0' - 4.0'	Medium-light brown sand and	Soft Dig 0.0' - 5.0'
1---		0.0		silt with abundant sub-angular	
---				and sub-rounded pebbles to	Auger 10" Diameter
2---		0.0		1.5', change to gray sand and	Borehole 5.0 ' - 15.0'
---				silt with sub-angular pebbles	
3---		0.0		and cobbles	Drill 6" diameter air-
---					rotary 15.0' - 20.5'
4---		0.0	Wet 4.0' - 15.0'	4.0' - 5.0'	
---				Light brown sand, silt and clay	
5---		0.0		with some angular and	
---				sub-angular cobbles	
6---		0.0		5.0' - 6.0'	
---				Dark brown silt and clay with	
7---		0.0		some sand and sub-angular	
---				pebbles	
8---		0.0		6.0' - 10.0'	
---				Weathered gray bedrock	
9---		0.0			

10---		0.0			
---					**Sample Log:**
11---		0.0			Sample ID #:
---					112-0206-MW9A
12---		0.0			Sample Depth:
---					2.0' - 3.0'
13---		0.0			Sample Time: 1134

14---		0.0			Sample ID #:
---					112-0206-MW9B
15---		0.0		14.0' - 15.0'	Sample Depth:
---			Hard / steady	Medium gray sandstone	4.0' - 5.0'
16---					Sample Time: 1147

17---			Wet @ rod change		
---			Soft ~ 17.0'		
18---					

19---					
---			Hard / steady	Log Approved By:	
				Martin Gilgallon, P.G.	

LaBella Associates, P.C	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: Soft Dig: 02.06.17 / Drilling: 02.09.17	
Client:	Pump-n-Pantry, Inc.	Date Finished: Soft Dig: 02.06.17 / Drilling: 02.09.17	
Purpose:	Site Characterization Activities		
Contractor:	Odyssey Environmental	Boring Number: MW-10	
Driller:	Jeff Zelko	Job Number: 25112	
Inspector:	Chris Herman (Soft) / Kevin Cucura (Drilling)	Sheet: 1of 1	

TIME	LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
	Soft Dig	13:02	13:30	5.0'	Elevation TOC	Surface
	Drilling	13:30	15:38	21.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 5.0'	Asphalt Surface
---			Moist 0.0' - 4.0'	Dark brown sand and silt with	Soft Dig 0.0' - 5.0'
1---		0.0		abundant sub-angular and	
---				angular pebbles and cobbles	Auger 10" Diameter
2---		0.0			Borehole 5.0 ' - 14.0'

3---		0.0			Drill 6" diameter air-rotary 14.0' - 21.0'

4---		0.0	Wet 4.0' - 14.0'		

5---		0.0		5.0' - 8.0'	
---				Dark brown sand and silt with	
6---		0.0		some clay and sub-angular	
---				pebbles and cobbles	
7---		0.0			

8---		0.0		8.0' - 14.0'	
---				Weathered gray sandstone	
9---		0.0		with some shale	

10---		0.0			
---					**Sample Log:**
11---		0.0			Sample ID #:
---					112-0206-MW10A
12---		0.0			Sample Depth:
---					2.0' - 3.0'
13---		0.0			Sample Time: 1310

14---		0.0		14.0' - 16.0'	Sample ID #:
---			Hard / steady	Medium-grained sandstone	112-0206-MW10B
15---				with shale interbeds near 17.0'	Sample Depth:
---				to 17.5'	4.0' - 5.0'
16---			Wet @ rod change		Sample Time: 1326
---			Soft / steady		
17---					
---			Hard / steady		
18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: April 19, 2017	
Client:	Pump-n-Pantry, Inc.				Date Finished: April 19, 2017	
Purpose:	Site Characterization Activities					
Contractor:	Odyssey Environmental				Boring Number: MW-11	
Driller:	Jeff Zelko				Job Number: 25112	
Inspectors:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		10:30	13:30	21.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 4.0'	Asphalt Surface
---			Moist to 4.0'	Soft dig to 4.0'; dark brown	
1---		0.0	No Odor	and gray sand and silt with	
---			No Visual	some clay; bedrock at 4.0'	
2---		0.0			

3---		0.0			

4---		2.0	Hard / Steady	4.0' - 11.0'	Water on top of
---				Gray sandstone	bedrock
5---		0.0			

6---		0.0			

7---			Rod Change 7.0'		
---			Dry		
8---					

9---		0.0			

10---					

11---			Soft / Steady	11.0' - 14.0'	
---				Red siltstone	
12---		0.0	Rod Change 12.0'		
---			Dry		
13---					

14---			Hard / Steady	14.0' - 15.0'	
---				Gray sandstone	
15---		0.0	Soft / Choppy	15.0' - 17.0'	
---				Weathered sandstone	
16---					

17---			Rod Change 17.0'	17.0' - 21.0'	
---			Water Observed	Gray sandstone	
18---			Hard / Steady		

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	
		0.0			

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
MARTIN PATRICK GILGALLON
GEOLOGIST NO. PG000639G

LaBella Associates, P.C					TEST BORING LOG	
					Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property				Date Started: 04/19/2017	4/20/2017
Client:	Pump-n-Pantry, Inc.				Date Finished: 04/19/2017	4/20/2017
Purpose:	Site Characterization Activities					
Contractor:	Odyssey Environmental				Boring Number: MW-12	
Driller:	Jeff Zelko				Job Number: 25112	
Inspector:	Kevin Cucura				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		8:15	10:30	21.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 5.0'	Gravel Surface
---			Moist to 7.0'	Soft dig to 5.0'; 1A modified	
1---			Wet Beyond	stone with some sand and silt	

2---		0.0			

3---					

4---		0.0			

5---			Slight Odors	5.0' - 17.0'	
---				Medium brown and dark	
6---		7.0		brown sand and silt with	
---				abundant clay; bedrock at	
7---				17.0'	

8---					

9---		14.0			

10---					

11---					

12---		13.0			

13---					

14---					

15---					

16---		5.0			

17---				17.0' - 18.0'	
---				Gray sandstone	
18---			Hard / Steady	18.0' - 21.0'	
---				Gray sandstone	
19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: April 19, 2017	
Client:	Pump-n-Pantry, Inc.	Date Finished: April 19, 2017	
Purpose:	Site Characterization Activities		
Contractor:	Odyssey Environmental	Boring Number: MW-13	
Driller:	Jeff Zelko	Job Number: 25112	
Inspector:	Chris Herman (Soft) / Kevin Cucura (Drilling)	Sheet: 1of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
	13:30	15:30	20.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 4.0'	Grass Surface
---			Moist to 3.5'	Soft dig to 4.0'; medium brown	
1---		0.0	Wet Beyond	and dark brown silt and clay	
---			No Odor	with sub-angular pebbles and	
2---		0.0	No Visual	cobbles	

3---		0.0			

4---		0.0		4.0' - 14.5'	
---				Medium brown silt and sand	
5---		0.0		with abundant clay and	
---				sub-angular pebbles and	
6---		0.0		cobbles; rock at 14.5'	

7---		0.0			

8---		0.0			

9---		0.0			

10---		0.0			

11---		0.0			

12---		0.0			

13---		0.0			

14---		0.0			
---			Hard / Steady	14.5' - 17.0'	
15---		0.0		Gray sandstone	

16---		0.0			

17---		0.0	Soft / Choppy	17.0' - 19.0'	
---				Brown weathered sandstone	
18---		0.0			
---				19.0' - 20.0'	
19---		0.0	Hard / Steady	Gray sandstone	
---				Log Approved By:	
		0.0		Martin Gilgallon, P.G.	

LaBella Associates, P.C					TEST BORING LOG	
					Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property				Date Started: 04/19/2017	4/20/2017
Client:	Pump-n-Pantry, Inc.				Date Finished: 04/19/2017	4/20/2017
Purpose:	Site Characterization Activities					
Contractor:	Odyssey Environmental				Boring Number: MW-14	
Driller:	Jeff Zelko				Job Number: 25112	
Inspector:	Chris Herman (Soft) / Kevin Cucura (Drilling)				Sheet: 1of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		12:10	14:30	20.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 5.0'	Asphalt Surface
---			Dry / Moist to 4.0'	Soft dig to 5.0'; medium brown	
1---		0.0	Wet Beyond	sand and silt with abundant	
---			No Odor	sub-angular pebbles and	
2---		0.0	No Visual	some clay	

3---					

4---		0.0			

5---		0.0		5.0' - 6.5'	
---				Medium brown sand and silt	
6---				with some sub-angular	
---				pebbles	
7---		0.0			

8---		0.0			

9---		0.0			

10---					

11---				Bedrock at 11.0'	
---			Hard / Steady	Gray sandstone and red	
12---				mudstone interbedded	

13---		0.0			

14---					

15---					

16---					

17---		0.0			

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	
		0.0			

LaBella Associates, P.C.					TEST BORING LOG	
Project:	Pump-n-Pantry #001 Property				Date Started: September 13, 2017	
Client:	Pump-n-Pantry, Inc.				Date Finished: September 13, 2017	
Purpose:	Site Characterization Activities					
Contractor:	Odyssey Environmental				Boring Number: MW-15	
Driller:	Fred Bahrenburg				Job Number: 2171845	
Inspector:	Kevin Cucura				Sheet: 1 of 1	
TIME LOG		Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
		10:15	11:30	20.0'		
Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log		Lithologic Description	Notes
---					Soft dig to 4.5' on 09/12/17	Asphalt Surface
1---		0.0			Medium gray sand and silt with abundant sub-angular pebbles, cobbles and some cinder blocks; weathered bedrock at 4.5'	Auger 10" diameter borehole to 4.5'
2---		0.0				
3---		0.0				
4---		229	Gassy odor at 4.0'		4.5' - 6.0'	Damp to 4.5'
---			Soft Choppy Drilling		Weathered gray sandstone	Wet at 4.5'
5---			4.5' - 7.5'			
6---					6.0' - 16.8'	Drill 6" diameter air-rotary borehole 4.5' - 20.0'
---					Medium gray (N5), fine to medium grained sandstone	
7---						
---			Soft Steady Drilling			
8---			7.5'- 8.5'			
---			Hard Steady Drilling			
9---			8.5' - 9.5'			
---			Very Hard Steady			
10---			Drilling 9.5' - 16.8'			

11---						Rod Change @ 11.0' Dry

12---						

13---		85				

14---						

15---						

16---					16.8' - 20.0'	Rod Change @16.0' Wet
---					Interbedded medium gray to	
17---			Soft Steady Drilling		dark gray sandstone with soft	
---			16.8' - 17.0'		interbeds at 16.5' & 19.5'	
18---			Hard Steady Drilling			
---			17.0' - 19.5'			
19---			Soft Steady Drilling		Log Approved By:	
---			19.5' - 20.0'		Martin Gilgallon, P.G.	

APPENDIX G

Well Construction Details

LaBella
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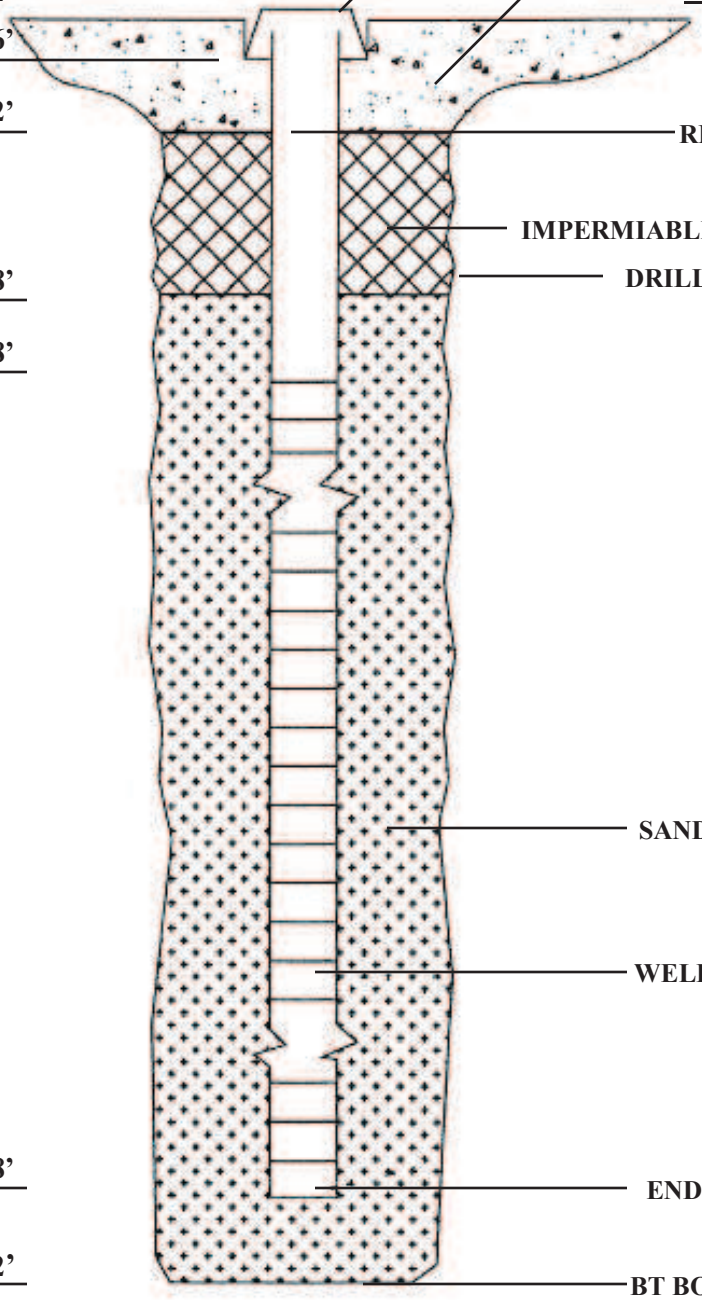
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.62’
0.46’	1,654.16’
1.10’	1,653.52’
2.64’	1,651.98’
3.64’	1,650.98’
20.64’	1,633.98’
21.00’	1,633.62’



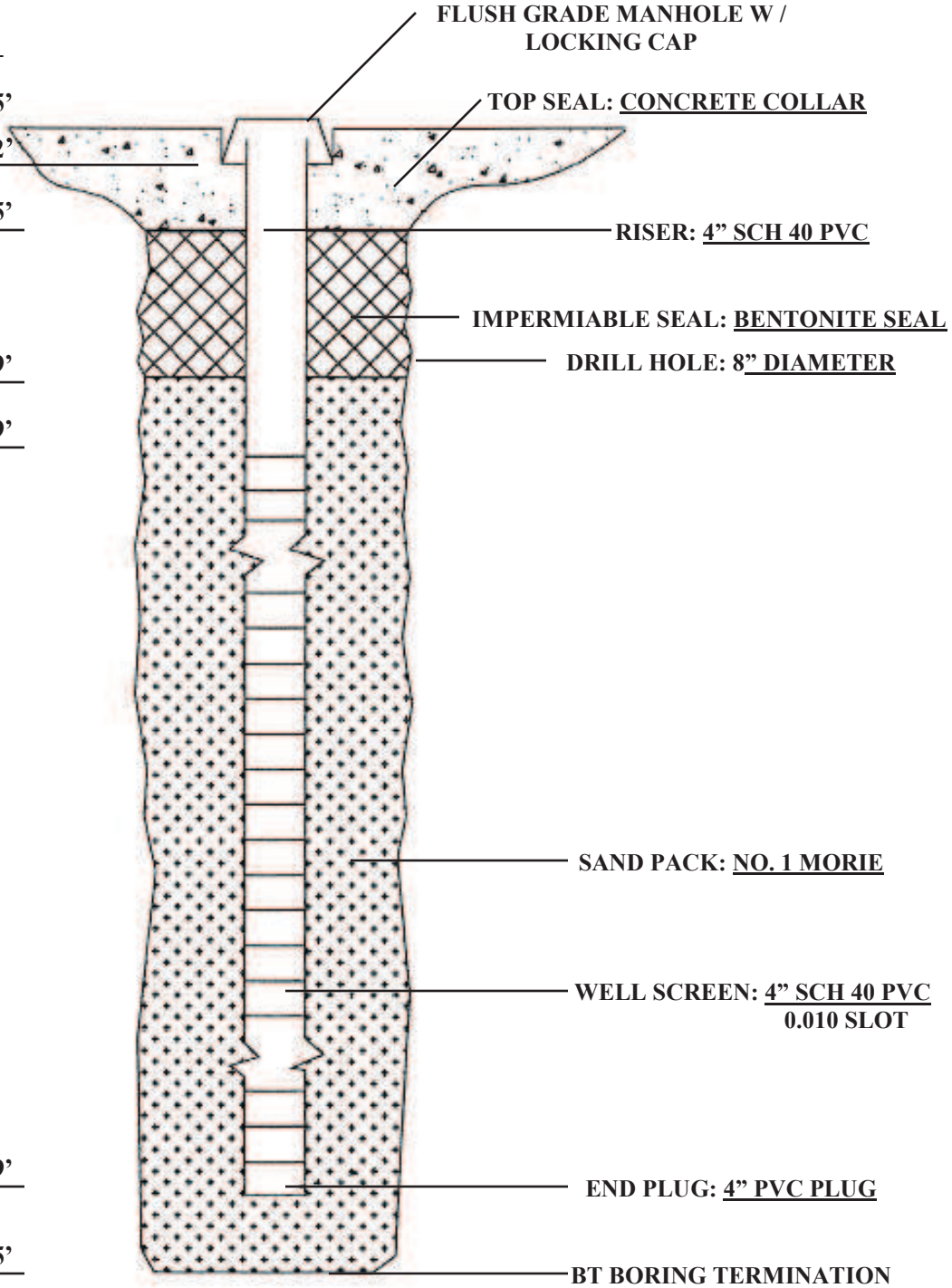
NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 1

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.15’
0.43’	1,653.72’
1.00’	1,653.15’
2.66’	1,651.49’
3.66’	1,650.49’
20.66’	1,633.49’
21.00’	1,633.15’



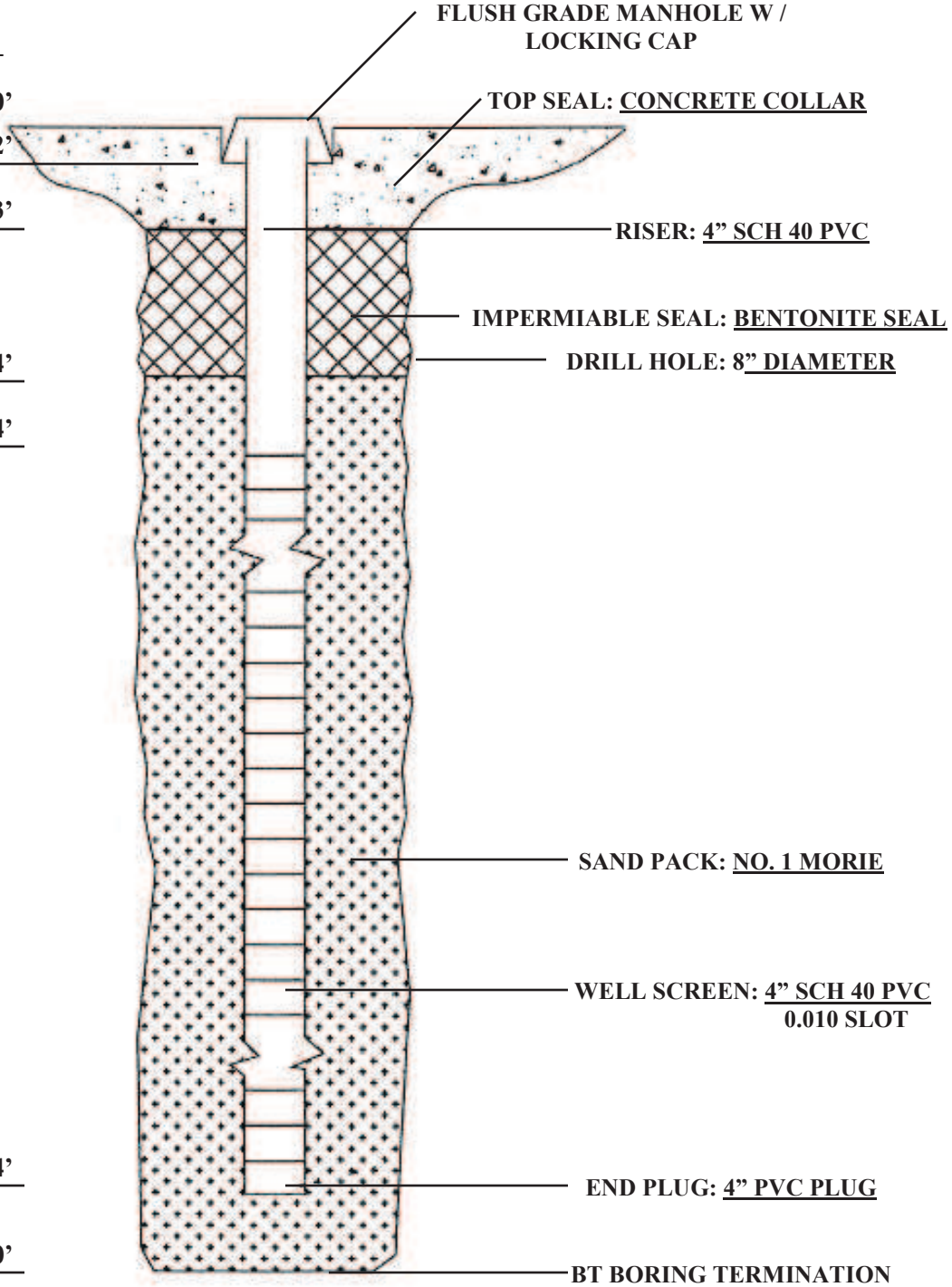
NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.20’
0.28’	1,652.92’
0.57’	1,652.63’
2.16’	1,651.04’
3.16’	1,650.04’
20.16’	1,633.04’
21.00’	1,632.20’



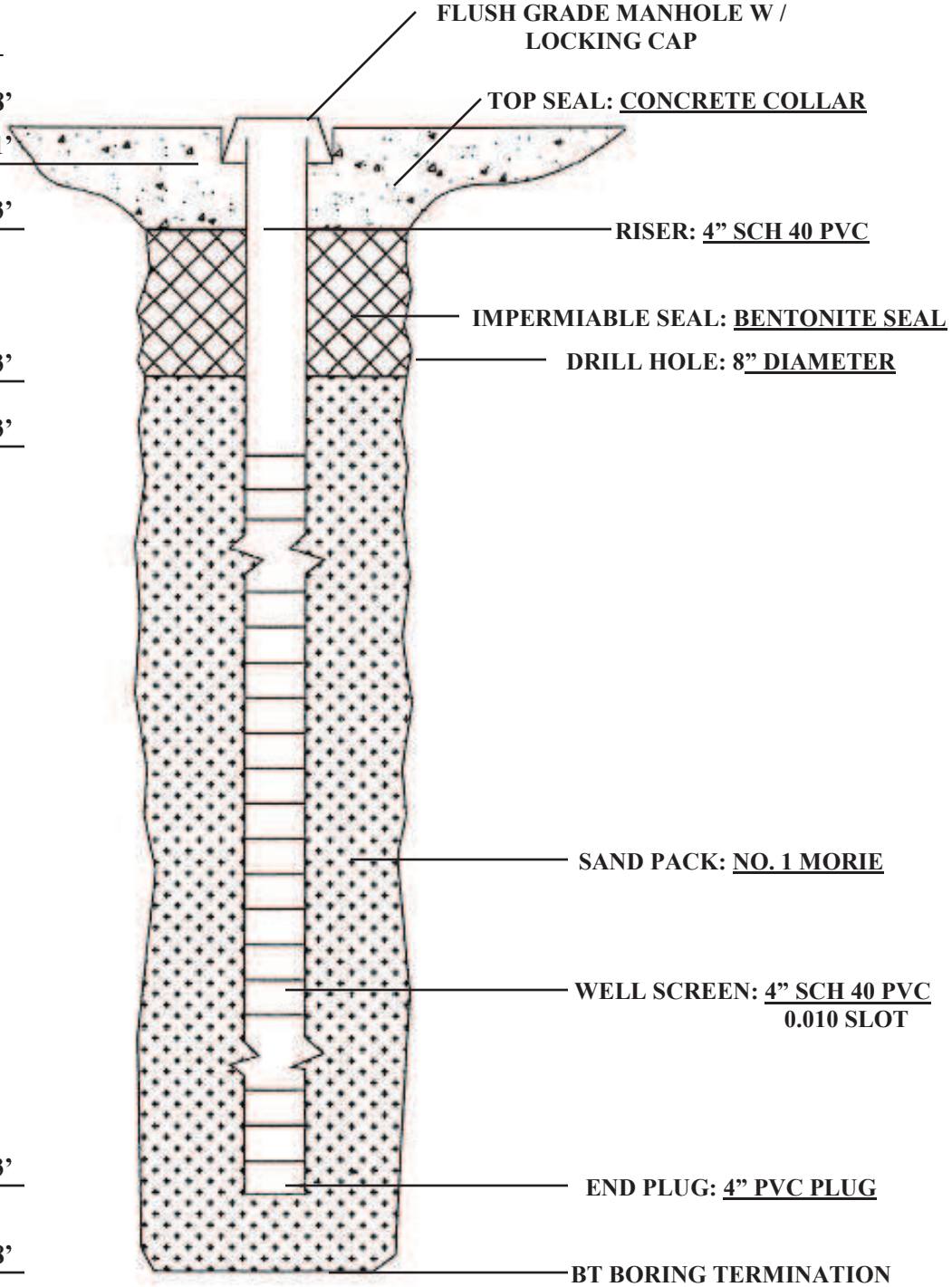
NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 3

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,651.68’
0.37’	1,651.31’
0.55’	1,651.13’
2.35’	1,649.33’
3.35’	1,648.33’
15.35’	1,636.33’
21.00’	1,630.68’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 4

LaBella
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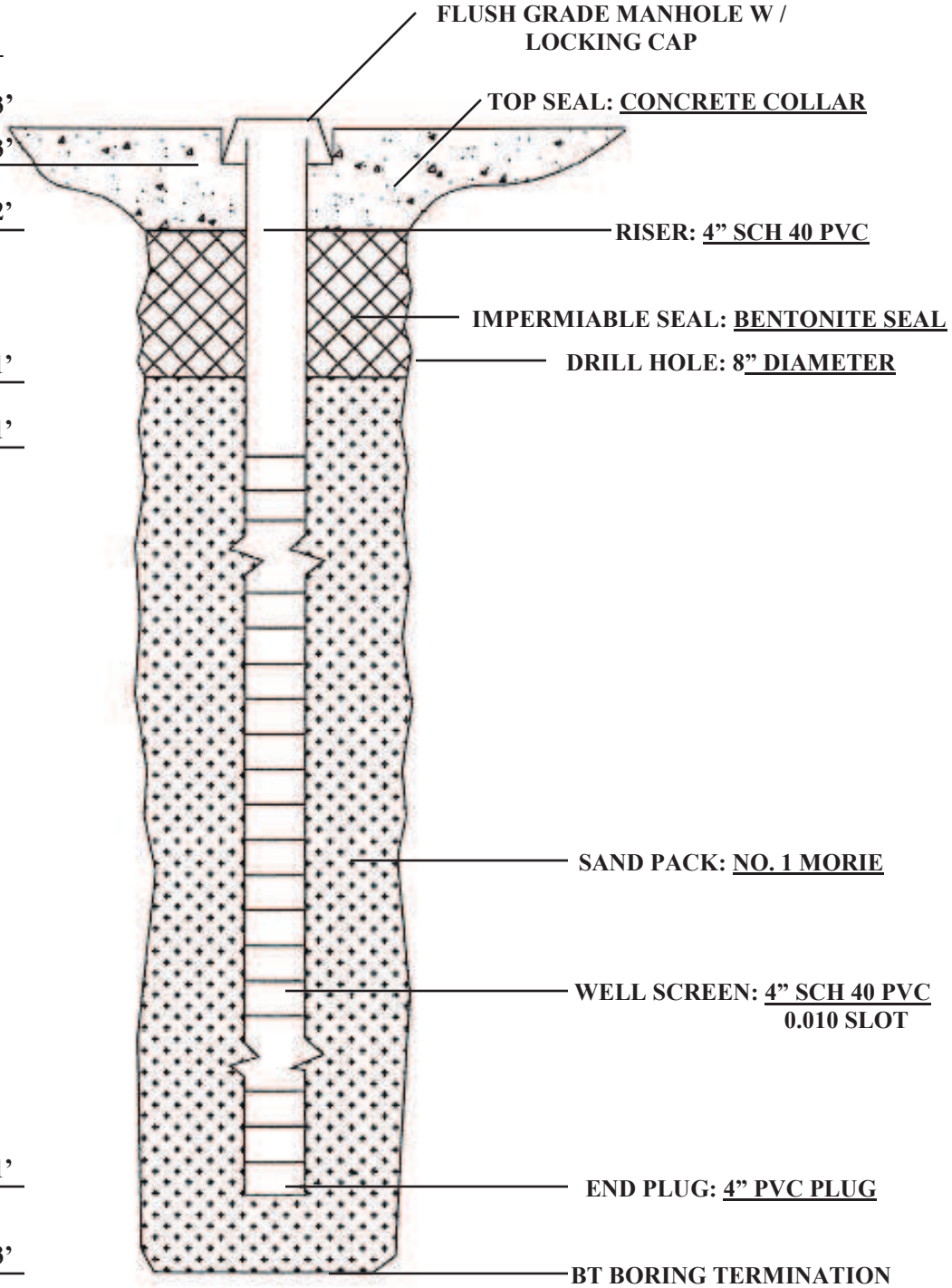
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,652.73’
0.40’	1,652.33’
0.61’	1,652.12’
2.32’	1,650.41’
3.32’	1,649.41’
20.32’	1,632.41’
21.00’	1,631.73’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 5

LaBella
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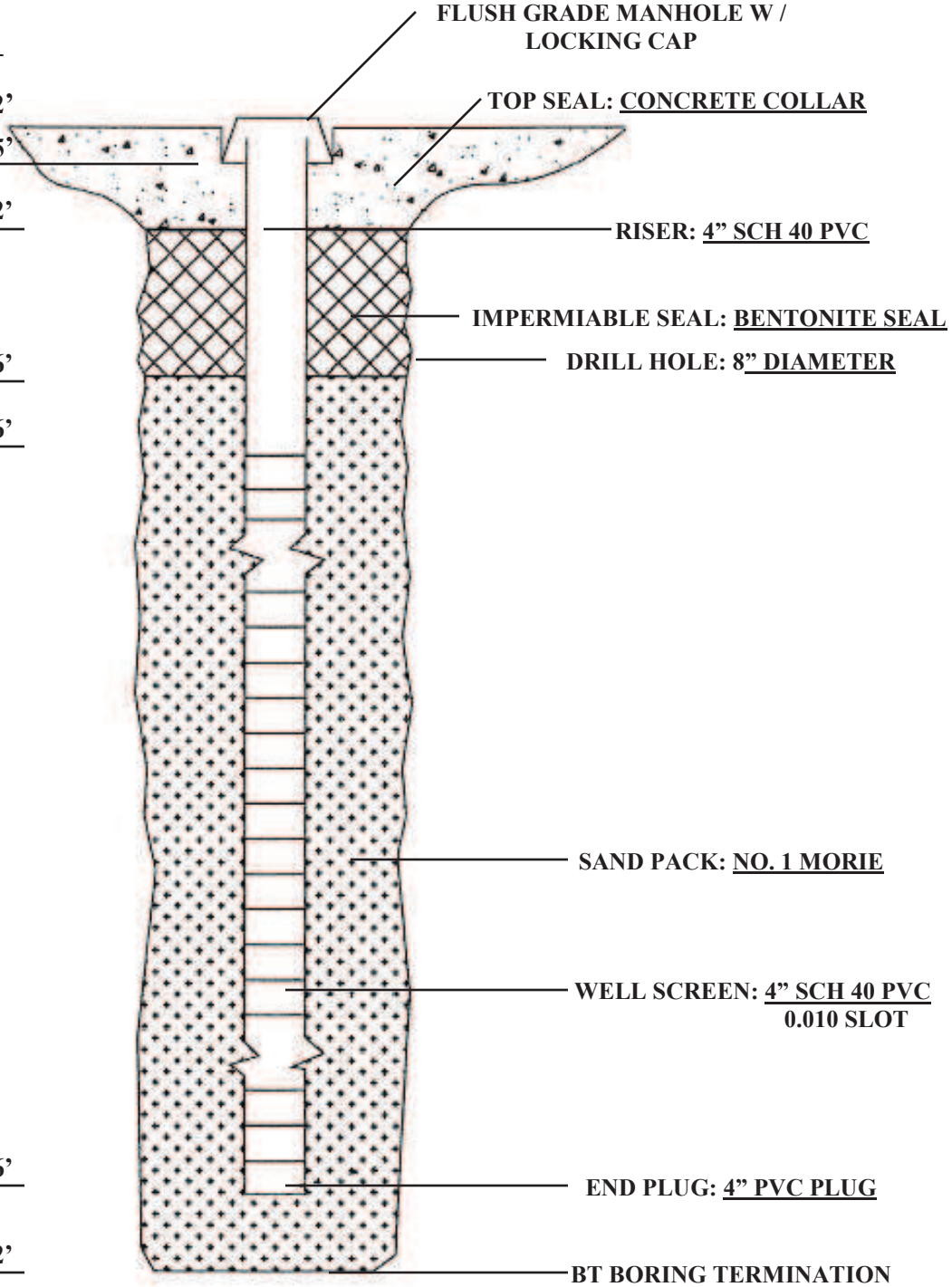
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.42’
0.47’	1,653.95’
0.70’	1,653.72’
2.46’	1,651.96’
3.46’	1,650.96’
20.46’	1,633.96’
21.00’	1,633.42’



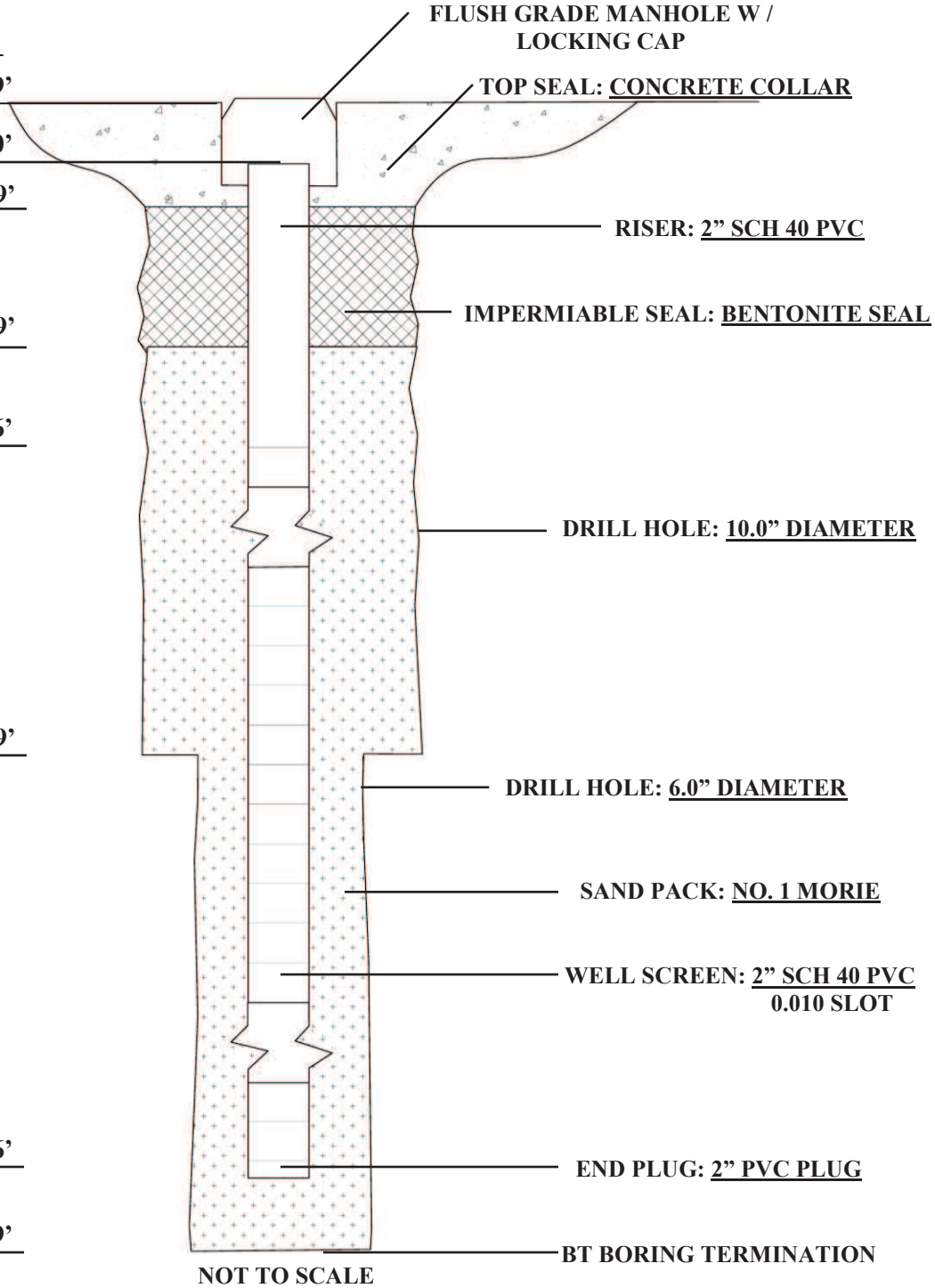
NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 6

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.0’	1,653.49’
0.49’	1,653.00’
1.00’	1,652.49’
2.00’	1,651.49’
3.23’	1,650.26’
10.00’	1,643.49’
20.23’	1,633.26’
21.00’	1,632.49’



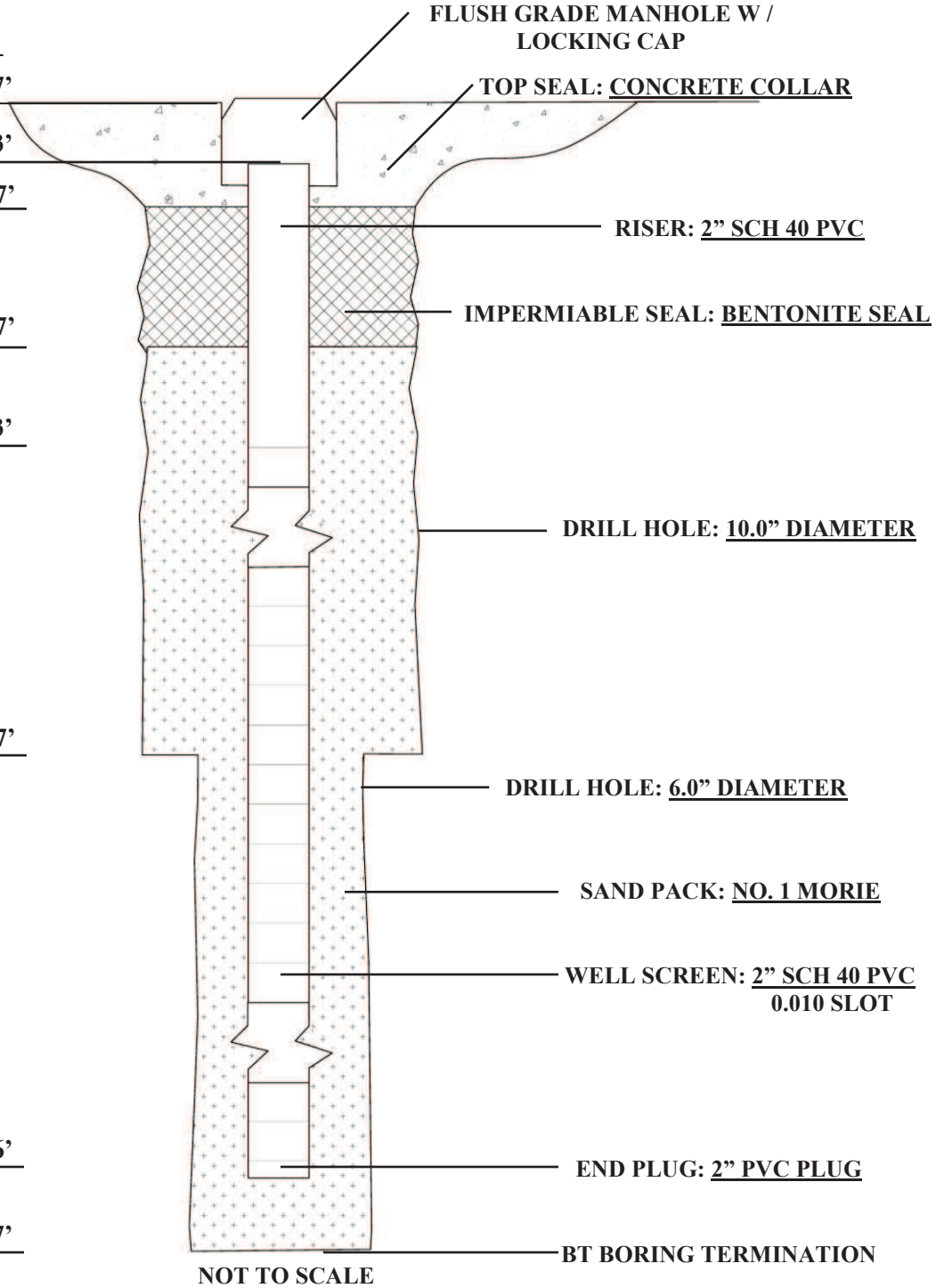
NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 7

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.57’
0.44’	1,653.13’
1.00’	1,652.57’
2.00’	1,651.57’
3.14’	1,650.43’
15.0’	1,638.57’
20.41’	1,633.16’
20.50’	1,633.07’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 8

LaBella
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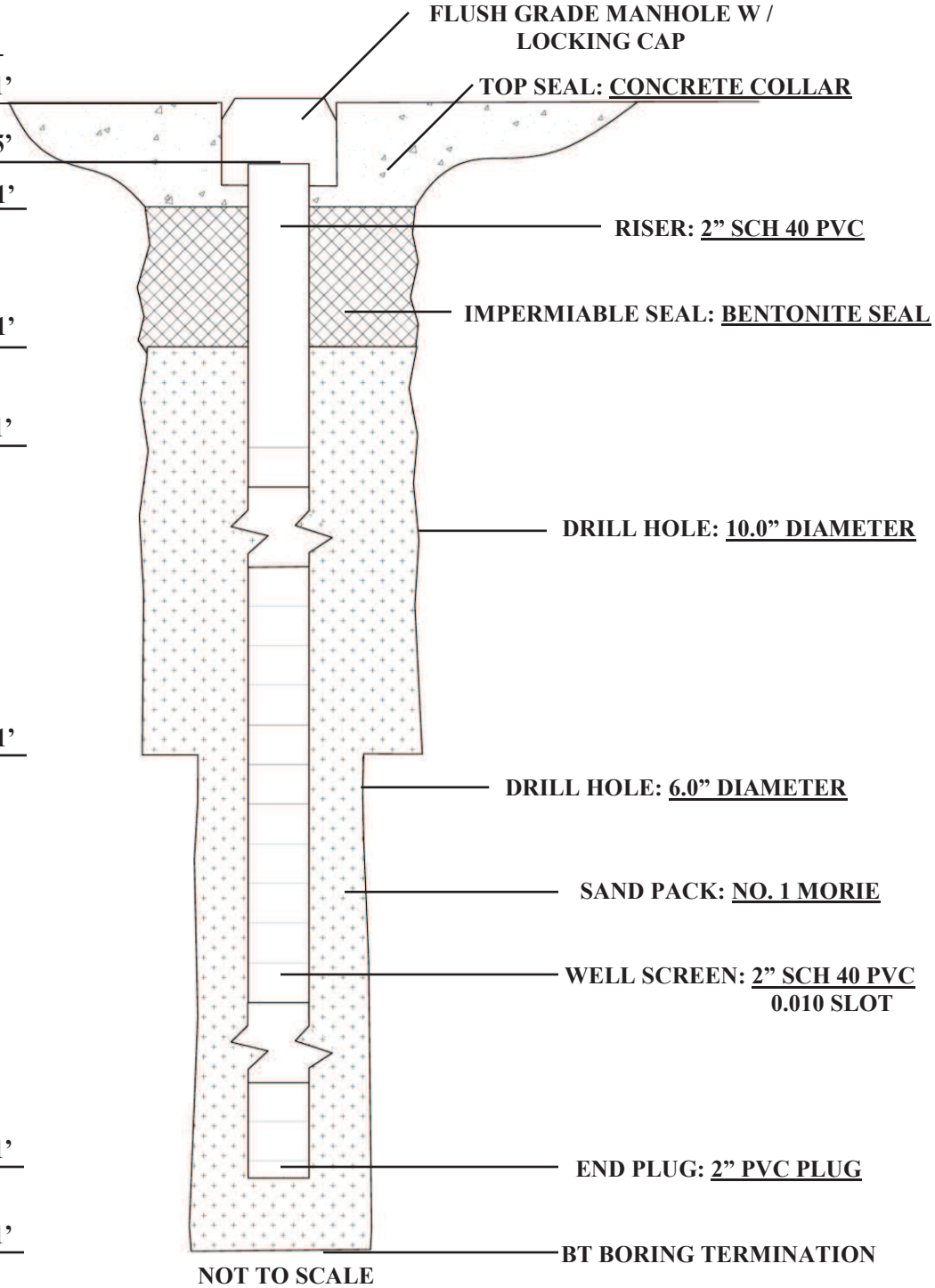
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,652.11’
0.36’	1,651.75’
1.00’	1,651.11’
2.00’	1,650.11’
2.80’	1,649.31’
15.00’	1,637.11’
19.80’	1,632.31’
20.50’	1,631.61’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 9

LaBella
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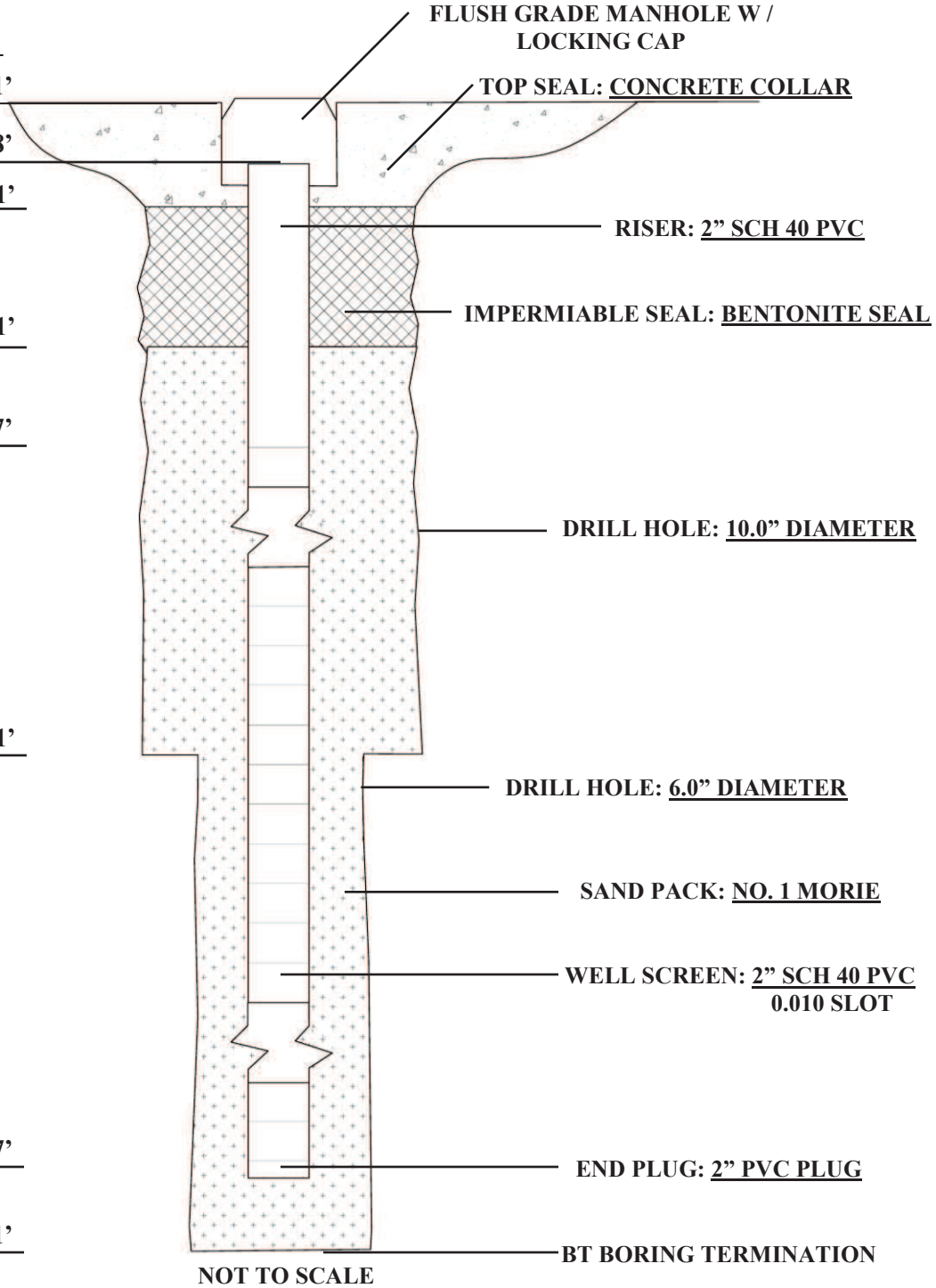
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,649.21’
0.23’	1,648.98’
1.00’	1,648.21’
2.00’	1,646.21’
2.34’	1,646.87’
14.00’	1,635.21’
19.34’	1,629.87’
21.00’	1,628.21’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 10

LaBella
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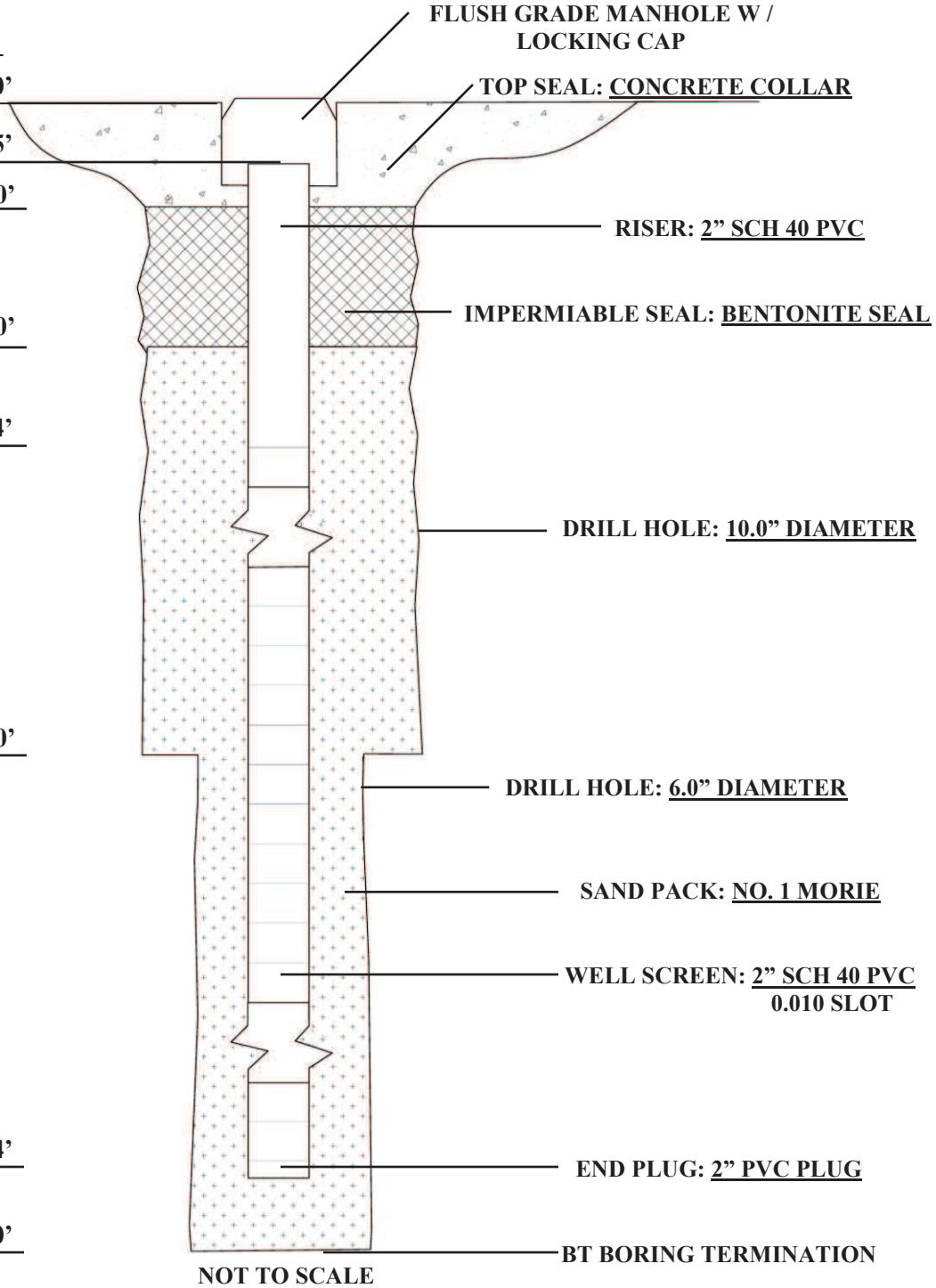
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,651.20’
0.75’	1,650.45’
1.00’	1,650.20’
2.00’	1,649.20’
3.56’	1,647.64’
4.00’	1,647.20’
20.56’	1,630.64’
21.00’	1,630.20’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 11

