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4-5-2016 wk Plan

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January 21, 2016

9-28-SI
10-10-16 Ambient Air

Terracon

Wisconsin Department of Natural Resources
Waukesha Service Center
141 NW Barstow Street
Waukesha, Wisconsin 53188

Attn: Mr. Dave Volkert



Re: **Supplementary Site Investigation Work Plan**
Clare Central Apartments
1003 and 1033 West Atkinson Avenue
Milwaukee, Wisconsin
Terracon Project No. 58107058
WDNR BRRTS #02-41-549867 & #06-41-560680

Dear Mr. Volkert:

Terracon Consultants, Inc. (Terracon) was retained by Telos, Inc. (Telos) to prepare this supplementary site investigation work plan (SSIWP) and perform environmental consulting services at the Clare Central apartment complexes located at 1003 and 1033 Atkinson Avenue, Milwaukee, Wisconsin (site). Terracon prepared this SSIWP in accordance with NR 716, Wisconsin Administrative Code (WAC), to include the requested Wisconsin Department of Natural Resources (WDNR) site investigation activities intended to receive a completed Voluntary Party Liability Exemption (VPLE) site investigation letter for the site from the WDNR. A brief outline of the project, Terracon's scope of services and project schedule are provided in the following sections.

1.0 PROJECT INFORMATION

In July 2006, Terracon performed a limited site assessment at the site to evaluate the recognized environmental conditions identified in a Phase I Environmental Site Assessment. In response to the identification of chlorinated volatile organic compounds (CVOCs) in soil and groundwater at the site, Terracon performed a site investigation from 2010 through 2013. The site investigation included the advancement of 27 direct-push soil borings (P-1 through P-27), construction of nine (9) temporary groundwater monitoring wells, construction of seven (7) NR 141, WAC-compliant, groundwater monitoring wells (MW-1 through MW-7), installation of two (2) sub-slab vapor monitoring points (SS-1 and SS-2), and collection of ambient air samples. Trichloroethene (TCE), the main contaminant of concern, along with other CVOCs, were reported in soil, groundwater, vapor, and air at concentrations exceeding applicable standards. In response to TCE detections at concentrations above the vapor screening levels and the vapor action level for the sub-slab and ambient air samples, respectfully, at both the 1003 and 1033 West Atkinson Avenue apartments, sub-slab depressurization systems (SSDS) were

installed in each apartment complex in May 2011 as an interim action to mitigate CVOC vapor intrusion. The investigative and interim action work was documented in Terracon's *Site Investigation and Interim Action* report dated March 1, 2013, which was submitted to the WDNR for review.

On June 3, 2013, a VPLE application was submitted to the WDNR for review and approval. The WDNR approved the application on July 7, 2013.

In September 2013, the WDNR stated that the site investigation was not complete, and that the WDNR would temporarily take over the investigation utilizing the Wisconsin Assessment Monies (WAM) and the Vapor Intrusion Zone Contract (VIZC) for additional investigative and interim action activities. The WDNR contracted with The Sigma Group (Sigma) to conduct additional soil and groundwater investigation, and SCS Engineers (SCS) for indoor and sub-slab vapor sampling in the offsite neighboring property at 3618 North 11th Street.

From May 2014 through May 2015, Sigma conducted additional site investigation on the site and one offsite neighboring property (3618 North 11th Street). Sigma's additional site investigation included the advancement of 12 direct-push soil borings (SGP-1 through SGP-12), construction of four (4) temporary groundwater monitoring wells (STW-1 through STW-4), construction of three (3) NR 141, WAC-compliant, groundwater monitoring wells (MW-8 through MW-10), construction of a double-cased piezometer (PZ-1), and installation of five (5) interior soil borings. The results were documented in Sigma's *Additional Site Investigation Summary Report*, dated September 10, 2015.

