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LETTER REGARDING U S NAVY REPOSSES TO FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION COMMENTS ON PCA 16 JP-5 PIPELINE RELEASE  
IMPACTS ON DOWN GRADIENT PROPERTIES NAS JACKSONVILLE FL  
9/26/2005  
ENSR CONSULTING

September 26, 2005

Mr. Jim Cason  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
MS4535  
Tallahassee, Florida 32399-2400

**Re: Comment Response to the TtNUS Data Assessment Report for PCA 16  
(Former 103<sup>rd</sup> Street Hawkins Property)  
Naval Air Station Jacksonville, Jacksonville, Florida**

Dear Mr. Cason:

On behalf of Kerr-McGee Refining Corporation (Kerr-McGee), ENSR Corporation submits this comment letter in response to the subject Tetra Tech NUS, Inc. (TtNUS) Data Assessment Report prepared for the former Hawkins Property located immediately west of the Kerr-McGee property at 6930 103<sup>rd</sup> Street in Jacksonville, Florida. This property has been designated "PCA 16" by the United States Navy (Navy). A copy of the TtNUS report is included as **Attachment A**. ENSR's comments regarding TtNUS findings are presented below.

### **TtNUS Data Assessment Report Findings and ENSR Comments**

#### **Impetus**

TtNUS prepared the Data Assessment Report for PCA 16 at the Navy's request to summarize historical data and evaluate current site conditions, and to address concerns raised by ENSR Corporation (ENSR) and the Florida Department of Environmental Protection (FDEP) that Navy JP-5 pipeline release impacts to the neighboring down-gradient (east) Kerr-McGee property had not been assessed. These concerns were raised during an April 25, 2005 teleconference attended by FDEP, ENSR, TtNUS and Navy representatives.

Due to the need for assessment and remediation of a JP-5 pipeline release discovered in 1989, the Navy purchased PCA 16 in 1996. Prior to 1996, the property was a private residence. To summarize historical and current site conditions, TtNUS reviewed several environmental reports prepared for PCA 16, a neighboring Texaco Station located west of PCA 16, and the Kerr-McGee property. A list of these reports is included in **Table 1 of Attachment A**.

### **Hydrogeology**

According to TtNUS, PCA 16 and the surrounding sites are underlain with sand to approximately 5.5 feet below ground surface (bgs). A hardpan clay layer is located between 5.5 and 12 feet bgs. Sand and silt are encountered at greater than 12 feet bgs. The hardpan layer separates the saturated zone into two units, one above and one below the hardpan layer. Based on the historical reports, TtNUS reported that the groundwater flow direction both at PCA 16 and the surrounding sites is to the south-southeast.

ENSR's review of groundwater data for the Shell service station leaking underground storage tank (LUST) site approximately 200 feet west of PCA 16, indicates groundwater flow direction in the immediate area varies significantly. The groundwater flow direction at the Shell site is directly to the east. Moving to the east, across the Texaco property, the groundwater flow direction appears to turn sharply to the south-southeast. Given this hydraulic flow situation, the Shell and Texaco LUST sites are directly up-gradient of PCA 16 and the Kerr-McGee site.

### **Source Removal Events**

Three separate source removal events were identified by TtNUS. The first source removal event was completed during the removal of the Kerr-McGee underground storage tanks (USTs) in 1994. During that event, 55 cubic yards of "excessively contaminated soil" (OVA readings greater than 500 parts per million (ppm)) were removed from the product tank basin area in the northwestern portion of the Kerr-McGee property. TtNUS indicates that product piping remains in place at the Kerr-McGee property; however, Earth Systems' October 14, 1994 Tank Closure Report documents removal of both tanks and product piping from the site.

The second and third source removal events addressed impacted soils from the Navy JP-5 pipeline release. In 1996, 4,032 cubic yards of petroleum-contaminated soil were removed from PCA 16. In 2003, an additional 472 cubic yards of petroleum-contaminated soil was removed from PCA 16.

### **Groundwater Contamination**

TtNUS summarizes that groundwater contamination at PCA 16 currently (as of July 2004) consists of naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, BTEX (benzene, toluene, ethylbenzene, xylene) compounds and methyl tertiary-butyl ether (MTBE). These results are summarized in Tables 2-1 and 4-1 of **Attachment A**. TtNUS indicates that the two possible sources for the groundwater contamination are the Navy JP-5 pipeline release and the former Kerr-McGee USTs.

TtNUS has concluded, based on groundwater monitoring and monitoring well construction, that hydrocarbon contamination exists both above and below the hardpan layer described above. TtNUS suggests contamination observed above the hardpan layer was caused by the Navy JP-5

pipeline release, but that contamination below the hardpan layer was caused either by the former Kerr-McGee USTs or "some unknown source".

TtNUS attempts to support this assertion through a comparison of monitoring wells TW-5B and TW-12A. Well TW-5B is screened below the hardpan, while TW-12A is screened above the hardpan. These wells are located adjacent to each other, down-gradient of the pipeline release and side-gradient of the former Kerr-McGee USTs. TtNUS suggests that simply the location of the contamination below the hardpan indicates that the concentrations of naphthalene, 1-methylnaphthalene and 2-methylnaphthalene in well TW-5B are attributable to the former Kerr-McGee USTs. No contamination is located above the hardpan in well TW-12A, construed by TtNUS to indicate that JP-5 impacts are not present at this location.

ENSR's evaluation of the data conflicts with the TtNUS assessment in several ways.

1. Naphthalene, 1-methylnaphthalene and 2-methylnaphthalene impacts below the hardpan layer, which TtNUS attributes to the former KM USTs, are typical of the JP-5 release impacts observed elsewhere on PCA 16, both above and below the hard pan. These constituents would not be observed as a result of a UST gasoline release as the TtNUS opinion would suggest.
2. Well TW-5B is located directly down-gradient of the JP-5 pipeline release, but only side-gradient to the former KM UST basin location. The strong groundwater flow gradient (0.018 ft/ft based upon the December 14, 1998 Figure 3 from Appendix A of the TtNUS report), would not suggest side-gradient hydrodynamic dispersion of any contaminant plume emanating from the former KM UST basin to the TW-5B location.
3. The mere presence of BTEX compounds in TW-5B groundwater (or any other well) is not sufficient data to substantiate the argument that the impacts are attributable to the former KM USTs and not associated with the JP-5 pipeline release or other hydrocarbon release. Two potential sources for the BTEX in TW-5B, and BTEX and/or MTBE in other PCA 16 wells obvious upon ENSR's initial review are:
  - a. Aromatic hydrocarbons are a known constituent present at low levels in JP-5 and could be the source of some or all of these BTEX impacts. This theory is supported by a significant BTEX concentration decrease in all 6 down-gradient PCA 16 wells after the 2003 removal of JP-5 impacted soils. However, the presence of MTBE in PCA 16 site groundwater is not explained by this theory.
  - b. A known leaking UST site exists directly up-gradient (west) of PCA 16 at the Shell service station addressed 7000 103<sup>rd</sup> Street. (See **Attachment B** for site information.) Information on file with FDEP indicates significant down-gradient off-site BTEX and MTBE groundwater impacts are associated with this site.
    - i. Well MW-11 associated with investigation of the Shell leaking UST site was located on the PCA 16 property, and indicated the presence of MTBE at 6 parts-per-billion (ppb) as late as November 2002. (Well data after that date was not available for ENSR's review.)

- ii. The well just east of the Texaco building, identified as TMW-10 in NAVFAC's 2004 Figure 3.1 from Appendix A of the TtNUS summary report, appears to be analogous to MW-10 associated with investigation of the Shell leaking UST site. Groundwater from this well contained 11 ppb MTBE as late as March 2003. (Well data after that date was not immediately available.)

MTBE and BTEX concentrations in Shell wells MW-10 and MW-11 were historically much higher (up to 317 ppb and 1,811 ppb, respectively). Shell tank basin wells historically indicated concentrations of up to 65,000 ppb MTBE and Total BTEX of 52,200 ppb. These historical MTBE and BTEX values in groundwater less than 200 feet directly upgradient of PCA 16 make the Shell LUST site a much more likely source for the MTBE/BTEX concentrations observed in PCA 16 monitoring wells than the former KM UST basin.

The TtNUS report also makes a disjointed attempt to link the occurrence of MTBE in well MW-1 located down-gradient and southeast of the former Kerr-McGee UST basin to former Kerr-McGee site activities by stating that:

1. The 1991 RAP for PCA 16 states that "excessively contaminated soils existed in the area southeast of the former USTs" on the Kerr-McGee property and that these soils were not removed;
  - a. While residual-contaminated soils adjacent to the former Kerr-McGee UST basin, if they exist, could be a source of impacts, a speculative statement in a RAP for a different site does not make it so.
2. A "septic drain field located southeast of the UST system is a *Recognized Environmental Condition*" and no analytical data exists regarding soil or groundwater "for this septic drain field area";
  - a. ENSR does not believe the septic drain field is a good candidate for the potential source of BTEX or MTBE impacts to PCA 16 or the Kerr-McGee property based upon its designed function.
  - b. ENSR does not believe the septic drain field is a good candidate for the potential source of BTEX or MTBE impacts to PCA 16 or the Kerr-McGee property due to its down-gradient location.
3. "A formal petroleum site assessment has not been performed on the property subsequent to the 1994 UST Removal at the Kerr-McGee site."
  - a. Impacts to PCA 16 and the Kerr-McGee site cannot be attributed to the former Kerr-McGee UST basin simply because a formal assessment was not conducted.
  - b. At the time of the UST removal, FDEP did not require a formal petroleum site assessment due to the wide-spread contamination of the immediate area caused by the Navy JP-5 pipeline release. Kerr-McGee fulfilled its regulatory obligations by reporting the 1994 UST removal to FDEP and completing all investigation requested by FDEP at that time.

Again, attribution of MTBE presence to the former Kerr-McGee USTs ignores the documented presence of significant MTBE concentrations in wells farther up-gradient of the Kerr-McGee USTs. The clear indication based upon groundwater data is that MTBE originates from some source other than the Kerr-McGee USTs, most likely the Shell or Texaco service station LUST sites located directly up-gradient west of PCA 16 and the Kerr-McGee properties.

### **ENSR Responses to TtNUS Report Conclusions**

In summary, the TtNUS Data Assessment Report makes the following conclusions and assumptions regarding the Kerr-McGee property:

**TtNUS Conclusion 1:** The groundwater contamination exists in the aquifer at two levels, separated by a hardpan clay layer. TtNUS believes contamination above the hardpan layer was caused by the Navy JP-5 pipeline release, while the contamination below the hardpan was caused by the Kerr-McGee USTs or another “unknown source”.

**ENSR Response:** Based upon groundwater flow direction data, observed groundwater contaminant constituents, and the presence of other contaminated properties in the immediate vicinity, contamination above and below the hardpan layer is likely attributable to both the JP-5 pipeline release and known up-gradient LUST sites. Contributions to PCA 16’s groundwater contamination by the down-gradient KM property are unlikely.

**TtNUS Conclusion 2:** The potential exists for soil contamination on the Kerr-McGee property, specifically southeast of the former Kerr-McGee UST basin, and at the septic drain field. These uncharacterized potential sources of contamination are likely contributing to groundwater impacts on the Kerr-McGee property and PCA 16.

**ENSR Response:** ENSR agrees there is potential for soil and groundwater contamination to exist at the Kerr-McGee property; however, due to the locations of both the JP-5 pipeline and the Shell/Texaco LUST releases directly up-gradient of the Kerr-McGee property, it is likely that a significant portion, if not all, of the contamination observed has been caused by these other sources. In addition, it is highly likely that BTEX and MTBE concentrations found at PCA 16 are caused by the up-gradient Shell/Texaco LUST releases rather than any potential release from then down-gradient/cross-gradient Kerr-McGee former UST basin.

**TtNUS Conclusion 3:** A formal petroleum site assessment has not been performed to define the extent of potential contamination on the Kerr-McGee property.

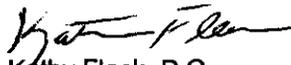
**ENSR Response:** A formal petroleum site assessment has not been performed at the Kerr-McGee facility because none was required by FDEP at the time of the Kerr-McGee UST removal,

or at any subsequent time. FDEP appears to have foregone further assessment of the Kerr-McGee site, based upon the discovery of massive contamination from the JP-5 pipeline release in the immediate area. Based upon the information presented herein suggesting contamination of groundwater at the Kerr-McGee property by multiple up-gradient sources including the JP-5 pipeline release, ENSR recommends that, at a minimum, a joint site assessment be conducted including both Navy and Kerr-McGee consultants.

ENSR appreciates the opportunity to provide FDEP with this comment response on Kerr-McGee's behalf. Please do not hesitate to contact the undersigned, if you should have any questions or comments.

Sincerely,

**ENSR Corporation**



Kathy Fleck, P.G.  
Project Manager  
(727) 577-5430



Gretchen McDonnell  
Program Manager  
(405) 270-2921

Attachments:

- A) TtNUS Data Assessment Report
- B) Shell/Texaco Leaking UST Release Documents and Review Summary

cc: Debbie Parr, Kerr-McGee

**ATTACHMENT A**

Document Tracking Number 05JAX0080

May 13, 2005

Project Number N4258

Southern Division  
Naval Facilities Engineering Command  
ATTN: Ms. Beverly Washington (Code ES24)  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Reference: CLEAN III Contract Number N62467-94-D-0888  
Contract Task Order Number 0252

Subject: Data Assessment  
PCA 16, Hawkins 103<sup>rd</sup> Street Property  
Naval Air Station Jacksonville, Jacksonville, Florida

Dear Ms. Washington:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit this letter addressing the Petroleum Contaminated Area (PCA) 16, also referred to as the Hawkins 103<sup>rd</sup> Street Property, near Naval Air Station (NAS) Jacksonville in Jacksonville, Florida. This letter report was prepared for the United States Navy (Navy) Southern Division, Naval Facilities Engineering Command (NAVFAC EFD SOUTH) under Contract Task Order (CTO) 0252, for the Comprehensive Long-term Environmental Action Navy (CLEAN) III Contract Number N62467-94-D-0888. The objective of this letter is to a) review historical data, b) evaluate site conditions, and c) identify uncertainties from previous assessments with respect to this property and the Kerr McGee site located to the adjacent east.

#### **SITE DESCRIPTION**

PCA 16 is located in the western portion of Jacksonville, Florida on the southern side of 103<sup>rd</sup> Street (State Road 134) approximately ¼ mile east of the Interstate 295-103<sup>rd</sup> Street interchange as shown on Figure 1. The site is approximately equidistant between NAS Jacksonville and Cecil Commerce Center (formerly NAS Cecil Field). The site address is 6952 103<sup>rd</sup> Street.

PCA 16 was previously a single family residence until the Navy purchased the property in 1996. The Navy razed the property and the site has remained unimproved since. Currently, the site is vacant and is partially covered with grass with a wooded area located in the southern portion of the property. An active Texaco gasoline station is located to the adjacent west with an active Shell gasoline station located further west. 103<sup>rd</sup> Street is located to the adjacent north; a former Kerr McGee gasoline station is located to the adjacent east; and a wooded area is located to the adjacent south, with a residential area located further south. PCA 16 and surrounding locations are illustrated on Figure 2.

Previous investigations, site conditions, contamination assessment, uncertainties and conclusions are discussed in the following sections.

