PCE REMEDIATION, VOPAK TERMINAL SAVANNAH, SAVANNAH, GEORGIA

REVISED VRP APPLICATION

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1

1 INTRODUCTION

The Vopak Terminal Savannah (VOPAK), in Savannah, Georgia is located on land leased from Georgia Ports Authority. Prior to VOPAK's acquisition in 1992, the terminal was operated by Paktank Corporation.

The site is subject of a tetrachloroethene or perchloroethene (PCE) release. Over the years, the PCE has degraded into other dissolved chlorinated volatile organic compounds (CVOCs). The site is currently listed on the State of Georgia Hazardous Site Response Act (HSRA) site inventory as Site Number 10464, Paktank Corporation – Savannah Terminal (now known as VOPAK).

VOPAK is currently addressing the PCE release under consent order No. EPD-HSR-384 issued by the Georgia Environmental Protection Division (EPD). The consent order involved implementation of an approved corrective action plan (CAP) (ERM, 2005). The CAP projected a 20-year cleanup time period.

This application to the EPD's Voluntary Remediation Program (VRP) was prepared to define a pathway for conducting remediation in a more effective and timely manner. Once approved, the VRP standards will supersede the CAP requirements. The completed VPR Application form and checklist is in Attachment A.

The following sections address the elements of the VRP application criteria. The material used in preparing this application was primarily derived from activities performed in compliance with the EPD approved CAP.

1.1 SITE LOCATION AND DESCRIPTION

The physical site address is the Georgia Ports Authority Gate No. 2 on Turner and Hart Street, Garden City, Savannah, Georgia. The site, located in Chatham County, has operated as a bulk storage facility since 1951. Historically the terminal stored various fuels and chemicals. The area surrounding the site consists of a latex products storage facility to the north, an asphalt roofing materials manufacturing facility and the Savannah River to the east, and the Georgia Port Authority container storage facility to the west. Figure 1-1 depicts the site location. The warranty deed for the site is located in Attachment B. The tax plats of the site are located in Attachment C.

1.2 SITE HYDROGEOLOGY

According to the CAP, the site is underlain by silty sands and clays to a depth of approximately 17 feet below ground surface (bgs). Two geologic cross-sections from the CAP illustrate the subsurface. Figure 1-2 depicts the cross section traces in plan view. Cross Section A-A' (Figure 1-3) extends south to north and Cross Section B-B' (Figure 1-4) extends east to west. Based on historical gauging data, depth to groundwater ranges approximately from 4 to 11 feet below ground surface. A groundwater potentiometric surface map (Figure 1-5), prepared by ERM for the recent CAP annual report (ERM, 2010), indicates a northerly to northeasterly direction of ground water flow at the site.

Estimates of the hydraulic gradient at the site ranges from 0.0145 to 0.0133. Hydraulic conductivity was determined to range from 3.09 x 10-4 cm/sec to 4.31 x 10-5 cm/sec, and the estimated seepage velocity to be approximately 21 to 23 feet per year (CAP).

1.3 COC & DELINEATION STANDARDS

The primary contaminants of concern (COC) at the site are CVOCs. As discussed in Section 2.1, the PCE released at the site has degraded into other CVOCs. Additionally, VOPAK is currently investigating historic volatile organic compounds (VOC) discovered at the site. The delineation standards for soil and groundwater are listed in Tables 1-1 and 1-2.

1.4 RISK REDUCTION STANDARDS

In accordance with EPD rules, VOPAK developed Type 3 risk reduction standards (RRS) for soil and Type 4 RRS for groundwater as delineation standards. According to ERM, EPD approved both standards for the site (ERM, 2002).

1.4.1 RRS for Soil

In 2003, VOPAK developed Type 4 RRS for soils (ERM, 2003). After successive iterations, between 2003 and 2004, EPD approved the final RRS for soils. VOPAK utilized the soil RRS to delineate the horizontal and vertical extent of soil contamination. As discussed in section 3.1, VOPAK remediated soils that exceeded the soil delineation standards. All source material exceeding the soil delineation standards was therefore removed from the site.

1.4.2 RRS for Groundwater

In 2005, EPD approved revised Type 3/4 RRS for groundwater (EPD, 2005). Table 1-3 lists the current RRS approved in the CAP. Subsequently, VOPAK initiated a groundwater remediation program as discussed in Section 3.2.

SECTION

2

2 SITE CONCEPTUAL MODEL

A Site Conceptual Model (SCM), also known as Conceptual Site Model, is a summary of the site condition as it pertains to a contaminant release. Typically, the model defines release sources, extent of the plume, likely fate and transport mechanisms, potential exposure pathways, and potential receptors that could be impacted. This information serves as an important tool in developing site remedies. The following sections provide a preliminary SCM based on available site data. As additional knowledge is gained, during the implementation of the VRP, VOPAK will further refine the SCM.

2.1 RELEASE SOURCES

2.1.1 PCE Release

PCE was stored in Tank 24 during the period December 1972 through April 1975 (CAP). In 1996, a PCE release was discovered in the vicinity of Tank 24. Since no PCE has been stored at the site since 1975, the release was attributed to previous terminal operations. Subsequently, the site's previous owners and VOPAK have conducted various investigatory and remedial activities per the EPD, including source removal.

Due to natural attenuation, the PCE has degraded into trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC). Therefore, both PCE and these daughter products are the main chemicals of concern at the facility. All four of these chemicals are CVOCs. Table 2-1 lists the analytical results of CVOCs monitored during the period Feb 1991 through September 2009.

2.1.2 BTEX Release

Based on the recent annual CAP report (ERM, 2010), it is apparent that certain VOCs consisting of benzene, toluene, ethylbenzene, and xylenes (BTEX) have been consistently detected in certain monitoring wells at the site. The BTEX analytical results monitored for the period from December 1998 through September 2009 from the recent CAP annual report are presented in Table 2-2.

To determine the source of the BTEX, VOPAK reviewed the historic data collected at the site. A brief summary of this review is included in Attachment D. Based on the review, it is clear that three well-defined dissolved BTEX plumes were identified back in 1996. The first plume was located within the same foot-print as the current PCE plume. The second BTEX plume, located to the west of the first plume, was separated by a distance of more than 1,000 feet. A smaller third BTEX plume was located approximately 400 feet to the north west of the second plume. The sources of these plumes were not apparent from the available documents.

On January 12, 1999, a major diesel release took place from AST 22 that resulted in LPH accumulations at the second and third plumes. VOPAK is currently performing diesel remediation in these areas in compliance with EPD requirements specified by the Watershed Protection Branch.

2.2 EXTENT OF PCE PLUME

2.2.1 Soil Delineation

Soil contamination resulting from the PCE release was delineated during the period from 2001 to 2006. A review of the analytical results from this activity indicated that BTEX concentrations were also delineated within the area impacted by PCE release. As discussed in Section 3.1, soil excavation within the PCE footprint met RRS standards for both CVOCs and BTEX concentrations.

2.2.2 Groundwater Delineation

Chlorinated Volatile Organic Compounds

Figures 2-1 through 2-4 illustrate the horizontal extent of the dissolved CVOCs relative to the groundwater delineation concentrations listed in Table 1-2. In reviewing the figures, it appears that the dissolved CVOC plume is confined to a relatively small area within the tank farm where the original PCE release took place. Referring to the historic data, it is apparent that the CVOC plume has remained stable in this area. VOPAK is currently evaluating both the horizontal and vertical extent of the CVOCs plume.

Dissolved CVOC concentrations of PCE, TCE, 1,2-DCE, and vinyl chloride currently meet the established RRSs in the CAP in all but seven wells, namely PAN-MW-9, LAW-PZ-8, MW-16, MW-22/22R, MW-24/24R, MW-26/26R, and MW-29. Referring to Table 2-1, the following observations of groundwater RRS exceedences are noted:

- CVOC concentrations in LAW-PZ-8, MW-22/22R, and MW-29 currently exceed the RRSs for PCE, TCE, 1,2-DCE, and vinyl chloride
- Concentrations in PAN-MW-9 and MW-24/24R currently meet all the RRS except for PCE, TCE, and vinyl chloride
- Concentrations in MW-16 and MW-26/26R meet all the RRS except for vinyl chloride

- The PCE concentration in LAW-PZ-8, that was 70 ppb in October 2003, increased to 300 ppb in October 2006, and has fluctuated between 99 and 570 ppb between October 2006 and September 2009. Similarly, the PCE concentration, in MW-24/24R, that was 97 ppb in October 2003, increased to as high as 1,300 ppb in June 2006, however it has decreased to 93 ppb.
- The PCE concentrations in MW-22/22R are the highest of the sampled wells at 3,000 ppb.

<u>BTEX</u>

Figures 2-5 through 2-8 illustrate the horizontal extent of BTEX concentrations, within the PCE foot-print, relative to the groundwater delineation concentrations listed in Table 1-2. Similar to the dissolved CVOCs, the dissolved BTEX plume in the PCE footprint also appears confined to a relatively small area within the tank farm where the original PCE release took place. Referring to the historic data, (Attachment D), it is apparent that the BTEX concentrations have significantly reduced in this area. VOPAK is currently evaluating both the horizontal and vertical extent of the dissolved BTEX plumes, in the area to the west of the PCE plume, under a separate program regulated by the EPD's Watershed Protection Branch.

2.3 FATE & TRANSPORT

The main purpose of determining potential exposure pathways is to assess the migration potential of the released COC in a multimedia setting. Based on such an assessment, it is possible to establish potential exposure levels, critical in establishing risk-based screening and cleanup goals.

It would be expected that the released COCs at the site are subject to the following mechanisms:

- Physical separation of released product into gas and other states of matter due to sorption, solubility and other equilibrium reactions.
- Advection referring to bulk movement of the immiscible liquid.
- Dispersion involving horizontal and vertical spreading of partitioned constituents.
- Diffusion consisting of spreading from concentration gradients.
- Biodegradation by native microorganisms along the migration pathway.
- Other attenuation processes that reduce the concentrations with time and distance.

The PCE release was terminated upon discovery and has not been stored at the site since 1975. According to the 2005 CAP, there are two main transport mechanisms of exposure occurring at the site. These included leachate from contaminated soils that act as source material and transport of leachate in the groundwater medium. However, leachate is no longer a concern at the VOPAK site, because the contaminated soil was excavated in 2006 (EPD, 2006). As such, at this site, the primary mechanisms affecting the exposure pathways of COCs are advection, dispersion, diffusion, and biodegradation.

2.4 MIGRATION PATHWAYS

Based on previous investigations, it is apparent that dissolved VOCs are the primary COC. The following sections outline both the CVOCs and VOCs that are currently under investigation.

2.4.1 CVOC Migration Potential

Typically, dissolved contaminants tend to move with the groundwater flow. Consequently, the peak plume would be subject to a migration consistent with seepage velocity. The PCE plume, illustrated in the sequential maps in Figure 2-9 has not migrated in the direction of ground water flow. Referring to Figure 2-9, however, it is apparent that the peak plume has remained stable in the vicinity of Tanks 32 and 34. As such, there appears to be no immediate down-gradient receptors of contaminated groundwater adjacent to the site. Further evaluation of the trends of the target contaminants will be conducted as described in the projected milestone schedule (Section 5).

2.4.2 VOC Migration Potential

Volatile organic compounds primarily composed of BTEX constituents are present within the PCE plume foot-print primarily in wells PAN-MW-9 and LAW-PZ-8/8R (ERM, 2010) and, as such, would likely be subject to similar hydrodynamic mechanisms as those that affect the PCE plume. VOPAK is currently evaluating the VOC migration potential of BTEX in the remaining areas. The results from a property-wide groundwater sampling event from all site wells will be utilized to identify potential source(s) and migration potential.

2.5 POTENTIAL RECEPTORS

2.5.1 Human Health Receptors

Since all contaminated soil that exceeded the RRS was excavated in 2006, as discussed in Section 3.1, subsurface soil is neither a concern to VOPAK employees nor to construction workers at the site. Consequently, only groundwater contamination presents potential human exposure at the site. When addressing groundwater exposure receptors, the 2005 CAP states, "Because the site and surrounding area are served by a municipal water supply system, groundwater from the surficial aquifer is not being used for human consumption. VOPAK will also ensure that any construction works conducted within the area covering contaminated groundwater will be limited to the extent of the vadose zone. Therefore, human exposure to contaminated ground water is an unlikely exposure pathway" (CAP). The CAP also states that there are no private wells within a two-mile radius of the VOPAK Terminal site.

2.5.2 Ecological Receptors

According to the 2005 CAP, the VOPAK Savannah site was reviewed by the Georgia Natural Heritage Program (GNHP) to identify potential ecological receptors that may be impacted from contamination levels at VOPAK. GNHP found no rare, imperiled, and critically imperiled plant and animal species at the site. Due to its entity as an industrial facility, VOPAK does not provide habitat for plants or animals. In addition, wetlands are not of concern at the VOPAK site. According to the 2005 CAP, "With the exception of drainage ditches and other man-made depressions, no wetland-like areas were observed on the site" (CAP).

2.6 OTHER PATHWAYS

As discussed in Section 2.4, groundwater is the primary pathway for migration of COCs is the primary pathway at this site. Upon completion of the horizontal and vertical delineation of COCs, proposed in this VRP, potential for migration through other media such as surface water, air, soil, and sediment will be evaluated. Figure 2-10 illustrates potential pathways through which the COCs can migrate. VOPAK will in particular evaluate the vapor intrusion potential to ensure that terminal personnel, contactors are not at risk of exposure.

2.7 MODEL LIMITATIONS

The preliminary SCM, outlined in Section 2, describes the site condition based on available site data. During the VRP process, VOPAK will calibrate the SCM based on additional findings.

If sufficient data is available, a three-dimensional rendering of the contaminant plume can be developed. Considering that the data pertaining to horizontal and vertical delineation were obtained from different monitoring dates, such a rendering was impractical for this site. VOPAK, however, included two-dimensional rendering of horizontal and vertical delineation in Section 2.2.

SECTION

3

3 CURRENT REMEDY

In 2003, VOPAK entered into a consent order with EPD to address soil and groundwater remediation. In 2005, EPD approved a CAP which included two important action items. The first action entailed prompt removal of the remaining source area contaminated soil to RRS standards. The second action entailed implementation of a groundwater remediation program to address dissolved CVOCs that were above RRS. The following sections summarize the soil and groundwater corrective actions.

3.1 SOIL REMEDIATION

According to the Final Soil Removal Closure Report and Compliance Status Report (CSR) Addendum (ERM, 2006), soil contaminated with CVOCs was successively removed from the site during three separate events in 2003, 2005, and 2006.

In May and June of 2003, approximately 54 cubic yards of soil was removed from a 320 square feet area along the northeast side of a containment dike with backhoe equipment around Tanks 23 through Tank 52. Soil samples collected after the excavation indicated that additional excavation was needed, as soils above RRS remained.

From January through March of 2005, approximately 1,950 tons of soil was removed from 180 linear feet of containment dike and 300 linear feet of drainage swale/railroad (paralleling the containment dike) along the northeast side and inside of the containment dike. Soil was excavated using both hand and machine methods to the depth of the water table, a depth ranging from 3 to 5 feet. Excavation was stopped where sidewall confirmation samples indicated that RRSs were met. A total of 18.5 tons of soil was sent to the Waste Management facility in Emelle, Alabama as hazardous waste and the remaining 1,931.5 tons was delivered to the Waste Management Superior Landfill in Savannah, Georgia.

In April 2006, approximately 108 tons of soil was removed from a 35-feet excavation along another railroad at a loading rack south of Tank 24. Much of the soil to the depth of the water table was excavated by hand due to presence of product lines and electrical conduits. The soil was delivered to the Waste Management Superior Landfill in Savannah, Georgia.

Upon completion of the 2006 soil removal activities, VOPAK submitted a report documenting the site activities. In a letter dated August 31, 2006, EPD concluded that soil at the site met the established RRS (EPD, 2006).

Analytical results from the confirmation samples obtained from PCE soil cleanup indicates that the cleanup also resulted in removal of BTEX contaminated soils since it was present within the same footprint as the PCE release. Therefore, RRS standards were achieved for BTEX concentrations at this location.

Soil remediation of both CVOC and BTEX concentrations are therefore complete in the PCE footprint.

3.2 GROUNDWATER REMEDIATION

The CAP established a 20-year schedule to remediate the groundwater contaminated with CVOCs (CAP). The groundwater remediation entailed enhanced bioremediation with natural attenuation. In May of 2006, VOPAK initiated the groundwater remediation program which entailed periodic injection of sodium, ethyl lactate, soybean oil, and pH buffer into 18 injection wells. The purpose of the injection program was to enhance reductive dechlorination of PCE. The injections were performed under an Underground Injection Control (UIC) Permit R-262, dated April 18, 2006, that is set to expire on April 18, 2011 (ERM, 2010). Currently the injections are conducted semi-annually.

3.3 PERFORMANCE OF THE GROUNDWATER REMEDIATION PROGRAM

The current groundwater remediation program entails enhanced bioremediation with natural attenuation to reduce the target contaminants. The recent annual CAP report (ERM, 2010) presents the results of the enhanced natural attenuation program. During the attenuation program, groundwater samples were collected from monitoring wells located within and outside the plume boundary. Analytical results from the samples are tabulated in Tables 2-1 and 2-2.

3.3.1 Bioremediation Rates

A table in ERM's CAP third annual report (ERM, 2010) claimed a 27% to 97% decrease in target contaminants. A closer examination of the data, however, indicates that the concentrations have fluctuated up and down since chemical injection was initiated. For instance, as shown in Figure 3-1, the PCE concentrations in PAN-MW-9 reduced from 14,000 to 80 ppb (a 99% decrease) between February 1991 and August 2005 from natural attenuation prior to an enhanced remedial approach. Subsequently, during the full-scale injection of chemicals, designed for enhance attenuation, the PCE actually increased to as high as 1,900 ppb, reversing the decreasing trend. A similar trend was observed in MW-22/22R (Figure 3-2) and MW-24/24R (Figure 3-3) in the vicinity. Also, as noted in the third annual report, both the pH and the oxygen reduction potential (ORP) values in several wells within the plume have transformed to unfavorable levels indicating that the current remedial approach is ineffective at the site.

3.3.2 Indicator Parameters

Table 3-1 presents data of indicator parameters that serve as a reference to evaluate biodegradation potential of PCE over time. In reviewing the table, it is clear that the injection program was unable to maintain optimum pH (greater than 5), dissolved oxygen (DO) (less than 2 mg/L), and ORP (less than 0) levels that would favor reductive dechlorination. In a letter dated November 12, 2009, EPD recognized that the indicator parameters were unfavorable (EPD, 2009).

3.3.3 Statistical Analysis of PCE Trends

A Mann-Kendall test was performed on all monitoring wells to determine whether PCE concentrations were increasing or decreasing over time based on 80% and 90% levels of confidence. At both confidence levels, PCE was found to be decreasing or with no trend – indicating that the plume remained stable (ERM, 2010).

3.3.4 Plume Stability

Typically, dissolved contaminants tend to move with the groundwater flow. Considering that the groundwater seepage velocity is between 21 to 23 feet per year (CAP), it is interesting to note that the peak PCE plume illustrated in the sequential maps (Figure 2-9) has not migrated in the direction of ground water flow. The peak plume, therefore, appears to be stable and contained in the vicinity of Tanks 32 and 34.

3.4 FEASIBILITY OF CONTINUING THE CURRENT INJECTION PROGRAM

Based on the findings from Section 3.3, it appears that the current injection program is actually producing results that are counterproductive to bioremediation process. By contrast, as discussed in the aforementioned paragraph, the target contaminants had naturally attenuated prior to ERM's injection events. It is unclear whether the aerobic or anaerobic processes were the dominant attenuation force at the site. Even if the right environment is identified, lack of technology to deliver injected material to targeted zones presents significant challenges in enhanced attenuation. Nonetheless, attempts to create anaerobic environments when the subsurface is more conducive to aerobic environments and vice-versa lead to unexpected results.

In reviewing the comment letters in response to various progress reports prepared by the current site engineer, it is apparent that EPD has also raised numerous concerns about the effectiveness of the current remedial approach. Consequently, VOPAK does not recognize value in staying the current course for the next 20 years. VOPAK therefore recommends termination of the current injection program.

3.5 FEASIBILITY OF USING CHEMICAL OXIDATION AS AN ALTERNATIVE

Referring to Appendix I of the CAP, it is apparent that the 2001 chemical oxidation treatability study, was unable to demonstrate whether chemical oxidation would be successful at the site, due to certain sample preparation errors (ERM 2005). Furthermore, potassium permanganate can potentially sterilize the subsurface thereby retarding the natural bioremediation mechanisms that have been historically demonstrated at the site. In a letter dated February 13, 2004, EPD concurs that chemical oxidation is counterproductive to bioremediation (EPD, 2004). Consequently, VOPAK has developed a proposed action as outlined in Section 4.

SECTION 4

4 PROPOSED ACTION

Clearly, VOPAK has remediated all soil contamination that exceeded the RRS. Considering that the mass source material was removed in the form of soil excavation, the dissolved contamination in the groundwater is the primary media to be addressed. Also, based on VOPAK's evaluation (Section 3.3.1), natural attenuation had reduced the target contaminant levels in the groundwater at PAN-MW-9 by as much as 99%. After the injection program was initiated, however, the levels fluctuated to the extent that the PCE level rose to 1,900 ppb, reversing the decreasing trend. In addition, the current CAP requires VOPAK to meet the most stringent drinking water standards, which places an undue burden for an industrial site. It is therefore clear that an alternative course of action is necessary to address the prevailing groundwater contamination.

4.1 REMEDIAL STRATEGY

The prevailing enhance attenuation-based remedial program, involving chemical injection for reductive dechlorination, has been only partially successful. It appears that the primary impediment was lack of definition on whether aerobic, anaerobic, or facultative anaerobes were the driving forces in attenuating the COCs at the site. According to EPD, anaerobic enhancements have been ineffective in the coastal plain areas of Georgia (EPD, 2005). It is also possible that chemical amendments were unsustainable.

As evidenced by historic PCE degradation, in-situ bioremediation, and natural attenuation of CVOCs was apparent prior to the chemical injection events used for enhanced bioremediation. Additionally, the groundwater plume appears to be stable and contained. Similarly, VOPAK, therefore, believes that monitored natural attenuation (MNA) would be the most practical and cost-effective remedial strategy. VOPAK will utilize certain performance metrics to verify the effectiveness of MNA as the best remedial strategy. If the CVOC trends indicate an unacceptable time frame to reach remedial end points, during MNA implementation, VOPAK will implement contingency measures.

4.2 PROPOSED ACTION

The VRP encourages cost-effective allocation of limited resources to meet remedial objectives. In accordance with these objectives, VOPAK has developed the following conceptual remedial strategy.

1. Terminate the current injection program.
2. Perform a site-wide groundwater sampling event for COC analysis from wells located both within the PCE foot-print as well as wells located to the west that were historically used for BTEX monitoring.
3. Utilizing MNA as an interim remedial program, monitor the groundwater contaminants for a period of two years to reestablish the natural attenuation that was well in progress prior to injection activities.
4. In concurrence with EPD, VOPAK will select a fate and transport model to evaluate the effectiveness of the MNA program and compliance with site-specific RRS.
5. Based on the observed trends, VOPAK can make further decisions to continue with natural attenuation to reach remedial end points or utilize other enhanced techniques.
6. If enhancement is required, VOPAK will develop a microcosm test to evaluate the role of facultative anaerobes or other limiting factors. VOPAK can then implement alternative techniques to reach remedial end points within a period of 3 to 5 years as mandated by the EPD.

4.3 PERFORMANCE METRICS

To determine the effectiveness of the selected remedy, VOPAK will periodically perform a two-dimensional concentration/time analysis of the data from MNA monitoring and indicator parameters to address the following performance metrics:

- Is the plume stable or shrinking?
- Is the contaminant flux meeting remedial goals and is sustainable?
- Is the prevailing remedy cost-effective?
- What is the projected time frame to reach remedial end points?

4.3.1 MNA Monitoring

Wells within the contaminant plume will be utilized for MNA monitoring during the course of the VRP. These include wells currently utilized for MNA (MW-17/17R, MW-18/18R, PAN-MW-9, and MW-22/22R) and "performance monitoring wells" that include shallow wells PAN-MW-10, MW-16, MW-19, MW-23, MW-24/24R, MW-25, MW-26/26R, MW-27, and deep well MW-15. The deep monitor well MW-14 and shallow monitoring wells MW-20, MW-21, and MW-28, previously utilized for monitoring purposes, were determined to be "no longer present" based on a recent well inventory. As such, VOPAK will repair/re-drill monitoring wells MW-20, MW-21, and MW-28 for MNA/performance monitoring. Existing monitoring wells LAW-PZ-8 and MW-29, previously not utilized, will be added for MNA/performance monitoring. Samples will be analyzed for VOCs and CVOCs. MNA sampling will be conducted as follows:

1. Samples will be collected from the wells on a quarterly basis.

2. Samples will be collected utilizing established low-flow sampling techniques.

4.3.2 Indicator Parameters

In addition to CVOC trend analysis, other indicator parameters such as pH, DO, ORP, and other inorganic parameters serve as important metrics in determining the change in site conditions and the effectiveness of the MNA program. Typically, data obtained from down-hole monitoring devices provide greater accuracy in defining such parameters than those obtained from traditional grab samples. As such, VOPAK plans to utilize down-hole data-logger devices in at least two wells to collect data on temperature, pH, DO, ORP, and conductivity. Because down-hole data loggers are greater than 1 inch in diameter, wells that are at least 2-inches in diameter are required. As such, VOPAK has selected PAN MW-9 (located within the plume) as a primary well and PAN MW-10 (located outside the plume) as a control well.

4.3.3 Fate and Transport Model

A two-dimensional analysis of contaminant trends and indicator parameters trends will be used to demonstrate whether the site is meeting the performance metrics. In addition, VOPAK will utilize a three-dimensional fate and transport model to evaluate the effect of dispersion, advection, sorption, and biodegradation. If the analysis is insufficient in addressing the performance metrics, VOPAK will consider statistical analysis to determine the performance metrics. If these tools indicate that the prevailing remedial strategy is unable to meet the performance metrics, contingency tasks will be initiated to develop an appropriate remedy.

4.3.4 Supplemental Data

After the horizontal and vertical delineation of the dissolved COCs is complete, VOPAK will consider collecting supplemental data from compound specific isotope analysis (CSIA), enzyme activity probes (EAP), or down-hole implants to demonstrate multiple lines of evidence on rates of degradation.

4.4 CONTINGENCY PLANNING

Since the groundwater contaminant plume is relatively stable, it appears that bioremediation may be a dominant natural attenuation mechanism at the site. If the performance metrics indicate that in-situ bioremediation alone is unable to attenuate the dissolved CVOCs, within a reasonable time frame, VOPAK will conduct a microcosm test to verify if enhancement is feasible. If enhancement is unfeasible and the contaminant plume is expanding beyond the point of demonstration, VOPAK will develop an alternative remedial strategy for EPD's approval.

4.5 UPDATED RRS

During the preparation of the VRP application, VOPAK computed Type 4 risk RRSs for groundwater based on non-residential properties using EPA's Risk Assessment Guidance for Superfund (RAGS) equations 1 and 2, in conformance with Georgia EPD Rule 391-3-19. In calculating RRS, VOPAK utilized the current COC associated with the PCE release and the latest regional screening level values (RSL) data published by the U.S. Environmental Protection Agency (EPA) in May 2010.

Table 4-1 presents the revised Type 4 RRS values and compares them with the current RRS values for both CVOCs and aromatic hydrocarbons based on the latest toxicity factors. Tables 4-2 through 4-5 include backup computations used in developing the revised Type 4 RRS values listed in Table 4-1. The revised RRS values will be used as groundwater standards in this VRP.

4.6 PROJECT CLOSURE

Upon completion of remedial activities, VOPAK will submit to the EPD a CSR establishing that the remedial endpoint was reached as per the VRP, and certify that the property is in compliance with the remedial standards. VOPAK understands that, at any time before the CSR is submitted, the EPD can terminate VOPAK's enrollment in the VRP, if the EPD determines that VOPAK failed to properly follow the Voluntary Remediation Plan requirements, or, that continued enrollment will lead to an "imminent or substantial danger to human health and the environment." If the EPD determines that the CSR is compliant with the "provisions, purposes, standards, and policies" of the VRP, the EPD will deem the site to be compliant with groundwater RRS.

SECTION

5

5 PROJECTED SCHEDULE

To accomplish the proposed corrective action tasks, EIC has developed a 4-Step milestone schedule. Figure 5-1 presents a Gantt Chart for VOPAK's Projected Milestone Schedule.

5.1 STEP 1 – MNA CALIBRATION

Within the first 12 months of participation in the program, VOPAK will conduct the following:

- Referring to the COCs, listed in Table 1-2, complete horizontal delineation of all COCs within the site during the first 12 months. Also conduct vertical delineation within 30 months. Based on historic data, off-site delineation is not required.
- Update all relevant Tables and Figures from CAP Annual Report with the most current data.
- Re-evaluate RRS values, based on site-specific risk factors.
- Conduct an investigation to identify the source(s) of BTEX contamination.
- Using down-hole data loggers evaluate the tidal and meteorological effects on groundwater levels in on-site wells.
- Using down-hole monitoring instrument collect in situ data on indicator parameters.
- Conduct Monitored Natural Attenuation sampling
- Analyze data collected, determine trends, refine horizontal and vertical delineation of the contaminant plume, and prepare reports to determine the most effective strategy for VOPAK to reach its remedial goals within a three to five year timeframe.
- Rehabilitate selected missing or damaged wells.
- Submit reports to the EPD following the VRP reporting requirements and the Projected Milestone Schedule.

5.2 STEP 2 – MNA TREND ANALYSIS

Within the first 24 months of participation in the program, VOPAK will conduct the following:

- Utilizing the MNA monitoring data, evaluate trends to determine if the CVOCs are progressively reducing such that the RRS will be met in a reasonable time frame.
- In concurrence with EPD, select a fate and transport model to evaluate compliance with site-specific RRS.
- If the site data concludes that MNA would be unable to reach remedial end points within the projected 60-month time schedule, implement contingency remedy.

5.3 STEP 3 – MNA CONFIRMATION

Within the first 30 months of participation in the program, VOPAK will conduct the following:

- Update the site conceptual model with information gained in Steps 1 and 2.
- If MNA appears unfeasible in meeting projected remedial goals, conduct a microcosm test to determine enhancements to increase the biodegradation potential of CVOCs. The results of the microcosm test may also lead to other alternative remedial technologies to reach remedial end points.
- Finalize the remediation plan.
- Provide a preliminary cost estimate for implementing remediation and associated tasks

5.4 STEP 4 - VRP CLOSURE

Within the first 60 months of participation in the program, VOPAK will conduct the following:

- Submit a CSR with mandatory certifications.
- Post-closure monitoring program.

SECTION

6

6 REFERENCES

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VRP APPLICATION (Revised)

TABLES

Table 1-1: Site Delineation Concentration Criteria for Soil

Constituents, (µg/L)	CAS No.	Delineation Criteria
Tetrachloroethene	127-18-4	180
Trichloroethene	79-01-6	130
1,2-Dichloroethene (cis)	156-59-2	530
Vinyl chloride	75-01-4	40
Benzene	71-43-2	20
Ethylbenzene	100-41-4	20,000
Toluene	108-88-3	14,400
Xylenes (total)	133-02-07	20,000

Derived from Table 1, App III or Background, or Detection Limit (from GA EPD 391-3-19)

Table 1-2: Site Delineation Concentration Criteria for Groundwater

Constituents, (µg/L)	CAS No.	Delineation Criteria
Tetrachloroethene	127-18-4	5
Trichloroethene	79-01-6	5
1,2-Dichloroethene (cis)	156-59-2	70
Vinyl chloride	75-01-4	2
Benzene	71-43-2	5
Ethylbenzene	100-41-4	700
Toluene	108-88-3	1,000
Xylenes (total)	133-02-07	10,000

Derived from Table 1, App III or Background, or Detection Limit (from GA EPD 391-3-19)

Table 1-3: Current Risk Reduction Standards (RRS) Based on Approved CAP

Constituents	CAS No.	Ground Water, µg/L	
		Non-Residential	
		Type 3	Type 4
Tetrachloroethene	127-18-4	**5**	NC
Trichloroethene	79-01-6	**5**	NC
1,2-Dichloroethene (cis)	156-59-2	None	**1,020**
Vinyl chloride	75-01-4	**2**	NC
Benzene	71-43-2	5	**15**
Ethylbenzene	100-41-4	700	**3,750**
Toluene	108-88-3	1,000	**2,030**
Xylenes (total)	133-02-07	**10,000**	595

Note:
*Applicable RRS Standards are in bold and highlighted.