LaBella
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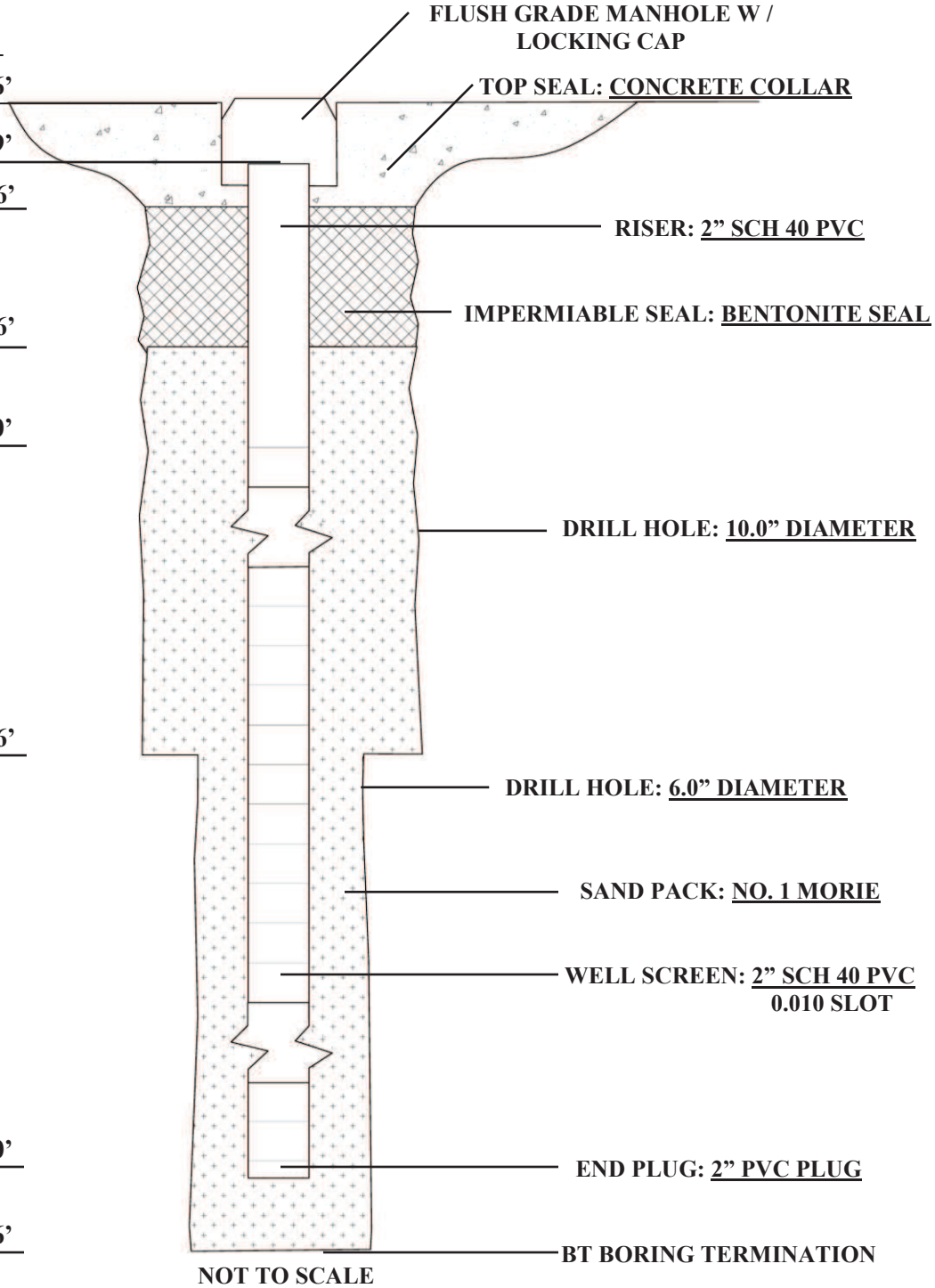
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,648.76’
0.37’	1,648.39’
1.00’	1,647.76’
2.00’	1,646.76’
3.56’	1,645.20’
18.00’	1,630.76’
20.56’	1,628.20’
21.00’	1,627.76’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 12

LaBella
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MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,646.08’
0.52’	1,645.56’
1.00’	1,645.08’
2.00’	1,644.08’
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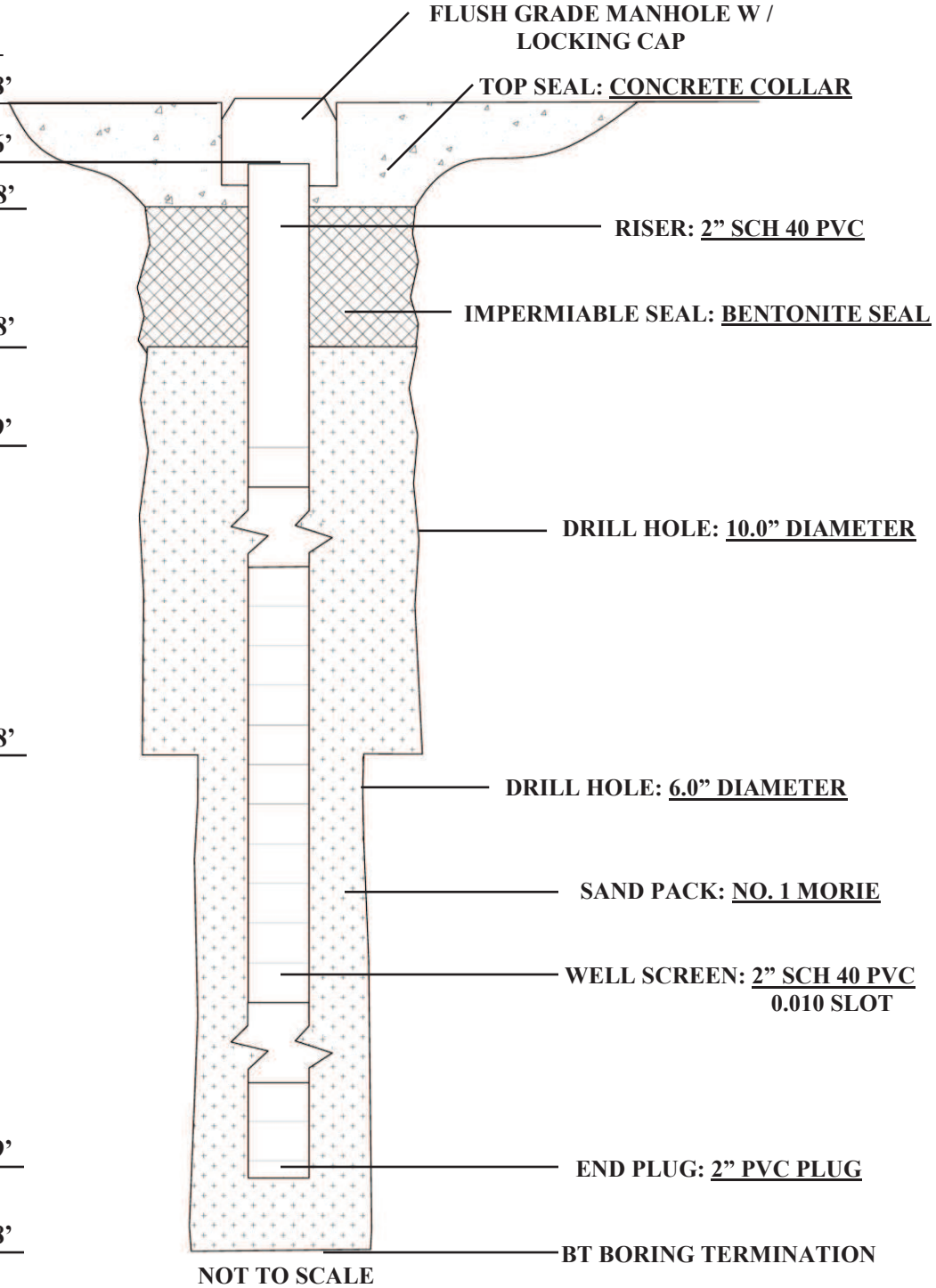
14.50’	1,631.58’
19.09’	1,626.99’
20.00’	1,626.08’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 13

LaBella
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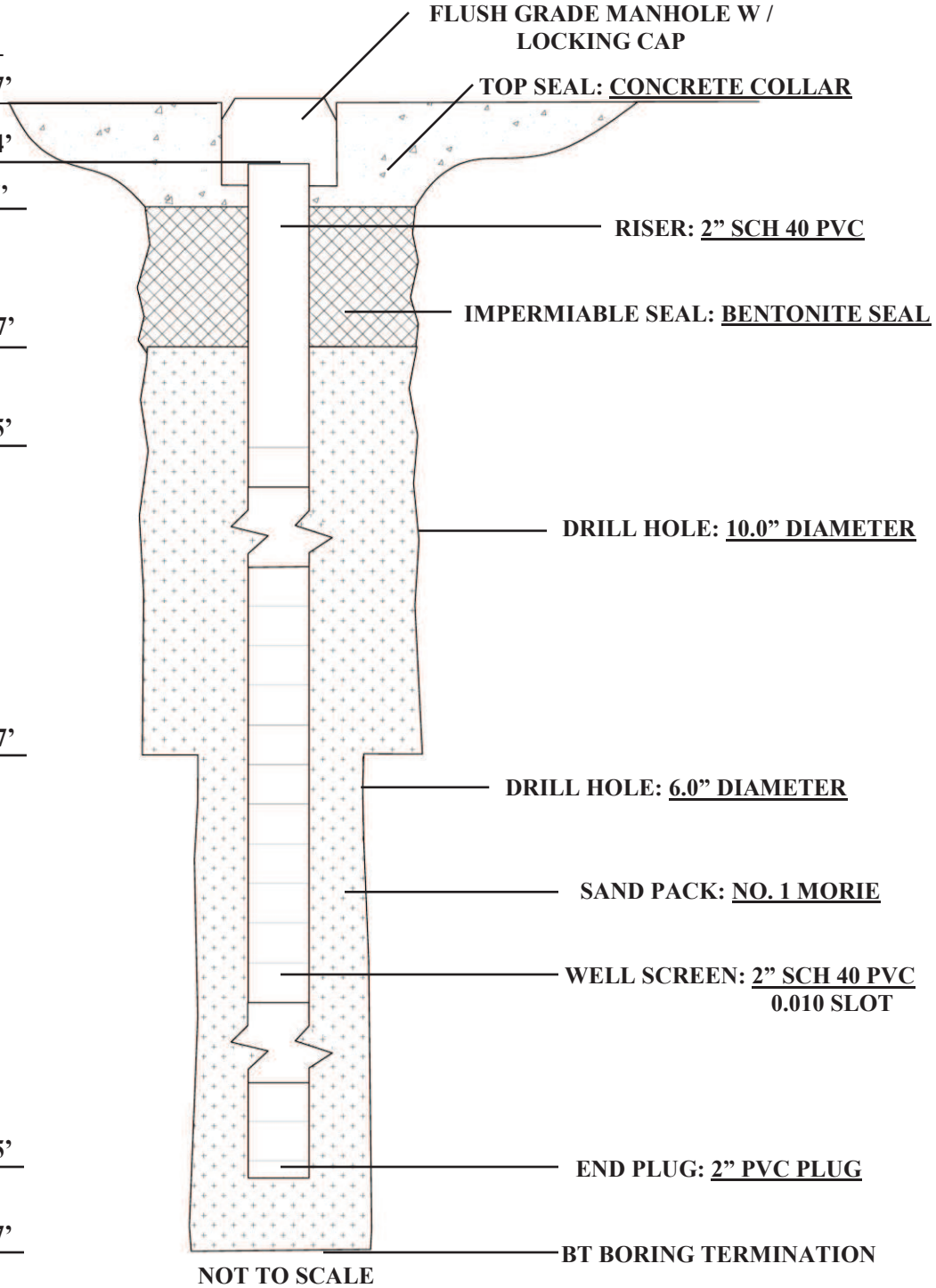
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,647.87’
0.53’	1,647.34’
1.00’	1646.87’
2.00’	1,645.87’
3.12’	1,644.75’
14.00’	1,633.87’
20.12’	1,627.75’
20.50’	1,627.37’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 14

LaBella
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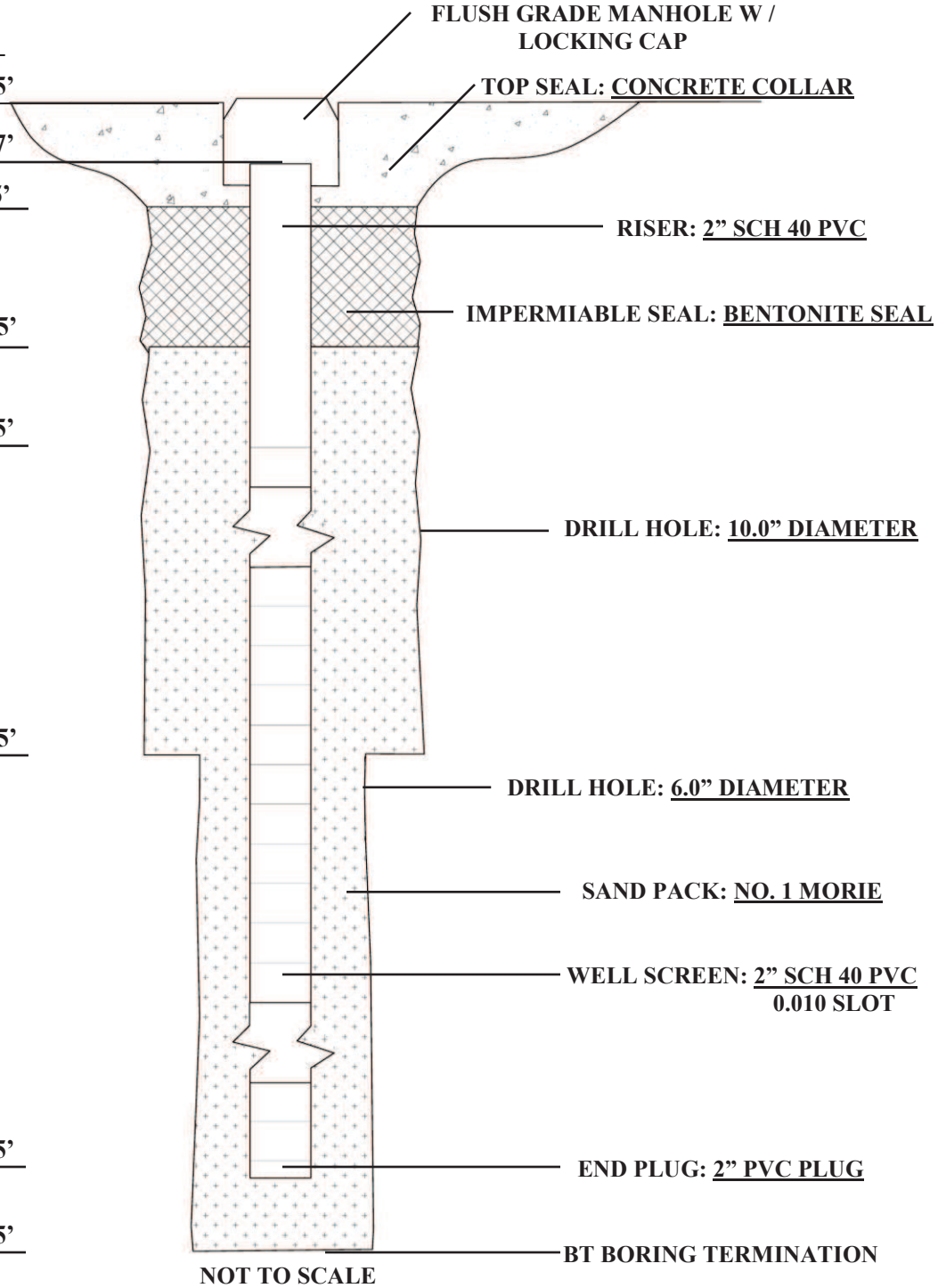
MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.55’
0.48’	1,654.07’
1.00’	1653.55’
2.00’	1,652.55’
2.60’	1,651.95’
4.50’	1,650.05’
19.60’	1,634.95’
20.00’	1,634.55’



NOT TO SCALE

SITE CHARACTERIZATION ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
MONITORING WELL 15

APPENDIX H

Development and Purge Logs

Field Notes

TO: File
FROM: Chris Herman
DATE: November 19 - 20, 2018
PROJECT: Pump-n-Pantry #001 / Site Characterization
PROJECT NUMBER: 2171845 / 2171846
SUBJECT: Groundwater Sampling Activities

0900: Arrived onsite and initiated site activities with the collection of static water levels from the fifteen (15) groundwater monitoring wells, four (4) observation wells, and one (1) recovery well located onsite. The purpose of the field activities was to collect groundwater samples from the fifteen (15) monitoring wells, four (4) observation wells, and one (1) recovery well for laboratory analysis. The general well information is as follows:

Table 1
General Well Information

Well #	S.W.L. (Feet)	Total Depth (Feet)	Pump Depth (Feet)	Rate (L/min.)	Purged (Gallons)
MW-1	2.47	20.18	2.8*	8.4**	10.0
MW-2	4.58	20.22	12.4	0.36	2.0
MW-3	4.32	19.88	12.1	0.40	3.0
MW-4	3.21	14.98	9.1	0.26	2.0
MW-5	3.22	19.92	11.6	0.25	2.0
MW-6	4.36	19.99	12.2	0.15	1.5
MW-7	3.48	19.74	11.6	0.44	3.0
MW-8	3.88	19.97	11.9	0.42	3.0
MW-9	3.92	19.44	11.7	0.39	4.0
MW-10	5.53	19.11	12.3	0.24	1.0
MW-11	3.58	19.81	11.7	0.24	2.0
MW-12	5.61	20.19	12.9	0.47	2.0
MW-13	2.82	18.57	10.7	0.37	3.0
MW-14	4.17	19.59	11.9	0.44	3.5
MW-15	3.92	19.12	11.5	0.10	1.0
OW-1	4.32	13.05	5.7*	17.0**	18.0
OW-2	3.28	12.25	5.8*	17.5**	18.0
OW-3	4.02	11.42	4.8*	14.4**	15.0
OW-4	3.58	11.11	4.9*	14.7**	15.0
RW-1	--	--	--	--	--

* = 1 volume, ** = 3 volumes in gallons

MW-1: MW-1 was not suited for low flow / low stress sampling methods. Therefore, the well was purged and sampled utilizing hand bailing methods. The well was evacuated prior to purging three (3) well volumes. No odorous or visual indications of contamination were observed. A total of 10.0 gallons was extracted from the well.

Table 2
Well Purging Data – MW-1

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	D.O. (mg/L)	Gallons	Comment
0944	7.54	7.05	255	11.1	4.92	0.25	Clear
0947	8.84	7.04	247	8.39	4.66	2.0	Clear
0949	10.04	7.00	242	7.40	3.87	4.0	Clear
0950	10.19	7.03	233	4.99	3.70	6.0	Clear
0952	9.93	7.05	229	4.29	3.84	8.0	Clear
0953	9.81	7.09	227	3.99	5.58	10.0	Clear

MW-2: MW-2 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 12.4'. The well was purged and sampled at 360 ml / min. The well maintained steady recharge during the purging activities. A total of 2.0 gallon was extracted from the well. Odorous indications of contamination were observed.

Table 3
Well Purging Data – MW-2

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1323	11.81	6.60	-69	3.44	2.5	0.83	4.52
1326	12.46	6.62	-71	3.49	1.4	0.62	4.52
1329	13.07	6.66	-79	3.39	4.4	0.60	4.52
1332	13.08	6.68	-81	3.35	3.3	0.61	4.52
1335	13.12	6.69	-84	3.27	4.3	0.65	4.52
1338	13.12	6.70	-85	3.20	4.2	0.75	4.52

MW-3: MW-3 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 12.1'. The well was purged and sampled at 400 ml / min. The well maintained steady recharge during the purging activities. A total of 3.0 gallons was extracted from the well. Odorous indications of contamination were observed.

Table 4
Well Purging Data – MW-3

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1240	12.40	6.73	-92	2.46	5.4	0.78	4.28
1243	13.40	6.72	-86	2.49	6.1	0.58	4.28
1246	14.06	6.72	-87	2.36	6.6	0.54	4.28
1249	14.25	6.74	-90	2.05	6.3	0.53	4.28
1252	14.24	6.75	-92	1.74	6.1	0.52	4.28
1253	14.12	6.73	-93	1.55	6.7	0.52	4.28
1256	14.12	6.72	-93	1.52	6.9	0.52	4.28
1259	14.14	6.72	-94	1.44	5.6	0.52	4.28

MW-4: MW-4 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 9.1'. The well was purged and sampled at 260 ml / min. The well maintained steady recharge during the purging activities. A total of 2.0 gallons was extracted from the well. Odorous indications of contamination were observed.

Table 5
Well Purging Data – MW-4

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1157	9.93	6.97	-126	2.34	3.2	0.80	3.24
1200	10.70	6.95	-125	2.38	0.6	0.65	3.24
1203	11.01	6.94	-125	2.38	0.1	0.63	3.24
1206	11.45	6.93	-126	2.38	0.2	0.62	3.24
1209	11.58	6.93	-127	2.37	0.0	0.61	3.24
1212	11.76	6.93	-127	2.37	0.0	0.60	3.24

MW-5: MW-5 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.6'. The well was purged and sampled at 250 ml / min. The well maintained steady recharge during the purging activities. A total of 2.0 gallons was extracted from the well. Odorous indications of contamination were observed.

Table 6
Well Purging Data – MW-5

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1116	11.87	6.97	-120	2.29	5.3	0.67	3.29
1119	12.56	6.98	-134	2.32	5.3	0.61	3.29
1122	12.66	6.98	-138	2.32	5.1	0.60	3.29
1125	12.83	6.98	-142	2.32	4.9	0.59	3.29
1128	12.95	6.98	-145	2.32	5.2	0.57	3.29
1131	12.95	6.99	-147	2.32	5.6	0.57	3.29

MW-6: MW-6 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 12.2'. The well was purged and sampled at 150 ml / min. The well maintained steady recharge during the purging activities. A total of 1.5 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 7
Well Purging Data – MW-6

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1023	8.71	6.37	312	1.60	6.5	3.30	4.53
1026	8.45	6.42	281	1.63	1.4	3.10	4.53
1029	9.12	6.50	250	1.65	2.9	3.19	4.53
1032	9.29	6.48	238	1.63	2.4	3.36	4.53
1035	9.49	6.41	224	1.64	1.0	3.39	4.53
1038	9.50	6.39	216	1.64	0.0	3.42	4.53
1041	9.52	6.36	201	1.63	0.0	3.91	4.53
1044	9.49	6.36	200	1.63	0.0	3.76	4.53
1047	9.48	6.36	196	1.63	0.0	3.58	4.53
1050	9.50	6.36	192	1.63	0.0	3.54	4.53

MW-7: MW-7 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.6'. The well was purged and sampled at 440 ml / min. The well maintained steady recharge during the purging activities. A total of 3.0 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 8
Well Purging Data – MW-7

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1058	12.38	6.25	170	0.496	>800	0.71	3.61
1101	12.34	6.21	167	0.499	>800	0.68	3.61
1104	12.51	6.22	155	0.502	>800	0.68	3.61
1107	12.73	6.25	123	0.503	>800	0.68	3.61
1110	12.51	6.20	95	0.509	722	0.72	3.61
1113	12.88	6.17	116	0.516	282	0.82	3.61
1116	13.11	6.16	127	0.519	157	0.87	3.61
1119	13.17	6.16	134	0.520	110	0.86	3.61

MW-8: MW-8 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.9'. The well was purged and sampled at 420 ml / min. The well maintained steady recharge during the purging activities. A total of 3.0 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 9
Well Purging Data – MW-8

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
0724	10.28	6.56	173	0.925	201	2.33	4.18
0727	11.77	6.31	137	0.922	142	1.62	4.18
0730	12.45	6.29	124	0.919	91.3	1.30	4.18
0733	12.80	6.28	118	0.929	63.3	1.12	4.18
0736	12.94	6.27	116	0.909	47.2	1.02	4.18
0739	13.05	6.27	115	0.902	37.1	0.96	4.18
0742	13.03	6.27	117	0.897	29.5	0.96	4.18

MW-9: MW-9 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.7'. The well was purged and sampled at 390 ml / min. The well maintained steady recharge during the purging activities. A total of 4.0 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 10
Well Purging Data – MW-9

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
0833	11.99	6.17	137	0.433	>800	1.37	4.07
0836	13.15	6.18	115	0.447	>800	1.29	4.08
0839	13.49	6.19	123	0.452	>800	1.26	4.08
0842	13.35	6.19	145	0.450	>800	1.28	4.08
0845	13.61	6.18	155	0.451	>800	1.26	4.08
0848	13.72	6.17	165	0.451	686	1.26	4.08
0851	13.69	6.17	174	0.450	538	1.26	4.08
0854	13.91	6.16	182	0.451	370	1.26	4.08
0857	13.81	6.15	188	0.450	332	1.25	4.08

MW-10: MW-10 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 12.3'. The well was purged and sampled at 240 ml / min. The well maintained steady recharge during the purging activities. A total of 1.0 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 11
Well Purging Data – MW-10

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1210	11.19	6.70	183	3.49	800	1.40	6.72
1213	11.10	6.69	141	3.49	800	0.97	6.72
1216	10.88	6.69	93	3.49	598	0.80	6.72
1219	11.94	6.69	40	3.56	321	0.69	6.72
1222	12.46	6.66	23	3.60	181	0.65	6.72
1225	12.60	6.66	20	3.60	178	0.63	6.72

MW-11: MW-11 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.7'. The well was purged and sampled at 240 ml / min. The well maintained steady recharge during the purging activities. A total of 2.0 gallons was extracted from the well. Visual indications of contamination were observed.

Table 12
Well Purging Data – MW-11

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
0919	10.35	6.35	270	0.101	235	5.42	3.63
0922	10.37	6.33	270	0.101	546	5.46	3.67
0925	10.67	6.32	279	0.101	677	5.46	3.67
0928	11.08	6.32	288	0.102	402	5.48	3.67
0931	11.15	6.32	290	0.102	306	5.50	3.67
0934	11.15	6.33	294	0.102	159	5.52	3.67
0937	11.32	6.33	294	0.103	144	5.47	3.67

MW-12: MW-12 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 12.9'. The well was purged and sampled at 470 ml / min. The well maintained steady recharge during the purging activities. A total of 2.0 gallons was extracted from the well. Odorous indications of contamination were observed.

Table 13
Well Purging Data – MW-12

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1248	10.34	6.65	-53	4.97	800	1.26	5.80
1251	10.86	6.56	-61	5.03	800	0.90	5.80
1254	10.11	6.55	-62	5.07	800	0.79	5.80
1257	12.00	6.53	-66	5.17	486	0.62	5.80
1300	12.40	6.52	-68	5.13	293	0.58	5.80
1303	12.61	6.52	-69	4.51	121	0.57	5.80

MW-13: MW-13 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 10.7'. The well was purged and sampled at 370 ml / min. The well maintained steady recharge during the purging activities. A total of 3.0 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 14
Well Purging Data – MW-13

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1336	10.34	6.32	-16	2.06	86.0	0.76	2.88
1339	10.90	6.27	15	2.07	104	0.63	2.88
1342	11.08	6.27	24	2.08	122	0.61	2.88
1345	10.99	6.26	32	2.08	116	0.59	2.88
1348	11.19	6.26	37	2.08	113	0.58	2.88
1351	11.03	6.26	43	2.08	111	0.57	2.88
1354	11.02	6.26	47	2.08	103	0.57	2.88

MW-14: MW-14 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.9'. The well was purged and sampled at 440 ml / min. The well maintained steady recharge during the purging activities. A total of 3.5 gallons was extracted from the well. No odorous or visual indications of contamination were observed.

Table 15
Well Purging Data – MW-14

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1422	10.65	6.35	149	0.098	389	6.20	4.25
1425	11.26	6.17	156	0.080	349	6.09	4.26
1428	11.53	6.14	167	0.078	222	6.16	4.26
1431	11.38	6.11	178	0.093	68.8	6.59	4.26
1434	11.28	6.12	186	0.106	27.1	6.92	4.26
1437	11.33	6.12	193	0.112	30.2	6.98	4.26
1440	11.42	6.13	194	0.119	10.4	7.09	4.26

MW-15: MW-15 was purged and sampled utilizing low flow / low stress sampling methods (*ASTM D 6771-02*). The pump was set at 11.5'. The well was purged and sampled at 100 ml / min. The well maintained steady recharge during the purging activities. A total of 1.0 gallons was extracted from the well. Strong odorous and visual indications of contamination were observed.

Table 16
Well Purging Data – MW-15

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Depth to Water (Feet)
1402	11.76	6.67	-77	3.33	16.1	0.64	3.98
1405	10.47	6.67	-82	2.98	11.7	0.66	3.98
1408	10.78	6.66	-91	3.05	10.6	0.61	3.98
1411	11.06	6.65	-93	3.03	10.2	0.61	3.98
1414	11.07	6.65	-99	3.02	9.6	0.61	3.98
1417	11.12	6.65	-103	3.02	9.1	0.61	3.98

OW-1: OW-1 was purged and sampled utilizing hand bailing methods. Three (3) well volumes were calculated and purged from the well. No odorous or visual indications of contamination were observed. A total of 18.0 gallons was extracted from the well.

Table 17
Well Purging Data – OW-1

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	D.O. (mg/L)	Gallons	Comment
1136	9.63	7.03	224	10.7	3.07	0.25	Clear
1138	9.22	7.22	212	4.35	3.36	5.0	Clear
1139	9.25	7.20	210	3.99	5.66	10.0	Clear
1141	9.19	7.22	207	3.89	10.28	15.0	Clear
1143	9.28	7.21	205	3.72	6.68	18.0	Clear

OW-2: OW-2 was purged and sampled utilizing hand bailing methods. Three (3) well volumes were calculated and purged from the well. No odorous or visual indications of contamination were observed. A total of 18.0 gallons was extracted from the well.

Table 18
Well Purging Data – OW-2

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	D.O. (mg/L)	Gallons	Comment
1118	9.56	7.07	154	3.48	4.10	0.25	Clear
1120	9.51	7.19	147	2.72	12.08	5.0	Clear
1122	9.74	7.20	142	2.58	10.63	10.0	Clear
1124	9.96	7.21	135	2.45	11.04	15.0	Clear
1126	10.08	7.19	136	2.57	4.92	18.0	Clear

OW-3: OW-3 was purged and sampled utilizing hand bailing methods. Three (3) well volumes were calculated and purged from the well. No odorous or visual indications of contamination were observed. A total of 15.0 gallons was extracted from the well.

Table 19
Well Purging Data – OW-3

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	D.O. (mg/L)	Gallons	Comment
0929	13.24	6.93	155	0.557	4.13	0.25	Clear
0930	10.99	7.02	146	0.671	3.39	1.0	Clear
0931	10.43	7.03	144	0.488	3.16	5.0	Clear
0932	10.35	7.01	141	0.543	3.05	10.0	Clear
0934	10.24	7.00	141	0.684	3.07	15.0	Clear

OW-4: OW-4 was purged and sampled utilizing hand bailing methods. Three (3) well volumes were calculated and purged from the well. No odorous or visual indications of contamination were observed. A total of 15.0 gallons was extracted from the well.

Table 20
Well Purging Data – OW-4

Time	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	D.O. (mg/L)	Gallons	Comment
0952	9.47	7.07	-22	2.80	3.88	0.25	Clear
0954	8.24	7.09	-23	3.90	8.04	1.0	Clear
0955	7.90	7.08	-22	3.00	5.70	5.0	Clear
0956	7.88	7.04	-21	3.06	5.57	10.0	Clear
0958	7.92	7.05	-20	3.03	6.60	15.0	Clear

RW-1: RW-1 was previously destroyed by on-site snow plowing activities, compromised and not sampled at this time.

Table 22
Final Sample Data Summary

Well #	Temp. (°C)	pH (SU)	ORP (mV)	Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/L)	Level (Feet)
MW-1	10.00	7.10	217	3.33	--	5.01	9.48
MW-2	13.12	6.70	-85	3.20	4.2	0.75	4.52
MW-3	14.14	6.72	-94	1.44	5.6	0.52	4.28
MW-4	11.76	6.93	-127	2.37	0.0	0.60	3.24
MW-5	12.95	6.99	-147	2.32	5.6	0.57	3.29
MW-6	9.50	6.36	192	1.63	0.0	3.54	4.53
MW-7	13.17	6.16	134	0.520	110	0.86	3.61
MW-8	13.03	6.27	117	0.897	29.5	0.96	4.18
MW-9	13.81	6.15	188	0.450	332	1.25	4.08
MW-10	12.60	6.66	20	3.60	178	0.63	6.72
MW-11	11.32	6.33	294	0.103	144	5.47	3.67
MW-12	12.61	6.52	-69	4.51	121	0.57	5.80
MW-13	11.02	6.26	47	2.08	103	0.57	2.88
MW-14	11.42	6.13	194	0.119	10.4	7.09	4.26
MW-15	11.12	6.65	-103	3.02	9.1	0.61	3.98
OW-1	8.99	7.41	177	0.986	--	14.73	4.30
OW-2	9.10	7.57	190	1.15	--	6.31	3.25
OW-3	8.07	7.22	146	3.18	--	0.920	3.95
OW-4	7.83	7.17	137	3.04	--	8.83	3.54
RW-1	--	--	--	--	--	--	--

Table 23
Metals Data Summary

Well #	Manganese (mg/L)	Ferrous Iron (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)
MW-1	0.6	0.00	0.0	62
MW-2	2.5	1.11	19.6	2
MW-3	3.0	3.12	3.8	0
MW-4	9.0	3.16	4.2	0
MW-5	4.6	>3.00	9.9	0
MW-6	0.9	0.13	1.8	22
MW-7	4.2	0.29	5.1	14
MW-8	1.1	0.10	5.3	14
MW-9	--	--	--	--
MW-10	--	--	--	--
MW-11	--	--	--	--
MW-12	11.9	2.59	0.6	33
MW-13	4.9	0.98	10.9	33
MW-14	0.0	0.00	0.0	0
MW-15	6.6	1.83	3.6	1
OW-1	--	--	--	--
OW-2	--	--	--	--
OW-3	--	--	--	--
OW-4	--	--	--	--
RW-1	--	--	--	--

Table 24
Sample Log

Well #	Time	Date
112-1119-MW1	1000	11.19.2018
112-1119-MW2	1340	11.20.2018
112-1119-MW3	1302	11.20.2018
112-1119-MW4	1215	11.20.2018
112-1119-MW5	1132	11.20.2018
112-1119-MW6	1053	11.20.2018
112-1119-MW7	1120	11.19.2018
112-1119-MW8	0745	11.20.2018
112-1119-MW9	0900	11.20.2018
112-1119-MW10	1226	11.19.2018
112-1119-MW11	0940	11.20.2018
112-1119-MW12	1305	11.19.2018
112-1119-MW13	1354	11.19.2018
112-1119-MW14	1443	11.19.2018
112-1119-MW15	1420	11.20.2018
112-1119-FB1	0924	11.19.2018
112-1119-FB2	1300	11.20.2018
112-1119-OW1	1145	11.20.2018
112-1119-OW2	1130	11.20.2018
112-1119-OW3	1000	11.20.2018
112-1119-OW4	1005	11.20.2018
112-1119-RW1	NS	NS

Day 1:
0900: Onsite
1516: Offsite

Day 2:
0703: Onsite
1450: Offsite

SN / ch

APPENDIX I

Waste Disposal Documentation

Keystone Sanitary Landfill

249 Dunham Dr.
Dunmore PA
18512

TICKET #01582250
STATION 1 SCALE C
DATE 08/26/16
TIME 07:46:44

CUSTOMER 5858 / Acc't
Diaz Disposal L.L.C.
7686 SR 167
Kingsley, PA 18826

VEHICLE CODE D306

TIME IN 07:14:25 TIME OUT 07:46:44

GRID 8087

SOURCE 58 Susquehanna

REFUSE 10 Demolition Waste

	lb
GROSS	44720
TARE	33700
NET	11020
NET TONS	5.51

DRIVER _____

WEIGHMASTER: Chris Gonzalvo
LICENSE: 068739/068199

Pump n Pantry
Montrose PA
15-5
Soil

RESIDUAL WASTE MANIFEST

GENERATOR:

Name: Pump N Pantry

Address: RR 7, Box 7024

Montrose, PA 18801

Contact Name/Phone: T.J.Jimmie 570/343-2878

Waste Code: FC-1

Waste Description: Virgin Fuel Contaminted Soil/Debris

Source County: Susquehanna

I hereby certify that the above referenced material is non-hazardous. I further certify that this material is accurately described above and conforms with all documentation that was filed when this waste stream was approved for disposal at the Landfill listed below.

Authorized Signature

8/19/16
Date

TRANSPORTER

Name: DIAZ WH# 12243 EXP. 1-17

Truck#: 306

I hereby certify that the above named material was picked up at the Generator's site listed above, and that it was delivered without incident to the destination listed below.

Driver: _____
Signature

A RIO
Print Name

8-26-17
Date

DESTINATION

Keystone Sanitary Landfill, Inc.

Dunmore, PA

Ticket#: 0158250

Weighmaster:

Date Received:

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
PADEP0021648	1	717-381-6943	PNP031417

GENERATOR

5. Generator's Name and Mailing Address

Pump-N-Pantry
754 Grow Avenue
Montrose, PA 18801

Generator's Phone: 570-278-1129

Generator's Site Address (if different than mailing address)

754 Grow Avenue
Montrose, PA 18801

6. Transporter 1 Company Name: Waste Recovery Solutions, Inc.

U.S. EPA ID Number: PAR000043026

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

Waste Recovery Solutions, Inc
343 King Street
Myerstown, PA 17067

Facility's Phone: 717-866-9955

U.S. EPA ID Number: PAR000043026

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non Regulated Material, (Drill Cuttings) LFI-95849	012	DM	8400	P	
2.	Non Regulated Material, (Purge Water) OWI-95851	008	DM	3200	P	
3.						
4.						

13. Special Handling Instructions and Additional Information

9.1 12x55
9.2 8x55

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: KEVIN CUCURA / PA TECTANKS | Signature | Month: 03 | Day: 22 | Year: 17

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Dennis Lynch | Signature | Month: 03 | Day: 22 | Year: 17

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) | U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name | Signature | Month | Day | Year

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
N/A		717-364-5970	PNPM082018

GENERATOR

5. Generator's Name and Mailing Address

Pump-N-Pantry-Montrose
754 Grow Avenue
Montrose, PA 18801

Generator's Phone: 570-278-1129-105

Generator's Site Address (if different than mailing address)

754 Grow Avenue
Montrose, PA 18801

6. Transporter 1 Company Name: Covanta Environmental Solutions — U.S. EPA ID Number: PAR000043026

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address — U.S. EPA ID Number: PAR000043026

Waste Recovery Solutions, Inc
343 King Street
Myerstown, PA 17067

Facility's Phone: 717-866-9955

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non Regulated Material, (Drill Cuttings) LFI-95849	006	DM	4200	P	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: MATT MORELL — Signature: [signature] — Month: 08 — Day: 20 — Year: 18

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. — Port of entry/exit:

Transporter Signature (for exports only): — Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Dennis Lynch — Signature: [signature] — Month: 08 — Day: 20 — Year: 18

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: [illegible] — Signature: [signature] — Month: 8 — Day: 20 — Year: 18

DESIGNATED FACILITY'S COPY

APPENDIX J

Groundwater Elevation Data Summary Tables

Table J-1
LaBella Associates, P.C.
Groundwater Elevation Data
Pump-n-Pantry #001

Date	Number	MW-1 Static	MW-1 Elevation	MW-1 GW Elevation	MW-2 Static	MW-2 Elevation	MW-2 GW Elevation	MW-3 Static	MW-3 Elevation	MW-3 GW Elevation	MW-4 Static	MW-4 Elevation	MW-4 GW Elevation	MW-5 Static	MW-5 Elevation	MW-5 GW Elevation
9/7/2016	42620.00	7.66	1654.16	1646.50	5.36	1653.72	1648.36	4.18	1652.92	1648.74	4.09	1651.31	1647.22	4.50	1652.33	1647.83
10/14/2016	42657.00	5.20	1654.16	1648.96	5.38	1653.72	1648.34	5.20	1652.92	1647.72	4.20	1651.31	1647.11	4.56	1652.33	1647.77
10/19/2016	42662.00	15.22	1654.16	1638.94	5.40	1653.72	1648.32	5.20	1652.92	1647.72	4.20	1651.31	1647.11	4.64	1652.33	1647.69
11/30/2016	42704.00	4.51	1654.16	1649.65	5.03	1653.72	1648.69	4.57	1652.92	1648.35	3.40	1651.31	1647.91	3.38	1652.33	1648.95
2/22/2017	42788.00	3.24	1654.16	1650.92	4.66	1653.72	1649.06	3.45	1652.92	1649.47	3.40	1651.31	1647.91	5.30	1652.33	1647.03
5/1/2017	42856.00	4.52	1654.16	1649.64	5.07	1653.72	1648.65	4.54	1652.92	1648.38	3.47	1651.31	1647.84	3.31	1652.33	1649.02
7/24/2017	42940.00	2.29	1654.16	1651.87	4.77	1653.72	1648.95	4.21	1652.92	1648.71	3.11	1651.31	1648.20	3.06	1652.33	1649.27
11/2/2017	43041.00	3.74	1654.16	1650.42	5.25	1653.72	1648.47	4.52	1652.92	1648.40	3.51	1651.31	1647.80	3.36	1652.33	1648.97
12/4/2017	43073.00	5.12	1654.16	1649.04	5.28	1653.72	1648.44	4.79	1652.92	1648.13	3.80	1651.31	1647.51	3.82	1652.33	1648.51
3/20/2018	43179.00	3.48	1654.16	1650.68	4.74	1653.72	1648.98	4.45	1652.92	1648.47	3.32	1651.31	1647.99	3.35	1652.33	1648.98
6/7/2018	43258.00	4.52	1654.16	1649.64	5.22	1653.72	1648.50	4.64	1652.92	1648.28	3.67	1651.31	1647.64	3.55	1652.33	1648.78
9/10/2018	43353.00	3.27	1654.16	1650.89	4.51	1653.72	1649.21	4.18	1652.92	1648.74	3.08	1651.31	1648.23	3.11	1652.33	1649.22
11/19/2018	43423.00	2.47	1654.16	1651.69	4.58	1653.72	1649.14	4.32	1652.92	1648.60	3.21	1651.31	1648.10	3.22	1652.33	1649.11

NM **Not Measured**
NA **Not Applicable**

Table J-1
LaBella Associates, P.C.
Groundwater Elevation Data
Pump-n-Pantry #001

Date	Number	MW-6 Static	MW-6 Elevation	MW-6 GW Elevation	MW-7 Static	MW-7 Elevation	MW-7 GW Elevation	MW-8 Static	MW-8 Elevation	MW-8 GW Elevation	MW-9 Static	MW-9 Elevation	MW-9 GW Elevation	MW-10 Static	MW-10 Elevation	MW-10 GW Elevation
9/7/2016	42620.00	6.10	1653.95	1647.85	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/14/2016	42657.00	6.10	1653.95	1647.85	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/19/2016	42662.00	6.18	1653.95	1647.77	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11/30/2016	42704.00	4.63	1653.95	1649.32	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2/22/2017	42788.00	4.21	1653.95	1649.74	3.62	1653.00	1649.38	4.46	1653.13	1648.67	4.66	1651.75	1647.09	5.66	1648.98	1643.32
5/1/2017	42856.00	4.50	1653.95	1649.45	3.82	1653.00	1649.18	4.43	1653.13	1648.70	4.83	1651.75	1646.92	5.82	1648.98	1643.16
7/24/2017	42940.00	3.05	1653.95	1650.90	3.10	1653.00	1649.90	3.81	1653.13	1649.32	3.96	1651.75	1647.79	4.98	1648.98	1644.00
11/2/2017	43041.00	4.48	1653.95	1649.47	3.87	1653.00	1649.13	4.83	1653.13	1648.30	5.01	1651.75	1646.74	5.77	1648.98	1643.21
12/4/2017	43073.00	5.35	1653.95	1648.60	4.10	1653.00	1648.90	5.11	1653.13	1648.02	5.28	1651.75	1646.47	6.11	1648.98	1642.87
3/20/2018	43179.00	4.51	1653.95	1649.44	3.63	1653.00	1649.37	4.51	1653.13	1648.62	4.57	1651.75	1647.18	5.81	1648.98	1643.17
6/7/2018	43258.00	4.99	1653.95	1648.96	3.91	1653.00	1649.09	4.77	1653.13	1648.36	5.03	1651.75	1646.72	6.04	1648.98	1642.94
9/10/2018	43353.00	3.94	1653.95	1650.01	3.24	1653.00	1649.76	4.26	1653.13	1648.87	4.30	1651.75	1647.45	5.35	1648.98	1643.63
11/19/2018	43423.00	4.36	1653.95	1649.59	3.48	1653.00	1649.52	3.88	1653.13	1649.25	3.92	1651.75	1647.83	5.53	1648.98	1643.45

NM **Not Measured**
NA **Not Applicable**

Table J-1
LaBella Associates, P.C.
Groundwater Elevation Data
Pump-n-Pantry #001

Date	Number	MW-11 Static	MW-11 Elevation	MW-11 GW Elevation	MW-12 Static	MW-12 Elevation	MW-12 GW Elevation	MW-13 Static	MW-13 Elevation	MW-13 GW Elevation	MW-14 Static	MW-14 Elevation	MW-14 GW Elevation	MW-15 Static	MW-15 Elevation	MW-15 GW Elevation
9/7/2016	42620.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/14/2016	42657.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/19/2016	42662.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
11/30/2016	42704.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2/22/2017	42788.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
5/1/2017	42856.00	3.91	1650.45	1646.54	5.88	1648.39	1642.51	3.14	1645.56	1642.42	4.25	1647.34	NM	NM	NM	NM
7/24/2017	42940.00	2.80	1650.45	1647.65	5.07	1648.39	1643.32	2.49	1645.56	1643.07	3.33	1647.34	1644.01	NM	NM	NM
11/2/2017	43041.00	3.92	1650.45	1646.53	5.81	1648.39	1642.58	3.10	1645.56	1642.46	4.44	1647.34	1642.90	4.47	1654.07	1649.60
12/4/2017	43073.00	4.18	1650.45	1646.27	6.12	1648.39	1642.27	3.37	1645.56	1642.19	4.77	1647.34	1642.57	5.11	1654.07	1648.96
3/20/2018	43179.00	3.99	1650.45	1646.46	5.64	1648.39	1642.75	2.97	1645.56	1642.59	4.25	1647.34	1643.09	3.67	1654.07	1650.40
6/7/2018	43258.00	4.20	1650.45	1646.25	6.02	1648.39	1642.37	3.19	1645.56	1642.37	4.71	1647.34	1642.63	4.63	1654.07	1649.44
9/10/2018	43353.00	3.12	1650.45	1647.33	5.24	1648.39	1643.15	2.60	1645.56	1642.96	3.93	1647.34	1643.41	3.65	1654.07	1650.42
11/19/2018	43423.00	3.58	1650.45	1646.87	5.61	1648.39	1642.78	2.82	1645.56	1642.74	4.17	1647.34	1643.17	3.92	1654.07	1650.15

NM **Not Measured**
NA **Not Applicable**

Table J-1
LaBella Associates, P.C.
Groundwater Elevation Data
Pump-n-Pantry #001

Date	Number	OW-1 Static	OW-1 Elevation	OW-1 GW Elevation	OW-2 Static	OW-2 Elevation	OW-2 GW Elevation	OW-3 Static	OW-3 Elevation	OW-3 GW Elevation	OW-4 Static	OW-4 Elevation	OW-4 GW Elevation
9/7/2016	42620.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/14/2016	42657.00	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
10/19/2016	42662.00	5.74	1653.44	1647.70	4.70	1652.39	1647.69	NM	NM	NM	NM	NM	NM
11/30/2016	42704.00	4.50	1653.44	1648.94	3.44	1652.39	1648.95	NM	NM	NM	NM	NM	NM
2/22/2017	42788.00	3.38	1653.44	1650.06	4.42	1652.39	1647.97	NM	NM	NM	NM	NM	NM
5/1/2017	42856.00	4.44	1653.44	1649.00	3.39	1652.39	1649.00	4.03	1650.70	1646.67	3.63	1649.74	1646.11
7/24/2017	42940.00	4.18	1653.44	1649.26	3.13	1652.39	1649.26	3.56	1650.70	1647.14	3.14	1649.74	1646.60
11/2/2017	43041.00	4.49	1653.44	1648.95	3.41	1652.39	1648.98	4.26	1650.70	1646.44	3.82	1649.74	1645.92
12/4/2017	43073.00	4.96	1653.44	1648.48	3.88	1652.39	1648.51	4.39	1650.70	1646.31	3.96	1649.74	1645.78
3/20/2018	43179.00	4.56	1653.44	1648.88	3.50	1652.39	1648.89	4.20	1650.70	1646.50	3.75	1649.74	1645.99
6/7/2018	43258.00	4.70	1653.44	1648.74	3.64	1652.39	1648.75	4.33	1650.70	1646.37	3.90	1649.74	1645.84
9/10/2018	43353.00	4.23	1653.44	1649.21	3.15	1652.39	1649.24	3.23	1650.70	1647.47	3.67	1649.74	1646.07
11/19/2018	43423.00	4.32	1653.44	1649.12	3.28	1652.39	1649.11	4.02	1650.70	1646.68	3.58	1649.74	1646.16

NM **Not Measured**
NA **Not Applicable**

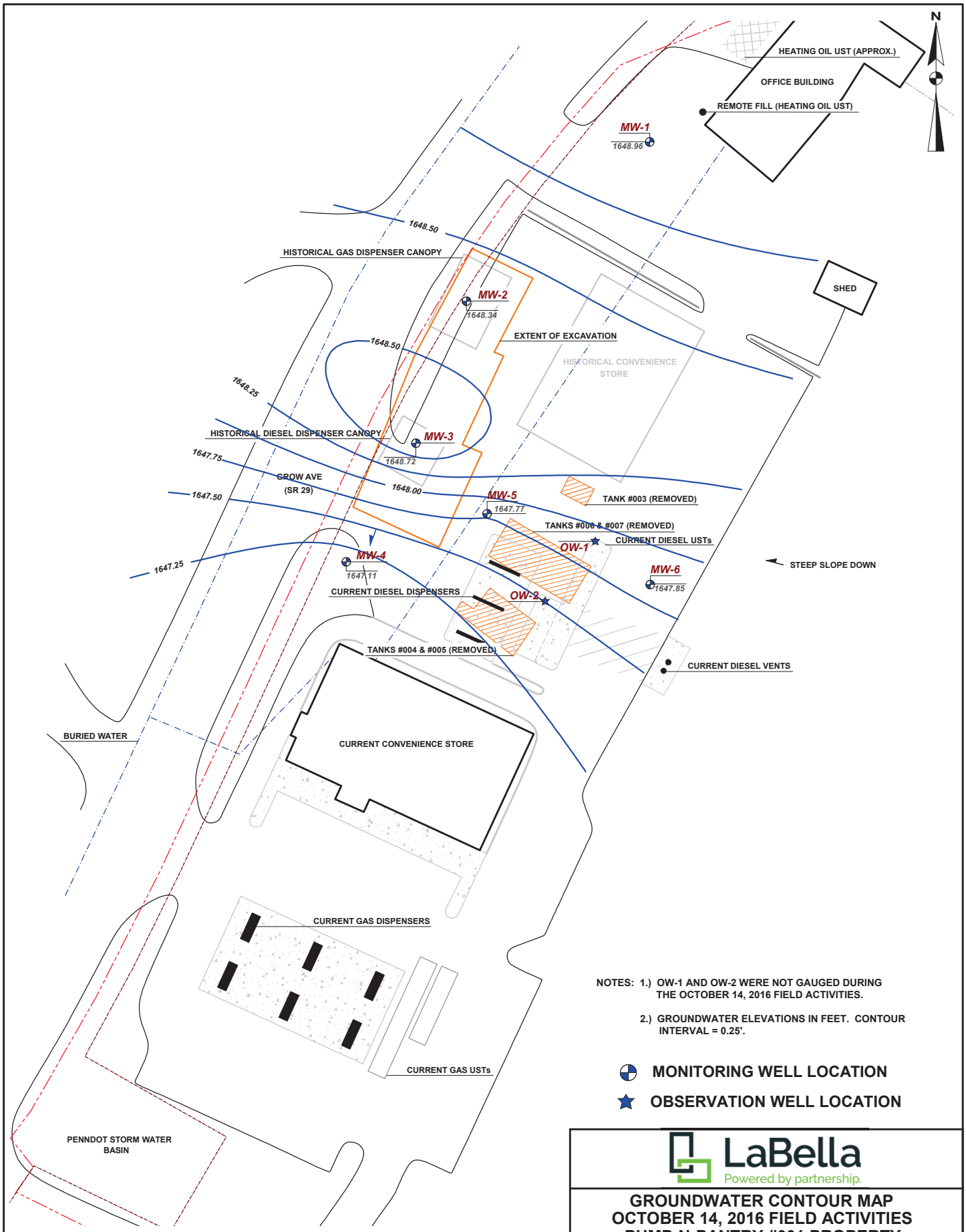
Table J-1
LaBella Associates, P.C.
Groundwater Elevation Data
Pump-n-Pantry #001

Date	Number	RW-1 Static	RW-1 Elevation	RW-1 GW Elevation
9/7/2016	42620.00	NM	NM	NM
10/14/2016	42657.00	NM	NM	NM
10/19/2016	42662.00	NM	NM	NM
11/30/2016	42704.00	NM	NM	NM
2/22/2017	42788.00	NM	NM	NM
5/1/2017	42856.00	8.67	1651.54	1642.87
7/24/2017	42940.00	8.59	1651.54	1642.95
11/2/2017	43041.00	8.78	1651.54	1642.76
12/4/2017	43073.00	8.95	1651.54	1642.59
3/20/2018	43179.00	NM	1651.54	NA
6/7/2018	43258.00	NM	1651.54	NA
9/10/2018	43353.00	NM	1651.54	NA
11/19/2018	43423.00	NM	1651.54	NA

NM **Not Measured**
NA **Not Applicable**

APPENDIX K

Groundwater Contour Maps



NOTES: 1.) OW-1 AND OW-2 WERE NOT GAUGED DURING THE OCTOBER 14, 2016 FIELD ACTIVITIES.