## **PREVIOUS INVESTIGATIONS**

As stated previously, PCA 16 is surrounded by several retail fuel facilities. In an effort to further understand subsurface site conditions and the nature and source of multiple contaminant plumes, previous investigations from PCA 16 and the aforementioned retail fuel facilities were researched. Information obtained from these investigations is summarized on Table 1.

## **SITE CONDITIONS**

Information obtained from the previous assessments summarized in Table 1 was reviewed to evaluate subsurface site conditions. These site conditions are summarized in the sections provided below.

### **Hydrogeologic Setting**

Review of previous assessments indicates groundwater flow direction is to the south/southeast at PCA 16 and the surrounding fuel facilities. Historical figures from previous assessments indicating groundwater flow are included in Attachment A.

### **Lithologic Setting**

Previous assessments investigated the subsurface environment of PCA 16 to a depth of approximately 18 feet (ft) below ground surface (bgs). The stratigraphic sequence of this 18-ft interval consists of fine grain sands and fine grain fill dirt which overlay an indurated sandy clay hard pan layer situated conformably above a silty sand layer. Vertical succession of the site stratigraphic sequence is summarized on Table 2 and illustrated on historical Figure 4-2 obtained from the Post Source Removal Groundwater Monitoring Report (TtNUS, 2004). A copy of Figure 4-2 is included in Attachment A.

Site observations made by TtNUS field geologists indicate the first stratigraphic sequence is primarily saturated through rain water percolation, while saturation in the third stratigraphic sequence is caused by the contact with the shallow zone of the surficial aquifer. The second stratigraphic sequence, the hardpan layer, is discussed below.

Lithologic information indicates the hardpan layer is extremely indurated. Soil cuttings observed from this layer [split spoon and direct push technology (DPT) core samplers could not penetrate this layer] were unsaturated with little to no pore space (i.e., low porosity). These lithologic properties are indicative of an aquitard as this layer appears to be separating the two saturation sources (i.e., rainwater and groundwater) of the first and third stratigraphic sequences.

### **Nature of Contamination**

As stated previously, the site has historically (since 1991) been contaminated with benzene, toluene, ethylbenzene and xylene (BTEX) constituents and methyl tert-butyl ether (MTBE). In addition, concentrations of total recoverable petroleum hydrocarbons, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene have been reported in soil and groundwater at the site. Recent analytical data (July 2004) indicates site contaminants in groundwater consist of benzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. Groundwater analytical results are summarized on Table 2-1 and Table 4-1 from the Post Source Removal Groundwater Monitoring Report (TtNUS, 2004). A copy of Table 2-1 and Table 4-1 is included as Attachment B.

### **Source Removal Activities**

To further understand the potential sources of contamination at site, source removal information (i.e., date of source removal activities, excavation dimensions, and quantities/structures removed) was reviewed. The following outlines this information:

- In 1994, three 10,000-gallon underground storage tanks (USTs) and 55 cubic yards of “excessively contaminated soil” [soil organic vapor analyzer (OVA) measurements greater than 500 ppm] were removed from the northwestern portion of the Kerr McGee site (see Figure 2). The excavated area measured approximately 45 ft wide x 45 ft wide by 12 ft bgs. Product piping associated with the UST system remains in place at the Kerr McGee site.
- In 1996, 4,032 cubic yards of petroleum contaminated soil were removed from PCA 16. The excavation covered an irregular shaped area approximately 16,775 square ft wide to a depth of approximately 5 ft bgs. According to the 1991 Remedial Action Plan (RAP) for PCA 16, excessively contaminated soils existed in the area southeast of the former USTs. This soil was not removed from the site.
- In 2003, approximately 472 cubic yards of petroleum contaminated soil were removed south of the 1996 excavation. The excavation covered an irregular shaped area approximately 5,375 square ft wide and averaging 5.5 ft bgs.

### **Contamination Assessment**

As previously stated, hydrocarbon contamination has impacted soil and groundwater at PCA 16. Previous assessments have reported two possible sources of contamination being 1) the jet fuel pipeline and 2) former USTs (Kerr McGee site). Two on-site source removals and one off-site UST removal have occurred to mitigate these sources of contamination. Groundwater monitoring at the site indicates hydrocarbon contamination is present above and below the aforementioned aquitard hardpan layer. The reported source for site (and off-site) contamination was the jet fuel pipeline located north and upgradient of PCA 16. Site observations indicate this pipeline is buried not greater than 5 ft bgs in the vicinity of PCA 16. Therefore, contamination above the aquitard hardpan layer is likely from the jet fuel pipeline. This contamination was the focus of the 1996 and 2003 source removals.

Groundwater contamination below the aquitard hardpan layer is likely associated with former the UST system (i.e., USTs, associated piping, dispensers, etc.) located on the Kerr McGee site or another unknown source. Based on information obtained from the 1994 UST removal, the aquitard hardpan layer was penetrated and petroleum hydrocarbon contamination had the potential to migrate below the hardpan layer. This concept was further explored during the post remedial groundwater monitoring (TtNUS, 2003) of PCA 16 with the sampling of ten monitoring wells installed below the hardpan and four monitoring wells installed above the hardpan. Evidence of the separation from the two potential sources of contamination is best observed in monitoring wells TW-12A and TW-5B. These monitoring wells are located approximately 20 ft southwest of the former UST system. TW-5B is screened below the hardpan (13 to 18 ft bgs) and TW-12A is screened above the hardpan (3.0 to 8.0 ft bgs). Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene [exceeding FDEP groundwater cleanup target levels (GCTLs)] were detected in groundwater samples collected from TW-5B. Hydrocarbon contamination was not detected in groundwater collected from TW-12A. In addition, TW-3B is located approximately 12 ft west of the UST system and also screened below the hardpan (13 to 18 ft bgs). Recent analytical results (July 2004) indicated concentrations of benzene and naphthalene in groundwater exceeding FDEP GCTLs.

In addition, analytical results from historical monitoring well MW-1 reported concentrations of MTBE at 136 micrograms per liter ( $\mu\text{g/L}$ ) (July 1998). This well was located southeast of the UST system and the septic drain field (see Figure 2) located on the Kerr McGee site and has since been removed from the monitoring well network. As stated previously, the 1991 RAP indicated excessively contaminated soils existed in the area southeast of the former UST vault, and that the contaminated soil was not removed from the site. Additionally, the septic drain field located southeast of the UST system is a *Recognized Environmental Condition* as defined by the American Society for Testing and Materials 1527-00 Standard (a standard used to evaluate the eligibility of a site for Comprehensive Environmental Response, Compensation, and Liability Act liability protection as amended by the 2002 Brownfields Revitalization Act). Previous assessments did not reveal any information regarding soil or additional groundwater

analytical data for this septic drain field area. A formal petroleum site assessment has not been performed on the property subsequent to the 1994 UST Removal at the Kerr McGee site.

## UNCERTAINTIES

Several uncertainties, or data gaps, were noted from the previous assessments. These uncertainties are detailed below.

1. Per 1996 Florida Department of Environmental (FDEP) regulations, soil OVA screening was performed to delineate the extent of soil contamination for the 1996 source removal. Confirmation soil samples were not collected for fixed-base laboratory analysis. Confirmation soil samples were collected within the southern portion of the previously excavated area during the 2003 source removal. Due to the nature of field screening with an OVA, the soil remaining in the excavation may have contained COCs at concentrations exceeding leachability soil cleanup target levels (SCTLs).
2. Soil OVA screening was also performed to delineate the extent of soil contamination during the 1994 Kerr McGee UST Removal. Confirmation samples were not collected for fixed-base laboratory analysis during the UST removal. In addition, product piping remains in place at the site. The 1991 RAP also identified "excessively contaminated soils" immediately southeast of the former UST vault. These soils were reportedly not removed during the UST removal.
3. Recent groundwater analytical results (July 2004) indicated benzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene remain in monitoring well KMW-0R. KMW-0R is located approximately 6 ft north of the former UST system and is screened through the hardpan (2 to 12 ft bgs). Hydrocarbon contamination in soil and groundwater is undefined in the immediate area surrounding KMW-0R.
4. The extent of hydrocarbon groundwater contamination is not defined southeast (i.e., direction of groundwater flow) of monitoring well TW-5B, the Kerr McGee former UST system, monitoring well KMW-0R, or the aforementioned septic drain field located on the Kerr McGee site.
5. The Kerr McGee UST Removal indicated that soil and groundwater contamination remained at the site. However, a petroleum site assessment per the Florida Administrative Code was not performed on the property subsequent to the 1994 UST Removal at the Kerr McGee site.

## CONCLUSIONS

Several uncertainties are present as to the extent of soil and groundwater contamination on PCA 16 and the Kerr McGee site. The following conclusions were derived from these uncertainties and the additional findings from the review of the previous assessments.

1. Groundwater hydrocarbon contamination at PCA 16 appears to be separated by the hardpan aquitard layer. The groundwater contamination in the southern portion of the site appears to have resulted from residual soil contamination above the hardpan. Although there appears to be low levels of COCs in the shallow wells in the northern portion of PCA 16, the GCTL exceedances have been confined to the saturated interval below the hardpan layer.
2. Confirmation soil samples were not collected from the northern portion of the 1996 excavation area; therefore, COC soil concentrations exceeding leachability SCTLs may exist in this area. However, the lack of groundwater contamination above the hardpan does not confirm this.
3. There is potential for soil and groundwater contamination to exist at the Kerr McGee site, specifically in the areas southeast of the former UST system, the septic drain field, and the immediate vicinity surrounding KMW-0R resulting from past Kerr McGee operations.

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4. A formal petroleum site assessment has not been performed to define the extent of potential contamination on the Kerr McGee site result from their former operations.

TtNUS appreciates the opportunity to provide you with these services. If you have any questions regarding the enclosed material, if I can be of any assistance, or if any of these proposed activities are unclear, please contact me at (904)-636-6125.

Sincerely,

Gregory S. Roof  
Task Order Manager

GR/sr

Attachments (6)

pc: Mr. Frank Sigona, NAS Jacksonville  
Mr. Mark Perry/File, TtNUS (unbound copy)  
Ms. Debbie Humbert, TtNUS (Cover letter only)  
Project File – CTO 252

## TABLES

**Table 1**  
**Summary of Previous Investigations**  
**Page 1 of 2**

Date	Document / Activity	Comments
April 1989	RAP, Texaco Station Number 24-110-079.	RAP documented groundwater contamination migrating onto western portion of PCA 16.
May 1989	Kerr McGee discovers product/water mixture in northwestern corner of UST vault during UST removal.	Navy and Florida Department of Environmental Regulation (FDER) notified. Contamination Assessment Report (CAR) initiated.
December 1989	CAR completed for PCA 16.	CAR verified JP-5 pipeline release. JP-5 fuel composition was characterized via fixed-base lab. Fuel contains no MTBE. Also noted Kerr McGee site and Texaco station as contributing sources of hydrocarbon contamination.
April 1990	JP-5 pipeline repaired in vicinity of suspected release.	Self Explanatory.
August 1991	RAP for PCA 16 submitted to FDER.	Proposed RAP activities included excavation, pump and treat, and air sparging. No record of RAP being field implemented.
October 1994	Tank Closure Report submitted to FDEP.	Three 10,000-gallon USTs and 55 cubic yards of "excessively contaminated soil" [(oil vapor measured >500 parts per million) were removed from Kerr McGee site. Dissolved benzene and combined BTEX constituents detected in four compliance wells above FDEP cleanup target levels reported prior to UST removal.
August 1996	Environmental Assessment of Kerr McGee site (not an official site assessment per FDEP petroleum rules).	Soil OVA data indicated "excessively contaminated soil" existed along 103 <sup>rd</sup> street northwest of the Kerr McGee former USTs. MTBE and benzene detected in groundwater at Kerr McGee site. Free Product detected in groundwater at PCA 16.
July 1997	PCA 16 RAP Addendum Report	Defined contaminated soil area via OVA soil results in northern portion of PCA 16 and along 103 <sup>rd</sup> Street. Groundwater monitoring begins.
October 1997	Completion Report for RAP at PCA 16.	4,032 cubic yards of petroleum contaminated soil removed. Installed four additional monitoring wells.
December 1997	PCA 16 Groundwater Monitoring Event.	Low concentrations of dissolved BTEX constituents (<50 µg/L combined) and low concentrations of MTBE (<15 µg/L) encountered at PCA 16. MTBE concentrations (34 µg/L) encountered at Kerr McGee site.
July 1998	PCA 16 Groundwater Monitoring Event.	Low concentrations of dissolved BTEX constituents (<50 µg/L combined) and MTBE (<10 µg/L) encountered at PCA 16. MTBE concentrations (136 µg/L) encountered at Kerr McGee site.
September 1998	PCA 16 Groundwater Monitoring Event.	Low concentrations of dissolved BTEX constituents (<35 µg/L combined) and no concentrations of MTBE encountered at PCA 16. MTBE concentrations not detected on Kerr McGee site.
April 1999 – August 2001	Eight Groundwater Monitoring Events for PCA 16.	Benzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene detected in excess of FDEP GCTLs.
May 1999	DPT Assessment of pipeline from NAS Cecil to NAS Jacksonville.	One anomaly identified during a 1996 internal pipeline assessment (conducted by the Navy) was identified in the vicinity of PCA 16. Soil and groundwater assessment from this anomaly did not indicate hydrocarbon contamination.
October 2001	Project Status and Water Well Survey Report for PCA 16.	Determined one water well was formally abandoned at PCA 16 in December 1996.

