ARCADIS Design & Consultancy for natural and built assets

Ms. Alyssa Sellwood
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ENVIRONMENT

Subject:
Response to Comments on the May 15, 2020 Interim Site Investigation Report
Tyco Fire Technology Center,
2700 Industrial Parkway South, Marinette, Wisconsin
BRRTS Activity#: 02-38-580694

Date:
January 12, 2021

Contact:
Scott Potter

Phone:
267.685.1805

Email:
scott.potter@arcadis.com

Dear Ms. Sellwood:

On behalf of Tyco Fire Products LP (Tyco), Arcadis US, Inc. (Arcadis) submits the following responses to the September 24, 2020 Wisconsin Department of Natural Resources (WDNR) comments on the May 2020 Interim Site Investigation Report (SIR) for the Tyco Fire Technology Center (FTC) Site (the Site) in Marinette, Wisconsin, referenced above.

The Interim SIR was prepared in tandem with the Conceptual Site Model Report (CSM), submitted under separate cover on May 26, 2020. Both documents provided a summary of PFAS investigations associated with the FTC: the SIR describing the work completed and investigation results, and the CSM synthesizing and interpreting the results. Both documents captured the site understanding as of the Spring 2020 and represent our comprehensive interpretation of over 10,000 data points presented in a total of 8 technical submittals related to ongoing investigations. Additional investigations are currently underway that will improve upon the site understanding and continue to advance the project within the Wisconsin Admin. Code § NR 700 process.

As noted in the comment responses below, and in the separate response-to-comment letter addressing similar WDNR comments on the CSM, Tyco is already conducting work that will address many of WDNR's concerns.

Each WDNR comment is presented below, followed by Tyco's response.

Report Review

PFAS Nature and Extent

Groundwater

Comment 1: The DNR does not concur with the conclusion that extent of PFAS contamination in groundwater is adequately delineated. Figure 15 of the Report presents a single 20 ng/L line to depict the perceived area of groundwater

impacts extending radially from the FTC. Per Wis. Admin. Code § NR 716.15(4)(c), an isoconcentration map is required depicting concentrations in each environmental media. In addition, the plume should be plotted to the proposed Wis. Admin Code ch. NR 140 preventative action level (PAL) of 2 ng/l, as remedial actions are being decided based on PFAS detections below 20 ng/l. The report indicates detailed plume plots are being deferred to a planned subsequent submittal of a three-dimensional groundwater flow and contaminant transport model; however, preliminary drawings of the PFAS plume data/extent are necessary in order to help visualize the plume based on current data and analysis, and to allow comparison of the current interpretation to future modeled results.

> ***Tyco Response:*** Detailed groundwater isoconcentration maps were shared with DNR during a "screen sharing" virtual meeting on September 11, 2020. Updated versions of those isoconcentration maps, including 2 ng/l for combined PFOS and PFOA concentration line were included in the November 16, 2020 Groundwater Flow and Solute Transport Model Report submitted to DNR. Soil data isoconcentration map for the Outdoor Testing/Training Area and Marine Testing Area are attached to this letter. Other media for which sample data exist (e.g., surface water, sediment, stormwater, and fish tissue) are not spatially continuous in plan view and therefore are not suitable for isoconcentration mapping.
>
> Current isoconcentration mapping depicts PFOA, PFOS and the sum of the two compounds. Future versions of isoconcentration figures will also present the sum of six compounds (FOSA, NEtFOSE, NEtFOSA, NEtFOSAA, PFOS, and PFOA) based on WDNR's recent Cycle 11 recommendations. Based on data obtained to-date for these additional four compounds, isoconcentration mapping is not expected to differ substantially for the sum of six compounds. Isoconcentration figures of other PFASs will be generated as needed for compounds with WDNR recommended enforcement standards and where detections above the standard exist. Results of PFASs without recommended enforcement standards that are on the current 36-compound analyte list will be reported in tables. The data will be evaluated to determine if isoconcentration figures would facilitate data interpretation.

Comment 2: Nature and extent in groundwater cannot be adequately assessed until the piezometer or monitoring well network is sampled and other investigation activities are complete based on data gaps identified with the three-dimensional model and other data requested by the DNR, per the May 27, 2020 Southern Area Groundwater Report and Response Letter. This includes installation and sampling of permanent groundwater monitoring wells where only vertical aquifer profile (VAP) sampling has been completed, as VAP sampling should be confirmed with permanent well data (Wis. Admin. Code § NR 716.13(10)). The DNR does not concur with any approach where a single round of VAP sampling is utilized to define the degree and extent of PFAS contamination given the large geographic area of this site.

> ***Tyco Response:*** Tyco will be proposing to verify and refine the current understanding of the nature and extent of PFAS in groundwater by sampling select monitoring wells and piezometers distributed across the investigation area. This work will include up to two newly

constructed bedrock monitoring wells and at least one overburden monitoring well proposed to refine the existing monitoring network.

Vertical aquifer profiling (VAP) borings were completed, as proposed in the following work plans:

- Revised Site Investigation Work Plan, submitted to WDNR on April 20, 2018 and approved by WDNR on April 27, 2018
- Supplemental Site Investigation Work Plan, submitted to WDNR on February 5, 2019 and approved by WDNR on February 28, 2019
- Heath Lane Area Investigation Work Plan, submitted to WDNR on May 28, 2019 and approved by WDNR on July 11, 2019

As discussed with WDNR previously, vertical aquifer profiling (VAP) borings were the most appropriate tool to determine the nature and extent of PFAS in groundwater across the study area. Compared to fixed monitoring points, VAP borings permit collection of a greater number of sample points at a higher vertical data resolution, often in physical locations where permanent wells are not feasible. The VAP data provide a much more detailed three-dimensional dataset from which to evaluate nature and extent than is feasible with fixed wells. Monitoring well data will be useful to confirm the VAP data, evaluate temporal trends, and provide sentinel monitoring on the plume edges.

Ditch Surface Water and Sediment

Comment 1: The DNR does not concur with the conclusion that nature and extent of PFAS impacts in surface water and sediment are adequately investigated. Surface water and sediment sampling in the site ditches and some off-site ponds has been completed and the ditch sampling has served to delineate the majority of current PFAS concentrations in the ditches. However, additional sampling in Ditch A is necessary [and] should be conducted south of both Madsen Road and sampling location SW-12. Currently, there are two sampling locations (SW-10 and SW-34) south of SW-12. Surface water sampling should also be conducted in the Little River, east of its confluence with Ditch A, to Green Bay with at least one surface water and sediment location west of the confluence. This is important as PFAS concentrations in this "Southern Area" (see Southern Area Report, Arcadis, March 2020) are being assessed, and the impacts to surface water and sediment in the ditch and river in this area should be investigated (Wis. Admin. Code § NR 716.11(3)(a)).

Tyco Response: Tyco anticipates completing additional evaluation of Ditch A as a component of performance monitoring and optimization of the interim Ditch A treatment system, and as needed to evaluate potential remedial options. Tyco does not agree, however, that further characterization of Ditch A is needed for general site-characterization purposes.

Data relating to Ditch A reported in the March 2020 Southern Area Report and the Interim SIR are sufficient to demonstrate the nature and extent of PFAS impacts in Ditch A. Multiple rounds of sampling have shown that surface water downstream of County Road B is below WDNR surface water quality guidelines. While no WDNR sediment screening criteria exist, sampling performed in Ditch A in 2018 found only very low PFAS concentrations downstream of the FTC, showing that sediment in the Ditch does not contribute materially to PFAS storage or transport. Furthermore, multiple lines of evidence described in the Southern Area Report show that no hydraulically plausible transport pathway exists for surface water in Ditch A to infiltrate into groundwater and adversely affect groundwater in the areas of isolated low PFAS detections present in the Southern Area.

Comment 2: The ditch sampling has generally served to delineate PFAS concentrations in the ditches (current) but does not assess historical concentrations, which are likely an important factor related to PFAS transport and resultant nature and extent associated with historically high PFAS concentrations in ditch surface water. Similarly, as referenced in the CSM, Ditch A historically flowed to the north and therefore, additional investigation to the north of the FTC will be required to address data gaps to the north (Wis. Admin. Code § NR 716.11(3)(a)).

Tyco Response: While Ditch A appears to have historically extended north of the FTC, any flow that occurred northward went into Ditch B, and then flowed eastward toward Green Bay. The existing surface water monitoring network encompasses all portions of Ditch B that may have been downstream of a historical input from Ditch A.

Previously completed VAP sampling northeast of the FTC in the vicinity of Ditch B did not identify groundwater with PFAS concentrations above the USEPA drinking water Lifetime Health Advisory Level (HAL) for PFOA and PFOS and the Wisconsin Department of Health Services (WDHS) recommended a groundwater enforcement standard of 20 ng/L for PFOA and PFOS, individually and combined.

Wetlands Surface Water and Sediment

Comment 1: Wetlands across the FTC are mapped in the CSM. To date, no surface water or sediment sampling has been conducted in the wetlands that provide a potential pathway for PFAS migration. Wetlands of interest primarily include those south of the FTC adjacent to and along Ditch A; however, wetlands extending in any direction from the FTC source area and along other ditches should be evaluated to further determine the nature and extent of PFAS in surface water and sediment. Further explanation of wetland conditions in potential PFAS contaminant fate and transport should be provided and assessed (Wis. Admin. Code § NR 716.11(3)(a)).

Tyco Response: The hydrology of wetlands is discussed in Sections 2.5.2 and 2.5.3.1 of the CSM, particularly as they relate to groundwater surface water interactions and groundwater recharge. The hydrologic and transport functions of wetlands were further evaluated via the

numerical groundwater modeling, as reported in the November 16, 2020 Groundwater Flow and Solute Transport Model Report

These evaluations show that the role of wetlands in the hydrologic system can be adequately understood via existing data collected in groundwater, soil and surface water adjacent to the wetlands. Tyco disagrees that additional investigation directly within the wetlands is needed to adequately characterize wetlands media or their function in the CSM. The data collected have demonstrated that this is a groundwater problem and not a wetlands issue. Moreover, data from such investigations would not provide information that materially advances progress toward an effective remedial action for groundwater.

Soil

Comment 1: Delineation of PFAS in the presumed FTC source area cannot currently be considered complete. The conclusion in the Report is based on sampling results at 47 on-site locations, none of which were collected from areas where a 2006 excavation to remove petroleum impacts was conducted. The extent of these excavation activities should be mapped to validate this conclusion. In addition, the report does not indicate if any other activities, such as the 2006 excavation, have been conducted at the Site that may have disturbed surface soil (Wis. Admin. Code § NR 716.11(3)(a)).

Tyco Response: Additional soil sampling was completed in the Fall 2020 to refine soil delineation at the FTC. The additional soil sampling locations were selected to determine whether the former Marine Testing Area (MTA) represents an additional PFAS source area and to complete delineation of shallow soil laterally outward from the OTA and MTA (if needed) to site-specific residual contaminant levels (SSRCLs). The extents of excavations completed to address volatile organic compounds are mapped in Figures C-2 and C-3 of the attached May 2007 Soil Excavation Documentation Report, prepared by Earth Tech Inc. No soil samples were subsequently collected and analyzed for PFAS within areas that were excavated.

Comment 2: Other potential source areas at the FTC (i.e., other historical training areas [potentially west of the current OTA], outdoor storage or potential locations of spills, former soil stockpile areas, and similar relevant areas), should be identified, mapped, and evaluated. Both the historical and current operational areas should be evaluated based on the soil data collected to date. An analysis should then be provided that discusses how each area is characterized for PFAS nature and extent. Until this is completed, a determination as to whether the on-site soil contamination has been fully characterized and delineated cannot be made (Wis. Admin. Code § NR 716.11(3)(a)).

Tyco Response: All of the available data regarding historical activities involving PFAS at the FTC were summarized in the Conceptual Site Model Report submitted to DNR on May 26, 2020. That document describes potential sources and release mechanisms at the FTC. The

sources areas are shown on a figure. Potentially affected media from the potential source areas and release mechanisms are described. If additional information is identified, it will be included in future updates to the CSM.

Additional soil sampling was completed in the Fall 2020 at the FTC. . One of the objectives for the soil sampling were to determine whether the former Marine Testing Area (MTA) represents an additional PFAS source area.

Geology and Hydrogeology Characterization

Comment 1: The Report fails to adequately provide interpretation of site geology and hydrogeology (Wis. Admin. Code § NR 716.15(3)(h)). Groundwater investigations that provide data relevant to geology and hydrogeology are described, however that data has not been interpreted and fit into a comprehensive site characterization, especially in relation to contaminant transport and nature and extent in the subsurface. Additional site cross-sections should be provided through the western side of the site area, from west to east on the south side of the area and along the Green Bay shoreline. Cross-sections should contain PFAS concentrations in groundwater where available along the sections (Wis. Admin. Code § NR716.15(4)d)).

Tyco Response: Interpretations of the site geology and hydrogeology were provided in the Conceptual Site Model Report. That document also included cross-sections extending north-to south and east-to-west across the investigation area. Additional cross sections will be included in the updated Site Investigation Report that will be provided to DNR after completion of the investigation work being completed in the Fall of 2020. Cross-sections provided in the updated Site Investigation Report will include posted concentrations of principal PFAS components in groundwater.

Comment 2: The Report should provide discussion to indicate locations of perceived preferential flow in the unconsolidated deposits based on aquifer heterogeneity in order to better understand contaminant flow and transport, and contaminant nature and extent on a more local scale, including along plume edges (Wis. Admin. Code § NR 716.15(3)(h)).

Tyco Response: Interpretations of the groundwater flow and transport pathways were provided in the Conceptual Site Model Report. That discussion described the role of heterogeneity, and the presence of aquitards in those flow and transport patterns. Additional analysis of transport patterns was provided in the Groundwater Modeling Report, submitted on November 16, 2020.

Comment 3: Different techniques were described for bedrock characterization related to the on-site production well and select bedrock borings, that generally concluded negligible groundwater flow in the bedrock; however, no regional or local geologic structural features are discussed and/or shown (i.e., faulting) in the bedrock or unconsolidated deposits along with discussion of potential influence on

groundwater and contaminant transport. A discussion of this data/analysis should be included in the Report (Wis. Admin. Code § NR 716.15(3)(h)).

Tyco Response: No faults are known to exist in the study area; however, additional discussion of structural features will be added to the updated Site Investigation Report that will be provided to DNR after completion of the investigation work being completed in the fall of 2020.

Aquifer Profiling Methods

Comment 1: A high percentage of the groundwater data collected through December 2019 was obtained through vertical aquifer profile (VAP) borings/methodology, which is generally considered a screening process at remedial action sites in Wisconsin and should be confirmed with permanent monitoring well installation and sampling. Therefore, to adequately assess aquifer profiling methods, the site investigation requires the existing piezometer/monitoring well network be sampled and the installation of additional piezometer/monitoring wells where the current array does not adequately cover the area (Wis. Admin. Code § NR 716.13(10)).

Tyco Response: See response to comment 2 under Groundwater, above.

Conclusion

Comment 1: Future site investigation workplans must address and incorporate site investigation activities aimed at addressing the data gaps and deficiencies identified above and in the CSM response letter, dated September 24, 2020.

Tyco Response: Comment noted. The investigation activities Tyco is currently performing are focused on addressing data gaps in the CSM, but also in making meaningful progress toward remedial action. Future work plans and investigations are anticipated to continue the shift focus toward data needs that support selection, design, implementation, and performance monitoring associated with remedial action.

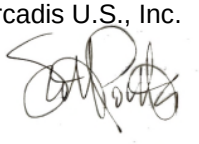
Comment 2: Be aware that during your investigation, you are required to comply with Wis. Admin. Code ch. NR 700-754 and all other applicable statutes and administrative rules, including those pertaining to solid and hazardous waste management and/or wastewater discharges. Wis. Admin. Code ch. NR 716 details specific requirements for site investigations and for interpretation and presentation of your findings.

Tyco Response: Comment noted.

If you have any questions regarding these comment responses, please let me know.

Sincerely,

Arcadis U.S., Inc.