Table 2-1
Chemical Concentrations of Volatile Organic Compounds in Ground Water Samples (CVOCs) *(Modified from ERM, 2010)*
Vopak
Savannah, GA

	Units	Method	Type 3 or 4 RRS	PAN-MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/ MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-28	MW-29
Tetrachloroethene																						
Feb-91	ug/l	624	5.	14,000.	37.	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-91	ug/l	600		9,200.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-96	ug/l	8260		3,040.	NS	NR	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-97	ug/l	8260		8,100.	10.	50/500	33.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-98	ug/l	8021		7,400.	< 1.	< 1,000.	< 1.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-99	ug/l	8260		NS	< 5.	NS	< 5.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-99	ug/l	8260		9,100.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		8,000.	< 1.	< 250.	< 1.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		9,800.	< 5.	< 1,200.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	8,700.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	400.	< 5.	2,400.	< 5.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260		2,400.	< 5.	NS	< 5.	5.3	< 5.	< 5.	NS	< 5.	< 5.	NS	1,000.	< 5.	97.	NS	300.	< 5.	NS	NI
Oct-03	ug/l	8260		NS	NS	70 J	NS	NS	NS	NS	< 1.	NS	NS	120.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		6,900.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	7,600.	760.	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		3,200.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	7,000.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		6,000.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	7,200.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		1,100.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	5,700.	NS	NS	NS	120.	NS	NS	NI
Aug-05	ug/l	8260		80.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	2,400.	NS	NS	NS	420.	NS	NS	NI
Jun-06	ug/l	8260		1,600.	NS	NS	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	12.	680.	NS	1,300.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		1,500.	NS	300.	< 2.	< 2.	< 2.	< 5.	< 5.	NS	NS	< 2.	2,600.	NS	580.	NS	< 2.	NS	NS	1,500.
Dec-06	ug/l	8260		1,900.	NS	240.	< 2.	12.	< 2.	< 2.	< 2.	NS	NS	< 2.	3,200.	NS	1,100.	NS	6.	NS	NS	NS
Mar-07	ug/l	8260		600.	NS	< 250.	< 5.	< 5.	9.	< 5.	< 5.	NS	NS	< 5.	3,400.	NS	130.	NS	< 5.	NS	NS	NS
Sep-07	ug/l	8260		1,500.	< 2.	240.	< 2.	3.	< 2.	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	62.	< 2.	< 2.	3.	NS	2,300.
May-08	ug/l	8260		510.	NS	380.	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	6,900.	NS	130.	NS	5.	NS	NS	NS
Dec-08	ug/l	8260		540.	NS	570.	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	4,400.	NS	110.	NS	< 5.	NS	NS	NS
Apr-09	ug/l	8260		460.	< 5.	510.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	1,900.	< 5.	93.	< 5.	< 5.	< 5.	NS	1,100.
Sep-09	ug/l	8260		440.	NS	99.	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	3,000.	NS	57.	NS	< 2.	NS	NS	NS
Trichloroethene																						
Feb-91	ug/l	624	5.	350.	< 5.	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-91	ug/l	600		430.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-96	ug/l	8260		< 2,500.	NS	NR	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-97	ug/l	8260		NR	NR	NR	NR	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-98	ug/l	8021		NR	NR	NR	NR	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-99	ug/l	8260		NS	< 5.	NS	< 5.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-99	ug/l	8260		< 1,000.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		360.	< 1.	< 250.	< 1.	NS	< 1.	< 1.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		260J	< 5.	< 1,200.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	900.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	95.	< 5.	100.	< 5.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260		< 500.	< 5.	NS	< 5.	14	< 5.	< 5.	NS	< 5.	< 5.	NS	480.	< 5.	51.	NS	14.	< 5.	NS	NI
Oct-03	ug/l	8260		NS	NS	18 J	NS	NS	NS	NS	< 1.	NS	NS	1.8	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		440.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	700.	2,300.	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		270.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	71.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		360.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 250.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		320.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	220.	NS	NS	NS	8.	NS	NS	NI
Aug-05	ug/l	8260		9.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	47.	NS	NS	NS	22.	NS	NS	NI
Jun-06	ug/l	8260		480.	NS	NS	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	71.	NS	180.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		300.	NS	< 100.	< 2.	< 2.	12.	< 5.	< 5.	NS	NS	< 2.	< 130.	NS	150.	NS	2.	NS	NS	340.
Dec-06	ug/l	8260		640.	NS	72.	< 2.	12.	24.	< 2.	< 2.	NS	NS	< 2.	60.	NS	680.	NS	4.	NS	NS	NS
Mar-07	ug/l	8260		370.	NS	< 250.	< 5.	< 5.	71.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	200.	NS	< 5.	NS	NS	NS
Sep-07	ug/l	8260		450.	< 2.	< 100.	< 2.	4.	< 2.	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	37.	< 2.	< 2.	2.	NS	320.
May-08	ug/l	8260		190.	NS	34.	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	89.	NS	24.	NS	< 2.	NS	NS	NS
Dec-08	ug/l	8260		150.	NS	52.	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	100.	NS	25.	NS	< 5.	NS	NS	NS
Apr-09	ug/l	8260		150.	< 5.	< 250.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	88.	< 5.	22.	< 5.	< 5.	< 5.	NS	320.
Sep-09	ug/l	8260		150.	NS	34.	< 2.	NS	4.1	< 2.	< 2.	NS	NS	NS	88.	NS	20.	NS	< 2.	NS	NS	NS

Table 2-1
Chemical Concentrations of Volatile Organic Compounds in Ground Water Samples (CVOCs) ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

	Units	Method	Type 3 or 4	PAN-MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R
cis,1-2,dichloroethene										
Feb-91	ug/l	624	1,020.	< 5.	< 5.	NS	NS	NS	NI	NI
Jul-91	ug/l	600		< 5.	NS	NS	NS	NS	NI	NI
Jun-96	ug/l	8260		< 2,500.	NS	NR	NS	NS	NI	NI
Sep-97	ug/l	8260		NR	NR	NR	NR	NS	NI	NI
Dec-98	ug/l	8021		NR	NR	NR	NR	NS	NI	NI
Nov-99	ug/l	8260		NS	< 2.	NS	< 2.	NS	NI	NI
Dec-99	ug/l	8260		< 400.	NS	NS	NS	NS	NI	NI
Oct-00	ug/l	8260		130.	< 1.	**1,800.**	< 1.	NS	110.	< 1.
Jun-01	ug/l	8260		100J	< 5.	**3,900.**	< 5.	< 5.	41.	< 5.
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS
Aug-03	ug/l	8260		< 500.	< 5.	NS	< 5.	< 5.	33	< 5.
Oct-03	ug/l	8260		NS	NS	350.	NS	NS	NS	NS
Mar-04	ug/l	8260		300.	NS	NS	NS	NS	NS	< 5.
Jul-04	ug/l	8260		170.	NS	NS	NS	NS	NS	< 5.
Sep-04	ug/l	8260		< 250.	NS	NS	NS	NS	NS	< 5.
May-05	ug/l	8261		220.	NS	NS	NS	NS	NS	NS
Aug-05	ug/l	8260		5.	NS	NS	NS	NS	NS	NS
Jun-06	ug/l	8260		550.	NS	NS	< 5.	< 5.	36.	< 5.
Oct-06	ug/L	8260		990.	NS	**31,000.**	< 2.	< 2.	120.	< 5.
Dec-06	ug/l	8260		600.	NS	**12,000.**	< 2.	4.	120.	< 2.
Mar-07	ug/l	8260		680.	NS	**16,000.**	< 5.	< 5.	320.	< 5.
Sep-07	ug/l	8260		880.	< 2.	**18,000.**	< 2.	3.	260.	< 2.
May-08	ug/l	8260		590.	NS	**6,900.**	< 2.	NS	61.	< 2.
Dec-08	ug/l	8260		500.	NS	**4,600.**	< 5.	NS	60.	< 5.
Apr-09	ug/l	8260		780.	< 5.	< 250.	< 5.	< 5.	78.	< 5.
Sep-09	ug/l	8260		730.	NS	**4,500.**	< 2.	NS	78.	< 2.
trans,1-2,dichloroethene										
Feb-91	ug/l	624	2,040.	< 5.	< 5.	NS	NS	NS	NI	NI
Jul-91	ug/l	600		< 5.	NS	NS	NS	NS	NI	NI
Jun-96	ug/l	8260		NR	NS	NR	NS	NS	NI	NI
Sep-97	ug/l	8260		NR	NS	NR	NR	NS	NI	NI
Dec-98	ug/l	8021		NR	NS	NR	NR	NS	NI	NI
Nov-99	ug/l	8260		NS	< 2.	NS	< 2.	NS	NI	NI
Dec-99	ug/l	8260		< 1,000.	NS	NS	NS	NS	NI	NI
Oct-00	ug/l	8260		< 100.	< 1.	< 250.	< 1.	NS	< 1.	< 1.
Jun-01	ug/l	8260		< 500.	< 5.	< 1,200.	< 5.	< 5.	5.	< 5.
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS
Aug-03	ug/l	8260		< 500.	< 5.	NS	< 5.	< 5.	< 5.	< 5.
Oct-03	ug/l	8260		NS	NS	< 100.	NS	NS	NS	NS
Mar-04	ug/l	8260		< 25.	NS	NS	NS	NS	NS	< 5.
Jul-04	ug/l	8260		< 5.	NS	NS	NS	NS	NS	< 5.
Sep-04	ug/l	8260		< 250.	NS	NS	NS	NS	NS	< 5.
May-05	ug/l	8261		NR	NS	NS	NS	NS	NS	NS
Aug-05	ug/l	8260		NR	NS	NS	NS	NS	NS	NS
Jun-06	ug/l	8260		< 100.	NS	NS	< 5.	< 5.	< 5.	< 5.
Oct-06	ug/L	8260		< 100.	NS	910.	< 2.	< 2.	< 2.	< 5.
Dec-06	ug/l	8260		7.	NS	210.	< 2.	< 2.	3.	< 2.
Mar-07	ug/l	8260		< 100.	NS	< 250.	< 5.	< 5.	< 5.	< 5.
Sep-07	ug/l	8260		< 40.	< 2.	220.	< 2.	< 2.	< 2.	< 2.
May-08	ug/l	8260		< 2.	NS	12.	< 2.	NS	< 2.	< 2.
Dec-08	ug/l	8260		< 5.	NS	25.	< 5.	NS	< 5.	< 5.
Apr-09	ug/l	8260		< 100.	< 5.	< 250.	< 5.	< 5.	< 5.	< 5.
Sep-09	ug/l	8260		< 10.	NS	61.	< 2.	NS	< 2.	< 2.

	Units	Method	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/ MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-28	MW-29
cis,1-2,dichloroethene														
Feb-91	ug/l	624	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-91	ug/l	600	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-96	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-97	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-98	ug/l	8021	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-99	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-99	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260	< 5.	< 5.	< 5.	< 5.	**3,100.**	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260	NS	NS	NS	NS	NS	NS	240.	< 5.	**1,100.**	< 5.	NI	NI
Oct-02	ug/l	8260	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260	NS	< 5.	< 5.	NS	930.	< 5.	100.	NS	180.	< 5.	NS	NI
Oct-03	ug/l	8260	< 1.	NS	NS	< 1.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260	< 5.	NS	NS	NS	**2,300.**	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260	< 5.	NS	NS	NS	310.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260	< 5.	NS	NS	NS	610.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261	NS	NS	NS	< 2.	840.	NS	NS	NS	120.	NS	NS	NI
Aug-05	ug/l	8260	NS	NS	NS	< 5.	240.	NS	NS	NS	210.	NS	NS	NI
Jun-06	ug/l	8260	< 5.	NS	NS	< 5.	**3,300.**	NS	500.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260	< 5.	NS	NS	2.	490.	NS	590.	NS	**2,800.**	NS	NS	**1,500.**
Dec-06	ug/l	8260	< 2.	NS	NS	< 2.	480.	NS	990.	NS	**5,100.**	NS	NS	NS
Mar-07	ug/l	8260	< 5.	NS	NS	< 5.	730.	NS	770.	NS	**2,600.**	NS	NS	NS
Sep-07	ug/l	8260	< 2.	< 2.	NS	< 2.	NS	< 2.	820.	< 2.	240.	350.	NS	**1,700.**
May-08	ug/l	8260	< 2.	NS	NS	NS	930.	NS	82.	NS	410.	NS	NS	NS
Dec-08	ug/l	8260	< 5.	NS	NS	NS	**2,100.**	NS	340.	NS	14.	NS	NS	NS
Apr-09	ug/l	8260	< 5.	< 5.	NS	NS	**1,700.**	< 5.	240.	< 5.	200.	40.	NS	**2,100.**
Sep-09	ug/l	8260	< 2.	NS	NS	NS	**1,000.**	NS	120.	NS	150.	NS	NS	NS
trans,1-2,dichloroethene														
Feb-91	ug/l	624	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-91	ug/l	600	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-96	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-97	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-98	ug/l	8021	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-99	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-99	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260	< 5.	< 5.	< 5.	< 5.	< 500.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260	NS	NS	NS	NS	NS	NS	< 12.	< 5.	1,100.	< 5.	NI	NI
Oct-02	ug/l	8260	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-03	ug/l	8260	NS	NS	< 5.	NS	< 250.	< 5.	< 10.	NS	< 50.	< 5.	NS	NI
Oct-03	ug/l	8260	< 1.	NS	NS		NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260	< 5.	NS	NS	NS	7.	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260	< 5.	NS	NS	< 1.	< 5.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260	< 5.	NS	NS	NS	< 250.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261	NS	NS	NS	NR	NR	NS	NS	NS	NR	NS	NS	NI
Aug-05	ug/l	8260	NS	NS	NS	NR	NR	NS	NS	NS	NR	NS	NS	NI
Jun-06	ug/l	8260	< 5.	NS	NS	< 5.	< 130.	NS	< 5.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260	< 5.	NS	NS	< 2.	< 130.	NS	< 20.	NS	44.	NS	NS	10.
Dec-06	ug/l	8260	< 2.	NS	NS	< 2.	19.	NS	10.	NS	89.	NS	NS	NS
Mar-07	ug/l	8260	< 5.	NS	NS	< 5.	< 130.	NS	9.	NS	24.	NS	NS	NS
Sep-07	ug/l	8260	< 2.	< 2.	NS	< 2.	NS	< 2.	4.	< 2.	3.	< 2.	NS	15.
May-08	ug/l	8260	< 2.	NS	NS	NS	4.	NS	< 2.	NS	< 2.	NS	NS	NS
Dec-08	ug/l	8260	< 5.	NS	NS	NS	6.	NS	< 5.	NS	< 5.	NS	NS	NS
Apr-09	ug/l	8260	< 5.	< 5.	NS	NS	12.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	16.
Sep-09	ug/l	8260	< 2.	NS	NS	NS	8.2	NS	< 2.	NS	< 2.	NS	NS	NS

Table 2-1
Chemical Concentrations of Volatile Organic Compounds in Ground Water Samples (CVOCs) ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

	Units	Method	Type 3 or 4	PAN-MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/ MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-28	MW-29
Vinyl Chloride																						
Feb-91	ug/l	624	2.	< 30.	< 30.	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul-91	ug/l	600		< 30.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-96	ug/l	8260		< 2,500.	NS	NR	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Sep-97	ug/l	8260		< 500.	< 5.	**350/< 500**	< 5.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-98	ug/l	8021		< 250.	< 1.	< 1,000.	< 1.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Nov-99	ug/l	8260		NS	< 2.	NS	< 2.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Dec-99	ug/l	8260		< 400.	NS	NS	NS	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		< 100.	< 1.	**890.**	< 1.	NS	**2.2**	< 1.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		< 200.	< 2.	**670.**	< 2.	< 2.	< 2.	< 2.	< 2.	< 2.	< 2.	< 2.	**380.**	< 2.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	**50.**	< 10.	**210.**	< 2.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	NI
Aug-03	ug/l	8260		< 200.	< 2.	NS	< 2.	NS	< 2.	< 2.	NS	< 2.	< 2.	NS	< 100.	< 2.	**22.**	NS	**38.**	< 2.	NS	NI
Oct-03	ug/l	8260		NS	NS	**120.**	NS	NS	NS	NS	< 1.	NS	NS	< 1.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		**35.**	NS	NS	NS	NS	NS	< 2.	< 2.	NS	NS	NS	**210.**	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		**14.**	NS	NS	NS	NS	NS	< 2.	< 2.	NS	NS	NS	36.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		< 100.	NS	NS	NS	NS	NS	< 2.	< 2.	NS	NS	NS	< 100.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		< 100.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	< 100.	NS	NS	NS	**28.**	NS	NS	NI
Aug-05	ug/l	8260		< 2.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	**37.**	NS	NS	NS	**47.**	NS	NS	NI
Jun-06	ug/l	8260		< 40.	NS	NS	2.	2.	2.	< 2.	< 2.	NS	NS	2.	< 140.	NS	**49.**	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		< 40.	NS	**1,700.**	< 2.	< 2.	**4.**	< 2.	< 2.	NS	NS	< 2.	**89.**	NS	**33.**	NS	**330.**	NS	NS	**24.**
Dec-06	ug/l	8260		**23.**	NS	**630.**	< 2.	< 2.	**8.**	< 2.	< 2.	NS	NS	< 2.	**100.**	NS	**68.**	NS	**560.**	NS	NS	NS
Mar-07	ug/l	8260		< 40.	NS	**1,200.**	< 2.	< 2.	**25.**	< 2.	< 2.	NS	NS	< 2.	**100.**	NS	**17.**	NS	**580.**	NS	NS	NS
Sep-07	ug/l	8260		< 40.	< 2.	**1,200.**	< 2.	< 2.	**63.**	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	**20.**	< 2.	**240.**	**5.**	NS	**64.**
May-08	ug/l	8260		**18.**	NS	**660.**	< 2.	NS	**53.**	< 2.	< 2.	NS	NS	NS	**270.**	NS	**9.**	NS	**83.**	NS	NS	NS
Dec-08	ug/l	8260		**25.**	NS	**360.**	< 2.	NS	**49.**	< 2.	< 2.	NS	NS	NS	**300.**	NS	**12.**	NS	**19.**	NS	NS	NS
Apr-09	ug/l	8260		< 40.	< 2.	**560.**	< 2.	< 2.	**82.**	< 2.	< 2.	< 2.	NS	NS	**280.**	< 2.	**18.**	< 5.	**76.**	**22.**	NS	**74.**
Sep-09	ug/l	8260		**49.**	NS	**470.**	< 2.	NS	**69.**	< 2.	< 2.	NS	NS	NS	**220.**	NS	**47.**	NS	**62.**	NS	NS	NS

Value exceeds a risk reduction standard
NR = not reported by the lab
NS = not sampled
NI = not installed
< = less than indicated value 0.950054289
< 5/< 500 = sample was analyzed twice
J this is an estimated value that is above the method detection limit but below the practical quantitation limit.
The sample denoted MW-10 on 12/18/98 is believed to have been collected from MW-9, I.e. the two samples were mislabeled. This table shows what is believed to be correct.
Risk reduction standard, the higher of the Type 3 or 4 from Table 2 of Risk Reduction Standards dated August 13, 2001
LAW-PZ-8 was found damaged during June 2006 sampling event and was not sampled. It was replaced by LAW-PZ-8R on 10/9/2006.
MW-17 was replaced by MW-17R on 10/10/2006.
MW-26 was replaced by MW-26R on 10/9/2006.

Table 2-2
Chemical Concentrations of Volatile Organic Compounds in Ground Water Samples (VOCs) ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

	Units	Method	Type 3 or 4 RRS	PAN-MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/ MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-28	MW-29
Benzene																						
Dec-98	ug/l	8260	15.1	< 250.	< 1.	< 1,000.	< 1.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		< 100.	< 1.	< 250.	< 1.	NS	< 1.	< 1.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		< 500.	< 5.	**69J**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 500.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 12.	< 5.	< 100.	< 5.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260		< 500.	< 5.	NS	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	NS	< 250	< 5.	**52.**	NS	NS	< 5.	NS	NI
Oct-03	ug/l	8260		NS	NS	**42 J**	NS	NS	NS	NS	< 1.	NS	NS	< 1.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		< 50.	NS	NS	NS	NS	NS	< 10.	< 10.	NS	NS	NS	< 10.	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		< 10.	NS	NS	NS	NS	NS	< 10.	< 10.	NS	NS	NS	< 10.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		< 500.	NS	NS	NS	NS	NS	< 10.	< 10.	NS	NS	NS	< 500.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		< 100.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	< 100.	NS	NS	NS	**17.**	NS	NS	NI
Aug-05	ug/l	8260		< 2.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	**35.**	NS	NS	NI
Jun-06	ug/l	8260		< 200.	NS	NS	< 10.	< 10.	< 10.	< 10.	< 10.	NS	NS	< 10.	< 250.	NS	11.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		< 200.	NS	**190.**	< 2.	< 2.	< 2.	< 10.	< 10.	NS	NS	< 2.	< 250.	NS	< 20.	NS	**16.**	NS	NS	2.
Dec-06	ug/l	8260		< 2.	NS	**47.**	< 2.	< 2.	< 2.	< 2.	< 2.	NS	NS	< 2.	< 2.	NS	13.	NS	**20.**	NS	NS	NS
Mar-07	ug/l	8260		< 200.	NS	< 500.	< 10.	< 10.	< 10.	< 10.	< 10.	NS	NS	< 10.	< 250.	NS	14.	NS	**17.**	NS	NS	NS
Sep-07	ug/l	8260		< 40.	< 2.	**310.**	< 2.	< 2.	< 2.	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	12.	< 2.	9.	< 2.	NS	3.
May-08	ug/l	8260		< 2.	NS	**450.**	NS	NS	< 2.	< 2.	< 2.	NS	NS	NS	2.	NS	16.	NS	12.	NS	NS	NS
Dec-08	ug/l	8260		< 5.	NS	**290.**	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	< 5.	NS	15.	NS	< 5.	NS	NS	NS
Apr-09	ug/l	8260		< 100.	< 5.	**320.**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 5.	12.	< 5.	14.	< 5.	NS	< 5.
Sep-09	ug/l	8260		< 10.	NS	**390.**	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	4.1	NS	10.	NS	4.4	NS	NS	NS
Ethylbenzene																						
Dec-98	ug/l	8260	3,750.	2,400.	< 1.	**4,300.**	2.9	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		**3,900.**	< 1.	**5,100.**	< 1.	NS	< 1.	< 1.	NI	NI	NI	NI	IN	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		3,700.	< 5.	**5,700.**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	600.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 12.	< 5.	< 100.	< 5.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260		1,100.	< 5.	NS	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	NS	< 250.	< 5.	< 10.	NS	NS	< 5.	NS	NI
Oct-03	ug/l	8260		NS	NS	3,700.	NS	NS	NS	NS	2.	NS	NS	4.2	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		3,100.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	2,300.	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		**8,400.**	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	14.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		2,200.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 250.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		**6,000.**	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	< 100.	NS	NS	NS	< 2.	NS	NS	NI
Aug-05	ug/l	8260		60.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 5.	NS	NS	NI
Jun-06	ug/l	8260		730.	NS	NS	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	150.	NS	5.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		990.	NS	**6,100.**	< 2.	< 2.	< 2.	< 5.	< 5.	NS	NS	< 2.	< 130.	NS	< 20.	NS	380.	NS	NS	67.
Dec-06	ug/l	8260		1,800.	NS	3,000.	< 2.	< 2.	< 2.	7.	< 2.	NS	NS	< 2.	20.	NS	10.	NS	1,500.	NS	NS	NS
Mar-07	ug/l	8260		**4,500.**	NS	**5,000.**	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	< 5.	NS	1,100.	NS	NS	NS
Sep-07	ug/l	8260		1,900.	< 2.	**4,400.**	< 2.	< 2.	2.	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	2.	< 2.	71.	< 2.	NS	63.
May-08	ug/l	8260		**8,800.**	NS	**6,500.**	< 2.	NS	6.	4.	2.	NS	NS	NS	10.	NS	< 2.	NS	260.	NS	NS	NS
Dec-08	ug/l	8260		**3,900.**	NS	**4,900.**	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	7.	NS	< 5.	NS	23.	NS	NS	NS
Apr-09	ug/l	8260		**2,400.**	< 5.	**3,800.**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	11.	< 5.	< 5.	< 5.	310.	< 5.	NS	35
Sep-09	ug/l	8260		2,300.	NS	**4,100.**	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	9.2	NS	< 2.	NS	63.	NS	NS	NS

Table 2-2
Chemical Concentrations of Volatile Organic Compounds in Ground Water Samples (VOCs) ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

	Units	Method	Type 3 or 4	PAN-MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/ MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-28	MW-29
Toluene																						
Dec-98	ug/l	8260	2,030.	< 250.	< 1.	< 1,000.	< 1.	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		< 100.	< 1.	< 250.	< 1.	NS	< 1.	< 1.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		< 500.	< 5.	220J	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	< 500.	< 5.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 12.	< 5.	< 100.	< 5.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	NI
Aug-03	ug/l	8260		< 500.	< 5.	NS	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	NS	< 250	< 5.	< 10.	NS	NS	< 5.	NS	NI
Oct-03	ug/l	8260		NS	NS	< 100.	NS	NS	NS	NS	< 1.	NS	NS	< 1.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		< 25.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 5.	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		< 5.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 5.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		< 250.	NS	NS	NS	NS	NS	5	< 5.	NS	NS	NS	< 250.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		< 100.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 2.	< 100.	NS	NS	NS	< 2.	NS	NS	NI
Aug-05	ug/l	8260		< 5.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 5.	NS	NS	NI
Jun-06	ug/l	8260		< 100.	NS	NS	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	< 5.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		< 100.	NS	1,200.	< 2.	< 2.	< 2.	8.	< 5.	NS	NS	< 2.	< 130.	NS	< 20.	NS	45.	NS	NS	< 2.
Dec-06	ug/l	8260		< 2.	NS	410.	< 2.	< 2.	< 2.	< 2.	< 2.	NS	NS	< 2.	< 2.	NS	< 2.	NS	83.	NS	NS	NS
Mar-07	ug/l	8260		< 100.	NS	760.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	< 5.	NS	45.	NS	NS	NS
Sep-07	ug/l	8260		< 40.	< 2.	720.	< 2.	< 2.	< 2.	< 2.	< 2.	< 2.	NS	< 2.	NS	< 2.	< 2.	< 2.	4.	< 2.	NS	< 2.
May-08	ug/l	8260		3.	NS	330.	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	< 2.	NS	< 2.	NS	10.	NS	NS	NS
Dec-08	ug/l	8260		< 5.	NS	290.	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	< 5.	NS	< 5.	NS	< 5.	NS	NS	NS
Apr-09	ug/l	8260		< 100.	< 5.	280.	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 5.	< 5.	< 5.	21.	< 5.	NS	< 5.
Sep-09	ug/l	8260		< 10.	NS	260.	< 2.	NS	< 2.	< 2.	< 2.	NS	NS	NS	< 2.	NS	< 2.	NS	3.8	NS	NS	NS
Xylenes																						
Dec-98	ug/l	8260	10,000.	5,200.	< 1.	5,600.	1.4	NS	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	ug/l	8260		8,600.	< 2.	**59,000.**	< 2.	NS	< 2.	< 2.	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun-01	ug/l	8260		8,500.	< 10.	**64,000.**	< 10.	< 10.	< 10.	< 10.	< 10.	< 10.	< 10.	< 10.	83J	< 10.	NI	NI	NI	NI	NI	NI
Nov-01	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 25.	< 10.	< 200.	< 10.	NI	NI
Oct-02	ug/l	8260		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 10.	NI
Aug-03	ug/l	8260		2,000.	< 10.	NS	< 10.	< 10.	< 10.	< 10.	NS	NS	< 10.	NS	< 500.	< 10.	< 20.	NS	NS	< 10.	NS	NI
Oct-03	ug/l	8260		NS	NS	**42,000.**	NS	NS	NS	NS	22	NS	NS	38.	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	ug/l	8260		7,300.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 50.	NS	NS	NS	NS	NS	NS	NI
Jul-04	ug/l	8260		**22,000.**	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 22.	NS	NS	NS	NS	NS	NS	NI
Sep-04	ug/l	8260		5,100.	NS	NS	NS	NS	NS	< 5.	< 5.	NS	NS	NS	< 250.	NS	NS	NS	NS	NS	NS	NI
May-05	ug/l	8261		**16,000.**	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	< 250.	NS	NS	NS	< 5.	NS	NS	NI
Aug-05	ug/l	8260		150.	NS	NS	NS	NS	NS	NS	NS	NS	NS	< 5.	10.	NS	NS	NS	6.	NS	NS	NI
Jun-06	ug/l	8260		1,800.	NS	NS	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	28.	NS	NS	NS	NS	NI
Oct-06	ug/L	8260		2,600.	NS	**84,000.**	< 5.	< 5.	7.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	< 50.	NS	2,700.	NS	NS	51.
Dec-06	ug/l	8260		4,900.	NS	**41,000.**	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	18.	NS	35.	NS	**13,000.**	NS	NS	NS
Mar-07	ug/l	8260		**12,000.**	NS	**70,000.**	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	< 5.	< 130.	NS	12.	NS	6,900.	NS	NS	NS
Sep-07	ug/l	8260		5,400.	< 5.	**54,000.**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	< 5.	NS	< 5.	7.	< 5.	250.	< 5.	NS	57.
May-08	ug/l	8260		**24,000.**	NS	**94,000.**	< 5.	NS	< 5.	27.	16.	NS	NS	NS	26.	NS	11.	NS	1,300.	NS	NS	NS
Dec-08	ug/l	8260		**11,000.**	NS	**55,000.**	< 5.	NS	< 5.	< 5.	< 5.	NS	NS	NS	12.	NS	< 5.	NS	120.	NS	NS	NS
Apr-09	ug/l	8260		**6,300.**	< 5.	**48,000.**	< 5.	< 5.	< 5.	< 5.	< 5.	< 5.	NS	NS	22.	< 5.	< 5.	< 5.	2,700.	< 5.	NS	98
Sep-09	ug/l	8260		6,100.	NS	**47,000.**	< 2.	NS	< 5.	< 5.	< 5.	NS	NS	NS	12.	NS	< 5.	NS	380.	NS	NS	NS

Value exceeds a risk reduction standard
NR = not reported by the lab
NS = not sampled
NI = not installed
< = less than indicated value 0.950054289
< 5/< 500 = sample was analyzed twice
J this is an estimated value that is above the method detection limit but below the practical quantitation limit.
The sample denoted MW-10 on 12/18/98 is believed to have been collected from MW-9, I.e. the two samples were mislabeled. This table shows what is believed to be correct.
Risk reduction standard, the higher of the Type 3 or 4 from Table 2 of Risk Reduction Standards dated August 13, 2001
LAW-PZ-8 was found damaged during June 2006 sampling event and was not sampled. It was replaced by LAW-PZ-8R on 10/9/2006.
MW-17 was replaced by MW-17R on 10/10/2006.
MW-26 was replaced by MW-26R on 10/9/2006.

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
pH																		
Aug-03	5.64	6.29	NS	7.54	8.18	5.57	3.71	NS	6.40	6.17	NS	4.98	6.88	4.87	NS	4.24	5.81	NI
Oct-03	4.43	6.42	5.66	6.60	6.97	5.27	3.99	NS	6.15	6.40	4.03	3.94	6.35	4.70	6.21	4.35	5.62	NI
Mar-04	5.04	NS	NS	NS	NS	NS	3.72	3.95	NS	NS	NS	4.09	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	5.49	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.45	4.23	NS	NS	NS	4.09	NS	NI
Aug-05	3.54	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.88	2.74	NS	NS	NS	2.60	NS	NI
Jun-06	4.63	NS	NS	7.48	7.63	5.60	4.93	4.05	NS	NS	4.87	4.35	NS	5.23	NS	NS	NS	NI
Oct-06	5.11	NS	4.8	8.9	11.1	6.4	5.20	4.10	NS	NS	4.6	3.67	NS	5.2	NS	5.3	NS	5.8
Dec-06	4.52	NS	5.38	6.67	7.15	5.45	5.95	4.45	NS	NS	4.61	4.04	NS	4.58	NS	5.21	NS	NS
Mar-07	4.87	NS	5.41	7.09	7.39	5.47	5.91	4.34	NS	NS	4.75	4.01	NS	4.35	NS	5.65	NS	NS
Sep-07	4.87	6.65	4.92	7.44	7.2	5.52	6.08	4.33	6.12	NS	4.67	NS	6.63	4.47	6.17	5.68	6.17	4.49
May-08	3.39	NS	4.62	6.6	NS	5.27	5.61	4.27	NS	NS	NS	2.44	NS	3.74	NS	4.94	NS	NS
Dec-08	4.24	NS	4.38	7.38	NS	4.65	5.94	3.88	NS	NS	NS	4.82	NS	4.08	NS	5.84	NS	NS
Apr-09	3.49	5.48	4.26	6.94	6.53	5.29	NS	3.38	5.47	NS	NS	4.83	6.09	4.29	5.71	4.7	5.99	4.32
Sep-09	4.21	NS	5.41	6.55	NS	5.87	5.98	4.89	NS	NS	NS	5.16	NS	4.54	NS	5.95	NS	NS
Temperature (ºC)																		
Aug-03	26.09	26.90	NS	23.92	30.14	24.33	25.80	NS	27.84	23.99	NS	25.19	25.27	22.71	NS	26.41	26.25	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	17.30	NS	NS	NS	NS	NS	21.17	19.57	NS	NS	NS	18.20	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	21.35	NS	NS	NS	NS	NS	NS	NS	NS	NS	21.40	20.91	NS	NS	NS	23.00	NS	NI
Aug-05	23.79	NS	NS	NS	NS	NS	NS	NS	NS	NS	25.06	25.12	NS	NS	NS	26.79	NS	NI
Jun-06	22.45	NS	NS	22.76	24.08	24.45	26.75	27.12	NS	NS	22.97	24.20	NS	24.20	NS	NS	NS	NI
Oct-06	24.39	NS	23	21	21	23	24.73	26.16	NS	NS	23	24.60	NS	21	NS	26	NS	20
Dec-06	21.54	NS	20.05	22.01	23.60	22.16	23.72	21.80	NS	NS	22.98	22.02	NS	20.63	NS	21.93	NS	NS
Mar-07	19.21	NS	18.71	21.71	22.29	19.95	24.45	19.22	NS	NS	20.44	20.68	NS	18.79	NS	20.68	NS	NS
Sep-07	24.78	27.40	28.9	21.93	25.83	24.99	28.95	27.37	27.84	NS	27.46	NS	26.80	23.67	28.31	31.12	27.03	24.67
May-08	19.38	NS	25.7	20.77	NS	20.15	25.25	22.82	NS	NS	NS	22.78	NS	20.65	NS	24.69	NS	NS
Dec-08	19.97	NS	21.05	20.71	NS	21.4	22.06	21.81	NS	NS	NS	20.91	NS	NS	NS	22.22	NS	NS
Apr-09	18.49	19.94	22.14	21.34	21.84	20.06	21.4	19.76	18.93	NS	NS	20.94	17.84	18.9	21.24	21.08	18.92	20.77
Sep-09	26.51	NS	30.96	22.64	NS	27.23	26.48	27.32	NS	NS	NS	27.1	NS	25.6	NS	29.67	NS	NS
Dissolved Oxygen, mg/L																		
Aug-03	0.51	0.45	NS	0.39	0.70	0.79	0.36	NS	0.49	1.44	NS	0.57	0.35	0.55	NS	2.14	0.33	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	0.13	NS	NS	NS	NS	NS	0.19	0.17	NS	NS	NS	0.17	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	0.11	NS	NS	NS	NS	NS	NS	NS	NS	NS	1.73	0.43	NS	NS	NS	0.359	NS	NI
Aug-05	0.11	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.16	0.42	NS	NS	NS	0.12	NS	NI
Jun-06	0.30	NS	NS	22.40	3.50	7.18	2.1	1.53	NS	NS	0.81	1.04	NS	7.86	NS	NS	NS	NI
Oct-06	3.75	NS	NS	2.8	4.4	6.5	1.86	0.88	NS	NS	2.7	0.81	NS	5.0	NS	1.6	NS	11.2
Dec-06	0.14	NS	0.68	6.04	3.76	1.49	1.56	1.09	NS	NS	0.41	3.15	NS	2.03	NS	0.69	NS	NS
Mar-07	19.69	NS	1.48	2.98	4.39	6.13	11.22	0.42	NS	NS	7.35	2.25	NS	114.19	NS	0.70	NS	NS
Sep-07	4.92	4.23	0.92	5.35	5.8	0.79	3.64	1.24	1.88	NS	2.38	NS	2.11	0.54	1.49	1.46	1.13	2.59
May-08	4.02	NS	1.07	2.38	NS	5.71	2.47	2.32	NS	NS	NS	0.89	NS	1.63	NS	2.15	NS	NS
Dec-08	34	NS	0.41	1.61	NS	2.0	3.31	1.1	NS	NS	NS	5.68	NS	2.53	NS	0.69	NS	NS
Apr-09	0.62	0.38	0.24	3.89	0.84	3.22	0.94	1.34	0.64	NS	NS	1.32	0.68	0.83	0.54	0.46	0.82	1.16
Sep-09	1.38	NS	1.88	2.44	NS	120	3.02	1.24	NS	NS	NS	36	NS	1.0	NS	107	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
Conductivity, ms/cm																		
Aug-03	0.341	0.404	NS	0.373	0.384	0.302	4.170	NS	0.423	0.292	NS	0.649	0.532	0.317	NS	0.227	0.217	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	0.340	NS	NS	NS	NS	NS	2.860	0.310	NS	NS	NS	0.570	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	0.310	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.145	0.377	NS	NS	NS	23.000	NS	NI
Aug-05	0.326	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.215	0.483	NS	NS	NS	0.324	NS	NS
Jun-06	0.585	NS	NS	0.470	0.481	0.319	2.587	0.308	NS	NS	12.525	3.515	NS	0.262	NS	NS	NS	NS
Oct-06	0.575	NS	0.001	0.400	0.410	0.310	0.429	0.235	NS	NS	0.500	6.943	NS	0.340	NS	0.460	NS	0.740
Dec-06	0.490	NS	0.609	0.451	0.217	0.322	0.790	0.122	NS	NS	0.408	5.162	NS	0.743	NS	0.476	NS	NS
Mar-07	0.401	NS	0.618	0.465	0.480	0.419	0.872	0.150	NS	NS	0.854	5.809	NS	1.303	NS	0.443	NS	NS
Sep-07	1.440	0.560	0.333	0.451	0.134	0.407	0.726	0.212	0.209	NS	0.468	NS	0.220	1.554	0.300	0.444	0.487	0.694
May-08	1.004	NS	0.809	0.454	NS	0.382	0.857	0.296	NS	NS	NS	4.940	NS	0.996	NS	0.519	NS	NS
Dec-08	1.282	NS	0.606	0.406	NS	0.418	0.525	0.27	NS	NS	NS	1.279	NS	0.406	NS	0.395	NS	NS
Apr-09	1.053	0.334	0.779	0.442	1.1	0.486	0.579	0.25	0.624	NS	NS	1.53	1.049	0.629	0.397	0.81	0.626	0.618
Sep-09	0.947	NS	0.718	0.480	NS	0.572	0.513	0.273	NS	NS	NS	1.074	NS	0.548	NS	0.647	NS	NS
ORP, mv																		
Aug-03	-180.0	-6.0	NS	-153.0	-164.0	-26.0	-22.0	NS	6.0	22.0	NS	16.0	134.0	178.0	NS	323.0	75.0	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	142.7	NS	NS	NS	NS	NS	67.7	233.9	NS	NS	NS	208.9	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	66.9	NS	NS	NS	NS	NS	NS	NS	NS	NS	25.5	169.5	NS	NS	NS	231.6	NS	NI
Aug-05	-112.6	NS	NS	NS	NS	NS	NS	NS	NS	NS	-18.1	146.1	NS	NS	NS	223.3	NS	NI
Jun-06	-21.6	NS	NS	44.7	NS	31.2	32.1	332.2	NS	NS	-69.6	38.6	NS	78.4	NS	NS	NS	NI
Oct-06	-227.7	NS	NS	NS	NS	NS	-96.1	244.9	NS	NS	NS	85.2	NS	NS	NS	NS	NS	NS
Dec-06	-184.4	NS	-151.8	-181.2	-179.4	-156.1	-182.3	-154.8	NS	NS	-154.3	-178.9	NS	-146.4	NS	-156.2	NS	NS
Mar-07	-179.5	NS	-203.2	-81.5	-189.1	-63.3	-156.3	226.3	NS	NS	-187.8	-87.0	NS	-101.7	NS	-204.5	NS	NS
Sep-07	-29.6	103.3	-11.4	66.2	-148.6	-25.8	-77.3	312.2	4.9	NS	-62.7	NS	-102.5	37.3	-103.4	-72.0	48.3	48.1
May-08	163.7	NS	139.7	353.9	NS	60.0	-26.5	317.0	NS	NS	NS	300.4	NS	199.9	NS	34.4	NS	NS
Dec-08	35.0	NS	-4.3	-47.9	NS	23.1	-50.3	338.7	NS	NS	NS	-104.9	NS	120.2	NS	-104.6	NS	NS
Apr-09	91.8	-23.5	18.2	49.3	-53.2	10.2	-97.6	446.0	-19.3	NS	NS	-24.2	-101.0	132.0	-132.0	-23.2	8.9	-31.3
Sep-09	-119.0	NS	-139	-8.2	NS	59.6	-89.4	81.3	NS	NS	NS	-111	NS	120	NS	-19.1	NS	NS
TOC mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	16.	NS	NS	NS	NS	NS	430.	NS	NS	NS	NS	13.	NS	NS	NS	NS	NS	NI
Mar-04	12.	NS	NS	NS	NS	NS	523.	3.	NS	NS	NS	9.	NS	NS	NS	NS	NS	NI
Jun-04	15.	NS	NS	NS	NS	NS	205.	2.	NS	NS	NS	8.	NS	NS	NS	NS	NS	NI
Sep-04	12.	NS	NS	NS	NS	NS	253.	2.	NS	NS	NS	8.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	230.	NS	NS	NS	NS	NS	NS	2.	NS	NS	NS	64.	NS	NS	NS	NS	NS	NI
Oct-06	34.	NS	NS	NS	NS	NS	1,720.	3.	NS	NS	NS	8.	NS	NS	NS	NS	NS	NS
Dec-06	175.	NS	219.	2.	13.	6.	228.	2.	NS	NS	320.	27.	NS	251.	NS	154.	NS	NS
Mar-07	38.	NS	NS	NS	NS	NS	43.	2.	NS	NS	NS	16.	NS	NS	NS	NS	NS	NS
Sep-07	1,210.	NS	NS	NS	NS	NS	24.	2.	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
Alkalinity (as $CaCO_3$), mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	62.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	16.	NS	NS	NS	NS	NS	NI
Mar-04	31.	NS	NS	NS	NS	NS	0.0	0.0	NS	NS	NS	0.0	NS	NS	NS	NS	NS	NI
Jun-04	29.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
Sep-04	19.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	17.	NS	NS	NS	NS	NS	1,112.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
Oct-06	59.	NS	NS	NS	NS	NS	177.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ferrous Iron (Fe^{2+}) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	13.	NS	NS	NS	NS	NS	530.	< 1.	NS	NS	NS	9.9	NS	NS	NS	NS	NS	NI
Mar-04	13.5J	NS	NS	NS	NS	NS	538J	0.31J	NS	NS	NS	16J	NS	NS	NS	NS	NS	NI
Jun-04	7.8J	NS	NS	NS	NS	NS	307J	0.08J	NS	NS	NS	8.2J	NS	NS	NS	NS	NS	NI
Sep-04	11.8J	NS	NS	NS	NS	NS	577J	0.19J	NS	NS	NS	12.4J	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	.53	NS	NS	NS	NS	NS	.03	.07	NS	NS	NS	.99	NS	NS	NS	NS	NS	NI
Oct-06	.34	NS	NS	NS	NS	NS	.53	< .02	NS	NS	NS	.76	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ferric Iron (Fe^{3+}) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	< 1.	NS	NS	NS	NS	NS	< 1.	22.	NS	NS	NS	1.1	NS	NS	NS	NS	NS	NI
Mar-04	BDL	NS	NS	NS	NS	NS	BDL	3.5	NS	NS	NS	BDL	NS	NS	NS	NS	NS	NI
Jun-04	1.3	NS	NS	NS	NS	NS	53	< .1	NS	NS	NS	5.8	NS	NS	NS	NS	NS	NI
Sep-04	< 5.	NS	NS	NS	NS	NS	< 25.	< 4.	NS	NS	NS	< 5.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	10.	NS	NS	NS	NS	NS	250.	0.68	NS	NS	NS	56.0	NS	NS	NS	NS	NS	NI
Oct-06	14.7	NS	NS	NS	NS	NS	35.	0.45	NS	NS	NS	67	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
Total Sulfide (S) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	2.7	NS	NS	NS	NS	NS	45.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
Mar-04	< 9.	NS	NS	NS	NS	NS	1.0	< .4	NS	NS	NS	< .4	NS	NS	NS	NS	NS	NI
Jun-04	< .2	NS	NS	NS	NS	NS	0.8	< .2	NS	NS	NS	< .2	NS	NS	NS	NS	NS	NI
Sep-04	0.4	NS	NS	NS	NS	NS	8.6	< 4.	NS	NS	NS	< 4.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	5.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	4.0	NS	NS	NS	NS	NS	NI
Oct-06	< 1.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NS
Sep-07	< 1.	NS	NS	NS	NS	NS	< 1.	< 1.	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chloride (Cl) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	43.	NS	NS	NS	NS	NS	16.0	12.0	NS	NS	NS	100.0	NS	NS	NS	NS	NS	NI
Mar-04	50.3	NS	NS	NS	NS	NS	14.6	12.5	NS	NS	NS	114.0	NS	NS	NS	NS	NS	NI
Jun-04	35.2	NS	NS	NS	NS	NS	10.5	73.7	NS	NS	NS	73.7	NS	NS	NS	NS	NS	NI
Sep-04	47.	NS	NS	NS	NS	NS	9.8	11.5	NS	NS	NS	73.0	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	100.	NS	NS	NS	NS	NS	4.9	10.4	NS	NS	NS	1,080	NS	NS	NS	NS	NS	NI
Oct-06	124.	NS	NS	NS	NS	NS	4.9	9.7	NS	NS	NS	2,240	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrate-(N) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	< 1.	NS	NS	NS	NS	NS	17.	36.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
Mar-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-04	< .01	NS	NS	NS	NS	NS	< .01	< .01	NS	NS	NS	< .01	NS	NS	NS	NS	NS	NI
Sep-04	< .01	NS	NS	NS	NS	NS	< .01	< .01	NS	NS	NS	< .01	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	< .01	NS	NS	NS	NS	NS	0.16	7.67	NS	NS	NS	0.19	NS	NS	NS	NS	NS	NI
Oct-06	< .01	NS	NS	NS	NS	NS	< .01	2.32	NS	NS	NS	0.02	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
Nitrite Nitrogen (N) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	< 1.	NS	NS	NS	NS	NS	0.8	< 1.	NS	NS	NS	< 1.	NS	NS	NS	NS	NS	NI
Mar-04	< .1	NS	NS	NS	NS	NS	< .01	0.2	NS	NS	NS	< .01	NS	NS	NS	NS	NS	NI
Jun-04	0.18	NS	NS	NS	NS	NS	< .01	21.6J	NS	NS	NS	< .01	NS	NS	NS	NS	NS	NI
Sep-04	< .01	NS	NS	NS	NS	NS	< .01	19.3	NS	NS	NS	< .01	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	< .01	NS	NS	NS	NS	NS	0.06	0.29	NS	NS	NS	<0.01	NS	NS	NS	NS	NS	NI
Oct-06	< .01	NS	NS	NS	NS	NS	< .01	0.17	NS	NS	NS	< .2	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate (SO_4) mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	79.	NS	NS	NS	NS	NS	3,700.	56.	NS	NS	NS	190.	NS	NS	NS	NS	NS	NI
Mar-04	82.	NS	NS	NS	NS	NS	3,480.	86.	NS	NS	NS	124.	NS	NS	NS	NS	NS	NI
Jun-04	78.	NS	NS	NS	NS	NS	3,250.	102.	NS	NS	NS	105.	NS	NS	NS	NS	NS	NI
Sep-04	89.	NS	NS	NS	NS	NS	4,600.	85.	NS	NS	NS	113.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	8.	NS	NS	NS	NS	NS	1,920.	71.	NS	NS	NS	42.	NS	NS	NS	NS	NS	NI
Oct-06	8.	NS	NS	NS	NS	NS	229.	55.	NS	NS	NS	120.	NS	NS	NS	NS	NS	NS
Sep-07	2.	NS	NS	NS	NS	NS	48.	55.	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Total Iron mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	13.	NS	NS	NS	NS	NS	500.	0.2	NS	NS	NS	11.	NS	NS	NS	NS	NS	NI
Mar-04	12.	NS	NS	NS	NS	NS	510.	3.8	NS	NS	NS	19.	NS	NS	NS	NS	NS	NI
Jun-04	9.1	NS	NS	NS	NS	NS	360.	< .04	NS	NS	NS	14.	NS	NS	NS	NS	NS	NI
Sep-04	9.8	NS	NS	NS	NS	NS	380.	< .15	NS	NS	NS	10.	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	11.	NS	NS	NS	NS	NS	250.	0.75	NS	NS	NS	57.	NS	NS	NS	NS	NS	NI
Oct-06	15.	NS	NS	NS	NS	NS	36.	0.45	NS	NS	NS	68.	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters ***(Modified from ERM, 2010)***
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
Methane ug/L																		
Aug-03	590.	NS	NS	NS	NS	NS	150 *F35	NS	NS	NS	NS	140.	NS	NS	NS	NS	NS	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	< .2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	1,700.	NS	NS	NS	NS	NS	1,300.	180.	NS	NS	NS	650.	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	2,800.	NS	NS	NS	NS	NS	1,800.	320.	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-06	4,500.	NS	NS	NS	NS	NS	2,200.	230.	NS	NS	NS	630.	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethane ug/L																		
Aug-03	< .35	NS	NS	NS	NS	NS	< .35	NS	NS	NS	NS	< .35	NS	NS	NS	NS	NS	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	< .35	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	10.0	NS	NS	NS	NS	NS	0.04	0.12	NS	NS	NS	44.0	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	2.5	NS	NS	NS	NS	NS	0.1	0.2	NS	NS	NS	21.0	NS	NS	NS	NS	NS	NI
Oct-06	3.500	NS	NS	NS	NS	NS	0.11	0.15	NS	NS	NS	10.00	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethene ug/L																		
Aug-03	< .33	NS	NS	NS	NS	NS	NS	< .33	NS	NS	NS	< .33	NS	NS	NS	NS	NS	NI
Oct-03	NS	NS	NS	NS	NS	NS	< .33	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	3.9	NS	NS	NS	NS	NS	0.02	0.01	NS	NS	NS	29.	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	1.7	NS	NS	NS	NS	NS	0.03	0.1	NS	NS	NS	19.	NS	NS	NS	NS	NS	NI
Oct-06	2.400	NS	NS	NS	NS	NS	0.14	0.10	NS	NS	NS	8.5	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-1
Ground Water Natural Attenuation Parameters *(Modified from ERM, 2010)*
Vopak
Savannah, GA

