



December 1, 2017

Mr. John Hnat  
Wisconsin Department of Natural Resources  
2300 N. Dr. Martin Luther King Jr. Drive  
Milwaukee, WI 53212

**Re: Response to WDNR Questions Regarding the Supplemental Site Investigation Report  
Former Hoffman's Valet Cleaners  
7215 W. Center Street  
Wauwatosa, Wisconsin 53210  
BRRTS# 02-41-307576  
FID# 241083150**

Dear Mr. Hnat:

On behalf of Hoffman's Valet Cleaners, EnviroForensics, LLC (EnviroForensics) is providing this written response to questions and comments posed in your letter to Mr. Ralph Hoffman, dated August 16, 2017. A copy of your letter is attached for reference. Please understand that the Supplemental Site Investigation Report (SSIR) submitted by EnviroForensics dated February 14, 2017, and which is the subject of your questions and comments, was prepared by EnviroForensics with the understanding that the site investigation was essentially complete, with the exception of actions required to address certain potential vapor intrusion issues. This understanding was conveyed to Mr. Hoffman and EnviroForensics through past communications with the Wisconsin Department of Natural Resources (WDNR).

We recognize that over time, environmental regulations and guidance can change. In our responses below we have taken that into account. Furthermore, we are providing additional information in our responses recognizing that the Supplemental Site Investigation Report was intended to build upon past investigative work previously reviewed and approved by the WDNR, and may not have provided detailed explanations of work performed by past consultants.

Your original comments are provided below in bold font, and our responses have been prepared following the numeric sequence of questions and comments provided in your August 16, 2017 letter:

**1. Soil Investigation:**

- a. The source area(s) aren't clearly defined. There appear to be source areas located at MW-2, GP-3, and SB-9/SG-4. Are these areas separate or connected by migration along**

*Document: 6200-0397*

Environmental Forensic Investigations, Inc.  
N16 W23390 Stone Ridge Dr, Suite G, Waukesha, WI 53188  
Phone: 414-982-3988 • Fax 317-972-7875

or from floor drains/sumps, utility lines, etc. or the type of lithology in which the soil contamination is found?

- b. The potential soil contamination hasn't been evaluated from the 0-4 foot depth beneath the dry cleaner location, east, and south of the building and 7219 West Center Street.

Responses:

- 1.a.** We do not believe that the impacts detected at MW-2, GP-3, and SB-3/SG-4 (it is SB-3, not SB-9) are from separate sources. Lines of evidence suggest that the subsurface impacts at these locations are related to releases of diluted PCE to a leaky sanitary sewer lateral and then diffusion within sand layers bounded below by clay. Soil and groundwater results show that most leakage occurred on the north side of the building where the sanitary lateral exits the building, but minor leakage likely occurred at various spots along the lateral

A site visit was made to observe sanitary sewer connections within the building and in reference to outside areas. It appears that boiler condensate, sinks, and lavatory facilities on the first floor slab-on-grade area feed vertically down to the basement in the southeast corner very near GP-3 as shown on the revised **Figures 2, 5, 6, and 7** located in **Attachment 1**. The lateral then proceeds beneath the basement slab and extends to the north. There is a sanitary clean-out in the northeast corner of the basement, the position of which coincides with the outside markings of where the sanitary lateral exits the building very near SB-3/SG-4 and connects with the main located in Center Street as shown on new **Figure 8** in **Attachment 1** which is a map of utility locations in plan and profile views. The basement floor is around seven feet below grade, and the sanitary lateral would be just below that at around eight feet below grade.

Old sanitary sewer laterals are notoriously leaky. Past floor spills of tetrachloroethene (PCE) or wash water used to clean up spills would likely have been further diluted in sinks, toilet, or even the floor drain in the basement which are all connected to the sanitary lateral. Any leakage of diluted PCE would have entered the subsurface at the point of leakage. The greatest concentrations of chlorinated volatile organic compounds (CVOC's) were detected in soil at GP-3 and SB-3/SG-4 at depths coinciding with the depth of burial of the sanitary lateral.

New geologic cross-sections have been prepared by Enviroforensics (**Figures 9, 10, and 11** in **Attachment 1**) according to the transects presented on **Figure 2**. As can be seen on **Figure 9**, the sanitary lateral is buried within a sand lense. The sand lense is continuous laterally from MW-2 to MW-1, but appears to pinch out near MW-1. The sand layer may have acted as a conduit for contaminant diffusion laterally to the south. Being near the lateral, soil samples collected from the 10-12 foot depth in MW-1 have contained elevated concentrations of CVOC's. Impacts at the same depth have been detected at MW-2, which is located to the south of MW-1. It is likely that contaminants have migrated laterally along the sand/clay interface which exists at a depth of approximately 12 feet.

We are not sure why soil at depth in MW-2 contains elevated concentrations of CVOC's, whereas samples collected from approximately similar depths in borings GP-103 and GP-105 had lower concentrations. This could be caused by sampling technique, actual depth of sample aliquot analyzed and/or the variability in soil characteristics at each location.

For example, boring GP-103 was located directly adjacent to the boring for MW-2, yet the soil samples from these locations show disparate results. The sample interval noted for GP-103 is 8-12 feet, whereas the sample interval from MW-2 is noted as 10-12 feet. Was the analytical aliquot at GP-103 taken from closer to 8 feet bgs and the sample aliquot from MW-2 taken from closer to 12 feet bgs? If so, the results would be expected to be less in GP-103 since this sample would have been collected from above the clay interface, which is the suspected interface of contaminant migration. The same analogy could be applied to the results from GP-105 and GP-102, where samples for analysis were collected from 4-foot intervals. Did the analytical aliquots from these borings come from closer to the 8-foot depth intervals? If so, these samples would be expected to have less contamination than if they were collected from the clay interface at a depth of 10-12 feet.

The only anomalous analytical result is at the location of SB-2. It is not known why PCE has been detected at 2-3 feet bgs at this location. This detection may not be valid since it was at a concentration between the laboratory limit of detection and limit of quantification. This detection does not appear to be associated with site impacts since it is very shallow and not near any contaminant transport mechanism.

**1.b.** We understand your question relates to the potential for direct contact exposure within the upper 4 feet of soil. We do not believe that there are direct contact issues in soil at the locations you reference. It appears that the main source of release (source area) is a leaky sanitary sewer lateral near SB-3/SG-4) and potentially some releases on the floor near the dry cleaning machine located on the first floor (GP-3). It is likely that wash water would have been used to clean up any spills, and the PCE contaminated wash water likely entered the sanitary sewer system upon disposal down sinks, the toilet, or floor drain in the basement. Impacts near the source are deeper than 4-feet as indicated in the soil results (**Table 2 in Attachment 2**) and the various figures in **Attachment 1**.

Arcadis screened soil samples for volatile organic compounds (VOC's) at every 2-foot depth interval during completion of their soil borings using a flame ionization detector (FID). They did not detect VOC's during this screening process (refer to FID readings recorded on Arcadis soil boring logs in past reports). The sensitivity of the FID is about 1 microgram per kilogram, so concentrations in the soil less than this would not be picked up by the instrument. However, the FID would have been able to detect concentrations of VOC's at least over 5 or 10 milligrams per kilogram (5,000 to 10,000 micrograms per kilogram), yet none were detected in the shallow upper 4 feet of soil. This is consistent with laboratory results of site soil samples collected by

Arcadis which indicate concentrations in soil just above or well below the detection capability of this type of field instrument. The direct contact exposure standard for PCE in a non-industrial setting is 33 milligrams per kilogram (mg/kg) or 33 instrument units as measured with the FID. Concentrations of this magnitude should have been detected with the FID. Since no detections were observed with the FID, and since shallow soils near the source area had only minimal concentrations based on laboratory analysis, it is not anticipated that shallow soil on site is contaminated with concentrations that exceed direct contact exposure standards.

**2. Groundwater investigation: Explain why piezometers weren't installed to define the degree and vertical extent of the chlorinated solvent groundwater plume.**

Response:

We do not know why piezometers were not requested in the past by the WDNR. However, piezometers are not necessary since concentrations detected in shallow groundwater are just above the enforcement standard and vertical migration through underlying fine grained clay soil would be prohibitive. Piezometers are typically utilized where shallow groundwater is significantly contaminated and/or where there is a suspected release of free product. In free product form, PCE is heavier than water and can sink deeper within the water table. Based on soil and groundwater analytical results, the concentrations of PCE detected in soil and groundwater are not at levels that would indicate a release in free product form. It is more likely that diluted PCE has entered the subsurface from leaking sections of the sanitary sewer system;

**3. Vapor Investigation:**

- a. **Discuss in more detail the results of the soil gas sampling in the right-of-way (ROW) relative to the depths of the utility lines. If there is a potential pathway for further migration along the utility lines, then assess the potential effect on offsite properties. This may result in additional vapor sampling.**
- b. **The vapor pathway for the building at 7219 West Center Street cannot be ruled out based on the existing information.**
- c. **Explain how the subslab vapor values drop from 244,000 ug/m<sup>3</sup> (SS-1, October 2009), to 118 ug/m<sup>3</sup> (SSV-2, February 2014) at this building for tetrachloroethene (PCE).**
- d. **Evaluate the sumps inside this building to determine whether they pose a direct pathway for vapor intrusion.**
- e. **Indoor air may need further assessment at 7219 West Center Street, depending on the results of the evaluation requested in items 3.a. and b., above. If the sumps pose a direct pathway for vapor intrusion, then indoor air samples will need to be completed to rule out this pathway.**
- f. **A new building has been constructed on the 7209 West Center Street property. A vapor screening assessment should be completed to evaluate whether subslab vapor samples**

**are needed at this property. The assessment should identify the type of structure, location and depth of utilities and foundation (basement?), and the building use.**

Responses:

**3.a.** Vapor samples were collected from near the water main both east and west of the site for subsurface vapor screening purposes as shown on **Figures 2, 5, 7, and 8**. An additional vapor sample was collected near where the sanitary lateral enters the site building. Soil samples were also collected at all of these locations. As shown on attached **Figure 8**, the natural gas service is located at 3.6 feet below ground surface (bgs) and the storm sewer service is 4.8 feet bgs. As shown on **Figure 9**, these two utilities would be expected to be located above the sand seams identified near MW-1. The water service and sanitary sewer lateral are located at a depth of 7.0 feet and 9.0 feet bgs, respectively. These two utilities were suspected as potential vapor migration pathways. All utilities are located above the water table, which exists at this location in the clayey soil at a depth of approximately 14 feet bgs, and as such the utilities are not expected to be conduits for the migration of groundwater impacts.