Scott T. Potter, PhD
Chief Hydrogeologist/Sr. Vice President

Copies:
Bridget Kelly – WDNR
David Neste – WDNR
Jeffrey Danko – Tyco

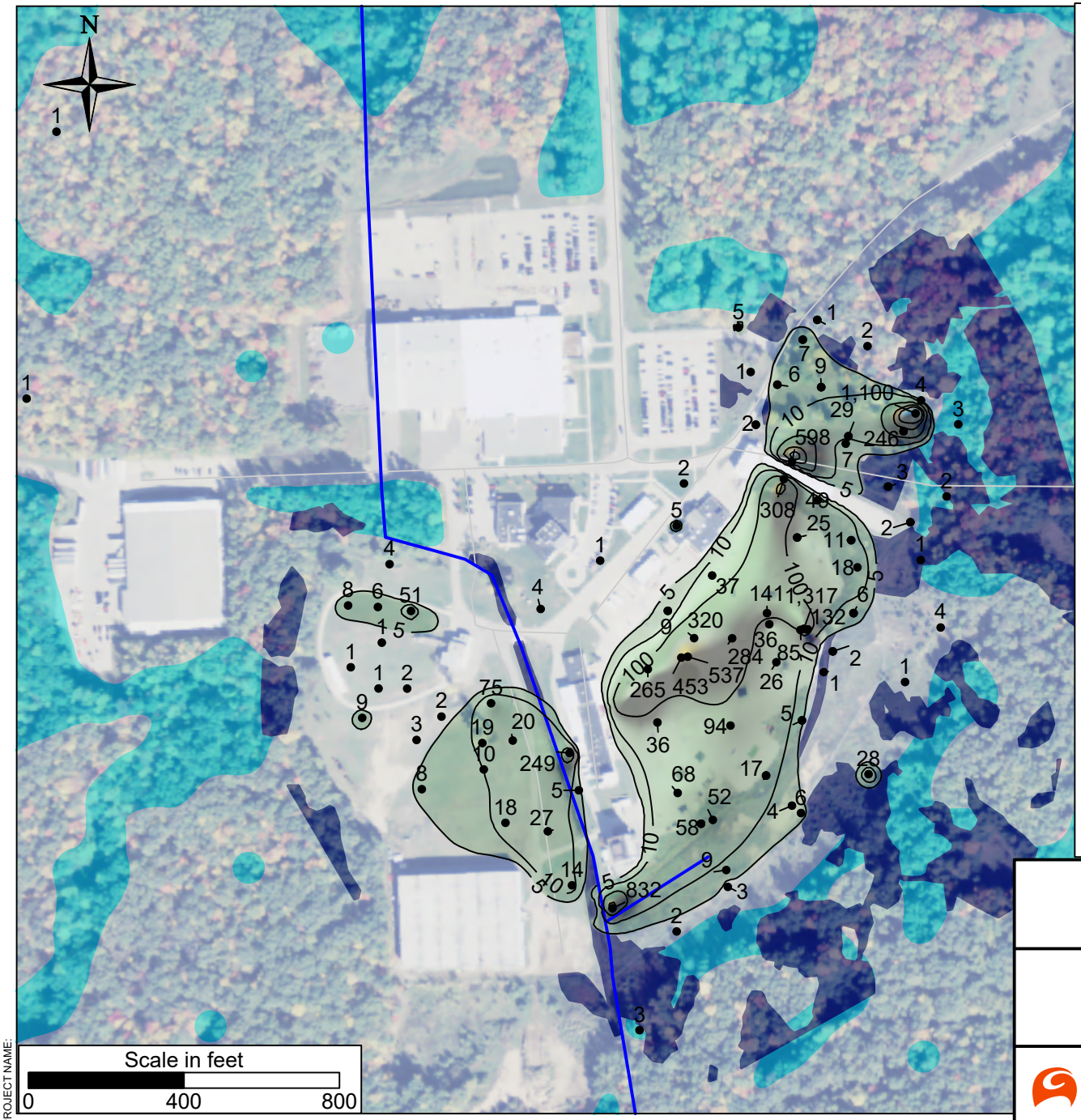
Attachments:

Attachment 1 – Soil Isoconcentration Figure

Attachment 2 – Soil Excavation Documentation Report (Earth Tech Inc., 2007)

Attachment 1

Soil Isoconcentration Figure



Legend

PFOA+PFOS Soil Concentration (µg/kg)

832 Soil Boring Location (PFOA +PFOS Concentration shown)

Wisconsin Wetlands Survey

Delineated Wetland

Ditch

1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
5

Notes

1. µg/kg = microgram per kilogram
2. Aerial map from USGS.
3. Soil samples represent depths ranging from 1 to 8 feet below ground surface.
4. PFOA+PFOS concentrations represent the average concentrations at a given location.

TYCO FIRE TECHNOLOGY CENTER
MARINETTE, WISCONSIN

OTA PFOA+PFOS SOIL CONCENTRATION CONTOURS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

PROJECT NAME:

Attachment 2

Soil Excavation Documentation Report (Earth Tech Inc., 2007)

Report

Soil Excavation Documentation

Fire Technology Center and R&D Grounds – Fuel Distribution System Upgrade Project

2700 Industrial Parkway South
Marinette, Wisconsin

FID No. 438005590
BRRTS No. 03-38-001345

Prepared for:

Tyco Safety Products, Ansul Incorporated
One Stanton Street
Marinette, Wisconsin 54143

Prepared by:

Earth Tech, Inc.
1020 North Broadway, Suite 400
Milwaukee, WI 53202

May 2007

CERTIFICATION

I, David Henderson, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, information contained in this document is correct and the document was prepared in compliance with applicable requirements in Chs. NR 700 to 726, Wis. Adm. Code.

David S. Henderson, P.E.
Senior Project Manager

Date & P.E. Stamp

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Appendix

EXECUTIVE SUMMARY

Earth Tech, Inc. was retained by Tyco Safety Products, Ansul Incorporated in May 2005 to perform a series of projects on the Fire Technology Center and Research and Development fuel distribution system including testing, demolition, and upgrade activities. The Fire Technology Center is located at 2700 Industrial Parkway South, Marinette Wisconsin. The Site has been identified by the Wisconsin Department of Natural Resources under the Bureau of Remediation and Redevelopment Tracking System (BRRTs) No. 03-38-001345.

Earth Tech prepared this report to present results from the excavation and disposal of petroleum impacted soil that occurred during the demolition and upgrade phases of the project. Earth Tech conducted these activities in accordance with Wisconsin Administrative Code Chapters NR 700 through NR 747 and Chapter NR 141. This report is submitted in general accordance with the requirements of NR 724.15 “Documentation of Construction and Completion”.

The first phase of construction work for the project began in January 2006 with removal/abandonment in place of the existing fuel distribution piping and demolition of a select number of fire training structures including excavations of associated petroleum contaminated soils. Construction for the upgraded fuel distribution system, along with several new fire training pans and props, occurred during the summer and fall of 2006.

In total, 3,212.94 tons (approximately 4,820 cubic yards) of petroleum contaminated soil was excavated, transported to, and disposed of at the Waste Management landfill facility located in Menominee, Michigan. In addition, 106.07 tons of concrete that exhibited petroleum staining was transported to the landfill for disposal as construction and demolition debris.

Based on confirmation soil sampling analytical results, field instrumentation readings, and construction observations, residual petroleum contamination appears to exist in six general areas on the Fire Technology Center training field.

Groundwater is being monitored on a quarterly basis to document contaminant concentrations and to evaluate the effectiveness of natural attenuation as a final remedial action. Monitoring program results are submitted to the Wisconsin Department of Natural Resources.

1.0 INTRODUCTION

Earth Tech, Inc. (Earth Tech) was retained by Tyco Safety Products (TSP), Ansul Incorporated in May 2005 to perform a series of projects on the Fire Technology Center (FTC) and Research and Development (R&D) fuel distribution system including testing, demolition, and upgrade activities. The FTC is located at the 2700 Industrial Parkway South, Marinette Wisconsin (the Site). The Site has been identified by the Wisconsin Department of Natural Resources (WDNR) under the Bureau of Remediation and Redevelopment Tracking System (BRRTs) No. 03-38-001345.

Earth Tech prepared this report to present the results from the soil excavation and associated investigation activities that occurred during the demolition and upgrade phases of the project. Earth Tech conducted these excavation and investigation activities in accordance with Wisconsin rules and regulations in effect at the time of the work. Specifically, Wisconsin Administrative Code (WAC) Chapters NR 700 through NR 747 and Chapter NR 141.

This report is submitted in general accordance with the requirements of NR 724.15 "Documentation of Construction and Completion".

2.0 BACKGROUND INFORMATION

2.1 Site Description

The Site is located at 2700 Industrial Parkway South in the City of Marinette, Marinette County, Wisconsin. The public land survey description is the NE ¼ of the NE ¼ of Section 13, Township 30 North, Range 23 East. A Project Location map is presented on the Drawings Title Sheet and the general pre-demolition site features are presented on Figure C-1.

2.2 Regional Geology

The topography of the site is generally flat. The Soil Survey of Marinette County, Wisconsin identifies the soils at the FTC training field as Udorthents loam[1]. Previous investigations have classified these soils by the Unified Soil Classification System (USCS) as poorly graded sand (SP) to silty sand (SM) from the ground surface to the depth of the investigated interval, approximately 33 feet below ground surface (bgs).

2.3 Regional Hydrogeology

Excavation occurred as part of the demolition excavation activities in January 2006, and groundwater was encountered at a depth of approximately 7 feet bgs. Historical groundwater elevation data[2] suggests that the depth to groundwater at the site varies seasonally across the site. Regional groundwater flow appears to be east and northeast, towards the Bay of Green Bay.

[1] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Official Soil Series Descriptions [Online WWW]. Available URL: "http://soils.usda.gov/technical/classification/osd/index.html"

[2] Results of February, May, and August 2005 Groundwater Monitoring Report, STS Consultants, LTD., November 1, 2005.

2.4 Site History

The FTC is a fire suppressant training, testing, research, and development facility initially built in the early 1960s. Activities generally occur in two areas at the facility, the Fire School area and the Research and Development (R&D) area.

In 1992 a 550-gallon gasoline underground storage tank was removed at the FTC grounds and identified on WDNR/WDCOM records as "abandoned by removal". Evidence of a release was identified at that time and a Notice of Release was filed with the WDNR (BRRTs No. 03-38-001345). Dames & Moore (subsequently named URS Corporation) was retained to conduct an assessment of the impact. URS Corporation continued site investigation activities until 2002 when STS Consultants of Green Bay, Wisconsin, was retained. In January 2006 Earth Tech of Sheboygan, Wisconsin was retained to continue the long-term groundwater monitoring.

The Fire Training School and R&D facilities use two 12,000-gallon aboveground storage tanks (ASTs) containing heptane, with their associated underground distribution piping, as a fuel source for training and testing. In May 2005, Earth Tech conducted tightness and cathodic protection testing of the underground lines associated with the AST fuel distribution piping. Four piping runs were tightness tested and one piping run was tested for cathodic protection. Three piping runs that serviced the Fire Training School did not pass tightness testing (and therefore cathodic protection testing was unnecessary). These lines were purged of fuel and immediately removed from service (abandoned in place) by capping and disconnection from the AST. The fourth pipe run, which serviced the R&D portion of the facility, passed its tightness test but did not pass the cathodic protection test.

On May 27, 2005, Earth Tech verbally notified Mr. James Walden, WDNR Project Manager, of the potential release associated with the Fire School fuel distribution piping. Mr. Walden indicated that a new, formal release report would be unnecessary for the piping and that he would record the "new" release in the existing file.

Removing the Fire Training School pipelines from service (capping them in-place) effectively shut down the school. Subsequently, Earth Tech designed and installed a Wisconsin Department of Commerce (WDCOM) approved temporary fuel distribution system that allowed the Fire School to operate for the 2005 training season. During the summer and fall of 2005 Earth Tech worked with TSP personnel to design an upgraded permanent fuel distribution system for both the Fire Training School and R&D facilities.

On December 13, 2005, Earth Tech provided the WDNR with a copy of the Bid Documents for Demolition Activities as a Work Plan in general accordance with the requirements of NR 724.06 "Design Report" and NR 724.11 "Design Plan and Specifications". The Work Plan scope of work was for possible remedial excavation activities scheduled to occur during demolition.

The first phase of work for the fuel distribution system upgrade project began in January 2006 with the removal/in-place abandonment of the existing fuel distribution piping, associated excavation activities, and the demolition of a select number of fire training pans and props. Construction of the upgraded fuel distribution system, along with several new fire training pans and props, occurred during the summer and fall of 2006. The focus of this report is the excavation and proper disposal of petroleum-impacted soil conducted in conjunction with the demolition and upgrade of the fuel distribution system. This report is submitted in general

accordance with the requirements of NR 724.15 “Documentation of Construction and Completion”.

3.0 SERVICES

3.1 Scope of Work

Earth Tech evaluated soils excavated during demolition and upgrade activities to ensure proper handling of petroleum impacted soils, and to evaluate contaminated soils left in place. In general, this included the following activities:

- Pre-demolition meetings with Earth Tech’s excavation contractor, SGS Environmental Services, to discuss excavation procedures and the handling of excavated petroleum-contaminated soils during demolition activities.

- Pre-system upgrade meetings with Earth Tech’s system upgrade contractor, Martell Construction, to discuss excavation procedures and the handling and disposal of excavated petroleum-contaminated soils during upgrade activities.

- Documenting abandonment of one groundwater monitoring well removed during excavation activities.

- Documentation of soil excavation, transportation, and disposal activities.

- Evaluation of soil field screening and analytical results from excavation activities.

3.2 Project Team

The parties involved in this project include:

Property Owner:
Tyco Safety Products, Ansul Incorporated
One Stanton Street
Marinette, Wisconsin 54143
Contact: Maritsa Goan: Senior Environmental Manager
Telephone: (715) 735-7411

Environmental Consulting Firm:
Earth Tech, Inc.
1020 North Broadway, Suite 400
Milwaukee, WI 53202
Contact: David Henderson, P.E.
Telephone: (414) 225-5100

Demolition General Contractor:
SGS Environmental Services, Inc.
W4490 Pope Road
Merrill, WI 54452
Contact: Jay Schlueter
Telephone: (715) 539-2803

System Upgrade General Contractor:
Martell Construction
1220 Hurlbut Street
Green Bay, WI 54303
Contact: Wayne Everson
Telephone: (920) 468-8071

Soils Disposal:
Waste Management – Menominee Landfill
6111 Elmwood Road
Menominee, MI 49858
Telephone: (906) 863-5998
Waste Profile # MW 756269

Laboratory Services:
Pace Analytical
1241 Bellevue Street, Suite 9
Green Bay, WI 54302
Telephone: (920) 469-2436

4.0 EXCAVATION AND INVESTIGATION PROCEDURES

Site-specific excavation procedures are described below. Earth Tech's standard field methodologies for excavation and surface soil sampling are presented in Appendix A.

4.1 Soil

4.1.1 Soil Field Screening Methods

Soil samples obtained from excavations were immediately split into field and laboratory samples. Soil samples were field screened with a photoionization detector (PID) to assist in determining the lateral extent and depth of excavation activities.

Earth Tech personnel screened the field samples for Volatile Organic Compounds (VOC's) with a calibrated PID (Mini-Rae Model 2000, 10.6 eV lamp) using the headspace method. Results were reported as instrument units (IUs). The results of the field screening were used to determine which soil samples to submit for laboratory analysis.

In general, excavated soils that exhibited PID readings greater than 10 IUs were considered contaminated. Excavated soils exhibiting PID readings greater than 10 IUs were either temporarily stockpiled on site for off-site disposal or loaded into trucks and transported to the landfill.

4.1.2 Soil Excavation Methods

Excavation of petroleum contaminated soils was conducted in conjunction with both demolition and upgrade activities.

Demolition Activities:

Demolition was focused on removal of existing unusable fuel lines, demolition of several fire training pans/pads, and the limited excavation of petroleum contaminated soils.

The existing unusable fuel lines were removed or abandoned in-place in accordance with WDCOM Com 10 regulations including purging of the pipelines and soil sampling along the piping trench runs. Throughout demolition activities Mr. Randy Barnes, WDCOM Local Program Officer, conducted inspections to verify the proper removal/abandonment of the piping runs.

Several concrete fire training pans or pads were demolished to facilitate future construction. Demolition included excavation of associated petroleum-contaminated soils, where identified. The structural demolition work was accomplished with the use of a skid-steer mounted concrete breaker.

The limited excavation of petroleum contaminated soils was accomplished using a backhoe, front-end loader, and skid-steer for excavation, stockpiling and/or placement of the excavated soil into trucks. The excavations were backfilled using clean soils excavated during demolition as well as imported clean sand fill.

Upgrade Activities:

The fuel distribution system upgrade included installing new underground fuel lines and electrical conduits, the construction of new fire training pans and pads, and the construction of additional support structures (i.e. loading dock, unloading area). During upgrade activities, petroleum-contaminated soil excavation was limited to the removal of soil directly associated with the new construction.

During both demolition and upgrade activities, petroleum-contaminated soils were temporarily stockpiled on and covered with plastic prior to transport to the landfill. Excavated contaminated soils were transported to the Waste Management landfill facility located in Menominee, Michigan.

4.1.3 Soil Laboratory Analysis Methods

During demolition activities, confirmation soil samples were collected from both the base and sidewalls of the excavations and/or trenches. Samples were submitted to a State of Wisconsin Certified laboratory for analyses of the following parameters: Volatile Organic Compounds (VOCs) plus n-heptane, EPA Method SW 846 8260B, and Polycyclic Aromatic Hydrocarbons (PAHs), EPA Method SW 8270C-SIM.

Confirmation soil samples were not collected for laboratory analysis during system upgrade activities because new construction generally occurred in areas previously sampled.