Wells	PAN MW-9	PAN-MW-10	LAW-PZ-8 / LAW-PZ-8R	MW-14	MW-15	MW-16	MW-17 / MW-17R	MW-18/ MW-18R	MW-19	MW-20	MW-21	MW-22/MW-22R	MW-23	MW-24/ MW-24R	MW-25	MW-26 / MW-26R	MW-27	MW-29
CO_2 ug/L																		
Aug-03	97,000.	NS	NS	NS	NS	NS	3,500,000.	NS	NS	NS	NS	86,000.	NS	NS	NS	NS	NS	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	83,000.	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	350,000.	NS	NS	NS	NS	NS	990,000.	410,000.	NS	NS	NS	390,000.	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	380,000.	NS	NS	NS	NS	NS	630,000.	300,000.	NS	NS	NS	420,000.	NS	NS	NS	NS	NS	NI
Oct-06	400.	NS	NS	NS	NS	NS	600.	220.	NS	NS	NS	200.	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrogen mg/L																		
Aug-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Oct-03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Mar-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
May-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Aug-05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NI
Jun-06	12.	NS	NS	NS	NS	NS	4.5	11.	NS	NS	NS	10.	NS	NS	NS	NS	NS	NI
Oct-06	12.	NS	NS	NS	NS	NS	9.70	18.	NS	NS	NS	14.	NS	NS	NS	NS	NS	NS
Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
May-08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dec-08																		
Apr-09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NS = Not sampled
J = Lab estimated value
*F35 = Lab estimated value
NVD = Color indicating field test for dissolved iron was used, but color was Not Visually Detected (NVD)
LAW-PZ-8 was found damaged during June 2006 sampling event and was not sampled. It was replaced by LAW-PZ-8R on 10/9/2006.
MW-17 was replaced by MW-17R on 10/10/2006.
MW-26 was replaced by MW-26R on 10/9/2006.

Table 4-1: Comparison of CAP RRS for Groundwater to Revised Type 4 RRS

Constituents	CAS No.	Current CAP RRS (µg/L)	Revised Type 4 RRS from Table 2-2 (µg/L)
Tetrachloroethene (PCE)	127-18-4	5	5
Trichloroethene (TCE)	79-01-6	5	38
1,2-Dichloroethene (cis)	156-59-2	1,020	1,022
Vinyl chloride	75-01-4	2	3
Benzene	71-43-2	15	9
Ethylbenzene	100-41-4	3,750	700
Toluene	108-88-3	2,030	5,241
Xylenes (total)	133-02-07	10,000	10,000

Table 4-2: Type 4 Risk Reduction Standards for Groundwater [Rule 391-3-19-.07(9)(c)]

Constituents (mg/L)	CAS No.	RAGS (Equation 2 from Table 2-3) Non-Carcinogenic Adult	RAGS (Equation 1 from Table 2-4) Carcinogenic Adult	Lesser of values from Equations 1 and 2	Table 1, App III or Background, or Detection Limit (from GA EPD 391-3-19)	Type 4 RRS (lesser of values from Equations 1 and 2)
Tetrachloroethene (PCE)	127-18-4	4.45E-01	3.83E-03	3.83E-03	5.00E-03	5.00E-03
Trichloroethene (TCE)	79-01-6	NC	3.77E-02	3.77E-02	5.00E-03	3.77E-02
1,2-Dichloroethene (cis)	156-59-2	1.02E+00	NC	1.02E+00	7.00E-02	1.02E+00
Vinyl chloride	75-01-4	1.50E-01	3.27E-03	3.27E-03	2.00E-03	3.27E-03
Benzene	71-43-2	7.21E-02	8.72E-03	8.72E-03	5.00E-03	8.72E-03
Ethylbenzene	100-41-4	2.27E+00	2.91E-02	2.91E-02	7.00E-01	7.00E-01
Toluene	108-88-3	5.24E+00	NC	5.24E+00	1.00E+00	5.24E+00
Xylenes (total)	133-02-07	2.88E-01	NC	2.88E-01	1.00E+01	1.00E+01

Notes:

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of "NC" was assigned when both parameters were not defined, due to the inability to divide an equation by zero.

Table 4-3: Type 4 Non-Carcinogenic Evaluation for Groundwater; Non-Residential Adult (RAGS Equation 2)

Constituents	CAS No.	THI	BW (kg)	AT (yr)	CF (d/yr)	EF (d/yr)	ED (yr)	Irw (L/d)	RfDo (mg/kg-d)	Ira (m^3/d)	K (L/m^3)	RfDi (from Table 2-5) (mg/kg-d)	RAGS (Equation 2) Non-Carcinogenic Adult (mg/L)
Tetrachloroethene (PCE)	127-18-4	1	70	25	365	250	25	1	1.00E-02	20	0.50	7.71E-02	4.45E-01
Trichloroethene (TCE)	79-01-6	1	70	25	365	250	25	1	0	20	0.50	0	NC
1,2-Dichloroethene (cis)	156-59-2	1	70	25	365	250	25	1	1.00E-02	20	0.50	0	1.02E+00
Vinyl chloride	75-01-4	1	70	25	365	250	25	1	3.00E-03	20	0.50	2.86E-02	1.50E-01
Benzene	71-43-2	1	70	25	365	250	25	1	4.00E-03	20	0.50	8.57E-03	7.21E-02
Ethylbenzene	100-41-4	1	70	25	365	250	25	1	1.00E-01	20	0.50	2.86E-01	2.27E+00
Toluene	108-88-3	1	70	25	365	250	25	1	8.00E-02	20	0.50	1.43E+00	5.24E+00
Xylenes (total)	133-02-07	1	70	25	365	250	25	1	2.00E-01	20	0.50	2.86E-02	2.88E-01

Notes:

Pursuant to Rule 391-3-19-.07(7)(b)1, groundwater RRS are calculated to evaluate the potential for noncancer toxic effects via ingestion of, or inhalation of volatiles from, groundwater. The water-air concentration relationship is applicable only to constituents with a Henry's Law constant of greater than 1 x 10 atm-m /mole and a molecular weight of less than 200 g/mole (RAGS Part B, EPA, 1991).

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'NC' was assigned when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; L/d = liters per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day;
L/m3 = liters per cubic meter; mg/L = milligrams per liter
THI = Target hazard index
BW = Adult body weight
AT = Averaging Time
CF = Conversion Factor
EF = Exposure Frequency
ED = Exposure Duration
IRw = Daily water ingestion rate
RfDo = Oral chronic reference dose
IRa = Daily inhalation rate of air
K = Water-to-air volatilization factor
RfDi = Inhalation chronic reference dose

Table 4-4: Type 4 Carcinogenic Evaluation for Groundwater; Non-Residential Adult (RAGS Equation 1)

Constituents	CAS No.	TR	BW (kg)	AT (yr)	CF (d/yr)	EF (d/yr)	ED (yr)	IRw (L/d)	SFo $(mg/kg\text{-}d)^{-1}$	IRa (m3/d)	K (L/m^3)	SFi (from Table 2-5) $(mg/kg\text{-}d)^{-1}$	RAGS (Equation 1) Carcinogenic Adult (mg/L)
Tetrachloroethene (PCE)	127-18-4	1.00E-05	70	70	365	250	25	1	5.40E-01	20	0.5	2.07E-02	3.83E-03
Trichloroethene (TCE)	79-01-6	1.00E-05	70	70	365	250	25	1	5.90E-03	20	0.5	7.00E-03	3.77E-02
1,2-Dichloroethene (cis)	156-59-2	1.00E-05	70	70	365	250	25	1	0	20	0.5	0	NC
Vinyl chloride	75-01-4	1.00E-05	70	70	365	250	25	1	7.20E-01	20	0.5	1.54E-02	3.27E-03
Benzene	71-43-2	1.00E-05	70	70	365	250	25	1	5.50E-02	20	0.5	2.73E-02	8.72E-03
Ethylbenzene	100-41-4	1.00E-05	70	70	365	250	25	1	1.10E-02	20	0.5	8.75E-03	2.91E-02
Toluene	108-88-3	1.00E-05	70	70	365	250	25	1	0	20	0.5	0	NC
Xylenes (total)	133-02-07	1.00E-05	70	70	365	250	25	1	0	20	0.5	0	NC

Notes:

Pursuant to Rule 391-3-19-.07(7)(b)1, groundwater RRS are calculated to evaluate the potential for noncancer toxic effects via ingestion of, or inhalation of volatiles from, groundwater. The water-air concentration relationship is applicable only to constituents with a Henry's Law constant of greater than 1 x 10 atm-m /mole and a molecular weight of less than 200 g/mole (RAGS Part B, EPA, 1991).

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991). A value of 'NC' was assigned when both parameters were not defined, due to the inability to divide an equation by zero.

kg = kilogram; yr = year; d/yr = days per year; L/d = liters per day; kg/mg = kilograms per milligram; mg/kg-d = milligram per kilogram day; m3/d =cubic meters per day; L/m3 = liters per cubic meter; mg/L = milligrams per liter

TR = Target excess individual lifetime cancer risk
BW = Adult body weight
AT = Averaging Time
CF = Conversion Factor
EF = Exposure Frequency
ED = Exposure Duration
IRw = Daily water ingestion rate
SFo = Oral cancer slope factor
IRa = Daily inhalation rate of air
K = Water-to-air volatilization factor
SFi = Inhalation cancer slope factor

Table 4-5: Toxicity Factors

Constituents	CAS No.	Non-Carcinogenic		Carcinogenic	
		RfCi[*1]	RfDi[*2]	IUR[*1]	SFi[*2]
Tetrachloroethene (PCE)	127-18-4	2.70E-01	7.71E-02	5.90E-06	2.07E-02
Trichloroethene (TCE)	79-01-6	0	0	2.00E-06	7.00E-03
1,2-Dichloroethene (cis)	156-59-2	0	0	0	0
Vinyl chloride	75-01-4	1.00E-01	2.86E-02	4.40E-06	1.54E-02
Benzene	71-43-2	3.00E-02	8.57E-03	7.80E-06	2.73E-02
Ethylbenzene	100-41-4	1.00E+00	2.86E-01	2.50E-06	8.75E-03
Toluene	108-88-3	5.00E+00	1.43E+00	0	0
Xylenes (total)	133-02-07	1.00E-01	2.86E-02	0	0

Notes:

*According to the EPA's Calculation of Risk-based PRG's, if a parameter is not defined for a contaminant, it should be given a zero value (RAGS Vol 1., EPA, 1991).

[*1] May 2010 Regional Screening Level (RSL) Summary Table data from EPA.

[*2] Calculated using "Conversion Equations for Inhalation Reference Concentrations and Inhalation Unit Risk Factors" from EPD, Georgia Dept of Natural Resources: Compliance Status Report 391-3-19-.07 (Cited 22 April, 2010).

RfCi = Chronic inhalation reference concentration
RfDi = Inhalation chronic reference dose
IUR = Chronic inhalation unit risk
SFi = Inhalation cancer slope factor

VRP APPLICATION (Revised)

FIGURES

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

THIRD ANNUAL REPORT ON CORRECTIVE ACTION

VOPAK (FORMERLY PAKTANK CORPORATION) SAVANNAH, GA

DRAWN BY J. BYRD
PROJECT ENGINEER J. BYRD
DESIGN ENGINEER S. THOMPSON
PROJECT MANAGER S. THOMPSON

ERM

NOT FOR CONST- RUCTION

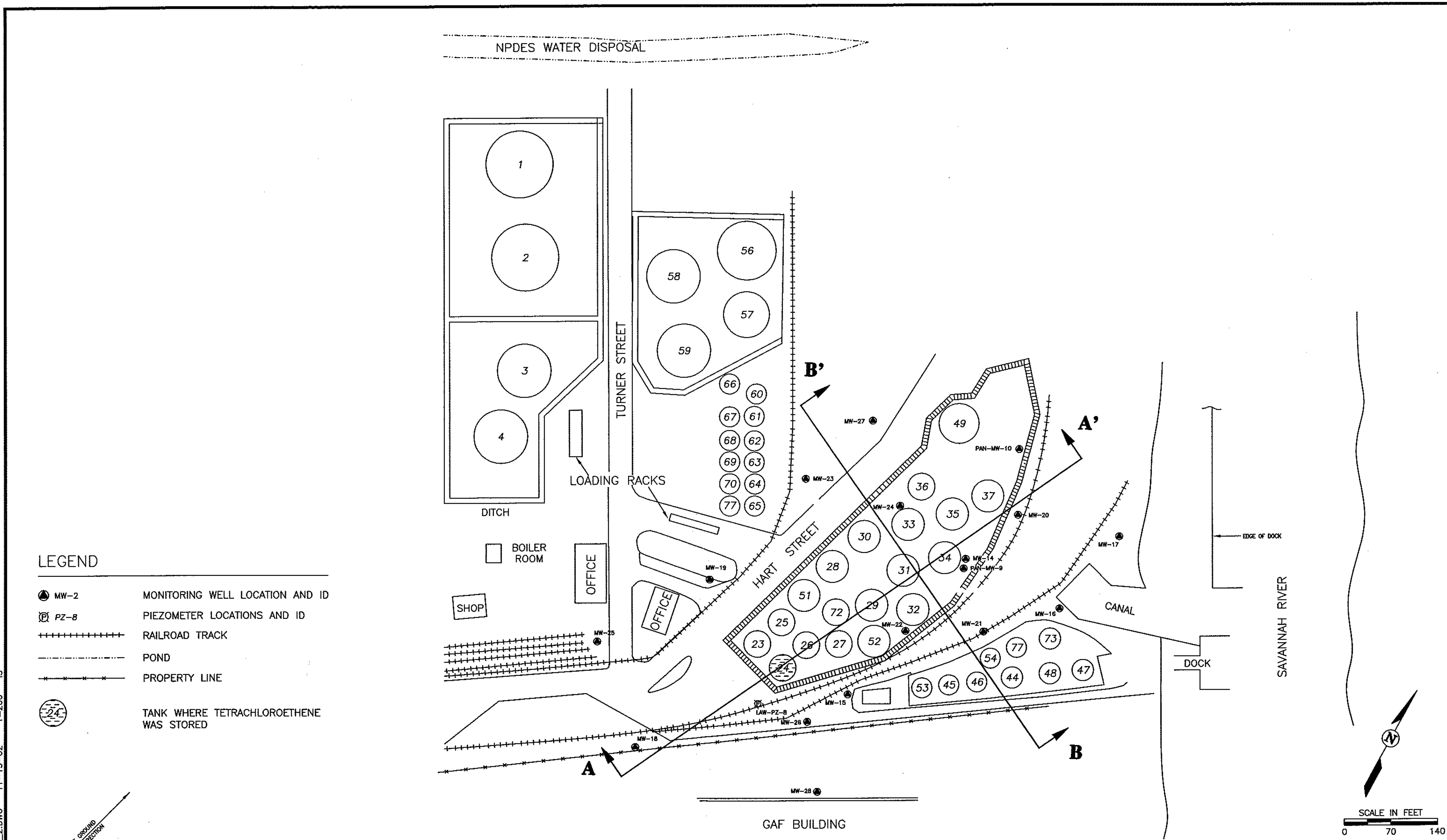
SITE MAP

SCALE AS SHOWN
DATE JANUARY 12, 2009
PROJECT NO. 110235 VOPAK
AutoCAD R-2002 110235_Vopak 2009 Annual Report.DWG

FIGURE 1-1

SHEET OF

110235_Vopak 2009 Annual Report.DWG 1/12/09 1=40 JGB REV



ERM Environmental Resources Management

CROSS SECTION LOCATIONS
REVISED CORRECTIVE ACTION PLAN
VOPAK (FORMERLY PAKTANK CORPORATION
SAVANNAH, GEORGIA

FIGURE 1-2

3224CSLOC_CAP_REV_2.DWG 11-15-02 1=200 IS

LEGEND

DATE SAMPLED
B – Benzene
E – Ethylbenzene
T – Toluene
X – Xylenes
PCE – Tetrachloroethene
TCE – Trichloroethene
DCE – CIS, 1, 2, Dichloroethene
VC – Vinyl Chloride

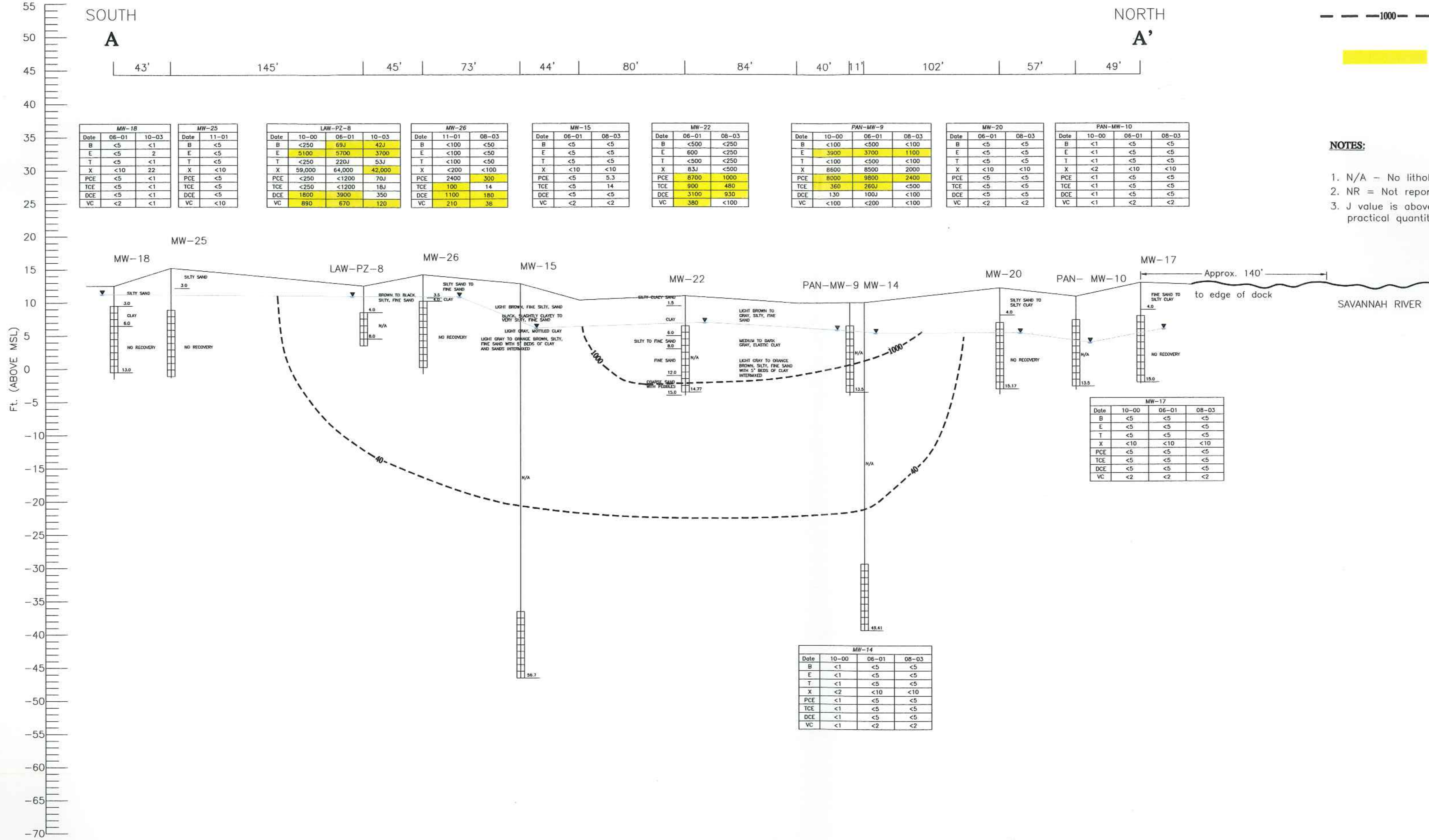
CONCENTRATIONS IN ug/L

— — —1000— — — PCE ISOCONCENTRATION CONTOUR (ug/L) BASED ON SEPTEMBER & OCTOBER 2003 DATA WHEN AVAILABLE

VALUE EXCEEDS TYPE 4 RRS

NOTES:

1. N/A – No lithologic data available.
2. NR = Not reported by laboratory.
3. J value is above detection limit and below the practical quantitation limit.



MW-18		
Date	06-01	10-03
B	<5	<1
E	<5	2
T	<5	<1
X	<10	22
PCE	<5	<1
TCE	<5	<1
DCE	<5	<1
VC	<2	<1

MW-25	
Date	11-01
B	<5
E	<5
T	<5
X	<10
PCE	<5
TCE	<5
DCE	<5
VC	<10

LAW-PZ-8			
Date	10-00	06-01	10-03
B	<250	69J	42J
E	5100	5700	3700
T	<250	220J	53J
X	59,000	64,000	42,000
PCE	<250	<1200	70J
TCE	<250	<1200	18J
DCE	1800	3900	350
VC	890	670	120

MW-26		
Date	11-01	08-03
B	<100	<50
E	<100	<50
T	<100	<50
X	<200	<100
PCE	2400	300
TCE	100	14
DCE	1100	180
VC	210	38

MW-15		
Date	06-01	08-03
B	<5	<5
E	<5	<5
T	<5	<5
X	<10	<10
PCE	<5	5.3
TCE	<5	14
DCE	<5	<5
VC	<2	<2

MW-22		
Date	06-01	08-03
B	<500	<250
E	600	<250
T	<500	<250
X	83J	<500
PCE	8700	1000
TCE	900	480
DCE	3100	930
VC	380	<100

PAN-MW-9			
Date	10-00	06-01	08-03
B	<100	<500	<100
E	3900	3700	1100
T	<100	<500	<100
X	8600	8500	2000
PCE	8000	9800	2400
TCE	360	260J	<500
DCE	130	100J	<100
VC	<100	<200	<100

MW-20		
Date	06-01	08-03
B	<5	<5
E	<5	<5
T	<5	<5
X	<10	<10
PCE	<5	<5
TCE	<5	<5
DCE	<5	<5
VC	<2	<2

PAN-MW-10			
Date	10-00	06-01	08-03
B	<1	<5	<5
E	<1	<5	<5
T	<1	<5	<5
X	<2	<10	<10
PCE	<1	<5	<5
TCE	<1	<5	<5
DCE	<1	<5	<5
VC	<1	<2	<2

MW-17			
Date	10-00	06-01	08-03
B	<5	<5	<5
E	<5	<5	<5
T	<5	<5	<5
X	<10	<10	<10
PCE	<5	<5	<5
TCE	<5	<5	<5
DCE	<5	<5	<5
VC	<2	<2	<2

MW-14			
Date	10-00	06-01	08-03
B	<1	<5	<5
E	<1	<5	<5
T	<1	<5	<5
X	<2	<10	<10
PCE	<1	<5	<5
TCE	<1	<5	<5
DCE	<1	<5	<5
VC	<1	<2	<2

PRELIMINARY

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION
1	10-27-03	JDR	UPDATED LAB DATA FOR AUGUST 2003 SAMPLING EVENT				

3224CSA-A_CAP_REV2.DWG 11-15-02 1=10 IS

REVISED CORRECTIVE ACTION PLAN

VOPAK (FORMERLY PAKTANK CORPORATION) **SAVANNAH, GA**

DRAWN BY	LAST REVIEWED	PROJECT ENGINEER	LAST REVIEWED
I. SULJUZOVIC	11-15-02	A. SLAYTON	11-15-02
DESIGN ENGINEER	LAST REVIEWED	PROJECT MANAGER	LAST REVIEWED
		J. RIGGENBACH	11-15-02

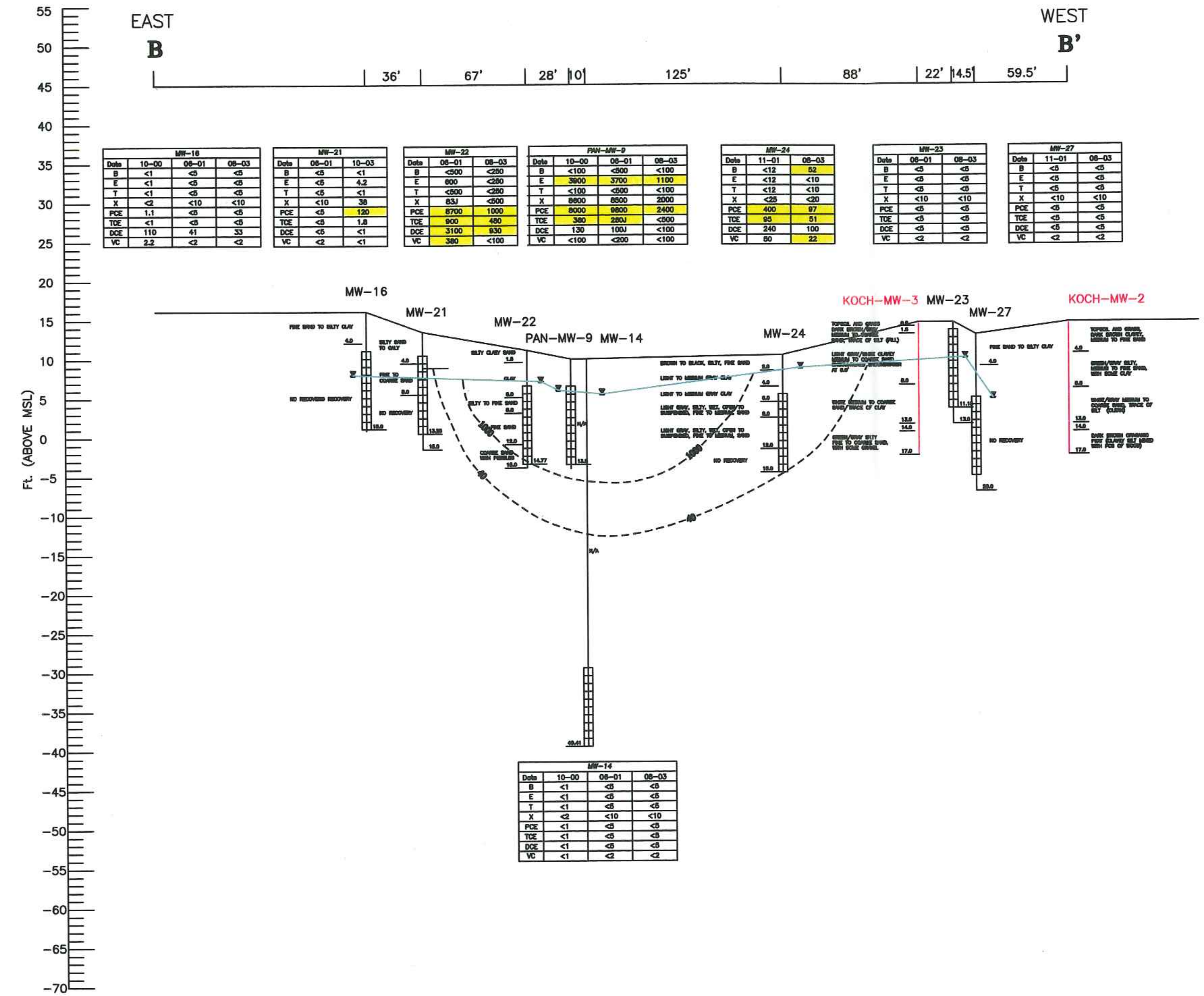
ERM

GEOLOGICAL CROSS - SECTION A-A'

SCALE	DATE	CLIENT APPROVAL
AS NOTED	NOVEMBER 15, 2002	
PROJECT NO. 3224 VOPAK	AutoCAD R-14 3224CSA-A_CAP_REV2.DWG	ISSUED FOR / DATE

FIGURE 1-3

SHEET OF



MW-16			
Date	10-00	06-01	08-03
B	<1	<5	<5
E	<1	<5	<5
T	<1	<5	<5
X	<2	<10	<10
PCE	1.1	<5	<5
TCE	<1	<5	<5
DCE	110	41	33
VC	2.2	<2	<2

MW-21		
Date	06-01	10-03
B	<5	<1
E	<5	4.2
T	<5	<1
X	<10	38
PCE	<5	120
TCE	<5	1.8
DCE	<5	<1
VC	<2	<1

MW-22		
Date	06-01	08-03
B	<500	<250
E	600	<250
T	<500	<250
X	83J	<500
PCE	8700	1000
TCE	900	480
DCE	3100	930
VC	380	<100

PAN-MW-9			
Date	10-00	06-01	08-03
B	<100	<500	<100
E	3900	3700	1100
T	<100	<500	<100
X	8600	8500	2000
PCE	8000	9800	2400
TCE	380	280J	<500
DCE	130	100J	<100
VC	<100	<200	<100

MW-24		
Date	11-01	08-03
B	<12	52
E	<12	<10
T	<12	<10
X	<25	<20
PCE	400	97
TCE	95	51
DCE	240	100
VC	50	22

MW-23		
Date	06-01	08-03
B	<5	<5
E	<5	<5
T	<5	<5
X	<10	<10
PCE	<5	<5
TCE	<5	<5
DCE	<5	<5
VC	<2	<2

MW-27		
Date	11-01	08-03
B	<5	<5
E	<5	<5
T	<5	<5
X	<10	<10
PCE	<5	<5
TCE	<5	<5
DCE	<5	<5
VC	<2	<2

MW-14			
Date	10-00	06-01	08-03
B	<1	<5	<5
E	<1	<5	<5
T	<1	<5	<5
X	<2	<10	<10
PCE	<1	<5	<5
TCE	<1	<5	<5
DCE	<1	<5	<5
VC	<1	<2	<2

LEGEND

DATE SAMPLED
B – Benzene
E – Ethylbenzene
T – Toluene
X – Xylenes
PCE – Tetrachloroethene
TCE – Trichloroethene
DCE – CIS, 1, 2, Dichloroethene
VC – Vinyl Chloride

CONCENTRATIONS IN ug/L

— — —1000— — — PCE ISOCONCENTRATION CONTOUR (ug/L) BASED ON AUGUST & OCTOBER 2003 DATA

VALUE EXCEEDS TYPE 4 RRS

WELLS NO LONGER EXISTING

NOTES:

1. KOCH–MW–3 and KOCH–MW–2 shown for lithology only.
2. N/A – No lithologic data available.
3. NR = Not reported by laboratory.
4. Lithology for MW–23 is assumed the same for KOCH–MW–3.

