

NOV 26 2013

**SITE INVESTIGATION WORKPLAN – ch. NR 716 CHLORINATED
VOLATILE ORGANIC COMPOUND RELEASE**

**WHITEFISH BAY CLEANERS
419 WEST SILVER SPRING DRIVE
GLENDALE, WISCONSIN**

BRRTS #02-41-550821

FID 241 246 060



November 2013

Stantec Project Number: 193702517

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TABLE OF CONTENTS

BY: _____

1.0 EXECUTIVE SUMMARY 1

2.0 BACKGROUND INFORMATION 2

3.0 SITE INVESTIGATION SCOPING 3

 3.1 PROPERTY LOCATION, DESCRIPTION, AND USE 3

 3.2 OVERVIEW OF LOCAL PHYSIOGRAPHY, GEOLOGY, AND HYDROGEOLOGY 3

 3.3 DERF-SPECIFIC SCOPING 3

4.0 SITE INVESTIGATION WORKPLAN 5

 4.1 INVESTIGATE SITE 5

 4.2 CONDUCT QUARTERLY GROUNDWATER SAMPLING 7

 4.3 PREPARE SITE INVESTIGATION REPORT 7

5.0 REFERENCES 8

FIGURE

Figure 1: Site Location and Local Topography

Figure 2: Site Layout

1.0 EXECUTIVE SUMMARY

This workplan outlines Stantec Consulting Services Inc. (Stantec's) technical approach to evaluate the extent of a chlorinated volatile organic compound (CVOC) release identified at Whitefish Bay Cleaners, 419 West Silver Spring Drive, Glendale, Wisconsin (the Site). After the degree and extent of contamination is known, a corrective action strategy will be recommended to appropriately address soil and groundwater contamination and obtain expedient case closure.

During December 2007, Giles Engineering Associates, Incorporated (Giles) completed a Preliminary Site Assessment (PSA) at the Site and identified CVOC contamination in the soil. The release discovery was reported to the Wisconsin Department of Natural Resources (WDNR) who subsequently required additional investigation.

The objective of the site investigation is to evaluate soil and groundwater quality and to determine the extent of the CVOC release. This information is essential in determining the risk to human health and the environment associated with the release and evaluating the necessity of a remedial action program. Consulting and engineering services will be provided from Stantec's Mequon office by project staff familiar with WDNR and Dry Cleaners Emergency Response Fund (DERF) regulations and personnel.

The scope of work includes the collection of soil samples from up to seven soil boreholes to further evaluate the source and extent of contamination in soil. Up to four of the boreholes will be completed at locations surrounding the Site building and converted to groundwater monitoring wells. One borehole will be completed in the Site building basement using a hand auger to evaluate the extent of CVOCs beneath the building.

The four groundwater monitoring wells will be sampled quarterly for one year to evaluate contaminant concentrations in groundwater. During the investigation, Stantec will evaluate the need for additional soil samples, groundwater monitoring wells, and/or piezometers to fully define the extent of CVOCs in soil and groundwater resulting from the CVOC release at the Site. After the investigation is complete, data will be interpreted to determine the extent, fate, and human and environmental health impacts of identified contaminants. After concurrence from the WDNR that the extent has been defined, a site investigation report will be prepared to document the findings.

2.0 BACKGROUND INFORMATION

Whitefish Bay Cleaners, an active dry cleaner business, has operated at 419 West Silver Spring Drive, Glendale, Wisconsin (the Site) for more than 30 years. Dry cleaning businesses have continuously operated at the Site since the 1950s. Giles Engineering Associates, Incorporated (Giles) completed a Preliminary Site Assessment (PSA) at the Site during December 2007. The PSA included the completion of three soil boreholes adjacent to the backdoor and within the Site building near the existing dry cleaning equipment location. Concentrations of PCE were detected in all laboratory analyzed soil samples. PCE and PCE breakdown products were also detected in a groundwater "grab" sample. Giles concluded that spillage and/or leakage of PCE associated with dry cleaning activities was the source of the release (Giles, 2008).

Giles reported the results of the PSA to the Wisconsin Department of Natural Resources (WDNR) who subsequently assigned a Bureau of Remediation and Redevelopment Tracking System number (02-41-550821) to the Site and requested a site investigation and appropriate remedial action be performed. This workplan describes the technical approach to evaluate the extent of a chlorinated volatile organic compounds (CVOCs) released at the Site.