In January 2014, SCS performed ambient air and sub-slab vapor sampling in the off-site neighboring property at 3618 North 11th Street. TCE was detected; however, the concentrations did not exceed residential standards. The results were documented in the SCS report, *Vapor Assessment Sampling Results for Clare Central Project-3618 North 11th Street*, dated February 21, 2014.

In March 2015, SCS installed a SSDS in the 3618 North 11th Street resident's basement. While indoor air contaminant levels remains below standards, this was a precautionary measure to address potential migration into the basement in the future. The results were documented in the Acura Services, LLC, *Post Mitigation Report for: Mr. Dennis Leonard, 3618 North 11th Street*, dated March 23, 2015.

To prepare this SSIWP, Terracon reviewed the following documents:

- *Environmental Health Investigation Update*, Wisconsin Department of Health Services (dated August 29, 2013);
- *SSDS Inspection at Both Complexes*, Acura Services, LLC (dated January 13, 2014);

Supplemental Site Investigation Work Plan

Clare Central Apartments ■ Milwaukee, Wisconsin
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- *AAI Phase I Environmental Site Assessment*, The Sigma Group, (dated February 2014);
- *Vapor Assessment Sampling Results for Clare Central Project-3618 North 11th Street*, SCS Engineers (dated February 21, 2014);
- *Post Mitigation Report for: Mr. Dennis Leonard, 3618 North 11th Street*, Acura Services, LLC (dated March 23, 2015);
- *Additional Site Investigation Summary Report*, The Sigma Group (dated September 10, 2015).

2.0 SCOPE OF SERVICES

Based on an October 5, 2015 meeting between Telos representatives and the WDNR, it is understood that supplemental site investigation is needed to complete a VPLE compliant site investigation in accordance with the requirements of Chapter NR 716, WAC. Terracon proposes the following scope of services to complete the essential tasks the WDNR identified as necessary to complete the site investigation.

2.1 Health and Safety Plan

Terracon is committed to the safety of all its employees. As such, and in accordance with our Incident and Injury Free® safety goals, Terracon will develop a safety plan to be used by our personnel during field services. Prior to commencement of on-site activities, Terracon will hold a brief health and safety meeting to review health and safety needs for this specific project. At this time, we anticipate performing fieldwork in a USEPA Level D work uniform consisting of hard hats, safety glasses, protective gloves, and steel toed boots. It may become necessary to upgrade this level of protection, at additional cost, during sampling activities in the event that we encounter petroleum or chemical constituents in soils or groundwater that present an increased risk for personal exposure.

2.2 Locate Utilities in the Work Area

In an effort to locate utilities in the work area, Terracon will review any site plans provided to us and will contact Diggers Hotline. To the extent practicable, the locations and depths of the various marked utilities will be identified to avoid damage to such utilities and to evaluate potential contaminant migration pathways and receptors. A private utility locator will be contracted to mark private utilities not marked by Diggers Hotline.

2.3 Supplementary Site Investigation

Task 1 – Sub-Slab Vapor and Ambient Air Testing

On December 8, 2015, Terracon personnel and a Telos representative performed an inspection of the SSDS at the 1003 and 1033 complexes to confirm that the SSDS were operational. The SSDS were operational in both complexes.

Based on the elapsed time since the sub-slab vapor and ambient air sampling was last performed, the WDNR, Milwaukee Health Department (MHD), and Wisconsin Department of Health Services (DHS) requested that vapor/ambient air sampling be performed in both apartment complexes, and the 3618 North 11th Street residence. Specifically, MHD and DHS requested that further indoor air sampling be performed in the cooler months, under conditions of reduced air exchange. It is understood that the resident at the 3618 North 11th Street residence is deceased; therefore, the WDNR, MHD, and DHS will need to assist Terracon in obtaining access to this residence.