2.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.25'.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

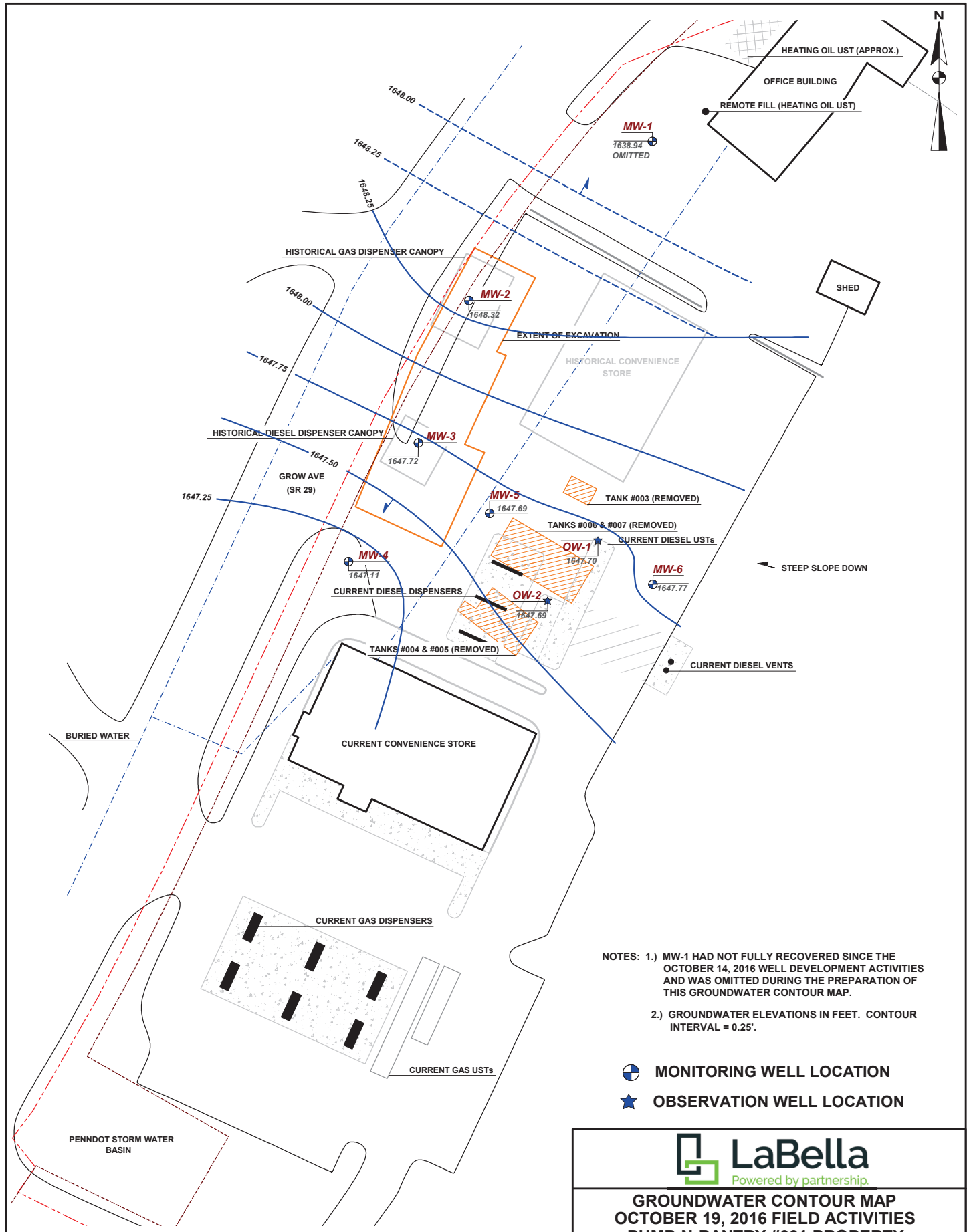
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016.

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
OCTOBER 14, 2016 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 11/01/2016

SCALE: 1" = 60'



NOTES: 1.) MW-1 HAD NOT FULLY RECOVERED SINCE THE OCTOBER 14, 2016 WELL DEVELOPMENT ACTIVITIES AND WAS OMITTED DURING THE PREPARATION OF THIS GROUNDWATER CONTOUR MAP.

2.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.25'.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

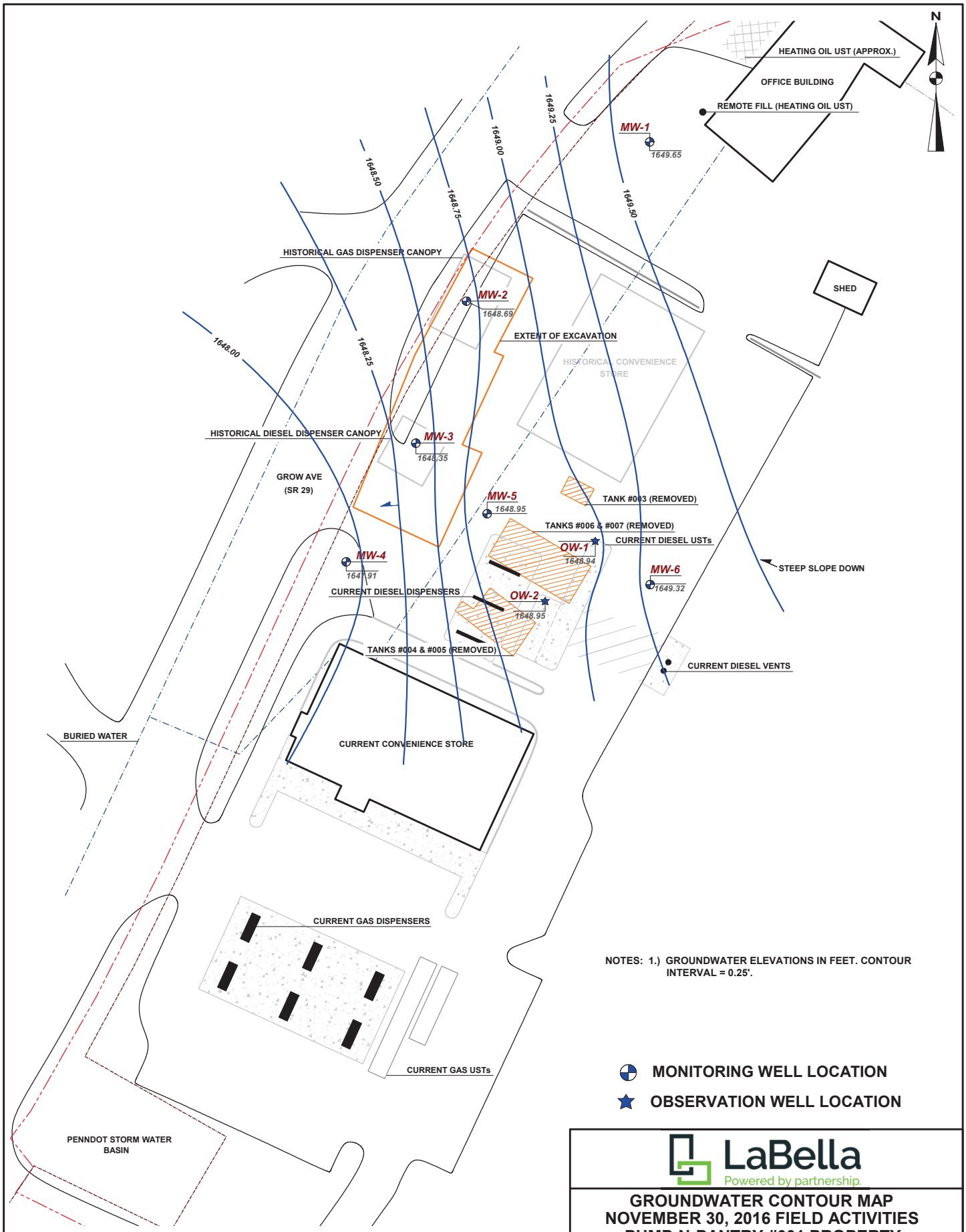
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
OCTOBER 19, 2016 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 11/02/2016

SCALE: 1" = 60'



NOTES: 1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.25'.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
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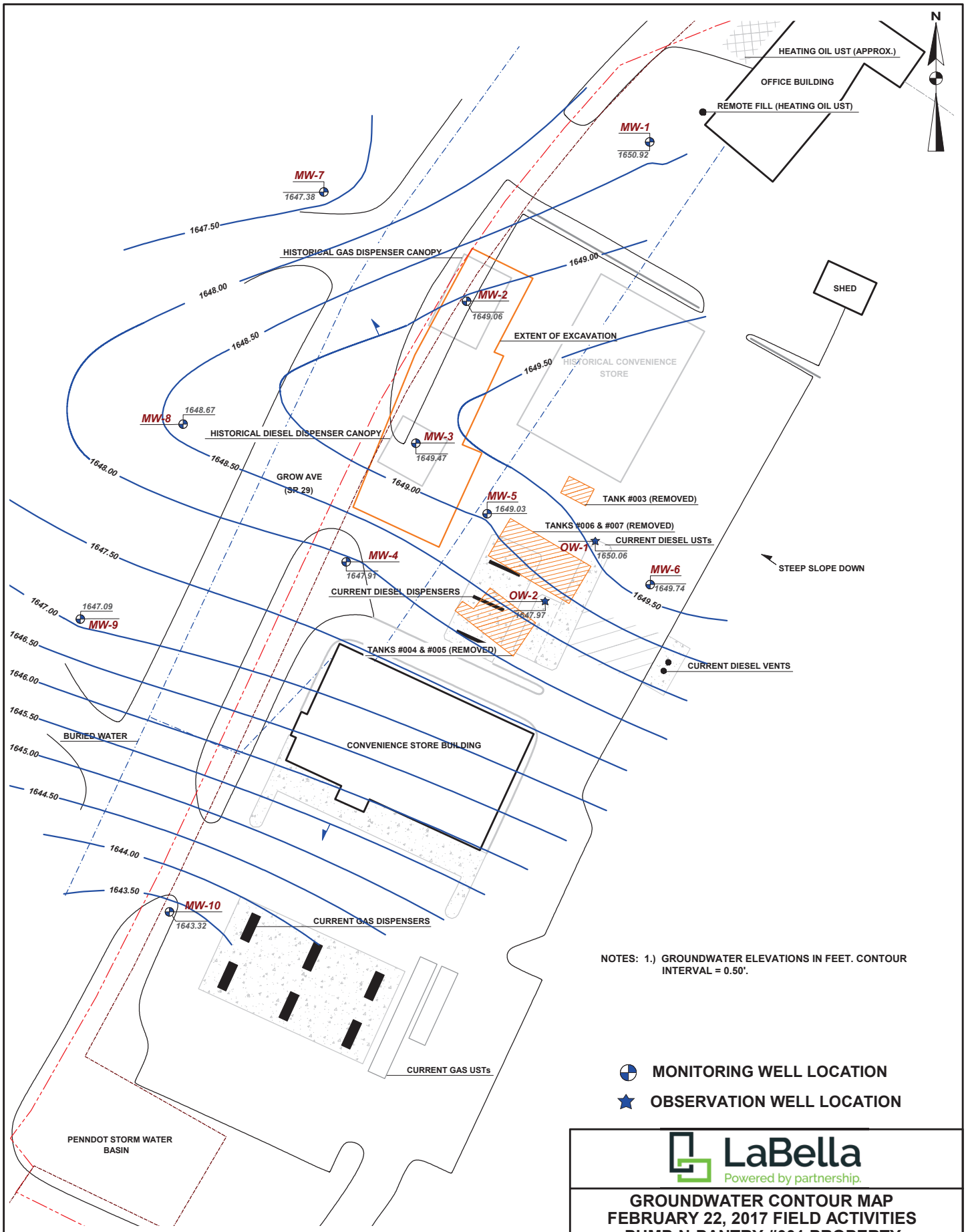
GROUNDWATER CONTOUR MAP
NOVEMBER 30, 2016 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 02/24/2017

SCALE: 1" = 60'



NOTES: 1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.50'.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
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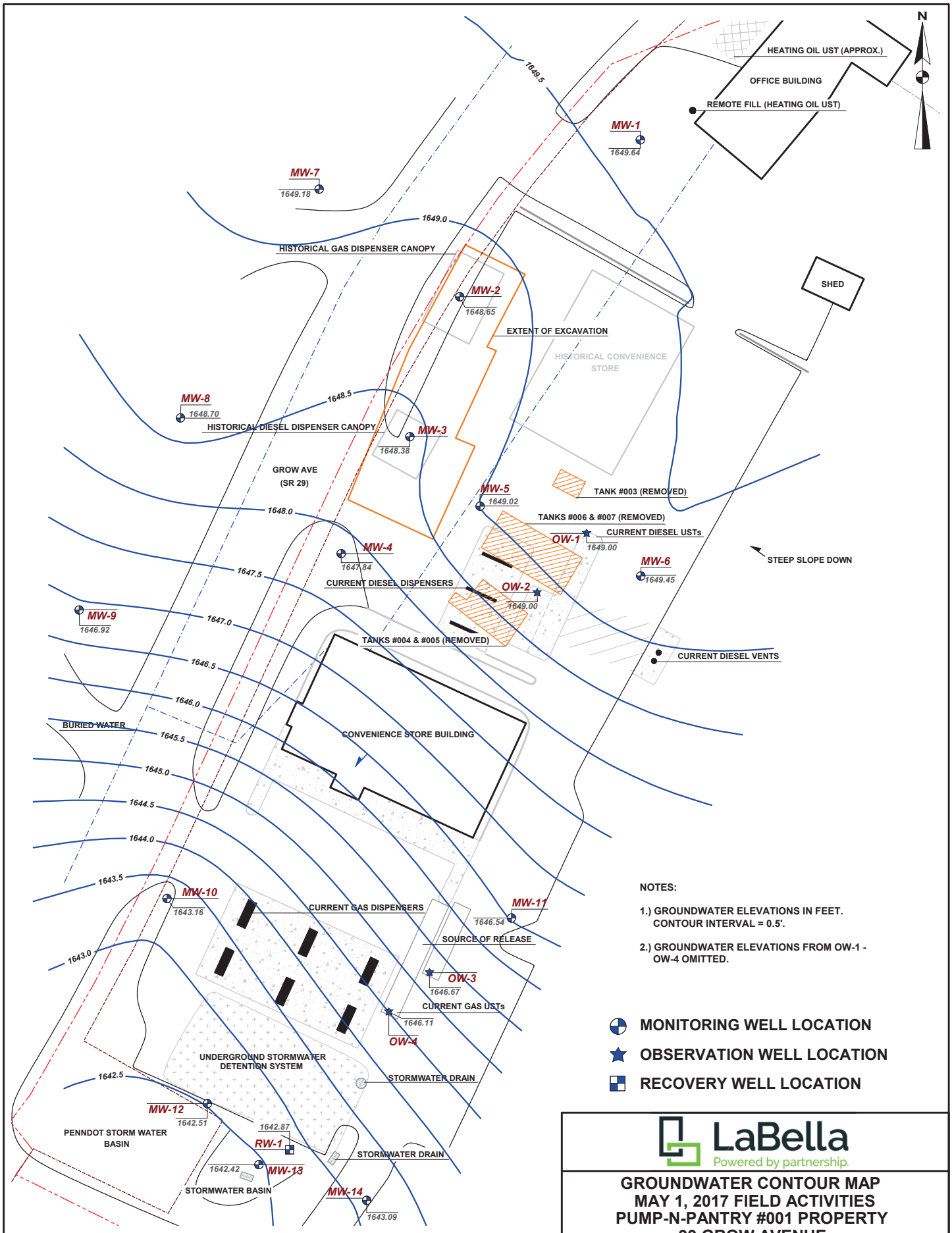
GROUNDWATER CONTOUR MAP
FEBRUARY 22, 2017 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 03/27/2017

SCALE: 1" = 60'



NOTES:

1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.5'.

2.) GROUNDWATER ELEVATIONS FROM OW-1 - OW-4 OMITTED.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

RECOVERY WELL LOCATION

ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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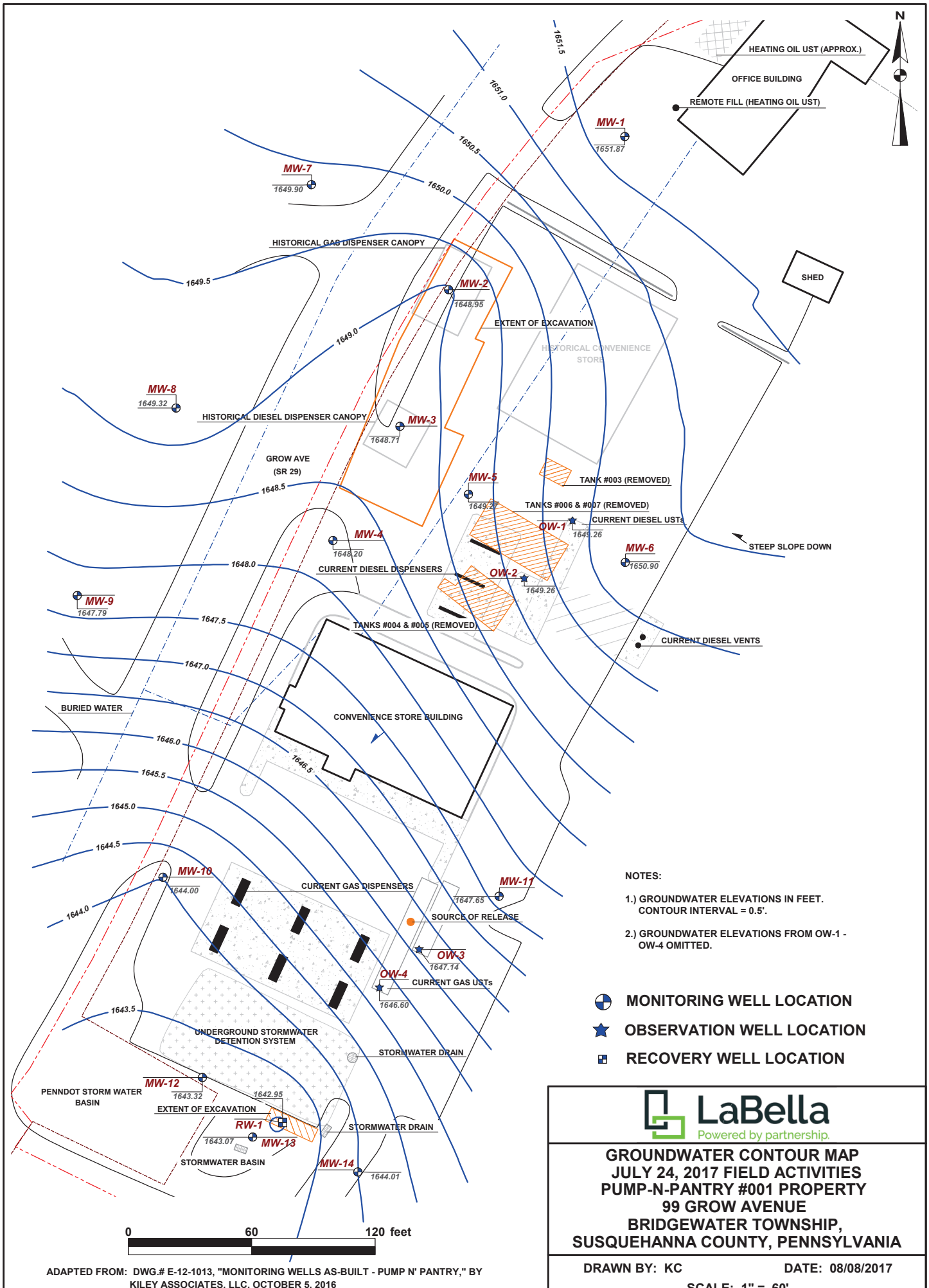
GROUNDWATER CONTOUR MAP
MAY 1, 2017 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 06/26/2017

SCALE: 1" = 60'



NOTES:

1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.5'.

2.) GROUNDWATER ELEVATIONS FROM OW-1 - OW-4 OMITTED.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

RECOVERY WELL LOCATION

ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

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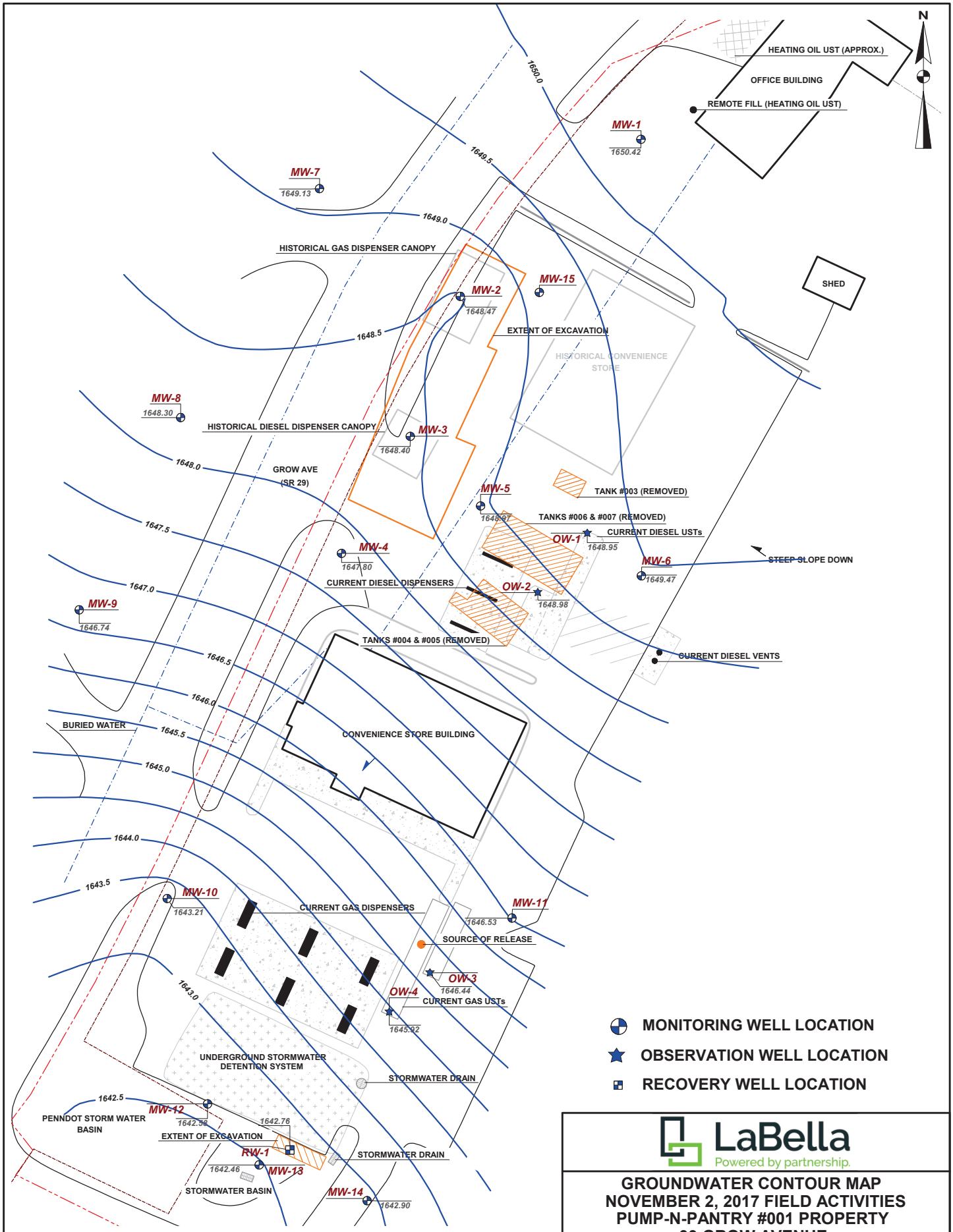
GROUNDWATER CONTOUR MAP
JULY 24, 2017 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 08/08/2017

SCALE: 1" = 60'



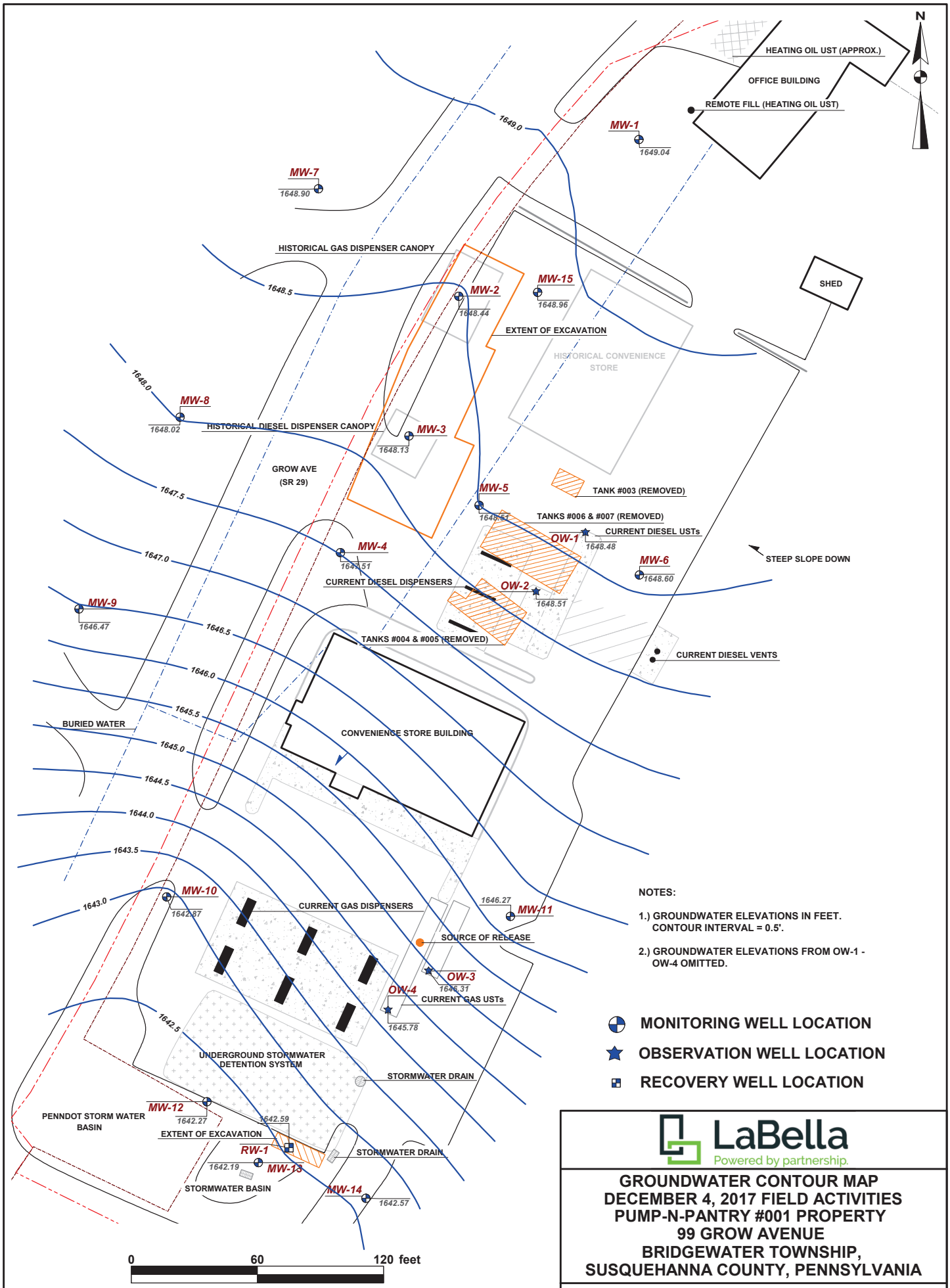
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
NOVEMBER 2, 2017 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 11/21/2017

SCALE: 1" = 60'



NOTES:

1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.5'.

2.) GROUNDWATER ELEVATIONS FROM OW-1 - OW-4 OMITTED.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

RECOVERY WELL LOCATION

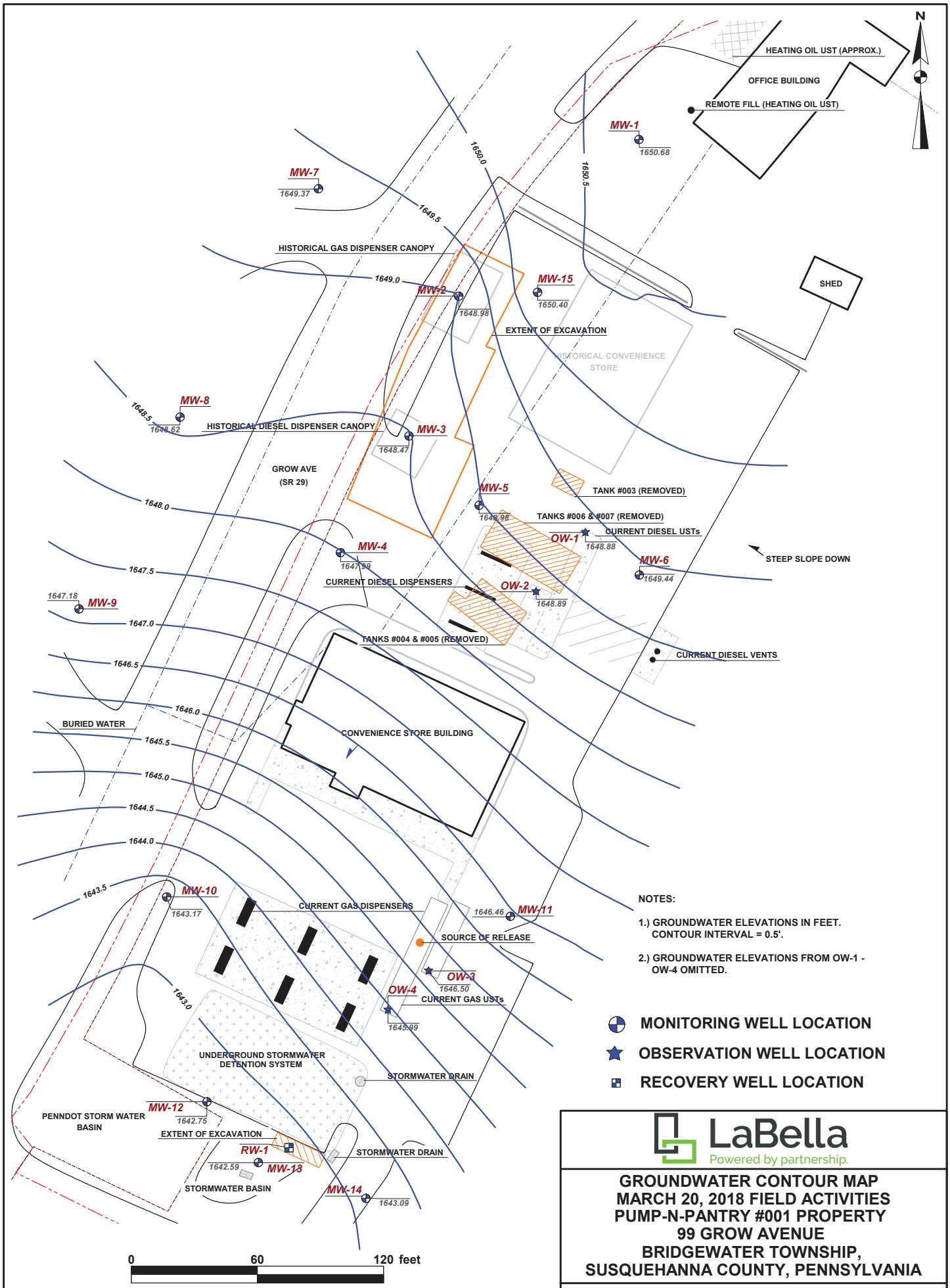
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
DECEMBER 4, 2017 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 12/28/2017

SCALE: 1" = 60'



NOTES:

1.) GROUNDWATER ELEVATIONS IN FEET. CONTOUR INTERVAL = 0.5'.

2.) GROUNDWATER ELEVATIONS FROM OW-1 - OW-4 OMITTED.

MONITORING WELL LOCATION

OBSERVATION WELL LOCATION

RECOVERY WELL LOCATION

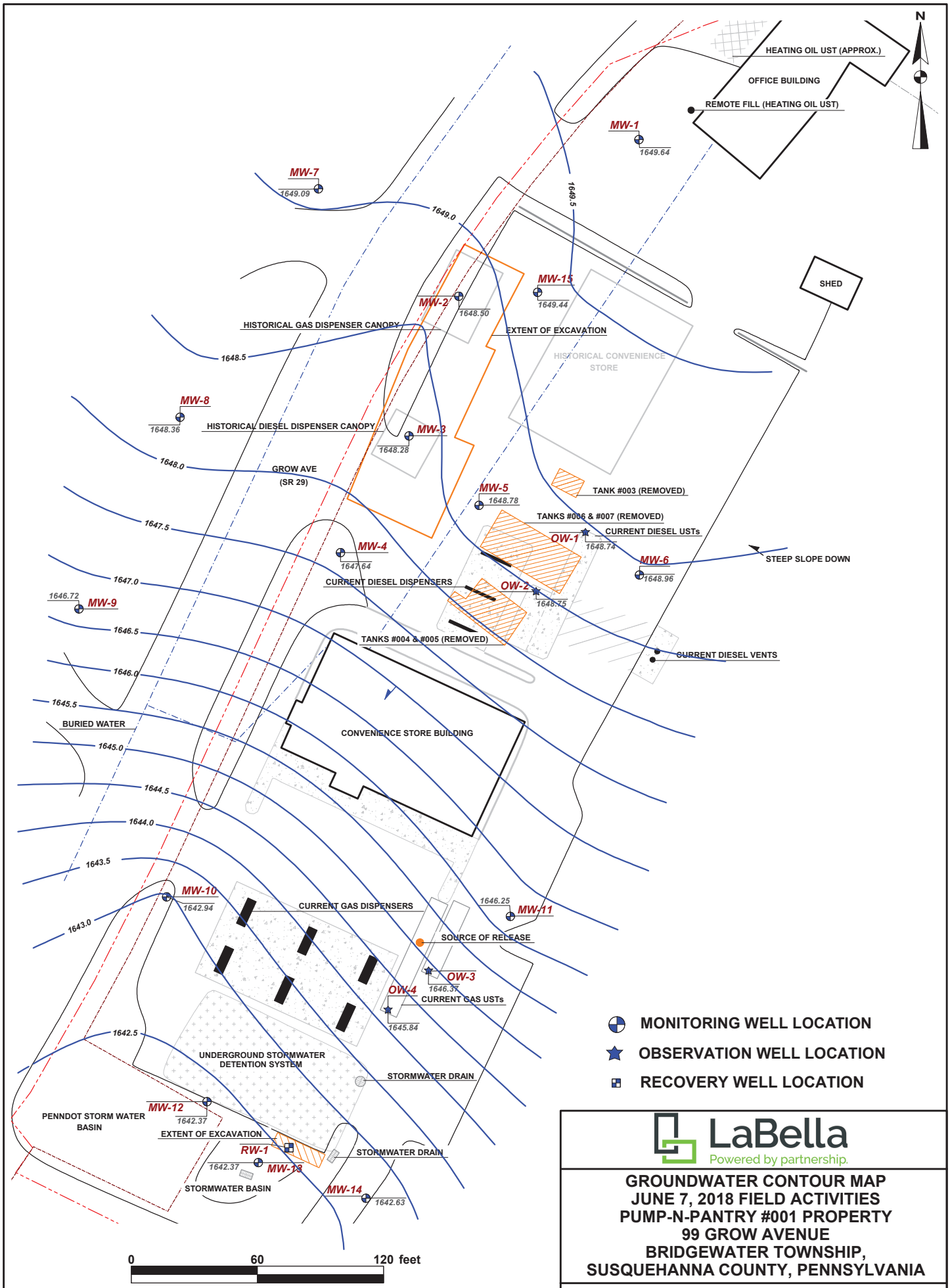
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
MARCH 20, 2018 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 04/06/2018

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
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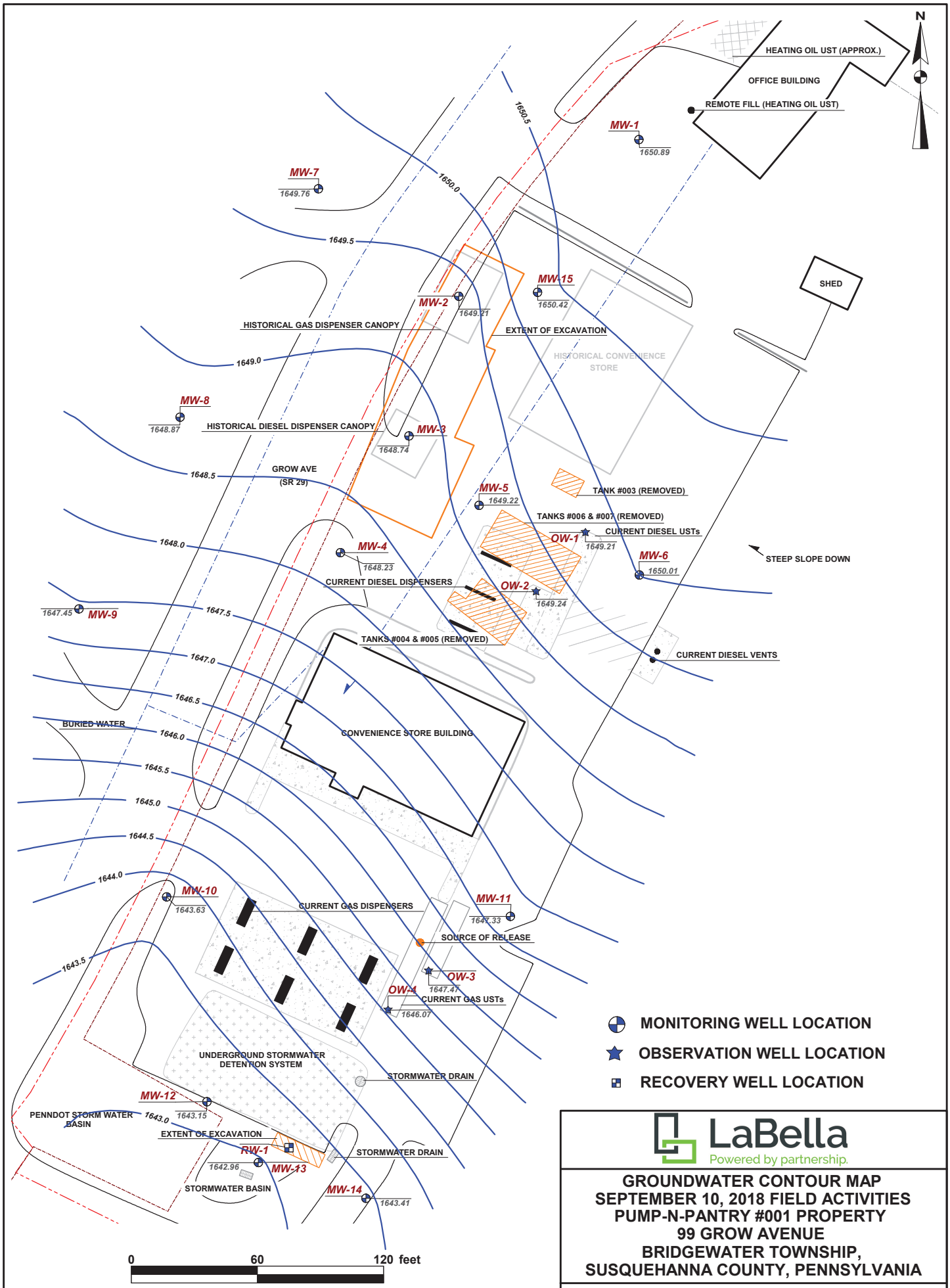
GROUNDWATER CONTOUR MAP
JUNE 7, 2018 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP, SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 08/13/2018

SCALE: 1" = 60'



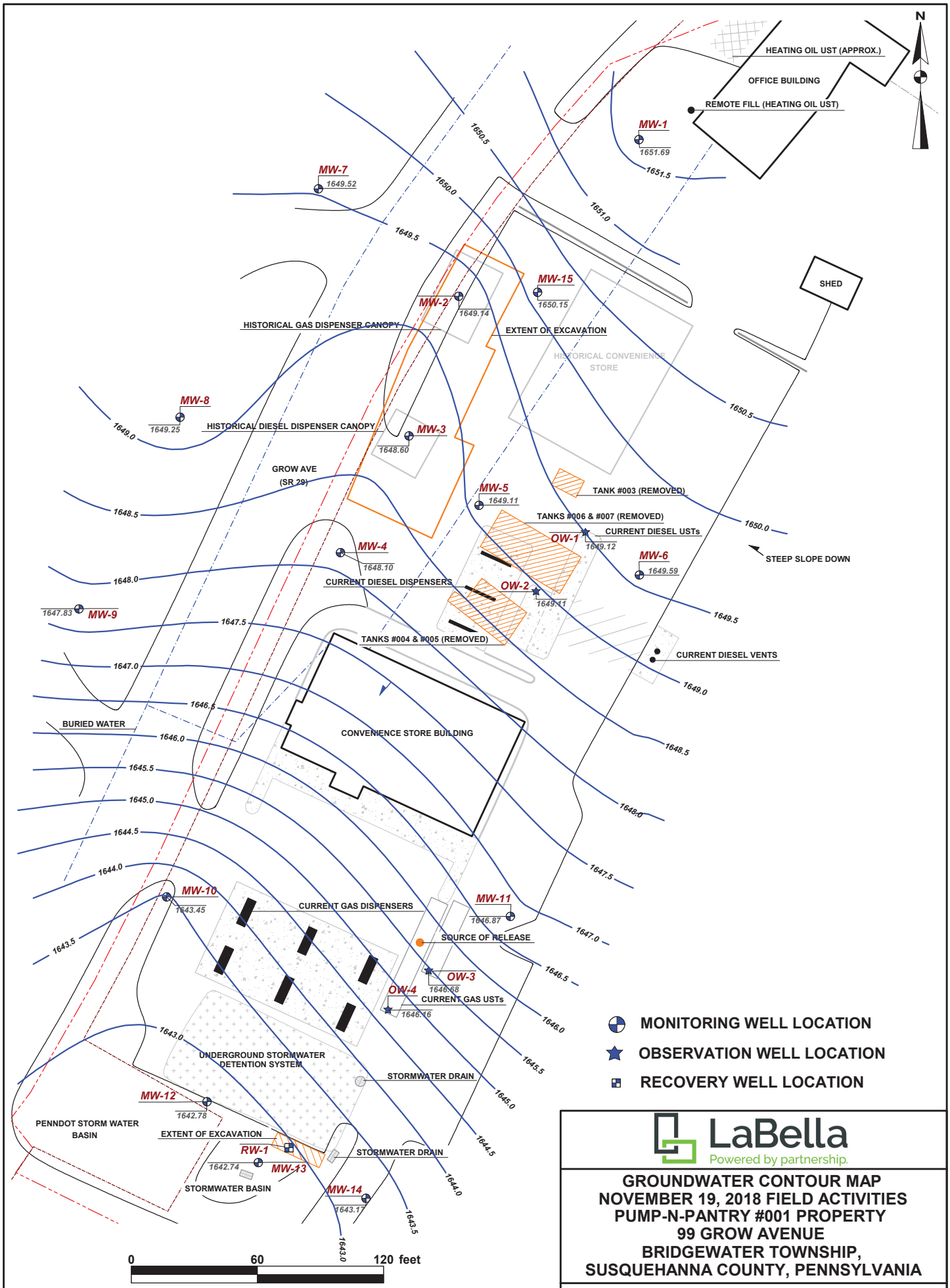
ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
SEPTEMBER 10, 2018 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 10/04/2018

SCALE: 1" = 60'



ADAPTED FROM: DWG.# E-12-1013, "MONITORING WELLS AS-BUILT - PUMP N' PANTRY," BY KILEY ASSOCIATES, LLC, OCTOBER 5, 2016

LaBella
Powered by partnership.

GROUNDWATER CONTOUR MAP
NOVEMBER 19, 2018 FIELD ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
99 GROW AVENUE
BRIDGEWATER TOWNSHIP,
SUSQUEHANNA COUNTY, PENNSYLVANIA

DRAWN BY: KC DATE: 02/15/2019

SCALE: 1" = 60'

APPENDIX L

Slug Test Analysis

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-2
Test ID: MW-2 Slug Out

Slug Info

Size: 3" X 4'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(1.5")^2 (48) = 339.12\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(339.12\ in^3) / (3.14)(2)^2 = 27.00"$ **or 2.25'**

Screen Radius (R) = 0.167'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 15.28' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.167'

Borehole Radius (B) = 0.33'

Static Water Level = 4.94' (measured in the field from top of casing)

Total Depth = 20.22' (measured in the field from top of casing)

Level @ Time 0 (To) = 6.96'

Slug Size = 3" X 4'

H*o = 2.25'

Actual Displacement (Ho) = 2.02'

Notes: No issues.

K = 2.64×10^{-2} **(ft/min)**
K = 1.34×10^{-2} **(cm/sec)**

LABELLA Associates | Engineering Architecture Environmental Planning

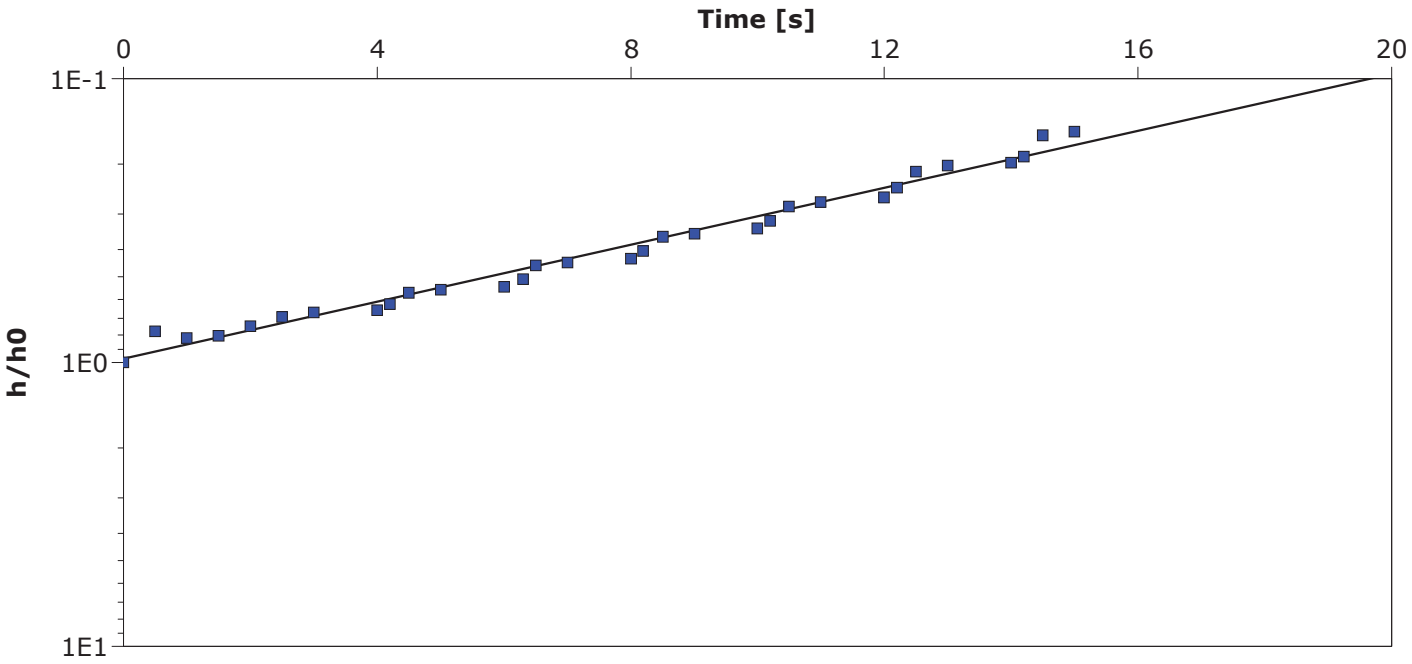
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-2 Slug Out	Test Well: MW-2
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-2 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-2	2.64×10^{-2}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-3
Test ID: MW-3 Slug Out

Slug Info

Size: 3" X 4'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(1.5")^2 (48) = 339.12\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(339.12\ in^3) / (3.14)(2)^2 = 27.00"$ **or 2.25'**

Screen Radius (R) = 0.167'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 15.46' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.167'

Borehole Radius (B) = 0.33'

Static Water Level = 4.42' (measured in the field from top of casing)

Total Depth = 19.88' (measured in the field from top of casing)

Level @ Time 0 (To) = 7.13'

Slug Size = 3" X 4'

H*o = 2.25'

Actual Displacement (Ho) = 2.71'

Notes: No issues.