3.0 SITE INVESTIGATION SCOPING

3.1 PROPERTY LOCATION, DESCRIPTION, AND USE

The Site occupies approximately 0.2 acres of the northwest quarter of the northeast quarter of section 32, Township 8 North, Range 22 East, Milwaukee County, Wisconsin as shown on Figure 1 (USGS, 1971). The Site is located in a commercial and residential area of the City of Glendale (the City), Wisconsin. The Site layout is shown in Figure 2.

A single-story building with a partial basement occupies the western portion of the Site. Asphalt paved parking and access drives cover the remainder of the Site. A dry cleaning business operates within the building. No other businesses occupy the building. The Site is served by City public water and sewer utilities.

3.2 OVERVIEW OF LOCAL PHYSIOGRAPHY, GEOLOGY, AND HYDROGEOLOGY

Ground surface at the Site gently slopes downward into Silver Spring Drive to the north or the alleyway to the south. Surface-water runoff at the Site flows into Silver Spring Drive and the alleyway. The entire Site is paved or covered by the Site building.

Native sediment in the area consists of till deposits of the Oak Creek Formation (WGNHS, 2011). The Oak Creek Formation was deposited by ice of the Lake Michigan Lobe. The formation includes fine-textured glacial till, lacustrine clay, silt, sand, and some glaciofluvial sand and gravel. The silty till is typically brown where oxidized and gray where un-oxidized, and typically overlies older glacial sediments or Silurian-age dolomite bedrock (Skinner and Borman, 1973).

The shallow water table is often a subdued expression of surface topography. Shallow groundwater generally flows from areas of groundwater recharge, such as hills and broad uplands, to areas of groundwater discharge, such as wetlands, rivers, and lakes. Based on the local surface topography and groundwater flow data from a petroleum contaminant investigation site located west of the Site, local shallow groundwater is expected to flow west or southwest towards the Milwaukee River (WDNR GIS, 2013). Other man-made features such as wells, roads, filled areas, buried utility lines and sewers, and drainage ditches may alter the natural shallow groundwater flow direction. The depth to shallow groundwater is estimated to 10 to 20 feet below grade (fbg). Groundwater in the bedrock aquifer is expected to flow generally east toward Lake Michigan (Skinner and Borman, 1973).

3.3 DERF-SPECIFIC SCOPING

Stantec also completed site investigation scoping to address the items specified in section NR 169.05 (27), Wisconsin Administrative Code (s. NR 169.05 [27], Wis. Adm. Code). The items are restated in italics below, followed by Stantec's findings.

- (a) *History of the facility, including the location of dry cleaning equipment and chemical and filter storage*

The Site contains one building which houses a dry cleaning business. A basement underlies the northeast portion of the building while the remainder of the building has a slab-on-grade concrete floor. Mr. Charles Mathers was interviewed to determine past dry cleaning activities (Mathers, 2013). Mr. Mathers has owned and operated Whitefish Bay Cleaners located at the Site since 2004 and has worked for dry cleaning businesses at the Site for more than 30 years. Mr. Mathers provided the following information.

- Dry cleaning businesses have operated continuously at the Site the 1950s.
- The layout of the interior of the dry cleaning facility has remained relatively unchanged with the dry cleaning machines located in the southwest corner of the Site building.
- For at least the past 30 years, PCE has been the sole chlorinated solvent used in the dry cleaning process.
- Used PCE and filter material have been stored inside the southwest corner of the Site building in sealed storage containers and periodically taken by Safety-Kleen for off-site disposal and/or recycling.
- Mr. Mathers stated that he has not observed a significant PCE spill at the Site while he has owned the dry cleaning business.

(b) Knowledge of the type of contamination and the amount of contamination

The exact source and quantity of the released dry cleaning solvents are unknown, but is likely from minor leakage from dry cleaning machine and/or spills over the past 60 years.

(c) Environmental media affected by contamination

Chlorinated solvents have been detected in soil and groundwater and are likely present in soil vapor at the Site.

(d) Location of the site and its proximity to other sources of contamination

No other sources of contamination, besides the ones listed above, are believed to be present at the Site. Released petroleum was detected in soil and/or groundwater at a site located approximately 300 feet west (5600 North Port Washington Road) of the Site. The petroleum release was investigated and petroleum contaminated soil or groundwater did not extend onto the Site. Groundwater flowed southwest and PCE was not detected in groundwater at the petroleum release site.

(e) Assessment of potential or known impacts to receptors

Numerous buried utilities are present at the Site and within adjacent street right-of-ways. Impacts to these receptors will be evaluated during the site investigation. A sump is also present in the basement of the Site building.