Vapor samples and soil samples were collected by EnviroForensics at the locations and depths shown on the utility drawing, **Figure 8**. The samples were collected from locations along the water service line extending east and west in front of neighboring properties. As can be seen on the soil boring logs previously provided for SB-1, SB-2, and SB-3, soil encountered was silty clay with the exception of a sand layer that was encountered in SB-1 at a depth of 9-10 feet bgs, which was the maximum depth of the boring. Vapor sampling points having a 6-inch long screen were set in sand filter pack from 8-10 feet bgs. The remaining upper eight feet of borehole was sealed with bentonite. This would have put the sample interval within one foot of the water main invert. SB-3/SG-4, was located near the water main, and also in close proximity to the sanitary lateral entering the building. As seen on **Figure 8**, high concentrations of PCE were detected in soil and vapor at this location. However, soil and vapor concentrations were very low at both SB-1 and SB-2. This indicates that the water main did not act as a conduit for vapor migration.

Due to the high concentrations of PCE vapor detected at the sanitary sewer lateral, there may be a potential for the sanitary sewer lateral to transmit these vapors to the main located in Center Street and then migrate to adjacent properties through conveyance to the sanitary laterals entering these buildings. However, past sub-slab sampling in the residence to the east, and the commercial property to the west did not exhibit vapors at concentrations exceeding risk levels, with the exception of a one-time detection of PCE vapor at the property to the west (7219) by Arcadis in 2009. This exception is discussed in 3.b. and 3.c. below. In addition, we would expect sub-slab vapor at the dry cleaner to be the greatest since it is the source of the impacts detected, and that vapor concentrations would decrease in directions away from the source. Sub-slab vapors beneath the dry cleaning building have been below current vapor risk screening levels (VRSL's).

**3.b.** We have concluded that the vapor pathway to 7219 is not complete. This conclusion is based on the results of two rounds of sub-slab sampling and paired indoor air sampling at this property. The results indicate that there are no VOC concentrations in indoor air that exceed vapor action levels, and there were no sub-slab VOC concentrations detected that exceed vapor risk levels. Sub-slab samples from SSV-2 were collected on the east side of the basement closest to the property boundary with Hoffman's. In addition, a vapor sample from along utility lines on the north front of the building had only minimal detections of VOC's, while soil samples collected by Arcadis both on the north and south sides of the 7219 building did not have detected VOC's which validates this conclusion.

**3.c.** We do not know why the concentration of PCE in sub-slab vapor detected by Arcadis at 7219 in 2009 was so high. In looking back at the reporting documents prepared by Arcadis, we noticed that they did not report performing a background screening for household chemicals that could contain contaminants of concern, they did not sample outdoor background air, and they did not report performing leak testing of the sampling train or of the sample port seal. We have found PCE vapors in our outside background air sample during the summer sampling event, and during several site visits we have noticed significant solvent odors in outside air emanating from the active dry cleaner. If there were chemicals in the basement that had contaminants of concern at the time that Arcadis sampled, or if the wind direction was towards the 7219 property, then that could affect their sample results. If they did not test for leaks and there were leaks in their sample train, then that could exacerbate the problem. A similar discrepancy is noticed in the sub-slab sample collected from the basement of the dry cleaner. Arcadis reported a sub-slab vapor concentration of 20,000 micrograms per cubic meter in 2006. Again, no sample QA/QC field procedures were reported for this sample. These compounding factors show the results to be invalid due to lack of appropriate quality control and the likelihood that they would not be reproducible.

EnviroForensics performed appropriate quality control procedures and yielded much lower concentrations that were reproducible. We performed paired sub-slab and indoor air sampling at 7219 both in the summer and winter months. We performed a background chemical search before sampling. The building at the time was vacant and there were no chemicals observed that could potentially affect the results. We sampled outdoor air and detected PCE and TCE during the summer event. We also performed pressure testing of our sample train, and performed helium leak testing of our port and connections. All connections were air tight. The location of our sampling point SSV-2 was very near the reported location of Arcadis sampling point SS-1. We followed all of the procedures outlined in the WDNR guidance document PUB-RR-800, and therefore our sampling results are valid.

**3.d.** EnviroForensics visited the dry cleaner on August 24, 2017 to locate and inspect the sump that Arcadis had sampled. We did not observe a foundation water collection sump in the basement. Instead, there is a floor drain in about the same location that Arcadis indicated a sump on their

figures. It appears that Arcadis sampled a floor drain connected to the sanitary sewer system. It is therefore possible that the two (2) sumps depicted on past figures and located in basement areas of the 7219 building are actually floor drains, but this has not been confirmed. Floor drains are suspected because the depth to groundwater (14 feet) is much deeper than the basement foundations, and storm water or groundwater collection sumps would not likely be needed in these basements. Paired indoor air/sub-slab sampling has been performed in the summer and winter months and the results do not show a vapor intrusion risk, or indoor air issue.

The vapor sample collected from the floor drain of the dry cleaner had concentrations of PCE and TCE vapors that could cause indoor air vapor action levels (VAL's) to be exceeded. This is consistent with our conclusion that releases of water contaminated with PCE had occurred within the (leaky) sanitary system. However, the dry cleaning operation is active, and the operators are subject to current OSHA criteria, rather than the more conservative VAL's. The concentrations of PCE and TCE vapors detected in the sump would not be expected to exceed current OSHA standards.

There is a residential apartment unit on the second floor of the building. During our site visit, we were told by the current property owner and operator of the dry cleaner (Ms. Natalia Berdnikova) that the unit is currently occupied. The residents of this unit could potentially be exposed to vapor concentrations exceeding current WDNR VAL's. Ms. Berdnikova indicated that in the near future she intends to shut down the dry cleaning operation, remove the dry cleaning machines, pressure wash the walls and floor on the first floor, and remodel the first floor for commercial use. We do not know what her time frame is to complete these transformations.

A sub-slab depressurization system (SSDS) has been installed in the partial basement area of the dry cleaner, and should help prevent the migration of PCE and TCE vapors into the basement from areas beneath the basement slab. Ms. Berdnikove was notified by us during our site visit that the WDNR will likely require that she initiate indoor air sampling on both the first and second floors after the transformation is completed and the SSDS system activated.

#### Action Items:

- Enviroforensics recommends replacing the old floor drain with a more modern drain that has a better functioning gas seal if property use changes from that of an active dry cleaner using PCE as the cleaning agent.
- Inspect the basement areas of 7219 W. Center Street to determine if the reported basement sumps are actually floor drains. If sumps are present, sample the sumps for the presence of CVOC vapor concentrations to determine if there is a potential vapor intrusion risk. In addition, sample indoor air in the two basement areas concurrently. If a vapor intrusion risk is identified, fit the basement sumps with a grommeted, vapor tight lid and re-evaluate the need for an SSDS.

**3.e.** Indoor air samples were not collected in the basement areas of 7219 W. Center Street because these areas were not occupied, only used for storage, and accessed infrequently. Based on the indoor air sampling on the first floor and sub-slab sampling performed in the basement areas, no vapor intrusion risk was identified. However, as stated in 3.d. above, we propose to inspect the basement areas for sumps.

Action Items:

- We propose to perform one additional round of paired indoor air sampling and sub-slab sampling at the 7219 W. Center Street property.
- In addition to sampling indoor air on the first floor of the building, we will collect indoor air samples from the two basement areas and sample vapor in basement sumps, if they are present.

**3.f.** During the course of field work performed in September of 2016, a new building was being constructed at 7209. The building was observed to be slab-on-grade construction. To pave the way for this construction, the former residential property at this address had been demolished. A sub-slab sample had been collected by Arcadis within the basement of the former residence in 2009. The sample was collected in the northwest corner of the basement, which would be a location closest to the source of release at the dry cleaner, as can be seen on **Figure 7**. On August 24, 2017 we visited the site to inquire about the new building. The building is a commercial property (out-patient mental health consulting). A representative indicated that there was no basement (slab on grade construction). In addition, during the preparation of a previous work scope, EnviroForensics personnel contacted the WDNR project manager at the time to inquire whether additional sub-slab sampling was required of the 7209 residential property. The WDNR project manager indicated that the vapor intrusion risk at this property had been adequately assessed and that no further vapor intrusion sampling was needed.