K = 3.12×10^{-2} **(ft/min)**
K = 1.59×10^{-2} **(cm/sec)**

LABELLA Associates | Engineering Architecture Environmental Planning

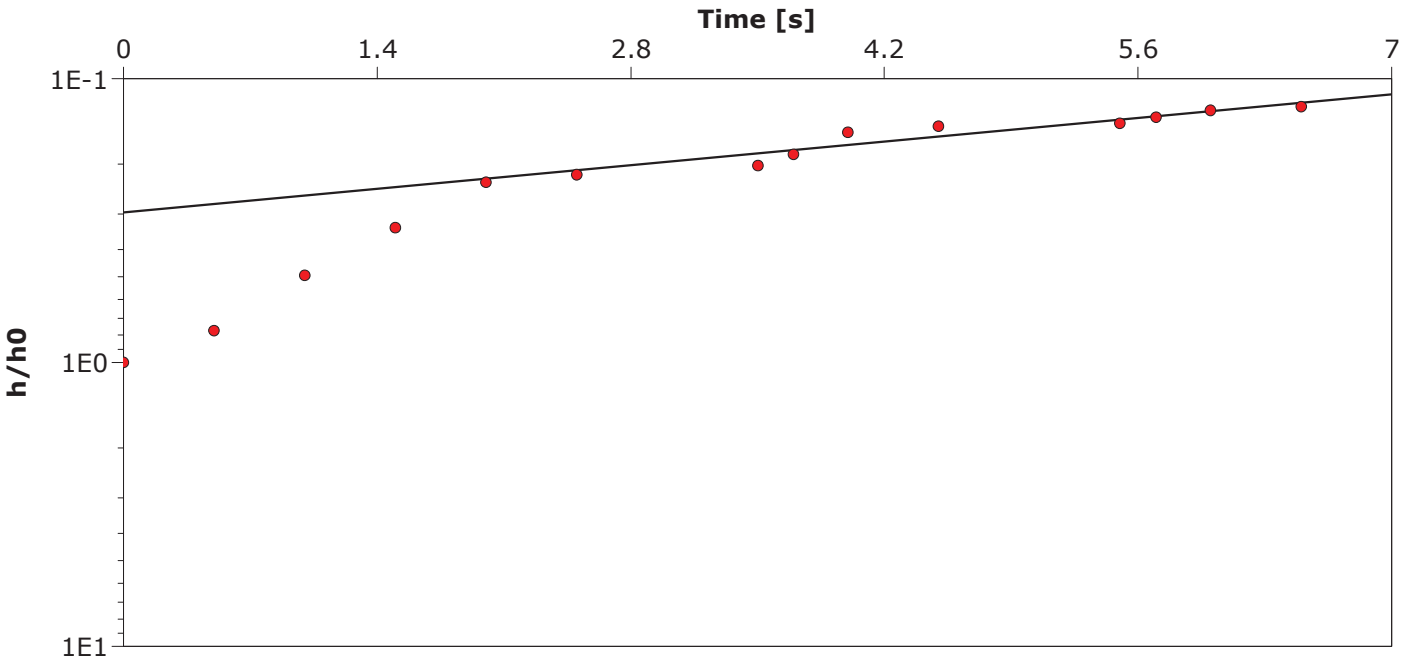
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-3 Slug Out	Test Well: MW-3
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-3 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-3	3.12×10^{-2}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-4
Test ID: MW-4 Slug Out

Slug Info

Size: 3" X 4'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(1.5")^2 (48) = 339.12\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(339.12\ in^3) / (3.14)(2)^2 = 27.00"$ **or 2.25'**

Screen Radius (R) = 0.167'

Screen Length (L) = 12.0'

Saturated Thickness (b) = 11.67' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.167'

Borehole Radius (B) = 0.33'

Static Water Level = 3.31' (measured in the field from top of casing)

Total Depth = 14.98' (measured in the field from top of casing)

Level @ Time 0 (To) = 6.20'

Slug Size = 3" X 4'

H*o = 2.25'

Actual Displacement (Ho) = 2.89'

Notes: No issues.

K = 5.23×10^{-2} **(ft/min)**
K = 2.66×10^{-2} **(cm/sec)**

LABELLA Associates | Engineering Architecture Environmental Planning

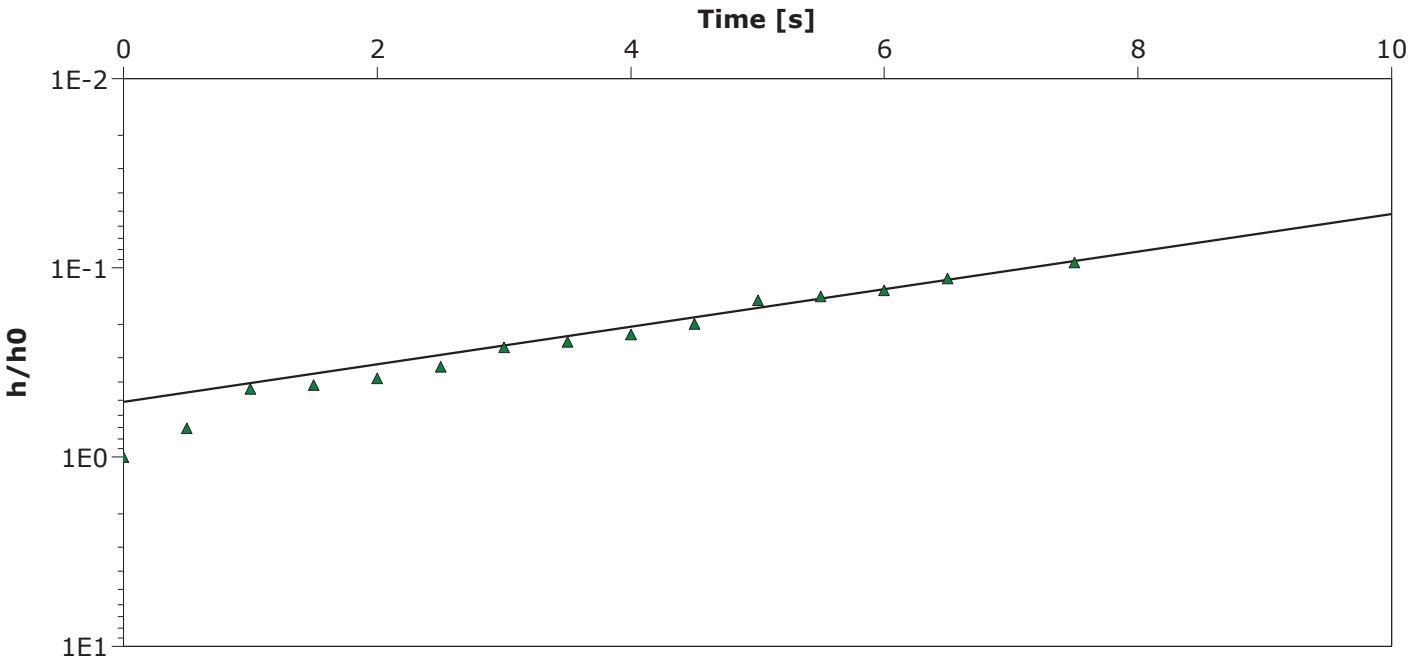
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-4 Slug Out	Test Well: MW-4
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-4 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-4	5.23×10^{-2}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-5
Test ID: MW-5 Slug Out

Slug Info

Size: 3" X 4'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(1.5")^2 (48) = 339.12\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(339.12\ in^3) / (3.14)(2)^2 = 27.00"$ **or 2.25'**

Screen Radius (R) = 0.167'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 16.70' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.167'

Borehole Radius (B) = 0.33'

Static Water Level = 3.22' (measured in the field from top of casing)

Total Depth = 19.92' (measured in the field from top of casing)

Level @ Time 0 (To) = 6.40'

Slug Size = 3" X 4'

H*o = 2.25'

Actual Displacement (Ho) = 3.19'

Notes: No issues.

K = 9.41×10^{-3} **(ft/min)**
K = 4.78×10^{-3} **(cm/sec)**

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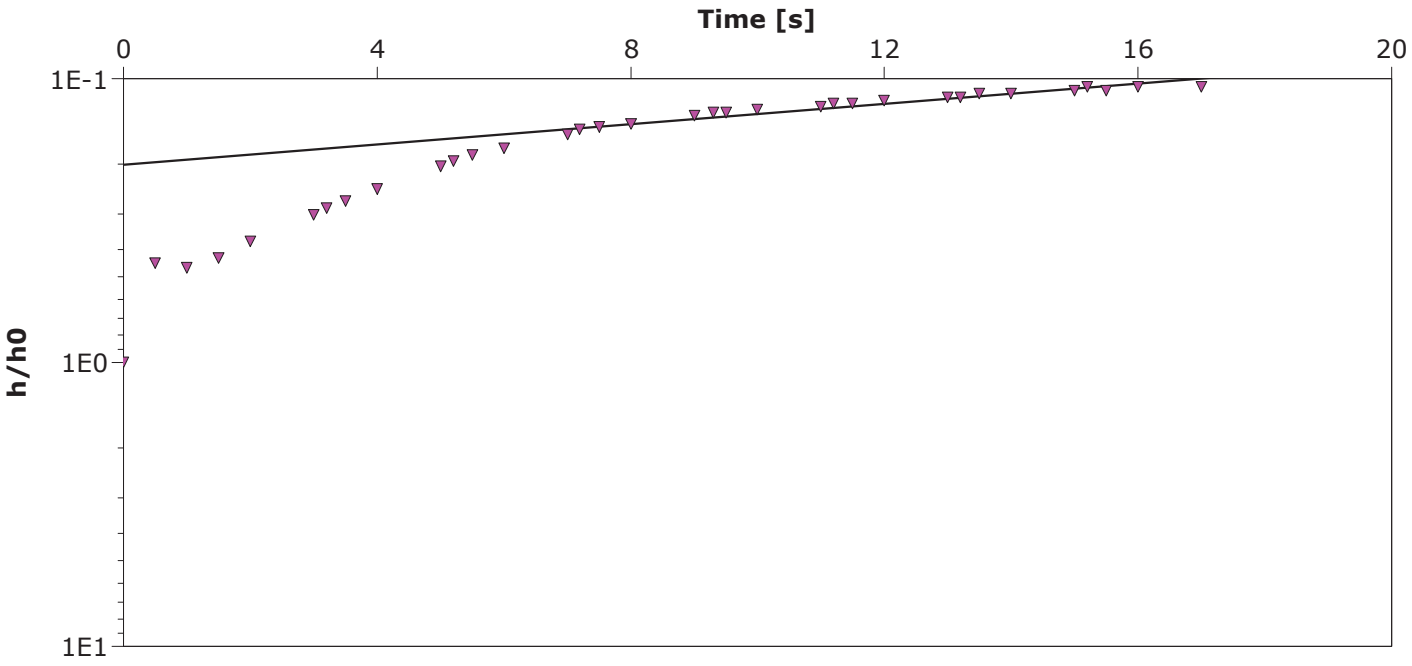
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-5 Slug Out	Test Well: MW-5
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-5 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-5	9.41×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-6
Test ID: MW-6 Slug Out

Slug Info

Size: 3" X 4'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(1.5")^2 (48) = 339.12\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(339.12\ in^3) / (3.14)(2)^2 = 27.00"$ **or 2.25'**

Screen Radius (R) = 0.167'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 15.51' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.167'

Borehole Radius (B) = 0.33'

Static Water Level = 4.48' (measured in the field from top of casing)

Total Depth = 19.99' (measured in the field from top of casing)

Level @ Time 0 (To) = 7.03'

Slug Size = 3" X 4'

H*o = 2.25'

Actual Displacement (Ho) = 2.55'

Notes: No issues.

K = 1.18×10^{-3} (ft/min)
K = 5.97×10^{-4} (cm/sec)

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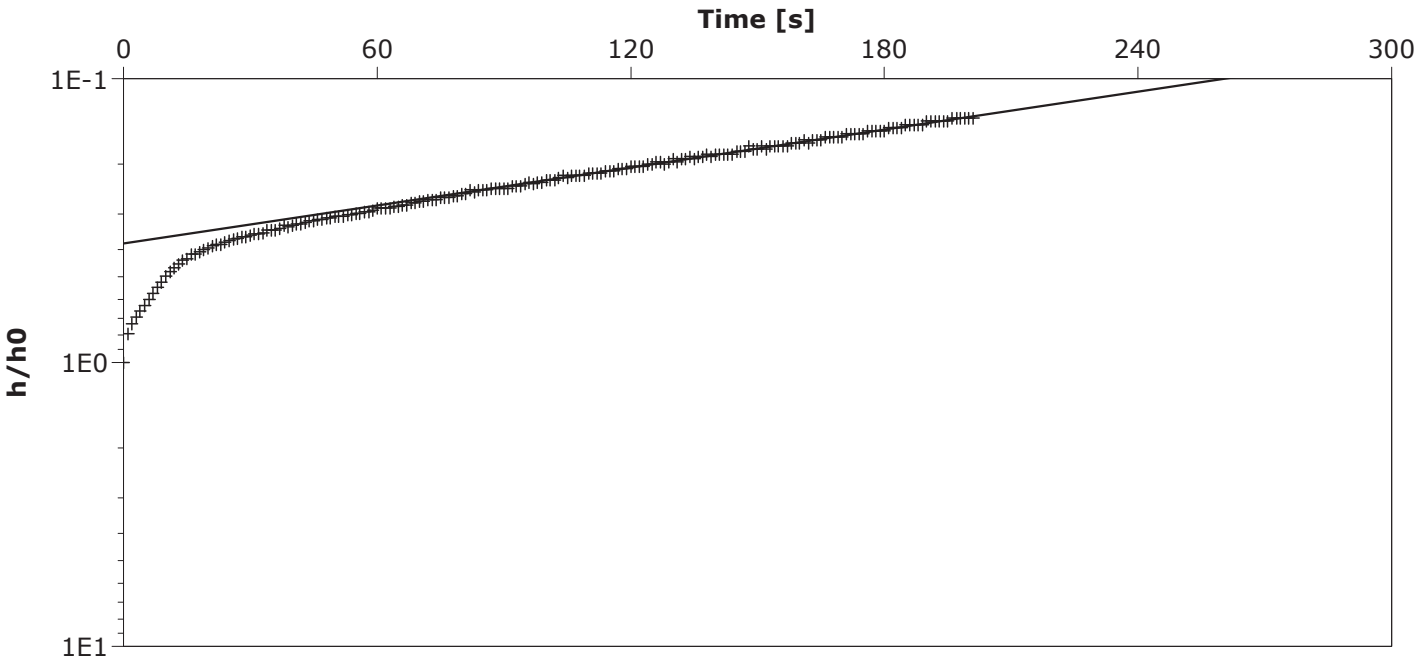
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-6 Slug Out	Test Well: MW-6
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-6 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-6	1.18×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-7
Test ID: MW-7 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2$ = 9" or 0.75'

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 16.09' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 3.65' (measured in the field from top of casing)

Total Depth = 19.74' (measured in the field from top of casing)

Level @ Time 0 (To) = 4.09'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.44'

Notes: No issues.

K = 1.00×10^{-2} (ft/min)
K = 5.09×10^{-3} (cm/sec)

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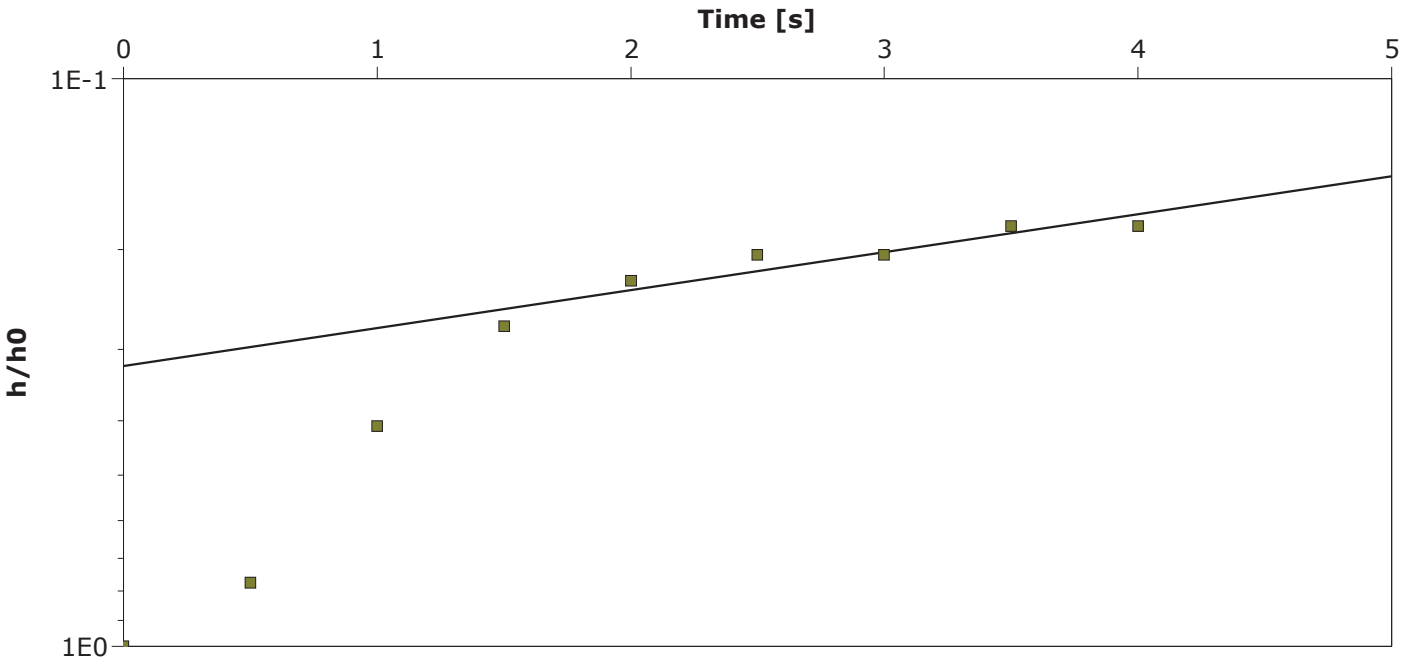
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-7 Slug Out	Test Well: MW-7
Test Conducted by: Kevin Cucura		Test Date: 1/4/2018
Analysis Performed by: Kevin Cucura	MW-7 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-7	1.00×10^{-2}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-8
Test ID: MW-8 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ **or 0.75'**

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 15.59' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 4.38' (measured in the field from top of casing)

Total Depth = 19.97' (measured in the field from top of casing)

Level @ Time 0 (To) = 5.15'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.77'

Notes: No issues.

K = 2.08×10^{-3} **(ft/min)**
K = 1.06×10^{-3} **(cm/sec)**

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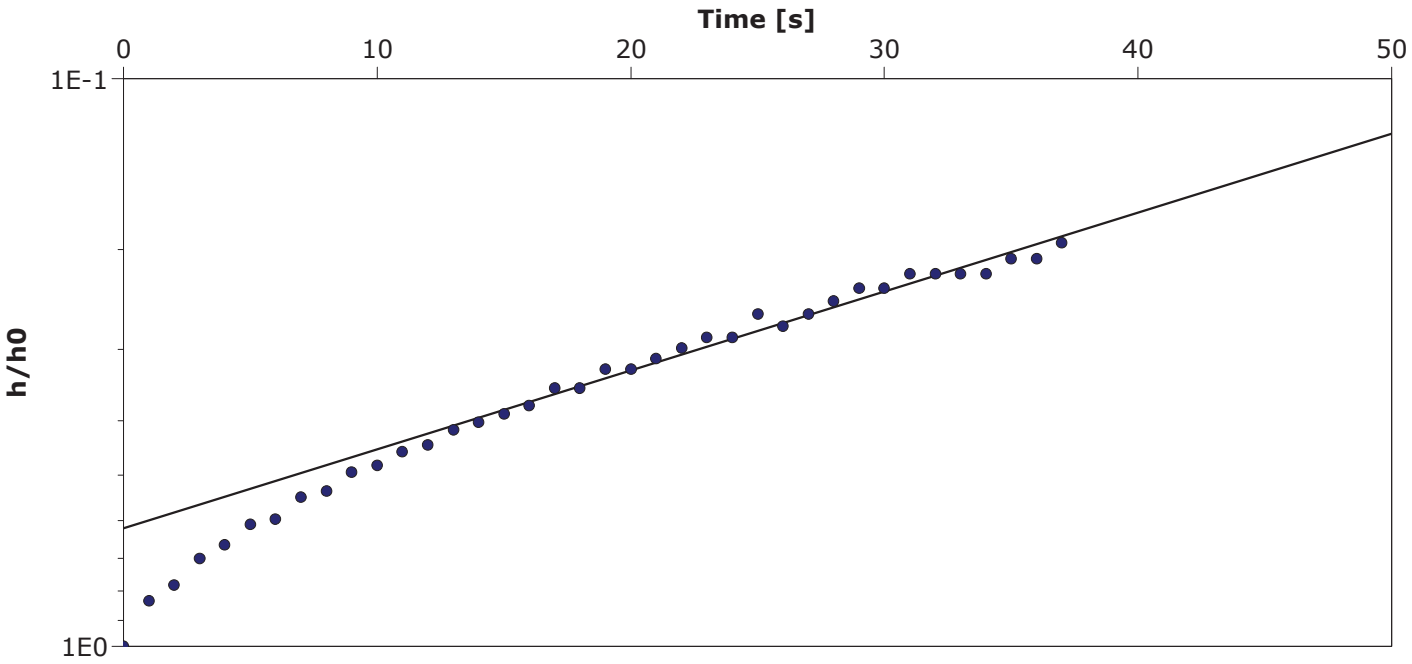
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-8 Slug Out	Test Well: MW-8
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-8 Slut Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-8	2.08×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-9
Test ID: MW-9 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ or 0.75'

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 14.91' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 4.53' (measured in the field from top of casing)

Total Depth = 19.44' (measured in the field from top of casing)

Level @ Time 0 (To) = 4.94'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.41'

Notes: No issues.

K = 2.55×10^{-3} (ft/min)
K = 1.29×10^{-3} (cm/sec)

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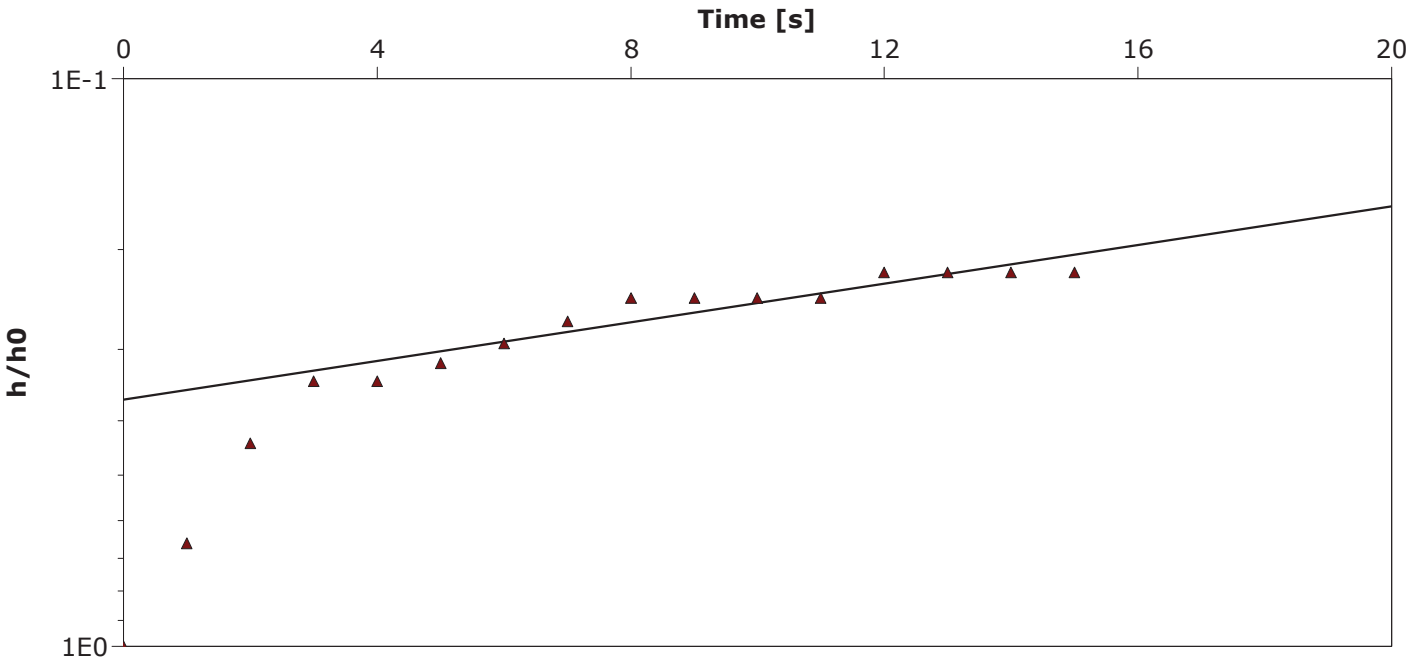
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-9 Slug Out	Test Well: MW-9
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-9 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-9	2.55×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-10
Test ID: MW-10 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ or 0.75'

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 13.68' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 5.43' (measured in the field from top of casing)

Total Depth = 19.11' (measured in the field from top of casing)

Level @ Time 0 (To) = 6.05'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.62'

Notes: No issues.

K = 2.40×10^{-4} (ft/min)
K = 1.22×10^{-4} (cm/sec)

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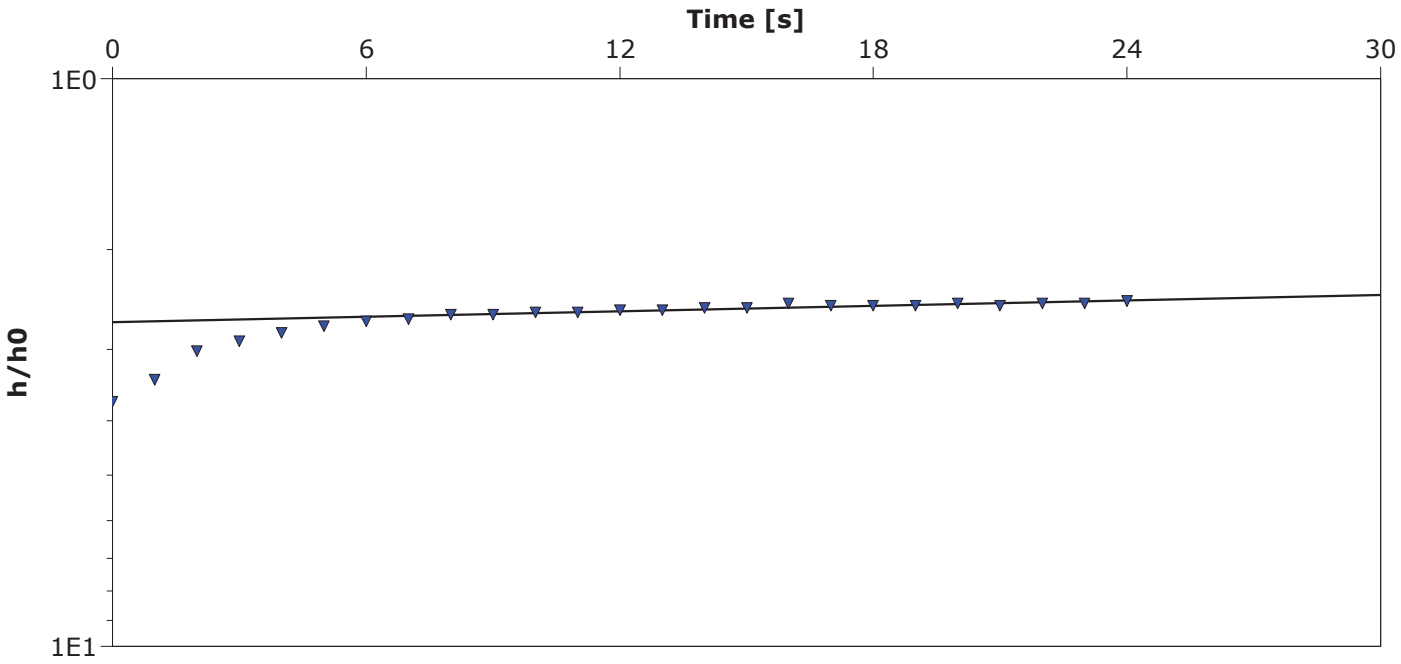
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-10 Slug Test	Test Well: MW-10
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-10 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-10	2.40×10^{-4}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-11
Test ID: MW-11 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ **or 0.75'**

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 16.52' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 3.29' (measured in the field from top of casing)

Total Depth = 19.81' (measured in the field from top of casing)

Level @ Time 0 (To) = 4.35'

Slug Size = 1" X 3'

H*o = 0.75'

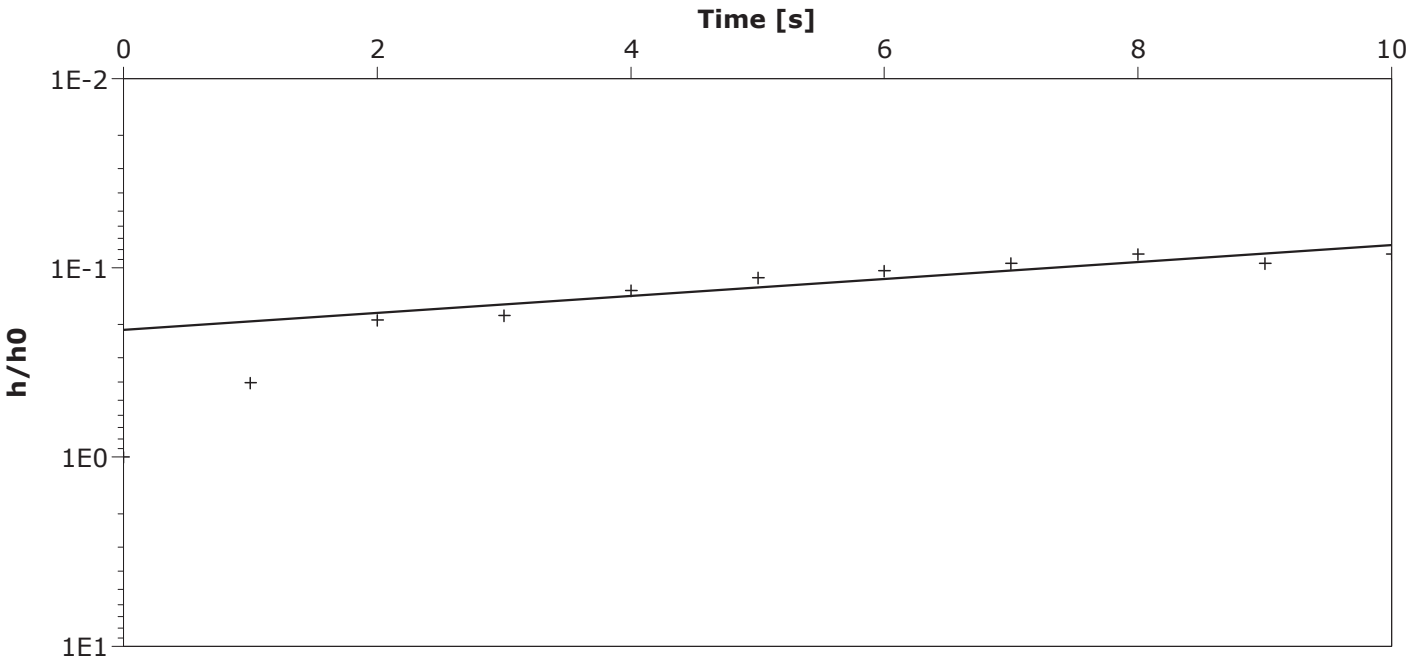
Actual Displacement (Ho) = 1.06'

Notes: No issues.

K = 6.71×10^{-3} (ft/min)
K = 3.41×10^{-3} (cm/sec)

LABELLA Associates — Engineering, Architecture, Environmental, Planning	**Slug Test Analysis Report**
	Project: Pump-n-Pantry #001 Property
	Number: 2171845 & 2171846
	Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-11 Slug Out	Test Well: MW-11
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-11 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-11	6.71×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-12
Test ID: MW-12 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2$ = 9" or 0.75'

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 14.65' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 5.54' (measured in the field from top of casing)

Total Depth = 20.19' (measured in the field from top of casing)

Level @ Time 0 (To) = 6.04'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.50'

Notes: No issues.

K = 4.71×10^{-3} **(ft/min)**
K = 2.39×10^{-3} **(cm/sec)**

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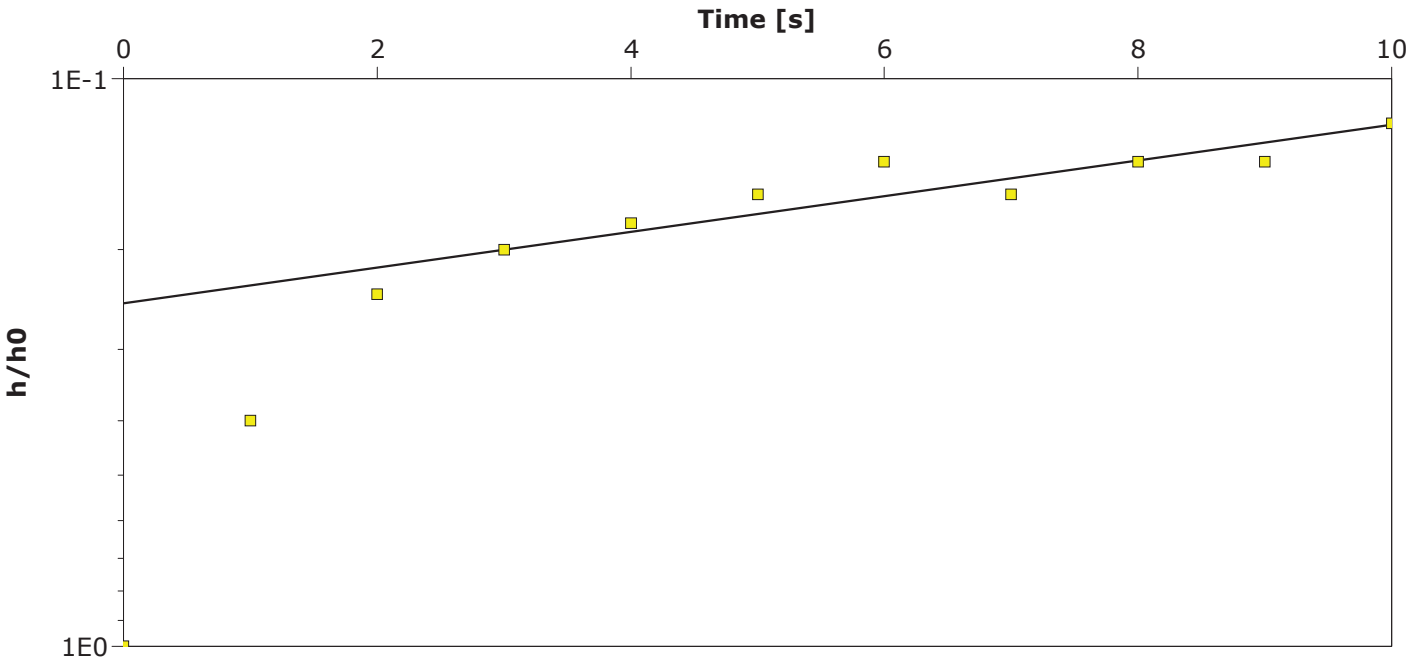
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-12 Slug Out	Test Well: MW-12
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-12 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-12	4.71×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-13
Test ID: MW-13 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ **or 0.75'**

Screen Radius (R) = 0.083'

Screen Length (L) = 16.0'

Saturated Thickness (b) = 15.45' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 3.12' (measured in the field from top of casing)

Total Depth = 18.57' (measured in the field from top of casing)

Level @ Time 0 (To) = 3.48'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.36'

Notes: No issues.

K = 4.45×10^{-3} (ft/min)
K = 2.26×10^{-3} (cm/sec)

LABELLA Associates | Engineering Architecture Environmental Planning

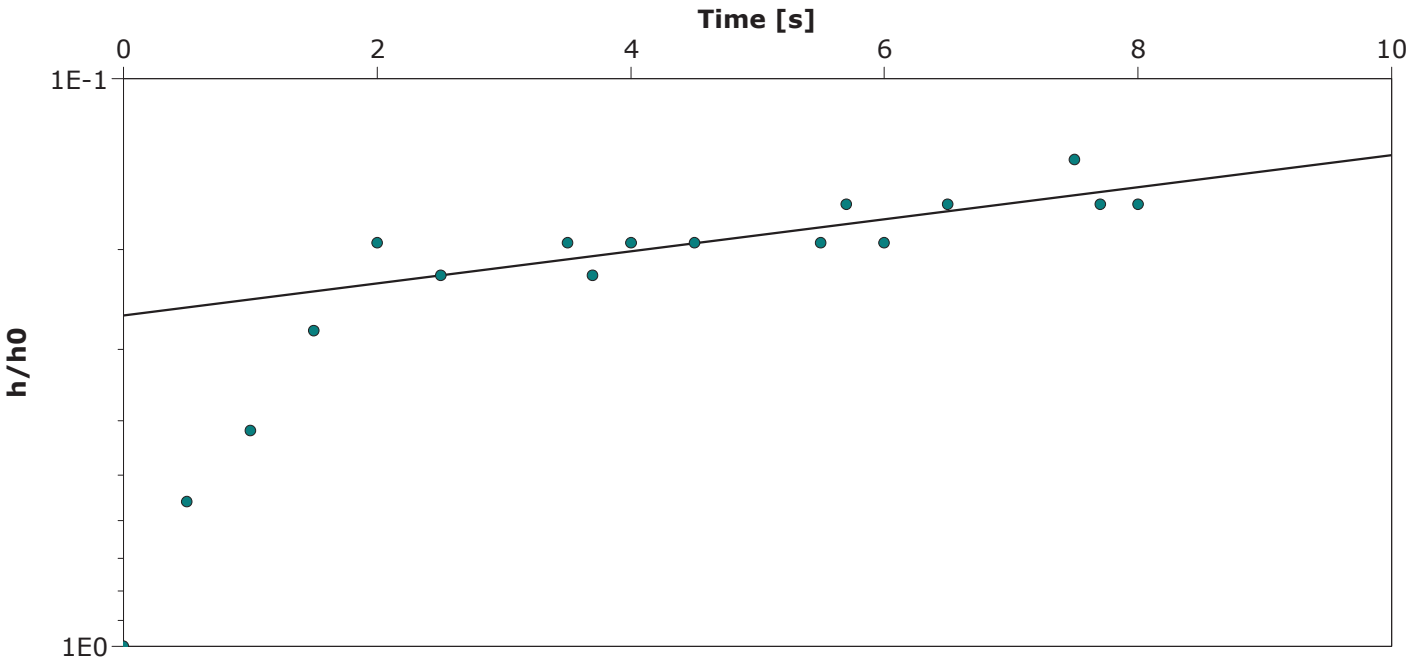
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-13 Slug Out	Test Well: MW-13
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-13 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [ft/min]	
MW-13	4.45×10^{-3}	

Slug Test Analysis Worksheet

Project: Pump-n-Pantry #001 Property
Project #: 2171845 & 2171846
Analyzed By: Kevin Cucura
Analysis Date: 12/29/2017
Test Date: 05/02/2017
Well #: MW-14
Test ID: MW-14 Slug Out

Slug Info

Size: 1" X 3'
Slug Volume (Vslug) = $\pi r^2 L$
Vslug = $(3.14)(0.5")^2 (36) = 28.26\ in^3$

Expected Displacement in 2" well (H*o) = Vslug / π casing radius $(rcasing)^2$

H*o = $(28.26\ in^3) / (3.14)\ (1)^2 = 9"$ **or 0.75'**

Screen Radius (R) = 0.083'

Screen Length (L) = 17.0'

Saturated Thickness (b) = 15.36' (Total Depth minus Static Water Level)

Casing Radius (r) = 0.083'

Borehole Radius (B) = 0.33'

Static Water Level = 4.23' (measured in the field from top of casing)

Total Depth = 19.59' (measured in the field from top of casing)

Level @ Time 0 (To) = 4.62'

Slug Size = 1" X 3'

H*o = 0.75'

Actual Displacement (Ho) = 0.39'

Notes: No issues.

K = 7.25×10^{-3} **(ft/min)**
K = 3.68×10^{-3} **(cm/sec)**

LABELLA Associates | Engineering Architecture Environmental Planning

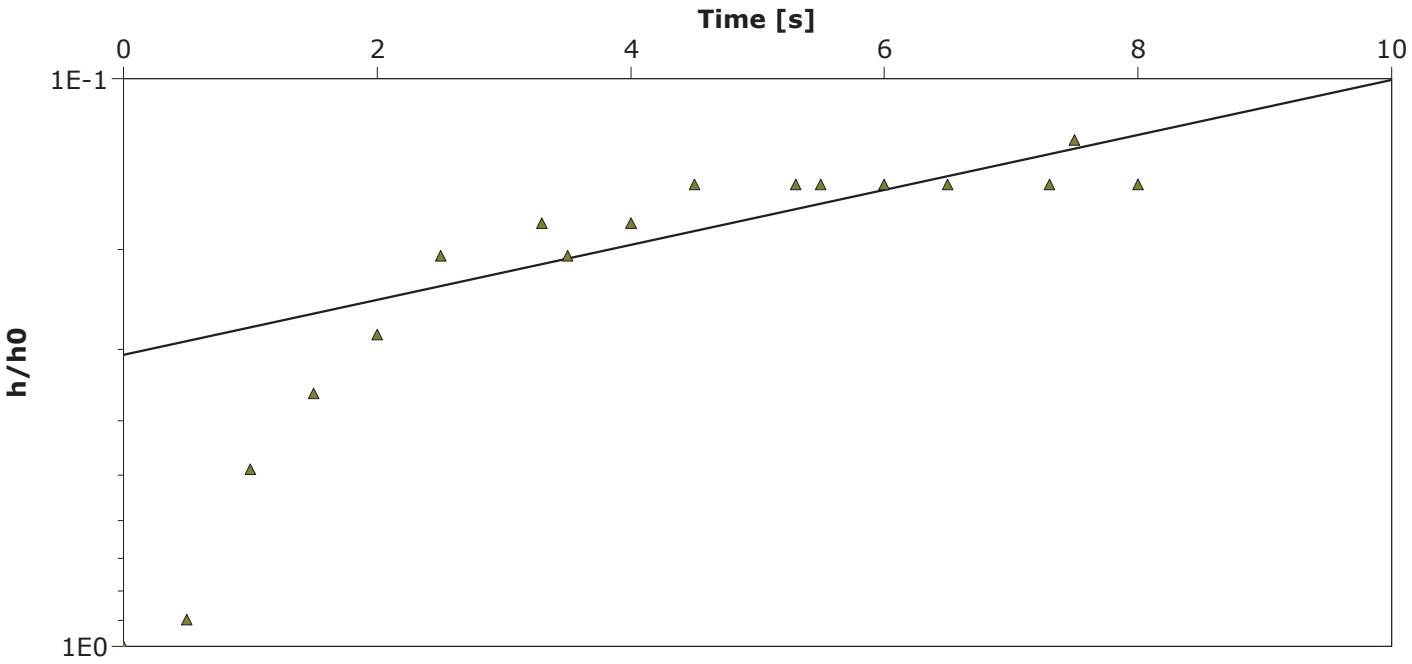
Slug Test Analysis Report

Project: Pump-n-Pantry #001 Property

Number: 2171845 & 2171846

Client: Pump-n-Pantry, Inc.

Location: Bridgewater Township	Slug Test: MW-14 Slug Out	Test Well: MW-14
Test Conducted by: Kevin Cucura		Test Date: 5/2/2017
Analysis Performed by: Kevin Cucura	MW-14 Slug Out	Analysis Date: 1/4/2018
Aquifer Thickness:		

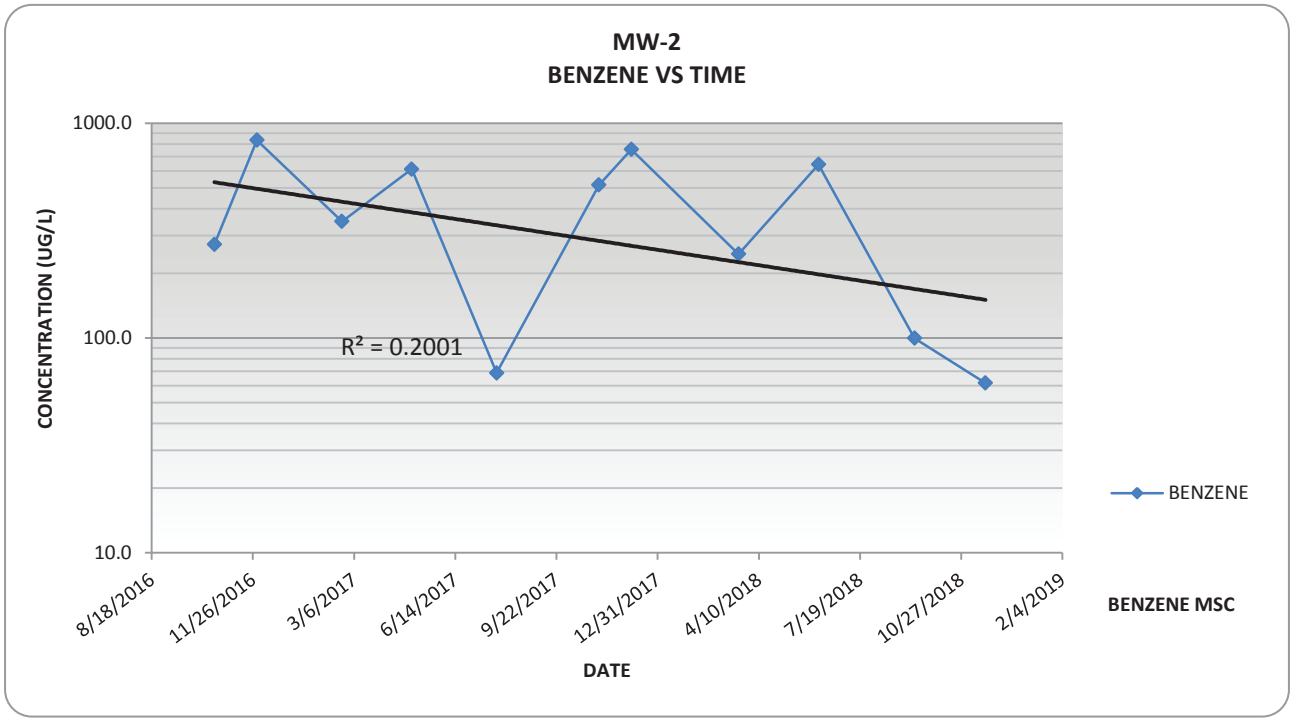


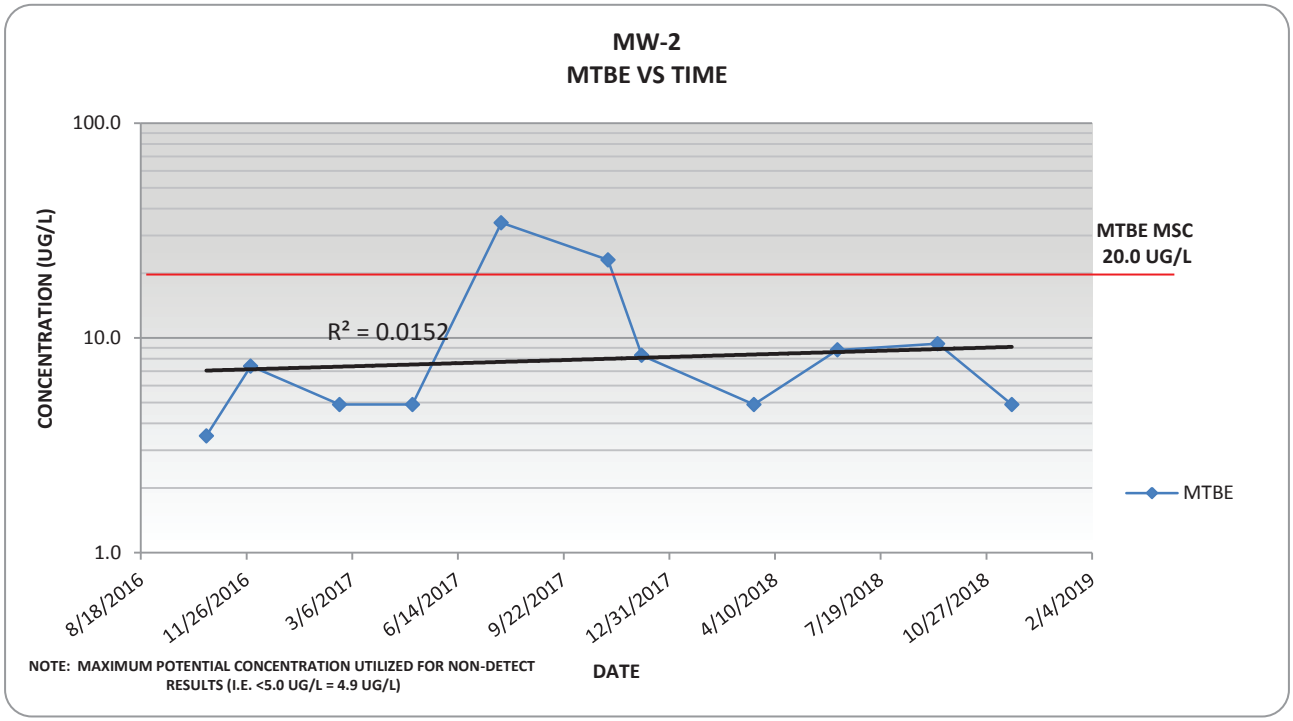
Calculation using Hvorslev

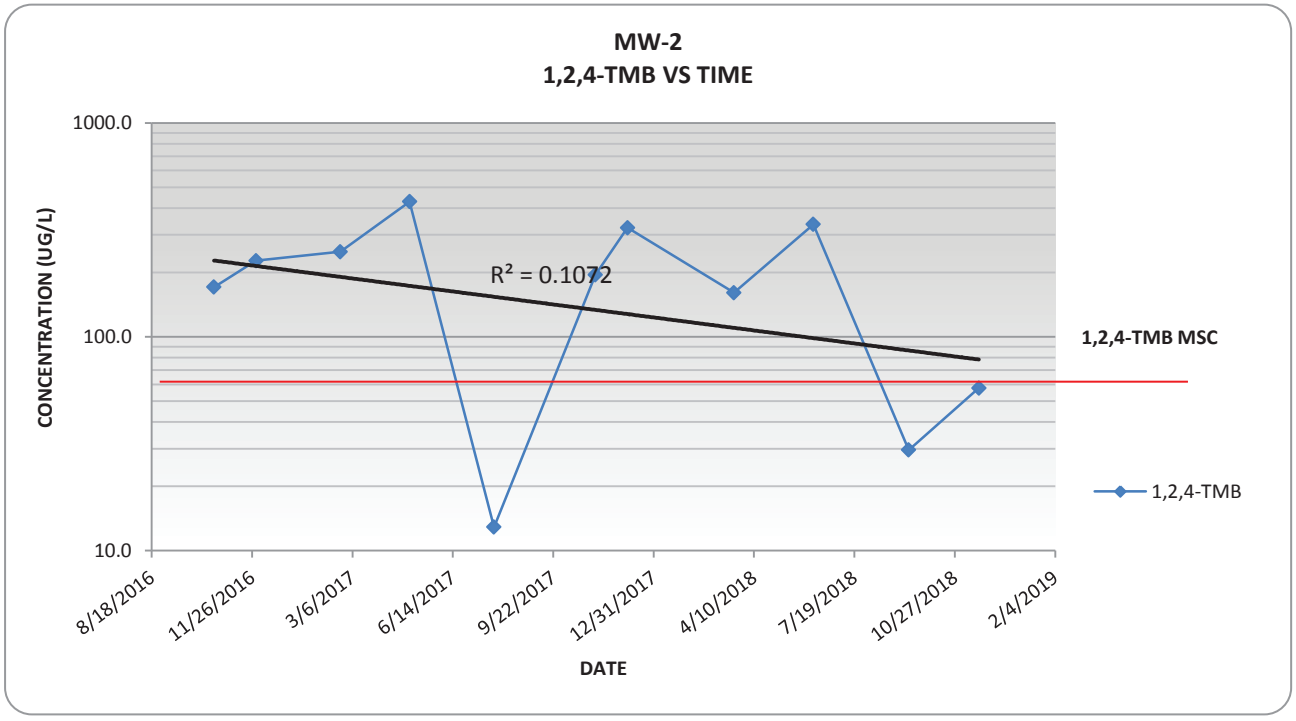
Observation Well	Hydraulic Conductivity [ft/min]	
MW-14	7.25×10^{-3}	