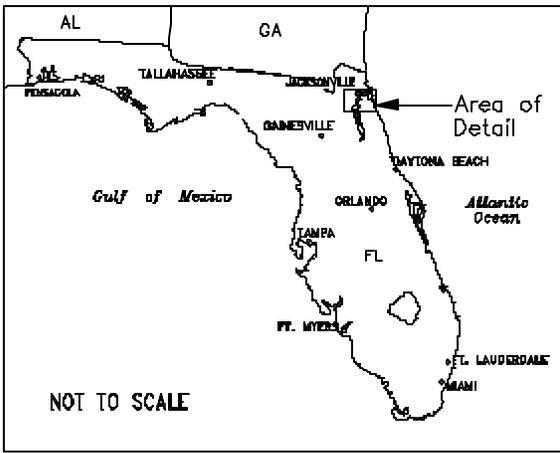
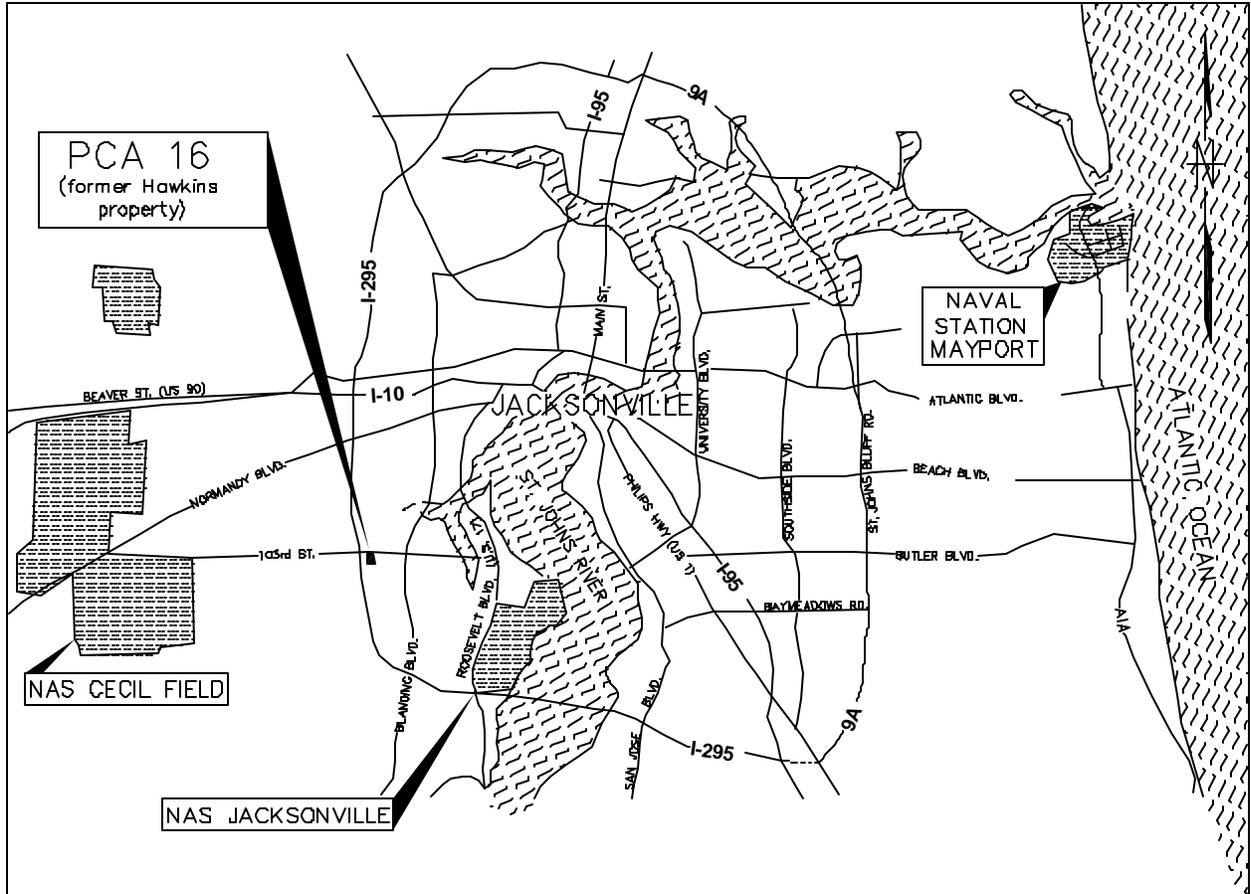
**Table 1**  
**Summary of Previous Investigations**  
**Page 2 of 2**

Date	Document / Activity	Comments
April 2002	Site Assessment Report of Jet Fuel Pipeline.	Similar to 1999 DPT assessment. One anomaly was encountered in the area of PCA 16. Soil and groundwater assessment from this anomaly did not indicate hydrocarbon contamination.
January 2003	PCA 16 Treatability Study – Oxygen Reduction Compound (ORC <sup>®</sup> ) injection event.	During injection point installation, an impermeable hardpan layer was encountered. Petroleum vapors were noted above the hardpan. After consultation with the Navy, TtNUS ceased the injection event and drafted a second scope of work.
January 2003	Scope of Work for Reassessment of Site Conditions at PCA 16.	Developed scope of work to reassess soil and groundwater at PCA 16.
July 2004	PCA 16 Source Removal Construction Oversight Report.	As a result of additional soil and groundwater assessment, approximately 675 tons of petroleum impacted soil was removed from PCA 16. Post source removal groundwater sampling indicated a slight overall reduction of hydrocarbon contamination.
February 2005	Completed ORC <sup>®</sup> Injection Event.	ORC <sup>®</sup> was injected to the subsurface through approximately 25 injection points.
April 2005	Completed First Quarter Post Injection Groundwater Sampling.	Analytical results pending.

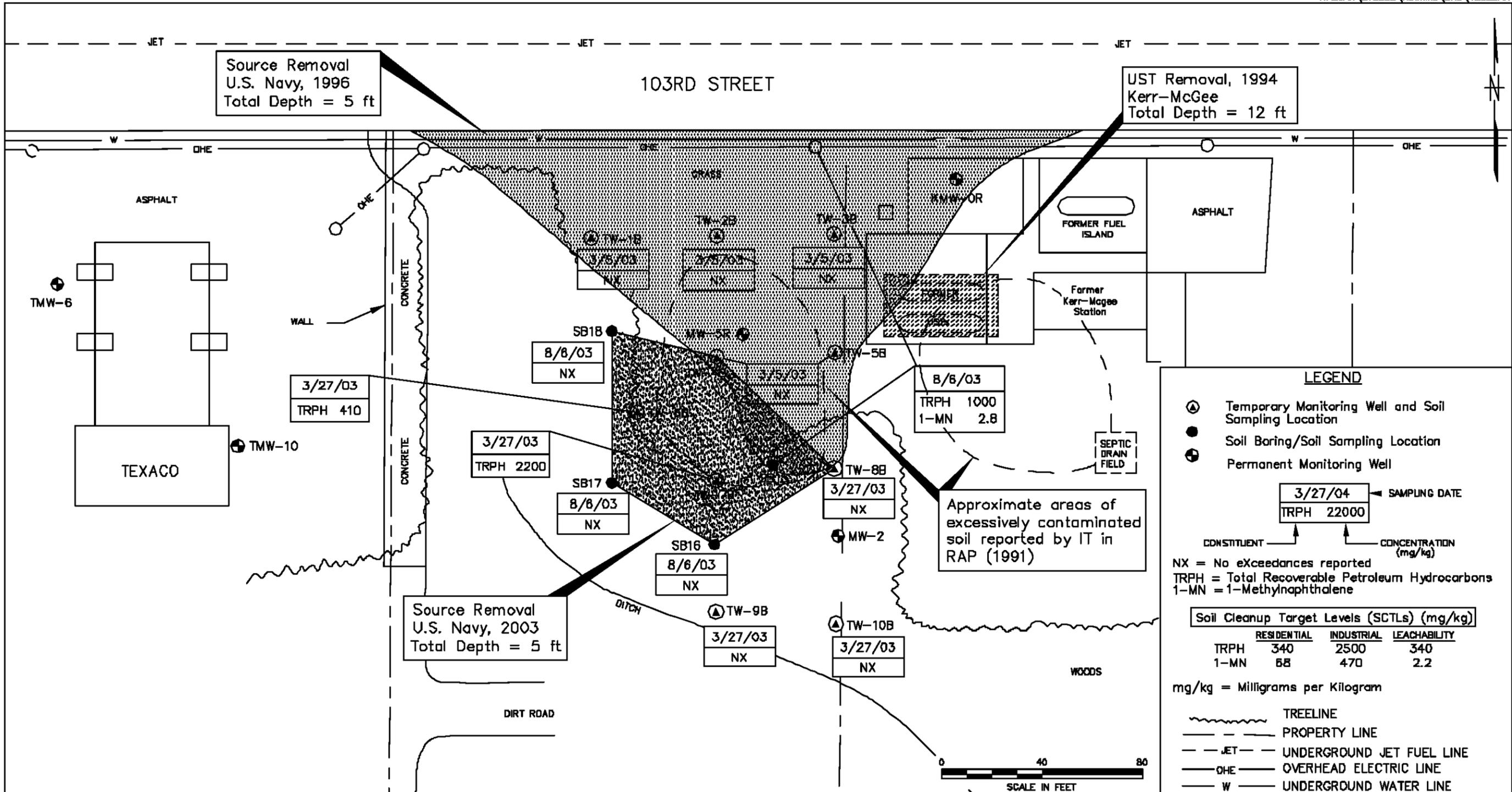
**Table 2**  
**Summary of Lithologic Sequence**

<b>Approximate Depth Interval (ft bgs)</b>	<b>Lithology</b>
0.0 to 5.5	Black, fine grain sand. Well rounded, well sorted, moderate consolidation. Slight to moderate saturation observed. Light brown, fine grain sands well rounded, moderately sorted, moderate to poor consolidation. Slight to moderate saturation observed.
5.5 to 12.0	Hardpan – orange fine grain sandy clay layer. Highly indurated, evidence of intergranular cementation observed, no saturation.
12.0 to 18.0	Green/Gray silty sand. Well rounded, well sorted, good consolidation. Moderate saturation observed.

## FIGURES



DRAWN BY LLK	DATE 8/19/04	SITE LOCATION MAP PCA 16 NAS JACKSONVILLE JACKSONVILLE, FLORIDA	CONTRACT NO. 4258	
CHECKED BY	DATE		APPROVED BY	DATE
COST/SCHED-AREA			APPROVED BY	DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1	REV. 0



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE	CONTRACT NO.
							LLK	8/20/04	425B
							CHECKED BY	DATE	APPROVED BY
							COST/SCHED-AREA		DATE
							SCALE		DRAWING NO.
							AS NOTED		FIGURE 2
									REV.
									0

SOIL ANALYTICAL RESULTS EXCEEDING SCTLs  
 HAWKINS 103rd STREET  
 NAS JACKSONVILLE  
 JACKSONVILLE, FLORIDA

**ATTACHMENT A**  
**HISTORICAL FIGURES**

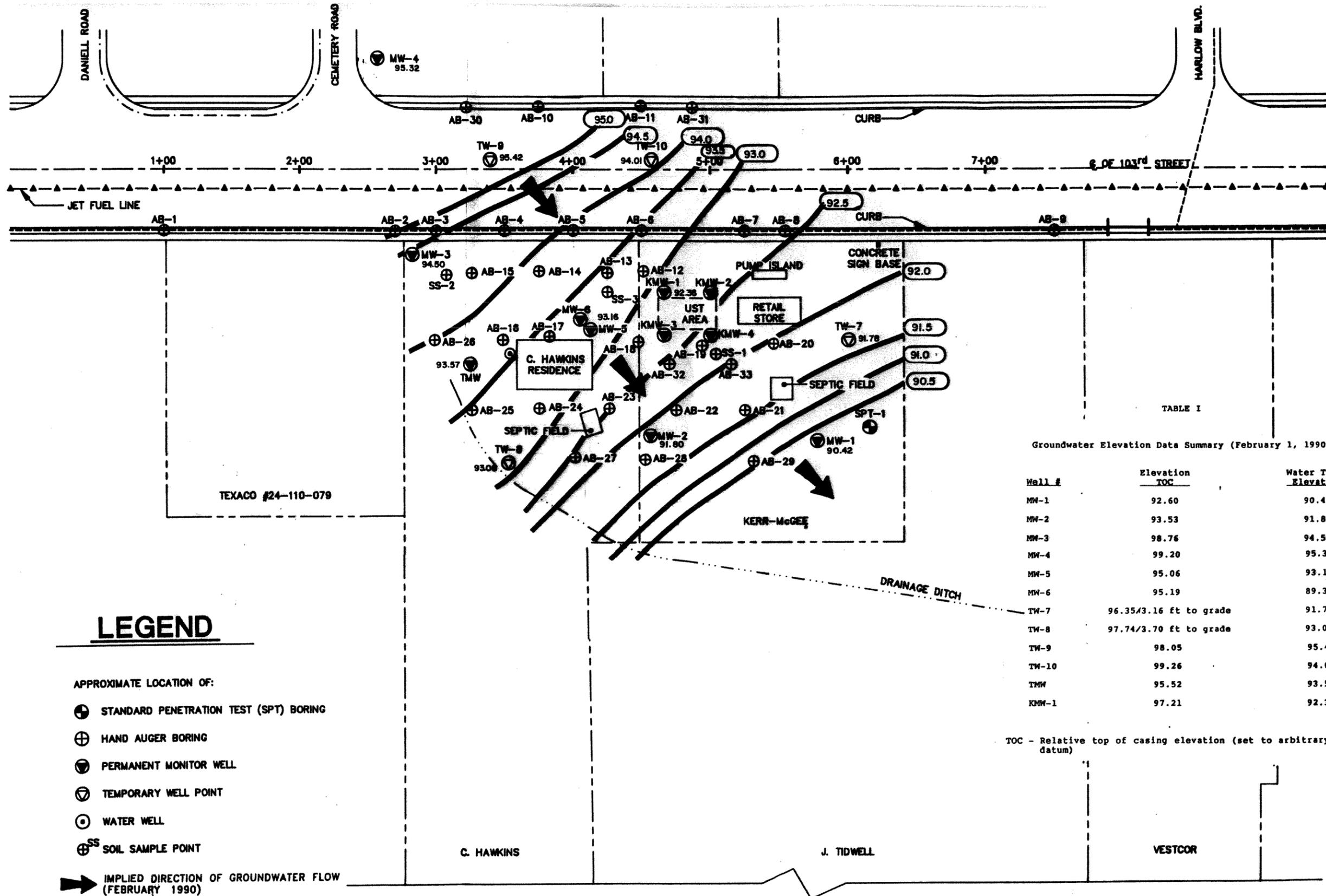


TABLE I  
Groundwater Elevation Data Summary (February 1, 1990)

Well #	Elevation TOC	Water Table Elevation
MW-1	92.60	90.42
MW-2	93.53	91.80
MW-3	98.76	94.50
MW-4	99.20	95.35
MW-5	95.06	93.16
MW-6	95.19	89.35
TW-7	96.35/3.16 ft to grade	91.78
TW-8	97.74/3.70 ft to grade	93.08
TW-9	98.05	95.42
TW-10	99.26	94.01
TMW	95.52	93.57
KMW-1	97.21	92.36

TOC - Relative top of casing elevation (set to arbitrary 100 datum)

### LEGEND

- APPROXIMATE LOCATION OF:
- ⊕ STANDARD PENETRATION TEST (SPT) BORING
  - ⊕ HAND AUGER BORING
  - ⊙ PERMANENT MONITOR WELL
  - ⊙ TEMPORARY WELL POINT
  - ⊙ WATER WELL
  - ⊕<sup>SS</sup> SOIL SAMPLE POINT
  - ➔ IMPLIED DIRECTION OF GROUNDWATER FLOW (FEBRUARY 1990)