**4. Remedial options evaluation: If there is defined vapor or direct contact pathways on or off the source property, then evaluate the potential remedies.**

Response:

There is no direct contact exposure pathway at the site since the source of impacts appears to be leakage from the sanitary sewer lateral system beneath the building and possibly some migration through discontinuous sand layers. These sand layers and the sanitary lateral system are located more than four feet bgs. Vapor migration may have occurred to some degree along the sanitary lateral of the dry cleaner building out to the main located in Center Street; however, there is evidence that the vapors have not migrated to adjacent buildings. In addition, vapor concentrations near the primary source area of release (sanitary sewer lateral directly outside the dry cleaner building) as measured at SG-4 have not posed a vapor intrusion risk to the site building as indicated by sub-slab PCE vapor concentrations below risk levels. Therefore,



additional remedial measures are not deemed necessary. Additional assessment of the vapor intrusion risk to 7219 W. Center Street has been proposed. If a risk is identified, then additional remedy will be needed.

The impervious cover material (concrete) and buildings overlying contaminated soil on and off site has proven to be effective in limiting the downward migration of soil impacts to the water table and should be maintained for that purpose as an engineered barrier.

Institutional controls can be used effectively to ensure that any contaminated soil removed from beneath the current engineered barriers is reassessed and managed appropriately.

**5. Submittal revisions:**

- a. The dry cleaning machine must be included on all maps.**
- b. The industrial and nonindustrial soil RCLs were updated in March 2017. All soil analytical tables must reflect current standards.**
- c. Groundwater Sample Analytical Results Figure 6 must include an isoconcentration line or lines that reflect the areal extent of the groundwater contamination plume.**

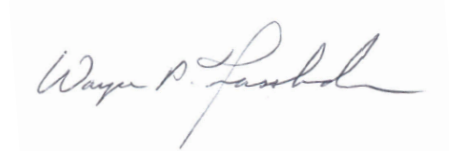
Responses:

- 5.a.** Report figures in **Attachment 1** have been revised as appropriate to show the locations of the dry cleaning machines. They are situated in the south part of the building which is slab on grade.. According to the owner, Ms. Natalia Berdnikova, dry cleaning machine #1 is no longer used.
- 5.b.** **Table 2** in **Attachment 2** has been revised to reflect the new soil standards.
- 5.c.** **Figure 6** has been updated to show the estimated extent of PCE above ES standards and above PAL standards.

If you have any further questions regarding our responses to your questions and comments, please feel free to contact me at 414-982-3988, or by email at [wfassbender@enviroforensics.com](mailto:wfassbender@enviroforensics.com).

Sincerely,

**Environmental Forensic Investigations, Inc.**

A handwritten signature in blue ink that reads "Wayne P. Fassbender".

Wayne Fassbender, PG, PMP  
*Senior Project Manager*

A handwritten signature in blue ink that reads "Brian Kappen".

Brian Kappen, PG  
*Project Manager*

cc: Ralph Hoffman

Attachments:

Attachment 1: Revised Figures 2, and 5 through 11

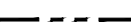


















Attachment 2: Revised Table 2

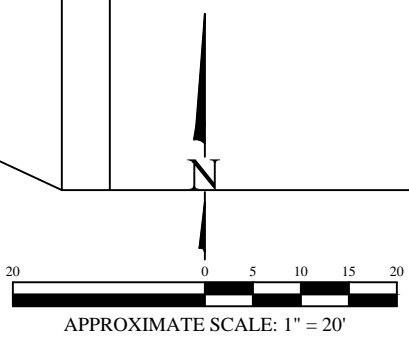
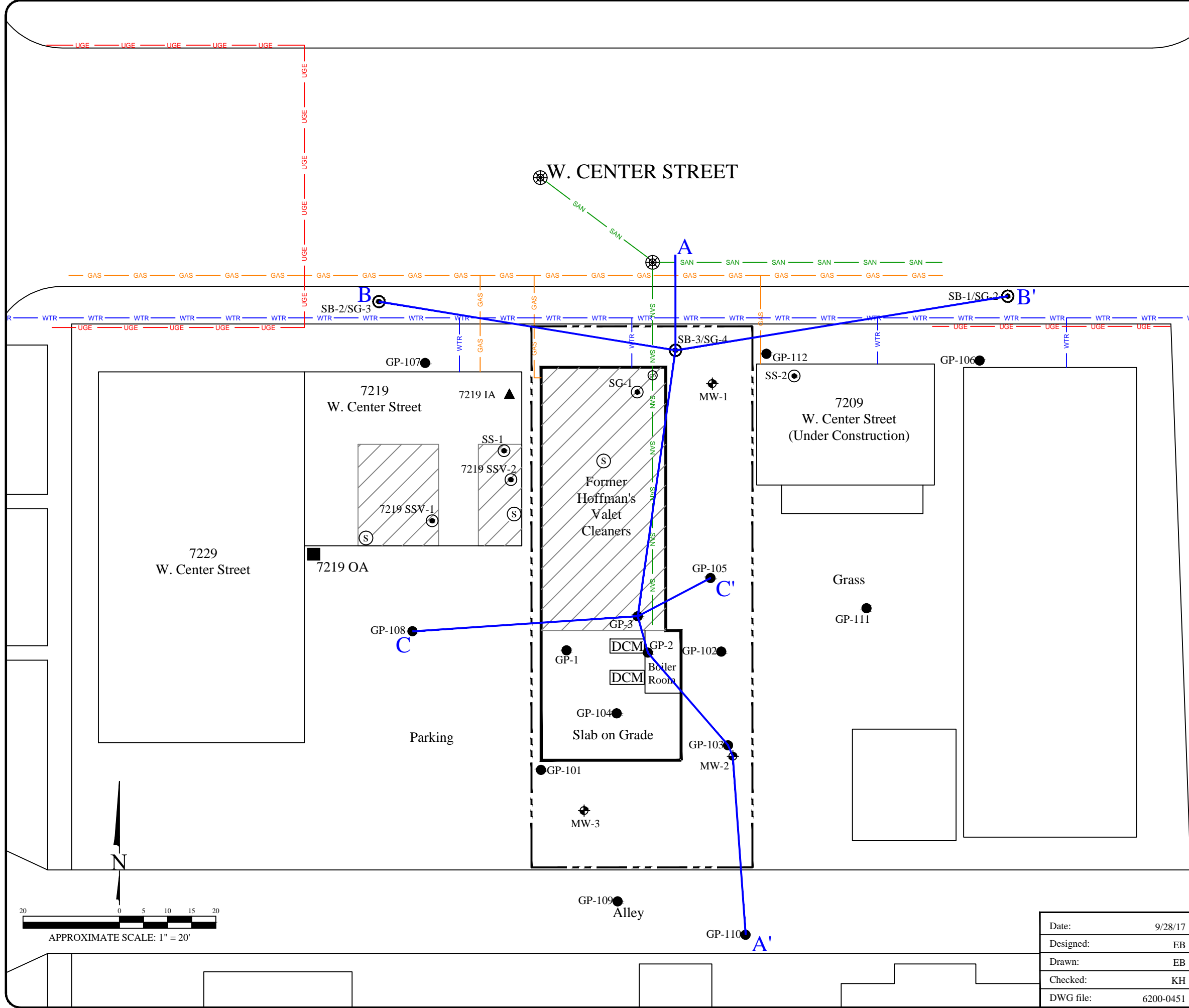


**ATTACHMENT 1**

**Revised Figure 2 and Figures 5 Through 11**

### Legend

-  Property boundary
-  GAS Underground gas utility line
-  WTR Underground water utility line
-  SAN Underground sanitary utility line
-  UGE Underground electrical utility line
-  Manhole
-  Sanitary clean out
-  Basement
-  Sump
-  DCM Dry cleaning machine location
-  MW-1 Monitoring Well
-  SB-1, GP-1 Soil Boring
-  SG-3 Soil Gas sample
-  SG-1, SSV-1 Sub-slab vapor sample
-  OA Outdoor air sample
-  IA Indoor air sample
-  A A' Cross section transect
-  B B' Cross section transect
-  C C' Cross section transect



**SITE LAYOUT AND CROSS-SECTION TRANSECT MAP**  
 Former Hoffman's Valet Cleaners  
 7215 W. Center Street  
 Wauwatosa, WI

Date:	9/28/17
Designed:	EB
Drawn:	EB
Checked:	KH
DWG file:	6200-0451

 825 North Capitol Avenue • Indianapolis, IN 46204 EnviroForensics.com	Figure
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	Project
	6200