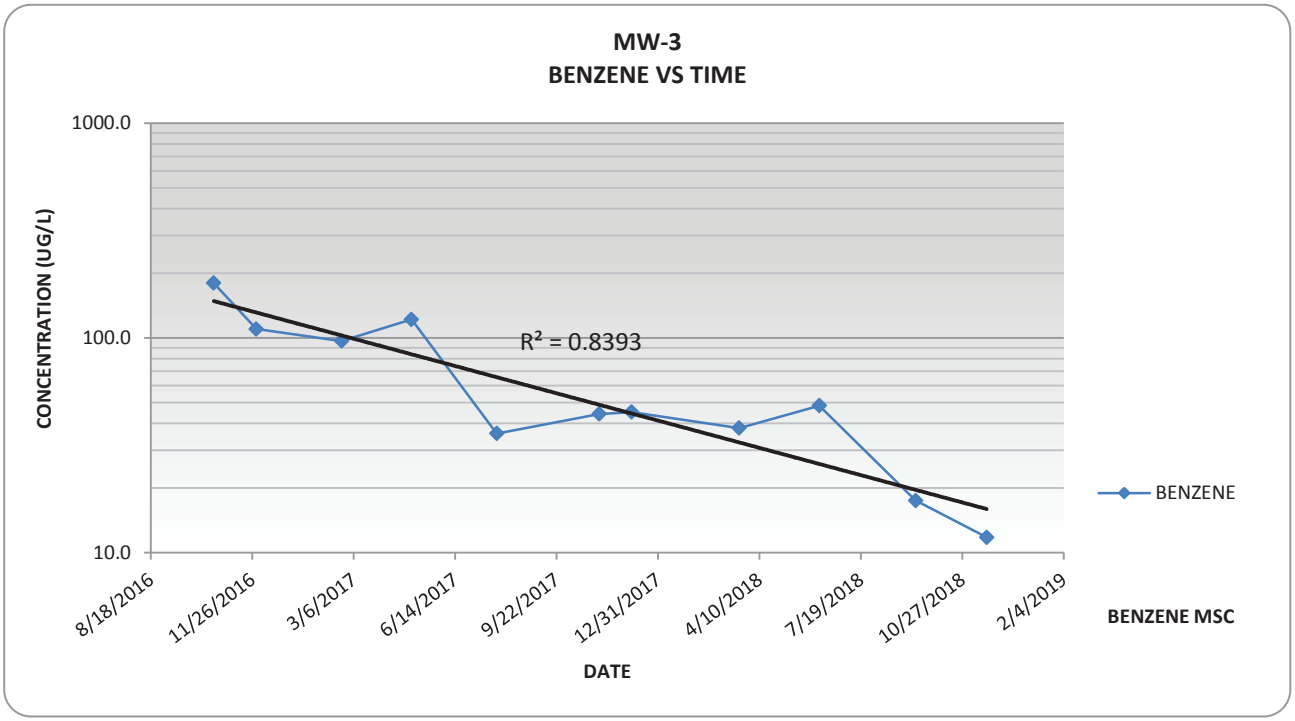
APPENDIX M

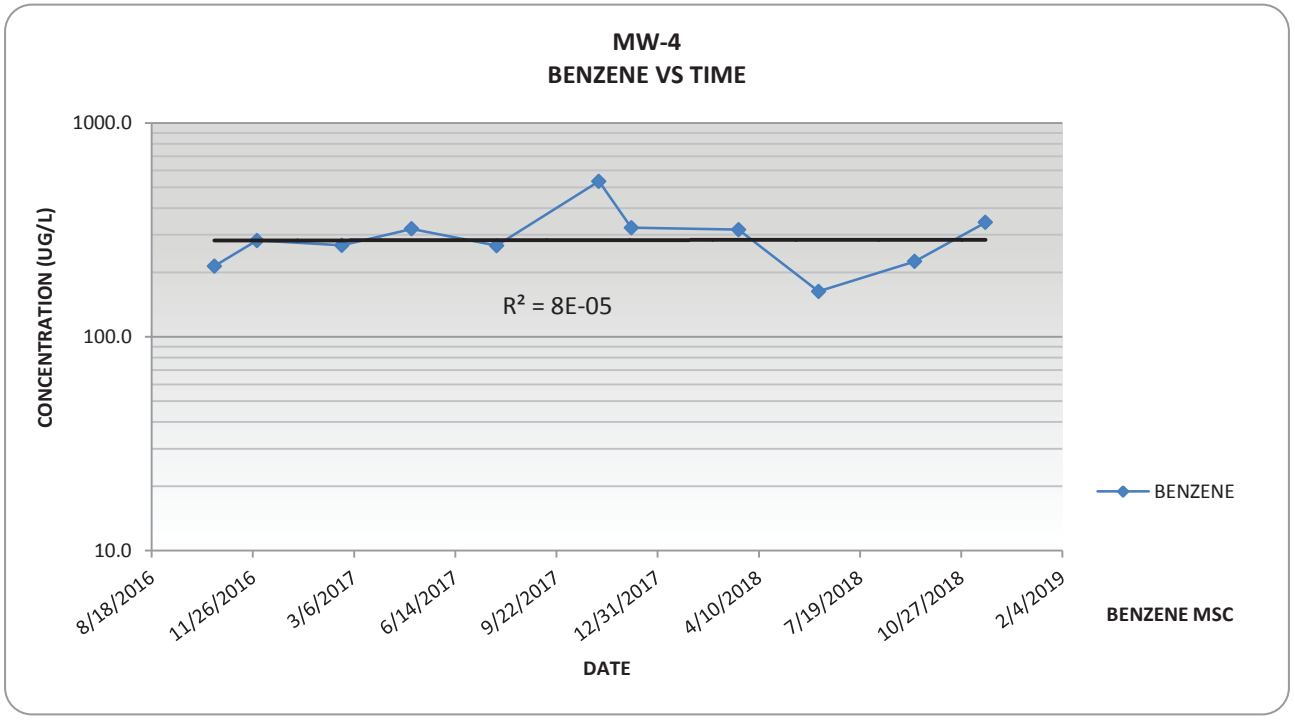
Temporal Trend Analysis

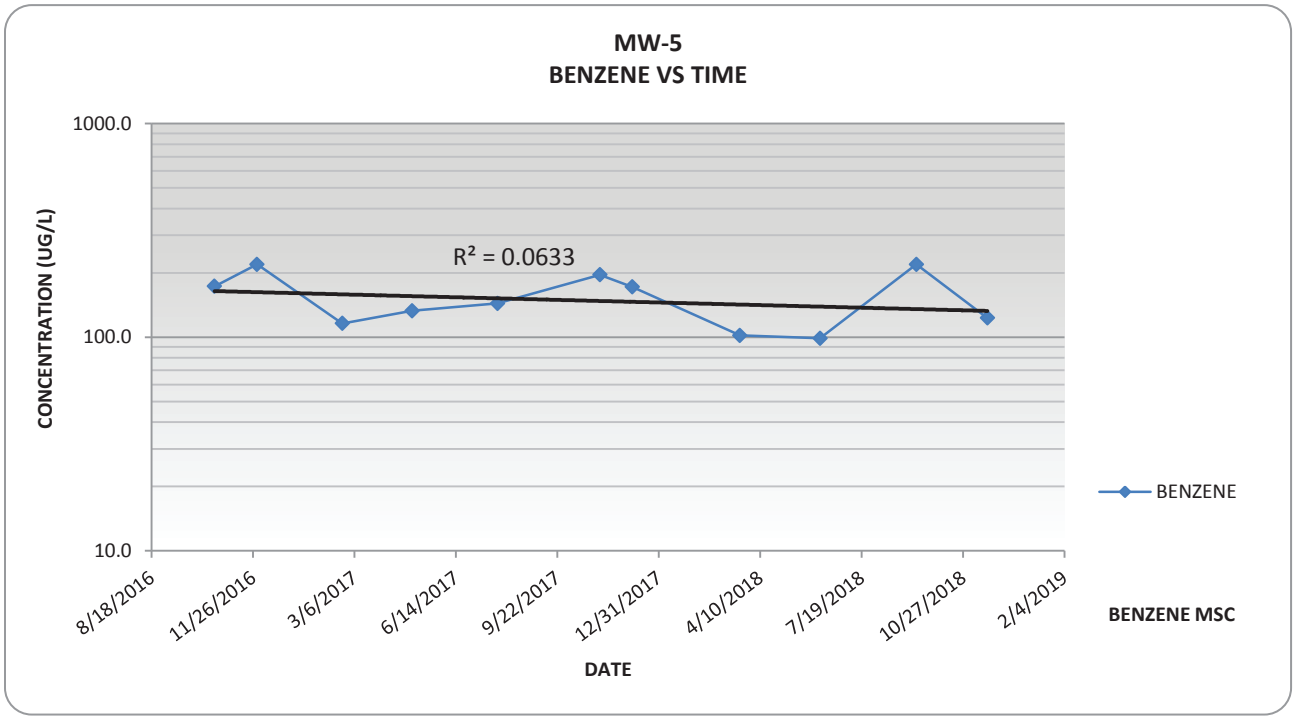

MW-2
BENZENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.2001
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
BENZENE
BENZENE MSC

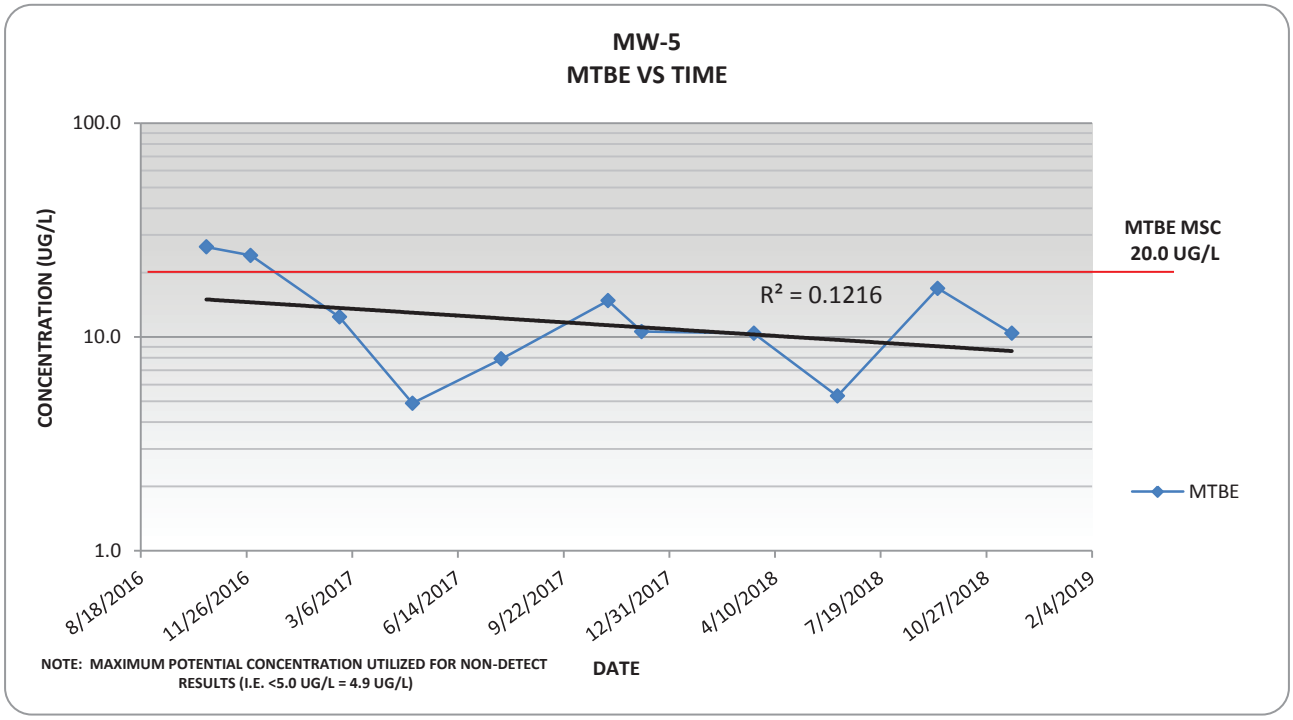

MW-2
MTBE VS TIME
100.0
10.0
1.0
CONCENTRATION (UG/L)
R² = 0.0152
MTBE MSC
20.0 UG/L
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
MTBE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <5.0 UG/L = 4.9 UG/L)

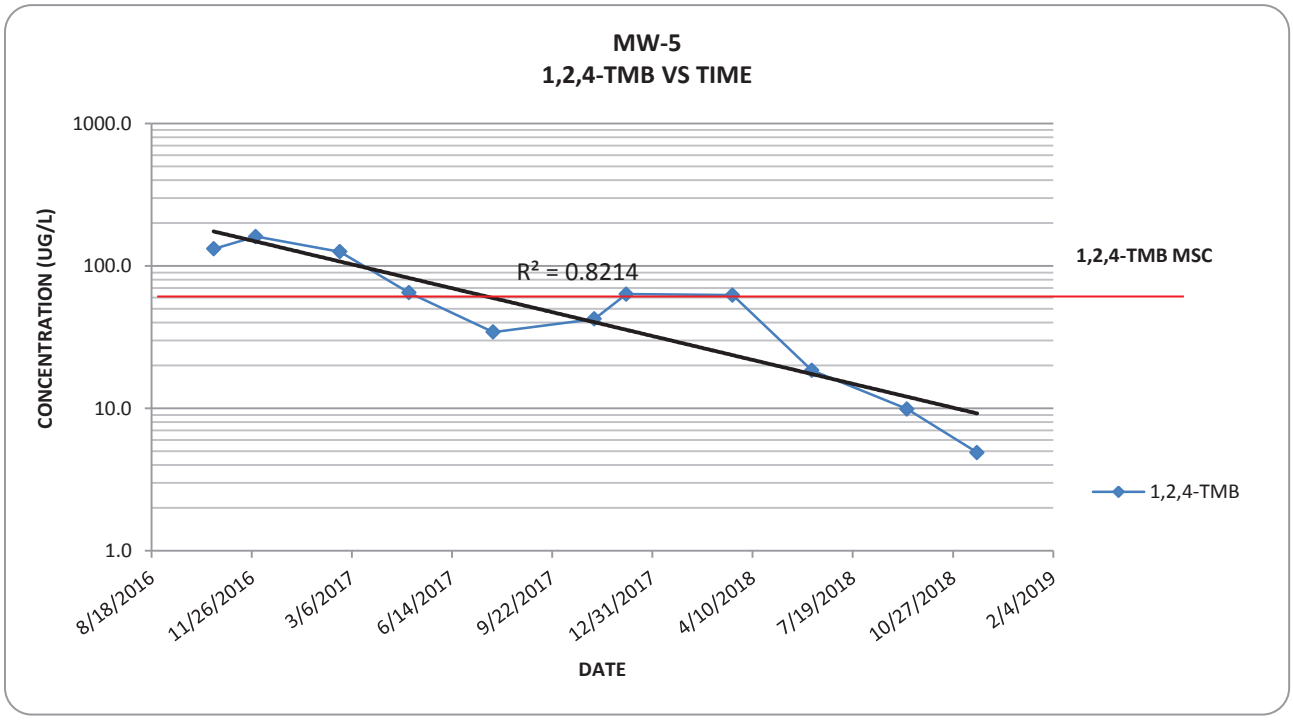

MW-2
1,2,4-TMB VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.1072
1,2,4-TMB MSC
1,2,4-TMB
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE

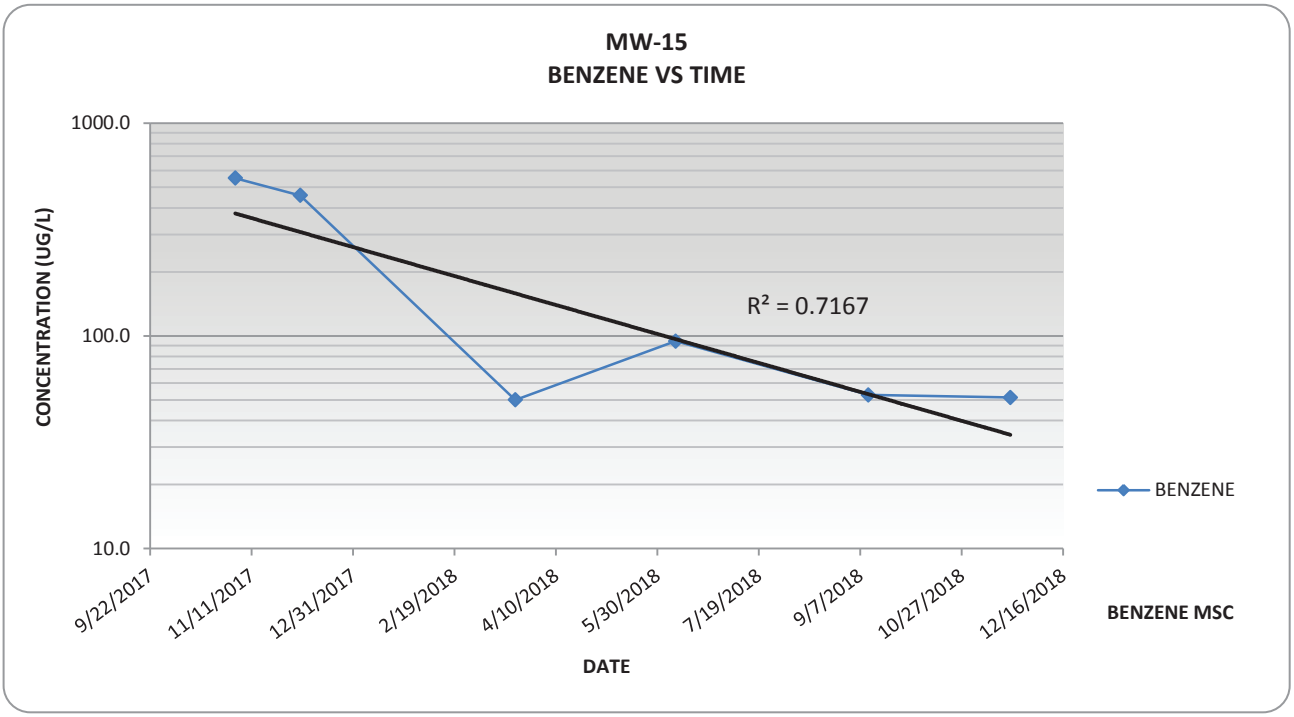

MW-3
BENZENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.8393
BENZENE
BENZENE MSC
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE

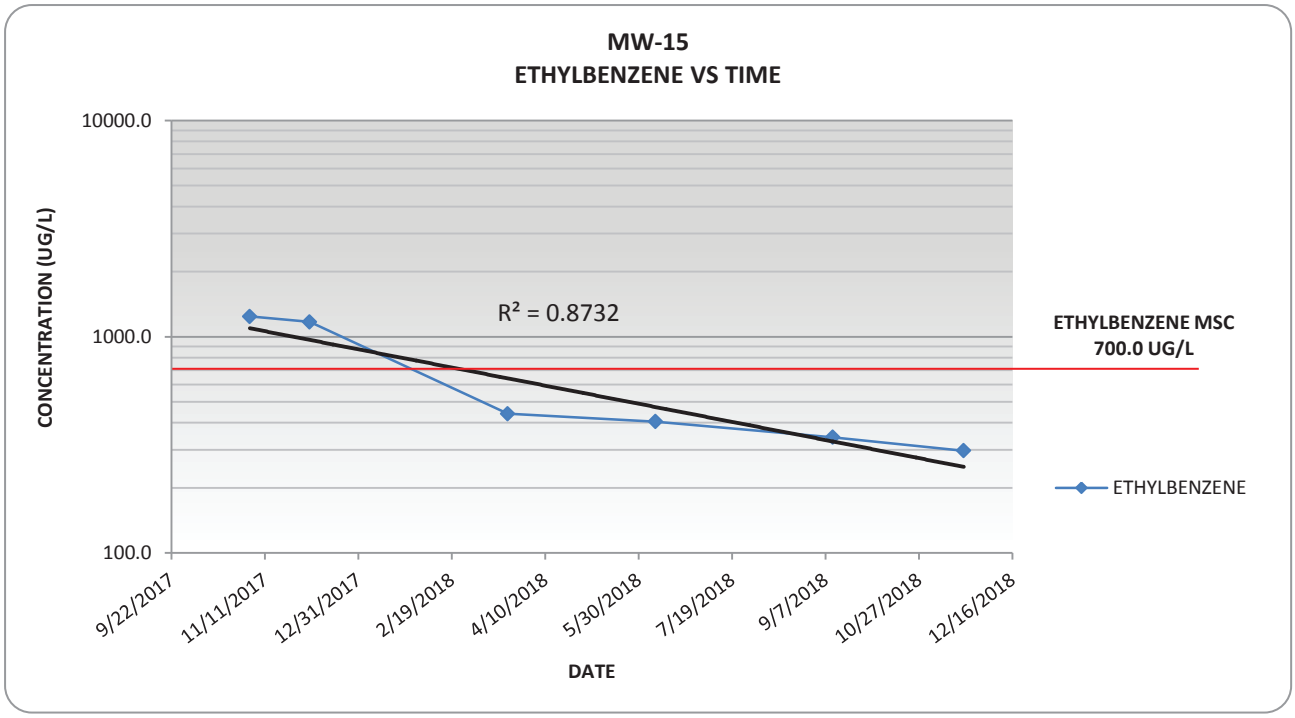

MW-4
BENZENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 8E-05
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
BENZENE
BENZENE MSC

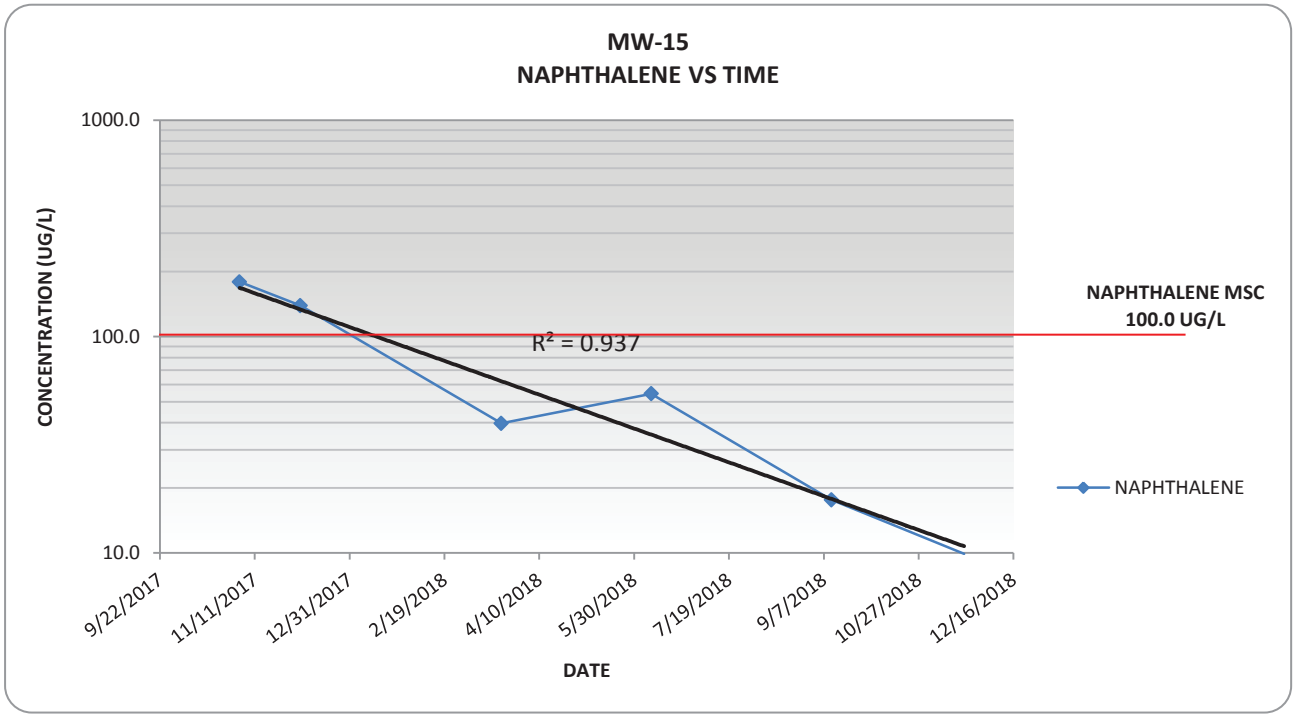

MW-5
BENZENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.0633
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
BENZENE
BENZENE MSC

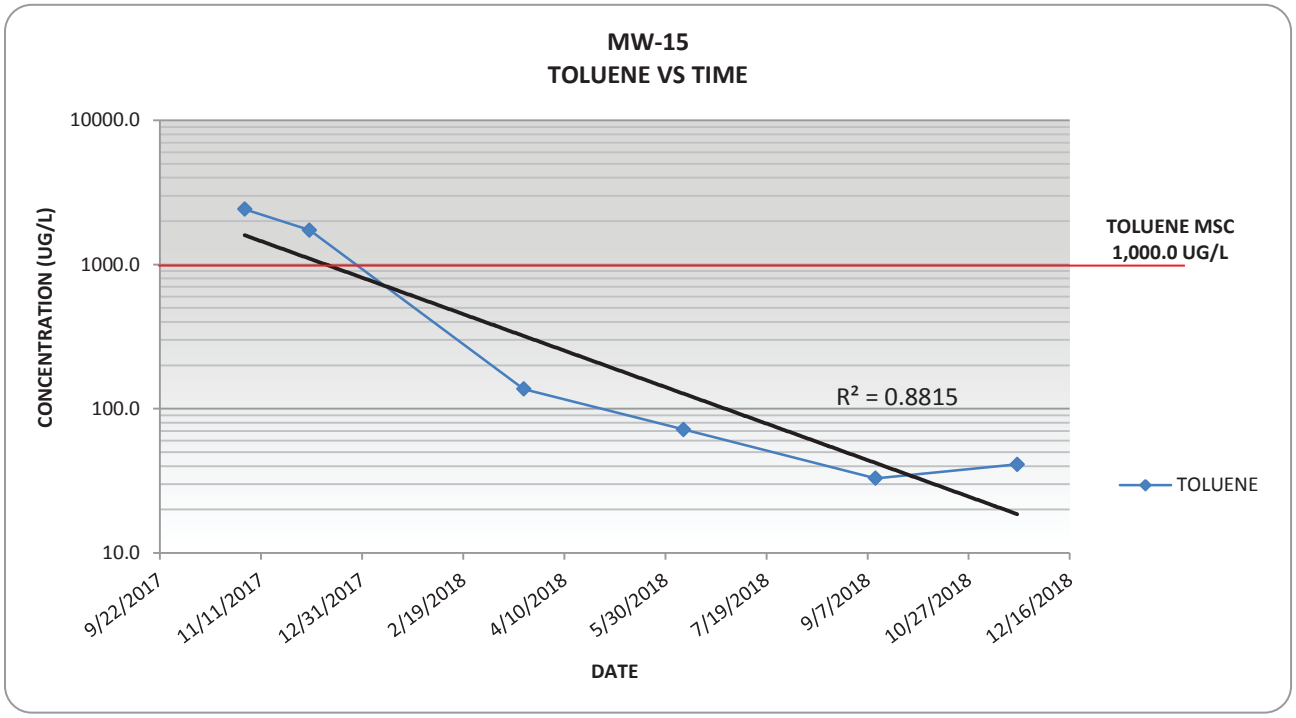

MW-5
MTBE VS TIME
100.0
10.0
1.0
CONCENTRATION (UG/L)
R² = 0.1216
MTBE MSC
20.0 UG/L
MTBE
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <5.0 UG/L = 4.9 UG/L)

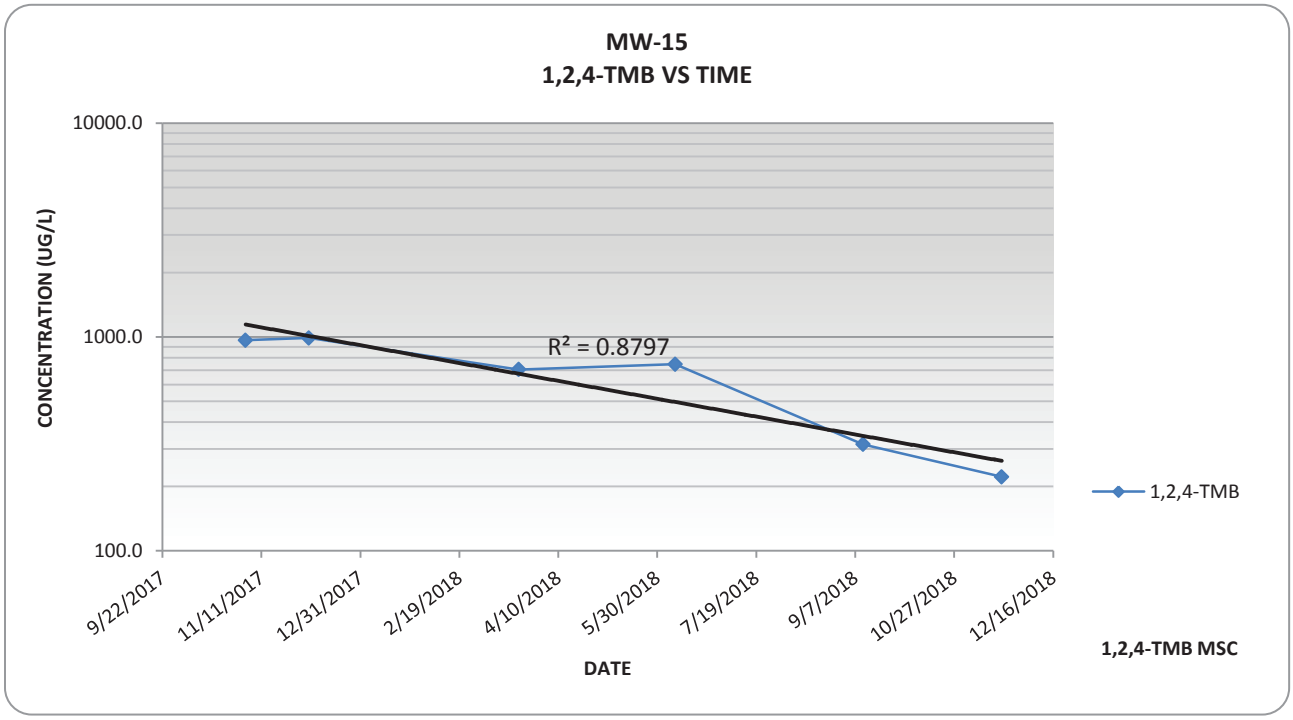

MW-5
1,2,4-TMB VS TIME
1000.0
100.0
10.0
1.0
CONCENTRATION (UG/L)
R² = 0.8214
1,2,4-TMB MSC
1,2,4-TMB
8/18/2016
11/26/2016
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE

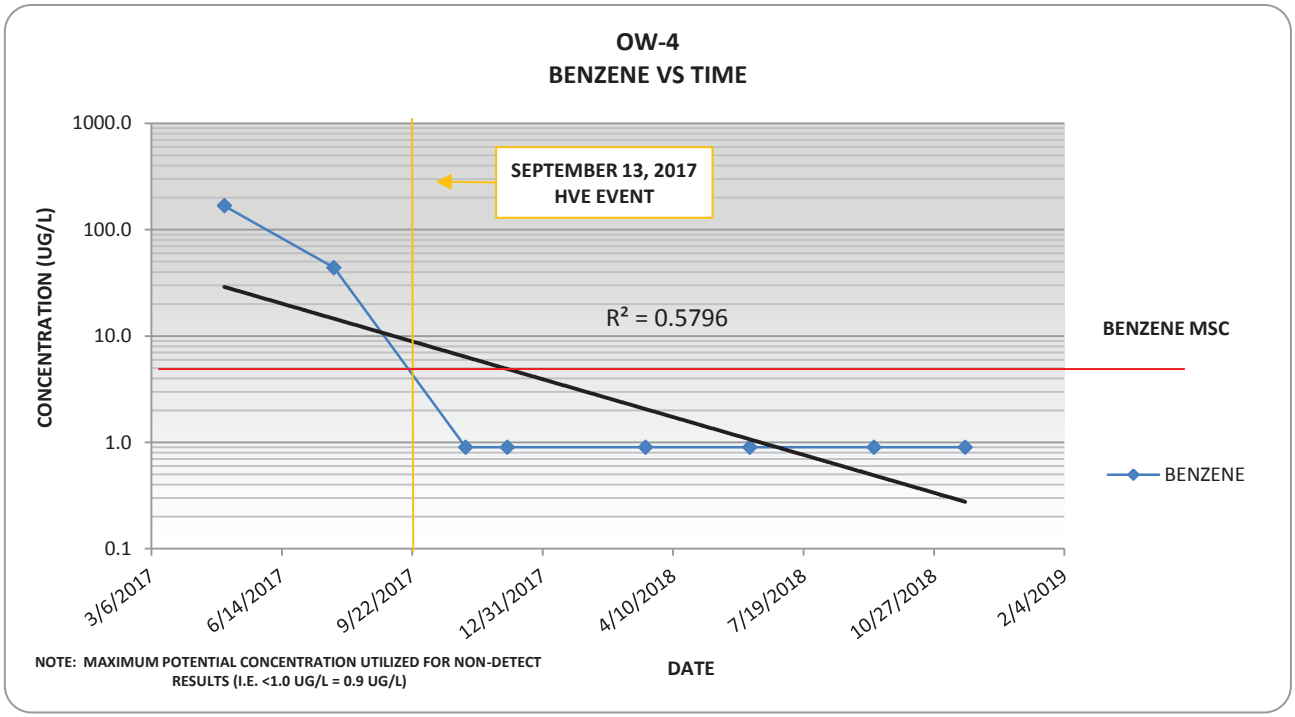

MW-15
BENZENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.7167
9/22/2017
11/11/2017
12/31/2017
2/19/2018
4/10/2018
5/30/2018
7/19/2018
9/7/2018
10/27/2018
12/16/2018
DATE
BENZENE
BENZENE MSC

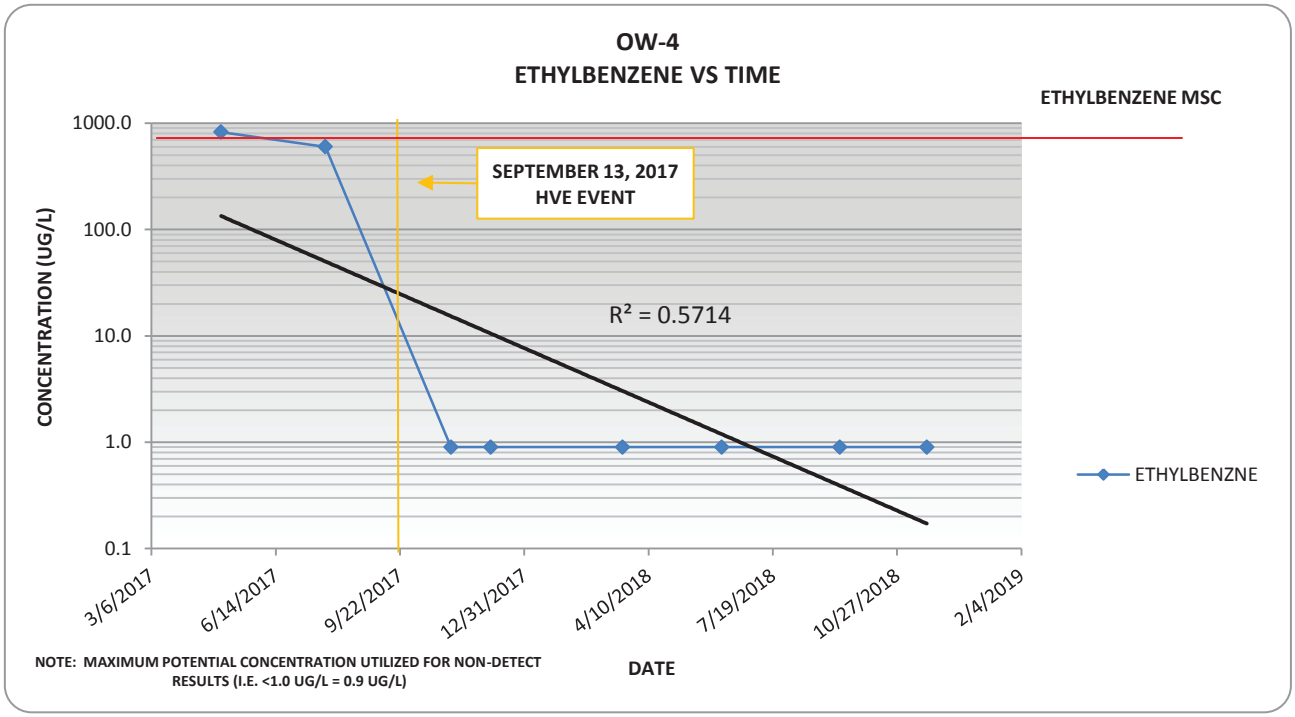

MW-15
ETHYLBENZENE VS TIME
10000.0
1000.0
100.0
CONCENTRATION (UG/L)
R² = 0.8732
9/22/2017
11/11/2017
12/31/2017
2/19/2018
4/10/2018
5/30/2018
7/19/2018
9/7/2018
10/27/2018
12/16/2018
DATE
ETHYLBENZENE MSC
700.0 UG/L
ETHYLBENZENE

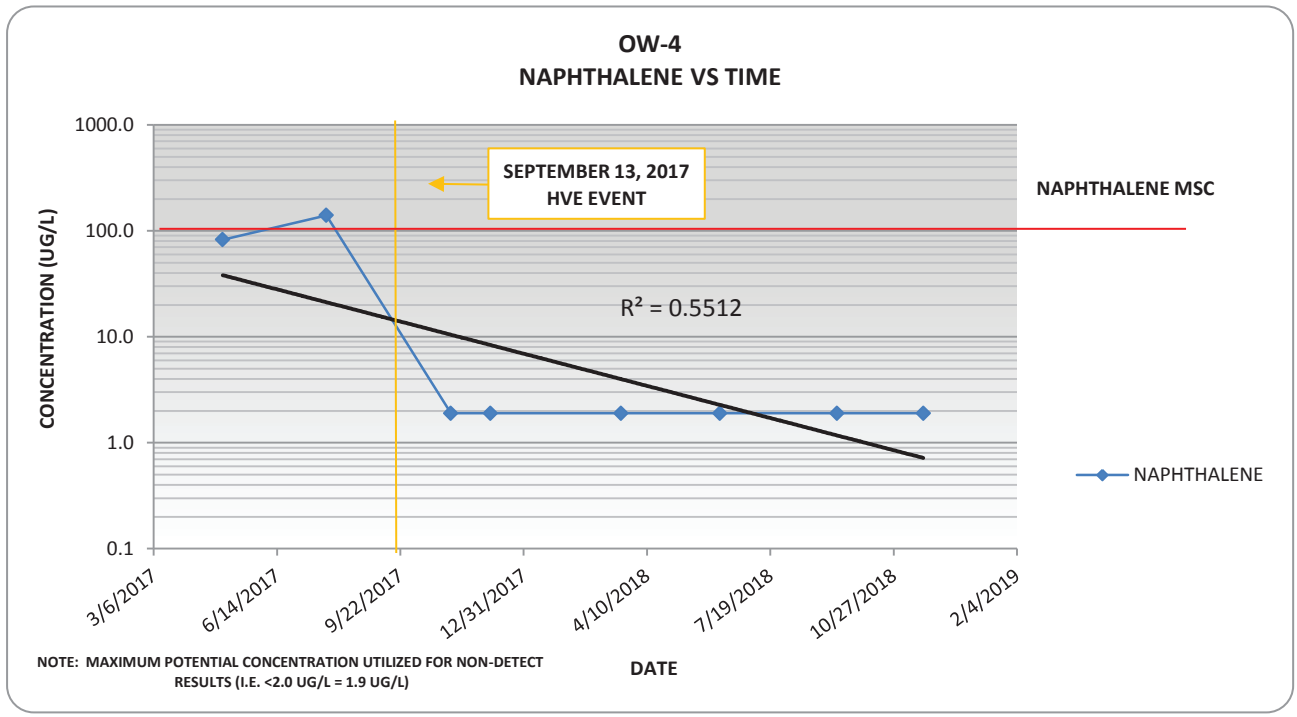

MW-15
NAPHTHALENE VS TIME
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.937
NAPHTHALENE MSC
100.0 UG/L
NAPHTHALENE
9/22/2017
11/11/2017
12/31/2017
2/19/2018
4/10/2018
5/30/2018
7/19/2018
9/7/2018
10/27/2018
12/16/2018
DATE

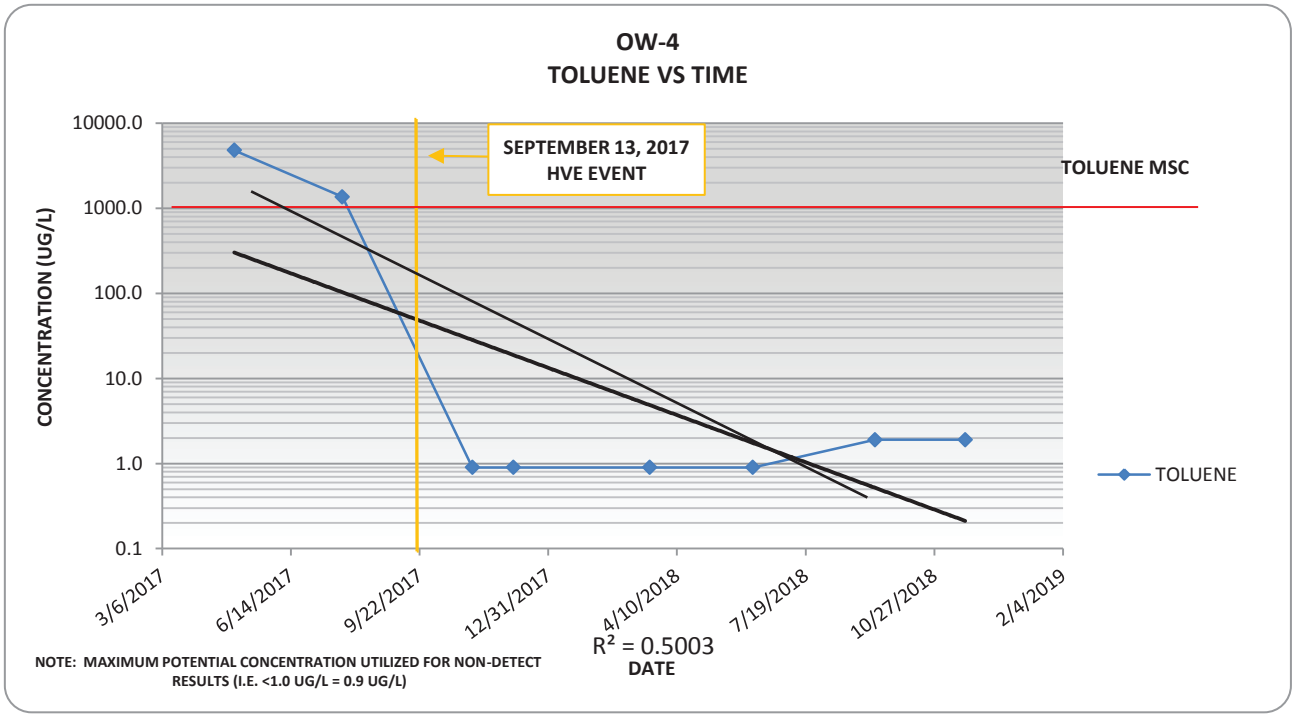

MW-15
TOLUENE VS TIME
10000.0
1000.0
100.0
10.0
CONCENTRATION (UG/L)
R² = 0.8815
TOLUENE MSC
1,000.0 UG/L
TOLUENE
9/22/2017
11/11/2017
12/31/2017
2/19/2018
4/10/2018
5/30/2018
7/19/2018
9/7/2018
10/27/2018
12/16/2018
DATE

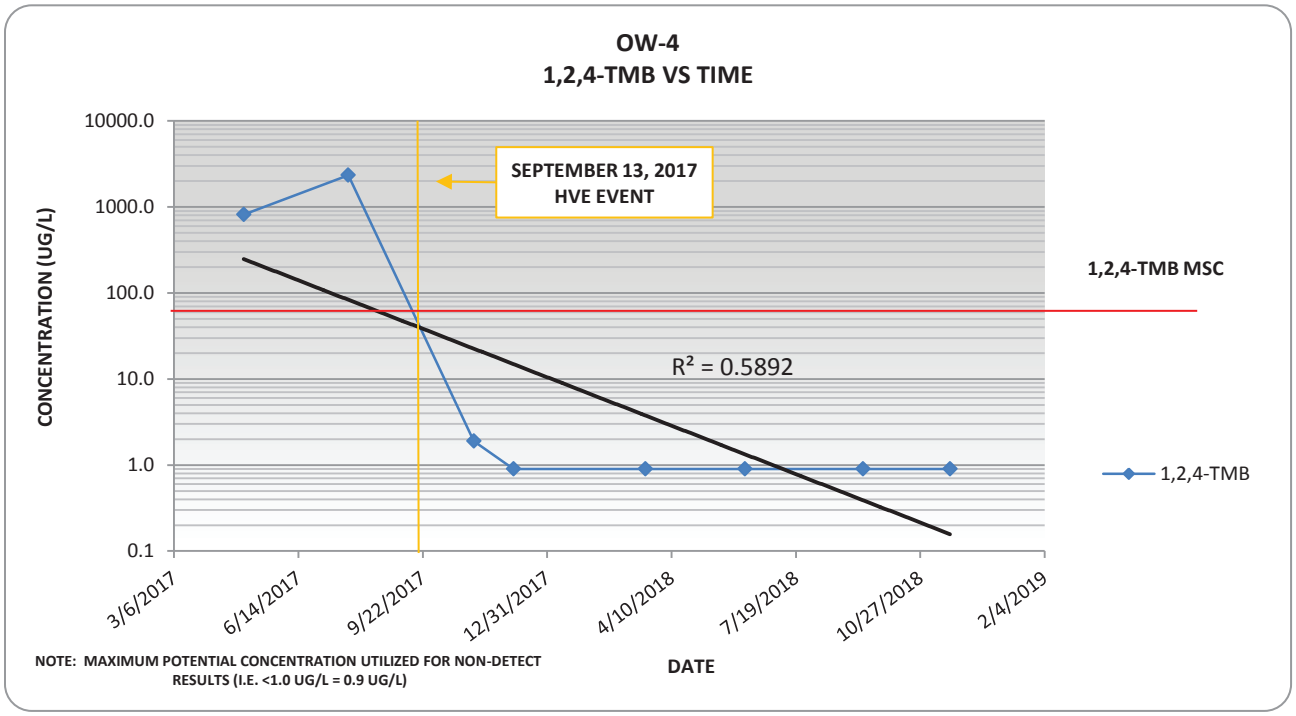

MW-15
1,2,4-TMB VS TIME
10000.0
1000.0
100.0
CONCENTRATION (UG/L)
R² = 0.8797
9/22/2017
11/11/2017
12/31/2017
2/19/2018
4/10/2018
5/30/2018
7/19/2018
9/7/2018
10/27/2018
12/16/2018
DATE
1,2,4-TMB
1,2,4-TMB MSC

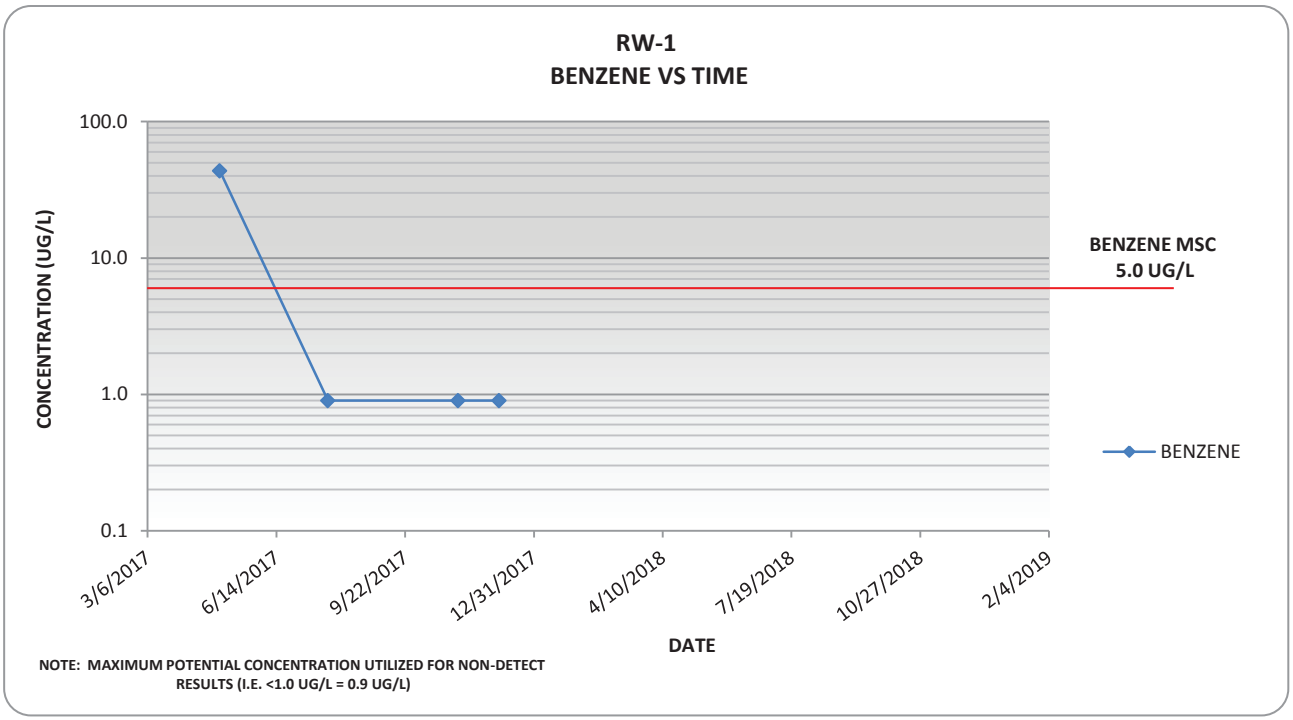

OW-4
BENZENE VS TIME
1000.0
100.0
10.0
1.0
0.1
CONCENTRATION (UG/L)
SEPTEMBER 13, 2017
HVE EVENT
R² = 0.5796
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
BENZENE MSC
BENZENE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <1.0 UG/L = 0.9 UG/L)


OW-4
ETHYLBENZENE VS TIME
ETHYLBENZENE MSC
SEPTEMBER 13, 2017
HVE EVENT
R² = 0.5714
CONCENTRATION (UG/L)
1000.0
100.0
10.0
1.0
0.1
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
ETHYLBENZNE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <1.0 UG/L = 0.9 UG/L)


OW-4
NAPHTHALENE VS TIME
NAPHTHALENE MSC
SEPTEMBER 13, 2017
HVE EVENT
R² = 0.5512
CONCENTRATION (UG/L)
1000.0
100.0
10.0
1.0
0.1
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
NAPHTHALENE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <2.0 UG/L = 1.9 UG/L)


OW-4
TOLUENE VS TIME
SEPTEMBER 13, 2017
HVE EVENT
TOLUENE MSC
TOLUENE
CONCENTRATION (UG/L)
10000.0
1000.0
100.0
10.0
1.0
0.1
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
R² = 0.5003
DATE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <1.0 UG/L = 0.9 UG/L)


OW-4
1,2,4-TMB VS TIME
SEPTEMBER 13, 2017
HVE EVENT
1,2,4-TMB MSC
1,2,4-TMB
CONCENTRATION (UG/L)
10000.0
1000.0
100.0
10.0
1.0
0.1
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
R² = 0.5892
DATE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT RESULTS (I.E. <1.0 UG/L = 0.9 UG/L)


RW-1
BENZENE VS TIME
100.0
10.0
1.0
0.1
CONCENTRATION (UG/L)
3/6/2017
6/14/2017
9/22/2017
12/31/2017
4/10/2018
7/19/2018
10/27/2018
2/4/2019
DATE
BENZENE MSC
5.0 UG/L
BENZENE
NOTE: MAXIMUM POTENTIAL CONCENTRATION UTILIZED FOR NON-DETECT
RESULTS (I.E. <1.0 UG/L = 0.9 UG/L)