4.2 Groundwater

4.2.1 Monitoring Well Abandonment

Monitoring well FTC-28 was abandoned by SGS Environmental Services on January 23, 2006 during demolition activities in the area of Pan 1000. The abandonment was conducted in

accordance with NR 141 requirements and the WDNR Well/Drillhole/Borehole Abandonment form (WDNR Form 3300-5) is included in Appendix B. The location of FTC-28 is illustrated on Figure C-1 (attached).

5.0 EXCAVATION AND TESTING RESULTS

Earth Tech evaluated soil field screening and laboratory analytical data to determine which soils were to be excavated and disposed of at the landfill and which soils could remain in-place.

5.1 Soil Results

5.1.1 Field Screening Results

Field instrument (PID) readings are not regulated by the WDNR, but are considered an indication of possible VOC contamination. Earth Tech used PID readings to help determine the extent of possible contamination and reduce the number of laboratory samples.

Demolition Activities:

SGS Environmental Services began excavation activities associated with demolition on January 10, 2006 and continued through February 6, 2006. Excavations included shallow trenching (0 to 2 feet bgs) where piping runs where removed and larger, deeper excavations (0 to 7 feet bgs), in areas where structures were demolished and petroleum-contaminated soils were present and accessible. PID readings ranging between <10 and 1,700 instrument units (IUs) were encountered during demolition activities.

Areas where shallow trenching for piping removal was conducted, along with the dates of removal, are illustrated on Figure C-2. Limited excavation required for demolition activities and contaminated soil removal was conducted in four separate areas (designated Area 1 through Area 4). These four excavation areas are illustrated on Figure C-3. PID field screening results are presented on Figure C-4.

Backfill was placed in lifts and compacted, where appropriate. Plastic was placed in the Area 4 excavation prior to backfilling to separate remaining petroleum-contaminated soils left in place and clean backfill soils. Final backfilling associated with demolition activities was completed on February 8, 2006.

Upgrade Activities:

Martell Construction, the general contractor for the fuel distribution system upgrade, began construction activities in June 2006 and continued through the fall of 2006. Excavation activities associated with the upgrade work were completed by the end of August 2006.

The excavations for system upgrades included shallow trenches for new fuel piping runs, pan drainage lines, and electrical conduit runs. Larger excavations were completed during construction of new fire training pans and pads, installation of a new oil/water separator (OWS) system, and a new loading dock.

Soils encountered during system upgrade activities exhibited PID readings between <10 to 1,350 IUs. Elevated PID field screening results were encountered in excavations near the

rebuilt 1,000 Pan, near the AST heptane storage area, near New Hose Reel #1 and HV-7 (heptane valve), near the Impinging prop, HV-8, Broken Flange prop, HV-4, Truck Pan 450, and southeast of the new OWS. Contaminated soil excavated areas associated with the upgrade activities along with PID field screening results are illustrated on Figure C-7.

Petroleum-contaminated soils were transported to the Waste Management landfill facility located in Menominee, Michigan on January 18, 19, and 23, 2006 during demolition activities and June 28, 29, and 30, and August 15, 16, and 17, 2006, during system upgrade activities. A total of 3,212.94 tons (approximately 4,820 cubic yards) of petroleum-contaminated soils were transported to the landfill. Concrete that exhibited petroleum staining was transported to the landfill for disposal as construction and demolition debris. A total of 106.07 tons of concrete was transported to the Waste Management, Menominee Landfill for disposal. A summary of landfill disposal tickets along with copies of the tickets is presented in Appendix C.

5.1.2 Laboratory Analysis Results

Twenty-eight confirmation soil samples were analyzed for VOC's plus n-heptane and PAHs during demolition activities. Laboratory analytical results were compared to WDNR generic soil residual contaminate levels (RCLs) standards as listed in Wisconsin Administrative Code NR 720.09 for the protection of groundwater, Environmental Protection Agency (EPA) soil screening levels (SSL) standards for protection of groundwater and direct contact per NR 720.19, and PAH interim generic RCL standards for protection of groundwater and direct contact.

According to the City of Marinette Zoning Administrator[3] the FTC property at 2700 Industrial Parkway South is zoned Heavy Industrial (I1). Therefore, soil analytical results were compared to applicable industrial direct contact health assessment standards.

In general, excavation confirmation soil samples were obtained from the following areas:

- Piping trench samples designated CS-1 through CS-11,
- Area 1 excavation samples (S-1 through S-3),
- Area 2 excavation samples (S-1 through S-8),
- Area 3 excavation samples (S-1 through S-4), and
- Area 4 excavation samples (S-1 and S-2).

Soil analytical results are summarized in Table 1. Figure C-5 illustrates the confirmation soil sampling locations.

VOC's Discussion: VOCs were detected in 17 of the 28 samples submitted for laboratory analysis. A total of 13 different VOCs were detected in the 17 soil samples that exhibited VOC concentrations. Only six of the thirteen VOCs detected exhibited concentrations at concentrations greater than established or calculated standards.

- 1,2,4-Trimethylbenzene (TMB) was detected at a concentration greater than the NR 720.19 EPA SSL Industrial Direct Contact standard in the sample collected from CS-3.
- 1,3,5-TMB was detected at a concentrations greater than the NR 720.19 EPA SSL Industrial Direct Contact standard in the sample collected from CS-3.

[3] City of Marinette, Zoning Administrator, personal communication, February 28, 2007.

- Benzene was detected at concentrations greater than the NR 720.09 Groundwater Protection standard in the samples collected from CS-2, CS-3, CS-10, Area 3:S-1, and Area 4:S-1 and the NR 720.19 EPA SSL Industrial Direct Contact standard in the samples collected from CS-3, and CS-10.
- Ethylbenzene was detected at concentrations greater than the NR 720.09 Groundwater Protection standard in the samples collected from CS- 1, CS-3, CS-4, CS-10, CS-11, Area 4:S-1, and Area 4:S-2 and the NR 720.19 EPA SSL Industrial Direct Contact standard in the samples collected from CS-3, and CS-10.
- Toluene was detected at concentrations greater than the NR 720.09 Groundwater Protection standard in the samples collected from CS-1, CS-2, CS-3, CS-4, CS-9, CS-10, CS-11, Area 4:S-1, and Area 4:S-2.
- Total xylenes were detected at concentrations greater than NR 720.09 Groundwater Protection standard in the samples collected from CS-1, CS-2, CS-3, CS-4, CS-9, CS-10, CS-11, Area 4:S-1, and Area 4:S-2 and the NR 720.19 EPA SSL Industrial Direct Contact standard in the samples collected from CS-3.
- Other VOCs detected were at concentrations less than standards or standards do not currently exist.

Although n-Heptane was detected in 15 of the 28 soil samples submitted for analysis, no regulatory standards, either WDNR or EPA SSLs, currently exist for heptane.

PAH's Discussion: PAHs were detected in 16 of the 28 samples submitted for laboratory analysis. Eighteen different PAHs were detected in the 16 soil samples that exhibited PAH concentrations. Five of the eighteen PAHs detected exhibited concentrations greater than standards.

- 1-Methylnaphthalene was detected at concentrations greater than NR Interim PAH Generic RCL's for Groundwater Protection standard in the samples collected from Area 4:S-1 and Area 4:S-2.
- 2-Methylnaphthalene was detected at concentrations greater than NR Interim PAH Generic RCL's for Groundwater Protection standard in the samples collected from Area 4:S-1 and Area 4:S-2.
- Acenaphthylene was also detected at concentrations greater than NR Interim PAH Generic RCL's for Groundwater Protection standard in the samples collected from Area 4:S-1 and Area 4:S-2.
- Naphthalene was detected at concentrations greater than NR Interim PAH Generic RCL's for Groundwater Protection standard in the samples collected from CS-1, CS-2, CS-3, CS-4, CS-9, CS-10, CS-11, Area 4:S-1, and Area 4:S-2.
- Phenanthrene was detected at concentrations greater than NR Interim PAH Generic RCL's for Groundwater Protection standard in the samples collected from CS-1, Area 4:S-1, and Area 4:S-2.

Figures C-5 and C-6 presents the VOC and PAH analytical results, respectively, and their sample locations. Laboratory reports are included in Appendix D.

5.1.3 Estimated Extent of Residual Contamination

Based on the results of the demolition and upgrade activities, residual petroleum contamination appears to exist in six general areas on the FTC grounds. The extent of these areas (See Figure 8) was estimated using confirmation soil sampling analytical results, PID readings greater than 10 IUs, and visual observations.

6.0 EXCAVATION SUMMARY

The following is a summary of the geologic, hydrogeologic, field observations, and analytical data obtained during Earth Tech's excavation and upgrade/remediation activities at the Site.

- The lithology beneath the site generally consists of poorly graded sand to silty sand from the ground surface to the depth of the investigated interval.

- Groundwater elevation data indicates that depth to groundwater varies seasonally across the site. Groundwater has been interpreted to flow in an easterly or northeasterly direction.

- Monitoring well FTC-28 was abandoned during excavation activities in January 2006.

- The excavation and proper disposal of 3,212.94 tons (approximately 4,820 cubic yards) of petroleum contaminated soil was transported to the Waste Management, Menominee Landfill for disposal.

- The demolition and proper disposal of a total of 106.07 tons of petroleum stained concrete was transported to the Waste Management, Menominee Landfill for disposal as construction and demolition debris.

- Groundwater is being monitored on a quarterly basis to document contaminant concentrations and to evaluate the effectiveness of natural attenuation as a final remedial action. Monitoring program results are submitted to the WDNR.

TABLES

TABLE 1

SOIL ANALYTICAL RESULTS
FUEL DISTRIBUTION SYSTEM UPGRADE
FIRE TECHNOLOGY CENTER
TYCO SAFETY PRODUCTS-ANSUL INCORPORATED
2700 INDUSTRIAL PARKWAY SOUTH
MARINETTE, WISCONSIN

	NR 720.09 RCL Groundwater Protection	NR 720.19 EPA SSL RCL Groundwater Protection	NR 720.19 EPA SSL RCL Direct Contact Industrial (inhalation of volatiles)	NR Interim PAH Generic RCL's Groundwater Protection	NR Interim PAH Generic RCL's Direct Contact Industrial	Pipe Trench Excavation											AREA 1		
						CS-1	CS-2	CS-3	CS-4	CS-5	CS-6	CS-7	CS-8	CS-9	CS-10	CS-11	S-1	S-2	S-3
						1/10/2006	1/11/2006	1/11/2006	1/12/2006	1/12/2006	1/12/2006	1/12/2006	1/12/2006	1/13/2006	1/16/2006	1/17/2006	1/18/2006	1/18/2006	1/18/2006
						2' bgs	3' bgs	2' bgs	2' bgs	2.5' bgs	3' bgs	2.5' bgs	3' bgs	2.5' bgs	3' bgs	3' bgs	3.5' bgs	3.5' bgs	3.5' bgs
VOCs: (ppb)																			
1,2,4-Trimethylbenzene			170,000			7,100	17,000	**270,000**	51,000	380	<25	1,100	<25	36,000	150,000	87,000	<25	<25	<25
1,3,5-Trimethylbenzene			70,000			3,600	6,300	**80,000**	15,000	330	<25	640	<25	11,000 Q	53,000	45,000	<25	<25	<25
Benzene	5.5	30	1,300			<200	**130 Q**	**12,000**	<1,200	<25	<25	<25	<25	<5,000	**5,400**	<620	<25	<25	<25
Ethylbenzene	2,900	13,000	20,000			**3,700**	1,300	**150,000**	**16,000**	<25	<25	40 Q	<25	<5,000	**27,000**	**8,300**	<25	<25	<25
Isopropylbenzene						1,300	230	9,300	2,100 Q	<25	<25	<25	<25	<5,000	3,000 Q	1,100 Q	<25	<25	<25
Methyl-tert-butyl-ether						<200	<50	<500	<1,200	<25	<25	<25	<25	<5,000	<2,000	<620	<25	<25	<25
Naphthalene						2,500	2,000	63,000	13,000	<25	<25	460	<25	21,000	21,000	18,000	<25	<25	<25
n-Heptane						86,000	3,600	42,000	430,000	<65	<65	340	850	1,400,000	660,000	21,000	110 Q	<65	<65
n-Propylbenzene						1,400	1,200	40,000	8,000	<25	<25	36 Q	<25	<5,000	12,000	4,900	<25	<25	<25
p-Isopropyltoluene						1,300	540	5,500	2,100 Q	250	<25	<25	<25	<5,000	4,700 Q	4,500	<25	<25	<25
sec-Butylbenzene			220,000			610	150	2,700	1,600 Q	45 Q	<25	<25	<25	<5,000	2,200 Q	1,400 Q	<25	<25	<25
Toluene	1,500	12,000	520,000			**6,300**	**3,400**	**260,000**	**72,000**	<25	<25	79	350	**150,000**	**360,000**	**12,000**	<25	<25	<25
Xylene, o						23,000	5,200	230,000	29,000	58 Q	<25	420	<25	20,000	73,000	38,000	<25	<25	<25
Xylenes, m+p						40,000	11,000	590,000	65,000	60 Q	<50	770	<50	60,000	170,000	76,000	<50	<50	<50
Xylene (Total)	4,100	210,000	420,000			**63,000**	**16,200**	**820,000**	**94,000**	118 Q	<75	1,190	<75	**80,000**	**243,000**	**114,000**	<75	<75	<75
PAHs: (ppb)																			
1-Methylnaphthalene				23,000	70,000,000	9,100	360	10,000	2,400	1,900 N	15 B	260	<3.3	2,200	9,700	22,000	4.3 Q	<3.4	<3.2
2-Methylnaphthalene				20,000	40,000,000	13,000	780	**21,000**	4,600	1,200	20	400	3.6 Q	4,000	**21,000**	**33,000**	6.2 Q	<3.6	<3.3
Acenaphthene				38,000	60,000,000	980	<7.2	<120	58 Q	230	<3.2	3.4 Q	<3.2	<26	<110	<200	<3.2	<3.4	<3.2
Acenaphthylene				700	360,000	460	<7.0	<120	<19	120 N	<3.1	<3.1	<3.1	<25	<100	<190	<3.1	<3.3	<3.1
Anthracene				3,000,000	300,000,000	810	<8.6	<150	<24	65	<3.8	<3.8	<3.9	<31	<130	<240	<3.8	<4.0	<3.8
Benzo(a)anthracene				17,000	3,900	<110	<13	<220	<36	<23	<5.7	<5.7	<5.7	<46	<190	<350	<5.6	<6.0	<5.6
Benzo(a)pyrene				48,000	390	<61	<6.9	<120	<19	<12	<3.1	<3.1	<3.1	<25	<100	<190	<3.1	<3.3	<3.0
Benzo(b)fluoranthene				360,000	39,000	62	<6.8 Z	<120 Z	<19 Z	<12 Z	<3.0 Z	<3.0 Z	4.4 QZ	<24 Z	<100	<190	<3.0	<3.2	<3.0
Benzo(g,h,i)perylene				6,800,000	39,000	<75	<8.6	<150	<24	<15	<3.8	<3.8	<3.9	<31	<130	<240	<3.8	<4.0	<3.8
Benzo(k)fluoranthene				870,000	39,000	<65	<7.4 Z	<130 Z	<21 Z	<13 Z	<3.3 Z	<3.3 Z	<3.3 Z	<27 Z	<110	<200	<3.3	<3.5	<3.3
Chrysene				37,000	390,000	230	<11	<180	<29	20 Q	<4.7	<4.7	<4.7	<38	<160	<290	<4.6	<5.0	<4.6
Dibenzo(a,h)anthracene				38,000	390	<58	<6.7	<110	<19	<12	<3.0	<3.0	<3.0	<24	<98	<180	<2.9	<3.1	<2.9
Fluoranthene				500,000	40,000,000	510	<7.0	<120	<19	17 Q	4.1 Q	3.9 Q	4.2 Q	<25	<100	<190	<3.1	<3.3	<3.1
Fluorene				100,000	40,000,000	2,300	<8.3	<140	51 Q	350	<3.7	5.9 Q	<3.7	<30	<120	<230	<3.6	<3.9	<3.6
Indeno(1,2,3-cd)pyrene				680,000	3,900	<53	<6.1	<100	<17	<11	<2.7	<2.7	<2.7	<22	<90	<170	<2.7	<2.9	<2.7
Naphthalene				400	110,000	**1,500**	**1,200**	**23,000**	**2,100**	52 Q	5.1 Q	42	<4.3	**3,000**	**13,000**	**9,400**	<4.3	<4.6	<4.3
Phenanthrene				1,800	390,000	**17,000**	10 Q	<120	42 Q	1,100	13	23	5.0 Q	<26	<100	<200	<3.1	<3.3	<3.1
Pyrene				87,000	30,000,000	1,300	<5.9	<100	<17	130	11	5.3 Q	6.7 Q	<21	<87	<160	<2.6	<2.8	<2.6