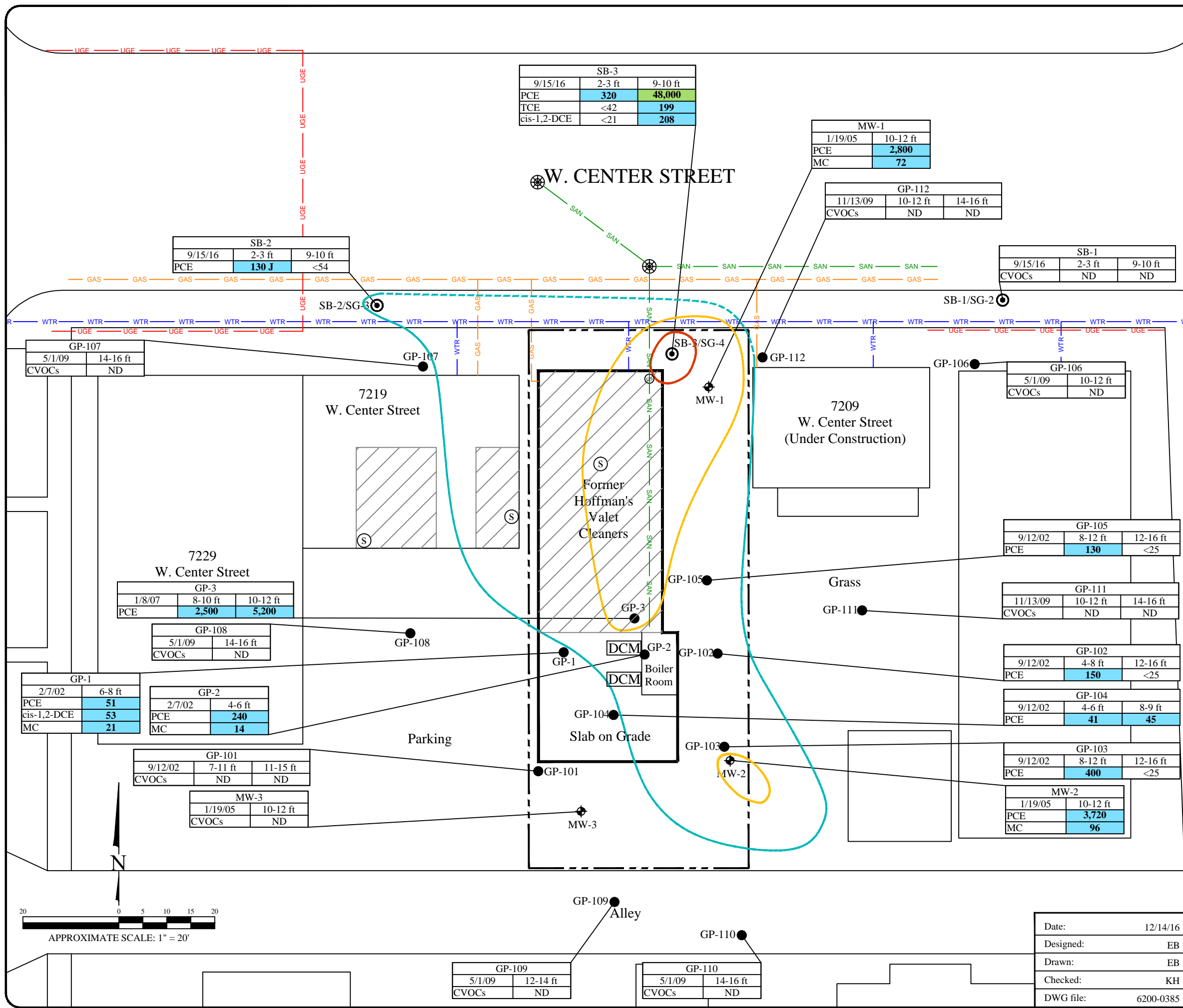
### Legend

- Property boundary
- GAS - Underground gas utility line
- WTR - Underground water utility line
- SAN - Underground sanitary utility line
- UGE - Underground electrical utility line
- Manhole
- Basement
- Sump
- Dry cleaning machine location
- Monitoring Well
- Soil Boring
- Soil/Soil Gas sample

Analyte	Soil to Groundwater Residual Contaminant Level	Residential Residual Contaminant Level	Industrial Residual Contaminant Level
PCE	<b>4.5</b>	<b>30,700</b>	<b>153,000</b>
TCE	<b>3.6</b>	<b>1,260</b>	<b>8,810</b>
cis-1,2-DCE	<b>41.2</b>	<b>156,000</b>	<b>2,040,000</b>
MC	<b>2.6</b>	<b>60,700</b>	<b>1,070,000</b>

- Note:
- Bolded and blue shaded values exceed the Soil to Groundwater Residual Contaminant Level
  - Bolded and green shaded values exceed the Residential Residual Contaminant Level
  - Bolded values are above detection limits
  - J = Analyte concentration less than laboratory detection limits
  - Samples analyzed using EPA SW-846 Method 8260
  - All results reported in units of micrograms per kilogram (µg/kg)
  - PCE = Tetrachloroethene
  - TCE = Trichloroethene
  - cis-1,2-DCE = cis-1,2-Dichloroethene
  - MC = Methylene Chloride
  - ND = Not detected
  - CVOCs = Chlorinated Volatile Organic Compounds

- PCE isocontour <100 µg/kg
- PCE isocontour <1,000 µg/kg
- PCE isocontour <10,000 µg/kg
- Dashed boundaries are inferred



SB-3		
9/15/16	2-3 ft	9-10 ft
PCE	<b>320</b>	<b>48,000</b>
TCE	<42	<b>199</b>
cis-1,2-DCE	<21	<b>208</b>