90.5 RELATIVE GROUNDWATER ELEVATION ISOPLETH CONTOUR (CONTOUR INTERVAL 0.5')

NOTE: PROPERTY BOUNDARY LINES ARE APPROXIMATE

### WATER TABLE HYDRAULIC GRADIENT MAP



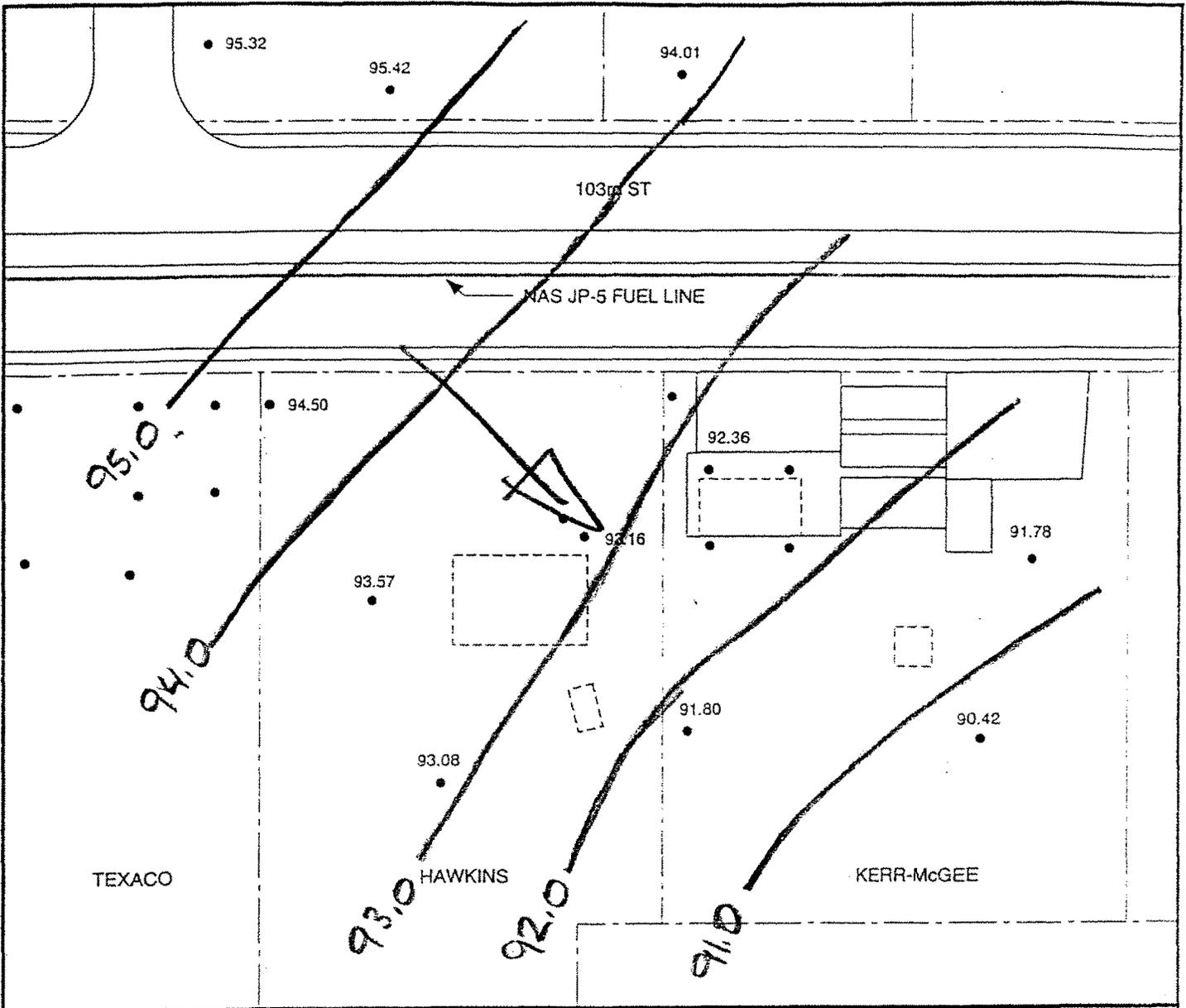
FIELD:	DATE	BY	REVISION
JL/CC			
DRAWN: JAS/BB			
CHECKED: JL			
APPVED: WP			
HORIZ. SCALE 1" = 50'			
VERT. SCALE 1" = 50'			



PETROLEUM CONTAMINATION ASSESSMENT  
**103rd STREET JET FUEL LINE**  
 NAS-CECL FIELD, JACKSONVILLE, FLORIDA

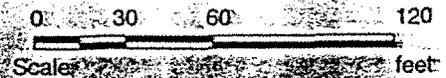
**JAMMAL & ASSOCIATES, INC.** Consulting Engineers

DATE: 2/19/90 PROJ. NO: 766-96008 SHEET 5 of 8

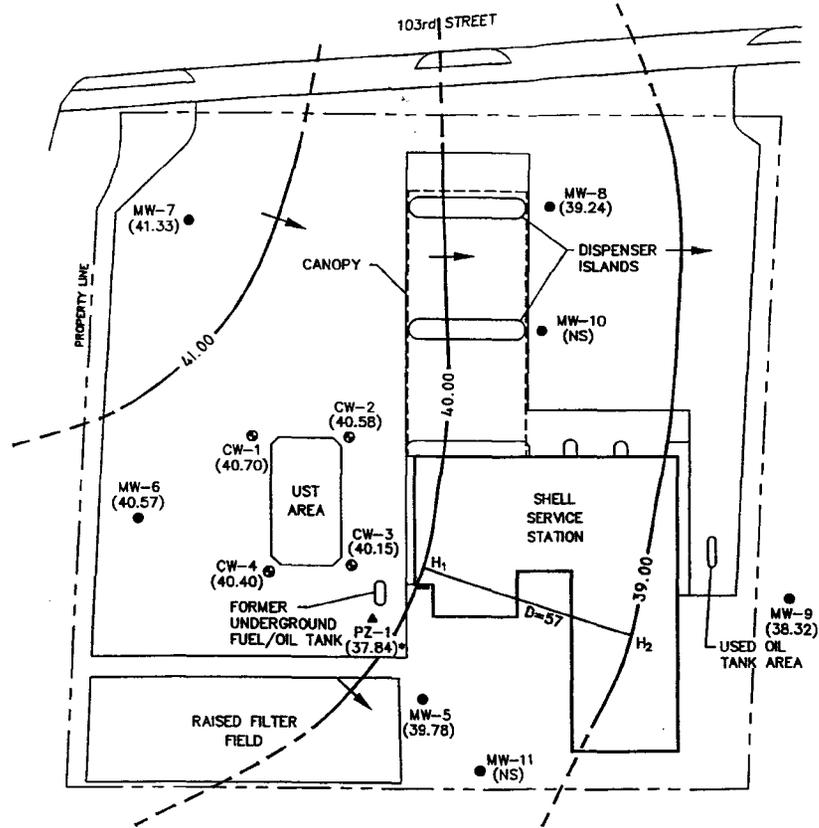


Explanation

93.08 • Water level measured in February 1990  
(referenced to an arbitrary datum in feet)



DRAWN BY: SDF  
 CHECKED BY: SDF  
 DATE: 3-9-00  
 DRAWING NUMBER: 779469-B7



- LEGEND:**
- MONITORING WELL LOCATION
  - ⊙ COMPLIANCE WELL LOCATION
  - ▲ DEEP WELL LOCATION
  - (38.32) GROUNDWATER ELEVATION (FEET)
  - 41.00 — GROUNDWATER ELEVATION CONTOUR
  - GROUNDWATER FLOW DIRECTION
  - \* DATA NOT UTILIZED
  - NS NOT SURVEYED

$$\text{HYDRAULIC GRADIENT} = \frac{H_1 - H_2}{D} = 0.016 \text{ FT/FT}$$

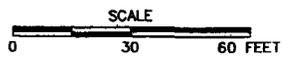
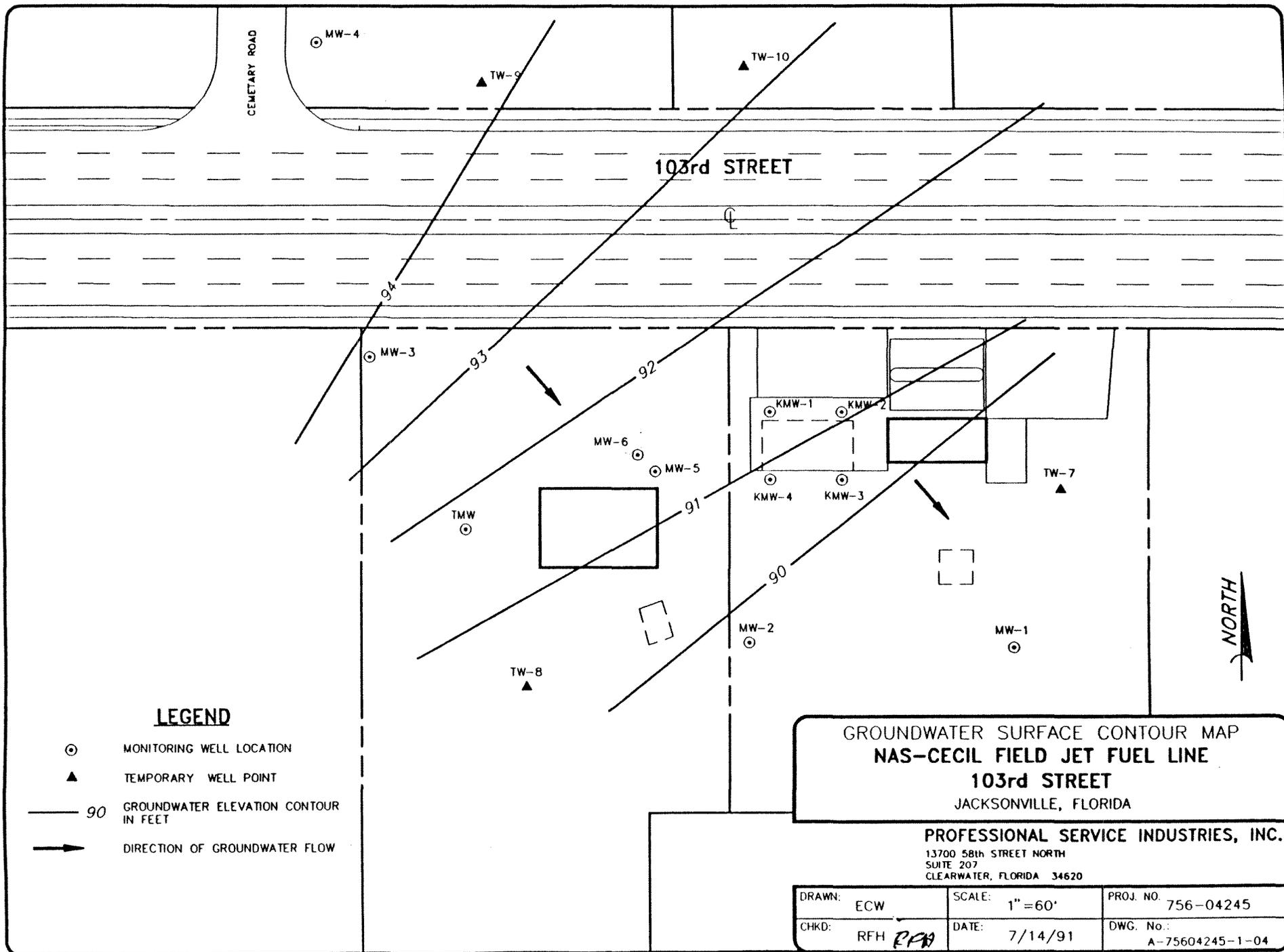
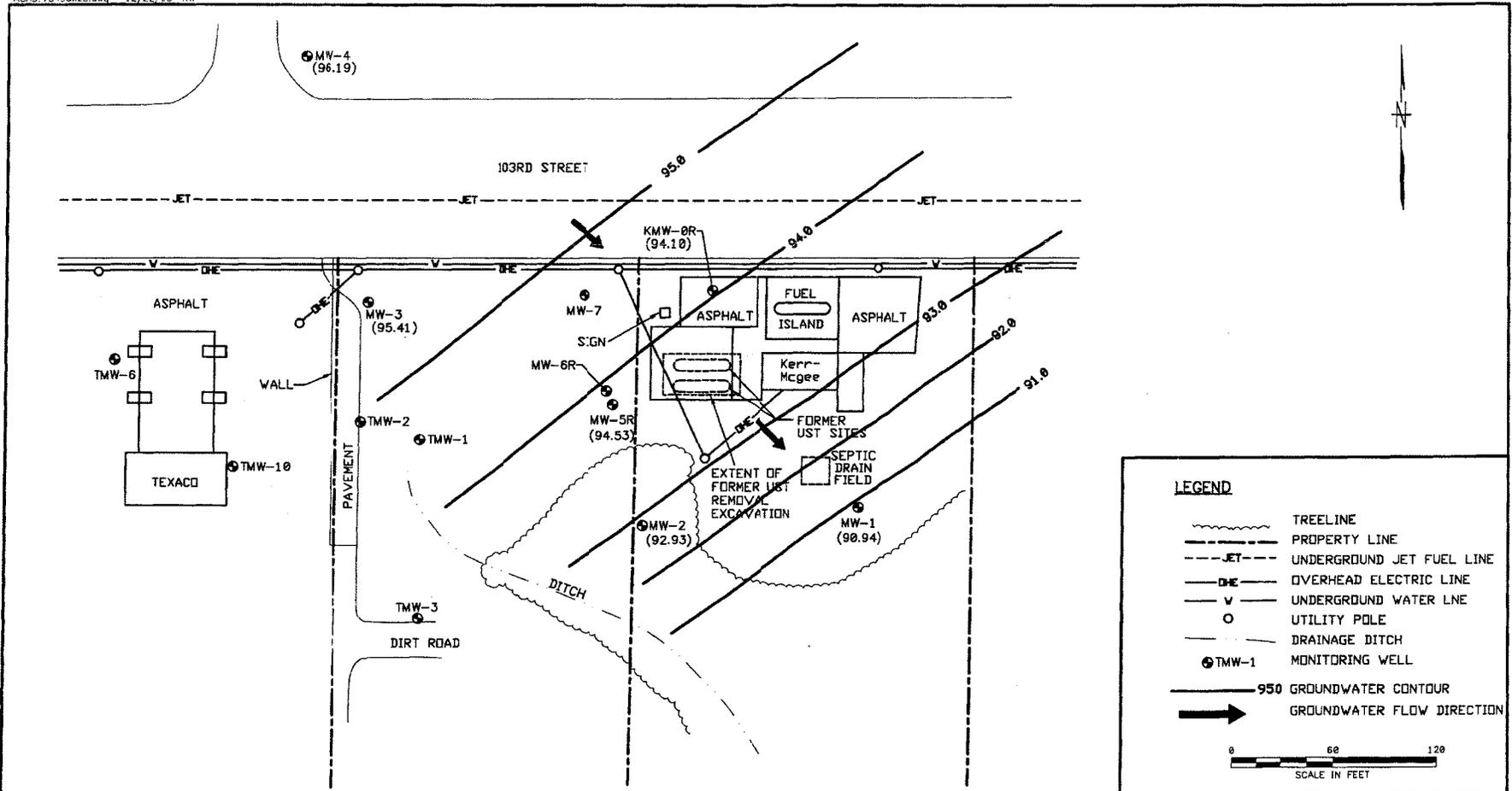


FIGURE 4  
 GROUNDWATER ELEVATION  
 CONTOUR MAP  
 FEBRUARY 24, 2000  
 SHELL RETAIL FACILITY  
 7000 103RD STREET  
 JACKSONVILLE, FLORIDA