Terracon will perform sub-slab vapor and ambient air sampling in both complexes and the 3618 North 11th Street residence. Specific activities associated with the sub-slab vapor and ambient air sampling vapor sampling follows:

- Sub-slab vapor monitoring points are in place at all three buildings (SS-1: 1003 West Atkinson; SS-2: 1033 West Atkinson; and S-1: 3618 11th Street). Terracon will collect one, 30-minute sub-slab vapor sample from each location in laboratory prepared 6-liter Summa canisters with a flow regulator calibrated for 30-minute collection.

The integrity of the sample point will be evaluated prior to sampling by conducting a helium-shroud leak test. The leak test is conducted by placing a shroud over the sample point and introducing helium into the shroud air space. Air is drawn through a tube connected to the sample point and tested for the presence of helium. The presence of helium indicates that the sample point is not sealed properly and should be repaired prior to sampling. The shroud test is necessary to verify that the gas sample is being collected from below the slab. After leak testing is complete, the sample will be collected by connecting the sample point to the Summa canister with dedicated tubing and opening the valve on the canister.

The sub-slab vapor samples collected within the Summa canisters will be submitted to the laboratory for analysis of chlorinated related VOCs

(tetrachloroethylene (PCE), trichloroethylene (TCE), trans-dichloroethylene (DCE), cis-DCE, and vinyl chloride (VC) using EPA Method TO-15.

Terracon will collect one, 24-hour ambient sample from each of the three buildings in laboratory prepared 6-liter Summa canisters with a flow regulator calibrated for 24-hour collection. The ambient air samples collected within the Summa canisters will be submitted to the laboratory for analysis of PCE, TCE, trans-DCE, cis-DCE, and VC using EPA Method TO-15.

Consistent with past sampling events, the ambient air samples will be collected from 1) 1003 Sump Closet (1st Floor), 2) 1033 Unit #2 Kitchen Counter (1st Floor), and 3) 3618 Basement.

A summary of the proposed sampling/analysis strategy is presented below.

<u>Sample Location</u>	<u>Matrix/Analyses</u>	<u>No. of Samples</u>	<u>Lab Method</u>
Clare:1003 West Atkinson	Sub-Slab (SS-1) and Ambient Air Samples: CVOCs	2	T0-15
Clare:1033 West Atkinson	Sub-Slab (SS-2) and Ambient Air Samples: CVOCs	2	T0-15
3618 North 11th Street	Sub-Slab and Ambient Air Samples: CVOCs	2	T0-15

Task 2 – Residential Vapor Intrusion Assessment

The WDNR, MHD, and DHS requested that vapor intrusion assessments be performed in the four (4) residences to the south of 3618 North 11th Street. Terracon will perform sub-slab vapor and ambient air sampling in the basements of the following residences:

- 3614 North 11th Street
- 3610 North 11th Street
- 3604 North 11th Street
- 3600 North 11th Street

Specific activities associated with the sub-slab vapor and ambient air sampling follows:

- Secure written access agreements to the four residences. The WDNR, MHD, and DHS will need to assist Terracon in obtaining the agreements.
- Procure a security firm to provide security during vapor intrusion assessment at the residences.
- Perform a chemical inventory, and complete a site diagram, including sampling locations for the residence basements.
- Install one (1) sub-slab vapor monitoring point in each residence's basement. The vapor monitoring points will consist of pre-fabricated Vapor Pin™ sample inserts, constructed using a hammer drill in accordance with Terracon's and Cox Colvin standard operating procedures. A 1.5-inch diameter drill bit will be used to penetrate the concrete to approximately 1¾ inches below grade, followed by advancing a ⅝-inch drill bit completely through the concrete slab and into the substrate below the concrete. Vapor Pin™ leak-tight sub-slab gas sampling inserts will subsequently be installed into the concrete and finished as a flush-mounted unit.
- Perform a sub-slab vapor point leak test. The integrity of the sub-slab vapor sample points will be evaluated prior to sampling by conducting a helium-shroud leak test. The leak test is conducted by placing a shroud over the sample point and introducing helium into the shroud air space. Air is drawn through a tube connected to the sample point and tested for the presence of helium. The presence of helium indicates that the sample point is not sealed properly and should be repaired prior to sampling. The shroud test is necessary to verify that the gas sample is being collected from below the slab.
- Collect one, 30-minute sub-slab vapor sample from each residence using a laboratory prepared 6-liter Summa canister with a flow regulator calibrated for 30-minute collection. After leak testing is complete, the sample will be collected by connecting the sample point to the Summa canister with dedicated tubing and opening the valve on the canister. The soil gas sample collected within the Summa canister will be submitted to the laboratory for analysis of PCE, TCE, trans-DCE, cis-DCE, and VC using EPA Method TO-15.
- Collect one ambient air sample from each residence's basement. The ambient air samples will be collected in laboratory provided 6-liter Summa canisters, which have flow controllers calibrated for 24-hour sample collection. The ambient air samples will be submitted for analytical testing of PCE, TCE, trans-1,2-DCE, cis-1,2-DCE, and VC using EPA Method TO-15.