(f) Assessment of potential impacts to sensitive areas

There are no known sensitive areas on or adjacent to the Property.

(g) A map showing the site boundaries, location of source areas, including utility corridors, sewer lines, adjacent streets, receptor locations and sample locations and results of sampling

The site layout is shown in Figure 2. Additional information regarding buried utility locations will be assessed and added to site drawings during the site investigation.

4.0 SITE INVESTIGATION WORKPLAN

The proposed workplan was designed to make maximum use of existing information, satisfy the regulatory requirements of Wisconsin Statute §292.11, minimize total project cost, and expedite project completion. To minimize project cost and time requirements, the project will be completed in a phased approach. Each phase uses information gathered in previous tasks to better focus subsequent portions of the investigation.

The goal of the project is to quantify the extent of released CVOCs, evaluate contaminant fate and transport, and consider the potential for identified contaminants to affect environmental and human health and welfare. Work will be performed according to WDNR guidelines, the requirements of Chapters NR 169 and the NR 700 Series, Wisconsin Administrative Code (NR 169 and NR 700 series, Wis. Adm. Code). The proposed workplan consists of the following tasks.

Task 1.0	Investigate Site
Task 2.0	Conduct Quarterly Groundwater Sampling
Task 3.0	Prepare Site Investigation Report

Project assumptions and tasks are described below.

4.1 INVESTIGATE SITE

The goal of the site investigation is to define the vertical and lateral extent of the CVOCs in soil and groundwater. This information is essential in determining the risk to human health and the environment associated with the release and evaluating the necessity of a remedial action program. The field investigation will be performed according to s. NR 716.11, Wis. Adm. Code and is described below.

4.1.1 SOIL INVESTIGATION

Based on the layout of the Site, and the results of the PSA completed by Giles, soil samples will be collected from seven soil boreholes to further evaluate the source and extent of contamination in soil. Four of the borings will be completed to approximately 20 feet below grade using a truck-mounted drill rig using hollow stem augers for the purpose of installing groundwater monitoring wells. One borehole will be completed inside the building north of the dry cleaning machines and one borehole outside the west wall of the Site building using cart-mounted direct-push soil sampling equipment. One borehole will be completed inside the Site building basement using a hand auger to determine if CVOCs are beneath the basement slab. The proposed borehole locations are shown in Figure 2. The actual locations, depths, and number of boreholes will depend on the existing Site conditions, stratigraphy, and hydrogeology.

Soil samples will be collected continuously, and a portion of each sample will be immediately sealed, cooled, and preserved for possible laboratory analysis according to WDNR guidelines. A portion of the sample will be field screened for the presence of CVOCs using a Thermo Environmental Instruments, Incorporated Model 580 photoionization detector (PID) outfitted with a 10.6 eV lamp. Stratigraphic borehole logs will be prepared by Stantec personnel in general conformance with the American Society Testing and Materials Method 2488. All soil sampling equipment will be washed with a detergent solution and double-rinsed with organic-free tap water before each soil sample is collected to prevent sample cross-contamination.

Stantec will submit for laboratory analysis a soil sample from the 0 to 4 fbg interval in each borehole (seven total samples). Stantec may also submit, for laboratory analysis, one other soil sample from each borehole collected between 4 fbg the observed water table exhibiting the highest PID reading. Soil samples will be analyzed by a WDNR-

certified laboratory for VOCs using Environmental Protection Agency (EPA) Method 8260B.

The horizontal locations and ground surface elevations of the borings will be surveyed. Each borehole not completed as a well will be decommissioned by filling with bentonite when the drilling and sampling are complete as required by state law (NR 141, Wis. Adm. Code). Soil cuttings produced from the boreholes will be temporarily stored on-site in labeled 55-gallon drums. Drums will be disposed following receipt of laboratory analytical results.

4.1.2 GROUNDWATER INVESTIGATION

Four of the borings discussed above in Section 4.1.1 will be completed as monitoring wells to evaluate groundwater quality at the Site. A temporary well will also be constructed in the borehole located inside the Site building north of the dry cleaning machines. A total depth of 20 feet below grade (fbg) is expected for the monitoring wells, but will depend upon observed groundwater elevations. The proposed monitoring well locations are shown in Figure 2.