VERT. SCALE 0

VE = 5X

HORZ. SCALE 40 20 0 40

PRELIMINARY

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION
1	10-27-03	JDR	ADDED AUGUST 2003 AND OCTOBER 2003 LAB DATA				

REVISED CORRECTIVE ACTION PLAN

VOPAK (FORMERLY PAKTANK CORPORATION) SAVANNAH, GA

DRAWN BY I. SULJUZOVIC LAST REVIEWED 11-15-02
PROJECT ENGINEER A. SLAYTON LAST REVIEWED 11-15-02
DESIGN ENGINEER LAST REVIEWED
PROJECT MANAGER J. RIGGENBACH LAST REVIEWED 11-15-02

ERM

NOT FOR CONST- RUCTION

GEOLOGICAL CROSS - SECTION B-B'

SCALE AS NOTED
DATE NOVEMBER 15, 2002
CLIENT APPROVAL
PROJECT NO. 3224 VOPAK
AutoCAD R-14 3224CSB-B_CAP_REV2.DWG
ISSUED FOR
DATE

FIGURE 1-4

SHEET OF

3224CSB-B.DWG 11-15-02 1=10

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

THIRD ANNUAL REPORT ON CORRECTIVE ACTION

VOPAK (FORMERLY PAKTANK CORPORATION) **SAVANNAH, GA**

DRAWN BY J. BYRD | PROJECT ENGINEER J. BYRD
DESIGN ENGINEER S. THOMPSON | PROJECT MANAGER S. THOMPSON

ERM

NOT FOR CONST-RUCTION

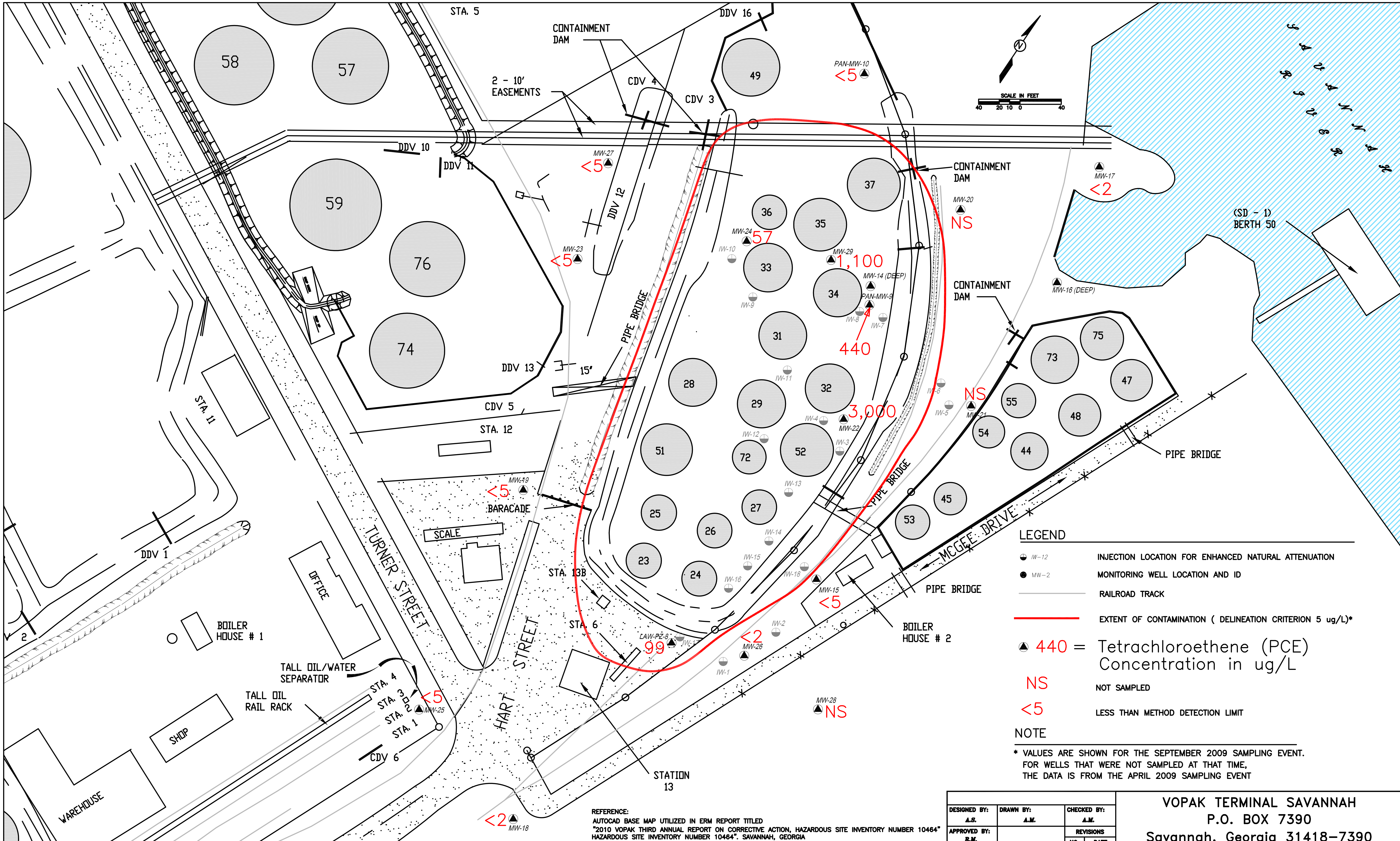
POTENTIOMETRIC SURFACE MAP SEPTEMBER 2009

SCALE AS SHOWN | DATE JANUARY 12, 2009
PROJECT NO. 110235 VOPAK | AutoCAD R-2002 110235_Vopak 2009 Annual Report.DWG

FIGURE 1-5

SHEET OF

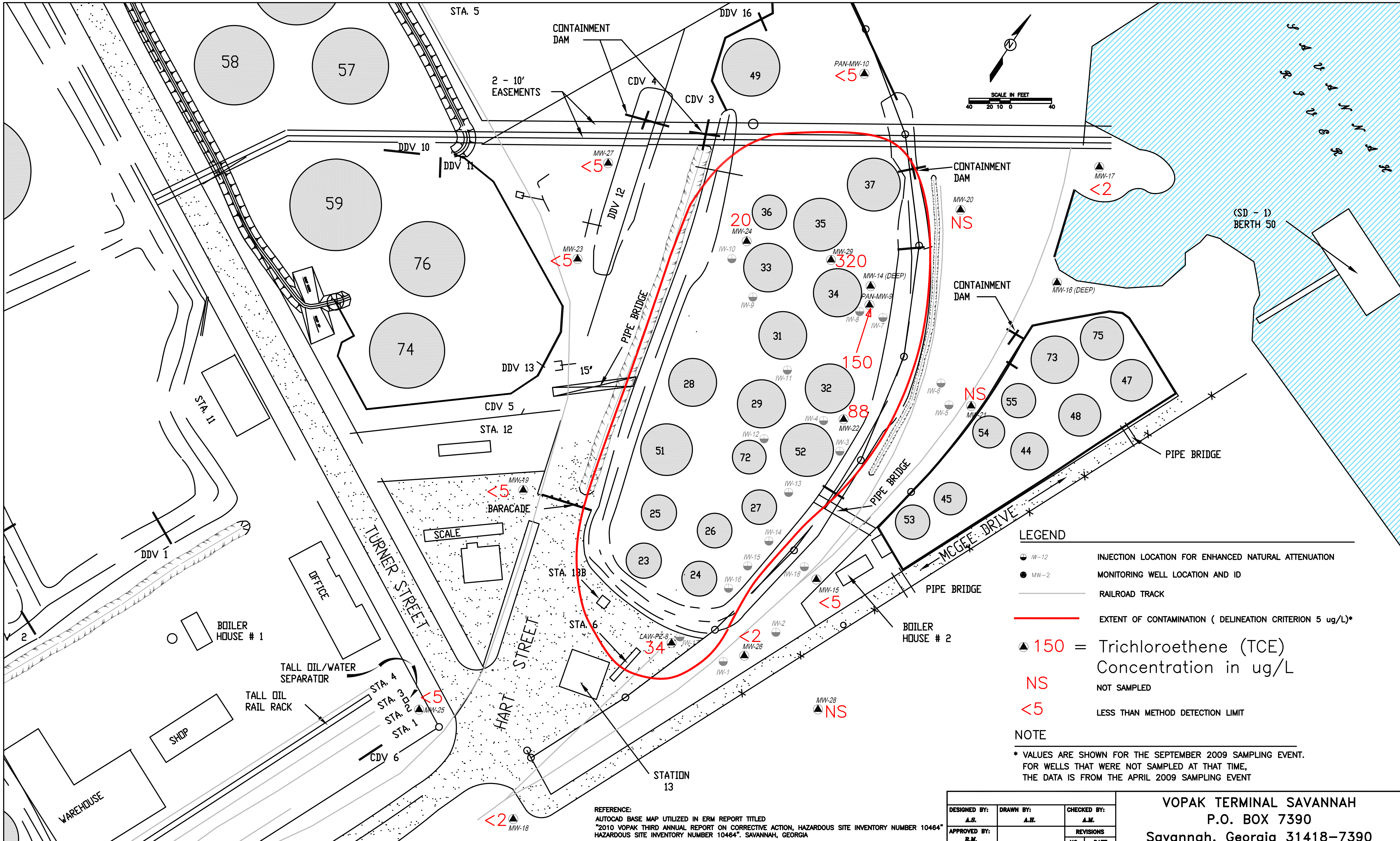
110235_Vopak 2009 Annual Report.DWG 1/12/09 1=40 JGB REV



DESIGNED BY: A.S.	DRAWN BY: A.M.	CHECKED BY: A.M.	VOPAK TERMINAL SAVANNAH P.O. BOX 7390 Savannah, Georgia 31418-7390
APPROVED BY: R.M.		REVISIONS (NO. / DATE)	
SEAL:			ENVIRONMENTAL INTERNATIONAL CORP. 161 KIMBALL BRIDGE ROAD ALPHARETTA GEORGIA 30009
		SCALE: SEE BAR SCALE	DATE: 02/09/2011 · FILE: 110235_Vopak 2009 Annual Report · SHEET NO.: 1 of 1

FIGURE 2–1

PCE CONTOUR MAP



DESIGNED BY: A.S.	DRAWN BY: A.H.	CHECKED BY: A.M.
APPROVED BY: R.M.		REVISIONS

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

SEAL:

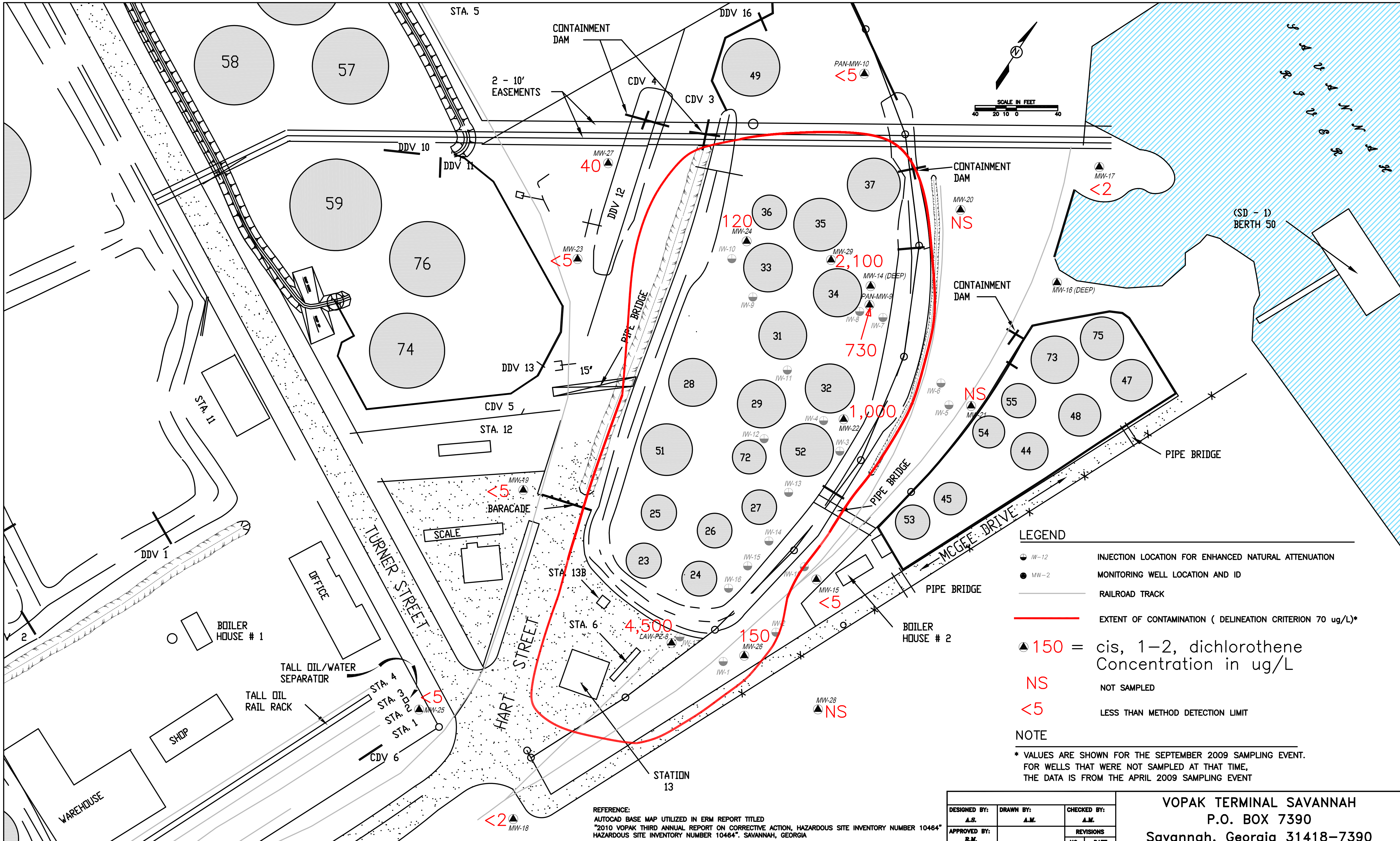
NO.	DATE

EIC

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

FIGURE 2-2
TCE CONTOUR MAP

SCALE:	DATE:	FILE:	SHEET NO.:
SEE BAR SCALE	02/09/2011	110235_Vopak 2009 Annual Report	



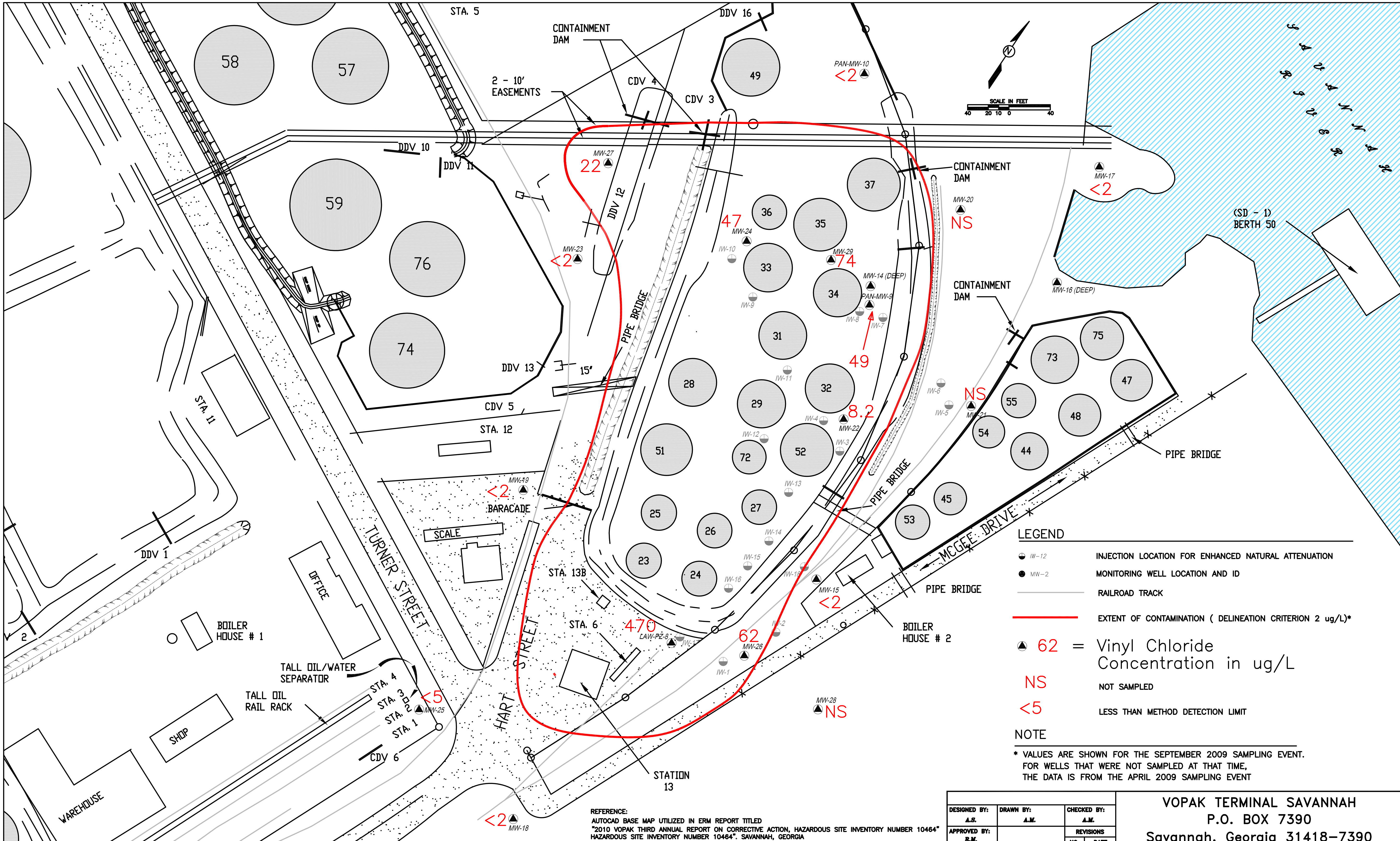
DESIGNED BY: A.S. | DRAWN BY: A.M. | CHECKED BY: A.M.
APPROVED BY: R.M. | REVISIONS | NO. | DATE
SEAL:

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

FIGURE 2-3
cis,1-2, DCE CONTOUR MAP

EIC
ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 03/16/2011 | FILE: 110235_Vopak 2009 Annual Report | SHEET NO.:



DESIGNED BY: A.S. | DRAWN BY: A.M. | CHECKED BY: A.M. | APPROVED BY: R.M. | REVISIONS NO. DATE | SEAL:

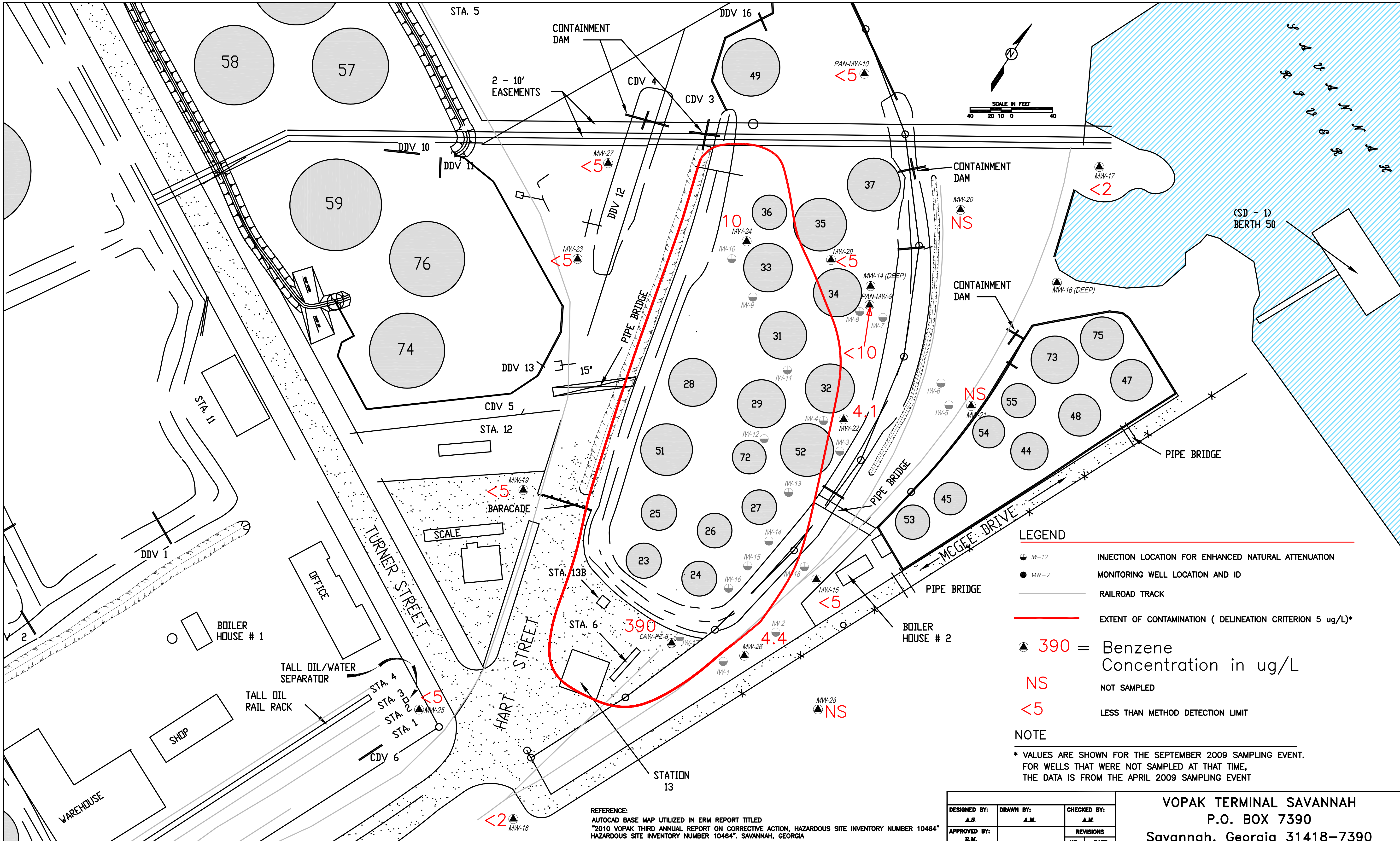
VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 03/16/2011 | FILE: 110235_Vopak 2009 Annual Report | SHEET NO.:

FIGURE 2-4

VINYL CHLORIDE CONTOUR MAP



DESIGNED BY: A.S.	DRAWN BY: A.M.	CHECKED BY: A.M.
APPROVED BY: R.M.		REVISIONS (NO. / DATE)
SEAL:		

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

FIGURE 2-5
BENZENE CONTOUR MAP

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE:	DATE:	FILE:	SHEET NO.:
SEE BAR SCALE	02/09/2011	110235_Vopak 2009 Annual Report	

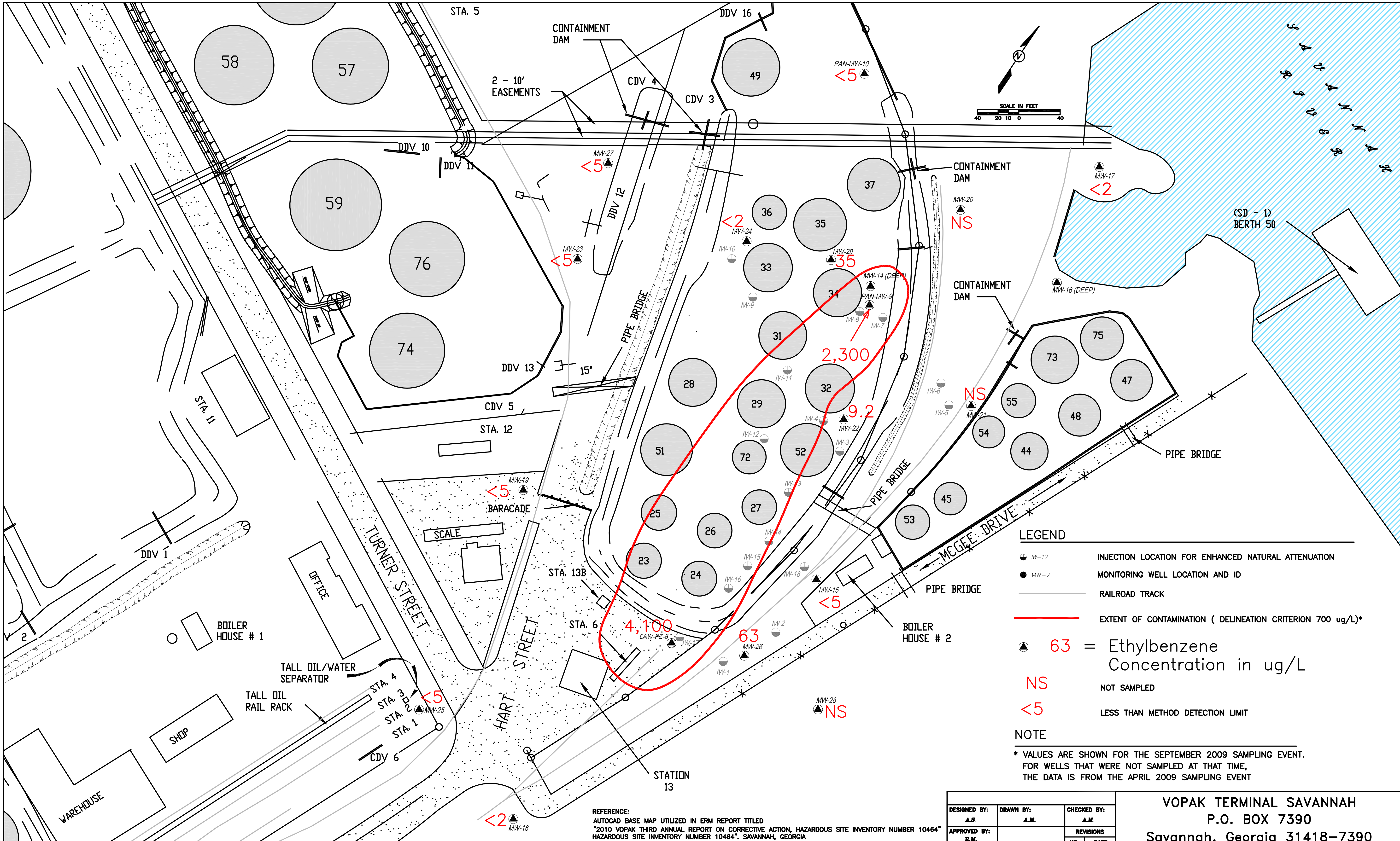


FIGURE 2-6

ETHYLBENZENE CONTOUR MAP

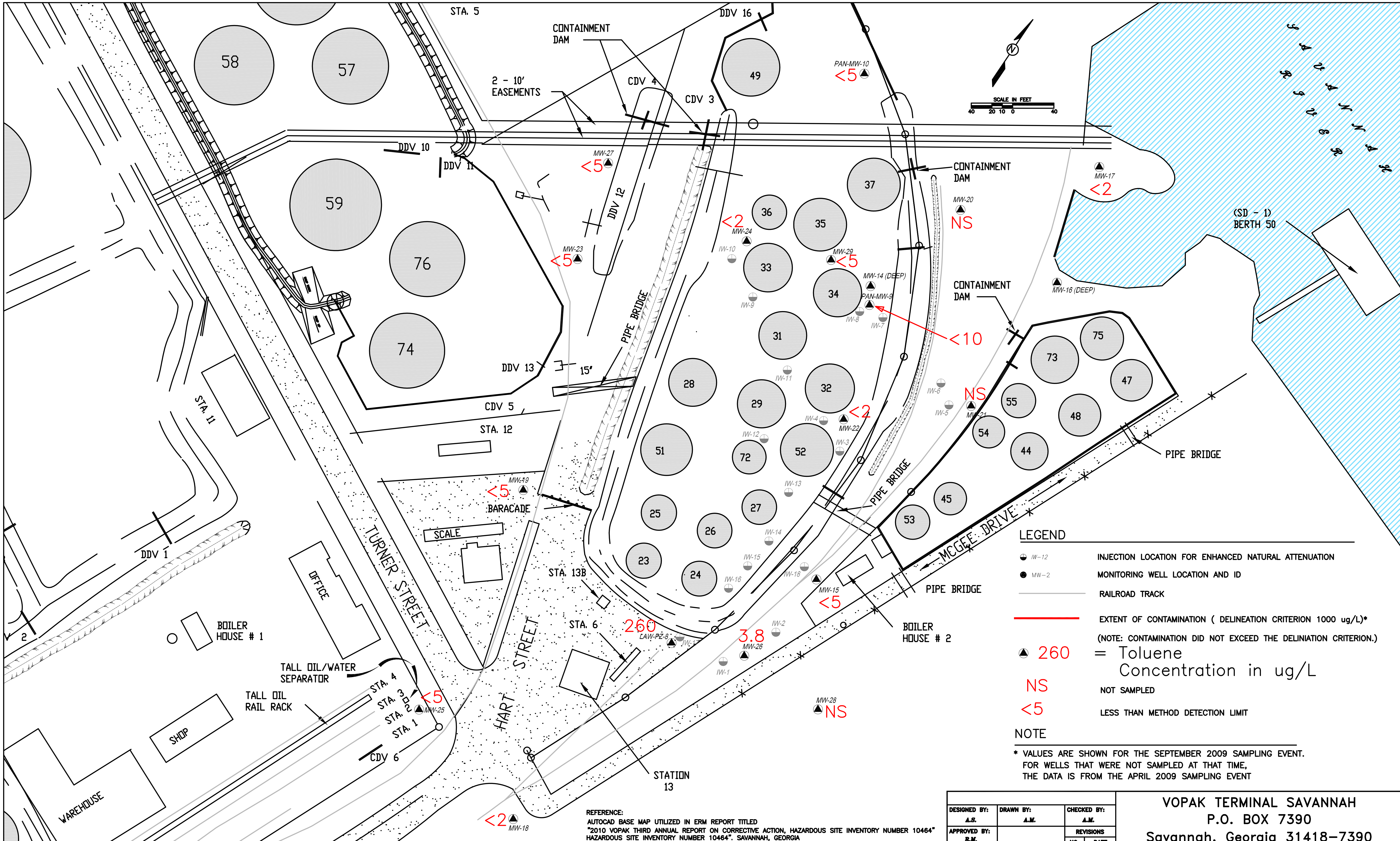
DESIGNED BY: A.S.	DRAWN BY: A.M.	CHECKED BY: A.M.
APPROVED BY: R.M.		REVISIONS NO. DATE

SEAL:

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE:	DATE:	FILE:	SHEET NO.:
SEE BAR SCALE	02/09/2011	110235_Vopak 2009 Annual Report	



LEGEND

IW-12	INJECTION LOCATION FOR ENHANCED NATURAL ATTENUATION
MW-2	MONITORING WELL LOCATION AND ID
	RAILROAD TRACK
	EXTENT OF CONTAMINATION (DELINEATION CRITERION 1000 ug/L)*
	(NOTE: CONTAMINATION DID NOT EXCEED THE DELINIATION CRITERION.)
260	= Toluene Concentration in ug/L
NS	NOT SAMPLED
<5	LESS THAN METHOD DETECTION LIMIT

NOTE

* VALUES ARE SHOWN FOR THE SEPTEMBER 2009 SAMPLING EVENT.
FOR WELLS THAT WERE NOT SAMPLED AT THAT TIME,
THE DATA IS FROM THE APRIL 2009 SAMPLING EVENT

REFERENCE:
AUTOCAD BASE MAP UTILIZED IN ERM REPORT TITLED
"2010 VOPAK THIRD ANNUAL REPORT ON CORRECTIVE ACTION, HAZARDOUS SITE INVENTORY NUMBER 10464"
HAZARDOUS SITE INVENTORY NUMBER 10464". SAVANNAH, GEORGIA

FIGURE 2-7

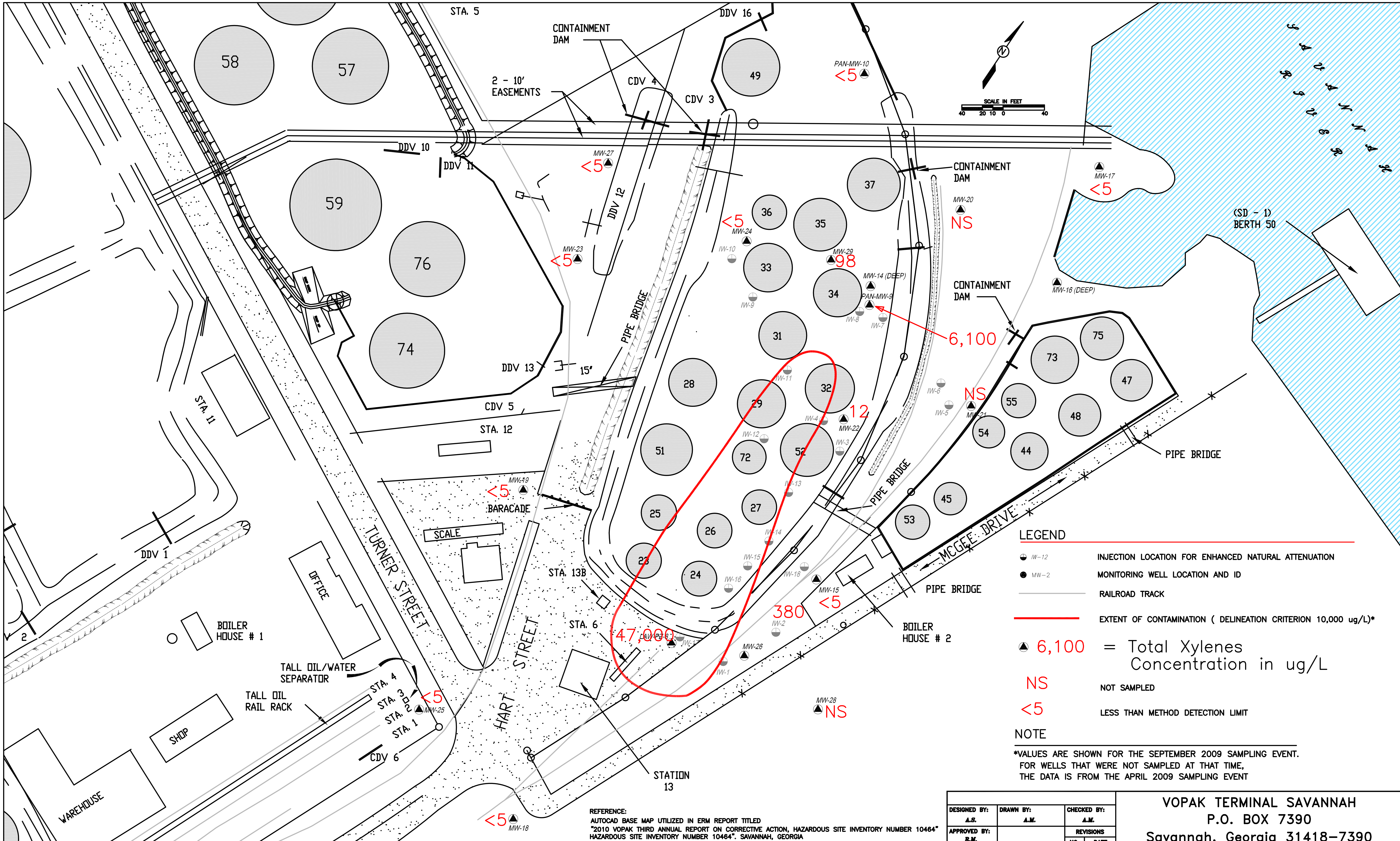
TOLUENE CONTOUR MAP

DESIGNED BY: A.S. | DRAWN BY: A.M. | CHECKED BY: A.M.
APPROVED BY: R.M.
REVISIONS: NO. | DATE
SEAL:

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 02/09/2011 | FILE: 110235_Vopak 2009 Annual Report | SHEET NO.:



DESIGNED BY: A.S.
DRAWN BY: A.M.
CHECKED BY: A.M.
APPROVED BY: R.M.
REVISIONS
NO. DATE
SEAL:

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE
DATE: 02/09/2011
FILE: 110235_Vopak 2009 Annual Report
SHEET NO.:

FIGURE 2-8

TOTAL XYLENE CONTOUR MAP

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

THIRD ANNUAL REPORT ON CORRECTIVE ACTION

VOPAK (FORMERLY PAKTANK CORPORATION) — SAVANNAH, GA

DRAWN BY: J. BYRD
PROJECT ENGINEER: J. BYRD
DESIGN ENGINEER: S. THOMPSON
PROJECT MANAGER: S. THOMPSON

ERM

NOT FOR CONSTRUCTION

PCE PLUME TRENDS OVER TIME

SCALE: AS SHOWN
DATE: JANUARY 12, 2009
PROJECT NO.: 110235 VOPAK
AutoCAD R-2002: 110235_Vopak 2009 Annual Report.DWG

FIGURE 2-9

SHEET OF

110235_Vopak 2009 Annual Report.DWG 1/12/09 1=40 JGB REV

Figure 2-10: Potential COC Migration Pathways

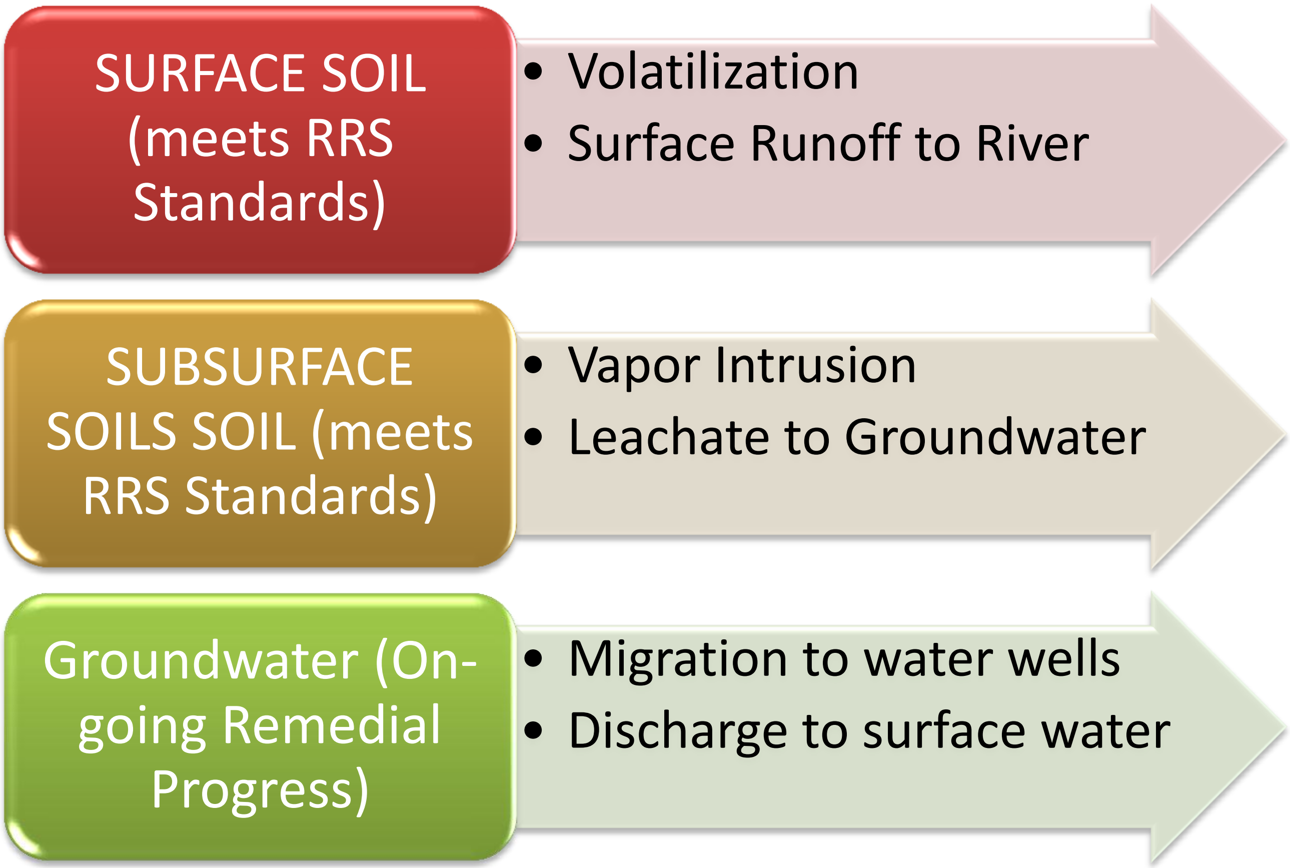


Figure 3-1: PAN-MW-9 Recent Trends

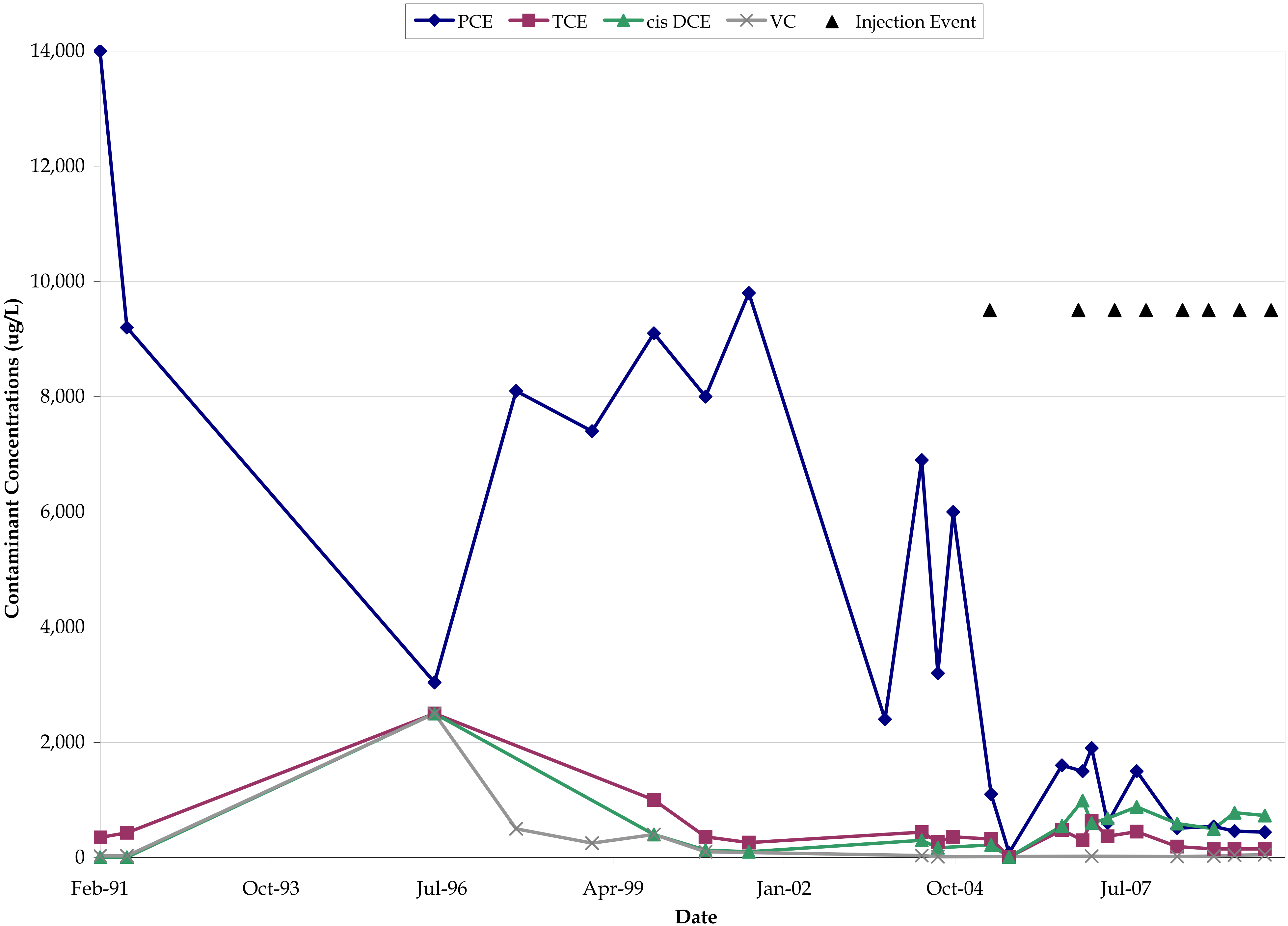


Figure 3-2: MW-22/MW-22R Recent Trends

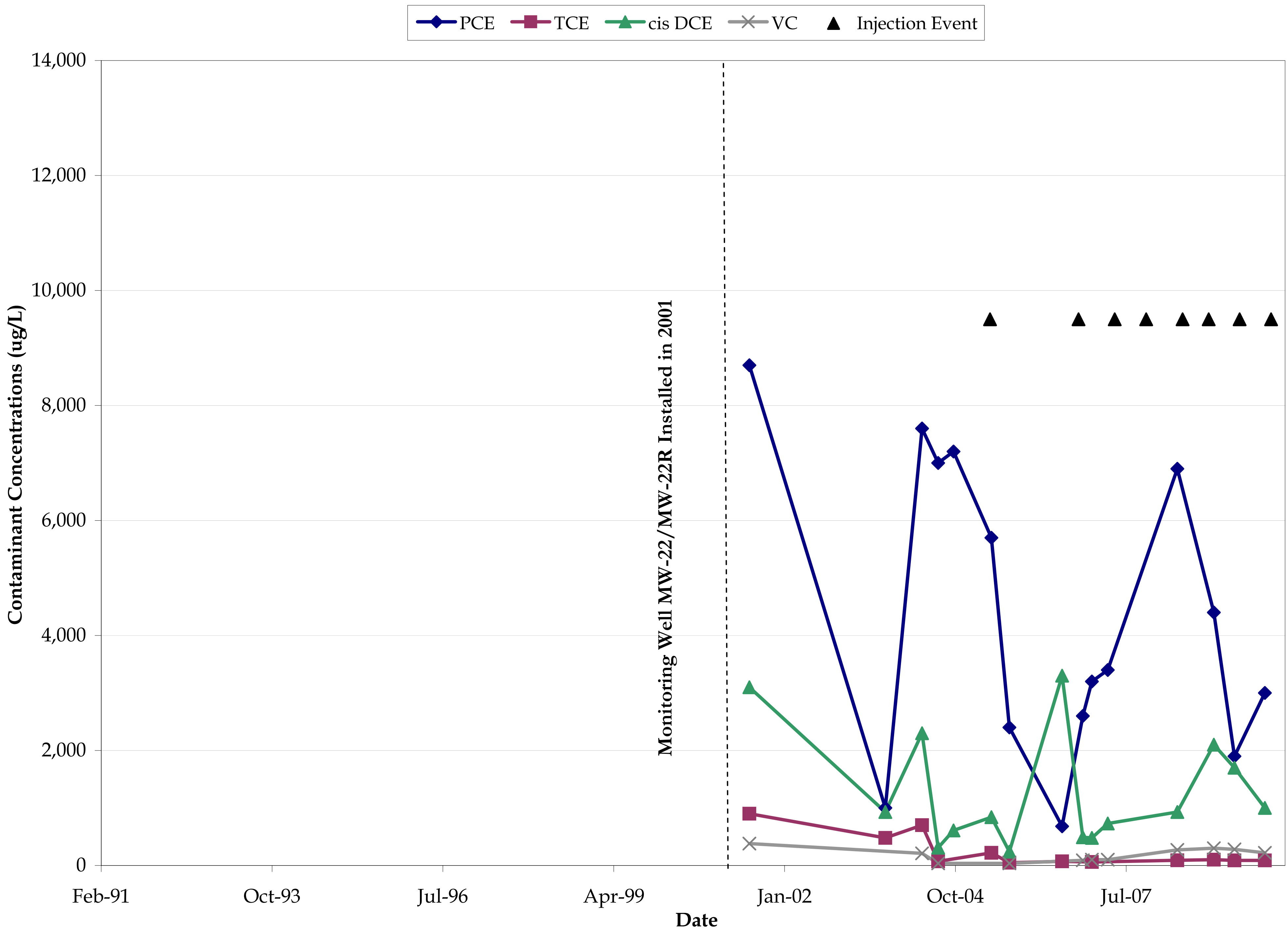


Figure 3-3: MW-24/MW-24R Recent Trends

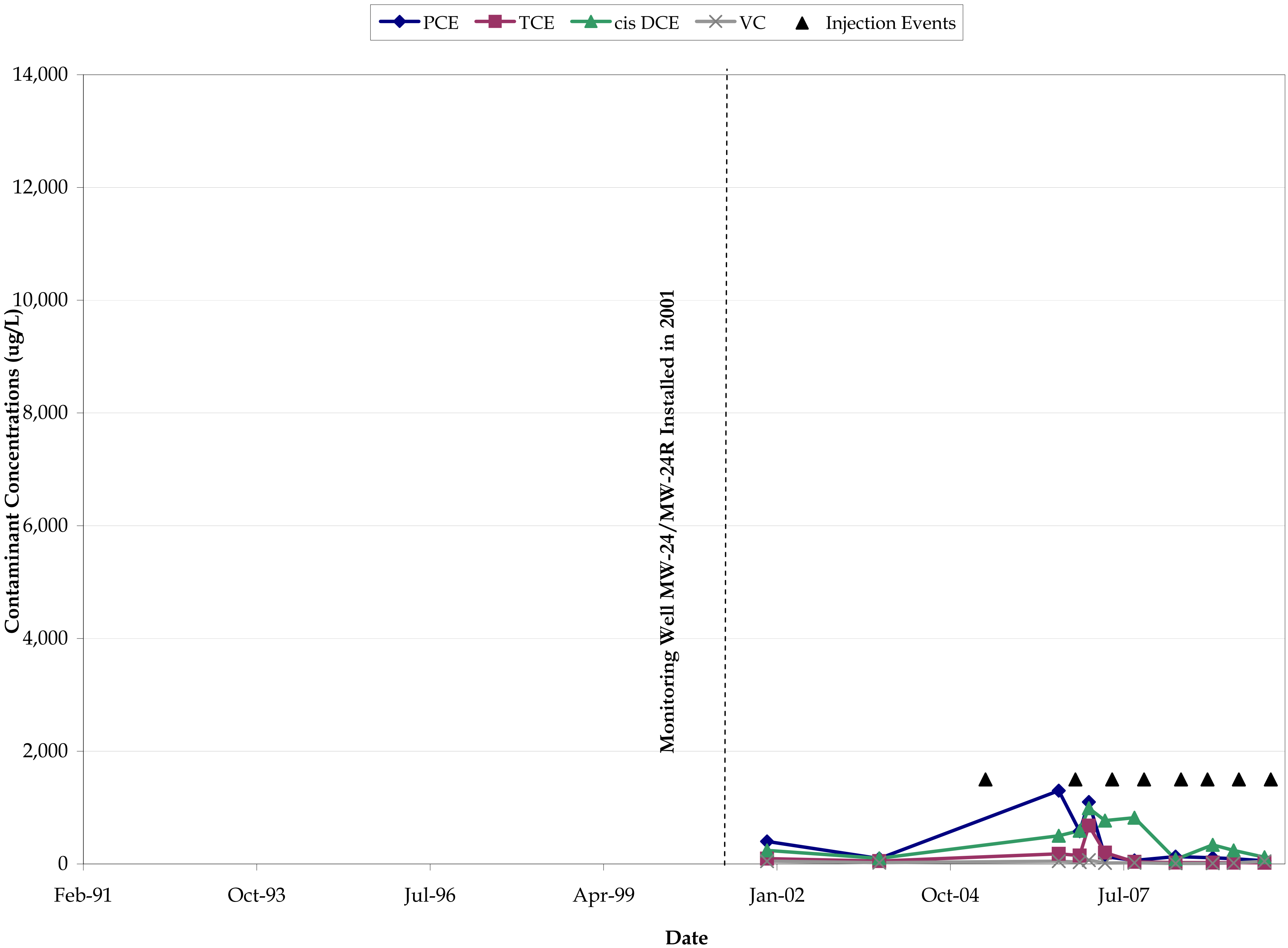
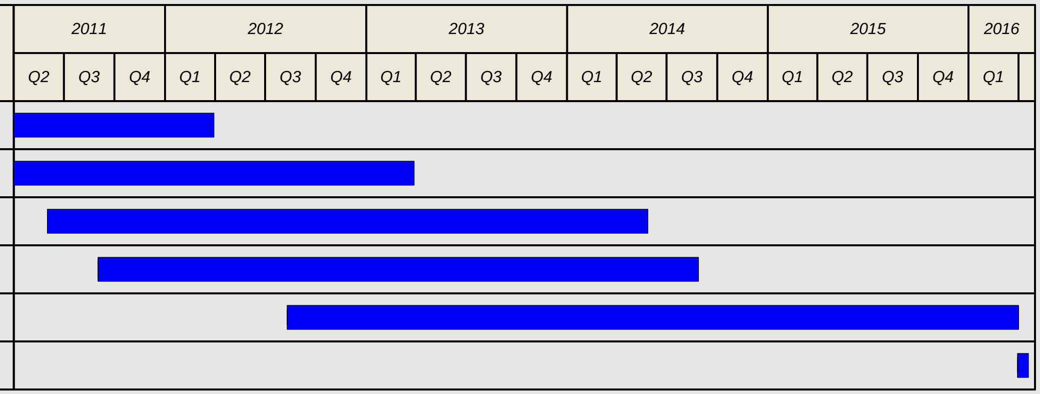


FIGURE 5-1: PROJECTED SCHEDULE

Step	Task Name	Start	Finish	Duration
1	Horizontal Delineation	4/1/2011	3/29/2012	52w
2	Vertical Delineation	4/1/2011	3/28/2013	104w
3	MNA Calibration	6/1/2011	5/27/2014	156w
4	MNA Trend Analysis	9/1/2011	8/27/2014	156w
5	MNA Closure	8/10/2012	3/31/2016	190w
6	Site Closure	3/30/2016	4/18/2016	2.8w



Note: MNA-based remediation will be in process throughout the 4 steps

ATTACHMENT A

VRP APPLICATION FORM AND CHECKLIST

Voluntary Remediation Plan Application Form and Checklist

VRP APPLICANT INFORMATION					
COMPANY NAME	VOPAK Terminal Savannah, Inc.				
CONTACT PERSON/TITLE	Branden Jones, CSP SH & E Manager, East Coast				
ADDRESS	PO Box 7390, Savannah, GA 31418-7390				
PHONE	912-964-1811 x 114	FAX	912-965-9045	E-MAIL	branden.jones@vopak.com

GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP					
NAME	Raj Mahadevaiah			GA PE/PG NUMBER	23198
COMPANY	Environmental International Corporation				
ADDRESS	161 Kimball Bridge Road, Suite 100, Alpharetta, GA 30009				
PHONE	770-772-7100	FAX	770-772-0555	E-MAIL	rajmahadevaiah@eicusa.com

APPLICANT'S CERTIFICATION

In order to be considered a qualifying property for the VRP:

(1) The property must have a release of regulated substances into the environment;
(2) The property shall not be:
- (A) Listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601.
- (B) Currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or
- (C) A facility required to have a permit under Code Section 12-8-66.

(3) Qualifying the property under this part would not violate the terms and conditions under which the division operates and administers remedial programs by delegation or similar authorization from the United States Environmental Protection Agency.
(4) Any lien filed under subsection (e) of Code Section 12-8-96 or subsection (b) of Code Section 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to Code Section 12-8-94 or Code Section 12-13-6.

In order to be considered a participant under the VRP:
1. The participant must be the property owner of the voluntary remediation property or have express permission to enter another's property to perform corrective action.
2. The participant must not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also certify that this property is eligible for the Voluntary Remediation Program (VRP) as defined in Code Section 12-8-105 and I am eligible as a participant as defined in Code Section 12-8-106.

APPLICANT'S SIGNATURE	[signature]		
APPLICANT'S NAME/TITLE (PRINT)	Branden Jones, CSP SH & E Manager, East Coast	DATE	10/14/2010

QUALIFYING PROPERTY INFORMATION			
TAX PARCEL ID	Plat Book 11-P, Folio 197	PROPERTY SIZE (ACRES)	5.0434
PROPERTY ADDRESS	Georgia Ports Authority Gate No. 2, Turner and Hart Street		
CITY	Garden City	COUNTY	Chatham
LATITUDE	32° 07' 02" N	LONGITUDE	81° 08' 17" W
PROPERTY OWNER(S)	Georgia Ports Authority	PHONE # 912-964-3891	
MAILING ADDRESS	Mr. William Jakubsen, PO Box 2406		
CITY	Savannah	STATE/ZIP	Georgia, 31402

ITEM #	DESCRIPTION OF REQUIREMENT	Location in VRP (i.e. pg., Table #, Figure #, etc.)	For EPD Comment Only (Leave Blank)
1.	**$5,000 APPLICATION FEE** IN THE FORM OF A CHECK PAYABLE TO THE GEORGIA DEPARTMENT OF NATURAL RESOURCES.	**Attached**	
2.	**WARRANTY DEED(S)** FOR QUALIFYING PROPERTY.	**Attachment A**	
3.	**TAX PLAT** OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S).	**Attachment B**	
4.	**ONE (1) PAPER COPY AND TWO (2) COMPACT DISC (CD) COPIES** OF THE VOLUNTARY REMEDIATION PLAN IN A SEARCHABLE PORTABLE DOCUMENT FORMAT (PDF).	**Attached**	
5.	The VRP participant's initial plan and application must include , using all reasonably available current information to the extent known at the time of application, a graphic three-dimensional preliminary conceptual site model (CSM) including a preliminary remediation plan with a table of delineation standards, brief supporting text, charts, and figures (no more than 10 pages, total) that illustrates the site's surface and subsurface setting, the known or suspected source(s) of contamination, how contamination might move within the environment, the potential human health and ecological receptors, and the complete or incomplete exposure pathways that may exist at the site; the preliminary CSM must be updated as the investigation and remediation progresses and an up-to-date CSM must be included in each semi-annual status report submitted to the director by the participant; a **PROJECTED MILESTONE SCHEDULE** for investigation and remediation of the site, and after enrollment as a participant, must update the schedule in each semi-annual status report to the director describing implementation of the plan during the preceding period. A Gantt chart format is preferred for the milestone schedule.		
5.a	**Conceptual Site Model**	**Section 2; Tables 2-1 & 2-2; Figures 1-1 through 1-5, 2-1, 2-2**	
5.b	**Preliminary Remediation Plan**	**Section 4; Tables 2-1, 2-2, 3-1;**	

		Figures 2-2 & 3-1 through 3-3	
5.c	**Table of Delineation Standards**	**Sections 1.3 & 4.5: Tables 4-1 through 4-6**	
5.d	**Supporting Text, Charts, and Figures which illustrate the following material:**		
i	**Surface and Sub-surface Setting**	**Section 1: Figures 1-1 through 1-5**	
ii	**Known or Suspected Sources of Contamination**	**Section 2: Tables 2-1 & 2-2**	
iii	**Potential Movement of Contamination within the Environment**	**Section 2.4: Figures 1-5 & 2-2**	
iv	**Potential Human Health and Ecological Receptors**	**Section 2.5**	
v	**Complete and/or Incomplete Exposure Pathways**	**Section 2.3**	
5.e	**Projected Milestone Schedule**	**Section 5; Figure 5-1**	
	The following four (4) generic milestones are required in all initial plans with the results reported in the participant's next applicable semi-annual reports to the director. The director may extend the time for or waive these or other milestones in the participant's plan where the director determines, based on a showing by the participant, that a longer time period is reasonably necessary:		
i	Within the first 12 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern on property where access is available at the time of enrollment;	**Section 5.1**	
ii	Within the first 24 months after enrollment, the participant must complete horizontal delineation of the release and associated constituents of concern extending onto property for which access was not available at the time of enrollment;	**Section 5.2**	
iii	Within 30 months after enrollment, the participant must update the site CSM to include vertical delineation, finalize the remediation plan and provide a preliminary cost estimate for implementation of remediation and associated continuing actions; and	**Section 5.3**	
iv	Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications.	**Section 5.4**	
	SIGNED AND SEALED PE/PG CERTIFICATION AND SUPPORTING DOCUMENTATION:		

6.	**SIGNED AND SEALED PE/PG CERTIFICATION** AND SUPPORTING DOCUMENTATION: "I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12-8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances. Furthermore, to document my direct oversight of the Voluntary Remediation Plan development, implementation of corrective action, and long term monitoring, I have attached a monthly summary of hours invoiced and description of services provided by me to the Voluntary Remediation Program participant since the previous submittal to the Georgia Environmental Protection Division. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." Basavaraj Mahadevaiah GA 23198 — 10/14/10 Printed Name and GA PE/PG Number — Date GEORGIA REGISTERED No. 23198 PROFESSIONAL ENGINEER BASAVARAJ MAHADEVAIAH Signature and Stamp		

VRP APPLICATION (Revised)

ATTACHMENT B

WARRANTY DEED

Eulaine Carnes
Notary Public, Chatham County, Ga.
Notarial Seal

Mrs. Pearl Foster (L.S.)
Clara B. Giles (L.S.)

Received for record April 9, 1949
Recorded April 14, 1949

hhhhhhhh

STATE OF GEORGIA
COUNTY OF FULTON

WHEREAS, on the 15th day of December, 1948, the STATE OF GEORGIA by quitclaim deed acquired from the UNITED STATES OF AMERICA, acting by and through its WAR ASSETS ADMINISTRATOR, title to a certain tract of land lying and being in the County of Chatham, State of Georgia, containing 407.59 acres, more or less, and known as the Medical Depot site in Chatham County, Georgia, adjacent to the Savannah River; said quitclaim deed being recorded in Record Book 48-F, Folio 272, in the Office of the Clerk of the Superior Court, Chatham County, Georgia, and at page 101 of Deeds to State Property book in the office of the Secretary of State of Georgia; and

WHEREAS, by section 4 of Act No. 174 (Senate Bill No. 55), approved by the Governor on February 17, 1949, the 1949 Session of the General Assembly authorized the Governor to convey for and in behalf of the State title to lands and improvements known as the Medical Depot site in Chatham County, Georgia, adjacent to the Savannah River, to the Georgia Ports Authority upon payment of such nominal sum to the State Treasurer as may be agreed upon by the Governor and the Authority.

NOW, THEREFORE, In consideration of the sum of $1000.00 (One Thousand) Dollars/and for other valuable considerations paid to the Treasurer of the State of Georgia, as provided and in accordance with said Act No. 174, I, HERMAN TALMADGE, GOVERNOR OF THE STATE OF GEORGIA, and for and in behalf of the STATE OF GEORGIA, have bargained, sold and conveyed, and do by these presents bargain, sell, convey, remise, release, and forever quitclaim unto the GEORGIA PORTS AUTHORITY, its successors and assigns, all the right, title, interest, claim or demand which the State of Georgia has or may have had in or to the following described property, situate, lying and being in the County of Chatham, State of Georgia to wit:

ALL those tracts or parcels of land lying and being in Chatham County, Georgia containing 430.09 acres, being more particularly described as follows:

PARCEL NO. 1- Beginning at an iron pipe at the intersection of the Northern right-of-way of Brampton Road and the Eastern right-of-way line of the Savannah and Atlanta Railroad; thence with Eastern right-of-way of the Savannah and Atlanta Railroad North 26 deg. 25 min. 41 sec. West, 700.00 feet to a point; thence North 56 deg. 07 min. 37 sec. East 40.0 feet to a point on the Eastern right-of-way line of a railroad spur of the Savannah Warehouse and Compress Company; thence Northerly along curvature of said right-of-way line to a point which is North 03 deg. 45 min. 01 sec. West, 282.52 feet from the immediately preceding point; thence continue Northerly along the curvature of said right-of-way line to a point which is North 04 deg. 55 min. 24 sec. East, 267.99 feet from the immediately preceding point; thence Southerly along the curvature of the Western right-of-way line of another railroad spur of the Savannah Warehouse and Compress Company to a point which is South 51 deg. 11 min. 19 sec. East 236.14 feet from the immediately preceding point; thence continue Southerly along the curvature of said Western right-of-way line to a point which is South 33 deg. 07 min. 28 sec. East 227.81 feet from the immediately preceding point; thence North 56 deg. 07 min. 37 sec. East 49.7 feet to a point on the Eastern right-of-way line of railroad spur of the Savannah Warehouse and Compress Company; thence Northerly along the curvature of said Eastern right-of-way to a point which is North 31 deg. 41 min. 49 sec. West, 215.5 feet from the immediately preceding point; thence continue Northerly along curvature of said right-of-way line to a point which is North 47 deg. 59 min, 35 sec. West, 275.9 feet from the immediately preceding point; thence continue Northerly along the curvature of said right-of-way line to a point which is North 21 deg. 20 min. 30 sec. West, 331.8 feet from the immediately preceding point; thence continue Northerly along the curvature of said right-of-way line to a point which is North 2 deg. 49 min. 14 sec. East 173.3 feet from the immediately preceding point; thence North 30 deg. 10 min. East 360.1 feet to a point; thence North 59 deg. 50 min. West, 76.0 feet to a point; thence South 44 deg. 48 min. 58 sec. West, 94.8 feet to a point; thence North 10 deg. 17 min. 14 sec. East, 928.8 feet to a pipe; thence North 06 deg. 09 min, 12 sec. East 2074.4 feet to a railroad iron; thence North 01 deg. 00 min. 48 sec. West, 900.0 feet to a point in center line of Pipemakers Canal; thence Easterly with the center line of said canal to a point on the low water line of the Western bank of Savannah River, said point being North 68 deg. 24 min. 47 sec. East 2945.1 feet from the immediately preceding point; thence Southerly 4300 feet along the low water line of Savannah River to a point which is South 27 deg.25 min. 50 sec. East 4238.0 feet from the immediately preceding point; thence South 56 deg. 07 min. 37 sec. West 5700.0 feet along the Northerly line of Brampton Road to the point of beginning, containing 426.25 acres, more or less.

PARCEL NO. 2- Commencing at an iron pipe at the intersection of the Northern right-of-way line of Brampton Road and the Eastern right-of-way line of the Savannah and Atlanta Railroad; thence North 26 deg. 25 min. 41 sec. West 765.0 feet to the point of beginning of herein described parcel; thence North 26 deg. 25 min. 41 sec. West 485.0 feet along the Eastern right of way line of the Savannah and Atlanta Railroad; thence Northerly along the curvature of the Eastern right of way line of the Chatham Terminal Company to a point which is North 06 deg. 13 min. 54 sec. East 335.8 feet from immediately preceding point; thence North 30 deg. 12 min. 20 sec. East 185.0 feet along the Southeastern right-of-way of the East track of Savannah Warehouse and Compress Company; thence Southerly along the curvature of the Western right-of-way line of a spur track of the Savannah Warehouse and Compress Company to a point which is South 13 deg. 15 min. 03 sec. East 318.5 feet from immediately preceding point; thence continuing Southerly along the curvature of said Western right-of-way line to a point which is South 05 deg. 31 min. 39 sec. East 280.3 feet from immediately preceding point; thence continuing Southerly along the curvature of said Western right-of-way line to the point of beginning, which is South 02 deg. 18 min. 27 sec. West 339.3 feet from immediately preceding point.

The above described tract is Lot 8 of the Industrial Subdivision of Savannah Warehouse and Compress Company and contains 2.78 acres, more or less.

PARCEL NO. 3- A certain tract or parcel of land, lying and being in Chatham County, Georgia, being more particularly described as follows:

Beginning at the intersection of the Eastern right-of-way line of U. S. Highway No. 17 and the Northern right-of-way line of the Savannah Warehouse and Compress Company's East track; thence North 06 deg. 05 min. 50 sec. East 442.5 feet along said Eastern right-of-way line of U. S. H'ghway No. 17; thence Easterly along the curvature of the Southern right-of-way line of the Savannah and Atlanta Railroad spur to the Savannah Warehouse and Compress Company to a point which is North 71 deg. 10 min. 55 sec. East 275.6 feet from immediately preceding point; thence South 30 deg. 12 min. 20 sec. West 612.0 feet along the Northern right-of-way line of the Savannah Warehouse and Compress Company's East tract to the point of beginning, containing 1.06 acres, more or less.

The above described parcel is Lot 7 of Industrial Subdivision of Savannah Warehouse . Compress Company.

Exception from said above described land the following described land and buildings, to-wit:

A tract or parcel of land, situate and being in the County of Chatham, State of Georgia, being a portion of the Savannah Quartermaster Depot, and a portion of the tract of land formerly owned by the Savannah Warehouse and Compress Company, and containing 22.50 acres, more or less, being more particularly described as follows:

Beginning at a point at the intersection of center line of Rethers Street with line parallel to and 25 feet southerly from the southerly line of Building 3 (A-G); thence South 68 deg. 25 min. West, 1870 feet along the A.C.L. Railroad Spur to a point on a fence line West of Tomochichi Road; thence North 13 deg. 52 min. East 724 feet along the aforementioned fence line; thence North 68 deg. 25 min. East, 1450 feet along same fence line to the intersection of center-line of Rethers Street; thence South 21 deg. 35 min. East 590 feet along the centerline of Rethers Street to the point of beginning.

Buildings 49-B with adjacent wharf, containing 21,030 sq. ft., more or less, being more particularly described as follows:

Beginning at the intersection of Hart Street with the Southwest corner of Bldg. 49-B and approximately 10 feet southerly from the Southerly line of railroad spur; thence North 68 deg. 25 min. East 140 feet; thence South 17 deg. 58 min. East 160 feet; thence South 72 deg. 30 min. West 130 feet; thence North 21 deg. 35 min. West 151 feet to the point of beginning.

All bearings and distances are scaled from map of the U. S. Engineer Office, Savannah, Georgia, Drawing No. QMDS-1/702.

Buildings No. 1 (A-E inclusive), Building No. 3 (A-G inclusive) and Bldg. No. 49 with adjacent wharf are located on the areas described herein.

Together with all the personal property acquired and retained by the State of Georgia from the United States pursuant to and under the terms of the aforesaid quitclaim deed from the United States to the State of Georgia which quitclaim deed appears of record, as hereinbefore set out, in Record Book 48-F, Folio 272, in the office of the Clerk of the Superior Court of Chatham County, Georgia, the said personal property being listed in Schedule "A" attached to and made a part of the aforesaid quitclaim deed from the United States to the State of Georgia.

All said property, both real and personal, being the same property acquired by the State of Georgia from the United States of America, acting by and through its War assets Administrator, by quitclaim deed which appears of record in Record Book 48-F, Folio 272, in the office of the Clerk of the Superior Court of Chatham County, Georgia, together with all the rights, members, and appurtenances to the said described premises in anywise appertaining or belonging, but for the following exceptions, which exceptions are the same as those contained in said deed from the United States of America to the State of Georgia, and are, to wit:

1. An Easement in favor of the City of Savannah, Georgia, to dig and excavate part of the land east of Pipemakers Creek.

2. Rights and Easements of railroad companies under an agreement dated October 20, 1916, as amended by an agreement dated June 24, 1942.

3. Outstanding rights of railroad companies under the railroad storage yard agreement dated November 17, 1919, as amended by agreement dated June 24, 1942.

4. Outstanding rights under an agreement dated September 25, 1925, as amended by agreement dated June 24, 1942.

5. Rights of Lindsay McMillan Company, or its successors and assigns, under an agreement in connection with the deed dated April 9, 1928.

6. All existing easements for public roads, highways, public utilities, railroads and pipelines.

7. All outstanding rights of third persons in and to that part of the land within Pipemakers Creek or Canal.

8. Joint use by the Department of the Army with party of the second part of Gibbins Road from entrance gate on Highway No. 17 to Tomochichi Road, thence to building 3-A; primary electric line from existing sub-station; existing water distribution system; existing sewer lines down Livingston Street to Savannah River; Rae's Hall Road around North side of requested area to Hart Street, to building No. 49-B, with adjacent wharf.

9. Easement from United States of America to Mayor and Aldermen of the City of Savannah dated July 16, 1948, for a water pipeline fifty (50) feet wide across the property hereinbefore described.

10. Any other outstanding rights appearing of record.

11. And further excepting from this conveyance certain mineral rights which have been reserved by the United States of America in accordance with Executive Order 9908, approved December 5, 1947, (12 F. R. 8223), being all uranium, thorium, and all other materials determined pursuant to section 5 (b) (1) of the Atomic Energy Act of 1946 (60 Stat. 761) to be peculiarly essential to the production of fissionable material, contained, in whatever concentration, in deposits in the lands covered by this instrument, which are hereby reserved for the use of the United States, together with the right of the United States through its authorized agents or representatives at any time to enter upon the land and prospect for, mine, and remove the same, making just compensation for any damage or injury occasioned thereby. However, such land may be used, and any rights otherwise acquired by this disposition may be exercised, as if no reservation of such materials had been made; except that, when such use results in the extraction of any such material from the land in quantities which may not be transferred or delivered without a license under the Atomic Energy Act of 1946, as it now exists or may hereafter be amended, such material shall be the property of the United States Atomic Energy Commission, and the Commission may require delivery of such material to it by any possessor thereof after such material has been separated as such from the ores in which it was contained. If the Commission requires the delivery of such material to it, it shall pay to the person mining or extracting the same, or to such other person as the Commission determines to be entitled thereto, such sums, including profits, as the Commission deems fair and reasonable for the discovery, mining, development, production, extraction, and other services performed with respect to such material prior to such delivery, but such payment shall not include any amount on account of the value of such material before removal from its place of deposit in nature. If the Commission does not require delivery of such material to it, the reservation hereby made shall be of no further force or effect.

