



August 1, 2016

Mr. Joe Ghiold  
Project Manager  
Division of Waste Management, Hazardous Waste Section  
North Carolina Department of Environmental Quality  
1646 Mail Service Center  
Raleigh, North Carolina 27699

**Re: Full-Scale BioEnhancement Injection Activities Report  
Former Rental Towel and Uniform Service Site  
800 Goldsboro Street Northeast, Wilson, North Carolina  
NCEPA ID No. 986 215 572  
Apex Project Number 510304-005**

Dear Mr. Ghiold,

Apex Companies, LLC (Apex) is submitting this letter report on behalf of BI Ventures, Inc. (BI) summarizing full-scale bio-enhancement injection activities at the Former Rental Towel and Uniform Service Site (site) located at 800 Goldsboro Street Northeast, Wilson County, North Carolina (**Figure 1**). This letter report provides background information on the subject property, a summary of field activities completed, and anticipated future activities including groundwater monitoring.

## **BACKGROUND**

The site consists of approximately 3.4 acres with a 33,000 square foot industrial structure (**Figure 2**). The facility was previously used for laundering uniforms but was reportedly not used for dry cleaning operations. An underground storage tank (UST) was removed on the southeastern side of the building and a release of petroleum products was discovered. While the UST tank pit was open, personnel at the facility disposed of drums containing chlorinated solvents primarily consisting of tetrachloroethene (PCE) in the excavation. These drums subsequently leaked, resulting in a comingled groundwater plume of PCE and petroleum compounds. During assessment activities to delineate the extent of impact from the UST tank pit area, additional PCE impacts were discovered inside the building. The area of highest concentration is currently centered on monitoring wells MW-25, MW-26, and MW-28.

The business was closed sometime between 2000 and 2002 and since approximately 2012, the site had been idle. A buyer willing to purchase the property under a Brownfields Agreement (BFA) issued by the North Carolina Department of Environmental Quality (NCDEQ), Division of Waste Management (DWM), Brownfields Program closed on the property and work on the BFA is progressing. The Site is managed under the regulatory authority of the NCDEQ, DWM, Hazardous Waste Section (HWS).

In September 2013, Apex completed additional assessment activities which included soil and groundwater sampling. The results showed that concentrations of PCE and associated daughter products have decreased in the 12 years since the groundwater monitoring network was last sampled in 2001. The limits of the groundwater plume are similar to those previously observed,

but constituents of concern (COCs) are now present in several wells adjacent to the property boundary. Based on Site data, minor impacts observed in several of the deeper wells are likely limited to the subject site. Historically, there have been large amounts of anaerobic degradation of COCs. However, based on the low levels of *Dehalococcoides* (DHC), a bacterial group capable of complete reductive dechlorination of PCE to ethene, observed in the source zone, the degradation processes have diminished. This is likely due to the buildup of hydrochloric acid and resulting reduction in groundwater pH, which in some areas was less than five standard units.

In order to determine the applicability of bioremediation as a remedial alternative, Apex completed bench- and field-scale testing activities in March 2015 which included alkalinity testing, maximum oil retention testing, and a potable water injection test. The results of the bench- and field-scale testing are detailed in the August 2015 *Work Plan for Full-Scale BioEnhancement Injection Activities*. Based on the results of the 2013 groundwater monitoring data and the 2015 bench- and field-scale testing data, enhanced bioremediation was selected as the remedial alternative for the site. Apex developed an injection plan to target the areas of highest PCE and associated daughter product concentrations in the shallow aquifer within the footprint of the building and a reactive barrier outside of the building to intercept the shallow aquifer COC plume prior to the property boundary. In order to stay within the confines of the shallow aquifer, the maximum injection depth was approximately 25 feet below the ground surface (bgs) inside the building, and approximately 22 feet bgs outside of the building. Amendment delivery efforts were focused on the higher permeability sand layers within the shallow aquifer. Based on the results of the alkalinity testing, buffer material (CoBupHMg) along with electron donor material (EOS 598B424) were selected as bioremediation amendments. Based on the results of the potable water injection test, injection points were spaced on 15-foot centers within the target treatment areas resulting in a total of 49 proposed injection locations.

## **INJECTION ACTIVITIES**

Amendment delivery activities were completed over eight days between March 7, 2016 and March 16, 2016. A *Notice of Intent to Construct or Operate Injection Wells* was submitted to NCDEQ, Division of Water Resources, Underground Injection Control (UIC) Program on December 21, 2016. Based on the Permit by Rule Standards, a UIC Permit was not required since the injection area was less than 10,000 square feet in size. A copy of the *Notice of Intent to Construct or Operate Injection Wells* is included as **Appendix A**.

Apex contacted North Carolina One-Call to locate utilities at least three days prior to initiating injection activities. Apex also mobilized KCI, a private utility locating service, to the site to mark utilities at the proposed boring locations. Prior to mobilizing to the site, a site specific Health and Safety Plan (HASP) was developed for the proposed scope of work which addresses potential hazards to on-site workers and the community.

Amendment delivery was completed through Geoprobe™ direct push drill rods. Geoprobe injection services were provided by Geologic Exploration, Inc. of Statesville, North Carolina. Injection locations were spaced on nominal 15 foot centers except where the presence of underground utilities required offsetting some locations. A total of 49 points was initially planned however, the drill rig could not access four of the proposed injection locations inside the building due to obstructions. Therefore, the four obstructed points were eliminated and amendment delivery was achieved through a total of 45 direct push points. The planned amendment delivery volumes for the four inaccessible points were added to adjacent injection locations INJ-5 through INJ-8. Final injection point locations are presented in **Figure 3**.

A manifold piping system was used for amendment delivery to allow injection into multiple delivery points (between two and four points) simultaneously. Typically, amendment was delivered to a cluster of four adjacent delivery points at one time. Injection activities were sequenced such that amendment would not be injected into adjacent clusters consecutively. Perimeter injection locations inside the building were completed first followed by interior injection locations inside the building. The barrier wall injection locations outside the building were completed last.

Each injection point was uniquely identified and monitored during injection activities for injection start and stop times, delivery intervals, amendment dose, flow rate, and injection pressure. Injection logs are presented as **Appendix B** and a summary of amendment delivery parameters is presented in **Table 1**. Injections were performed from the bottom up with amendment delivered over two foot intervals to achieve uniform delivery across the vertical target treatment area. The target treatment area consisted of the upper aquifer which extends from the water table (approximately 7 to 8 feet bgs) to a maximum depth of 25 feet bgs inside the building and 22 bgs outside the building. Injection pressures were monitored continuously throughout the injection process in order to avoid fracturing the aquifer formation. Injection pressures ranged from 2.4 pounds per square inch (psi) to 41.0 psi based on injection depth. Additionally, flow rates were monitored and adjusted throughout the injection activities so as to deliver consistent amendment volumes throughout the treatment interval. Flow rates ranged from approximately 0.24 gallons per minute (gpm) to approximately 2.4 gpm depending on formation permeability and injection depth.

Bioremediation amendments (EOS 598B42 and CoBupHMg) were supplied by EOS Remediation, LLC (EOS) and dosing was determined using the results of the bench scale testing described above and a spreadsheet supplied by EOS. Due to the results of the alkalinity testing, the calculated buffer requirement was much higher than initially anticipated. Approximately half the calculated buffer dose was delivered during the full-scale injection activities. If subsequent groundwater monitoring events indicate that more buffer is required (i.e. pH readings remain below 6), additional injection events will be completed to adjust the groundwater pH. The CoBupHMg and EOS 598B424 were mixed in batches onsite with potable water as a ten percent dilution and introduced to the subsurface as one amendment mixture. All amendment batches were mixed for at least five minutes prior to injection to insure a homogeneous blend.

In total, approximately 4,200 pounds (lbs) of EOS 598B424 and 1,250 lbs of CoBupHMg were delivered to the subsurface. In order to best treat the area of highest impact, Apex focused the injection material in the interior of the building. Interior injection points received an average of approximately 151.9 gallons of amendment mixture each (approximately 8.3 gallons per vertical foot), while exterior points comprising the barrier received an average of approximately 84.5 gallons of amendment mixture each (approximately 6 gallons per vertical foot). Injection points INJ-5 through INJ-8, which received additional amendment originally planned for the eliminated injection point locations, received an average of approximately 283.1 gallons of amendment mixture each (approximately 15.7 gallons per vertical foot).

Before and after injection activities each day, existing monitoring wells in and near the target treatment areas were monitored for changes in water table levels as an indicator of radius of influence of injection activities or the presence of preferential flow paths (**Table 2**). While completing injection activities at locations inside the building (INJ-1 through INJ-34), monitoring wells MW-23 through MW-31 were observed for changes in depth to water table while monitoring wells MW-14, MW-34, MW-37, MW-38, and MW-42 and piezometer PZ-1 were observed during barrier wall injection activities (INJ-35 through INJ-45).

Changes in depth to water table were observed in all monitoring wells checked during interior injection activities (INJ-1 through INJ-34). Changes in water table depth were also noted in all monitoring wells gauged during barrier wall injection activities (INJ-35 through INJ-45) with the exception of monitoring well MW-42. No change was expected in monitoring well MW-42 because the screened interval for MW-42 is in a deeper aquifer zone than the target injection interval. The greatest change following injection activities (depth to water decreased by 4.50 feet) was observed in monitoring well MW-25 on March 10, 2016. This is likely attributed to injection activities completed on March 10, 2016 at points INJ-17 through INJ-21 which are located adjacent to monitoring well MW-25.

Upon completion of injection activities, all borings were backfilled and sealed using a bentonite slurry and repaired to surface grade with concrete inside the building and soil outside the building.

### **INVESTIGATION DERIVED WASTE**

Investigation derived waste (IDW) generated during injection activities consisted of only personal protective equipment (gloves, etc.) and approximately 0.5 gallons of decontamination water that were containerized, labelled, and staged in a secure area at the facility. Additional IDW generated during the upcoming monitoring activities in September will be added to the drums. Analytical data collected as part of monitoring activities will be used as practicable to characterize waste material.

Soil IDW generated during previous site activities and stored onsite in seven 55-gallon steel drums were disposed of on June 22, 2016 by Republic Services, Inc. The seven drums were transported offsite by Jesse Wade of Shavender Trucking, LLC for disposal. Based on the analytical results, the waste materials were transported to East Carolina Environmental Resource Conservation and Recovery Act Subtitle D Landfill. A copy of the 2016 waste manifest is provided in **Appendix C**.

### **FUTURE ACTIVITIES**

Four limited groundwater sampling events will be conducted over a two year period to monitor the performance of the amendment injections. Groundwater samples will be collected from ten onsite monitoring wells located at the perimeter of the site and within the target treatment area including MW-14, MW-24, MW-25, MW-26, MW-28, MW-29, MW-31, MW-34, MW-36 (upgradient), and MW-38. All ten wells are shallow monitoring wells that extend into the unconfined upper aquifer where the amendments were delivered. These wells were not used for injection activities.

Groundwater sampling and purging will be conducted using low flow methods in general accordance with the EPA Guideline Document 'Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures' (EPA/540/S-95/504, 1996) and with the procedures outlined in the USEPA Region IV SESD Field Branches Quality System and Technical Procedures. A site plan with the proposed sampling locations is provided as **Figure 4**.

Upon arriving onsite, all wells will be opened and allowed to equilibrate. Wells will be gauged with a decontaminated water level meter in accordance with procedures outlined in the USEPA Region IV SESD Field Branches Quality System and Technical Procedures. The wells will be gauged in order of impact, moving from wells which have historically not exhibited detectable concentrations of COCs to those which have exhibited the highest levels.

All wells will be purged and sampled via low flow protocol using a peristaltic pump. The wells will be sampled in order of impact, moving from wells which have historically not exhibited detectable concentrations of COCs to those which have exhibited the highest levels. During low-flow well purging, groundwater chemistry parameters will be recorded at five minute intervals using a Horiba U-52 multi-probe meter or the like which measures dissolved oxygen, electric conductivity, temperature, pH, and turbidity. Groundwater samples will be collected when water chemistry parameters have stabilized.

Following purging, groundwater samples from each well will be placed in laboratory-supplied, pre-preserved glassware for analysis of volatile organic compounds (VOCs) according to EPA SW-846 Method 8260B. In addition to VOC analysis, groundwater samples from five wells (MW-26, MW-29, MW-31, MW-34, and MW-36) may be analyzed for the presence of select monitored natural attenuation parameters including volatile fatty acids, select DHC functional genes, nitrate (Method 9056A), sulfate (Method 9056A), manganese (EPA Method 6010C), ferrous iron (SM3500), and dissolved gases including methane, ethane, and ethene (SW3810).

## **CONCLUSIONS**

Bioremediation was selected as the remedial alternative to address PCE impacts in the shallow aquifer at the Former Rental Towel and Uniform Service site. Between March 7, 2016 and March 16, 2016, Apex completed delivery of approximately 4,200 lbs of EOS 598B42 and approximately 1,250 lbs of CoBupHMg to the shallow aquifer via 45 direct push delivery points. Delivery points were spaced on 15 foot centers and located in the areas of highest PCE and associated daughter product concentrations in the shallow aquifer within the footprint of the building. Amendments were also injected in a reactive barrier outside of the building to intercept the shallow aquifer COC plume prior to the property boundary. Four groundwater sampling events will be conducted over a two year period to monitor the performance of the injections. The first monitoring event is planned for September 2016.

If you have any questions regarding this report, please us at (704) 799-6390.

