# INTERIM REMEDIAL ACTION DOCUMENTATION AND SITE STATUS REPORT

***Klinke Cleaners – Fox Run***
***2346 West St. Paul Avenue***
***Waukesha, WI 53188***

**November 14, 2011**

Prepared By:

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**Project No. 05-529**

2681888910

November 14, 2011

Mr. Jim Delwiche
Wisconsin Department of Natural Resources
141 NW Barstow Street, Room 180
Waukesha, Wisconsin 53188

**RE: INTERIM REMEDIAL ACTION RESULTS**
**KLINKE CLEANERS FOX RUN**
**WAUKESHA, WI**
**BRRTS# 02-68-535535**

Dear Mr. Delwiche:

Saga Environmental and Engineering, Inc. (Saga) is pleased to provide one hard copy and one electronic copy of the Interim Remedial Action Documentation and Site Status Report for the above referenced property located in Waukesha, Wisconsin. The Report summarizes site investigation and soil interim remedial action activities conducted at the site in 2006 through 2011, and documents current site status with respect to soil and groundwater contaminant concentrations.

If you have any questions please contact the undersigned at (920) 674-3411.

Regards,

**Paula A. Richardson, P.G.**
Vice President/ Senior Hydrogeologist

cc: Mr. Richard Klinke, Klinke Cleaners

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# 1. BACKGROUND

## 1.1 SITE DESCRIPTION

The Klinke Cleaners Fox Run facility is located within the Fox Run Shopping Center at 2346 West St. Paul Avenue, near the intersection of St. Paul Avenue and Sunset Road in Waukesha, WI (Figure 1). The surrounding area is mixed-use commercial and industrial.

The strip mall building the Klinke Cleaners facility is located in was constructed in the late 1970s. The current Klinke Cleaners facility at 2346 W. St. Paul Ave. was originally operated as a dry cleaning facility by Fabricare of Waukesha, and drycleaning operations began around the time the building was constructed. Klinke Cleaners purchased the existing dry cleaning operation at that location on October 1, 2000. Klinke Cleaners discontinued use of tetrachloroethene (PCE) at the facility shortly thereafter, in 2002.

## 1.2 PREVIOUS INVESTIGATIONS

Background information on the site, site history, investigation history, interim remedial action measures (IRAMs), geologic and hydrogeologic setting, and current understanding of contaminant sources, release mechanisms, and nature extent of site contamination has already been presented in multiple previous reports that will not be repeated in detail here. However, for clarity, a summary of this information is presented below.

### *1.2.1 2004-2005 Drake Environmental Phase II Investigation*

In September 2004, Drake Environmental, Inc. (Drake) conducted a limited Phase II Site Investigation on behalf of the owner of the strip mall property (Richter Realty & Investment, Inc. (Richter)), which included completion and sampling of four Geoprobe soil borings (P-1 through P-4) and installation and sampling of four temporary groundwater monitoring wells (TW-1 through TW-4).

Drake's field evaluation indicated that soils at the site generally consisted of brown to gray sand and silt. Soil samples collected from soil borings P-1, P-2 and P-3 also exhibited noticeable solvent odors. Wet soils were observed from approximately 8.5 to 16 feet below ground surface (bgs). Soil and groundwater results of the investigation indicated that a release of dry cleaning solvents (PCE) had occurred at the property, and the Wisconsin Department of Natural Resources (WDNR) was notified of the contamination on October 29, 2004.

Additional site investigation was conducted by Drake on behalf of Richter in February and March 2005. The March 2005 site investigation included advancement of six soil borings (MW-1 through MW-6), all of which were subsequently completed as Wisconsin Administrative Code (W.A.C.) Ch. NR 141-compliant groundwater monitoring wells (Figure 2). One soil sample was collected from each boring during drilling activities and one groundwater sample was collected from each well following well development. All soil and groundwater samples were submitted to a laboratory for analysis of volatile organic compounds (VOCs) by US EPA Method SW846 8260 B. Relevant figures showing Drake sampling locations are included in Appendix A.

Subsurface materials encountered by Drake during drilling generally consisted of medium to fine light brown silty sand and sand to depths of approximately 15 to 20 feet bgs, followed by gray clay.

Laboratory analytical results of the soil samples collected indicated that PCE concentrations were highest in the samples collected adjacent to the back door of the facility (P-1 and P-2), and directly to the east (MW-3; Appendix A). However, it should be noted that the "soil" samples collected during this investigation were saturated soil samples, and are therefore more representative of a mixture of soil and groundwater conditions, rather than soil conditions.

Groundwater was measured at approximately 10 feet bgs in shallow monitoring wells MW-2, MW-3, MW-5 and MW-6 (screened from approximately 3 to 18 feet bgs). Groundwater was measured in deeper monitoring wells MW-1 and MW-4 (screened from approximately 15 to 30 feet bgs) at approximately 23 feet bgs, indicating perched groundwater conditions may be present at the locations of monitoring wells MW-2, MW-3, MW-5 and MW-6. Groundwater PCE concentration distribution was similar to observed soil PCE concentration distribution, with the highest concentrations observed beneath the building and adjacent to the back door.

### *1.2.2 2005-2010 RSV Engineering, Inc. Investigation*

In April 2005, RSV Engineering, Inc. (RSV) was contracted by Klinke Cleaners to perform additional site investigation at the Klinke Cleaners Fox Run facility. Between May 2005 and May 2007, RSV advanced 26 additional soil borings and collected and submitted an additional 28 soil samples for laboratory analysis of VOCs (Figure 3), to further define the extent and magnitude of elevated soil PCE concentrations behind the building. Four additional groundwater monitoring wells were also installed at the site by RSV in November 2005 (MW-3P), October 2008 (MW-7 and MW-8, on the Cooper Power facility property adjacent to the north), and September 2009 (MW-9, downgradient of MW-5), to further

evaluate the horizontal and vertical extent of groundwater PCE impacts at the site (Figure 2).

#### *1.2.2.1 Soil Results*

Soil analytical results indicated that soil PCE concentrations as high as 5,100 mg/kg were present in soil adjacent to the back door (B-5). However, concentrations of this magnitude were limited in extent to the immediate vicinity of the back door, with concentrations decreasing radially from that point to the north, east, and west. Soil PCE concentrations in samples collected along the northern property boundary were near or below laboratory detection limits for PCE in that area (Figure 3).

#### *1.2.2.2 Groundwater Results*

**Groundwater Flow**

During the RSV investigation, depth to water measured at site monitoring wells ranged from approximately 6.5 to 10 feet bgs in the shallow monitoring wells to 21 to 24 feet bgs in the deeper groundwater monitoring wells (Table 1).

Similar to previous investigation results, groundwater contours constructed from water table surface elevations indicated that shallow groundwater flowed to the east in the vicinity of monitoring wells MW-3 and MW-5, and to the northeast in the vicinity of monitoring well MW-2 (see selected RSV figures included in Appendix B). Data collected from the two monitoring wells installed on the Cooper Power property to the north indicated that there is also a southerly component of groundwater flow (Figures 2 and 4 in Appendix B). Specifically, groundwater appeared to flow radially from a high spot near monitoring well MW-8 to the southwest toward monitoring well MW-6 and to the southeast toward monitoring wells MW-3 and MW-5. The water table elevation at monitoring well MW-2 was generally slightly higher than the water table elevation at monitoring wells MW-5 or MW-6, indicating groundwater flows to the northeast in the general area of monitoring well MW-2.

Piezometric surface elevation contours were also constructed from water elevations in deep monitoring wells (MW-1, MW-3P and MW-4). Contours constructed by RSV for the January 2006 piezometric surface indicated that deeper groundwater flowed to the north and northwest across the site (Appendix B). Piezometric surface contours constructed by RSV from the November 2008 and April 2009 deep groundwater elevations appeared to indicate that flow had reversed at that time and flowed to the south (Appendix B).

**Groundwater Analytical Data**

Volatile organic compounds were not detected in the groundwater samples collected from monitoring wells MW-7 or MW-8 installed on the adjacent property to the north (Table 2). Additionally, analytical results of the groundwater samples collected in November 2008 from monitoring wells previously sampled suggested that VOC concentrations in shallow and deep groundwater were stable at the site. PCE concentrations in samples collected from monitoring well MW-5 continued to be the highest at the site (Table 2).

Based on groundwater flow patterns documented at the site in 2008, groundwater appeared to flow to the east near monitoring well MW-5. As such, no monitoring well was present downgradient of MW-5 in November 2008. Additionally, as the area is a major utility corridor, and was considered a potential preferential pathway for groundwater flow, RSV recommended that a water table monitoring well be installed downgradient (east) of monitoring well MW-5.

Monitoring well MW-9 was installed downgradient of monitoring well MW-5 in September 2009. No VOCs were detected at this location. Based on the groundwater analytical results of samples collected from monitoring well MW-9, installed directly downgradient of monitoring well MW-5 and along the utility corridor, it did not appear that the utility corridor was acting as a preferential pathway for contaminant transport in this direction. In addition, the horizontal extent of groundwater PCE concentrations exceeding the ES had been defined in the downgradient direction at that time.

PCE concentrations in site piezometers were below the NR 140 enforcement standard (ES) in November 2008. However, concentrations of PCE were approximately 3 orders of magnitude higher in monitoring well MW-5 than monitoring well MW-3, and the potentiometric surface elevation difference between the piezometer and water table well in the MW-3 nest suggested there was a strong downward gradient in the area of these wells. Consequently, RSV recommended that an additional piezometer be installed downgradient of monitoring well MW-5. However, as the downgradient extent of PCE concentrations in shallow groundwater exceeding the ES remained undefined at that time, RSV recommended that the location of the piezometer be selected following completion of additional shallow groundwater investigation activities, particularly with respect to the utility corridor's potential to act as a preferential pathway for groundwater flow.

*1.2.3 2010-2011 Saga Environmental and Engineering, Inc. Investigation*

Based on the analytical results of groundwater samples collected from monitoring well MW-9 in September 2009 and November 2010, Saga Environmental and Engineering, Inc. (Saga) installed a piezometer adjacent to monitoring well MW-5 in March 2011 (P-5). An 8-inch

diameter steel casing was installed approximately 3 feet into the clay till during well installation, grouted and allowed to cure overnight, then drilled through the following day, to prevent drag-down of contamination from shallow materials into the deeper clay zone. A soil boring log, well construction form and well development form for piezometer P-5 are included in Appendix C.

## 2. SUMMARY OF INTERIM REMEDIAL ACTIONS (IRAM)

Based on the perceived proximity of groundwater contamination at the site to a nearby City of Waukesha water supply well (located near the driveway into the Fox Run Shopping Centre off of Sunset Drive), the WDNR required interim remedial action measures (IRAM) be conducted to mitigate potential risk to this receptor. IRAM activities were planned as a two-pronged approach: Excavation with off-site disposal for the soils adjacent to the building to the north, and chemical reagent injection for impacted soils beneath the building. Excavation and chem.-ox injection were generally completed as outlined in RSV's April 8, 2009 Interim Action Plan. The area in which PCE concentrations were above 1 mg/kg were generally targeted for remediation (Figure 3). However, due to the presence of numerous utilities, a transformer and trees in the grassed area of soil with concentrations exceeding 1 mg/kg, that area was planned to remain in place.

The excavation was planned to extend to approximately 8 feet bgs, or to the approximate depth of the water table. Saturated soils were not planned to be removed, nor would dewatering of the excavation occur.

### 2.1 Hazardous Waste Determination

Prior to excavation activities commencing, RSV completed a WDNR Remediation Site Hazardous Waste Determination and requested a "contained-out" determination be made for the disposal of the PCE-impacted soil, in accordance with the US EPA Soil Screening Guidance. RSV proposed that soil containing PCE or trichloroethene (TCE), which would otherwise be considered a "listed" hazardous waste under Wisconsin and US EPA regulations, be considered a non-hazardous waste for disposal and management purposes. The condition would apply when soil PCE concentrations were less than 35 mg/kg and TCE concentrations were less than 7.15 mg/kg. Concentrations were based on site-specific screening levels calculated for the industrial site direct contact pathway using the US EPA Soil Screening Guidance.

The waste determination was approved by the WDNR on May 21, 2009. However, although the "contained-out" determination made by the WDNR applied to PCE concentrations less than 35 mg/kg, the receiving landfill (Waste Management's Metro refuse disposal facility (RDF)) determined that it would not accept soil with concentrations exceeding 14 mg/kg PCE as non-hazardous. Therefore, although the entire area behind the building outlined on

Figure 3 was planned for excavation, the decision was made to leave the area surrounding the location of soil boring B-5 in place, to be treated during the chemical oxidant injection.

### 2.2 Excavation

Excavation activities were completed May 27th through June 2nd, 2009. During excavation activities, a sanitary sewer line was uncovered that runs parallel to the rear of the building, approximately three to four feet north of the building. Laterals were observed to run at angles from the building foundation to the sewer line, making excavation in this area extremely difficult (see photos in Appendix D). Based on the potential for significant damage to the sewer line, which was constructed of PVC pipe, the excavation team decided it would be best to leave the area surrounding the pipe unexcavated. In addition to multiple subsurface utilities, two groundwater monitoring wells were also present within the excavation area. Monitoring well MW-3 and piezometer MW-3P were abandoned during site excavation activities, due to the likelihood that their integrity would be compromised during excavation activities. The approximate extent of the actual excavation is illustrated on Figure 4.

Approximately 601 tons of PCE-impacted soil were removed from the site and transported by dump truck for disposal at Metro RDF. Waste disposal documentation is included in Appendix E.

Pursuant to WDNR guidelines, at the completion of the excavation work confirmation samples were collected at 25-foot intervals along the sidewalls of the excavation and one base sample was collected for every 100 square feet of excavation. Nine excavation wall samples (EW-101 through EW-109) and 22 excavation base samples (EB-101 through EB-122) were collected and analyzed for volatile organic compounds VOCs (Figure 4). Laboratory analytical reports are included in Appendix F.

Following completion of excavation activities, the excavation was backfilled with 651 tons of granular backfill, and repaved with asphalt to match the surrounding surface.

#### *2.2.1 Excavation Confirmation Soil Analytical Results*

Soil analytical results of excavation confirmation samples collected indicated that soil PCE concentrations in several locations remained above the preliminary remediation goal of 1 mg/kg. However, soil PCE concentrations did not exceed the calculated US EPA site-specific soil screening level (SSL) of 12.3 mg/kg in any of the excavation confirmation soil samples collected (Figure 4).

## 2.3 Chemical Oxidant (Cool-Ox™) Injections

RSV selected Deep Earth Technologies (DTI) to implement their patented Cool-Ox™ process at the site. Cool-Ox™ is an in-situ (and ex-situ) remediation technology that combines controlled chemical oxidation with accelerated biodegradation subsequent to the oxidation phase. The process is based upon using hydrogen peroxide as the generator of the oxidizing radicals. However, unlike the Fenton or Fenton-like processes that use liquid hydrogen peroxide, the Cool-Ox™ process generates hydrogen peroxide from solid peroxygens that are injected into the soil or groundwater in an aqueous suspension. Once in place, the peroxygens react with water to produce hydrogen peroxide.

According to DTI, the distinguishing feature of the Cool-Ox™ technology is that it does not require the injection of metal catalysts to activate the production of oxidizing radicals in the substrata; thus, the creation of heat is eliminated. Therefore, a very important characteristic of the Cool-Ox™ technology is that the chemical reaction is controllable.

Because most peroxygens are only sparingly soluble in aqueous solutions, their dissolution rate is quite slow. Therefore, once injected they would be expected to remain in the contaminated media for an extended period of time before they become soluble. This low solubility characteristic also would be expected to allow peroxygens to be hydraulically distributed by the injection equipment, thereby theoretically increasing the radius of influence of the injection point. This allegedly significantly increases the probability of the oxidizer contacting the contaminants. In addition, another distinguishing feature of the Cool-Ox™ process is that it does not require the introduction of iron salts to produce the radicals necessary for chemical oxidation. Therefore, the reagents are iron free.

The Cool-Ox™ formulations include compounds that activate the catalytic metals that are expected to be intrinsic in the soil matrix being treated and therefore eliminate the need to artificially introduce iron salts either into the oxidizing reagent or by sequential injections.

According to DTI, unlike the Fenton or Fenton-like reactions that require a low acidic pH, the optimum pH of the Cool-Ox™ process is slightly basic at pH 8. This characteristic would be beneficial when treating contaminants found in limestone or soils containing high concentrations of carbonates where a low pH would be buffered toward neutrality. In addition, chlorinated organic compounds generally exhibit organic acid characteristics, becoming increasing soluble in aqueous solutions as the pH is increased. As solubility increases, it would be expected that their susceptibility to oxidation would similarly increase.

A final desirable attribute is that the Cool-Ox™ reaction is purportedly self initiating, as the reaction starts when the oxidizer contacts organic contaminants. This ostensibly makes it unnecessary to catalytically "start" the reaction as is the case with persulfates.

### *2.3.1 Initial injection*

On June 2, 2009, DeepEarth Technology, Inc. (DTI) personnel mobilized to the site, staged the injection equipment and laid out the injection points (IPs) located outside of the building.

On June 3, 2009, DTI began injection activities outside of the building. DTI completed a total of twelve IPs (4 through 9 and 13 through 18, Appendix F) outside the building, then completed eight IPs (9, 10, 11, 13, 15, 18, 19 and 23) inside the building (Appendix F). All IPs were treated from land surface to approximately 10 feet bgs, with each point receiving 72 gallons of Cool-Ox™ reagent. The quantity of reagent utilized per point in this area was doubled, due to the high PCE concentrations previously documented in this area (adjacent to the back door).

During the injection of IP 9 inside of the building a large quantity of Cool-Ox™ reagent was observed to daylight near the back hallway door. Upon investigation, a 1-inch microwell was discovered behind several soap containers. The well was not sealed to the existing concrete surface and was secured with a 1-inch PVC slip cap. The well was approximately 13 feet deep, with soft sediment at the bottom, and it was not properly sealed or secured. RSV determined that the well's integrity was in question requested that DTI abandon it. DTI abandoned the well by filling it with grout from approximately 13 feet bgs to land surface and capping it with concrete.

On June 4, 2009, DTI returned to the outside of the building to complete the remaining six IPs (1, 2, 3, 10, 11, and 12) outside of the building. Each IP was treated from land surface to approximately 10 feet bgs with each point receiving 36 gallons of Cool-Ox™ reagent. DTI personnel returned to the site after closing to complete the treatment of the inside of the building. DTI completed 15 IPs (1 through 8, 12, 14, 16, 17, 20, 21 and 22) inside of the building. All IPs were treated from land surface to approximately 10 feet bgs. IPs 1, 3, 5, 7, 8, 16, 17 and 21 each received 72 gallons (double load) of Cool-Ox™ reagent. IPs 2, 4, 6, 12, 14, 20 and 22 each received 36 gallons of Cool-Ox™ reagent.

During the June 2009 injection event, a total of 2,484 gallons of Cool-Ox™ reagent was applied to the subsurface at the site in 41 injection point locations.

#### *2.3.1.1 September 2009 Post-Injection Soil Sampling Results*

Post-injection soil analytical results are summarized on Figure 4. Significant PCE concentration reductions were observed near the back door of the facility (CS-103), where concentrations decreased from 5,100 mg/kg pre-injection (B-5) to 34.2 mg/kg post-injection (CS-103). However, soil concentrations in all treatment areas remained above calculated US EPA SSLs of 12.3 mg/kg. One proposed explanation for the remaining high levels of PCE following injection was inadequate contact between reagent and source material, primarily due to daylighting and short-circuiting of reagent back to the surface. DTI personnel reported that, based on their project experience, daylighting is generally expected to decrease with additional injections, as subsurface material becomes more "crumbly" after treatment. In addition, calculations as to the reagent loading rate necessary to reduce PCE concentrations below screening levels may have underestimated the contaminant mass present in the subsurface. As very few source area soil samples had been collected prior to completion of the June 2009 chem.-ox injection event, this was likely a contributing factor.

To address soil concentrations remaining above USEPA SSLs, three additional smaller-scale injections were planned to be conducted, each about 3 months apart. The additional injections would use less reagent, pumped at a slower rate into the subsurface and be carried out over time to maximize contact time between reagent and contaminant mass in the soil.

