# VOLUNTARY REMEDIATION PROGRAM APPLICATION

**Axeon Savannah Terminal**
**7 Foundation Drive**
**Savannah, Chatham County, Georgia**

August 8, 2015
Terracon Project No. ES157077

**Prepared for:**

Axeon Specialty Products
Savannah, Georgia

**Prepared by:**

Terracon Consultants, Inc.
Savannah, Georgia

Terracon

August 8, 2015

Georgia Environmental Protection Division
Response and Remediation Program
Land Protection Branch
2 Martin Luther King, Jr. Drive SE
Suite 1054 East
Atlanta, Georgia 30334

Attn: Mr. Jason Metzger
P: (404) 657 0490
E: peter.johnson@dnr.ga.gov

**Re: Voluntary Remediation Program Application**
Axeon Savannah Terminal
7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

Dear Mr. Metzger:

Terracon Consultants, Inc. (Terracon) has completed a Voluntary Remediation Program (VRP) Application for the above-referenced facility on behalf of Axeon Specialty Products. This VRP Application has been completed in general accordance with the Georgia Voluntary Remediation Program Act (O.C.G.A. § 12-8-100) and the directions received during the meeting between Terracon and the Georgia EPD on July 22, 2015. The VRP Application fee is attached.

If you have any questions concerning this report, please contact us at (912) 629 4000.

Sincerely,
**Terracon Consultants, Inc.**

R. Luke Bragg
Environmental Engineer

William S. Anderson, III, P.E.
Senior Principal

Enclosures
cc: 1 – Georgia EPD (1 hard copy; 2 electronic copies)
1 – Client (1 hard copy; 1 electronic copy)
1 – File (1 electronic copy)

## TABLE OF CONTENTS

## TABLE OF CONTENTS (continued)

# VOLUNTARY REMEDIATION PROGRAM APPLICATION

**AXEON SAVANNAH TERMINAL**
**7 Foundation Drive**
**Savannah, Chatham County, Georgia**

Terracon Project No. ES157077
August 8, 2015

## 1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) has prepared this Voluntary Remediation Program (VRP) Application on behalf of Axeon Specialty Products (Participant) for the Axeon Savannah Terminal facility located at 7 Foundation Drive in Savannah, Chatham County, Georgia (Property). This VRP Application has been completed in general accordance with the Georgia Voluntary Remediation Program Act (O.C.G.A. § 12-8-100) and the directions received during the meeting between Terracon and the Georgia EPD on July 22, 2015.

The VRP Application and Checklist have been included in Appendix A. Tax map and warranty deed documentation for the property have been included in Appendix B. A Site Vicinity Map (Figure 1), Surrounding Land Use Map (Figure 2), and Site Plan (Figure 3) have been included in Appendix C.

### 1.1 Background

The 66.82-acre subject property is located along the Savannah River in Savannah, Georgia and has been utilized for petroleum refining/storage activities since the early 1900s. The property was first developed as a petroleum refinery by Mexican Petroleum in 1929. Petroleum operations continued under American Oil Company (and later Amoco) throughout most of the 20$^{th}$ century. The property was operated by CITGO Asphalt Refining (CITGO) from 1993 until acquisition by NuStar Asphalt Refining, LLC in 2008. Asphalt refining operations were temporarily halted in 2012. The property was acquired by Axeon Specialty Products in 2014. Current site operations consist of bulk storage and distribution of petroleum-related products.

Light non-aqueous phase liquid (LNAPL) was discovered at the site in 1989. A subsequent investigation by Amoco concluded that detected LNAPL was the result of the "gradual accumulation of residual oil over several decades." The LNAPL has been determined to be petroleum hydrocarbon based material. Subsurface investigations and LNAPL recovery operations have been conducted in various capacities since the discovery of the release.

Fifty-seven (57) groundwater monitoring wells currently exist at the site as a result of previous environmental investigation. Twenty-seven (27) of these monitoring wells contain LNAPL. A 40-mil high-density polyethylene (HDPE) poly wall (installed in 1996) located along the downgradient edge of the site prevents the migration of LNAPL to the Savannah River. The poly wall is reported to be a total of 1,500 feet in length and installed to a depth of approximately 20 feet below grade. In June and July 2015, Axeon excavated and exposed the poly wall in several locations along the water front. Upon inspection, the exposed sections of the poly wall did not show any signs of delamination, blistering, or deterioration. The poly wall continues to provide effective containment in these areas. Site plans, maps, and cross sections depicting the facility location and conditions are provided in Appendix C.

## 1.2 Purpose

The purpose of this document is to provide justification for enrollment of the property into the VRP by presenting a current understanding of site conditions based on existing data and a preliminary conceptual site model (CSM), a plan for additional voluntary investigation to fill data gaps, and a plan for the development of a remedial design.

## 1.3 Property Eligibility

Under O.C.G.A § 12-8-105, the following criteria must be met in order to be considered a qualifying property for the VRP:

1. The property must be listed on the inventory under Part 2 of this article or be a property which meets the criteria of O.C.G.A. § 12-8-105 or otherwise have a release of regulated substances into the environment;
2. The property shall not:
   a. Be listed on the federal National Priorities List pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601, et seq;
   b. Be currently undergoing response activities required by an order of the regional administrator of the federal Environmental Protection Agency; or
   c. Be a facility required to have a permit under O.C.G.A. § 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; and
4. Any lien filed under subsection (e) of O.C.G.A. § 12-8-96 or subsection (b) of O.C.G.A. § 12-13-12 against the property shall be satisfied or settled and released by the director pursuant to O.C.G.A. § 12-8-94 or O.C.G.A. § 12-13-6.

Based on the criteria listed above, the Axeon Savannah Terminal is a “qualifying property” under the VRP.

## 1.4 Participant Eligibility

Under O.C.G.A. § 12-8-106, the following criteria must be met in order for the participant to meet the qualifications of the VRP:

1. Be the property owner of the voluntary remediation property or have express permission to enter another’s property to perform corrective action including, to the extent practical, implementing controls for the site pursuant to written lease, order, or indenture;
2. Not be in violation of any order, judgment, statute, rule, or regulation subject to the enforcement authority of the director; and
3. Meet other such criteria as may be established by the board pursuant to O.C.G.A. § 12-8-103.

The participant, Axeon Specialty Products meets all of the criteria stated above, and is therefore “qualified” under the VRP.

The contact for the applicant and owner of the subject property is as follows:

Ms. Janet Ferris
HSE Senior Manager
Axeon Specialty Products
4 Paradise Road
Paulsboro, New Jersey 08066
(856) 224 7405
janet.ferris@axeonsp.com

The tax plat and warranty deed for the qualifying property have been attached in Appendix B.

## 1.5 Historical Documentation

This VRP Application has been prepared based, in part, on information contained in numerous historical documents provided to Terracon. A list of these documents is below. Brief summaries of the historical documents are contained Appendix F. The complete documents are also included in Appendix F.

| Document Title | Prepared By | Date |
|---|---|---|
| Report #041789-10 (release notification) | Amoco Oil Company | April 20, 1989 |
| "Gas Hole" by Riverbank | Internal Memorandum | October 18, 1989 |
| Recovery System Operation and Maintenance | Bechtel Environmental, Inc. | March 1991 |
| Estimated Areal Extent – Free Product Plumes | Westinghouse Environmental and Geotechnical Services, Inc. | October 31, 1991 |
| Report of Site Evaluation and Remedial Alternatives Evaluation | Geraghty & Miller, Inc. | August 16, 1995 |
| Poly Wall Location map | Horizontal Technologies, Inc. | January 1996 |
| Water Elevation/Hydrocarbon Thickness Monitoring Report | S&ME, Inc. | October 31, 2003 |
| Permit to Use Groundwater | Georgia EPD | December 30, 2008 |
| January through July 2009 Field Work Summary | Conestoga-Rovers & Associates | November 10, 2009 |
| Groundwater and LNAPL Gauging Event | Ash Creek Associates, Inc. | September 7, 2010 |
| Well Installation, SPH Gauging, and Remedial Options Evaluation Report | Apex Companies, LLC | August 8, 2012 |
| Draft Remedial Design Report | Apex Companies, LLC | June 14, 2013 |
| Free Product Survey of Existing Monitoring Wells | Terracon Consultants, Inc. | May 28, 2015 |

| Document Title | Prepared By | Date |
|---|---|---|
| Monthly Free Product Measurement and Removal Summary Report | Terracon Consultants, Inc. | July 31, 2015 |

# 2.0 CURRENT SITE CONDITIONS

## 2.1 Geologic Setting

The below subsections contain a summary of geomorphic, stratigraphic, and hydrogeologic information pertaining to a 25 mile radius of the subject site (regional) and the property itself. Geologic data for this area are based on numerous published reports, previous environmental studies conducted at the site, and discussions with other researchers familiar with the geology and hydrogeology of the area.

### 2.1.1 Regional Geology

The site is located in the Coastal Plain physiographic province of Georgia. The stratigraphy of the Coastal Plain of Georgia and Chatham County has been described by numerous authors (e.g., Herrick, 1961; Herrick and Vorhis, 1963; Counts and Donsky, 1963; Furlow, 1969; Chowns and Williams, 1983; Clarke et al., 1990; Weems and Edwards, 2001; Williams and Gill, 2010; and Clarke et al., 2011) and is summarized in the following paragraphs. The area stratigraphic units are discussed in ascending order, from the deepest Paleocene units to the surficial Holocene deposits. Cretaceous and pre-Cretaceous rock units are typically found at depths of several thousand feet below ground surface in the area, and therefore only a general description of the lithologic character is included.

<u>Cretaceous and pre-Cretaceous Stratigraphy</u>
Pre-Cretaceous strata underlying the area are considered “basement” rocks. These “basement” rocks consist of igneous intrusive rocks and low-grade metamorphic rocks of Paleozoic age, and sedimentary rocks and volcanic rocks of Triassic to Early Jurassic Age (Chowns and Williams, 1983). Upper Cretaceous sediments consist of inter-bedded sands and clayey silts at depths of 1,600 feet below ground surface (Herrick, 1961).

<u>Paleocene Stratigraphy</u>
Paleocene units in the area mark the beginning of a regional transgression of the sea that lasted through the late Eocene (Clarke et al., 1990). Paleocene units unconformably overlie strata of Late Cretaceous age. The Clayton Formation and the Cedar Keys Formation make up the Paleocene units in the area. The upper portion of the Clayton Formation is a hard, sandy

glauconitic, fossiliferous limestone, while the remaining portion of the formation consists of glauconitic sand, argillaceous sand, and small amounts of medium-to-dark gray clay (Clarke et al., 1990). The Cedar Keys Formation is a Paleocene carbonate-evaporite facies. The Cedar Keys Formation consists of thick beds of anhydrite and dolomite (Clarke et al., 1990).

Eocene Stratigraphy

The early Eocene Oldsmar Formation unconformably overlies the Paleocene Clayton Formation (Clarke et al., 1990). Glauconitic limestone and dolomite are characteristic lithologies of the Oldsmar Formation (Miller, 1986; Clarke et al., 1990). The Oldsmar Formation may also contain an upper layer of sand in some areas (Clarke et al., 1990).

The middle Eocene Avon Park Formation unconformably overlies the Oldsmar formation (Miller, 1986; Clarke et al., 1990). The Avon Park, a glauconitic dolomite and limestone, has a thickness in the range of 700 to 500 feet in the Chatham County area.

The Ocala Limestone is a massive, fossiliferous limestone. Fossils identified in the Ocala include bryozoan remains, foraminiferal tests, and mollusk shells (Furlow, 1969; Miller, 1986; Clarke et al., 1990). The Ocala Limestone unconformably overlies the dolomite and limestone of the Avon Park Formation (Furlow, 1989; Krause and Randolph, 1989; and Clarke et al., 1990). The thickness of the Ocala is more than 200 feet thick, and in some areas exceeds 400 feet (Clarke et al., 1990).

Oligocene Stratigraphy

Buff-colored, porous fossiliferous (foraminiferal tests, micrite, and non-particulate ubiquitous phosphate) limestone describe the sediments of Oligocene age (Clarke et al., 1990). Huddleston (1988) named these sediments the Lazaretto Creek Formation and the Tiger Leap Formation. Weems and Edwards (2001) refined the descriptions of the two formations. The Lazaretto Creek Formation includes the lower Oligocene sediments in the study area and the Tiger Leap Formation includes the upper Oligocene sediments marked by an increase in phosphate. The abundance of miliolid foraminifera in the Oligocene sediments is used to differentiate the unit from the underlying Ocala Limestone, and the absence of particulate phosphate is used to differentiate the overlying Miocene carbonate sediments.

Miocene Stratigraphy

There are three units of Miocene age in Chatham County. These units have been described lithologically and by geophysical markers by several authors (Furlow, 1969; Huddleston, 1988; Clarke et al., 1990; Weems and Lewis, 2001). The three (3) layers are lithologically similar and are only differentiated based on stratigraphic position, geophysical characteristics, and limited paleontologic evidence (Clarke et al., 1990).

The lowermost Miocene unit in the Chatham County area was designated as Unit C by Clarke and others (1990). Unit C is correlative to the Parachucla Formation of Huddleston (1988) and the Tampa Limestone Equivalent of Furlow (1969). Typically, only the lower portion of Unit C is found in the area, which is generally a sandy, phosphatic dolomite or limestone (Clarke et al., 1990). The middle clay and upper sandy layers have been removed by erosion (Clarke et al., 1990).

The middle Miocene unit has been designated as Miocene Unit B (Miller, 1986, and Clarke et al., 1990). Unit B is correlative to the Hawthorn Formation of Counts and Donsky (1963) and Miller (1986); the Marks Head Formation of Woolsey (1977) and Huddlestun (1988). The Marks Head Formation name has been used for this study after the work of Weems and Edwards (2001). The basal carbonate layer on Unit B typically consists of olive-green dolomite and limestone that contains very fine to coarse quartz sand, shiny brown to black phosphatic sand, and contains some fossils, typically mollusk molds and shark teeth. (Furlow, 1969; Clarke et al., 1990). Distinguishing the basal layer of Unit B from Unit C is difficult because both Unit C and Unit B are lithologically similar, therefore requiring paleontological evidence and/or borehole geophysical logs (Clarke et al., 1990). The two (2) basal units are juxtaposed because the middle and upper clastic layers of Unit C have been eroded away (Clarke et al., 1990). The middle layer of Unit B typically consists of olive-green phosphatic silty clay and clayey silt and grades upward to the upper sandy layer (Furlow, 1969; and Clarke et al., 1990). The upper sandy unit of Unit B typically consists of poorly sorted, very fine to coarse sand and locally a thin very dense dolomite layer (Furlow, 1969; and Clarke et al., 1990). Unit B (Hawthorn Formation) ranges in thickness from 20 to 55 feet thick (Furlow, 1969).

Miocene Unit A overlies Unit B and is included in the Hawthorn Formation of Counts and Donsky (1963) and Miller (1986), and correlates with the Coosawhatchie Formation of Woolsey (1977) and Huddleston (1988). The name Coosawhatchie Formation is adopted for this study based on the work of Weems and Edwards (2001). The Coosawhatchie Formation contains two (2) members. The basal layer, which is the Tybee Phosphorite Member, consists of a sandy phosphatic limestone and dolomite with some fossils (Clarke et al., 1990). In Chatham County, clay is the matrix material surrounding most of the phosphate grains instead of dolomite (Clarke et al., 1990). The sand in the basal unit generally consists of very fine to coarse quartz and brown to black phosphate. The middle clay layer consists of fossiliferous clay and silt laminae and the upper sand unit consists of a very fine to coarse, poorly sorted sand (Clarke et al., 1990). The upper portion of this unit is equivalent to the Berryville Clay Member. Unit A is about 20 feet thick in the Savannah Area.

<u>Pliocene, Pleistocene, and Holocene Stratigraphy</u>

Sediments of Pliocene age are generally accepted as absent in Chatham County, with Pleistocene sediments unconformably overlying Miocene sediments (Herrick, 1965; Furlow, 1969; and Clarke et al., 1990). Pleistocene sediments typically consist of arkosic sand and gravel with discontinuous clay beds. Basal Pleistocene sediments contain reworked olive-green clay from the underlying Miocene units (Furlow, 1969). Lignitic and fossiliferous clay and micaceous sandy sediment ranging in thickness from 10 to 60 feet are typical of Pleistocene sediments. The Penholoway Formation is the principal surficial Pleistocene deposit in Chatham County (Weems and Edwards, 2001). The Penholoway is one of many remnants of former shoreline complexes through the area, which were the result of numerous transgressions and regressions of the sea, the result of extensive glaciations in North American during the Pleistocene Epoch.

### 2.1.2 Regional Hydrogeology

Hydrologic units in Chatham County, Georgia include (in descending order), the surficial aquifer system, consisting of the water-table zone, upper confined zone; the Upper Floridan aquifer; middle confining; the lower Floridan aquifer; and the lower confining unit (Williams and Gill, 2010).

In the vicinity of the subject site, the surficial aquifer system is present from land surface to 25 feet below land surface (bls) (Williams and Gill, 2010). For this study, the surficial aquifer is undifferentiated; however the surficial aquifer is typically informally divided into a water-table zone, an upper confined zone, and a lower confined zone. The confining unit underlying the surficial aquifer system is identified on natural-gamma radiation logs by the A-marker horizon. The bottom of the confining unit is determined by the location of the C-marker horizon, which coincides with the top of the Upper Floridan aquifer (Clarke et al., 1990).

The principal source for all drinking water uses in the coastal area of Georgia is the Floridan aquifer system. The Floridan aquifer system is composed of carbonate rocks of varying permeability (Clarke et al., 1990; Clark et al., 2011). There are several water-bearing zones within the Floridan aquifer system that are separated by layers of relatively dense limestone and dolostone that act as semiconfining units (Krause and Randolph, 1989; Clarke et al., 1990; Williams and Gill, 2010).

The Chatham County area, the two shallowest water bearing zones of the five that comprise Floridan aquifer system are part of the upper Floridan aquifer (McCollum and Counts, 1964; Krause and Randolph, 1989; Clark et al., 1990; Williams and Gill, 2010). The upper Floridan aquifer is overlain by a confining unit consisting of layers of silty clay and dense phosphatic Oligocene dolomite identified by a distinct response on gamma-ray logs (Clarke et al., 1990). Clarke and others (1990) identified the base of the confining unit as the C-marker horizon. The C-marker is approximately the top of the upper Floridan aquifer in the project area and is present at a depth of 228 feet (Williams and Gill, 2010). The C-marker horizon is present near the top of the Suwannee Limestone in the study area; while the D-marker horizon is present at the top of the Ocala Limestone at a depth of 330 feet in the study area. Based on well log information for USGS Well ID 37Q001 near the site, the bottom of the upper Floridan aquifer is encountered at a depth of 433 feet. The top of the lower Floridan aquifer was encountered at a depth of 683 feet (Williams and Gill, 2010).

### 2.1.3 Property Geology

Based on geologic boring logs prepared during previous environmental studies, the general stratigraphic section consists of thin silty-sandy silt at the surface, silty sands, clayey sands, and sandy clays from 0.5 feet to approximately 13 feet below grade, and silty sand to fine to coarse sand to total boring depth (approximately 20 feet below grade).
Limited stratigraphic cross-sections have been prepared utilizing available boring log information developed during monitoring/recovery well installations completed by others. These cross-sections have been included as Figure 4 and Figure 5 in Appendix C. Please note, based on a review of all available documentation, boring log and/or cross-section information was unavailable perpendicular to the Savannah River.

### 2.1.4 Property Hydrogeology

The depth to groundwater at the site typically ranges from approximately 4 feet to 20 feet below grade. Groundwater typically occurs in sand and silt layers, which correspond to the regional surficial aquifer. Based on data acquired by Terracon during a 2015 gauging event, the direction of groundwater flow is generally towards the northeast (towards the Savannah River) with an average site-wide hydraulic gradient of 0.005 ft/ft (see Figure 6 in Appendix C). Previous environmental studies have determined that the hydraulic conductivity at the site is approximately 30 feet per day (0.011 cm/sec).

The site is located adjacent to the tidally influenced Savannah River. Based on data from the Fort Pulaski monitoring station (approximately 18 miles downstream from the site), there are two tidal cycles per day and each cycle has an approximate 12-hour duration. The mean tidal range for the Savannah River at the National Oceanic and Atmospheric Administration (NOAA) Savannah tide station (32.0817, -81.0917) located 2.8 miles from the site is 8.9 feet (NOAA, 2015).

The tidal effects on groundwater elevations were evaluated by Conestoga-Rovers & Associates (CRA) in 2009. Data compiled by a fluid level monitoring program indicated that for AW-67 (adjacent to the Savannah River) the tidally induced change in groundwater levels (high to low tide) was approximately three feet to six feet over each of the approximate 6-hour high to low tide cycles (CRA, 2009). At monitoring wells AW-73 and AW-44 located further inland, the tidally-induced change in groundwater levels was approximately 0.5 feet. The time delay between high tide (at the site) and peak groundwater levels at AW-67 (adjacent to the Savannah River) was approximately 2 hours to 2.25 hours. The time delay between low tide (at the site) and low groundwater levels at AW-67 was approximately 1.75 hours. Further inland, the time delay for high tide and low tide was approximately 0.5 hours. The 2009 data indicates that tidal influences on groundwater elevation dissipate rapidly with distance from the Savannah River.

## 2.2 Regulated Constituents in Soil and Groundwater

According to a 2003 report by S&ME, Inc., LNAPL samples were collected from wells AW-10, AW-11, AW-15, AW-22, AW-51, AW-54 and submitted to Friedman & Bruya, Inc. of Seattle, Washington for fingerprinting analysis. The results were generally consistent for four of the six samples, indicating a mixture of light and middle distillates with varying degrees of weathering. One sample (AW-15) indicated only the presence of light distillates. The sample from AW-54 indicated the presence of only middle distillates such as diesel fuel or #2 fuel oil.

In 2009, CRA collected LNAPL samples from AW-12, AW-13, AW-51, AW-65, and AW-68 to be analyzed for viscosity and specific gravity. The results from AW-12, AW-51, AW-65, and AW-68 were relatively similar, indicating specific gravity and viscosity values consistent with diesel-range LNAPL. The average LNAPL specific gravity at the site (with the exception of AW-13) is 0.854. The specific gravity of the product within AW-13 was determined to be 1.0826. The LNAPL in AW-13 is much more viscous than the LNAPL in other wells at the site and is consistent with #6 fuel oil and/or crude oils.

Based on a review of previous environmental studies conducted at the site, soil and groundwater samples have not been submitted for laboratory analysis. According to the results of LNAPL fingerprinting analysis, it is probable that regulated petroleum-related volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) exist within the surficial soil and groundwater at the site. As detailed in Section 4.0 below, voluntary investigation will be conducted to identify and delineate regulated constituents in soil and groundwater.

## 2.3 Areal Distribution of Constituents in Soil and Groundwater

### 2.3.1 Vadose Zone Soil Conditions

As shown on Figure 7 (Appendix C), LNAPL was detected at in-well thicknesses ranging from 0.1 feet (AW-45) to 10.10 feet (AW-54) throughout a majority of the site during the 2015 gauging event. Given that the surficial aquifer at the site is tidally influenced, it is likely that a substantial smear zone exists, especially in the vicinity of the poly wall near the Savannah River.

As previously stated laboratory analyses of vadose zone soils at the site have not been conducted. Horizontal delineation will be required to determine the extent of soil contamination.

### 2.3.2 Groundwater Conditions

Based on information from Axeon personnel, an underground pipeline corridor servicing the historic dock operation of the terminal ran through the approximate center of the site (north to south). It is suspected that these decommissioned underground pipes could have been a historic source of the LNAPL plume located in the center of the tank field. Active pipelines at the facility are currently aboveground. As shown on Figure 7, LNAPL in-well thicknesses exceed 2 feet in the vicinity of Tanks 3 and 5. It appears that no new LNAPL has accumulated north of the poly wall, indicating that this structure has been effective at preventing further downgradient migration towards the Savannah River.

As shown on Figure 7, the LNAPL thickness in AW-56 (5.70 feet) located adjacent to the current loading rack is elevated compared to the surrounding area. LNAPL in this area is not the result of current or recent operation of the lading rack, given that all loading rack piping is aboveground and overhead, and no known releases or spills have occurred. LNAPL in this area is the result of the historical operation of a railroad siding that was previously located in this area and other historical practices associated with the previous railroad operations.

Downgradient well AW-62 is the only well downgradient of the poly wall that has historically exhibited LNAPL. Given that LNAPL was present in well AW-62 before the installation of the poly wall, it is likely that the LNAPL in this area pre-existed the poly wall and as such is not the result of breakthrough. Given the lack of monitoring wells downgradient of AW-62, it cannot be definitively demonstrated that LNAPL is not migrating to the Savannah River; however, no sheen has been observed on this surface water body.

Based on the results of recent monitoring, it appears that the extent of the LNAPL plume has been delineated along the western and southern property boundaries. Additional horizontal LNAPL delineation will be required along the eastern property boundary, specifically in the vicinity of AW-45, and downgradient of AW-62. Further delineation will be required along each of the property boundaries to establish the extent of aqueous phase contamination.

## 2.4 Interim Corrective Action

In June 2015, Terracon initiated a four month LNAPL gauging and removal program at the site. According to the specified scope of work, Terracon is to gauge the monitoring well network on a weekly basis for the presence of LNAPL. Detectable in-well LNAPL is immediately removed following the gauging event by a mobile vacuum extraction truck. This proactive LNAPL recovery program employs an aggressive fluid vapor recovery (AFVR) process utilizing a high-flow, high-vacuum system. By employing an AFVR well head system along with a high-vacuum truck, LNAPL recovery is maximized. Recovered LNAPL is stored on-site within an aboveground storage tank for reuse. The objective of this scope of work is to identify and remove LNAPL in order to mitigate potential off-site and downgradient impacts. As of the issuance of this VRP, LNAPL gauging and removal events have been conducted on June 26, July 1, July 9, July 15, July 23, and July 30, 2015.

# 3.0 PRELIMINARY CONCEPTUAL SITE MODEL

## 3.1 Potential Exposure Pathways

An evaluation of potential exposure pathways was conducted for the site. The exposure pathways evaluated include the potential exposure of chemicals of concern (COC) in soil, groundwater, vapors, and sediment and/or surface water from impacted soil and groundwater. The receptors potentially exposed to these pathways include:

- Current and future on-site industrial/construction workers
- Current and future off-site industrial/construction workers
- Current and future trespassers onto the property

The subject site and surrounding parcels are zoned heavy industrial. Potential exposure pathways to future residents were not evaluated as it is unlikely residential properties will be developed on or adjacent to the site. The nearest residential structures are located upgradient, in excess of one mile from the site. As such, the potential exposure pathways to off-site residents were not evaluated.

### 3.1.1 Soil Ingestion, Inhalation, or Direct Contact

The soil exposure pathway to on-site/off-site industrial/construction workers and trespassers is potentially complete for the petroleum-related COCs. Given the currently identified areal extent of the LNAPL plume, the depth to groundwater, and tidal fluctuations, it is possible that impacted soils exist both on-site and off-site to near ground surface. Laboratory analysis of on-site and off-site vadose zone soils will be conducted to accurately evaluate any potential soil exposure pathway.

### 3.1.2 Groundwater Ingestion, Inhalation, or Direct Contact

The groundwater exposure pathway for ingestion, inhalation, or direct contact by on-site and off-site construction workers during future excavation activities is potentially complete. The groundwater elevation is shallow and LNAPL has been detected throughout the property. Given the historical detections of LNAPL within AW-45, it is possible that LNAPL impacts extend off-site. Additional delineation and evaluation of both the LNAPL and aqueous phase plumes will be conducted to accurately evaluate any potential groundwater exposure pathway.

### 3.1.3 Vapor Intrusion

As indicated above, LNAPL exists throughout the subject property and is present beneath some building structures. However, based on current information, it does not appear that LNAPL exists beneath the frequently occupied general administrative building and guard house. Given the volatile and semi-volatile nature of the COCs, the risk of vapor intrusion into building structures and/or poorly ventilated areas exists. As such, the exposure pathway to on-site/off-site workers and trespassers potentially exists. Vapor modeling and/or the collection of soil gas and/or indoor air quality samples will be conducted to accurately evaluate any potential vapor intrusion pathway.

### 3.1.4 Future Contaminant Migration to Sediment and/or Surface Water

Historical impacts to the Savannah River have been documented in prior environmental studies. Given the presence of LNAPL downgradient of the poly wall barrier and the direction of groundwater flow towards the Savannah River, the pathway for contaminant migration to sediment and/or surface water is potentially complete. The bank of the Savannah River is routinely inspected and no free product and/or sheens have been noted as present. Further sampling and evaluation will be conducted to further determine any exposure pathway.

## 3.2 Human Receptors

According to information from the USGS National Water Information System (NWIS), numerous water wells exist within a 1-mile radius of the site (see Figure 8 in Appendix C). As shown on Figure 8, one water well (USGS Well ID 36Q333) exists on the site. According to the Permit to Use Groundwater (Permit Number 025-0012) issued on December 30, 2008, 0.100 MGD monthly average and 0.010 MGD annual average of groundwater may be withdrawn from the upper Floridan aquifer (the top of which is located at a depth of 228 feet below grade at the site). Withdrawn groundwater is permitted only "for the purpose of a consumptive use as central water supply, cooling water, and process water for boiler feed water." According to Axeon personnel, groundwater is used to increase the pressure in the lines during turnaround clean outs and not for drinking water usage. Groundwater was last withdrawn in 2011; however, monthly zero usage is tracked and reported to the State. Drinking water is provided to the site from the City of Savannah municipal supply.

As stated previously, the surficial aquifer containing the contaminant plume extends to a depth of 25 feet below ground surface. An approximate 200-foot thick confining layer separates the surficial aquifer from the upper Floridan aquifer from which the on-site well withdraws groundwater. Given the nature of the contaminant plume (average specific gravity <1), it is highly unlikely that groundwater within the upper Floridan has been or has the potential to be impacted. Further, withdrawn groundwater is not used for drinking water. As such, it does not appear that the on-site water well constitutes an exposure pathway.

The additional off-site wells indicated on Figure 8 are cased to withdraw from the Floridan aquifer system, specifically the upper Floridan aquifer. Based on the information above, these off-site water wells do not constitute exposure pathways.

## 3.3 Ecological Receptors

The site is highly industrialized and does not provide a suitable habitat for plants or animals. In the absence of natural habitats and vegetation, as well as the significant amount of anthropogenic disturbance, biologically significant populations of wildlife receptors will not be present within the terrestrial areas of the site. Therefore, the potential ecological exposures are limited to aquatic organisms, particularly fish.

The Savannah River in the vicinity of the site is split into two channels by Hutchinson Island. The southwest channel adjacent to the site (Front River) is approximately 1,200 feet wide. This is a part of the Marsh Island Channel dredging area and is maintained by periodic dredging by the U.S. Army Corps of Engineers (USACE) to a depth between 40 feet and 43 feet. The northeast channel of the Savannah River (Back River) opposite of Hutchinson Island is approximately 1,600 feet wide, approximately 15 feet deep, and is undredged. In general, the Back River is a much more attractive aquatic habitat than the Front River because it is undredged, mostly unaltered, and has a much lower level of human disturbance.

As a whole, the Savannah River provides habitats for biologically significant populations of wildlife receptors. The recent USACE Savannah Harbor Expansion Project Final Environmental Impact Statement contains exhaustive documentation pertaining to aquatic wildlife in the area. In particular, the section of the Savannah River near the site may provide some habitat for American shad, striped bass, and sturgeon species. Fish are likely to be present within the Front River near the site at least some of the time, notwithstanding anthropogenic disturbances.

Based on a review of the USACE Savannah Harbor Expansion Project Final Environmental Impact Statement (USACE, 2012), a U.S. Fish and Wildlife Information Planning and Conservation (iPAC) report prepared for the site vicinity, and information from the Georgia Natural Heritage Program (GNHP), the shortnose sturgeon (federally and state listed as endangered) and the Atlantic sturgeon (state species of concern) may be present within the Savannah River near the site. The USACE report indicates that shortnose sturgeon feed in relatively soft sediment or gravel that may be home to established communities of benthic invertebrates. The Atlantic sturgeon is likely to feed in the same manner, given the similarity between these species.

Since the Front River is dredged to maintain its depth and has substantial maritime traffic, the community of benthic invertebrates is likely to be frequently disturbed. In addition, dredged areas tend to have consolidated sediments that are likely to be poor habitats for benthic invertebrates. Further, the fisheries maps of the USACE report indicate that, in its existing condition, the Front River near the site is: not suitable for juvenile sturgeon in January (when they might possibly be in the area); not suitable for adult sturgeon in August (because of low dissolved oxygen concentrations); and suitable habitat only for adult sturgeon and only during winter months.

As previously noted, impacts to the Savannah River (specifically Front River) have been documented and mitigated. Given the proximity to the Savannah River, the hydraulic gradient, and the direction of groundwater flow, the risk for future petroleum-related impacts to this water body exists. However, because the Front River channel adjacent to the site is a dredged, disturbed habitat that is of relatively low quality and maintains a high volume of maritime traffic, significant exposures to aquatic receptors are considered to be unlikely. Sturgeons appear to be the lone protected species that may have habitats in areas near the site. However, poor natural water quality conditions and anthropogenic conditions have resulted in areas near the site being less than optimal for sturgeon habitats.

## 3.4 Fate and Transport Modeling

Following horizontal delineation of the contaminant plume, fate and transport modeling will be conducted, if required, to substantiate the use of Type 5 risk reduction standards (RRS). The Savannah River will likely be selected as the Point of Exposure (POE). A Point of Demonstration (POD) monitoring well will likely be required to be installed downgradient of monitoring well AW-62, which has historically contained LNAPL.

## 3.5 Cleanup Standards

Axeon intends to remove LNAPL to in-well thicknesses of 1/8$^{th}$-inch or to the maximum extent practical through the use of an active LNAPL recovery system. Residual soil and groundwater contamination will be subject to Type 5 risk reduction standards (RRS). The Type 5 RRS allows contamination to remain in place, provided the principal exposure pathways at the site are mitigated by engineering and institutional controls. These controls could include, but are not limited to, a uniform environmental covenant governing site activity and use limitations (AULs), hydraulic control of the contaminant plume, restricted access, and 24-hour security measures.