PREPARED FOR  
 EQUIVA SERVICES LLC  
 ALTAMONTE SPRINGS, FLORIDA

**IT CORPORATION**  
 TAMPA, FL





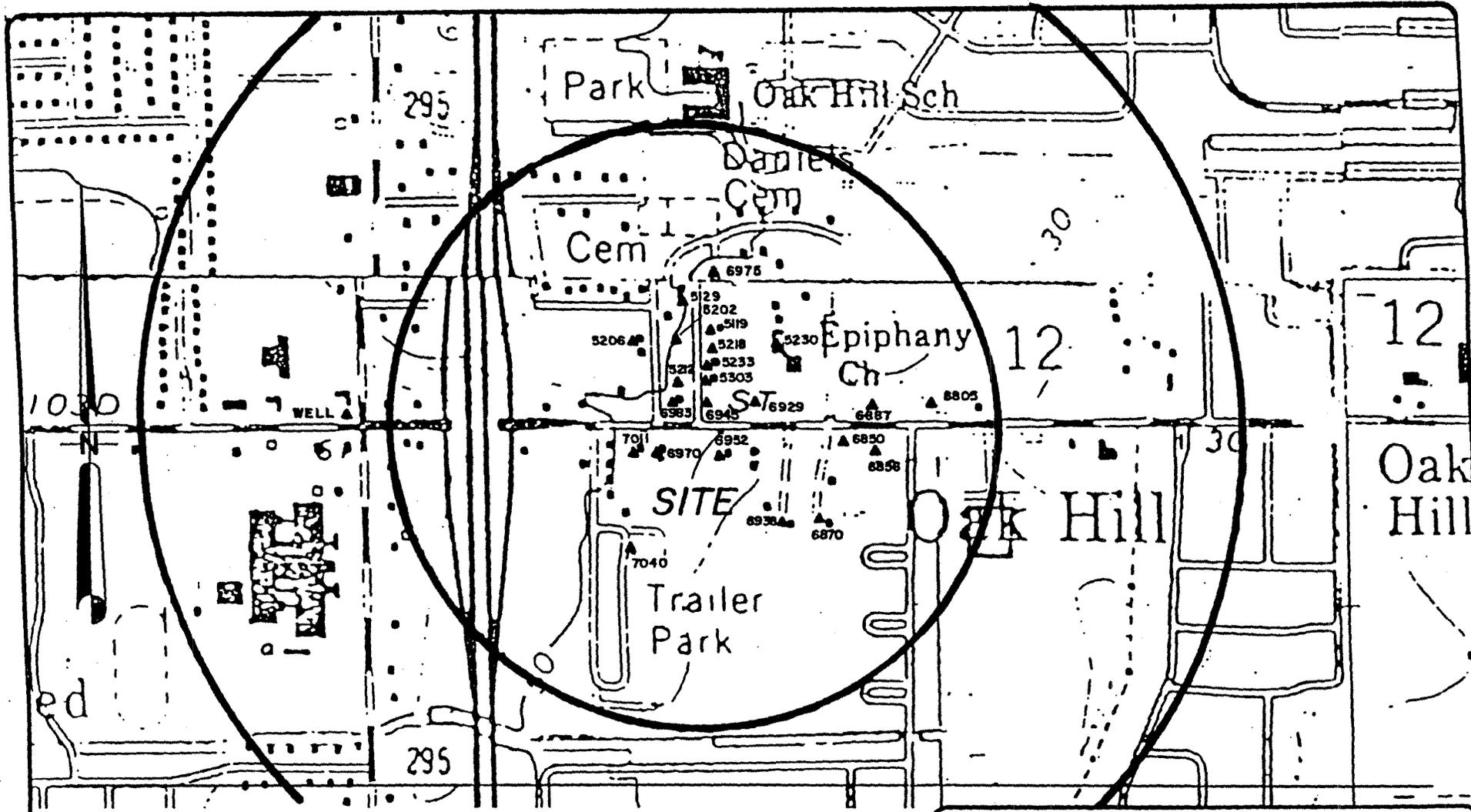
NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY DATE  
MF 12/14/98  
CHECKED BY DATE  
COST/SCHED-AREA  
SCALE AS NOTED



GROUNDWATER CONTOUR MAP  
HAWKINS 103rd STREET  
SEPTEMBER 25, 1998 RESULTS  
NAS JACKSONVILLE  
JACKSONVILLE, FLORIDA

CONTRACT NO. 7849	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3	REV. 0



REFERENCE: U.S.G.S. "JACKSONVILLE HEIGHTS, FLORIDA" QUADRANGLE MAP  
 SECTION: 12, 13  
 TOWNSHIP: 3 SOUTH  
 RANGE: 25 EAST  
 ISSUED: 1964  
 PHOTOREVISED: 1970  
 SCALE: 1" = 600'

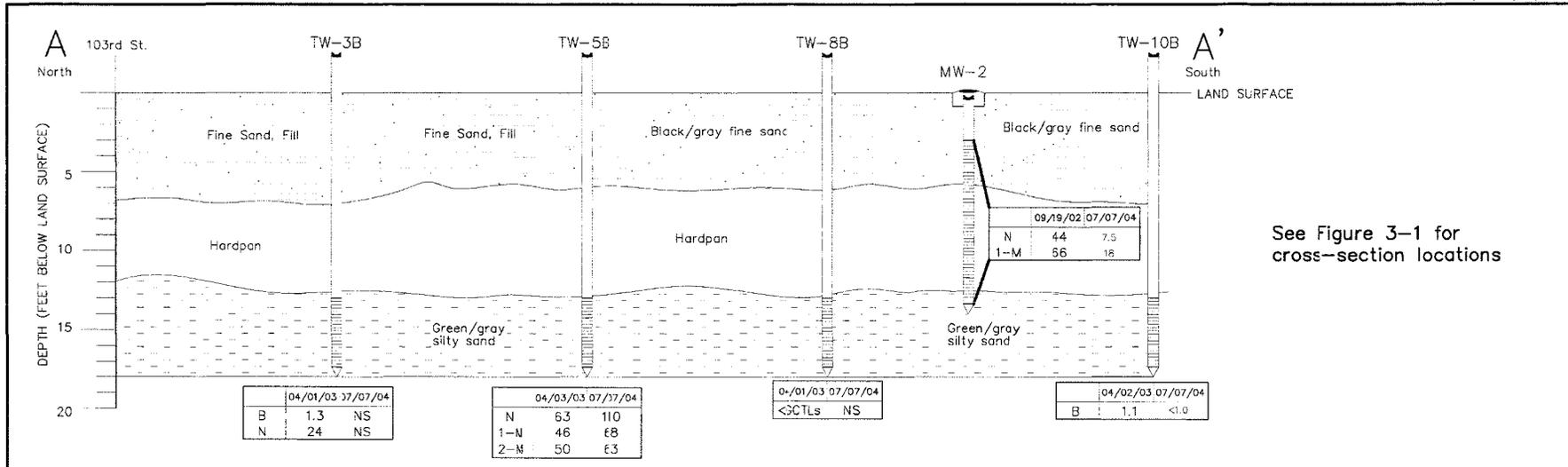
POTABLE WELL INVENTORY  
 PETROLEUM CONTAMINATION ASSESSMENT  
 103rd ST. JET FUEL LINE  
 NAS-CECIL FIELD, JACKSONVILLE, FLORIDA

VICINITY MAP

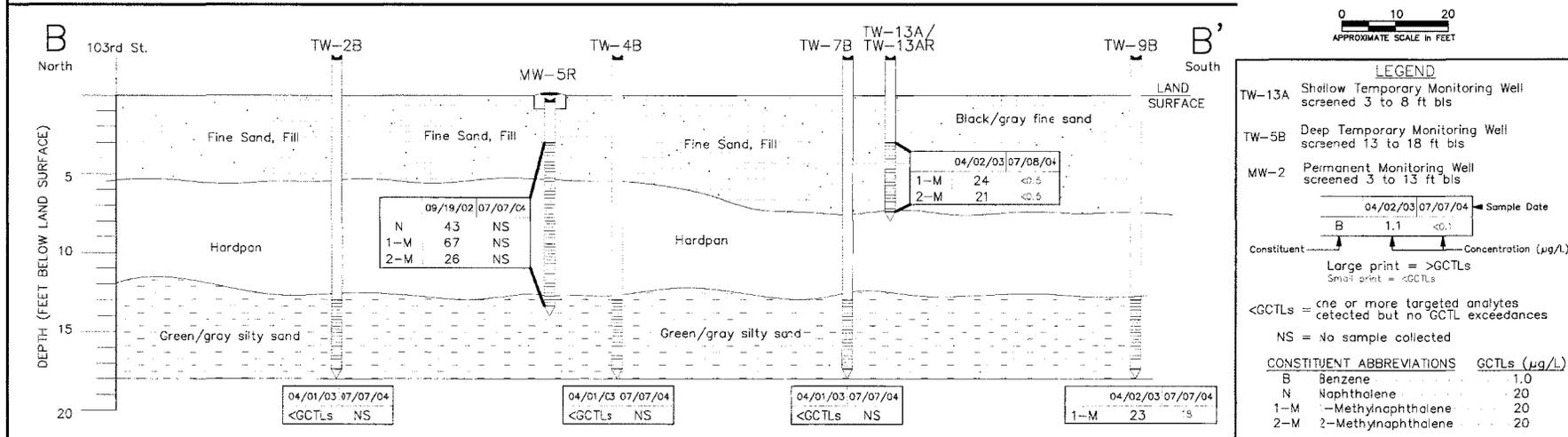
▲ APPROXIMATE LOCATION OF POTABLE WELLS


**JAMMAL & ASSOCIATES, INC.** Consulting Engineers

DRAWN	JRG	PROJECT NO	766-96008
CHKD	AC		



See Figure 3-1 for cross-section locations



**LEGEND**

TW-13A Shallow Temporary Monitoring Well screened 3 to 8 ft bls

TW-5B Deep Temporary Monitoring Well screened 13 to 18 ft bls

MW-2 Permanent Monitoring Well screened 3 to 13 ft bls

04/02/03 07/07/04 Sample Date

Constituent B 1.1 <0.5 Concentration (µg/L)

Large print = >GCTLs  
Small print = <GCTLs

<GCTLs = one or more targeted analytes detected but no GCTL exceedances

NS = No sample collected

**CONSTITUENT ABBREVIATIONS GCTLs (µg/L)**

B	Benzene	1.0
N	Naphthalene	20
1-M	1-Methylnaphthalene	20
2-M	2-Methylnaphthalene	20

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE
							LLK	9/02/04
							CHECKED BY	DATE
							COST/SCHED-AREA	
							SCALE	
							AS NOTED	

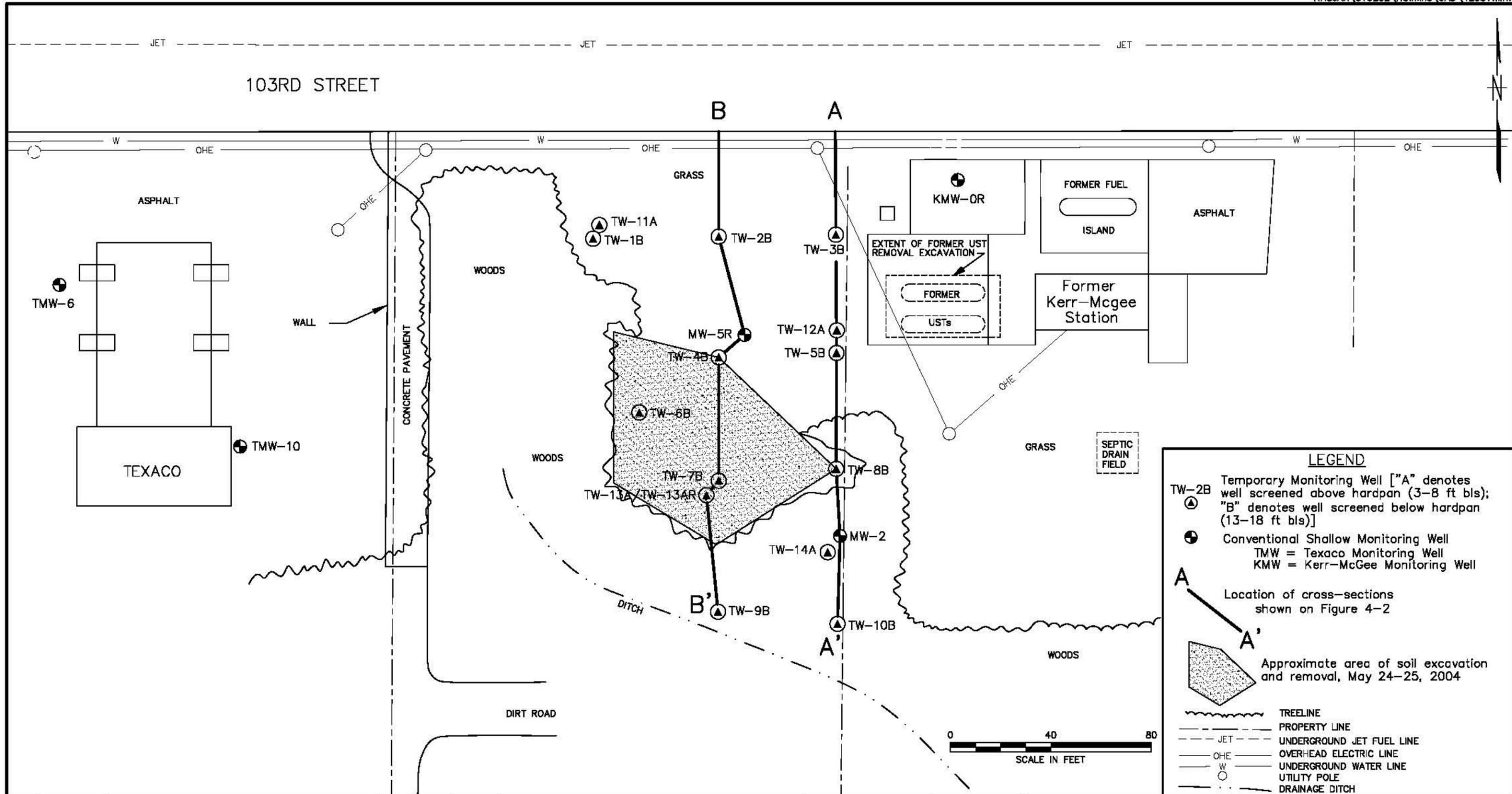
CONTAMINANT DISTRIBUTION PROFILES  
PCA 16  
NAS JACKSONVILLE  
JACKSONVILLE, FLORIDA