### *2.3.2 Additional Injections*

The three additional injections were completed in November 2009, March 2010 and June 2010. DTI was again contracted to perform the injection work, which continued to utilize the Cool-Ox™ reagent technology, as previously implemented at the site in June 2009. As discussed above, the additional injection events were designed to maximize reagent contact with the substrate and minimize surface expression (daylighting) of the reagent. DTI's previous site experience had indicated that daylighting is lessened during injections subsequent to the initial injection event, as the physical properties of the soil are altered with the introduction of the reagent (soil becomes more "crumbly" or porous), which facilitates more efficient distribution of the reagent within the subsurface.

As expected, the occurrence of daylighting did decrease with each subsequent injection event completed at the Fox Run facility. A copy of the DTI Application Report, which details injection parameters, is included in Appendix G. A brief summary follows.

Injection points were spaced at 4-foot intervals, and approximately 32 gallons of chemical reagent were injected into each location during each injection event. Two injection intervals were used at each IP during each event. Sixteen gallons of reagent were injected into each

of the 2 and 4 feet bgs intervals at each location during the first injection event; the 6 and 8 feet bgs intervals during the second injection; and the 3 and 5 feet bgs intervals during the third injection event.

A total of approximately 2,784 gallons of Cool-Ox™ reagent was applied to the site during the three additional injection events.

#### *2.3.2.1 December 2010 Soil Sampling Results*

Post-injection soil confirmation samples collected in December 2010 were co-located with previous soil samples collected in September 2009 to the extent possible, to allow for more accurate comparison of pre and post second round of injection concentrations. Laboratory analytical results of soil samples collected in December 2010 indicated that the additional injections were not successful in destroying the contaminant mass in the unsaturated zone (Figure 5). Possible explanations include: 1) loading calculations by contractor did not account for enough contaminant mass in subsurface, 2) insufficient contact between reagent and contaminant achieved, and 3) natural subsurface conditions interfered with the reaction or consumed the oxidant mass reducing its availability to react with the target contaminants.

In addition, the mechanism by which the Cool-Ox™ reagent in particular operates may contribute to its observed ineffectiveness at the Klinke Cleaners Facility, based on site-specific circumstances. As discussed in Section 2.3 above, the reaction between the Cool-Ox™ reagent and contaminants in the subsurface is necessarily a multi-step process. First, solid peroxygens react with water in solution to produce hydrogen peroxide, and the rate of dissolution of peroxygens is slow. Then, the chemical breakdown of VOCs in the soil and groundwater occurs only after this released hydrogen peroxide comes into contact with organic contaminants in the subsurface. This extended oxidation process, coupled with the potential for subsurface materials to increase in permeability after the initial injection suggests that the efficacy of additional injections could potentially decrease, as there may not be sufficient time for the reactions to occur (dissolution of peroxygens, release of sufficient hydrogen peroxide, and adequate contact with VOCs) before the reagent moves through the target interval. However, although the circumstances outlined above would make treatment of the unsaturated zone challenging, the slow release of hydrogen peroxide on contact with water over time would be expected to have a positive long-term effect on groundwater VOC concentrations at the site, as discussed below.

## 3. CURRENT SITE CONDITIONS

### 3.1 Shallow Groundwater Conditions

Shallow groundwater flow continues to be generally to the east in the vicinity of monitoring wells MW-5 and MW-9, to the northeast in the vicinity of monitoring well MW-2, and to the south and east from monitoring well MW-8 (Figure 6). Analytical results of groundwater samples collected in March and June 2011 indicate that the horizontal and vertical extents and magnitude of groundwater impacts have generally been defined (with the exception of to the west of monitoring well MW-6) and are limited (Figure 7).

Comparison of PCE concentrations detected in groundwater samples collected from monitoring well MW-5 in November 2008 (before IRAM activities) and June 2011 indicate that there has been an approximately 78% reduction in PCE concentrations at that location. As significant unsaturated source removal and treatment at the site have been completed, groundwater PCE concentrations are expected to continue to decrease over time. In addition, as discussed in Section 2.3.2.1 above, the Cool-Ox™ reagent injected into the unsaturated zone at the site is expected to continue to react with dissolved contaminant mass, as well as contaminant mass sorbed to soil particles in the saturated zone, further decreasing groundwater PCE concentrations over time. Currently, only groundwater PCE concentrations in monitoring wells MW-5 and MW-6 remain above the NR 140 ES, and those concentrations are expected to continue to decrease over time.

### 3.2 Till Groundwater Conditions

Deeper groundwater flow maps created from March and June 2011 piezometric surface elevations suggest that groundwater in the clay till formation flowed to the northeast in March 2011 and to the southwest in June 2011 (Figures 8 and 9, respectively). Regional groundwater flow is expected to be to the east or southeast, toward the Fox River, located approximately 1000 feet east of the Klinke Cleaners Fox Run facility. Substantial seasonal fluctuation is not generally expected in a very low permeability formation, such as the Waukesha Till. The reason for this apparent fluctuation is unknown. However, as the till is generally not affected by the groundwater PCE plume related to the Klinke Cleaners facility (discussed below), more detailed investigation and evaluation of the apparent variability in groundwater head

(and associated groundwater flow) in the till formation has not been conducted.

Tetrachloroethene was detected in the groundwater sample collected from piezometer P-5 at 0.56 µg/L, slightly above the NR 140 Preventive Action Limit (PAL), in March 2011, but was not detected above a method detection limit of 0.45 µg/L in June 2011 (Table 2). PCE was also detected at concentrations between the PAL and the ES in the groundwater samples collected from deep monitoring well MW-1 in March 2011 and June 2011. PCE was not detected in the groundwater samples collected from deep monitoring well MW-4 in March or June 2011. No other VOCs were detected in groundwater samples collected from any of the deep monitoring wells in March 2011 or June 2011.

Current and historic groundwater monitoring results from site monitoring wells screened in the clay till formation indicate that the till has not been significantly impacted by a PCE release at the facility, and that the vertical extent of groundwater impacts has been defined. In addition, based on the expected low hydraulic transmissivity of the till formation, and the very low concentrations of PCE detected in samples collected from piezometer P-5 (adjacent to the highest area of shallow groundwater concentrations (MW-5)), it is not expected that groundwater PCE concentrations historically detected in piezometers MW-1 or MW-4 would be related to a historic release from the present Klinke Cleaners facility location.

# TABLES

**TABLE 1**
**KLINKE CLEANERS**
**FOX RUN SHOPPING CENTER**
**WAUKESHA, WISCONSIN**
**GROUNDWATER ELEVATIONS**

| Well Location | Date | Top of Casing Elevation (feet) | Depth to Water from TOC (feet ) | Water Table Elevation (feet) |
|---|---|---|---|---|
| **MW-1** | 1/12/2006 | 101.39 | 24.60 | 76.79 |
| | 11/3/2008 | | 24.48 | 76.91 |
| | 2/25/2009 | | 23.89 | 77.50 |
| | 4/28/2009 | | 22.05 | 79.34 |
| | 11/10/2010 | | 24.43 | 76.96 |
| | 3/31/2011 | | 22.50 | 78.89 |
| | 6/28/2011 | | 22.5 | 78.89 |
| **MW-2** | 1/12/2006 | 100.21 | 8.68 | 91.53 |
| | 11/3/2008 | | 8.84 | 91.37 |
| | 2/25/2009 | | 8.40 | 91.81 |
| | 4/28/2009 | | 7.57 | 92.64 |
| | 9/2/2009 | | 8.58 | 91.63 |
| | 11/10/2010 | | 9.00 | 91.21 |
| | 3/31/2011 | | 7.70 | 92.51 |
| | 6/28/2011 | | 8.02 | 92.19 |
| **MW-3** | 1/12/2006 | 99.66 | 8.16 | 91.50 |
| | 11/3/2008 | | 8.50 | 91.16 |
| | 2/25/2009 | | 8.38 | 91.28 |
| | 4/28/2009 | | 6.98 | 92.68 |
| | | | Abandoned | |
| **P-3** | 1/12/2006 | 100.44 | 32.03 | 68.41 |
| | 11/3/2008 | | 20.89 | 79.55 |
| | 2/25/2009 | | 20.44 | 80.00 |
| | 4/28/2009 | | 19.22 | 81.22 |
| | | | Abandoned | |
| **MW-4** | 1/12/2006 | 100.41 | 23.48 | 76.93 |
| | 11/3/2008 | | 23.43 | 76.98 |
| | 2/25/2009 | | 22.85 | 77.56 |
| | 4/28/2009 | | 21.11 | 79.3 |
| | 11/10/2010 | | 23.34 | 77.07 |
| | 3/31/2011 | | 21.35 | 79.06 |
| | 6/28/2011 | | 22.40 | 78.01 |

**TABLE 1**
**KLINKE CLEANERS**
**FOX RUN SHOPPING CENTER**
**WAUKESHA, WISCONSIN**
**GROUNDWATER ELEVATIONS**

| Well Location | Date | Top of Casing Elevation (feet) | Depth to Water from TOC (feet ) | Water Table Elevation (feet) |
|---|---|---|---|---|
| **MW-5** | 1/12/2006 | 99.78 | 9.20 | 90.58 |
| | 11/3/2008 | | 9.48 | 90.30 |
| | 2/25/2009 | | 9.63 | 90.15 |
| | 4/28/2009 | | 8.24 | 91.54 |
| | 9/2/2009 | | 8.93 | 90.85 |
| | 11/10/2010 | | 9.48 | 90.30 |
| | 3/31/2011 | | 9.39 | 90.39 |
| | 6/28/2011 | | 9.16 | 90.62 |
| **P-5** | 3/31/2011 | 99.62 | 20.79 | 78.83 |
| | 6/28/2011 | | 20.83 | 78.79 |
| **MW-6** | 1/12/2006 | 100.00 | 8.64 | 91.36 |
| | 11/3/2008 | | 8.80 | 91.20 |
| | 2/25/2009 | | 8.79 | 91.21 |
| | 4/28/2009 | | 8.17 | 91.83 |
| | 9/2/2009 | | 8.80 | 91.20 |
| | 11/10/2010 | | 8.90 | 91.10 |
| | 3/31/2011 | | 8.55 | 91.45 |
| | 6/28/2011 | | 8.62 | 91.38 |
| **MW-7** | 11/3/2008 | 99.04 | 8.32 | 90.72 |
| | 2/25/2009 | | 8.47 | 90.57 |
| | 4/28/2009 | | 7.15 | 91.89 |
| | 9/2/2009 | | 8.09 | 90.95 |
| | 11/10/2010 | | 8.44 | 90.6 |
| | 3/31/2011 | | 8.32 | 90.72 |
| | 6/28/2011 | | 8.16 | 90.88 |
| **MW-8** | 11/3/2008 | 99.83 | 8.05 | 91.78 |
| | 2/25/2009 | | 8.00 | 91.83 |
| | 4/28/2009 | | 6.61 | 93.22 |
| | 9/2/2009 | | 8.08 | 91.75 |
| | 11/10/2010 | | 8.16 | 91.67 |
| | 3/31/2011 | | 7.67 | 92.16 |
| | 6/28/2011 | | 7.82 | 92.01 |
| **MW-9** | 9/2/2009 | 99.51 | 10.00 | 89.51 |
| | 11/10/2010 | | 11.13 | 88.38 |
| | 3/31/2011 | | 10.69 | 88.82 |
| | 6/28/2011 | | 10.48 | 89.03 |

TOC : Top of casing.
bgs: Below ground surface.
[1] Elevations in feet, referenced to a local datum (top of MW-6 PVC casing).

**TABLE 2**
**GROUNDWATER ANALYTICAL SUMMARY**
**KLINKE CLEANERS - FOX RUN**
**WAUKESHA, WI**
**Concentrations in µg/L**

| Sample ID | Date | Volatile Organic Compounds (VOCs) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Chloroform | cis-1,2-Dichloroethene | Tetrachloroethene | Toluene | 1,1,1-Trichloroethane | Trichloroethene |
| Wisconsin Administrative Code NR 140 Groundwater Standards | | | | | | | |
| NR 140 PAL | | *0.6* | *7* | *0.5* | *160* | *40* | *0.5* |
| NR 140 ES | | **6** | **70** | **5** | **800** | **200** | **5** |
| NR 141 Monitoring Wells | | | | | | | |
| MW-1 | 3/2/2005 | <0.37 | <0.83 | *1.8* | 0.78 | <0.90 | <0.48 |
| | 1/12/2006 | <0.23 | <0.18 | *1.9* | 0.23 J | 0.26 J | <0.19 |
| | 11/3/2008 | <1.3 | <0.83 | *0.94 J* | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | *0.98 J* | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | *1.2* | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | *0.89 J* | <0.67 | <0.90 | <0.48 |
| MW-2 | 3/2/2005 | <0.37 | 2.8 | *0.99* | <0.67 | <0.90 | <0.48 |
| | 1/12/2006 | <0.23 | <0.18 | *0.70* | 0.43 J | <0.21 | <0.19 |
| | 11/3/2008 | <1.3 | <0.83 | *0.51 J* | <0.67 | <0.90 | <0.48 |
| | 9/2/2009 | <1.3 | <0.83 | *0.98 J* | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | *0.70 J* | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| MW-3 | 3/2/2005 | <180* | <420* | **64,000*** | <340* | <450* | <480* |
| | 1/12/2006 | <2.3 | 2.2 J | **130.0** | <2.1 | <2.1 | <1.9 |
| | 11/3/2008 | <1.3 | 12.7 | **81.4** | <0.67 | <0.90 | *1.2* |
| | | | | **Well Abandoned** | | | |
| MW-3P | 1/12/2006 | <0.23 | <0.18 | *3.7* | <0.21 | <0.21 | <0.19 |
| | 11/3/2008 | <1.3 | <0.83 | *4.8* | <0.67 | <0.90 | <0.48 |
| | | | | **Well Abandoned** | | | |
| MW-4 | 3/2/2005 | <0.37 | <0.83 | *1.3* | <0.67 | <0.90 | <0.48 |
| | 1/12/2006 | <0.23 | <0.18 | *1.4* | 0.25 J | <0.21 | <0.19 |
| | 11/3/2008 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| MW-5 | 3/2/2005 | <0.37* | <0.83* | **28*** | <0.67* | <0.90* | *0.69** |
| | 1/12/2006 | <1,200 | <900 | **57,000** | <1,000 | <1,000 | <930 |
| | 11/3/2008 | <260 | <166 | **55,600** | <134 | <180 | <96.0 |
| | 9/2/2009 | <325 | <208 | **24,100** | <168 | <225 | <120 |
| | 11/10/2010 | <325 | <208 | **18,500** | <168 | <225 | <120 |
| | 3/31/2011 | <130 | <83.0 | **11,100** | <67.0 | <90.0 | <48.0 |
| | 6/28/2011 | <162 | <104 | **12,500** | <83.8 | <112 | <60.0 |

**TABLE 2**
**GROUNDWATER ANALYTICAL SUMMARY**
**KLINKE CLEANERS - FOX RUN**
**WAUKESHA, WI**
**Concentrations in µg/L**

| Sample ID | Date | Volatile Organic Compounds (VOCs) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Chloroform | cis-1,2-Dichloroethene | Tetrachloroethene | Toluene | 1,1,1-Trichloroethane | Trichloroethene |
| Wisconsin Administrative Code NR 140 Groundwater Standards | | | | | | | |
| NR 140 PAL | | *0.6* | *7* | *0.5* | *160* | *40* | *0.5* |
| NR 140 ES | | **6** | **70** | **5** | **800** | **200** | **5** |
| NR 141 Monitoring Wells | | | | | | | |
| P-5 | 3/31/2011 | <1.3 | <0.83 | *0.56 J* | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| MW-6 | 3/2/2005 | 0.49 | <0.83 | *4.7* | <0.67 | <0.90 | <0.48 |
| | 1/12/2006 | *1.5* | <0.18 | **18** | 0.22 J | <0.21 | *0.55 J* |
| | 11/3/2008 | <1.3 | <0.83 | **18.8** | <0.67 | <0.90 | <0.48 |
| | 9/2/2009 | <1.3 | <0.83 | **19.1** | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | **26.9** | <0.67 | <0.90 | *0.55 J* |
| | 3/31/2011 | <1.3 | <0.83 | **28.2** | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | **24.0** | <0.67 | <0.90 | <0.48 |
| MW-7 | 11/3/2008 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 9/2/2009 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| MW-8 | 11/3/2008 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 9/2/2009 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| MW-9 | 9/2/2009 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 11/10/2010 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 3/31/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |
| | 6/28/2011 | <1.3 | <0.83 | <0.45 | <0.67 | <0.90 | <0.48 |

Notes:

**28** : Concentration exceeds NR 140 ES.
*4.7* : Concentration exceeds NR 140 PAL.
µg/L : Micrograms per liter.
PAL : Preventive Action Limit.
ES : Enforcement Standard.
<0.20 : Analyte not detected above limit of detection shown.
J : Laboratory flag - Analyte detected between limit of detection and limit of quantitation. Results qualified due to lack of certainty of results within this range.
* : It appears likely that samples for MW-3 and MW-5 were mislabled during the March 2, 2005 sampling event.

# FIGURES


**LEGEND**

Saga Environmental & Engineering, Inc.