# 4.0 VOLUNTARY INVESTIGATION PLAN

## 4.1 Soil

### 4.1.1 Source Zone Soil Profile

Lithologic data for a majority of the site is limited. Pursuant to gaining an understanding of site stratigraphy, contaminant source zones, and preferential flow pathways, continuous macro core samples will be collected from within the LNAPL plume. Collected samples will be visually classified in general accordance with ASTM D-2488 – 09a *"Standard Practice for Description and Identification of Soils: Visual-Manual Procedure"* and field-screened for volatile organic vapors with a MiniRaeTM 2000 Photo-Ionization Detector (PID) with a 10.6 eV lamp source. Field data will be utilized to develop additional stratigraphic cross sections (both parallel and perpendicular to the Savannah River), which will be presented in a semi-annual progress report.

### 4.1.2 Delineation

Soil samples will be collected from various locations throughout the site to identify and delineate regulated constituents. Soil sampling activities will be conducted in general accordance with ASTM D-6282-14 – *"Standard Guide for Direct-Push Soil Sampling for Environmental Site Characterizations."* Representative surface soil samples (≤ 2 feet below grade) and samples collected within the smear zone, just above the saturated zone will be submitted to an independent laboratory to be analyzed for VOCs via EPA Method 8260, SVOCs via EPA Method 8270, and Resource Conservation and Recovery Act (RCRA) metals via EPA Method 6010.

Following identification of the regulated COCs, Terracon will continue with delineation as practical (on-site and off-site if needed). For metals detected in soils (if applicable), delineation will continue if necessary until concentrations are below the concentrations reported for Georgia undisturbed native soil samples as reported in the U.S.G.S. Open File Report 8 1-197 (Boerngen and Shacklette, 1981) or such later version as may be adopted by rule or regulation of the board pursuant to O.C.G.A. § 12-8-108.1(d).

Soil exposure domains will be developed following the completion of delineation activities.

## 4.2 Groundwater

### 4.2.1 Hydraulic Conductivity

Hydraulic conductivity, or the coefficient of permeability, describes the ease with which a fluid moves through the pore spaces or fractures in the subsurface. A report by Geraghty & Miller, Inc.

dated August 16, 1995 states that a hydraulic conductivity for the site of 30 feet per day (0.011 cm/sec) was determined based on data from previous pumping tests. The accuracy of this value cannot be ascertained, given the lack of data and supporting documentation. As such, Terracon will determine a representative site hydraulic conductivity pursuant to the further development of the conceptual site model.

A representative hydraulic conductivity value will be determined by conducting rising head slug tests within various monitoring wells throughout the site. Rising head slug tests are conducted by quickly removing a known volume of water (the slug) from a monitoring well and measuring the rate at which groundwater returns to static conditions. In order to collect accurate data, a transducer with an on-board data logger will be used to collect depth to water and hydrostatic pressure data over time. Slug tests will not be conducted on wells containing LNAPL due uncertainties and risk of error.

Upon completion of the slug tests, time and depth to water data will be imported into the AQTESOLV™ aquifer software for analysis. Additional information input to the software will include the monitoring well diameter, the borehole diameter, the total depth of the monitoring well, the static water column height, the initial displacement, and an assumed gravel pack porosity. It is presumed that the Bouwer and Rice method for determining the hydraulic conductivity in an unconfined aquifer will be used.

### 4.2.2 Delineation

Groundwater samples will be collected from select existing monitoring wells throughout the site to identify and delineate regulated aqueous phase constituents. The monitoring wells will be purged and sampled in general accordance with the procedures outlined in the US Environmental Protection Agency (EPA) Science and Ecosystem Support Division (SESD) *Field Branches Quality System and Technical Procedures* (SESDPROC-301-R3, March 6, 2013). Collected groundwater samples will be submitted to an independent laboratory to be analyzed for VOCs via EPA Method 8260, SVOCs via EPA Method 8270, and Resource Conservation and Recovery Act (RCRA) metals via EPA Method 6010.

Following identification of the regulated COCs, Terracon will delineate as needed/practical (on-site and off-site). Aqueous phase delineation will be conducted utilizing direct push techniques in general accordance with ASTM D-6001-05(2012) *"Standard Guide for Direct-Push Groundwater Sampling for Environmental Site Characterization."* Terracon will also delineate the off-site extent of LNAPL impacts, as necessary.

Groundwater exposure domains will be developed following the completion of delineation activities. The installation of permanent peripheral monitoring wells, including a Point of Demonstration (POD) well, may be required.

### 4.3 Soil Gas and Indoor Air Quality

Terracon will first evaluate the vapor intrusion exposure pathway utilizing soil and groundwater data collected during delineation activities. Groundwater concentration data will be imported into the U.S. EPA Office of Solid Waste and Emergency Response (OSWER) Vapor Intrusion Screening Level (VISL) calculator, which provides a cursory evaluation screening tool for potential vapor intrusion risks. In the event the VISL calculator indicates unacceptable cumulative risks, Terracon will conduct site specific modeling utilizing the Johnson and Ettinger model (1991) or collect soil gas samples to be analyzed via EPA Method TO-15 for the site-specific regulated COCs.

If the results of modeling and/or soil gas sampling indicate an unacceptable risk of vapor intrusion, Terracon will coordinate with Axeon to determine the next steps for evaluating vapor intrusion risk and impact.

## 5.0 REMEDIATION PLAN

### 5.1 On-Going Corrective Action

As previously indicated in Section 2.4, a four month duration LNAPL gauging and removal program was initiated in June 2015. According to the specified scope of work, Terracon is to gauge the monitoring well network on a weekly basis for the presence of LNAPL. Detectable in-well LNAPL is immediately removed following the gauging event utilizing AFVR. This proactive LNAPL recovery program employs the AFVR process utilizing a high-flow, high-vacuum system. By employing an AFVR well head system along with a high-vacuum truck, LNAPL recovery is maximized. Recovered LNAPL is stored on-site within an aboveground storage tank for reuse. The objective of this scope of work is to identify and remove in-well LNAPL in order to mitigate potential off-site and downgradient impacts.

### 5.2 Remedial Design

Axeon intends to remove LNAPL to in-well thicknesses of 1/8$^{th}$-inch or to the maximum extent practical through the use of an active LNAPL recovery system. It is Terracon's understanding that a conceptual remedial design based on current site information will be completed by others. The 2013 Draft Remedial Design Report (see Appendix F) does not appear to propose an effective remedy. As such, additional site testing and evaluation will be conducted under the VRP to identify the most efficient and applicable remediation methodologies available.

Residual soil and groundwater contamination will be subject to Type 5 risk reduction standards (RRS). The Type 5 RRS allows contamination to remain in place, provided the principal threats at the site are mitigated by engineering and institutional controls. An environmental covenant will likely be executed on the site in conformance with O.C.G.A. § 44-61-1, et seq., the "Georgia Uniform Environmental Covenants Act." This covenant will require that the site land use remain industrial, no drinking water well will be installed on-site, and any future construction plans for buildings on-site will be evaluated for vapor intrusion. Other controls could include, but are not limited to hydraulic control of the contaminant plume, restricted access, and 24-hour security measures.

## 6.0 MILESTONE SCHEDULE

The schedule for the implementation of the Voluntary Investigation and Remediation Plan is presented in Appendix E. Progress reports will be submitted to the Georgia EPD on a semi-annual basis during the implementation period until the final VRP compliance status report (CSR) is submitted. A discussion of the VRP milestones is below:

- **Identification of Regulated COCs in Soil and Groundwater** – Identification of the applicable COCs will occur immediately following VRP enrollment. It is likely that this information will be acquired within 6 months after VRP enrollment and provided in the next progress report thereafter.
- **Source Zone Soil Profiling and Slug Testing** – Source zone soil profiling and slug testing activities will be conducted in conjunction with identification of the applicable COCs. This information will be developed within 6 months after VRP enrollment and provided in the next progress report thereafter.
- **Horizontal/Vertical Delineation of LNAPL, Soil, and Groundwater Impacts** – The results of on-site LNAPL, soil, and groundwater delineation will be completed within the 12 month period specified under the VRP. The results of the delineation effort will be presented in a progress report submitted in a subsequent progress report.

  The results of off-site LNAPL, soil, and groundwater delineation will be completed within the 24 month period specified under the VRP. The results of the delineation effort will be presented in a progress report submitted in a subsequent progress report.
- **Evaluation of the Vapor Intrusion Exposure Pathway** – Evaluation of the vapor intrusion exposure pathway will be conducted in conjunction with horizontal delineation activities. Modeling and/or analytical results will be completed within 12 months following VRP enrollment and submitted in a subsequent progress report.
- **Updated CSM Submittal with Final Remediation Plan** – An updated CSM and final remediation plan will be submitted within 30 months following VRP enrollment. A Uniform Environmental Covenant will be prepared and executed in conjunction with this submittal.

- **VRP Compliance Status Report** – A VRP CSR certifying compliance with applicable rules and regulations will be submitted within 60 months following VRP enrollment.

# 7.0 REFERENCES


- Gas Hole by Riverbank Internal Memorandum, prepared by Amoco, dated October 18, 1989
- Recovery System Operation and Maintenance, prepared by Bechtel Environmental, Inc., dated March 1991
- Estimated Areal Extent – Free Product Plumes map, prepared by Westinghouse Environmental and Geotechnical Services, Inc., dated October 31, 1991
- Report of Site Evaluation and Remedial Alternatives Evaluation, prepared by Geraghty & Miller, Inc., dated August 16, 1995
- Poly Wall Location Map, prepared by Horizontal Technologies, Inc., dated January 1996
- Water Elevation/Hydrocarbon Thickness Monitoring Report, prepared by S&ME, Inc., dated October 31, 2003
- January through July 2009 Field Work Summary, prepared by Conestoga-Rovers & Associates, dated November 10, 2009
- Groundwater and LNAPL Gauging Event, prepared by Ash Creek Associates, Inc., dated September 7, 2010
- Well Installation, SPH Gauging, and Remedial Options Evaluation Report, prepared by Apex Companies, LLC, dated August 8, 2012
- Draft Remedial Design Report, prepared by Apex Companies, LLC, dated June 14, 2013
- Free Product Survey of Existing Monitoring Wells, prepared by Terracon Consultants, Inc., dated May 28, 2015
- Monthly Free Product Measurement and Removal Summary Report, prepared by Terracon Consultants, Inc., dated July 31, 2015
- Chowns, T.M., and Williams, C.T., 1983, Pre-Cretaceous rocks beneath the Georgia Coastal Plain- Regional Implications: *in* Gohn, G.S., *ed.,* Studies related to the Charleston, South Carolina Earthquake of 1886-tectonics and seismicity: U.S. Geologic Survey Professional Paper, p. L1- L42
- Clarke, J.S., Cherry, G.C., and Gonthier, G.J., 2011, Hydrogeology and water quality of the Floridan aquifer system and effects of Lower Floridan aquifer pumping on the Upper Floridan aquifer at Fort Stewart, Georgia: U.S. Geological Survey Scientific Investigations Report 2011–5065, p. 59

- Clarke, W.Z., and Zisa, A.C., 1976, *Physiographic Map of Georgia*: Georgia Department of Natural Resources, 1 Plate.
- Deutsch, W.J., 1997, Groundwater Geochemistry: Fundamentals and Applications to Contamination, CRC Press, Boca Raton, p. 221
- Fetter, C.W., 1994, Applied Hydrogeology: 3rd Edition, Prentice Hall, Upper Saddle River, p. 691
- Furlow, J.W., 1969, Stratigraphy and Economic Geology of the Eastern Chatham County Phosphate Deposit: Georgia Department of Natural Resources, Division of Mines, Mining, and Geology Bulletin 82, 40 pages.
- Georgia Department of Natural Resources (GDNR), 2008, Georgia Department of Natural Resources Environmental Protection Division, Permit to Use Groundwater, Permit No. 025-0012.
- Georgia Department of Natural Resources (GDNR), 1976, Geologic Map of Georgia, Atlanta, Georgia.
- Georgia Department of Natural Resources (GDNR), 2012, Georgia Department of Natural Resources Wildlife Resources Division, Georgia Rare Species and Natural Community Data, County Rare Elements
- Georgia Department of Natural Resources (GDNR), 2012, Georgia Department of Natural Resources Wildlife Resources Division, Georgia Rare Species and Natural Community Data, HUC8 Watershed Rare Elements
- Herrick, S.M., 1961, Well Logs of the Coastal Plain of Georgia: Georgia Geologic Survey Bulletin 70, 426 p.
- Herrick, S.M., 1965, A subsurface study of Pleistocene deposits in coastal Georgia: Georgia Dept. of Natural Resources, Division of Mines, Mining, and Geology Information Circular 31, 8 p.
- Herrick, S.M., and Vorhes, R.C., 1963, Subsurface Geology of the Georgia Coastal Plain, Georgia: State Division Conservation, Department of Mines, Mining and Geology, Geological Survey Information Circular 25, 79 p.
- Huddlestun, P.F., 1988, A revision of the Lithostratigraphic Units of the Coastal Plain of Georgia, the Miocene through Holocene: Georgia Geologic Survey Bull 104, 162 p.
- Huddlestun, P.F., 1993, A Revision of the Lithostratigraphic Units of the Coastal Plain of Georgia: Georgia Geologic Survey Bulletin 105, p. 152.
- Krause, R.E., and Randolph, R.B., 1989, Hydrology of the Floridian Aquifer System in Southeast Georgia and Adjacent Parts of Florida and South Carolina: U.S. Geologic Survey Professional Paper 1403-D, 65 pages.

- National Wetlands Inventory, 2015, U.S. Fish and Wildlife Services, National Wetlands Inventory, Wetlands Mapper
- United States Army Corps of Engineers (USACE), 1998, Potential Ground-Water Impacts-Savannah Harbor Expansion Feasibility Study: U.S. Army Corp of Engineers, Savannah District, Savannah, Georgia
- United States Army Corps of Engineers (USACE), 2012, Final Environmental Impact Statement for Savannah Harbor Expansion Project, Chatham County, Georgia and Jasper County South Carolina
- United States Geologic Survey (USGS), 2015, National Water Information System: Mapper.
- Weems, R.E., and Edwards, L.E., 2001, Geology of Oligocene, Miocene, and Younger Deposits in the Coastal Area of Georgia: Georgia Geologic Survey Bulletin 131, 124 p.
- Williams, L.J., and Gill, H.E., 2010, Revised hydrogeologic framework of the Floridan aquifer system in the northern coastal area of Georgia and adjacent parts of South Carolina: U.S. Geological Survey Scientific Investigations Report 2010–5158, 103 p., 3 plates.

# APPENDIX A

VOLUNTARY REMEDIATION PROGRAM APPLICATION AND CHECKLIST
APPLICATION FEE CHECK

# Voluntary Investigation and Remediation Plan Application Form and Checklist

| VRP APPLICANT INFORMATION | | | | | |
|---|---|---|---|---|---|
| COMPANY NAME | AXEON SPECIALTY PRODUCTS | | | | |
| CONTACT PERSON/TITLE | JANET FERRIS/HSE SENIOR MANAGER | | | | |
| ADDRESS | 4 PARADISE ROAD, PAULSBORO, NEW JERSEY 08066 | | | | |
| PHONE | (856) 224 7405 | FAX | | E-MAIL | janet.ferris@axeonsp.com |

| GEORGIA CERTIFIED PROFESSIONAL GEOLOGIST OR PROFESSIONAL ENGINEER OVERSEEING CLEANUP | | | | | |
|---|---|---|---|---|---|
| NAME | WILLIAM S. ANDERSON, III, P.E. | | GA PE/PG NUMBER | 20997 | |
| COMPANY | TERRACON CONSULTANTS, INC. | | | | |
| ADDRESS | 2201 ROWLAND AVENUE, SAVANNAH, GEORGIA 31404 | | | | |
| PHONE | (912) 629 4000 | FAX | (912) 629 4001 | E-MAIL | wsanderson@terracon.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 | Darius Sweet | | |
| APPLICANT'S NAME/TITLE (PRINT) | DARIUS SWEET/EVP & PRESIDENT OF REFINING AND SUPPLY | DATE 8/13/15 | |

| QUALIFYING PROPERTY INFORMATION (For additional qualifying properties, please refer to the last page of application form) | | | |
|---|---|---|---|
| **HAZARDOUS SITE INVENTORY INFORMATION (if applicable)** | | | |
| HSI Number | N/A | Date HSI Site listed | N/A |
| HSI Facility Name | N/A | NAICS CODE | N/A |
| **PROPERTY INFORMATION** | | | |
| TAX PARCEL ID | 1-065-01-001 & 1-065-01-001L | PROPERTY SIZE (ACRES) | 66.82 ACRES |
| PROPERTY ADDRESS | 7 FOUNDATION DRIVE | | |
| CITY | SAVANNAH | COUNTY | CHATHAM |
| STATE | GEORGIA | ZIPCODE | 31408 |
| LATITUDE (decimal format) | 32.108612 | LONGITUDE (decimal format) | -81.126684 |
| **PROPERTY OWNER INFORMATION** | | | |
| PROPERTY OWNER(S) | AXEON SPECIALTY PRODUCTS | PHONE # | (856) 224 7405 |
| MAILING ADDRESS | 4 PARADISE ROAD | | |
| CITY | PAULSBORO | STATE/ZIPCODE | NEW JERSEY/08066 |

| 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. (PLEASE LIST CHECK DATE AND CHECK NUMBER IN COLUMN TITLED “LOCATION IN VRP.” PLEASE DO NOT INCLUDE A SCANNED COPY OF CHECK IN ELECTRONIC COPY OF APPLICATION.) | **ATTACHED** Check Date: 7/30/2015 Check Number 21510045 | |
| **2.** | **WARRANTY DEED(S)** FOR QUALIFYING PROPERTY. | **APPENDIX B** | |
| **3.** | **TAX PLAT** OR OTHER FIGURE INCLUDING QUALIFYING PROPERTY BOUNDARIES, ABUTTING PROPERTIES, AND TAX PARCEL IDENTIFICATION NUMBER(S). | **APPENDIX 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). | **ENCLOSED** | |
| **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 | **ENCLOSED** | |

| | | | |
|---|---|---|---|
| | during the preceding period. A Gantt chart format is preferred for the milestone schedule.<br><br>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: | | |
| **5.a.** | 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 6.0** | |
| **5.b.** | 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 6.0** | |
| **5.c.** | 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 6.0** | |
| **5.d.** | Within 60 months after enrollment, the participant must submit the compliance status report required under the VRP, including the requisite certifications. | **SECTION 6.0** | |
| **6.** | **SIGNED AND SEALED PE/PG CERTIFICATION** AND SUPPORTING DOCUMENTATION:<br><br>"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.<br><br>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.<br><br>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."<br><br>William S. Anderson, III, 20997<br>Printed Name and GA PE/PG Number<br><br>8-8-15<br>Date<br><br>Signature and Stamp<br><br>GEORGIA REGISTERED No. 20997 PROFESSIONAL ENGINEER WILLIAM S. ANDERSON III | **ENCLOSED** | |

# APPENDIX B

TAX PLAT AND WARRANTY DEED

# 2015 Chatham County Board of Assessors — 1-0605-01-001

## Property Record Card — 7 FOUNDATION RD SAVANNAH

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| APPRAISER | swcorcor | PART FOUNDATION TRACT | AXEON REFINING LLC<br>2338 NORTH LOOP 1604 W<br>SUITE 350<br>SAN ANTONIO TX 78248 | CAMA | ASMT | | |
| LAST INSP | 06/26/2014 | | | 4,123,400 | 4,123,400 | LAND | 4 |
| APPR ZONE | 000009 | | | 995,800 | 1,004,800 | BLDG | 20 |
| | | | | 3,605,100 | 3,608,800 | OBXF | 51 |
| | | | | 8,724,300 | 8,737,000 | OVERRIDE | |

| SALES | BOOK / PAGE | INS | VI | QU | RSN | PRICE |
|---|---|---|---|---|---|---|
| 15 Apr 2014 | 339A 761 | NA | I | U | UR | |
| *GRANTOR:NUSTAR ASPHALT REFINING LLC GRANTEE:AXEON REFINING LLC* | | | | | | |
| 01 Jan 2008 | 339A 0761 | WD | I | U | UR | 7,865,000 |
| *GRANTOR:CITGO ASPHALT COMPANY GRANTEE:NUSTAR ASPHALT REFINING* | | | | | | |
| 29 Apr 1993 | 159U 0093 | WD | I | U | UO | 12,500,000 |
| *GRANTOR:AMERICAN OIL COMPANY GRANTEE:CITGO ASPHALT COMPANY* | | | | | | |

[Click for larger picture]

| CODES | | |
|---|---|---|
| PROPERTY USE | 0004 | INDUSTRIAL |
| UTA | 0001 | UnIncorporated |
| NBHD | 009900.00 | I900 WATERFRONT (HVY |
| EXEMPTIONS | | |
| COMMCATEG | 495 | Industrials, Heavy Mftg. |
| SAVINDZN | SIZ | Savannah Industrial Zone |

| PERMITS | TYPE | DATE | | AMOUNT |
|---|---|---|---|---|
| 09-01353 | CM | 23 Feb 2012 | Comp | 68,000 |
| 11-00185 | CM | 01 Jan 2012 | Comp | 549,709 |
| 04-00985 | RN | 01 Jan 2005 | Comp | 132,724 |
| 04-01392 | EL | 01 Jan 2005 | Comp | 990 |
| 94-01733 | CM | 01 Jan 1996 | Comp | 354,367 |
| 86-27705 | CM | 01 Jan 1988 | Comp | |
| 86-26940 | CM | 01 Jan 1987 | Comp | |
| 77-19289 | CM | 01 Jan 1978 | Comp | 8,400 |
| 76-17457 | CM | 01 Jan 1977 | Comp | 49,100 |

| HISTORY | LAND | IMPR | TOTAL | |
|---|---|---|---|---|
| 2014 | 4,123,400 | 6,420,900 | 10,544,300 | Cama |
| 2014 | 4,123,400 | 4,613,600 | 8,737,000 | Over |
| 2013 | 4,123,400 | 6,456,300 | 10,579,700 | Cama |
| 2012 | 4,123,400 | 6,383,300 | 10,506,700 | Cama |
| 2011 | 4,123,500 | 5,659,000 | 9,782,500 | MAV |
| 2010 | 4,123,500 | 5,659,000 | 9,782,500 | MAV |
| 2009 | 4,123,500 | 5,659,000 | 9,782,500 | Over |
| 2008 | 4,123,500 | 5,659,000 | 9,782,500 | Cama |
| 2007 | 3,550,500 | 4,166,000 | 7,716,500 | Cama |
| 2006 | 3,550,500 | 4,166,000 | 7,716,500 | Cama |
| 2005 | 3,550,500 | 4,166,000 | 7,716,500 | Cama |
| 2004 | 3,550,500 | 4,142,500 | 7,693,000 | Cama |
| 2003 | 3,550,500 | 4,142,500 | 7,693,000 | Cama |
| 2002 | 3,550,500 | 4,142,500 | 7,693,000 | Cama |
| 2001 | 3,550,500 | 4,215,500 | 7,766,000 | Cama |
| 2000 | 3,550,500 | 4,215,500 | 7,766,000 | Cama |
| 1999 | 3,550,500 | 4,215,500 | 7,766,000 | Cama |
| 1998 | 3,550,500 | 4,256,500 | 7,807,000 | Cama |
| 1997 | 3,550,500 | 4,236,000 | 7,786,500 | Cama |
| 1996 | 3,550,330 | 4,263,280 | 7,813,610 | Cama |
| 1995 | 3,550,330 | 4,218,370 | 7,768,700 | Cama |
| 1994 | 3,550,330 | 4,191,560 | 7,741,890 | Over |
| 1993 | 3,550,330 | 4,191,560 | 7,741,890 | Over |
| 1992 | 3,550,330 | 2,196,010 | 5,746,340 | Over |

| COMMENTS: | |
|---|---|
| 14 Nov 2014 | TY15 NAME CHANGE PER MERGER & SOS |
| 26 Jun 2014 | 06/26/2014 PLANT VISIT BY STEVE CORCORAN AND VICTORIA MCCUEN. PLANT IS OPERATIONAL AS AXEON SPECIALTY PRODUCTS. |
| 26 Jun 2014 | AXEON SPECIALTY PRODUCTS WAS PART OF CITGO ASPHALT; THE COMPANY WAS ACQUIRED BY NUSTAR ASPHALT, WHO SOLD 50% TO LINDSAY GOLDBERG LLC TO FORM NUSTAR ASPHALT. LINDSAY GOLDBERG THEN PURCHASED THE COMPANY OUTRIGHT IN FEBRUARY 2014, NAMING IT AXERON SPECIALTY PRODUCTS. |
| 26 Jun 2014 | 06/26/2014 PLANT IS OPERATING AS AXEON, PER PUBLIC AFFAIRS DIRECTOR. |
| 07 Apr 2014 | TY14 RET VAL ENT |
| 03 Mar 2009 | 12/04/2007 LN. ADD CHG PER FORM 08/07/08 DLB. 03/02/2009 Plant visited so as to review tanks; tank data is updated as per Tank Schedule revised 12/31/2008. |
| 07 Aug 2008 | 1991 29.51 Ac split to parcel |
| 04 Dec 2007 | TY08 COA PER WRITTEN INSTR |
| 09 Feb 2000 | 1-0623-01-004. |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43494 | 21974 | AWN STY 14 ST AVG<br>*Awning on north side.* | 13 | 17 | 221.00 | 3 | 12.13 | 2,681 | 1930 | 1930 | 35 | | | | | 536 | 500 |
| 43495 | 21978 | AWN STY 14 ST AVG | 18 | 6 | 108.00 | 3 | 12.13 | 1,310 | 1978 | 1978 | 45 | | | | | 511 | 500 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43496 | 21978 | AWN STY 14 ST AVG | 4 | 4 | 16.00 | 3 | 12.13 | 194 | 1978 | 1978 | 45 | | | 76 | 100 |
| 43497 | 21978 | Storage/Utility avg<br>*Behind Building #10.* | 10 | 10 | 100.00 | 3 | 9.84 | 984 | 1978 | 1978 | 20 | | | 197 | 200 |
| 43498 | 21979 | AWN STY 14 ST AVG<br>*In front of Building #11.* | 73 | 5 | 365.00 | 3 | 12.13 | 4,427 | 1987 | 1987 | 35 | | | 1,727 | 1,600 |
| 43499 | 21981 | CAN STY 14 ST AVG<br>*Loading Rack Canopy* | 62 | 38 | 2356.00 | 3 | 24.25 | 57,133 | 1992 | 1992 | 35 | | | 31,423 | 28,300 |
| 43500 | 21981 | Uncoded Feature<br>*Description=Loading Rack Office Section 64, Page* | 0 | 0 | 100.00 | 3 | 98.38 | 9,838 | 1992 | 1992 | 35 | | | 5,411 | 4,900 |
| 43501 | 21981 | Uncoded Feature<br>*Description=40 Ton Truck Scale Section 17, Page 5* | 0 | 0 | 1.00 | 3 | 30,600.00 | 30,600 | 1992 | 1992 | 35 | | | 16,830 | 15,100 |
| 43502 | 21981 | Uncoded Feature<br>*Description=40 Ton Truck Scale Section 17, Page 5* | 0 | 0 | 1.00 | 3 | 30,600.00 | 30,600 | 1992 | 1992 | 35 | | | 16,830 | 15,100 |
| 43503 | | Uncoded Feature<br>*Description=40 Ton Truck Scale Section 17, Page 5* | 0 | 0 | 1.00 | 3 | 30,600.00 | 30,600 | 1930 | 1930 | 35 | | | 6,120 | 5,500 |
| 43504 | 21984 | AWN STY 14 ST AVG<br>*In front of Building #16.* | 8 | 4 | 32.00 | 3 | 12.13 | 388 | 1986 | 1986 | 45 | | | 233 | 200 |
| 43505 | 21985 | Dock 4"Heavy piling<br>*Section 67, Page 5.* | 0 | 0 | 25276.00 | 3 | 65.50 | 1,655,578 | 1970 | 1970 | 35 | | | 331,116 | 298,000 |
| 43506 | 21987 | AWN STY 14 ST AVG<br>*In front of Building #19* | 6 | 6 | 36.00 | 3 | 12.13 | 437 | 1994 | 1994 | 50 | | | 363 | 300 |
| 43507 | 21987 | CONCRETE SLAB 4"<br>*In front of Building #19* | 6 | 6 | 36.00 | 3 | 2.43 | 87 | 1994 | 1994 | 50 | | | 72 | 100 |
| 43508 | 21987 | AWN STY 14 ST AVG<br>*North side of Bldg. #19.* | 6 | 4 | 24.00 | 3 | 12.13 | 291 | 1994 | 1994 | 50 | | | 242 | 200 |
| 43509 | 21987 | CONCRETE SLAB 4"<br>*North side of Bldg. #19.* | 6 | 4 | 24.00 | 3 | 2.43 | 58 | 1994 | 1994 | 50 | | | 48 | |
| 43510 | 21987 | AWN STY 14 ST AVG<br>*South side of Bldg. #19.* | 45 | 4 | 180.00 | 3 | 12.13 | 2,183 | 1994 | 1994 | 50 | | | 1,812 | 1,600 |
| 43511 | 21987 | CONCRETE SLAB 4"<br>*South side of Bldg. #19.* | 45 | 4 | 180.00 | 3 | 2.43 | 437 | 1994 | 1994 | 50 | | | 363 | 300 |
| 43512 | | 6'CL FENCE 3 BARB W<br>*Perimeter Fence.* | 8180 | 0 | 8180.00 | 3 | 14.50 | 118,610 | 1985 | 1985 | 20 | | | 23,722 | 21,300 |
| 43513 | | Uncoded Feature<br>*Description=Railroad Spur Section 66, Page 3* | 2100 | 0 | 2100.00 | 3 | 77.13 | 161,973 | 1953 | 1953 | 35 | | | 32,395 | 29,200 |
| 43514 | | CONCRETE PAVE 500 | 0 | 0 | 7200.00 | 3 | 2.73 | 19,656 | 1953 | 1953 | 35 | | | 3,931 | 3,500 |
| 43515 | | ASPHALT PAVE TO 500 | 0 | 0 | 7900.00 | 3 | 1.46 | 11,534 | 1953 | 1953 | 20 | | | 2,307 | 2,100 |
| 43516 | | Uncoded Feature<br>*Description=Seawall - Rubble Section 51, Page 4* | 400 | 0 | 400.00 | 3 | 545.00 | 218,000 | 1953 | 1953 | 35 | | | 43,600 | 39,200 |
| 43517 | | Uncoded Feature<br>*Description=Tank #1 77,077 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 551,565.00 | 551,565 | 2008 | 2008 | | OC | 98.00 | 540,534 | 486,500 |
| 43521 | | Uncoded Feature<br>*Description=Tank #5 73,715 BBLs / S61 P5* | 0 | 0 | 1.00 | 3 | 530,860.00 | 530,860 | 1929 | 1929 | | OC | 50.00 | 265,430 | 238,900 |
| 43525 | | Uncoded Feature<br>*Description=Tank #9 77,831 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 556,217.00 | 556,217 | 1957 | 1957 | | OC | 50.00 | 278,109 | 250,300 |
| 43526 | | Uncoded Feature<br>*Description=Tank #10 77,282 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 552,830.00 | 552,830 | 1948 | 1948 | | OC | 50.00 | 276,415 | 248,800 |
| 43528 | | Uncoded Feature<br>*Description=Tank #17 18,031 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 193,845.00 | 193,845 | 1939 | 1939 | | OC | 50.00 | 96,923 | 87,200 |
| 43529 | | Uncoded Feature<br>*Description=Tank #18 19,401 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 202,476.00 | 202,476 | 1970 | 1970 | | OC | 50.00 | 101,238 | 91,100 |
| 43530 | | Uncoded Feature<br>*Description=Tank #19 33,374 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 291,105.00 | 291,105 | 1970 | 1970 | | OC | 50.00 | 145,553 | 131,000 |
| 43533 | | Uncoded Feature<br>*Description=Tank #24 1,626 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 53,890.00 | 53,890 | 1935 | 1935 | | OC | 50.00 | 26,945 | 24,300 |
| 43535 | | Uncoded Feature<br>*Description=Tank #40 8,654 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 124,867.00 | 124,867 | 1993 | 1993 | | OC | 50.00 | 62,434 | 56,200 |
| 43536 | | Uncoded Feature<br>*Description=Tank #50 157,999 BBLs/ S61 P5* | 0 | 0 | 1.00 | 3 | 1,022,336.00 | 1,022,336 | 1980 | 1980 | | OC | 50.00 | 511,168 | 460,100 |
| 43537 | | Uncoded Feature<br>*Description=Tank #51 76,736 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 549,461.00 | 549,461 | 1985 | 1985 | | OC | 50.00 | 274,731 | 247,300 |
| 43538 | | | 0 | 0 | 1.00 | 3 | 551,993.00 | 551,993 | 1987 | 1987 | | OC | 50.00 | 275,997 | 248,400 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Uncoded Feature *Description=Tank #52 77,135 BBLs / Sect 61 P5* | | | | | | | | | | | | | |
| 43539 | | Uncoded Feature *Description=Tank #150 2,500 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 73,250.00 | 73,250 | 1952 | 1952 | | OC | 50.00 | 36,625 | 33,000 |
| 43540 | | Uncoded Feature *Description=Tank #302 2,585 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 74,015.00 | 74,015 | 1954 | 1954 | | OC | 50.00 | 37,008 | 33,300 |
| 43541 | | Uncoded Feature *Description=Tank #200 3,774 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 85,684.00 | 85,684 | 1952 | 1952 | | OC | 50.00 | 42,842 | 38,600 |
| 43542 | | Uncoded Feature *Description=Tank #324 2,611 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 74,249.00 | 74,249 | 1959 | 1959 | | OC | 50.00 | 37,125 | 33,400 |
| 43543 | | Uncoded Feature *Description=Tank #325 475 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 21,729.00 | 21,729 | 1959 | 1959 | | OC | 50.00 | 10,865 | 9,800 |
| 43545 | | Uncoded Feature *Description=Tank #413 300 BBLs / Sect 61 P5* | 0 | 0 | 1.00 | 3 | 14,583.00 | 14,583 | 1992 | 1992 | | OC | 50.00 | 7,292 | 6,600 |
| 43546 | | Uncoded Feature *Description=Tank #414 1,050 GAL / Horizontal* | 0 | 0 | 1.00 | 3 | 2,325.00 | 2,325 | 1990 | 1990 | | OC | 50.00 | 1,163 | 1,000 |
| 43547 | | Uncoded Feature *Description=Tank #55 12,000 GAL / Fibergalss* | 0 | 0 | 1.00 | 3 | 14,275.00 | 14,275 | 1987 | 1987 | 20 | | | 2,855 | 2,600 |
| 43548 | | Uncoded Feature *Description=Tank #53 77,135 BBLs / S61 P5* | 0 | 0 | 1.00 | 3 | 551,993.00 | 551,993 | 2000 | 2000 | | OC | 50.00 | 275,997 | 248,400 |
| 43549 | | Uncoded Feature *Description=Tank #73 5,000 BBLs / Polymer* | 0 | 0 | 1.00 | 3 | 97,250.00 | 97,250 | 1997 | 1997 | | OC | 50.00 | 48,625 | 43,800 |
| 43550 | | Uncoded Feature *Description=Tank #74 5,000 BBLs / Polymer* | 0 | 0 | 1.00 | 3 | 97,250.00 | 97,250 | 1997 | 1997 | | OC | 50.00 | 48,625 | 43,800 |
| 43552 | | Uncoded Feature *Description=Tank #100 9,000 BBLs / S61 P5* | 0 | 0 | 1.00 | 3 | 128,500.00 | 128,500 | 1980 | 1980 | | OC | 50.00 | 64,250 | 57,800 |
| 43554 | | Uncoded Feature *Description=Tank #411 588 BBLs / S61 P5* | 0 | 0 | 1.00 | 3 | 25,390.00 | 25,390 | 1979 | 1979 | | OC | 50.00 | 12,695 | 11,400 |
| 43555 | | Uncoded Feature *Description=Tank #412 5,600 Gal / Fiberglass* | 0 | 0 | 1.00 | 3 | 6,765.00 | 6,765 | 1990 | 1990 | 20 | | | 1,353 | 1,200 |
| 43556 | | Uncoded Feature *Description=Tank #415 5'4" X 12' Horizontal* | 0 | 0 | 1.00 | 3 | 2,875.00 | 2,875 | 1980 | 1980 | | OC | 50.00 | 1,438 | 1,300 |
| 43558 | 21969 | Comm porch avg | 25 | 5 | 125.00 | 3 | 11.68 | 1,460 | 2004 | 2004 | 50 | | | 1,372 | 1,200 |