Sincerely,

**Apex Companies, LLC**

*Anne Haluska*

Annie Haluska, PE  
Environmental Engineer

*Kathleen Roush*

Kathleen Roush, P.G  
Division Manager/Principal Geologist



cc: Mr. George House – Brooks, Pierce, McLendon, Humphry & Leonard, LLP  
Ed Fulford

## TABLES

**Table 1**  
**Summary of Injection Point Monitoring Parameters**  
**Former Rental Towel Uniform Service**  
**Wilson, North Carolina**

<b>Injection Point ID</b>	<b>Date of Injection</b>	<b>Injection Duration (Minutes)</b>	<b>Maximum Recorded Flow Rate (GPM)</b>	<b>Maximum Recorded Pressure (PSI)</b>	<b>Approximate Amendment Volume Injected (Gallons)</b>
INJ-1	3/7/2016 *	140	1.89	38.7	143.1
INJ-2	3/7/2016 *	140	2.40	34.5	159.6
INJ-3	3/7/2016 *	140	1.57	38.8	172.3
INJ-4	3/7/2016 *	140	1.39	10.5	155.7
INJ-5	3/8/2016	388	1.97	17.0	299.7
INJ-6	3/8/2016	388	1.99	31.2	266.7
INJ-7	3/8/2016	388	1.88	29.1	266.1
INJ-8	3/8/2016	388	1.92	31.1	299.8
INJ-9	3/9/2016	152	1.79	24.5	165.4
INJ-10	3/9/2016	160	1.64	26.5	153.7
INJ-11	3/9/2016	147	1.62	38.1	152.6
INJ-12	3/9/2016	157	1.56	26.2	153.1
INJ-13	3/9/2016	183	1.87	27.5	152.5
INJ-14	3/9/2016	173	1.92	29.0	154.5
INJ-15	3/9/2016	153	1.99	31.1	155.3
INJ-16	3/9/2016	147	1.78	27.0	150.5
INJ-17	3/10/2016	156	1.98	33.3	154.9
INJ-18	3/10/2016	145	1.85	25.6	152.9
INJ-19	3/10/2016	155	1.80	32.8	152.2
INJ-20	3/10/2016	134	1.84	25.8	152.7
INJ-21	3/10/2016	185	1.79	34.0	151.7
INJ-22	3/10/2016	192	1.69	26.3	151.3
INJ-23	3/10/2016	180	1.74	25.3	152.6
INJ-24	3/10/2016	165	1.73	23.8	152.7
INJ-25	3/11/2016	172	1.77	27.6	128.1
INJ-26	3/11/2016	182	1.80	41.0	127.8
INJ-27	3/11/2016	173	1.80	29.8	150.0
INJ-28	3/14/2016	165	1.79	24.1	153.6
INJ-29	3/14/2016	137	2.00	21.8	151.5
INJ-30	3/14/2016	136	1.97	40.5	152.9
INJ-31	3/14/2016	137	2.00	23.3	151.3
INJ-32	3/14/2016	139	1.88	27.0	151.6
INJ-33	3/14/2016	128	1.40	24.2	151.2
INJ-34	3/14/2016	122	1.69	25.5	150.9
INJ-35	3/15/2016	134	1.21	32.5	84.7
INJ-36	3/15/2016	140	1.22	23.1	84.2
INJ-37	3/15/2016	154	1.60	31.3	83.9
INJ-38	3/15/2016	158	1.34	22.4	85.1
INJ-39	3/15/2016	102	1.56	24.8	85.4
INJ-40	3/15/2016	91	1.56	20.0	84.5
INJ-41	3/15/2016	98	1.96	24.4	84.8
INJ-42	3/15/2016	87	1.63	28.1	85.2
INJ-43	3/16/2016	112	1.58	29.3	82.3
INJ-44	3/16/2016	103	1.57	31.2	85.0
INJ-45	3/16/2016	101	1.55	26.6	84.1

**Notes**

GPM = gallons per minute

PSI = pounds per square inch

\* = Injection at these points began 3/7/16 and was completed on 3/8/16

**Table 2**  
**Summary of Gauging Data**  
**Former Rental Towel and Uniform Service**  
**Wilson, North Carolina**

<b>Monitor Well No.</b>	<b>Date</b>	<b>Pre- or Post- Injection</b>	<b>Evidence of EOS? (Y/N)</b>	<b>Depth to Water (feet bgs)</b>	<b>Change in Depth to Water (feet)</b>	
MW-23	3/7/2016	Pre	N	6.59	-0.72	
		Post	N	5.87		
	3/8/2016	Pre	N	6.53	-0.33	
		Post	N	6.20		
	3/9/2016	Pre	N	6.39	-0.89	
		Post	N	5.50		
	3/10/2016	Pre	N	6.19	-1.44	
		Post	N	4.75		
	3/11/2016	Pre	N	6.00	-0.02	
		Post	N	5.98		
	3/14/2016	Pre	N	6.51	-0.63	
		Post	N	5.88		
	MW-24	3/7/2016	Pre	N	7.18	-0.88
			Post	N	6.30	
3/8/2016		Pre	N	6.10	-0.34	
		Post	N	5.76		
3/9/2016		Pre	N	6.96	-1.06	
		Post	N	5.90		
3/10/2016		Pre	N	6.76	-3.66	
		Post	N	3.10		
3/11/2016		Pre	N	6.59	-0.28	
		Post	N	6.31		
3/14/2016		Pre	N	7.04	-0.99	
		Post	N	6.05		
MW-25		3/7/2016	Pre	N	7.48	-1.19
			Post	N	6.29	
	3/8/2016	Pre	N	7.40	-1.46	
		Post	N	5.94		
	3/9/2016	Pre	N	7.04	-2.24	
		Post	N	4.80		
	3/10/2016	Pre	N	7.00	-4.50	
		Post	N	2.50		
	3/11/2016	Pre	N	6.76	-0.96	
		Post	N	5.80		
	3/14/2016	Pre	N	7.32	-2.20	
		Post	N	5.12		

**Table 2**  
**Summary of Gauging Data**  
**Former Rental Towel and Uniform Service**  
**Wilson, North Carolina**

Monitor Well No.	Date	Pre- or Post- Injection	Evidence of EOS? (Y/N)	Depth to Water (feet bgs)	Change in Depth to Water (feet)	
MW-26	3/7/2016	Pre	N	7.49	-1.54	
		Post	N	5.95		
	3/8/2016	Pre	N	7.40	-1.37	
		Post	N	6.03		
	3/9/2016	Pre	N	7.13	-1.23	
		Post	N	5.90		
	3/10/2016	Pre	N	6.72	-1.69	
		Post	N	5.03		
	3/11/2016	Pre	N	6.95	-1.57	
		Post	N	5.38		
	3/14/2016	Pre	N	7.32	-2.05	
		Post	N	5.27		
	MW-27	3/7/2016	Pre	N	7.62	-0.38
			Post	N	7.24	
3/8/2016		Pre	N	7.60	-0.30	
		Post	N	7.30		
3/9/2016		Pre	N	7.45	-0.70	
		Post	N	6.75		
3/10/2016		Pre	N	7.28	-1.98	
		Post	N	5.30		
3/11/2016		Pre	N	7.15	-0.15	
		Post	N	7.00		
3/14/2016		Pre	N	7.55	-0.65	
		Post	N	6.90		
MW-28		3/7/2016	Pre	N	7.59	-0.29
			Post	N	7.30	
	3/8/2016	Pre	N	7.52	-2.92	
		Post	N	4.60		
	3/9/2016	Pre	N	6.95	-0.54	
		Post	Y	6.41		
	3/10/2016	Pre	Y	7.11	-1.04	
		Post	Y	6.07		
	3/11/2016	Pre	Y	6.95	-1.15	
		Post	Y	5.80		
	3/14/2016	Pre	Y	7.48	-1.49	
		Post	Y	5.99		

**Table 2**  
**Summary of Gauging Data**  
**Former Rental Towel and Uniform Service**  
**Wilson, North Carolina**

Monitor Well No.	Date	Pre- or Post-Injection	Evidence of EOS? (Y/N)	Depth to Water (feet bgs)	Change in Depth to Water (feet)	
MW-29	3/7/2016	Pre	N	6.82	-0.34	
		Post	N	6.48		
	3/8/2016	Pre	N	6.79	-0.18	
		Post	N	6.61		
	3/9/2016	Pre	N	6.70	0.08	
		Post	N	6.78		
	3/10/2016	Pre	N	6.52	-0.50	
		Post	N	6.02		
	3/11/2016	Pre	N	6.29	0.12	
		Post	N	6.41		
	3/14/2016	Pre	N	6.77	-0.38	
		Post	N	6.39		
	MW-30	3/7/2016	Pre	N	7.66	-0.16
			Post	N	7.50	
3/8/2016		Pre	N	7.67	-0.67	
		Post	N	7.00		
3/9/2016		Pre	N	7.38	-0.43	
		Post	N	6.95		
3/10/2016		Pre	N	7.44	-1.57	
		Post	N	5.87		
3/11/2016		Pre	N	7.39	-0.66	
		Post	N	6.73		
3/14/2016		Pre	N	7.62	-0.62	
		Post	N	7.00		
MW-31		3/7/2016	Pre	N	7.55	-0.10
			Post	N	7.45	
	3/8/2016	Pre	N	7.49	0.25	
		Post	N	7.74		
	3/9/2016	Pre	N	6.07	0.53	
		Post	N	6.60		
	3/10/2016	Pre	N	7.00	0.02	
		Post	Y	7.02		
	3/11/2016	Pre	Y	6.45	-0.05	
		Post	Y	6.40		
	3/14/2016	Pre	Y	7.37	-0.63	
		Post	Y	6.74		

**Table 2**  
**Summary of Gauging Data**  
**Former Rental Towel and Uniform Service**  
**Wilson, North Carolina**

Monitor Well No.	Date	Pre- or Post- Injection	Evidence of EOS? (Y/N)	Depth to Water (feet bgs)	Change in Depth to Water (feet)
MW-14	3/15/2016	Pre	N	4.44	-0.19
		Post	N	4.25	
	3/16/2016	Pre	N	4.26	0.99
		Post	N	5.25	
MW-34	3/15/2016	Pre	N	6.66	-1.79
		Post	N	4.87	
	3/16/2016	Pre	N	6.29	-1.04
		Post	N	5.25	
MW-37	3/15/2016	Pre	N	3.53	-1.43
		Post	N	2.10	
	3/16/2016	Pre	N	3.00	-0.03
		Post	N	2.97	
MW-38	3/15/2016	Pre	N	3.84	-0.71
		Post	N	3.13	
	3/16/2016	Pre	N	3.73	-0.16
		Post	N	3.57	
MW-42	3/15/2016	Pre	N	3.02	0.00
		Post	N	3.02	
	3/16/2016	Pre	N	2.96	0.00
		Post	N	2.96	
PZ-1	3/15/2016	Pre	N	4.95	-1.31
		Post	N	3.64	
	3/16/2016	Pre	N	4.31	-1.57
		Post	N	2.74	

**Notes**

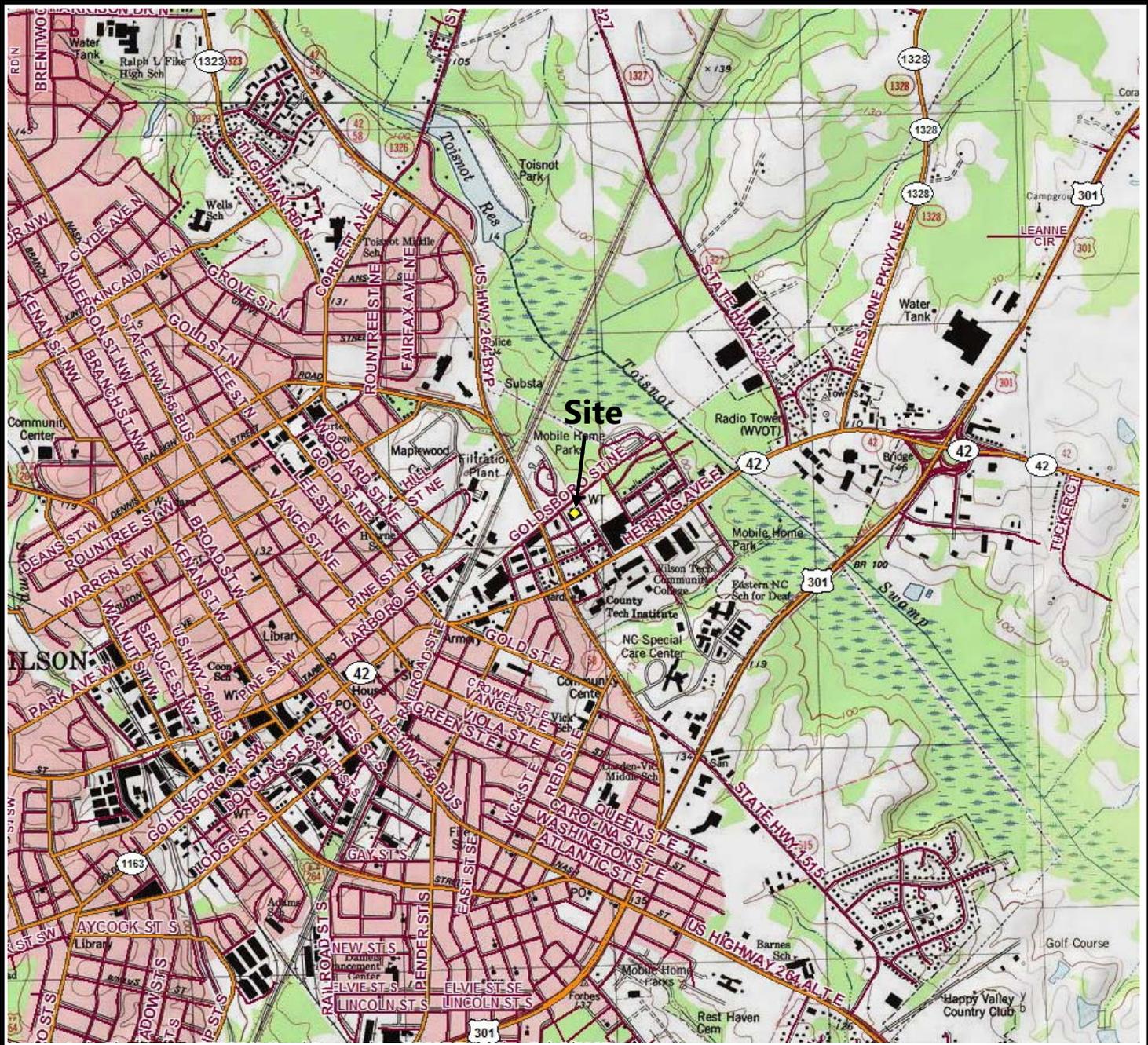
bgs = below ground surface

N = no EOS observed in monitoring well

Y = EOS observed in monitoring well

## FIGURES

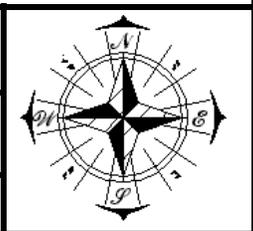
**Figure 1**  
**Site Location Map**  
**Former Rental Towel and Uniform Service**  
**800 Goldsboro Street Northeast**  
**Wilson, NC**