0 175 350 700

Approximate Scale: 1"=350'

N

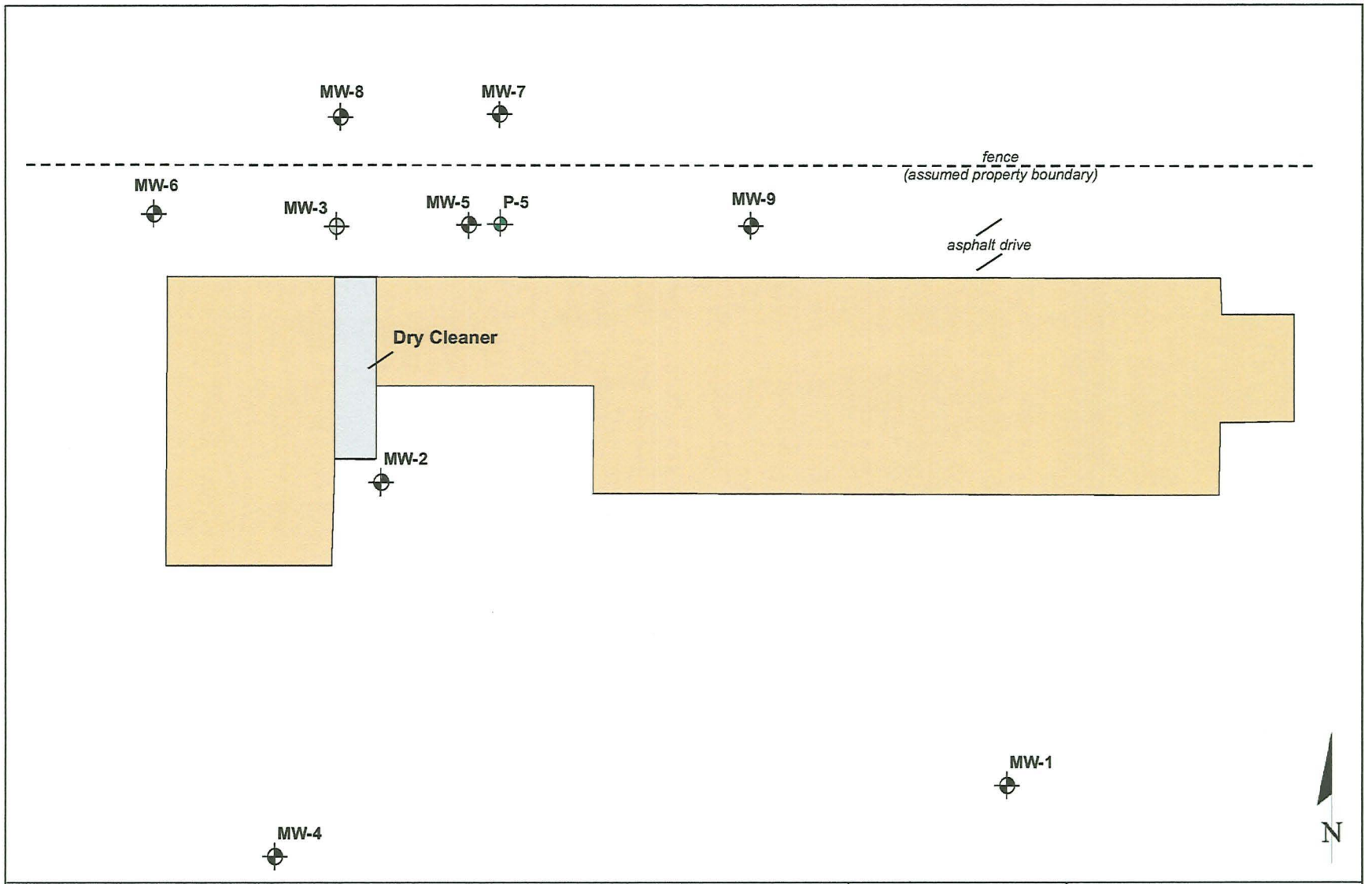
Base Map: Google Earth, 2011

# FIGURE 1

**Site Location**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin

Project No. 05-529 July 2011

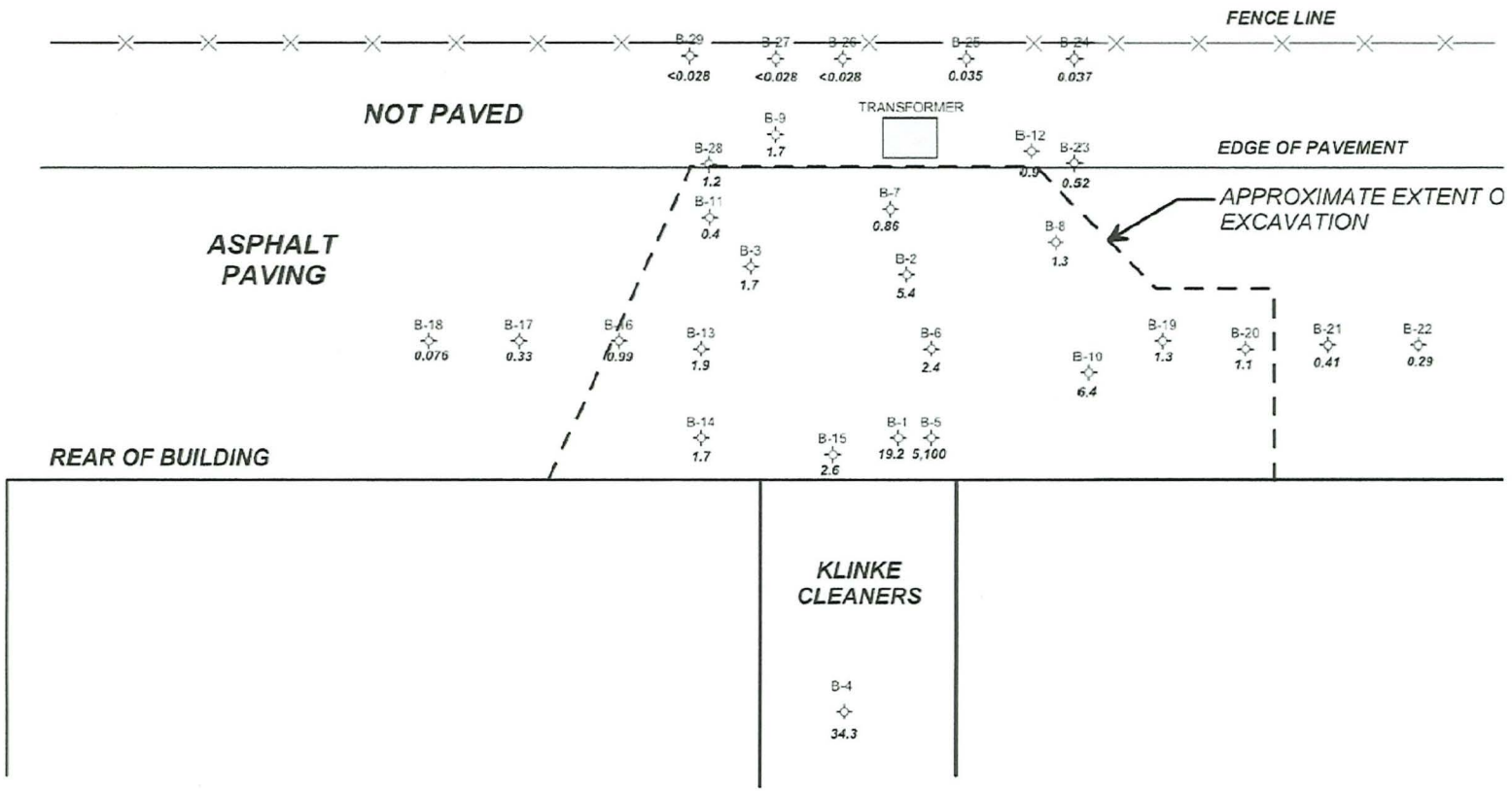



Project No: 05-529
Date: July 2011
Adapted By: GHT

# FIGURE 2

## Monitoring Well Locations

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin




**LEGEND**

Boring Location With PCE
*1.7* Concentration in mg/kg

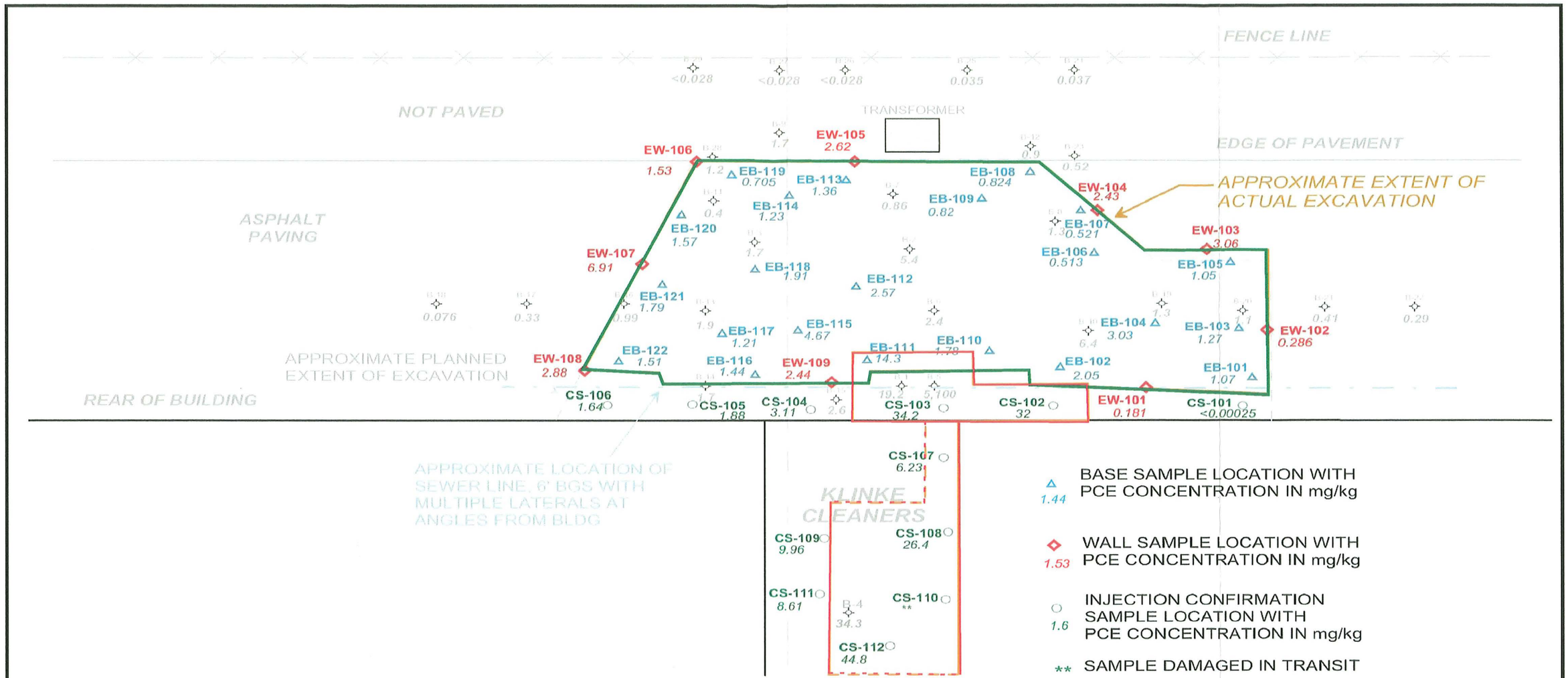
0 10 20 40
Approximate Scale (feet)

Project No: 05-529
Date: July 2011
Adapted By: GHT

# FIGURE 3

**Soil Analytical Summary - May 2008**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin

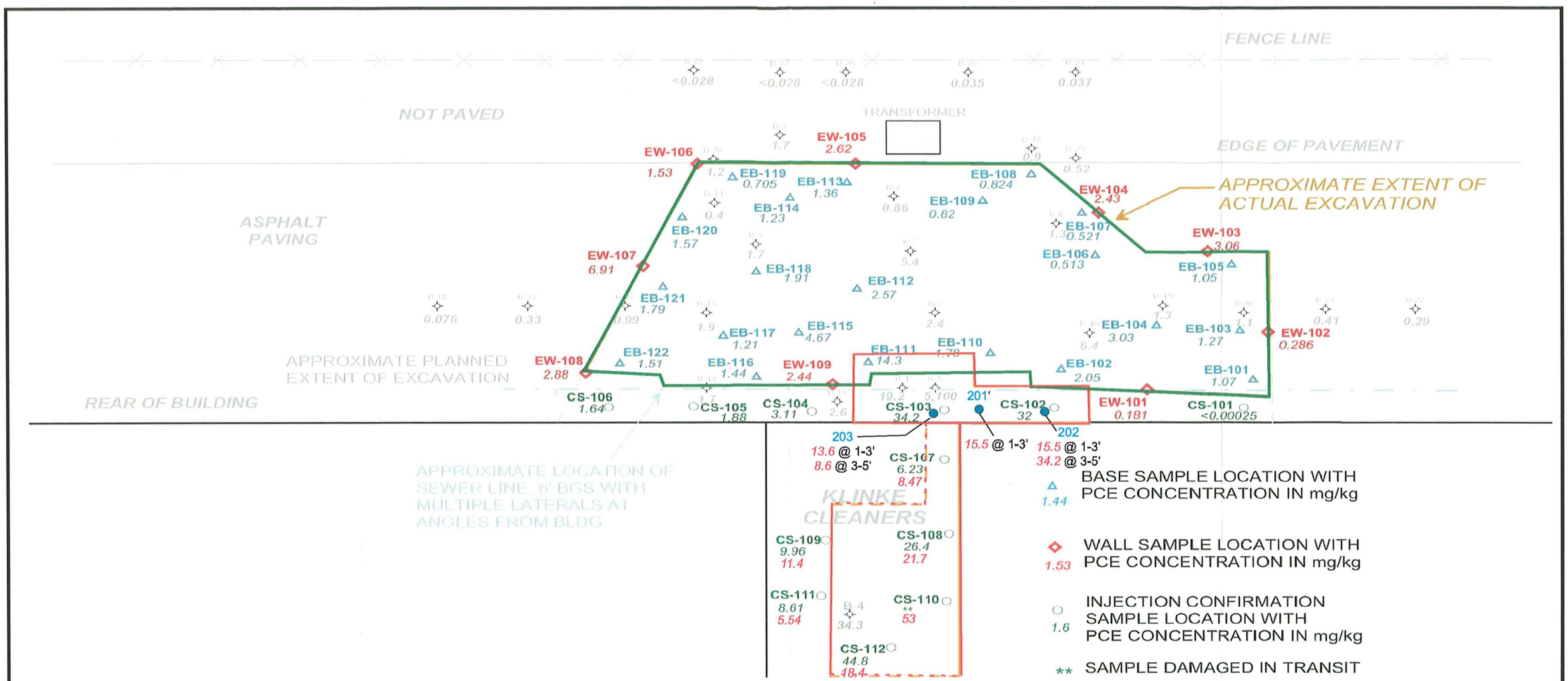



Saga Environmental & Engineering, Inc.

Project No: 05-529
Date: July 2011
Adapted By: GHT

**FIGURE 4**
**Soil Analytical Summary - September 2009**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin




BASE SAMPLE LOCATION WITH PCE CONCENTRATION IN mg/kg

1.53 WALL SAMPLE LOCATION WITH PCE CONCENTRATION IN mg/kg

1.6 INJECTION CONFIRMATION SAMPLE LOCATION WITH PCE CONCENTRATION IN mg/kg

** SAMPLE DAMAGED IN TRANSIT

1.7 PRE-REMEDIAL BORING LOCATION WITH PCE CONCENTRATION IN mg/kg

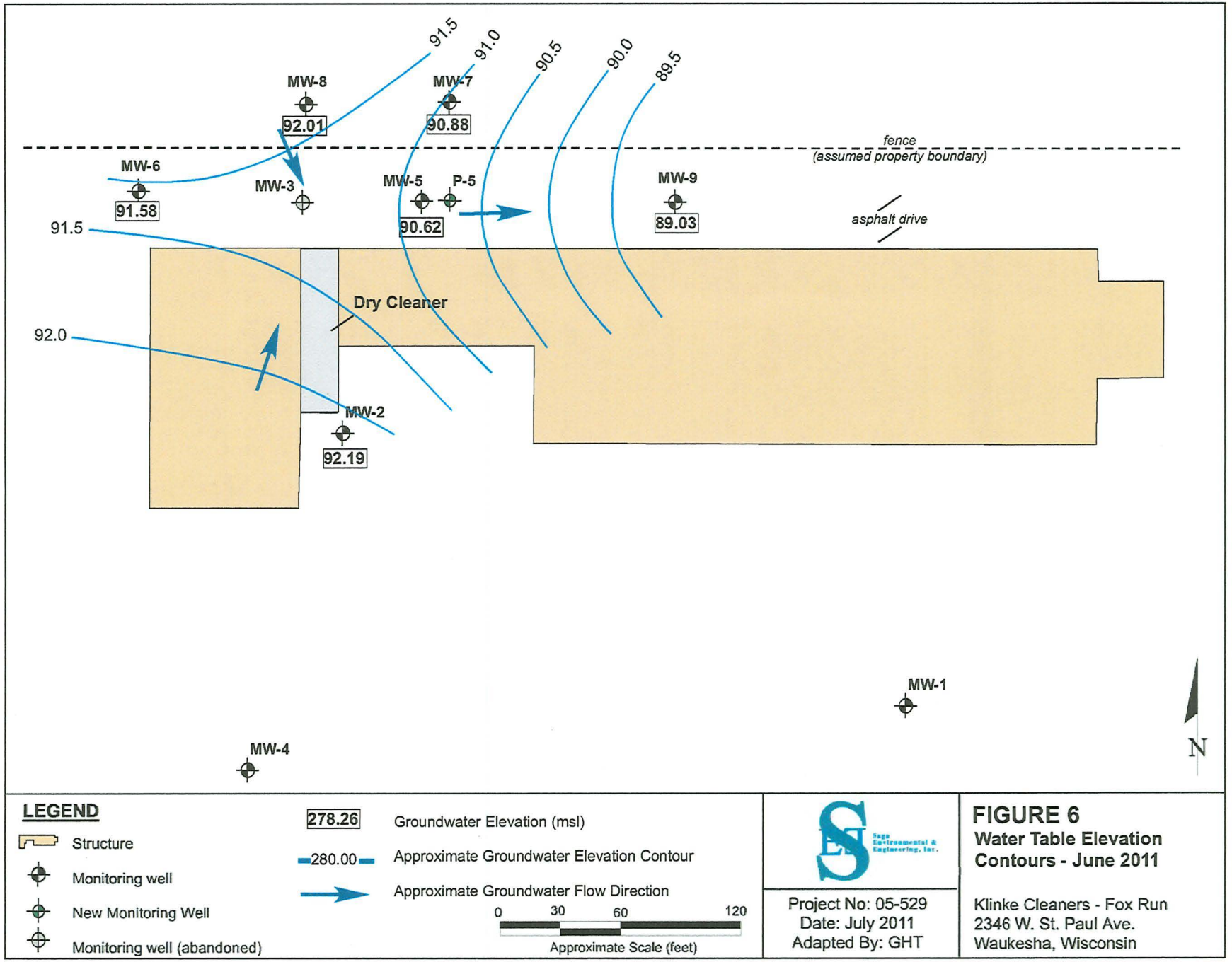
APPROXIMATE EXTENT OF SOIL PCE CONCENTRATIONS EXCEEDING USEPA SSL OF 12.3 mg/kg (DASHED WHERE LIMITS OF PRODUCTION AREAS INFERRED)

Sage Environmental & Engineering, Inc.

Project No: 05-529
Date: July 2011
Adapted By: GHT

**FIGURE 5**
**Soil Analytical Summary - December 2010**

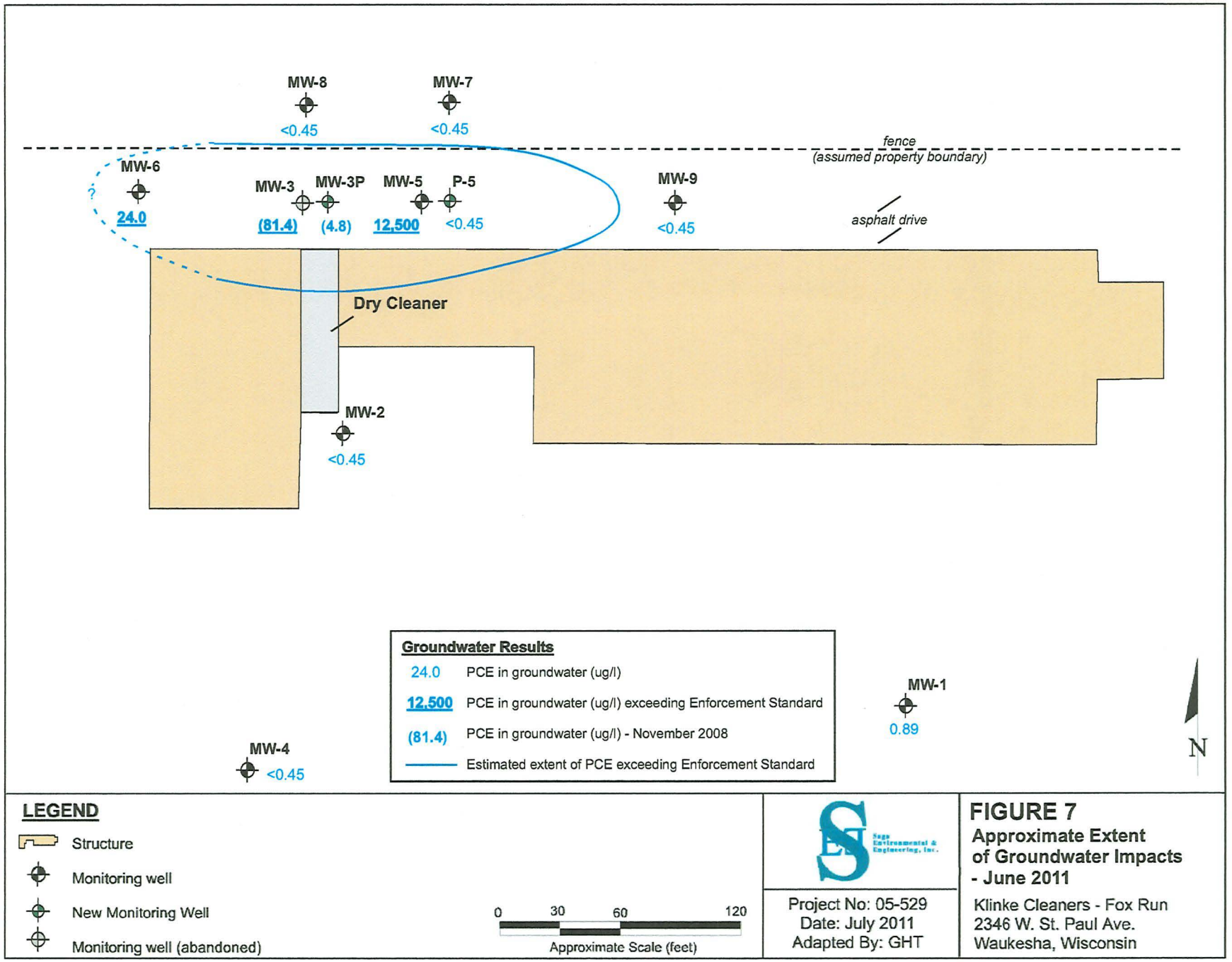
Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin




Project No: 05-529
Date: July 2011
Adapted By: GHT

**FIGURE 6**
**Water Table Elevation Contours - June 2011**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin

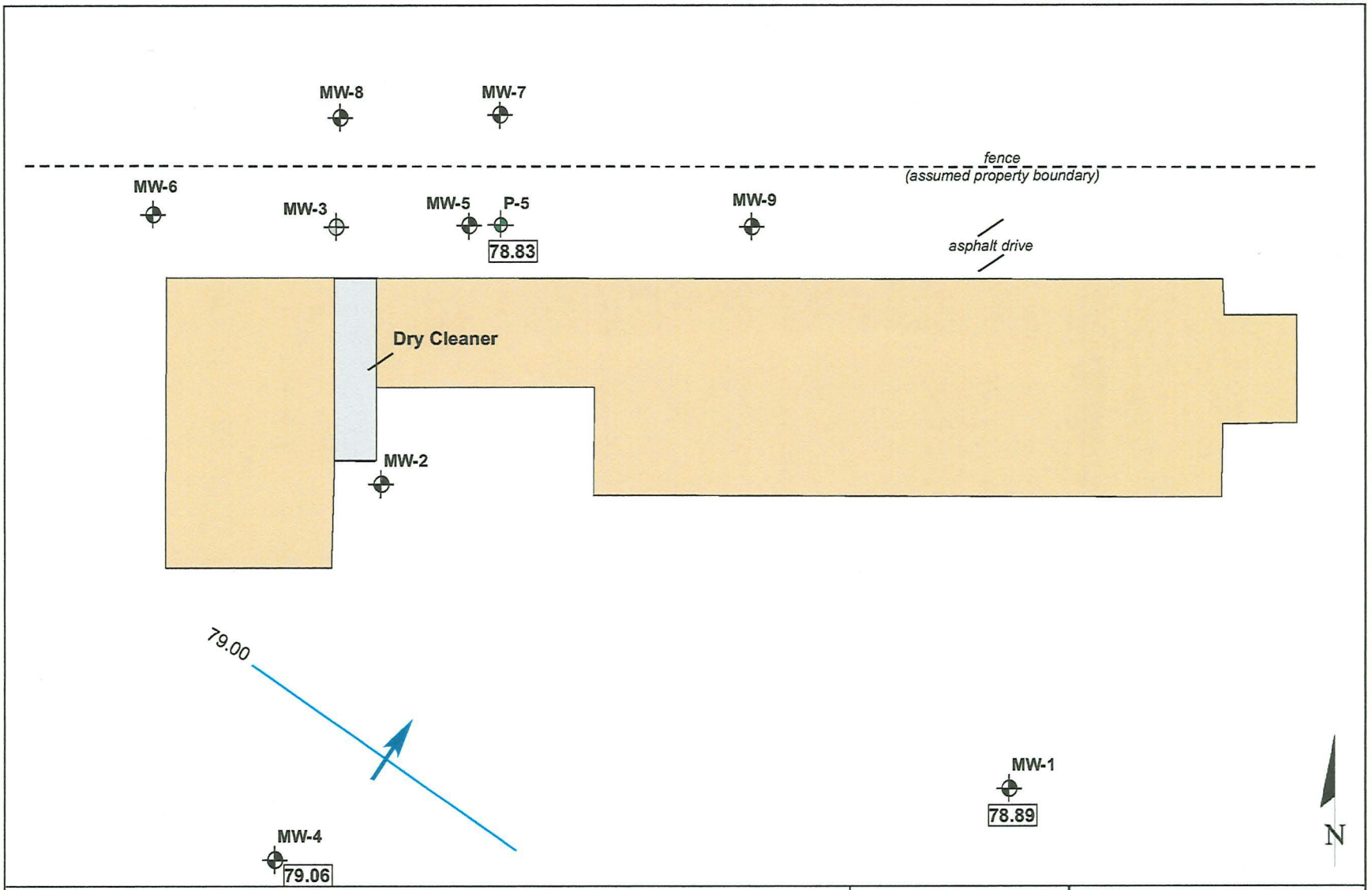



Project No: 05-529
Date: July 2011
Adapted By: GHT

# FIGURE 7

**Approximate Extent of Groundwater Impacts - June 2011**

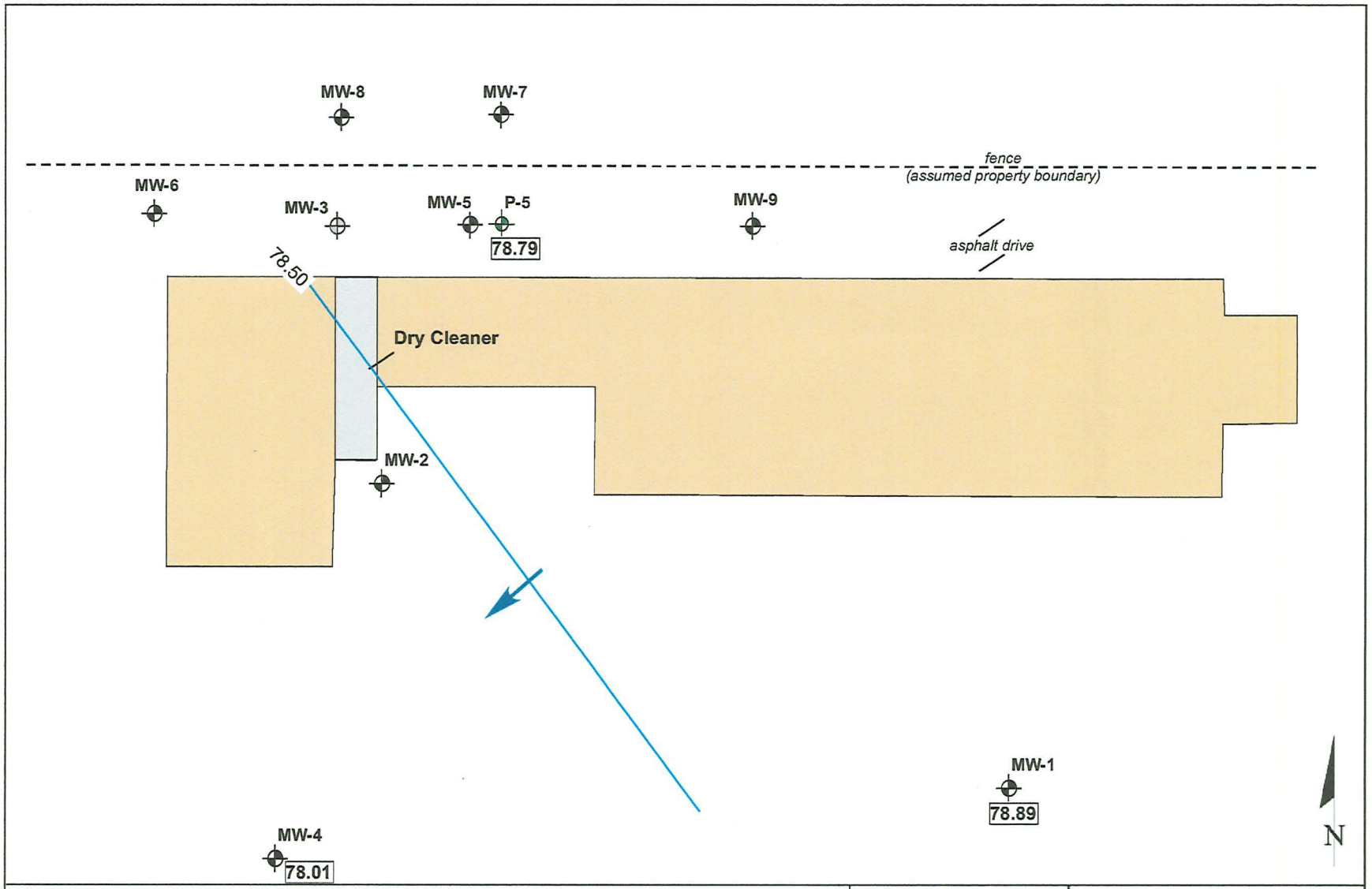
Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin




Project No: 05-529
Date: July 2011
Adapted By: GHT

# FIGURE 8
**Piezometric Surface Elevations: March 2011**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin



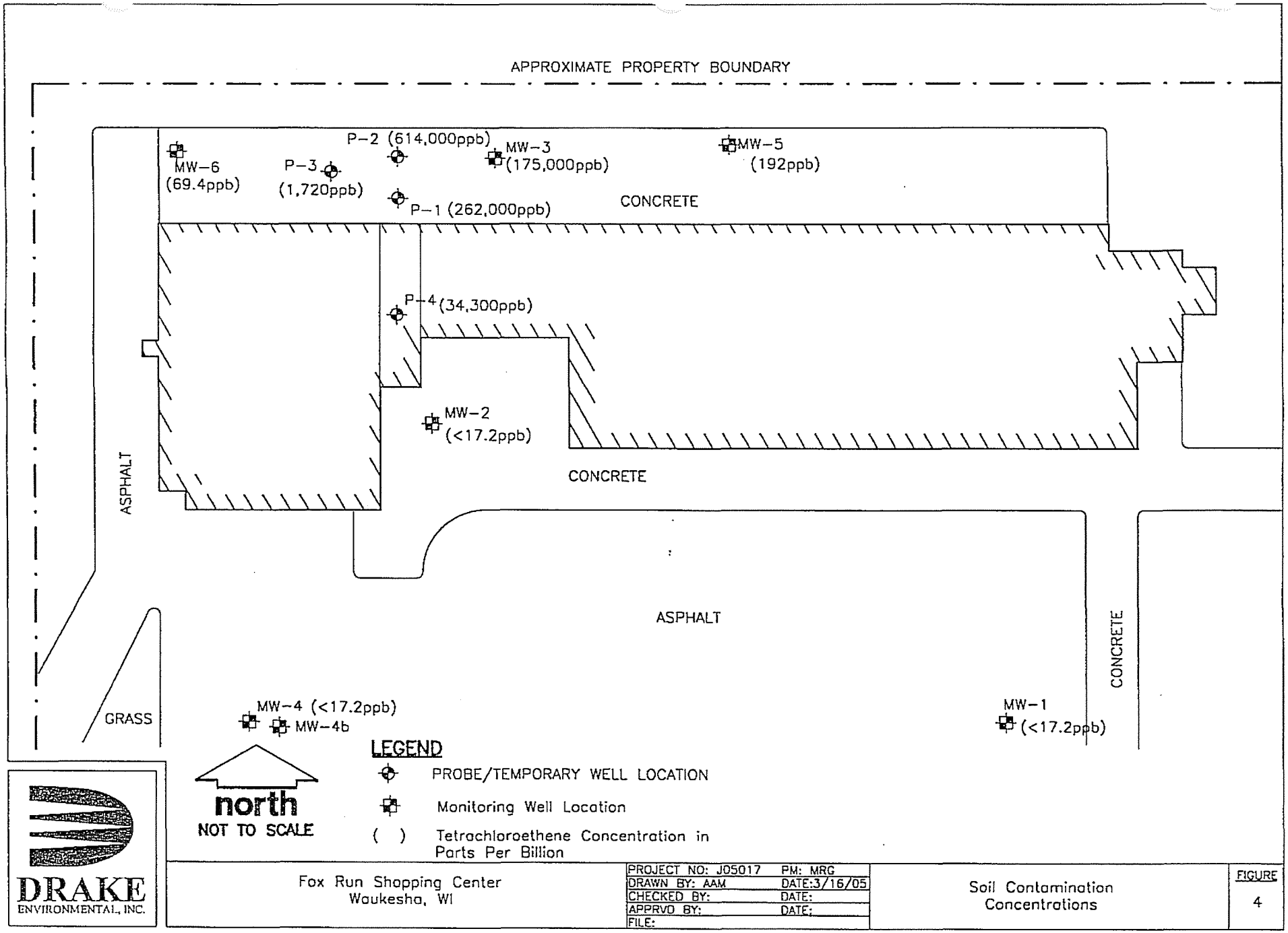

Project No: 05-529
Date: July 2011
Adapted By: GHT

**FIGURE 9**
**Piezometric Surface Elevations: June 2011**

Klinke Cleaners - Fox Run
2346 W. St. Paul Ave.
Waukesha, Wisconsin

# APPENDIX A

## Drake Environmental Report Excerpts



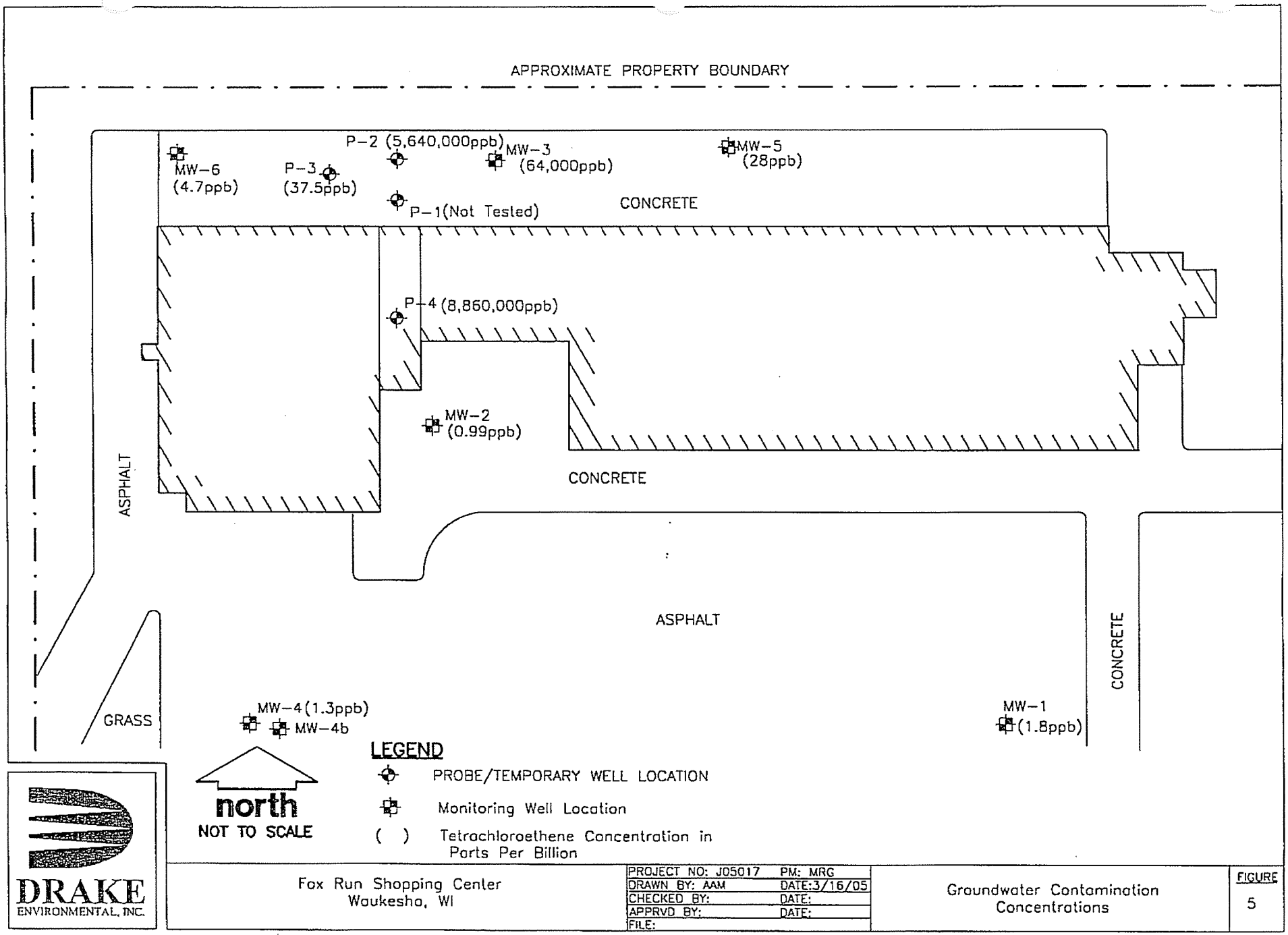

DRAKE ENVIRONMENTAL, INC.

Fox Run Shopping Center
Waukesha, WI

| | |
|---|---|
| PROJECT NO: J05017 | PM: MRG |
| DRAWN BY: AAM | DATE:3/16/05 |
| CHECKED BY: | DATE: |
| APPRVD BY: | DATE: |
| FILE: | |

Soil Contamination Concentrations

FIGURE 4




DRAKE
ENVIRONMENTAL, INC.

Fox Run Shopping Center
Waukesha, WI

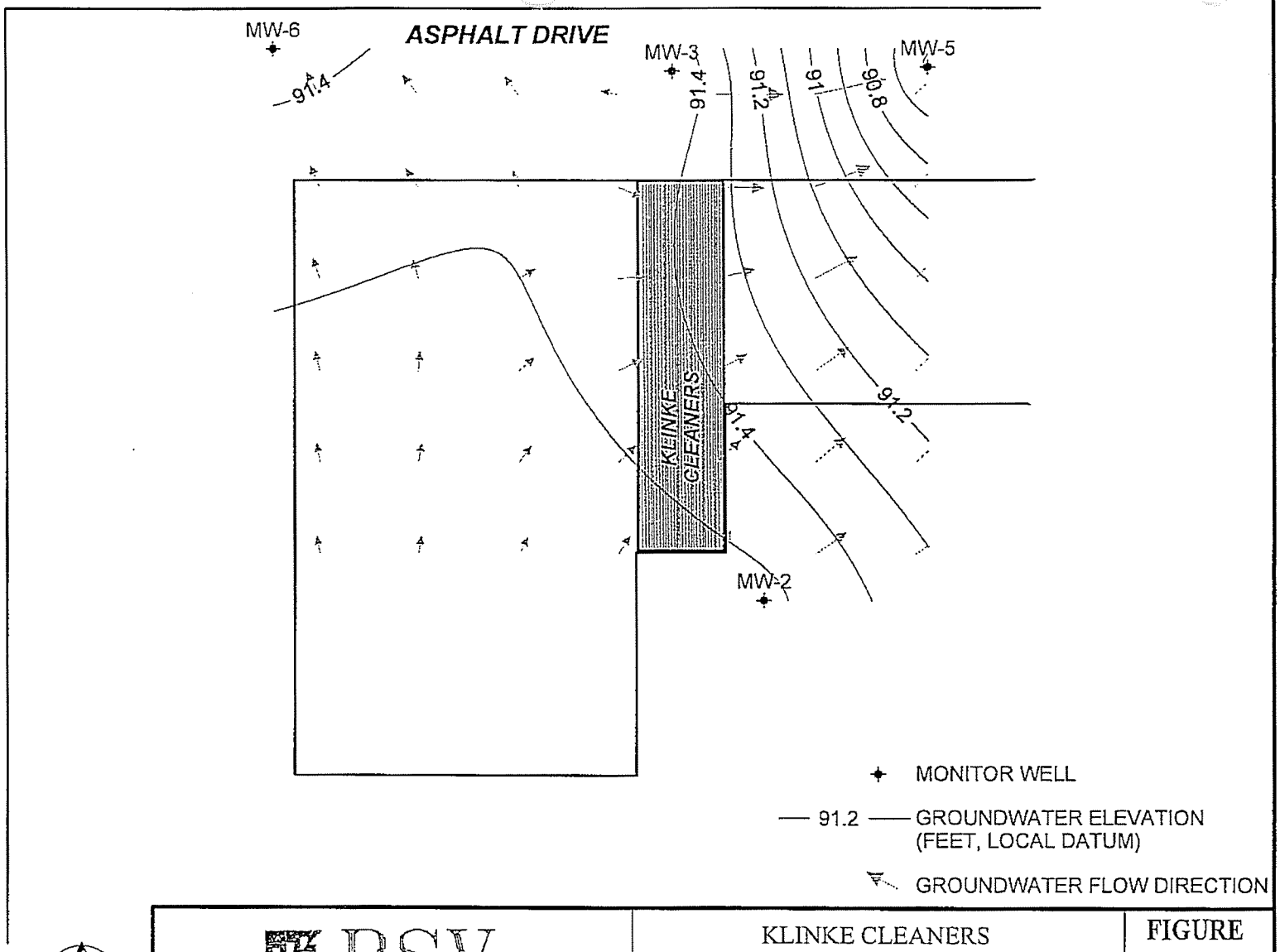
| | |
|---|---|
| PROJECT NO: J05017 | PM: MRG |
| DRAWN BY: AAM | DATE:3/16/05 |
| CHECKED BY: | DATE: |
| APPRVD BY: | DATE: |
| FILE: | |