A summary of the proposed sampling/analysis strategy is presented below.

<u>Sample Location</u>	<u>Matrix/Analyses</u>	<u>No. of Samples</u>	<u>Lab Method</u>
3614 North 11 th Street	Sub-Slab ¹ and Ambient Air ² Samples: CVOCs	2	T0-15
3610 North 11 th Street	Sub-Slab ¹ and Ambient Air ² Samples: CVOCs	2	T0-15
3604 North 11 th Street	Sub-Slab ¹ and Ambient Air ² Samples: CVOCs	2	T0-15
3600 North 11 th Street	Sub-Slab ¹ and Ambient Air ² Samples: CVOCs	2	T0-15

¹ Sub-slab vapor samples collected for 30-minutes.

² Ambient air samples collected for 24-hours.

Task 3- Direct-Push Supplemental Investigation

Based upon the CVOC detections in direct-push soil borings SGP-11 and SGP-12, which are located in the 3618 North 11th Street yard, and borings P-10 and P-18, which are located in the alley east of the 3614 North 11th Street residence, Terracon will subcontract a firm to obtain soil and groundwater samples to delineate the extent of impacts to the south-southwest of the site.

Terracon will subcontract a direct-push sampling rig to advance seven direct-push borings (P-28 through P-34) to approximately 20 feet bgs. Soil samples will be collected continuously using a 5-foot long, 2-inch diameter core barrel sampler equipped with disposable acetate liners. Drilling equipment will be decontaminated between uses at each boring location using a high pressure washer. The proposed locations are depicted in the attached figure; however, the locations may be modified based upon the presence of utilities or if access is otherwise restricted.

Soil characteristics (e.g. texture, color) and any unusual odors or discoloration will be noted on the soil boring log. A photoionization detector (PID) will be used to field screen soil samples for VOC vapors. At each boring, one soil sample will be selected for analysis from the interval with the highest PID reading or from immediately above the water table, unless other indications of impacts suggest another sample. Soil samples will be submitted for laboratory analysis of VOCs by USEPA Method 8260B.

Temporary groundwater monitoring wells will be constructed within soil borings P-28 (east of the 3614 North 11th Street residence) and P-31(east of the 3604 North 11th Street residence). The

temporary groundwater monitoring wells will be constructed within each soil boring using 10-foot sections of No. 10-slot, 3/4-inch diameter, polyvinyl chloride (PVC) well screen. The well screen will be connected to a 3/4-inch diameter PVC riser pipe which extends above the ground surface.

Groundwater samples will be collected by inserting disposable tubing into the temporary groundwater monitoring wells and extracting water with a peristaltic pump. Prior to sample collection, groundwater will be purged from the temporary groundwater monitoring wells until relatively sediment free water is observed. It is anticipated that the temporary groundwater monitoring wells may not recharge immediately after installation; therefore, a separate mobilization for temporary well sampling may be needed if groundwater does not accumulate immediately after construction. Terracon will submit the groundwater samples for laboratory analysis of VOCs by USEPA Method 8260B.