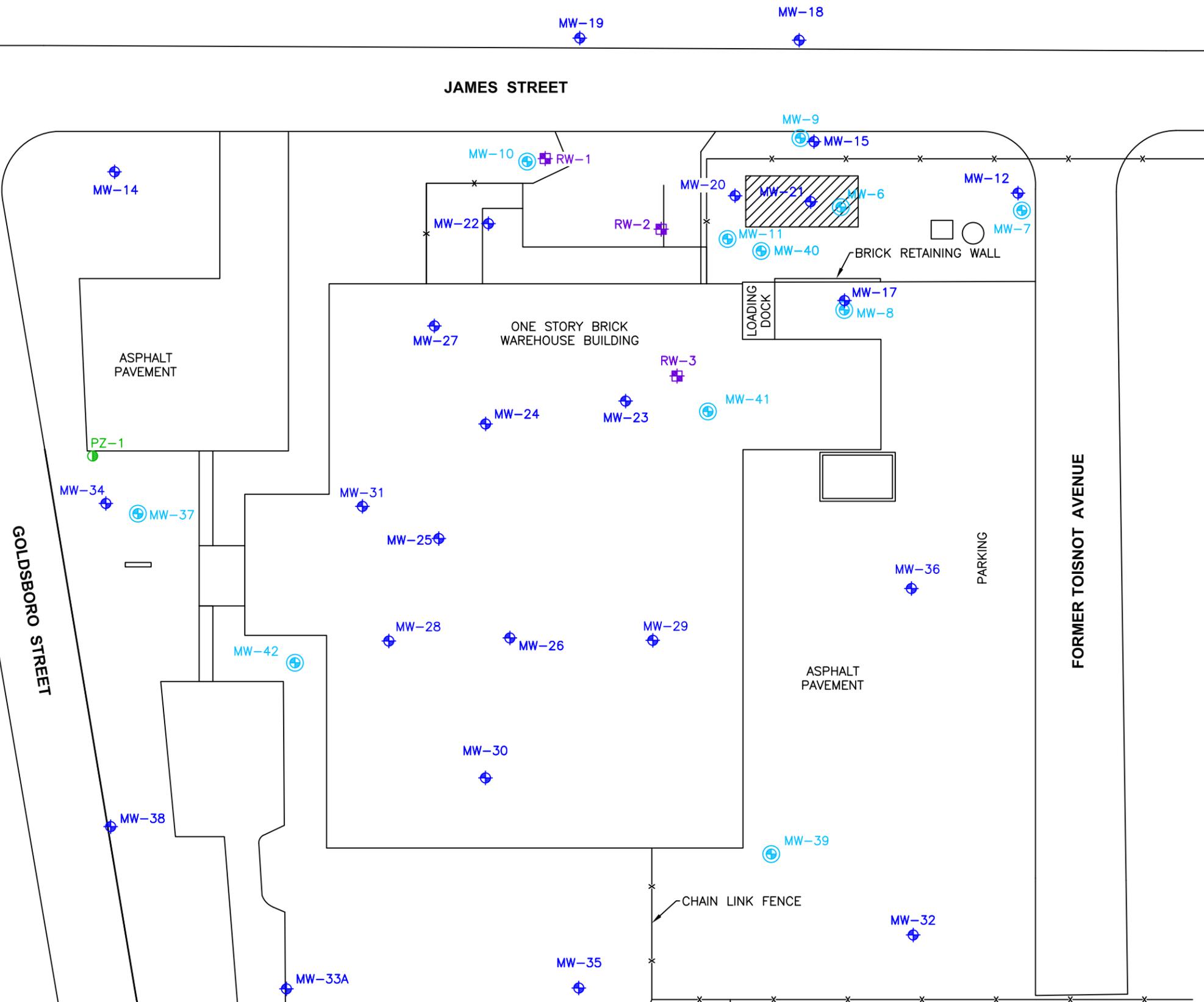
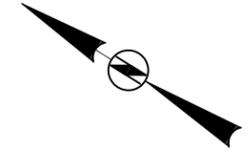



Apex Companies LLC  
 10610 Metromont Parkway  
 Charlotte, NC 28269

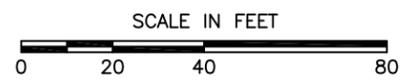
U.S. Department of the Interior  
 Geological Survey  
 7.5 Minute Series Topographic Map  
 Contour Interval: 10 feet  
 Scale: 1 inch = 2000 feet  
 Wilson, NC

Project: Former Rental Towel and Uniform Service  
 Client: BI Ventures, Inc.  
 Apex Job #: 510304.005





- LEGEND**
-  APPROXIMATE EXCAVATION LOCATION
  -  UPPER AQUIFER MONITORING WELL
  -  LOWER AQUIFER MONITORING WELL
  -  RECOVERY WELL
  -  PIEZOMETER LOCATION



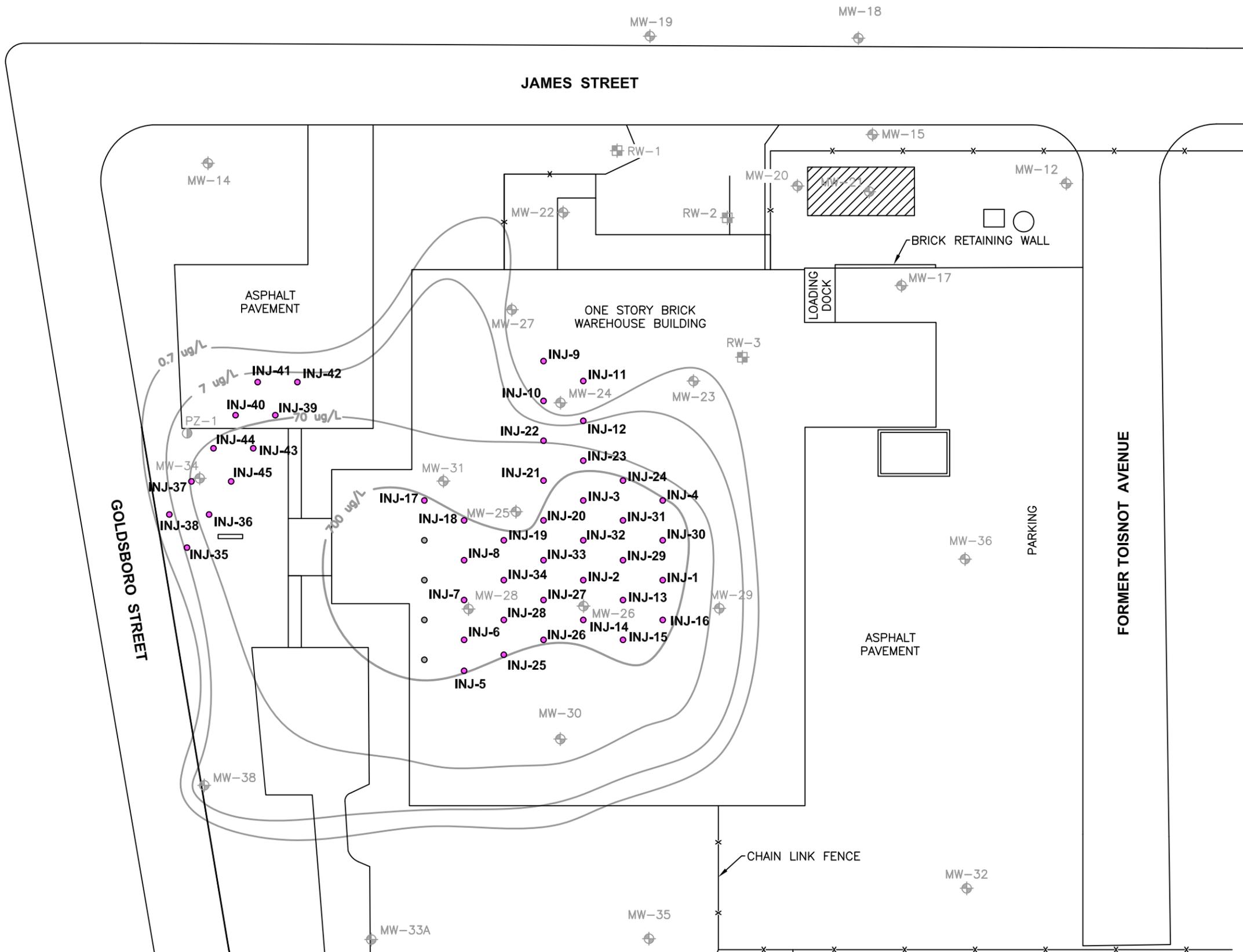
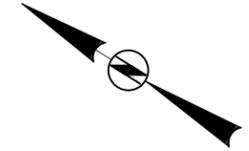
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DATE	7-15-16
SCALE	AS SHOWN
CAD NO.	510304.005
PRJ NO.	510304-005

SITE PLAN  
 FORMER RENTAL TOWEL AND UNIFORM SERVICE  
 800 GOLDSBORO ST NE  
 WILSON, NORTH CAROLINA



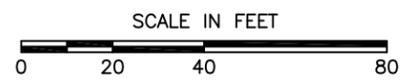
FIGURE

2



**LEGEND**

- APPROXIMATE EXCAVATION LOCATION
- UPPER AQUIFER MONITORING WELL
- RECOVERY WELL
- PIEZOMETER LOCATION
- INJECTION POINT LOCATION
- ELIMINATED INJECTION POINT
- TETRACHLOROETHENE (PCE) ISOCONTOUR (2L STANDARD 0.7 ug/L) BASED ON SEPTEMBER 2013 DATA



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DATE	7-15-16
SCALE	AS SHOWN
CAD NO.	510304.005
PRJ NO.	510304-005

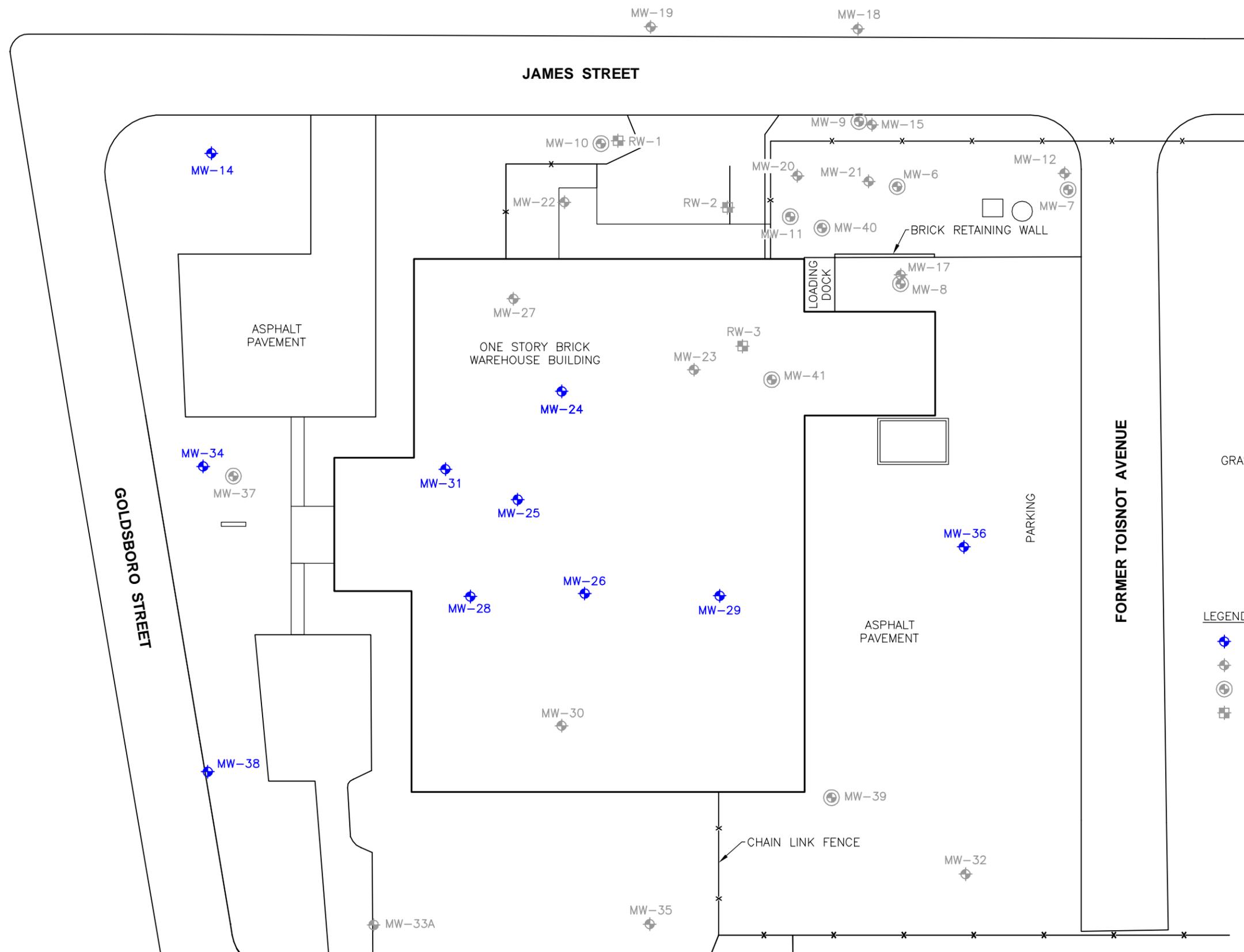
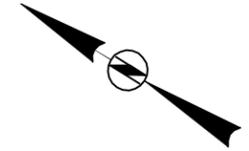
INJECTION POINT LOCATIONS ON PCE ISOCONTOUR  
(SEPTEMBER 2013)

FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NORTH CAROLINA



FIGURE

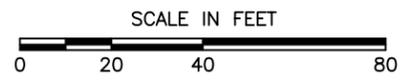
3



GRASS OPEN AREA

LEGEND

- UPPER AQUIFER MONITOR WELL TO BE SAMPLED
- UPPER AQUIFER MONITOR WELL
- LOWER AQUIFER MONITOR WELL
- RECOVERY WELL



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DATE	6-22-15
SCALE	AS SHOWN
CAD NO.	510304.04B
PRJ NO.	510304.004

PROPOSED GROUNDWATER MONITORING PLAN  
 FORMER RENTAL TOWEL AND UNIFORM SERVICE  
 800 GOLDSBORO ST NE  
 WILSON, NC



## **APPENDIX A**

### **Notification of Intent to Construct or Operate Injection Wells**

**NOTIFICATION OF INTENT TO CONSTRUCT OR OPERATE INJECTION WELLS**

*The following are “permitted by rule” and do not require an individual permit when constructed in accordance with the rules of 15A NCAC 02C .0200. This form shall be submitted at least 2 weeks prior to injection.*

**AQUIFER TEST WELLS (15A NCAC 02C .0220)**

These wells are used to inject uncontaminated fluid into an aquifer to determine aquifer hydraulic characteristics.

**IN SITU REMEDIATION (15A NCAC 02C .0225) or TRACER WELLS (15A NCAC 02C .0229):**

- 1) Passive Injection Systems - In-well delivery systems to diffuse injectants into the subsurface. Examples include ORC socks, iSOC systems, and other gas infusion methods.
- 2) Small-Scale Injection Operations – Injection wells located within a land surface area not to exceed 10,000 square feet for the purpose of soil or groundwater remediation or tracer tests. **An individual permit shall be required for test or treatment areas exceeding 10,000 square feet.**
- 3) Pilot Tests - Preliminary studies conducted for the purpose of evaluating the technical feasibility of a remediation strategy in order to develop a full scale remediation plan for future implementation, and where the surface area of the injection zone wells are located within an area that does not exceed five percent of the land surface above the known extent of groundwater contamination. **An individual permit shall be required to conduct more than one pilot test on any separate groundwater contaminant plume.**
- 4) Air Injection Wells - Used to inject ambient air to enhance in-situ treatment of soil or groundwater.