CONTRACT NO. 4258

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

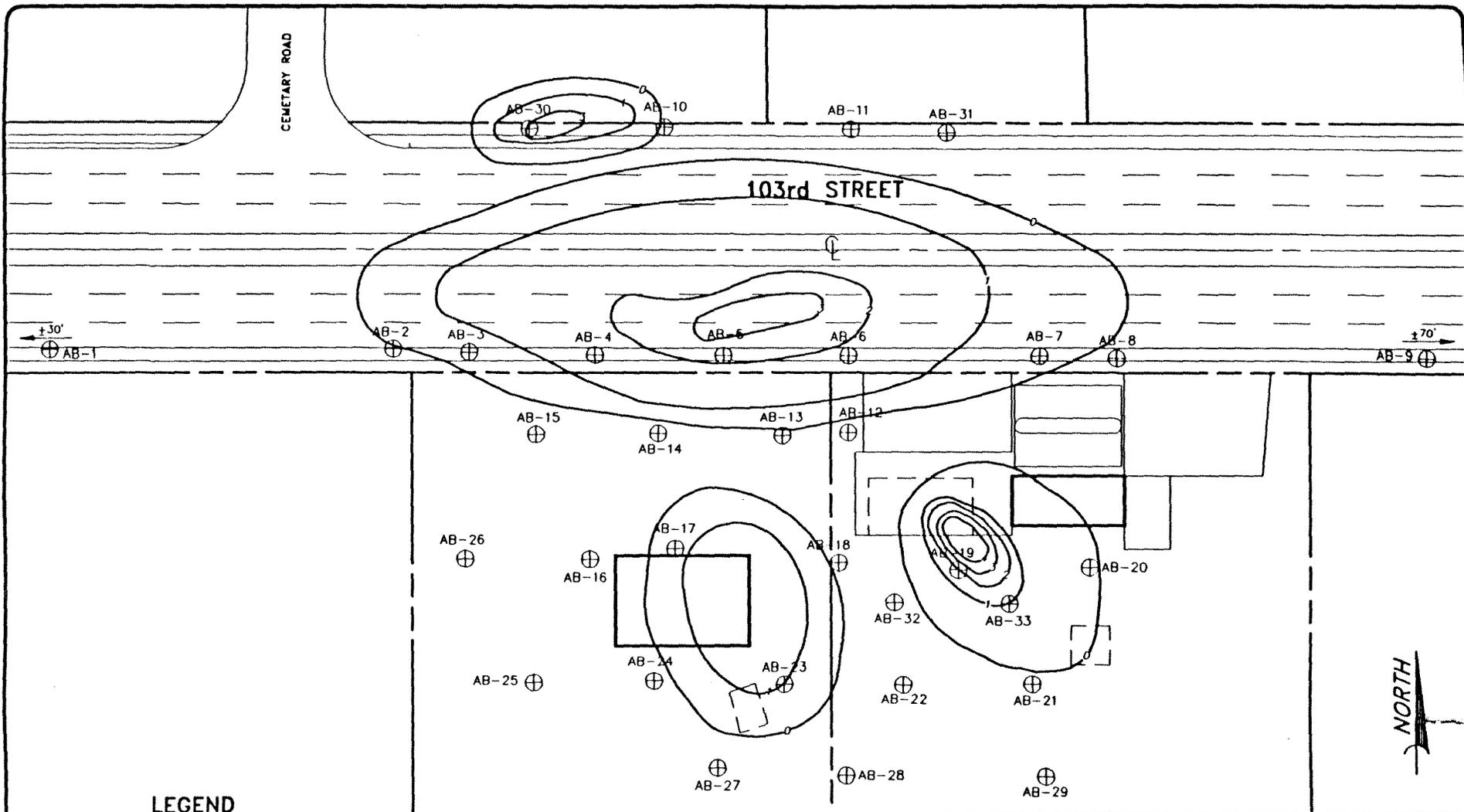
DRAWING NO. FIGURE 4-2 REV. 0



**LEGEND**

- ▲ TW-2B Temporary Monitoring Well ["A" denotes well screened above hardpan (3-8 ft bls); "B" denotes well screened below hardpan (13-18 ft bls)]
- Conventional Shallow Monitoring Well
- ⊙ TMW = Texaco Monitoring Well
- ⊙ KMW = Kerr-McGee Monitoring Well
- A-A' Location of cross-sections shown on Figure 4-2
- Approximate area of soil excavation and removal, May 24-25, 2004
- TREELINE
- PROPERTY LINE
- - - JET UNDERGROUND JET FUEL LINE
- OHE OVERHEAD ELECTRIC LINE
- UNDERGROUND WATER LINE
- UTILITY POLE
- - - DRAINAGE DITCH

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		TEMPORARY AND PERMANENT MONITORING WELL LOCATIONS PCA 16 NAS JACKSONVILLE JACKSONVILLE, FLORIDA	CONTRACT NO. 4258			
							LLK	8/20/04			APPROVED BY	DATE		
											APPROVED BY	DATE		
											DRAWING NO.	REV.	FIGURE 3-1	0



**LEGEND**

- ⊕ AUGER BORING LOCATION
- 5 CONTOUR OF EXCESSIVELY CONTAMINATED SOILS IN FEET BELOW LAND SURFACE

AREAL EXTENT OF EXCESSIVELY CONTAMINATED SOILS  
**NAS-CECIL FIELD JET FUEL LINE**  
**103rd STREET**  
 JACKSONVILLE, FLORIDA

**PROFESSIONAL SERVICE INDUSTRIES, INC.**  
 13700 58th STREET NORTH  
 SUITE 207  
 CLEARWATER, FLORIDA 34620

DRAWN: ECW	SCALE: 1" = 60'	PROJ. NO. 756-04245
CHKD: RFH <i>RFH</i>	DATE: 7/14/91	DWG. No.: A-75604245-III-01

**ATTACHMENT B**  
**HISTORICAL TABLES**

**TABLE 2-1**  
**HISTORICAL SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE**  
**PCA 16/HAWKINS 103RD STREET SITE**  
**NAVAL AIR STATION JACKSONVILLE**  
**JACKSONVILLE, FLORIDA**  
**PAGE 1 OF 4**

Compound	FDEP GCTLs <sup>1</sup>	MW-2							
		4/19/1999	6/30/1999	10/19/1999	1/27/2000	5/24/2000	8/24/2000	10/26/2000	1/16/2001
<b><u>Volatile Organic Compounds (USEPA Method 8021B)(µg/L)</u></b>									
Benzene	1	0.77	ND	ND	ND	ND	0.72 J	0.61J	ND
Toluene	40	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	30	8.9	8.2	4.7	15.1	10.5	15.2	8.7	9.9
Total Xylenes	20	5.4	4.2	ND	8.4	6.3	8.7	2.5J	5.8
<b><u>Polynuclear Aromatic Hydrocarbons (USEPA Method 8310)(µg/L)</u></b>									
Acenaphthene	20	ND	ND	3.5	6.7	11.7	ND	ND	ND
Chrysene	4.8	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	280	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	280	ND	0.24	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	20	<b>31.8</b>	<b>61</b>	<b>45.4</b>	<b>48.8</b>	<b>82.0</b>	<b>104.0</b>	<b>56.2</b>	<b>111</b>
2-Methylnaphthalene	20	<b>29.8</b>	13	ND	13.2	<b>21.1</b>	<b>25.2</b>	18.9	<b>26.9</b>
Naphthalene	20	<b>61.8</b>	<b>54</b>	<b>30.5</b>	<b>41.7</b>	<b>63.6</b>	<b>84.3</b>	<b>140</b>	<b>81.6</b>
Phenanthrene	210	5.40	ND	5.6	3.7	ND	ND	ND	ND
Pyrene	210	ND	ND	ND	ND	ND	ND	ND	ND

See notes at end of table

**TABLE 2-1**  
**HISTORICAL SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE**  
**PCA 16/HAWKINS 103RD STREET SITE**  
**NAVAL AIR STATION JACKSONVILLE**  
**JACKSONVILLE, FLORIDA**  
**PAGE 2 OF 4**

Compound	FDEP GCTLs <sup>1</sup>	MW-2			MW-5R					
		8/2/2001	1/17/2002	9/19/2002	4/20/1999	6/30/1999	10/18/1999	1/27/2000	5/24/2000	8/24/2000
<b><u>Volatile Organic Compounds (USEPA Method 8021B)(µg/L)</u></b>										
Benzene	1	ND	NA	NA	1.0	ND	ND	ND	ND	ND
Toluene	40	ND	NA	NA	ND	ND	ND	ND	ND	ND
Ethylbenzene	30	4.3	NA	NA	17.5	19.3	12.8	20	16.9	13.8
Total Xylenes	20	1.4J	NA	NA	8.0	14.0	6.7	11.7	10.3	6.8
<b><u>Polynuclear Aromatic Hydrocarbons (USEPA Method 8310)(µg/L)</u></b>										
Acenaphthene	20	ND	ND	ND	ND	ND	ND	7.5	14.9	ND
Chrysene	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	280	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	280	ND	ND	ND	ND	0.31	ND	1.3	ND	ND
1-Methylnaphthalene	20	<b>54.8</b>	<b>60.3</b>	<b>66</b>	<b>26.1</b>	<b>49</b>	<b>41.1</b>	<b>44.4</b>	<b>99.0</b>	<b>123.0</b>
2-Methylnaphthalene	20	12	9.6	5.7	<b>57.7</b>	<b>55</b>	<b>34.1</b>	<b>34.7</b>	<b>77.6</b>	<b>61.6</b>
Naphthalene	20	<b>39.4</b>	<b>38.8</b>	<b>44</b>	<b>32.6</b>	<b>72</b>	<b>44.2</b>	<b>48.8</b>	<b>102.0</b>	<b>121.0</b>
Phenanthrene	210	ND	ND	ND	17.8	0.55	9.9	2.8	ND	ND
Pyrene	210	ND	ND	ND	ND	ND	ND	ND	ND	ND

See notes at end of table

**TABLE 2-1**  
**HISTORICAL SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE**  
**PCA 16/HAWKINS 103RD STREET SITE**  
**NAVAL AIR STATION JACKSONVILLE**  
**JACKSONVILLE, FLORIDA**  
**PAGE 3 OF 4**

Compound	FDEP GCTLs <sup>1</sup>	MW-5R					KMW-0R			
		10/26/2000	1/16/2001	8/2/2001	1/17/2002	9/19/2002	4/20/1999	6/30/1999	10/18/1999	1/27/2000
<b><u>Volatile Organic Compounds (USEPA Method 8021B)(µg/L)</u></b>										
Benzene	1	ND	ND	ND	NA	NA	4.4	8.8	8.3	9.6
Toluene	40	ND	ND	ND	NA	NA	ND	3.6 J	ND	ND
Ethylbenzene	30	11.5	9.2	10.2	NA	NA	13.3	23.1	18.1	18.2
Total Xylenes	20	6	5.5	5.6	NA	NA	5.2	13.7 J	3.7	4.4
<b><u>Polynuclear Aromatic Hydrocarbons (USEPA Method 8310)(µg/L)</u></b>										
Acenaphthene	20	ND	ND	ND	ND	ND	7.9	ND	ND	7.5
Chrysene	4.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	280	ND	ND	ND	ND	ND	ND	0.27	ND	ND
Fluorene	280	ND	ND	ND	ND	ND	ND	0.43	ND	ND
1-Methylnaphthalene	20	102	102	112	86.9	67	17.9	37.0	28.2	24.6
2-Methylnaphthalene	20	51.5	42.4	57.7	25.8	26	18.8	44.0	41.0	25.5
Naphthalene	20	107	93.3	95.5	67	43	64.9	120.0	82.5	62.4
Phenanthrene	210	ND	ND	ND	ND	ND	ND	0.63	6.9	2
Pyrene	210	ND	ND	ND	ND	ND	ND	ND	ND	ND

See notes at end of table

**TABLE 2-1**  
**HISTORICAL SUMMARY OF GROUNDWATER SAMPLE ANALYTICAL RESULTS**  
**POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE**  
**PCA 16/HAWKINS 103RD STREET SITE**  
**NAVAL AIR STATION JACKSONVILLE**  
**JACKSONVILLE, FLORIDA**  
**PAGE 4 OF 4**

Compound	FDEP GCTLs <sup>1</sup>	KMW-0R						
		5/24/2000	8/24/2000	10/26/2000	1/16/2001	1/16/2001	1/17/2002	9/19/2002
<b>Volatile Organic Compounds (USEPA Method 8021B)(µg/L)</b>								
Benzene	1	<b>7.8</b>	<b>9.2</b>	<b>5.6</b>	<b>7.1</b>	<b>9.2</b>	<b>3.8</b>	<b>1.3</b>
Toluene	40	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	30	15.0	13.0	8.7	14.1	20.3	ND	17
Total Xylenes	20	3.4	3.9	2.5J	2.6J	2.9J	1.1 J	ND
<b>Polynuclear Aromatic Hydrocarbons (USEPA Method 8310)(µg/L)</b>								
Acenaphthene	20	15.4	ND	ND	ND	ND	ND	ND
Chrysene	4.8	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	280	ND	ND	ND	ND	ND	ND	ND
Fluorene	280	ND	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	20	<b>54.0</b>	<b>57.4</b>	<b>51.8</b>	<b>59.1</b>	<b>68.2</b>	<b>39.5</b>	<b>30</b>
2-Methylnaphthalene	20	<b>39.6</b>	<b>47.7</b>	<b>38.5</b>	<b>40.6</b>	<b>53.1</b>	17	11
Naphthalene	20	<b>120.0</b>	<b>130.0</b>	<b>140</b>	<b>160</b>	<b>158</b>	<b>77.4</b>	<b>61</b>
Phenanthrene	210	ND	ND	ND	ND	ND	ND	ND
Pyrene	210	ND	ND	ND	ND	ND	ND	ND

**Note:**

<sup>1</sup> Groundwater Cleanup Target Levels, Chapter 62-770, Florida Administrative Code (September 23, 1997).

**Bold** values depict constituents exceeding FDEP GCTLs.

USEPA = United States Environmental Protection Agency

FDEP = Florida Department of Environmental Protection

µg/L = micrograms per liter

J = estimated

NA = not analyzed

ND = not detected above method detection limits

TABLE 4-1

## GROUNDWATER ANALYTICAL RESULTS BEFORE AND AFTER SOURCE REMOVAL

PCA 16/HAWKINS 103RD STREET SITE  
 POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE  
 NAVAL AIR STATION JACKSONVILLE  
 JACKSONVILLE, FLORIDA

PAGE 1 OF 5

Compound	FDEP Target Level <sup>1</sup>	KMW-OR <sup>2</sup>		MW-5R <sup>3</sup>		MW-2		TW-1 <sup>4</sup>	
Sample ID		JAX-HWK- KMW-OR-14	JAX-PCA16- KMW-OR-01	JAX-HWK- MW-5R-14		JAX-HWK- MW-2-14	JAX-PCA16- MW-2-01	HWK-GW- TW01-01	
Sample Date		9/19/2002	7/7/2004	9/19/2002	7/7/2004	9/19/2002	7/7/2004	4/2/2003	7/7/2004
<b>VOCs (USEPA Method 8260B) (µg/L)</b>									
Benzene	1	1.3	3.8	NS	NL	NS	<1.0	<1	NS
Toluene	40	<1	<1.0	NS	NL	NS	<1.0	<1	NS
Ethylbenzene	30	17	14	NS	NL	NS	<1.0	<1	NS
Total Xylenes	20	<1	<1.0	NS	NL	NS	<1.0	<1	NS
Chloromethane	2.7	<1	<1.0	NS	NL	NS	<1.0	<1	NS
MTBE	50	<2	<1.0	NS	NL	NS	<1.0	<2	NS
<b>USEPA 504.1 (µg/L)</b>									
EDB	0.02	NS	<0.020		NL	NS		<0.02	NS
<b>PAHs (USEPA Method 8310) (µg/L)</b>									
1-Methylnaphthalene	20	30	35	67	NL	66	18	0.37	NS
2-Methylnaphthalene	20	11	27	26	NL	5.7	<0.50	0.26	NS
Acenaphthene	20	<0.50	0.36	<0.5	NL	<0.50	0.25	<0.10	NS
Anthracene	2100	<0.20	<0.10	<0.20	NL	<0.20	<0.10	<0.10	NS
Fluorene	280	<0.10	0.39	<0.1	NL	<0.1	0.31	<0.10	NS
Phenanthrene	210	<1.0	<0.10	<1.0	NL	<1.0	<0.10	<0.10	NS
Acenaphthylene	210	<1.0	<0.10	<1.0	NL	<1.0	<0.10	0.12	NS
Naphthalene	20	61	81	43	NL	44	7.5	0.43	NS
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>									
TRPH	5	NS	2.5	NS	NL	NS	0.76	<0.20	NS

See notes at end of table.