TO HAVE AND TO HOLD the said described premises unto the GEORGIA PORTS AUTHORITY, its successors and assigns, so that neither the STATE OF GEORGIA nor its assigns, nor any person or persons claiming under it shall at any time claim or demand any right, title, or interest to the described premises or its appurtenances.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the State of Georgia this the 29 day of March, 1949.

Signed, sealed and delivered
in the presence of:
Gladys Creal
Notary Public, Georgia, State at Large.
My commission Expires Jan. 9, 1950
Notarial Seal

Herman E. Talmadge (L.S.)
Governor of the State of Georgia
SEAL OF THE STATE OF GEORGIA

Benton Odom
Joe N. Burton N. P.
(Witness as to Secretary of State and affixing of Seal)
Notorial Seal

BY THE GOVERNOR:
Ben. W. Fortson Jr.
Secretary of State

This Deed approved as to form, substance and title, this the 11 day of April 1949

2010 Chatham County Board of Assessors

1-0618 -01-003L

Property Record Card

 Requested By: READONLY 7/2/2010

BRAMPTON RD SAVANNAH

APPRAISER	swcorcor
LAST INSP	04/27/2010
APPR ZONE	000009

IMPTS ONLY ON STATE PORT AUTH PROPERTY

SOUTHLAND OIL CO
C/O RASH #698-10-820
PO BOX 260888
PLANO, TX 75026-0888

CAMA	ASMT		
0	0	LAND	1
229,300	229,300	BLDG	9
4,193,100	4,193,100	OBXF	53
4,422,400	4,422,400	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE
						-

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

PERMITS	TYPE	DATE	AMOUNT

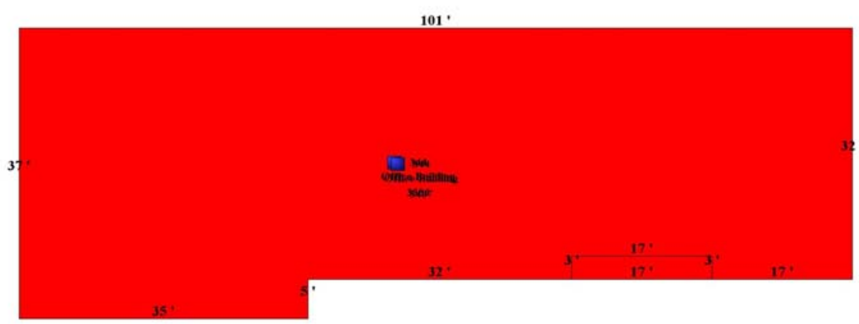
HISTORY	LAND	IMPR	TOTAL
2010		4,422,400	4,422,400 Cama
2009		5,271,500	5,271,500 Over
2008			5,271,500 A/C
2007		3,672,000	3,672,000 Cama
2006		3,672,000	3,672,000 Cama

COMMENTS

3/25/2010	*03/25/2010 REVIEWED AND TAKEN OFF OVER-RIDE PER RETURN AND NEW INFORMATION. SWC.*
3/24/2010	*03/24/2010 UPDATED TANK DATA PER INFORMATION PROVIDED. SWC.*
3/8/2010	*TY010 RET VAL ENT*

NOTES

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22010-1	Commercial	838,882	1959	1959	MS	80.00	0.00	0.00	0.00	80.00	167,776	1.00	167,776



AREA	6,763
STORIES	2.0
PERIMETER / SHAPE	558

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
344 Office Building	3,407	50.38	D	9.00	3.00
344 Office Building	3,356	49.62	D	9.00	3.00

COMPONENTS			UNITS	%	QUAL
C1	882	Stud -Brick Veneer	-	100.00	
C2	611	Package Unit	-	100.00	

Office (Building #1). Two stories; 4" face brick on wood frame; 9' height per floor; built in 1959; reinforced concrete slab; wood plank flooring upstairs; six plumbing fixtures; conduit wiring & fluorescent lighting; central forced air heating and cooling; suspended tile ceiling; vinyl tile flooring; drywall & wood panel partitions; double pitch asphalt shingle roofing. http://www.vopakamericas.com/

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
43601		CAN STY 14 ST AVG	62	32	1,984.00	3	24.25	48,112	1955	1955	35					9,622	8,700
43602	22020	CAN STY 14 ST AVG	37	75	2,775.00	3	24.25	67,294	1969	1969	35					13,459	12,100
43603	22020	Uncoded Feature *Description=Service Booth Section 64, Page 2*	6	6	36.00	3	127.44	4,588	1969	1969	35					918	800
177133		Uncoded Feature *GUARD HOUSE SECTION 17 PAGE 15*	10	10	100.00	A	32.93	3,293	2009	2009	20					3,194	2,900
177134		Uncoded Feature *TANK #1 55,000 BBLS 1951 S61 P5*	0	0	1.00	A	415,950.00	415,950	1951	1951				OC	50.00	207,975	187,200
177135		Uncoded Feature *TANK #2 55,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	415,950.00	415,950	1951	1951				OC	50.00	207,975	187,200
177136		Uncoded Feature *TANK 5 55,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	415,950.00	415,950	1951	1951				OC	50.00	207,975	187,200
177137		Uncoded Feature *TANK 6 55,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	415,950.00	415,950	1951	1951				OC	50.00	207,975	187,200

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE
25688	INDUSTRIAL	0	0	1.000 G	0.00	I-H	1.00								0

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO	CAMA	ASMT		
LAST INSP	04/27/2010		C/O RASH #698-10-820	0	0	LAND	1
APPR ZONE	000009		PO BOX 260888	229,300	229,300	BLDG	9
			PLANO, TX 75026-0888	4,193,100	4,193,100	OBXF	53
				4,422,400	4,422,400	Cost - MS	

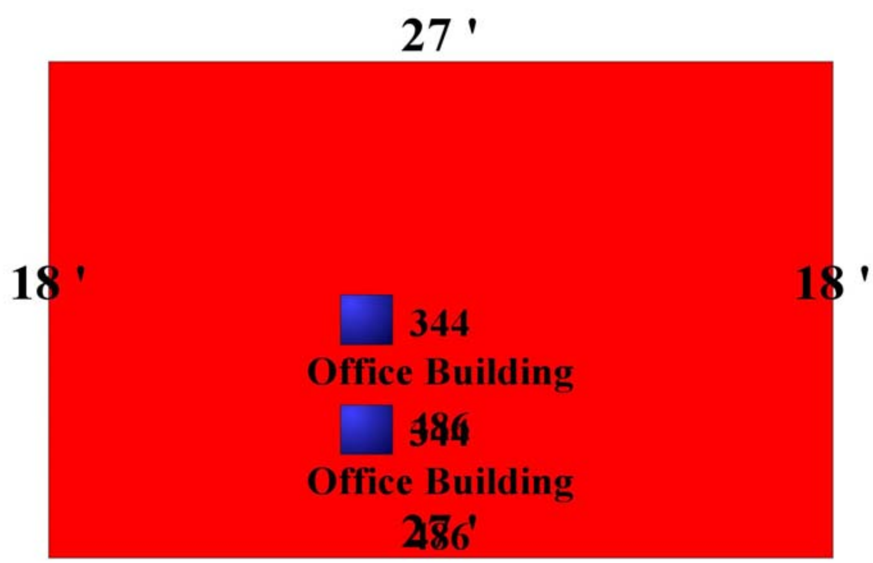
SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

PERMITS	TYPE	DATE	AMOUNT

CODES		
PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY	LAND	IMPR	TOTAL
2005		3,672,000	3,672,000 Cama
2004		3,686,000	3,686,000 Cama
2003		3,686,000	3,686,000 Cama
2002		3,686,000	3,686,000 Cama
2001		3,738,000	3,738,000 Cama

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22011-1	Commercial	71,724	1960	1960	MS	80.00	0.00	0.00	0.00	80.00	14,345	1.00	14,345



Office (Building #2). Two stories; concrete block; 9' height per floor; built in 1960; painted 8" concrete block walls; reinforced concrete slab; wood plank flooring up-stairs; conduit wiring & fluorescent lighting; flat type composition roof. Located adjoining Building #3. Refer to "DRAW" Screen #4 for a "Plot Plan" showing the relative position of these two structures.

AREA	972
STORIES	2.0
PERIMETER / SHAPE	180

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
344 Office Building	486	50.00	C	9.00	1.00
344 Office Building	486	50.00	C	9.00	1.00

COMPONENTS	UNITS	%	QUAL
C1 812 Concrete Block	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177138		Uncoded Feature *TANK 8 80,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	569,600.00	569,600	1951	1951				OC	50.00	284,800	256,300
177139		Uncoded Feature *TANK 9 80,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	569,600.00	569,600	1951	1951				OC	50.00	284,800	256,300
177140		Uncoded Feature *TANK 10 55,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	415,950.00	415,950	1951	1951				OC	50.00	207,975	187,200
177141		Uncoded Feature *TANK 11 55,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	415,950.00	415,950	1955	1955				OC	50.00	207,975	187,200
177142		Uncoded Feature *TANK 16 20,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	206,250.00	206,250	1955	1955				OC	50.00	103,125	92,800
177143		Uncoded Feature *TANK 17 20,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	206,250.00	206,250	1955	1955				OC	50.00	103,125	92,800
177144		Uncoded Feature *TANK 7 20,000 BBLS SECTION 61 PAGE 5 OUT OF SERVICE*	0	0	1.00	A	206,250.00	206,250	1951	1951				OC	20.00	41,250	37,100

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO	CAMA	ASMT		
LAST INSP	04/27/2010		C/O RASH #698-10-820	0	0	LAND	1
APPR ZONE	000009		PO BOX 260888	229,300	229,300	BLDG	9
			PLANO, TX 75026-0888	4,193,100	4,193,100	OBXF	53
				4,422,400	4,422,400	Cost - MS	

SALES

BOOK / PAGE	INS	VI	QU	RSN	PRICE

PERMITS

TYPE	DATE	AMOUNT

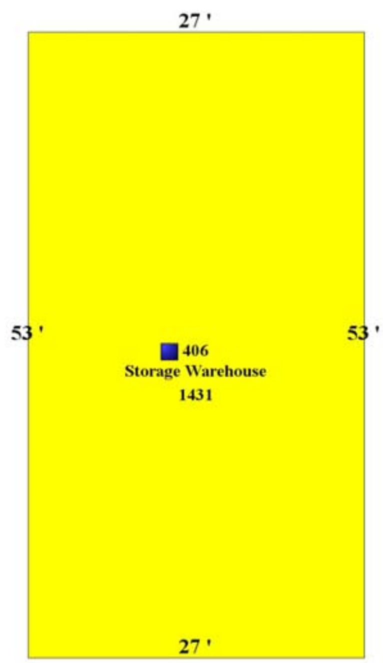
CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY

	LAND	IMPR	TOTAL	
2000		3,738,000	3,738,000	Cama
1999		3,738,000	3,738,000	Cama
1998		3,739,500	3,739,500	Cama
1997		3,762,000	3,762,000	Cama
1996		3,769,830	3,769,830	Cama

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22012-1	Commercial	62,206	1960	1960	MS	80.00	0.00	0.00	0.00	80.00	12,441	1.00	12,441



AREA	1,431
STORIES	1.0
PERIMETER / SHAPE	160

OCCUPANCIES

	AREA	%	CLASS	HEIGHT	QUAL
406 Storage Warehouse	1,431	######	C	18.00	2.00

COMPONENTS

	UNITS	%	QUAL
C1 812 Concrete Block	-	100.00	

Warehouse (Building #3). One story concrete block; 18' height; built in 1960; painted 8" concrete block walls; reinforced concrete slab; conduit wiring & fluorescent lighting; flat type composition roof. Located adjoining Building #2. Refer to "DRAW" Screen #4 for a "Plot Plan" showing the relative position of these two structures. http://www.vopakamericas.com/

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177145		Uncoded Feature *TANK 18 20,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	206,250.00	206,250	1955	1955				OC	50.00	103,125	92,800
177146		Uncoded Feature *TANK 19 20,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	206,250.00	206,250	1955	1955				OC	50.00	103,125	92,800
177147		Uncoded Feature *TANK 23 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177148		Uncoded Feature *TANK 24 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177149		Uncoded Feature *TANK 25 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177150		Uncoded Feature *TANK 26 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177151		Uncoded Feature *TANK 27 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

2010 Chatham County Board of Assessors

1-0618 -01-003L

Property Record Card

Page 4 of 9 Requested By: READONLY 7/2/2010

BRAMPTON RD SAVANNAH

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO		CAMA	ASMT	
LAST INSP	04/27/2010		C/O RASH #698-10-820	LAND	0	0	1
APPR ZONE	000009		PO BOX 260888	BLDG	229,300	229,300	9
			PLANO, TX 75026-0888	OBXF	4,193,100	4,193,100	53
				Cost - MS	4,422,400	4,422,400	

SALES

BOOK / PAGE	INS	VI	QU	RSN	PRICE

PERMITS

TYPE	DATE	AMOUNT

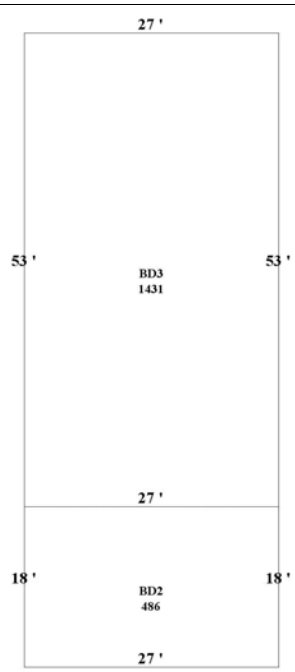
CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY

	LAND	IMPR	TOTAL
1995		3,876,850	3,876,850 Over
1994		3,876,850	3,876,850 Over
1993		2,581,080	2,581,080 Over
1992		2,581,080	2,581,080 Over

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22013-1	Drawing Only	0			MS	0.00	0.00	0.00	0.00		0		0



"DRAW" Screen #4 - "Plot Plan". BD2 represents Building #2. BD3 represents Building #3. http://www.vopakamericas.com/

SECTION TYPE	1 - Main	
AREA	0	
TYPE	-	
FRAME	-	
STYLE	-	%
QUALITY	0.00	
CONDITION	0.00	
# UNITS	0	
# OF BEDS / BATHS	0 / 0.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177152		Uncoded Feature *TANK 28 10,000 BBLS SECTION 61 PAGE 5 OUT OF SERVICE*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	20.00	27,800	25,000
177153		Uncoded Feature *TANK 29 10,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177154		Uncoded Feature *TANK 31 10,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177155		Uncoded Feature	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177156		Uncoded Feature *TANK 33 6,500 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	6,500.00	6,500	1958	1958				OC	50.00	3,250	2,900
177157		Uncoded Feature *TANK 34 10,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177158		Uncoded Feature *TANK 35 10,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO	
LAST INSP	04/27/2010		C/O RASH #698-10-820	
APPR ZONE	000009		PO BOX 260888	
			PLANO, TX 75026-0888	

CAMA	ASMT		
0	0	LAND	1
229,300	229,300	BLDG	9
4,193,100	4,193,100	OBXF	53
4,422,400	4,422,400	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

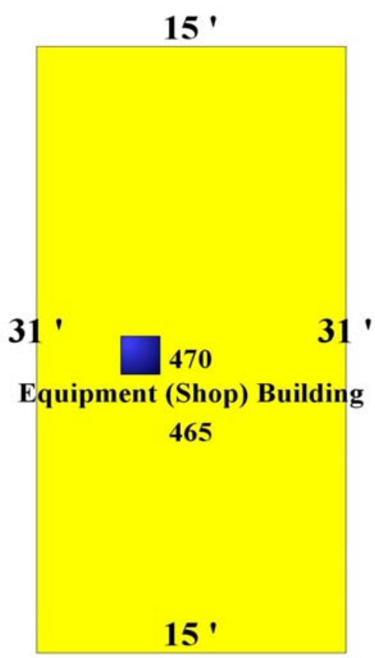
PERMITS	TYPE	DATE	AMOUNT

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY	LAND	IMPR	TOTAL

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22015-1	Commercial	15,429	1955	1955	MS	80.00	0.00	0.00	0.00	80.00	3,086	1.00	3,086



Engine Building (Building #6). One story metal; 20' height; built in 1955; space heat; no plumbing fixtures.

AREA	465
STORIES	1.0
PERIMETER / SHAPE	92

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
470 Equipment (Shop) Buildir	465	######	S	20.00	2.00

COMPONENTS	UNITS	%	QUAL
C1 888 Stud -Metal Siding	-	100.00	
C2 606 Space Heater	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177159		Uncoded Feature *TANK 36 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177160		Uncoded Feature *TANK 37 12,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	153,300.00	153,300	1958	1958				OC	50.00	76,650	69,000
177161		Uncoded Feature *TANK 44 6,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	103,450.00	103,450	1958	1958				OC	50.00	51,725	46,600
177162		Uncoded Feature *TANK 45 2,650 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	74,600.00	74,600	1958	1958				OC	50.00	37,300	33,600
177163		Uncoded Feature *TANK 47 7,700 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	99,350.00	99,350	1958	1958				OC	50.00	49,675	44,700
177164		Uncoded Feature *TANK 48 7,700 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	99,350.00	99,350	1958	1958				OC	50.00	49,675	44,700
177165		Uncoded Feature *TANK 49 15,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	174,750.00	174,750	1958	1958				OC	50.00	87,375	78,600

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO	CAMA	ASMT	
LAST INSP	04/27/2010		C/O RASH #698-10-820	0	0	LAND 1
APPR ZONE	000009		PO BOX 260888	229,300	229,300	BLDG 9
			PLANO, TX 75026-0888	4,193,100	4,193,100	OBXF 53
				4,422,400	4,422,400	Cost - MS

SALES BOOK / PAGE INS VI QU RSN PRICE

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

PERMITS TYPE DATE AMOUNT

HISTORY LAND IMPR TOTAL

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22016-1	Commercial	11,263	1955	1955	MS	80.00	0.00	0.00	0.00	80.00	2,253	1.00	2,253

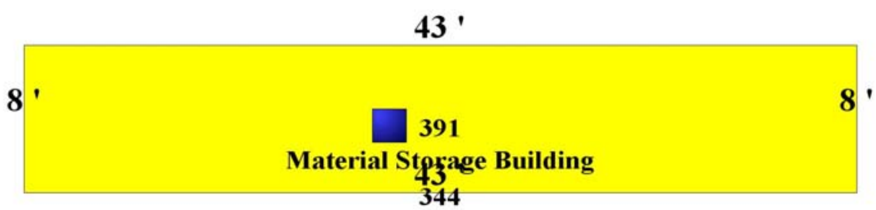
AREA 344
STORIES 1.0
PERIMETER / SHAPE 102

OCCUPANCIES

		AREA	%	CLASS	HEIGHT	QUAL
391	Material Storage Building	344	######	S	10.00	2.00

COMPONENTS

			UNITS	%	QUAL
C1	888	Stud -Metal Siding	-	100.00	



Storage Building (Building #7). One story concrete block; 10' height; built in 1955.

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177166		Uncoded Feature *TANK 50 20,000 BBLS OUT OF SERVICE SECTION 61 PAGE 5*	0	0	1.00	A	206,250.00	206,250	1958	1958				OC	20.00	41,250	37,100
177167		Uncoded Feature *TANK 51 12,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	153,300.00	153,300	1958	1958				OC	50.00	76,650	69,000
177168		Uncoded Feature *TANK 52 12,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	153,330.00	153,330	1958	1958				OC	50.00	76,665	69,000
177169		Uncoded Feature *TANK 53 3,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	77,350.00	77,350	1958	1958				OC	50.00	38,675	34,800
177170		Uncoded Feature *TANK 54 2,600 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	74,150.00	74,150	1958	1958				OC	50.00	37,075	33,400
177171		Uncoded Feature *TANK 55, 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177172		Uncoded Feature *TANK 56 35,600 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	303,710.00	303,710	1958	1958				OC	50.00	151,855	136,700

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO C/O RASH #698-10-820 PO BOX 260888 PLANO, TX 75026-0888
LAST INSP	04/27/2010		
APPR ZONE	000009		

CAMA	ASMT		
0	0	LAND	1
229,300	229,300	BLDG	9
4,193,100	4,193,100	OBXF	53
4,422,400	4,422,400	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

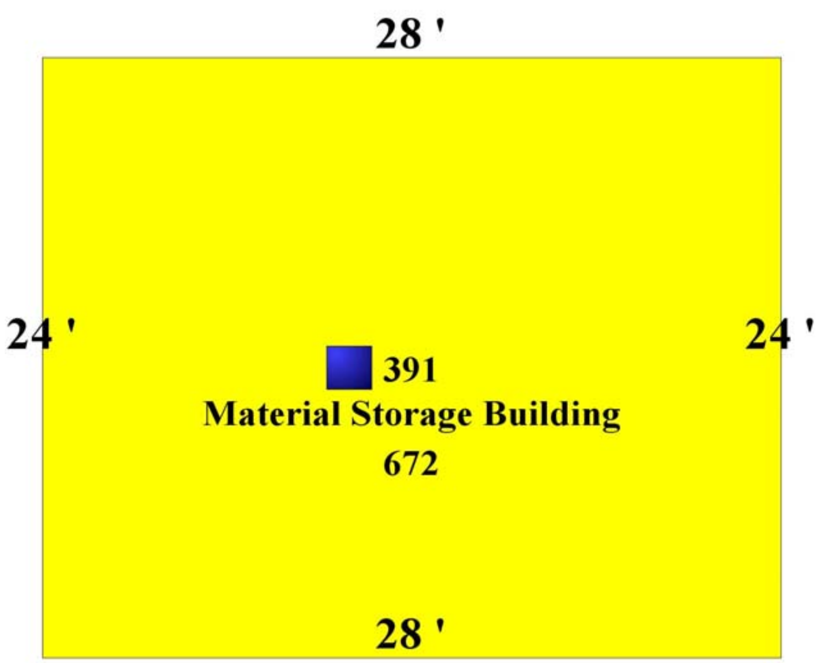
PERMITS	TYPE	DATE	AMOUNT

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY	LAND	IMPR	TOTAL

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22018-1	Commercial	19,421	1970	1970	MS	80.00	0.00	0.00	0.00	80.00	3,884	1.00	3,884



Pump Room & Storage (Building #9). One story concrete block; 8' height; built in 1970; space heat.

AREA	672
STORIES	1.0
PERIMETER / SHAPE	104

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
391 Material Storage Building	672	######	C	8.00	2.00

COMPONENTS	UNITS	%	QUAL
C1 812 Concrete Block	-	100.00	
C2 606 Space Heater	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177173		Uncoded Feature *TANK 57 25,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	239,125.00	239,125	1958	1958				OC	50.00	119,563	107,600
177174		Uncoded Feature *TANK 58 27,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	252,275.00	252,275	1958	1958				OC	50.00	126,138	113,500
177175		Uncoded Feature *TANK 59 35,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	300,312.00	300,312	1958	1958				OC	50.00	150,156	135,100
177177		Uncoded Feature *TANK 60 2,800 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	75,950.00	75,950	1958	1958				OC	50.00	37,975	34,200
177178		Uncoded Feature *TANK 72 5,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	97,250.00	97,250	1958	1958				OC	50.00	48,625	43,800
177179		Uncoded Feature *TANK 73 10,000 BBLS SECTION 61 PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177180		Uncoded Feature *TANK 74 25,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	239,125.00	239,125	1958	1958				OC	50.00	119,563	107,600

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO C/O RASH #698-10-820 PO BOX 260888 PLANO, TX 75026-0888
LAST INSP	04/27/2010		
APPR ZONE	000009		

CAMA	ASMT		
0	0	LAND	1
229,300	229,300	BLDG	9
4,193,100	4,193,100	OBXF	53
4,422,400	4,422,400	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

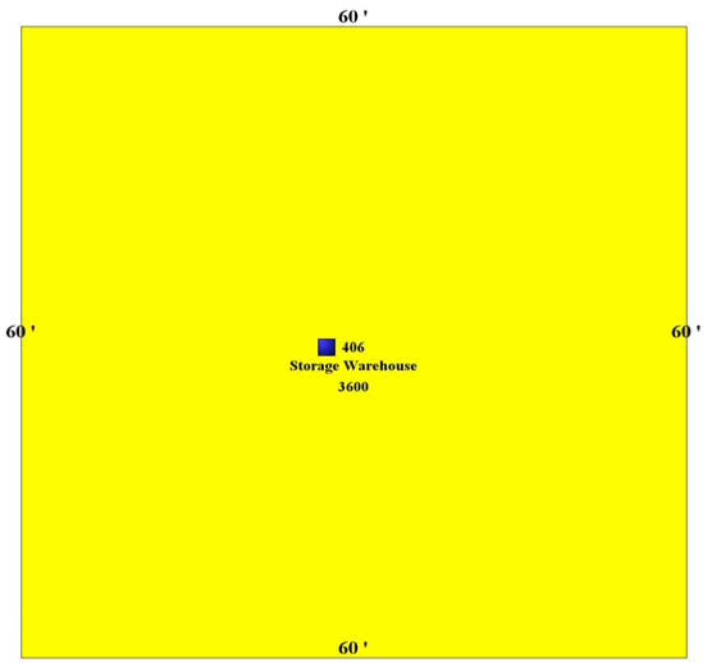
PERMITS	TYPE	DATE	AMOUNT

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY	LAND	IMPR	TOTAL

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22019-1	Commercial	121,644	1970	1970	MS	79.00	0.00	0.00	0.00	79.00	25,545	1.00	25,545



Blue Warehouse / Nisco Building (#10).One story metal; 14' height; built in 1970; space heat; building brand is "Butler".

AREA	3,600
STORIES	1.0
PERIMETER / SHAPE	240

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
406 Storage Warehouse	3,600	######	S	14.00	2.00

COMPONENTS	UNITS	%	QUAL
C1 888 Stud -Metal Siding	-	100.00	
C2 606 Space Heater	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
177181		Uncoded Feature *TANK 75 10,000 BBLS SECTION 61, PAGE 5*	0	0	1.00	A	139,000.00	139,000	1958	1958				OC	50.00	69,500	62,600
177182		Uncoded Feature *TANK 76 25,000 BBLS SECTION 61, PAGE 5.*	0	0	1.00	A	239,125.00	239,125	1958	1958				OC	50.00	119,563	107,600
177183		Uncoded Feature *TANK 77 119 BBLS SECTION 61, PAGE 3*	0	0	1.00	A	7,260.00	7,260	2001	2001				OC	80.00	5,808	5,200

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

APPRAISER	swcorcor	IMPTS ONLY ON STATE PORT AUTH PROPERTY	SOUTHLAND OIL CO
LAST INSP	04/27/2010		C/O RASH #698-10-820
APPR ZONE	000009		PO BOX 260888
			PLANO, TX 75026-0888

CAMA	ASMT		
0	0	LAND	1
229,300	229,300	BLDG	9
4,193,100	4,193,100	OBXF	53
4,422,400	4,422,400	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

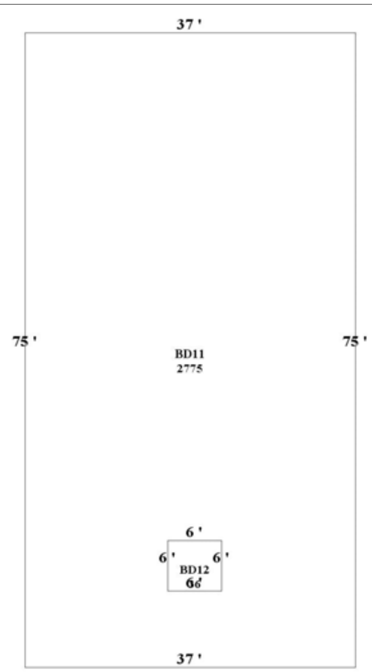
PERMITS	TYPE	DATE	AMOUNT

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4500	Manufacturing light

HISTORY	LAND	IMPR	TOTAL

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22020-1	Drawing Only	0			MS	0.00	0.00	0.00	0.00		0		0



BD11 represents a canopy built in 1969 and is valued as "MISC" Item #2. BD12 represents a small "office" and is valued as "MISC" Item #3.

SECTION TYPE	1 - Main
AREA	0
TYPE	-
FRAME	-
STYLE	- %
QUALITY	0.00
CONDITION	0.00
# UNITS	0
# OF BEDS / BATHS	0 / 0.00

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

2010 Chatham County Board of Assessors
Property Record Card

Page 1 of 2 Requested By: READONLY 7/2/2010

1-0618 -01-004L

BRAMPTON RD SAVANNAH

APPRAISER	swcorcor	IMPROVEMENTS ONLY ON STATE PORT PROPERTY	PANOCEAN SOUTHLAND INC	CAMA	ASMT		
LAST INSP	04/27/2010		RASH & ASSOCIATES	0	0	LAND	1
APPR ZONE	000009		PO BOX 260888	32,400	32,400	BLDG	2
			PLANO, TX 75026-0888	1,743,100	1,743,100	OBXF	6
				1,775,500	1,775,500	Cost - MS	

SALES

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE
0/11/1977	109K 0345	WD	I	U	UN	1,200,000
GRANTOR: SHELL OIL COMPANY, GRANTEE: KOCH FUELS INCORPORATED,						
6/29/1973	102M 0215	NA	I	U	UN	-
GRANTOR: SAVANNAH TERMINAL, INC., GRANTEE: SHELL OIL COMPANY,						

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4000	Industrial

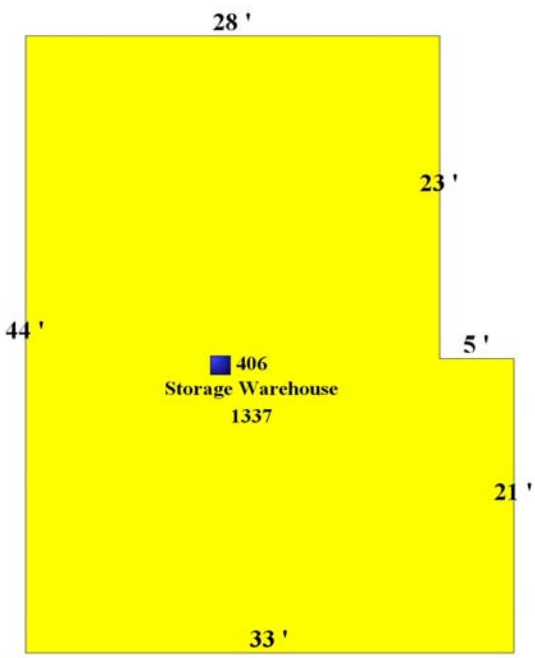
PERMITS	TYPE	DATE	AMOUNT

HISTORY	LAND	IMPR	TOTAL
2010		1,775,500	1,775,500 Cama
2009		1,527,000	1,527,000 Over
2008			1,527,000 A/C
2007		943,500	943,500 Cama
2006		943,500	943,500 Cama

COMMENTS
3/25/2010 *03/25/2010 OVER-RIDE VALUE UPDATED TO REFLECT 2010 RETURN AND NEW INFORMATION PROVIDED. SWC.*
3/24/2010 *03/24/2010 TANK INFORMATION UPDATED. SWC.*
3/8/2010 *TY010 RET VAL ENT*

NOTES

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22021-1	Commercial	49,856	1968	1968	MS	75.00	0.00	0.00	0.00	75.00	12,464	1.00	12,464



Warehouse (Building #1). One story concrete block; 10' height; built in 1968. http://www.vopakamericas.com/

AREA	1,337
STORIES	1.0
PERIMETER / SHAPE	154

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
406 Storage Warehouse	1,337	######	C	10.00	2.00

COMPONENTS	UNITS	%	QUAL
C1 812 Concrete Block	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE
43638		Storage/Utility avg	12	8	96.00	3	9.84	945	1958	1958	35					189	200
177126		Uncoded Feature *TANK 12 80000 BBL S61 P5*	0	0	1.00	A	569,600.00	569,600	2008	2008				OC	95.00	541,120	487,000
177128		Uncoded Feature *TANK 13 80,000 BBL S61 P5*	0	0	1.00	A	569,600.00	569,600	2008	2008				OC	95.00	541,120	487,000
177129		Uncoded Feature *TANK 20 80,000 BBL S61 P5*	0	0	1.00	A	569,600.00	569,600	1955	1955				OC	50.00	284,800	256,300
177130		Uncoded Feature *TANK 21 80,000 BBL S61 P5*	0	0	1.00	A	569,600.00	569,600	1955	1955				OC	50.00	284,800	256,300
177131		Uncoded Feature *TANK 22 80,000 BBL S61 P5*	0	0	1.00	A	569,600.00	569,600	1955	1955				OC	50.00	284,800	256,300

LAND

ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE
25689	INDUSTRIAL	0	0	1.000 G	0.00	I-H	1.00								0

APPRAISER	swcorcor	IMPROVEMENTS ONLY ON STATE PORT PROPERTY	PANOCEAN SOUTHLAND INC	
LAST INSP	04/27/2010		RASH & ASSOCIATES	
APPR ZONE	000009		PO BOX 260888	
			PLANO, TX 75026-0888	

CAMA	ASMT		
0	0	LAND	1
32,400	32,400	BLDG	2
1,743,100	1,743,100	OBXF	6
1,775,500	1,775,500	Cost - MS	

SALES	BOOK / PAGE	INS	VI	QU	RSN	PRICE

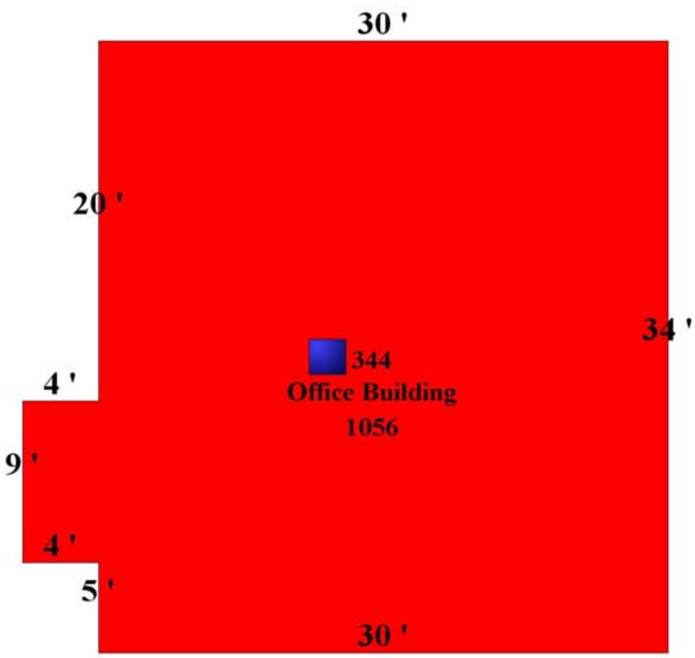
PERMITS	TYPE	DATE	AMOUNT

CODES

PROPERTY USE	0004	Industrial
UTA	0001	Unincorporated
NBHD	009900.00	I900 Waterfront(Hvy
EXEMPTIONS		
COMMCATEG	4000	Industrial

HISTORY	LAND	IMPR	TOTAL
2005		943,500	943,500 Cama
2004		950,500	950,500 Cama
2003		950,500	950,500 Cama
2002		950,500	950,500 Cama
2001		954,000	954,000 Cama

BUILDING SECTION	CONSTRUCTION TYPE	RCN	AYB	EYB	DEP TYPE	PHYS	ECON	FUNC	OBSV / %	TOTAL DEP %	RCNLD	U.FACTOR	MKT VAL
22022-1	Commercial	99,539	1958	1958	MS	80.00	0.00	0.00	0.00	80.00	19,908	1.00	19,908



Office (Building #2). One story concrete block; 10' height; built in 1958; CHAC; four plumbing fixtures; tile floor covering. http://www.vopakamericas.com/

AREA	1,056
STORIES	1.0
PERIMETER / SHAPE	136

OCCUPANCIES	AREA	%	CLASS	HEIGHT	QUAL
344 Office Building	1,056	######	C	10.00	2.00

COMPONENTS	UNITS	%	QUAL
C1 812 Concrete Block	-	100.00	
C2 614 Heat Pump	-	100.00	