The soil borings and temporary groundwater monitoring wells will be abandoned in accordance with NR 141, Wisconsin Administrative Code (WAC) after the groundwater samples are collected.

A summary of the proposed sampling/analysis strategy is presented below.

<u>Sample Location</u>	<u>Matrix/Analyses</u>	<u>No. of Samples</u>	<u>Lab Method</u>
P-28 through P-34	Deep Soil Samples: VOCs	7	8260B
P-28 and P-31	Groundwater: VOCs	2	8260B

Task 4- Groundwater Monitoring Well Installation and Development

Terracon will subcontract a drill rig utilizing hollow-stem augers to install one groundwater monitoring well (MW-11) at the 3610 North 11th Street residence to approximately 20 feet bgs. The groundwater monitoring well will be installed per Chapter NR 141, WAC. The groundwater monitoring well will be constructed by attaching a 10-foot length of 2-inch diameter, 0.010-inch slotted, polyvinyl chloride (PVC) well screen to a solid PVC riser pipe that will extend near the ground surface. A sand filter pack will be placed around the screen to a depth of approximately one foot above the top of the screen. The remainder of the borehole will be grouted with bentonite to near the ground surface. A bolt-down, flush-mount well protector will be installed at ground surface.

The groundwater monitoring well will be developed with bailers and/or pumps per NR 141, WAC. The groundwater monitoring wells will be surveyed relative to the National Geodetic Vertical Datum (NGVD), so that groundwater flow direction can be determined from static water level measurements. All investigation-derived wastes (IDW), soil cuttings and development water, will be containerized in labeled 55-gallon drums for temporary storage on site. Upon receipt of the analytical results, Terracon will arrange for the appropriate disposal of the IDW generated during well construction.

Task 5- Groundwater Monitoring Well Sampling

Not sooner than one week following well development, a groundwater sample will be collected from the newly installed groundwater monitoring well (MW-11) and groundwater monitoring well MW-10. The groundwater samples will be collected using low-flow sampling methods to reduce the potential for sample turbidity. Terracon will purge the monitoring well prior to sampling using a low-flow pump and dedicated tubing. Natural attenuation field parameters such as dissolved oxygen (DO), oxidation-reduction potential (ORP), specific conductance, pH, and temperature will be measured using a water quality meter with a flow-through cell until stable readings are observed for each of the parameters. Generally a goal of 3 consecutive readings within 10% taken a minimum of 5 minutes apart during purging is indicative that groundwater in the well has stabilized. Upon stabilization, a groundwater sample will be collected from the monitoring well.

The groundwater samples will be submitted for laboratory analysis of VOCs by USEPA Method 8260B. The groundwater samples will be collected in laboratory-supplied containers, placed in an ice chest to cool to approximately 4°C, and transferred under chain-of-custody protocol to a Wisconsin-certified laboratory for analysis. A trip blank will also be submitted for VOC laboratory analysis.

Static water levels will be measured from the groundwater monitoring well network.

A summary of the proposed sampling/analysis strategy is presented below.

<u>Sample Location</u>	<u>Matrix/Analyses</u>	<u>No. of Samples</u>	<u>Lab Method</u>
MW-10 and MW-11	Groundwater: VOCs	2	8260B

Task 6- Supplemental Site Investigation Report

Assuming the extent of contamination is delineated; Terracon will prepare an NR 716, WAC compliant, Supplemental Site Investigation (SSI) report documenting Terracon's supplemental investigative procedures, findings and results. The SSI report will also include all work performed by Acura, SCS, and Sigma, such that one, comprehensive SSI report is developed.

As requested, an assessment of the underground utilities beneath 11th Street will be performed. The assessment will include evaluation available as-built construction records regarding burial depth, construction, etc. that are available from the City of Milwaukee and/or Diggers Hotline. It is understood that the WDNR will assist in obtaining right-of-way access.