Groundwater Contamination Concentrations

FIGURE 5

# APPENDIX B

## Selected RSV Engineering, Inc. Figures




SCALE IN FEET
0 20 40

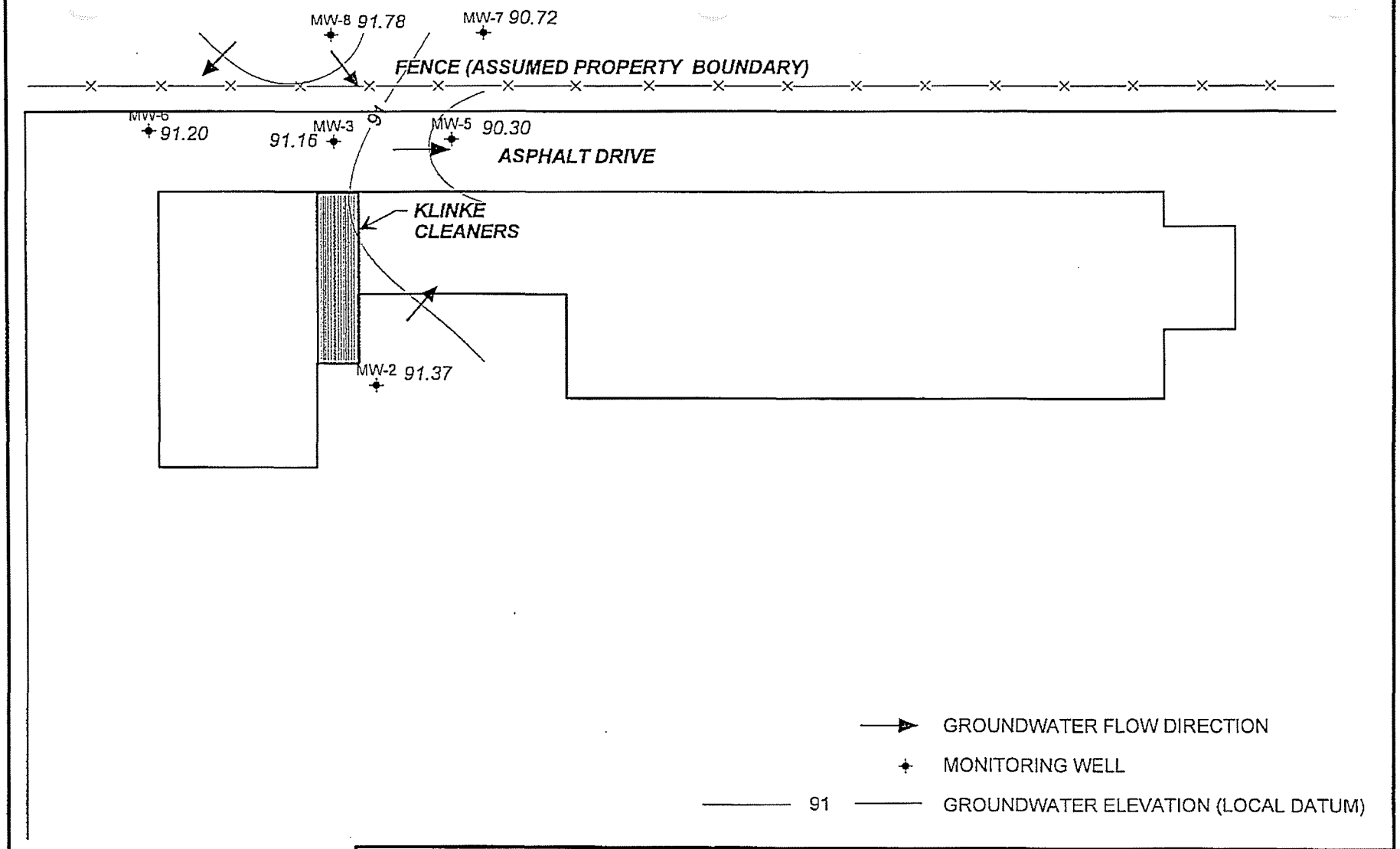
NORTH

RSV ENGINEERING, INC.
Engineers ▪ Land Surveyors ▪ Environmental Scientists
146 E. MILWAUKEE STREET JEFFERSON, WISCONSIN 53549 (920) 674-3411

KLINKE CLEANERS
FOX RUN - WAUKESHA, WISCONSIN
WATER TABLE - 10 JAN 06

FIGURE 3

| DRAWN BY | PROJ. No. | DATE | FILE NAME |
|---|---|---|---|
| RN | 05-529 | 14 FEB 06 | WATER TABLE |




SCALE IN FEET
0 20 40 60 80

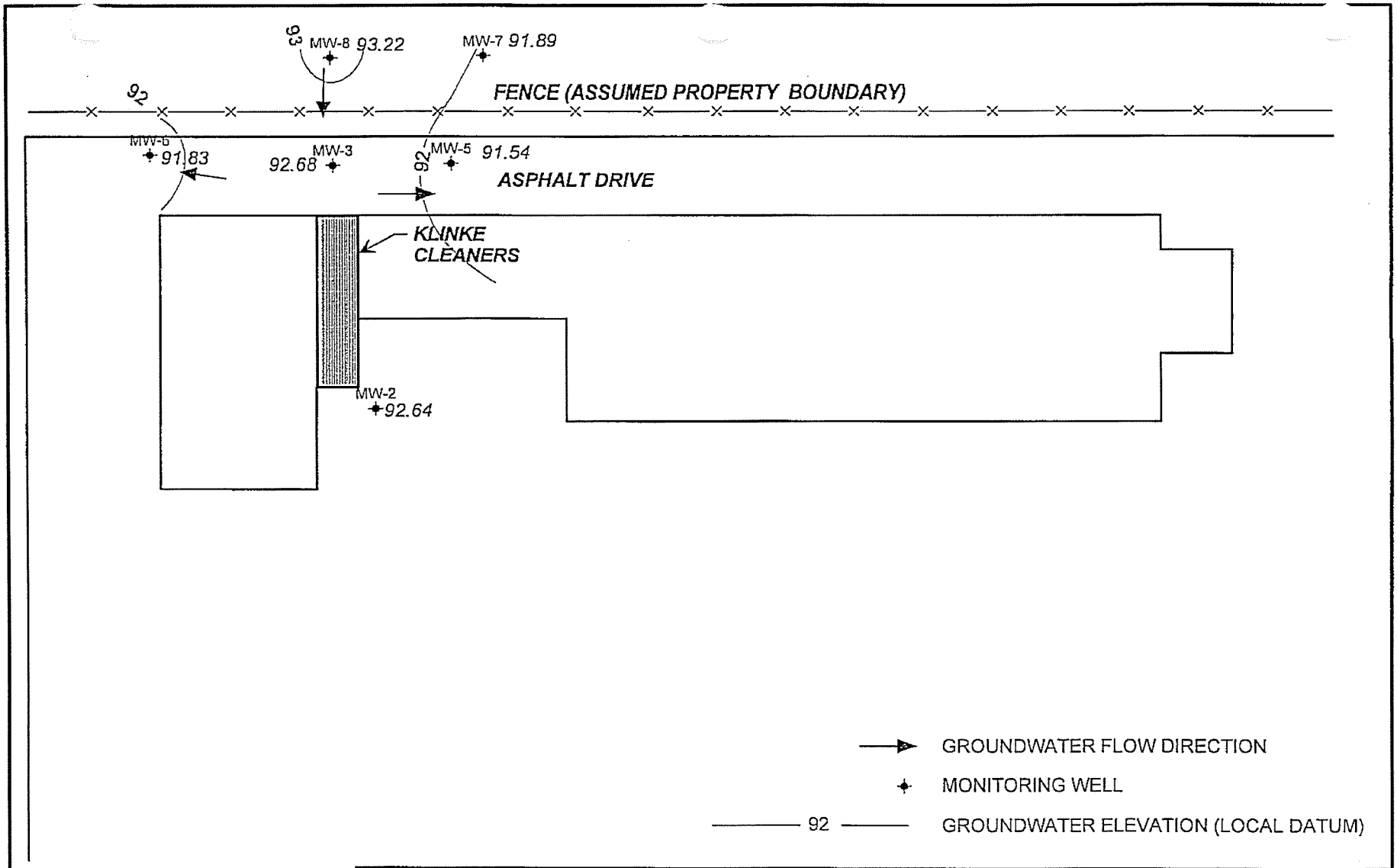
NORTH

RSV ENGINEERING, INC.
Engineers - Land Surveyors - Environmental Scientists
146 E. MILWAUKEE STREET JEFFERSON, WISCONSIN 53549 (920) 674-3411

KLINKE CLEANERS
FOX RUN - WAUKESHA, WISCONSIN
WATER TABLE ELEVATION CONTOURS
NOVEMBER 3, 2008

FIGURE 4

| DRAWN BY | PROJ. No. | DATE | FILE NAME |
|---|---|---|---|
| RN | 05-529 | 04 DEC 08 | WTR LVL |




SCALE IN FEET
0 20 40 60 80

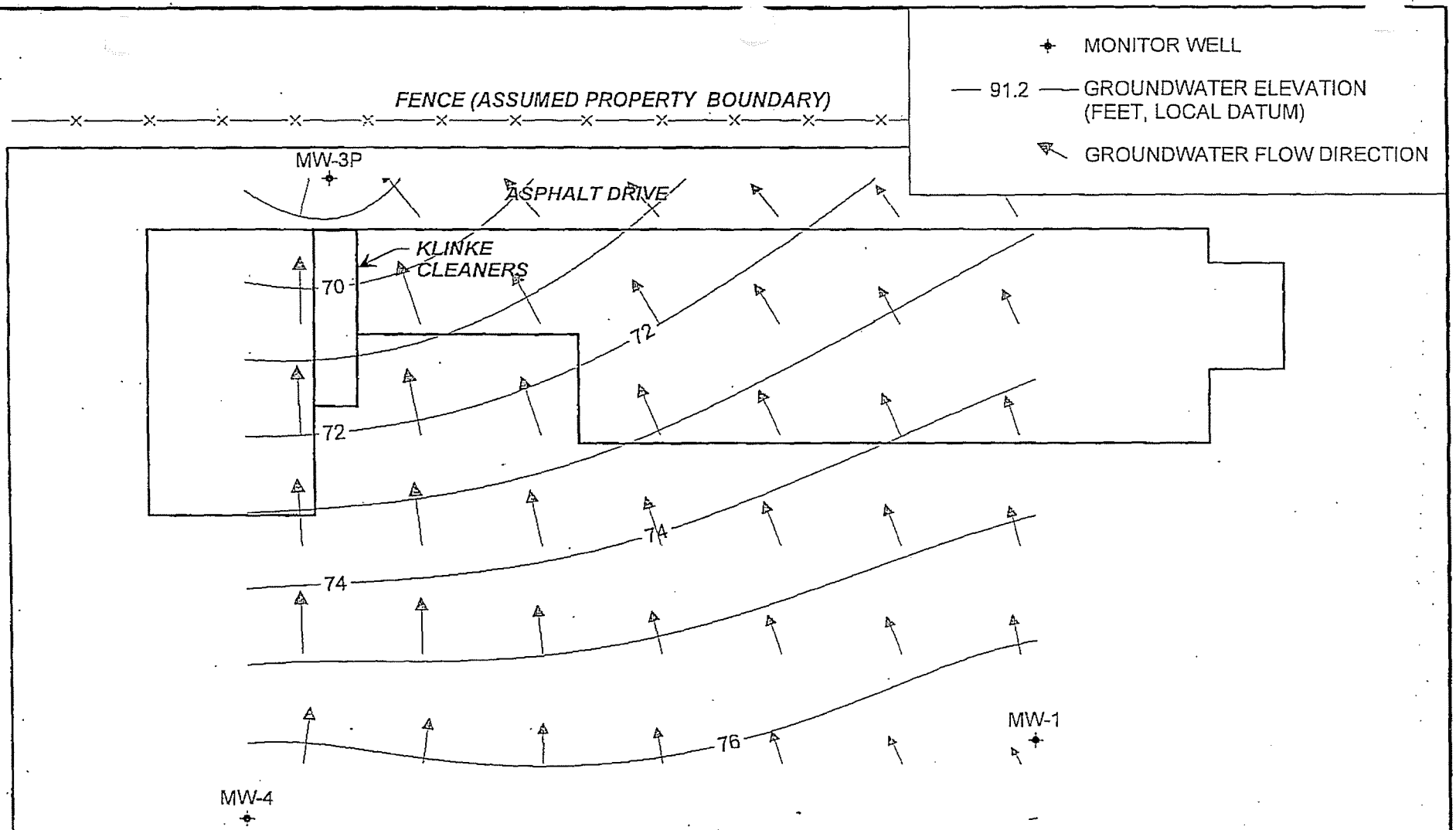
NORTH

RSV ENGINEERING, INC.
Engineers - Land Surveyors - Environmental Scientists
146 E. MILWAUKEE STREET JEFFERSON, WISCONSIN 53549 (920) 674-3411

KLINKE CLEANERS
FOX RUN - WAUKESHA, WISCONSIN
WATER TABLE ELEVATION CONTOURS
APRIL 28, 2009

FIGURE
2

| DRAWN BY | PROJ. No. | DATE | FILE NAME |
|---|---|---|---|
| PAR | 05-529 | 11 MAY 09 | WTR LVL 0409 |




SCALE IN FEET
0 20 40 60 80

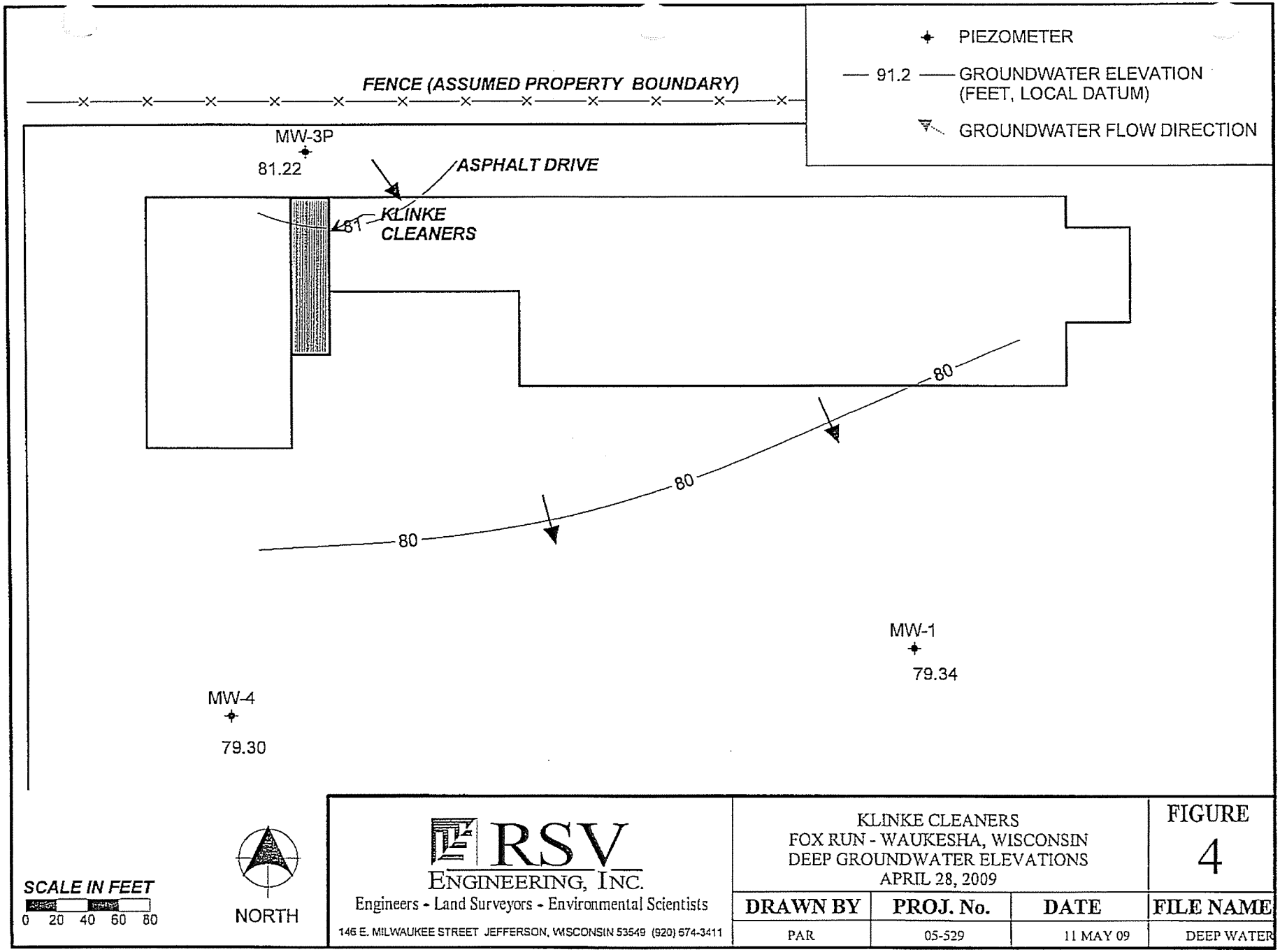
NORTH

RSV ENGINEERING, INC.
Engineers • Land Surveyors • Environmental Scientists
146 E. MILWAUKEE STREET JEFFERSON, WISCONSIN 53549 (920) 674-3411

KLINKE CLEANERS
FOX RUN - WAUKESHA, WISCONSIN
DEEP GROUNDWATER ELEVATIONS

FIGURE
4

| DRAWN BY | PROJ. No. | DATE | FILE NAME |
|---|---|---|---|
| RN | 05-529 | 14 FEB 06 | DEEP WATER |




RSV ENGINEERING, INC.
Engineers - Land Surveyors - Environmental Scientists
146 E. MILWAUKEE STREET JEFFERSON, WISCONSIN 53549 (920) 674-3411