EXTRA FEATURES

ID#	BLDG #	SYSTEM DESC	DIM 1	DIM 2	UNITS	QL	UNIT PRICE	RCN	AYB	EYB	DT	ECON	FUNC	SP	SP%	RCNLD	MKT VALUE

LAND

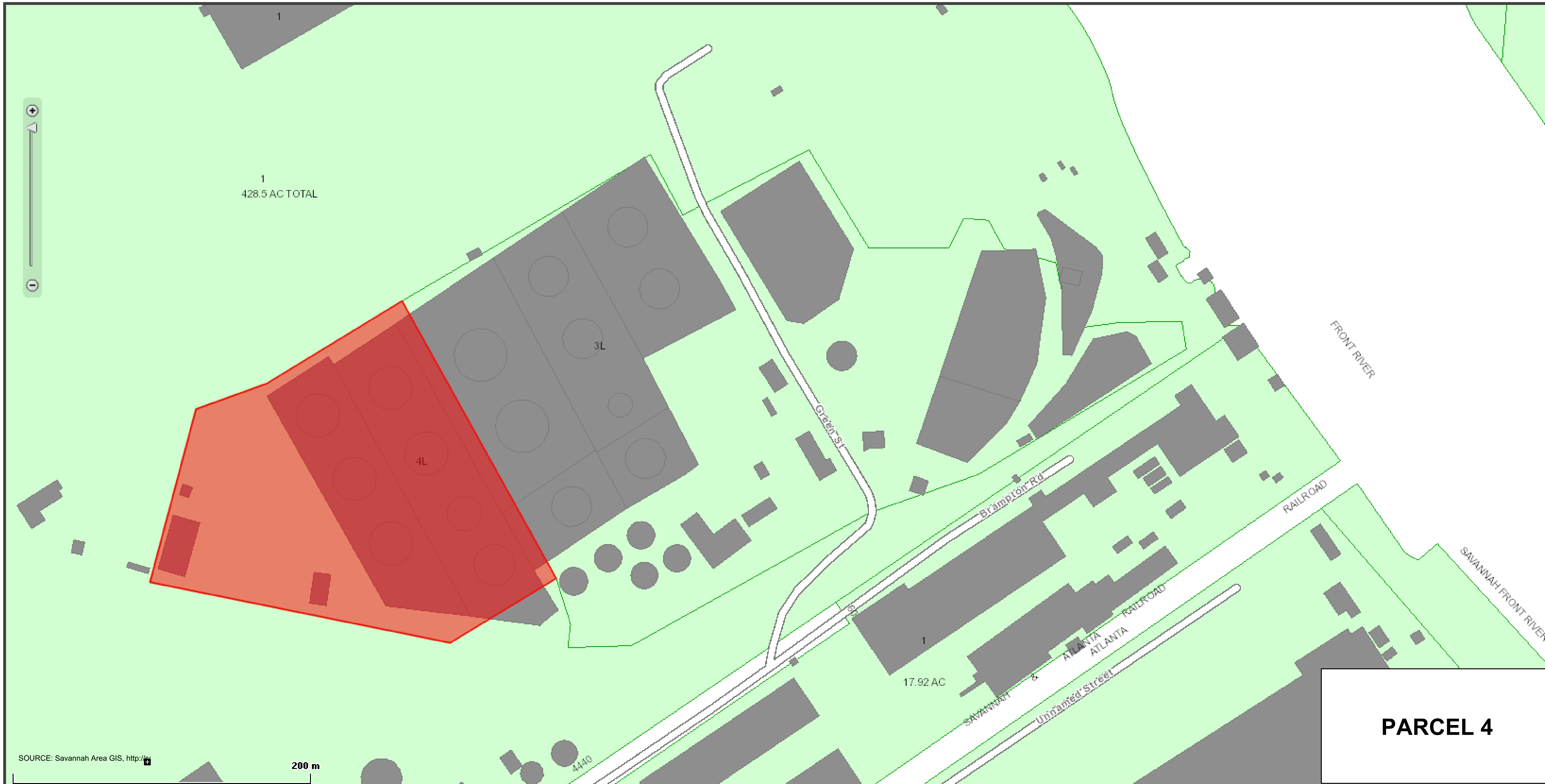
ID#	USE DESC	FRONT	DEPTH	UNITS / TYPE	PRICE	ZONING	SIZE	LCTN	TOPO	OTHER	ADJ1	ADJ2	ADJ3	ADJ4	MKT VALUE

VRP APPLICATION (Revised)

ATTACHMENT C

TAX PLATS


1
1
428.5 AC TOTAL
3L
4L
Green St
Brampton Rd
FRONT RIVER
RAILROAD
SAVANNAH FRONT RIVER
1
17.92 AC
ATLANTA
ATLANTA
RAILROAD
Unnamed Street
4440
200 m
SOURCE: Savannah Area GIS, http://sagis.org/flex/
PARCEL 3



1
1
428.5 AC TOTAL
3L
4L
Green St
Brampton Rd
FRONT RIVER
RAILROAD
SAVANNAH FRONT RIVER
ATLANTA
ATLANTA
RAILROAD
SAVANNAH
&
Unnamed Street
1
17.92 AC
4440
SOURCE: Savannah Area GIS, http://
200 m

PARCEL 4

PLAT REFERENCE

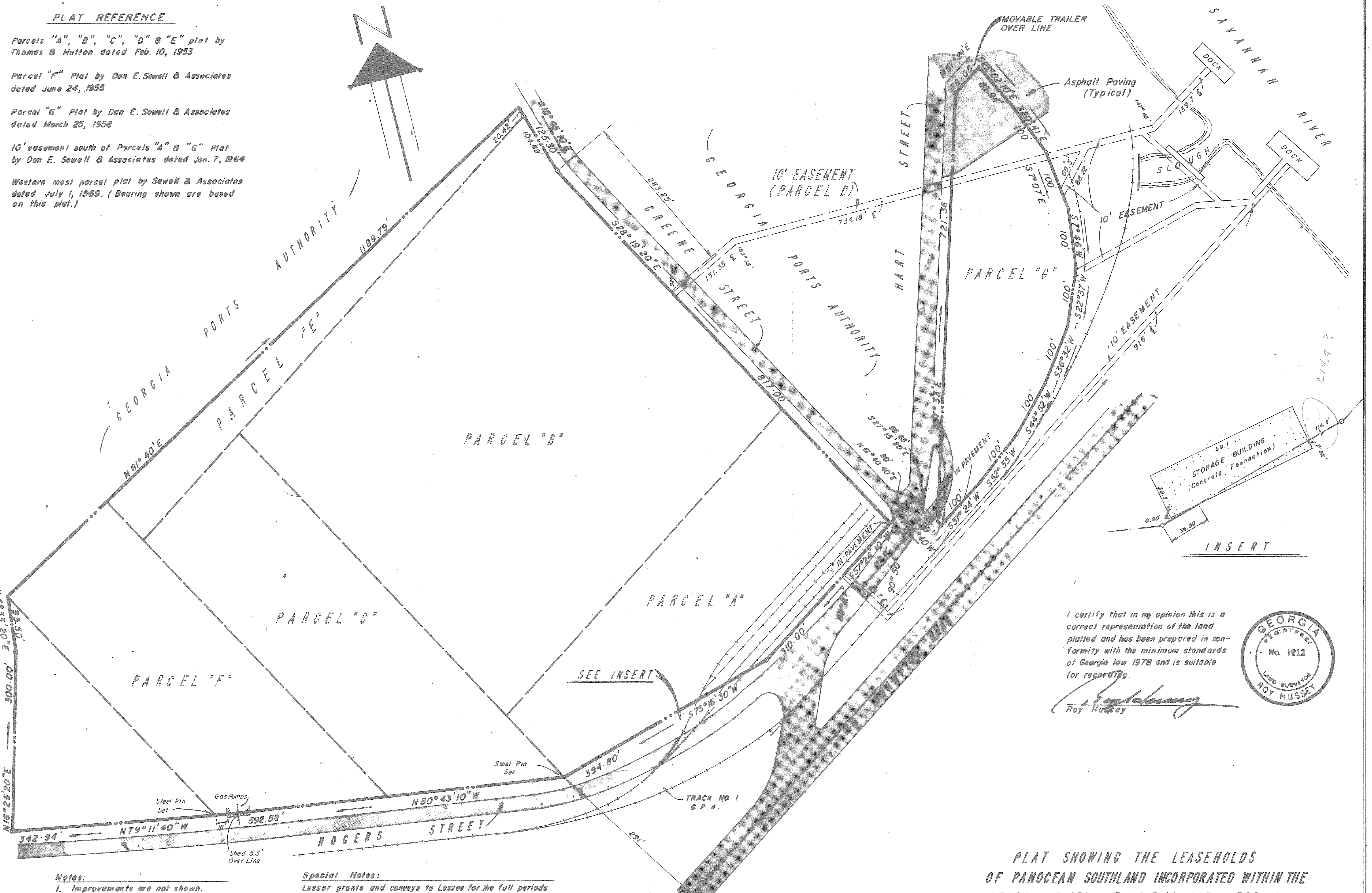
Parcels "A", "B", "C", "D" & "E" plat by Thomas & Hutton dated Feb. 10, 1953

Parcel "F" Plat by Dan E. Sewell & Associates dated June 24, 1955

Parcel "G" Plat by Dan E. Sewell & Associates dated March 25, 1958

10' easement south of Parcels "A" & "G" Plat by Dan E. Sewell & Associates dated Jan. 7, 1964

Western most parcel plat by Sewell & Associates dated July 1, 1969. (Bearing shown are based on this plat.)



Notes:

1. Improvements are not shown.
2. "▣" denotes concrete monument (old)
3. "○" denotes iron pipe unless otherwise noted.
4. Total area = 26.35 acres
5. Error of closure: 1/30,361
6. Equipment used: Electronic distance measurer

Special Notes:

Lessor grants and conveys to Lessee for the full periods of the original lease and supplements thereto, an easement of right-of-way for a roadbed, the laying of tracks, and the use thereof, on Lessor's land lying Southerly and Westerly of said Parcel "A", to have such uniform width as is needed for full and complete service of Lessee's operations, and needed to connect such tracks with the present track over which Lessee now has and is using an easement, and which presently used track connects with track No. 1

HUSSEY, GAY & BELL
CONSULTING ENGINEERS
SAVANNAH, GEORGIA

I certify that in my opinion this is a correct representation of the land platted and has been prepared in conformity with the minimum standards of Georgia law 1978 and is suitable for recording.

Roy Hussey

GEORGIA REGISTERED No. 1212 LAND SURVEYOR ROY HUSSEY

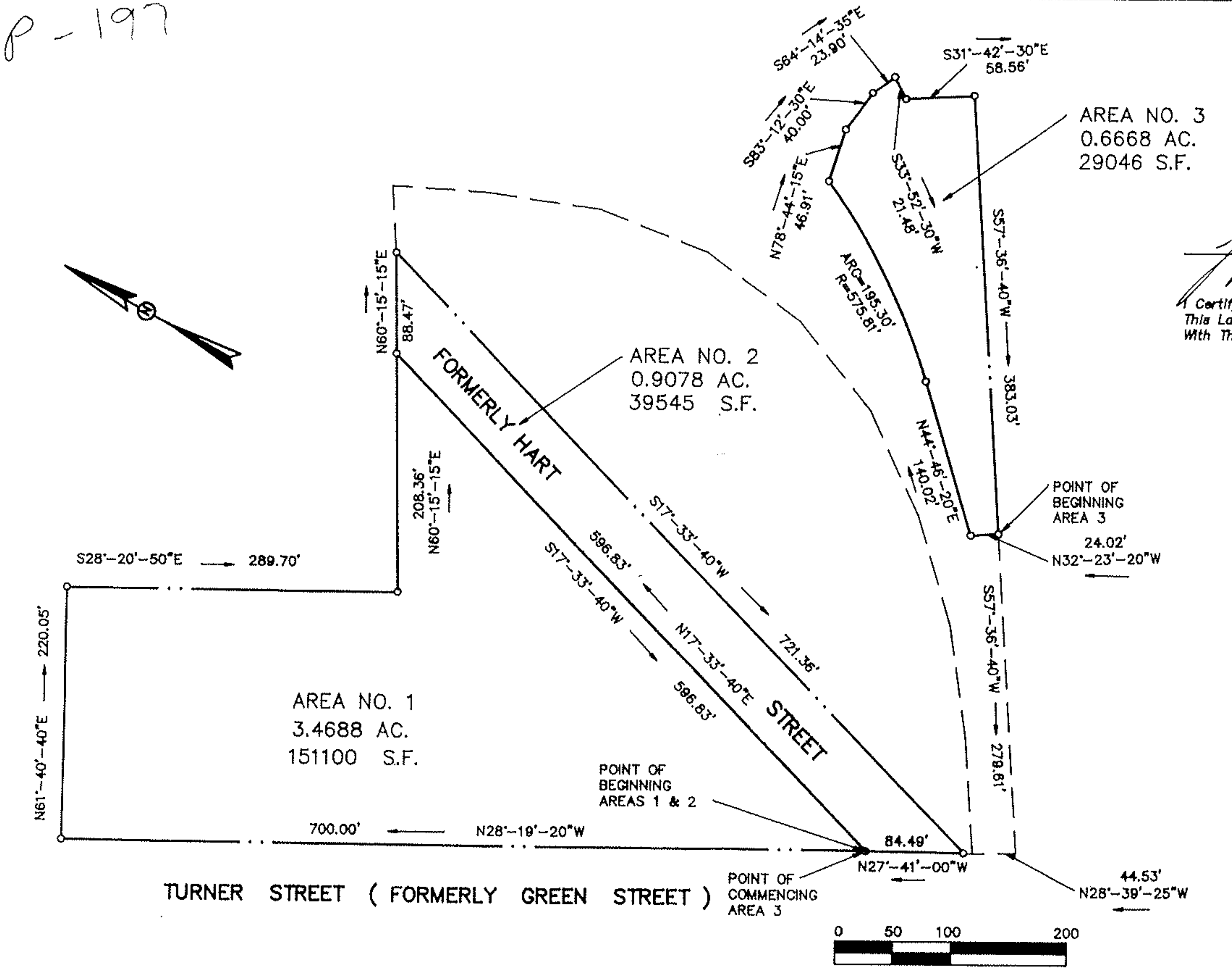
PLAT SHOWING THE LEASEHOLDS OF PANOCEAN SOUTHLAND INCORPORATED WITHIN THE GEORGIA PORTS AUTHORITY'S OCEAN TERMINAL PROPERTY- GARDEN CITY, CHATHAM COUNTY, GEORGIA

Scale: 1" = 100'

Revised April 5, 1983
Date: April 5, 1979

TUBE 2

11 P - 197



Joseph C. Keaton, Jr.
Ga. Reg. Land Surveyor No. 2233

I Certify That This Plat Is A Correct Representation Of This Land Platted And Has Been Prepared In Conformity With The Minimum Standards And Requirements Of Law

GEORGIA REGISTERED No.2233 LAND SURVEYOR JOSEPH C. KEATON, JR.

PLAT OF VARIOUS PARCELS WITHIN GEORGIA PORTS AUTHORITY'S GARDEN CITY TERMINAL, GARDEN CITY, CHATHAM COUNTY, GEORGIA

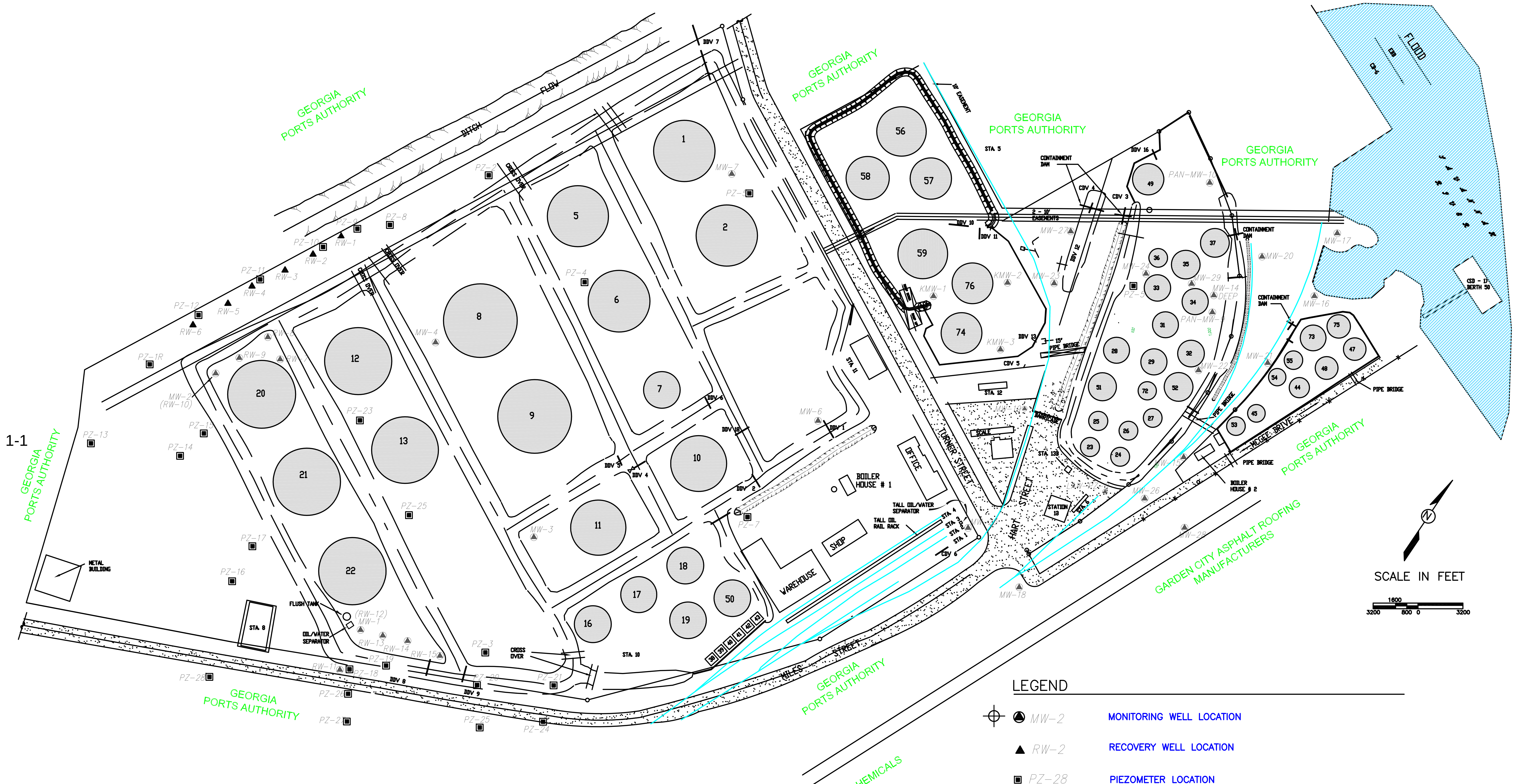
SURVEYED FOR:

PANOCEAN SOUTHLAND INCORPORATED

Scale: 1" = 100'
Date: JUNE 13, 1991
File: 91-173
Equipment Used:

EXHIBIT A

Keaton Land Surveying Inc.
7505 Waters Avenue Suite D-5
Savannah, Georgia (912) 354-0300



SOURCES:

1. AUTOCAD BASE MAP UTILIZED IN ERM REPORT TITLED "2010 VOPAK THIRD ANNUAL REPORT ON CORRECTIVE ACTION, HAZARDOUS SITE INVENTORY NUMBER 10464" HAZARDOUS SITE INVENTORY NUMBER 10464". SAVANNAH, GEORGIA
2. LAW REPORT TITLED "1996 GROUND-WATER ASSESSMENT, PAKTANK CORP. – SAVANNAH TERMINAL, GEORGIA PORTS AUTHORITY; DRAWING #2
3. ERM REPORT TITLED "2001 COMPLIANCE STATUS REPORT ADDENDUM, HASARDOUS SITE INVENTORY NO. 10464; FIGURE #3
4. ERM REPORT TITLED "2010 VOPAK THIRD ANNUAL REPORT ON CORRECTIVE ACTION, HAZARDOUS SITE INVENTORY NUMBER 10464"
5. WPC REPORT TITLED "2010 REMEDIATION ACTIVITIES REPORTS"; FIGURE 2

FIGURE 1

ABUTTING PROPERTIES

DESIGNED BY: A.S.	DRAWN BY: R.H.	CHECKED BY: R.M.
APPROVED BY: R.M.		REVISIONS
SEAL:		NO. / DATE

VOPAK TERMINAL SAVANNAH
P.O. BOX 7390
Savannah, Georgia 31418-7390

ENVIRONMENTAL INTERNATIONAL CORP.
161 KIMBALL BRIDGE ROAD
ALPHARETTA GEORGIA 30009

SCALE: SEE BAR SCALE | DATE: 02/10/2011 | SHEET NO.:

ATTACHMENT D

SUMMARY OF HISTORIC BTEX INVESTIGATIONS

SUMMARY OF HISTORIC BTEX INVESTIGATIONS

In reviewing site-wide total BTEX concentration isopleth maps and groundwater elevation contour maps in various environmental reports by Law, ERM, and WPC since 1996, EIC has determined that three well-defined dissolved BTEX contaminant source plumes have existed at the site since at least 1996 and continue to exist at present. Two of the plumes have historically been located at the western end of the largest tank farm, designated as the Number 1 Tank Farm (Exhibit 1). A third plume has historically been located within the relatively smaller Number 2 Tank Farm where a PCE plume also exists. Based on the ERM and WPC reports, the LNAPL and BTEX plumes on the western side of the site are currently being addressed under the Watershed Protection program of the GA EPD, while the eastern PCE and BTEX contaminant plumes were being addressed under the HSRA program of the GA EPD. Following are EIC's findings regarding potential migration of the BTEX from the western plumes to the location of the PCE plume.

1.0 BTEX Plumes Defined in 1996

Exhibit 1 (LAW, 1996) is a site-wide map that illustrates the location and horizontal extent of the three dissolved BTEX plumes in groundwater on June 12, 1996. The first plume is located within the same foot-print as the PCE plume addressed in the VRP. The second and third BTEX plumes are located on the western end of the site near AST 20 and ASTs 15/22, respectively, of the Number 1 Tank Farm west of Turner Street. From Exhibit 1 it is apparent that the first plume was located within the same foot-print as the current PCE plume. The second BTEX plume, located to the west of the first plume, was separated by a distance of more than 1,000 feet. A smaller third BTEX plume was located approximately 400 feet to the north west of the second plume. The sources of these plumes were not apparent from the available documents.

2.0 1999 Diesel Spill in the Number 1 Tank Farm Area

On January 12, 1999, a major diesel release took place from AST 22 that resulted in LPH accumulations at the second and third plumes. According to a historic report, the release discharged approximately 1 million gallons of diesel into the common containment berm surrounding ASTs 20, 21, and 22 (ERM, 1999). After recovery activities were completed, it was determined by ERM that 30,000 to 40,000 gallons of diesel had infiltrated into the soil. Since 1999, several remediation technologies have been applied in this area (first by ERM and then by WPC), in an attempt to remediate diesel LNAPL from the subsurface. According to a series of reports by WPC (all titled "Remediation Activities Report"), the Surfactant Enhanced Aquifer Remediation (SEAR) injection technique reportedly recovered "to date" "approximately 6,992 liquid/vapor equivalent gallons of free product from the subsurface" from 2008 to July 2010 (WPC, 2011). Prior to initiating this technique, 17 surfactant injection wells and 23 surfactant extraction wells were installed. According to this report and other WPC and ERM reports (EIC has reviewed regarding the diesel spill and remediation) a total of approximately 28,726 gallons of LNAPL appear to remain in the subsurface at present in the areas of ASTs 20 and 22, respectively.

3.0 Input of Area of Diesel Spill on BTEX Concentrations in Groundwater

After the diesel release occurred, however, by January 2006, the diesel product had accumulated within in the same general areas in the Number 1 Tank Farm as the BTEX plumes were present prior to the release. The diesel product plumes are illustrated in Exhibit 2 (ERM, 2006). Exhibit 3 (WPC, 2011) illustrates the western area of the Number 1 Tank Farm, including ASTs 20, 21, and 22, injection and extraction wells, and other wells. Exhibits 4 and 5 of the same report illustrate the extent of the diesel product plumes near ASTs 20 and 22, respectively, as of October 2010. The WPC reports, however, only addressed the progress of diesel product recovery in the Number 1 Tank Farm and did not address nor illustrate the dissolved BTEX constituents in groundwater associated with the plumes. Referring to Exhibit 6 (ERM, 2006), the BTEX constituent levels in January 2006 were below MDL in all the sampled wells except for two wells, PZ-3 and RW-6. At PZ-3, concentrations in groundwater of Benzene, Toluene, Ethyl-Benzene, and Xylene were 46, 5, 69, and 160 ug/L, respectively and at RW-6 only Ethyl-Benzene was detected at 3 ug/L. As such, it is likely that such relatively low BTEX concentrations would not act as a source for BTEX at the eastern BTEX plume located 1,000 feet away and side-gradient to the groundwater flow direction (as described in Section 4.0).

4.0 Potential for BTEX Plume Migration into the Number 2 Tank Farm Area

Referring to Exhibit 7 (Law, 1996), an east-west orientated groundwater divide is located across the western half of the site in the Number 1 Tank Farm from the vicinity of AST 20 to AST 6, where groundwater apparently flows to the north and to the south from the apex of the divide. The eastern extent of the divide terminates at Tank 6. From this exhibit, the water table slopes solely to the north in the eastern half of the site. Also, a groundwater surface topographic high exists in the south-central area of the site. Exhibit 8 (ERM, 2001) from the "February 8, 2001 First Quarterly Groundwater Quality Report" illustrates that the groundwater flow in the western side of the site within the Number 1 Tank Farm is primarily towards the northeast. The groundwater surface contours remained very similar in maps the following ERM quarterly reports from 2001 through 2003. Exhibit 9 (ERM, 2005) illustrates a topographic high to the east of the two western-most bermed areas of the Number 1 Tank Farm in 2004. Other quarterly ERM reports through January 2006 illustrate a similar topographic high feature in a series of ten groundwater elevation contour maps prepared, with the exception of one indicating a flow to the northeast. EIC believes that, due to the topographic barriers of the potentiometric surface therefore inhibit groundwater flow from the area of the western BTEX plumes towards the east. Consequently, BTEX contamination from the western plumes would not likely serve as a source for the eastern dissolved BTEX plume within the PCE foot-print.

Recent groundwater elevation contour maps in the area of the PCE plume for December 2008 and March 2009 that are depicted in Exhibit 10 and Exhibit 11, respectively (ERM, 2010) have indicated that the groundwater flow is from south-southwest to the north-northeast and not from the west. This is another indicator that the BTEX plumes on the west side of the site would not migrate side-gradient act as a source of BTEX in the PCE plume area. It is therefore possible that the sole source of BTEX in this area resulted from unknown source(s) within this area. It should be noted that EIC wasn't able to locate a recent site-wide groundwater elevation contour map, site-wide gauging data, nor site-wide groundwater sampling data to further investigate potential sources. As part of the VRP, EIC has proposed a site-wide gauging/sampling event of selected wells to further evaluate the BTEX plumes.

5.0 Reduction in BTEX Plume Concentration at the Number 2 Tank Farm

Based on a comparison of four concentration maps of the individual BTEX constituents of Benzene, Toluene, Ethyl-Benzene, and Xylene shown in Figures 2-5, 2-6, 2-7, and 2-8, respectively (in the main body of the VRP application) that to the total BTEX map outlined in Exhibit 1 (Law, 1996), the concentration levels of BTEX have gradually diminished since 1996. Referring to Figure 2-8, the highest Xylene concentration of the current BTEX plume was 47,000 ug/L whereas the lowest Xylene concentration in 1996 (Exhibit 1), was 60,500 ug/L. This represents a 22 percent reduction in Xylene concentrations. During the VRP program, Vopak will further monitor the BTEX concentrations to determine whether the BTEX is naturally attenuating at the site.

6.0 List of Figures (in the main body of the VRP application)

7.0 List of Exhibits

8.0 References

Environmental Resources Management, 2010. *VOPAK Third Annual Report on Corrective Action, Hazardous Site Inventory Number 10464*. Savannah, Georgia, January 2010.

Environmental Resources Management, 2007. *Corrective Action Report, VOPAK Savannah Terminal, Semi-Annual Second-Half 2006*, January 17, 2007.

Environmental Resources Management, 2005. *Corrective Action Report, VOPAK Savannah Terminal, August 2005*, September 1, 2005.

Environmental Resources Management, 2001. *First Quarterly Groundwater Quality Report, VOPAK Terminal, Savannah, Georgia,* February 8, 2001.

Environmental Resources Management, 1999. *Paktank Corporation, Garden City, Georgia, Spill Report and Remediation Plan,* August 13, 1999.

LAW Engineering and Environmental Services, 1996. *Report of Ground-Water Assessment Paktank Corporation – Savannah Terminal, Georgia Port Authority, Garden City, Georgia,* September 3 1996.

WPC, A Terracon Company, 2011, *2010 Remediation Activities Report, Vopak Terminal Savannah Inc., Garden City, Georgia,* January 24, 2011

EXHIBITS

Notes: Survey performed by Freeman and Vaughn
Tank and dike locations are approximate.
GP-1 = Geoprobe Locations (Surveyed)
PZ-1 = Piezometer Locations (Surveyed)
MW-1 = Monitoring Well Locations (Surveyed)
100 = TOTAL BTEX CONCENTRATION CONTOUR (µg/L)
ND = NOT DETECTED

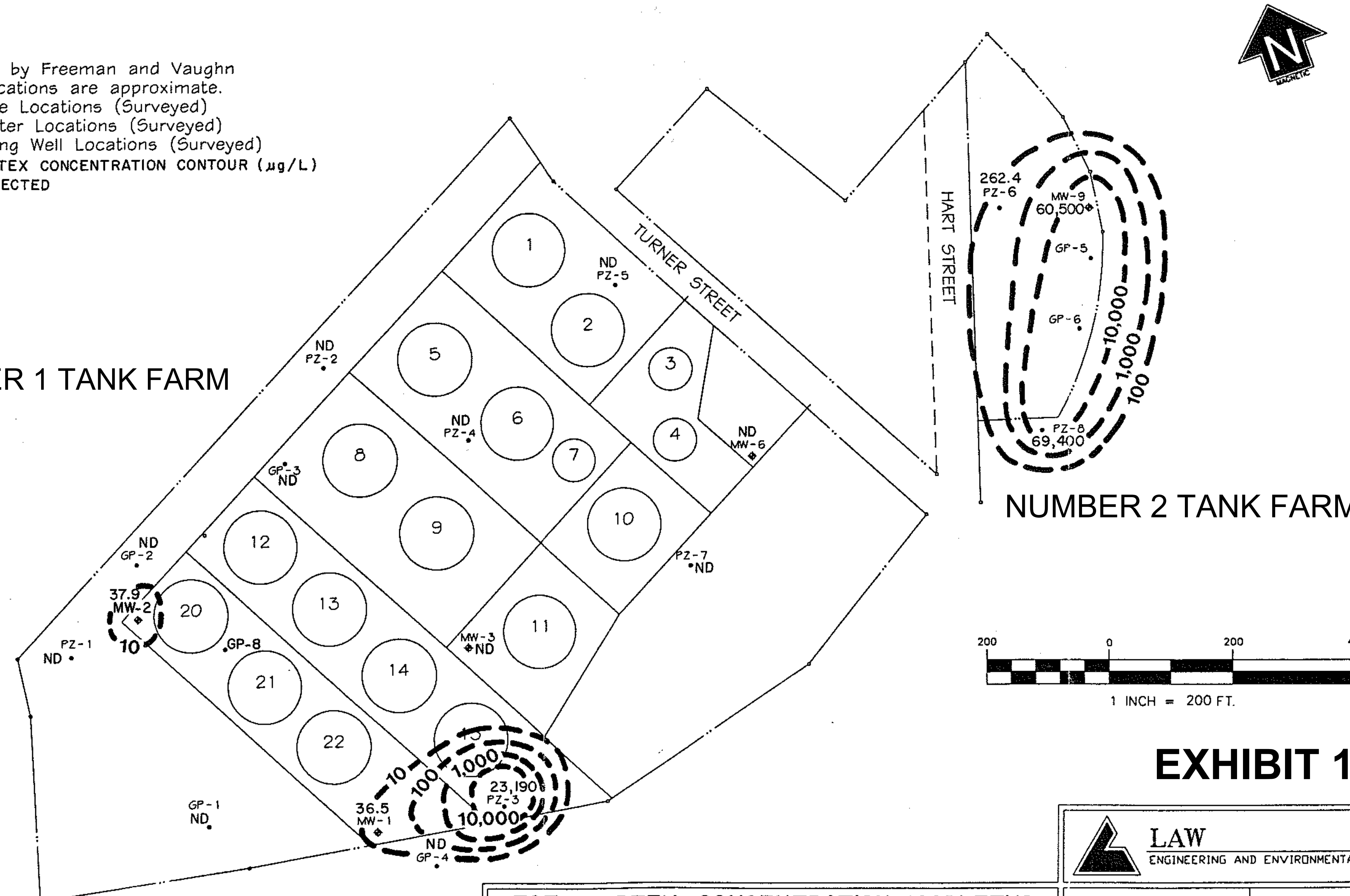


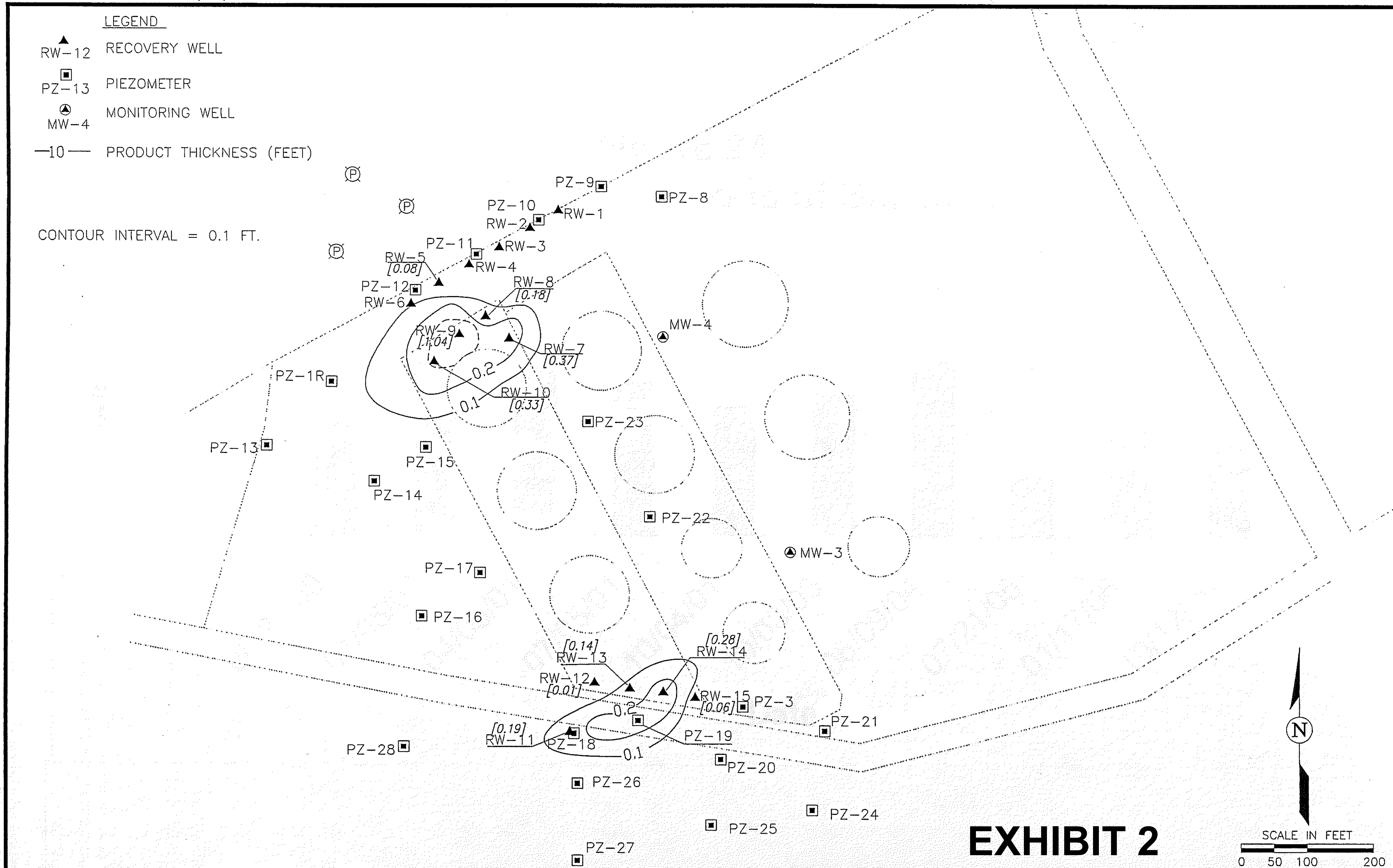
EXHIBIT 1

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES

TOTAL BTEX CONCENTRATION ISOPLETHS (6-12-96)
PAKTANK CORPORATION
GEORGIA PORT AUTHORITY
SAVANNAH, GEORGIA

DRAWN: KLC	DATE: 7-16-96
DFT CHECK: DLB	SCALE: AS SHOWN
ENG CHECK: ——	JOB: 31040-6-0671
APPROVAL: DCS	FILE: \PAKTANK\BASE
REFERENCE:	DRAWING NO.: 4