**LAND**

| ID# | USE DESC | FRONT | DEPTH | UNITS / TYPE | PRICE | ZONING | LCTN | TOPO | OTHER | ADJ1 | ADJ2 | ADJ3 | ADJ4 | MKT VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25660 | MANUFACTURING HEAVY | 0 | 0 | 3.50-AC | 1500.00 | I-H | | | | | | | | 5300 |
| 25661 | MANUFACTURING HEAVY | 0 | 0 | 35.00-AC | 80000.00 | I-H | | | | | | | | 2800000 |
| 25662 | MANUFACTURING HEAVY | 0 | 0 | 15.00-AC | 45000.00 | I-H | | | | | | | | 675000 |
| 25663 | MANUFACTURING HEAVY | 0 | 0 | 14.29-AC | 45000.00 | I-H | | | | | | | | 643100 |

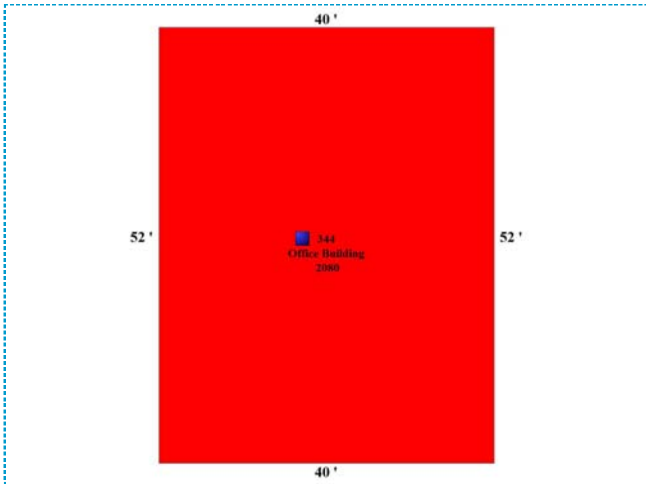
## 2015 Chatham County Board of Assessors

### Property Record Card

## 1-0605-01-001

### 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 110461-1-2015 | Commercial | 315,993 | 2011 | | MS | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 312,833 | | 312,833 |



[Click for larger picture]

DCS CONTROL ROOM; CONSTRUCTED IN 2011 (SEE BUILDING PERMIT #11-00185); SUSPENDED TILE CEILING; CHAC; KITCHEN AREA; TWO RESTROOMS; MUCH ELECTRICAL TO ACCOMODATE COMPUTERS AND ELECTRONIC EQUIPTMENT.

| | |
|---|---|
| AREA | 2080 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 184 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 344 | Office Building | 2080 | 100.00 | D | 10.00 | 4.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C2 | 611 | Package Unit | | 100.00 | 4.00 |
| C1 | 896 | Stud Walls-Wood Siding | | 100.00 | 2.00 |

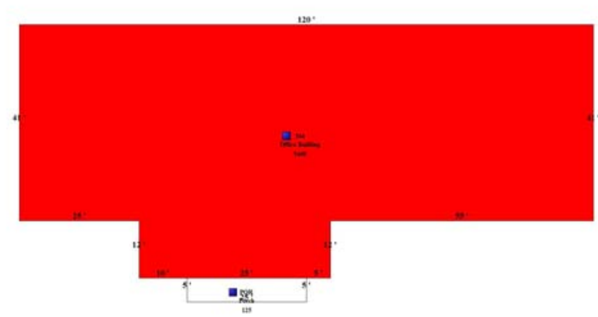
# 2015 Chatham County Board of Assessors

## 1-0605-01-001

### Property Record Card

### 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21969-1-2015 | Commercial | 446,148 | 1930 | 1975 | MS | 56.00 | 0.00 | 0.00 | 0.00 | 56.00 | 196,305 | 1.00 | 196,305 |



[Click for larger picture]

Main Office (Building #1). One story concrete block; 8' height; built in 1930; effective age 1975; conduit wiring & fluorescent lights; central forced air system; thirteen plumbing fixtures; drywall partitions and suspended acoustical tile ceiling; a

| | |
|---|---|
| AREA | 5400 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 346 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 344 | Office Building | 5400 | 100.00 | C | 8.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C2 | 611 | Package Unit | | 100.00 | |
| C1 | 812 | Concrete Block | | 100.00 | |

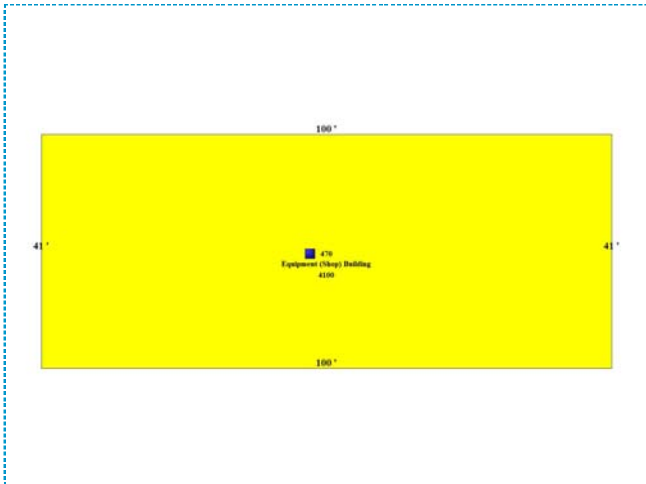
# 2015 Chatham County Board of Assessors

# 1-0605-01-001

## Property Record Card

## 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION 21970-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 92,414 | 1930 | 1965 | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 18,483 | 1.00 | 18,483 |




[Click for larger picture]

Shop (Building #2). One story metal; 8' height; built in 1930; corrugated metal siding on steelframe; reinforced concrete slab; space heat; conduit wiring & fluorescent lighting. NOTE: This structure adjoins Building #1. See "DRAW" Screen #3 - "Plot

| | |
|---|---|
| AREA | 4100 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 282 |

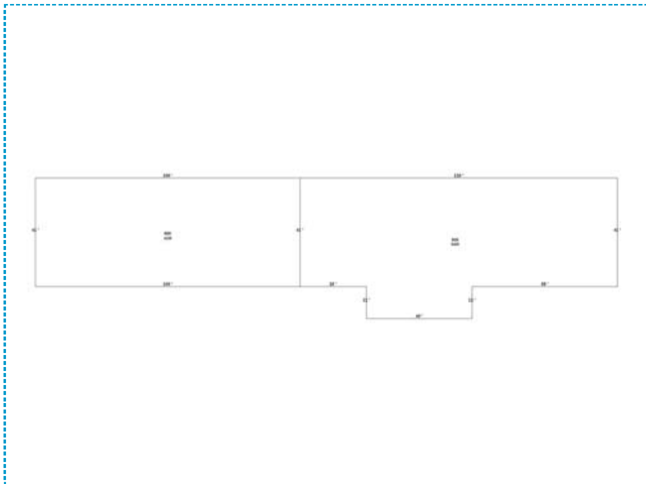
| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 470 Equipment (Shop) Building | 4100 | 100.00 | S | 8.00 | 2.00 |

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

## 2015 Chatham County Board of Assessors
**Property Record Card**

## 1-0605-01-001
**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21971-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Drawing Only | NaN | | | MS | | 0.00 | 0.00 | 0.00 | | NaN | | NaN |



[Click for larger picture]

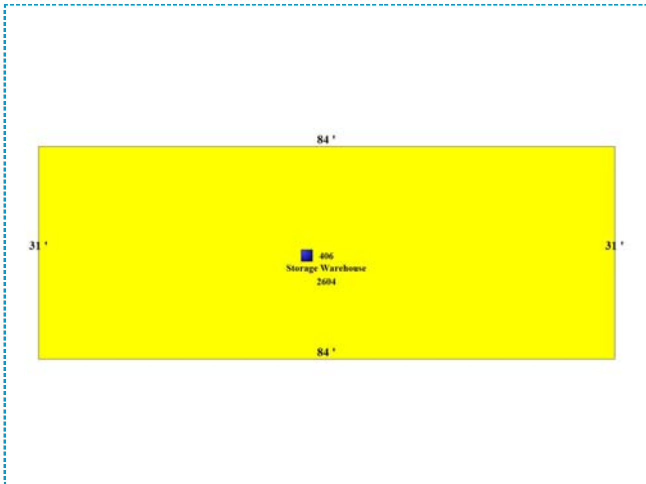
"DRAW" Screen #3 - "Plot Plan". BD1 represents Building #1. BD2 represents Building #2.

| COMPONENTS | Units | % | QUAL |
|---|---|---|---|

## 2015 Chatham County Board of Assessors
**Property Record Card**

## 1-0605-01-001
**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21972-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 106,790 | 1953 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 21,358 | 1.00 | 21,358 |




[Click for larger picture]

Warehouse (Building #4). One story concrete block; 10' height; built in 1953; painted concrete block walls; reinforced concrete slab; double pitch metal roof on wood purlins & timber trusses; conduit wiring andfluorescent & incandescent lighting; ste

| | |
|---|---|
| AREA | 2604 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 230 |

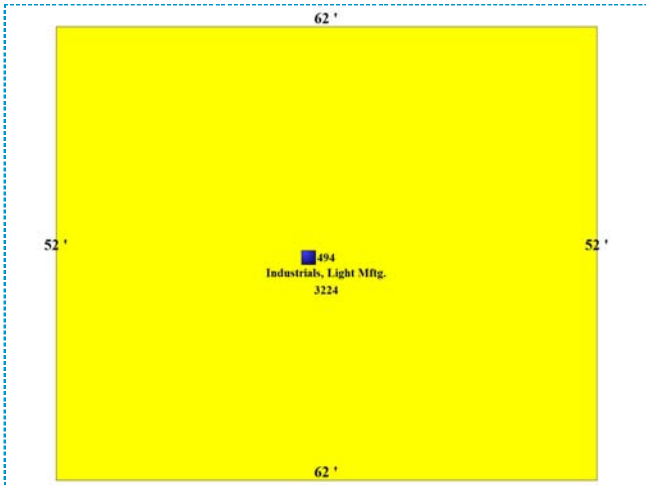
| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 406 | Storage Warehouse | 2604 | 100.00 | C | 10.00 | 2.00 |

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

## 2015 Chatham County Board of Assessors **1-0605-01-001**

**Property Record Card** **7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21973-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 202,274 | 1930 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 40,455 | 1.00 | 40,455 |




[Click for larger picture]

Boiler Room (Building #5). One story metal; 30' height; built in 1930; corrugated metal siding on steelframe; reinforced concrete slab; double pitch metal roof; conduit wiring with fluorescent & incandescentlighting. This structure combines with Buil

| | |
|---|---|
| AREA | 3224 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 228 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 494 Industrials, Light Mftg. | 3224 | 100.00 | S | 30.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

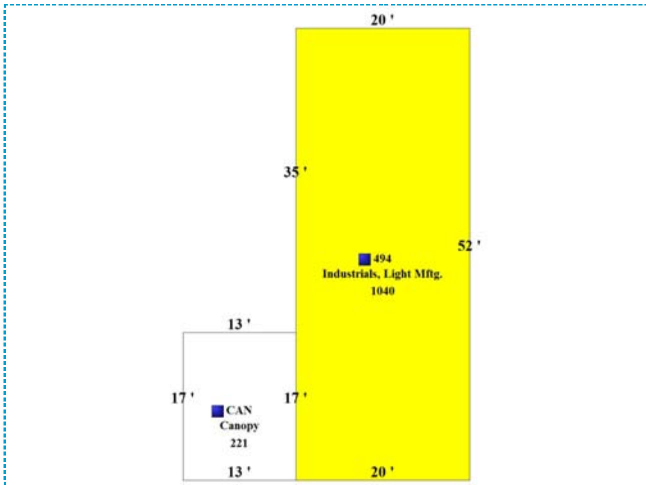
# 2015 Chatham County Board of Assessors

# 1-0605-01-001

## Property Record Card

## 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION 21974-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 59,404 | 1930 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 11,881 | 1.00 | 11,881 |




[Click for larger picture]

Boiler Room (Building #6). One story metal; 14' height; built in 1930; corrugated metal siding on steelframe; reinforced concrete slab; double pitch metal roof; conduit wiring with fluorescent & incandescentlighting; OHD RSC 8' X 12'. This structure

| | |
|---|---|
| AREA | 1040 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 144 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 494 Industrials, Light Mftg. | 1040 | 100.00 | S | 14.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

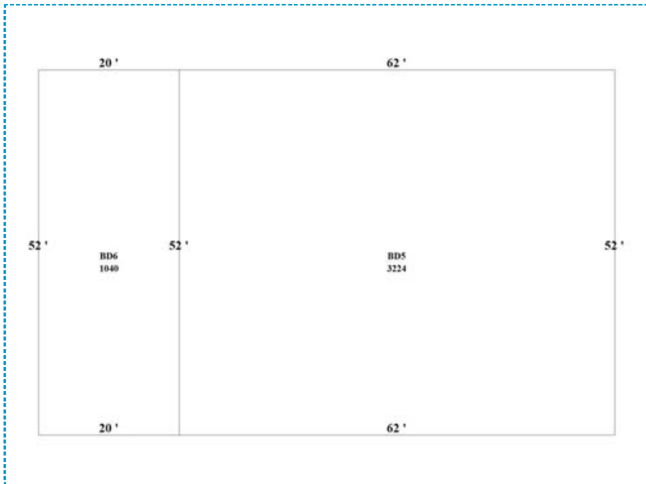
# 2015 Chatham County Board of Assessors

**1-0605-01-001**

## Property Record Card

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21975-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Drawing Only | NaN | | | MS | | 0.00 | 0.00 | 0.00 | | NaN | | NaN |




[Click for larger picture]

"DRAW" Screen #7 - "Plot Plan". BD5 represents Building #5. BD6 represents Building #6.

| COMPONENTS | Units | % | QUAL |
|---|---|---|---|

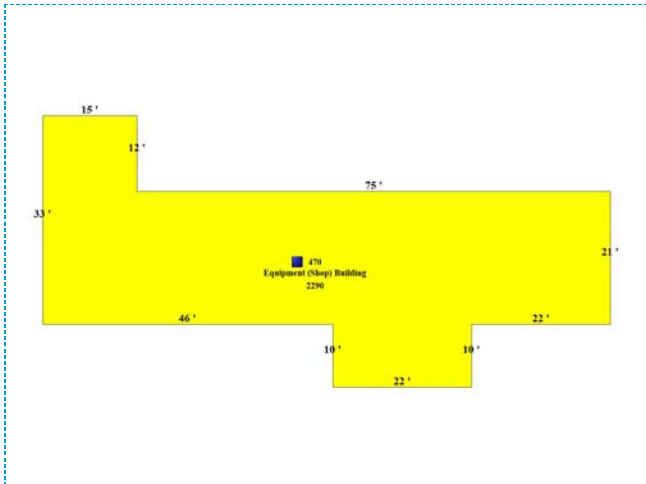
# 2015 Chatham County Board of Assessors

**1-0605-01-001**

**Property Record Card**

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21976-1-2015** | Commercial | 78,043 | 1936 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 15,609 | 1.00 | 15,609 |




[Click for larger picture]

Locker Room (Building #8). One story brick; 12' height; built in 1936; painted 8" common brick; steel sash windows; reinforced concrete slab; flat type composition roofing; CHAC; conduit wiring with incandescent lighting; 22 plumbing fixtures; one OH

| | |
|---|---|
| AREA | 2290 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 266 |

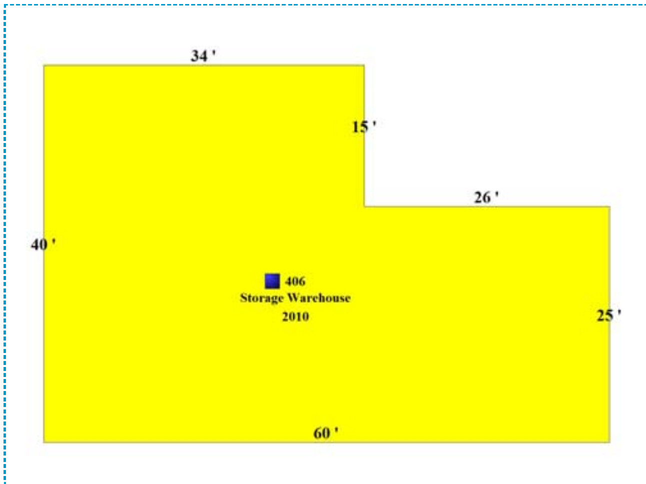
| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 470 Equipment (Shop) Building | 2290 | 100.00 | C | 12.00 | 2.00 |

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

# 2015 Chatham County Board of Assessors
## Property Record Card

## 1-0605-01-001
## 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION 21977-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 80,963 | 1950 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 16,193 | 1.00 | 16,193 |




[Click for larger picture]

| | |
|---|---|
| AREA | 2010 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 200 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 406 Storage Warehouse | 2010 | 100.00 | S | 12.00 | 2.00 |

| COMPONENTS | Units | % | QUAL |
|---|---|---|---|
| C1 888 Stud -Metal Siding | | 100.00 | |

Warehouse (Building #9). Former Emulsion Shed; one story metal; 12' height; built in 1950; corrugated metal siding on steel frame; steel sash windows; reinforced concrete slab; double pitch type roof; conduit wiring with incandescent lighting; no hea

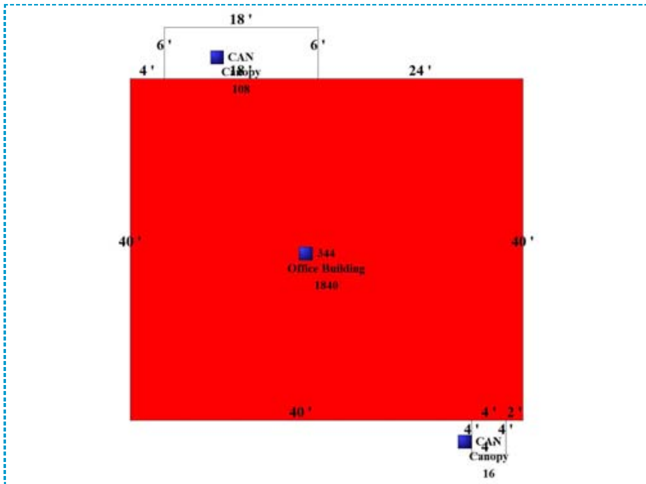
## 2015 Chatham County Board of Assessors

**1-0605-01-001**

### Property Record Card

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21978-1-2015** | Commercial | 163,852 | 1978 | | MS | 61.00 | 0.00 | 0.00 | 0.00 | 61.00 | 63,902 | 1.00 | 63,902 |




[Click for larger picture]

Operations Building (Building #10). One story metal; 10' height; built in 1978; suspended ceiling; conduit wiring and fluorescent lighting; tile floor covering; CHAC. A 10' X 10' aluminum storage shed is located behind this structure.

| | |
|---|---|
| AREA | 1840 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 172 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 344 | Office Building | 1840 | 100.00 | S | 10.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C2 | 611 | Package Unit | | 100.00 | |
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

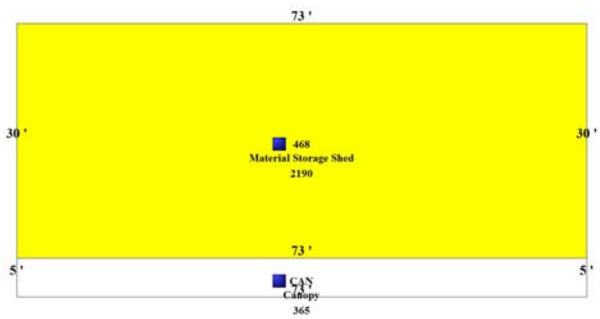
## 2015 Chatham County Board of Assessors

**Property Record Card**

## 1-0605-01-001

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21979-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 44,063 | 1987 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 8,813 | 1.00 | 8,813 |




[Click for larger picture]

Equiptment Storage Shed (Bldg. #11). One story metal; 14' height; built in 1987; no wall along the front 73' area. This structure is located behind the main office / shop structure (Building #1 and #2).

| | |
|---|---|
| AREA | 2190 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 206 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 468 Material Storage Shed | 2190 | 100.00 | S | 14.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

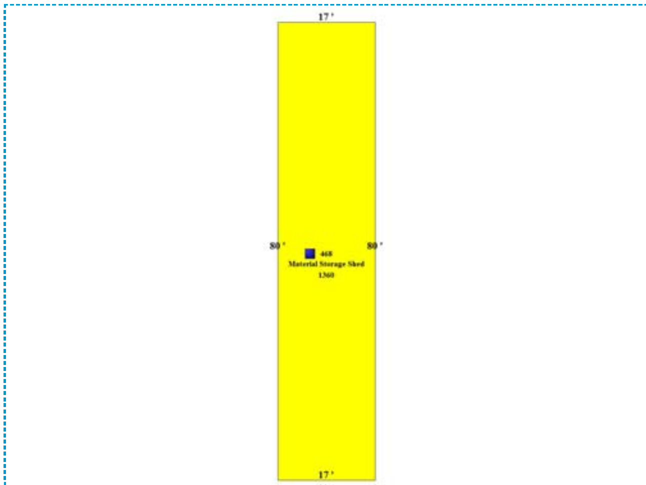
# 2015 Chatham County Board of Assessors

## 1-0605-01-001

**Property Record Card**

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21980-1-2015 | Commercial | 24,534 | 1978 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 4,907 | 1.00 | 4,907 |




[Click for larger picture]

Equiptment Storage Shed (Bldg. #12). One story metal; 14' height; built in 1978; no wall along the front 80' area. This structure is located near the Savannah River and the River Loading Rack.

| | |
|---|---|
| AREA | 1360 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 194 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 468 Material Storage Shed | 1360 | 100.00 | S | 14.00 | 1.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

## 2015 Chatham County Board of Assessors 1-0605-01-001

**Property Record Card** **7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21981-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Drawing Only | NaN | | | MS | | 0.00 | 0.00 | 0.00 | | NaN | | NaN |


[Click for larger picture]

River Loading Rack (Building #13). This structure represents a canopy; built in 1992; and is valued as "MISC" Item #6. Also located here are two truck scales, each having a capacity of 80,000 pounds. These scales are valued as "MISC" Items #8 & #9. T

| COMPONENTS | Units | % | QUAL |
|---|---|---|---|

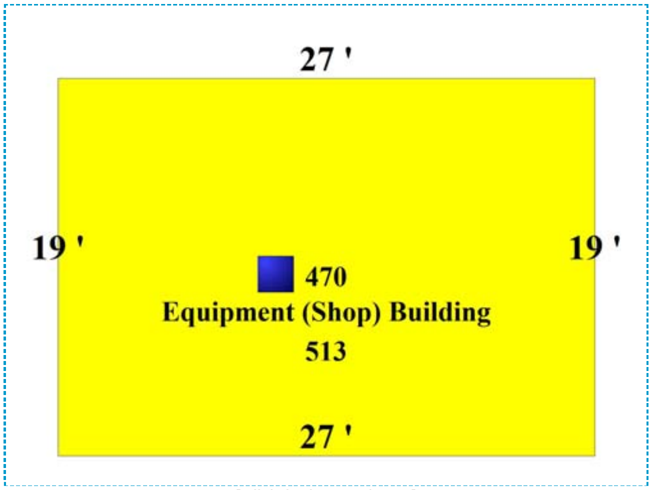
## 2015 Chatham County Board of Assessors

**Property Record Card**

## 1-0605-01-001

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21982-1-2015 | Commercial | 15,211 | 1978 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 3,042 | 1.00 | 3,042 |




[Click for larger picture]

PDC Electrical Switch Gear Building. (Building #14). One story metal building; 10' height; estimated year of construction: 1978.

| | |
|---|---|
| AREA | 513 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 92 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 470 Equipment (Shop) Building | 513 | 100.00 | S | 10.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

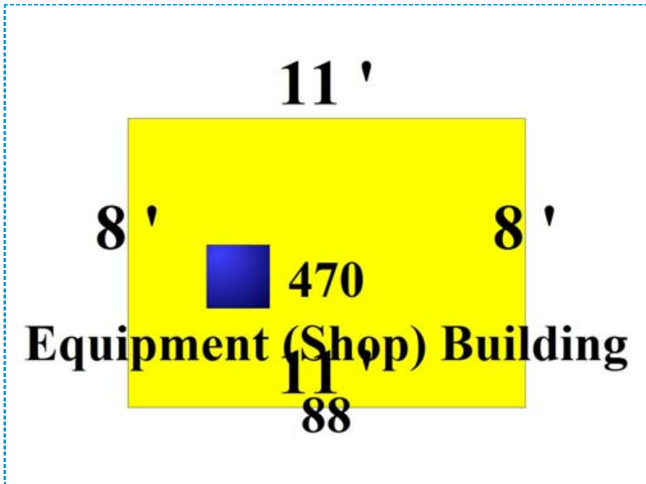
# 2015 Chatham County Board of Assessors

**1-0605-01-001**

## Property Record Card

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION 21983-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 3,990 | 1978 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 798 | 1.00 | 798 |




[Click for larger picture]

Power Distribution Center (Bldg. #15).One story metal building; 10' height; estimated year of construction: 1978.

| | |
|---|---|
| AREA | 88 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 38 |

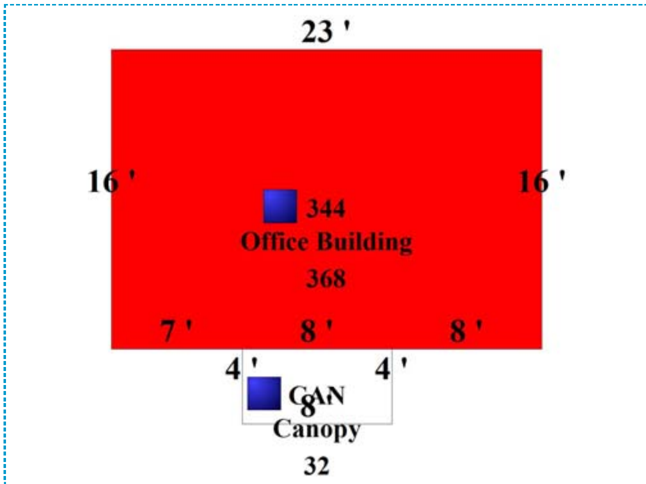
| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 470 Equipment (Shop) Building | 88 | 100.00 | S | 10.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

## 2015 Chatham County Board of Assessors
### Property Record Card

## 1-0605-01-001
### 7 FOUNDATION RD SAVANNAH

| BUILDING SECTION 21984-1-2015 | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | 30,459 | 1986 | | MS | 40.00 | 0.00 | 0.00 | 0.00 | 40.00 | 18,275 | 1.00 | 18,275 |




[Click for larger picture]

Dock House (Building #16). One story concrete block; 8' height; built in 1986; tile floor covering; one restroom, two plumbing fixtures; air conditioner unit built into wall. See Building Permit # 86-26940.

| | |
|---|---|
| AREA | 368 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 78 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 344 | Office Building | 368 | 100.00 | C | 8.00 | 1.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C2 | 616 | Ind Thu-Wall Heat Pump | | 100.00 | |
| C1 | 812 | Concrete Block | | 100.00 | |

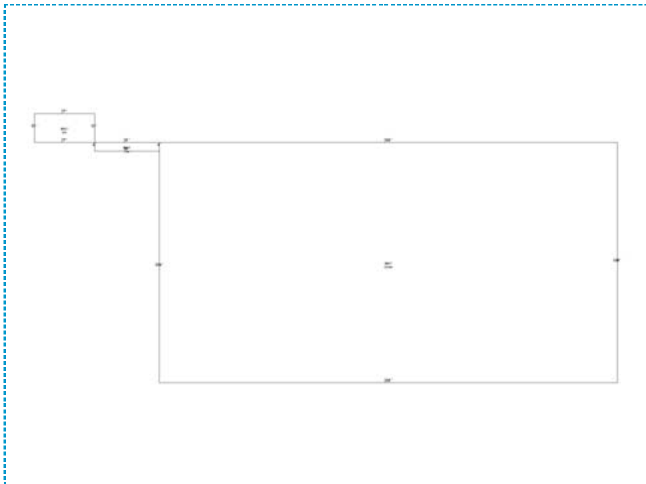
# 2015 Chatham County Board of Assessors

**1-0605-01-001**

## Property Record Card

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21985-1-2015** | Drawing Only | NaN | | | MS | | 0.00 | 0.00 | 0.00 | | NaN | | NaN |



[Click for larger picture]

Ship Dock (Building #17). Estimated year of construction: 1970; 22,248 square foot section is built of concrete and has a surface covered by gravel and asphalt. The 351 sq. foot section is of concrete construction. The 116 sq. foot section is of meta

| COMPONENTS | Units | % | QUAL |
|---|---|---|---|

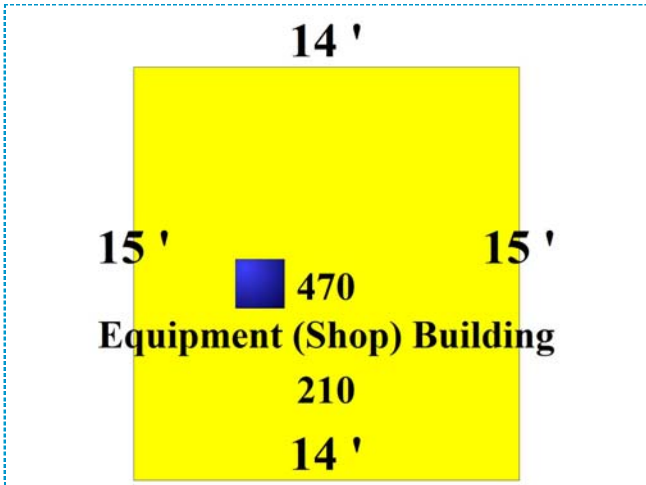
## 2015 Chatham County Board of Assessors

**1-0605-01-001**

**Property Record Card**

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21986-1-2015** | Commercial | 7,459 | 1950 | | MS | 80.00 | 0.00 | 0.00 | 0.00 | 80.00 | 1,492 | 1.00 | 1,492 |




[Click for larger picture]

Pump House. One story metal; 10' height; built in 1950.

| | |
|---|---|
| AREA | 210 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 58 |

| OCCUPANCIES | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|
| 470 Equipment (Shop) Building | 210 | 100.00 | S | 10.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |

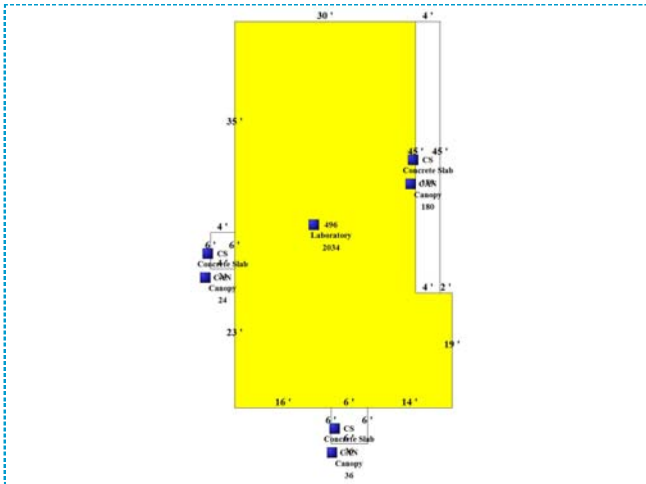
## 2015 Chatham County Board of Assessors

**1-0605-01-001**

**Property Record Card**

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21987-1-2015** | Commercial | 339,455 | 1994 | | MS | 23.00 | 0.00 | 0.00 | 0.00 | 23.00 | 261,380 | 1.00 | 261,380 |



[Click for larger picture]