NOTES:
Bold indicates a standard has been exceeded.
bgs - below ground surface.
ppb - parts per billion
B - Analyte is present in the method blank.
Q - results between the limit of detection and the limit of quantitation
Z - This compound was separated in the check standard but it did not meet the resolution criteria as set forth in SW846.
N - Spiked sample recovery not within control limits.
K - Detection limit may be elevated due to the presence of an unrequested analyte.
RCL - Residual contaminant Level NR 720
EPA - U.S. Environmental Protection Agency
SSL - EPA Soil Screening Levels as per NR 720.19
PAH - Polycyclic Aromatic Hydrocarbons
A Data Quality Review Memo is included in the Appendix with Laboratory Data

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	NR 720.09 RCL Groundwater Protection	NR 720.19 EPA SSL RCL Groundwater Protection	NR 720.19 EPA SSL RCL Direct Contact Industrial (inhalation of volatiles)	NR Interim PAH Generic RCL's Groundwater Protection	NR Interim PAH Generic RCL's Direct Contact Industrial	AREA 2								AREA 3				AREA 4	
						S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-1	S-2	S-3	S-4	S-1	S-2
						1/18/2006	1/18/2006	1/19/2006	1/19/2006	1/19/2006	1/19/2006	1/19/2006	1/19/2006	1/23/2006	1/23/2006	1/23/2006	1/23/2006	1/23/2006	1/23/2006
						3.5' bgs	3.5' bgs	5' bgs	4' bgs	5' bgs	4' bgs	5' bgs	4' bgs	4' bgs	3' bgs	3.5' bgs	4' bgs	4' bgs	3.5' bgs
VOCs: (ppb)																			
1,2,4-Trimethylbenzene			170,000			<25	<25	<25	<25	<25	<25	170	<25	590	<25	<25	<25	58,000	61,000 K
1,3,5-Trimethylbenzene			70,000			<25	<25	<25	<25	<25	<25	130	<25	180	<25	<25	<25	16,000	18,000 K
Benzene	5.5	30	1,300			<25	<25	<25	<25	<25	<25	<25	<25	**34 Q**	<25	<25	<25	**510 Q**	<620 K
Ethylbenzene	2,900	13,000	20,000			<25	<25	<25	<25	<25	<25	<25	<25	84	<25	<25	<25	**8,300**	**7,500 K**
Isopropylbenzene						<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	2,800	2,500 K
Methyl-tert-butyl-ether						<25	<25	<25	<25	<25	41 Q	66 Q	<25	<25	<25	<25	<25	<310	<620 K
Naphthalene						<25	<25	<25	<25	<25	<25	<25	<25	280	<25	<25	<25	51,000	65,000 K
n-Heptane						<65	<65	<65	<65	<65	<65	97 Q	<65	190	190 Q	<65	<65	31,000	26,000 K
n-Propylbenzene						<25	<25	<25	<25	<25	<25	<25	<25	81	<25	<25	<25	6,400	5,900 K
p-Isopropyltoluene						<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	6,900	7,400 K
sec-Butylbenzene			220,000			<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	4,400	4,600 K
Toluene	1,500	12,000	520,000			<25	<25	<25	<25	<25	<25	54 Q	<25	330	<25	<25	<25	**9,600**	**9,000 K**
Xylene, o						<25	<25	<25	<25	<25	<25	140	<25	130	<25	<25	<25	20,000	20,000 K
Xylenes, m+p						<50	<50	<50	<50	<50	<50	270	<50	280	<50	<50	<50	43,000	45,000 K
Xylene (Total)	4,100	210,000	420,000			<75	<75	<75	<75	<75	<75	410	<75	410	<75	<75	<75	**63,000**	**65,000 K**
PAHs: (ppb)																			
1-Methylnaphthalene				23,000	70,000,000	<3.2	<3.2	<3.2	<3.2	<3.2	<3.5	<3.4	<3.2	52	<3.8	<3.2	<3.3	**130,000**	**100,000**
2-Methylnaphthalene				20,000	40,000,000	<3.3	<3.3	<3.3	<3.3	<3.3	<3.6	5.2 Q	<3.3	97	<3.9	<3.3	<3.4	**230,000**	**180,000**
Acenaphthene				38,000	60,000,000	<3.1	<3.1	<3.1	<3.1	<3.1	<3.4	<3.3	<3.1	<3.3	<3.7	<3.2	<3.3	9,300	6,800
Acenaphthylene				700	360,000	<3.0	<3.0	<3.0	<3.0	<3.0	<3.3	<3.2	<3.0	<3.2	<3.6	<3.1	<3.2	**2,400 Q**	**1,900 Q**
Anthracene				3,000,000	300,000,000	<3.7	<3.8	<3.7	<3.7	<3.7	<4.1	<4.0	<3.7	<4.0	<4.5	<3.8	<3.9	<1,500	<1,500
Benzo(a)anthracene				17,000	3,900	<5.5	<5.6	<5.6	<5.6	<5.5	<6.0	<5.9	<5.6	<6.0	<6.7	<5.7	<5.8	<2,200	<2,300
Benzo(a)pyrene				48,000	390	<3.0	<3.0	<3.0	<3.0	<3.0	<3.3	<3.2	<3.0	<3.2	<3.6	<3.1	<3.1	<1,200	<1,200
Benzo(b)fluoranthene				360,000	39,000	<2.9	<3.0	<3.0	<3.0	<2.9	<3.2	<3.1	<2.9	<3.2	<3.5	<3.0	<3.1	<1,200 Z	<1,200 Z
Benzo(g,h,i)perylene				6,800,000	39,000	<3.7	<3.8	<3.7	<3.7	<3.7	<4.1	<4.0	<3.7	<4.0	<4.5	<3.8	<3.9	<1,500	<1,500
Benzo(k)fluoranthene				870,000	39,000	<3.2	<3.2	<3.2	<3.2	<3.2	<3.5	<3.4	<3.2	<3.4	<3.8	<3.3	<3.4	<1,300 Z	<1,300 Z
Chrysene				37,000	390,000	<4.5	<4.6	<4.6	<4.6	<4.6	<5.0	<4.9	<4.6	<4.9	<5.5	<4.7	<4.8	<1,800	<1,900
Dibenzo(a,h)anthracene				38,000	390	<2.9	<2.9	<2.9	<2.9	<2.9	<3.1	<3.1	<2.9	<3.1	<3.5	<2.9	<3.0	<1,200	<1,200
Fluoranthene				500,000	40,000,000	<3.0	<3.0	<3.0	<3.0	<3.0	<3.3	<3.2	<3.0	<3.2	<3.6	<3.1	<3.2	<1,200	<1,200
Fluorene				100,000	40,000,000	<3.6	<3.6	<3.6	<3.6	<3.6	<3.9	<3.8	<3.6	<3.8	<4.3	<3.7	<3.7	12,000	8,800
Indeno(1,2,3-cd)pyrene				680,000	3,900	<2.6	<2.7	<2.6	<2.6	<2.6	<2.9	<2.8	<2.6	<2.8	<3.2	<2.7	<2.8	<1,100	<1,100
Naphthalene				400	110,000	<4.2	<4.2	<4.2	<4.2	<4.2	<4.6	7.1 Q	<4.2	41 N	<5.0	<4.3	<4.4	**40,000**	**32,000**
Phenanthrene				1,800	390,000	<3.1	<3.1	<3.1	<3.1	<3.1	<3.4	<3.3	<3.1	<3.3	<3.7	<3.2	<3.2	**45,000**	**33,000**
Pyrene				87,000	30,000,000	<2.6	<2.6	<2.6	<2.6	<2.6	<2.8	<2.7	<2.6	<2.8	<3.1	<2.6	<2.7	3,000 Q	1,300 Q

NOTES:
Bold indicates a standard has been exceeded.
bgs - below ground surface.
ppb - parts per billion
B - Analyte is present in the method blank.
Q - results between the limit of detection and the limit of quantitation
Z - This compound was separated in the check standard but it did not meet the resolution criteria as set
N - Spiked sample recovery not within control limits.
K - Detection limit may be elevated due to the presence of an unrequested analyte.
RCL - Residual contaminant Level NR 720
EPA - U.S. Environmental Protection Agency
SSL - EPA Soil Screening Levels as per NR 720.19
PAH - Polycyclic Aromatic Hydrocarbons
A Data Quality Review Memo is included in the Appendix with Laboratory Data

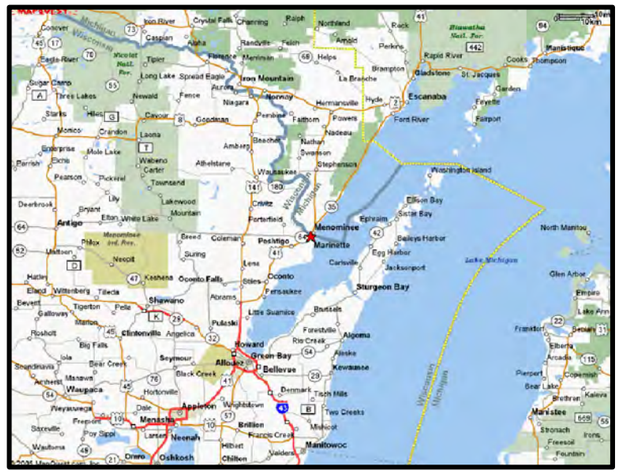
FIGURES

SOIL EXCAVATION DOCUMENTATION

FIRE TECHNOLOGY CENTER AND R&D GROUNDS
FUEL DISTRIBUTION SYSTEM UPGRADE PROJECT
TYCO SAFETY PRODUCTS - ANSUL INCORPORATED

MARINETTE, WISCONSIN

MARCH 2007



N

N

PROJECT LOCATION
2700 INDUSTRIAL PARKWAY SOUTH
MARINETTE, WI

SHEET INDEX

DRAWING NO.	SHEET TITLE
	TITLE SHEET
C–1	2006 PRE–DEMOLITION SITE FEATURES MAP
C–2	JANUARY 2006 PIPING REMOVAL TRENCHING AND REMOVAL DATES
C–3	JANUARY 2006 EXTENT OF DEMOLITION EXCAVATIONS
C–4	JANUARY 2006 PID SCREENING RESULTS
C–5	JANUARY 2006 SOIL SAMPLE ANALYTICAL RESULTS–VOCs
C–6	JANUARY 2006 SOIL SAMPLE ANALYTICAL RESULTS–PAHs
C–7	EXTENT OF UPGRADE EXCAVATIONS WITH PID SCREENING RESULTS
C–8	ESTIMATED EXTENT OF RESIDUAL SOIL CONTAMINATION

PREPARED FOR:

ANSUL Innovative Fire Solutions

tyco Safety Products

ONE STATON STREET
Marinette, Wisconsin

PREPARED BY:

EarthTech
A Tyco International Ltd. Company

1020 N. Broadway, Suite 400
Milwaukee, Wisconsin

414–225–5100

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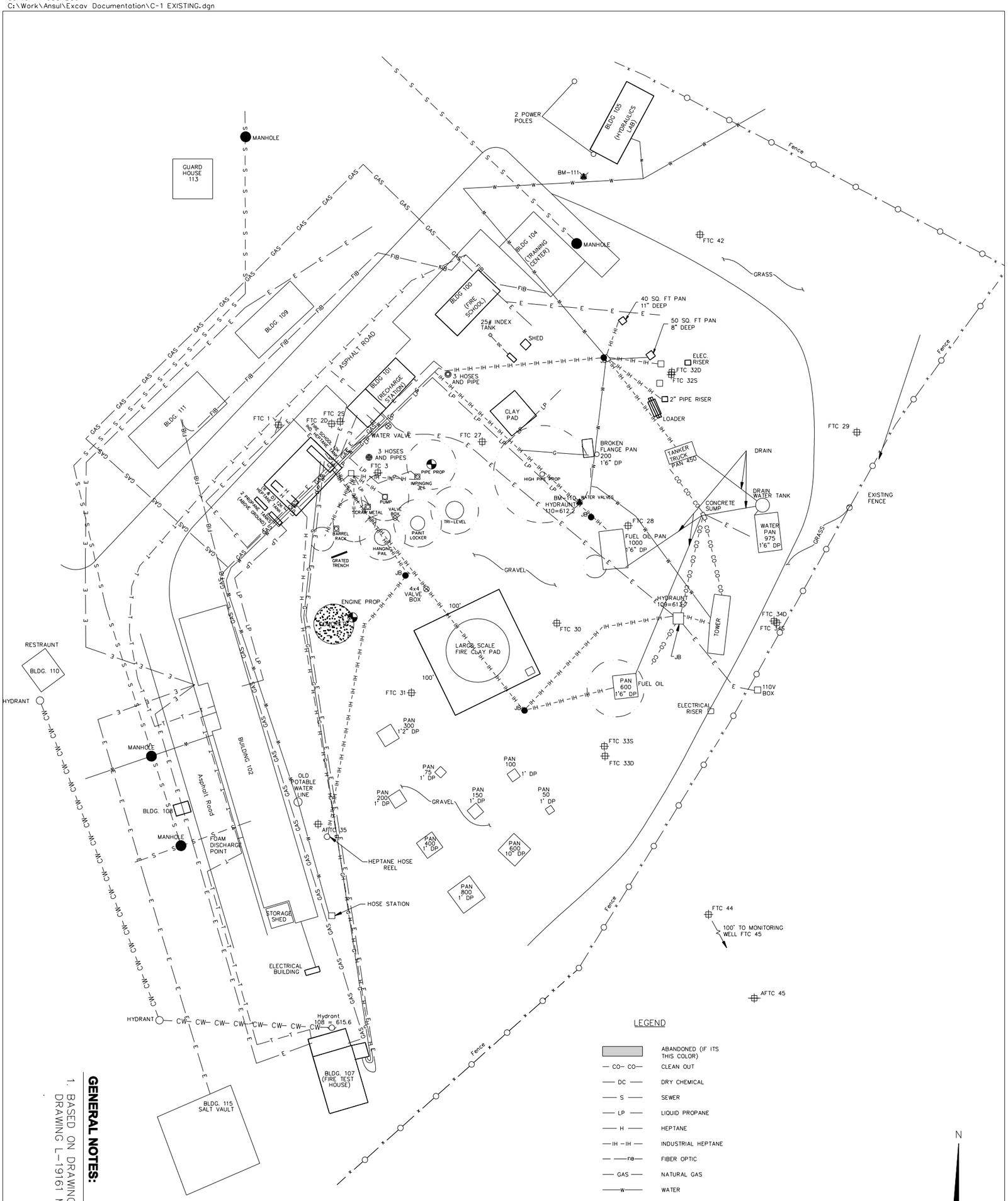

GENERAL NOTES:

1. BASED ON DRAWING FROM ANSUL FIRE PROTECTION DRAWING L-19161 MAY 2004

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

2006 PRE-DEMOLITION SITE FEATURES

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1020 NORTH BROADWAY
414-225-5100

DRN	ARG		03/2006
DES			
CHK			
APP			

NO	REVISIONS	DRN	CHK	DATE
1.	SOIL EXCAVATION DOCUMENTATION REPORT	DRB		FEB. 2007

DRAWING NO C-1
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FILENAME C-1 EXISTING.dgn
PROJECT NO 89773
DATE MARCH 2006