*Print Clearly or Type Information. Illegible Submittals Will Be Returned As Incomplete.*

**DATE:** \_\_\_\_\_, 20\_\_\_\_ **PERMIT NO.** \_\_\_\_\_ (to be filled in by DWR)

**A. WELL TYPE TO BE CONSTRUCTED OR OPERATED**

- (1) \_\_\_\_\_ Air Injection Well.....Complete sections B-F, K, N
- (2) \_\_\_\_\_ Aquifer Test Well.....Complete sections B-F, K, N
- (3) \_\_\_\_\_ Passive Injection System.....Complete sections B-F, H-N
- (4)   X   Small-Scale Injection Operation.....Complete sections B-N
- (5) \_\_\_\_\_ Pilot Test.....Complete sections B-N
- (6) \_\_\_\_\_ Tracer Injection Well.....Complete sections B-N

**B. STATUS OF WELL OWNER:** Business/Organization

**C. WELL OWNER** – State name of entity and name of person delegated authority to sign on behalf of the business or agency:

Name: Jim Divers, BI Ventures, Inc., c/o Mr. George House, Brooks, Pierce, McLendon, Humphry & Leonard

Mailing Address: PO Box 26000

City: Greensboro State: NC Zip Code: 27420 County: Guilford

Day Tele No.: 336-373-8850 Cell No.: \_\_\_\_\_

EMAIL Address: ghouse@brookspierce.com Fax No.: 336-378-1001

**D. PROPERTY OWNER** (if different than well owner)

Name: Double E, LLC

Mailing Address: 800 Goldsboro St NE

City: Wilson State: NC Zip Code: 27893 County: Wilson

Day Tele No.: 252-205-1040 Cell No.: \_\_\_\_\_

EMAIL Address: ed@fulfords.us Fax No.: \_\_\_\_\_

**E. PROJECT CONTACT** - Person who can answer technical questions about the proposed injection project.

Name: Anne Haluska

Mailing Address: 10610 Metromont Parkway, Suite 206

City: Charlotte State: NC Zip Code: 28269 County: Mecklenburg

Day Tele No.: 704-799-6390 x 4804 Cell No.: 757-817-0914

EMAIL Address: ahaluska@apexcos.com Fax No.: \_\_\_\_\_

**F. PHYSICAL LOCATION OF WELL SITE**

(1) Physical Address: 800 Goldsboro St NE

\_\_\_\_\_ County: Wilson

City: Wilson State: NC Zip Code: 27893

(2) Geographic Coordinates: Latitude\*\*: \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " or 35 °.732465

Longitude\*\*: \_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " or -77 °.898298

Reference Datum: \_\_\_\_\_ Accuracy: \_\_\_\_\_

Method of Collection: Google Maps

\*\*FOR AIR INJECTION AND AQUIFER TEST WELLS ONLY: A FACILITY SITE MAP WITH PROPERTY BOUNDARIES MAY BE SUBMITTED IN LIEU OF GEOGRAPHIC COORDINATES.

**G. TREATMENT AREA**

Land surface area of contaminant plume: 41,000 square feet

Land surface area of inj. well network: 9,990 square feet ( $\leq 10,000$  ft<sup>2</sup> for small-scale injections)

Percent of contaminant plume area to be treated: 24% (must be  $\leq 5\%$  of plume for pilot test injections)

**H. INJECTION ZONE MAPS** – Attach the following to the notification.

- (1) Contaminant plume map(s) with isoconcentration lines that show the horizontal extent of the contaminant plume in soil and groundwater, existing and proposed monitoring wells, and existing and proposed injection wells; and
- (2) Cross-section(s) to the known or projected depth of contamination that show the horizontal and vertical extent of the contaminant plume in soil and groundwater, changes in lithology, existing and proposed monitoring wells, and existing and proposed injection wells.
- (3) Potentiometric surface map(s) indicating the rate and direction of groundwater movement, plus existing and proposed wells.

**I. DESCRIPTION OF PROPOSED INJECTION ACTIVITIES** – Provide a brief narrative regarding the purpose, scope, and goals of the proposed injection activity. This should include the rate, volume, and duration of injection over time.

We will be injecting EOS 598B42 and CoBupHMg buffer supplied by EOS Remediation, LLC to stimulate reductive dechlorination of PCE and associated daughter products in the site groundwater suspected source zone. The two amendments will be mixed onsite with potable water and introduced to the subsurface as one amendment mixture via direct push methods. The estimated total volume of amendments and dilution water is 7,724 gallons. The target flow rate at each point is 1.25 gpm. Amendment will be injected in up to four injection points simultaneously for a total flow rate of 5 gpm resulting in an estimated injection duration of 32 hours.

**J. INJECTANTS** – Provide a MSDS and the following for each injectant. Attach additional sheets if necessary.

*NOTE: Approved injectants (tracers and remediation additives) can be found online at <http://portal.ncdenr.org/web/wq/aps/gwpro>. All other substances must be reviewed by the Division of Public Health, Department of Health and Human Services. Contact the UIC Program for more info (919-807-6496).*

Injectant: EOS 598B42  
Volume of injectant: 550 gallons  
Concentration at point of injection: 10:1 dilution  
Percent if in a mixture with other injectants: 7.1% by volume

Injectant: CoBupHMg  
Volume of injectant: 125 gallons  
Concentration at point of injection: 10:1 dilution  
Percent if in a mixture with other injectants: 1.6% by volume

Injectant: \_\_\_\_\_  
Volume of injectant: \_\_\_\_\_  
Concentration at point of injection: \_\_\_\_\_  
Percent if in a mixture with other injectants: \_\_\_\_\_

**K. WELL CONSTRUCTION DATA**

- (1) Number of injection wells: 49 Proposed 0 Existing
- (2) Provide well construction details for each injection well in a diagram or table format. A single diagram or line in a table can be used for multiple wells with the same construction details. Well construction details shall include the following:
  - (a) well type as permanent, direct-push, or subsurface distribution system (infiltration gallery)
  - (b) depth below land surface of grout, screen, and casing intervals
  - (c) well contractor name and certification number

**L. SCHEDULES** – Briefly describe the schedule for well construction and injection activities.

Injections will be performed through direct push points and total time for construction and injection activities is estimated at 8 days.

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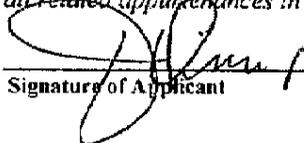
**M. MONITORING PLAN** – Describe below or in separate attachment a monitoring plan to be used to determine if violations of groundwater quality standards specified in [Subchapter 02L](#) result from the injection activity.

Four limited groundwater sampling events will be conducted over a two year period to monitor the performance of the amendment injections. The first sampling event will be conducted six months following the completion of the amendment injections and subsequent sampling events will be conducted semi-annually. Groundwater samples will be collected from ten onsite monitoring wells located at the perimeter of the site and within the target treatment area including MW-14, MW-24, MW-25, MW-26, MW-28, MW-29, MW-31, MW-34, MW-36 (upgradient), and MW-38. The wells are located upgradient, within the injection area, and downgradient limits of the property. All ten wells are shallow monitoring wells that extend into the unconfined upper aquifer where the amendments will be delivered. These wells will not be used for injection activities, but monitoring only. Groundwater sampling and purging will be conducted using low flow methods in general accordance with the EPA Guideline Document ‘Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures’ (EPA/540/S-95/504, 1996) and with the procedures outlined in the USEPA Region IV SESD Field Branches Quality System and Technical Procedures. Groundwater samples from all ten wells will be analyzed for VOCs according to EPA SW-846 Method 8260B. In addition to VOC analysis, groundwater samples from five wells (MW-26, MW-29, MW-31, MW-34, and MW-36) will be analyzed for the presence of select monitored natural attenuation parameters including nitrate (Method 9056A), sulfate (Method 9056A), manganese (EPA Method 6010C), ferrous iron (SM3500), and dissolved gases including methane, ethane, and ethene (SW3810).

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**N. SIGNATURE OF APPLICANT AND PROPERTY OWNER**

**APPLICANT:** "I hereby certify, under penalty of law, that I am familiar with the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining said information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties, including the possibility of fines and imprisonment, for submitting false information. I agree to construct, operate, maintain, repair, and if applicable, abandon the injection well and all related appurtenances in accordance with the 15A NCAC 02C 0200 Rules."



Signature of Applicant

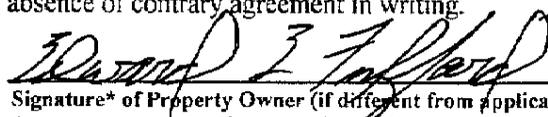


Print or Type Full Name

**PROPERTY OWNER (if the property is not owned by the permit applicant):**

"As owner of the property on which the injection well(s) are to be constructed and operated, I hereby consent to allow the applicant to construct each injection well as outlined in this application and agree that it shall be the responsibility of the applicant to ensure that the injection well(s) conform to the Well Construction Standards (15A NCAC 02C .0200)."

"Owner" means any person who holds the fee or other property rights in the well being constructed. A well is real property and its construction on land shall be deemed to vest ownership in the land owner, in the absence of contrary agreement in writing.



Signature\* of Property Owner (if different from applicant)

*DOUBLE E. LLC*

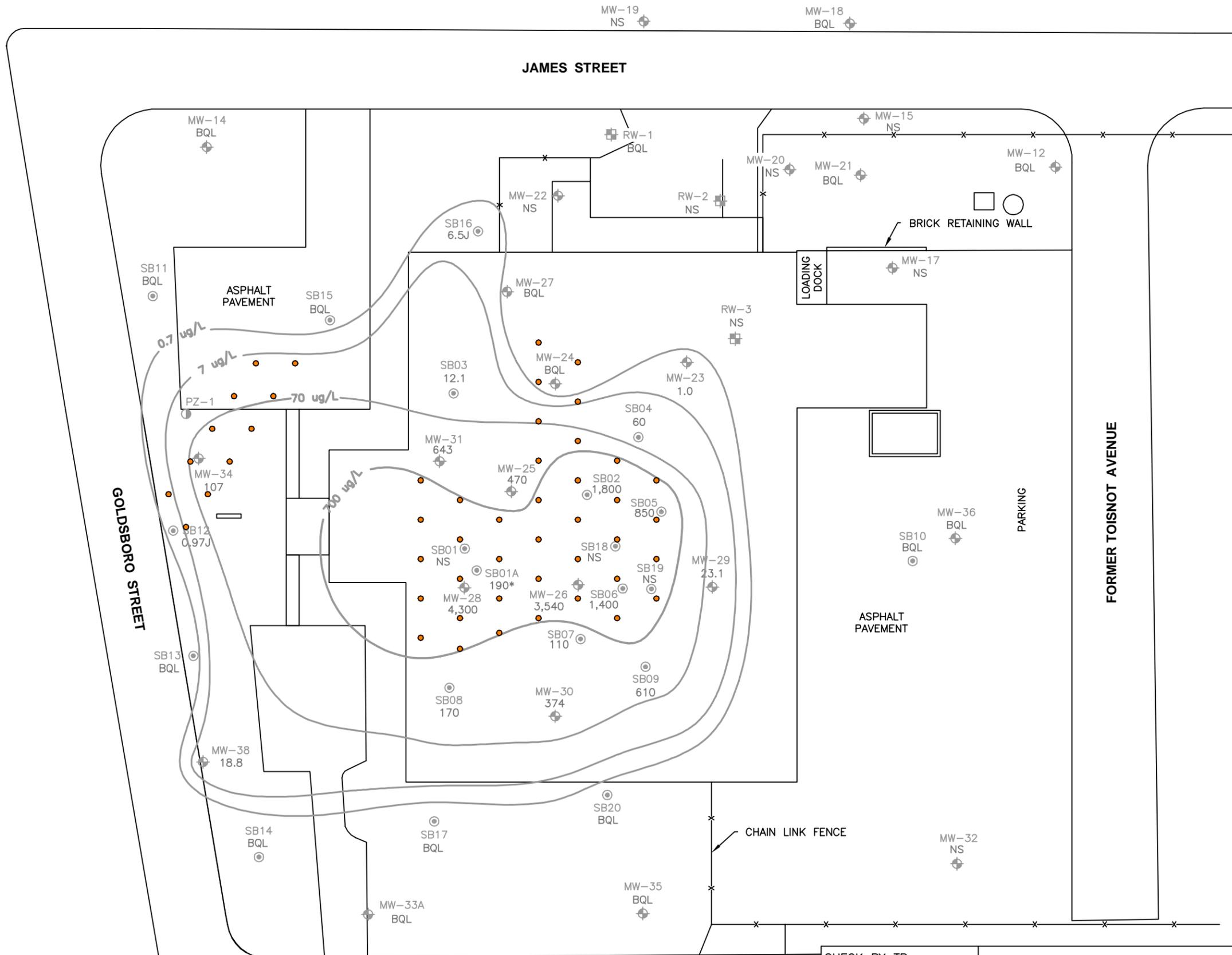


Print or Type Full Name

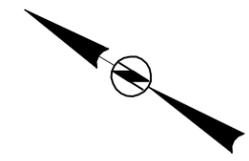
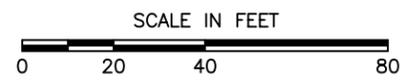
\* An access agreement between the applicant and property owner may be submitted in lieu of a signature on this form.

**Submit the completed notification package to:**

DWR – UIC Program  
1636 Mail Service Center  
Raleigh, NC 27699-1636  
Telephone: (919) 807-6464



- LEGEND**
- UPPER AQUIFER MONITOR WELL
  - RECOVERY WELL
  - PIEZOMETER LOCATION
  - SOIL BORING (SEPT. 2013)  
(GRAB GROUNDWATER SAMPLE)
  - PROPOSED INJECTION POINT LOCATIONS
  - 840 TETRACHLOROETHENE (PCE)  
CONCENTRATION (SEPTEMBER 2013)
  - 30 ug/L TETRACHLOROETHENE (PCE)  
ISOCONTOUR (2L STANDARD 0.7 ug/L)  
BASED ON SEPTEMBER 2013 DATA
  - BQL RESULT LESS THAN LABORATORY  
PRACTICAL QUANTITATION LIMIT
  - NS WELL/BORING NOT SAMPLED
  - J ESTIMATED CONCENTRATION
- \* VALUE NOT INCLUDED IN CONTOUR  
BECAUSE GRAB SAMPLE COLLECTED AT  
DEEPER INTERVAL
- RESULTS SHOWN IN MICROGRAMS  
PER LITER (ug/L)
- GRASS OPEN AREA