Laboratory (Building #19). One story concrete block; 14' height; built in 1994 (building permit number 94-01733); CHAC; 5 plumbing fixtures; suspended ceiling; fluorescent lights;tile floor covering; steam heating and forced air electric air conditio

| | |
|---|---|
| AREA | 2034 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 200 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 496 | Laboratory | 2034 | 100.00 | C | 14.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C2 | 611 | Package Unit | | 100.00 | |
| C1 | 812 | Concrete Block | | 100.00 | |

# 2015 Chatham County Board of Assessors 1-0605-01-001L

## Property Record Card 7 FOUNDATION RD SAVANNAH

| | |
|---|---|
| APPRAISER | swcorcor |
| LAST INSP | 03/02/2009 |
| APPR ZONE | 000009 |

IMPROVEMENTS ONLY FOUNDATION TRACT

CITERCO
C/O CITCO PETROLEUM CORP
PO BOX 780339 ATTN: GEORGE WALKER
SAN ANTONIO TX 78278-0339

| CAMA | ASMT | | |
|---|---|---|---|
| | | LAND | 1 |
| 174,800 | 174,800 | BLDG | 1 |
| 29,500 | 29,500 | OBXF | 4 |
| 204,300 | 204,300 | Cost - MS | |

| SALES | BOOK / PAGE | INS | VI | QU | RSN | PRICE |
|---|---|---|---|---|---|---|

| COMMENTS: | |
|---|---|
| 10 Feb 2000 | 1998 New PIN; improvements only per S. Corcoran 05/20/98. 05/13/1998 Inspected by SWC. ADD CHG 10/28/98 DH PER OWNER. |

Picture Unavailable

[Click for larger picture]

SAGIS Savannah Area Geographic Information System

Chatham County Tax Commissioner Property Tax Statement

| CODES | | |
|---|---|---|
| PROPERTY USE | 0004 | INDUSTRIAL |
| UTA | 0001 | UnIncorporated |
| NBHD | 009900.00 | I900 WATERFRONT (HVY |
| EXEMPTIONS | | |
| COMMCATEG | 494 | Industrials, Light Mftg. |

| HISTORY | LAND | IMPR | TOTAL | |
|---|---|---|---|---|
| 2014 | | 211,300 | 211,300 | Cama |
| 2013 | | 215,500 | 215,500 | Cama |
| 2012 | | 202,900 | 202,900 | Cama |
| 2011 | | 152,000 | 152,000 | MAV |
| 2010 | | 152,000 | 152,000 | MAV |
| 2009 | | 152,000 | 152,000 | Over |
| 2008 | | 152,000 | 152,000 | Cama |
| 2007 | | 148,500 | 148,500 | Cama |
| 2006 | | 148,500 | 148,500 | Cama |
| 2005 | | 148,500 | 148,500 | Cama |
| 2004 | | 146,500 | 146,500 | Cama |
| 2003 | | 146,500 | 146,500 | Cama |
| 2002 | | 146,500 | 146,500 | Cama |
| 2001 | | 147,000 | 147,000 | Cama |
| 2000 | | 147,000 | 147,000 | Cama |
| 1999 | | 147,000 | 147,000 | Cama |
| 1998 | | | 145,000 | A/C |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43559 | 21988 | EXCESS IND OFF AVG *1,036 SF versus 428.28 SF* | 0 | 0 | 607.72 | 3 | 35.26 | 21,428 | 1997 | 1997 | 35 | | | | | 14,785 | 13,300 |
| 43560 | 21988 | Uncoded Feature *Description=Dock Height Floor Section 14, Page 27* | 83 | 43 | 3569.00 | 3 | 4.20 | 14,990 | 1997 | 1997 | 35 | | | | | 10,343 | 9,300 |
| 43561 | 21988 | Uncoded Feature *Description=Loading Dock Section 14, Page 27* | 0 | 0 | 492.00 | 3 | 10.45 | 5,141 | 1997 | 1997 | 35 | | | | | 3,547 | 3,200 |
| 43562 | 21988 | Uncoded Feature *Description=Dock Leveler Section 14, Page 27* | 0 | 0 | 1.00 | 3 | 6,013.00 | 6,013 | 1997 | 1997 | 35 | | | | | 4,149 | 3,700 |

**LAND**

| ID# | USE DESC | FRONT | DEPTH | UNITS / TYPE | PRICE | ZONING | LCTN | TOPO | OTHER | ADJ1 | ADJ2 | ADJ3 | ADJ4 | MKT VALUE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25664 | MANUFACTURING LIGHT | 0 | 0 | .00-LT | .00 | I-H | | | | | | | | 0 |

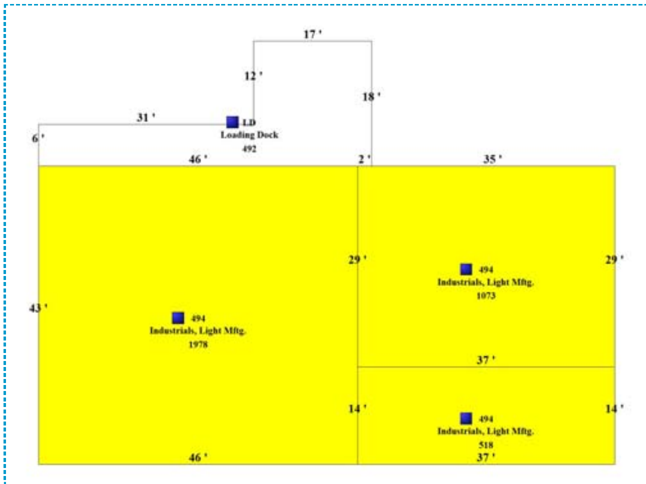
## 2015 Chatham County Board of Assessors

**1-0605-01-001L**

### Property Record Card

**7 FOUNDATION RD SAVANNAH**

| BUILDING SECTION | CONSTRUCTION TYPE | RCN | AYB | EYB | DEP TYPE | PHYS | ECON | FUNC | OBSV / % | TOTAL DEP % | RCNLD | U.FACTOR | MKT VAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21988-1-2015 | Commercial | 253,399 | 1997 | | MS | 31.00 | 0.00 | 0.00 | 0.00 | 31.00 | 174,845 | 1.00 | 174,845 |



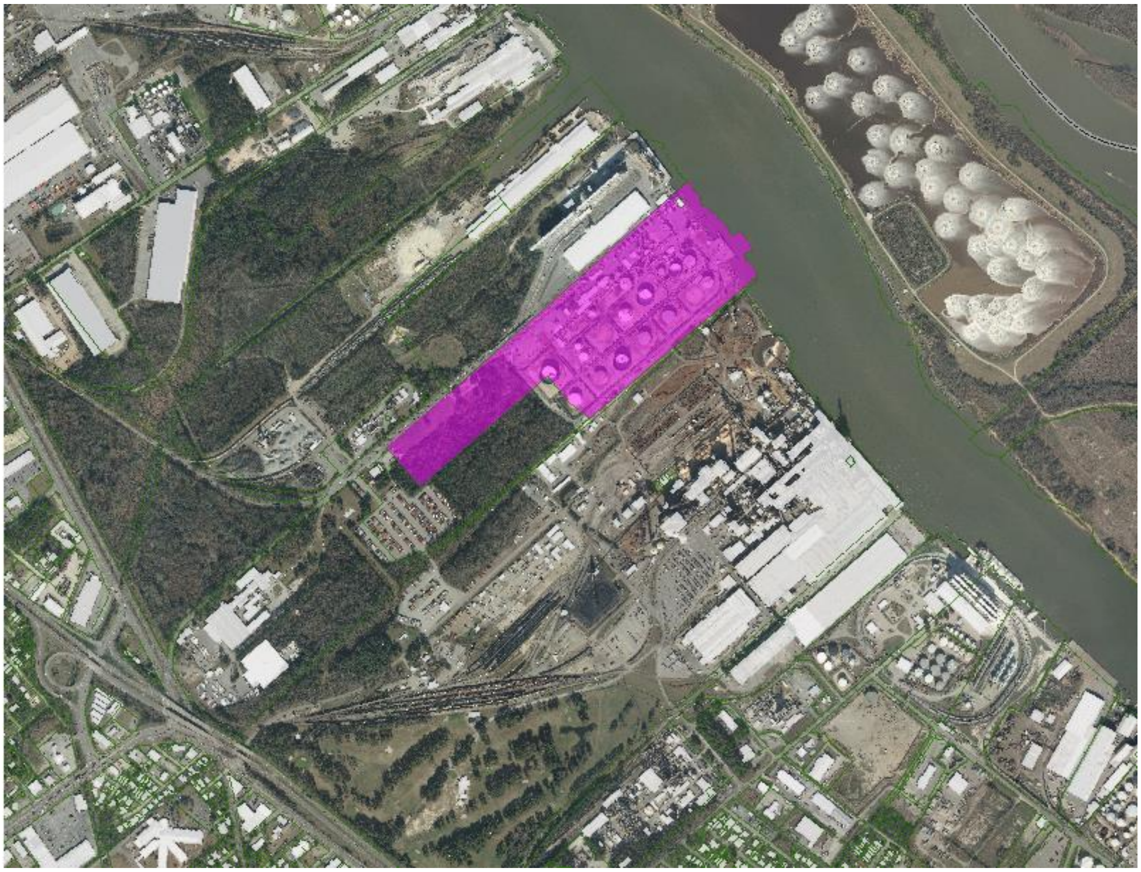

[Click for larger picture]

Polymer Modidied Asphalt Facility. One story steel joist with corrugated metal siding; built in 1997; has dock height concrete floor; insulation; halogen lighting; 1,036 square feet of interior office & electronic equiptment room (two 518 square foot

| | |
|---|---|
| AREA | 3569 |
| STORIES | 1.0 |
| PERIMETER / SHAPE | 412 |

| OCCUPANCIES | | AREA | % | CLASS | HEIGHT | QUAL |
|---|---|---|---|---|---|---|
| 494 | Industrials, Light Mftg. | 518 | 14.51 | S | 28.00 | 2.00 |
| 494 | Industrials, Light Mftg. | 1978 | 55.43 | S | 28.00 | 2.00 |
| 494 | Industrials, Light Mftg. | 1073 | 30.06 | S | 28.00 | 2.00 |

| COMPONENTS | | | Units | % | QUAL |
|---|---|---|---|---|---|
| C1 | 888 | Stud -Metal Siding | | 100.00 | |



# Delaware



*The First State*

*I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "NUSTAR ASPHALT REFINING, LLC", CHANGING ITS NAME FROM "NUSTAR ASPHALT REFINING, LLC" TO "AXEON REFINING LLC", FILED IN THIS OFFICE ON THE TWENTY-SIXTH DAY OF FEBRUARY, A.D. 2014, AT 4 O'CLOCK P.M.*

Jeffrey W. Bullock, Secretary of State

*4448858 8100*

*AUTHENTICATION: 1165467*

*140247210*

*DATE: 02-26-14*

*State of Delaware*
*Secretary of State*
*Division of Corporations*
*Delivered 04:07 PM 02/26/2014*
*FILED 04:00 PM 02/26/2014*
*SRV 140247210 - 4448858 FILE*

CERTIFICATE OF AMENDMENT

OF

CERTIFICATE OF FORMATION

OF

NUSTAR ASPHALT REFINING, LLC

February 26, 2014

The undersigned, an authorized person of NUSTAR ASPHALT REFINING, LLC (the "Company"), a limited liability company organized and existing under and by virtue of the Delaware Limited Liability Company Act (the "Act"), hereby certifies that:

1. The name of the limited liability company is NuStar Asphalt Refining, LLC.

2. Pursuant to the provisions of Section 18-202 of the Act, Article 1 of the Certificate of Formation of the Company, dated October 30, 2007, is hereby amended and restated in its entirety to read as follows:

"The name of the limited liability company continued hereby is Axeon Refining LLC."

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Amendment as of this 26 day of February, 2014.

by

Name: Michael F. Pesch
Title: Authorized Person

{[3444377]}

# Vesting Documents

Clock#: 1045754
FILED FOR RECORD

3/27/2008 10:24am

PAID: 28.00 **COPY**

Daniel W. Massey, Clerk
Superior Court of Chatham County
Chatham County, Georgia

Real Estate Transfer Tax

PAID $**7865.00

For Clerk of Superior Court

BOOK 339A PAGE 761

AFTER RECORDING RETURN TO:
Rhonda Obaugh
Fidelity National Title
1330 Post Oak Blvd., Suite 2330
Houston, Texas 77056

Return to:
R.E. HODGES, JR., LLC
Attorney at Law
2230 Towne Lake Parkway
Building 200, Suite 120
Woodstock, GA 30189 H098.023

# LIMITED WARRANTY DEED

THE STATE OF GEORGIA §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF CHATHAM §

That, on the 20th day of March 2008, **CITGO ASPHALT REFINING COMPANY**, a New Jersey general partnership (the "Grantor"), whose address is 1293 Eldridge Parkway, Houston, Texas 77077, for and in consideration of the sum of Ten and No/100 Dollars ($10.00) paid to Grantor and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, has, subject to the exceptions and other matters hereinafter set forth, GRANTED, SOLD, and CONVEYED and by these presents does hereby GRANT, SELL, and CONVEY unto **NUSTAR ASPHALT REFINING, LLC**, a Delaware limited liability company (the "Grantee"), whose address is 2330 N. Loop 1604 W. San Antonio, Texas 78248, certain properties located in the Eighth G. M. District, County of Chatham, State of Georgia, and being more particularly described in Exhibit A attached hereto and incorporated herein by reference for all purposes, together with all buildings, improvements, fixtures and appurtenances located thereon, if any, (collectively, the "Property"). To the limited extent the land described in Exhibit A includes acreage not conveyed to Grantor by that certain Limited Warranty Deed from Amoco Oil Company dated April 29, 1993, recorded in Deed Book 159U, Page 93, records of the Superior Court, Chatham County, Georgia ("Excess Acreage"), Grantor hereby grants and conveys only Grantor's right, title and interest (if any) in and to such Excess Acreage.

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances pertaining thereto, including all of Grantor's right, title and interest in and to adjoining streets, alleys and rights-of-way, subject to the exceptions, limitations, reservations and other matters set forth herein, unto Grantee, and Grantee's successors and assigns, forever; and Grantor does hereby bind itself, and its successors and assigns, to warrant and forever defend the title to the Property (except the Excess Acreage for which Grantor makes no warranty hereunder), subject as aforesaid, unto Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by, through or under Grantor, but not otherwise.

This conveyance is made by Grantor and accepted by Grantee subject to the provisions of that certain Sale and Purchase Agreement dated as of November 5, 2007, as amended, between Grantor and Grantee (the "Purchase Agreement") and to those matters listed in Exhibit B hereto. Capitalized terms used but not defined herein shall have the meaning ascribed to them in the Purchase Agreement.

By acceptance of this Deed, Grantee acknowledges and affirms that (i) it has had full access, to the extent it deems useful or necessary, to all information and materials made available by Grantor and its representatives during the course of Grantee's due diligence investigation of Grantor and the Property and (ii) it has had access to the personnel, officers, professional advisors, operations and records of Grantor. Grantee acknowledges by the acceptance of this Deed, that as of the date hereof, Grantee has completed its independent investigation, verification, analysis, review and evaluation of the Property, as Grantee has deemed necessary or appropriate. EXCEPT FOR THE REPRESENTATIONS AND WARRANTIES EXPRESSLY MADE BY GRANTOR HEREIN AND IN THE PURCHASE AGREEMENT, GRANTEE ACKNOWLEDGES AND AGREES THAT (a) THERE ARE NO REPRESENTATIONS, WARRANTIES, STATEMENTS, ASSURANCES OR GUARANTEES MADE BY GRANTOR, EXPRESS OR IMPLIED, AS TO (i) THE PROPERTY, OR (ii) THE OBLIGATIONS, CONDITION (FINANCIAL, ENVIRONMENTAL OR OTHERWISE) OR PROSPECTS RELATING TO THE PROPERTY AND THAT IN MAKING ITS DECISION TO ACCEPT THIS DEED, GRANTEE HAS RELIED AND WILL RELY SOLELY UPON ITS OWN INDEPENDENT INVESTIGATION, VERIFICATION, ANALYSIS AND EVALUATION; (b) GRANTOR DISCLAIMS ALL LIABILITY AND RESPONSIBILITY FOR ANY REPRESENTATION, WARRANTY, STATEMENT OR INFORMATION ORALLY OR IN WRITING MADE OR COMMUNICATED TO GRANTEE INCLUDING ANY OPINION, INFORMATION OR ADVICE WHICH MAY HAVE BEEN PROVIDED TO GRANTEE BY GRANTOR OR ANY OF ITS AFFILIATES (INCLUDING ANY BACKCAST DATA OR MODELS PROVIDED BY GRANTOR WHICH HAVE BEEN PROVIDED FOR ILLUSTRATION PURPOSES ONLY, ANY OTHER INFORMATION PROVIDED IN THE CONFIDENTIAL INFORMATION MEMORANDUM DATED WINTER 2007, AS SUPPLEMENTED TO THE DATE OF THIS DEED, ANY CORRESPONDENCE FROM GRANTOR OR ANY OF ITS AFFILIATES OR FROM UBS SECURITIES LLC AS GRANTOR'S ADVISOR, ANY PRESENTATION BY THE MANAGEMENT OF GRANTOR OR ANY OF ITS AFFILIATES AND ANY INFORMATION, DOCUMENT OR MATERIAL PROVIDED OR MADE AVAILABLE TO GRANTEE, OR STATEMENTS MADE TO GRANTEE DURING SITE OR OFFICE VISITS, IN ANY DATAROOMS OR MANAGEMENT PRESENTATIONS); (c) NEITHER GRANTOR NOR ANY OF ITS AFFILIATES HAVE MADE, AND GRANTOR HEREBY EXPRESSLY DISCLAIMS AND NEGATES, ANY IMPLIED OR EXPRESS WARRANTY OF MERCHANTABILITY, FITNESS (BOTH GENERALLY AND FOR A PARTICULAR PURPOSE), OR CONFORMITY TO MODELS OR SAMPLES AND ANY OTHER REPRESENTATION OR WARRANTY, EXPRESS, STATUTORY OR IMPLIED, RELATING TO THE PROPERTY; AND (d) GRANTOR MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE USE OR CONDITION (INCLUDING ENVIRONMENTAL USE OR CONDITION), THE PRESENCE OR ABSENCE OF HAZARDOUS MATERIALS AT,

ON OR UNDER ANY PORTION OF THE PROPERTY, COMPLIANCE WITH APPLICABLE LAWS AND AUTHORIZATIONS. NOTWITHSTANDING ANYTHING HEREIN, THE DELIVERY OF THIS SPECIAL WARRANTY DEED SHALL NOT DIMINISH OR OTHERWISE IMPAIR ANY OF THE REPRESENTATIONS, WARRANTIES, COVENANTS, CONDITIONS, INDEMNITIES, TERMS, OR PROVISIONS OF THE PURCHASE AGREEMENT, AND ALL OF THE REPRESENTATIONS, WARRANTIES, COVENANTS, CONDITIONS, INDEMNITIES, TERMS, AND PROVISIONS CONTAINED IN THE PURCHASE AGREEMENT SHALL SURVIVE THE DELIVERY OF THIS SPECIAL WARRANTY DEED TO THE EXTENT, AND IN THE MANNER, SET FORTH IN THE PURCHASE AGREEMENT.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

[SIGNATURES APPEAR ON FOLLOWING PAGE]

March IN WITNESS WHEREOF, this instrument is executed on the 19th day of March, 2008, but is effective for all purposes on the date first written above.

Signed, sealed and delivered in the presence of:

By: [signature]
Unofficial Witness Christian A. Garza

Name: Elizabeth Aguilar

By: [signature]
Notary Public (Official Witness)

Commission Expires 4-4-2011

(Affix Notary Seal)

By: [signature]
Unofficial Witness Christian A. Garza

Name: Elizabeth Aguilar

By: [signature]
Notary Public (Official Witness)

Commission Expires 4-4-2011

(Affix Notary Seal)

By: [signature]
Unofficial Witness Kristen McCartney

Name: Karen C Thomas

By: [signature]
Notary Public (Official Witness)

Commission Expires 9-12-11

(Affix Notary Seal)

KAREN CHRISTY THOMAS
NOTARY PUBLIC
STATE OF TEXAS
EXPIRES
09-12-2011

4206485v5 CARCO

**CITGO ASPHALT REFINING COMPANY**

By: CITGO Petroleum Corporation,
General Partner

By: [signature] CAG

Name: Philip J. Reedy
Title: Vice President, Finance

ELIZABETH AGUILAR
MY COMMISSION EXPIRES
April 4, 2011

By: CITGO East Coast Oil Corporation,
General Partner

By: [signature] CAG

Name: Dean Hasseman
Title: Assistant Secretary

ELIZABETH AGUILAR
MY COMMISSION EXPIRES
April 4, 2011

**NUSTAR ASPHALT REFINING, LLC**

By: [signature]

Name: Michael H. Hoeltzel

Title: Senior Vice President

BOOK 339A PAGE 764

Exhibit A – Property
Exhibit B – Permitted Liens Exceptions

## EXHIBIT A

## PROPERTY LEGAL DESCRIPTION

LEGAL DESCRIPTION



ALL THAT CERTAIN LOT, TRACT, OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE EIGHTH G.M. DISTRICT, CHATHAM COUNTY, GEORGIA AND KNOWN AS A PORTION OF THE FOUNDATION TRACT, FORMERLY BRAMPTON AND RETREAT PLANTATIONS, CONTAINING 66.82 ACRES, MORE OR LESS, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

**BEGINNING** AT AN IRON PIN AT THE POINT OF INTERSECTION OF THE EASTERN PROPERTY LINE OF LANDS OF INTERNATIONAL PAPER COMPANY AND THE SOUTHERN RIGHT OF WAY LINE FOUNDATION DRIVE, WHICH POINT IS LOCATED AT GEORGIA STATE PLANE GRID COORDINATES, EAST ZONE-NAD '83, N=767,010.369, E=975,783.916; THENCE EXTEND NORTH 48 DEGREES 31 MINUTES 00 SECONDS EAST, ALONG THE SOUTHERN RIGHT OF WAY LINE OF FOUNDATION DRIVE, A DISTANCE OF 1478.07 FEET TO A POINT MARKED BY AN IRON PIN; THENCE EXTEND NORTH 41 DEGREES 31 MINUTES 11 SECONDS WEST, A DISTANCE OF 30.77 FEET TO A POINT MARKED BY A STEEL PIN ON THE SOUTHERN PROPERTY LINE OF LANDS OF THE SAVANNAH ECONOMIC DEVELOPMENT AUTHORITY; THENCE EXTEND NORTH 48 DEGREES 28 MINUTES 49 SECONDS EAST, ALONG SAID SOUTHERN PROPERTY LINE, A DISTANCE OF 2273.19 FEET TO A POINT ON THE UNITED STATES ARMY CORPS OF ENGINEERS HARBOR LINE ALONG THE WESTERN SIDE OF THE SAVANNAH RIVER; THENCE EXTEND SOUTH 40 DEGREES 40 MINUTES 53 SECONDS EAST, ALONG SAID HARBOR LINE, A DISTANCE OF 609.98 FEET, TO HARBOR LINE POINT P-29; THENCE CONTINUE ALONG SAID HARBOR LINE, SOUTH 31 DEGREES 42 MINUTES 50 SECONDS EAST, A DISTANCE OF 395.87 FEET TO A POINT ON THE NORTHERN PROPERTY LINE OF LANDS OF INTERNATIONAL PAPER COMPANY; THENCE EXTEND SOUTH 48 DEGREES 27 MINUTES 47 SECONDS WEST, ALONG SAID NORTHERN PROPERTY LINE, A DISTANCE OF 2136.82 FEET TO A POINT MARKED BY A STEEL PIN IN THE BASE OF A FENCE POST ON THE EASTERN PROPERTY LINE OF LANDS OF INTERNATIONAL PAPER COMPANY; THENCE EXTEND NORTH 54 DEGREES 43 MINUTES 15 SECONDS WEST, ALONG SAID EASTERN PROPERTY LINE, A DISTANCE OF 231.53 FEET TO A POINT MARKED BY A FENCE POST; THENCE CONTINUE ALONG SAID EASTERN PROPERTY LINE, NORTH 42 DEGREES 02 MINUTES 45 SECONDS WEST, A DISTANCE OF 294.47 FEET TO A POINT MARKED BY AN IRON PIN ON THE SOUTHERN LINE OF LANDS OF INTERNATIONAL PAPER COMPANY; THENCE EXTEND SOUTH 48 DEGREES 31 MINUTES 00 SECONDS WEST, ALONG SAID SOUTHERN PROPERTY LINE, A DISTANCE OF 1482.79 FEET TO A POINT MARKED BY AN IRON PIN ON THE EASTERN PROPERTY LINE OF LANDS OF INTERNATIONAL PAPER COMPANY; THENCE EXTEND NORTH 41 DEGREES 29 MINUTES 00 SECONDS WEST, ALONG SAID EASTERN PROPERTY LINE, A DISTANCE OF 450.00 FEET TO THE **POINT OF BEGINNING.**

THE ABOVE DESCRIBED PROPERTY IS SUBJECT TO RIGHTS, IF ANY, OF THE UNITED STATES OF AMERICA, THE STATE OF GEORGIA, ANY OTHER

GOVERNMENTAL BODY, AND/OR THE PUBLIC AND OTHER RIPARIAN OWNERS, TO ANY PORTIONS OF THE PROPERTY CONVEYED AS MAY LIE BELOW THE HIGH WATER MARK OF THE SAVANNAH RIVER OR MAY BE "ESTUARINE AREA" AS DEFINED BY THE GEORGIA COASTAL MARSHLANDS PROTECTION ACT.

TOGETHER WITH ALL RIGHT, TITLE AND INTEREST IN THAT CERTAIN EASEMENT FOR RIGHT OF WAY AS REFLECTED IN INSTRUMENT RECORDED IN BOOK 145-T, FOLIO 241.

TOGETHER WITH SUCH EASEMENT RIGHTS SHARED IN COMMON WITH OTHERS AS ESTABLISHED UNDER A CERTAIN RIGHT OF WAY AGREEMENT BY AND BETWEEN IMBRIE SECURITIES COMPANY, LTD., MEXICAN PETROLEUM CORPORATION OF GEORGIA AND SOUTHERN BUILDING PRODUCTS CORPORATION, DATED SEPTEMBER 23, 1929, FILED SEPTEMBER 25, 1929 AND RECORDED IN DEED BOOK 25-W, PAGE 491, AFORESAID RECORDS.

## EXHIBIT B

## PERMITTED LIENS EXCEPTIONS



1. The following matters as shown on that certain ALTA/ACSM land Title Survey prepared for NuStar Energy, L P , by James M Sims, R. L S No 2280, of Hussey, Gay, Bell & DeYoung, Inc., Consulting Engineers, dated December 18, 2007, certified December 27, 2007, as follows:

   (a) Fence line at variance with northern property line.

2. Rights of any railroad in and to any railroad tracts or spurs, including appurtenances thereto, located within the boundaries of subject property.

3. Easements as contained in that certain Agreement between Imbrie Securities Company, Ltd , a New York corporation and Port Wentworth Terminal Corporation, a New York corporation, dated March 28, 1928, flied March 28, 1928 and recorded in Deed Book 24-H, Page 271, records of the Superior Court of Chatham County, Georgia.

4. Easements as may be contained in that certain Right of Way Agreement by and between Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Products Corporation, dated September 23, 1929, filed September 25, 1929 and recorded in Deed Book 25-W, Page 491, aforesaid records.

5. Easements as contained in that certain Right of Way Deed from Imbrie Securities Company, Ltd., a New York corporation and Mexican Petroleum Corporation of Georgia, dated September 23, 1929, filed September 25, 1929 and recorded in Deed Book 25-Y, Page 1, aforesaid records.

6. Easements as contained in that certain Agreement by and between Imbrie Securities Company, Ltd , Mexican Petroleum Corporation of Georgia and Southern Building Products Corporation, dated October 26, 1929, filed October 26, 1929 and recorded in Deed Book 26-B, Page 8, aforesaid records.

7. Easements as contained in that certain Agreement between The Foundation Company, a Georgia corporation and Industrial and Domestic Water Supply Commission, an agency of the Mayor and Aldermen of the City of Savannah, Georgia, dated March 20, 1947, filed July 18, 1947 and recorded in Deed Book 45-B, Page 389, aforesaid records.

8. Easements as contained in that certain Agreement between Mexican Petroleum Corporation of Georgia and The Mayor and Aldermen of the City of Savannah, Georgia, a municipal corporation of the State of Georgia, dated June 17, 1948, filed July 24, 1948, and recorded in Deed Book 47-F, Page 315, aforesaid records.

9. License Agreement by and between The American Oil Company and Southern Natural Gas Company, dated October 8, 1954, filed November 5, 1954 and recorded in Deed Book 60-V, Page 123, aforesaid records; as affected by that certain Supplemental License Agreement by and between The American Oil Company and Southern Natural Gas Company, dated February 10, 1956, filed February 24, 1956 and recorded in Deed Book 64-C, Page 12, aforesaid records; as further affected by that certain Certified Resolution

evidencing the name change of The American Oil Company to Amoco Oil Company, effective December 31, 1972, filed February 20, 1973 and recorded in Deed Book 101-V, Page 421, aforesaid records; as assigned to Union Camp Corporation, a Virginia corporation by virtue of that certain Assignment from Amoco Oil Company, dated May 4, 1990, filed May 15, 1990 and recorded in Deed Book 145-T, Page 244, aforesaid records.

10. Easements as contained in that certain Agreement by and between The American Oil Company and Industrial and Domestic Water Supply Commission, dated November 21, 1955, filed January 27, 1956 and recorded in Deed Book 63-U, Page 35, aforesaid records.

11. Easement for Drainage Right-of-Way from Amoco Oil Company, a Maryland corporation to Union Camp Corporation, a Virginia corporation, dated May 4, 1990, filed May 15, 1990 and recorded in Deed Book 145-T, Page 238, aforesaid records.

12. Easement for Right-of-Way from Union Camp Corporation, a Virginia corporation to Amoco Oil Company, a Maryland corporation, dated May 4, 1990, filed May 15, 1990 and recorded in Deed Book 145-T, Page 241, aforesaid records.

13. Assignment of License Agreement by and between Amoco Oil Company (formerly The American Oil Company), a Maryland corporation and Union Camp Corporation, a Virginia corporation, dated May 4, 1990, filed May 15, 1990 and recorded in Deed Book 145-T, Page 235, aforesaid records.

14. As to the easement parcel described in that certain instrument recorded in Book 145-T, page 241 only, Affidavit of James R Kobleur regarding the presence of hazardous wastes, hazardous constituents, or hazardous substances regulated under state law, filed January 24, 2000 and recorded in Deed Book 209-N, Page 676, aforesaid records

15. All matters affecting subject property as shown on those certain plats recorded in Plat Book 11P, Page 43, Plat Book 5S, Page 28A, Plat Book GP, Page 122 and Plat Book GP, Page 160, all aforesaid records.

16. Rights, if any, of the United States of America, the State of Georgia, any other governmental body, and/or the public and other riparian owners, to any portions of the property conveyed as may lie below the high water mark of the Savannah River or may be Aestuarine area@ as defined by the Georgia Coastal Marshlands Protection Act.

17. Rights, if any, of the general public and of adjacent owners, their heirs, successors, assigns, tenants and invitees, in and to the adjacent paved road, the center line of which forms the northwestern boundary of the property.

18. Any adverse claim based upon the assertion that:

    (b) Some portion of said land is tide or submerged land or has been created by artificial means or has accreted to such portion so created;

    (b) Some portion of said land has been brought within the boundaries thereof by an allusive movement of the Savannah River or has been formed by accretion to any such property.

19. Pipeline Right-of-Way Agreement between Union Bag & Paper Corporation of Georgia and Mexican Petroleum Corporation, dated December 14, 1935 and recorded in Deed Book 31-C, Page 332, aforesaid records ; as assigned by Union Bag & Paper Corporation of Georgia to Union Bag & Paper Corporation by Assignment dated November 23, 1936 and recorded in Deed Book 31-U, Page 144, aforesaid records.

20. Pipeline Right-of-Way Agreement between Union Bag & Paper Corporation and Mexican Petroleum Corporation of Georgia dated September 22, 1939 and recorded in Deed Book 34-R, Page 418, aforesaid records.

Clock#: 1045755
FILED FOR RECORD
3/27/2008 10:25am
PAID: 20.00
Daniel W. Massey, Clerk
Superior Court of Chatham County
Chatham County, Georgia

COPY

BOOK 339A PAGE 771

AFTER RECORDING RETURN TO:
Rhonda Obaugh
Fidelity National Title
1330 Post Oak Blvd., Suite 2330
Houston, Texas 77056

Return to:
R.E. HODGES, JR., LLC
Attorney at Law
2230 Towne Lake Parkway
Building 200, Suite 120
Woodstock, GA 30189 HD98.023

## ASSIGNMENT AND ASSUMPTION OF LEASES AND EASEMENTS

THIS ASSIGNMENT AND ASSUMPTION OF LEASES AND EASEMENTS (this "Assignment") is made on this 20th day of March 2008, between **CITGO Asphalt Refining Company,** a New Jersey general partnership, with offices at 1293 Eldridge Parkway, Houston, Texas 77077 ("Assignor") and **NuStar Asphalt Refining, LLC**, a Delaware limited liability company, having an address at 2330 N. Loop 1604 W. San Antonio, Texas 78248 ("Assignee").

### WITNESSETH:

WHEREAS, Assignor and Assignee have entered into a Sale and Purchase Agreement dated as of November 5, 2007, as amended (the "Purchase Agreement"), wherein Assignor agreed to sell to Assignee, and Assignee agreed to buy from Assignor, all of Assignor's right, title and interest in the leases, easements, right-of-way grants, licenses, permits and similar instruments described on Exhibit A hereto and made a part hereof for all purposes as same may have been amended or modified prior to the date hereof (collectively the "Easements"); and

WHEREAS all capitalized terms used but not defined herein shall have the meanings set forth in the Purchase Agreement; and

WHEREAS, pursuant to the Purchase Agreement, Assignor agreed to assign to Assignee, and Assignee agreed to assume, the rights and obligations of Assignor under the Easements; and

WHEREAS, in accordance with the Purchase Agreement, Assignor desires to assign its interest in the Easements to Assignee, and Assignee desires to assume Assignor's obligations under the Easements, in each case as of the date hereof.