KLINKE CLEANERS
FOX RUN - WAUKESHA, WISCONSIN
DEEP GROUNDWATER ELEVATIONS
APRIL 28, 2009

FIGURE 4

| DRAWN BY | PROJ. No. | DATE | FILE NAME |
|---|---|---|---|
| PAR | 05-529 | 11 MAY 09 | DEEP WATER |

# APPENDIX C

## Soil Boring Logs, Monitoring Well Construction and Development Forms

State of Wisconsin
Department of Natural Resources

# SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Revelopment ☐ Other ☐ _____



| | | | |
|---|---|---|---|
| Facility/Project Name: Clinke Cleaners - Fox River | License/Permit/Monitoring Number: | Boring Number: MW-9 | |
| Boring Drilled By: Name of crew chief (first, last) and Firm — First Name: Tony Last Name: Kapuge — Firm: On-Site Environmental | Date Drilling Started: 8/25/2009 (m m d d y y y y) | Date Drilling Completed: 08/25/2009 | Drilling Method: HSA 4 1/4" |
| WI Unique Well No.: | DNR Well ID No.: | Well Name: MW-9 | Final Static Water Level: ____ Feet MSL |
| Surface Elevation: ____ Feet MSL | Borehole Diameter: 8 inches | | |
| Local Grid Origin ☐ (estimated: ☐ ) or Boring Location ☐ — State Plane ____ N, ____ E | Lat ° ' " — Long ° ' " | Local Grid Location: ____ Feet ☐ N ☐ S ____ Feet ☐ E ☐ W | |
| ____ 1/4 of ____ 1/4 of Section ____, T ____ N, R ____ | | | |
| Facility ID | County: Waukesha | County Code | Civil Town/City/ or Village: Waukesha |

| Sample Number and Type | Sample Length Att. & Recovered (in) | Blow Counts | Depth in Feet (Below ground surface) | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 CS | 44/60 | | 1 | 0'-1' SILTY SAND, dark brown, moist, 20% fine gravel | SM | | | | | | | | | |
| | | | 2 | 1'-4' SANDY CLAY WITH GRAVEL, yellowish-brown, moist, fine gravel | SCg | | | | | | | | | |
| | | | 3 | | | | | | | | | | | |
| | | | 4 | | | | | | | | | | | |
| | | | 5 | 4'-6' SILT WITH GRAVEL, yellowish-brown, moist, fine gravel | MLg | | | | | | | | | |
| | | | 6 | | | | | | | | | | | |
| 2 CS | 47/60 | | 7 | 6'-7' SILTY SAND WITH GRAVEL, yellowish-brown, moist | SMg | | | | | | | | | |
| | | | 8 | 7'-12' LEAN CLAY WITH GRAVEL, gray, moist, firm | CLg | | | | | | | | | |
| | | | 9 | @ 8' color change to dark gray | | | | | | | | | | |
| | | | 10 | @ 10' 2" layer black organic material | | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: RSV Engineering, Inc

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

MW-9



| Sample Number and Type | Sample Length Att. & Recovered (in) | Blow Counts | Depth in Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 CS | 48/48 | | 11 | 7'-12' LEAN CLAY WITH GRAVEL (continued) | CLg | | | | | | | | | |
| | | | 12 | 12'-14' SILTY SAND, gray, very fine sand, wet, trace organics | SM | | | | | | | | | |
| | | | 13 | | | | | | | | | | | |
| | | | 14 | End of Boring @ 14' | | | | | | | | | | |
| | | | | Set Well w/ 10' Screen 4'-14' | | | | | | | | | | |

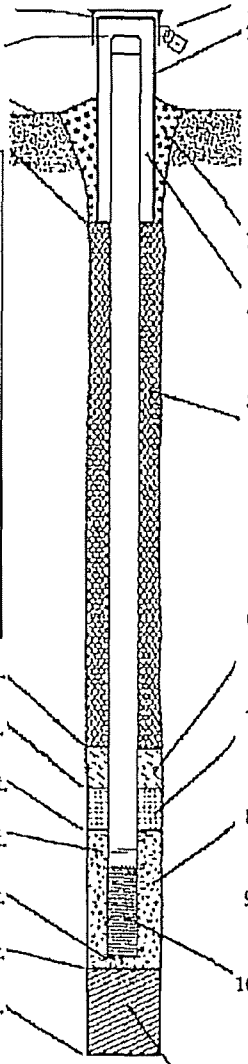
State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

# MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

| | | |
|---|---|---|
| Facility/Project Name: Kwik Trip Corners - Fox Run | Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W. | Well Name: MW-9 |
| Facility License, Permit or Monitoring No. | Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or | Wis. Unique Well No. / DNR Well ID No. |
| Facility ID | St. Plane ____ ft. N, ____ ft. E. S/C/N | Date Well Installed: 08/25/2009 (m m d d y y y y) |
| Type of Well: Well Code MW1 | Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐E ☐W | Well Installed By: Name (first, last) and Firm: Tony Kapusi / On-Site Environmental |
| Distance from Waste/Source: 150 ft. | Enf. Stds. Apply ☑ | Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☑ Downgradient n ☐ Not Known |
| | | Gov. Lot Number |



A. Protective pipe, top elevation 99.98 ft. MSL
B. Well casing, top elevation 99.51 ft. MSL
C. Land surface elevation 99.98 ft. MSL
D. Surface seal, bottom ____ ft. MSL or 1 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☑ SC ☐ ML ☐ MH ☐ CL ☑ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☑ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☑ 41; Other ☐

15. Drilling fluid used: Water ☐ 02 Air ☐ 01; Drilling Mud ☐ 03 None ☑ 99

16. Drilling additives used? ☐ Yes ☑ No
Describe ____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top ____ ft. MSL or ____ ft.
F. Fine sand, top ____ ft. MSL or 3 ft.
G. Filter pack, top ____ ft. MSL or 3.5 ft.
H. Screen joint, top ____ ft. MSL or 4 ft.
I. Well bottom ____ ft. MSL or 14 ft.
J. Filter pack, bottom ____ ft. MSL or 14.5 ft.
K. Borehole, bottom ____ ft. MSL or 14.5 ft.
L. Borehole, diameter 8 in.
M. O.D. well casing 2.33 in.
N. I.D. well casing 2.07 in.

1. Cap and lock? ☑ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 1 ft.
c. Material: Steel ☑ 04 Other ☐
d. Additional protection? ☐ Yes ☑ No
If yes, describe: ____
3. Surface seal: Bentonite ☐ 30 Concrete ☑ 01 Other ☐
4. Material between well casing and protective pipe: Sand — Bentonite ☐ 30 Other ☑
5. Annular space seal: a. Granular/Chipped Bentonite ☑ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ $Ft^3$ volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☑ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite chips ☐ 32
c. ____ Other ☐
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley 4100
b. Volume added 0 $ft^3$
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley 5000
b. Volume added 4 $ft^3$
9. Well casing: Flush threaded PVC schedule 40 ☑ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐
10. Screen material: PVC
a. Screen type: Factory cut ☑ 11 Continuous slot ☐ 01 Other ☐
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☑ 14 Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: RSV Engineering Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

# MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

| Facility/Project Name | County Name | Well Name |
|---|---|---|
| Klinke Cleaners - Fox Run | Waukesha | MW-9 |

| Facility License, Permit or Monitoring Number | County Code | Wis. Unique Well Number | DNR Well ID Number |
|---|---|---|---|
| | __ | _____ | ___ |

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

| | | |
|---|---|---|
| surged with bailer and bailed | ☐ | 41 |
| surged with bailer and pumped | ☒ | 61 |
| surged with block and bailed | ☐ | 42 |
| surged with block and pumped | ☐ | 62 |
| surged with block, bailed and pumped | ☐ | 70 |
| compressed air | ☐ | 20 |
| bailed only | ☐ | 10 |
| pumped only | ☐ | 51 |
| pumped slowly | ☐ | 50 |
| Other _____ | ☐ | ▒▒ |

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 13.9 ft.

5. Inside diameter of well 2.07 in.

6. Volume of water in filter pack and well casing 14. gal.

7. Volume of water removed from well 70. gal.

8. Volume of water added (if any) ___.__ gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

| | Before Development | After Development |
|---|---|---|
| 11. Depth to Water (from top of well casing) a. | 10.00 ft. | 10.05 ft. |
| Date b. (m m d d y y y y) | 08/25/2009 | 08/25/2009 |
| Time c. | 2:30 ☐ a.m. ☒ p.m. | 3:30 ☐ a.m. ☒ p.m. |
| 12. Sediment in well bottom | ___.__ inches | ___.__ inches |
| 13. Water clarity | Clear ☐ 10 Turbid ☒ 15 | Clear ☐ 20 Turbid ☒ 25 |
| (Describe) | opaque | translucent |
| | grayish brown | very light brown |

Fill in if drilling fluids were used and well is at solid waste facility:

| | | |
|---|---|---|
| 14. Total suspended solids | ____.__ mg/l | ____.__ mg/l |
| 15. COD | ____.__ mg/l | ____.__ mg/l |

16. Well developed by: Name (first, last) and Firm
First Name: Paula Last Name: Richardson
Firm: RSV Engineering, Inc.

17. Additional comments on development:

Name and Address of Facility Contact/Owner/Responsible Party
First Name: Richard Last Name: Klinke
Facility/Firm: Klinke Cleaners
Street: 4518 Monona Dr.
City/State/Zip: Madison, WI 53716

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Paula Richardson
Print Name: Paula Richardson
Firm: RSV Engineering, Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

**SOIL BORING LOG INFORMATION**
Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Revelopment ☒ Other ☐ _____

Page 1 of 2

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Kliniks Cleaners - Fox Run | | P-5 |

| Boring Drilled By: Name of crew chief (first, last) and Firm | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| First Name: Alex Last Name: Firm: Badger State Drilling | 03/23/2011 (m m d d y y y y) | 03/24/2011 (m m d d y y y y) | HSA 9.25" 5 7/8" Rotary |

| WI Unique Well No. | DNR Well ID No. | Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| | | P-5 | _____ Feet MSL | _____ Feet MSL | 8-12 inches |

Local Grid Origin ☐ (estimated: ☐ ) or Boring Location ☐
State Plane _____ N, _____ E
_____ 1/4 of _____ 1/4 of Section _____, T _____ N, R _____
Lat _____ ° ' "
Long _____ ° ' "
Local Grid Location ☐ N ☐ E _____ Feet ☐ S _____ Feet ☐ W

| Facility ID | County | County Code | Civil Town/City/ or Village |
|---|---|---|---|
| | Waukesha | | Waukesha |

| Sample Number and Type | Sample Length Att. & Recovered (in) | Blow Counts | Depth in Feet (Below ground surface) | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0'-20' Drill without Sampling - See Log of MW-5 | | | | | | | | | | |
| | | | | (0'-13' SP, POORLY-GRADED SAND) | SP | | | | | | | | | |
| | | | | (13'-20' CL, LEAN CLAY) | CL | | | | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Sage Environmental + Engr., Inc.

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

| Sample Number and Type | Sample Length Att. & Recovered (in) | Blow Counts | Depth in Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Compressive Strength | Soil Properties: Moisture Content | Soil Properties: Liquid Limit | Soil Properties: Plasticity Index | Soil Properties: P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 20 | 20 - 35 LEAN CLAY, gray, firm, moist | CL | | | | | | | | | |
| | | | 21 | | | | | | | | | | | |
| | | | 22 | | | | | | | | | | | |
| | | | 23 | | | | | | | | | | | |
| | | | 24 | | | | | | | | | | | |
| | | | 25 | | | | | | | | | | | |
| | | | 26 | | | | | | | | | | | |
| | | | 27 | | | | | | | | | | | |
| | | | 28 | | | | | | | | | | | |
| | | | 29 | | | | | | | | | | | |
| | | | 30 | Set steel outer casing to 30'. Grout and let cure overnight | | | | | | | | | | |
| | | | 31 | | | | | | | | | | | |
| | | | 32 | | | | | | | | | | | |
| | | | 33 | | | | | | | | | | | |
| | | | 34 | | | | | | | | | | | |
| | | | 35 | End of Boring @ 35' Set 5' screen 30'-35' | | | | | | | | | | |

State of Wisconsin
Department of Natural Resources

# SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Revelopment ☒ Other ☐ _____

Page 1 of 1

| Facility/Project Name | License/Permit/Monitoring Number | Boring Number |
|---|---|---|
| Fox Run Shopping Center | | MW-5 |

| Boring Drilled By: Name of crew chief (first, last) and Firm | Date Drilling Started | Date Drilling Completed | Drilling Method |
|---|---|---|---|
| First Name: Adam Last Name: Rick<br>Firm: GESTRA | 07 25 2005 (m m d d y y y y) | 07 25 2005 (m m d d y y y y) | HSA |

| WI Unique Well No. | DNR Well ID No. | Well Name | Final Static Water Level | Surface Elevation | Borehole Diameter |
|---|---|---|---|---|---|
| _ _ _ _ _ _ | _ _ _ _ | MW-5 | _____ Feet MSL | _____ Feet MSL | 7.5 inches |

Local Grid Origin ☐ (estimated: ☐ ) or Boring Location ☐
State Plane _____ N, _____ E
SE 1/4 of SE 1/4 of Section 20, T 6 N, R 19 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E _____ Feet ☐ S _____ Feet ☐ W

| Facility ID | County | County Code | Civil Town/City/ or Village |
|---|---|---|---|
| | Waukesha | | Muskego |

| Sample Number and Type | Sample Length Att. & Recovered (in) | Blow Counts | Depth in Feet | Soil/Rock Description And Geologic Origin For Each Major Unit | USCS | Graphic Log | Well Diagram | PID/FID | Soil Properties: Compressive Strength | Moisture Content | Liquid Limit | Plasticity Index | P 200 | RQD/ Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | | | | | | | | | | | |
| | | | 2 | No Recovery | / | | | / | | | | | | |
| | | | 4 | No Recovery | / | | | / | | | | | | |
| | | | 6 | Light tan medium/fine grained Sand w/fines | SP | | | 19 | | | | | | |
| | | | 8 | Light tan extremely fine grained Sand | SP | | | 10 | | | | | | |
| | | | 10 | SAA -Moist | SP | | | 2 | | | | | | |
| | | | 12 | SAA | SP | | | 1 | | | | | | |
| | | | 14 | SAA Stiff moist grey clay | SP CL | | | MD | | | | | | |
| | | | 16 | SAA Moist grey Clay | CL | | | MD | | | | | | |
| | | | 18 | Blind Drill | / | | | / | | | | | | |
| | | | 20 | Blind Drill | / | | | / | | | | | | |

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Dakota Environmental Inc.

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

# MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

| | | |
|---|---|---|
| Facility/Project Name: Klinke Cleaners - Fox Riv | Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W. | Well Name: P-5 |
| Facility License, Permit or Monitoring No. | Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat, ° ' " Long, ° ' " or | Wis. Unique Well No. / DNR Well ID No. |
| Facility ID | St. Plane ____ ft. N, ____ ft. E. S/C/N | Date Well Installed: 03/24/2011 (m m d d y y y y) |
| Type of Well: Well Code 102 | Section Location of Waste/Source: ____ 1/4 of ____ 1/4 of Sec. ____, T. ____ N, R. ____ ☐E ☐W | Well Installed By: Name (first, last) and Firm: Alex / Badger State Drilling |
| Distance from Waste/Source: 30 ft. / Enf. Stds. Apply ☒ | Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known | Gov. Lot Number |

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐

15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top _____ ft. MSL or _____ ft.

F. Fine sand, top _____ ft. MSL or 28 ft.

G. Filter pack, top _____ ft. MSL or 29 ft.

H. Screen joint, top _____ ft. MSL or 30 ft.

I. Well bottom _____ ft. MSL or 35 ft.

J. Filter pack, bottom _____ ft. MSL or 35 ft.

K. Borehole, bottom _____ ft. MSL or 35 ft.

L. Borehole, diameter 8-12 in.

M. O.D. well casing 2.33 in.

N. I.D. well casing 2.07 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 4 ft.
c. Material: Steel ☒ 04 Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐

4. Material between well casing and protective pipe: Sand
Bentonite ☐ 30 Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ $Ft^3$ volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite chips ☐ 32
c. _____ Other ☐

7. Fine sand material: Manufacturer, product name & mesh size
a. Ohio 40-60
b. Volume added _____ $ft^3$

8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5
b. Volume added _____ $ft^3$

9. Well casing: Flush threaded PVC schedule 40 ☐ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐

10. Screen material: Sch. 40 PVC
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5 ft.

11. Backfill material (below filter pack): None ☒ 14 Other ☐

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm Soja Environmental and Engineering Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

# MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

| Facility/Project Name | County Name | Well Name |
|---|---|---|
| Klinke Cleaners - Fox River | Waukesha | P-5 |
| **Facility License, Permit or Monitoring Number** | **County Code** | **Wis. Unique Well Number** | **DNR Well ID Number** |
| | __ | _____ | ____ |

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

| | | |
|---|---|---|
| surged with bailer and bailed | ☐ | 41 |
| surged with bailer and pumped | ☐ | 61 |
| surged with block and bailed | ☐ | 42 |
| surged with block and pumped | ☐ | 62 |
| surged with block, bailed and pumped | ☐ | 70 |
| compressed air | ☐ | 20 |
| bailed only | ☐ | 10 |
| pumped only | ☒ | 51 |
| pumped slowly | ☐ | 50 |
| Other _____ | ☐ | |

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 35.4 ft.

5. Inside diameter of well 2.07 in.

6. Volume of water in filter pack and well casing 11.0 gal.

7. Volume of water removed from well 35.0 gal.

8. Volume of water added (if any) 0. gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

| | Before Development | After Development |
|---|---|---|
| 11. Depth to Water (from top of well casing) | a. 20.67 ft. | 37.4 ft. |
| Date | b. 03/24/2011 (m m d d y y y y) | 03/24/2011 (m m d d y y y y) |
| Time | c. 2:30 ☐ a.m. ☒ p.m. | 3:30 ☐ a.m. ☒ p.m. |
| 12. Sediment in well bottom | ___.__ inches | ___.__ inches |
| 13. Water clarity | Clear ☐ 10 Turbid ☒ 15 | Clear ☐ 20 Turbid ☒ 25 |
| (Describe) | opaque, reddish brown. | translucent, light brown |
| 14. Total suspended solids | _____.__ mg/l | _____.__ mg/l |
| 15. COD | _____.__ mg/l | _____.__ mg/l |

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Paula Last Name: Richardson
Firm: Saga Environmental and Engineering

17. Additional comments on development:
Pumped dry several times over an hour

Name and Address of Facility Contact/Owner/Responsible Party
First Name: Richard Last Name: Klinke
Facility/Firm: Klinke Cleaners
Street: 4518 Monona Dr.
City/State/Zip: Madison, WI 53716

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Paula Richardson
Print Name: Paula Richardson
Firm: Saga Environmental Engineering, Inc.

NOTE: See instructions for more information including a list of county codes and well type codes.

# APPENDIX D

## Excavation Photos

| Saga Environmental & Engineering, Inc. | CLIENT: Klinke Cleaners | PROJ. NO: 05-529 | DATE: 5/28/09 |
|---|---|---|---|
| | PROJECT: Klinke Cleaners – Fox Run | LOCATION: Klinke Cleaners –Fox Run 2346 W. St Paul Ave, Waukesha, WI | |

PHOTO: 1

DESCRIPTION:

Hand-digging around power lines during excavation. A portion of the sewer line is visible – bluish pipe in the left-central foreground of the photo.

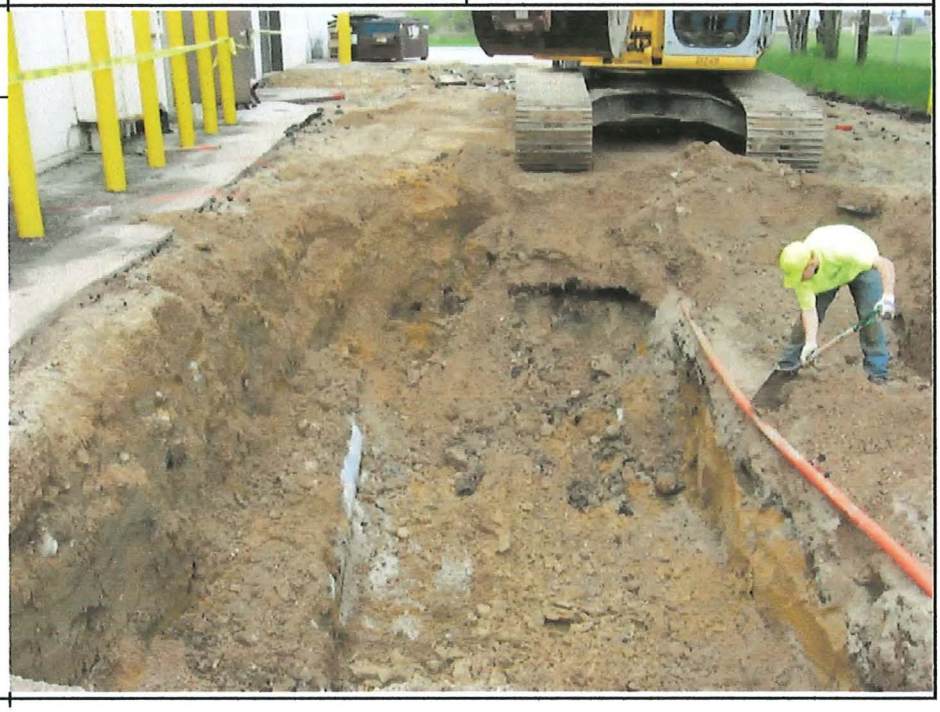


PHOTO: 2

DESCRIPTION:

Excavation around the many utilities behind the facility was challenging.

| Saga Environmental & Engineering, Inc. | CLIENT: Klinke Cleaners | PROJ. NO: 05-529 | DATE: 5/29/09 |
|---|---|---|---|
| | PROJECT: Klinke Cleaners – Fox Run | LOCATION: Klinke Cleaners –Fox Run 2346 W. St Paul Ave, Waukesha, WI | |

PHOTO: 3

DESCRIPTION:

Sanitary sewer laterals present at angles to the shopping center building (gray pipes). Back door to Klinke Cleaners facility is to the right of yellow bollards and electrical panel, with contractor standing in doorway.