APPENDIX N

Historical Soil Data Tables

08/30/18

Table N-1
UST Closure Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	Montrose 16	Montrose 17	Montrose 18	Montrose 19	Montrose 20	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**T-006 & T-007**	**T-003**	**T-003**	**T-003**	**Diesel Pump**			
Depth	**11.0' - 12.0'**	**11.0' - 12.0'**	**11.0' - 12.0'**	**11.0' - 12.0'**	**4.0'**			
Condition	**PSZ**	**PSZ**	**PSZ**	**PSZ**	**Smear**			
% Moisture	**Not Reported**	**Not Reported**	**Not Reported**	**Not Reported**	**Not Reported**			
Sample Date	**10/22/2015**	**10/22/2015**	**10/22/2015**	**10/22/2015**	**10/22/2015**			
Benzene	**0.41**	**0.36**	**0.61**	**0.92**	<0.025	0.5	0.5	0.5
Toluene	<0.025	<0.025	<0.025	<0.400	**0.1**	100	100	100
Ethylbenzene	<0.025	**0.026**	**0.51**	**0.66**	**1.8**	70	70	70
Xylenes (Total)	<0.075	<0.075	**1.7**	**1.7**	**2.3**	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.025	**0.38**	<0.025	**0.6**	**1.0**	2,500	2,500	350
MTBE	<0.050	<0.050	<0.050	<0.050	<0.050	2	2	2
Naphthalene	**0.885**	**1.0**	**0.73**	**2.6**	<6.3	25	25	10
1,2,4-Trimethylbenzene	<0.025	<0.600	**0.72**	**0.5**	<6.3	35	35	6.2
1,3,5-Trimethylbenzene	<0.025	**0.047**	<0.025	<0.400	**4.7**	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
UST Closure Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	Montrose 21	Montrose 22	Montrose 23	Montrose 24	Montrose 25	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**Gas Pump**	**Piping**	**Piping**	**Piping**	**Soil Pile**			
Depth	**4.0'**	**4.0'**	**4.0'**	**4.0'**	**NA**			
Condition	**Smear**	**Smear**	**Smear**	**Smear**	**NA**			
% Moisture	**Not Reported**	**Not Reported**	**Not Reported**	**Not Reported**	**Not Reported**			
Sample Date	**10/22/2015**	**10/22/2015**	**10/22/2015**	**10/22/2015**	**10/22/2015**			
Benzene	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	0.5	0.5
Toluene	**0.9**	**1.8**	<0.025	<0.025	<0.025	100	100	100
Ethylbenzene	**17.0**	**5.0**	<0.025	<0.025	<0.025	70	70	70
Xylenes (Total)	**100.0**	**46.0**	<0.075	<0.075	<0.075	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	**3.0**	**2.2**	<0.025	<0.025	<0.025	2,500	2,500	350
MTBE	<0.050	<0.050	<0.050	<0.050	<0.050	2	2	2
Naphthalene	**15.0**	**7.3**	**0.044**	**0.35**	<0.025	25	25	10
1,2,4-Trimethylbenzene	**110.0**	**71.0**	**0.045**	**0.600**	<0.025	35	35	6.2
1,3,5-Trimethylbenzene	**33.0**	**20.0**	**0.32**	**0.037**	<0.025	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-1A	TB-1B	TB-2A	TB-2B	TB-3A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-1**	**TB-1**	**TB-2**	**TB-2**	**TB-3**			
Depth	**2.0' - 3.0'**	**5.0' - 6.0'**	**1.5' - 2.5'**	**5.0' - 6.0'**	**1.5' - 2.5'**			
Condition	**Vadose**	**Smear**	**Vadose**	**Smear**	**Vadose**			
% Moisture	**15.8%**	**8.9%**	**10.4%**	**8.5%**	**12.6%**			
Sample Date	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**			
Benzene	<0.0494	<0.034	**0.583**	**0.281**	**3.08**	0.5	0.5	0.5
Toluene	<0.0494	<0.034	**1.78**	**3.51**	**19.2**	100	100	100
Ethylbenzene	<0.0494	<0.034	**1.88**	**12.9**	**32.4**	70	70	70
Xylenes (Total)	<0.148	<0.102	**4.8**	**59.8**	**384.0**	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0494	<0.034	**0.161**	**1.380**	**5.62**	2,500	2,500	350
MTBE	<0.0494	<0.034	<0.0382	<0.149	<0.242	2	2	2
Naphthalene	<0.0988	<0.0679	**2.49**	**5.32**	**60.5**	25	25	10
1,2,4-Trimethylbenzene	<0.0988	<0.034	**19.9**	**40.0**	**562.0**	35	35	6.2
1,3,5-Trimethylbenzene	<0.0494	<0.034	**1.71**	**11.3**	**246.0**	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-3B	TB-4A	TB-4B	TB-5A	TB-5B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	TB-3	TB-4	TB-4	TB-5	TB-5			
Depth	5.0' - 6.0'	2.0' - 3.0'	5.0' - 6.0'	1.0' - 2.0'	4.5' - 5.0'			
Condition	Smear	Vadose	Smear	Vadose	Smear			
% Moisture	4.9%	5.2%	7.2%	10.4%	12.5%			
Sample Date	3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016			
Benzene	<0.0424	0.093	0.977	1.41	1.03	0.5	0.5	0.5
Toluene	0.0473	<0.0309	0.6	0.0413	<0.167	100	100	100
Ethylbenzene	1.19	0.332	25.1	3.54	23.4	70	70	70
Xylenes (Total)	1.67	0.944	16.0	1.25	1.17	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	0.234	0.0365	2.86	0.246	3.81	2,500	2,500	350
MTBE	<0.0424	<0.0309	<0.0135	<0.0340	<0.167	2	2	2
Naphthalene	1.12	0.0874	10.4	0.183	9.26	25	25	10
1,2,4-Trimethylbenzene	8.19	0.658	57.4	2.1	7.55	35	35	6.2
1,3,5-Trimethylbenzene	2.5	0.239	15.6	1.18	18.8	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-6A	TB-6B	TB-7A	TB-7B	TB-8A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-6**	**TB-6**	**TB-7**	**TB-7**	**TB-8**			
Depth	**2.5' - 3.5'**	**5.0' - 6.0'**	**2.0' - 3.0'**	**4.5' - 5.0'**	**2.0' - 3.0'**			
Condition	**Vadose**	**Smear**	**Vadose**	**Smear**	**Vadose**			
% Moisture	**8.7%**	**11.9%**	**15.6%**	**9.4%**	**6.6%**			
Sample Date	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**			
Benzene	**1.05**	<0.150	**0.200**	**2.15**	<0.158	0.5	0.5	0.5
Toluene	**5.63**	<0.150	<0.0390	**0.767**	<0.158	100	100	100
Ethylbenzene	**35.5**	**2.59**	**0.118**	**35.7**	<0.158	70	70	70
Xylenes (Total)	**106.0**	**0.771**	<0.117	**10.1**	<0.474	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	**5.67**	**0.594**	<0.0390	**6.42**	<0.158	2,500	2,500	350
MTBE	<0.146	<0.150	<0.0390	<0.329	<0.158	2	2	2
Naphthalene	**18.7**	**1.97**	<0.0780	**19.9**	<0.316	25	25	10
1,2,4-Trimethylbenzene	**126.0**	**5.53**	**0.122**	**25.3**	<0.316	35	35	6.2
1,3,5-Trimethylbenzene	**41.2**	**3.5**	**0.0631**	**36.0**	<0.158	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-8B	TB-9A	TB-9B	TB-10A	TB-10B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-8**	**TB-9**	**TB-9**	**TB-10**	**TB-10**			
Depth	**4.5' - 5.0'**	**2.0' - 3.0'**	**4.5' - 5.0'**	**1.0' - 2.0'**	**3.0' - 3.5'**			
Condition	**Smear**	**Vadose**	**Smear**	**Vadose**	**Smear**			
% Moisture	**13.5%**	**6.8%**	**9.9%**	**15.9%**	**16.1%**			
Sample Date	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**			
Benzene	<0.236	<0.175	<0.158	<0.291	**1.61**	0.5	0.5	0.5
Toluene	<0.236	<0.175	<0.158	<0.291	**33.0**	100	100	100
Ethylbenzene	**0.285**	<0.175	<0.158	<0.291	**12.0**	70	70	70
Xylenes (Total)	<0.707	<0.524	<0.473	<0.873	**56.5**	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	**2.84**	<0.175	<0.158	<0.291	**8.44**	2,500	2,500	350
MTBE	<0.236	<0.175	<0.158	<0.291	<0.513	2	2	2
Naphthalene	**4.35**	<0.349	<0.315	<0.582	**1.51**	25	25	10
1,2,4-Trimethylbenzene	<0.471	<0.349	<0.315	<0.582	**28.2**	35	35	6.2
1,3,5-Trimethylbenzene	<0.236	<0.175	<0.158	<0.291	**8.1**	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-11A	TB-11B	TB-12A	TB-12B	TB-13A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	TB-11	TB-11	TB-12	TB-12	TB-13			
Depth	1.0' - 2.0'	3.0' - 3.5'	1.0' - 2.0'	3.0' - 3.5'	1.0' - 2.0'			
Condition	Vadose	Smear	Vadose	Smear	Vadose			
% Moisture	15.8%	6.7%	5.2%	2.5%	6.8%			
Sample Date	3/29/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016			
Benzene	<0.183	1.85	<0.0330	<0.172	5.34	0.5	0.5	0.5
Toluene	<0.183	66.7	0.0438	<0.172	17.6	100	100	100
Ethylbenzene	<0.183	28.9	<0.0330	<0.172	80.4	70	70	70
Xylenes (Total)	<0.548	143.0	0.101	<0.517	285.0	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.183	18.4	<0.0330	<0.172	15.7	2,500	2,500	350
MTBE	<0.183	<0.319	<0.0330	<0.172	<1.610	2	2	2
Naphthalene	<0.366	2.58	<0.0659	<0.345	72.4	25	25	10
1,2,4-Trimethylbenzene	<0.366	47.5	<0.0330	<0.345	349.0	35	35	6.2
1,3,5-Trimethylbenzene	<0.183	15.1	0.0407	<0.172	127.0	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-13B	TB-14A	TB-14B	TB-15A	TB-15B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	TB-13	TB-14	TB-14	TB-15	TB-15			
Depth	5.0' - 6.0'	2.0' - 3.0'	5.0' - 6.0'	2.0' - 3.0'	5.0' - 6.0'			
Condition	Smear	Vadose	Smear	Vadose	Smear			
% Moisture	20.8%	10.7%	20.4%	12.1%	10.9%			
Sample Date	3/29/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016			
Benzene	1.13	<0.0323	0.0492	<0.0316	<0.0335	0.5	0.5	0.5
Toluene	1.72	<0.0323	<0.0389	<0.0316	<0.0335	100	100	100
Ethylbenzene	23.6	<0.0323	<0.0389	<0.0316	<0.0335	70	70	70
Xylenes (Total)	41.5	<0.0969	<0.117	<0.0947	<0.100	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	5.2	<0.0323	<0.0389	<0.0316	<0.0335	2,500	2,500	350
MTBE	<0.352	<0.0323	<0.0389	<0.0316	<0.0335	2	2	2
Naphthalene	14.8	<0.0646	<0.0778	<0.0631	<0.0670	25	25	10
1,2,4-Trimethylbenzene	101.0	<0.0323	<0.0389	<0.0316	<0.0335	35	35	6.2
1,3,5-Trimethylbenzene	35.5	<0.0323	<0.0389	<0.0316	<0.0335	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-16A	TB-16B	TB-17A	TB-17B	TB-18A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-16**	**TB-16**	**TB-17**	**TB-17**	**TB-18**			
Depth	**2.0' - 3.0'**	**3.0' - 4.0'**	**2.0' - 3.0'**	**5.0' - 6.0'**	**1.0' - 2.0'**			
Condition	**Vadose**	**Smear**	**Vadose**	**Smear**	**Vadose**			
% Moisture	**9.0%**	**10.1%**	**7.3%**	**11.3%**	**4.8%**			
Sample Date	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/29/2016**	**3/30/2016**			
Benzene	<0.0343	<0.154	<0.163	<0.148	<0.0367	0.5	0.5	0.5
Toluene	<0.0343	<0.154	**0.361**	<0.148	<0.0367	100	100	100
Ethylbenzene	<0.0343	<0.154	<0.163	<0.148	<0.0367	70	70	70
Xylenes (Total)	<0.103	<0.462	<0.490	<0.445	<0.110	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0343	<0.154	<0.163	<0.148	<0.0367	2,500	2,500	350
MTBE	<0.0343	<0.154	<0.163	<0.148	<0.0367	2	2	2
Naphthalene	<0.0687	<0.308	<0.327	<0.297	<0.0735	25	25	10
1,2,4-Trimethylbenzene	<0.0343	<0.308	<0.327	**0.370**	<0.0367	35	35	6.2
1,3,5-Trimethylbenzene	<0.0343	<0.154	<0.163	<0.148	<0.0367	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-18B	TB-19A	TB-19B	TB-20A	TB-20B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-18**	**TB-19**	**TB-19**	**TB-20**	**TB-20**			
Depth	**2.0' - 3.0'**	**1.0' - 2.0'**	**2.0' - 3.0'**	**1.0' - 2.0'**	**2.0' - 3.0'**			
Condition	**Smear**	**Vadose**	**Smear**	**Vadose**	**Smear**			
% Moisture	**9.8%**	**4.7%**	**6.0%**	**6.2%**	**12.9%**			
Sample Date	**3/30/2016**	**3/30/2016**	**3/30/2016**	**3/30/2016**	**3/30/2016**			
Benzene	<0.0314	<0.0333	<0.164	<0.164	<0.0328	0.5	0.5	0.5
Toluene	<0.0314	<0.0333	<0.164	<0.164	<0.0328	100	100	100
Ethylbenzene	<0.0314	<0.0333	<0.164	<0.164	<0.0328	70	70	70
Xylenes (Total)	<0.0941	<0.100	<0.491	<0.492	<0.0985	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0314	<0.0333	**0.214**	**0.543**	<0.0328	2,500	2,500	350
MTBE	<0.0314	<0.0333	<0.164	<0.164	<0.0328	2	2	2
Naphthalene	<0.0627	<0.0667	<0.328	**2.63**	<0.0656	25	25	10
1,2,4-Trimethylbenzene	<0.0314	<0.0333	**0.88**	<0.164	<0.0328	35	35	6.2
1,3,5-Trimethylbenzene	<0.0314	<0.0333	<0.164	<0.164	<0.0328	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-21	TB-22	TB-23	TB-24	TB-25A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	TB-21	TB-22	TB-23	TB-24	TB-25			
Depth	1.0' - 2.0'	1.5' - 2.5'	1.5' - 2.5'	0.5' - 1.5'	1.0' - 2.0'			
Condition	Vadose	Vadose	Vadose	Vadose	Vadose			
% Moisture	5.4%	3.9%	6.2%	6.2%	11.4%			
Sample Date	3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016			
Benzene	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	0.5	0.5	0.5
Toluene	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	100	100	100
Ethylbenzene	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	70	70	70
Xylenes (Total)	<0.106	<0.0954	<0.0980	<0.102	<0.167	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	2,500	2,500	350
MTBE	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	2	2	2
Naphthalene	<0.0704	<0.0636	<0.0653	<0.0682	<0.111	25	25	10
1,2,4-Trimethylbenzene	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	35	35	6.2
1,3,5-Trimethylbenzene	<0.0352	<0.0318	<0.0327	<0.0341	<0.0555	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-25B	TB-26A	TB-26B	TB-27A	TB-27B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	TB-25	TB-26	TB-26	TB-27	TB-27			
Depth	2.5' - 3.5'	2.0' - 3.0'	3.5' - 4.5'	2.0' - 3.0'	5.0' - 6.0'			
Condition	Smear	Vadose	Smear	Vadose	Smear			
% Moisture	9.2%	12.9%	6.4%	14.6%	22.9%			
Sample Date	3/30/2016	3/30/2016	3/30/2016	3/30/2016	3/30/2016			
Benzene	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	0.5	0.5	0.5
Toluene	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	100	100	100
Ethylbenzene	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	70	70	70
Xylenes (Total)	<0.147	<0.150	<0.139	<0.165	<0.116	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	2,500	2,500	350
MTBE	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	2	2	2
Naphthalene	<0.0982	<0.100	<0.0924	<0.110	<0.0772	25	25	10
1,2,4-Trimethylbenzene	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	35	35	6.2
1,3,5-Trimethylbenzene	<0.0491	<0.0500	<0.0462	<0.0550	<0.386	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	MW-7A	MW-8A	MW-8B	MW-9A	MW-9B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**MW-7**	**MW-8**	**MW-8**	**MW-9**	**MW-9**			
Depth	**2.0' - 3.0'**	**2.0' - 3.0'**	**4.0' - 4.5'**	**2.0' - 3.0'**	**4.0' - 5.0'**			
Condition	**Vadose**	**Vadose**	**Smear**	**Vadose**	**Smear**			
% Moisture	**14.1%**	**7.3%**	**12.0%**	**13.9%**	**16.9%**			
Sample Date	**2/6/2017**	**2/6/2017**	**2/6/2017**	**2/6/2017**	**2/6/2017**			
Benzene	<0.0451	<0.0427	**0.308**	<0.0371	<0.0394	0.5	0.5	0.5
Toluene	<0.0451	**0.0951**	**0.107**	<0.0371	<0.0394	100	100	100
Ethylbenzene	<0.0451	**0.0683**	**2.46**	<0.0371	<0.0394	70	70	70
Xylenes (Total)	<0.135	**0.204**	**1.75**	<0.111	<0.118	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0451	<0.0427	**0.968**	<0.0371	<0.0394	2,500	2,500	350
MTBE	<0.0451	<0.0427	<0.0426	<0.0371	<0.0394	2	2	2
Naphthalene	<0.0903	**0.107**	**2.68**	<0.0742	<0.0789	25	25	10
1,2,4-Trimethylbenzene	<0.0451	**0.0809**	**9.08**	<0.0371	<0.0394	35	35	6.2
1,3,5-Trimethylbenzene	<0.0451	<0.0427	**4.42**	<0.0371	<0.0394	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

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Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	MW-10A	MW-10B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**MW-10**	**MW-10**			
Depth	**2.0' - 3.0'**	**4.0' - 5.0'**			
Condition	**Vadose**	**Smear**			
% Moisture	**23.3%**	**33.3%**			
Sample Date	**2/6/2017**	**2/6/2017**			
Benzene	<0.0496	<0.0599	0.5	0.5	0.5
Toluene	<0.0496	<0.0599	100	100	100
Ethylbenzene	<0.0496	<0.0599	70	70	70
Xylenes (Total)	<0.149	<0.180	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0496	<0.0599	2,500	2,500	350
MTBE	<0.0496	<0.0599	2	2	2
Naphthalene	<0.0992	<0.120	25	25	10
1,2,4-Trimethylbenzene	<0.0496	<0.0599	35	35	6.2
1,3,5-Trimethylbenzene	<0.0496	<0.0599	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

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Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
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08/30/18

Table N-1
Northridge Attainment Data
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	B-4	B-5	B-6	B-7	B-8	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**B-4**	**B-4**	**B-4**	**B-4**	**B-4**			
Depth	**Unkown**	**Unkown**	**Unkown**	**Unkown**	**Unkown**			
Condition	**Biased**	**Biased**	**Biased**	**Biased**	**Biased**			
% Moisture	**9.4%**	**12.1%**	**12.0%**	**10.1%**	**7.1%**			
Sample Date	**2/6/2017**	**2/6/2017**	**2/6/2017**	**2/6/2017**	**2/6/2017**			
Benzene	<0.0023	**0.0033**	**0.0023**	**0.0087**	**0.0967**	0.5	0.5	0.5
Toluene	<0.0056	**0.0163**	<0.0032	<0.0061	**0.0417**	100	100	100
Ethylbenzene	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	70	70	70
Xylenes (Total)	<0.0113	**0.0155**	<0.0064	<0.0122	<0.0089	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	2,500	2,500	350
MTBE	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	2	2	2
Naphthalene	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	25	25	10
1,2,4-Trimethylbenzene	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	35	35	6.2
1,3,5-Trimethylbenzene	<0.0056	<0.0041	<0.0032	<0.0061	<0.0045	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-28A	TB-28B	TB-29A	TB-29B	TB-30A	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-28**	**TB-28**	**TB-29**	**TB-29**	**TB-30**			
Depth	**2.0' - 2.5'**	**4.5' 5.0'**	**2.0' - 2.5'**	**4.0' - 4.5'**	**2.0' - 2.5'**			
Condition	**Vadose**	**Smear**	**Vadose**	**Smear**	**Vadose**			
% Moisture	**9.4%**	**12.1%**	**12.0%**	**10.1%**	**7.1%**			
Sample Date	**9/12/2017**	**9/12/2017**	**9/12/2017**	**9/12/2017**	**9/12/2017**			
Benzene	<0.0354	<0.0348	<0.0380	<0.0300	<0.0471	0.5	0.5	0.5
Toluene	<0.0354	<0.0348	<0.0380	<0.0300	**0.279**	100	100	100
Ethylbenzene	<0.0354	<0.0348	<0.0380	<0.0300	**0.0746**	70	70	70
Xylenes (Total)	<0.106	<0.104	<0.114	<0.0899	**0.378**	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0354	<0.0348	<0.0380	<0.0300	<0.0471	2,500	2,500	350
MTBE	<0.0354	<0.0348	<0.0380	<0.0300	<0.0471	2	2	2
Naphthalene	<0.0708	<0.0695	<0.0760	<0.0600	**0.382**	25	25	10
1,2,4-Trimethylbenzene	<0.0354	<0.0348	<0.0380	<0.0300	**0.192**	35	35	6.2
1,3,5-Trimethylbenzene	<0.0354	<0.0348	<0.0380	<0.0300	**0.126**	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

08/30/18

Table N-1
Site Characterization Activities
Pump-n-Pantry #001 Property
Summary of Soil Analytical Data (mg/kg)

Parameter	TB-30B	TB-31A	TB-31B	SHS MSC*	SHS MSC**	SHS MSC***
Sample Location	**TB-30**	**TB-31**	**TB-31**			
Depth	**4.0' - 4.5'**	**2.0' - 2.5'**	**4.0' - 4.5'**			
Condition	**Smear**	**Vadose**	**Smear**			
% Moisture	**6.6%**	**5.3%**	**8.3%**			
Sample Date	**9/12/2017**	**9/12/2017**	**9/12/2017**			
Benzene	**0.0299**	**0.092**	**0.0436**	0.5	0.5	0.5
Toluene	**0.0829**	**1.66**	**0.805**	100	100	100
Ethylbenzene	<0.0264	**0.322**	**0.208**	70	70	70
Xylenes (Total)	<0.0792	**2.38**	**2.26**	1,000.00	1,000.00	1,000.00
Isopropylbenzene (Cumene)	<0.0264	<0.0344	<0.0301	2,500	2,500	350
MTBE	<0.0264	<0.0344	<0.0301	2	2	2
Naphthalene	<0.0528	<0.0688	<0.0603	25	25	10
1,2,4-Trimethylbenzene	<0.0264	**0.487**	**0.747**	35	35	6.2
1,3,5-Trimethylbenzene	<0.0264	**0.608**	**0.432**	210	210	120

PA Act 2 Statewide Health Standards for Non-Residential Used Aquifer setting

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 0' - 2' *

Shaded values indicate Act 2 SHS exceedances - Unsaturated Zone 2' - 15' **

Shaded values indicate Act 2 SHS exceedances - Saturated Zone 2' - 15' ***

Condition:
Vadose: Vadose Zone - Unsaturated MSCs Apply
Smear: Zone of Groundwater Saturation (Smear Zone) - Saturated MSCs Apply
PSZ: Permanently Saturated Zone - Groundwater Issue - No Soil MSCs Apply

APPENDIX O

Oxygen Injection Pilot Test Boring Logs

LaBella Associates, P.C.

TEST BORING LOG

		Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property	Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: IP-1	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	13:26	13:47	3.5'	Elevation TOC	Surface
Geoprobe	14:30	15:10	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.5'; gray sand and	Moist / Wet
---				silt with abundant sub-angular	Auger 0.0' - 4.0'
2---		0.0		cobbles to 5.0'	(8" Diameter Borehole)

3---		80.1			
---		122.2			
4---			Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0'
---					(6" Diameter Borehole)
5---		--	Hard / Steady	5.0' - 10.0'	
---			5.0' - 10.0'	Gray sandstone	
6---		--	Odors 5.0' - 10.0'		
---			Rod Change 6.0'		
7---		--	Wet		

8---		--			

9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C.					TEST BORING LOG	
					Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property				Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.				Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test					
Contractor:	Odyssey Environmental				Boring Number: IP-2	
Driller:	Jake Shaffer				Job Number: 2171845	
Inspector:	Kevin Cucura				Sheet: 1 of 1	
TIME LOG		Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig		12:10	12:45	3.0'	Elevation TOC	Surface
Geoprobe		15:30	16:03	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Moist / Wet Auger 0.0' - 4.0' (8" Diameter Borehole)
2---		0.0			
3---		0.0			
4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0' (6" Diameter Borehole)
5---		--	Hard / Steady 5.0' - 10.0'	5.0' - 10.0' Gray sandstone	
6---		--	Odors 5.0' - 10.0'		
---			Rod Change 6.0'		
7---		--	Wet		
8---		--			
9---		--			
10---		--			
11---					
12---					
13---					
14---					
15---					
16---					
17---					
18---					
19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

		Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property	Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: IP-3	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:00	11:40	3.0'	Elevation TOC	Surface
Geoprobe	12:20	13:00	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 5.0'	Asphalt Surface
---				Soft dig to 3.0'; modified fill to	8" Thick
1---		0.0		1.0', change to shot rock	Dry
---				(large angular sandstone) to	Auger 0.0' - 4.0'
2---		0.0		5.0'	(8" Diameter Borehole)

3---		0.0			

4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0'
---					(6" Diameter Borehole)
5---		--	Hard / Steady	5.0' - 10.0'	
---			5.0' - 6.0'	Gray sandstone	
6---		--	Rod Change 6.0'		
---			Dry		
7---		--			

8---		--	Water & Odor		
---			8.0' - 10.0'		
9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---					
---				Log Approved By:	
				Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Soft Dig: Date Started:	Drilling 06/11/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-1	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:45	12:06	3.0'	Elevation TOC	Surface
Geoprobe	13:20	14:00	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Asphalt Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock	8" Thick
---				(large angular sandstone) to	Dry
2---		0.0		4.5', change to gray sandstone	Auger 0.0' - 4.0'
---				to 5.0'	(8" Diameter Borehole)
3---		0.0			

4---		0.0	Choppy 4.0' - 4.5'		Air Rotary 4.0' - 10.0'
---			Hard / Steady		(6" Diameter Borehole)
5---		--	4.5' - 10.0'	5.0' - 10.0'	
---				Gray sandstone	
6---		--	Rod Change 6.0'		
---			Odor / Wet		
7---		--	6.0' - 10.0'		

8---		--			

9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Soft Dig: / Date Started:	Drilling / 06/11/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-2	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. / Elevation TOC	TOC/GL / Surface
Soft Dig	13:50	14:30	3.0'		
Geoprobe	11:05	11:46	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Dry / Damp Auger 0.0' - 4.0' (8" Diameter Borehole)
2---		0.0			
3---		0.0			
4---		0.0	Choppy 4.0' - 4.5'		Air Rotary 4.0' - 10.0' (6" Diameter Borehole)
5---		--	Hard / Steady 5.0' - 10.0'	5.0' - 10.0' Gray sandstone	
6---		--	Rod Change 6.0' Odor / Wet		
7---		--	4.0' - 10.0'		
8---		--			
9---		--			
10---		--			
11---					
12---					
13---					
14---					
15---					
16---					
17---					
18---					
19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

		Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property	Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-3	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	14:35	15:00	3.0'	Elevation TOC	Surface
Geoprobe	10:00	10:40	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Damp / Moist Auger 0.0' - 4.0' (8" Diameter Borehole)

2---		0.0			

3---		0.0			

4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0'
---			Odors 4.0' - 10.0'		(6" Diameter Borehole)
5---		--	Hard / Steady	5.0' - 10.0'	
---			5.0' - 10.0'	Gray sandstone	
6---		--	Rod Change 6.0'		
---			Wet		
7---		--			

8---		--			

9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

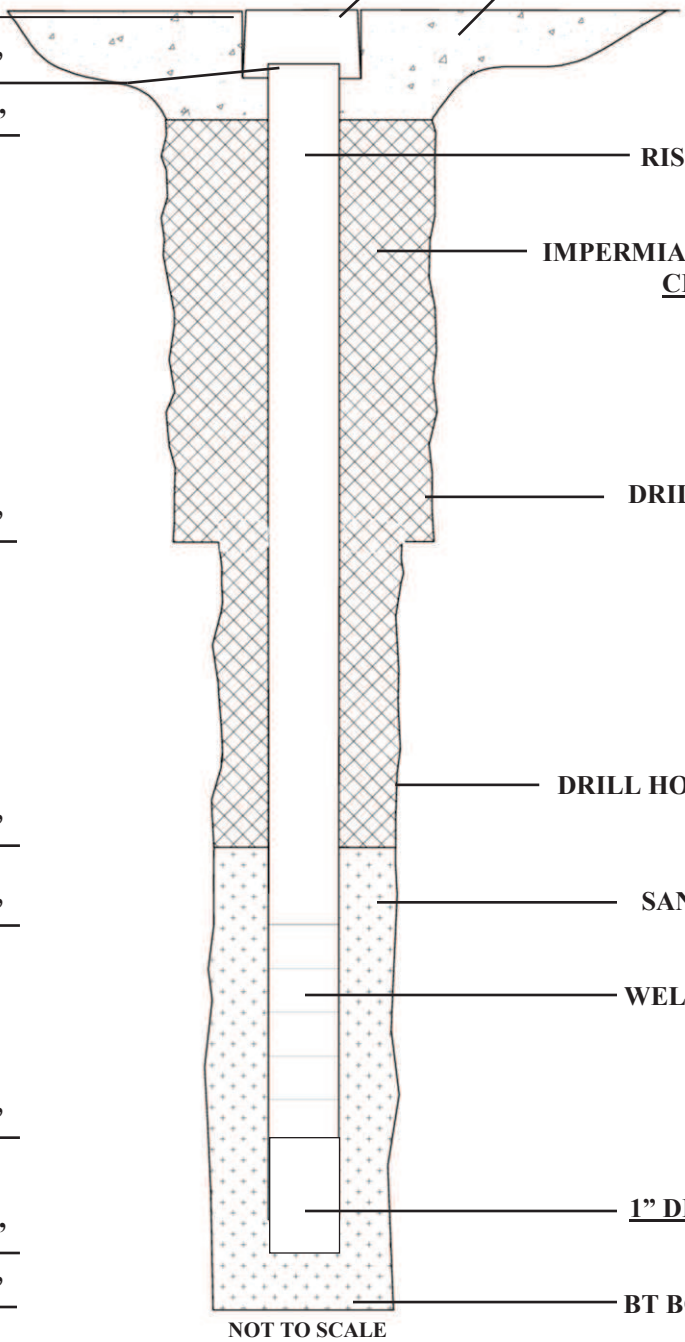
APPENDIX P

Oxygen Injection Pilot Test Well Construction Details

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.90’
0.30’	1,653.60’
1.00’	1,652.90’
4.00’	1,649.90’
7.00’	1,646.90’
8.00’	1,645.90’
9.00’	1,644.90’
10.00’	1,643.90’
10.00’	1,643.90’



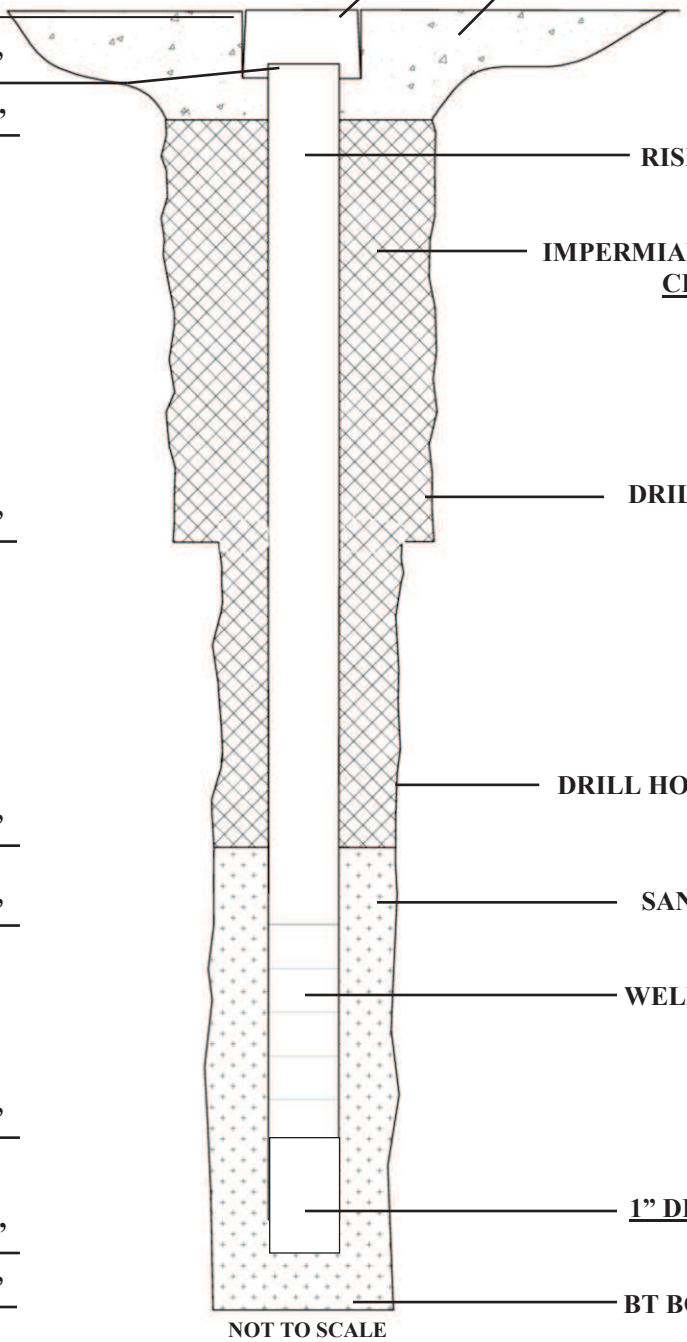
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
INJECTION POINT 1

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.23’
0.30’	1,652.93’
1.00’	1,652.29’
4.00’	1,649.23’
7.00’	1,646.23’
8.00’	1,645.23’
9.00’	1,644.23’
10.00’	1,643.23’
10.00’	1,643.23’



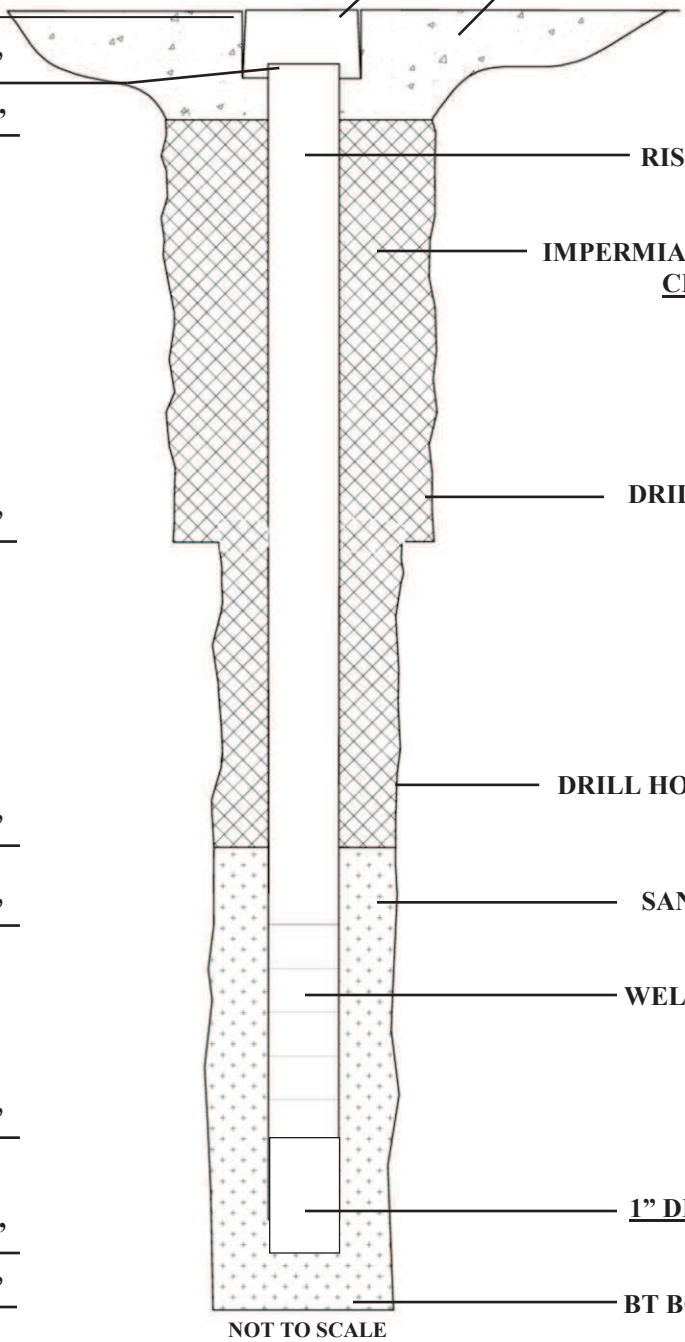
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
INJECTION POINT 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.12’
0.29’	1,652.83’
1.00’	1,652.12’
4.00’	1,649.12’
7.00’	1,646.12’
8.00’	1,645.12’
9.00’	1,644.12’
10.00’	1,643.12’
10.00’	1,643.12’



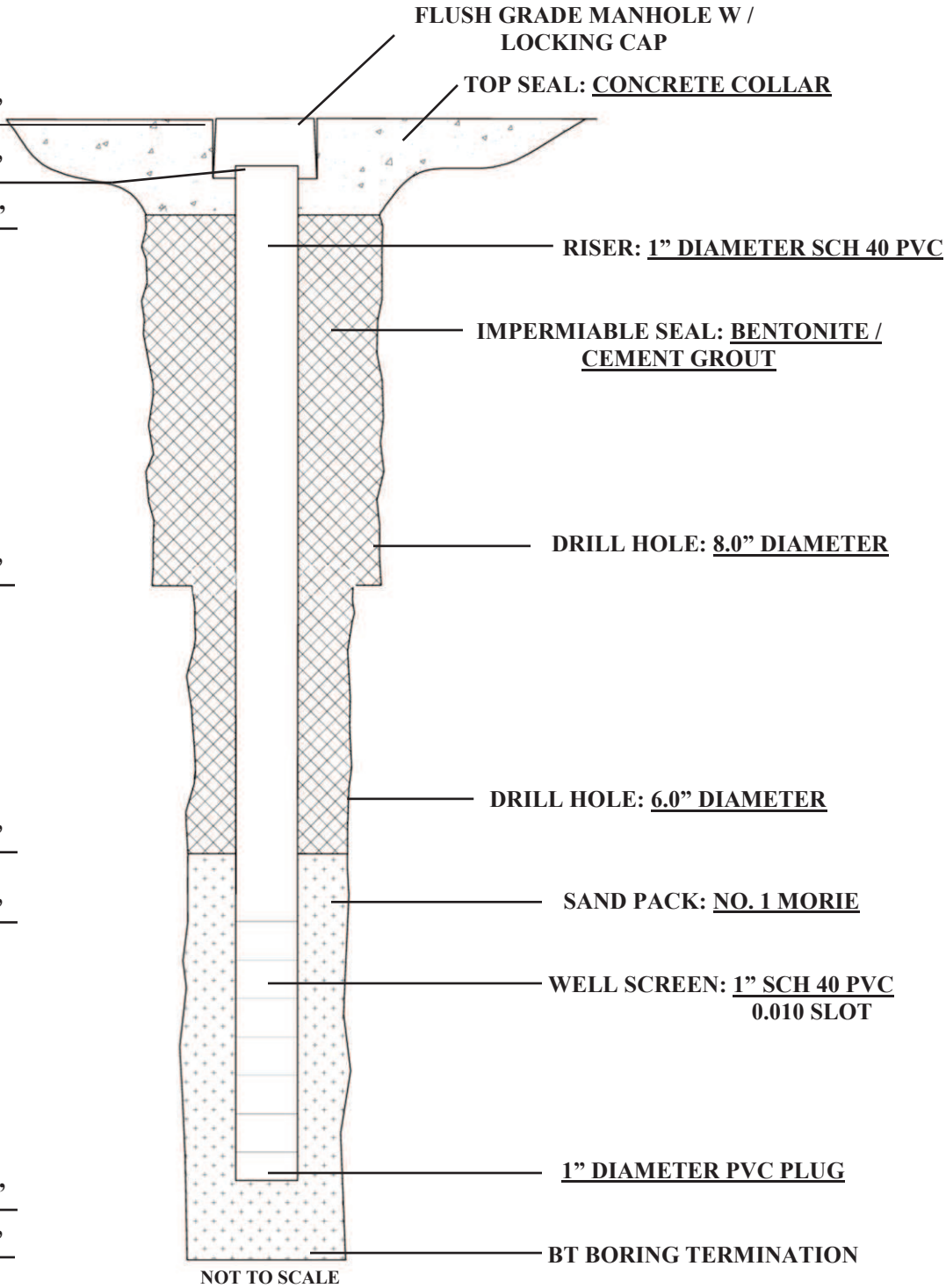
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
INJECTION POINT 3

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.25’
0.33’	1,653.92’
1.00’	1,653.25’
4.00’	1,650.25’
4.00’	1,650.25’
5.00’	1,649.25’
10.00’	1,643.12’
10.00’	1,643.12’



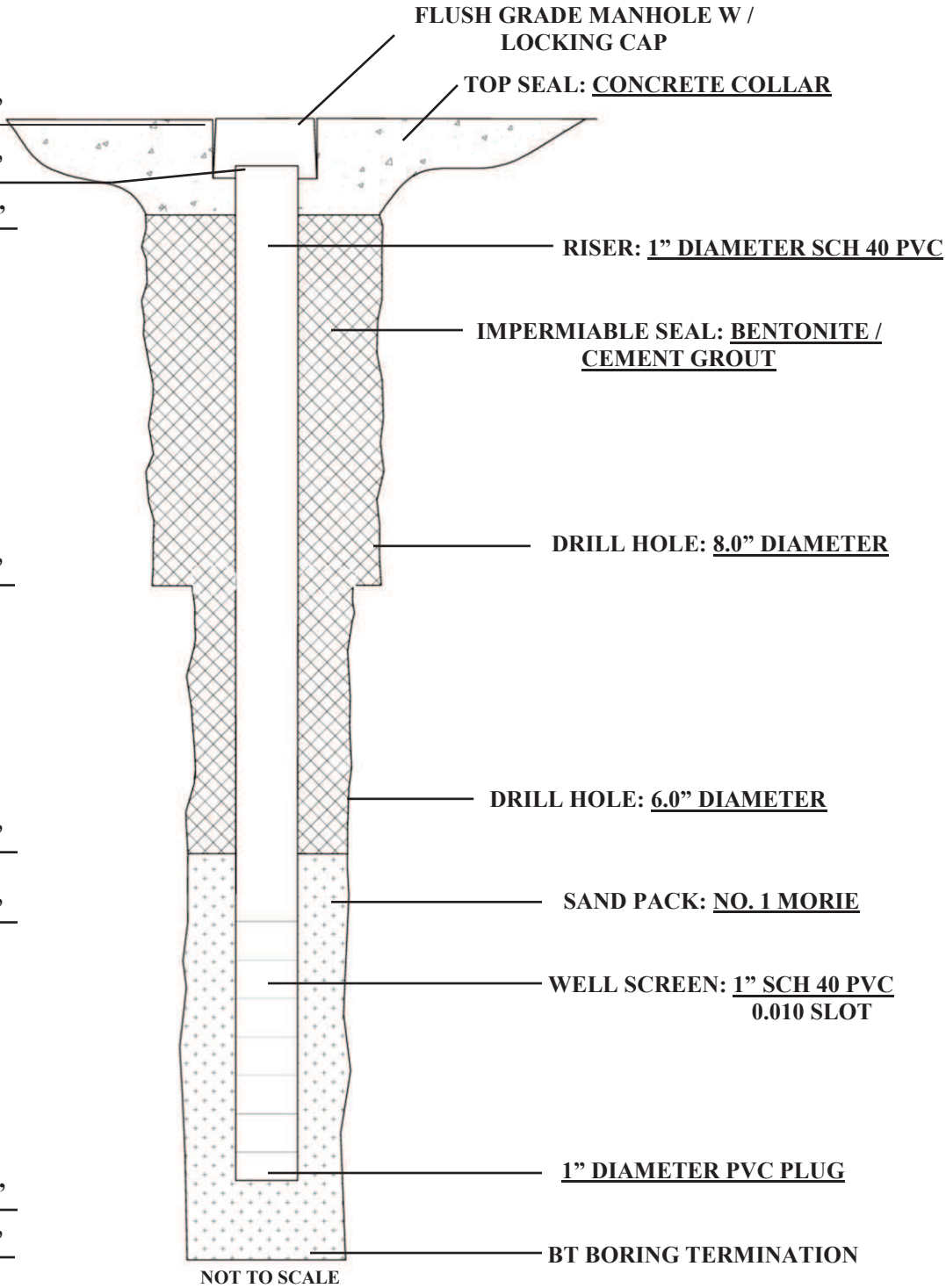
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 1

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.68’
0.35’	1,653.33’
1.00’	1,652.68’
4.00’	1,649.68’
4.00’	1,649.68’
5.00’	1,648.68’
10.00’	1,643.68’
10.00’	1,643.68’



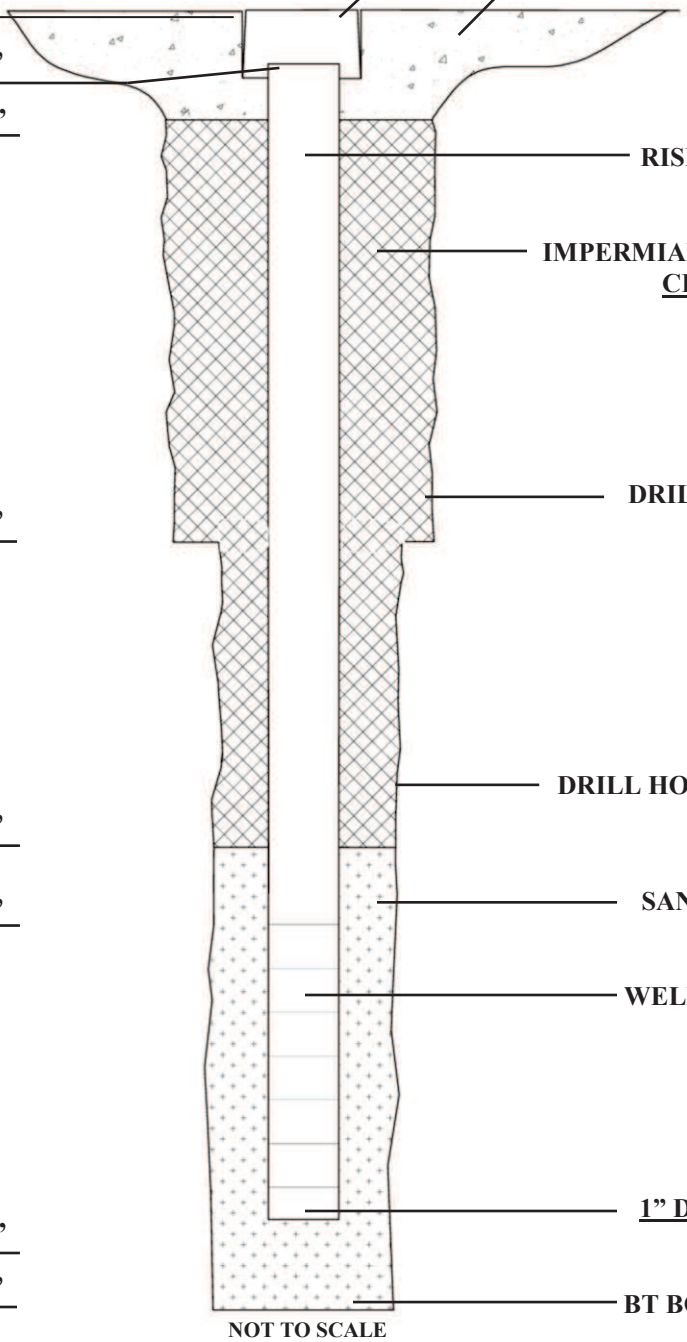
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.07’
0.41’	1,653.66’
1.00’	1,653.07’
4.00’	1,650.07’
4.00’	1,650.07’
5.00’	1,649.07’
10.00’	1,644.07’
10.00’	1,644.07’



NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 3

APPENDIX Q

Oxygen Injection Pilot Test Development Logs

Field Notes

TO: File
FROM: Kevin Cucura
DATE: June 26, 2018
PROJECT: Pump-n-Pantry #001 / Oxygen Injection Pilot Test
PROJECT NUMBER: 2171845
SUBJECT: Pilot Test Point Development Activities

0900: Arrived onsite and initiated site activities with the collection of static water levels from the three (3) Injection Points (IP-1 through IP-3) and three (3) Monitoring Points (MP-1 through MP-3) installed at the subject property as a part of the Oxygen Injection Pilot Test. The purpose of the field activities was to develop the Pilot Test Points installed at the subject property between June 11, 2018 and June 13, 2018. The general well information is as follows:

Table 1
General Well Information

Well #	S.W.L. (Feet)	Total Depth (Feet)	1 Volume (Gallons)	10 Volumes (Gallons)	Purged (Gallons)
IP-1	5.70	10.00	0.13	1.3	0.75
IP-2	6.24	10.00	0.11	1.1	0.75
IP-3	6.06	10.00	0.12	1.2	0.50
MP-1	6.08	10.00	0.12	1.2	0.50
MP-2	5.80	10.00	0.13	1.3	0.75
MP-3	6.16	10.00	0.12	1.2	0.75

IP-1: A total of 0.75 gallons was extracted from IP-1 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. Recharge was good. Odorous and visual (sheen) indications of potential contamination were observed.

IP-2: A total of 0.75 gallons was extracted from IP-2 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. Recharge was good. Odorous and visual (sheen) indications of potential contamination were observed.

IP-3: A total of 0.50 gallons was extracted from IP-3 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. The well was evacuated several times. Recharge was fair. Odorous indications of potential contamination were observed. No visual indications of potential contamination were observed.

MP-1: A total of 0.50 gallons was extracted from MP-1 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. The well was evacuated several times. Recharge was fair. Odorous indications of potential contamination were observed. No visual indications of potential contamination were observed.

MP-2: A total of 0.75 gallons was extracted from MP-2 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. Recharge was good. Odorous and visual (sheen) indications of potential contamination were observed.

MP-3: A total of 0.75 gallons was extracted from MP-3 utilizing a disposable hand bailer. The well was surged for five (5) minutes prior to extracting any groundwater. The groundwater effluent was extremely silty at the beginning of development and silty upon completion. Recharge was good. Odorous and visual (sheen) indications of potential contamination were observed.