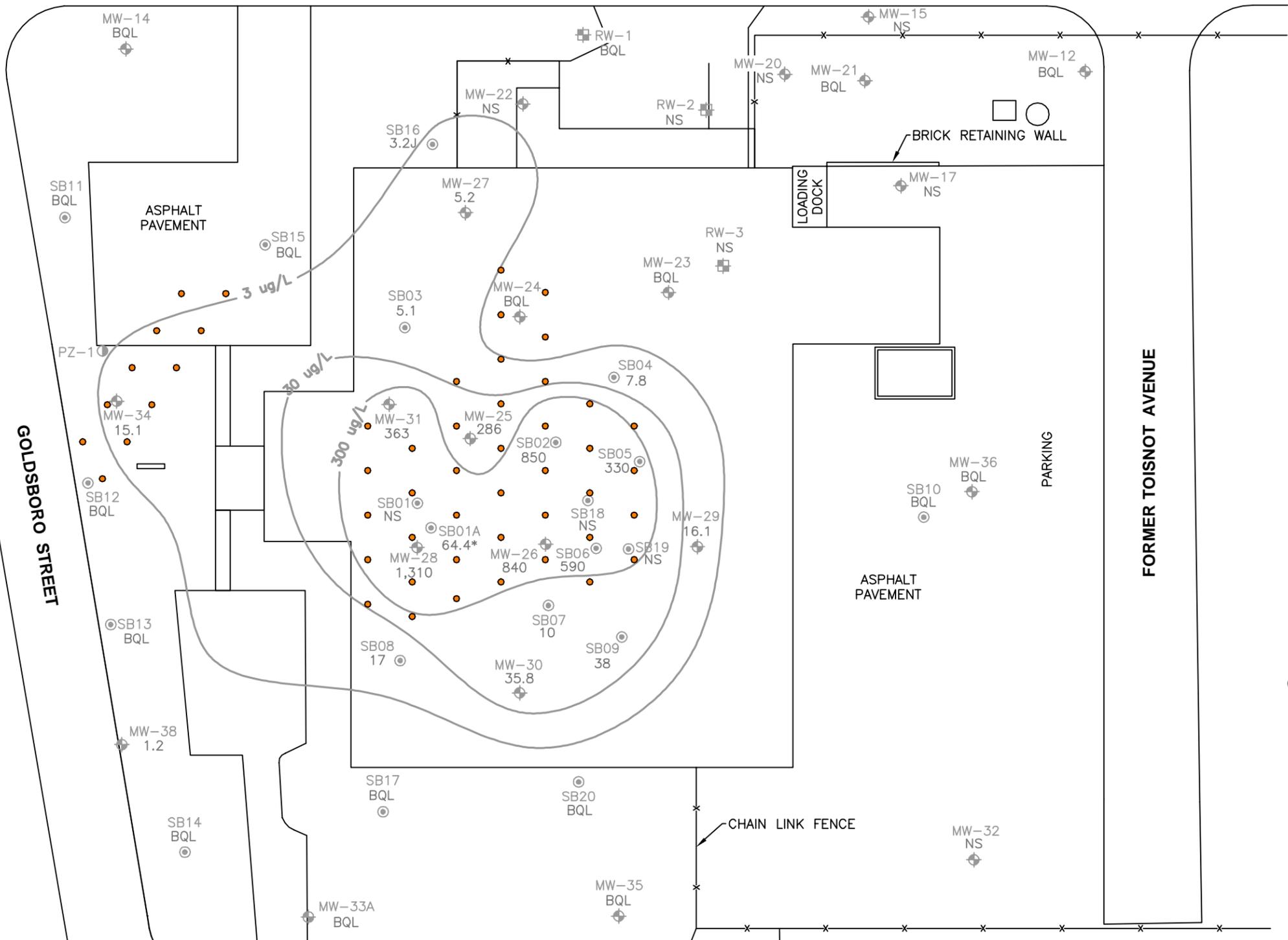
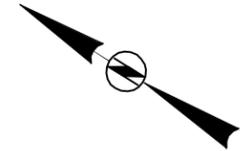
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DATE	7-10-15
SCALE	AS SHOWN
CAD NO.	510304.04a
PRJ NO.	510304.004

PROPOSED INJECTION POINT LOCATIONS ON  
PCE ISOCONTOUR (SEPTEMBER 2013)

FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC



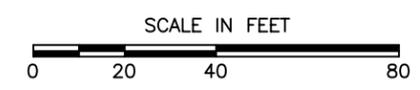
MW-19 NS  
 MW-18 BQL  
**JAMES STREET**



- LEGEND**
- UPPER AQUIFER MONITOR WELL
  - RECOVERY WELL
  - PIEZOMETER LOCATION
  - SOIL BORING (SEPT. 2013)
  - PROPOSED INJECTION POINT LOCATIONS
  - 840 TRICHLOROETHENE (TCE) CONCENTRATION
  - TRICHLOROETHENE (TCE) ISOCONTOUR (2L STANDARD 3 ug/L)
  - BQL RESULT LESS THAN LABORATORY PRACTICAL QUANTITATION LIMIT
  - NS WELL/BORING NOT SAMPLED
  - J ESTIMATED CONCENTRATION

RESULTS SHOWN IN MICROGRAMS PER LITER (ug/L)  
 \* VALUE NOT INCLUDED IN CONTOUR BECAUSE GRAB SAMPLE COLLECTED AT DEEPER INTERVAL

GRASS OPEN AREA



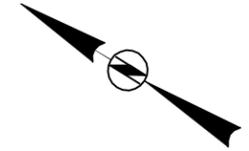
CHECK BY	TB
DRAWN BY	OS
DATE	7-10-15
SCALE	AS SHOWN
CAD NO.	TCE-Upper
PRJ NO.	510304.002

PROPOSED INJECTION POINT LOCATIONS ON TCE ISOCONTOUR (SEPTEMBER 2013)  
 FORMER RENTAL TOWEL AND UNIFORM SERVICE  
 800 GOLDSBORO ST NE  
 WILSON, NC



FIGURE  
**2**

JAMES STREET

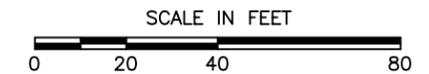


LEGEND

- UPPER AQUIFER MONITOR WELL
- RECOVERY WELL
- PIEZOMETER LOCATION
- SOIL BORING (SEPT. 2013)  
(GRAB GROUNDWATER SAMPLE)
- PROPOSED INJECTION POINT LOCATIONS
- 840 CIS-1,2-DICHLOROETHENE CONCENTRATION
- 70 ug/L CIS-1,2-DICHLOROETHENE ISOCONTOUR  
(2L STANDARD 70 ug/L)
- BQL RESULT LESS THAN LABORATORY PRACTICAL QUANTITATION LIMIT
- NS WELL/BORING NOT SAMPLED
- J ESTIMATED CONCENTRATION

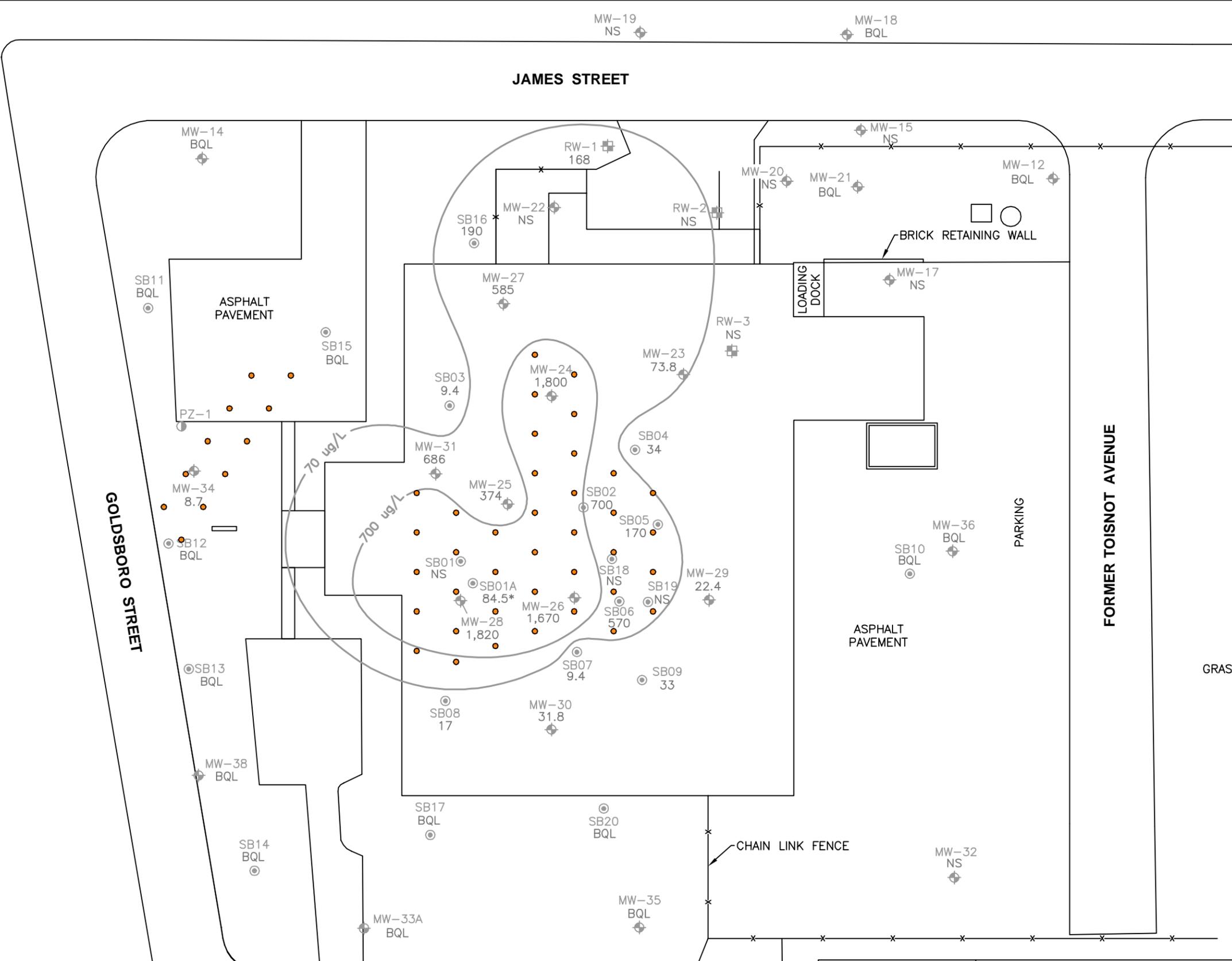
RESULTS SHOWN IN MICROGRAMS PER LITER (ug/L)

\*VALUE NOT INCLUDED IN CONTOUR BECAUSE GRAB SAMPLE COLLECTED AT DEEPER INTERVAL



GOLDSBORO STREET

FORMER TOISNOT AVENUE

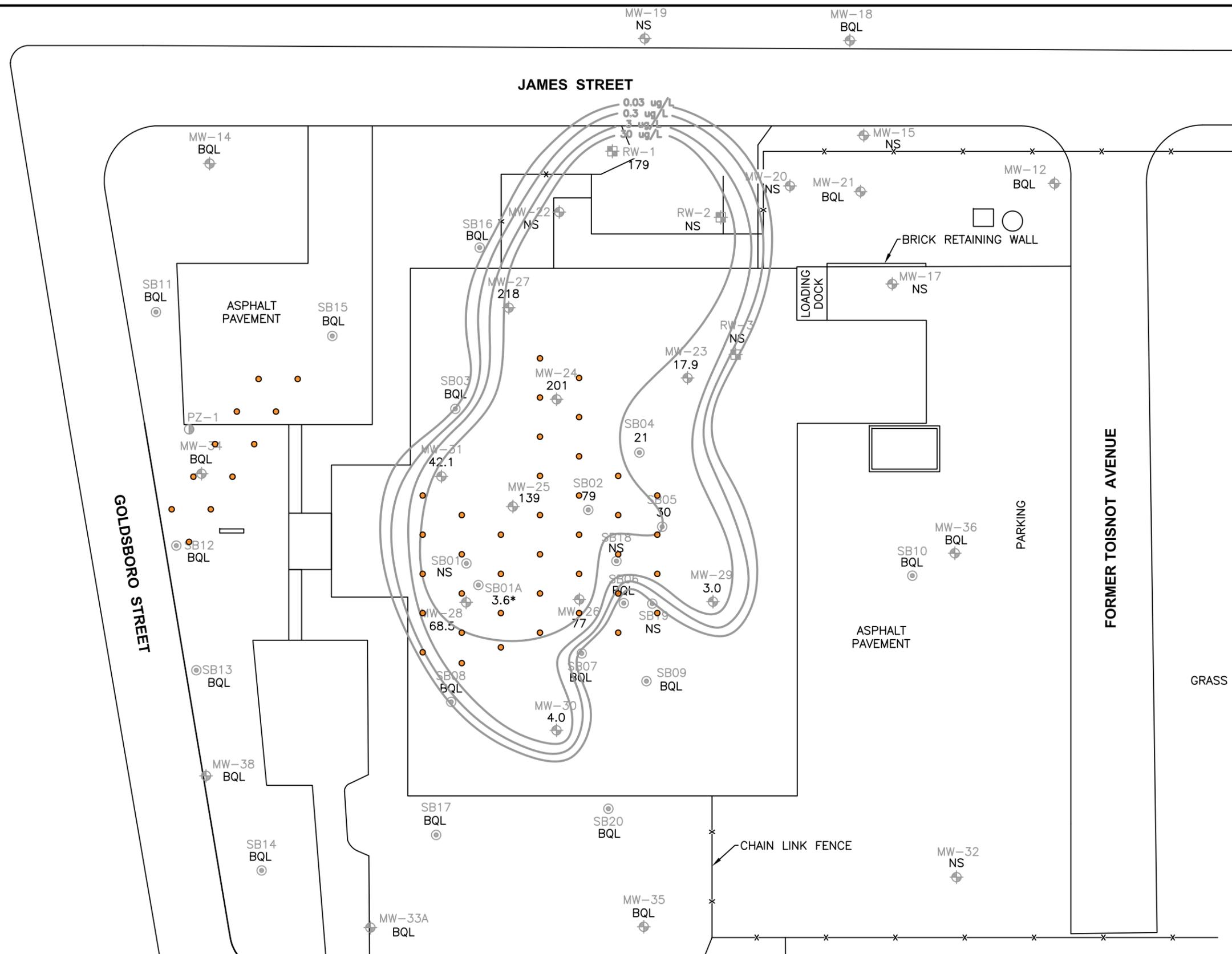
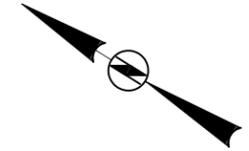


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PRJ NO.	510304.004

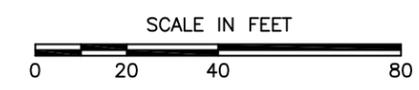
PROPOSED INJECTION POINT LOCATIONS ON  
CIS-1,2-DCE ISOCONTOUR (SEPTEMBER 2013)

FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC





- LEGEND**
- UPPER AQUIFER MONITOR WELL
  - RECOVERY WELL
  - PIEZOMETER LOCATION
  - SOIL BORING (SEPT. 2013)  
(GRAB GROUNDWATER SAMPLE)
  - 840** VINYL CHLORIDE CONCENTRATION
  - VINYL CHLORIDE ISOCONTOUR  
(2L STANDARD 0.03 ug/L)
  - BQL** RESULT LESS THAN LABORATORY  
PRACTICAL QUANTITATION LIMIT
  - NS** WELL/BORING NOT SAMPLED
  - J** ESTIMATED CONCENTRATION
- RESULTS SHOWN IN MICROGRAMS  
PER LITER (ug/L)
- \* VALUE NOT INCLUDED IN CONTOUR  
BECAUSE GRAB SAMPLE COLLECTED AT  
DEEPER INTERVAL
- PROPOSED INJECTION POINT LOCATIONS