TABLE 4-1

## GROUNDWATER ANALYTICAL RESULTS BEFORE AND AFTER SOURCE REMOVAL

PCA 16/HAWKINS 103RD STREET SITE  
 POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE  
 NAVAL AIR STATION JACKSONVILLE  
 JACKSONVILLE, FLORIDA

PAGE 2 OF 5

Compound	FDEP Target Level <sup>1</sup>	TW-2B <sup>4</sup>		TW-3B <sup>5</sup>		TW-4B <sup>3</sup>		TW-5B	
		HWK-GW-TW02-01		HWK-GW-TW03-01		HWK-GW-TW04-01		HWK-GW-TW05-01	JAX-PCA16-TW5B-01
Sample ID									
Sample Date		4/1/2003	7/7/2004	4/1/2003	7/7/2004	4/1/2003	7/7/2004	4/3/2003	7/7/2004
<b>VOCs (USEPA Method 8260B) (µg/L)</b>									
Benzene	1	<1	NS	1.3	NL	<1	NL	<1	<1.0
Toluene	40	<1	NS	<1	NL	<1	NL	<1	<1.0
Ethylbenzene	30	<1	NS	4.9	NL	<1	NL	22	16
Total Xylenes	20	<1	NS	<1	NL	<1	NL	8.5	6.4
Chloromethane	2.7	<1	NS	<1	NL	<1	NL	<1	<1.0
MTBE	50	<2	NS	<2	NL	<2	NL	<2	<1.0
<b>USEPA 504.1 (µg/L)</b>									
EDB	0.02	<0.02	NS	<0.02	NL	<0.02	NL	<0.02	<0.020
<b>PAHs (USEPA Method 8310) (µg/L)</b>									
1-Methylnaphthalene	20	2.6	NS	15	NL	1.7	NL	46	68
2-Methylnaphthalene	20	0.98	NS	8	NL	0.32	NL	50	63
Acenaphthene	20	<0.10	NS	0.5	NL	<0.10	NL	0.35	0.63
Anthracene	2100	<0.10	NS	0.13	NL	<0.10	NL	<0.10	0.11
Fluorene	280	<0.10	NS	0.13	NL	<0.10	NL	0.24	0.53
Phenanthrene	210	<0.10	NS	<0.10	NL	<0.10	NL	0.13	<0.10
Acenaphthylene	210	<0.10	NS	0.14	NL	<0.10	NL	0.17	<0.10
Naphthalene	20	1.3	NS	24	NL	0.43	NL	63	110
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>									
TRPH	5	<0.20	NS	0.71	NL	<0.20	NL	1.6	1.9

See notes at end of table.

TABLE 4-1

## GROUNDWATER ANALYTICAL RESULTS BEFORE AND AFTER SOURCE REMOVAL

PCA 16/HAWKINS 103RD STREET SITE  
 POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE  
 NAVAL AIR STATION JACKSONVILLE  
 JACKSONVILLE, FLORIDA

PAGE 3 OF 5

Compound	FDEP Target Level <sup>1</sup>	TW-6B		TW-7B		TW-8B <sup>4</sup>		TW-9B <sup>4</sup>	
Sample ID		HWK-GW- TW06-01		HWK-GW- TW07-01		HWK-GW- TW08-01		HWK-GW- TW09-01	
Sample Date		4/1/2003	7/7/2004	4/1/2003	7/7/2004	4/1/2003	7/7/2004	4/2/2003	7/7/2004
<b>VOCs (USEPA Method 8260B) (µg/L)</b>									
Benzene	1	<1	NS	<1	NS	<1	NS	<1	NS
Toluene	40	<1	NS	<1	NS	<1	NS	<1	NS
Ethylbenzene	30	2.6	NS	<1	NS	2.6	NS	<1	NS
Total Xyenes	20	2.9	NS	<1	NS	2.4	NS	<1	NS
Chloromethane	2.7	<1	NS	<1	NS	<1	NS	<1	NS
MTBE	50	2.2	NS	2	NS	<2	NS	7.3	NS
<b>USEPA 504.1 (µg/L)</b>									
EDB	0.02	<0.02	NS	<0.02	NS	<0.02	NS	<0.02	NS
<b>PAHs (USEPA Method 8310) (µg/L)</b>									
1-Methylnaphthalene	20	8.9	NS	2.1	NS	8.1	NS	0.27	NS
2-Methylnaphthalene	20	8.6	NS	1.5	NS	7.7	NS	<0.10	NS
Acenaphthene	20	<0.10	NS	<0.10	NS	<0.10	NS	<0.10	NS
Anthracene	2100	<0.10	NS	<0.10	NS	<0.10	NS	<0.10	NS
Fluorene	280	<0.10	NS	<0.10	NS	<0.10	NS	<0.10	NS
Phenanthrene	210	<0.10	NS	<0.10	NS	0.1	NS	<0.10	NS
Acenaphthylene	210	<0.10	NS	0.13	NS	0.13	NS	<0.10	NS
Naphthalene	20	6	NS	0.46	NS	5.1	NS	<0.10	NS
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>									
TRPH	5	0.55	NS	<0.20	NS	<0.20	NS	<0.20	NS

See notes at end of table.

TABLE 4-1

## GROUNDWATER ANALYTICAL RESULTS BEFORE AND AFTER SOURCE REMOVAL

PCA 16/HAWKINS 103RD STREET SITE  
 POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE  
 NAVAL AIR STATION JACKSONVILLE  
 JACKSONVILLE, FLORIDA

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Compound	FDEP Target Level <sup>1</sup>	TW-10B		TW-11A <sup>6</sup>		TW-12A		TW-13A	TW-13AR <sup>7</sup>
		HWK-GW-TW10-01	JAX-PCA16-TW10B-01		JAX-PCA16-TW11A-01	HWK-GW-TW12-01	JAX-PCA16-TW12A-01	HWK-GW-TW13-01	JAX-PCA16-TW13A-01
Sample ID		4/2/2003	7/7/2004	4/2/2003	7/7/2004	4/3/2003	7/7/2004	4/2/2003	7/8/2004
<b>VOCs (USEPA Method 8260B) (µg/L)</b>									
Benzene	1	1.1	<1	NS	<1.0	<1	<1.0	<1	<1.0
Toluene	40	<1	<1	NS	<1.0	<1	<1.0	<1	<1.0
Ethylbenzene	30	<1	<1	NS	6.7	3.7	<1.0	2	<1.0
Total Xylenes	20	<1	<1	NS	7.4	1.2	<1.0	1.6	<1.0
Chloromethane	2.7	<1	<1	NS	<1.0	<1	<1.0	<1	<1.0
MTBE	50	11	6	NS	<1.0	<2	<1.0	2	<1.0
<b>USEPA 504.1 (µg/L)</b>									
EDB	0.02	<0.02	<0.020	NS	<0.020	<0.02	<0.020	<0.02	<0.020
<b>PAHs (USEPA Method 8310) (µg/L)</b>									
1-Methylnaphthalene	20	3	1	NS	8.7	12	12	<b>24</b>	<0.50
2-Methylnaphthalene	20	0.2	<0.50	NS	11	3.8	4.9	<b>21</b>	<0.50
Acenaphthene	20	<0.10	<0.10	NS	<0.10	0.25	0.44	0.16	<0.10
Anthracene	2100	<0.10	<0.10	NS	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	280	<0.10	<0.10	NS	0.12	0.27	0.42	0.31	<0.10
Phenanthrene	210	<0.10	<0.10	NS	<0.10	0.1	<0.10	0.1	<0.10
Acenaphthylene	210	<0.10	<0.10	NS	<0.10	0.17	<0.10	0.35	<0.10
Naphthalene	20	1.5	<0.50	NS	12	0.8	7.6	6.6	<0.50
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>									
TRPH	5	<0.20	<0.20	NS	0.62	0.88	1.0	1	<0.20

See notes at end of table.

TABLE 4-1

## GROUNDWATER ANALYTICAL RESULTS BEFORE AND AFTER SOURCE REMOVAL

PCA 16/HAWKINS 103RD STREET SITE  
 POST SOURCE REMOVAL GROUNDWATER MONITORING REPORT - QUARTER ONE  
 NAVAL AIR STATION JACKSONVILLE  
 JACKSONVILLE, FLORIDA

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Compound	FDEP Target Level <sup>1</sup>	TW-14A	
Sample ID		HWK-GW- TW14-01	JAX-PCA16- TW14A-01
Sample Date		4/2/2003	7/7/2004
<b>VOCs (USEPA Method 8260B) (µg/L)</b>			
Benzene	-	<1	<1
Toluene	40	<1	<1
Ethylbenzene	30	1.2	<1
Total Xylenes	20	<1	<1
Chloromethane	2.7	<1	<1
MTBE	50	<2	<1
<b>USEPA 504.1 (µg/L)</b>			
EDB	0.02		<0.020
<b>PAHs (USEPA Method 8310) (µg/L)</b>			
1-Methylnaphthalene	20	<b>23</b>	18
2-Methylnaphthalene	20	<0.10	<0.50
Acenaphthene	20	0.17	0.21
Anthracene	2100	<0.10	<0.10
Fluorene	280	0.21	0.26
Phenanthrene	210	<0.10	<0.10
Acenaphthylene	210	0.18	<0.10
Naphthalene	20	5.4	1.8
<b>FL-PRO (USEPA Method 8270) (mg/L)</b>			
TRPH	5	0.68	0.59

See notes at end of table.

**Notes:**<sup>1</sup>Chapter 62-770, Florida Administrative Code (FAC) (April 30, 1999)<sup>2</sup>9/19/02 was the last semi-annual sampling event prior to re-assessment and source removal.<sup>3</sup>Well was destroyed or buried during the source removal.<sup>4</sup>Monitoring wells TW-1B, TW-2B, TW-8B, and TW-9B were abandoned due to non-detection.<sup>5</sup>TW-3B was damaged or destroyed before the post-source removal sampling event.<sup>6</sup>TW-11B was not sampled on 4/2/03 due to a free product sheen in well.<sup>7</sup>July 8, 2004 sample was taken from TW13-AR which is a replacement well for TW-13A which was destroyed during the source removal.**Bold** indicates values in excess of GCTLs.

NL - Not Located

NS - Not Sampled

**ATTACHMENT B**

## **Attachment B – Shell Leaking UST / Texaco Leaking UST File Review Summary**

Based on the current and historical presence of MTBE at PCA 16 and the Kerr-McGee property, ENSR reviewed the online FDEP file for the combined Shell and Texaco releases located up-gradient at 7000 and 6970 103<sup>rd</sup> Street, respectively. The Shell station is currently inactive, while the Texaco station is in operation. According to an Operations and Maintenance Annual Report, prepared for the Shell/Texaco sites in September 2004, EnviroTrac is currently the environmental contractor for both sites.

A soil vapor extraction and air sparge remediation system is currently operating on the former Shell site. A map of the two sites with a layout of the systems and monitoring well locations is included in this attachment. The systems were installed in 1999 and operated through July 2003, with subsequent reactivation in April 2004. According to EnviroTrac, levels of petroleum hydrocarbons have decreased substantially since system startup in 1999.

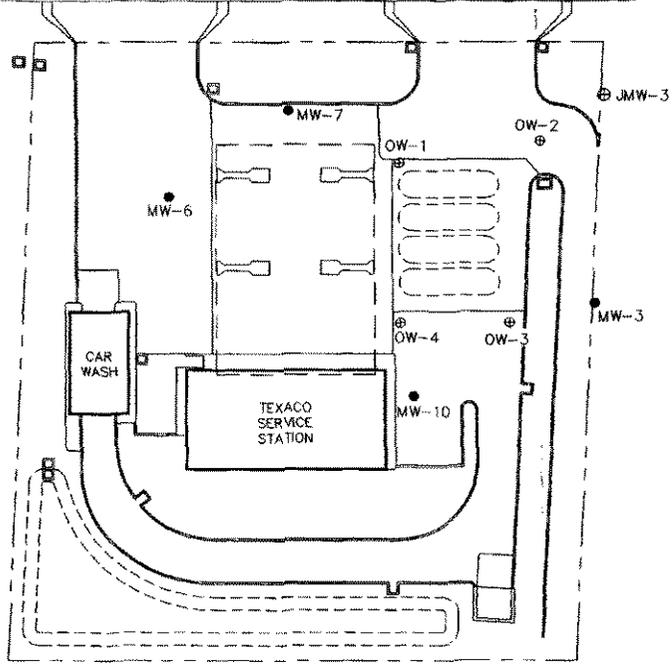
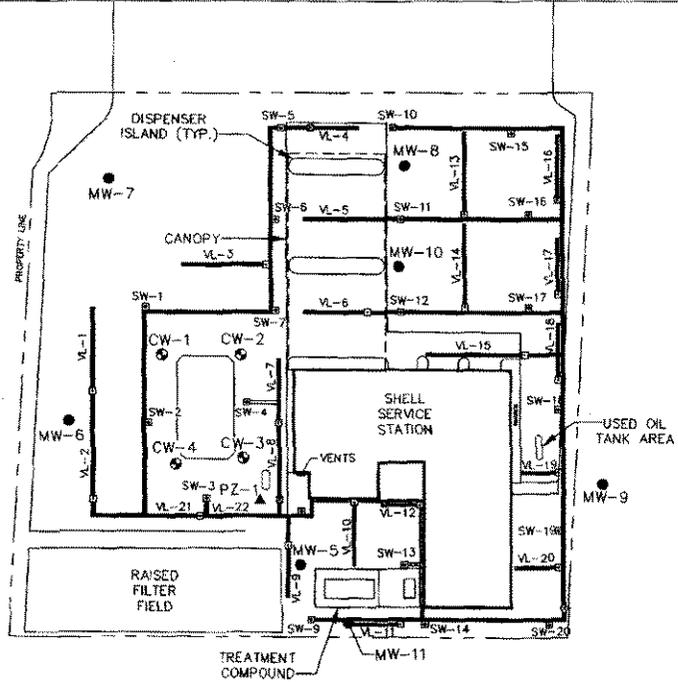
However, historically high levels of MTBE and BTEX concentrations were detected in wells located on both the Shell and Texaco sites. During the initial 1991 sampling event, MTBE down-gradient of the former Shell USTs ranged from 29 micrograms per liter (ug/l) in well MW-9 to 65,000 ug/l in well CW-3. A summary of the groundwater analytical data from the Shell/Texaco releases is included in Table 3 of this attachment.

The historical high levels of MTBE observed primarily in the wells closest to the former USTs are indicative of a directly up-gradient (~200 feet) release of MTBE from the Shell USTs, sometime prior to 1991. Persistence of substantial concentrations of MTBE and BTEX compounds in groundwater monitored through at 2004 indicates the potential for a continuing up-gradient source of those compounds that may continue to affect PCA 16 and Kerr-McGee groundwater quality at this time.