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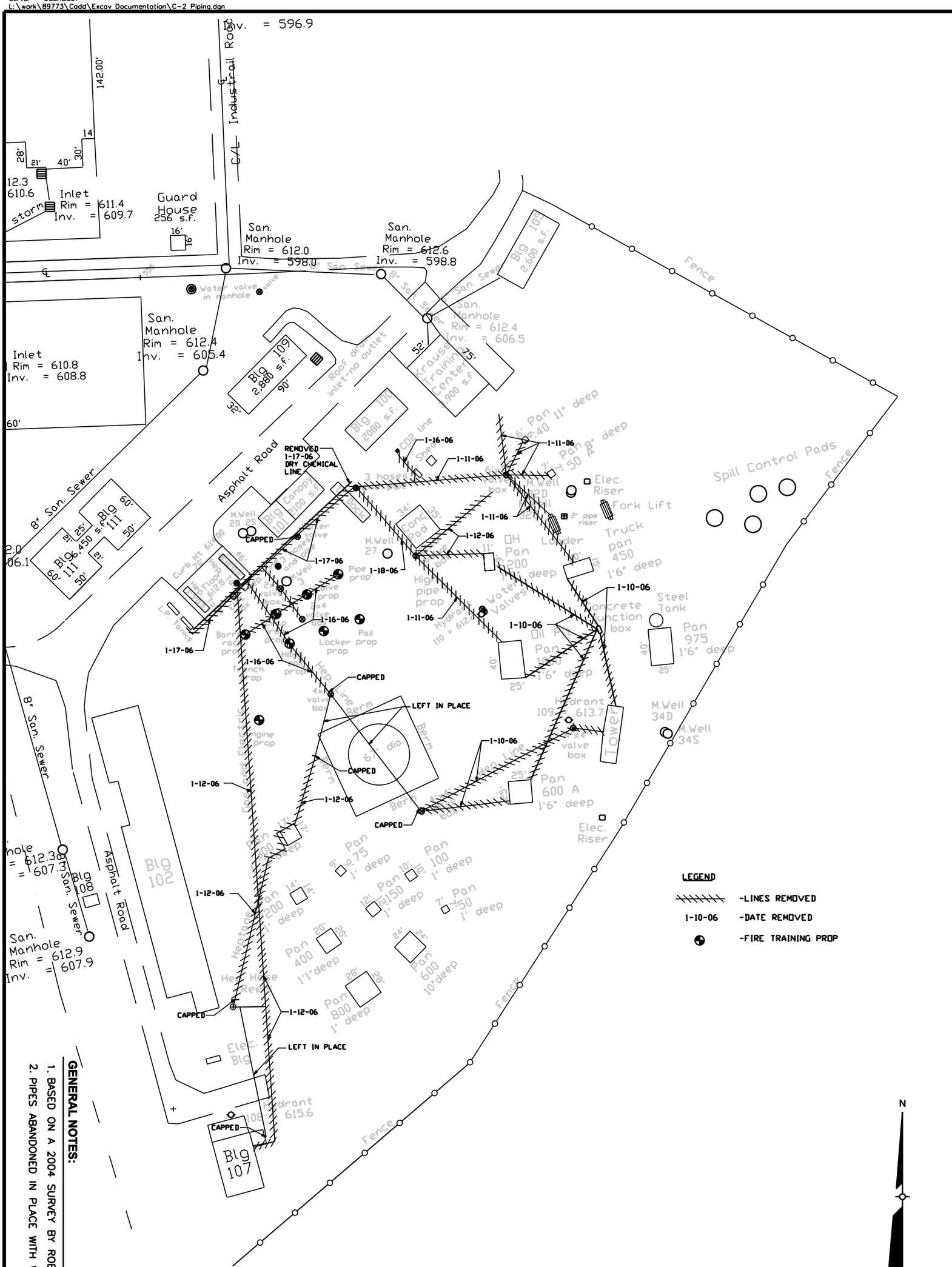

GENERAL NOTES:

1. BASED ON A 2004 SURVEY BY ROBERT JOHNSON, RLS.
2. PIPES ABANDONED IN PLACE WITH WDCOM'S APPROVAL.

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

JANUARY 2006
PIPING REMOVAL TRENCHING AND REMOVAL DATES

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414-225-5100

DRN	ARG		01/2006
DES			
CHK			
APP			

NO	REVISIONS	DRN	CHK	DATE
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1.	SOIL EXCAVATION DOCUMENTATION REPORT	DRB		FEB. 2007

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SHEET NO	
FILENAME	C-2 Piping.dgn
PROJECT NO	89773
DATE	MARCH 2006

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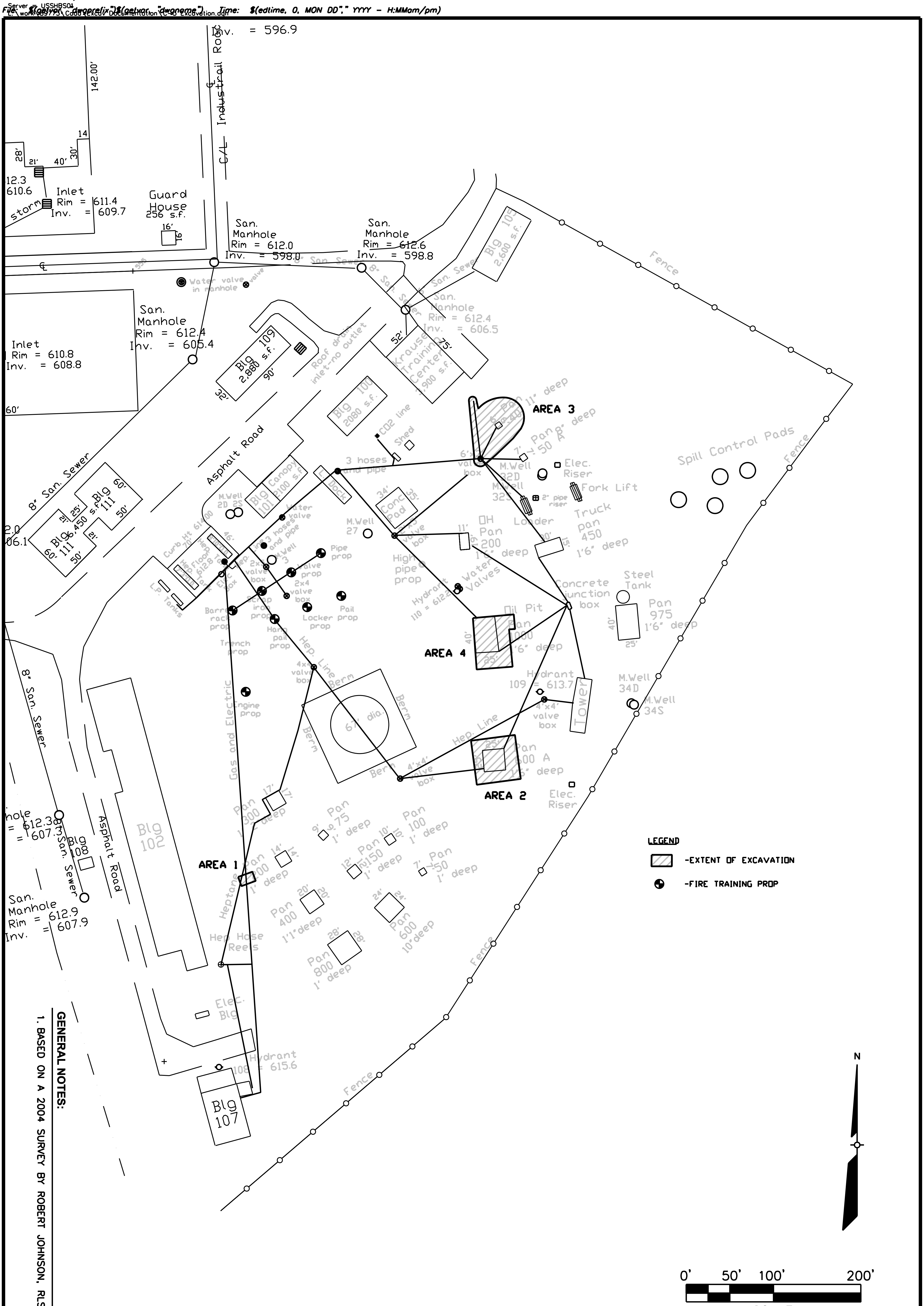
AREA 1
AREA 2
AREA 3
AREA 4
LEGEND
-EXTENT OF EXCAVATION
-FIRE TRAINING PROP
0' 50' 100' 200'
SCALE
N
Fence
Spill Control Pads
Asphalt Road
8" San. Sewer
C/L Industrail Road
Guard House 256 s.f.
San. Manhole Rim = 612.0 Inv. = 598.0
San. Manhole Rim = 612.6 Inv. = 598.8
San. Manhole Rim = 612.4 Inv. = 606.5
San. Manhole Rim = 612.4 Inv. = 605.4
San. Manhole Rim = 612.9 Inv. = 607.9
Inlet Rim = 611.4 Inv. = 609.7
Inlet Rim = 610.8 Inv. = 608.8
Inv. = 596.9
Blg 109 2,880 s.f.
Blg 100 2080 s.f.
Blg 105 2,600 s.f.
Blg 101 Canopy 2100 s.f.
Blg 111 6,450 s.f.
Blg 102
Blg 107
Blg 108
Krause Training Center 1,900 s.f.
Steel Tank
Tower
Oil Pit
Concrete Junction box
Berm
67' dia.
Hep. Line
Gas and Electric
Hydrant 109 = 613.7
Hydrant 615.6
Elec. Riser
Elec. Blg
Fork Lift
Truck pan 450 1'6" deep
Pan 975 1'6" deep
Pan 200 1'6" deep
Pan 300 1' deep
Pan 400 1'1"deep
Pan 600 10"deep
Pan 800 1' deep
Pan 100 1' deep
Pan 150 1' deep
Pan 75 1' deep
Pan 50 1' deep
Engine prop
Trench prop
Locker prop
Pail prop
Pipe prop
High pipe prop
M.Well 27
M.Well 34D
M.Well 34S
Hep Hose Reels
L.P. Tanks

GENERAL NOTES:

1. BASED ON A 2004 SURVEY BY ROBERT JOHNSON, RLS.

DATE	MARCH 2006	
PROJECT NO	89773	
FILENAME	C-3 Excavation.dgn	
SHEET NO		
DRAWING NO	C-3	

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

JANUARY 2006 EXTENT OF DEMOLITION EXCAVATIONS

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1020 NORTH BORADWAY
414-225-5100

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DES			
CHK			
APP			

NO	REVISIONS	DRN	CHK	DATE
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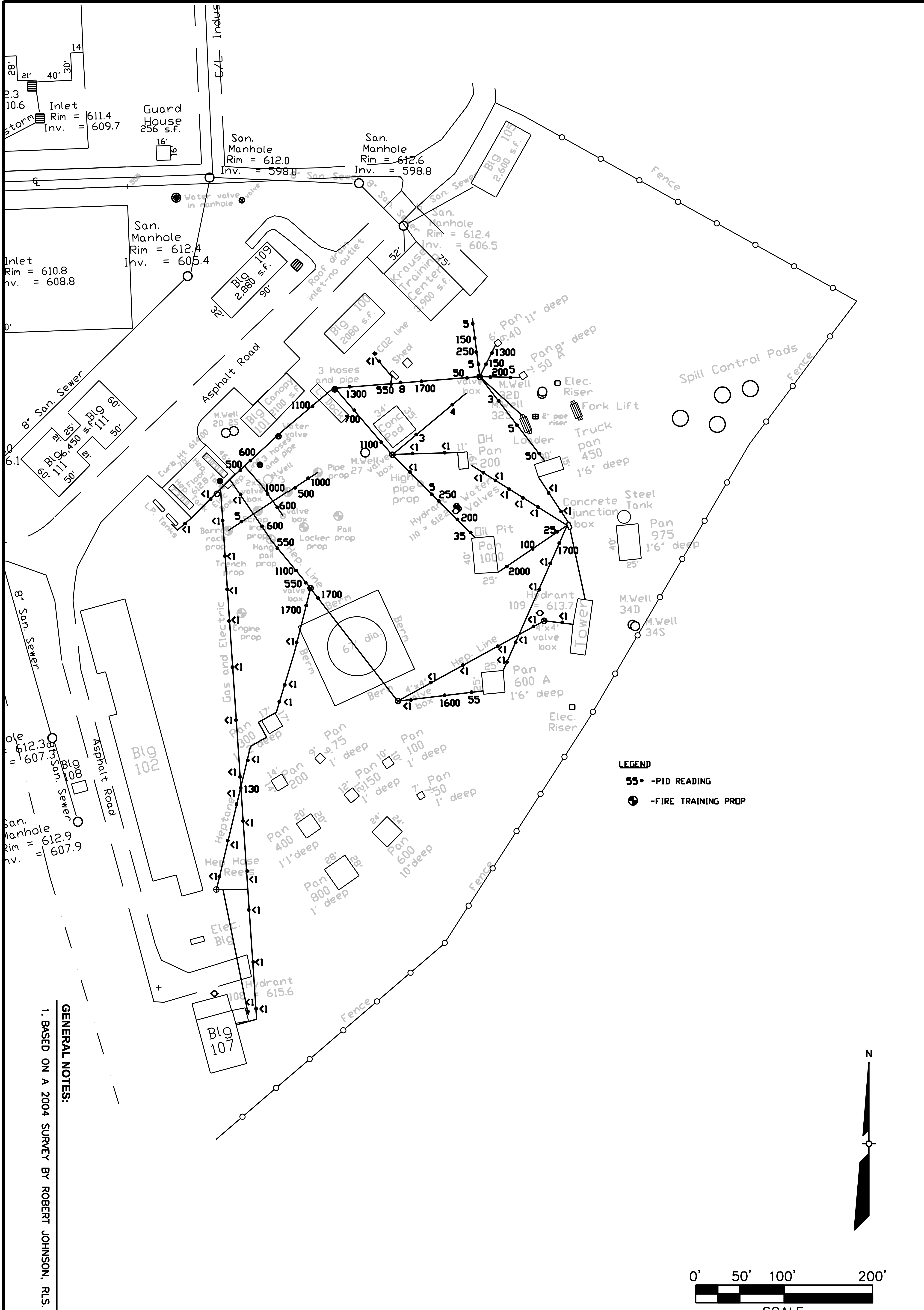
LEGEND
55• -PID READING
-FIRE TRAINING PROP
Spill Control Pads
Fence
Guard House
256 s.f.
San. Manhole
Rim = 612.0
Inv. = 598.0
San. Manhole
Rim = 612.6
Inv. = 598.8
San. Manhole
Rim = 612.4
Inv. = 605.4
San. Manhole
Rim = 612.4
Inv. = 606.5
Inlet
Rim = 611.4
Inv. = 609.7
Inlet
Rim = 610.8
Inv. = 608.8
8" San. Sewer
Asphalt Road
Blg 109
2,880 s.f.
Blg 100
2080 s.f.
Krause Training Center
1,900 s.f.
Blg 105
2,600 s.f.
Blg 101
Blg 102
Blg 107
Blg 108
Blg 111
Berm
67' dia.
Tower
Concrete junction box
Steel Tank
Pan 975
1'6" deep
Hep. Line
Gas and Electric
Heptane
Elec. Riser
Fork Lift
Truck pan 450
1'6" deep
Pan 600 A
1'6" deep
Hydrant
109 = 613.7
Hydrant
108 = 615.6
Oil Pit
Pan 1000
Pan 200
M.Well 34D
M.Well 34S
N
0' 50' 100' 200'
SCALE

GENERAL NOTES:

1. BASED ON A 2004 SURVEY BY ROBERT JOHNSON, RLS.

DATE	MARCH 2006
PROJECT NO	89773
FILENAME	C-4 PID.dgn
SHEET NO	
DRAWING NO	C-4

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

JANUARY 2006
PID SCREENING RESULTS

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DES		
CHK		
APP		

NO	REVISIONS	DRN	CHK	DATE
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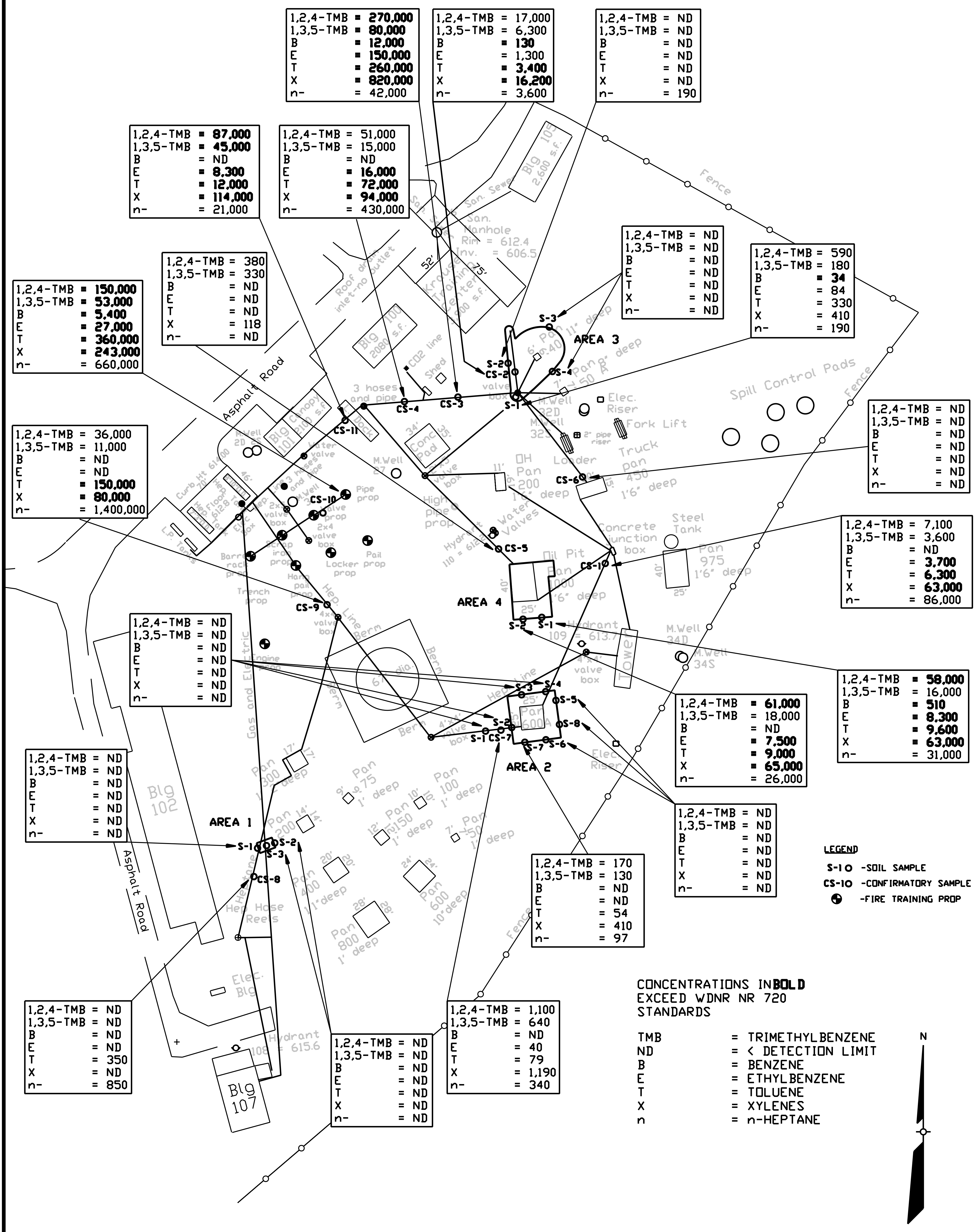