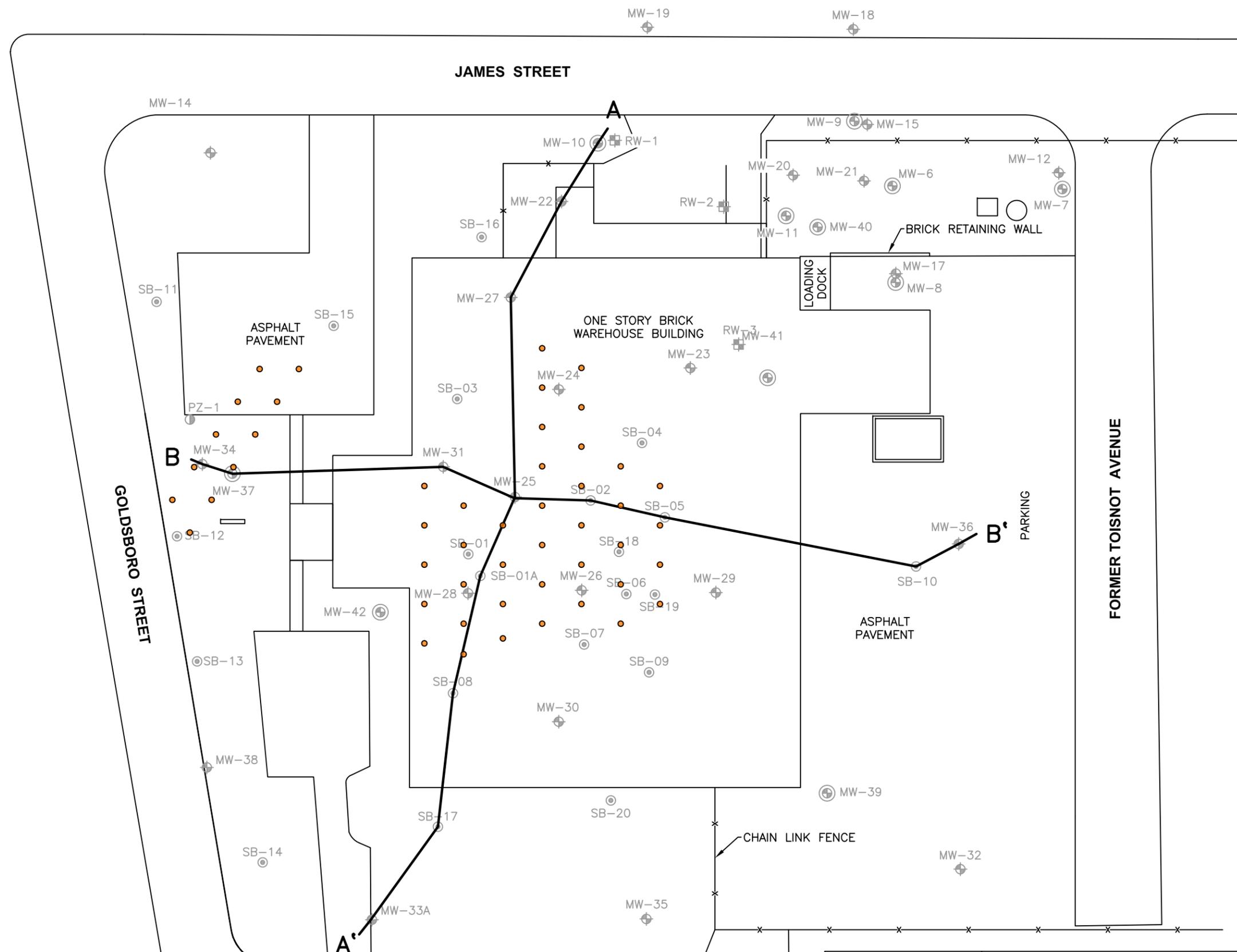
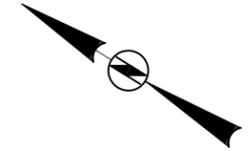


CHECK BY	TB
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DATE	11-16-15
SCALE	AS SHOWN
CAD NO.	510304.02B
PRJ NO.	510304.004

PROPOSED INJECTION POINT LOCATIONS  
ON VINYL CHLORIDE ISOCONTOUR (SEPTEMBER 2013)

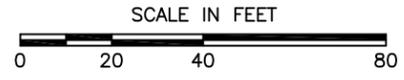
FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC





- LEGEND**
- UPPER AQUIFER MONITOR WELL
  - LOWER AQUIFER MONITOR WELL
  - RECOVERY WELL
  - PIEZOMETER LOCATION
  - SOIL BORING (SEPT. 2013)
  - CROSS SECTION LINE
  - PROPOSED INJECTION POINT LOCATIONS

GRASS OPEN AREA



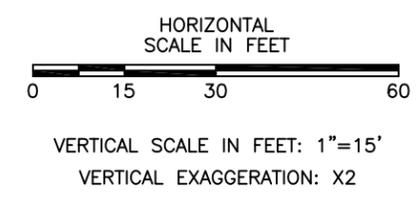
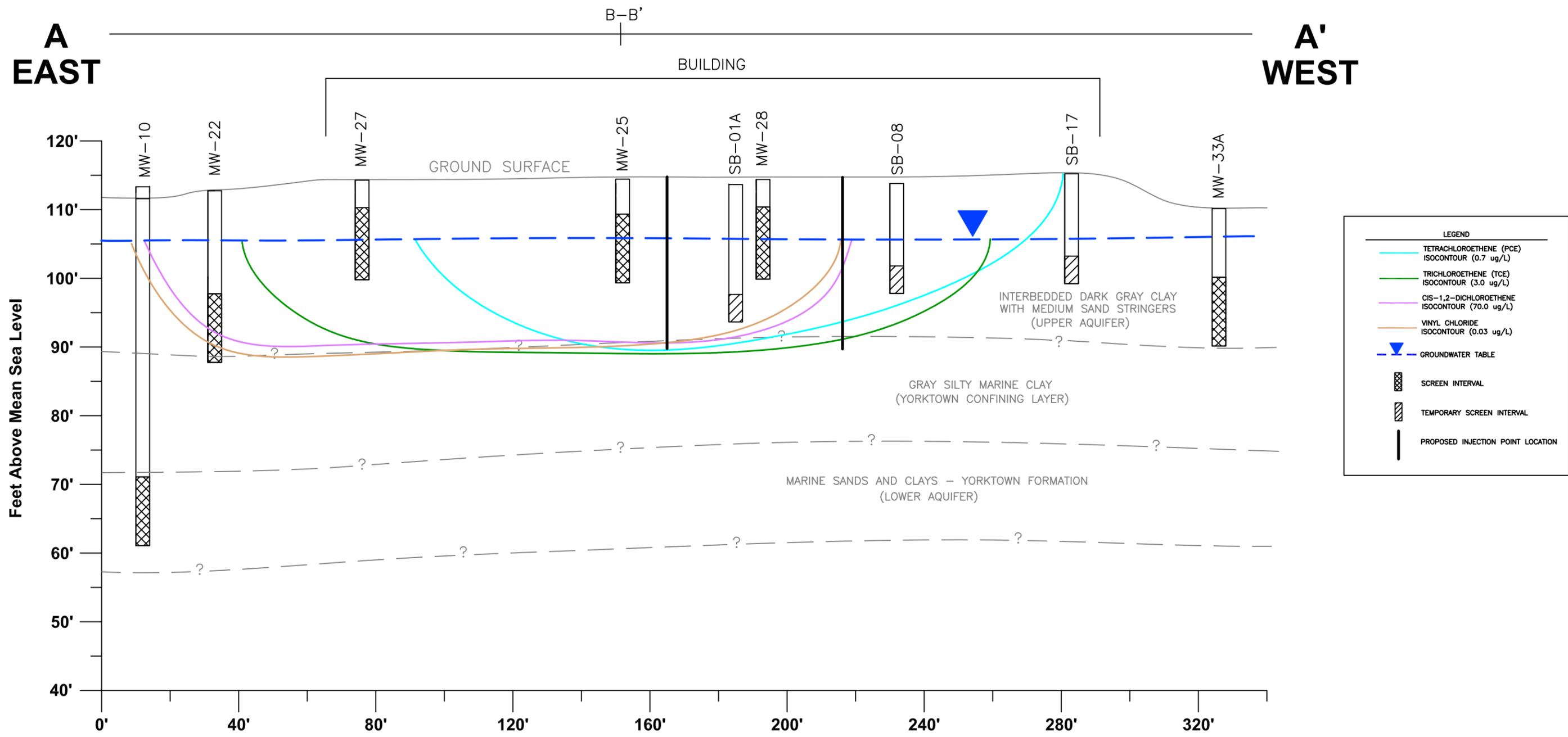
CHECK BY	TB
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DATE	11-16-15
SCALE	AS SHOWN
CAD NO.	510304.02B
PRJ NO.	510304.002

CROSS SECTION INDEX WITH PROPOSED INJECTION POINT LOCATIONS  
FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC



**A  
EAST**

**A'  
WEST**



CHECK BY	TB
DRAWN BY	SP
DATE	11-16-15
SCALE	AS SHOWN
CAD NO.	510304-004
PRJ NO.	510304-004

A-A' CROSS SECTION

FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC



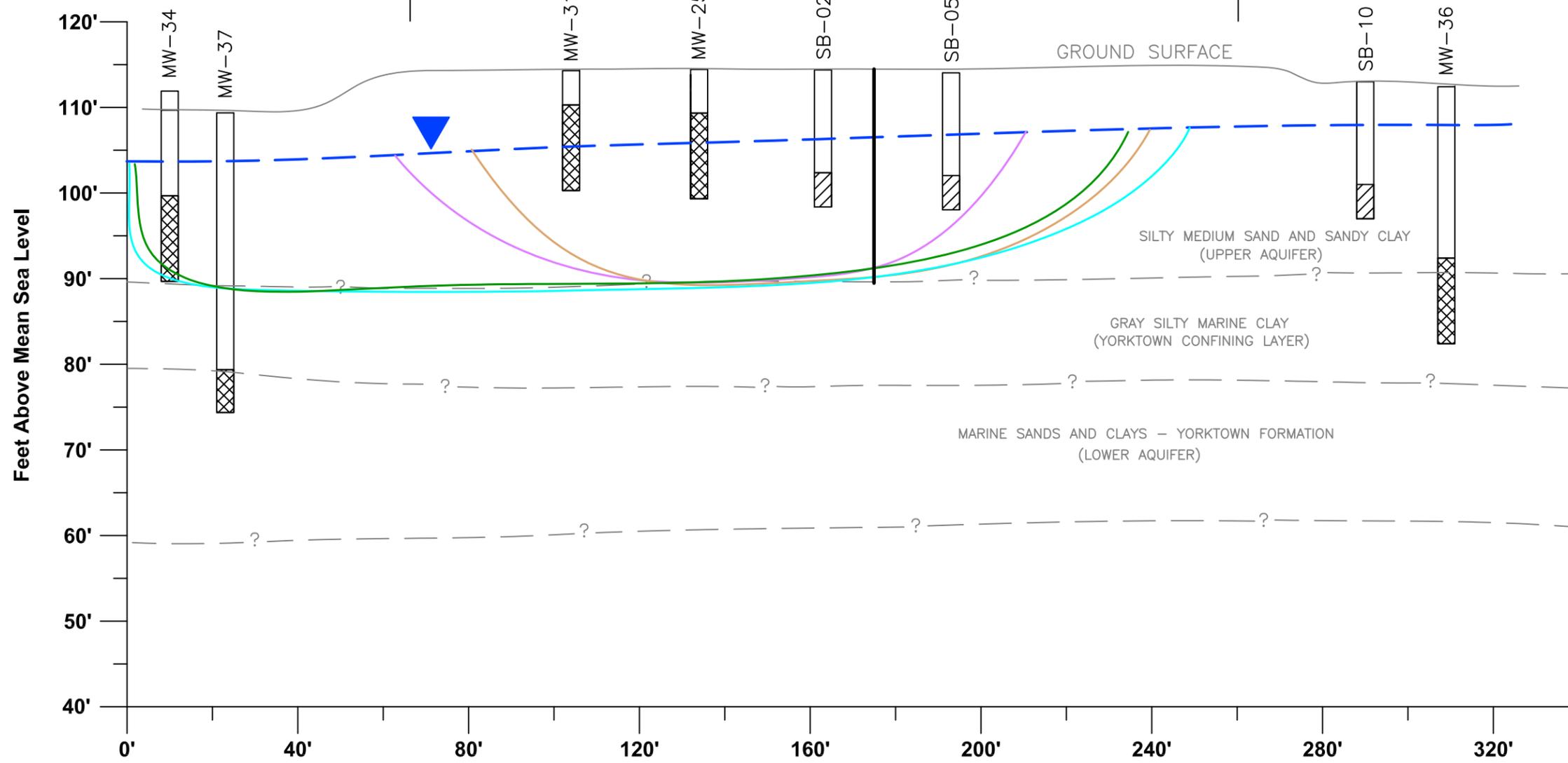
FIGURE  
**6**

**B  
NORTH**

**B'  
SOUTH**

BUILDING

A-A'



**LEGEND**

- TETRACHLOROETHENE (PCE) ISOCONTOUR (0.7 ug/L)
- TRICHLOROETHENE (TCE) ISOCONTOUR (3.0 ug/L)
- CIS-1,2-DICHLOROETHENE ISOCONTOUR (70.0 ug/L)
- VINYL CHLORIDE ISOCONTOUR (0.03 ug/L)
- - - GROUNDWATER TABLE
- SCREEN INTERVAL
- TEMPORARY SCREEN INTERVAL
- PROPOSED INJECTION POINT LOCATION

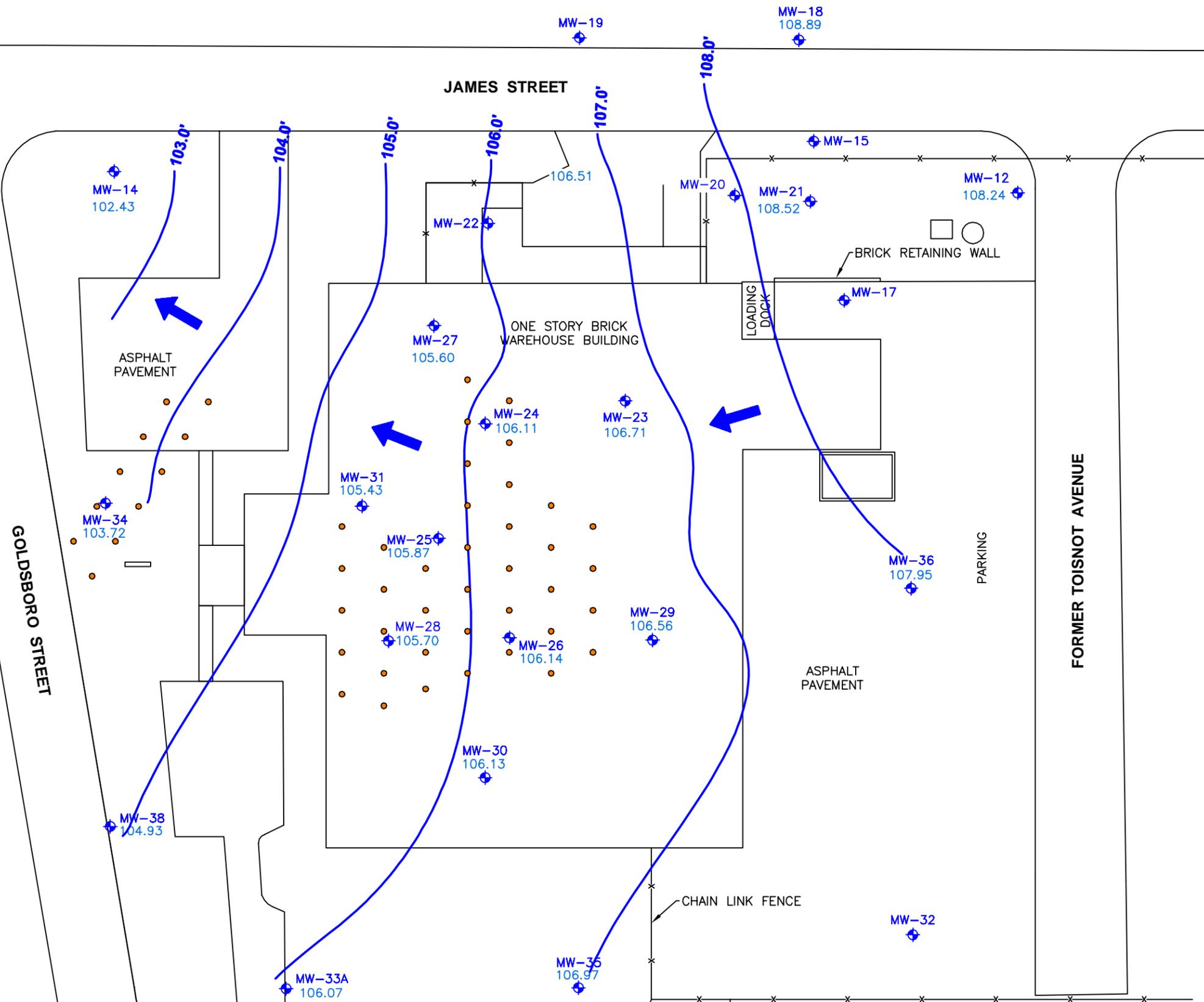
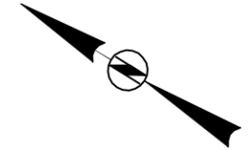
HORIZONTAL SCALE IN FEET  
  