An NR 716, WAC, SSI report will only be appropriate if the investigation has provided data indicating that the extent of impacted soil and groundwater has been delineated to appropriate levels.

2.4 Schedule

The proposed schedule is as follows:

TASK	PROPOSED SCHEDULE	ANTICIPATED COMPLETION DATE*
SSI Work Plan Approval		February 2016
Off-Site Access Agreements	Two to three weeks after work plan approval	March 2016
Sub-Slab Vapor and Ambient Air Sampling Testing	At least two weeks after work plan approval	February 2016
Residential Vapor Intrusion Assessment	At least two weeks after site access approval	March/April 2016
Direct-Push Supplemental Investigation	Two to three weeks after access approval	April 2016
Groundwater Monitoring Well Installation & Development	Two to three weeks after access approval	April 2016
Groundwater Monitoring Well Sampling	At least one week after well development	May 2016
Submital of Supplemental Site Investigation Report	30 days from receipt of groundwater analytical results	May 2016**

* Anticipated completion date will be based on off-site access approval, and the schedules of the WDNR, Terracon, drilling subcontractor, and laboratory.
 ** Completion of the SSI report is contingent upon the extent of contamination being defined with the scope of services described in this SSI work plan. If additional investigation is necessary, the completion date of the SSI Report will be adjusted accordingly.


Supplemental Site Investigation Work Plan
Clare Central Apartments ■ Milwaukee, Wisconsin
January 21, 2016 ■ Terracon Project No. 58107058




We look forward to working with you on this project, and if you have any questions or comments regarding this scope of work, please contact us at your earliest convenience at (414) 423-0255.