12598_1-07_CAR.DWG 1/17/07 1-200 MDH REV

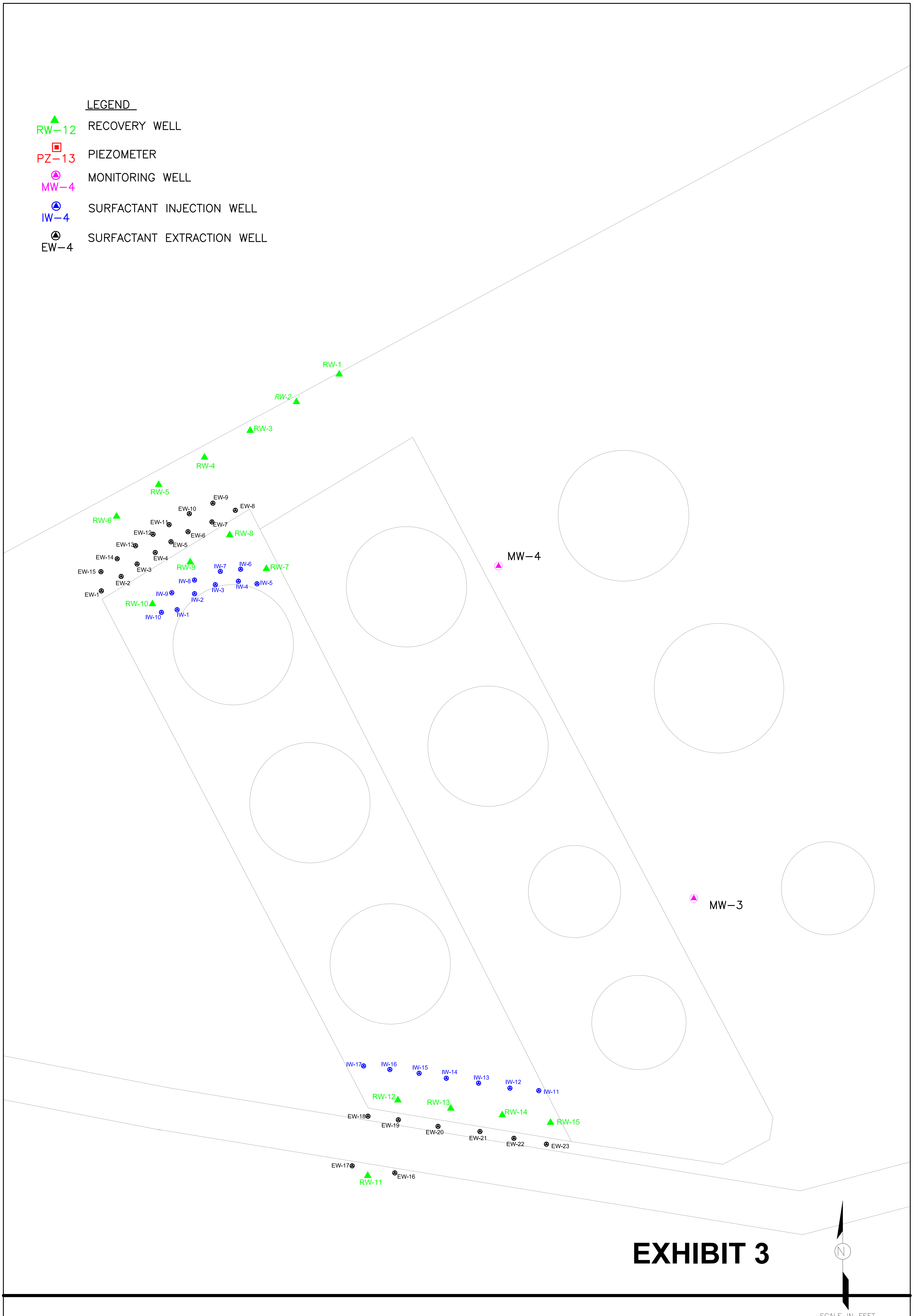


ERM Environmental Resources Management

PRODUCT THICKNESS IN FORMATION AS OF AUGUST 3, 2006

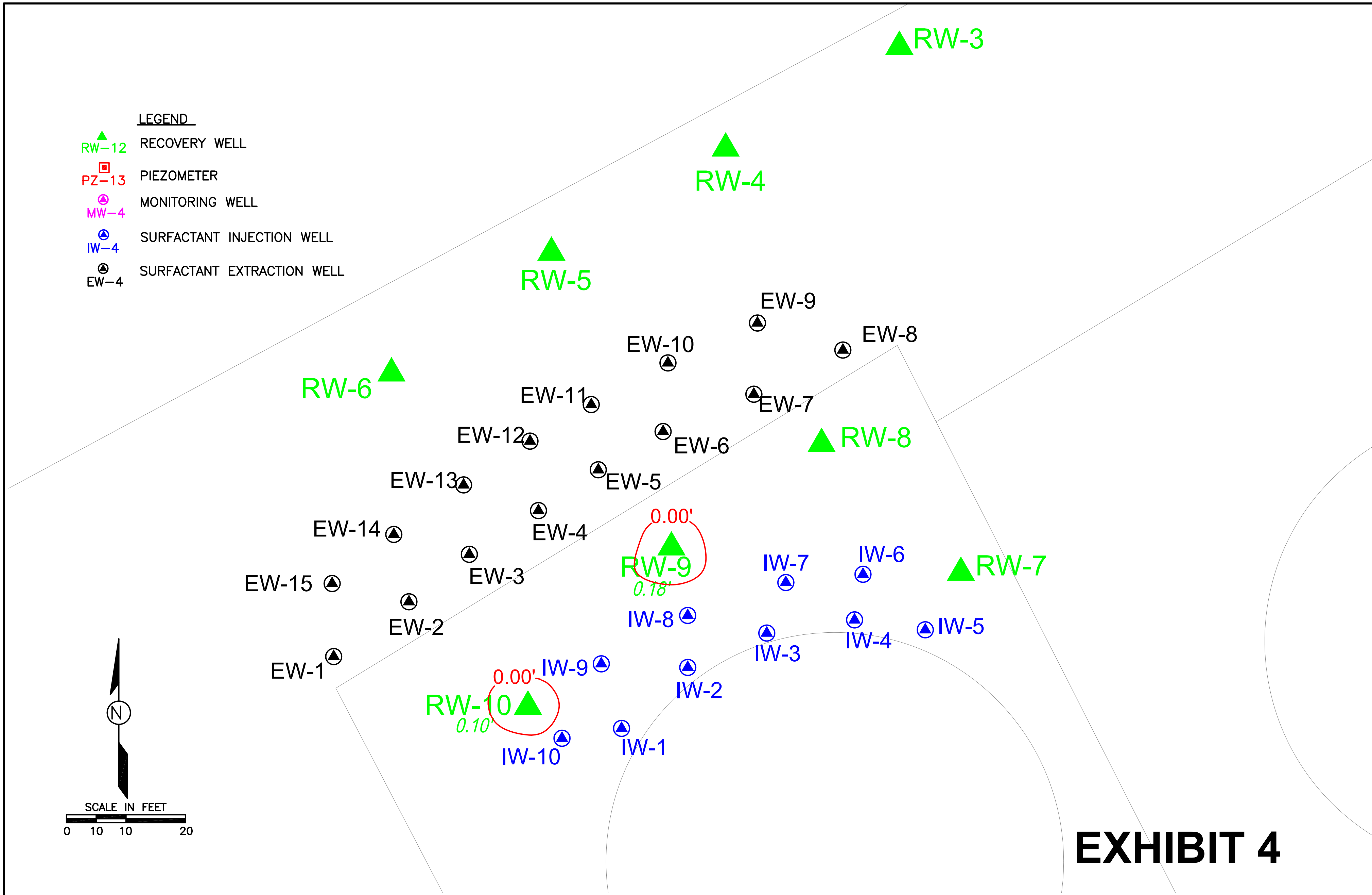
VOPAK SAVANNAH TERMINAL
GARDEN CITY, GEORGIA

FIGURE 23



Project Mngr: JRR	Project No. ES077123	Terracon Consulting Engineers and Scientists	Surfactant Injection/Extraction Well Layout
Drawn By: JM	Scale: As Shown	2201 Rowland Avenue, Savannah, Georgia 31404	USTs & ASTs
Checked By: WSA	File No. ES077123.DWG	Phone: 912.629.4000 Fax: 912.629.4001	Vopak Savannah Terminal
Approved By: WSA	Date: DECEMBER 29, 2010		Savannah, Georgia

FIG. No. 2



Project Mngr: JRR	Project No. ES077123		
Drawn By: JM	Scale: 1" = 20'		
Checked By: WSA	File No. ES077123.DWG		
Approved By: WSA	Date: DECEMBER 29, 2010		

Terracon
Consulting Engineers and Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone: 912.629.4000 Fax: 912.629.4001

North Free Product Levels (10/15/2010)
USTs & ASTs
Vopak Savannah Terminal
Savannah, Georgia

FIG. No.
4i

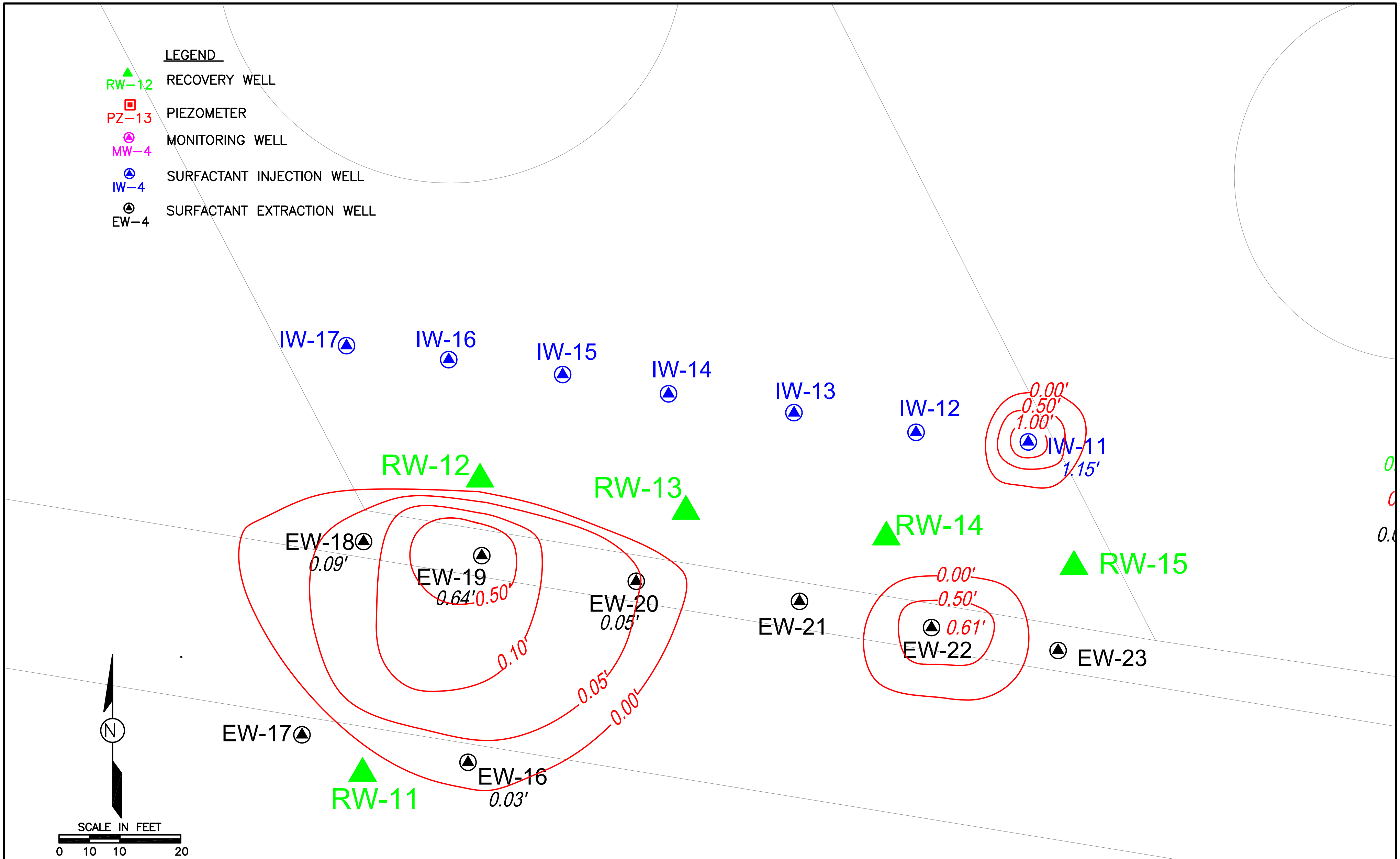


EXHIBIT 5

Project Mngr: JRR	Project No. ES077123	Terracon Consulting Engineers and Scientists	South Free Product Levels (10/15/2010)	FIG. No.
Drawn By: JM	Scale: 1" = 20'		USTs & ASTs	5i
Checked By: WSA	File No. ES077123.DWG	2201 Rowland Avenue Savannah, Georgia 31404	Vopak Savannah Terminal	
Approved By: WSA	Date: DECEMBER 29, 2010	Phone: 912.629.4000 Fax: 912.629.4001	Savannah, Georgia	

12598_1-06_CAR.DWG 1/26/06 1-200 MDH REV

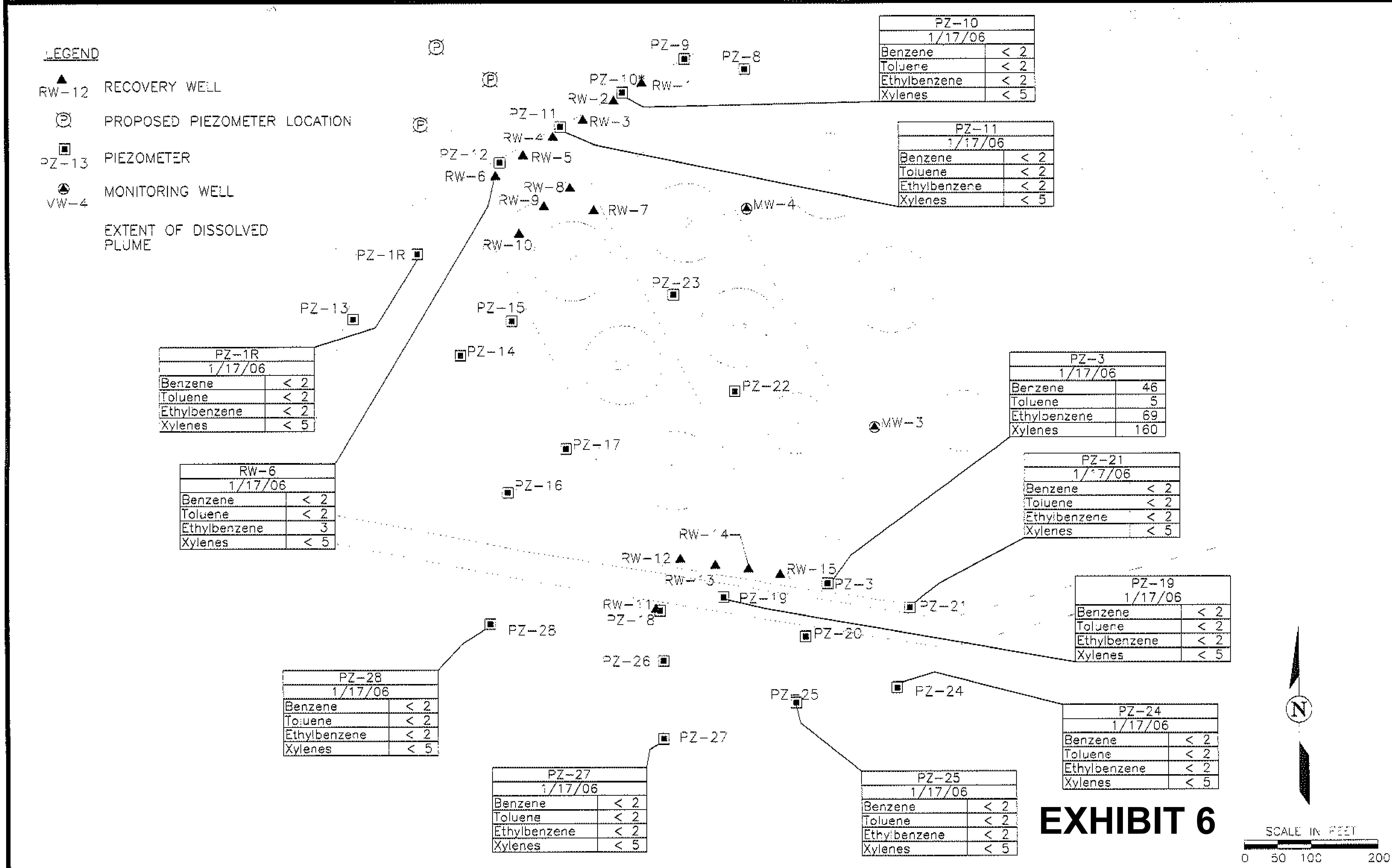


EXHIBIT 6

Environmental Resources Management

BTEX DISSOLVED PLUME AS OF JANUARY 2006

VOPAK SAVANNAH TERMINAL
GARDEN CITY, GEORGIA

FIGURE 1

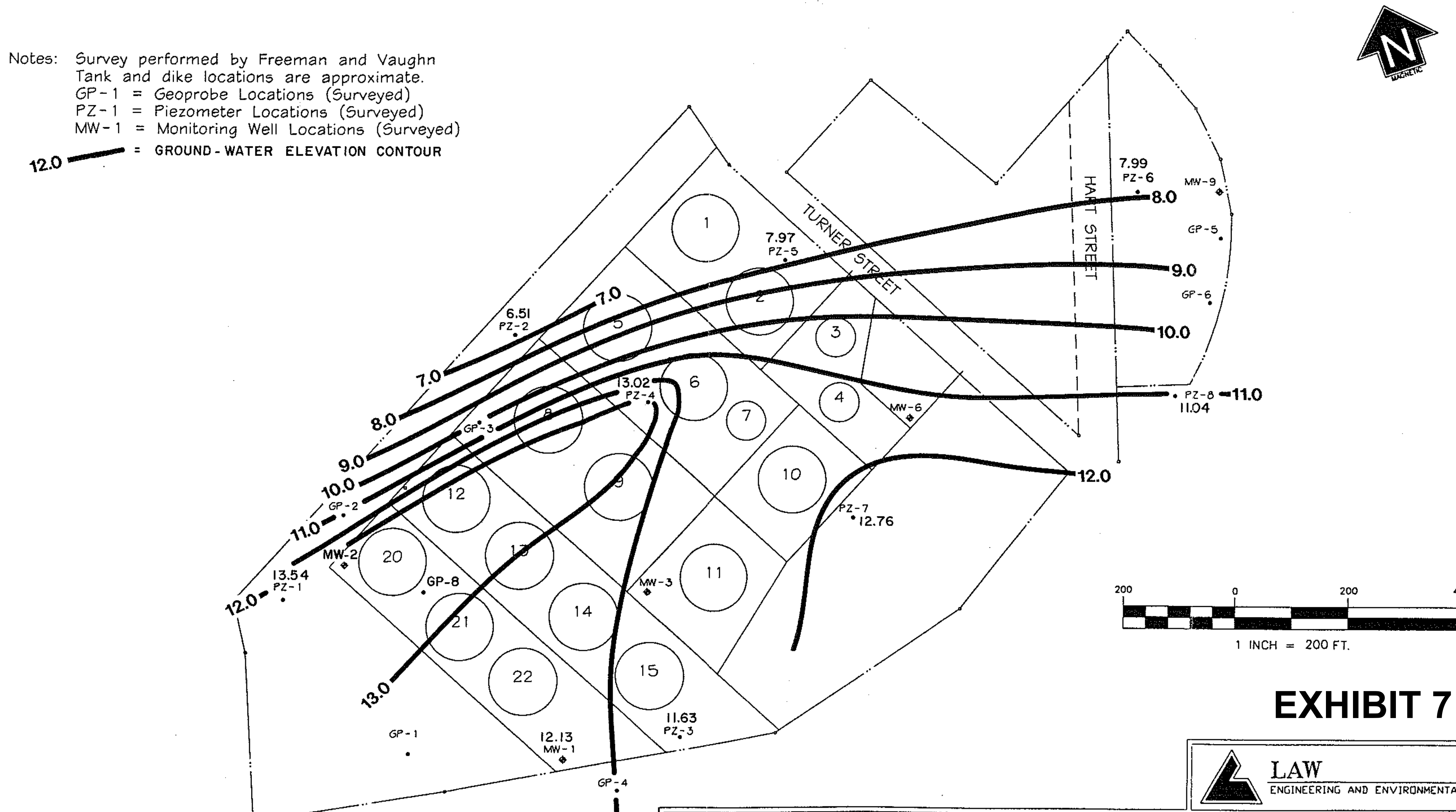


EXHIBIT 7

LAW
ENGINEERING AND ENVIRONMENTAL SERVICES

GROUND-WATER ELEVATION CONTOUR MAP
(6-12-96)
PAKTANK CORPORATION
GEORGIA PORT AUTHORITY
SAVANNAH, GEORGIA

DRAWN: KLC	DATE: 7-16-96
DFT CHECK: DLB	SCALE: AS SHOWN
ENG CHECK: ——	JOB: 31040-6-0671
APPROVAL: DCS	FILE: \PAKTANK\BASE
REFERENCE:	DRAWING NO.: 3

3200_11301GWF.DWG 01-29-01 IS

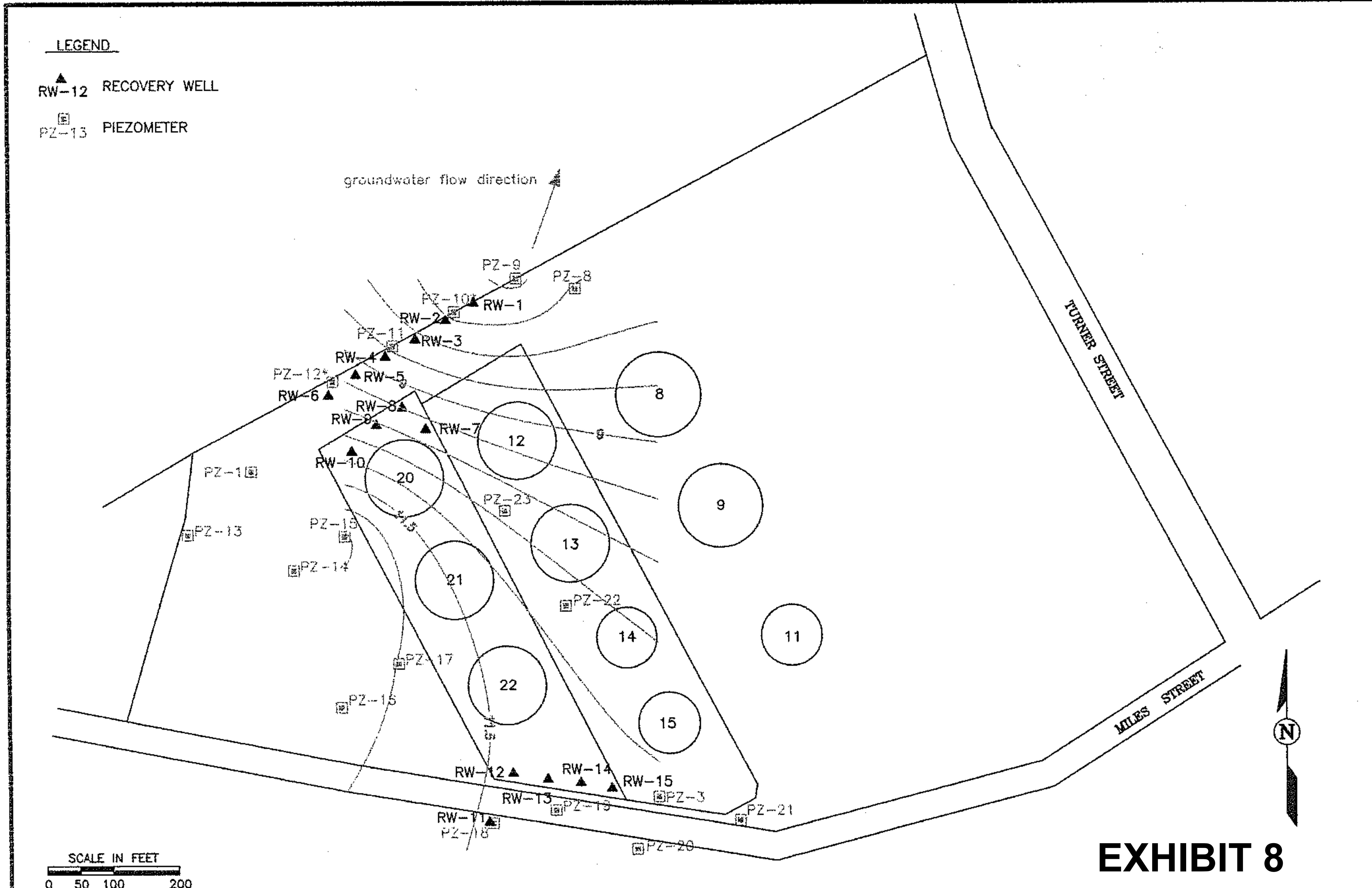


EXHIBIT 8

ERM Environmental Resources Management

GROUNDWATER POTENTIOMETRIC SURFACE MAP
JANUARY 13, 2001
VOPAK
SAVANNAH TERMINAL

FIGURE 1

12598_8-05_CAR.DWG 8/29/05 1-200 MDH REV

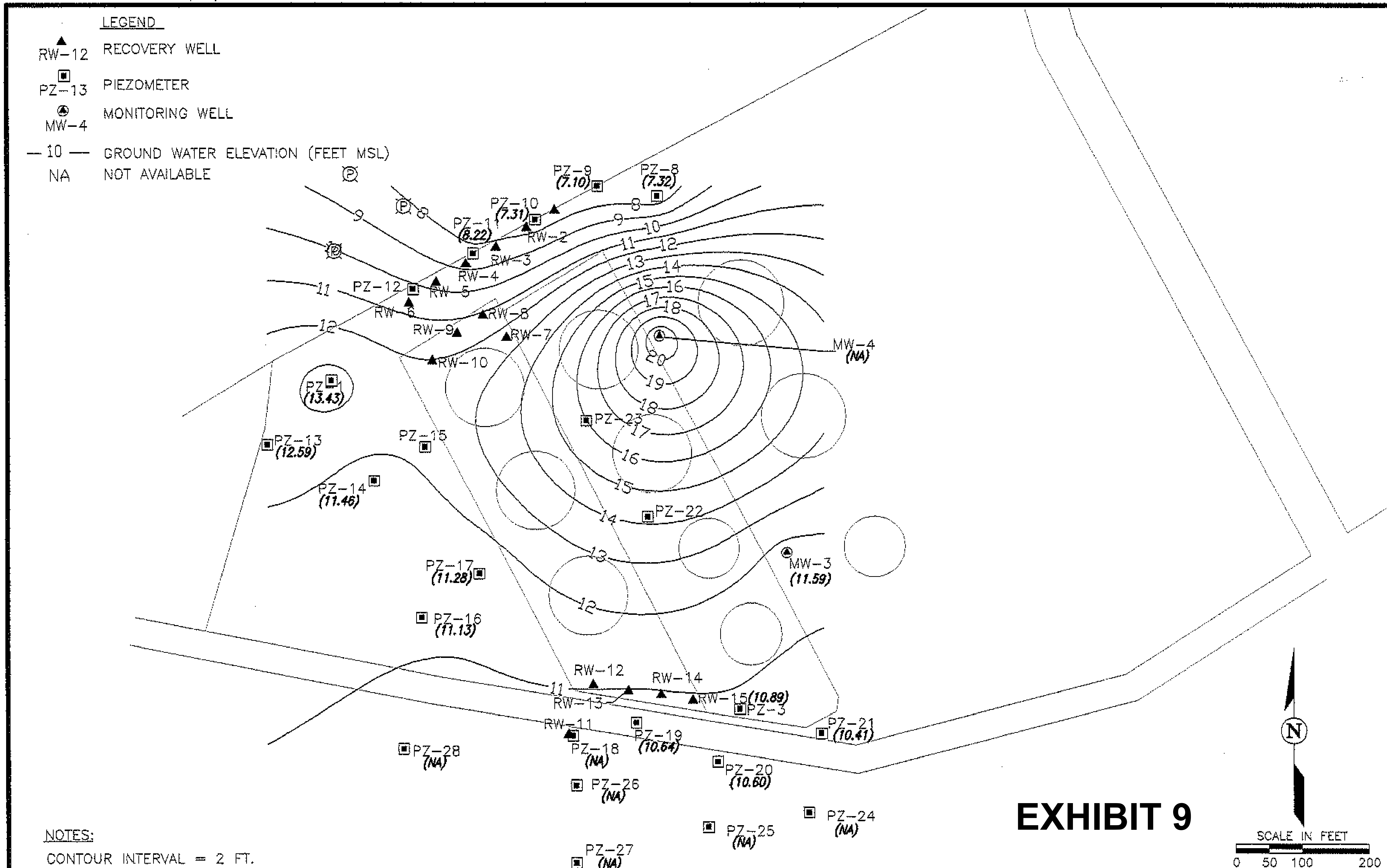


EXHIBIT 9

Environmental Resources Management

ERM

JUNE 9, 2004 GROUND WATER CONTOURS

PRE HVE

VOPAK SAVANNAH TERMINAL

GARDEN CITY, GEORGIA

FIGURE 2

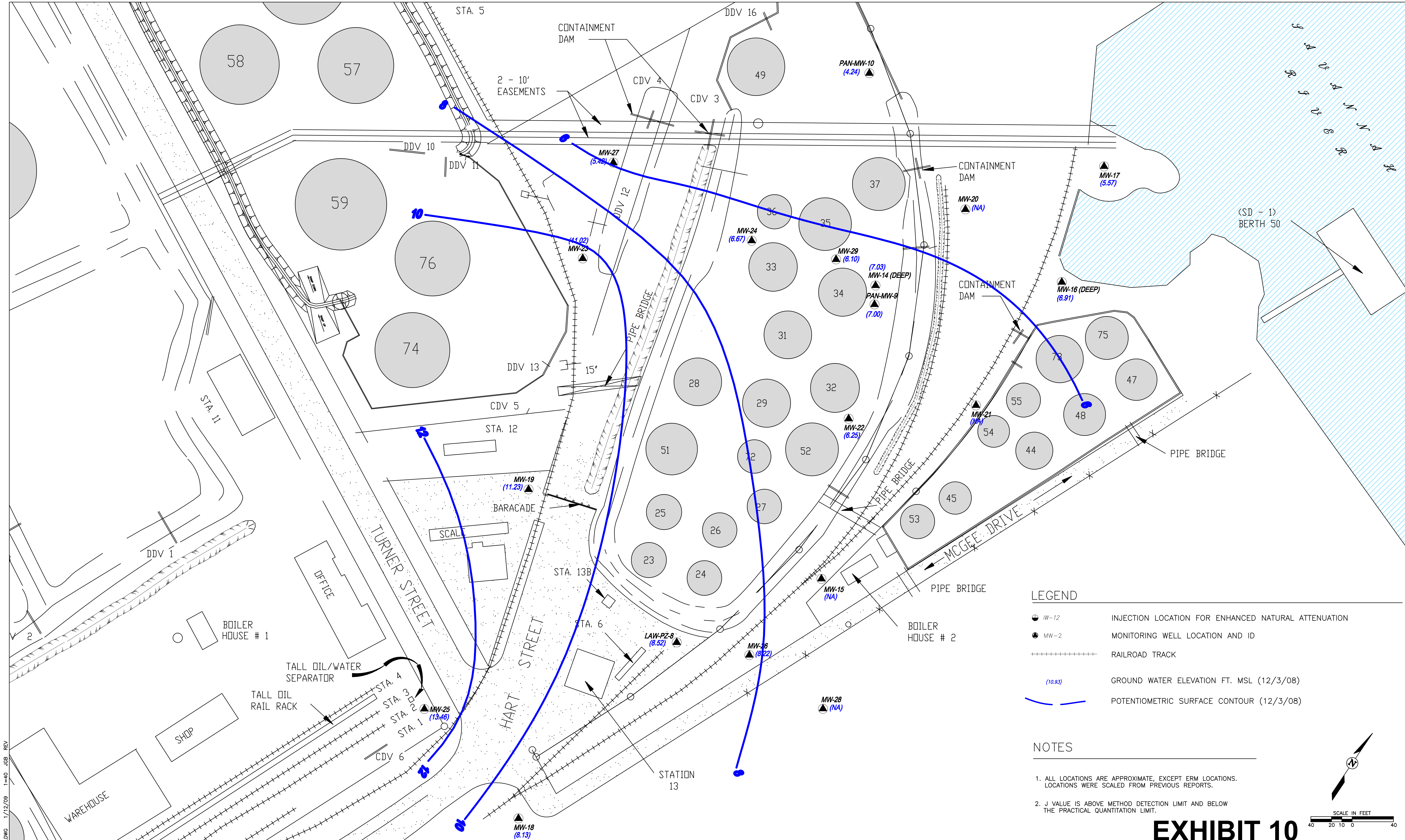


EXHIBIT 10

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

THIRD ANNUAL REPORT ON CORRECTIVE ACTION

VOPAK (FORMERLY PAKTANK CORPORATION) SAVANNAH, GA

DRAWN BY J. BYRD
PROJECT ENGINEER J. BYRD
DESIGN ENGINEER S. THOMPSON
PROJECT MANAGER S. THOMPSON

ERM

NOT FOR CONST-RUCTION

POTENTIOMETRIC SURFACE MAP
DECEMBER 2008

SCALE AS SHOWN
DATE JANUARY 12, 2009
PROJECT NO. 110235 VOPAK
AutoCAD R-2002 110235_Vopak 2009 Annual Report.DWG

DRAWING NO. **4-1**
REV. NO. **1**
SHEET OF

110235_Vopak 2009 Annual Report.DWG 1/12/09 1=40 JGB REV

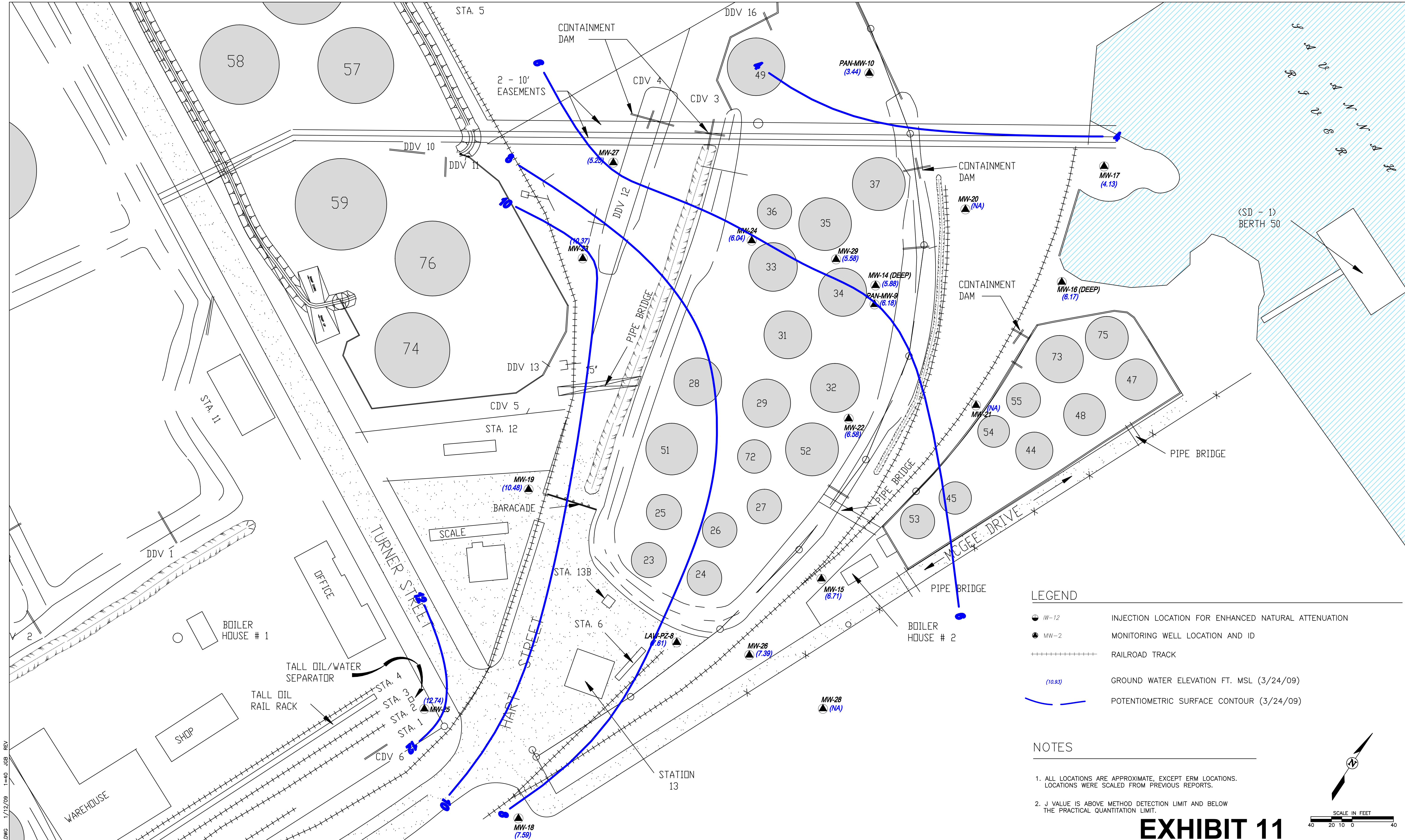


EXHIBIT 11

NO.	DATE	APPR.	REVISION	NO.	DATE	APPR.	REVISION

THIRD ANNUAL REPORT ON CORRECTIVE ACTION

VOPAK (FORMERLY PAKTANK CORPORATION) SAVANNAH, GA

DRAWN BY: J. BYRD
PROJECT ENGINEER: J. BYRD
DESIGN ENGINEER: S. THOMPSON
PROJECT MANAGER: S. THOMPSON

ERM

NOT FOR CONSTRUCTION

POTENTIOMETRIC SURFACE MAP MARCH 2009

SCALE: AS SHOWN
DATE: JANUARY 12, 2009
PROJECT NO.: 110235 VOPAK
AutoCAD R-2002 110235_Vopak 2009 Annual Report.DWG

DRAWING NO.: 4-2
REV. NO.: 1
SHEET OF

110235_Vopak 2009 Annual Report.DWG 1/12/09 1=40 JGB REV