MW-1	
1/19/05	10-12 ft
PCE	<b>2,800</b>
MC	<b>72</b>

GP-112		
11/13/09	10-12 ft	14-16 ft
CVOCs	ND	ND

SB-1		
9/15/16	2-3 ft	9-10 ft
CVOCs	ND	ND

GP-107	
5/1/09	14-16 ft
CVOCs	ND

SB-2		
9/15/16	2-3 ft	9-10 ft
PCE	<b>130 J</b>	<54

GP-3		
1/8/07	8-10 ft	10-12 ft
PCE	<b>2,500</b>	<b>5,200</b>

GP-108	
5/1/09	14-16 ft
CVOCs	ND

GP-1	
2/7/02	6-8 ft
PCE	<b>51</b>
cis-1,2-DCE	<b>53</b>
MC	<b>21</b>

GP-2	
2/7/02	4-6 ft
PCE	<b>240</b>
MC	<b>14</b>

GP-101		
9/12/02	7-11 ft	11-15 ft
CVOCs	ND	ND

MW-3	
1/19/05	10-12 ft
CVOCs	ND

GP-106		
5/1/09	10-12 ft	
CVOCs	ND	

GP-105		
9/12/02	8-12 ft	12-16 ft
PCE	<b>130</b>	<25

GP-111		
11/13/09	10-12 ft	14-16 ft
CVOCs	ND	ND

GP-102		
9/12/02	4-8 ft	12-16 ft
PCE	<b>150</b>	<25

GP-104		
9/12/02	4-6 ft	8-9 ft
PCE	<b>41</b>	<b>45</b>

GP-103		
9/12/02	8-12 ft	12-16 ft
PCE	<b>400</b>	<25

MW-2	
1/19/05	10-12 ft
PCE	<b>3,720</b>
MC	<b>96</b>

GP-109	
5/1/09	12-14 ft
CVOCs	ND

GP-110	
5/1/09	14-16 ft
CVOCs	ND

Date:	12/14/16
Designed:	EB
Drawn:	EB
Checked:	KH
DWG file:	6200-0385

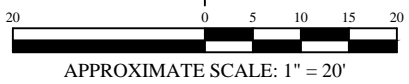
### SOIL SAMPLE ANALYTICAL RESULTS

Former Hoffman's Valet Cleaners  
7215 W. Center Street  
Wauwatosa, WI



825 North Capitol Avenue • Indianapolis, IN 46204  
EnviroForensics.com

Figure	5
Project	6200



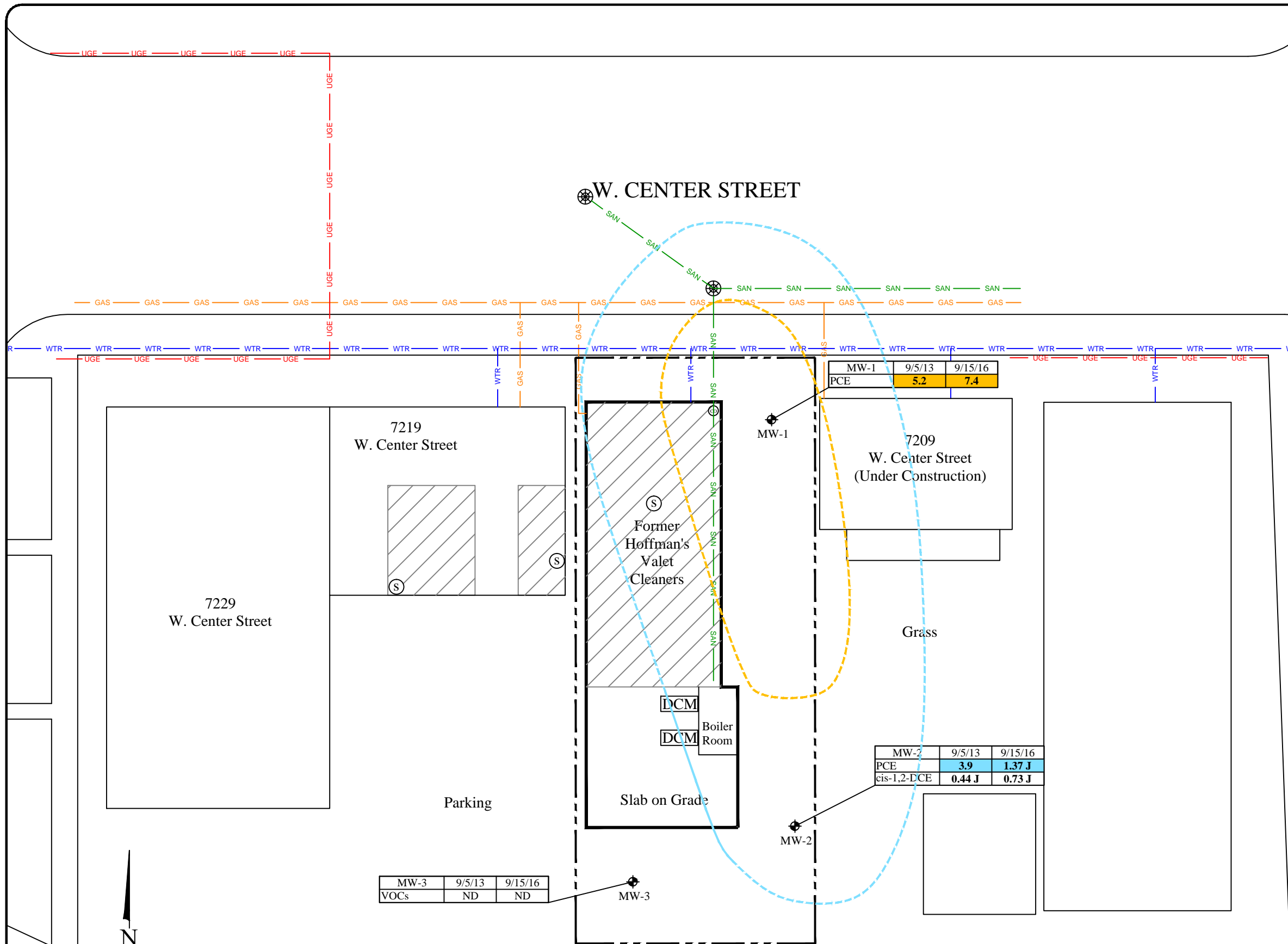
# Legend

- Property boundary
- GAS Underground gas utility line
- WTR Underground water utility line
- SAN Underground sanitary utility line
- UGE Underground electrical utility line
- Manhole
- Basement
- Sump
- DCM Dry cleaning machine location
- MW-1 Monitoring Well

Analyte	Public Health Preventive Action Limit	Public Health Enforcement Standard
PCE	<b>0.5</b>	<b>5</b>
TCE	<b>0.5</b>	<b>5</b>
cis-1,2-DCE	<b>7</b>	<b>70</b>
MC	<b>0.5</b>	<b>5</b>
Chloroform	<b>0.6</b>	<b>6</b>

- Note:
- Bolded and orange shaded values exceed the Public Health Enforcement Standard
  - Bolded and blue shaded values exceed the Public Health Preventive Action Limit
  - Bolded values are above detection limits
  - J = Analyte concentration less than laboratory detection limits
  - Samples analyzed using EPA SW-846 Method 8260
  - All results reported in units of micrograms per liter (µg/L)
  - PCE = Tetrachloroethene
  - cis-1,2-DCE = cis-1,2-Dichloroethene
  - VOCs = Volatile Organic Compounds
  - ND = Not detected

- Anticipated area of groundwater impacts exceeding the PAL
- Anticipated area of groundwater impacts exceeding the ES
- Dashed boundaries are inferred



MW-1	9/5/13	9/15/16
PCE	<b>5.2</b>	<b>7.4</b>

MW-2	9/5/13	9/15/16
PCE	<b>3.9</b>	<b>1.37 J</b>
cis-1,2-DCE	<b>0.44 J</b>	<b>0.73 J</b>

MW-3	9/5/13	9/15/16
VOCs	ND	ND

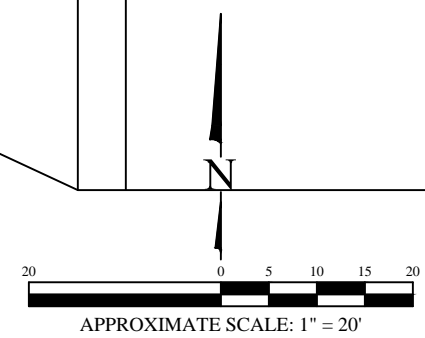
## GROUNDWATER SAMPLE ANALYTICAL RESULTS

Former Hoffman's Valet Cleaners  
7215 W. Center Street  
Wauwatosa, WI











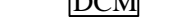


Date:	12/14/16
Designed:	EB
Drawn:	EB
Checked:	KH
DWG file:	6200-0386

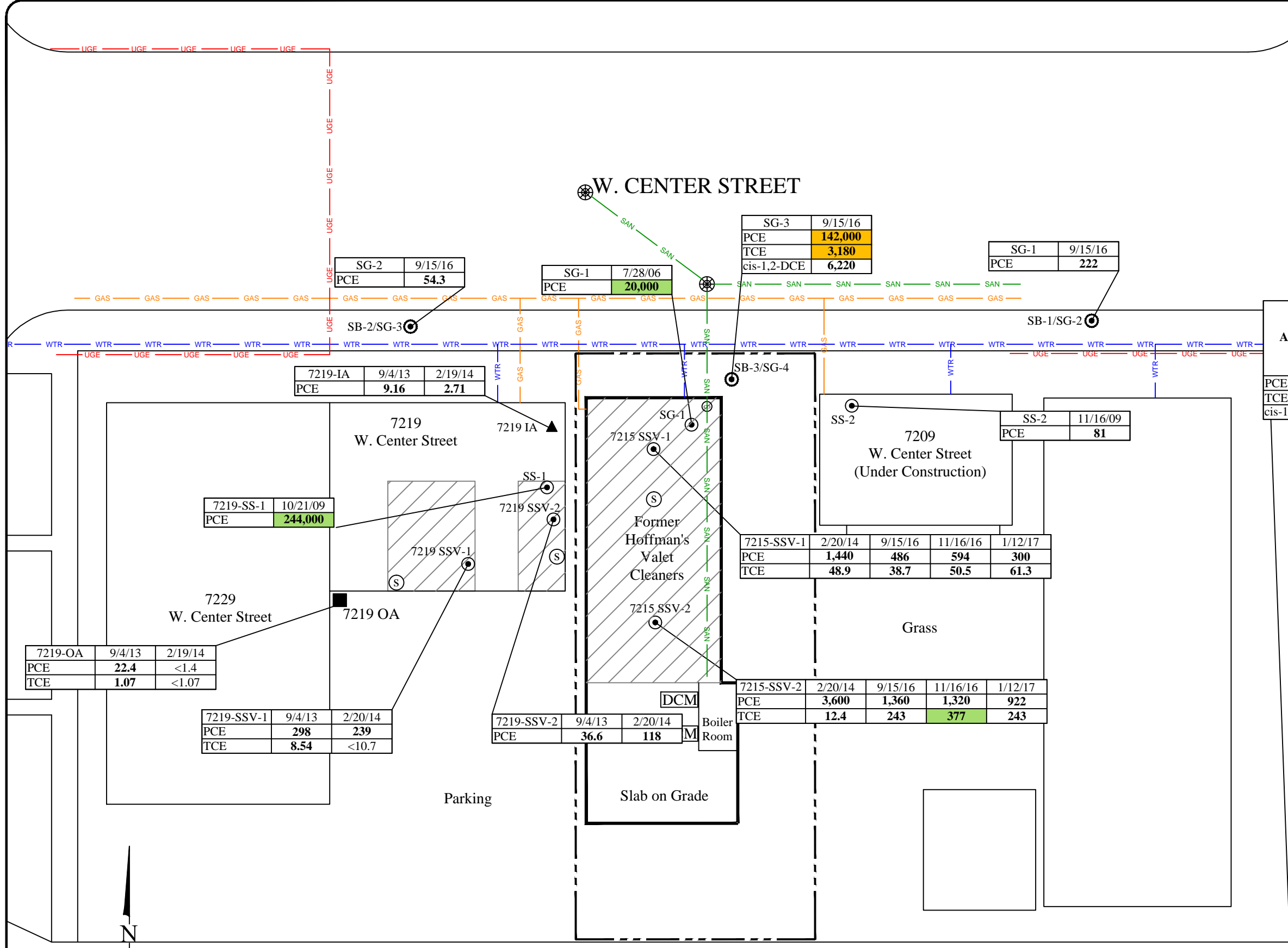
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Figure	6
Project	6200



### Legend

-  Property boundary
-  GAS Underground gas utility line
-  WTR Underground water utility line
-  SAN Underground sanitary utility line
-  UGE Underground electrical utility line
-  Manhole
-  Basement
-  Sump
-  DCM Dry cleaning machine location
-  SG-3 Soil/Soil Gas sample
-  SS-1/SSV-1 Sub-slab vapor sample
-  OA Outdoor air sample
-  IA Indoor air sample