Offsite: 1500

KC / kc

APPENDIX R

Oxygen Injection Pilot Test In-Situ Data

02/22/19

Table R-1
Oxygen Injection Pilot Test
Pump-n-Pantry #001 Property
Summary of In-Situ Groundwater Data

Well Number	Date Sampled	Well Head Elevation (feet)	Depth to Groundwater (feet)*	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Remediation Status	D.O. (mg/L)	O.R.P. (mV)
MW-2	10/19/2016	1653.72	5.40	1648.32	0.00	Characterization	0.38	-49.0
	11/30/2016	1653.72	5.03	1648.69	0.00	Characterization	0.38	-97.0
	2/22/2017	1653.72	4.66	1649.06	0.00	Characterization	0.31	-63.00
	5/2/2017	1653.72	5.07	1648.65	0.00	Characterization	0.59	-75.0
	7/25/2017	1653.72	4.77	1648.95	0.00	Characterization	0.29	-41.0
	11/3/2017	1653.72	5.25	1648.47	0.00	Characterization	0.31	-80.0
	12/5/2017	1653.72	5.28	1648.44	0.00	Characterization	0.37	-102.0
	3/21/2018	1653.72	4.74	1648.98	0.00	Characterization	0.29	-79.0
	6/8/2018	1653.72	5.22	1648.50	0.00	Characterization	0.00	-79.0
Screened Interval: 3.66' - 20.66'	6/29/2018	1653.72	4.97	1648.75	0.00	Remediation	0.51	-70.0
	7/3/2018	1653.72	5.00	1648.72	0.00	Remediation	0.48	-132.1
Total Depth: 20.66'	7/6/2018	1653.72	5.01	1648.71	0.00	Remediation	0.77	-159.9
	7/11/2018	1653.72	5.09	1648.63	0.00	Remediation	0.68	-147.8
	7/13/2018	1653.72	5.09	1648.63	0.00	Remediation	0.55	-123.6
	7/16/2018	1653.72	5.00	1648.72	0.00	Remediation	0.64	-154.8
	7/18/2018	1653.72	5.02	1648.70	0.00	Remediation	0.29	-126.7
	7/24/2018	1653.72	4.58	1649.14	0.00	Remediation	4.30	-27.0
	7/31/2018	1653.72	4.90	1648.82	0.00	Remediation	0.48	-122.0
MW-3	10/19/2016	1652.92	5.20	1647.72	0.00	Characterization	0.39	-69.0
	11/30/2016	1652.92	4.57	1648.35	0.00	Characterization	0.37	-79.0
	2/22/2017	1652.92	3.45	1649.47	0.00	Characterization	0.28	-87.00
	5/2/2017	1652.92	4.54	1648.38	0.00	Characterization	0.30	-83.0
	7/25/2017	1652.92	4.21	1648.71	0.00	Characterization	0.28	-108.0
	11/3/2017	1652.92	4.52	1648.40	0.00	Characterization	0.35	-116.0
	12/5/2017	1652.92	4.79	1648.13	0.00	Characterization	0.35	-109.0
	3/21/2018	1652.92	4.45	1648.47	0.00	Characterization	0.08	-83.0
Screened Interval: 3.16' - 20.16'	6/8/2018	1652.92	4.64	1648.28	0.00	Characterization	0.00	-68.0
	6/29/2018	1652.92	4.35	1648.57	0.00	Remediation	0.12	-84.0
Total Depth: 20.16'	7/3/2018	1652.92	4.44	1648.48	0.00	Remediation	0.42	-101.3
	7/6/2018	1652.92	4.38	1648.54	0.00	Remediation	0.70	-158.1
	7/11/2018	1652.92	4.47	1648.45	0.00	Remediation	0.62	-113.9
	7/13/2018	1652.92	4.46	1648.46	0.00	Remediation	0.74	-77.7
	7/16/2018	1652.92	4.41	1648.51	0.00	Remediation	0.71	-124.7
	7/18/2018	1652.92	4.46	1648.46	0.00	Remediation	0.33	-86.6
	7/24/2018	1652.92	4.27	1648.65	0.00	Remediation	0.46	-83.0
	7/31/2018	1652.92	4.40	1648.52	0.00	Remediation	0.54	-114.0
MW-4	10/19/2016	1651.31	4.20	1647.11	0.00	Characterization	0.44	-88.0
	11/30/2016	1651.31	3.40	1647.91	0.00	Characterization	0.49	-93.0
	2/22/2017	1651.31	3.40	1647.91	0.00	Characterization	0.31	-110.0
	5/2/2017	1651.31	3.47	1647.84	0.00	Characterization	0.31	-103.0
	7/25/2017	1651.31	3.11	1648.20	0.00	Characterization	0.27	-128.0
	11/3/2017	1651.31	3.51	1647.80	0.00	Characterization	0.40	-107.0
	12/5/2017	1651.31	3.80	1647.51	0.00	Characterization	0.37	-125.0
	3/21/2018	1651.31	3.32	1647.99	0.00	Characterization	0.13	-115.0
	6/8/2018	1651.31	3.67	1647.64	0.00	Characterization	0.10	-114.0
Screened Interval: 3.35' - 15.35'	6/29/2018	1651.31	3.30	1648.01	0.00	Remediation	0.02	-84.0
	7/3/2018	1651.31	3.47	1647.84	0.00	Remediation	0.80	-105.5
Total Depth: 15.35'	7/6/2018	1651.31	3.47	1647.84	0.00	Remediation	0.66	-159.0
	7/11/2018	1651.31	3.55	1647.76	0.00	Remediation	1.17	-146.4
	7/13/2018	1651.31	3.57	1647.74	0.00	Remediation	0.49	-146.5
	7/16/2018	1651.31	3.50	1647.81	0.00	Remediation	0.58	-141.2
	7/18/2018	1651.31	3.56	1647.75	0.00	Remediation	0.40	-92.4
	7/24/2018	1651.31	3.28	1648.03	0.00	Remediation	0.47	-85.0
	7/31/2018	1651.31	3.45	1647.86	0.00	Remediation	3.16	-131.0

NM Not Measured
NS Not Sampled
NA Not Applicable

02/22/19

Table R-1
Oxygen Injection Pilot Test
Pump-n-Pantry #001 Property
Summary of In-Situ Groundwater Data

Well Number	Date Sampled	Well Head Elevation (feet)	Depth to Groundwater (feet)*	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Remediation Status	D.O. (mg/L)	O.R.P. (mV)
MW-6	10/19/2016	1653.95	6.18	1647.77	0.00	Characterization	0.91	172.0
	11/30/2016	1653.95	4.63	1649.32	0.00	Characterization	3.61	211.0
	2/22/2017	1653.95	4.21	1649.74	0.00	Characterization	5.41	248.0
	5/1/2017	1653.95	4.50	1649.45	0.00	Characterization	3.24	208.0
	7/25/2017	1653.95	3.05	1650.90	0.00	Characterization	3.67	232.0
	11/2/2017	1653.95	4.48	1649.47	0.00	Characterization	2.37	153.0
	12/5/2017	1653.95	5.35	1648.60	0.00	Characterization	2.93	271.0
	3/21/2018	1653.95	4.51	1649.44	0.00	Characterization	2.63	-108.0
Screened Interval: 3.46' - 20.46'	6/8/2018	1653.95	4.99	1648.96	0.00	Characterization	3.05	70.0
	6/29/2018	1653.95	4.16	1649.79	0.00	Remediation	2.62	253.0
	7/3/2018	1653.95	4.50	1649.45	0.00	Remediation	3.53	385.0
Total Depth: 20.46'	7/6/2018	1653.95	4.70	1649.25	0.00	Remediation	3.87	362.4
	7/11/2018	1653.95	5.15	1648.80	0.00	Remediation	3.48	131.9
	7/13/2018	1653.95	5.31	1648.64	0.00	Remediation	1.15	91.5
	7/16/2018	1653.95	5.31	1648.64	0.00	Remediation	2.29	169.3
	7/18/2018	1653.95	5.39	1648.56	0.00	Remediation	0.87	87.7
	7/24/2018	1653.95	4.76	1649.19	0.00	Remediation	1.18	223.0
	7/31/2018	1653.95	4.54	1649.41	0.00	Remediation	4.02	194.0
MW-15	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/25/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	1654.07	4.47	1649.60	0.00	Characterization	0.39	-84.0
	12/5/2017	1654.07	5.11	1648.96	0.00	Characterization	0.35	-112.0
	3/20/2018	1654.07	3.67	1650.40	0.00	Characterization	0.00	-66.0
Screened Interval: 2.60' - 19.60'	6/8/2018	1654.07	4.63	1649.44	0.00	Characterization	0.00	-131.0
	7/6/2018	1654.07	4.59	1649.48	0.00	Remediation	3.53	-299.5
	7/11/2018	1654.07	4.78	1649.29	0.00	Remediation	0.42	-228.4
Total Depth: 19.60'	7/13/2018	1654.07	4.83	1649.24	0.00	Remediation	0.39	-219.5
	7/16/2018	1654.07	5.09	1648.98	0.00	Remediation	0.38	-180.8
	7/18/2018	1654.07	4.86	1649.21	0.00	Remediation	0.25	-198.8
	7/24/2018	1654.07	3.73	1650.34	0.00	Remediation	0.39	-131.0
MP-1	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/25/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	NA	NA	NA	NA	NA	NA	NA
	12/5/2017	NA	NA	NA	NA	NA	NA	NA
	3/20/2018	NA	NA	NA	NA	NA	NA	NA
	6/8/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.92	4.70	1649.22	0.00	Remediation	0.18	-100.0
	7/3/2018	1653.92	4.93	1648.99	0.00	Remediation	0.68	-161.4
	7/6/2018	1653.92	4.66	1649.26	0.00	Remediation	0.99	-192.6
	7/11/2018	1653.92	5.00	1648.92	0.00	Remediation	0.51	-142.4
	7/13/2018	1653.92	5.01	1648.91	0.00	Remediation	0.38	-185.6
	7/16/2018	1653.92	4.96	1648.96	0.00	Remediation	0.72	-81.9
	7/18/2018	1653.92	4.97	1648.95	0.00	Remediation	0.29	-99.8
	7/24/2018	1653.92	4.50	1649.42	0.00	Remediation	0.61	-74.0
	7/31/2018	1653.92	4.82	1649.10	0.00	Remediation	0.37	-164.0

NM Not Measured
NS Not Sampled
NA Not Applicable

02/22/19

Table R-1
Oxygen Injection Pilot Test
Pump-n-Pantry #001 Property
Summary of In-Situ Groundwater Data

Well Number	Date Sampled	Well Head Elevation (feet)	Depth to Groundwater (feet)*	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Remediation Status	D.O. (mg/L)	O.R.P. (mV)
MP-2	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/25/2017	NA	NA	NA	NA	NA	NA	NA
	11/3/2017	NA	NA	NA	NA	NA	NA	NA
	12/4/2017	NA	NA	NA	NA	NA	NA	NA
	3/20/2018	NA	NA	NA	NA	NA	NA	NA
	6/7/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.33	4.91	1648.42	0.00	Remediation	0.53	-96.0
	7/3/2018	1653.33	5.41	1647.92	0.00	Remediation	0.40	-147.1
	7/6/2018	1653.33	5.37	1647.96	0.00	Remediation	0.73	-180.2
	7/11/2018	1653.33	5.48	1647.85	0.00	Remediation	0.43	-147.8
	7/13/2018	1653.33	5.48	1647.85	0.00	Remediation	0.65	-145.3
	7/16/2018	1653.33	5.35	1647.98	0.00	Remediation	0.28	-162.0
	7/18/2018	1653.33	5.45	1647.88	0.00	Remediation	0.24	-139.3
	7/24/2018	1653.33	4.98	1648.35	0.00	Remediation	0.84	-61.0
	7/31/2018	1653.33	5.30	1648.03	0.00	Remediation	0.42	-126.0
MP-3	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/24/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	NA	NA	NA	NA	NA	NA	NA
	12/4/2017	NA	NA	NA	NA	NA	NA	NA
	3/20/2018	NA	NA	NA	NA	NA	NA	NA
	6/7/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.66	5.01	1648.65	0.00	Remediation	0.00	-95.0
	7/3/2018	1653.66	5.09	1648.57	0.00	Remediation	0.32	-143.9
	7/6/2018	1653.66	5.04	1648.62	0.00	Remediation	0.67	-174.9
	7/11/2018	1653.66	5.14	1648.52	0.00	Remediation	0.42	-151.8
	7/13/2018	1653.66	5.10	1648.56	0.00	Remediation	0.63	-110.8
	7/16/2018	1653.66	5.04	1648.62	0.00	Remediation	0.47	-143.9
	7/18/2018	1653.66	5.11	1648.55	0.00	Remediation	0.26	-107.7
	7/24/2018	1653.66	4.65	1649.01	0.00	Remediation	0.38	-87.0
	7/31/2018	1653.66	4.98	1648.68	0.00	Remediation	0.53	-123.0
IP-1	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/24/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	NA	NA	NA	NA	NA	NA	NA
	12/4/2017	NA	NA	NA	NA	NA	NA	NA
	3/20/2018	NA	NA	NA	NA	NA	NA	NA
	6/7/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.90	NM	NA	NM	Remediation	NM	NM
	7/3/2018	1653.90	NM	NA	NM	Remediation	NM	NM
	7/6/2018	1653.90	6.41	1647.49	0.00	Remediation	0.83	-193.3
	7/11/2018	1653.90	6.26	1647.64	0.00	Remediation	1.85	9.5
	7/13/2018	1653.90	6.28	1647.62	0.00	Remediation	2.00	-13.5
	7/16/2018	1653.60	6.32	1647.28	0.00	Remediation	0.79	-98.6
	7/18/2018	1653.60	5.31	1648.29	0.00	Remediation	0.42	-50.8
	7/27/2018	1653.60	4.79	1648.81	0.00	Remediation	0.52	-67.0
	7/31/2018	1653.60	5.12	1648.48	0.00	Remediation	0.44	-132.0

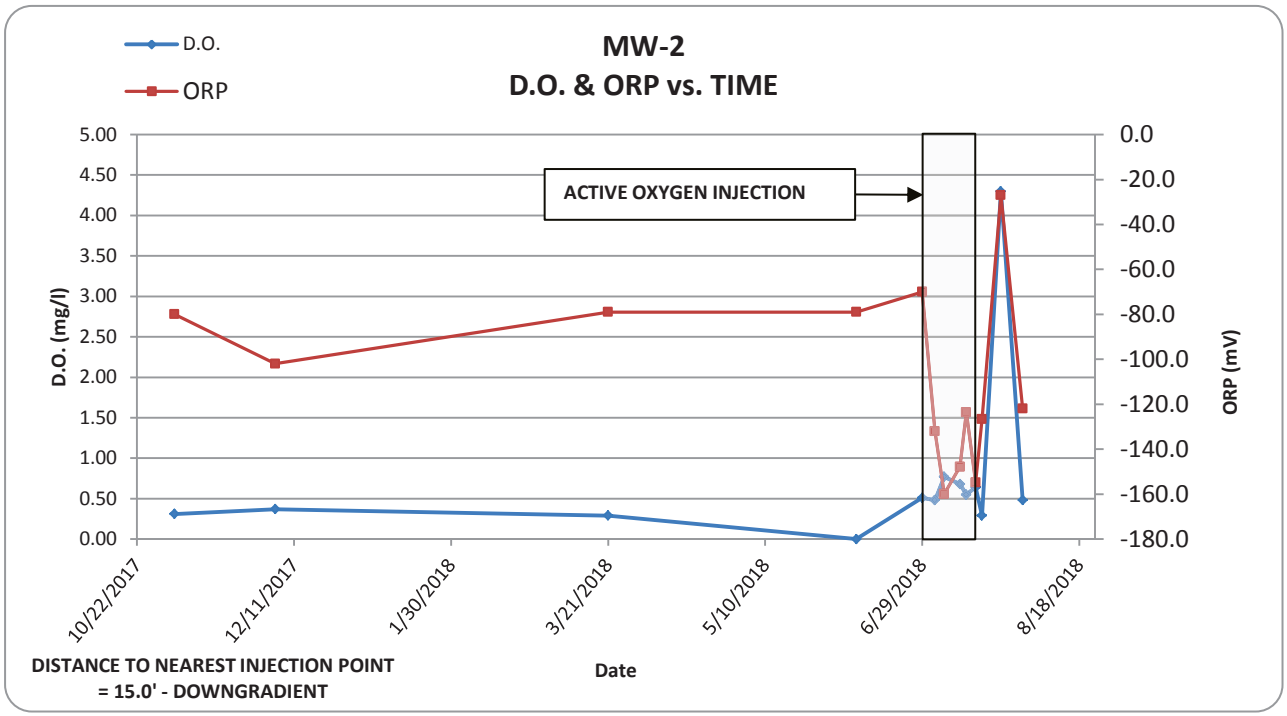
NM Not Measured
NS Not Sampled
NA Not Applicable

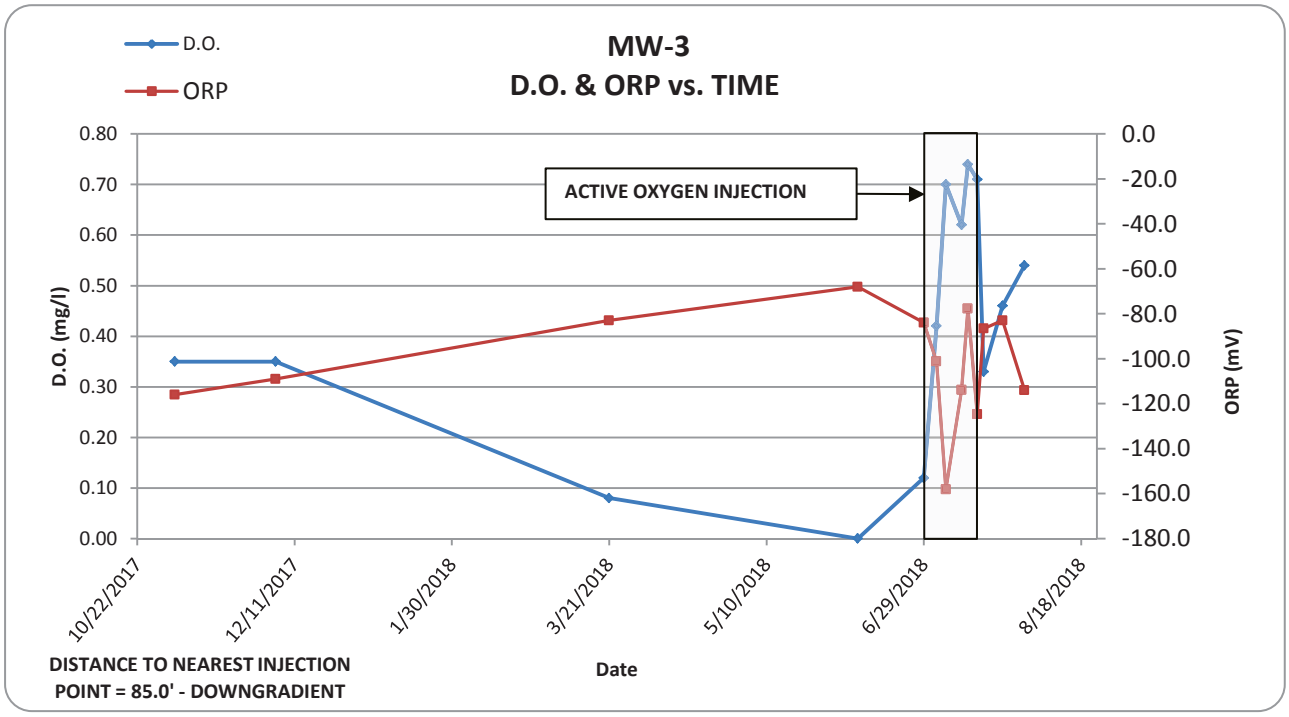
02/22/19

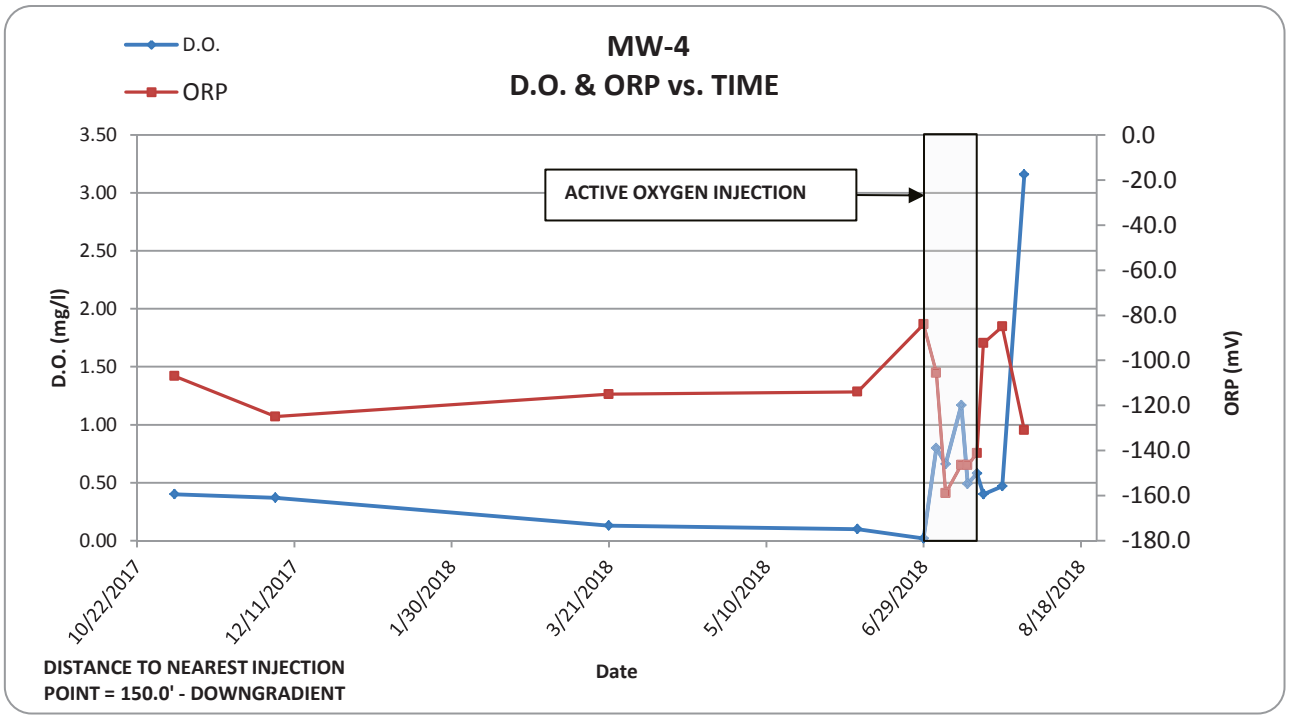
Table R-1
Oxygen Injection Pilot Test
Pump-n-Pantry #001 Property
Summary of In-Situ Groundwater Data

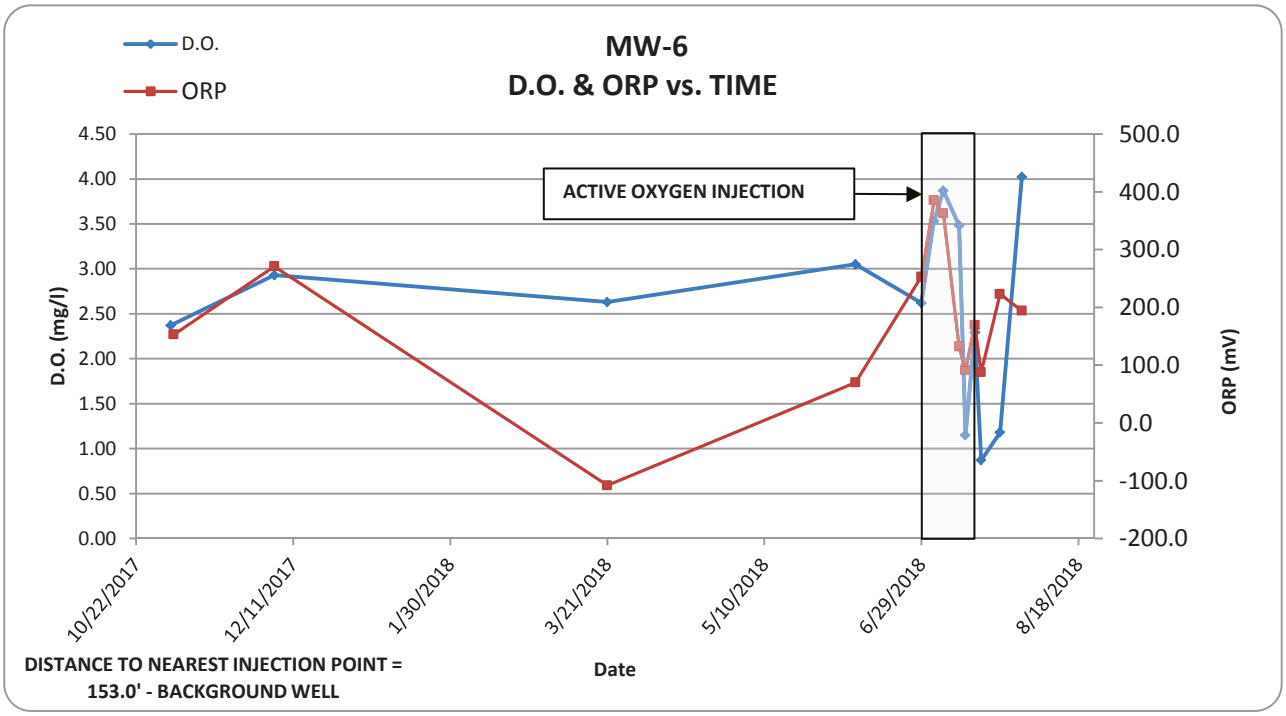
Well Number	Date Sampled	Well Head Elevation (feet)	Depth to Groundwater (feet)*	Relative Groundwater Elevation (feet)	Product Thickness (feet)	Remediation Status	D.O. (mg/L)	O.R.P. (mV)
IP-2	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/2/2017	NA	NA	NA	NA	NA	NA	NA
	7/25/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	NA	NA	NA	NA	NA	NA	NA
	12/4/2017	NA	NA	NA	NA	NA	NA	NA
	3/21/2018	NA	NA	NA	NA	NA	NA	NA
	6/7/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.38	NM	NA	NM	Remediation	NM	NM
	7/3/2018	1653.38	NM	NA	NM	Remediation	NM	NM
	7/6/2018	1653.38	5.72	1647.66	0.00	Remediation	28.90	174.7
	7/11/2018	1653.38	5.70	1647.68	0.00	Remediation	20.60	69.8
	7/13/2018	1653.38	5.92	1647.46	0.00	Remediation	29.99	82.1
	7/16/2018	1652.93	4.71	1648.22	0.00	Remediation	21.32	90.7
	7/18/2018	1652.93	4.73	1648.20	0.00	Remediation	6.15	-11.0
	7/24/2018	1652.93	4.39	1648.54	0.00	Remediation	0.44	-79.0
	7/31/2018	1652.93	4.62	1648.31	0.00	Remediation	0.37	-173.0
IP-3	10/19/2016	NA	NA	NA	NA	NA	NA	NA
	11/30/2016	NA	NA	NA	NA	NA	NA	NA
	2/22/2017	NA	NA	NA	NA	NA	NA	NA
	5/1/2017	NA	NA	NA	NA	NA	NA	NA
	7/25/2017	NA	NA	NA	NA	NA	NA	NA
	11/2/2017	NA	NA	NA	NA	NA	NA	NA
	12/4/2017	NA	NA	NA	NA	NA	NA	NA
	3/21/2018	NA	NA	NA	NA	NA	NA	NA
	6/7/2018	NA	NA	NA	NA	NA	NA	NA
	6/29/2018	1653.43	NM	NA	NM	Remediation	NM	NM
	7/3/2018	1653.43	NM	NA	NM	Remediation	NM	NM
	7/6/2018	1653.43	5.88	1647.55	0.00	Remediation	35.08	168.2
	7/11/2018	1653.43	5.82	1647.61	0.00	Remediation	32.11	94.6
	7/13/2018	1653.43	6.19	1647.24	0.00	Remediation	33.58	107.3
	7/16/2018	1652.83	4.98	1647.85	0.00	Remediation	29.24	150.3
	7/18/2018	1652.83	5.02	1647.81	0.00	Remediation	9.70	22.2
	7/24/2018	1652.83	4.63	1648.20	0.00	Remediation	0.42	-75.0
	7/31/2018	1652.83	4.86	1647.97	0.00	Remediation	0.35	-179.0

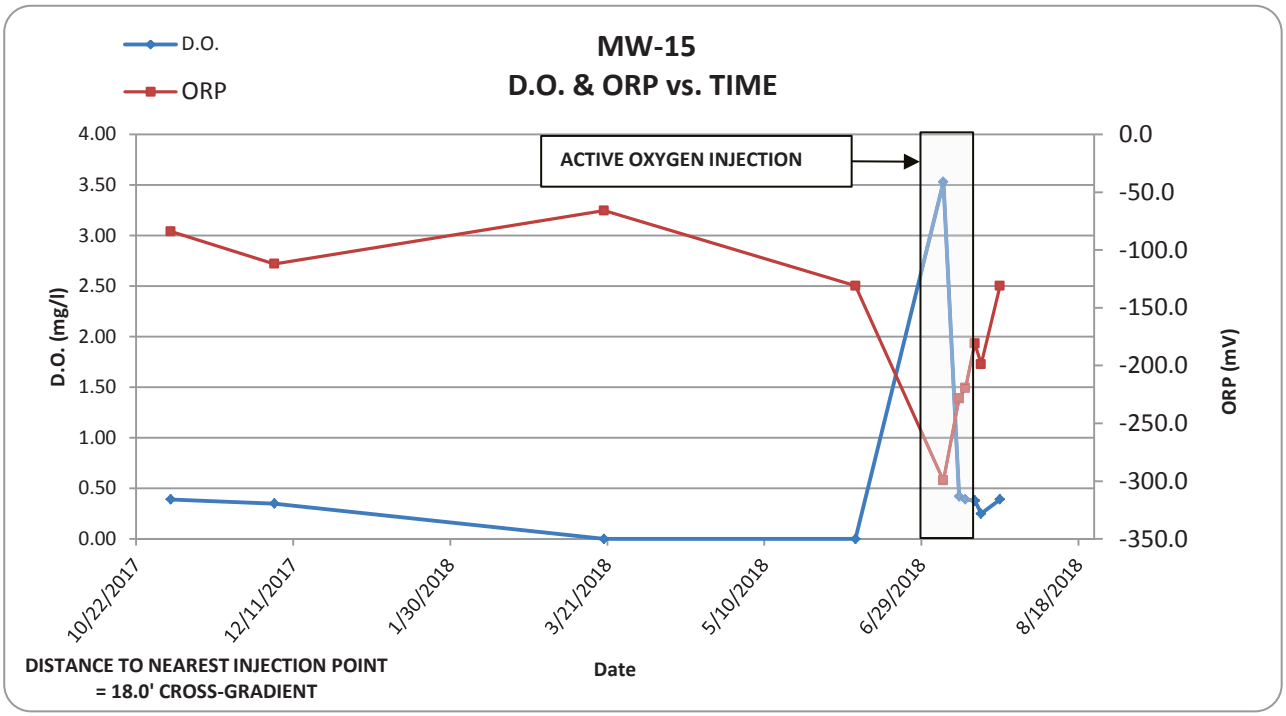
NM Not Measured
NS Not Sampled
NA Not Applicable

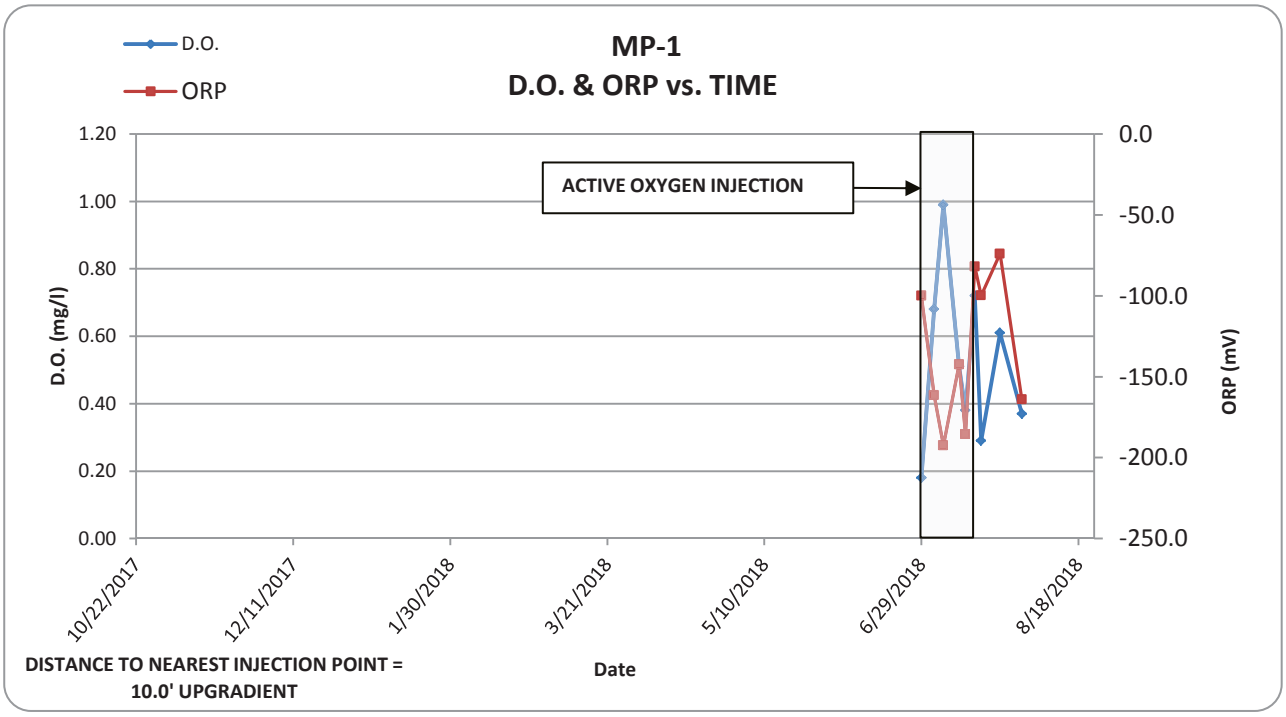

D.O.
ORP
MW-2
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT
= 15.0' - DOWNGRADIENT

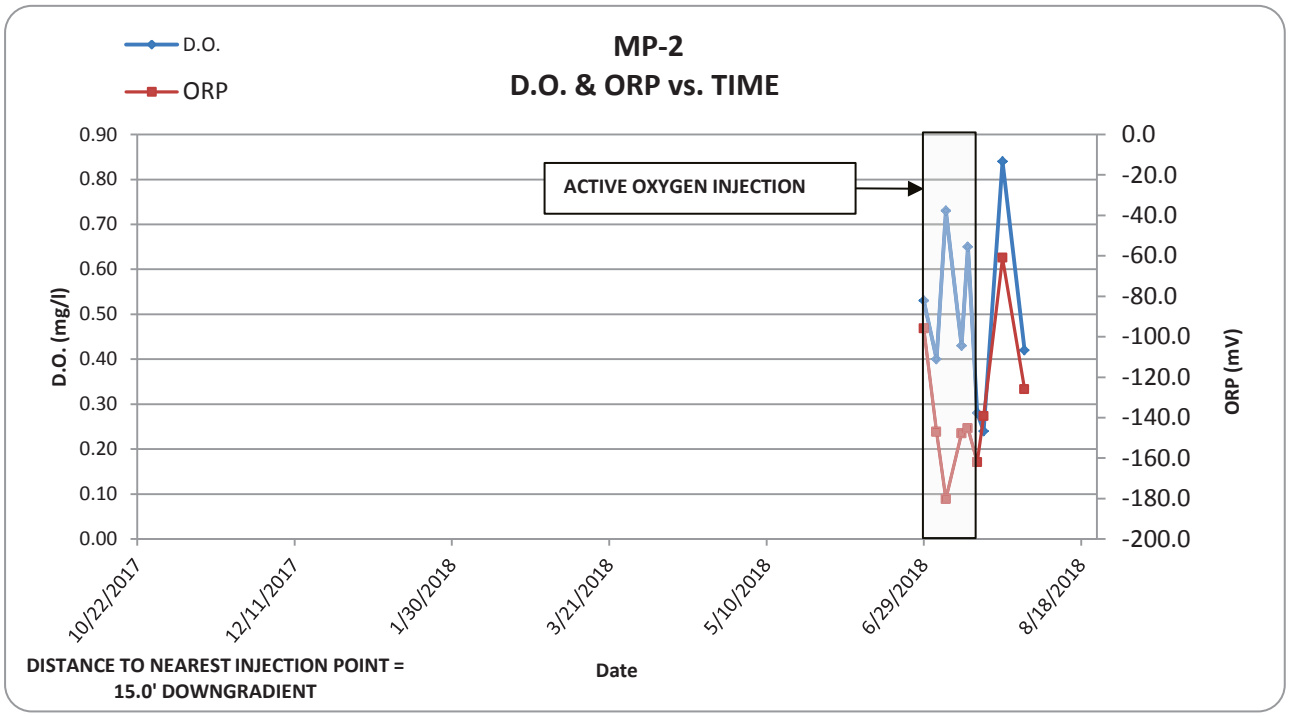

D.O.
ORP
MW-3
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION
POINT = 85.0' - DOWNGRADIENT

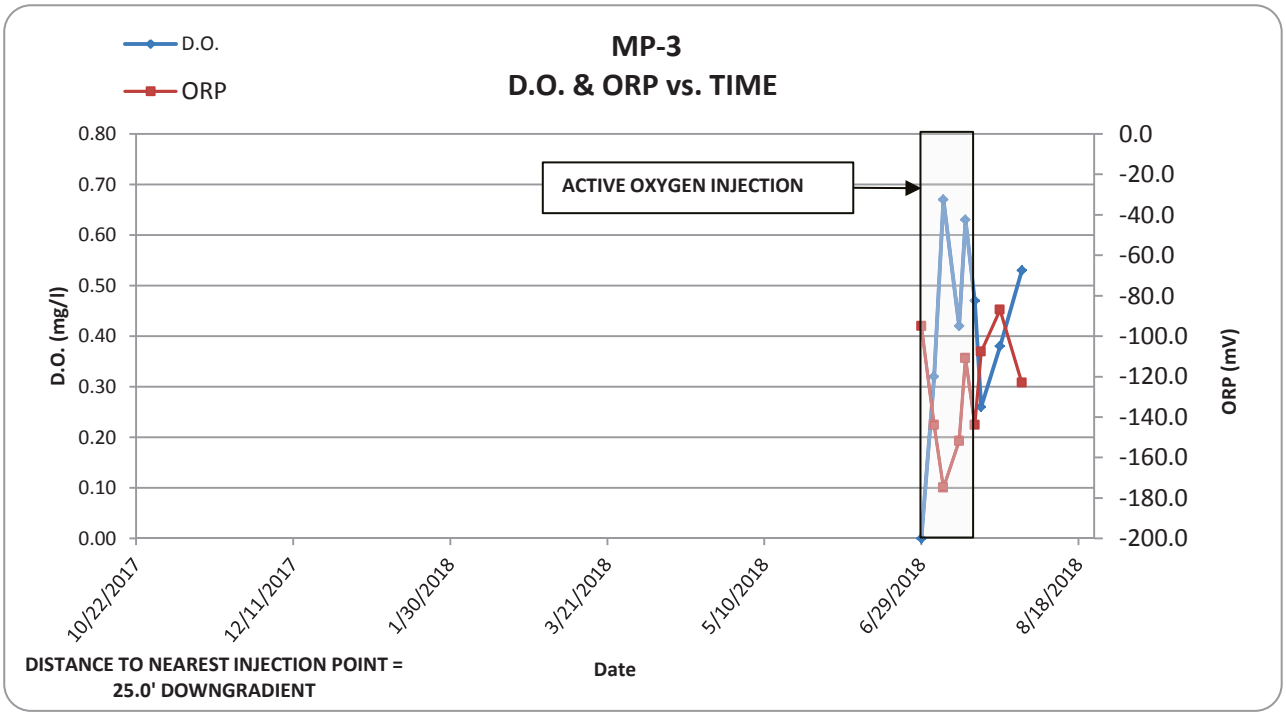

D.O.
ORP
MW-4
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT = 150.0' - DOWNGRADIENT


D.O.
ORP
MW-6
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
500.0
400.0
300.0
200.0
100.0
0.0
-100.0
-200.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT = 153.0' - BACKGROUND WELL


D.O.
ORP
MW-15
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
D.O. (mg/l)
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
-300.0
-350.0
ORP (mV)
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT
= 18.0' CROSS-GRADIENT


D.O.
ORP
MP-1
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
1.20
1.00
0.80
0.60
0.40
0.20
0.00
D.O. (mg/l)
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
ORP (mV)
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT =
10.0' UPGRADIENT


D.O.
ORP
MP-2
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
-200.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT =
15.0' DOWNGRADIENT


D.O.
ORP
MP-3
D.O. & ORP vs. TIME
ACTIVE OXYGEN INJECTION
D.O. (mg/l)
ORP (mV)
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.0
-20.0
-40.0
-60.0
-80.0
-100.0
-120.0
-140.0
-160.0
-180.0
-200.0
10/22/2017
12/11/2017
1/30/2018
3/21/2018
5/10/2018
6/29/2018
8/18/2018
Date
DISTANCE TO NEAREST INJECTION POINT =
25.0' DOWNGRADIENT

APPENDIX S

Oxygen Injection Pilot Test O&M Data

Table S-1
Pump-n-Pantry #001 Property
Oxygen Injection Pilot Test
System O&M

Date / Time	IP-1 Flow Rate (SCFH)	IP-2 Flow Rate (SCFH)	IP-3 Flow Rate (SCFH)	Reciever Pressure (PSI)	Output Pressure (PSI)	Leaks?	O2 Purity (%)	O2 System Hours	Refuel Generator?	Generator Hours	Notes / Observations
6/26/2018 / 1300	0.0	0.0	0.0	20.0	20.0	No	--	35643.8	No	--	Started system for the first time and allowed pressure to build before starting timers for injection points.
06/26/2018 / 1430	0.0	0.0	0.0	40.0	20.0	No	77.8	--	Yes	--	Bump check IP-1, IP-2 and IP-3. All points have good flow and maintain 30 SCFH. Shut down system.
6/29/2018 / 1150	30.0	30.0	30.0	45.0	20.0	Yes	79.0	35647.9 @ 0830	Yes	--	System started at 0830 and allowed to build pressure. Leak observed at flow gauge for reciever tank (Matrix to send replacement). Reconfigure points to timers. IP-1 = Timer 1. IP-2 and IP-3 = Timer 2. Timer 2 = broken (Matrix to send replacement). Generator should run for 2.5 days based on refuel volume. Timers set to inject at IP-1 for ten (10) minutes, recharge for 1 hr 50 min, inject at IP-2 and IP-3 for ten (10) minutes, recharge for 1 hr 50 min and restart cycle. Start injecting at 1150.
07/03/2018 / 1210	29.0	50.0	25.0	52.0	20.0	Yes	NM	--	No	--	Bump check IP-1, IP-2 and IP-3. Adjust all points to 30 SCFH.
07/03/2018 / 1505	30.0	30.0	30.0	50.0	20.0	No	80.0	--	Yes	--	Replace leaking flow gauge at reciever tank. Check for leaks (no leaks). Bump check inject points (all 30 SCFH) and refuel generator.

Table S-1
Pump-n-Pantry #001 Property
Oxygen Injection Pilot Test
System O&M

Date / Time	IP-1 Flow Rate (SCFH)	IP-2 Flow Rate (SCFH)	IP-3 Flow Rate (SCFH)	Reciever Pressure (PSI)	Output Pressure (PSI)	Leaks?	O2 Purity (%)	O2 System Hours	Refuel Generator?	Generator Hours	Notes / Observations
07/06/2018 / 1200	0.0	0.0	0.0	0.0	0.0	No	NM	35753.5	No	NM	Unit off upon arrival. "AirSEP" tripped. Restarted.
07/06/2018 / 1519	40.0	40.0	20.0	50.0	22.0	No	81.3	35756.7	Yes	6215.0	Set all IP's to 30 SCFH. Called Matrix; no answer. Fixed AirSEP issue.
07/08/2018 / 1740	30.0	20.0	20.0	61.0	19.0	No	83.1	35771.2	Yes	6265.5	Unit running on arrival. Bump checked IP's. Refueled generator.
07/11/2018 / 0836	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Unit running on arrival. Bump checked IP's. Refueled generator.
07/11/2018 / 1200	30.0	30.0	30.0	21.0	No	75.2	35771.2	Yes	6330.9	6330.9	Bump checked IP's. Set to 30 SCFH. Refueled generator.

Table S-1
Pump-n-Pantry #001 Property
Oxygen Injection Pilot Test
System O&M

Date / Time	IP-1 Flow Rate (SCFH)	IP-2 Flow Rate (SCFH)	IP-3 Flow Rate (SCFH)	Reciever Pressure (PSI)	Output Pressure (PSI)	Leaks?	O2 Purity (%)	O2 System Hours	Refuel Generator?	Generator Hours	Notes / Observations
07/13/2018 / 1630	35.0	25.0	25.0	41.0	23.0	No	74.5	35771.3	Yes	6383.7	System running on arrival. Bump checked IP's. Refueled generator.
07/16/2018 / 1019	20.0	34.0	30.0	58.0	22.0	No	78.8	35774.9	No	6450.1	System running on arrival. Final readings taken. Set to inject all O2 in IP-1, IP-2, and IP-3.

APPENDIX T

Oxygen Injection Pilot Test – Bioactivity Testing Analytical Data Sheets

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Marty Gilgallon
LaBella Associates, P.C.
1000 Dunham Dr
Suite B
Dunmore, PA 18512

Phone: 570-904-6205

Fax:

Identifier: 128PF **Date Rec:** 06/29/2018 **Report Date:** 07/10/2018

Client Project #: 2171845 **Client Project Name:** Pump-N-Pantry #001

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **LaBella Associates, P.C.**
Project: Pump-N-Pantry #001

MI Project Number: **128PF**
Date Received: 06/29/2018

Sample Information

Client Sample ID:		**1845-0628-MW6**	**1845-0628-MP2**
Sample Date:		06/28/2018	06/28/2018
Units:		cells/mL	cells/mL
Analyst/Reviewer:		JS	JS

Functional Genes

Toluene Dioxygenase	TOD	<1.28E+01	<3.23E+01
Phenol Hydroxylase	PHE	**1.54E+02**	**2.18E+04**
Toluene Monooxygenase	RMO	**2.33E+02**	**8.70E+03**

Phylogenetic Group

Total Eubacteria	EBAC	**2.80E+05**	**1.15E+06**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **6/29/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
EBAC	06/29/2018	07/10/2018	1 °C	99%	non-detect	non-detect
PHE	06/29/2018	07/10/2018	1 °C	100%	non-detect	non-detect
RMO	06/29/2018	07/10/2018	1 °C	100%	non-detect	non-detect
TOD	06/29/2018	07/10/2018	1 °C	106%	non-detect	non-detect

REPORT TO:

Name: Martin Gilgallon
Company: Labella Associates, PC
Address: 1000 Dunham Drive
Suite B
Dunmore PA 18512
email: Mgilgallon@labellapc.com
Phone: 570-487-1959
Fax: 570-487-1961

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name: Martin Gilgallon
Company: Labella Associates, PC
Address: 1000 Dunham Drive
Suite B
Dunmore PA 18512
email: Mgilgallon@labellapc.com
Phone: 570-487-1959
Fax: 570-487-1961

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Project Manager: Martin Gilgallon
Project Name: Pump-N-Pantry #001
Project No.: 2171845

Purchase Order No.
Subcontract No. 2171845 (KC)
MI Quote No. Q20184 19.0002

Please Check One:
☒ More samples to follow
☐ No Additional Samples

Report Type: ☒ Standard (default) ☐ Microbial Insights Level III raw data (15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive (15%) ☐ Historical Interpretive (35%)

EDD type: ☒ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
128PF 1	1845-0628-MW6	6.28.18	1310	GW	2				X																							
2	1845-0628-MP2	6.28.18	1345	GW	2				X																							

Relinquished by: Kevin Cocura / Labella Date 06.28.18/1530 Received by: (KC) 1530 Date 6/29/18 940

Kevin Cocura

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

SHIPPED VIA FED-EX 813153660 0743
06.28.18/1530

* additional cost and sample preservation are associated with RNA samples.

**Saturday delivery: See sampling protocol for alternate shipping address.

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: Marty Gilgallon
LaBella Associates, P.C.
1000 Dunham Dr
Suite B
Dunmore, PA 18512

Phone: 570-904-6205

Fax:

Identifier: 060PG **Date Rec:** 07/20/2018 **Report Date:** 07/24/2018

Client Project #: 2171845 **Client Project Name:** Pump-N-Pantry #001

Purchase Order #:

Analysis Requested: CENSUS

Reviewed By:

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **LaBella Associates, P.C.**
Project: Pump-N-Pantry #001

MI Project Number: **060PG**
Date Received: 07/20/2018

Sample Information

Client Sample ID:		**1845-0718-MW6**	**1845-0718-MP2**
Sample Date:		07/18/2018	07/18/2018
Units:		cells/mL	cells/mL
Analyst/Reviewer:		JS	JS

Functional Genes

Toluene Dioxygenase	TOD	**3.15E+02**	<5.00E+00
Phenol Hydroxylase	PHE	**8.16E+02**	**5.64E+04**
Toluene Monooxygenase	RMO	**9.65E+02**	**3.42E+04**

Phylogenetic Group

Total Eubacteria	EBAC	**6.56E+05**	**2.53E+06**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **7/20/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
EBAC	07/20/2018	07/24/2018	0 °C	99%	non-detect	non-detect
TOD	07/20/2018	07/24/2018	0 °C	100%	non-detect	non-detect
PHE	07/20/2018	07/24/2018	0 °C	100%	non-detect	non-detect
RMO	07/20/2018	07/24/2018	0 °C	100%	non-detect	non-detect

REPORT TO:

Name: Martin Gilgallon
Company: LaBella Associates, PC
Address: 1000 Dunham Drive
Suite B
Dunmore, PA 18512
email: mgilgallon@labellapc.com
Phone: 570-487-1959
Fax: 570-487-1961

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)

Name: Martin Gilgallon
Company: LaBella Associates, PC
Address: 1000 Dunham Drive
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Dunmore, PA 18512
email: mgilgallon@labellapc.com
Phone: 570-487-1959
Fax: 570-487-1961

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Project Manager: Martin Gilgallon
Project Name: Pump-N-Pantry #001
Project No.: 217845

Purchase Order No.
Subcontract No.
MI Quote No. Q 20180419.0002

Please Check One:
☐ More samples to follow
☒ No Additional Samples

Report Type: ☒ Standard (default) ☐ Microbial Insights Level III raw data (15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive (15%) ☐ Historical Interpretive (35%)

EDD type: ☒ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																				
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Naphthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other: TOD (Toluene Dioxygenase)	Other:	Other:
D60PG1	1845-0718-MW6	7/18/18	1013	GW	1											X								X		X					X		
2	1845-0718-MP2	7/18/18	1245	GW	1											X								X		X					X		

Relinquished by: Chris Yeomen/LaBella Date 7-19-18
Received by: Date 7/20/18

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

Shipped Via FedEx
8131 5366 0651

* additional cost and sample preservation are associated with RNA samples.

**Saturday delivery: See sampling protocol for alternate shipping address.

APPENDIX U

SVE/AS Pilot Test Boring Logs

LaBella Associates, P.C.					TEST BORING LOG	
					Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property				Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.				Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test					
Contractor:	Odyssey Environmental				Boring Number: IP-2	
Driller:	Jake Shaffer				Job Number: 2171845	
Inspector:	Kevin Cucura				Sheet: 1 of 1	
TIME LOG		Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig		12:10	12:45	3.0'	Elevation TOC	Surface
Geoprobe		15:30	16:03	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Moist / Wet Auger 0.0' - 4.0' (8" Diameter Borehole)
2---		0.0			
3---		0.0			
4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0' (6" Diameter Borehole)
5---		--	Hard / Steady 5.0' - 10.0'	5.0' - 10.0' Gray sandstone	
6---		--	Odors 5.0' - 10.0'		
---			Rod Change 6.0'		
7---		--	Wet		
8---		--			
9---		--			
10---		--			
11---					
12---					
13---					
14---					
15---					
16---					
17---					
18---					
19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

		Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property	Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: IP-3	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:00	11:40	3.0'	Elevation TOC	Surface
Geoprobe	12:20	13:00	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
				0.0' - 5.0'	Asphalt Surface
---				Soft dig to 3.0'; modified fill to	8" Thick
1---		0.0		1.0', change to shot rock	Dry
---				(large angular sandstone) to	Auger 0.0' - 4.0'
2---		0.0		5.0'	(8" Diameter Borehole)

3---		0.0			

4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0'
---					(6" Diameter Borehole)
5---		--	Hard / Steady	5.0' - 10.0'	
---			5.0' - 6.0'	Gray sandstone	
6---		--	Rod Change 6.0'		
---			Dry		
7---		--			

8---		--	Water & Odor		
---			8.0' - 10.0'		
9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---					
---				Log Approved By:	
				Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Soft Dig: Date Started:	Drilling 06/11/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-1	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	11:45	12:06	3.0'	Elevation TOC	Surface
Geoprobe	13:20	14:00	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Asphalt Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock	8" Thick
---				(large angular sandstone) to	Dry
2---		0.0		4.5', change to gray sandstone	Auger 0.0' - 4.0'
---				to 5.0'	(8" Diameter Borehole)
3---		0.0			

4---		0.0	Choppy 4.0' - 4.5'		Air Rotary 4.0' - 10.0'
---			Hard / Steady		(6" Diameter Borehole)
5---		--	4.5' - 10.0'	5.0' - 10.0'	
---				Gray sandstone	
6---		--	Rod Change 6.0'		
---			Odor / Wet		
7---		--	6.0' - 10.0'		

8---		--			

9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Soft Dig: / Date Started:	Drilling / 06/11/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-2	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. / Elevation TOC	TOC/GL / Surface
Soft Dig	13:50	14:30	3.0'		
Geoprobe	11:05	11:46	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Dry / Damp Auger 0.0' - 4.0' (8" Diameter Borehole)
2---		0.0			
3---		0.0			
4---		0.0	Choppy 4.0' - 4.5'		Air Rotary 4.0' - 10.0' (6" Diameter Borehole)
5---		--	Hard / Steady 5.0' - 10.0'	5.0' - 10.0' Gray sandstone	
6---		--	Rod Change 6.0' Odor / Wet		
7---		--	4.0' - 10.0'		
8---		--			
9---		--			
10---		--			
11---					
12---					
13---					
14---					
15---					
16---					
17---					
18---					
19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.

TEST BORING LOG

		Soft Dig:	Drilling
Project:	Pump-n-Pantry #001 Property	Date Started: 06/11/2018	06/12/2018
Client:	Pump-n-Pantry, Inc.	Date Finished: 06/11/2018	06/12/2018
Purpose:	Oxygen Injection Pilot Test		
Contractor:	Odyssey Environmental	Boring Number: MP-3	
Driller:	Jake Shaffer	Job Number: 2171845	
Inspector:	Kevin Cucura	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L.	TOC/GL
Soft Dig	14:35	15:00	3.0'	Elevation TOC	Surface
Geoprobe	10:00	10:40	10.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---				0.0' - 5.0'	Mulch Surface
1---		0.0		Soft dig to 3.0'; modified fill to 1.0', change to shot rock (large angular sandstone) to 5.0'	Damp / Moist Auger 0.0' - 4.0' (8" Diameter Borehole)

2---		0.0			

3---		0.0			

4---		0.0	Choppy 4.0' - 5.0'		Air Rotary 4.0' - 10.0'
---			Odors 4.0' - 10.0'		(6" Diameter Borehole)
5---		--	Hard / Steady	5.0' - 10.0'	
---			5.0' - 10.0'	Gray sandstone	
6---		--	Rod Change 6.0'		
---			Wet		
7---		--			

8---		--			

9---		--			

10---		--			

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

LaBella Associates, P.C.	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: November 28, 2018	
Client:	Pump-n-Pantry, Inc.	Date Finished: November 28, 2018	
Purpose:	Pilot Test Activities		
Contractor:	LaBella, LLC	Boring Number: SVE-1	
Driller:	Dylan Hitchcock	Job Number: 2171845.02	
Inspector:	Dean Cruciani	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
	15:25	16:40	5.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---			Ran points and rods to depth prior to augers	0.0' - 0.8' Asphalt and gray sandstone gravel	Asphalt Surface No Odor No Visual
1---		0.0			

2---			Very difficult drilling	0.8' - 5.0' Brown to grayish brown sand and silt with abundant sandstone pebbles and cobbles; gray sandstone at 5.0'	

3---					
---		0.0			
4---					

5---					

6---					

7---					

8---					

9---					

10---					

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: November 28, 2018	
Client:	Pump-n-Pantry, Inc.	Date Finished: November 28, 2018	
Purpose:	Pilot Test Activities		
Contractor:	LaBella, LLC	Boring Number: SVE-2	
Driller:	Dylan Hitchcock	Job Number: 2171845.02	
Inspector:	Dean Cruciani	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
	16:55	18:45	5.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---			Ran points and rods to depth prior to augers	0.0' - 0.8' Asphalt and gravel base	Asphalt Surface No Odor No Visual
1---		0.0		0.8' - 5.0' Brown to grayish brown sand and silt with abundant sandstone pebbles and cobbles; large sandstone boulder 3.0' - 4.0'; gray sandstone 5.0'	
---			Very difficult drilling		
2---					

3---					

4---		0.0			

5---					

6---					

7---					

8---					

9---					

10---					

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By: Martin Gilgallon, P.G.	