**NOW, THEREFORE,** in consideration of Ten Dollars ($10) and other good and valuable consideration paid by Assignee to Assignor, the receipt and sufficiency of which is hereby acknowledged, Assignor and Assignee hereby agree as follows:

Effective as of the Effective Time, Assignor has granted, sold, assigned and delivered and by these presents grants, sells, assigns and delivers unto Assignee, its successors and assigns, subject to the exceptions and other matters set forth herein below, all of Assignor's right, title and interest in and to the Easements together with any buildings, pipelines, valves, cathodic protection equipment, scraper traps, improvements, fixtures and appurtenances, if any, located thereon;



TO HAVE AND TO HOLD the Easements, together with all and singular the rights and appurtenances respectively belonging thereto, unto Assignee, its successors and assigns, forever; and Assignor does hereby bind itself, and its successors and assigns, to warrant and forever defend title to the Easements, subject to the matters and limitations set forth herein below, unto Assignee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by, through or under Assignor but not otherwise.

This conveyance is made by Assignor and accepted by Assignee subject to all validly existing matters affecting the Easements, including but not limited to, easements, rights-of-way, and prescriptive rights, whether of record or not; all matters affecting the Easements which are or would be readily apparent from an inspection of the Easements; and all presently recorded and validly existing restrictions, reservations, covenants, conditions, oil and gas leases, mineral interests, and water interests outstanding in persons other than Assignor that affect the Easements (the "Permitted Liens").

This Assignment is given pursuant to and is made subject to the provisions of the Purchase Agreement.

**ASSIGNEE ACCEPTS THE EASEMENTS IN THEIR AS-IS, WHERE-IS CONDITION WITH ALL FAULTS, WITHOUT ANY EXPRESS OR IMPLIED COVENANT, WARRANTY AS TO TITLE, CONDITION (INCLUDING ANY ENVIRONMENTAL CONDITION), MERCHANTABILITY, PERFORMANCE, FITNESS (BOTH GENERALLY AND FOR ANY PARTICULAR PURPOSE) OR OTHERWISE (WHICH WARRANTIES ASSIGNOR HEREBY EXPRESSLY DISCLAIMS), OR RECOURSE, OTHER THAN AS EXPRESSLY SET FORTH HEREIN OR IN THE PURCHASE AGREEMENT.**

Assignee acknowledges and affirms that (i) it has had full access to the extent it deems useful or necessary to all information and materials made available by Assignor and its representatives during the course of Assignee's due diligence investigation of Assignor and the Easements and (ii) it has had access to the personnel, officers, professional advisors, operations and records of Assignor. As of the date hereof, Assignee has completed its independent investigation, verification, analysis, review and evaluation of the Easements, as Assignee has deemed necessary or appropriate. **EXCEPT FOR THE REPRESENTATIONS AND WARRANTIES EXPRESSLY MADE BY ASSIGNOR HEREIN AND IN THE PURCHASE AGREEMENT, ASSIGNEE ACKNOWLEDGES AND AGREES THAT (a) THERE ARE NO REPRESENTATIONS, WARRANTIES, STATEMENTS, ASSURANCES OR GUARANTEES MADE BY ASSIGNOR, EXPRESS OR IMPLIED, AS TO (i) THE EASEMENTS, OR (ii) THE OBLIGATIONS, CONDITION (FINANCIAL, ENVIRONMENTAL OR OTHERWISE) OR PROSPECTS RELATING TO THE EASEMENTS AND THAT IN MAKING ITS DECISION TO ENTER INTO THIS ASSIGNMENT AND TO ASSUME THE OBLIGATIONS UNDER THE EASEMENTS, ASSIGNEE HAS RELIED AND WILL RELY SOLELY UPON ITS OWN INDEPENDENT INVESTIGATION, VERIFICATION, ANALYSIS AND**

EVALUATION; (b) ASSIGNOR DISCLAIMS ALL LIABILITY AND RESPONSIBILITY FOR ANY REPRESENTATION, WARRANTY, STATEMENT OR INFORMATION ORALLY OR IN WRITING MADE OR COMMUNICATED TO ASSIGNEE INCLUDING ANY OPINION, INFORMATION OR ADVICE WHICH MAY HAVE BEEN PROVIDED TO ASSIGNEE BY ASSIGNOR OR ANY OF ITS AFFILIATES (INCLUDING ANY BACKCAST DATA OR MODELS PROVIDED BY ASSIGNOR, WHICH HAVE BEEN PROVIDED FOR ILLUSTRATION PURPOSES ONLY, ANY OTHER INFORMATION PROVIDED IN THE CONFIDENTIAL INFORMATION MEMORANDUM DATED WINTER 2007, AS SUPPLEMENTED TO THE DATE OF THIS ASSIGNMENT, ANY CORRESPONDENCE FROM ASSIGNOR OR ANY OF ITS AFFILIATES OR FROM UBS SECURITIES LLC AS ASSIGNOR'S ADVISOR, ANY PRESENTATION BY THE MANAGEMENT OF ASSIGNOR OR ANY OF ITS AFFILIATES AND ANY INFORMATION, DOCUMENT OR MATERIAL PROVIDED OR MADE AVAILABLE TO ASSIGNEE, OR STATEMENTS MADE TO ASSIGNEE DURING SITE OR OFFICE VISITS, IN ANY DATAROOMS OR MANAGEMENT PRESENTATIONS); (c) NEITHER ASSIGNOR NOR ANY OF ITS AFFILIATES HAVE MADE, AND ASSIGNOR HEREBY EXPRESSLY DISCLAIMS AND NEGATES, ANY IMPLIED OR EXPRESS WARRANTY OF MERCHANTABILITY, FITNESS (BOTH GENERALLY AND FOR A PARTICULAR PURPOSE), OR CONFORMITY TO MODELS OR SAMPLES AND ANY OTHER REPRESENTATION OR WARRANTY, EXPRESS, STATUTORY OR IMPLIED, RELATING TO THE EASEMENTS; AND (d) ASSIGNOR MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE USE OR CONDITION (INCLUDING ENVIRONMENTAL USE OR CONDITION), THE PRESENCE OR ABSENCE OF HAZARDOUS MATERIALS AT, ON OR UNDER ANY PORTION OF THE EASEMENTS, COMPLIANCE WITH APPLICABLE LAWS AND AUTHORIZATIONS.

Effective as of the Effective Time, Assignee hereby assumes all of the promises, covenants, representations, warranties, obligations and duties (the "Obligations") of Assignor under the Easements and hereby releases, waives and discharges Assignor from all such Obligations, to the extent set forth in the Purchase Agreement, but no further.

Separate assignments of certain parts of the Easements may be executed by Assignor and Assignee in sufficient counterparts to satisfy applicable statutory and regulatory requirements. In addition, to facilitate recording or filing of this Assignment in the appropriate real property records, the counterpart to be recorded in a specific county may contain only those portions of the Exhibit that describes the real property located in such county. Any such separate assignments or counterpart shall be deemed to contain all of the exceptions, reservations, rights, titles, powers and privileges set forth herein as fully as though they were set forth in each such assignment or counterpart. The interests conveyed by such separate assignments or counterparts are the same, and not in addition to, the Easements conveyed herein.

This Assignment shall not constitute an assignment of any Easements or any Claim or any benefit arising under or resulting from such Easements if an attempted assignment thereof, without a required Third Person Consent or Authorization, would constitute a breach or other contravention of the rights of such third party, would be ineffective with respect to any party to an agreement concerning such Easements, would violate or otherwise is not permitted by

BOOK 339A PAGE 773

applicable Law, or would in any way adversely affect the rights of Assignor or, upon transfer, of Assignee under or in respect of such Easements. If any transfer or assignment by Assignor to, or any assumption by Assignee of, any interest in, or Obligations under, any Easements requires any Third Person Consent or Authorization, then no such assignment or assumption shall be made without such Third Person Consent or Authorization being obtained or expressly waived by such third person. When any required consent is obtained by either party hereto (or otherwise waived), this Assignment shall immediately thereafter become effective as to the affected right or interest without further action by either party being required, provided that Assignor shall, upon request from Assignee, deliver additional assignments of the same form as this Assignment covering the affected right or interest. If any such Third Person Consent or Authorization is not obtained or waived by Assignor and Assignee within 21 years after the date of delivery of this Assignment, this Assignment shall be null and void, but only as to those Easements for which the applicable Third Party Consent or Authorization has not been obtained at that time.

This Assignment shall be binding upon, and inure to the benefit of, the parties hereto and their respective successors and assigns. In the event of any irreconcilable conflict between this Assignment and the Purchase Agreement, the terms and provisions of the Purchase Agreement shall control.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

[SIGNATURES APPEAR ON FOLLOWING PAGE]

BOOK 339A PAGE 775

IN WITNESS WHEREOF, this instrument is executed on the 19th day of March 2008, but is effective for all purposes on the date first above written.

Signed, sealed and delivered in the presence of:

By: ______________________

Unofficial Witness Christian A. Garza

Name: Elizabeth Aguilar

By: ______________________

Notary Public (Official Witness)

Commission Expires 4-4-2011

(Affix Notary Seal)

CITGO ASPHALT REFINING COMPANY

By: CITGO Petroleum Corporation, General Partner

By: ______________________ CAG

Name: Philip J. Reedy
Title: Vice President, Finance

ELIZABETH AGUILAR
MY COMMISSION EXPIRES
April 4, 2011

By: ______________________

Unofficial Witness Christian A. Garza

Name: Elizabeth Aguilar

By: ______________________

Notary Public (Official Witness)

Commission Expires 4-4-2011

(Affix Notary Seal)

By: CITGO East Coast Oil Corporation, General Partner

By: ______________________ CAG

Name: Dean Hasseman
Title: Assistant Secretary

ELIZABETH AGUILAR
MY COMMISSION EXPIRES
April 4, 2011

By: ______________________

Unofficial Witness Kristen McCartney

Name: Karen Thomas

By: ______________________

Notary Public (Official Witness)

Commission Expires 9-12-11

(Affix Notary Seal)

KAREN CHRISTY THOMAS
NOTARY PUBLIC
STATE OF TEXAS
EXPIRES
09-12-2011

NUSTAR ASPHALT REFINING, LLC

By: ______________________

Name: Michael H. Hoeltzel

Title: Senior Vice President



4199153v4 CARCO

## Exhibit A

Savannah Refinery - Chatham GA

| RE# | GRANTOR | GRANTEE | DATE | DESC | BOOK | PAGE |
|---|---|---|---|---|---|---|
| 15660 | UNION CAMP CORPORATION | AMOCO OIL COMPANY | 5/4/1990 | all tract or parcel, in 8th g.m. district of chatham co, described: strip 7' wide and approx 412.33' long | 145-T | 241 |
| 11452 | CHATHAM TERMINAL COMPANY | MEXICAN CORPORATION, AND SOUTHERN BUILDING PRODUCTS CORPORATION | 10/26/1929 | LAND LEASE | | |

.......................................... DataSite Printout ..........................................

Project Name:Camino
Index No: 2.6.2.4
Title: RE 15298 ROW Agreemnt 9-26-29
User: Perry, Amy L
te: Tue Jun 12 14:40:02 CDT 2007
ocument Total Page Count: 10

twenty-four weeks from date of purchase, according to the tenor of an agreement and promissory note executed contemporaneously herewith.

Signed, sealed and delivered

in the presence of: Ben Ferguson

Zoe Coburn J. M. Harris.

N. P. C. C. Ga.

Received for record Sep. 26, 1929.

Recorded Sep. 26, 1929.

OoCoOoOoO

RIGHT OF WAY AGREEMENT between IMBRIE SECURITIES COMPANY, LTD. and MEXICAN PETROLEUM CORPORATION OF GEORGIA and SOUTHERN BUILDING PRODUCTS CORPORATION.

This Indenture, made and entered into by and between Imbrie Securities Company, Ltd., a corporation organized and existing under the laws of the State of New York, and having its principal office and place of business in the City of New York, State of New York, and hereinafter sometimes for convenience called the Imbrie Company, as party of the first part, and Mexican Petroleum Corporation of Georgia, a corporation organized and existing under the laws of the State of Georgia, and having its principal office and place of business near Savannah, said State of Georgia, and hereinafter sometimes for convenience called the Mexican Corporation, as party of the second part, and Southern Building Products Corporation, a corporation organized and existing under the laws of the State of Georgia, and having its principal office and place of business at Savannah, said State of Georgia, and hereinafter sometimes for convenience called the Southern Corporation, as party of the third part,

Witnesseth.

Thatwhereas, the Imbrie Company has agreed to deliver to the Mexican Corporation and to the Southern Corporation, respectively, fifty (50) acres of land on the Savannah River, in the Eighth District G. M., Chatham County, Georgia, about 2-3/4 miles in a northwesterly direction from the City of Savannah, comprising portions of a tract formerly known as the Foundation Tract, conveyed, with other land, by Theodore G. Smith, as sole Permanent Receiver of Imbrie & Company, to Imbrie Securities Company, Ltd., by deed dated March 22, 1928, filed for record May 7, 1928 in the office of the Clerk of the Superior Court of Chatham County, Georgia, and recorded in said Clerk's office in County Records Book 24 H, page 249, the 50 acre tract so conveyed to the Southern Corporation being contiguous to and northward of the 50-acre tract so conveyed to the Mexican Corporation, all of which will more fully appear by reference to (a) description of said 50 acre parcel of land to be conveyed to the Mexican Corporation, (b) description of said 50 acre parcel to be conveyed to the Southern Corporation, (c) a map, all of which are hereto attached and marked respectively Exhibits "A", "B" and "C"; and

Whereas, the Imbrie Company has also agreed to grant to the Mexican Corporation an option to purchase an additional 50 acres contiguous to and to the southwestward of the 50 acres this day conveyed by it to the Mexican Corporation as above set forth, all of which will more fully appear by reference to description of said 50 acre plot so optioned hereto attached and made a part hereof, and marked Exhibit "D"; and

Whereas, the Imbrie Company has agreed to establish the right of way hereinafter granted;

Now, therefore, for and in consideration of the premises and of the sum of Ten

(\$10.00) dollars to each in hand paid by the others, at and before the sealing and delivery of these presents, and for other valuable considerations the parties hereunto moving, receipt whereof by each from the others is hereby acknowledged, the parties above named contract and agree, each with the others, as follows:

1. Imbrie Company hereby grants and establishes a right of way, having a uniform width of sixty (60) feet for the benefit of the parties hereinafter named, their successors in ownership, occupancy or enjoyment of the lands herein referred to, for the purposes herein expressed, subject to the conditions and limitations hereinafter set forth, and passing over and across the lands of Imbrie Company in the manner and to the extent hereinafter mentioned.

2. Said right of way shall commence at a point, designated as E on map hereto attached, on the boundary line between the 50 acre tract to be conveyed to the Southern Corporation and the 50 acre tract to be conveyed to the Mexican Corporation, as above mentioned, and six hundred (600) feet from the southwesterly mean low water line of the Savannah River, and shall extend on a sixty (60) feet front, measured thirty (30) feet from, and on each side of, and at right angles to, said boundary line, in a course running south 48 degrees 35 minutes west, along and across the lands to be respectively conveyed to each of the parties hereto, as hereinafter more particularly expressed, until a point is reached approximately three hundred forty-five (345) feet from the northeasterly boundary line of the right of way of Chatham Terminal Company; thence proceeding on a 12 degree curve, to the southward, until it reaches the northeasterly boundary line of said right of way of said Chatham Terminal Company at the point designated as A on said attached map. Returning over the route of said right of way as just described, and commencing at the point where it leaves the said boundary of the Chatham Terminal Company right of way, and which is designated as A on the map hereto attached to a point designated as B on the map hereto attached, on the northwesterly boundary line of the 50 acre tract covered by the above mentioned option to the Mexican Corporation; from that point until the right of way reaches the point designated on the attached map as C, on the southwesterly boundary line of the 50 acre tract to be conveyed to the Southern Corporation, one-half of the width of said right of way passes over lands belonging to the Imbrie Company and the other one-half of the width of said right of way passes over lands likewise belonging to the Imbrie Company but covered by the above mentioned option to the Mexican Corporation, the distance from B to C being 1334.30 feet; from said point C one-half of the width of said right of way passes over lands to be conveyed to the Southern Corporation and the other one-half of the width of said right of way passes over lands belonging to the Imbrie Company but covered by the above mentioned option to the Mexican Corporation, until the right of way reaches the point designated as D on the map hereto attached, on the northwesterly boundary line of the 50 acre tract to be conveyed to the Mexican Corporation as above mentioned, the distance from C to D being 873.93 feet; from said point D one-half of the width of said right of way passes over lands to be conveyed to the Southern Corporation and the other one-half of the width of said right of way passes over lands to be conveyed to the Mexican Corporation, until the right of way reaches its terminus at the point designated as E on the map hereto attached, the distance from D to E being 1637.00 feet

3. From the beginning point of said right of way at the point designated on said map as E, to the point designated on map as B at the northwesterly boundary of the 50 acre tract covered by the option to the Mexican Corporation, the easement hereby granted shall be for the purposes of the construction and operation of a highway, street railroad tracks, electric power lines, pipelines, telegraph and telephone lines, and railroad tracks.

4. From the point designated as B on the map, at the northwesterly boundary of the 50 acre tract covered by the option to the Mexican Corporation, to the point A on the

northeasterly boundary of the right of way of Chatham Terminal Company, the easement hereby granted shall be for the purpose of a highway and transportation facilities of any kind whatever; provided, however, that said easement shall not be used for railroad or pipeline purposes prior to the first day of March, 1933, or if the plant of the Mexican Corporation is not completed on or about March 1, 1930, prior to three years from the date of such completion.

5. Any and all industries which may now or be hereafter located on the above mentioned Foundation Tract may use said right of way as a perpetual highway; provided, however, that such use of said right of way (a) shall in no way interfere with the exercise of said easement by the Mexican Corporation or the Southern Corporation, their successors in ownership, enjoyment or possession; and (b) shall be contingent upon the full payment of all proper charges the Imbrie Company hereby agreeing for itself, its successors and assigns, to the Foundation Tract, that in future deeds or leases of portions of the Foundation Tract adjacent to said right of way, it will provide that the grantee or lessee shall, as a condition to the use of any of said right of way, assume a proper share of the expense of the improvement and maintenance thereof, based upon the use of said right of way by such grantee or lessee. Users of said right of way other than the Mexican Corporation and the Southern Corporation shall not have any right of crossing or entering into the properties owned and occupied by the respective plants of said companies, or of entering upon said right of way between points B and E, as shown on said map, or the properties which either of said companies may hold under option. This provisionshall not be construed as giving the Southern Corporation the right to cross or to enter the property of the Mexican Corporation, or vice versa, unless they shall mutually so agree, except in so far as the right of way overlaps the property of either.

6. The Imbrie Company reserves, for itself, its successors and assigns, the right to build, maintain, and use railroad tracks across said right of way at any point where it can be corssed without entering the properties owned by or subject to option in favor of the Mexican Corporation or the Southern Corporation; subject, however, to such terms and conditions as shall assure to the Mexican Corporation and the Southern Corporation, their successors in ownership, possession or enjoyment, free and unobstructed use of said right of way; provided, however, that any such crossing track shall have the rights, at any such crossing, of those of a junior railroad under the decisions and statutes of the State of Georgia.

7. The Savannah and Atlanta Railway, in Receivership, is about to be reorganized on a plan of Reorganization that involves, among other things, the conveyance by the Imbrie Company to the Reorganized Railway of so much of the said Foundation Tract as remains after the two fifty acre parcels shall have been conveyed to Mexican Corporation and Southern Corporation and the said additional parcel shall have been optioned to Mexican Corporation.

If on or before October 1, 1930 said Plan should not go into effect so as to involve said conveyance to the Reorganized Railway, then, and in that event, Imbrie Company reserves, for itself, its successors and assigns, the exclusive right, either for a period of three years from the 31st day of March, 1930, or for a period of three years from the said completion date of said refinery and roofing plant if that date shall be later than the 31st day of March, 1930, to construct or cause to be constructed a railroad track or tracks on said sixty (60) right of way between said points B and A on said exhibit, to a connection with any tract thereon ffom B to E. In the aforesaid contingency and for the aforesaid period, Imbrie is given the exclusive right to serve said refinery and said roofing plant as provided in paragraph 9 of a contract between Pan American Petroleum & Transport Company, Certain-teed Products Corporation and Robert H. Nelson of New York City, bearing date the 7th day of August, 1929, a copy of which paragraph 9 is hereto annexed, marked Exhibit "E" and made a part hereof.

8. The Imbrie Company reserves for itself, its successors and assigns, the right to connect the track constructed or to be constructed from B to F as shown on the exhi

hereto annexed with any and all tracks that may, at any time, be laid upon said sixty (60) feet right of way between said points B and E, and to maintain such connections, without cost, however to the Mexican Corporation or the Southern Corporation, their respective successors and assigns.

In Witness whereof, the parties above named have caused these presents to be executed in their respective corporate names, by their respective Presidents or Vice-Presidents and their respective corporate seals to be hereunto affixed, attested by their respective Secretaries or Assistant Secretaries, all of whom are hereunto duly authorized on the dates and at the places and in the presence of the witnesses named opposite their respective signatures.

Signed, sealed and delivered by Imbrie Securities Company, Ltd., the 20th day of Sept. 1929, in the State of New York, County of New York, in presence of:

James F. Dwyer

Edward J. Holgan

Notary Public Countyof New York, State of New York.

Notary Public Kings Co. Clerk's No. 661

Cert. filed in N. Y. Co. No.959, Reg. No. 1-H-627

Commission expires March 30, 1931.

Notarial Seal.

Imbrie Securities Company, Ltd.

By- Geo. P. King
Vice Pres.

Attest: Benj. B. Watson
Secretary

Corporate Seal

Signed, sealed and delivered by Mexican Petroleum Corporation of Georgia, the 20th day of September 1929 in the State of New York, County of New York, in presence of:

James F. Dwyer

William J. Willmott E.W.

N. P. State of New York, County of Nassau

Notary Public Nassau County

New York County Clerk's No. 29

Commission expires March 30, 1931

Notarial Seal.

Mexican Petroleum Corporation of Georgia

By- P. H. Harwood.
Vice President.

Attest: L. W. Bernhard
Secretary.

Corporate Seal.

Signed sealed and delivered by Southern Building Products Corporation, the 20 day of September, 1929, in the State of New York, County of New York, in presence of:

James F. Dwyer

Edward J. Holgan

Notary Public State of New York

County of New York

Notary Public Kings Co. Clerk's No. 661

Cert. filed in N. Y. Co. No. 959, Reg. No. 1-H-627

Commission expires March 30, 1931.

Notarial Seal.

Southern Building Products Corporation

By- John C. Collins
Vice President.

Attest: Wm. E. Horn
Asst Secretary.

Corporate Seal.

EXHIBIT A.

RIGHT OF WAY AGREEMENT between IMBRIE SECURITIES COMPANY, LTD., MEXICAN PETROLEUM CORPORATION OF GEORGIA and SOUTHERN BUILDING PRODUCTS CORPORATION.

All that certain tract or parcel of land, containing 50 acres, situate, lying and being in the 8th District G. M., Chatham County, Georgia, between the Augusta Road and the Savannah River, about 2-3/4 Miles in a northwesterly direction from the City of Savannah, comprising a portion of the tract formerly known as Brampton and Retreat Plantations, and lately known as the Foundation Tract, conveyed with other land by Theodore J. Smith, as sole Permanent Receiver of Imbrie & Company, to Imbrie Securities Company, Ltd., by deed dated March 22, 1928, filed for record May 7, 1928 in the office of the Clerk of the Superior Court of Chatham County, Georgia, and recorded in said Clerk's office in County Records Book 24 H, page 249, said 50 acre tract being more particularly described as follows:

Commencing at a concrete post on the southerly border of the above mentioned Foundation Tract and on the boundary line between said Foundation Tract and the adjoining tract to the southward known as Hermitage Plantation, which said concrete post is approximately 99 feet distant in a southwesterly direction from Low water mark on the Savannah River, and running from said concrete post a distance of 30 feet north 41 degrees and 25 minutes west to an iron monument; thence running from said iron monument south 48 degrees and 35 minutes west, a distance of 2014.0 feet to an iron monument for a beginning point; thence running from said beginning point south 48 degrees 35 minutes west a distance of 1672.08 feet to a point; thence running in a westerly direction on a curve northerly tangent to the last described point; said curve having a radius of 947.37 feet for a distance of 582.06 feet to a point; thence running north 41 degrees and 25 minutes west for a distance of 826.83 feet to a point; thence running north 48 degrees and 35 minutes east 2208.23 feet to a corner marked by an iron monument; thence from said iron monument south 41 degrees 25 minutes east for a distance of 1000 feet to the beginning point; all being shown on map hereto attached and made part hereof.

EXHIBIT B.

RIGHT OF WAY AGREEMENT between Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Products Corporation.

All that certain tract or parcel of land, containing 50 acres, situate, lying and being in the 8th District, G. M., Chatham County, Georgia, between the Augusta Road, and the Savannah River, about 2 3/4 miles in a northwesterly direction from the City of Savannah, comprising a portion of the tract formerly known as Brampton and Retreat Plantations, and lately known as the Foundation Tract, conveyed, with other land by Theodore J. Smith, as sole Permanent Receiver of Imbrie & Company, to Imbrie Securities Company, Ltd., by deed dated March 22nd, 1928, filed for record May 7th, 1928, in the office of the Clerk of the Superior Court of Chatham County Georgia, and recorded in said Clerk's office in County Records Book 24 H, page 249, and more particularly described as follows:

Commencing at a concrete post on the southerly border of the above mentioned Foundation Tract, and on the boundary line between said Foundation Tract and the adjoining tract to the southward known as Hermitage Plantation which said concrete post is approximately 99 feet distant in a southwesterly direction from low water mark on the Savannah River and running from said concrete post north 41 degrees and 25 minutes west, for a distance of 1030 feet to an iron monument for a beginning point; thence running from said iron monument south 48 degrees and 35 minutes west for a distance of 2887.93 feet to a corner marked by a second iron monument; thence running from said second iron monument north 41 degrees and 25 minutes west for a distance of 700 feet to a corner marked by a third iron monument; thence running from said third iron monument north 48 degrees and 35 minutes east for a distance of 2887.93 feet to a fourth iron monument; thence running from said fourth iron monument in the same direction last named for an additional distance of 224 feet to low water mark on the Savannah River; thence running from said last named point 41 degrees and 20 minutes east along the low water line of the Savannah River for a distance of 700 feet to a point; thence running from said last named point south 48 degrees 35 minutes west for a distance of 223 feet to the iron monument marking the point of beginning; all being shown on map hereto attached and made part hereof.

EXHIBIT "D"

RIGHT OF WAY AGREEMENT between IMBRIE SECURITIES COMPANY, LTD., MEXICAN PETROLEUM CORPORATION OF GEORGIA AND SOUTHERN BUILDING PRODUCTS CORPORATION.

All that certain tract or parcel of land containing 50 acres, more or less, lying and being in the 7th District G. M., Chatham County, Georgia, between the Augusta Road and the Savannah River, about 2-3/4 miles in a northwesterly direction from the City of Savannah, comprising a portion of the tract formerly known as Brampton and Retreat Plantations, and lately known as the Foundation Tract, conveyed, with other land by Theodore G. Smith, as sole Permanent Receiver of Imbrie & Company, to Imbrie Securities Company, Ltd., by deed dated March 22, 1928, filed for record May 7, 1928, in the office of the Clerk of the Superior Court of Chatham County, Georgia, and recorded in said Clerk's office in County Records Book 24 M, page 249, said 50-acre tract being more particularly described as follows:

Commencing at a concrete post on the southerly border of the above mentioned Foundation Tract, and on the boundary line between said Foundation Tract and the adjoining tract to the southward known as Hermitage Plantation, which said concrete post is approximately 99 feet distant in a southwesterly direction from low water mark on the Savannah River, and running from said concrete post a distance of 30 feet north 41 degrees and 25 minutes west to a beginning point marked by an iron monument; thence running from said beginning point south 48 degrees and 35 minutes west, and parallel with and at a uniform distance of 30 feet from said boundary line between the Foundation Tract and Hermitage Plantation, a distance of 1500.0 feet to a point opposite a concrete post; and thence continuing in the same direction as before, but at a slightly increasing distance from said boundary line, for an additional distance of 514.0 feet to a corner marked by a second iron monument; thence running from said last named iron monument north 41 degrees and 25 minutes west a distance of 1000 feet to a corner marked by a third iron monument; thence running from said last named iron monument north 48 degrees and 35 minutes east a distance of 2014.0 feet to a fourth iron monument; thence running from said last named iron monument in the same direction last named an additional distance of 223.0 feet to low water mark on the Savannah River; thence running from said last named point south 34 degrees and 41 minutes east along the low water line of the Savannah River a distance of 1006.95 feet to a point which is 30 feet distant from the boundary line between said Foundation Tract and Hermitage Plantation; thence running from said last named point south 48 degrees 35 minutes west a distance of 105 feet to the iron monument marking the point of beginning; all being shown on map hereto attached and made part hereof.

EXHIBIT "E" - RIGHT OF WAY AGREEMENT. Paragraph 9: Contract between PAN AMERICAN PETROLEUM & TRANSPORT COMPANY, CERTAIN-TEED PRODUCTS CORPORATION AND ROBERT H. NELSON, dated August 7th, 1929

9. The Petroleum Company, the Georgia Company and Certain-teed will enter into an agreement with Imbrie on the closing date whereby said companies will agree in case said reorganization plan shall not be consummated in such manner as to involve the conveyance by Imbrie of the balance of the Foundation Tract to the Savannah & Atlanta Railway or its successor on or before October 1, 1930, then (a) Imbrie shall have the right at any time to construct or cause to be constructed an industrial railway lead on that part of the above mentioned right-of-way extending from the point marked A to the point marked B on Exhibit A in such manner as to connect at the point marked B with the lead B-E be constructed by the Petroleum Company, or its nominee and the Georgia Company at the point marked B and (b) the Petroleum Company, the Georgia Company and Certain-teed will agree to favor such railway company as Imbrie shall designate with all of its traffic over a period of three years from March 1, 1930, or if the plant of the Petroleum Company is not completed on or about March 1, 1930, three years from the date of such completion, so long as rates and service are equal with those of other lines, and after said three year period that said companies will, to

the extent that they may respectively determine proper and not detrimental to its own interests, continue to favor such railway company as Imbrie shall designate so long as rates and service are equal with those of other lines. In the event that the owner of said lead from A to B shall, for any reason, cease to carry the traffic to and from said plants, said owner shall remove said lead from said right-of-way within forty days after written notice from Certain-teed or the Petroleum Company or its nominee so to do, unless said owner shall sell the lead to the said plants or some railroad carrier which they desire to have serve them. Subject only to the provisions of this Article and Articles 1, 3, 4, 8 and 10 hereof, said right-of-way shall be free and clear of all conditions or obligations on the part of the Petroleum Company and the Georgia Company.

Received for record Sep. 25, 1929

Recorded Sep. 27, 1929.

OoOoOoOoOoO

K.

THIS AGREEMENT, made and entered into by and between Imbrie Securities Company, Ltd., a New York corporation, ( hereinafter called Imbrie), and The Port Wentworth Company, a Massachusetts corporation, ( hereinafter called the Company).

Witnesseth.