 VERTICAL SCALE IN FEET: 1"=20'  
 VERTICAL EXAGGERATION: X2

CHECK BY	TB
DRAWN BY	SP
DATE	11-16-15
SCALE	AS SHOWN
CAD NO.	510304-004
PRJ NO.	510304-004

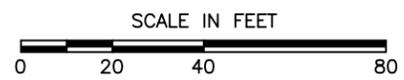
B-B' CROSS SECTION  
 FORMER RENTAL TOWEL AND UNIFORM SERVICE  
 800 GOLDSBORO ST NE  
 WILSON, NC



FIGURE  
**7**



- LEGEND**
- MW-26 106.14 UPPER AQUIFER MONITOR WELL WITH GROUNDWATER ELEVATION
  - 108.0' GROUNDWATER CONTOUR
  - APPROXIMATE DIRECTION OF GROUNDWATER FLOW
  - PROPOSED INJECTION POINT LOCATIONS



CHECK BY	TB
DRAWN BY	OS
DATE	7-10-15
SCALE	AS SHOWN
CAD NO.	510304.04c
PRJ NO.	510304.002

GROUNDWATER CONTOUR MAP – UPPER AQUIFER  
AND PROPOSED INJECTION POINT LOCATIONS

FORMER RENTAL TOWEL AND UNIFORM SERVICE  
800 GOLDSBORO ST NE  
WILSON, NC





**APPENDIX B**  
**Injection Point Logs**

**INJ-1**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/7/16 - 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
3/7/2016					
1755	25	38.7	1.89	0	
1800	23	23.1	1.08		
1815	23	NM	0.95		
1825	21	26.7	1.29		
1833	19	NM	1.46		
1841	19	18.5	0.96		
1905	19	11.14	1.01		
3/8/2016					
750	17	15.5	1.42		
805	15	10.4	0.85		
815	13	11	1.03		
830	13	NM	NM		
832	11	6.2	0.66		
844	9	7.3	0.88		
900	7	0	0	143.1	143.1

NOTES: \_\_\_\_\_ PSI = pounds per square inch \_\_\_\_\_ GPM = gallons per minute  
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 \_\_\_\_\_  
 \_\_\_\_\_

**INJ-2**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/7/16 - 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
3/7/2016					
1755	25	34.5	1.69	0	
1800	23	NM	2.4		
1820	21	NM	1.28		
1830	21	16.6	1.27		
1835	19	NM	1.28		
1841	17	16.9	1.09		
1850	17	NM	1.07		
3/8/2016					
750	15	8.5	1.15		
800	15	NM	1.2		
805	13	4.5	1.03		
815	11	NM	NM		
817	9	3.4	1.07		
830	9	2.4	1.06		
844	7	0	0		
900	7	0	0	159.6	159.6

NOTES: PSI = pounds per square inch GPM = gallons per minute

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**INJ-3**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/7/16 - 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
3/7/2016					
1755	25	37.4	1.01	0	
1800	23	38.8	0.91		
1820	23	NM	1.27		
1833	21	NM	NM		
1841	21	24.0	1.34		
1850	19	20.4	1.57		
1905	17	NM	1.17		
3/8/2016					
750	15	8.9	0.67		
800	15	NM	NM		
805	13	8.9	1.16		
815	11	5.6	0.84		
830	9	5.0	1.43		
844	6-7	7.0	1.34		
900	6	0	0	172.3	172.3

NOTES: \_\_\_\_\_ PSI = pounds per square inch \_\_\_\_\_ GPM = gallons per minute  
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 \_\_\_\_\_  
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**INJ-4**  
**INJECTION POINT LOG**

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/7/16 - 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
3/7/2016					
1755	25	10.5	1.13	0	
1800	23	9.8	0.93		
1815	23	NM	1.29		
1818	21	NM	1.03		
1831	21	NM	NM		
1841	21	3.1	0		
1905	19	NM	NM		
1910	19	NM	NM		
3/8/2016					
750	17	10.1	1.32		
805	15	9.7	1.24		
813	13	NM	NM		
815	11	6.7	0.89		
830	11	6.7	1.23		
844	9	8.2	1.39		
900	7	0	0	155.7	155.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

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**INJ-5**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1147	25	16.3	1.53	155.7	
1152	25	15.5	1.4		
1207	23	17.0	1.12		
1216	23	17.0	1.22		
1400	21	13.1	1.6		
1410	21	12.9	1.37		
1430	19	15.6	1.97		
1445	19	12.5	1.26		
1515	17	9.5	0.72		
1530	17	12.7	1.3		
1545	15	12.9	1.79		
1550	15	13.9	1.07		
1600	13	11.0	1.14		
1612	13	11.4	1.18		
1720	11	12.2	1.74		
1743	11	9.9	1.17		
1800	8	9.1	0.95		
1815	8	9.9	1.29	455.4	299.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Injection halted at 1216 to break rods and mix new batch.

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**INJ-6**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1147	25	31.1	1.56	159.6	
1152	25	21.1	1.43		
1205	25	11.1	0		
1216	23	0.0	0		
1400	21	23	1.27		
1410	21	31.2	0.99		
1430	19	18.8	0.93		
1445	19	13.5	1.21		
1510	17	13.9	1.02		
1530	17	12.9	1.35		
1545	15	14.7	1.19		
1600	15	13.9	1.25		
1612	15	13.8	1.20		
1633	13	13.8	1.33		
1645	13	13.9	1.30		
1720	11	7.0	1.08		
1743	11	5.8	0.83		
1800	8	8.8	1.99		
1815	8	7.8	1.73	426.3	266.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Injection halted at 1216 to break rods and mix new batch.

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**INJ-7**  
**INJECTION POINT LOG**

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1147	25	23.1	1.56	159.6	
1152	25	22.4	1.43		
1207	25	29.1	0		
1216	23	2.3	0		
1400	21	17.4	1.27		
1410	21	18.4	0.99		
1430	19	17	0.93		
1445	19	12.4	1.21		
1510	17	15.8	1.02		
1530	17	19.8	1.35		
1545	15	14.5	1.19		
1600	15	14.5	1.25		
1612	15	12.8	1.20		
1633	13	14.5	1.33		
1645	13	14.8	1.30		
1720	11	12.4	1.08		
1745	11	9.4	0.83		
1800	8	10.7	1.99		
1815	8	9.4	1.73	426.3	266.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Injection halted at 1216 to break rods and mix new batch.

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**INJ-8**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/8/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1147	25	31.1	1.64	143.1	
1152	25	28.8	1.21		
1205	23	20.2	0.91		
1216	23	24.2	0.91		
1400	21	16.9	1.07		
1405	21	20.9	1		
1430	19	13.1	0.77		
1445	19	14	1.37		
1515	17	12.3	1.01		
1530	17	12.9	1.29		
1550	15	12.8	1.23		
1600	15	12.3	1.27		
1612	15	14.8	1.74		
1633	13	12.3	1.44		
1645	13	12.9	1.47		
1720	11	9.7	1.41		
1745	11	12.6	1.78		
1800	8	6.6	1.37		
1815	8	10.0	1.92	442.9	299.8

NOTES: PSI = pounds per square inch GPM = gallons per minute

Injection halted at 1216 to break rods and mix new batch.

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**INJ-9**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
915	24	24.5	1.35	430.0	
920	24	24.5	1.10		
926	22	23.3	0.88		
937	22	17.4	1.04		
943	20	18.6	1.43		
953	20	19.2	1.33		
1022	18	18.6	1.79		
1030	18	18.6	1.76		
1035	16	14	1.76		
1040	16	8.9	1.27		
1050	14	11.0	1.21		
1057	14	10.0	0.91		
1115	12	8.3	1.38		
1125	12	9.1	1.41		
1130	10	9.1	1.53		
1135	10	9.4	1.44		
1145	8	9.1	1.66		
1147	8	7.1	1.59	595.4	165.4

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-10**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
915	24	19.7	1.01	438.5	
920	24	26.5	0.80		
925	22	26.5	0.91		
937	22	22.5	1.28		
943	20	15.0	1.55		
953	20	15.1	1.14		
1020	18	16	1.38		
1030	18	17.1	1.09		
1035	16	15.8	1.32		
1049	16	14.9	1.61		
1055	14	9.7	0		
1057	14	13.1	1.05		
1115	12	9.7	1.32		
1125	12	12.8	1.64		
1135	10	7.7	1.23		
1143	10	9.0	1.04		
1152	8	10.4	1.90		
1155	8	8.0	1.19	592.2	153.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-11**  
**INJECTION POINT LOG**

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
916	24	26.3	0.83	426.8	
920	24	38.1	1.31		
927	22	22.6	1.08		
937	22	24.0	1.12		
943	20	15.3	1.51		
953	20	14.8	0.76		
1020	18	11.9	1.15		
1030	18	10.9	1.57		
1035	16	12.8	1.62		
1040	16	11.2	1.34		
1050	14	15.3	1.34		
1057	14	13.2	1.35		
1105	12	11.3	1.33		
1110	12	10.4	1.13		
1125	10	9.7	1.04		
1130	10	10.1	0.91		
1135	8	9.8	1.09		
1143	8	5.9	0.95	579.4	152.6

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-12**  
**INJECTION POINT LOG**

BI HOLDINGS  
 800 GOLDSBORO ST NE  
 WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
915	24	25.1	1.21	455.5	
920	24	26.2	1.18		
930	22	20.1	1.16		
937	22	19.4	1.03		
945	20	22.4	1.37		
953	20	21.0	0.87		
1020	18	21.0	1.17		
1030	18	19.4	1.13		
1035	16	19.8	1.36		
1040	16	19.0	1.17		
1050	14	13.9	1.07		
1057	14	16.0	1.56		
1115	12	11.0	1.39		
1125	12	11.0	1.12		
1135	10	10.3	1.02		
1143	10	11.0	1.28		
1147	8	9.9	0.98		
1152	8	11.8	1.42	608.6	153.1

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-13**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1437	24	26.8	1.82	608.6	
1447	24	NM	NM		
1450	22	27.5	0.83		
1500	22	22.9	1.01		
1510	20	20.6	0.97		
1515	20	22.9	1.36		
1527	18	21.4	1.57		
1533	18	20.6	1.5		
1605	16	17.6	1.61		
1613	16	16.4	1.43		
1620	14	16.8	1.08		
1628	14	14.5	1.06		
1656	12	7.6	1.15		
1703	12	3.8	0.94		
1710	10	4.6	0.87		
1720	10	4.9	1.08		
1730	8	5.7	1.23		
1740	8	6.5	1.87	761.1	152.5

NOTES:      PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-14**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1437	24	29.0	0.85	579.4	
1447	24	NM	NM		
1450	22	24.8	1.57		
1500	22	19.8	1.76		
1510	20	16.4	1.09		
1515	20	15.1	1.18		
1527	18	19.9	1.86		
1533	18	15.9	1.28		
1605	16	17.8	1.31		
1613	16	17.1	1.14		
1620	14	13.6	1.23		
1628	14	14.0	1.85		
1653	12	11.2	1.29		
1703	12	9.9	0.95		
1710	10	10.5	1.40		
1715	10	8.7	1.22		
1721	8	9.8	1.68		
1730	8	11.2	1.92	733.9	154.5

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-15**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1453	24	31.1	1.03	592.2	
1500	24	31.1	0.96		
1510	22	29.3	0.52		
1517	22	24.7	1.50		
1533	20	23.6	1.71		
1537	20	23.5	1.99		
1540	18	20.1	1.43		
1547	18	17.5	1.20		
1605	16	20.1	1.32		
1613	16	20.7	1.26		
1622	14	18.4	1.16		
1628	14	14.4	1.87		
1653	12	9.2	1.20		
1703	12	13.2	1.51		
1710	10	10.9	1.84		
1713	10	8.1	1.78		
1720	8	9.2	1.74		
1730	8	7.4	1.62	747.5	155.3

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-16**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/9/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1503	24	24.6	1.53	595.4	
1510	24	26.0	1.28		
1517	22	27.0	1.60		
1527	22	22.9	1.27		
1533	20	25.7	1.59		
1537	20	26.3	1.78		
1543	18	25.8	1.61		
1550	18	24.3	1.50		
1605	16	20.0	1.48		
1613	16	21.6	1.40		
1620	14	23.0	1.01		
1628	14	16.9	1.21		
1703	12	10.8	1.58		
1705	12	9.9	1.71		
1710	10	7.1	1.74		
1715	10	5.4	1.76		
1720	8	8.7	1.74		
1730	8	4.4	1.58	745.9	150.5

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-17**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
911	24	33.3	0.70	747.7	
919	24	24.1	1.51		
923	22	20.6	1.68		
935	22	14.9	1.69		
942	20	17.2	1.94		
945	20	16.6	1.75		
947	18	15.9	1.51		
952	18	13.2	1.75		
1016	16	14.5	1.67		
1025	16	NM	1.50		
1028	14	12.3	1.26		
1033	14	12.0	1.20		
1112	12	12.0	1.98		
1119	12	8.6	1.21		
1130	10	10.3	1.23		
1135	10	10.2	1.42		
1143	8	9.7	1.89		
1147	8	10.6	1.81	902.6	154.9

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-18**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
900	24	25.6	1.62	746.0	
910	24	25.6	0.91		
919	22	18.8	1.31		
923	22	19.2	1.85		
925	20	15.1	1.34		
935	20	15.5	1.20		
942	18	15.5	1.39		
946	18	16.1	1.45		
1015	16	16.0	1.51		
1025	16	NM	1.85		
1028	14	15.6	1.76		
1033	14	16.2	1.65		
1059	12	14.8	1.16		
1105	12	12.1	1.52		
1112	10	10.8	1.60		
1119	10	11.1	1.28		
1124	8	12.1	1.40		
1135	8	6.0	1.38	898.9	152.9

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.