The temporary monitoring well will be constructed utilizing 2-inch diameter PVC with 10-feet of 0.010-inch slot PVC screen. The remaining monitoring wells will be constructed in accordance with state requirements (Chapter NR 141, Wis. Adm. Code). Specifically, they will be constructed of 2-inch diameter polyvinyl chloride (PVC) threaded casing and will utilize a 10-feet of 0.010-inch slot PVC screen. No glues, solvents, or lubricants will be used in well construction. The horizontal and vertical locations of the wells will be surveyed to determine the groundwater flow direction and gradient. The wells will be completed with flush-mounted protective covers.

The monitoring wells will be developed using a variable capacity bailer or centrifugal pump to remove the effects of drilling and well installation, and to maximize well yield. During development, measurements of specific conductance, pH, temperature, and turbidity will be recorded. Development will continue until ten saturated well volumes are removed from the well or the well produces sediment-free water. All well development and sampling equipment will be thoroughly cleaned between wells. Groundwater produced from each well will be stored in 55-gallon drums on site. Appropriate disposal of the groundwater will be determined after receipt of laboratory analyses. Drums will be disposed of following receipt of laboratory analytical results.

After well development and purging, the wells will be sampled in accordance with WDNR groundwater sampling procedures (WDNR Publication No. WR-168). Groundwater samples will be submitted for laboratory analysis for VOCs. Duplicate samples will be prepared and analyzed for VOCs using EPA Method 8260B. Static water levels and free product thickness, if any, will be measured at each well location.

4.1.3 INTERPRET DATA

Data collected during the previous tasks will be compiled and analyzed to determine if the extent of CVOC contamination has been adequately defined. The data evaluation will include:

- Review and tabulation of soil field screening and laboratory analytical data.
- Preparation of a map depicting the distribution of CVOCs in soil and groundwater at the Site.
- Review and tabulation of soil and groundwater laboratory analytical data.
- Preparation of cross sections depicting the site geology and vertical distribution of CVOCs in soil.

- Water table contour maps will be drawn based on the water level measurements.
- Evaluation of the need for additional soil sampling, groundwater monitoring wells, and/or piezometers to fully define the extent of CVOCs in soil and groundwater resulting from the CVOC release at the Site.
- Discussion of the results of the data with the WDNR and Whitefish Bay Cleaners

If additional investigative work is necessary to define the extent of the release, the work will be discussed with the WDNR and Whitefish Bay Cleaners.

4.2 CONDUCT QUARTERLY GROUNDWATER SAMPLING

Up to three additional rounds of groundwater monitoring will be completed to assess plume stability and viability of natural attenuation as a remedial option. Samples from each quarterly round will be analyzed for VOCs using low-flow sampling techniques.

During each sampling event, depth-to-water measurements will be collected from each monitoring well to evaluate groundwater flow direction and horizontal hydraulic gradient, as appropriate. Water table contour maps will be drawn based on the water level measurements.

4.3 PREPARE SITE INVESTIGATION REPORT

If no additional site investigation is required, the results of Tasks 1.0 and 2.0 will be detailed in a report that documents the investigation and summarizes the results and conclusions. The report will include sufficient text, tables, figures, field data, and laboratory reports necessary to support the findings and conclusions. Specifically, the report will:

- Describe investigative methods in detail
- Provide a conceptual model of site hydrogeology
- Present and interpret analytical data
- Assess the significance of identified contaminant migration pathways
- Assess the ultimate fate and significance of the identified contaminants

Project work will be supervised by a Stantec professional geologist. After review and incorporation of any comments, the report may be submitted to the WDNR. Information collected during the site investigation will be used to determine appropriate response actions.

5.0 REFERENCES

Mathers, Charles (Whitefish Bay Cleaners), telephone conversation with Christopher C. Hatfield (Stantec, Inc.) October 30, 2013.

Hnat, John J. (Wisconsin Department of Natural Resources), letter to Charles Mathers (Whitefish Bay Cleaners) April 26, 2013.