That for and in consideration of the sum of One dollar ($1.00.), receipt whereof by each of the parties from the other is hereby acknowledged, and in consideration of the agreements herein contained, said parties agree as follows:

Whereas, Imbrie is conveying to the Company an easement for a fifty-foot right-of-way shown upon the map hereto annexed, marked exhibit A and made a part hereof, by dotted lines extending from the point on said exhibit marked F to the point thereon marked B and

Whereas, the Receiver of the Savannah & Atlanta Railway is proceeding to construct upon said right-of-way a railroad track from said point F to said point B to a connection with a track to be constructed from point B to point E on a sixty-foot right-of-way shown upon said map as extending between the points marked A and E and

Whereas, said right-of-way, and said track so to be constructed, are to be owned by the Company, and it is desired that the right to connect said track from F to B with any track that may hereafter be laid upon said sixty-foot right-of-way from the point marked B to the point marked E, shall be secured to the Company, subject to a ninety-nine-year lease of December 31st, 1917, to which the Company is a successor party, as lessor, and the said Receiver is a successor party, as lessee, and

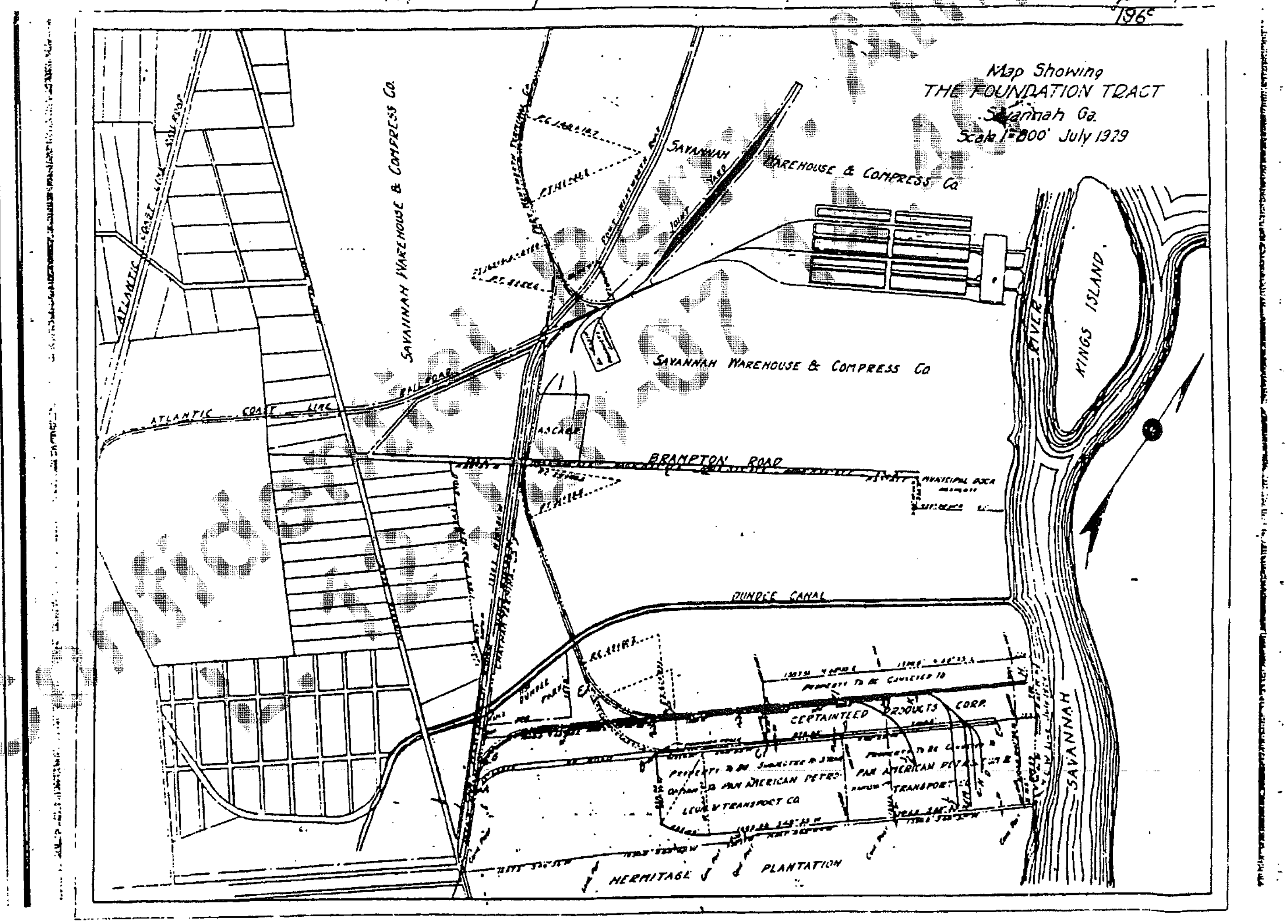
Whereas, Imbrie is granting the easement for the said sixty-foot-right-of-way jointly to the Mexican Petroleum Corporation of Georgia, and Southern Building Products Corporation of Georgia, and Southern Building Porducts Corporation, in order that industrial plants which they are to build on parcels of land adjacent to said right of way may be served thereby, and

Whereas in the grant of said sixty-foot easement, Imbrie has reserved to itself, its successors and assigns, the right to a connection of said track from F to B with any tracks that may hereafter be laid upon said sixty-foot right of way between said points B and E, and the right to maintain any such connections,

Now therefore, the parties agree as follows:

1. Imbrie, herein and hereby assigns, transfers and sets over unto the Company its successors and assigns(W.M.RMN,)the right to connect the track to be constructed from the point marked F to the point marked B, as shown on said exhibit A, with any and all tracks that may, at any time, be laid upon said sixty foot right of way between said point B and said point E as shown upon said exhibit, and to maintain such connections, without cost however, to the said Mexican Petroleum Corporation of Georgia, or the said Southern Building Products Corporation,

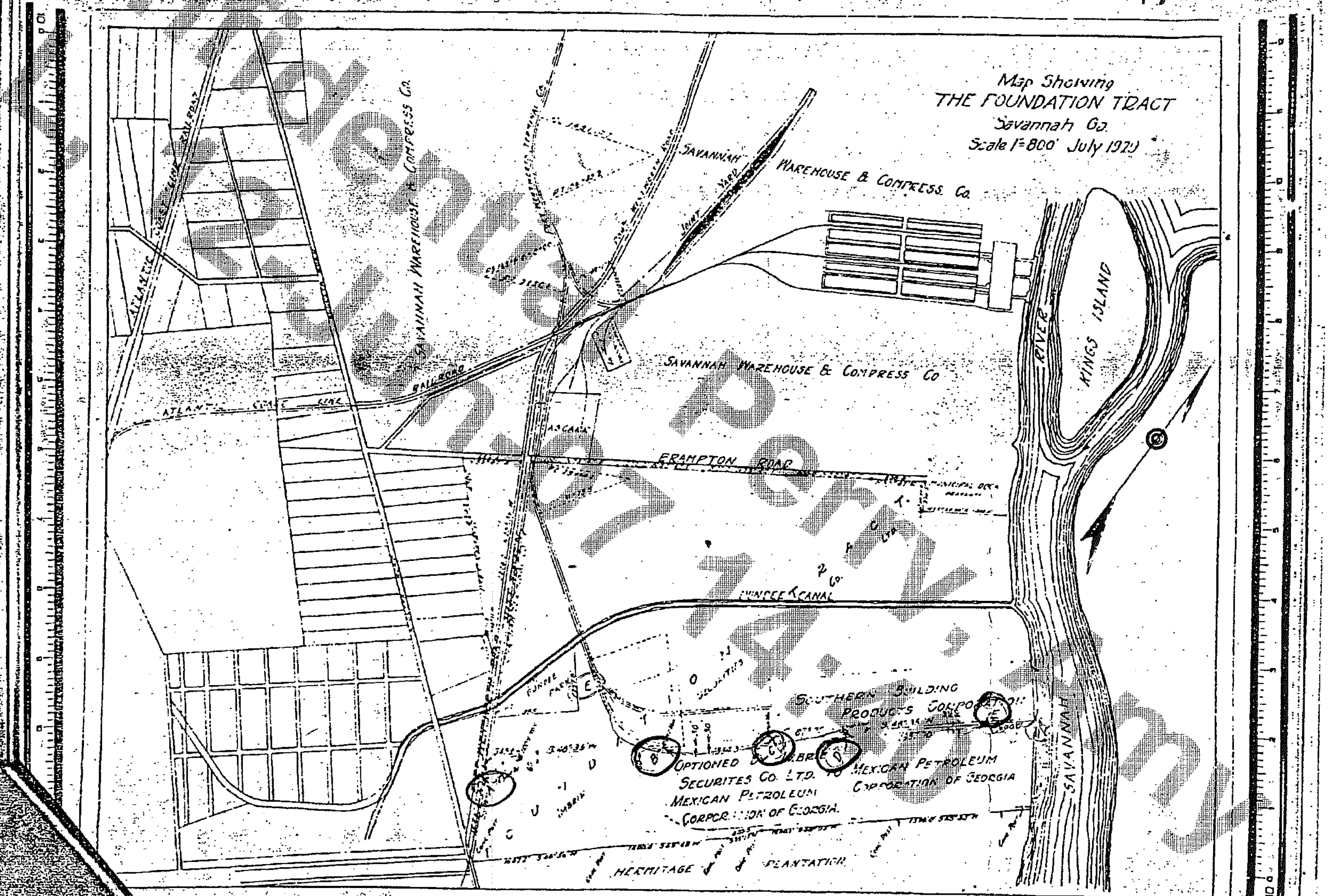
See Plat Book # 2, Folio 196



Map Showing
THE FOUNDATION TRACT
Savannah Ga.
Scale 1"=800' July 1929
196c
SAVANNAH WAREHOUSE & COMPRESS CO.
SAVANNAH WAREHOUSE & COMPRESS Co
SAVANNAH WAREHOUSE & COMPRESS Co
ATLANTIC COAST LINE
RAILROAD
BRAMPTON ROAD
DUNDEE CANAL
KINGS ISLAND
SAVANNAH RIVER
HERMITAGE PLANTATION
PAN AMERICAN PETROLEUM & TRANSPORT
CERTAINTEED PRODUCTS CORP.
PAN AMERICAN PETRO LEUM & TRANSPORT CO.

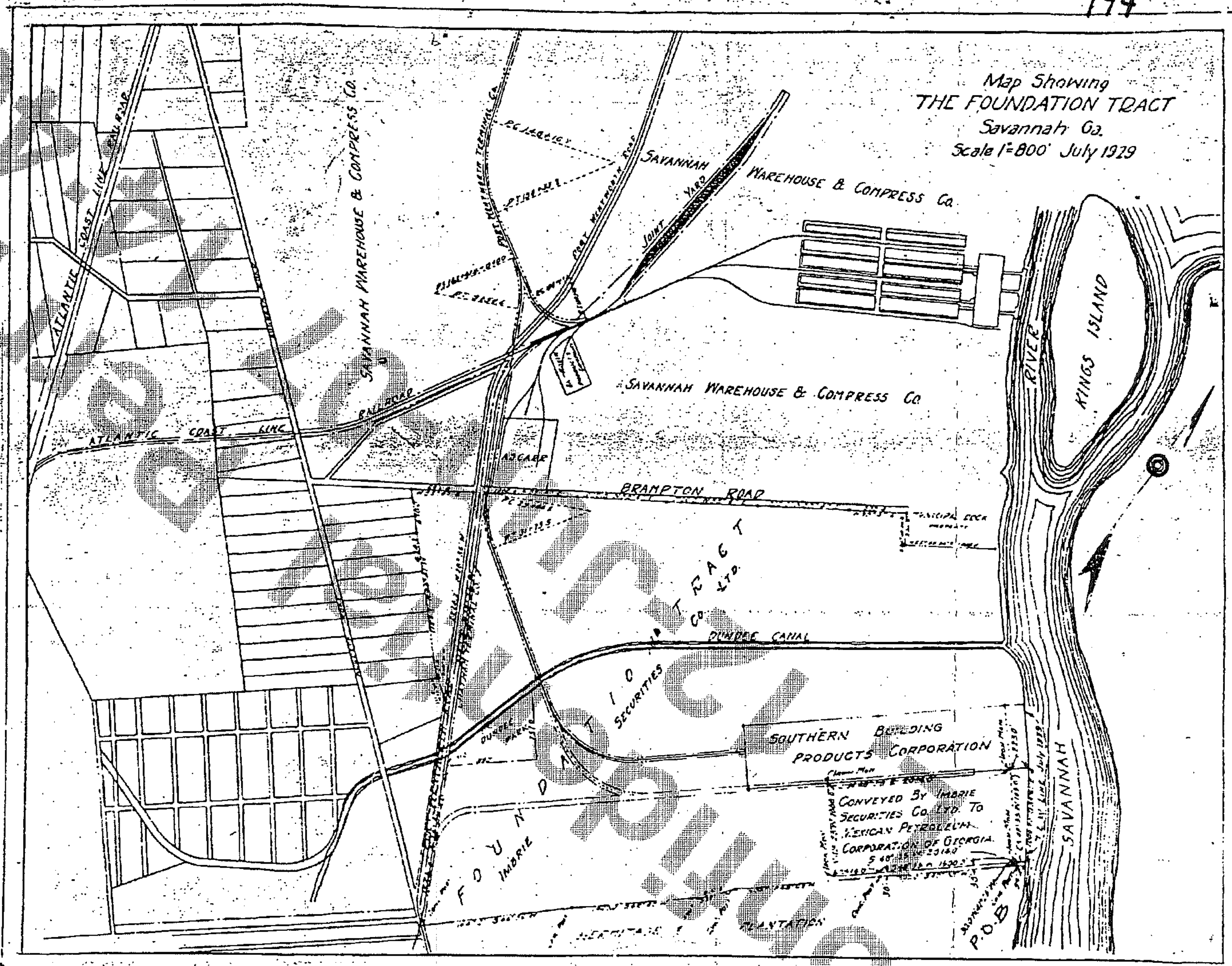
Imbrie Securities Co. Ltd., Mexican Petroleum Co. of Georgia
Southern Bldg Products, Corp. Book 25 W 491

194c



Imbrie Securities Co. Ltd. to Mexican Petroleum

194




SCALE OF REPRODUCED PRINT

M.B. 2-194

## VESTING DEED

159U/93

NA12067

RECEIVED FOR RECORD
93 MAY -4 AM 10:11
CLERK, S.C.C.GA.

STATE OF ILLINOIS )
)
COUNTY OF COOK )

LIMITED WARRANTY DEED

THIS INDENTURE is made this 29 day of April, 1993, by and between AMOCO OIL COMPANY, a Maryland corporation (hereinafter referred to as "Grantor"), and CITGO ASPHALT REFINING COMPANY (hereinafter referred to as "Grantee"), a New Jersey general partnership whose managing general partner is CITGO East Coast Refining Corporation, a Delaware corporation (the terms "Grantor" and "Grantee" to include their respective legal representatives, heirs, successors and assigns and, further, the singular shall include the plural where the context requires or permits).

Chatham County ... 5-4-93 ... 744.00 ... Clerk of Sup. Court

W I T N E S S E T H:

Filed For Record At 10:11 O'Clock A M. On The 4 Day Of May 1993. Recorded In Record Book 159-U Folio 93 On The 4 Day Of May 1993

FOR AND IN CONSIDERATION of Ten Dollars ($10.00) and other good and valuable consideration in hand paid at and before the sealing and delivery of these presents, the receipt and sufficiency of which are hereby acknowledged, Grantor has granted, bargained, sold, aliened, conveyed and confirmed, and by these presents does grant, bargain, sell, alien, convey and confirm, unto Grantee the fee simple estate in and to that certain tract or parcel of land lying and being in Chatham County, Georgia, and being more particularly described on Exhibit "A" attached hereto and incorporated herein by reference (hereinafter referred to as the "Property").

TO HAVE AND TO HOLD the Property, with all and singular the rights, members and appurtenances thereof, to the same being, belonging, or in anywise appertaining, to the only proper use, benefit and behoof of Grantee forever in fee simple, subject only to the items, exceptions and encumbrances (collectively, the "Permitted Exceptions") more particularly described in Exhibit "B" attached hereto and incorporated herein by this reference.

Grantor shall warrant and forever defend the right and title to the Property unto Grantee against the claims of all persons claiming by, through or under Grantor, subject only to the Permitted Exceptions.

381450A001 05/04/93TOTAL 17.00

MILJM553\REALESTA\WARRANTY.GA 381450A001 05/04/93TRANSFER 744.00

159U|93

94

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed, sealed and delivered by its duly authorized officers or representatives on the date first above written.

AMOCO OIL COMPANY,
a Maryland corporation

Signed, sealed and delivered in the presence of:

Witness

By:
Name: Robert J. Rauscher
Title: V.P. Marketing, Amoco Oil Company

Notary Public

ATTEST:

By:
Name:
Title:

Commission expiration date:
12-11-96

[NOTARIAL SEAL]

[CORPORATE SEAL]

"OFFICIAL SEAL"
REGINA A. WILKENS
Notary Public, State of Illinois
My Commission Expires 12/11/96

MRJMDS38:REALESTA\WARRANTY.GA

ACKNOWLEDGEMENT

STATE OF ILLINOIS )
)
COUNTY OF COOK )

95

This 29th day of April, 1993, personally came before me, Regina Wilkens, a Notary Public duly authorized to take such proof, Robert J. Carroll, who, being duly sworn by me, says the he/~~she~~ is the Vice President of AMOCO OIL COMPANY, a Maryland corporation (the "Company"), and that the seal affixed to the foregoing instrument is the corporate seal of the Company and that said instrument was signed and sealed by him/~~her~~ on behalf of said Company by its authority duly given, and he/she acknowledged the instrument to be the act and deed of said Company.

Regina A. Wilkens
NOTARY PUBLIC

My Commission Expires:
12-11-96

[NOTARY SEAL]

"OFFICIAL SEAL"
REGINA A. WILKENS
Notary Public, State of Illinois
My Commission Expires 12/11/96

M:\JMS535\REALESTA\WARRANTY.CA

96

All that certain lot, tract, or parcel of land situate, lying and being in the County of Chatham and the State of Georgia and known as a 65.5± acre portion of the Foundation Tract formerly known as Brampton and Retreat Plantations being more particularly described as follows:

Beginning at a point where the dividing line between lands of Union Camp Corporation and the property herein described intersects the south line of Foundation Drive, said point being situated at Georgia State Plane Grid Coordinates (East Zone) N-766,908.98, E-819,573.51; extend thence N48°31'E along the south line of Foundation Drive a distance of 1478.33' to a point; extend thence N41°32'55"W a distance of 30.77' to a point on the dividing line between lands now or formerly of Certain-Teed Products Corporation and the property herein described; extend thence along said line N48°27'05"E a distance of approximately 2272.95' to a point on the harbor line of the Savannah River; extend thence along said harbor line S40°40'53"E a distance of 611.12' to a point; extend thence S31°42'50"E a distance of 397.16' to a point on the dividing line between lands now or formerly of Manville Corporation and the property described herein; extend thence along said dividing line S48°31'05"W a distance of 1623.43' to a point; extend thence S48°27'55"W a distance of 513.02' to a point on the dividing line of lands now or formerly of Union Camp Corporation and the property herein described; extend thence N54°43'13"W a distance of 231.53' to a point; thence continue N42°02'45"W a distance of 294.47' to a point; thence continue S48°31'W a distance of 1482.79' to a point; thence continue N41°29'W a distance of 450.00' to a point, said point also being the Point of Beginning.

Together with all right, title and interest in that certain Easement for right of way as reflected in instrument recorded in Book 145-T, Folio 241.

EXHIBIT B

Permitted Exceptions



1. General and special taxes or assessments for 1993 and subsequent years not yet due and payable.

2. Agreement dated March 28, 1928 between Imbrie Securities Company, Ltd. and Port Wentworth Terminal Corporation for maintenance and operation of railroad spur tracks across the property, as recorded in the Chatham County Records in Deed Book 24-H, Folio 271.

3. Right-of-Way Agreement dated September 23 1929 between Imbrie Securities Company, Ltd. and Mexican Petroleum Corp. recorded in the Chatham County Records in Deed Book 25-Y, Folio 1, covering a 30 foot strip along the southern boundary of the property.

4. License Agreement dated March 20, 1947 between The Foundation Co. and the Industrial and Domestic Water Supply Commission [City of Savannah] recorded in the aforesaid records in Deed Book 45-B, Folio 389, concerning construction and operation of a water supply system and related water lines.

5. Right-of-Way Agreement dated September 20, 1929 between Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Products Corporation for a 60 foot right-of-way, 30 feet on either side of the northern boundary line of the property, as recorded in the Chatham County Records in Deed Book 25-W, Folio 491.

6. Easement dated October 26, 1929 by Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Corporation in favor of Savannah Electric and Power Company for the erection and maintenance of its electric transmission lines and necessary poles, guys, wires and other fixtures, as evidenced by agreement recorded in the aforesaid records in Deed Book 26-B, Folio 8.

7. [INTENTIONALLY DELETED]

8. Easement Agreement dated June 17, 1948, recorded in the aforesaid records in Deed Book 47-F, Folio 315, by and between Mexican Petroleum Corporation of Georgia and the Mayor and Aldermen of the City of Savannah concerning the construction, operation and maintenance of water lines through the property.

9. License Agreement dated October 8, 1954 between The American Oil Company and Southern Natural Gas Company for the erection, operation and maintenance of a four-inch natural gas pipeline,

as recorded in the aforesaid records in Deed Book 60-V, Folio 123; as amended by Supplemental License Agreement dated February 10, 1956 and recorded in Deed Book 64-C, Folio 12; as partially assigned by Amoco Oil Company (formerly The American Oil Company) to Union Camp Corporation by Assignment dated May 4, 1990 and recorded in Deed Book 145-T, Folio 244.

10. License Agreement dated November 21, 1955 between The American Oil Company and the Industrial and Domestic Water Supply Commission [of the City of Savannah] for construction, operation and maintenance of an underground 12-inch water pipeline or water main and connections thereto, as recorded in the aforesaid records in Deed Book 63-U, Folio 35.

11. Drainage Easement dated May 4, 1990 from Amoco Oil Company to Union Camp Corporation for use as a drainage right-of-way along the southeastern corner of the property, as recorded in the aforesaid records in Deed Book 145-T, Folio 238.

12. Matters disclosed by that certain plat of survey prepared by Hussey, Gay, Bell & DeYoung dated April 1992, revised October 19, 1992, and entitled "Plat of a Portion of the Foundation Tract Formerly Known as Brampton and Retreat Plantation, 8th G.M. District, Chatham County, Georgia" including, but not limited to:

    (a) Encroachment of fence, wall and metal dolphin shown in the southeast corner of the property;

    (b) Railroad tracks extending across various portions of the property;

    (c) Overhead power lines and poles along the northwestern portion of the property;

    (d) Various access or maintenance easements bordering or crossing the southwestern portion of the property, including but not limited to that certain 20' access easement, 7' location and maintenance easement, and 50' access easement, all as depicted on that certain plat recorded in Plat Record Book 11-P, Folio 43.

    (e) Gas line along the western boundary of the property and gas line easements (15') crossing the western portion of the property, the latter being evidenced by License Agreement dated December 29, 1961 between Amoco and South Atlantic Gas Company and that certain plat of survey prepared by Thomas & Hutton Engineering Co. dated November 14, 1961.

    (f) Fence encroachment along northwestern portion of the property, adjacent to Parcel "C";

(g) Pipelines and related access and maintenance easements, said pipelines running in a northeasterly direction across the property;

(h) Industrial and domestic water line traversing the property and service water line entering the southwestern portion of the property.

(i) Extension beyond the harbor line of metal pier, concrete pier, wood wall and dolphin.

(j) Drainage easement (50') crossing the southern portion of the property, reference being made to Easement recorded in Deed Book 145-T, Folio 238.

13. Rights, if any, of the United States of American, the State of Georgia, any other governmental body, and/or the public and other riparian owners, to any portions of the property conveyed as may lie below the high water mark of the Savannah River or may be "estuarine area" as defined by the Georgia Coastal Marshlands Protection Act.

14. Rights, if any, of the general public and of adjacent owners, their heirs, successors, assigns, tenants and invitees, in and to the adjacent paved road, the center line of which forms the northwestern boundary of the property.

15. Easement for Drainage Right-of-Way dated May 9, 1990 by and between Amoco Oil Company and Union Camp Corporation, a Virginia corporation, for the purpose of the diversion and drainage of surface waters from lands of Union Camp on, over and across the Property as recorded on May 15, 1990 in Chatman County Record Book 145-T, Folio 238.

and any other matter which should have been disclosed by a search of public records.

................................................ DataSite Printout ................................................

Project Name:Camino
Index No: 2.6.2.2
Title: RE 11956.01 Lmtd. Warrnty Deed 4-29-1993
User: Perry, Amy L
Date: Tue Jun 12 14:39:14 CDT 2007
:ument Total Page Count: 12

NA12067

93

RECEIVED FOR RECORD
93 MAY -4 AM 10:11
CLERK, S.C.C.GA.

STATE OF ILLINOIS )
)
COUNTY OF COOK )

LIMITED WARRANTY DEED

THIS INDENTURE is made this 29 day of April, 1993, by and between AMOCO OIL COMPANY, a Maryland corporation (hereinafter referred to as "Grantor"), and CITGO ASPHALT REFINING COMPANY (hereinafter referred to as "Grantee"), a New Jersey general partnership whose managing general partner is CITGO East Coast Refining Corporation, a Delaware corporation (the terms "Grantor" and "Grantee" to include their respective legal representatives, heirs, successors and assigns and, further, the singular shall include the plural where the context requires or permits).

Chatham Co. Real Estate Transfer Tax Paid $744.00 Date 5-4-93
Patrick Donaldson
For Clerk of Sup. Court

Filed For Record At 10:11 O'Clock A M. On The 4 Day Of May 1993
Recorded in Record Book 159-U Folio 93 On The 4 Day Of May 1993
Clerk Superior Court Chatham Co. GA.

W I T N E S S E T H:

FOR AND IN CONSIDERATION of Ten Dollars ($10.00) and other good and valuable consideration in hand paid at and before the sealing and delivery of these presents, the receipt and sufficiency of which are hereby acknowledged, Grantor has granted, bargained, sold, aliened, conveyed and confirmed, and by these presents does grant, bargain, sell, alien, convey and confirm, unto Grantee the fee simple estate in and to that certain tract or parcel of land lying and being in Chatham County, Georgia, and being more particularly described on Exhibit "A" attached hereto and incorporated herein by reference (hereinafter referred to as the "Property").

TO HAVE AND TO HOLD the Property, with all and singular the rights, members and appurtenances thereof, to the same being, belonging, or in anywise appertaining, to the only proper use, benefit and behoof of Grantee forever in fee simple, subject only to the items, exceptions and encumbrances (collectively, the "Permitted Exceptions") more particularly described in Exhibit "B" attached hereto and incorporated herein by this reference.

Grantor shall warrant and forever defend the right and title to the Property unto Grantee against the claims of all persons claiming by, through or under Grantor, subject only to the Permitted Exceptions.

381450A001 05/04/93TOTAL 17.00

M:\JM5539\REALESTA\WARRANTY.GA

381450A001 05/04/93TRANSFER 744.00

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed, sealed and delivered by its duly authorized officers or representatives on the date first above written.

AMOCO OIL COMPANY,
a Maryland corporation

Signed, sealed and delivered
in the presence of:

Witness

By:
Name: Robert J. Ruescher
Title: V.P. Marketing, Amoco Oil Company

ATTEST:

Notary Public

By: C. J. Hartar
Name:
Title:

Commission expiration date:
12-11-96

[NOTARIAL SEAL]

"OFFICIAL SEAL"
REGINA A. WILKENS
Notary Public, State of Illinois
My Commission Expires 12/11/96

[CORPORATE SEAL]

1922

M:\JM5539\REALESTA\WARRANTY.GA

# ACKNOWLEDGEMENT

STATE OF ILLINOIS )
)
COUNTY OF COOK )

This 29th day of April, 1993, personally came before me, Regina Wilkens, a Notary Public duly authorized to take such proof, Robert J. [illegible], who, being duly sworn by me, says the he/~~she~~ is the Vice President of AMOCO OIL COMPANY, a Maryland corporation (the "Company"), and that the seal affixed to the foregoing instrument is the corporate seal of the Company and that said instrument was signed and sealed by him/~~her~~ on behalf of said Company by its authority duly given, and he/she acknowledged the instrument to be the act and deed of said Company.

Regina A. Wilkens
NOTARY PUBLIC

My Commission Expires:
12-11-96

[NOTARY SEAL]

"OFFICIAL SEAL"
REGINA A. WILKENS
Notary Public, State of Illinois
My Commission Expires 12/11/96

96

All that certain lot, tract, or parcel of land situate, lying and being in the County of Chatham and the State of Georgia and known as a 65.5± acre portion of the Foundation Tract formerly known as Brampton and Retreat Plantations being more particularly described as follows:

Beginning at a point where the dividing line between lands of Union Camp Corporation and the property herein described intersects the south line of Foundation Drive, said point being situated at Georgia State Plane Grid Coordinates (East Zone) N-766,908.98, E-819,573.51; extend thence N48°31'E along the south line of Foundation Drive a distance of 1478.33' to a point; extend thence N41°32'55"W a distance of 30.77' to a point on the dividing line between lands now or formerly of Certain-Teed Products Corporation and the property herein described; extend thence along said line N48°27'05"E a distance of approximately 2272.95' to a point on the harbor line of the Savannah River; extend thence along said harbor line S40°40'53"E a distance of 611.12' to a point; extend thence S31°42'50"E a distance of 397.16' to a point on the dividing line between lands now or formerly of Manville Corporation and the property described herein; extend thence along said dividing line S48°31'05"W a distance of 1623.43' to a point; extend thence S48°27'55"W a distance of 513.02' to a point on the dividing line of lands now or formerly of Union Camp Corporation and the property herein described; extend thence N54°43'15"W a distance of 231.53' to a point; thence continue N42°02'45"W a distance of 294.47' to a point; thence continue S48°31'W a distance of 1482.79' to a point; thence continue N41°29'W a distance of 450.00' to a point, said point also being the Point of Beginning.

Together with all right, title and interest in that certain Easement for right of way as reflected in instrument recorded in Book 145-T, Folio 241.

# EXHIBIT B

## Permitted Exceptions

1. General and special taxes or assessments for 1993 and subsequent years not yet due and payable.

2. Agreement dated March 28, 1928 between Imbrie Securities Company, Ltd. and Port Wentworth Terminal Corporation for maintenance and operation of railroad spur tracks across the property, as recorded in the Chatham County Records in Deed Book 24-H, Folio 271.

3. Right-of-Way Agreement dated September 23 1929 between Imbrie Securities Company, Ltd. and Mexican Petroleum Corp. recorded in the Chatham County Records in Deed Book 25-Y, Folio 1, covering a 30 foot strip along the southern boundary of the property.

4. License Agreement dated March 20, 1947 between The Foundation Co. and the Industrial and Domestic Water Supply Commission [City of Savannah] recorded in the aforesaid records in Deed Book 45-B, Folio 389, concerning construction and operation of a water supply system and related water lines.

5. Right-of-Way Agreement dated September 20, 1929 between Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Products Corporation for a 60 foot right-of-way, 30 feet on either side of the northern boundary line of the property, as recorded in the Chatham County Records in Deed Book 25-W, Folio 491.

6. Easement dated October 26, 1929 by Imbrie Securities Company, Ltd., Mexican Petroleum Corporation of Georgia and Southern Building Corporation in favor of Savannah Electric and Power Company for the erection and maintenance of its electric transmission lines and necessary poles, guys, wires and other fixtures, as evidenced by agreement recorded in the aforesaid records in Deed Book 26-B, Folio 8.

7. [INTENTIONALLY DELETED]

8. Easement Agreement dated June 17, 1948, recorded in the aforesaid records in Deed Book 47-F, Folio 315, by and between Mexican Petroleum Corporation of Georgia and the Mayor and Aldermen of the City of Savannah concerning the construction, operation and maintenance of water lines through the property.

9. License Agreement dated October 8, 1954 between The American Oil Company and Southern Natural Gas Company for the erection, operation and maintenance of a four-inch natural gas pipeline,

as recorded in the aforesaid records in Deed Book 60-V, Folio 123; as amended by Supplemental License Agreement dated February 10, 1956 and recorded in Deed Book 64-C, Folio 12; as partially assigned by Amoco Oil Company (formerly The American Oil Company) to Union Camp Corporation by Assignment dated May 4, 1990 and recorded in Deed Book 145-T, Folio 244.

10. License Agreement dated November 21, 1955 between The American Oil Company and the Industrial and Domestic Water Supply Commission [of the City of Savannah] for construction, operation and maintenance of an underground 12-inch water pipeline or water main and connections thereto, as recorded in the aforesaid records in Deed Book 63-U, Folio 35.

11. Drainage Easement dated May 4, 1990 from Amoco Oil Company to Union Camp Corporation for use as a drainage right-of-way along the southeastern corner of the property, as recorded in the aforesaid records in Deed Book 145-T, Folio 238.

12. Matters disclosed by that certain plat of survey prepared by Hussey, Gay, Bell & DeYoung dated April 1992, revised October 19, 1992, and entitled "Plat of a Portion of the Foundation Tract Formerly Known as Brampton and Retreat Plantation, 8th G.M. District, Chatham County, Georgia" including, but not limited to:

    (a) Encroachment of fence, wall and metal dolphin shown in the southeast corner of the property;

    (b) Railroad tracks extending across various portions of the property;

    (c) Overhead power lines and poles along the northwestern portion of the property;

    (d) Various access or maintenance easements bordering or crossing the southwestern portion of the property, including but not limited to that certain 20' access easement, 7' location and maintenance easement, and 50' access easement, all as depicted on that certain plat recorded in Plat Record Book 11-P, Folio 43.

    (e) Gas line along the western boundary of the property and gas line easements (15') crossing the western portion of the property, the latter being evidenced by License Agreement dated December 29, 1961 between Amoco and South Atlantic Gas Company and that certain plat of survey prepared by Thomas & Hutton Engineering Co. dated November 14, 1961.

    (f) Fence encroachment along northwestern portion of the property, adjacent to Parcel "C";

(g) Pipelines and related access and maintenance easements, said pipelines running in a northeasterly direction across the property;

(h) Industrial and domestic water line traversing the property and service water line entering the southwestern portion of the property.

(i) Extension beyond the harbor line of metal pier, concrete pier, wood wall and dolphin.

(j) Drainage easement (50') crossing the southern portion of the property, reference being made to Easement recorded in Deed Book 145-T, Folio 238.

13. Rights, if any, of the United States of American, the State of Georgia, any other governmental body, and/or the public and other riparian owners, to any portions of the property conveyed as may lie below the high water mark of the Savannah River or may be "estuarine area" as defined by the Georgia Coastal Marshlands Protection Act.

14. Rights, if any, of the general public and of adjacent owners, their heirs, successors, assigns, tenants and invitees, in and to the adjacent paved road, the center line of which forms the northwestern boundary of the property.

15. Easement for Drainage Right-of-Way dated May 9, 1990 by and between Amoco Oil Company and Union Camp Corporation, a Virginia corporation, for the purpose of the diversion and drainage of surface waters from lands of Union Camp on, over and across the Property as recorded on May 15, 1990 in Chatman County Record Book 145-T, Folio 238.

and any other matter which should have been disclosed by a search of public records.

P O Box 3014
Fayetteville, NC 28302
Returned: Cindy
1-800-433-3961

RECORDED AND VERIFIED
MARY SUE [illegible]
REGISTER OF DEEDS
NEW HANOVER CO. NC

'93 MAY 3 PM 3 20

NA 12268

BOOK PAGE
1663 0273

Prepared by:
Aasia Mustakeem, Esq.
Jones, Day, Reavis & Pogue
3500 One Peachtree Center
303 Peachtree Street, N.E.
Atlanta, GA 30308-3242

NEW HANOVER CO 05-03-93

STATE OF NORTH CAROLINA $1000.00 Real Estate Excise Tax

STATE OF ILLINOIS )
)
COUNTY OF COOK )

LIMITED WARRANTY DEED

THIS INDENTURE is made this 29th day of April, 1993, by and between AMOCO OIL COMPANY, a Maryland corporation (hereinafter referred to as "Grantor"), and CITGO ASPHALT REFINING COMPANY (hereinafter referred to as "Grantee"), a New Jersey general partnership whose managing general partner is CITGO East Coast Refining Corporation, a Delaware corporation (the terms "Grantor" and "Grantee" to include their respective legal representatives, heirs, successors and assigns and, further, the singular shall include the plural where the context requires or permits).