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E = 150,000
T = 260,000
X = 820,000
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1,2,4-TMB = 17,000
1,3,5-TMB = 6,300
B = 130
E = 1,300
T = 3,400
X = 16,200
n- = 3,600
1,2,4-TMB = ND
1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = 190
1,2,4-TMB = 87,000
1,3,5-TMB = 45,000
B = ND
E = 8,300
T = 12,000
X = 114,000
n- = 21,000
1,2,4-TMB = 51,000
1,3,5-TMB = 15,000
B = ND
E = 16,000
T = 72,000
X = 94,000
n- = 430,000
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1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = ND
1,2,4-TMB = 590
1,3,5-TMB = 180
B = 34
E = 84
T = 330
X = 410
n- = 190
1,2,4-TMB = 380
1,3,5-TMB = 330
B = ND
E = ND
T = ND
X = 118
n- = ND
1,2,4-TMB = 150,000
1,3,5-TMB = 53,000
B = 5,400
E = 27,000
T = 360,000
X = 243,000
n- = 660,000
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1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = ND
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1,3,5-TMB = 11,000
B = ND
E = ND
T = 150,000
X = 80,000
n- = 1,400,000
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1,3,5-TMB = 3,600
B = ND
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T = 6,300
X = 63,000
n- = 86,000
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1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = ND
1,2,4-TMB = 58,000
1,3,5-TMB = 16,000
B = 510
E = 8,300
T = 9,600
X = 63,000
n- = 31,000
1,2,4-TMB = 61,000
1,3,5-TMB = 18,000
B = ND
E = 7,500
T = 9,000
X = 65,000
n- = 26,000
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1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = ND
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1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
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B = ND
E = ND
T = 54
X = 410
n- = 97
1,2,4-TMB = ND
1,3,5-TMB = ND
B = ND
E = ND
T = 350
X = ND
n- = 850
1,2,4-TMB = ND
1,3,5-TMB = ND
B = ND
E = ND
T = ND
X = ND
n- = ND
1,2,4-TMB = 1,100
1,3,5-TMB = 640
B = ND
E = 40
T = 79
X = 1,190
n- = 340
AREA 1
AREA 2
AREA 3
AREA 4
Asphalt Road
Spill Control Pads
Fence
Blg 102
Blg 107
Blg 100
Blg 105
Oil Pit
Tower

LEGEND

S-10 -SOIL SAMPLE
CS-10 -CONFIRMATORY SAMPLE
-FIRE TRAINING PROP

CONCENTRATIONS IN **BOLD** EXCEED WDNR NR 720 STANDARDS

TMB	=	TRIMETHYLBENZENE
ND	=	< DETECTION LIMIT
B	=	BENZENE
E	=	ETHYLBENZENE
T	=	TOLUENE
X	=	XYLENES
n	=	n-HEPTANE

N

GENERAL NOTES:

1. BASED ON A 2004 SURVEY BY ROBERT JOHNSON, RLS.

0' 50' 100' 200'
SCALE

DATE MARCH 2006
PROJECT NO 89773
FILENAME C-5 SAMPLE VOC.dgn
SHEET NO
DRAWING NO C-5

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

JANUARY 2006
SOIL SAMPLE ANALYTICAL
RESULTS - VOCs

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414-225-5100

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DES		
CHK		
APP		

NO	REVISIONS	DRN	CHK	DATE
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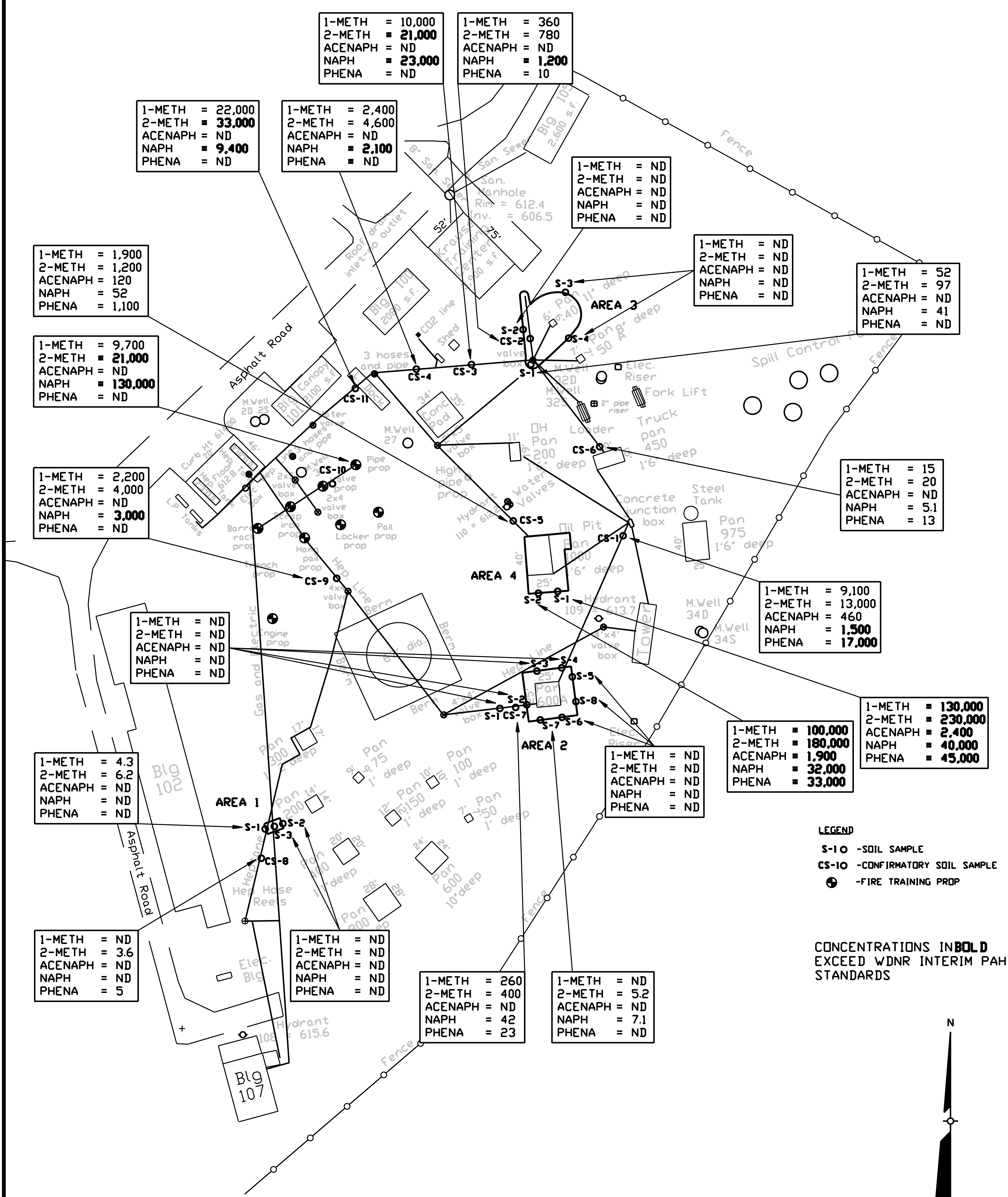

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NAPH = 23,000
PHENA = ND
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NAPH = 1,200
PHENA = 10
1-METH = 22,000
2-METH = 33,000
ACENAPH = ND
NAPH = 9,400
PHENA = ND
1-METH = 2,400
2-METH = 4,600
ACENAPH = ND
NAPH = 2,100
PHENA = ND
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PHENA = ND
1-METH = 1,900
2-METH = 1,200
ACENAPH = 120
NAPH = 52
PHENA = 1,100
1-METH = 9,700
2-METH = 21,000
ACENAPH = ND
NAPH = 130,000
PHENA = ND
1-METH = 15
2-METH = 20
ACENAPH = ND
NAPH = 5.1
PHENA = 13
1-METH = 2,200
2-METH = 4,000
ACENAPH = ND
NAPH = 3,000
PHENA = ND
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2-METH = 13,000
ACENAPH = 460
NAPH = 1,500
PHENA = 17,000
1-METH = ND
2-METH = ND
ACENAPH = ND
NAPH = ND
PHENA = ND
1-METH = 130,000
2-METH = 230,000
ACENAPH = 2,400
NAPH = 40,000
PHENA = 45,000
1-METH = 100,000
2-METH = 180,000
ACENAPH = 1,900
NAPH = 32,000
PHENA = 33,000
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2-METH = 6.2
ACENAPH = ND
NAPH = ND
PHENA = ND
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2-METH = ND
ACENAPH = ND
NAPH = ND
PHENA = ND
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2-METH = 3.6
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NAPH = 42
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1-METH = ND
2-METH = 5.2
ACENAPH = ND
NAPH = 7.1
PHENA = ND
AREA 1
AREA 2
AREA 3
AREA 4
Asphalt Road
Fence
Spill Control
Fork Lift
Truck
Steel Tank
Tower
Oil Pit
Berm
Blg 102
Blg 107
Blg 100
Kraus Training Center
San. Manhole Rim = 612.4 Inv. = 606.5
Gas and Electric
Hep. Line
L.P. Tanks
LEGEND
S-10 -SOIL SAMPLE
CS-10 -CONFIRMATORY SOIL SAMPLE
-FIRE TRAINING PROP
CONCENTRATIONS IN BOLD EXCEED WDNR INTERIM PAH STANDARDS
N

GENERAL NOTES:

1. BASED ON A 2004 SURVEY BY ROBERT JOHNSON, RLS.

0' 50' 100' 200'
SCALE

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

JANUARY 2006
SOIL SAMPLE ANALYTICAL
RESULTS - PAHs

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414-225-5100

DRN	ARG	01/2006
DES		
CHK		
APP		

NO	REVISIONS	DRN	CHK	DATE
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1.	SOIL EXCAVATION DOCUMENTATION REPORT	DRB		FEB. 2007

DATE: MARCH 2006
PROJECT NO: 89773
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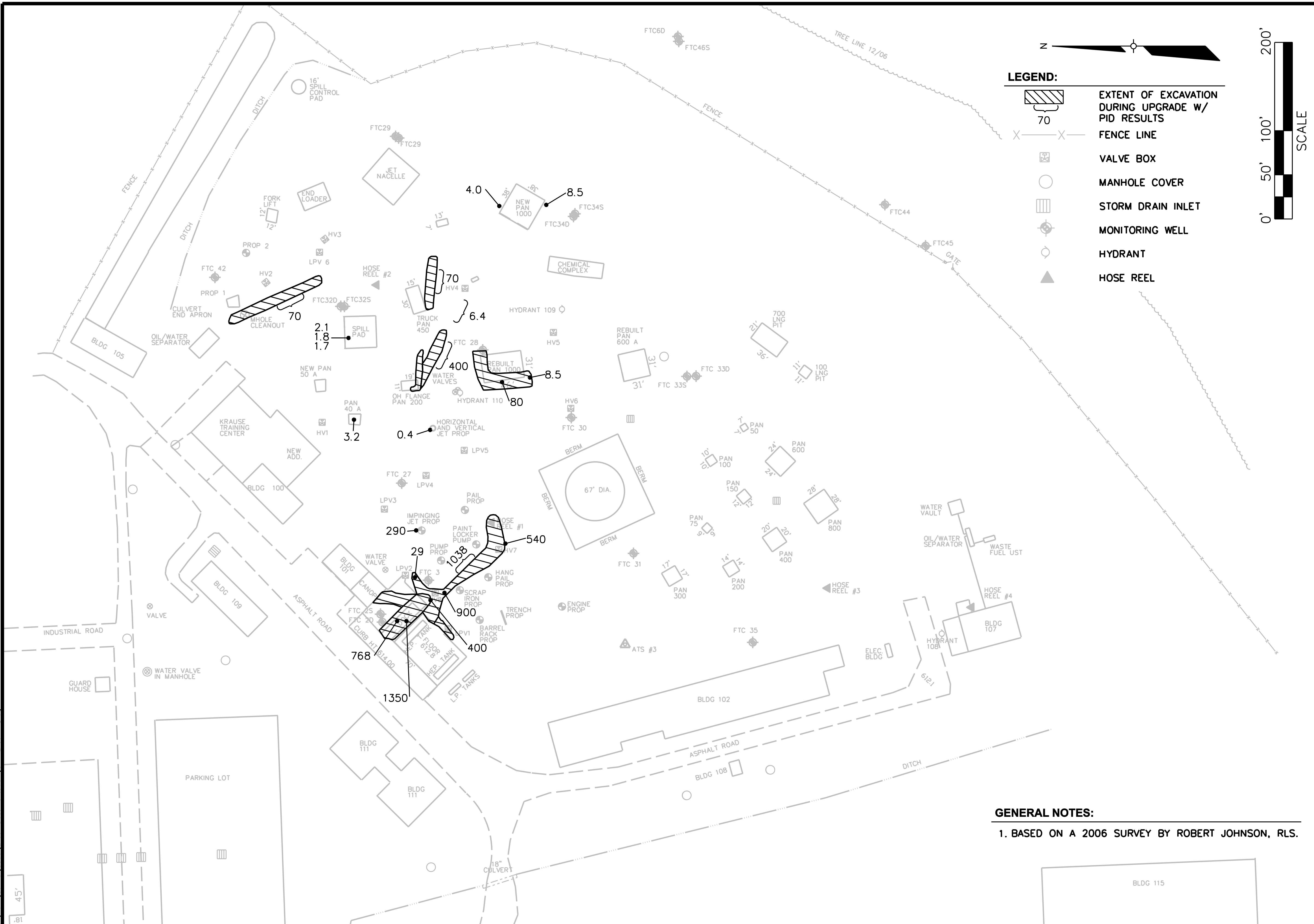

LEGEND:

70	EXTENT OF EXCAVATION DURING UPGRADE W/ PID RESULTS
X——X	FENCE LINE
	VALVE BOX
	MANHOLE COVER
	STORM DRAIN INLET
	MONITORING WELL
	HYDRANT
	HOSE REEL

SCALE 0' 50' 100' 200'

GENERAL NOTES:

1. BASED ON A 2006 SURVEY BY ROBERT JOHNSON, RLS.

NO	REVISIONS	DRN	CHK	DATE
1.	SOIL EXCAVATION DOCUMENTATION REPORT	DRB		FEB. 2007

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DRN ARG 03/2006
DES
CHK
APP

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TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