PHOTO: 4

DESCRIPTION:

Repairs to sanitary sewer laterals (green and white pipes) were necessary due to damage sustained during excavation.

# APPENDIX E

## Waste Disposal Documentation

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Matthew J. Frank, Secretary
Gloria L. McCutchen, Regional Director

Waukesha Service Center
141 NW Barstow St., Room 180
Waukesha, Wisconsin 53188
Telephone 262-574-2100
FAX 262-574-2117

May 21, 2009

Mr. Richard Klinke
Klinke Cleaners
4518 Monona Drive
Madison, WI 537116-1098

**SUBJECT: Requested "Contained-Out" Determination for Klinke Cleaners – Fox Run**
**2346 W. St Paul Avenue, Waukesha, WI 53188**
**FID# 268188910 BRRTS# 02-68-535535**

Dear Mr. Klinke:

The Department received a request for a "contained-out" determination for the property at 2346 West St. Paul Avenue, Waukesha, WI from the RSV Engineering. Your consultant has requested Department concurrence with the "contained-out" soil concentrations calculated using the USEPA Soil Screening Guidance. It is proposed that soil containing trichloroethene (TCE) and/or tetrachloroethene (PCE), which would otherwise be considered a "listed" hazardous waste under Wisconsin and USEPA regulations, be considered a non-hazardous waste for disposal and management purposes. This will apply when soil is generated as investigative or remedial waste when the concentration of TCE is less than 7.15 mg/kg and the concentration of PCE is less than 35 mg/ kg. Soil with concentrations below these criteria would be managed as a non-hazardous solid waste upon excavation.

The Department may consider environmental media to not contain a hazardous waste and therefore not be regulated as a hazardous waste when concentrations of the hazardous waste constituents do not exceed site specific health based levels and when the soils are managed appropriately upon excavation. The Department has established that use of the industrial site direct contact protection concentrations, as calculated through the USEPA's Soil Screening Guidance equations using the Department's established default input values, would be acceptable for determining when excavated soil could be considered to no longer contain hazardous waste.

Based on the information received, the Department concurs that RSV Engineering has used the appropriate method and default values for the hazardous waste constituents PCE to determine the proposed "contained-out" concentration. If soils are excavated from the site for investigative or remediation purposes under Department approval and are disposed of in accordance with state solid waste regulations in a licensed landfill, the soils containing concentrations of PCE less than 35 mg/ kg would not be considered a hazardous waste.

The Department appreciates your efforts to protect and restore the environment at this site. If you have any questions regarding this letter or the site in general, please contact me at the letterhead address or (262) 574-2145.

Sincerely,

James C. Delwiche

James C. Delwiche, P.G.
Hydrogeologist
Bureau for Remediation & Redevelopment

cc: SER Case File
Paula A. Richardson, P.G. – RSV Engineering

# Generator's Nonhazardous Waste Profile Sheet

WASTE MANAGEMENT

Requested Disposal Facility _____ Profile Number

☐ Renewal for Profile Number _____ Waste Approval Expiration Date _____

## A. Waste Generator Facility Information (must reflect location of waste generation/origin)

1. Generator Name: Klinke Cleaners
2. Site Address: 2346 West St. Paul Ave.
3. City/ZIP: Waukesha, 53188
4. State: WI
5. County: Waukesha
6. Contact Name/Title: _____
7. Email Address: richard@klinkecleaners.com
8. Phone: 608-222-6060 ex. 16 9. FAX: 608-222-6546
10. NAICS Code: _____
11. Generator USEPA ID #: WID981196017
12. State ID# (if applicable): _____

## B. Customer Information ☐ same as above

P. O. Number: _____

1. Customer Name: Advanced Waste Services
2. Billing Address: 1126 S. 70th St., Suite N408B
3. City, State and ZIP: West Allis, WI 53214
4. Contact Name: Chris Duba
5. Contact Email: cduba@advancedwasteservices.com
6. Phone: (414) 475-3100 FAX: (414) 475-4496
7. Transporter Name: _____
8. Transporter ID # (if appl.): _____
9. Transporter Address: _____
10. City, State and ZIP: _____

## C. Waste Stream Information

1. DESCRIPTION

a. Common Waste Name: Soil impacted with Tetrachloroethene

State Waste Code(s): None

b. Describe Process Generating Waste or Source of Contamination:

Soil Clean up from a dry cleaner release. Soil disposed of using the Contained Out Ruling

c. Typical Color(s): Brown

d. Strong Odor? ☐ Yes ☑ No Describe: _____

e. Physical State at 70°F: ☑ Solid ☐ Liquid ☐ Powder ☐ Semi-Solid or Sludge ☐ Other: _____

f. Layers? ☑ Single layer ☐ Multi- layer ☐ NA

g. Water Reactive? ☐ Yes ☑ No If Yes, Describe: _____

h. Free Liquid Range (%): _____ to _____ ☑ NA(solid)

i. pH Range: ☐ ≤2 ☐ 2.1-12.4 ☐ ≥12.5 ☑ NA(solid) ☐ Actual: _____

j. Liquid Flash Point: ☐ < 140°F ☐ ≥ 140°F ☑ NA(solid) ☐ Actual: _____

k. Flammable Solid: ☐ Yes ☑ No

l. Physical Constituents: List all constituents of waste stream - (e.g. Soil 0-80%, Wood 0-20%): ☐ (See Attached)

| Constituents *(Total Composition Must be = 100%)* | Lower Range | Unit of Measure | Upper Range | Unit of Measure |
|---|---|---|---|---|
| 1. Soil | 99 | % | 100 | % |
| 2. VOC's | 0 | % | 1 | % |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |

2. ESTIMATED QUANTITY OF WASTE AND SHIPPING INFORMATION

a. ☑ One Time Event ☐ Base ☐ Repeat Event

b. Estimated Annual Quantity: 1600 ☑ Tons ☐ Cubic Yards ☐ Drums ☐ Gallons ☐ Other (specify): _____

Shipping Frequency: _____ Units per ☐ Month ☐ Quarter ☐ Year ☑ One Time ☐ Other

c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If yes, answer e.) ☐ Yes ☑ No

e. USDOT Shipping Description (if applicable): Non regulated special waste solid

3. SAFETY REQUIREMENTS (Handling, PPE, etc.): NA

# Generator's Nonhazardous Waste Profile Sheet

## D. Regulatory Status (Please check appropriate responses)

1. Is this a USEPA (40 CFR Part 261)/State hazardous waste? If yes, contact your sales representative. ☐ Yes ☑ No
2. Is this waste included in one or more of categories below (Check all that apply)? If yes, attach supporting documentation. ☐ Yes ☑ No
   - ☐ Delisted Hazardous Waste
   - ☐ Excluded Wastes Under 40 CFR 261.4
   - ☐ Treated Hazardous Waste Debris
   - ☐ Treated Characteristic Hazardous Waste
3. Is the waste from a Federal (40 CFR 300, Appendix B) or state mandated clean-up? If yes, see instructions. ☐ Yes ☑ No
4. Does the waste represented by this waste profile sheet contain radioactive material? ☐ Yes ☑ No
   a. If yes, is disposal regulated by the Nuclear Regulatory Commission? ☐ Yes ☐ No
   b. If yes, is disposal regulated by a State Agency for radioactive waste/NORM? ☐ Yes ☐ No
5. Does the waste represented by this waste profile sheet contain concentrations of regulated Polychlorinated Biphenyls (PCBs)? ☐ Yes ☑ No
   a. If yes, is disposal regulated under TSCA? ☐ Yes ☐ No
6. Does the waste contain untreated, regulated, medical or infectious waste? ☐ Yes ☑ No
7. Does the waste contain asbestos? ☐ Yes ☑ No If Yes, ☐ Friable ☐ Non Friable
8. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? ☐ Yes ☑ No
   If yes, does the waste contain <500 ppmw VOHAPs at the point of determination? ☐ Yes ☐ No

## E. Generator Certification (Please read and certify by signature below)

By signing this Generator's Waste Profile Sheet, I hereby certify that all:

1. Information submitted in this profile and all attached documents contain true and accurate descriptions of the waste material;
2. Relevant information within the possession of the Generator regarding known or suspected hazards pertaining to this waste has been disclosed to WM/the Contractor;
3. Analytical data attached pertaining to the profiled waste was derived from testing a representative sample in accordance with 40 CFR 261.20(c) or equivalent rules; and
4. Changes that occur in the character of the waste (i.e. changes in the process or new analytical) will be identified by the Generator disclosed to WM (and the Contractor if applicable) prior to providing the waste to WM (and the Contractor if applicable).
5. Check all that apply:
   - ☑ Attached analytical pertains to the waste. Identify laboratory & sample ID #'s and parameters tested: _____ # Pages: _____
   - ☐ Only the analyses identified on the attachment pertain to the waste (identify by laboratory & sample ID #'s and parameters tested). Attachment #: _____
   - ☐ Additional information necessary to characterize the profiled waste has been attached (other than analytical). Indicate the number of attached pages: _____
   - ☐ I am an agent signing on behalf of the Generator, and the delegation of authority to me from the Generator for this signature is available upon request.
   - ☐ By Generator process knowledge, the following waste is not a listed waste and is below all TCLP regulatory limits.

Certification Signature: Richard Klinke II Title: Owner

Company Name: Klinke Cleaners Name (Print): Richard Klinke

Date: 5/21/09

## FOR WM USE ONLY

Management Method: ☐ Landfill ☐ Bioremediation ☐ Non-hazardous solidification ☐ Other: _____

Approval Decision: ☐ Approved ☐ Not Approved

Waste Approval Expiration Date: _____

Management Facility Precautions, Special Handling Procedures or Limitation on approval:

_____

_____

- ☐ Shall not contain free liquid
- ☐ Shipment must be scheduled into disposal facility
- ☐ Approval Number must accompany each shipment
- ☐ Waste Manifest must accompany load

WM Authorization Name / Title: _____ Date: _____

State Authorization (if Required): _____ Date: _____

WASTE MANAGEMENT

# SPECIAL WASTE MANAGEMENT DECISION

DC102333WI
Waste Profile Sheet Code

I. Request For Decision: __XX__ Initial _____ Renewal _____High Volume (F,A,P,N/A)

GENERATOR NAME: Klinke Cleaners ADDRESS: 2346 W St. Paul Avenue

CITY,STATE: Waukesha, WI 53188

WASTE NAME(S): PCE Contaminated Soil

PROPOSED MANAGEMENT FACILITY: Metro RDF

PROPOSED INTERMEDIATE
TRANSFER FACILITY: N/A TRANSPORTER: Advanced Waste Services

WMNA REQUESTER: Peggy Slind

II. TECHNICAL MANAGER DECISION: (circle one) (APPROVED) DISAPPROVED ____ Check if additional information is attached.

If Disapproved, Explain:

If Approved, Complete A,B,C
And D Below:

A. agement Method(s): Beneficial Reuse-Alternate Daily Cover

B. Precautions, Conditions, or
Limitations on Approval Per the sites Special Waste Plan and Departments approval for use as daily cover

Waste must not contain free liquids.

C: Decision Expiration Date: 05/26/2010

MAS Code:_____ State Waste Code:_____

TECH MGR. SIGNATURE C. M. Walczak NAME (Print) Cynthia M. Walczak DATE: 05/26/2009

**This Approval includes only soils that are <14 ppm PCE.**

**This Approval may be amended to include soils containing PCE at concentrations of PCE > 14 ppm but < 35 ppm if such soils are shown to be less than <0.7 ppm leachable PCE via the TCLP. Analtical data must be provided to and approved by WM prior to amending this Approval.**

1126 South 70th Street
Suite N408B
West Allis, WI 53214
www.advancedwasteservices.com
(414) 475-3100
Fax: (414) 475-4496

# Payment Document

| | |
|---|---|
| Date | 5/31/2009 |
| Invoice # | 127256 |
| Due Date | Upon receipt |
| PO # | |
| Results Advisor | Duba, Chris |
| Phone Number | (608) 222-6060 |
| Fax Number | (608) 222-6546 |
| | Klinke Cleaners (Fox Run - Waukesha) |
| Memo | Contaminated Soil Excavation |
| | 5/27-6/2-2009 |

**Bill To**
Klinke Enterprises LLC
4518 Monona Drive
Madison WI 53716
United States

| | | | | |
|---|---|---|---|---|
| Klinke Cleaners (Fox Run - Waukesha) | Excavation & Backfill | 1 | 8,730.00 | 8,730.00 |
| | Transportation & Disposal: 601.14 Tons | 1 | 24,754.95 | 24,754.95 |
| | Gravel Backfill: 651.32 Tons | 1 | 7,972.16 | 7,972.16 |
| | Concrete & Asphalt | 1 | 13,000.00 | 13,000.00 |
| | Plumbing | 1 | 3,920.15 | 3,920.15 |

**Total** $58,377.26

Transforming Today's Wastes Into Tomorrow's Resources!
We accept American Express, Mastercard, Visa and Diner's Club

Contact Advanced Waste Services @ 800-842-9792 within 30 days of the invoice date for any and all billing discrepancies

# APPENDIX F

## Laboratory Analytical Reports

# APPENDIX G

## DeepEarth Technologies, Inc. Reports

DeepEarth Technologies, Inc.

12635 South Kroll Drive - Alsip, IL 60803 Tel: (708) 396-0100 Fax: (708) 396-0111
tech@deepearthtech.com

# A Report© for the Application of

# Cool-Ox™

for

## Paula A. Richardson, P.G.

RSV Engineering, Inc.
112 S. Main Street
Jefferson, WI 53549

Project

**Klinke Cleaners**
2346 W. St. Paul Ave.
Waukesha, WI 53188

July 7, 2009

DTI Project # 1441-R2

# Field Services Group — Cool-Ox™ Site Application Report

Client: **RSV Engineering, Inc.**
112 S Main St.
Jefferson, WI 53549

Site: Klinke Cleaners
2346 W St. Paul Ave.
Waukesha, WI 53188

Attn: Paula A Richardson, P.G.

**Work Scope:**

The work scope conducted at Klinke Cleaners Site called for the placement of up to 65 *Cool-OX™* injection points through which reagent was to be injected. The work was conducted from Tuesday 6/02/09 through Thursday 6/04/09, as outlined below.

**Project Overview:**

In general, the injection activities, at the Klinke Cleaners site, were found to be what was expected. The work plan called for injecting (2) areas one inside of the building and one outside of the building along the back wall in an area that could not be excavated.

Listed below are the design parameters as well as a delineation of the actual work scope as implemented. The application varied somewhat from the designed work scope. These changes are normal to the nuances of the *Cool-Ox™* process and will be addressed in the narrative for the work performed.

Upon completion of the remedial work, the injection points were sealed and the site restored to a condition to that found prior to implementation.

***DTI's Site Safety program was implemented at the onset of operations and no reportable incidents were suffered.***

***Designed Work Scope Parameters***

| # Injection Points | Total Gallons - *Cool-OX™* |
|---|---|
| ~65 | ~2,311 |

***Work Scope as Applied***

| # Injection Points | Total Gallons - *Cool-OX™* |
|---|---|
| 41 | 2,484 |

**Injection Work:**

On June 2, 2009, DTI personnel mobilized to the site and met with an RSV representative. DTI personnel took delivery of materials and staged the injection equipment. DTI personnel laid out the injection points (IPs) located outside of the building.

On June 3, 2009, DTI mobilized to the site and began injection activities outside of the building. DTI completed a total of twelve (12) IPs (4 through 9 and 13 through 18) as shown on the enclosed Figure 1. DTI personnel returned to the site after closing to begin the treatment of the inside of the building. DTI completed eight (8) IPs (9, 10, 11, 13, 15, 18, 19 and 23) inside of the building as shown on Figure 2. All IPs were treated from land surface to approximately 10 feet below land surface (BLS) with each point receiving 72 gallons (double load) of *Cool-Ox*™ reagent. During the injection of IP 9, inside of the building, a large quantity of *Cool-Ox*™ reagent was day lighting near the back hallway door. Upon investigation, a 1" microwell was discovered after moving several soap containers. The well was not sealed to the existing concrete surface and was secured with a 1" PVC slip cap. This completed injection activities for the day.

On the morning of June 4, 2009, DTI mobilized to the site to continue injection activities outside of the building. The discovery of the microwell was discussed with an RSV representative. The well was 1" in diameter, ~13' deep, with soft sediment at the bottom and was not properly sealed or secured. It was decided that the wells integrity was in question and it should be abandoned. The well was abandoned by filling with grout from ~13' BLS to land surface and capped with concrete. DTI completed six (6) IPs (1, 2, 3, 10, 11, and 12) outside of the building. Each IP was treated from land surface to approximately 10 feet below land surface (BLS) with each point receiving 36 gallons of *Cool-Ox*™ reagent. DTI personnel returned to the site after closing to complete the treatment of the inside of the building. DTI completed fifteen (15) IPs (1 through 8, 12, 14, 16, 17, 20, 21 and 22) inside of the building. All IPs were treated from land surface to approximately 10 feet below land surface (BLS). IPs 1, 3, 5, 7, 8, 16, 17 and 21 each received 72 gallons (double load) of *Cool-Ox*™ reagent. IPs 2, 4, 6, 12, 14, 20 and 22 each received 36 gallons of *Cool-Ox*™ reagent. This completed the injection activities at the site.

A total of 2,484 gallons of *Cool-Ox*™ reagent was applied at the site in 41 injection point locations.