Analyte	Indoor Air	Sub-slab vapor	Soil Gas	
	Small Commercial Vapor Action Level	Small Commercial Vapor Risk Screening Level	Shallow Vapor Risk Screening Level	Deep/Utility Soil Gas Vapor Risk Screening Level
PCE	<b>180</b>	<b>6,000</b>	<b>6,000</b>	<b>18,000</b>
TCE	<b>8.8</b>	<b>290</b>	<b>290</b>	<b>880</b>
cis-1,2-DCE	NE	NE	NE	NE

Note:

1. Bolded and shaded orange values exceed the Small Commercial Vapor Action level
2. Bolded and shaded orange values exceed the Soil Gas Deep/Utility Soil Gas Vapor Risk Screening Level
3. Bolded and shaded green values exceed the Small Commercial Sub-Slab vapor Vapor Risk Screening Level
4. All results reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )
5. NE = Not established
6. Vapor risk screening level = US EPA Regional Screening Levels with an attenuation factor of 0.03 for sub-slab vapor to indoor air, and a 0.1 adjustment for carcinogens as described in WDNR Publication RR-800
7. PCE = Tetrachloroethene
8. TCE = Trichloroethene
9. cis-1,2-DCE = cis-1,2-Dichloroethene

### SOIL GAS AND VAPOR INTRUSION ASSESSMENT RESULTS

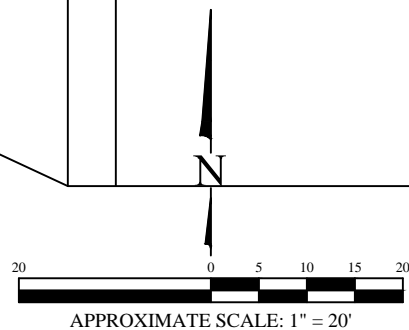
Former Hoffman's Valet Cleaners  
7215 W. Center Street  
Wauwatosa, WI

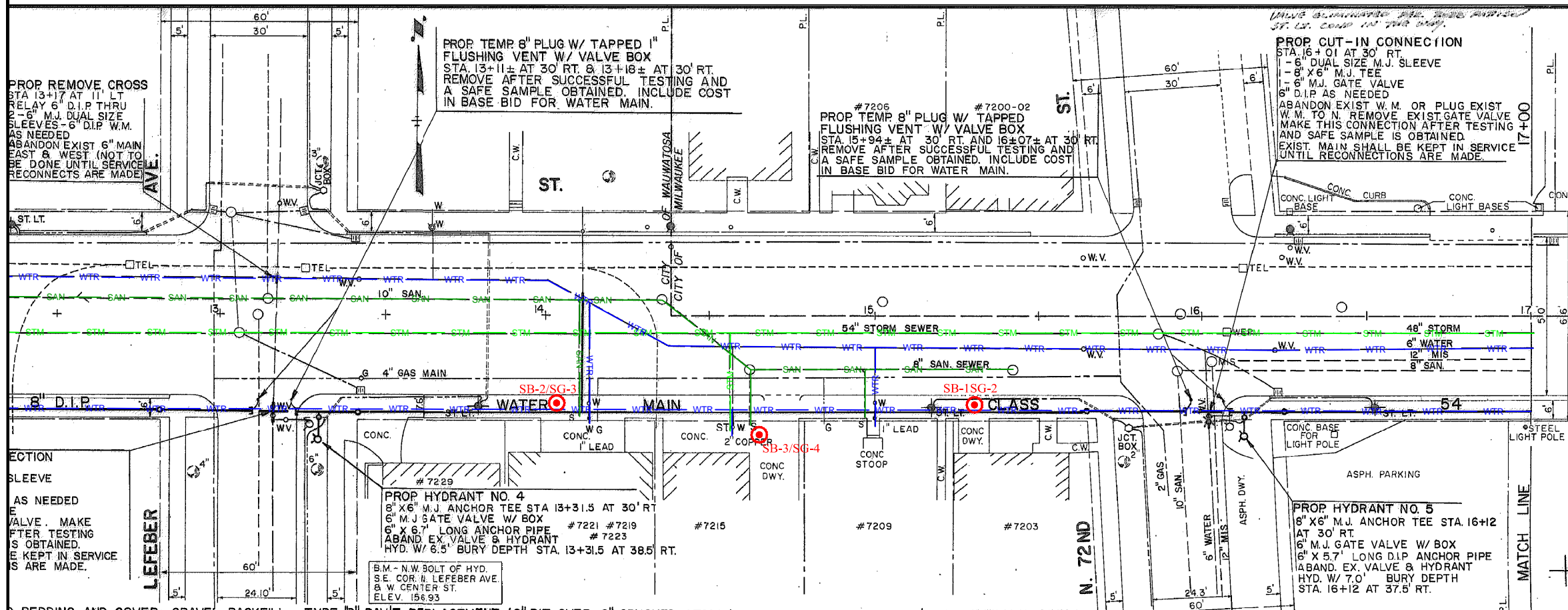
Date:	1/24/17
Designed:	EB
Drawn:	EB
Checked:	KH
DWG file:	6200-0387



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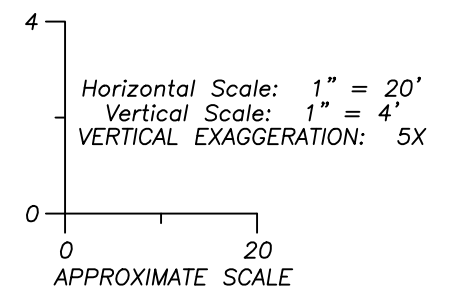
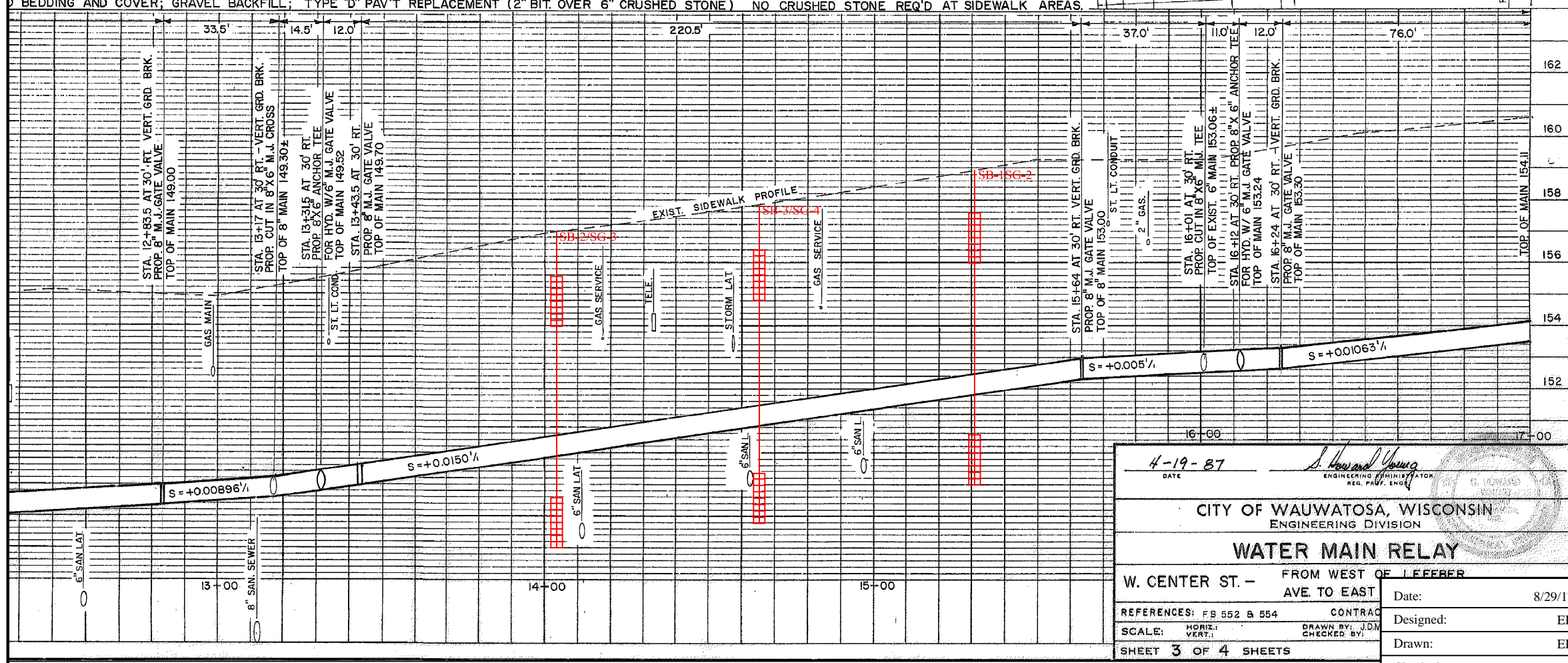
Figure	7
Project	6200





### Legend

- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- STM — Underground storm utility line
- SG-2 — Soil Gas sample
- Soil gas well screen



4-19-87 DATE

*S. Howard Young*  
 ENGINEERING ADMINISTRATOR  
 REG. PROF. ENGR.