Sincerely,

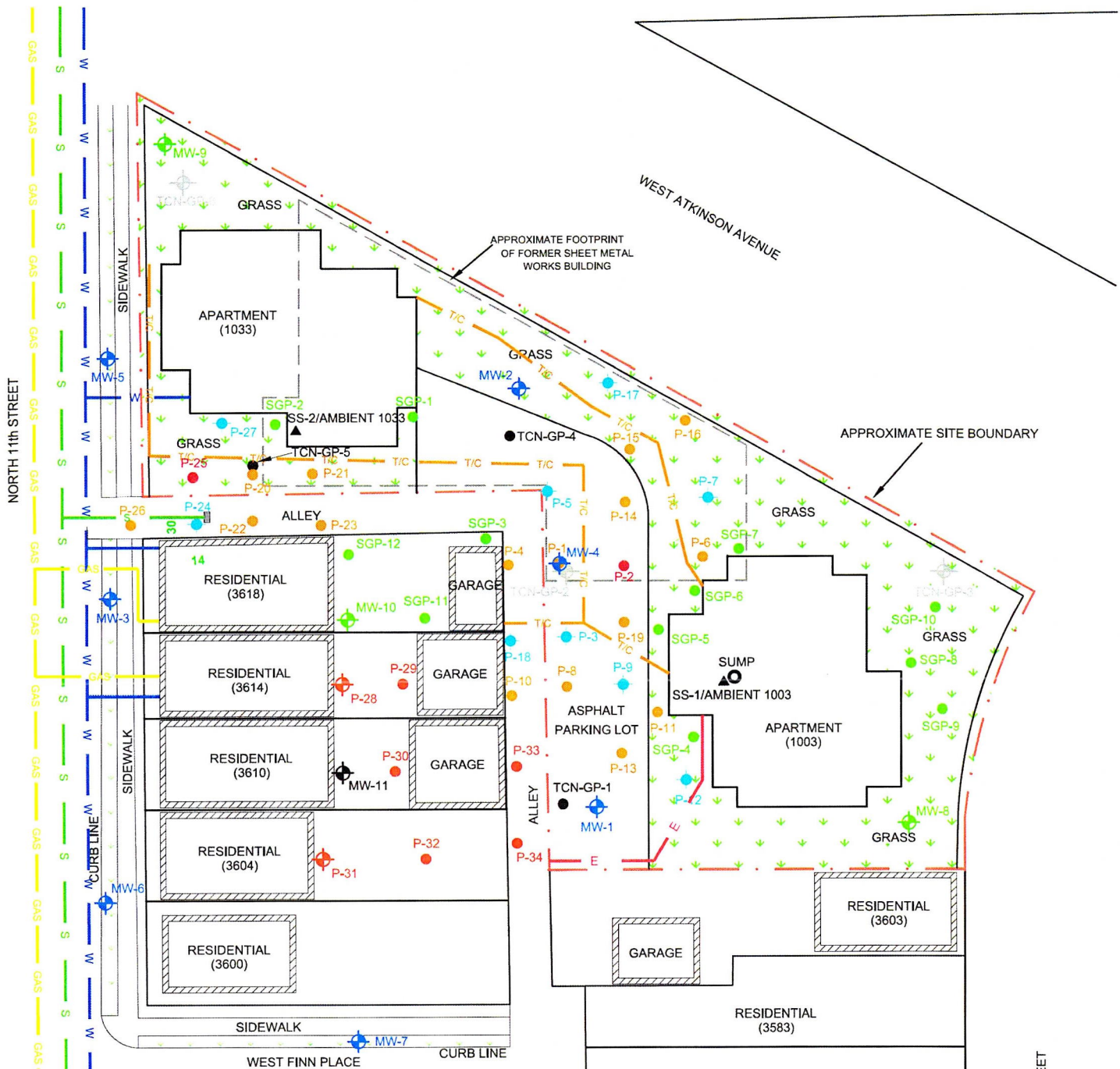



Timothy P. Welch, P.G.
Environmental Department Manager


Blaine R. Schroyer, P.E.
Principal/Office Manager

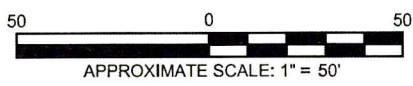
TPW/BRS:tpw\MILWAUKEE1\2010\58107058\SSIWP\Supplemental Site Investigation Work Plan Final 1.21.16.docx

Attachment - Site Diagram



LEGEND

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| <ul style="list-style-type: none"> ◆ SOIL & GROUNDWATER PROBE LOCATION (TERRACON LSI, AUGUST 16, 2006) ● SOIL PROBE LOCATION (TERRACON LSI, AUGUST 16, 2006) ◆ GROUNDWATER MONITORING WELL (TERRACON) ● GEOPROBE BORING TO 20 FEET BGS (TERRACON) ● GEOPROBE BORING TO 20 FEET BGS WITH TEMPORARY WELL (TERRACON) ● GEOPROBE BORING TO 35 FEET BGS (TERRACON) ▲ SUB SLAB VAPOR MONITORING POINT (2/11/11) — E — ELECTRIC (WE ENERGIES) — W — WATER LINE — TC — COMMUNICATION (AT & T) — GAS — GAS LINE — S — SEWER LINE ▨ STORM SEWER | <ul style="list-style-type: none"> ● PROPOSED SOIL BORING ◆ PROPOSED GROUNDWATER TEMPORARY WELL ◆ PROPOSED GROUNDWATER MONITORING WELL ◆ GROUNDWATER MONITORING WELL (SIGMA) ● GEOPROBE BORING (SIGMA) |
|--|---|



Project Mngr:	TPW	Project No.	58107058
Drawn By:	JMN	Scale:	AS SHOWN
Checked By:	TPW	File No.	58107058 BL
Approved By:	TPW	Date:	12/30/2015

Terracon
 Consulting Engineers and Scientists
 9566 SOUTH 57th STREET FRANKLIN, WI 53132
 PH. (414) 423-0255 FAX. (414) 423-0566

SITE DIAGRAM - PROPOSED BORING LOCATIONS
 CLARE CENTRAL
 1003 AND 1033 WEST ATKINSON AVENUE
 MILWAUKEE WISCONSIN

FIGURE
 1