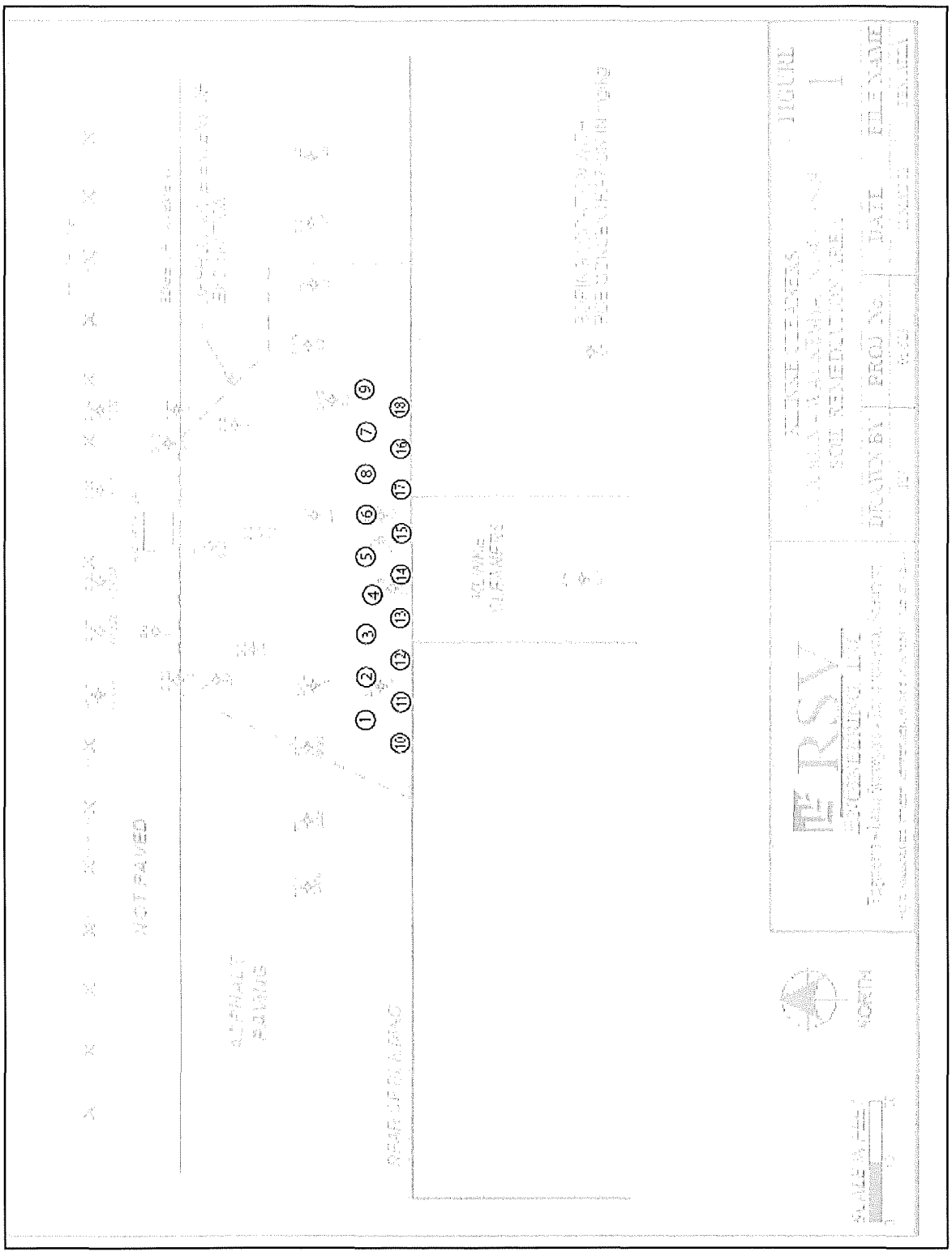
**Summary:**

The areas that were treated utilized approximate 4 foot injection point spacing. DTI conducted a total of 41 IPs at the facility. The quantity of *Cool-Ox*™ reagent, injected at each IP location is detailed in the text above. The vertical treatment interval was from land surface to ~10 feet BLS. Injection point 17 (outside of the building) showed signs of the highest contamination with a very strong solvent odor noted. Injection points 13, 17, 21, 23 (inside of the building) showed signs of the highest contamination with a strong solvent odor noted. All IPs conducted at the facility showed signs of solvent contamination. The expression of reagent to ground surface, referred to as day lighting, was an issue at this facility. The concrete floor of the facility has noticeable cracks and apparently expansion joints in which the *Cool-Ox*™ reagent was observed day lighting through. During the injection of IPs 10, 11 and 12 (outside) and 2 through 5 (inside) several gallons of reagent as well as sediment was discovered day lighting in the Power Room as noted on Figure 2. Upon investigation, it was noted that, an approximate 8" pipe with a pump installed in it was located along the western wall of the Power Room. This is where the majority of the reagent seemed to daylight. The reagent was recovered and the room cleaned. During the injection of IPs 7 and 16 (inside) several gallons of reagent was discovered day lighting in the Beauty Salon adjoining to the east of the facility. Upon investigation, it was noted that, an expansion joint is apparently located beneath the wall adjoining the two establishments. The reagent was recovered and the room cleaned.

**Conclusions:**

DTI believes, that in the treatment areas, significant reductions of contaminants in the soil and groundwater will be accomplished. If future applications are considered at the facility, consideration must be given to the issue of day lighting. Access to adjoining structures is recommended during application(s) to avoid potential day lighting while injecting. Future applications, if conducted, are recommended to be small (~10 gallons or less per injection location) and more frequent in order to reduce day lighting and to effectively mitigate PCE concentrations associated with the facility.

# Site Map 1



# Site Map 2

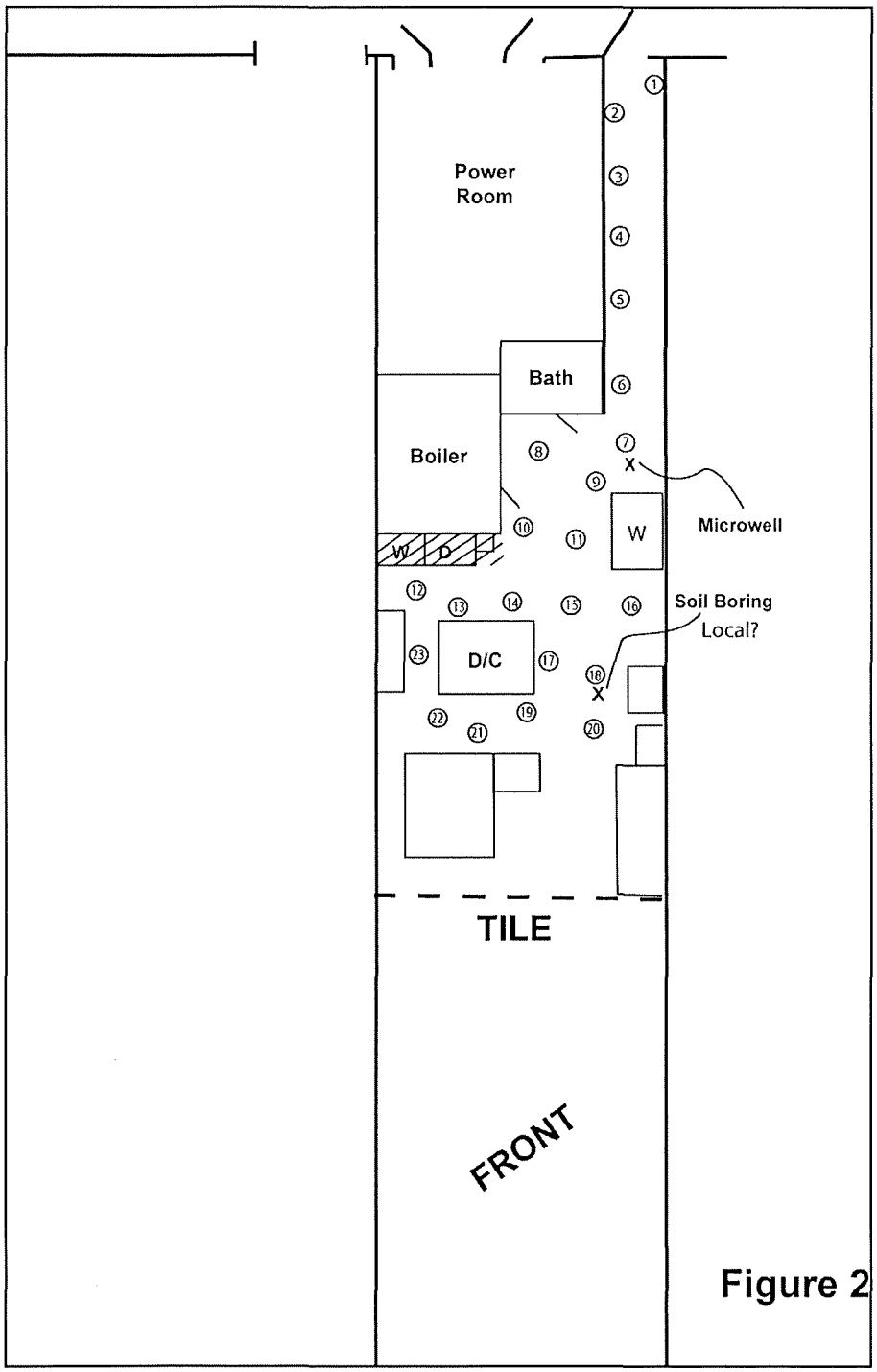



Figure 2

DeepEarth Technologies, Inc.

12635 South Kroll Drive - Alsip, IL 60803 Tel: (708) 396-0100 Fax: (708) 396-0111
tech@deepearthtech.com

# A Report© for the Application of

# Cool-Ox™

for

## Paula A. Richardson, P.G.

RSV Engineering, Inc.
112 S. Main Street
Jefferson, WI 53549

Project

**Klinke Cleaners**
2346 W. St. Paul Ave.
Waukesha, WI 53188

July, 2010

DTI Project # 1441

# Field Services Group — Cool-Ox™ Site Application Report

Client: **RSV Engineering, Inc.**
112 S Main St.
Jefferson, WI 53549

Site: Klinke Cleaners
2346 W St. Paul Ave.
Waukesha, WI 53188

Attn: Paula A Richardson, P.G.

**Activities Overview:**

The first application of *Cool-Ox*™ at the Klinke Cleaners site was completed on 6/04/2009 and included the injection of 2,484 gallons of reagent. It became apparent, during the application activities, that the treatment area could not take large amounts of reagent in a single application. Post sampling results (approximate sample locations (107 through 112) shown on **Figure 1**) revealed that contaminant concentrations still exceeded soil cleanup target levels. It was agreed that additional treatment would be required. DTI and RSV designed a three phase application for the remaining identified soil contamination. This report will serve as the Final report detailing activities conducted during the three phased injection events. The work plan called for injecting two areas one inside of the building and one outside of the building along the back wall of the facility.

Upon completion of the remedial work, the injection points were sealed and the site restored to a condition to that found prior to implementation.

***DTI's Site Safety program was implemented at the onset of operations and no reportable incidents were suffered.***

**Injection Work:**

On November 17, 2009, DTI personnel mobilized to the site and met with an RSV representative. DTI personnel staged the injection equipment and laid out the injection points (IPs) located outside of the building. The outside application was focused on the area displaying the highest soil concentrations as depicted on the enclosed **Figure 2**. A total of fourteen (14) IPs were conducted. Each IP location was injected at two and at four feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 448 gallons of *Cool-Ox*™ reagent was injected in the outside area as depicted on **Figure 2**.

On the afternoon of November 17, 2009 DTI personnel laid out the IPs for the treatment of the inside area. The enclosed **Figure 1** shows the approximate locations of the soil samples utilized to define the inside area requiring treatment. A total of fifteen (15) IPs were conducted. Each IP location was injected at two and at four feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 480 gallons of *Cool-Ox*™ reagent was injected in the inside area as depicted on **Figure 3**.

On March 8, 2010, DTI personnel mobilized to the site and met with an RSV representative. DTI personnel staged the injection equipment and laid out the IPs located outside of the building. A total of fourteen (14) IPs were conducted. Each IP location was injected at six and at eight feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 448 gallons of *Cool-Ox*™ reagent was injected in the outside area as depicted on **Figure 2**.

On the afternoon of March 8, 2010, DTI personnel laid out the IPs for the treatment of the inside area. A total of fifteen (15) IPs were conducted. Each IP location was injected at six and at eight feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 480 gallons of *Cool-Ox*™ reagent was injected in the inside area as depicted on **Figure 3**.

On June 20, 2010, DTI personnel mobilized to the site and met with an RSV representative. DTI personnel staged the injection equipment and laid out the IPs located outside of the building. A total of fourteen (14) IPs were conducted. Each IP location was injected at three and at five feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 448 gallons of *Cool-Ox*™ reagent was injected in the outside area as depicted on **Figure 2**.

On the afternoon of June 20, 2010, DTI personnel laid out the IPs for the treatment of the inside area. A total of fifteen (15) IPs were conducted. Each IP location was injected at three and at five feet below land surface receiving a total of ~32 gallons of *Cool-Ox*™ reagent (~16 gallons at each vertical). A total of 480 gallons of *Cool-Ox*™ reagent was injected in the inside area as depicted on **Figure 3**.

A total of ~2,784 gallons of *Cool-Ox*™ reagent was applied at the site, as described above, during the three injection events.

**Summary:**

The inside and outside areas were treated utilizing an approximate four foot injection point spacing layout. DTI conducted a total of 87 IPs at the facility over the three events. The injected vertical interval was from two to eight (plus) feet below land surface. The expression of reagent to ground surface, referred to as day lighting did occur during each event, but appeared to decrease over the course of applications.

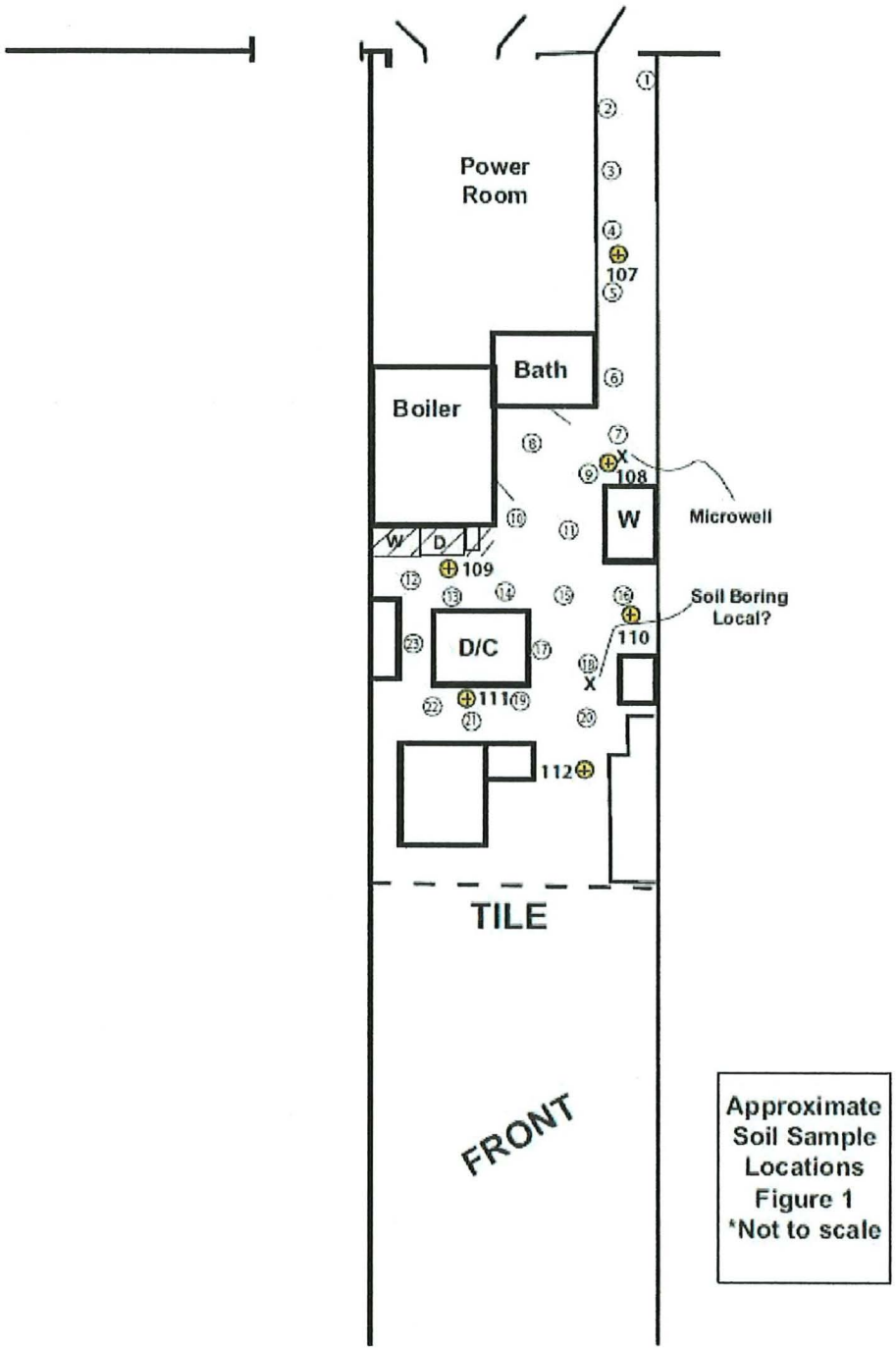
**Conclusions:**

DTI believes, that in the treatment areas, significant reductions of contaminants in the soil and groundwater will be accomplished. DTI believes that the subsequent biological activity associated with all Cool-Ox™ injections will produce on-going remedial activity. DTI's Site Safety program was implemented at the onset of operations and no reportable incidents were suffered.

Sincerely,

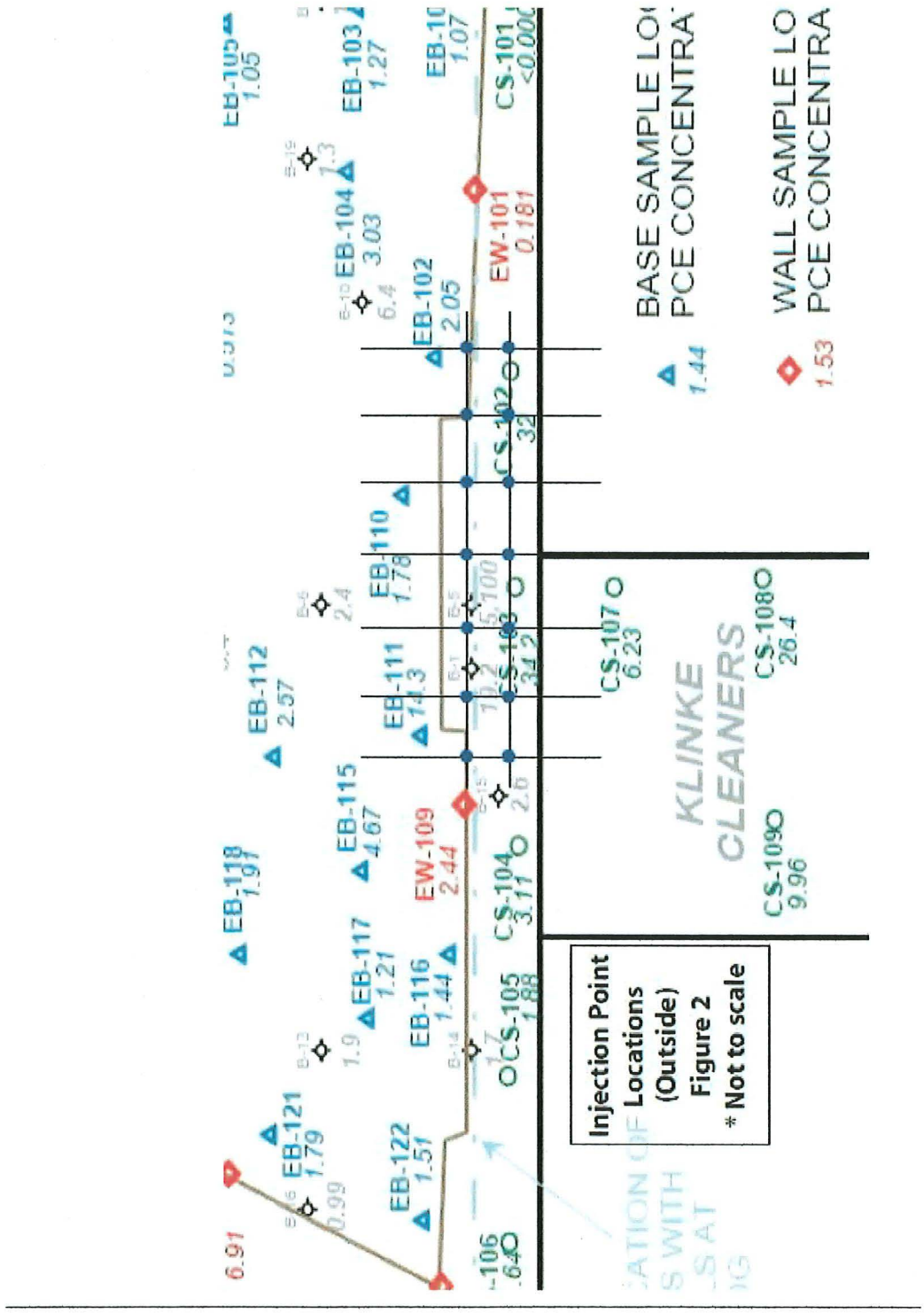
Wesley F. Wiley, P.G.
DeepEarth Technologies, Inc.
12635 South Kroll Drive
Alsip, IL 60803
(direct) 850-206-3260
wwiley@cool-ox.com

# Figure 1


Power Room
Bath
Boiler
W
D
D/C
107
108
109
110
111
112
Microwell
Soil Boring Local?
TILE
FRONT
Approximate Soil Sample Locations Figure 1
*Not to scale

Cool-Ox™

# Figure 2



Cool-Ox™

## Figure 3