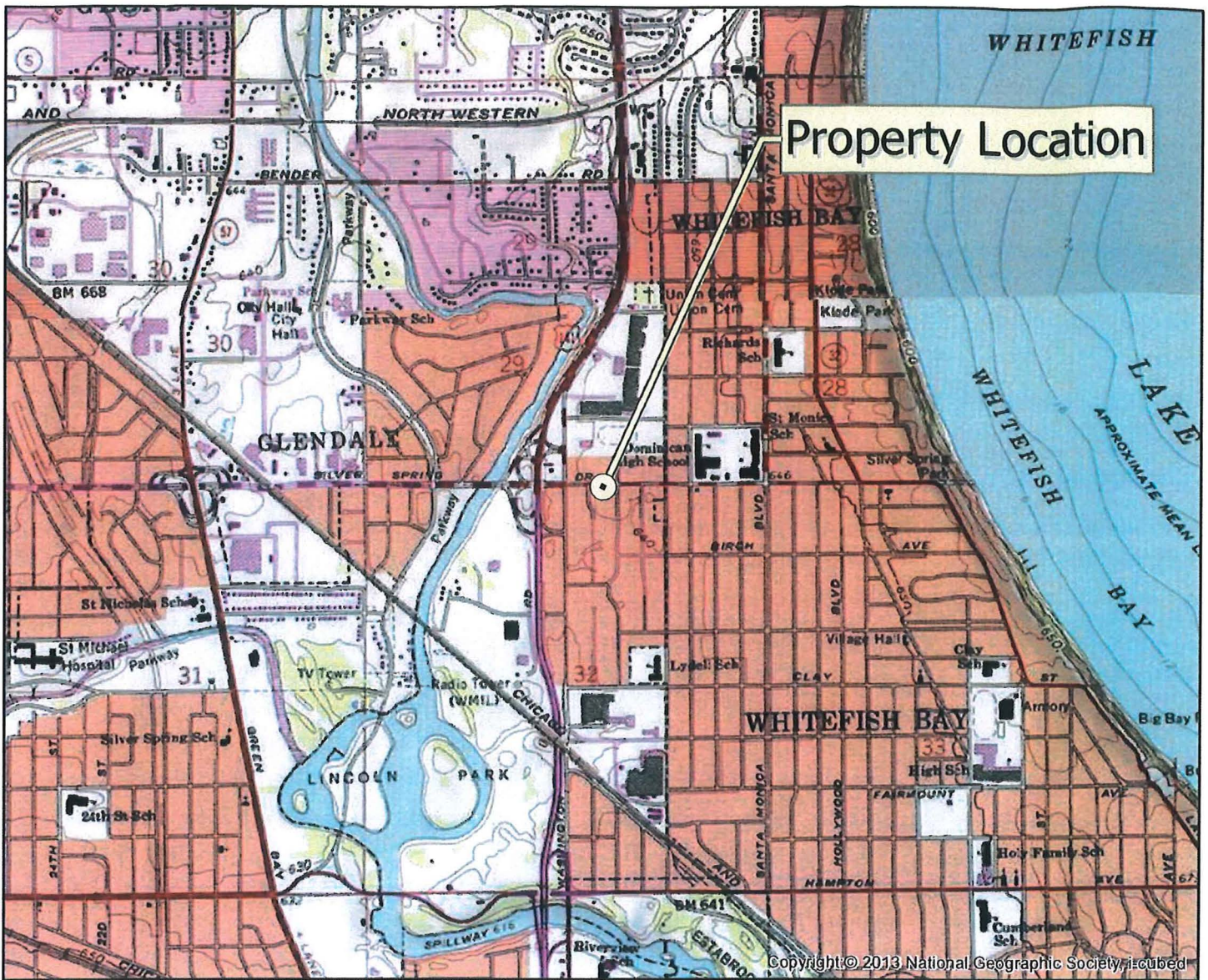
Skinner, Earl L. and Ronald G. Borman, *Hydraulic Investigations, Water Resources of Wisconsin, Lake Michigan Basin*, Atlas HA-432, 1973.

U.S. Geological Survey, *Milwaukee, Wisconsin, 7.5 Minute Quadrangle Topographic Map*, 1958 (Photo revised 1971).

Wisconsin Department of Safety and Professional Services, on-line tank database search performed by Christopher C. Hatfield (Stantec), October 24, 2013.

Wisconsin Department of Natural Resources Geographic Information System (WDNR GIS) database, reviewed by Christopher C. Hatfield (Stantec) October 24, 2013.

Wisconsin Geological and Natural History Survey (WGNHS), "Lexicon of Pleistocene Stratigraphic Units of Wisconsin," Technical Report 1 2011.