DRAWN BY: [ ] CHECKED BY: [ ] 779469-B6  
 DATE: 12-11-99 APPROVED BY: [ ]



103rd STREET



- LEGEND:**
- MONITORING WELL LOCATION
  - ⊕ COMPLIANCE WELL LOCATION
  - ▲ DEEP WELL LOCATION
  - ⊖ ABANDONED WELL LOCATION



**FIGURE I**  
**SITE MAP**  
 SHELL AND TEXACO SERVICE STATION  
 6970 AND 7000 103RD STREET  
 JACKSONVILLE, FLORIDA

PREPARED FOR  
 SHELL OIL PRODUCTS US  
 ALTAMONTE SPRINGS, FLORIDA



**TABLE 3: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

Facility Name: Shell Service Station  
69707000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

Analytical Results = ppb  
Non Detectable = ND  
No Data = Blank

Sample Location	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total VOA	MTBE	Naphthalene	1-Methyl Naphthalene	2-Methyl Naphthalene	Total Naphthalene	PAH	Lead	1,2-DCA
Cleanup Target Levels		1	40	30	20		50	20	20	20			15	3
CW-1	07/17/91	140	120	140	760	1,160	130	-	-	-	250	-	-	-
	12/10/92	63	4	58	47	172	30	-	-	-	-	-	ND	-
	02/15/94	32	ND	93	94	219	39	-	-	-	51	-	-	-
	08/14/95	40	7	97	14	158	ND	-	-	-	7	-	-	-
	07/03/99	4	4	60	11	79	ND	5	-	-	5	-	-	-
	08/21/03	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	07/22/04	<0.50	1.2	0.83	7.3	9.3	<0.50	1.3	0.48	0.48	2	-	-	-
CW-2	07/17/91	550	2,000	610	910	4,070	260	-	-	-	500	-	-	-
	12/10/92	840	1,600	450	970	3,860	ND	-	-	-	139	-	-	-
	02/15/94	440	1,400	390	2,200	4,430	ND	-	-	-	133	-	-	-
	08/14/95	254	486	351	1,050	2,140	113	-	-	-	49	-	-	-
	07/01/99	29	44	120	236	429	ND	6	-	-	6	-	-	-
	08/21/03	ND (1)	ND (1)	2	7	9	ND	2	-	-	2	2	-	-
	07/22/04	0.59	12	4.6	57	73	0.66	4.2	1.8	1.4	7.4	-	-	-
CW-3	07/17/91	11,000	26,000	2,200	13,000	52,200	65,000	-	-	-	2,070	-	-	-
	12/10/92	6,600	25,900	1,600	9,200	43,300	10,500	-	-	-	432	-	-	-
	02/15/94	4,600	24,400	2,000	9,900	40,900	5,700	-	-	-	680	-	-	-
	08/14/95	9,190	26,300	2,760	11,600	49,900	1,990	-	-	-	197	-	-	-
	07/29/97	1,860	24,000	2,410	14,300	42,570	ND	-	-	-	-	-	-	-
	07/03/99	790	15,000	2,500	16,200	34,490	ND	557	-	-	785	-	ND	ND
	11/01/99	342	4,660	307	4,920	10,229	ND	199	-	-	289	324	-	ND
	02/24/00	400	7,900	1,100	9,300	18,700	ND	340	-	-	506	529	-	ND
	05/03/00	590	5,560	520	3,170	9,840	ND	182	-	-	243	-	-	ND
	08/17/00	62	2,680	455	4,650	7,847	26	32	-	-	99	99	-	-
	11/26/02	8	44	77	283	412	21	40	-	-	60	60	-	-
	03/03/03	11	56	17	178	262	8	5	-	-	5	ND	-	-
	08/21/03	27	99	262	620	1,008	164	80	-	-	162	162	-	-
07/22/04	16	227	65	957	1,265	19	46	14	19	-	-	-	-	

**TABLE 3: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

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69707000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

Analytical Results = ppb  
Non Detectable = ND  
No Data = Blank

Sample Location	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total VOA	MTBE	Naphthalene	1-Methyl Naphthalene	2-Methyl Naphthalene	Total Naphthalene	PAH	Lead	1,2-DCA
Cleanup Target Levels		1	40	30	20		50	20	20	20			15	3
CW-4	07/17/91	4,900	14,000	2,600	15,000	36,500	980	-	-	-	1,483	-	-	-
	12/10/92	3,800	10,000	2,600	16,000	32,400	ND	-	-	-	650	-	-	-
	02/15/94	2,300	7,000	2,500	11,000	22,800	260	-	-	-	860	-	-	-
	08/14/95	1,750	8,380	2,980	12,200	25,300	ND	-	-	-	270	-	-	-
	07/29/97	584	519	2,720	14,450	22,944	ND	-	-	-	-	-	-	-
	07/03/99	140	1,600	2,100	9,000	12,840	ND	280	-	-	459	-	ND	-
	03/03/03	ND	ND	2	2	4	3	ND	-	-	ND	ND	-	-
	08/21/03	3	2	4	2	11	2	3	-	-	24	28	-	-
	07/22/04	<0.50	2.3	1.1	1.0	1.4	<0.50	<1.0	<0.51	<0.51	-	-	-	-
MW-5	07/17/91	6	10	2	5	23	-	-	-	-	ND	-	-	-
	12/10/92	520	350	75	220	1,165	460	-	-	-	32	-	-	-
	02/15/94	220	31	28	65	344	260	-	-	-	13	-	-	-
	08/14/95	2,030	465	335	619	3,450	2,250	-	-	-	25	-	-	-
	07/13/99	1,900	1,800	2,920	1,300	7,920	270	36	-	-	60	-	-	-
	03/03/03	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	08/21/03	ND	ND	ND	ND	ND	5	ND	-	-	ND	ND	-	-
MW-6	07/17/91	4	13	ND	27	44	ND	-	-	-	ND	-	-	-
	12/10/92	2	ND	ND	ND	2	ND	-	-	-	ND	-	-	-
	02/15/94	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	08/14/95	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	07/29/97	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	07/03/99	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	-	ND
	11/01/99	ND	<1	ND	ND	<1	ND	ND	-	-	ND	ND	-	-
	02/24/00	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	05/03/00	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	08/17/00	ND	2	ND	ND	2	ND	ND	-	-	ND	ND	-	-
	11/26/02	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
03/03/03	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-	

**TABLE 3: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

Facility Name: Shell Service Station  
69707000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

Analytical Results = ppb  
Non Detectable = ND  
No Data = Blank

Sample Location	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total VOA	MTBE	Naphthalene	1-Methyl Naphthalene	2-Methyl Naphthalene	Total Naphthalene	PAH	Lead	1,2,-DCA
Cleanup Target Levels		1	40	30	20		50	20	20	20			15	3
MW-7	07/17/91	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	12/10/92	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	02/15/94	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	08/14/95	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	07/01/99	ND	ND	ND	2	2	ND	ND	-	-	ND	-	-	-
	11/26/02	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	03/03/03	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-
MW-8	07/17/91	18	4	6	14	41	690	-	-	-	ND	-	-	-
	12/10/92	160	1	13	29	203	92	-	-	-	ND	-	-	-
	02/15/94	18	ND	6	12	36	24	-	-	-	ND	-	-	-
	08/14/95	6	17	36	54	113	42	-	-	-	ND	-	-	-
	07/29/97	10	1	15	32	58	14	-	-	-	-	-	-	-
	07/03/99	6	1	13	23	44	ND	ND	-	-	ND	-	-	ND
	11/01/99	ND	ND	ND	ND	ND	2	ND	-	-	ND	ND	-	-
	02/24/00	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	05/03/00	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	08/17/00	ND	2	ND	ND	2	ND	ND	-	-	ND	ND	-	-
	11/26/02	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-
	03/03/02	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-
	08/21/03	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-

**TABLE 3: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

Facility Name: Shell Service Station  
69707000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

Analytical Results = ppb  
Non Detectable = ND  
No Data = Blank

Sample		Benzene	Toluene	Ethyl- benzene	Total Xylenes	Total VOA	MTBE	Naphthalene	1-Methyl	2-Methyl	Total Naphthalene	PAH	Lead	1,2,-DCA
Location	Date								Naphthalene					
Cleanup Target Levels		1	40	30	20		50	20	20			15	3	
MW-9	07/17/91	62	ND	3	4	68	29	-	-	-	3	-	-	-
	12/10/92	18	1	1	2	22	23	-	-	-	ND	-	-	-
	02/15/94	1	ND	ND	ND	1	81	-	-	-	ND	-	-	-
	08/14/95	1	ND	ND	ND	1	8	-	-	-	ND	-	-	-
	07/29/97	ND	ND	ND	ND	ND	ND	-	-	-	ND	-	-	-
	07/03/99	51	1	6	22	80	320	ND	-	-	ND	-	-	ND
	11/01/99	9	ND	1	<1	10	156	ND	-	-	ND	ND	-	-
	02/24/00	21	ND	1	ND	22	17	7	-	-	9	-	-	-
	05/03/00	ND	2	ND	2	4	66	ND	-	-	ND	ND	-	-
	08/17/00	ND	3	ND	ND	3	92	ND	-	-	ND	ND	-	-
	11/26/02	ND	ND	ND	ND	ND	2	ND	-	-	ND	ND	-	-
	03/03/03	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-
08/21/03	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-	
MW-10	07/29/97	186	6	91	174	457	317	-	-	-	-	-	-	-
	07/01/99	180	4	80	73	337	ND	28	-	-	28	-	-	-
	11/01/99	17	ND	7	1	25	4	ND	-	-	ND	ND	-	-
	02/24/00	24	ND	6	5	35	5	10	-	-	12	13	-	-
	05/03/00	43	ND	11	6	59	6	4	-	-	4	4	-	-
	08/17/00	11	1	5	1	19	6	4	-	-	4	4	-	-
	11/26/02	ND	ND	ND	ND	ND	2	ND	-	-	ND	ND	-	-
	03/03/03	ND	ND	ND	ND	ND	11	ND	-	-	ND	ND	-	-
MW-11	09/22/97	709	69	99	934	1,811	117	-	-	-	-	-	-	-
	07/01/99	350	33	120	612	1,115	ND	71	-	-	96	-	-	-
	02/24/00	ND	ND	ND	ND	ND	12	ND	-	-	ND	ND	-	-
	05/03/00	ND	ND	ND	ND	ND	6	ND	-	-	ND	ND	-	-
	08/17/00	Dry	Dry	Dry	Dry	Dry	Dry	Dry	-	-	Dry	Dry	-	-
	11/26/02	ND	ND	ND	ND	ND	6	ND	-	-	ND	ND	-	-

**TABLE 3: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY**

Facility Name: Shell Service Station  
69707000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

Analytical Results = ppb  
Non Detectable = ND  
No Data = Blank

Sample		Benzene	Toluene	Ethyl- benzene	Total Xylenes	Total VOA	MTBE	Naphthalene	1-Methyl Naphthalene	2-Methyl Naphthalene	Total Naphthalene	PAH	Lead	1,2-DCA
Location	Date													
Cleanup Target Levels		1	40	30	20		50	20	20	20			15	3
PZ-1	07/17/91	1	3	ND	3	6	ND	-	-	-	ND	-	-	-
	12/10/92	46	55	3	28	132	58	-	-	-	ND	-	-	-
	02/15/94	23	30	7	24	84	15	-	-	-	ND	-	-	-
	03/15/95	1	ND	ND	ND	1	12	-	-	-	ND	-	-	-
	08/14/95	ND	1	ND	1	1	29	-	-	-	ND	-	-	-
	07/01/99	ND	ND	ND	ND	ND	ND	ND	-	-	ND	-	ND	ND
	11/01/99	ND	ND	ND	ND	ND	5	ND	-	-	ND	ND	-	-
	02/24/00	ND	1	ND	ND	1	5	ND	-	-	ND	ND	-	-
	05/03/00	ND	ND	ND	ND	ND	2	ND	-	-	ND	ND	-	-
	08/17/02	ND	3	ND	ND	3	2	ND	-	-	ND	ND	-	-
	11/26/02	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-
	03/03/03	ND	ND	ND	ND	ND	1	ND	-	-	ND	ND	-	-
	08/21/03	ND	ND	ND	ND	ND	ND	ND	-	-	ND	ND	-	-

**TABLE 4: MONITORING WELL DISSOLVED OXYGEN, OVA AND VACUUM**

Facility Name: Shell Service Station  
6970/7000 103rd Street, Jacksonville

Facility ID# 16/8736220  
16/8506591

OVA = parts per million  
DO = milligrams per liter

Vacuum = inches of water

ND = Non Detect

WELL NO.	CW-1			CW-2			CW-3			CW-4			MW-5			MW-6		
DIAMETER	4"			4"			4"			4"			4"			4"		
WELL DEPTH	-			-			-			-			-			-		
SCREEN INTERVAL	unknown			unknown			unknown			unknown			unknown			unknown		
TOC ELEVATION	44.63			44.98			45.69			45.63			44.84			45.19		
DATE	DO	OVA	VAC	DO	OVA	VAC	DO	OVA	VAC	DO	OVA	VAC	DO	OVA	VAC	DO	OVA	VAC
08/03/99	0.3	5000.0	-	0.3	2000.0	-	0.3	>10,000	-	0.6	3500	-	0.3	300.0	-	0.4	800.0	-
08/10/99	0.2	-	-	0.2	-	-	0.1	-	-	0.2	-	-	0.3	-	-	0.3	-	-
08/11/99	0.3	-	1.2	0.4	-	1.2	0.4	-	0.2	0.5	-	0.4	0.5	-	-0.1	0.7	-	0.3
09/04/99	0.2	-	0.7	0.3	-	0.4	0.2	-	0.1	0.3	-	0.2	0.4	-	0.1	0.3	-	0.1
11/30/99	0.4	ND	NG	0.4	ND	-	0.5	15	-	0.5	10	-	0.3	ND	-	0.4	ND	-
01/04/00	1.4	ND	0.0	1.9	ND	0.0	1.4	ND	0.2	1.4	35	0.1	1.7	ND	0.0	1.9	ND	0.6
02/22/00	1.3	10.0	-	1.4	NG	NG	1.6	-	NG	1.5	-	NG	1.7	-	-	3.2	-	-
03/02/00	7.1	-	-	10	-	>25	9.4	-	6.0	3.6	-	0.0	8.9	-	-3.0	9.0	-	1.0
04/12/00	-	7.0	-	-	14	-	-	20	-	-	456	-	-	7.0	-	-	6.0	-
05/03/00	7.4	6.0	1.6	8.2	10	3.8	7.6	52	0.0	1.7	150	0.2	7.9	>3	-1.0	7.9	>3	2.2
08/21/00	7.5	6.6	1.6	7.9	7.0	2.1	7.8	105	0.4	7.8	45	0.6	7.8	2.0	1.0	7.9	9.2	1.4
09/24/02	5.6	0.7	0.0	7.5	4.4	0.0	NG	-	-	1.4	0.0	0.0	6.7	0.0	-2.5	7.0	1.0	0.0
10/23/02	0.9	0.0	0.0	7.8	0.0	0.0	7.6	0.0	0.1	4.3	7.0	0.0	7.8	0.0	-0.5	4.1	0.0	-0.2
11/25/02	1.2	-	-	7.8	NG	0.5	5.2	-	0.0	5.1	-	0.0	8.0	-	-0.9	3.5	-	-0.2
01/09/03	7.5	0.2	0.0	9.4	1.3	1.1	7.9	21.3	2.8	3.2	2.1	1.0	8.4	0.0	-0.6	3.2	2.1	1.0
02/12/03	7.2	8.0	0.0	8.6	6.0	2.2	6.9	8.1	0.0	6.2	17.0	0.2	8.7	2.0	-0.4	6.2	2.0	-0.1
03/19/03	6.4	50.0	0.0	8.4	6.8	1.8	7.8	17.0	0.4	5.6	20.0	0.1	8.3	3.8	-2.6	7.3	1.2	-0.2
04/21/03	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0
07/01/03	SVE restart following NAM activities																	
10/03/03	1.1	-	0.0	0.8	NG	0.0	0.7	-	-0.1	0.4	NG	-0.1	0.6	-	0.0	1.9	-	-0.4
07/22/04	3.1	-	-	6.5	-	-	0.3	-	-	0.6	-	-	-	-	-	-	-	-