EXTENT OF UPGRADE EXCAVATIONS WITH PID SCREENING RESULTS

DATE MARCH 2006
PROJECT NO 89773
FILENAME C-7 Excav PID.dgn
SHEET NO
DRAWING NO C-7

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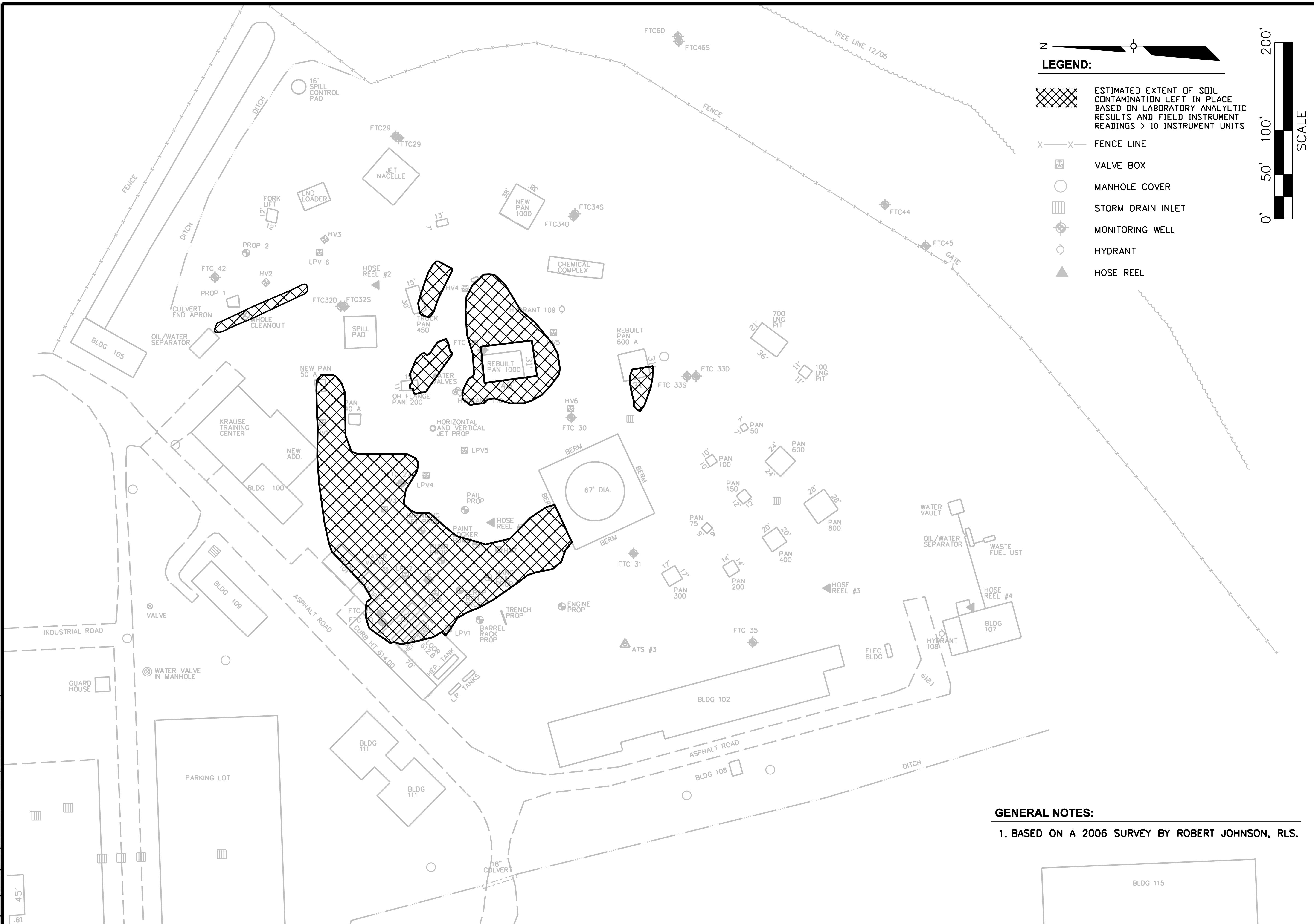

N

LEGEND:

(crosshatch)	ESTIMATED EXTENT OF SOIL CONTAMINATION LEFT IN PLACE BASED ON LABORATORY ANALYTIC RESULTS AND FIELD INSTRUMENT READINGS > 10 INSTRUMENT UNITS
—X—X—	FENCE LINE
	VALVE BOX
	MANHOLE COVER
	STORM DRAIN INLET
	MONITORING WELL
	HYDRANT
	HOSE REEL

SCALE 0' 50' 100' 200'

GENERAL NOTES:

1. BASED ON A 2006 SURVEY BY ROBERT JOHNSON, RLS.

NO	REVISIONS	DRN	CHK	DATE
1.	SOIL EXCAVATION DOCUMENTATION REPORT	DRB		FEB. 2007

MILWAUKEE, WI
1020 NORTH BROADWAY
414-225-5100

DRN ARG 03/2006
DES
CHK
APP

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A Tyco International Ltd. Company

TYCO FIRE SAFETY PRODUCTS
ANSUL INDUSTRIAL PARKWAY FACILITY
MARINETTE, WISCONSIN

ESTIMATED EXTENT OF RESIDUAL SOIL CONTAMINATION

DATE MARCH 2006
PROJECT NO 89773
FILENAME C-8 Contamination.dgn
SHEET NO
DRAWING NO C-8

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APPENDIX A

Earth Tech's Standard Field Methodologies

STANDARD OPERATING PROCEDURE
FOR
EXCAVATION AND SURFACE SOIL SAMPLING

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to describe the method for sampling surface soils at grade or from excavations. Typically, these excavations would be associated with the removal of above or underground storage tanks, piping, transfer stations, pump facilities, valve pits, sumps, etc. Soil samples are collected over an aerial distribution to characterize the surface conditions and used to verify that the area of concern is free of contamination or to define the extent of contamination. This procedure describes equipment and field methods necessary to collect surface and excavation soil samples.

2.0 REQUIREMENTS

Sample collection information should be recorded in the field log book or the Soils Data form provided in Appendix E of the QAPP. Soil sampling locations, intervals and chemical parameters are discussed in the site-specific Work Plan. All soil samples will be visually classified in the field using the Unified Soil Classification System (USCS) pursuant to ASTM D-2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

Sample forms will be prepared in the field, as samples are taken, by a qualified, experienced geologist. Each form will be signed by the preparer. All log book and form entries should be printed in ink and photo reproductions should be clear and legible. Illegible or incomplete forms will not be accepted.

The sampling locations must be clearly marked on a site map or location sketch and staked in the field using suitable markers (e.g., wire flags or lath). The accuracy of the soil sampling locations will be identified in the site-specific Work Plan. Location sketches, referenced by measured distances from prominent surface features or known coordinates, will be shown on or attached to the form. Map scale should be indicated on a scaled drawing or sketch must contain all dimensions of excavations, sampling locations and reference surface features as would be required for a scaled CADD drawing. Each and every material type encountered will be described.

Unconsolidated materials should be described as outlined below and in the following sequence:

1. Descriptive USCS classification in accordance with ASTM D 2488-90.

2. Consistency of cohesive materials or density of non-cohesive materials.

3. Moisture content assessment (e.g., moist, wet, saturated).

4. Color.

5. Other descriptive feature (bedding, characteristics, organic materials, macrostructure of fine-grained soils such as root holes, fractures, etc.).

6. Depositional type (such as alluvium, till, loess).

Any special sampling problems should be recorded on the field forms or in the field log book, including descriptions of problem resolutions. Forms should include all other information relevant to a particular investigation, including but not limited to:

1. Odors.

2. Measurements with a photoionization detector (PID) or other field screening or testing results.

3. Any observed evidence of contamination in samples or excavations or evidence of leaking pipes, tanks, etc.

3.0 RESPONSIBILITIES

The Site Geologist performs or directly supervises the sampling procedure and classifies soil samples. The Site Geologist is also responsible for the measurements, observations, and the decontamination of sampling equipment. He/she must record all pertinent information on the appropriate form(s) and in the field log book.
The Field Team Leader directs the packing and sealing of samples as described in SOP F-8.

4.0 EQUIPMENT

The following pieces of equipment may be needed to collect samples:

1. Stainless steel spatula, spoon or other sampler.

2. Stainless steel bowl.

3. Appropriate sampling containers.

4. Deionized or distilled water.

5. Decontamination supplies as specified in the project-specific work plan.

6. Steel retractable engineer's measuring tape (calibrated to 0.01 foot).

7. Organic vapor monitoring device (photoionization detector (PID) or similar instrument).

8. Appropriate health and safety equipment.

9. Soil Data Form

10. Field log book.

5.0 PROCEDURE

Before soil sampling begins, complete all general information on the field forms or the field log book in ink such as the site name, project number and equipment operator. Inventory the sample jars to be certain that a sufficient number of sample jars of the correct size and type are available to complete the sampling.

Equipment for shallow (approximately 0-1 foot) soil samples includes, but is not limited to, hand augers, hand trowels, shovels, spoons, sampling tubes, bowls, aluminum foil, and sampling slide hammers. This equipment must be stainless steel. Equipment must be decontaminated in accordance with SOP F-6 prior to use and between sample locations.

There are two sampling techniques generally used for surface sampling: the grab sample and the composite sample. A common way to select samples or do field screening is to perform a head space analysis. If the excavation is too deep to enter, sampling from a backhoe bucket may be necessary. These aspects of surface sampling are discussed below.

Grab sample — A grab sample is collected at a specific location to represent soil conditions at a single point. It is not combined with soil from any other location. The soil will be taken from the sample location and placed and mixed in a clean stainless steel mixing bowl for placement in a sampling jar as described below.

Composite sample — A composite sample represents the soil conditions over an area. Several sub-samples are collected from multiple locations in an area, mixed together and the mixture is then sampled. The procedure for composite soil sampling is as follows: upon each retrieval of the sampling device, the contents in the sampler shall be placed in a clean stainless steel mixing bowl keeping the bowl covered with aluminum foil between subsamples. After all sub-samples are collected in the bowl, the soil is stirred with a clean stainless steel spoon into a homogeneous mixture.

For both grab and composite samples, the soil mixture in the mixing bowl should be sectioned into four equal quadrants and placed into the appropriate sample jar(s) by taking small amounts from each successive quadrant until the sample jar is filled.

Samples for volatile organic compounds (VOCs) analysis should not be mixed in a bowl but should be taken directly from the sampling device. The soil sample will be collected using a coring device (e.g., cut syringe, EnCore™, or US Analytical's Easy Draw Syringe™ Sampler). The soil core (approximately 25g of soil) will be placed directly into a preweighed laboratory container and preserved with approximately 25 ml of methanol. Prior to collecting samples for analysis, a sample of similar material will be weighed to establish the correct volume of soil. Alternately, samples can be collected directly into a coring device and sealed using laboratory supplied containers. The VOC sample must be collected immediately upon retrieval of the sampling device and before any other samples are removed.

If head space analysis of the sample is required, the head space sample should be taken immediately upon retrieval and opening of the sampling device -- do not composite. If a VOC sample *and* a headspace sample are required, the VOC sample is taken first and the headspace

sample second in quick succession. For the headspace analysis, a representative sample, approximately 2 to 4 ounces, shall be placed in a glass jar. The jar shall be covered with at least one continuous sheet of aluminum foil and immediately secured with the jar lid. To minimize the number of jars used and the amount of contaminated waste generated, the jar may first be lined with a new clean sandwich bag inserted into the jar and draped over the edges. The jar shall be shaken for at least 15 seconds and allowed a minimum of 10 minutes to adequately volatilize. During cold weather, the sample will be warmed to room temperature prior to taking a head space measurement. If sandwich bags are used, new clean bags must be tested with a PID to verify that VOCs related to the bag's manufacturing are not present.

After the waiting period, the probe of the PID shall quickly be inserted into the bag, taking care not to push it into the sample, and the maximum meter response within 2 to 5 seconds shall be recorded as the head space analysis. The remainder of the sample in the sampling device shall be collected as described above.

Excavations may not be safe to enter as defined by OSHA regulations. These are deep and/or steep sided excavations which typically result from the removal of a underground storage tank (UST) or the excavation of deep contamination. In these situations, a backhoe can also be used to collect soil samples. The backhoe bucket must be free of soil from previous locations before the sample is taken. Once the sample is obtained and brought up to an area at grade and away from the edge of the excavation, the soil sample is collected from the backhoe bucket after the bucket has been placed on the ground and the backhoe operator signals for the sample to be taken. The sample should then be taken from the central portion of the bucket taking care to ensure that the sample soil has not contacted the sides of the bucket. The Health and Safety Plans and OSHA regulations shall be followed when working near open trenches and backhoes.

After a sample is collected it shall be labeled, preserved, stored, and shipped in compliance with SOP F-8.

6.0 REFERENCES

6.1 USACE, 1994 TERC Scope of Services for Remedial Investigation. Feasibility Study, K.I. Sawyer AFB, Michigan, Contract No. DACW45-94-D-0001, Appendix A3, General Geology Requirements, K.I. Sawyer AFB.

APPENDIX B

Well/Borehole Abandonment Form

EARTH TECH

A tyco INTERNATIONAL LTD. COMPANY

Well/Drillhole/Borehole Abandonmen

(1) GENERAL INFORMATION

Well/Drillhole/Borehole Location: FTC-28

County: Marinette

(If applicable) _____ Gov't Lot _____ Grid Number

Grid Location _____ ft. ☐ N. ☐ S., _____ ft. ☐ E. ☐ W.

Civil Town Name: Marinette

Street Address of Well: 2700 Industrial Parkway South

City, Village: Marinette

(2) FACILITY NAME

Original Well Owner (If Known): Ansul

Present Well Owner: Tyco Safety Products

Street or Route: 2700 Industrial Parkway South

City, State, Zip Code: Marinette Wi

Facility Well No. and/or Name (If Applicable): FTC-28

Reason for Abandonment: Soil Excavation

Date of Abandonment: 1/23/06

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On

(Date) October 2002

☒ Monitoring Well
☐ Water Well
☐ Drillhole
☐ Borehole

Construction Report Available? ☐ Yes ☒ No

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (Specify) _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth (ft.) 13 (From Ground Surface)

Casing diameter (in.) 2.0

Casing Depth (ft.) 13.0

Lower Drillhole Diameter (in.) NA

Was Well Annular Space Grouted? ☐ Yes ☒ No ☐ Unknown
If Yes, To What Depth? _____ Feet

(4) Depth to Water (Feet) 7.1

Pump & Piping Removed?	☐ Yes	☐ No	☒ Not Applicable
Liner(s) Removed?	☐ Yes	☐ No	☐ Not Applicable
Screen Removed?	☒ Yes	☐ No	☐ Not Applicable
Casing Left in Place?	☐ Yes	☒ No	

If No, Explain: Removed by Operations

Was Casing Cut Off Below Surface?	☐ Yes	☒ No
Did Sealing Material Rise to Surface?	☐ Yes	☒ No
Did Material Settle After 24 Hours?	☐ Yes	☒ No
If Yes, Was Hole Retopped?	☐ Yes	☐ No

(5) Required Method of Placing Sealing Material

☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Dump Bailer ☒ Other (Explain)

Well removed by backhoe

(6) Sealing Materials

☐ Neat Cement Grout
☐ Sand-Cement (Concrete) Grout
☐ Concrete
☐ Clay-Sand Slurry
☐ Bentonite-Sand Slurry
☐ Chipped Bentonite

For monitoring wells and monitoring well boreholes only

☐ Bentonite Pellets
☐ Granular Bentonite
☐ Bentonite - Cement Grout

(7) Material Used to Fill Well/Drillhole	From (Ft.)	To (Ft.)	No. of Yards, Sacks Sealant, or Volume (Circle One)	Mix Ratio or Mud Weight
Well removed during excavation operations	Surface	13	—	—

(8) Comments: _____

(9) Name of Person or Firm Doing Sealing Work: Pat McCoy

Signature of Person Doing Work: Pat McCoy

Date Signed: 1/23/06

Street or Route: N6128 Nelson Vue

Telephone Number: (920) 912-0548

City, State, Zip Code: Plymouth, Wi

APPENDIX C

Landfill Tonnage Summary

EarthTech
A tyco International Ltd. Company

FIRE TECHNOLOGY CENTER
TYCO SAFETY PRODUCTS-ANSUL FACILITY
MARINETTE, WISCONSIN

FTC Upgrade Project - Landfill Tonnage

Date	Ticket #	Material	Tons
1/18/2006	10502	Contaminated Soil	17.23
1/18/2006	10503	Contaminated Soil	15.51
1/18/2006	10504	Contaminated Soil	16.92
1/18/2006	10505	Contaminated Soil	19.87
1/18/2006	10506	Contaminated Soil	19.97
1/18/2006	10507	Contaminated Soil	19.43
1/18/2006	10508	Contaminated Soil	18.37
1/18/2006	10509	Contaminated Soil	19.18
1/18/2006	10510	Contaminated Soil	18.75
1/18/2006	10511	Contaminated Soil	18.11
1/18/2006	10515	Contaminated Soil	21.52
1/18/2006	10516	Contaminated Soil	20.96
1/18/2006	10517	Contaminated Soil	18.85
1/18/2006	10518	Contaminated Soil	20.73
1/18/2006	10519	Contaminated Soil	20.31
1/18/2006	10520	Contaminated Soil	21.85
1/18/2006	10521	Contaminated Soil	18.55
		Sub-Total:	326.11
1/19/2006	10522	Contaminated Soil	19.85
1/19/2006	10523	Contaminated Soil	16.87
1/19/2006	10524	Contaminated Soil	17.84
1/19/2006	10525	Contaminated Soil	19.50
1/19/2006	10526	Contaminated Soil	20.37
1/19/2006	10527	Contaminated Soil	19.37
1/19/2006	10528	Contaminated Soil	18.53
1/19/2006	10529	Contaminated Soil	21.38
1/19/2006	10530	Contaminated Soil	18.89
1/19/2006	10531	Contaminated Soil	19.26
1/19/2006	10532	Contaminated Soil	20.60
1/19/2006	10533	Contaminated Soil	20.05
1/19/2006	10534	Contaminated Soil	20.97
1/19/2006	10535	Contaminated Soil	19.14
1/19/2006	10536	Contaminated Soil	22.22
1/19/2006	10537	Contaminated Soil	19.39
1/19/2006	10538	Contaminated Soil	23.28
1/19/2006	10539	Contaminated Soil	20.35
1/19/2006	10540	Contaminated Soil	23.05
1/19/2006	10541	Contaminated Soil	21.89
1/19/2006	10542	Contaminated Soil	20.90
1/19/2006	10543	Contaminated Soil	23.83
1/19/2006	10544	Contaminated Soil	19.99
1/19/2006	10545	Contaminated Soil	22.22
1/19/2006	10546	Contaminated Soil	21.82
1/19/2006	10547	Contaminated Soil	22.65
1/19/2006	10548	Contaminated Soil	19.49
1/19/2006	10549	Contaminated Soil	19.47
1/19/2006	10550	Contaminated Soil	20.11
1/19/2006	10551	Contaminated Soil	22.13
1/19/2006	10552	Contaminated Soil	22.82
1/19/2006	10553	Contaminated Soil	22.13
		Sub-Total:	660.36