**INJ-20**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
845	24	18.8	0.85	761.2	
855	24	17.8	0.67		
901	22	23.8	1.47		
910	22	25.8	0.92		
919	20	14.5	1.35		
926	20	17.5	1.17		
935	18	17.8	1.68		
937	18	12.5	1.73		
1000	16	16.8	1.48		
1004	16	16.4	1.47		
1014	14	14.6	1.29		
1017	14	12.9	1.04		
1034	12	12.2	0.73		
1042	12	14.6	1.68		
1050	10	8.4	1.57		
1053	10	9.4	1.84		
1058	8	9.9	1.65		
1101	8	10.7	1.70	913.9	152.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-21**  
**INJECTION POINT LOG**

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1327	24	29.4	0.81	902.7	
1340	24	34.0	1.11		
1343	22	33.4	1.04		
1353	22	31.6	1.17		
1359	20	21.6	1.56		
1403	20	20.1	1.06		
1405	18	20.1	1.43		
1415	18	18.6	1.42		
1505	16	17.0	1.05		
1513	16	16.4	1.01		
1523	14	15.5	1.08		
1556	14	16.4	1.12		
1539	12	14.4	1.52		
1547	12	13.2	1.79		
1610	10	6.7	1.72		
1620	10	11.9	1.42		
1625	8	10.2	1.23		
1632	8	8.6	0.79	1054.4	151.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-22**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1325	24	25.0	1.13	899.1	
1340	24	23.3	0.77		
1343	22	26.3	1.24		
1353	22	26.0	1.30		
1357	20	20.2	1.38		
1403	20	18.9	1.25		
1411	18	19.6	1.65		
1417	18	17.9	1.25		
1505	16	16.2	1.01		
1513	16	15.9	1.03		
1521	14	15.3	1.43		
1525	14	16.9	1.44		
1535	12	13.8	1.69		
1547	12	12.1	1.59		
1610	10	9.4	0.81		
1623	10	10.1	1.41		
1633	8	9.4	0.86		
1637	8	10.8	1.49	1050.4	151.3

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-23**  
**INJECTION POINT LOG**

BI HOLDINGS  
 800 GOLDSBORO ST NE  
 WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1342	24	25.3	1.42	913.9	
1346	24	25.0	1.35		
1353	22	23.3	1.32		
1402	22	24.1	0.96		
1412	20	22.2	1.10		
1419	20	22.6	1.51		
1427	18	19.1	1.74		
1431	18	15.7	1.69		
1505	16	17.6	1.25		
1513	16	14.2	1.01		
1520	14	14.5	1.09		
1525	14	13.0	1.15		
1536	12	13.8	1.07		
1547	12	12.4	1.21		
1610	10	15.3	1.53		
1625	10	10.3	0.81		
1633	8	10.7	0.92		
1642	8	11.5	1.68	1066.5	152.6

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-24**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/10/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1354	24	23.8	1.11	886.5	
1402	24	19.9	1.44		
1411	22	19.8	1.58		
1418	22	20.0	1.73		
1425	20	19.8	1.15		
1427	20	17.9	1.68		
1432	18	15.8	1.36		
1437	18	13.2	1.64		
1505	16	13.3	1.16		
1513	16	14.3	1.54		
1520	14	14.2	1.55		
1524	14	15.0	1.48		
1526	12	12.6	1.44		
1536	12	13.2	1.40		
1619	10	15.0	1.45		
1625	10	12.8	1.31		
1633	8	9.4	1.27		
1639	8	10.1	1.17	1039.2	152.7

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-25**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/11/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
808	24	25.8	1.77	1054.4	
816	24	27.4	1.04		
826	22	25.3	0.89		
835	22	27.6	1.18		
844	20	17.2	1.39		
NM	20	17.8	1.33		
855	18	15.8	1.36		
903	18	18.4	1.26		
856	16	16.9	1.64		
1003	16	16.1	1.33		
1009	14	16.4	1.45		
1013	14	16.1	1.33		
1030	12	14.4	1.43		
1039	12	12.6	1.30		
1043	10	9.4	1.40		
1052	10	4.3	NM		
1100	10	5.2	-0.75		
1110	8	6.8	-0.75	1182.5	128.1

NOTES: PSI = pounds per square inch GPM = gallons per minute NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-26**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/11/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
808	24	41.0	0.90	1050.5	
816	24	32.4	1.55		
827	22	23.0	0.49		
837	22	28.2	1.80		
845	20	16.8	1.21		
856	20	14.8	1.18		
903	18	17.5	0.76		
907	18	15.9	1.39		
956	16	14.2	1.1		
1004	16	15.5	1.34		
1008	14	15.5	1.26		
1013	14	15.2	1.31		
1031	12	9.4	1.46		
1039	12	10.0	1.35		
1044	10	8.1	1.53		
1052	10	4.0	NM		
1100	10	-7.0	-0.75		
1110	8	-7.0	-0.75	1178.3	127.8

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-27**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/11/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
817	24	27.4	1.56	1066.6	
825	24	29.8	1.15		
831	22	25.6	1.13		
838	22	24.5	1.03		
856	20	19.5	1.05		
903	20	20.6	1.19		
905	18	20.6	1.42		
915	18	21.6	1.80		
935	16	14.9	1.59		
941	16	13.0	1.72		
947	14	17.2	1.75		
952	14	14.1	1.38		
1003	12	13.0	1.05		
1011	12	9.9	1.03		
1015	10	7.6	1.06		
1021	10	8.9	1.12		
1028	8	10.7	1.32		
1037	8	8.8	1.09		
1110	8	NM	-0.75	1216.6	150.0

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-28**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/11/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
825	24	22.0	1.05	1039.3	
831	24	24.1	1.04		
840	22	21.7	1.28		
NM	22	18.5	1.35		
857	20	15.8	1.33		
903	20	17.7	0.90		
906	18	15.7	0.87		
917	18	11.1	1.79		
935	16	16.4	1.17		
941	16	17.6	1.71		
947	14	16.4	1.53		
952	14	17.1	1.30		
1011	12	13.5	1.26		
1019	12	9.1	1.28		
1026	10	10.1	1.55		
1032	10	7.7	1.23		
1036	8	7.7	1.29		
1044	8	9.4	1.31		
1110	8	NM	-0.75	1192.9	153.6

NOTES: PSI = pounds per square inch GPM = gallons per minute NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

**INJ-29**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/14/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1113	24	NM	NM	1186.5	
1114	22	16.8	1.43		
1119	22	21.2	1.36		
1125	20	21.3	1.37		
1128	20	21.8	1.44		
1138	18	18.1	0.80		
1144	18	11.8	1.48		
1206	16	14.6	1.17		
1213	16	13.2	1.08		
1225	14	NM	NM		
1228	14	14.6	1.42		
1300	12	16.7	2.00		
1303	12	12.8	0.85		
1310	10	15.9	1.28		
1318	10	14.6	1.40		
1327	8	10.3	0.91		
1330	8	14.4	1.56	1338.0	151.5

NOTES:      PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-30**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/14/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1114	24	40.5	1.05	1187.1	
1119	24	37.4	1.19		
1127	22	34.7	1.39		
1133	22	31.9	1.50		
1144	20	25.6	1.26		
1150	20	28.4	1.51		
1201	18	27.0	1.67		
1204	18	25.7	1.62		
1226	16	17.9	1.01		
1234	16	15.6	1.89		
1240	14	14.0	1.83		
1245	14	NM	NM		
1300	12	9.8	0.86		
1308	12	11.9	1.84		
1312	10	13.6	1.76		
1318	10	NM	NM		
1327	8	9.3	1.27		
1330	8	10.8	1.97	1340.0	152.9

NOTES: PSI = pounds per square inch                      GPM = gallons per minute                      NM = Not Measured

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-33**  
INJECTION POINT LOG

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/14/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1520	24	17.3	1.25	1338.0	
1530	24	17.9	1.38		
1533	22	16.8	1.36		
1539	22	24.2	1.29		
1547	20	14.4	1.40		
1555	20	12.2	1.21		
1600	18	15.5	1.2		
1607	18	14.4	1.35		
1619	16	10.9	0.84		
1626	16	12.7	1.23		
1635	14	9.2	1.27		
1640	14	8.9	1.24		
1650	12	7.7	1.20		
1656	12	8.5	1.22		
1704	10	8.0	1.19		
1710	10	7.0	1.28		
1722	8	6.9	1.01		
1728	8	7.2	1.27	1489.2	151.2

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**INJ-34**  
**INJECTION POINT LOG**

BI HOLDINGS  
800 GOLDSBORO ST NE  
WILSON, NC

Date: 3/14/16

Staff: KH

TIME	INJECTION DEPTH (FT BGS)	PRESSURE (PSI)	FLOW RATE (GPM)	CUMULATIVE FLOW METER READINGS	CUMMULATIVE VOLUME INJECTED (GALLONS)
1520	24	25.5	1.34	1344.4	
1528	24	21.0	1.36		
1532	22	22.0	1.33		
1539	22	16.1	1.39		
1546	20	14.3	1.46		
1555	20	16.1	1.55		
1559	18	16.4	1.69		
1607	18	15.0	1.28		
1619	16	12.9	1.42		
1626	16	11.5	1.30		
1634	14	12.2	1.26		
1640	14	11.5	1.28		
1649	12	9.1	1.46		
1656	12	8.1	1.27		
1703	10	7.3	1.33		
1711	10	8.6	1.19		
1715	8	7.3	1.30		
1722	8	7.7	1.22	1495.3	150.9

NOTES: PSI = pounds per square inch GPM = gallons per minute

Drilled to 25 ft bgs, then pulled up 1 ft before beginning injections.

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**APPENDIX C**  
**Waste Manifest**



# NON-HAZARDOUS SPECIAL WASTE & ASBESTOS MANIFEST

EO-252.205-1040

If waste is asbestos waste, complete Sections I, II, III and IV  
If waste is **NOT** asbestos waste, complete Sections I, II and III

## I. GENERATOR (Generator completes Ia-r)

a. Generator's US EPA ID Number N/A		b. Manifest Document Number 042716		c. Page 1 of	
d. Generator's Name and Location: BI Ventures, Inc. 800 Goldsboro Street Northeast Wilson, NC 27893 f. Phone: 704-799-6390			e. Generator's Mailing Address: BI Ventures, Inc. 505 East South Temple Salt Lake City, UT 84102 g. Phone:		
If owner of the generating facility differs from the generator, provide:					
h. Owner's Name:			i. Owner's Phone No.:		
j. Waste Profile #	k. Exp. Date	l. Waste Shipping Name and Description	m. Containers No.	n. Total Quantity	o. Unit WT/Vol
3026165519	3/18/2017	Soil IDW	7 Drums	2.49	
GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations; AND, if this waste is a treatment residue of a previously restricted hazardous waste subject to the Land Disposal Restrictions. I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR 268 and is no longer a hazardous waste as defined by 40 CFR 261.					
p. Generator Authorized Agent Name (Print): <i>Jim Dwan</i>			q. Signature <i>[Signature]</i>		r. Date 6-2-16

## II. TRANSPORTER (Generator completes IIa-b and Transporter completes IIc-e)

a. Transporter's Name and Address Shavender Trucking LLC. P.O. Box 206 Pantego, NC 27860 b. Phone: 252-943-3379		
c. Driver Name (Print) <i>JESSE WADE</i>	d. Signature <i>Jesse Wade</i>	e. Date 6-22-16

## III. DESTINATION (Generator complete IIIa-c and Destination Site completes III d-g)

a. Disposal Facility and Site Address: East Carolina Environmental 1922 Republican Road Autander, NC 27805 b. Phone: 252-348-3322		c. US EPA Number N/A	d. Discrepancy Indication Space:
I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.			
e. Name of Authorized Agent (Print) <i>Andre Durl</i>	f. Signature <i>[Signature]</i>	g. Date 6/22/16	

## IV. ASBESTOS (Generator completes IVa-f and Operator complete IVg-i)

a. Operator's Name and Address: N/A		c. Responsible Agency Name and Address: NC Department of Health and Human Services - Health Hazards CU 1912 Mail Service Center Raleigh, NC 27699-1912 d. Phone: 919-707-5660	
b. Phone:			
e. Special Handling Instructions and Additional Information:			
f. <input type="checkbox"/> Friable <input type="checkbox"/> Non-Friable <input type="checkbox"/> Both % Friable % Non-Friable			
OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.			
g. Operator's Name and Title (Print)		h. Signature	
i. Date		Operator refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation or both	

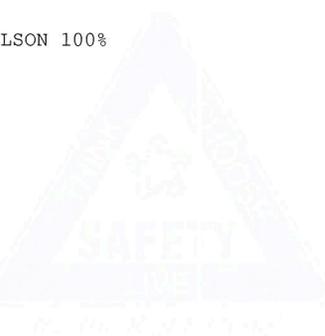
**SITE**  
**EAST CAROLINA ENV LANDFILL 252-348-3322**  
**1922 REPUBLICAN RD-AULANDER, NC 27805**

**CUSTOMER** 454417  
 APEX COMPANIES, LLC  
 10610 Metomont Pkwy  
 Charlotte, NC 28269  
 Contract:3026165519  
 Generator:BI Ventures, Inc.

<b>SITE</b> 01	<b>TICKET #</b> 1037742	<b>CELL</b>
<b>WEIGHMASTER</b> IN - ARCHIE B. OUT - JP		
<b>DATE/TIME IN</b> 6/22/16 12:23 pm	<b>DATE/TIME OUT</b> 6/22/16 12:42 pm	
<b>VEHICLE</b> S30	<b>CONTAINER</b>	
<b>REFERENCE</b>		
<b>BILL OF LADING</b>		

SCALE IN GROSS WEIGHT	27,700	NET TONS	2.49	INBOUND
SCALE OUT TARE WEIGHT	22,720	NET WEIGHT	4,980	INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
0.00	FD	Tracking QTY				
0.00	fd	SW-CONT SOIL Origin:WILSON 100%				



*[Handwritten signature]*

Indemnification. Generator agrees to indemnify, hold harmless, and defend Republic Services of NC, LLC, its subsidiaries, affiliates, employees, officer and directors from and against any and all liabilities, claims, penalties, forfeitures, suits, and cost and expenses incident thereto, including cost of defense, settlement and reasonable attorney's fees, which may be incurred, as a result of death or injuries to any person, or damage to any property contamination of or adverse effect on the environment, caused in whole or in part by the generator or its subsidiaries, affiliates, employees, officer and directors. The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

<b>NET AMOUNT</b>
TENDERED
CHANGE
CHECK#

RS-F042UPR (07/12)

SIGNATURE *[Handwritten Signature]*