LaBella Associates, P.C.	TEST BORING LOG

Project:	Pump-n-Pantry #001 Property	Date Started: November 28, 2018	
Client:	Pump-n-Pantry, Inc.	Date Finished: November 28, 2018	
Purpose:	Pilot Test Activities		
Contractor:	LaBella, LLC	Boring Number: SVE-3	
Driller:	Dylan Hitchcock	Job Number: 2171845.02	
Inspector:	Dean Cruciani	Sheet: 1 of 1	

TIME LOG	Begin	Finish	Depth	S.W.L. Elevation TOC	TOC/GL Surface
	13:50	15:14	5.0'		

Dept (feet)	Sample No's	PID (ppm)	Field Assessment Log	Lithologic Description	Notes
---			Difficult drilling	0.0' - 0.8'	Asphalt Surface
---		0.0		Asphalt and medium gray	No Odor
1---				sandstone gravel	No Visual

2---				0.8' - 5.0'	
---				Brown to grayish brown sand	
3---				and silt with abundant	
---				sub-angular sandstone	
4---		0.0		pebbles and cobbles; gray	
---				sandstone at 5.0'	
5---					

6---					

7---					

8---					

9---					

10---					

11---					

12---					

13---					

14---					

15---					

16---					

17---					

18---					

19---				Log Approved By:	
---				Martin Gilgallon, P.G.	

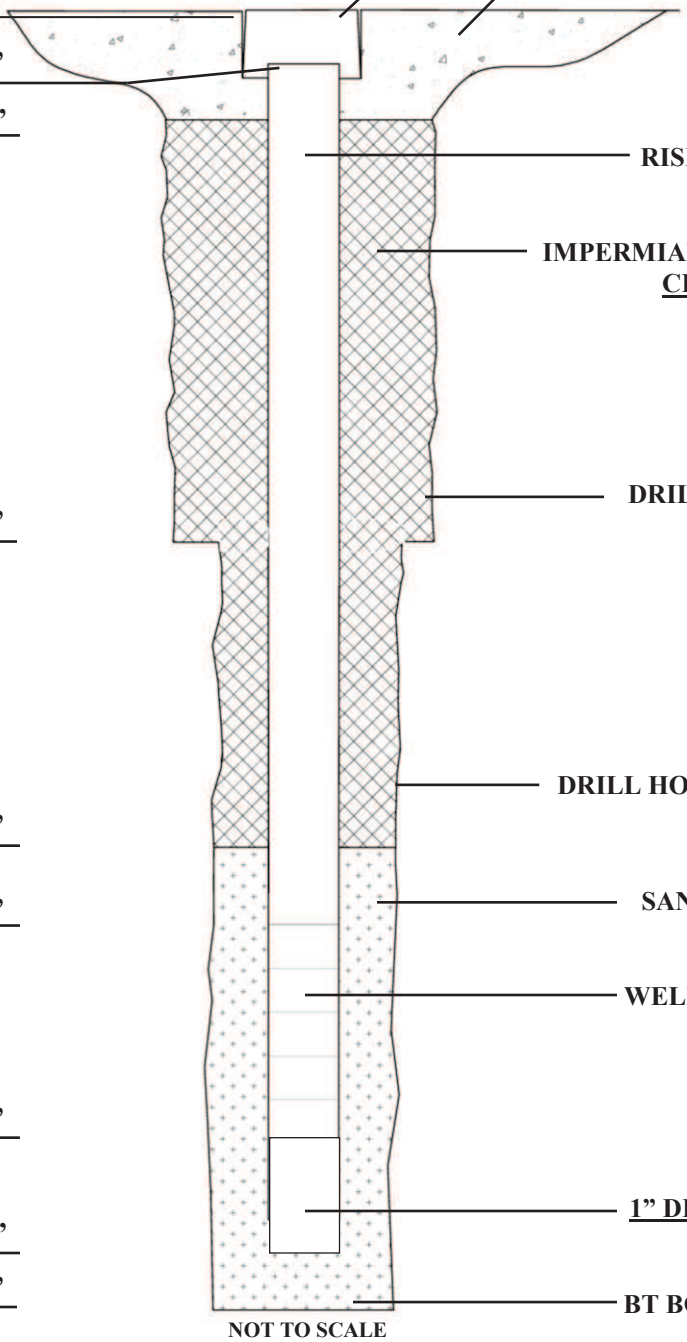
APPENDIX V

SVE/AS Pilot Test Well Construction Logs

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.23’
0.30’	1,652.93’
1.00’	1,652.29’
4.00’	1,649.23’
7.00’	1,646.23’
8.00’	1,645.23’
9.00’	1,644.23’
10.00’	1,643.23’
10.00’	1,643.23’



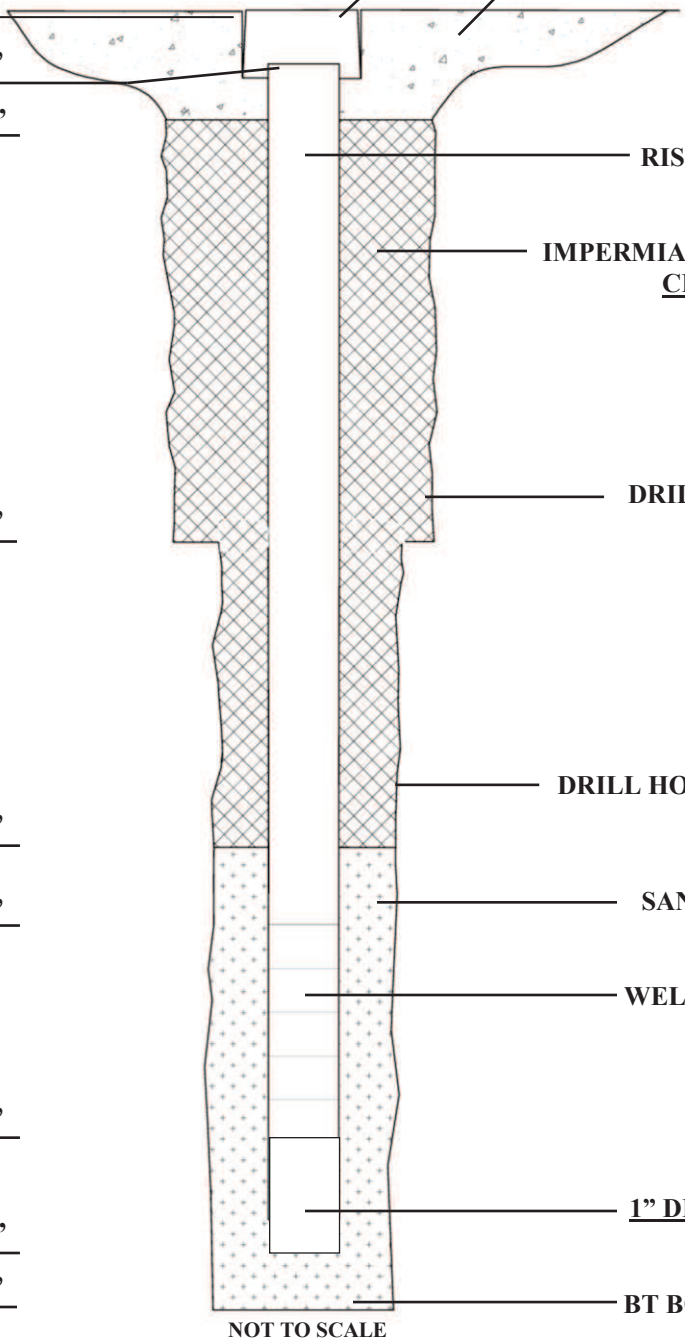
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
INJECTION POINT 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.12’
0.29’	1,652.83’
1.00’	1,652.12’
4.00’	1,649.12’
7.00’	1,646.12’
8.00’	1,645.12’
9.00’	1,644.12’
10.00’	1,643.12’
10.00’	1,643.12’



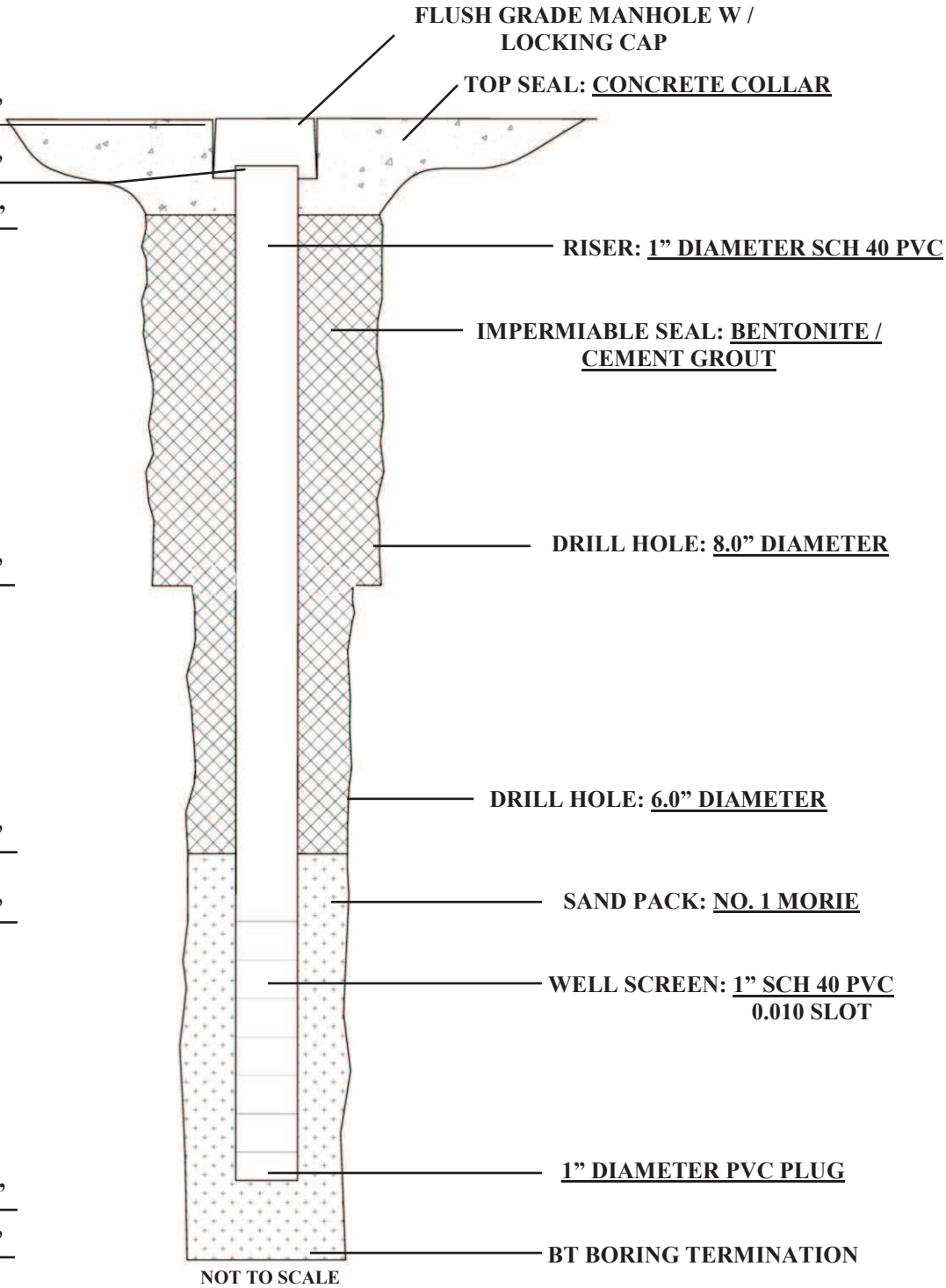
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
INJECTION POINT 3

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.25’
0.33’	1,653.92’
1.00’	1,653.25’
4.00’	1,650.25’
4.00’	1,650.25’
5.00’	1,649.25’
10.00’	1,643.12’
10.00’	1,643.12’



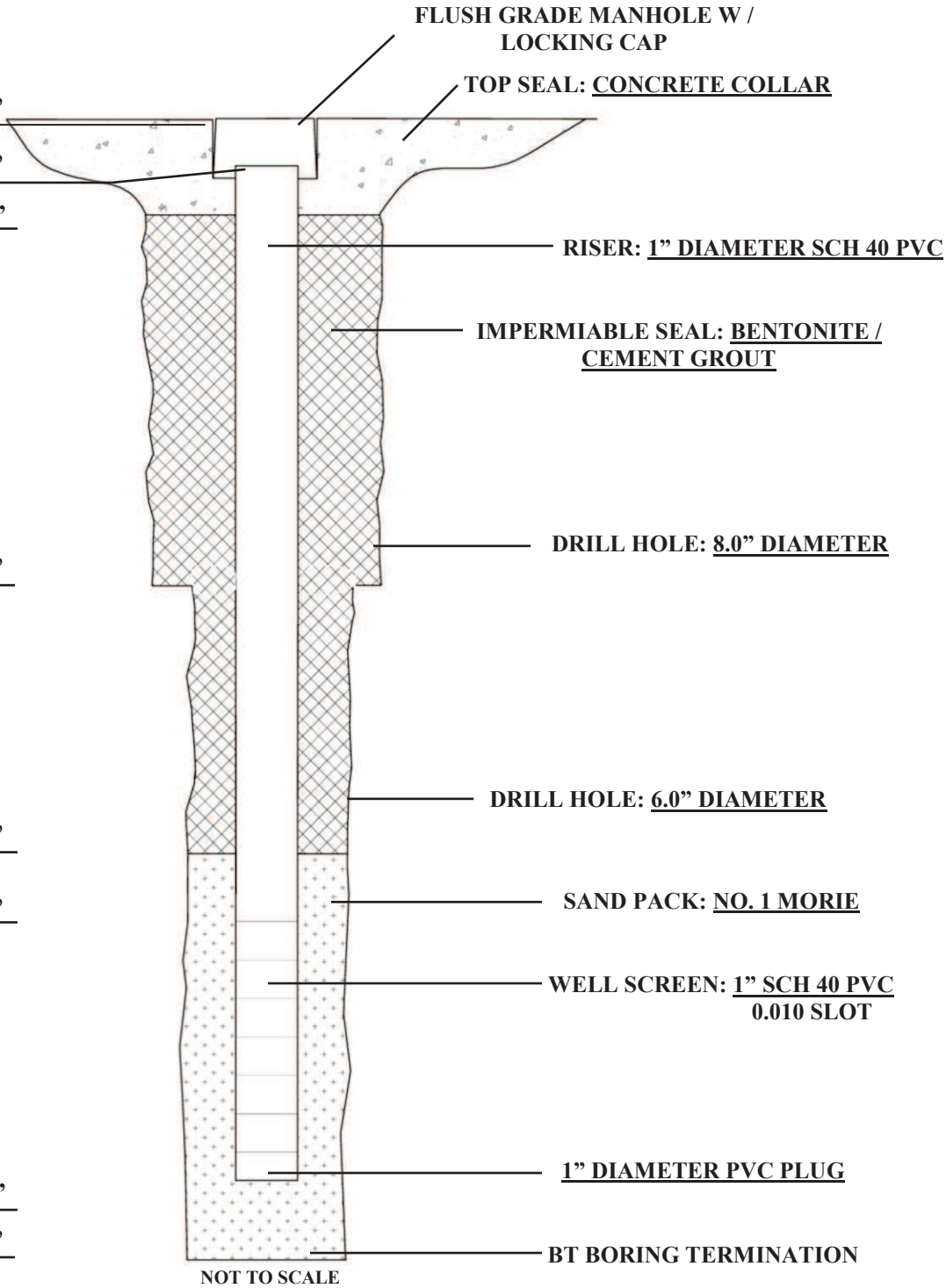
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 1

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,653.68’
0.35’	1,653.33’
1.00’	1,652.68’
4.00’	1,649.68’
4.00’	1,649.68’
5.00’	1,648.68’
10.00’	1,643.68’
10.00’	1,643.68’



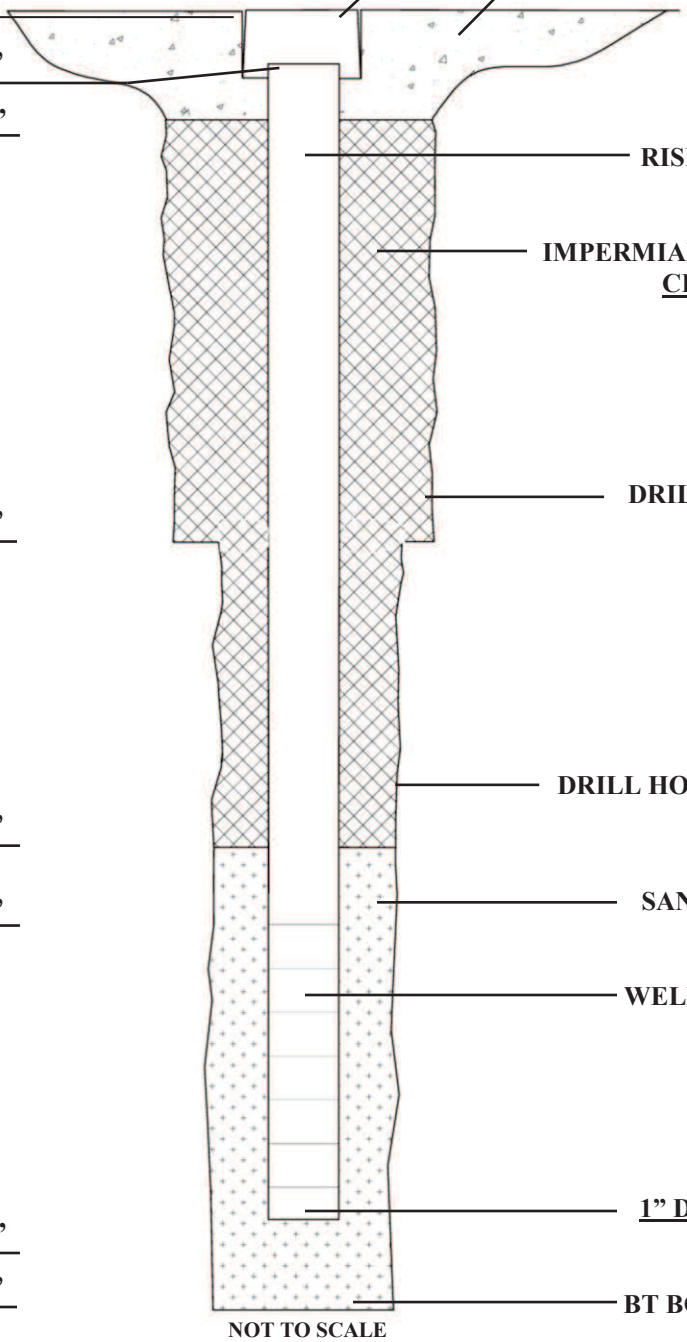
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	1,654.07’
0.41’	1,653.66’
1.00’	1,653.07’
4.00’	1,650.07’
4.00’	1,650.07’
5.00’	1,649.07’
10.00’	1,644.07’
10.00’	1,644.07’



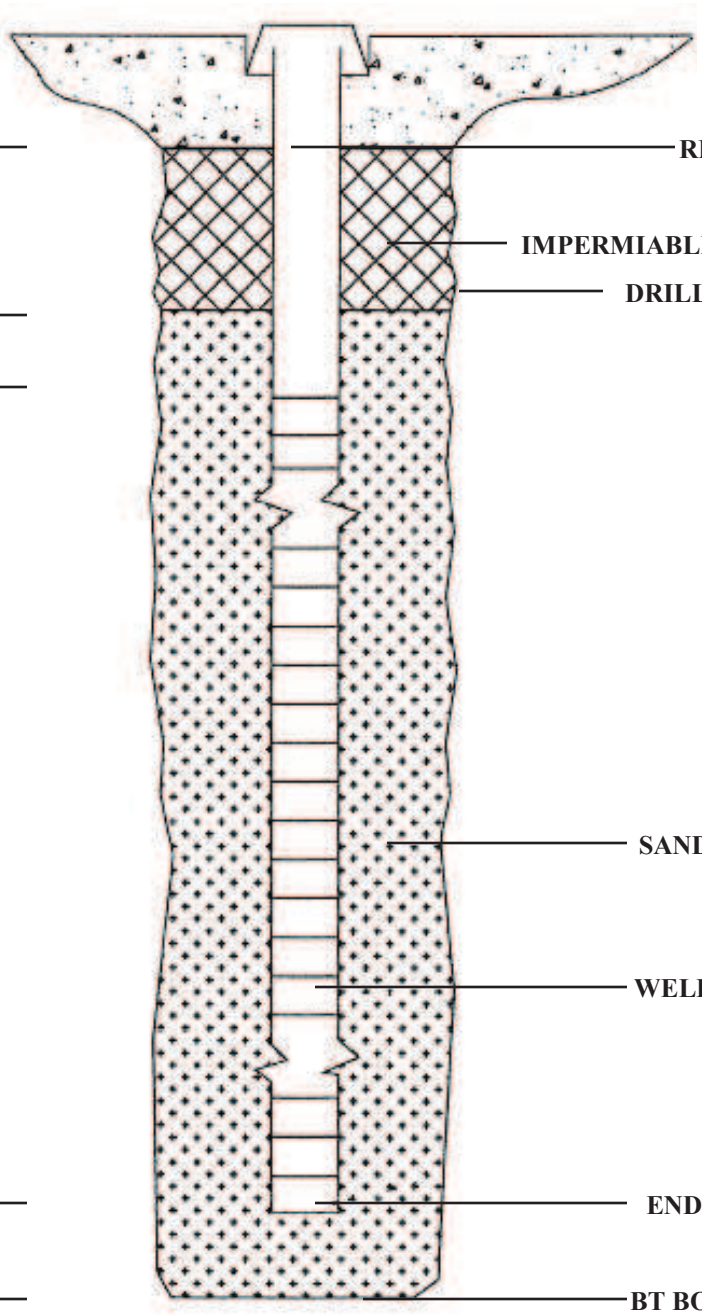
NOT TO SCALE

OXYGEN INJECTION PILOT TEST
PUMP-N-PANTRY #001 PROPERTY
MONITORING POINT 3

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	
0.5’	
1.5’	
2.0’	
5.0’	
5.0’	



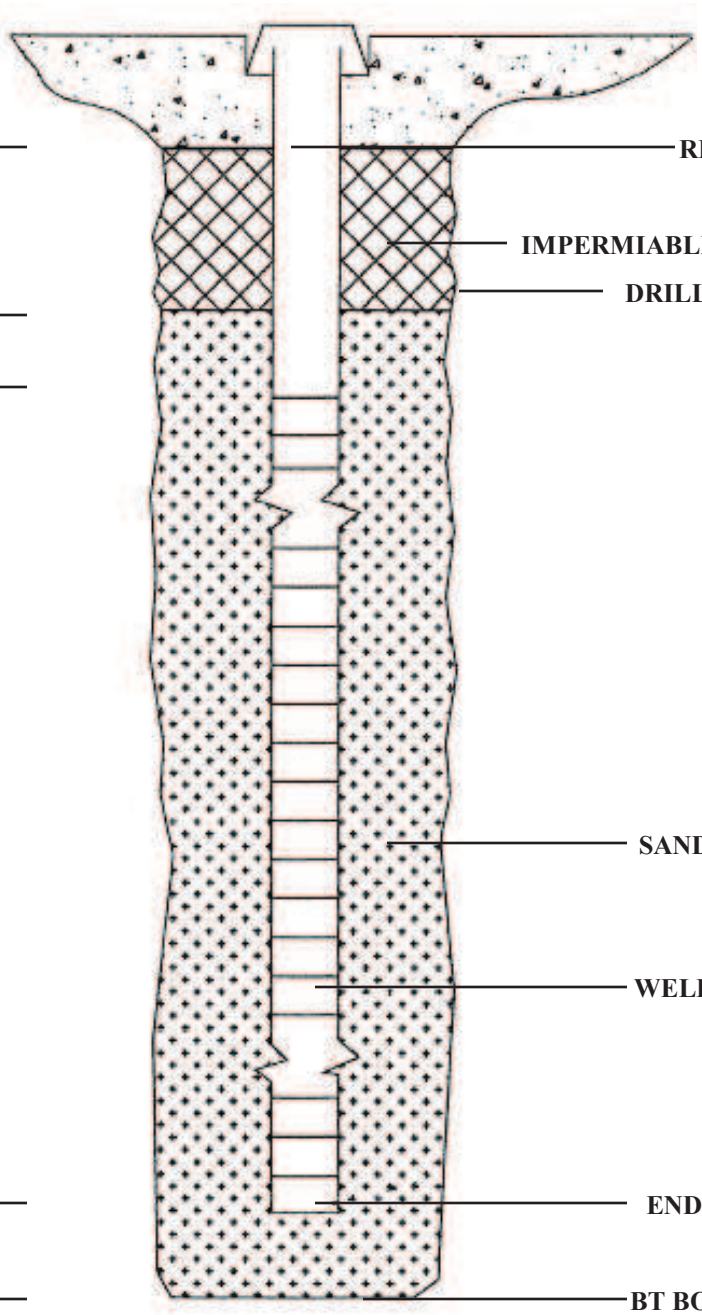
NOT TO SCALE

PILOT TEST ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
SOIL VAPOR EXTRACTION POINT 1

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	
0.5’	
1.5’	
2.0’	
5.0’	
5.0’	



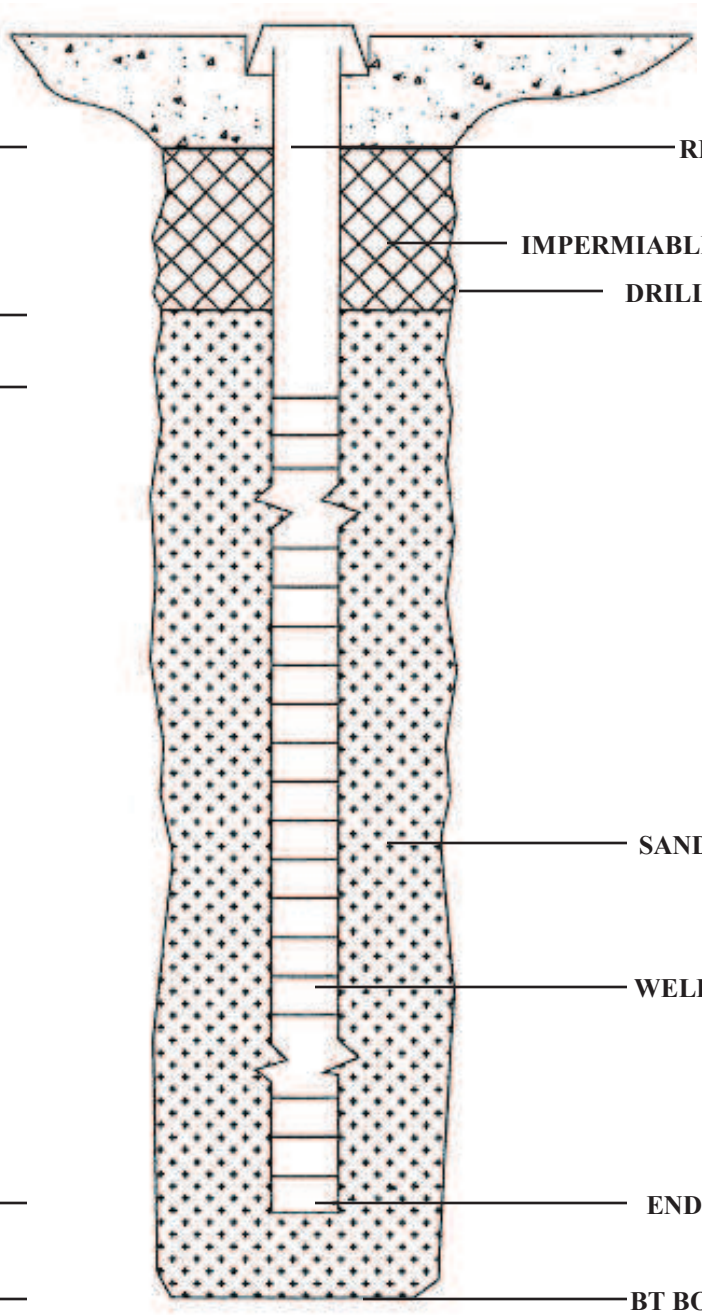
NOT TO SCALE

PILOT TEST ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
SOIL VAPOR EXTRACTION POINT 2

LaBella
Powered by partnership.

MONITORING WELL CONSTRUCTION DETAIL

DEPTH	ELEV.
0.00’	
0.5’	
1.5’	
2.0’	
5.0’	
5.0’	



RISER: 2” SCH 40 PVC

IMPERMIABLE SEAL: BENTONITE SEAL

DRILL HOLE: 8” DIAMETER

SAND PACK: NO. 1 MORIE

WELL SCREEN: 2” SCH 40 PVC
0.010 SLOT

END PLUG: 2” PVC PLUG

BT BORING TERMINATION

NOT TO SCALE

PILOT TEST ACTIVITIES
PUMP-N-PANTRY #001 PROPERTY
SOIL VAPOR EXTRACTION POINT 3

APPENDIX W

SVE/AS Pilot Test Data

2/22/2019

Table W-1
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Baseline Data - 12/18/2018

Parameter	SVE-1	SVE-2	SVE-3	IP-1	IP-2	IP-3	MP-1	MP-2	MP-3	MW-1	MW-2	MW-3	MW-4*
Temp (^{o}C)	5.4	NM	6.4	8.9	5.9	6.8	7.6	9.6	9.0	NM	8.3	10.3	NM
D.O. (MG/L)	0.16	NM	1.03	2.04	5.28	7.25	1.39	1.35	1.87	NM	1.91	0.17	NM
VACUUM (IN. H20)	-0.008	-0.014	-0.012	-0.012	-0.012	-0.008	-0.006	-0.004	-0.008	NM	-0.004	-0.006	NM
WATER LEVEL (FEET)	3.92	NM	4.06	4.82	4.32	4.55	4.47	4.93	4.79	NM	4.56	4.30	NM
PID (PPM)	428.7	1181.0	4.4	1.3	1.7	1.2	1.6	0.4	1.2	NM	0.2	0.7	NM

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

* Could not locate - may be located beneath snow/ice pile

2/22/2019

Table W-1
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Baseline Data - 12/18/2018

Parameter	MW-5	MW-6	MW-7*	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15
Temp (^{o}C)	8.4	7.3	NM	8.2	10.9	NM	NM	NM	NM	NM	8.7
D.O. (MG/L)	0.34	3.52	NM	0.16	0.91	NM	NM	NM	NM	NM	0.11
VACUUM (IN. H20)	-0.002	-0.001	NM	-0.001	-0.002	NM	NM	NM	NM	NM	-0.013
WATER LEVEL (FEET)	3.19	4.26	NM	4.15	4.20	5.57	3.45	5.69	2.79	4.13	3.92
PID (PPM)	104.6	1.1	NM	1.5	0.2	NM	NM	NM	NM	NM	236.3

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

* Could not locate - may be located beneath snow/ice pile

2/22/2019

Table W-2
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Soil Vapor Extraction Pilot Test - SVE-1 (12/19/2018)

Date / Time	Blower Vacuum (IN. HG)	Blower Flow Rate (SCFM)	SVE Point Flow Rate (FT/MIN)	SVE PID (PPM) *	Effluent PID (PPM) **	Applied Vacuum (IN. H20)	Parameter	SOIL VAPOR EXTRACTION PILOT TEST MONITORING DATA											
			SVE-1	SVE-1		SVE-1		SVE-2	SVE-3	IP-1	IP-2	IP-3	MP-1	MP-2	MP-3	MW-2	MW-3	MW-6	MW-15
12/19/18 0940	2.0	130.0	270.0	18.4	0.9	-2.07	VACUUM (IN. H2O)	-0.006	-0.002	0.016	0.004	0.001	0.005	0.001	0.002	-0.001	-0.003	0.001	-0.006
							BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	MM	4.09	4.93	4.42	4.64	4.57	5.01	4.80	4.67	4.33	4.29	4.00
							BASELINE WATER LEVEL (FT.)	**NM**	**4.06**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
12/19/18 1130	2.6	152.0	1204.0	42.5	7.6	-11.08	VACUUM (IN. H2O)	0.000	0.002	-0.005	0.011	0.007	0.006	-0.009	0.027	0.001	0.006	0.005	0.005
							BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	NM	4.09	4.92	4.41	4.65	4.58	5.02	4.79	4.68	4.34	4.28	4.01
							BASELINE WATER LEVEL (FT.)	**NM**	**4.06**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.29**	**3.98**
12/19/18 1238	7.0	50.0	3360.0	95.6	184.4	-84	VACUUM (IN. H2O)	-0.036	0.003	0.002	0.006	0.003	0.003	-0.001	0.006	0.002	0.002	0.003	-0.020
							BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	NM	4.12	5.04	4.43	4.68	4.60	5.03	4.80	4.67	4.34	4.29	4.03
							BASELINE WATER LEVEL (FT.)	**NM**	**4.06**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.29**	**3.92**
							Distance to SVE-1	**13.8**	**24.3**	**30.8**	**21.3**	**15.2**	**10.9**	**10.9**	**42.0**	**37.0**	**98.0**	**161.0**	**18.0**

Notes:

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

*** = SVE PID readings are actual PID readings of soil vapor extracted from the respective SVE point.**

**** = Effluent PID readings are from the total system effluent including SVE-1 and bleed air. As such, these values are diluted.**

Additional Observations:

0910: Start vacuum at SVE-1
1044: Increase blower rate to 160 SCFM @ 2.5 IN. HG
1156: Close both bleeder valves; applied vacuum @ SVE-1 to 84 IN. H2O
1240: Collect air sample for laboratory analysis (1845-1219-SVE1 -TE)

2/22/2019

Table W-3
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Soil Vapor Extraction Pilot Test - SVE-2 (12/19/2018)

Date / Time	Blower Vacuum (IN. HG)	Blower Flow Rate (SCFM)	SVE Point Flow Rate (FT/MIN)	SVE PID (PPM) *	Effluent PID (PPM) **	Applied Vacuum (IN. H20)	Parameter	SOIL VAPOR EXTRACTION PILOT TEST MONITORING DATA											
			SVE-2	SVE-2		SVE-2		SVE-1	SVE-3	IP-1	IP-2	IP-3	MP-1	MP-2	MP-3	MW-2	MW-3	MW-6	MW-15
12/19/18 1340	3.4	147.0	2250.0	948.0	318.2	-20.0	VACUUM (IN. H2O)	-0.008	-0.006	-0.016	0.003	0.265	0.006	0.000	0.108	-0.004	-0.004	0.000	-3.767
							BASELINE VACUUM (IN. H2O)	**-0.008**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	3.52	4.11	4.92	4.52	4.65	4.56	5.02	4.80	4.68	4.33	4.29	4.02
							BASELINE WATER LEVEL (FT.)	**3.92**	**4.06**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
12/19/18 1436	7.0	50.0	2980.0	664.0	660.0	-81.0	VACUUM (IN. H2O)	-0.016	0.002	0.000	0.003	-0.184	0.042	-0.003	0.023	0.000	-0.004	0.000	-2.968
							BASELINE VACUUM (IN. H2O)	**-0.008**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	3.55	4.06	4.94	4.43	4.67	4.59	5.03	4.80	4.67	4.33	4.29	4.30
							BASELINE WATER LEVEL (FT.)	**3.92**	**4.06**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
							Distance to SVE-2	**13.8**	**23.5**	**25.0**	**27.6**	**12.0**	**19.0**	**18.8**	**38.0**	**32.0**	**89.0**	**146.0**	**6.0**

Notes:

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

*** = SVE PID readings are actual PID readings of soil vapor extracted from the respective SVE point.**

**** = Effluent PID readings are from the total system effluent including SVE-2 and bleed air. As such, these values are diluted.**

Additional Observations:

1310: Start vacuum at SVE-2
1407: Close both bleeder valves; applied vacuum @ SVE-2 to 91 IN. H2O
1443: Collect air sample for laboratory analysis (1845-1219-SVE2 -TE)

2/22/2019

Table W-4
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Soil Vapor Extraction Pilot Test - SVE-3 (12/19/2018)

Date / Time	Blower Vacuum (IN. HG)	Blower Flow Rate (SCFM)	SVE Point Flow Rate (FT/MIN)	SVE PID (PPM) *	Effluent PID (PPM) **	Applied Vacuum (IN. H20)	Parameter	SOIL VAPOR EXTRACTION PILOT TEST MONITORING DATA											
			SVE-3	SVE-3		SVE-3		SVE-1	SVE-2	IP-1	IP-2	IP-3	MP-1	MP-2	MP-3	MW-2	MW-3	MW-6	MW-15
12/19/18 1535	3.7	142.0	1056.0	1.1	0.7	-22.0	VACUUM (IN. H2O)	0.002	0.002	-0.005	0.006	0.065	0.011	-0.015	0.200	-0.013	-0.014	0.000	0.006
							BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	3.56	NM	4.93	4.41	4.65	4.57	5.03	4.80	4.69	4.35	4.29	4.16
							BASELINE WATER LEVEL (FT.)	**3.92**	**NM**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
12/19/18 1632	6.8	70.0	5975.0	0.5	0.2	-72.0	VACUUM (IN. H2O)	-0.001	-0.003	-0.004	-0.001	-0.077	0.015	-0.083	0.031	-0.088	-0.060	-0.001	-0.020
							BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.012**	**-0.008**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
							WATER LEVEL (FT.)	3.56	NM	4.95	4.45	4.76	4.59	5.05	4.82	4.68	4.35	4.29	4.10
							BASELINE WATER LEVEL (FT.)	**3.92**	**NM**	**4.82**	**4.32**	**4.55**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
							Distance to SVE-3	**24.2**	**13.8**	**17.0**	**10.0**	**10.0**	**15.0**	**15.0**	**19.0**	**10.2**	**77.0**	**155.0**	**22.0**

Notes:

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

*** = SVE PID readings are actual PID readings of soil vapor extracted from the respective SVE point.**

**** = Effluent PID readings are from the total system effluent including SVE-3 and bleed air. As such, these values are diluted.**

Additional Observations:

1505: Start vacuum at SVE-3
1600: Close both bleeder valves; applied vacuum @ SVE-3 to 74 IN. H20
1700: Collect air sample for laboratory analysis (1845-1219-SVE3 -TE)

2/22/2019

Table W-5
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Air Sparge Pilot Test - 12/20/2018

Date / Time	Blower Vacuum (IN. HG)	Blower Flow Rate (SCFM)	Compressor @ IP-3		SVE Point Flow Rate (FT/MIN)		SVE PID (PPM) *		Effluent PID (PPM) **	Applied Vacuum (IN. H20)		Parameter	AIR SPARGE PILOT TEST MONITORING DATA									
			PSI	CFM	SVE-1	SVE-3	SVE-1	SVE-3		SVE-1	SVE-3		SVE-2	IP-1	IP-2	MP-1	MP-2	MP-3	MW-2	MW-3	MW-6	MW-15
12/20/18 1010	6.0	100.0	2.0	3.25	6993.0	3102.0	167.3	3.2	89.2	-60.0	-60.0	D.O. (MG/L)	6.72	NM	NM	NM	MNM	NM	0.22	0.14	4.66	0.20
												BASELINE D.O. (MG/L)	**NM**	**2.04**	**5.28**	**1.39**	**1.35**	**1.87**	**1.91**	**0.17**	**3.52**	**0.11**
												VACUUM (IN. H2O)	-0.009	0.004	0.005	0.052	-0.062	0.130	-0.068	-0.046	0.002	-0.064
												BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
												WATER LEVEL (FT.)	3.55	4.98	4.48	4.62	5.08	4.82	4.72	4.34	4.31	4.20
												BASELINE WATER LEVEL (FT.)	**NM**	**4.82**	**4.32**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
12/20/18 1130	5.8	105.0	2.6	4.40	1995.0	<9000	181.0	39.9	156.9	-60.0	-57.0	D.O. (MG/L)	6.91	NM	NM	NM	NM	NM	0.31	0.23	4.67	0.52
												BASELINE D.O. (MG/L)	**NM**	**2.04**	**5.28**	**1.39**	**1.35**	**1.87**	**1.91**	**0.17**	**3.52**	**0.11**
												Vacuum (IN. H2O)	0.000	-0.036	-0.002	0.202	0.076	0.071	-0.065	-0.047	0.004	0.097
												BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
												Water Level (Feet)	3.580	4.97	4.47	4.60	5.09	4.81	4.70	4.34	4.30	4.18
												BASELINE WATER LEVEL (FT.)	**NM**	**4.82**	**4.32**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.31**	**4.20**
12/20/18 1230	5.8	105.0	4.4	9.43	2010.0	5500.0	164.0	139.8	302.3	-59.0	-57.0	D.O. (MG/L)	6.96	NM	NM	NM	NM	NM	0.23	0.19	4.57	0.45
												BASELINE D.O. (MG/L)	**NM**	**2.04**	**5.28**	**1.39**	**1.35**	**1.87**	**1.91**	**0.17**	**3.52**	**0.11**
												Vacuum (IN. H2O)	0.029	0.009	0.041	6.464	-0.057	0.041	-0.059	-0.039	0.007	0.063
												BASELINE VACUUM (IN. H2O)	**-0.014**	**-0.012**	**-0.012**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
												Water Level (Feet)	3.57	4.94	4.44	4.51	5.05	4.80	4.67	4.36	4.30	4.14
												BASELINE WATER LEVEL (FT.)	**NM**	**4.82**	**4.32**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
												Distance to IP-3	**14.2**	**24.0**	**12.0**	**9.0**	**25.0**	**29.0**	**22.0**	**85.0**	**154.0**	**17.0**
												Distance to Nearest SVE Point ***	**10.0**	**17.0**	**10.0**	**10.9**	**15.0**	**19.0**	**10.2**	**77.0**	**155.0**	**18.0**

Notes:

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

*** = SVE PID readings are actual PID readings of soil vapor extracted from the respective SVE point.**

**** = Effluent PID readings are from the total system effluent including SVE-1, SVE-3 and bleed air. As such, these values are diluted.**

***** = The nearest monitoring wells to the SVE points are color coded as follows:**

SVE-1

SVE-3

Additional Observations:

0910: Start vacuum at SVE-1 and SVE-3. Start Sparge at IP-3 (breakout at 2.0 PSI)
1050: Increase sparge at IP-3 to 3.0 PSI
1155: Increase sparge at IP-3 to 4.9 PSI
1230: Strong odor eminating from MW-15 during last round of data collection

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Table W-6
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Air Sparge Pilot Test 2 (12/20/2018)

Date / Time	Blower Vacuum (IN. HG)	Blower Flow Rate (SCFM)	Compressor @ IP-2 & IP-3				SVE Point Flow Rate (FT/MIN)			SVE PID (PPM) *			Effluent PID (PPM) **	Applied Vacuum (IN. H20)			Parameter	AIR SPARGE PILOT TEST MONITORING DATA							
			IP-2 - PSI	IP-2 - CFM	IP-3 - PSI	IP-3 - CFM	SVE-1	SVE-2	SVE-3	SVE-1	SVE-2	SVE-3		SVE-1	SVE-2	SVE-3		IP-1	MP-1	MP-2	MP-3	MW-2	MW-3	MW-6	MW-15
12/20/18 1345	4.9	123.0	2.2	1.65	2.7	6.15	2818.0	1966.0	3732.0	191.2	54.6	393.6	393.0	-45.0	-45.0	-43.0	D.O. (MG/L)	NM	NM	NM	NM	0.26	0.31	4.50	0.32
																	BASELINE D.O. (MG/L)	**2.04**	**1.39**	**1.35**	**1.87**	**1.91**	**0.11**	**3.52**	**0.11**
																	VACUUM (IN. H2O)	0.000	0.064	-0.054	1.480	-0.056	-0.041	0.003	-5.282
																	BASELINE VACUUM (IN. H2O)	**-0.012**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
																	WATER LEVEL (FT.)	4.98	4.64	5.05	4.82	4.69	4.35	4.32	4.12
																	BASELINE WATER LEVEL (FT.)	**4.82**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
12/20/18 1445	5.0	125.0	3.0	5.39	3.2	7.88	2541.0	>9000	>9000	184.9	289.0	138.5	326.0	-43.0	-41.0	-41.0	D.O. (MG/L)	NM	NM	NM	NM	0.21	0.23	4.63	0.55
																	BASELINE D.O. (MG/L)	**2.04**	**1.39**	**1.35**	**1.87**	**1.91**	**0.17**	**3.52**	**0.11**
																	Vacuum (IN. H2O)	0.006	6.997	-0.537	0.181	-0.047	-0.034	0.003	-3.462
																	BASELINE VACUUM (IN. H2O)	**-0.012**	**-0.006**	**-0.004**	**-0.008**	**-0.004**	**-0.006**	**-0.001**	**-0.013**
																	Water Level (Feet)	4.97	4.60	5.05	4.79	4.69	4.34	4.32	4.25
																	BASELINE WATER LEVEL (FT.)	**4.82**	**4.47**	**4.93**	**4.79**	**4.56**	**4.30**	**4.26**	**3.92**
																	Distance to Nearest Sparge Point ***	**12.0**	**10.0**	**15.0**	**25.0**	**15.0**	**85.0**	**154.0**	**17.0**
																	Distance to Nearest SVE Point ****	**18.0**	**10.9**	**15.0**	**19.0**	**10.2**	**77.0**	**146.0**	**6.0**

Notes:

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

*** = SVE PID readings are actual PID readings of soil vapor extracted from the respective SVE point.**

**** = Effluent PID readings are from the total system effluent including SVE-1, SVE-2, SVE-3 and bleed air. As such, these values are diluted.**

***** = The nearest monitoring wells to the sparge points are color coded as follows:**

IP-2

IP-3

***** = The nearest monitoring wells to the SVE Points are color coded as follows:**

SVE-1

SVE-2

SVE-3

Additional Observations:

1300: Start vacuum at SVE-1, SVE-2 and SVE-3. Start Sparge at IP-2 and IP-3
1415: Increase sparge at IP-2 and IP-3 to 3.5 PSI
1455: Collect air sample for laboratory analysis (1845-1219-Test 2-TE)

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Table W-7
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Post SVE-AS Pilot Test Data - 12/20/2018

Parameter	SVE-1	SVE-2	SVE-3	IP-1	IP-2	IP-3	MP-1	MP-2	MP-3	MW-1	MW-2	MW-3	MW-4*
Temp (°C)	5.8	5.6	6.0	9.2	8.0	8.1	8.4	9.6	8.4	NM	9.5	NM	NM
D.O. (MG/L)	2.64	9.14	31.04	1.79	6.01	6.49	5.57	1.39	1.93	NM	0.21	0.13	NM
VACUUM (IN. H20)	-0.1	NM	NM	0.006	0.182	0.036	6.997	-0.537	0.181	NM	-0.047	-0.034	NM
WATER LEVEL (FEET)	3.40	3.20	3.94	4.97	4.55	4.85	4.60	5.05	4.79	NM	4.69	4.34	NM
PID (PPM)	184.9	289.0	138.5	487.0	8.8	47.3	621.0	21.9	0.0	NM	0.0	1.0	NM

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

* Could not locate - may be located beneath snow/ice pile

2/22/2019

Table W-7
Pump-n-Pantry #001 Property
Soil Vapor Extraction / Air Sparge Pilot Test
Post SVE-AS Pilot Test Data - 12/20/2018

Parameter	MW-5	MW-6	MW-7*	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15
Temp (^{o}C)	9.8	7.2	NM	9.2	11.9	NM	NM	NM	NM	NM	9.0
D.O. (MG/L)	0.15	4.63	NM	0.49	1.23	NM	NM	NM	NM	NM	0.55
VACUUM (IN. H20)	-0.008	0.003	NM	0.003	-0.044	NM	NM	NM	NM	NM	3.462
WATER LEVEL (FEET)	3.20	4.32	NM	4.40	4.47	5.66	3.52	5.70	2.87	4.14	4.25
PID (PPM)	58.8	1.0	NM	4.2	0.8	NM	NM	NM	NM	NM	33.1

NM = Not Measured

Positive Values indicate pressure

Negative Values indicate vacuum

* Could not locate - may be located beneath snow/ice pile

APPENDIX X

Soil & Groundwater Mass Calculations

Appendix X-1
Pump-n-Pantry Montrose #001
Contaminant Mass Calculations for Soil

SOIL DATA (mg/kg):

Parameter	TB-7B	TB-10B	TB-11B
Benzene	2.15	1.61	1.85
Ethylbenzene	35.7	12.0	28.9
Cumene	6.42	8.44	18.4
MTBE	0.328	0.512	0.318
Naphthalene	19.9	1.51	2.58
Toluene	0.767	33.0	66.7
Total Xylenes	10.1	56.5	143.0
1,2,4-TMB	25.3	28.2	47.5
1,3,5-TMB	36.0	8.1	15.1
TOTAL VOCs	**136.7**	**149.9**	**324.3**
Average		**203.6**	

SOIL PLUME:

plume depth	2	ft	0.6 m
plume width	40	ft	12.2 m
plume length	100	ft	30.5 m
density	1280	kg/m3	*assumed density of loam
TB-11B conc.	324.3	mg/kg	Max
Average conc.	203.6	mg/kg	Average
mass in plume (maximum)	94049	g	207.3 lb
mass in plume (average)	59045	g	130.2 lb

Appendix X-2
Pump-n-Pantry Montrose #001
Contaminant Mass Calculations for Groundwater

GROUNDWATER DATA (ug/l):

Well ID	Date	Benzene	Ethylbenzene	Cumene	MTBE	Naphthalene	Toluene	Total Xylenes	1,2,4-TMB	1,3,5-TMB	Total	Average	
MW-2	3/21/2018	246	265.0	10.8	4.9	21.1	24.2	151.0	161.0	4.9	889	985	ug/L
	6/8/2018	643	625.0	50.2	8.8	77.8	89.8	565.0	336.0	4.9	2401		
	9/11/2018	99.8	119.0	7.7	9.4	9.9	10.0	25.8	29.6	4.9	316		
	11/19/2018	61.8	158.0	11.8	5.0	10.0	9.0	15.0	57.6	5.0	333		
MW-3	3/21/2018	38.1	117	8.5	12.5	1.9	3.6	7.9	0.9	0.90	191	109	ug/L
	6/8/2018	48.4	83.1	14.0	0.9	5.4	3.0	2.9	2.3	0.90	161		
	9/11/2018	17.5	15.6	5.4	0.9	1.9	0.9	2.9	0.9	0.90	47		
	11/19/2018	11.8	14.0	2.9	0.9	1.9	0.9	2.9	0.9	0.90	37		
MW-4	3/21/2018	317	280	25.2	4.9	13.7	36.8	65.0	28.3	4.9	776	645	ug/L
	6/8/2018	163	132	24.6	4.9	18.9	14.6	37.4	16.2	4.9	417		
	9/11/2018	225	128	17.4	4.9	28.1	17.0	60.3	9.2	5.4	495		
	11/19/2018	343	245	23.0	4.9	35.2	35.0	157.0	34.3	15.4	893		
MW-5	3/21/2018	102	183	22.4	10.4	40.5	7.2	26.7	62.4	4.9	460	385	ug/L
	6/8/2018	98.8	124	20.9	5.3	9.9	4.9	14.9	18.5	4.9	302		
	9/11/2018	219	181	28.3	16.9	29.0	10.0	14.9	9.9	4.9	514		
	11/19/2018	123	73	19.6	10.4	9.9	4.9	14.9	4.9	4.9	265		
MW-15	3/21/2018	50.0	440	75.1	4.9	39.7	137	360	705	5	1817	1376	ug/L
	6/8/2018	94.4	405	90.5	4.9	54.4	71.8	288	746	76.6	1832		
	9/11/2018	52.8	343	72.4	4.9	17.6	32.9	152	315	4.9	996		
	11/19/2018	51.3	297	64.4	4.9	9.9	41.1	166	222	4.9	862		
										AVERAGE TOTAL VOC CONCENTRATION		**700**	**ug/L**

GROUNDWATER PLUME:

plume depth	15.5	ft		Plume dimensions determined via November 2018 Isopleths
plume width	100	ft		
plume length	200	ft		
porosity	0.3			
conversion factor	28.3168	L/ft3		
MW-15 conc.	1376	ug/L	Max	
Average conc.	700	ug/L	Average	
mass in plume (Max)	3624	g	7.99	lb
mass in plume (average)	1844	g	4.06	lb