1 inch = 2,000 feet

0 2,000 Feet



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AERIAL IMAGERY AND PARCEL DATA SOURCE:
ESRI Mapping Center World Imagery Layer - USGS TOPO QUAD

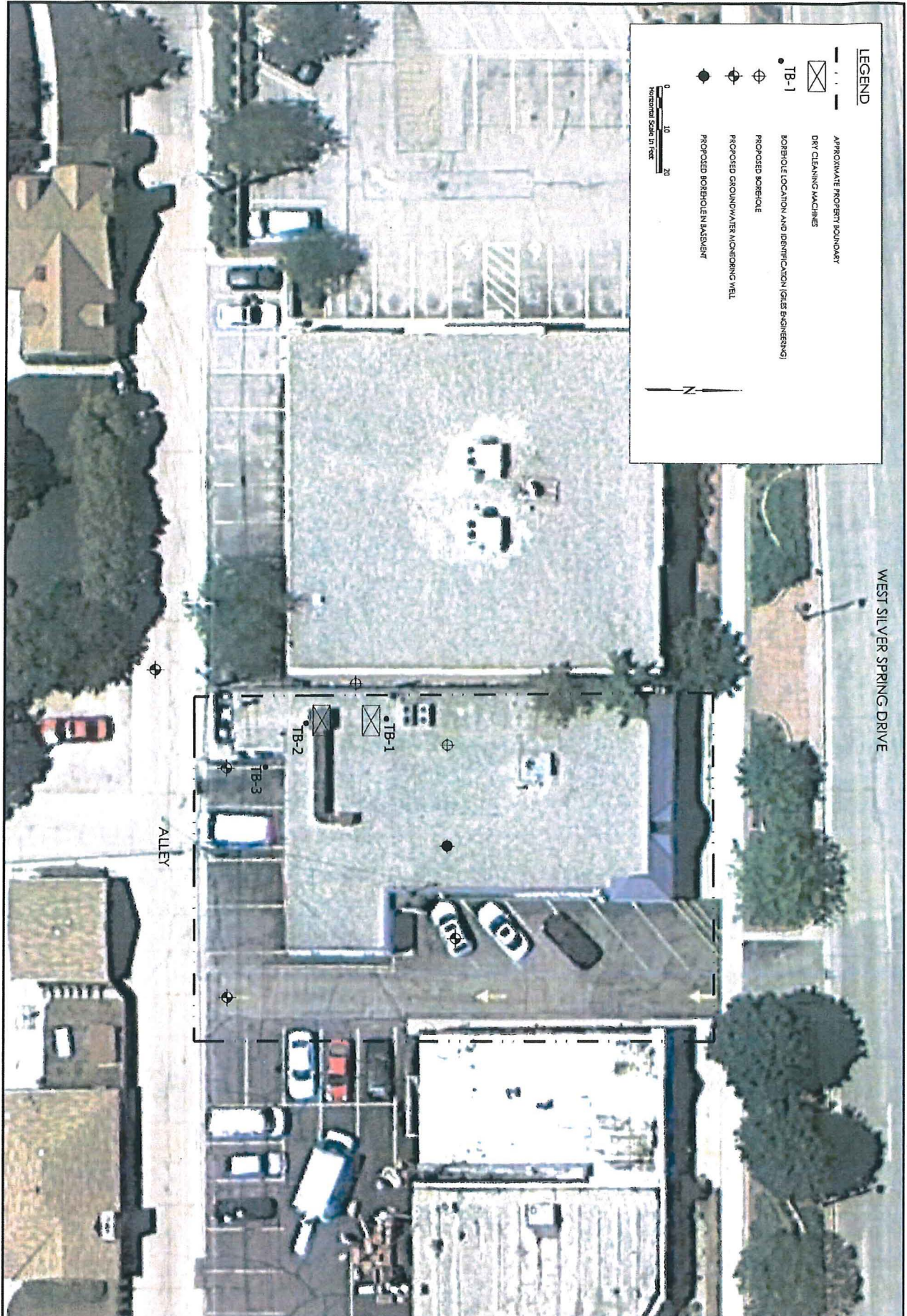
Property Location & Local Topography

WHITEFISH BAY CLEANERS
419 W. SILVER SPRING DRIVE
MILWAUKEE COUNTY, GLENDALE, WI









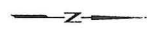
DATE: 2013-10-28
 Project Path: V:\1937\active\193702517\07_gis\mxd\193702517_Milwaukee_FIG 1.mxd

Design With Community In Mind



LEGEND

-  APPROXIMATE PROJECT BOUNDARY
-  DRY CLEANING MACHINES
-  BOBHOLE LOCATION AND IDENTIFICATION (GELS ENGINEERING)
-  PROPOSED BOBHOLE
-  PROPOSED GROUNDWATER MONITORING WELL
-  PROPOSED BOBHOLE IN BASMENT



NO.	REVISION	DATE

SITE LAYOUT
WHITEFISH BAY CLEANERS INVESTIGATION
WHITEFISH BAY CLEANERS
MILWAUKEE COUNTY, GLENDALE, WI



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FIG 2