Date	Ticket #	Material	Tons
1/19/2006	10554	Contaminated Soil	18.98
1/19/2006	10555	Contaminated Soil	18.04
1/19/2006	10556	Contaminated Soil	19.25
1/19/2006	10557	Contaminated Soil	21.94
1/19/2006	10558	Contaminated Soil	18.11
1/19/2006	10559	Contaminated Soil	21.50
1/19/2006	10560	Contaminated Soil	19.89
1/19/2006	10562	Contaminated Soil	18.35
1/19/2006	10563	Contaminated Soil	23.55
1/19/2006	10564	Contaminated Soil	22.19
1/19/2006	10565	Contaminated Soil	22.26
		Sub-Total:	224.06
1/23/2006	10567	Contaminated Soil	18.79
1/23/2006	10568	Contaminated Soil	21.35
1/23/2006	10569	Contaminated Soil	21.57
1/23/2006	10570	Contaminated Soil	20.04
1/23/2006	10571	Contaminated Soil	19.37
1/23/2006	10573	Contaminated Soil	20.77
1/23/2006	10574	Contaminated Soil	18.76
1/23/2006	10575	Contaminated Soil	20.74
1/23/2006	10576	Contaminated Soil	21.83
1/23/2006	10577	Contaminated Soil	19.01
1/23/2006	10578	Contaminated Soil	18.71
1/23/2006	10579	Contaminated Soil	21.82
1/23/2006	10581	Contaminated Soil	21.04
1/23/2006	10582	Contaminated Soil	19.17
1/23/2006	10583	Contaminated Soil	20.72
1/23/2006	10584	Contaminated Soil	19.50
1/23/2006	10585	Contaminated Soil	18.51
1/23/2006	10586	Contaminated Soil	19.66
1/23/2006	10587	Contaminated Soil	21.76
1/23/2006	10588	Contaminated Soil	22.35
1/23/2006	10589	Contaminated Soil	22.44
1/23/2006	10590	Contaminated Soil	20.52
1/23/2006	10591	Contaminated Soil	18.35
1/23/2006	10592	Contaminated Soil	19.92
1/23/2006	10594	Contaminated Soil	20.42
1/23/2006	10595	Contaminated Soil	19.89
1/23/2006	10596	Contaminated Soil	20.96
1/23/2006	10597	Contaminated Soil	20.79
1/23/2006	10598	Contaminated Soil	19.89
1/23/2006	576472	Contaminated Soil	20.54
1/23/2006	576473	Contaminated Soil	20.78
1/23/2006	576474	Contaminated Soil	21.38
1/23/2006	576475	Contaminated Soil	19.91
1/23/2006	576476	Contaminated Soil	20.62
1/23/2006	576477	Contaminated Soil	20.23
1/23/2006	576478	Contaminated Soil	18.99
		Sub-Total:	731.10

FIRE TECHNOLOGY CENTER
TYCO SAFETY PRODUCTS-ANSUL FACILITY
MARINETTE, WISCONSIN

FTC Upgrade Project - Landfill Tonnage

Date	Ticket #	Material	Tons
6/28/2006	637967	Contaminated Soil	23.92
6/28/2006	637977	Contaminated Soil	20.96
6/28/2006	637953	Contaminated Soil	20.08
6/28/2006	637944	Contaminated Soil	21.00
6/28/2006	637928	Contaminated Soil	21.92
		Sub-Total:	107.88
6/29/2006	637991	Contaminated Soil	22.21
6/29/2006	638057	Contaminated Soil	18.02
6/29/2006	638056	Contaminated Soil	19.57
6/29/2006	638049	Contaminated Soil	14.69
6/29/2006	638047	Contaminated Soil	20.77
6/29/2006	638035	Contaminated Soil	16.76
6/29/2006	638034	Contaminated Soil	18.92
6/29/2006	638022	Contaminated Soil	21.47
6/29/2006	638013	Contaminated Soil	21.25
6/29/2006	638002	Contaminated Soil	19.55
		Sub-Total:	193.21
6/30/2006	638085	Contaminated Soil	24.81
6/30/2006	638063	Contaminated Soil	22.77
6/30/2006	638077	Contaminated Soil	22.35
		Sub-Total:	69.93
8/15/2006	641046	Contaminated Soil	25.53
		Sub-Total:	25.53
8/16/2006	641085	Contaminated Soil	33.02
8/16/2006	641099	Contaminated Soil	32.41
8/16/2006	641101	Contaminated Soil	23.95
8/16/2006	641108	Contaminated Soil	32.84
8/16/2006	641125	Contaminated Soil	33.90
8/16/2006	641073	Contaminated Soil	30.47
8/16/2006	641074	Contaminated Soil	25.43
8/16/2006	641105	Contaminated Soil	19.43
8/16/2006	641091	Contaminated Soil	17.79
8/16/2006	641082	Contaminated Soil	18.94
8/16/2006	641070	Contaminated Soil	15.73
8/16/2006	641069	Contaminated Soil	15.89
8/16/2006	641129	Contaminated Soil	20.38
8/16/2006	641114	Contaminated Soil	16.37
8/16/2006	641115	Contaminated Soil	23.63
8/16/2006	641086	Contaminated Soil	24.47
8/16/2006	641062	Contaminated Soil	23.92
8/16/2006	641060	Contaminated Soil	27.45
		Sub-Total:	436.02

Date	Ticket #	Material	Tons
8/17/2006	641145	Contaminated Soil	18.55
8/17/2006	641144	Contaminated Soil	30.48
8/17/2006	641152	Contaminated Soil	18.38
8/17/2006	641156	Contaminated Soil	22.85
8/17/2006	641155	Contaminated Soil	30.88
8/17/2006	641164	Contaminated Soil	16.34
8/17/2006	641170	Contaminated Soil	31.58
8/17/2006	6411?8	Contaminated Soil	18.09
8/17/2006	641184	Contaminated Soil	32.35
8/17/2006	641185	Contaminated Soil	23.74
8/17/2006	641171	Contaminated Soil	23.39
8/17/2006	641198	Contaminated Soil	31.74
8/17/2006	641199	Contaminated Soil	23.63
8/17/2006	641204	Contaminated Soil	14.84
8/17/2006	641187	Contaminated Soil	20.72
8/17/2006	641173	Contaminated Soil	21.48
8/17/2006	641158	Contaminated Soil	21.32
8/17/2006	641146	Contaminated Soil	21.79
8/17/2006	641140	Contaminated Soil	16.59
		Sub-Total:	438.74
		Total:	**3,212.94**
1/18/2006	10512	Concrete	17.48
1/18/2006	10513	Concrete	14.96
1/18/2006	10514	Concrete	15.95
1/23/2006	10572	Concrete	16.55
1/23/2006	10580	Concrete	14.73
1/23/2006	10593	Concrete	14.75
1/25/2006	576479	Concrete	11.65
		Total:	**106.07**

APPENDIX D

Soil Laboratory Analytical Report

EarthTech
A Tyco International Ltd. Company

MEMO

PRIVILEGED & CONFIDENTIAL

Date: April 23, 2007

To: Doug Graham, Project Manager

From: Lisa Smith, Environmental Chemist (CEAC)

Subject: **Data Quality Review**
January 2006 Demolition Sampling – Fire Technology Center
Ansul Facility - Marinette, Wisconsin

I have assessed the data packages submitted to Earth Tech, Inc. from Pace Analytical® of Green Bay for the Demolition Soil Sampling event. Table 1 summarizes the samples reviewed. The data packages submitted included summarized quality control results. The quality control parameters reviewed included the following, if applicable to the specific methodology:

Holding Time
Laboratory Blanks
Surrogate Recoveries
Matrix Spikes/Matrix Spike Duplicates
Laboratory Control Samples
Quantitation Limits

The following sections of this technical memorandum provide a critical review of laboratory results. Quality assurance reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most-experienced and capable laboratories.

1.0 Soil Samples

Soil samples, as summarized in Table 1, were analyzed volatile organic compounds (VOCs) by Method SW-846 8260B and polycyclic aromatic hydrocarbons (PAHs) by Method SW-846 8270C-SIM (Selective Ion Monitoring).

1.1 Data Package Completeness

Pace provided analytical data packages that included summary quality control data. The data packages were initially reviewed to determine if all analyses requested were received, that all components of a Level 1 package were included, and that sufficient quality control samples were analyzed to meet project QA/QC requirements. The data packages included all requested analyses and chain-of-custody documentation.

1.2 Sample Receipt

Samples were received at the laboratory in good condition and on ice.

1.3 Holding Times

Samples were analyzed within the required holding times.

1.4 Laboratory Blanks

Laboratory blanks are analyzed to assess contamination from the laboratory procedures. Laboratory blanks were analyzed at the correct frequency. 1-Methylnaphthylene was detected in the method blank for batch 9049 at a concentration between the limit of detection (LOD) and the limit of quantitation (LOQ) at 3.77 J µg/kg. The 1-methylnaphthalene results for samples *CS-6 3' BGS* and *CS-6 3' BGS* were within five times the method blank concentration and may be considered false positives due to laboratory contamination.

1.5 Surrogates

Surrogates are spiked into all field samples, field QC samples, and method QC samples and are used to evaluate accuracy and extraction efficiency. The surrogates are organic compounds similar to the target compounds in chemical composition and behavior in the extraction and analytical process, but are not usually found in environmental samples. For PAH analysis, surrogates are added during sample preparation and undergo dilution if the samples require dilution. These dilutions also resulted in the surrogates being diluted out. Surrogates that were diluted out during PAH analysis were not used to asses data quality. VOC surrogates that were outside the laboratory established acceptance criteria are summarized in Table 2. The laboratory indicated the out-of-control surrogate recoveries were confirmed through re-analysis.

1.6 Laboratory Control Samples (LCSs)

LCSs are analyzed to monitor the accuracy of the analytical method independent of matrix effects. The LCS recoveries were within the laboratory specified QC limits.

1.7 Matrix Spike/Matrix Spike Duplicates (MS/MSDs)

MS/MSDs are analyzed to determine the effects of sample matrix on the measurement methodology. The laboratory analyzed four Ansul PAH samples as MS/MSDs (*CS-5 2 ½' BGS, CS-9 2 1/2 ' BGS, Area 2 S-8 4' BGS,* and *Area 3 S-1 4' BGS*). MS/MSD exceedances and the affects on samples results are summarized in Table 3. Only MS/MSDs performed on Ansul samples were used to assess data.

Methanol preserved MS/MSDs were not collected for VOC analysis. The affects of sample matrix on VOC data could not be determined.

1.8 PAH Resolution

The laboratory indicated that the PAHs benzo(b)fluoranthene and benzo(k)fluoranthene were separated in the check sample, but did not achieve resolution criteria identified in SW-846. Resolution problems for benzo(b)fluoranthene and benzo(k)fluoranthene are common and the sample results indicate that the laboratory was able to provide separate values for the isomers.

1.9 Limits of Detection (LODs) and Limits of Quantitation (LOQs)

The laboratory indicated that the detection limit for VOC sample *Area 4 S-2 3 1/2' BGS* may be elevated due to the presence of unrequested analytes. A 1,250 times dilution was performed on this sample due to high concentrations of aromatic hydrocarbons and the sample dilution was necessary to bring the concentrations within the calibration range of the instrument.

1.10 Field Duplicates

Field duplicates were not required per NR 716.13 (11) and were not collected.

2.0 OVERALL ASSESSMENT

Samples collected during the January 2006 sampling event were successfully analyzed and are acceptable for project use. Minor quality control exceedances were found. Two 1-methylnaphthene results are considered false positives due to possible laboratory contamination. VOC results for sample *CS-3 2' BGS* are considered to have a potential for low bias due to a low surrogate recovery. Positive VOC results for sample *CS-1 2' BGS* are considered to have a potential for high bias due to a high surrogate recovery. In addition, three PAH results are considered to have a potential for low bias due to low MS/MSD recoveries. Results were not rejected and the percent completeness was 100 percent.

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
SOIL SAMPLING
MARINETTE, WISCONSIN

Field Sample ID	Date Sampled	Laboratory ID	Analyses
CS-1 2' BGS	1/10/06	868279-001	VOCs, PAHs
CS-2 3' BGS	1/11/06	868279-002	VOCs, PAHs
CS-3 2' BGS	1/11/06	868279-003	VOCs, PAHs
CS-4 2' BGS	1/12/06	868279-004	VOCs, PAHs
CS-5 2 1/2' BGS	1/12/06	868279-005	VOCs, PAHs
CS-6 3' BGS	1/12/06	868279-006	VOCs, PAHs
CS-7 2 1/2' BGS	1/12/06	868279-007	VOCs, PAHs
CS-8 3' BGS	1/12/06	868279-008	VOCs, PAHs
CS-9 2 1/2' BGS	1/13/06	868279-009	VOCs, PAHs
CS-10 3' BGS	1/16/06	868455-001	VOCs, PAHs
CS-11 3' BGS	1/17/06	868455-002	VOCs, PAHs
AREA 1 S-1 3.5' BGS	1/18/06	868455-003	VOCs, PAHs
AREA 1 S-2 3.5' BGS	1/18/06	868455-004	VOCs, PAHs
AREA 1 S-3 3.5' BGS	1/18/06	868455-005	VOCs, PAHs
AREA 2 S-1 3.5' BGS	1/18/06	868455-006	VOCs, PAHs
AREA 2 S-2 3.5' BGS	1/18/06	868455-007	VOCs, PAHs
AREA 2 S-3 5' BGS	1/19/06	868455-008	VOCs, PAHs
AREA 2 S-4 4' BGS	1/19/06	868455-009	VOCs, PAHs
AREA 2 S-5 5' BGS	1/19/06	868455-010	VOCs, PAHs
AREA 2 S-6 4' BGS	1/19/06	868455-011	VOCs, PAHs
AREA 2 S-7 5' BGS	1/19/06	868455-012	VOCs, PAHs
AREA 2 S-8 4' BGS	1/19/06	868455-013	VOCs, PAHs
AREA 3 S-1 4' BGS	1/23/06	868575-001	VOCs, PAHs
AREA 3 S-2 3' BGS	1/23/06	868575-002	VOCs, PAHs
AREA 3 S-3 3 1/2' BGS	1/23/06	868575-003	VOCs, PAHs
AREA 3 S-4 4' BGS	1/23/06	868575-004	VOCs, PAHs
AREA 4 S-1 4' BGS	1/23/06	868575-005	VOCs, PAHs
AREA 4 S-2 3 1/2' BGS	1/23/06	868575-006	VOCs, PAHs

Notes:

VOCs - Volatile Organic Compounds.
PAHs - Polycyclic Aromatic Hydrocarbons.
Pace (Green Bay) performed the analyses.

TABLE 2

SURROGATE RECOVERY EXCEEDANCES
SOIL SAMPLING
MARINETTE, WISCONSIN

Field ID	Lab Sample Number	Fraction	Parameter	% Recovery	Acceptable Limits	Qualifications
CS-1 2' BGS	868279-001	VOCs	Toluene-d_8	187	64-133	Positive VOC results are considered to have a potential for high bias.
CS-3 2' BGS	868279-003	VOCs	Dibromofluoromethane	58	64-140	VOC results for sample *CS-2 2' BGS* are considered to have a potential for low bias

Notes:

VOCs - Volatile Organic Compounds.

TABLE 3

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) EXCEEDANCES
SOIL SAMPLING
MARINETTE, WISCONSIN

	Parameter	MS % Recov	MSD % Recov	Limits	RPD	RPD Limit	Results Qualified
Area 3 S-1 4'BGS	Naphthalene	**31**	**33**	40-130	2.8	30	The positive naphthalene result for sample *Area 3 S-1 4' BGS is considered to have a potetnial for low bias.*
CS-5 2 1/2' BGS	1-Methylnaphthylene	**30**	**10**	44-130	5.3	32	The positive 1-methylnaphthalene and acenaphthylene results for sample *CS-5 1/2' BGS* are considered to have a potential for low bias.
	Acenaphthylene	**19**	**20**	39-130	2.7	29	

Notes:

RPD - Relative Percent Difference.
Only MS/MSDs performed on Ansul samples were used to qualify results.
Bold indicates an exceedance.