CITY OF WAUWATOSA, WISCONSIN  
 ENGINEERING DIVISION

### WATER MAIN RELAY

W. CENTER ST. - FROM WEST OF LEFEBER AVE TO EAST

REFERENCES: FB 552 & 554 CONTRACT

SCALE: HORIZ: VERT: DRAWN BY: JGM CHECKED BY:

SHEET 3 OF 4 SHEETS

Date: 8/29/17  
 Designed: EB  
 Drawn: EB  
 Checked: KH  
 DWG file: 6200-0446

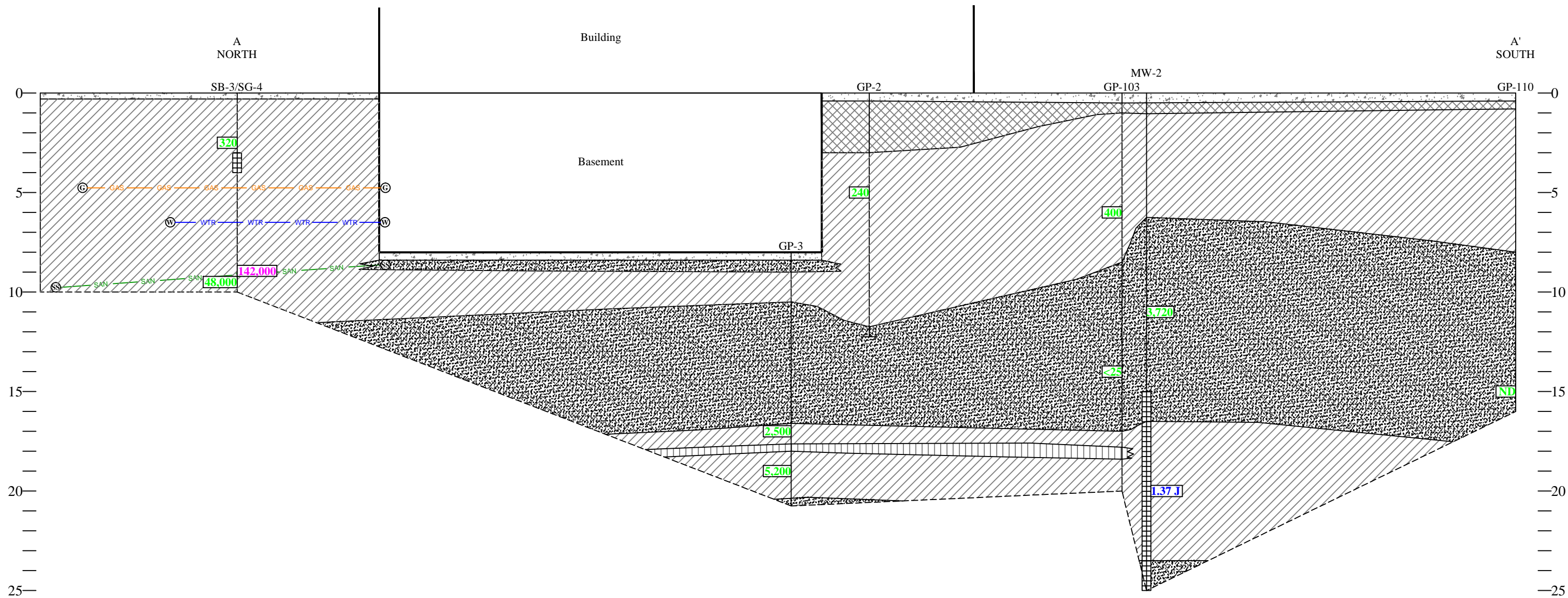
CITY UTILITY LAYOUT

Former Hoffman's Valet Cleaners  
 7215 W. Center Street  
 Wauwatosa, WI

825 North Capitol Avenue • Indianapolis, IN 46204  
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Figure	*
Project	6200



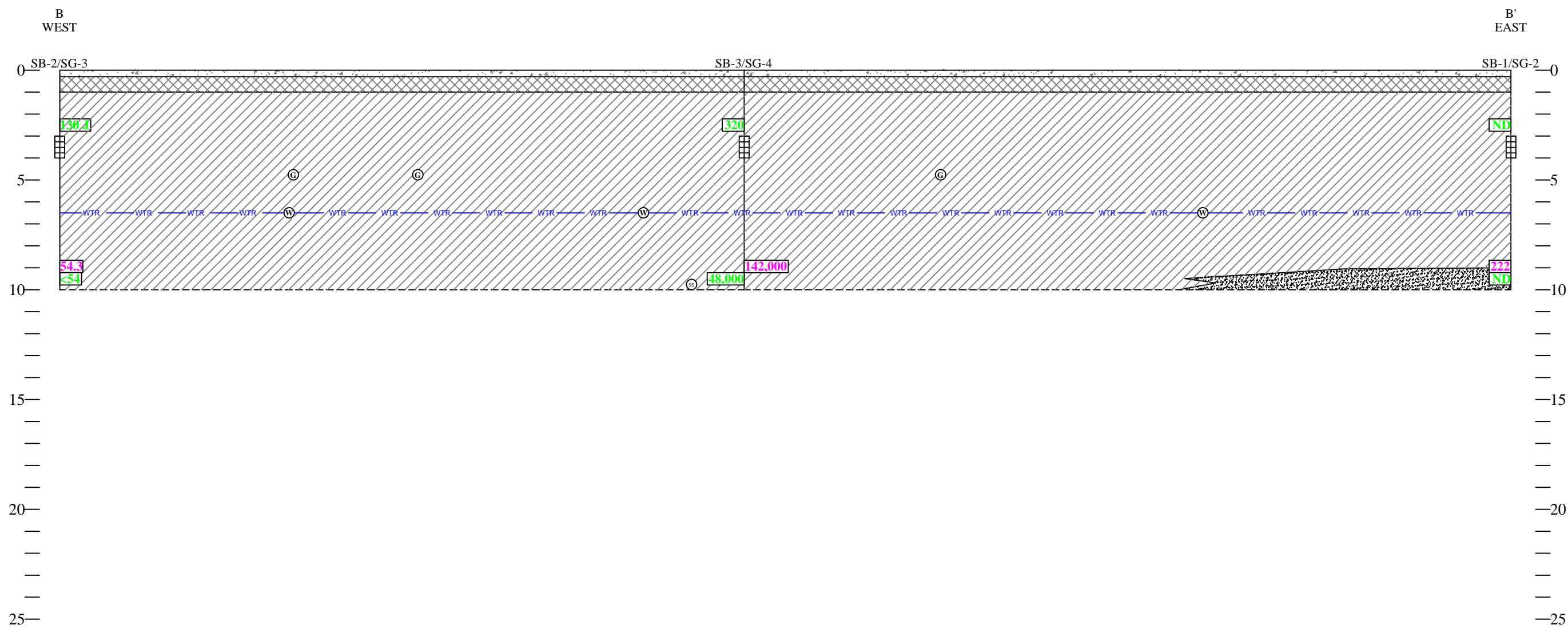


**CROSS SECTION  
A-A'**

Former Hoffman's Valet Cleaners  
7215 W. Center Street  
Wauwatosa, WI

<b>ENVIROforensics</b>	Figure
825 North Capitol Avenue • Indianapolis, IN 46204 EnviroForensics.com	9
	Project
	6200

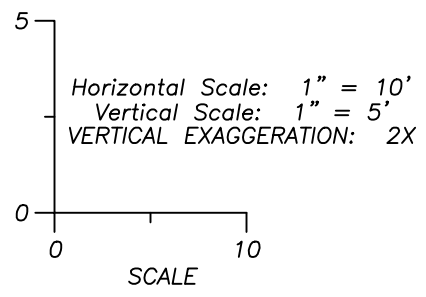
Date:	9/28/17
Designed:	EB
Drawn:	EB
Checked:	KH
DWG file:	6200-0451



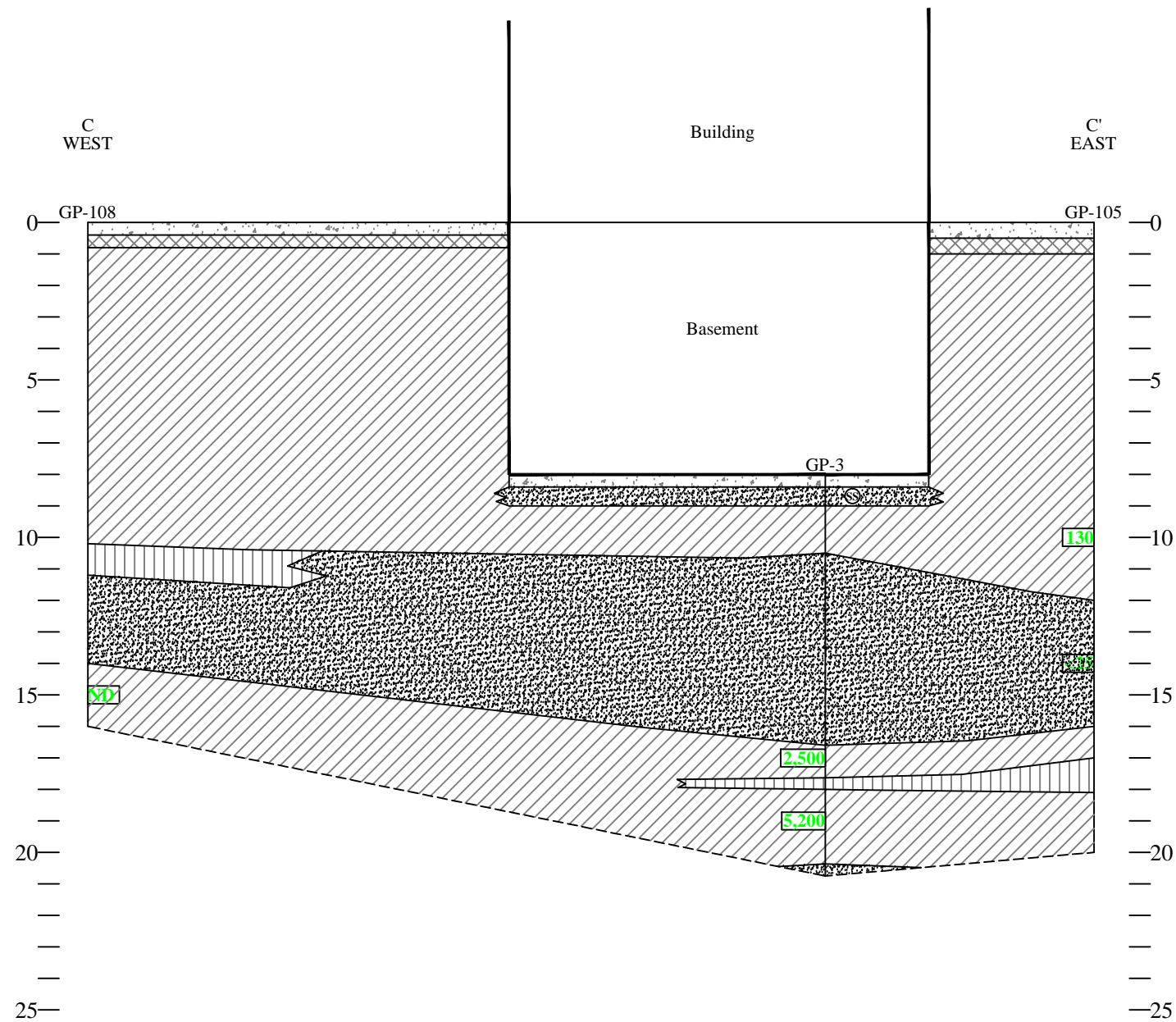
**Legend**

	Concrete/Asphalt
	Fill
	Sand
	Clay
	Silt

- 700 PCE concentration in soil sample ( $\mu\text{g}/\text{kg}$ )
- 700 PCE concentration in soil gas sample ( $\mu\text{g}/\text{m}^3$ )
- Monitoring well/Soil gas screen
- Underground sanitary utility line
- Underground gas utility line
- Underground water utility line



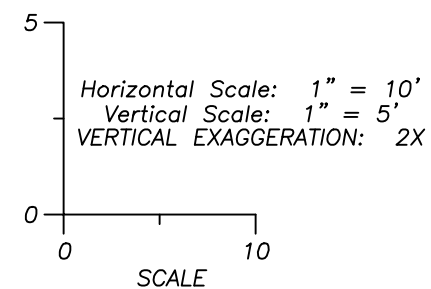
<b>CROSS SECTION B-B'</b> Former Hoffman's Valet Cleaners 7215 W. Center Street Wauwatosa, WI		Figure
		10
825 North Capitol Avenue • Indianapolis, IN 46204 EnviroForensics.com		Project
Date: 9/28/17 Designed: EB Drawn: EB Checked: KH DWG file: 6200-0451		6200



**Legend**

	Concrete/Asphalt
	Fill
	Sand
	Clay
	Silt

700 PCE concentration in soil sample (µg/kg)  
 Underground sanitary utility line



<b>CROSS SECTION C-C'</b> Former Hoffman's Valet Cleaners 7215 W. Center Street Wauwatosa, WI		Figure
 825 North Capitol Avenue • Indianapolis, IN 46204 EnviroForensics.com		11
		Project
Date: 9/28/17 Designed: EB Drawn: EB Checked: KH DWG file: 6200-0451	6200	



**ATTACHMENT 2**

**Revised Table 2**

**TABLE 2**  
**SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS**  
Former Hoffman's Valet Cleaners  
7215 W. Center Street, Wauwatosa, Wisconsin

Sample Identification	Sample Depth (ft bgs)	Date Sampled	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Ethylbenzene	Methylene Chloride	Naphthalene	Trichlorofluoromethane	Total Xylenes
<b>Industrial Residual Contaminant Level</b>			<b>145,000</b>	<b>8,410</b>	<b>2,340,000</b>	<b>35,400</b>	<b>1,150,000</b>	<b>24,100</b>	<b>1,230,000</b>	<b>260,000</b>
<b>Non-Industrial Residual Contaminant Level</b>			<b>33,000</b>	<b>1,300</b>	<b>156,000</b>	<b>8,020</b>	<b>61,800</b>	<b>5,520</b>	<b>1,230,000</b>	<b>260,000</b>
<b>Soil to Groundwater Residual Contaminant Level</b>			<b>4.5</b>	<b>3.6</b>	<b>41.2</b>	<b>1,570</b>	<b>2.6</b>	<b>658</b>	<b>NE</b>	<b>3,960</b>
GP-1	6-8	2/7/2002	<b>51</b>	ND	<b>53</b>	<10	<b>21 Q</b>	ND	ND	<20
GP-2	4-6	2/7/2002	<b>240</b>	ND	<10	<10	<b>14 Q</b>	ND	ND	<20
GP-101	7-11	9/12/2002	<25	ND	<25	<25	<25	<b>50 Q</b>	<25	<50
	11-15	9/12/2002	<25	ND	<25	<25	<25	<25	<25	<50
GP-102	4-8	9/12/2002	<b>150</b>	ND	3.0	<25	<25	<25	<25	<50
	12-16	9/12/2002	<25	ND	<25	<25	<25	<25	<25	<50
GP-103	8-12	9/12/2002	<b>400</b>	ND	<25	<25	<25	<25	<25	<50
	12-16	9/12/2002	<25	ND	<25	<25	<25	<25	<25	<50
GP-104	4-6	9/12/2002	<b>41 Q</b>	ND	<25	<25	<25	<25	<b>61</b>	<50
	8-9	9/12/2002	<b>45 Q</b>	ND	<25	<25	<25	<25	<25	<50
GP-105	8-12	9/12/2002	<b>130</b>	ND	<25	<25	<25	<25	<25	<50
	12-16	9/12/2002	<25	ND	<25	<25	<25	<25	<25	<50
GP-106	10-12	5/1/2009	<26	ND	<26	<26	<53	<53	ND	<b>100</b>
GP-107	14-16	5/1/2009	<28	ND	<28	<28	<56	<56	ND	<95
GP-108	14-16	5/1/2009	<28	ND	<28	<28	<56	<56	ND	<95
GP-109	12-14	5/1/2009	<28	ND	<28	<28	<56	<56	ND	<96
GP-110	14-16	5/1/2009	<29	ND	<29	<29	<57	<57	ND	<98
GP-111	10-12	11/13/2009	<25	<25	<25	<25	<25	<25	<25	<50
	14-16	11/13/2009	<25	<25	<25	<25	<25	<25	<25	<50
GP-112	10-12	11/13/2009	<25	<25	<25	<25	<25	<25	<25	<50
	14-16	11/13/2009	<25	<25	<25	<25	<25	<25	<25	<50
MW-1	10-12	1/19/2005	<b>2,800</b>	ND	<29	<29	<b>72</b>	<29	<29	<58
MW-2	10-12	1/19/2005	<b>3,720</b>	ND	<28	<28	<b>96</b>	<28	<28	<56
MW-3	10-12	1/19/2005	<31	ND	<31	<31	<62	<31	<31	<62
GP-3	8-10	1/8/2007	<b>2,500</b>	ND	<35	<b>80</b>	<69	<69	ND	<b>320</b>
	10-12	1/8/2007	<b>5,200</b>	ND	<54	<b>130</b>	<110	<110	ND	<b>550</b>
SB-1	2-3	9/15/2016	<54	<42	<21	NA	NA	NA	NA	NA
	9-10	9/15/2016	<54	<42	<21	NA	NA	NA	NA	NA
SB-2	2-3	9/15/2016	<b>130 J</b>	<42	<21	NA	NA	NA	NA	NA
	9-10	9/15/2016	<54	<42	<21	NA	NA	NA	NA	NA
SB-3	2-3	9/15/2016	<b>320</b>	<42	<21	NA	NA	NA	NA	NA
	9-10	9/15/2016	<b>48,000</b>	<b>199</b>	<b>208</b>	NA	NA	NA	NA	NA

**Notes:**

- All data collected by ARCADIS. Some information not known at this time
- All concentrations reported in units of micrograms per kilogram (µg/kg)
- ft bgs = feet below ground surface
- Samples analyzed using EPA SW-846 Method 8260
- Bolded** values are above laboratory detection limits
- Bolded and orange shaded** values are above the Industrial RCL
- Bolded and green shaded** values are above the Non-Industrial RCL
- Bolded and blue shaded** values are above the Soil to Groundwater RCL
- NA = Not analyzed
- ND = Compound not detected above the method detection limit
- Q = One or more quality control criteria failed
- RCL = Residual Contaminant Level