W I T N E S S E T H:

FOR AND IN CONSIDERATION of Ten Dollars ($10.00) and other good and valuable consideration in hand paid at and before the sealing and delivery of these presents, the receipt and sufficiency of which are hereby acknowledged, Grantor has granted, bargained, sold, aliened, conveyed and confirmed, and by these presents does grant, bargain, sell, alien, convey and confirm, unto Grantee the fee simple estate in and to that certain tract or parcel of land lying and being in New Hanover County, North Carolina, and being more particularly described on Exhibit "A" attached hereto and incorporated herein by reference (hereinafter referred to as the "Property"). The hereinabove described Property was conveyed to Grantor, as to Parcels I through VIII, by virtue of a deed in favor of The American Oil Company, a corporation duly organized under the laws of the State of Maryland, executed by Socony-Vacuum Oil Company, Incorporated, a New York corporation, dated September 8, 1947, recorded September 17, 1947 in Book 380 at Page 436, Office of the Register of Deeds, New Hanover County, North Carolina; and,

M:\JM5539\REALESTA\WARRANTY.NC



000117

as to Parcel IX, by virtue of a deed in favor of The American Oil Company, a corporation duly organized under the laws of the State of Maryland, executed by The Atlantic Refining Company, a Pennsylvania corporation, dated August 18, 1950, recorded September 23, 1950 in Book 466 at Page 226, aforesaid Records.

TO HAVE AND TO HOLD the Property, with all and singular the rights, members and appurtenances thereof, to the same being, belonging, or in anywise appertaining, to the only proper use, benefit and behoof of Grantee forever in fee simple, subject only to the items, exceptions and encumbrances (collectively, the "Permitted Exceptions") more particularly described in Exhibit "B" attached hereto and incorporated herein by this reference.

Grantor shall warrant and forever defend the right and title to the Property unto Grantee against the claims of all persons claiming by, through or under Grantor, subject only to the Permitted Exceptions.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed, sealed and delivered by its duly authorized officers or representatives on the date first above written.

AMOCO OIL COMPANY,
a Maryland corporation

Signed, sealed and delivered
in the presence of:

Unofficial Witness

By:
Name: Robert J. Rueschel
Title: V.P. Marketing
Amoco Oil Co.

ATTEST:

Unofficial Witness

By:
Name:
Title:

[CORPORATE SEAL]

ACKNOWLEDGEMENT

STATE OF ILLINOIS )
)
COUNTY OF COOK )

This 29th day of April, 1993, personally came before me, Regina Wilkens, a Notary Public duly authorized to take such proof, Robert J. Rosacker, who, being duly sworn by me, says the he/~~she~~ is the Vice President of AMOCO OIL COMPANY, a Maryland corporation (the "Company"), and that the seal affixed to the foregoing instrument is the corporate seal of the Company and that said instrument was signed and sealed by him/~~her~~ on behalf of said Company by its authority duly given, and he/she acknowledged the instrument to be the act and deed of said Company.

Regina A Wilkens
NOTARY PUBLIC

My Commission Expires:
12-11-96

[NOTARY SEAL]

"OFFICIAL SEAL"
REGINA A. WILKENS
Notary Public, State of Illinois
My Commission Expires 12/11/96

STATE OF NORTH CAROLINA
New Hanover County
The Foregoing/ Annexed Certificate(~~s~~) of
Regina A. Wilkens

Notary ~~(Notaries)~~ Public is/~~are~~ certified to be correct.

This the 3rd day of May 1993
Mary Sue Oots, Register of deeds
by Deborah McMaurllen
Deputy/~~Assistant~~



M:\JM5539\REALESTA\WARRANTY.NC

PARCEL I:

BEING all of that certain 30.656 acre tract as shown on the map of "Survey of Property for Amoco Oil Company," dated February 1992, by Howard M. Loughlin, Registered Land Surveyor, corded in Map Book 33 at Page 34 and re-recorded in Map Book 33 at Page 37 of the New over County Registry, North Carolina.

PARCEL II:

TOGETHER WITH a right-of-way in common with Koch Refining, its successors and assigns, for ingress and egress of persons and vehicles over a strip of land twenty-five (25) feet in width, said right-of-way extending from River Road to the high water line of the Cape Fear River, as shown on the aforementioned map.

PARCEL III:

TOGETHER WITH a right-of-way and easement over, under and through a strip of land fifteen (15) feet in width, said right-of-way extending from River Road to the high water line of the Cape Fear River, said right-of-way to be used for the purposes of maintaining existing pipe lines and constructing, maintaining and operating not more than a total of six (6) pipe lines within said right-of-way, said right-of-way being located as shown on the aforementioned map.

PARCEL IV:

TOGETHER with the free right and passage, in common with Koch Refining, it successors and assigns, for roads, pipe lines and conduits over or underneath the tracks of Atlantic Coast e Railroad Company, to be constructed and maintained in a manner satisfactory to Atlantic Line Railroad Company, and to cross the southernmost forty (40') foot portion of said y (40') foot strip of land conveyed in fee simple to Atlantic Coast Line Railroad Company deed dated July 2, 1946, and recorded in Book 373 at Page 390, New Hanover County Registry, and as shown on the aforementioned map.

PARCEL V:

TOGETHER WITH any right, title and interest in and to the bed of that part of River Road lying between the northerly line of the twenty-five (25') foot right of way and the southerly line of the fifteen (15') foot pipe line easement above described as Parcels II and III, respectively, projected easterly across River Road, as shown on the aforementioned map.

SUBJECT TO the rights of the public and others entitled thereto to use the same for road and highway purposes.

BOOK 1663 PAGE 0277

**EXHIBIT "B"**

Permitted Encumbrances
(Wilmington)

1. Taxes and assessments for the year 1993, and subsequent years, not yet due and payable but a lien against the premises.

2. Title to that portion of the premises lying below the mean high water mark of the Cape Fear River.

3. Riparian rights incident to the premises.

4. Reservations contained in deed from The Atlantic Refining Company to Sacony-Vacuum Oil Company, Incorporated, dated August 3, 1945, and recorded in Book 368 at Page 605, New Hanover County Registry. [20-foot pipeline easement to Grantee and docking facilities to Grantor].

5. [Easement] Agreement from Sacony-Vacuum Oil Company, Incorporated in favor of Tidewater Power Company, dated October 30, 1946, for an electric transmission line, including poles and the necessary wires, etc., which affects the southwest portion of Part I, but which provides that no poles shall be placed more than one (1) foot distance from River Road, as recorded in Book 380 at Page 159, New Hanover County Registry, and set out in Deed recorded in Book 380 at Page 436 of the aforementioned County Registry.

6. Terms, conditions, reservations and easements [for pipeline and related appurtenances] as contained in that certain Agreement between Amoco Oil Company and Sun Oil Company of Pennsylvania, dated May 1, 1973 and recorded in Book 979 at Page 290 of the New Hanover County Registry.

7. Power poles and overhead power lines located on Parcel I as shown on the Plat of Survey by Howard M. Loughlin, NCRLS, dated February, 1992, recorded in Map Book 33 at Page 34 and re-recorded in Map Book 33 at Page 37 .

8. Fence which does not coincide with the property line(s) as shown on the Plat of Survey by Howard M. Loughlin, NCRLS, dated February, 1992, recorded in Map Book 33 at Page 34 and re-recorded in Map Book 33 at Page 37 .

and any other matter which should have been disclosed by a search of public records.

Project Name:Camino
Index No: 2.6.2.15
Title: RE 15673 Indenture 10-26-29
User: Perry, Amy L
Date: Tue Jun 12 14:42:28 CDT 2007
Document Total Page Count: 3

Deed Book 26-B, Page 8

A. Godbold

Esther F. Greenbaum

Notary Public Chatham County Georgia

MENDEL REAL ESTATE AND INVESTMENT COMPANY

By Carl Mendel (Seal)

President

Attest: Rae Levy

Secretary

Fred Wessels (CORPORATE SEAL) (L.S.)

Received for record Oct. 26th, 1929

Recorded Oct. 28th, 1929.

::::::::::::::::

STATE OF GEORGIA

CHATHAM COUNTY

THIS INDENTURE made and entered into this 26th day of October, 1929 by and between IMBRIE SECURITIES COMPANY, LTD., a corporation organized and existing under the laws of the State of New York and having its principal office and place of business in the City of New York, State of New York, and MEXICAN PETROLEUM CORPORATION OF GEORGIA, a corporation organized and existing under the laws of the State of Georgia, and having its principal office and place of business in the City of Savannah, State of Georgia, and SOUTHERN BUILDING PRODUCTS CORPORATION, a corporation organized and existing under the laws of the State of Georgia, and having its principal office and place of business in the City of Savannah, State of Georgia, hereinafter collectively called the Grantors, parties of the first part, and SAVANNAH ELECTRIC AND POWER COMPANY, a corporation organized and existing under the laws of the State of Georgia, and having its principal office and place of business in the City of Savannah, State of Georgia, hereinafter called the Grantee, party of the second part;

WITNESSETH:

THAT WHEREAS, the Grantors are the owners of certain tracts of land situated in Chatham County, Georgia, on the Savannah River about two and three quarters (2-3/4) miles in a northwesterly direction from the City of Savannah, comprising portions of a tract formerly known as the Brampton and Retreat Plantations, and lately known as the Foundation Tract, and,

WHEREAS, the Grantors entered into an agreement on the 20th day of September, 1929 whereby IMBRIE SECURITIES COMPANY, LTD. granted to MEXICAN PETROLEUM CORPORATION OF GEORGIA and SOUTHERN BUILDING PRODUCTS CORPORATION, a right-of-way having a uniform width of sixty (60) feet, running from a point on the boundary of the Chatham Terminal Company right-of-way over and across the lands now of said Grantors, as set out on the map attached hereto and made a part hereof marked Exhibit "A" for the purpose of the construction and operation of a highway, street railroad tracks, electric power lines, pipe lines, telegraph and telephone lines and railroad tracks, and,

WHEREAS, said Grantee desires to erect an electric transmission line along aforesaid right-of-way as shown on Exhibit "A" attached in order to serve the properties of the Grantors with electric power;

NOW THEREFORE, for and in consideration of the sum of Ten ($10.00) Dollars to each in hand paid, the receipt of which is hereby acknowledged, and the benefits to be derived, the parties above named contract and agree as follows:

1. The Grantors hereby permit the Grantee to erect and maintain an electric transmission line, together with necessary poles, guys, cross-arms, wires and fix-

Map Book 22 Folio 196

not attached

tures over and along the sixty (60) foot right-of-way, as shown on Exhibit "A" attached, from the point on the boundary line of the Chatham Terminal Company right-of-way marked "A" to approximately the point on said sixty (60) foot right-of-way marked "B".

2. The poles of said transmission line, other than guy poles, to be set so that the center line of same shall be two (2) feet from the southeasterly boundary of said right-of-way and to be of sufficient height so as to provide proper clearance for any railroad tracks that may be constructed across said sixty (60) foot right-of-way.

3. In granting this easement said Grantors agree that a portion of the cross-arms and wires of said transmission line shall overhang the properties of the IMBRIE SECURITIES COMPANY, LTD. and the MEXICAN PETROLEUM CORPORATION OF GEORGIA.

4. Said grantee shall have the right and privilege to cross aforesaid sixty (60) foot right-of-way with electric power lines that may be necessary in order to serve the prospective plants of the MEXICAN PETROLEUM CORPORATION OF GEORGIA and/or the SOUTHERN BUILDING PRODUCTS CORPORATION OR any other industries that might later be located along said sixty (60) foot right-of-way, and to set such guy poles on and cross over with guy wires, the properties of the Grantors, that may be necessary in the construction of said transmission line; the setting of such guy poles or installing of guy wires to be in such manner as not to conflict with the operation or use of the properties of said grantors.

5. Any and all necessary poles, transmission lines and other equipment placed on said right-of-way or the properties of any of the Grantors shall be for the purpose of serving the properties of such Grantors with electric power and it is understood and agreed that in case the Grantee shall cease to serve any of the properties of any one or more of the Grantors, it will remove all of its equipment from any such property or properties within sixty (60) days after the termination of such service, and thereupon any easement granted or acquired in relation to such property or properties shall terminate and any and all rights so granted or acquired shall revert forthwith to the Grantor; and it is further understood and agreed that in case said Grantee shall cease to service all of the Grantors the Grantee will remove all its equipment from said right-of-way and the properties of said Grantors within sixty (60) days after it so ceases to service all of said properties and in such event all of the rights privileges and easements herein granted shall terminate, and all said rights privileges and easements granted hereunder shall revert forthwith to the Grantors. In the event the Grantee refuses to remove its equipment upon the happening of any of the events in this paragraph set out, the Grantor and/or Grantors shall have the right to remove the same and may charge the costs thereof to the Grantee and shall not be responsible to the Grantee for the disposition of such equipment.

6. The covenants herein contained shall accrue to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their legally authorized officers on the dates opposite their respective signatures.

Signed, sealed and delivered
by Imbrie Securities Co., Ltd.
the 17th day of October, 1929
in the State of New York, County
of New York, in presence of:

Wm. E. Horn

Edward J. Holgan

Notary Public County of New York

State of New York

Notary Public Kings Co. Clerk No. 661
Cert. Filed N.Y. Co. No. 959 Reg. No. 1-H-627
Commission Expires March 30, 1931
NOTARIAL SEAL

IMBRIE SECURITIES COMPANY, LTD.,

by Geo. F. King

Vice-President

Attest: Benj. B. Watson

Secretary

CORPORATE SEAL

Signed, sealed and delivered by Mexican Petroleum Corporation of Georgia, the 19th day of Oct. 1929, in the State of New York County of New York in the presence of:

William J. Willmott

Notary Public Nassau County
New York County Clerk's No. 39
Commission expires March 30, 1931

NOTARIAL SEAL

MEXICAN PETROLEUM CORPORATION OF GA.

By P. A. Harwood

Vice-President

Attest: L. W. Bernard

Secretary

CORPORATE SEAL

Signed, sealed and delivered by Southern Building Products Corporation on the 17th day of October, 1929, in the State of New York, County of New York in the presence of;

Wm. E. Horn

Edward J. Holgan

Notary Public State of......County Of.....

Notary Public Kings Co. Clerk's No. 661
Certificate Filed in N.Y.Co. No. 959 Reg. No. 1-H-627
Commission expires March 30, 1931

NOTARIAL SEAL

SOUTHERN BUILDING PRODUCTS CORPORATION

By Audenvied Whittemore

President

Attest: Bergt S. Watson

Secretary

CORPORATE SEAL

Signed, sealed and delivered by Savannah Electric and Power Company on the 26th day of October 1929, in the State of Georgia County of Chatham, in the presence of:

J. E. Brown

W. LeMoyne Minturn

Notary Public State of Georgia

County of Chatham

My Commission expires Sept. 17, 1932

NOTARIAL SEAL

SAVANNAH ELECTRIC AND POWER COMPANY

By Howard C. Foss

President

Attest: H. V. Faber

Secretary

CORPORATE SEAL

Received for record Oct. 26th, 1929

Recorded Oct. 28th, 1929.

::::::::::::::::

STATE OF GEORGIA )
...........COUNTY )

KNOW ALL MEN BY THESE PRESENTS, That we, E.P. Williams and J.N. Jones of Chatham County,Ga. for and in consideration of the sum of Seven Hundred and Twenty-four and 09/100 Dollars to them in paid paid, at or before the sealing and delivery of these presents by D.F. Thompson, of Chatham County,Georgia., the receipt whereof we do hereby acknowledge; having bargained, and sold and by these presents, do bargain, sell and deliver unto the said D.F. Thompson, all the following described property, to-wit:
One fifteen barrel still and fixtures, together with Fifty dip barrels, Cooper shop and tools, and such other things connected with said Still, unto the said D.F. Thompson and his Executors Administrators and Assigns to his and their only proper use and behoof forever. And we the said Williams & Jones their heirs executors and administrators the said bargained premises, unto the said D. F. Thompson, his Executors Administrators and Assigns, from and against all persons shall and will WARRANT AND FOREVER DEFEND by these presents.

IN WITNESS WHEREOF, we have hereunto set our hand and seals dated

DataSite Printout

Project Name:Camino
Index No: 2.6.2.6
Title: RE 15660 Easement for Right-of-Way 5-4-90
User: Dowlearn, Martha
e: Tue May 15 14:43:01 CDT 2007
ument Total Page Count: 3

STATE OF GEORGIA

COUNTY OF CHATHAM

241

EASEMENT FOR RIGHT-OF-WAY

KNOW ALL MEN BY THESE PRESENTS, that UNION CAMP CORPORATION, a Virginia corporation, having an office in Chatham County, Georgia (hereinafter referred to as "UNION CAMP"), for and in consideration of a good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby grant AMOCO OIL COMPANY, a Maryland corporation, having an office and place of business in Chatham County, Georgia (hereinafter referred to as "AMOCO"), the right to enter in and upon for right-of-way purposes as hereinafter defined those certain lands of UNION CAMP described below, to-wit:

> All that tract or parcel of land situate, lying and being in the 8th G. M. District of Chatham County, Georgia, and being more particularly described as follows:
>
> A strip of land seven (7) feet in width and approximately 412.33 feet in length, said strip being parallel with and approximately 244 feet southeast of Foundation Drive and being 3.5 feet on each side of the centerline of an existing pipe system shown on a map or plat recorded in Plat Record Book 11-P, page 43, Chatham County, Georgia records, a copy of which is attached hereto and reference to which is hereby made for all purposes hereof.

Filed For Record At 4:12 O'Clock P M. On The 15 Day Of May 19 90

Recorded In R. E. Book 145-T Folio 241

On The 15 Day Of May 19 90

CLERK SUPERIOR COURT, CHATHAM CO., GA.

IT IS HEREBY UNDERSTOOD AND AGREED THAT:

1. The right-of-way easement herein conveyed is granted for the purpose of transporting petroleum based products and for that purpose shall allow the location, maintenance, repair or replacement of a pipe support and piping system over and across the above-described lands, said system consisting of:

   (i) Pipe bridge and rack for support of piping;

   (ii) Four pipelines, comprising a four-inch line, a six-inch line, an eight inch line, and a 12-inch steam line.

RECEIVED FOR RECORD

1990 MAY 15 PM 4:12

DORIS S STEPHENS
CLERK, S.C.C.GA.

2. AMOCO shall possess and enjoy a right of ingress and egress to the above-described lands at all times and as provided in paragraph 3 below, subject, however, to the safety

226108A001 05/15/90TOTAL 9.00

requirements imposed by Union Camp on contractors on its Chatham County plant site and provided that such ingress and egress shall not interfere with the normal operations of Union Camp.

3. In addition, UNION CAMP hereby permits and grants to AMOCO the right to enter upon a strip of land twenty feet in width, said strip consisting of two strips ten feet in width each, lying on either side of the centerline of the existing pipe system as shown on the map attached hereto for the sole and exclusive purpose of ingress and egress as is necessary to access the pipe support and piping system for location, maintenance, repair or replacement activity.

4. AMOCO hereby covenants to clear the land and keep it cleared of all trees, undergrowth or other obstructions within the easement area.

5. No unnecessary fire may be set along said lands, and, if any fire is set, it will not be left untended.

6. AMOCO will indemnify UNION CAMP against all claims, fines, suits, demands, or expenses, including, without limitation, attorneys fees, incurred by UNION CAMP arising out of or in connection with the location, maintenance, presence, and operation of the pipe support and piping system located on said lands, except, however, AMOCO does not indemnify against UNION CAMP's willful or negligent acts.

7. UNION CAMP reserves the absolute right, at any time and from time to time, to raise, lower or otherwise relocate the above-described pipelines and pipe support system, at UNION CAMP's sole effort and expense, for whatever reason UNION CAMP in its sole discretion deems necessary, provided, however, that such raising, lowering, or relocation does not interfere unreasonably with AMOCO's use of said pipelines and pipe support system.

8. UNION CAMP reserves complete and full dominion of the land included within said easement and the use thereof for any and all purposes whatsoever so long as the same does not

interfere unreasonably with the said pipelines and pipe support system or other rights granted herein.

9. The above-described right-of-way is granted to AMOCO for so long as the property described herein is used for transportation of petroleum based products and at such time as the above-described property is abandoned by AMOCO for a period of twenty-four consecutive months, then the right to such property herein granted shall automatically revert and revest in UNION CAMP, its successors and assigns.

IN WITNESS WHEREOF, the parties hereto have caused this right-of-way Easement to be executed by their respective corporate officers thereunto duly authorized and their respective seals affixed, as of the 4th day of May, 1990.

Signed, sealed and delivered
in the presence of:

Dorothy Owen

Thelma Ann Dodd

Notary Public

N.P. SEAL

UNION CAMP CORPORATION

By: [signature]

Vice President

Attest: [signature]

Assistant Secretary

CORPORATE SEAL

Signed, sealed and delivered
in the presence of:

Tricia Muha

Theresa M. Salazar

Notary Public

"OFFICIAL SEAL"
Theresa M. Salazar
Notary Public, State of Illinois
My Commission Expires 9/8/91

AMOCO OIL COMPANY

By: [signature]

Title: Vice President

Attest: [signature]

Title: Assistant Secretary

CORPORATE SEAL

APPROVED
AS TO FORM
[signature]
REAL ESTATE DEPT.
AMOCO CORP'N.

.................................... DataSite Printout ....................................

Project Name:Camino
Index No: 2.6.2.6
Title: RE 15660 Easement for Right-of-Way 5-4-90
User: Perry, Amy L
Date: Tue Jun 12 14:40:35 CDT 2007
cument Total Page Count: 3

STATE OF GEORGIA

COUNTY OF CHATHAM



## EASEMENT FOR RIGHT-OF-WAY

KNOW ALL MEN BY THESE PRESENTS, that UNION CAMP CORPORATION, a Virginia corporation, having an office in Chatham County, Georgia (hereinafter referred to as "UNION CAMP"), for and in consideration of a good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, does hereby grant AMOCO OIL COMPANY, a Maryland corporation, having an office and place of business in Chatham County, Georgia (hereinafter referred to as "AMOCO"), the right to enter in and upon for right-of-way purposes as hereinafter defined those certain lands of UNION CAMP described below, to-wit:

> All that tract or parcel of land situate, lying and being in the 8th G. M. District of Chatham County, Georgia, and being more particularly described as follows:
>
> A strip of land seven (7) feet in width and approximately 412.33 feet in length, said strip being parallel with and approximately 244 feet southeast of Foundation Drive and being 3.5 feet on each side of the centerline of an existing pipe system shown on a map or plat recorded in Plat Record Book 11-P, page 43, Chatham County, Georgia records, a copy of which is attached hereto and reference to which is hereby made for all purposes hereof.

Filed For Record At 4:12 O'Clock P M.On The 15 Day Of May 19 90
Recorded In R... Book 145-T Folio 241
On The 15 Day Of May 19 90
CLERK SUPERIOR COURT, CHATHAM CO. GA.

IT IS HEREBY UNDERSTOOD AND AGREED THAT:

1. The right-of-way easement herein conveyed is granted for the purpose of transporting petroleum based products and for that purpose shall allow the location, maintenance, repair or replacement of a pipe support and piping system over and across the above-described lands, said system consisting of:

   (i) Pipe bridge and rack for support of piping;

   (ii) Four pipelines, comprising a four-inch line, a six-inch line, an eight inch line, and a 12-inch steam line.

RECEIVED FOR RECORD
1990 MAY 15 PM 4:12
DORIS S STEPHENS
CLERK, S.C.C.GA.

2. AMOCO shall possess and enjoy a right of ingress and egress to the above-described lands at all times and as provided in paragraph 3 below, subject, however, to the safety

requirements imposed by Union Camp on contractors on its Chatham County plant site and provided that such ingress and egress shall not interfere with the normal operations of Union Camp.

3. In addition, UNION CAMP hereby permits and grants to AMOCO the right to enter upon a strip of land twenty feet in width, said strip consisting of two strips ten feet in width each, lying on either side of the centerline of the existing pipe system as shown on the map attached hereto for the sole and exclusive purpose of ingress and egress as is necessary to access the pipe support and piping system for location, maintenance, repair or replacement activity.

4. AMOCO hereby covenants to clear the land and keep it cleared of all trees, undergrowth or other obstructions within the easement area.

5. No unnecessary fire may be set along said lands, and, if any fire is set, it will not be left untended.

6. AMOCO will indemnify UNION CAMP against all claims, fines, suits, demands, or expenses, including, without limitation, attorneys fees, incurred by UNION CAMP arising out of or in connection with the location, maintenance, presence, and operation of the pipe support and piping system located on said lands, except, however, AMOCO does not indemnify against UNION CAMP's willful or negligent acts.

7. UNION CAMP reserves the absolute right, at any time and from time to time, to raise, lower or otherwise relocate the above-described pipelines and pipe support system, at UNION CAMP's sole effort and expense, for whatever reason UNION CAMP in its sole discretion deems necessary, provided, however, that such raising, lowering, or relocation does not interfere unreasonably with AMOCO's use of said pipelines and pipe support system.

8. UNION CAMP reserves complete and full dominion of the land included within said easement and the use thereof for any and all purposes whatsoever so long as the same does not

243

interfere unreasonably with the said pipelines and pipe support system or other rights granted herein.

9. The above-described right-of-way is granted to AMOCO for so long as the property described herein is used for transportation of petroleum based products and at such time as the above-described property is abandoned by AMOCO for a period of twenty-four consecutive months, then the right to such property herein granted shall automatically revert and revest in UNION CAMP, its successors and assigns.

IN WITNESS WHEREOF, the parties hereto have caused this right-of-way Easement to be executed by their respective corporate officers thereunto duly authorized and their respective seals affixed, as of the 4th day of May, 1989 90.

Signed, sealed and delivered in the presence of:

N.P. SEAL

Notary Public

UNION CAMP CORPORATION

By:

Vice President

Attest:

Assistant Secretary

CORPORATE SEAL

Signed, sealed and delivered in the presence of:

Tricia Muha

Theresa M. Salazar

Notary Public

"OFFICIAL SEAL"
Theresa M. Salazar
Notary Public, State of Illinois
My Commission Expires 9/8/91

AMOCO OIL COMPANY

By:

Title: Vice President

Attest:

Title: Assistant Secretary

CORPORATE SEAL

APPROVED AS TO FORM
REAL ESTATE DEPT.
AMOCO CORP'N.

.................................... DataSite Printout ....................................

Project Name:Camino
Index No: 2.6.2.1
Title: RE 11452 Lease agreemnt 10-26-1929
User: Perry, Amy L
Date: Tue Jun 12 14:39:04 CDT 2007
cument Total Page Count: 3

SA

AN AGREEMENT, dated this 26th day of October, A.D. 1929, between CHATHAM TERMINAL COMPANY, a corporation created by and existing under the laws of the State of Georgia, party of the first part, hereinafter called the Railroad, and MEXICAN PETROLEUM CORPORATION OF GEORGIA, a corporation of the State of Georgia, and SOUTHERN BUILDING PRODUCTS CORPORATION, a corporation of the State of Georgia, parties of the second part, hereinafter collectively called the Tenant.

WITNESSETH:

1. The Railroad will permit the Tenant to construct and maintain in Chatham County, Georgia, a private road over the right of way and tracks of the Railroad at a point 60 feet, more or less, Southeast of Mile Post 1, Chatham Terminal Company, the location of which is more fully shown in red on blue print marked Exh."A" hereto attached and hereby made a part of this agreement.

2. The Tenant shall pay the entire cost of construction of such private road and shall, at their own expense, maintain it in a safe condition and in accordance with law and shall construct said road under the supervision and in accordance with the direction of a representative of the Railroad.

3. The Tenant specially agrees that the said road shall be a temporary private road and may be closed by the Railroad for any reason and at any time on thirty (30) days notice to the Tenant, and it is further agreed that in the event the Railroad shall at any time, desire to use all or any part of its right of way occupied by said private road, or to make changes in the grade or alignment of its roadbed, which use or change, in the opinion of the Railroad makes desirable a change of location or removal of all or any part of said private road, the Tenant agrees that they will, within thirty (30) days after receipt of written request, make such change or changes as may be necessary in the opinion of the Railroad, to permit the proper use of its property as aforesaid, such changes to be made without expense to the Railroad, or will, if required by the Railroad, remove said private road entirely from the Railroad's

right of way or property.

4. The Tenant agrees to indemnify the Railroad against all loss, damage, liability or expense arising from injury or damages to all persons or property, when said injury or damage occurs at or on said private road, or as a direct or indirect result of the use thereof, and this notwithstanding any negligence, contributory or otherwise, on the part of the Railroad, or its employes. It is the intent of this agreement that, as the establishment of said road is for the sole benefit of the Tenant, the Railroad shall not incur any loss, damage, liability or expense, which it would not have incurred had said road never been constructed or used.

5. The Tenant will record this agreement at their own expense in Chatham County, Georgia.

6. The Tenant agrees to pay to the Railroad as rental for the use of said premises the sum of One ($1.00) Dollar, payable annually in advance.

IN WITNESS WHEREOF, the parties hereto have executed this agreement in duplicate, on the day and year first above written.

Signed, sealed and delivered by Chatham Terminal Company, in Chatham County, Georgia, in presence of:

Notary Public Chatham County, Ga.

CHATHAM TERMINAL COMPANY

BY

Vice President & General Manager.

Signed, sealed and delivered by Mexican Petroleum Corporation of Georgia, in New York County, New York in presence of:

Notary Public

MEXICAN PETROLEUM CORPORATION OF GEORGIA.

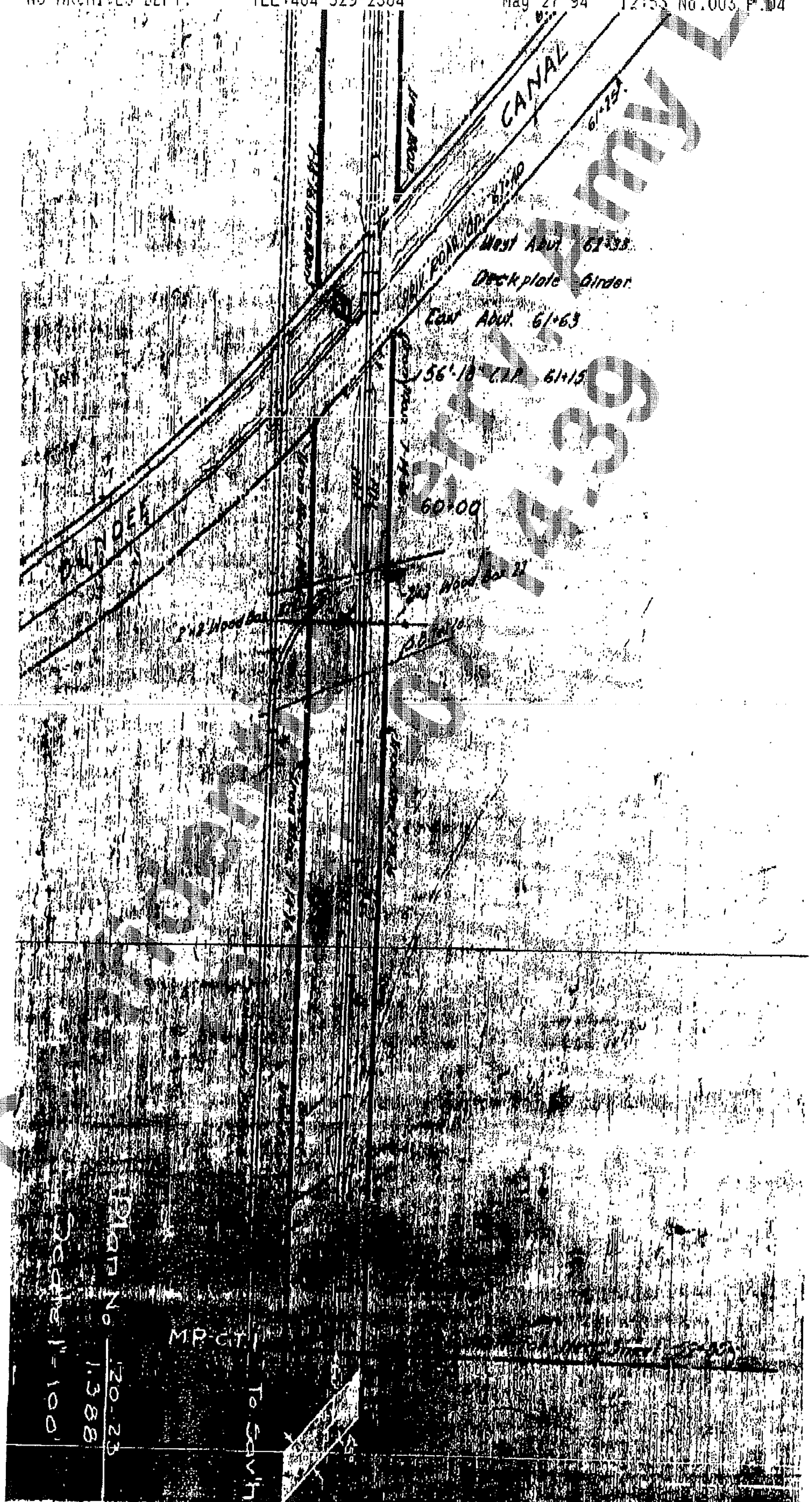
BY

Signed, sealed and delivered by The Southern Building Products Corporation, in New York County, New York: In presence of:

Notary Public

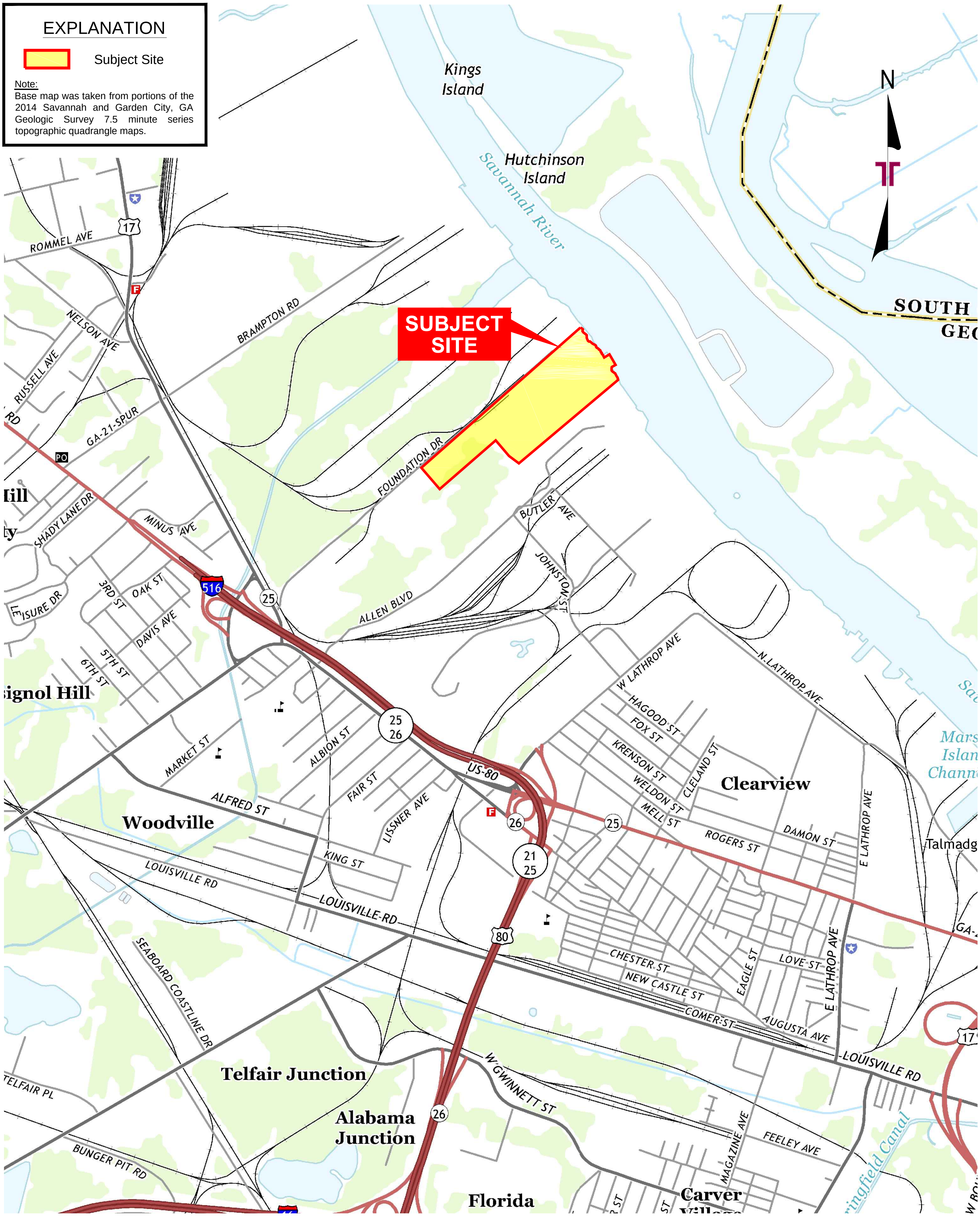
SOUTHERN BUILDING PRODUCTS CORPORATION

BY


CANAL
West Abut 61+33
Deckplate Girder
East Abut 61+63
56'-10" C.I.P. 61+15
60+00
Map No 20.23
1.388
Scale 1" = 100'
To Sav'h

# APPENDIX C

FIGURES




| | | | |
|---|---|---|---|
| Project Mngr: RLB | Project No. ES157077 | | |
| Drawn By: JCM | Scale: 1" = 2,000' | | |
| Checked By: RLB | File Name: ES157077.dwg | | |
| Approved By: WSA | Date: July 28, 2015 | | |

0 1,000' 2,000'

1" = 2,000'

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

**GENERAL VICINITY MAP**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure

1


| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | 1" = 300' |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | July 30, 2015 |

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

**SURROUNDING LAND USE**

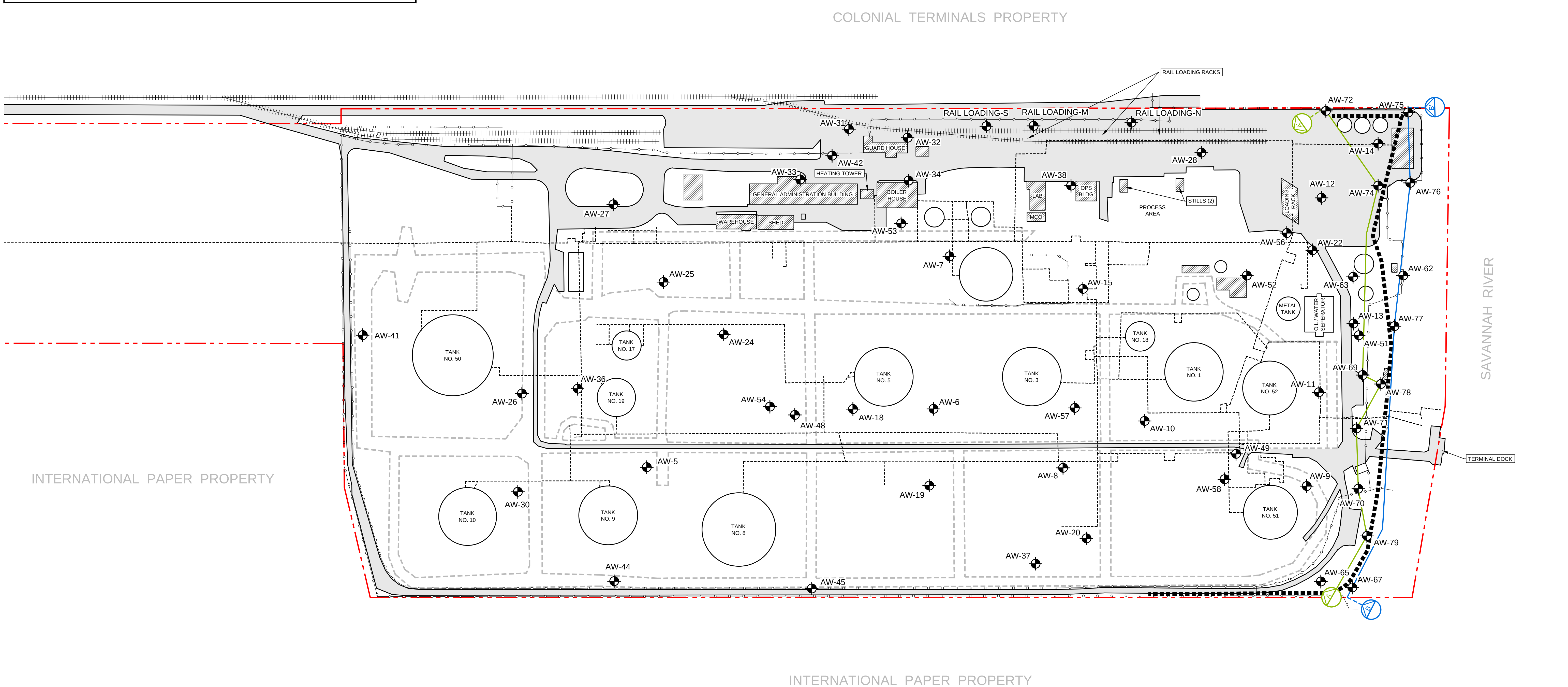
**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure
2

## EXPLANATION

- MONITORING WELL
- SUBTERRANEAN POLY-WALL
- APPROXIMATE PROPERTY BOUNDARY
- STRATIGRAPHIC CROSS SECTION A-A'
- STRATIGRAPHIC CROSS SECTION B-B'
- EXISTING BUILDING
- PAVED ROAD
- RAILROAD LINE
- FENCE LINE
- EARTHEN BERM

Note:
Map Features generated using the site plan for NuStar Savannah Refinery created by Ash Creek Associates in August 2012 and a site survey completed by Hussey Gay Bell & DeYoung in April 2015, both provided to Terracon by Axeon Specialty Products. Pertinent tanks and pipe runs are shown, however some buildings, piping, and/or process areas are not included in this figure.



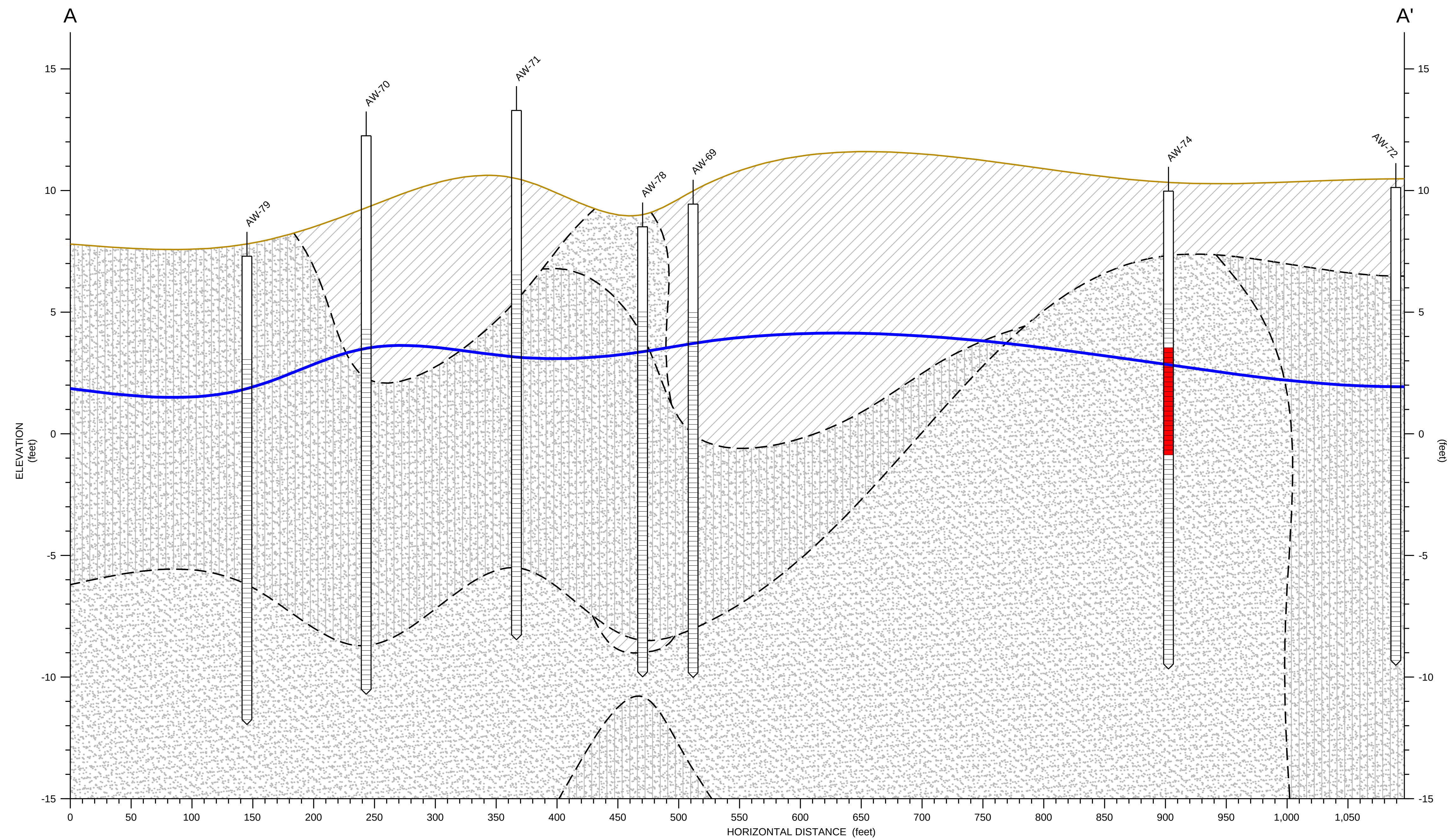

0 100' 200'
1" = 200'
APPROXIMATE SCALE IN FEET

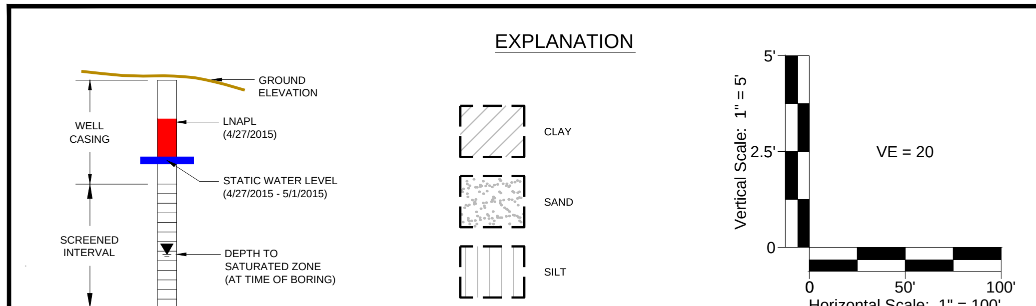
| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | 1" = 200' |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | July 28, 2015 |

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

**SITE PLAN**
**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure
3




Notes

1. The widths of each well are not to scale in the horizontal direction.
2. Well depths and screened intervals are correctly scaled in the vertical direction.
3. Well construction data and lithological data acquired from three seperate sets of boring logs dated 1995 (AW-66 through AW-70), 2009 (AW-68 through AW-74), and 2012 (AW-75 through AW-79).
4. Overlapping lithology graphics indicate a zone where multiple soil grain sizes were identified.

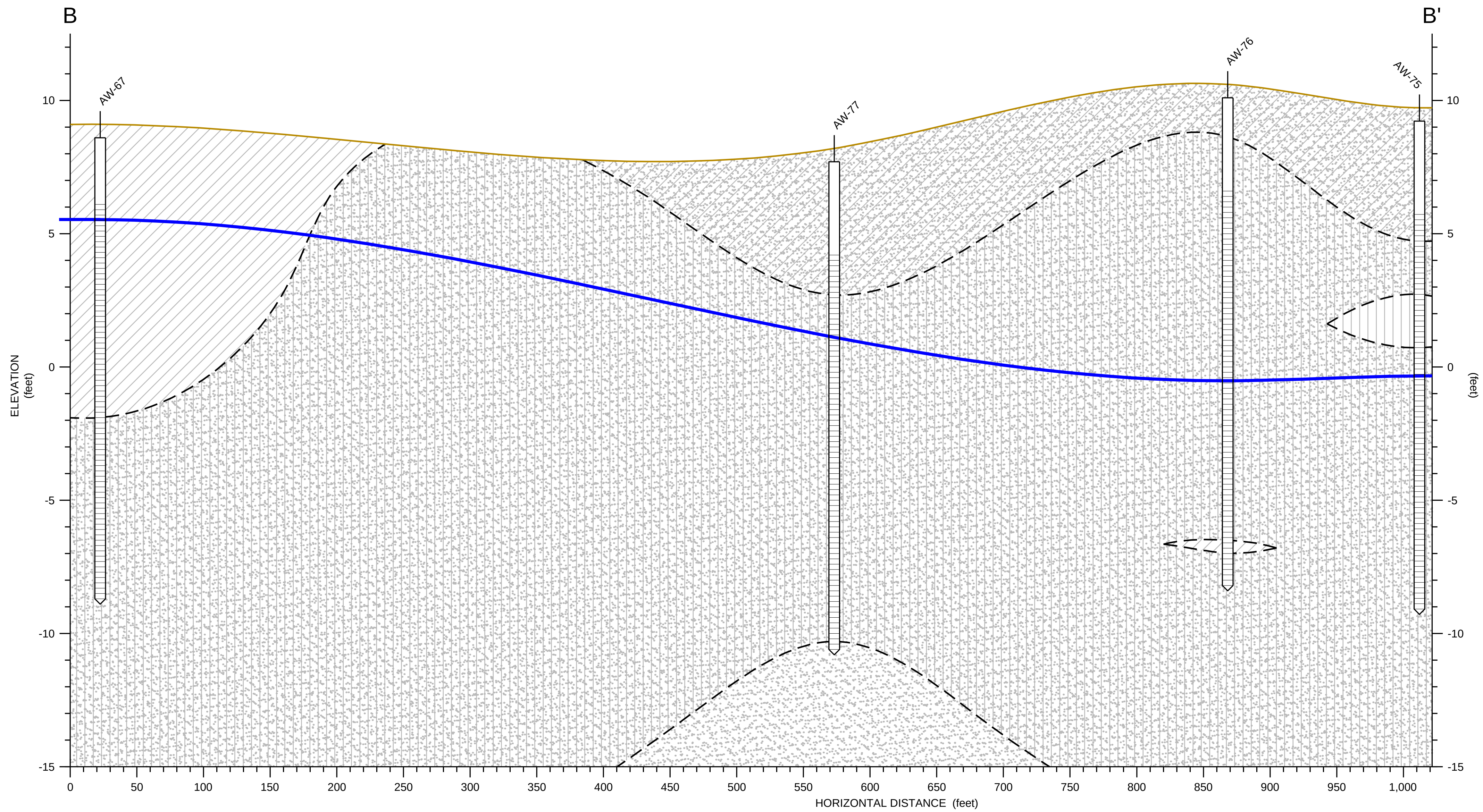
| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | As Shown |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | August 7, 2015 |

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

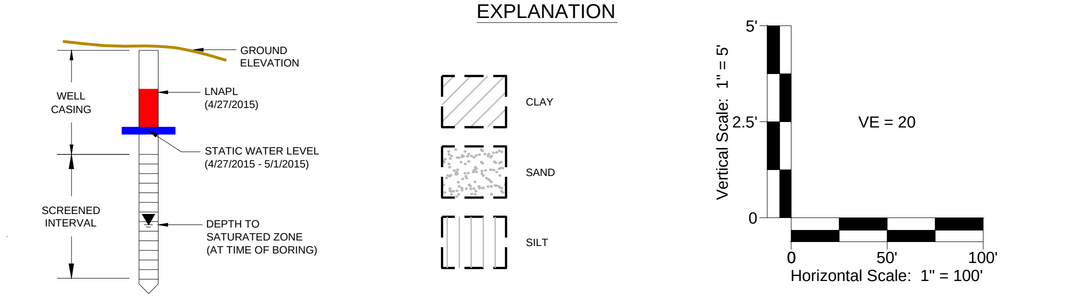
**STRATIGRAPHIC CROSS SECTION A - A'**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure:
4




EXPLANATION




Notes

1. The widths of each well are not to scale in the horizontal direction.
2. Well depths and screened intervals are correctly scaled in the vertical direction.
3. Well construction data and lithological data acquired from three seperate sets of boring logs dated 1995 (AW-66 through AW-70), 2009 (AW-68 through AW-74), and 2012 (AW-75 through AW-79).
4. Overlapping lithology graphics indicate a zone where multiple soil grain sizes were identified.

| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | As Shown |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | August 7, 2015 |

Terracon
Consulting Engineers & Scientists

2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

**STRATIGRAPHIC CROSS SECTION B - B'**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure:
5

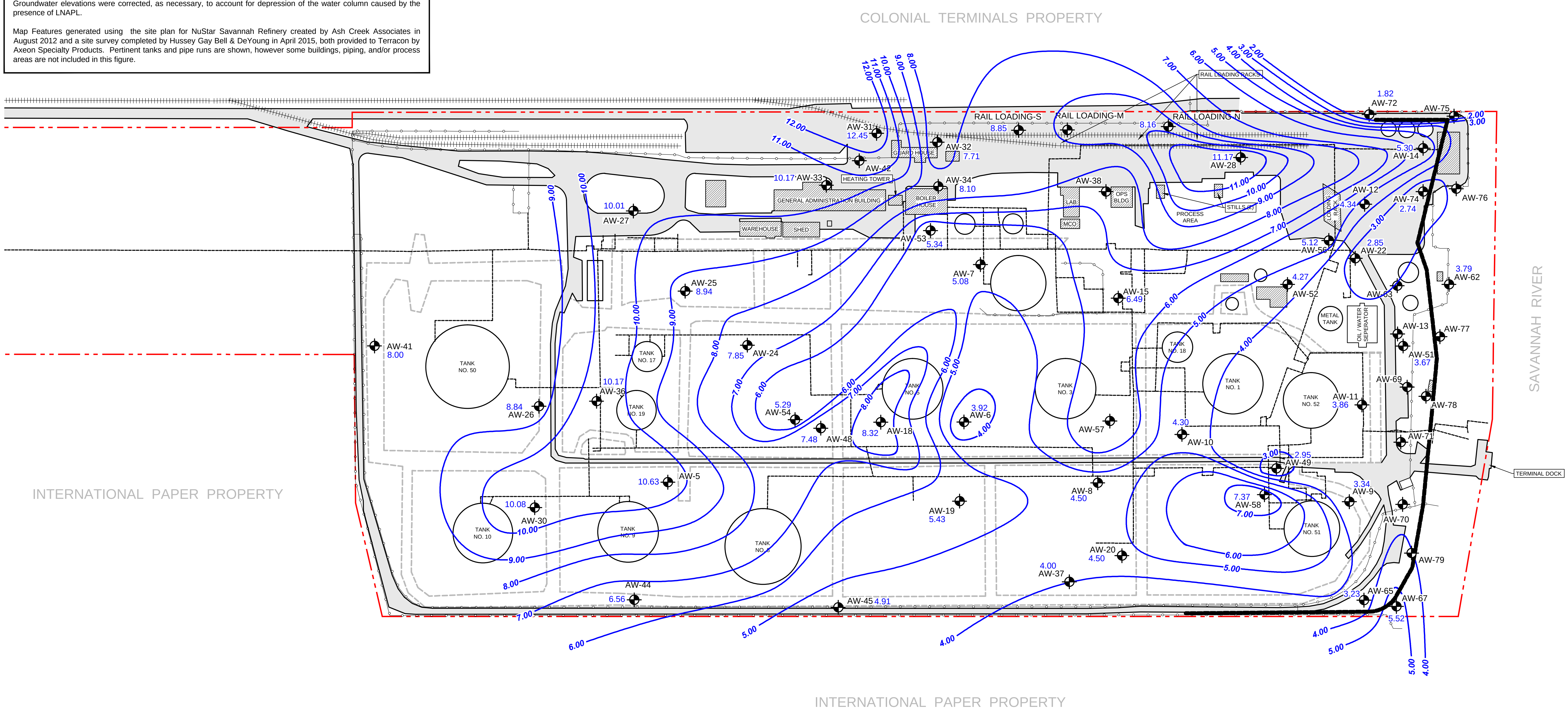
## EXPLANATION

- MONITORING WELL
- SUBTERRANEAN POLY-WALL
- EARTHEN BERM
- APPROXIMATE PROPERTY BOUNDARY
- 10.00 POTENTIOMETRIC SURFACE ELEVATION (FEET ABOVE MSL)
- POTENTIOMETRIC CONTOUR
- EXISTING BUILDING
- PAVED ROAD
- RAILROAD LINE
- FENCE LINE

Notes:
Groundwater elevation data was collected from April 27, 2015 though May 1, 2015.

Groundwater elevations were corrected, as necessary, to account for depression of the water column caused by the presence of LNAPL.

Map Features generated using the site plan for NuStar Savannah Refinery created by Ash Creek Associates in August 2012 and a site survey completed by Hussey Gay Bell & DeYoung in April 2015, both provided to Terracon by Axeon Specialty Products. Pertinent tanks and pipe runs are shown, however some buildings, piping, and/or process areas are not included in this figure.




0 100' 200'
1" = 200'
APPROXIMATE SCALE IN FEET

| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | 1" = 200' |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | August 3, 2015 |


Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001


**POTENTIOMETRIC SURFACE MAP - APRIL/MAY 2015**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

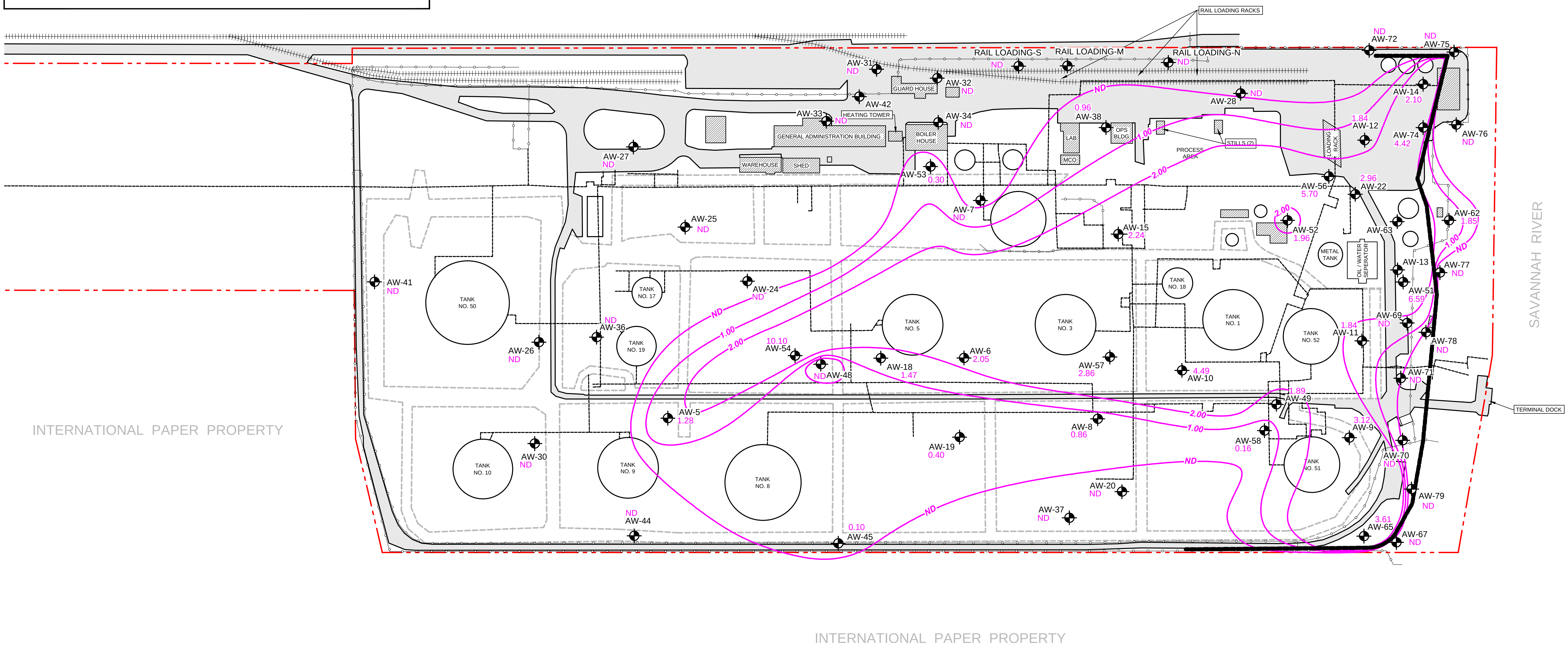
Figure
6

## EXPLANATION

- MONITORING WELL
- SUBTERRANEAN POLY-WALL
- EARTHEN BERM
- APPROXIMATE PROPERTY BOUNDARY
- 3.25 IN-WELL APPARENT LNAPL THICKNESS (FEET)
- LNAPL THICKNESS CONTOUR
- ND LNAPL NOT DETECTED
- EXISTING BUILDING
- PAVED ROAD
- RAILROAD LINE
- FENCE LINE

Notes:
Groundwater elevation/LNAPL data was collected from April 27, 2015 though May 1, 2015.

Map Features generated using the site plan for NuStar Savannah Refinery created by Ash Creek Associates in August 2012 and a site survey completed by Hussey Gay Bell & DeYoung in April 2015, both provided to Terracon by Axeon Specialty Products. Pertinent tanks and pipe runs are shown, however some buildings, piping, and/or process areas are not included in this figure.




0 100' 200'
1" = 200'
APPROXIMATE SCALE IN FEET

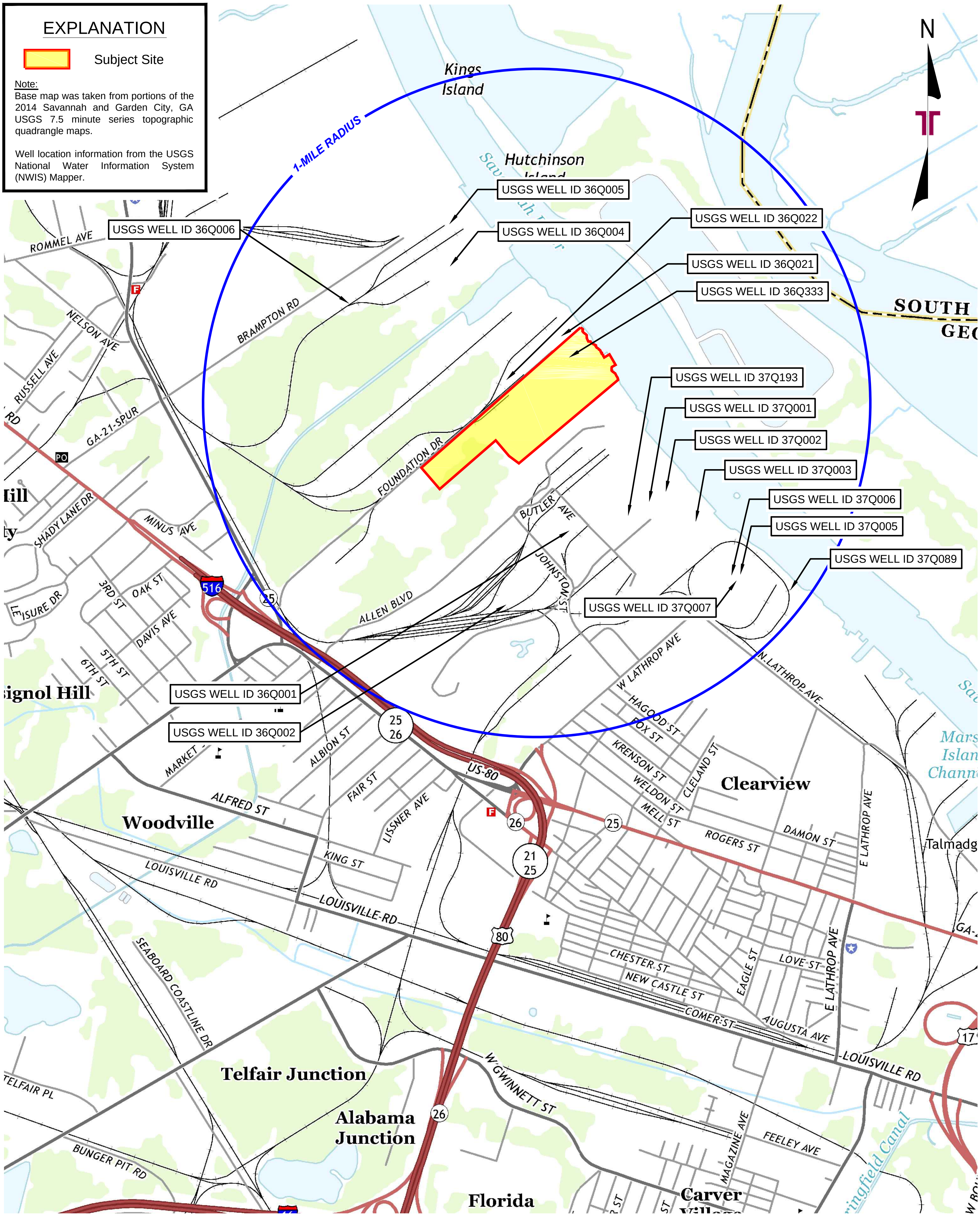
| | | | |
|---|---|---|---|
| Project Mngr: | RLB | Project No. | ES157077 |
| Drawn By: | JCM | Scale: | 1" = 200' |
| Checked By: | RLB | File Name: | ES157077.dwg |
| Approved By: | WSA | Date: | August 3, 2015 |


Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001


**LNAPL ISOCONTOUR MAP - APRIL/MAY 2015**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure 7




| 0 | 1,000' | 2,000' |
|---|---|---|

1" = 2,000'

| | |
|---|---|
| Project Mngr: | RLB |
| Drawn By: | JCM |
| Checked By: | RLB |
| Approved By: | WSA |

| | |
|---|---|
| Project No. | ES157077 |
| Scale: | 1" = 2,000' |
| File Name: | ES157077.dwg |
| Date: | July 28, 2015 |

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

# WATER WELL SURVEY

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County, Georgia

Figure
8

# APPENDIX D

TABLES

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-5 | 8/28/1990 | 16.47 | 6.60 | 7.64 | 1.04 | 9.79 |
| | 7/23/1991 | | 4.16 | 7.21 | 3.05 | 12.07 |
| | 8/22/1991 | | 4.38 | 7.70 | 3.32 | 11.82 |
| | 9/26/1991 | | 5.93 | 8.70 | 2.77 | 10.32 |
| | 10/25-26/1991 | | 6.61 | 9.60 | 2.99 | 9.62 |
| | 11/26/1991 | | 6.95 | 9.74 | 2.79 | 9.30 |
| | 12/20/1991 | | 7.29 | 10.01 | 2.72 | 8.96 |
| | 1/20/1992 | | 6.29 | 7.75 | 1.46 | 10.06 |
| | 2/27-28/1992 | | 5.15 | 7.25 | 2.10 | 11.15 |
| | 3/23/1992 | | 5.50 | 7.65 | 2.15 | 10.80 |
| | 4/22/1992 | | 4.71 | 7.29 | 2.58 | 11.55 |
| | 5/27-28/1992 | | 6.15 | 8.28 | 2.13 | 10.15 |
| | 6/24/1992 | | 4.45 | 7.32 | 2.87 | 11.79 |
| | 7/27/1992 | | 5.29 | 7.75 | 2.46 | 10.98 |
| | 8/26/1992 | | 3.35 | 4.81 | 1.46 | 13.00 |
| | 9/29/1992 | | 5.04 | 7.42 | 2.38 | 11.24 |
| | 10/29/1992 | | 5.77 | 7.80 | 2.03 | 10.54 |
| | 11/25/1992 | | 5.05 | 7.40 | 2.35 | 11.23 |
| | 12/18/1992 | | 5.23 | 7.30 | 2.07 | 11.07 |
| | 1/28/1993 | | 4.67 | 7.11 | 2.44 | 11.60 |
| | 2/24/1993 | | 5.19 | 7.48 | 2.29 | 11.10 |
| | 3/30/1993 | | 3.85 | 6.78 | 2.93 | 12.39 |
| | 5/28/1993 | | 6.30 | 8.46 | 2.16 | 10.00 |
| | 8/9-10/1993 | | 7.54 | 10.03 | 2.49 | 8.73 |
| | 9/28/1993 | | 6.86 | 9.91 | 3.05 | 9.37 |
| | 10/29/1993 | | 7.25 | 9.49 | 2.24 | 9.04 |
| | 11/30/1993 | | 5.86 | 7.18 | 1.32 | 10.50 |
| | 12/27/1993 | | 6.16 | 7.49 | 1.33 | 10.20 |
| | 3/31/1994 | | 5.74 | 7.55 | 1.81 | 10.59 |
| | 9/9/1994 | | 4.91 | 6.82 | 1.91 | 11.41 |
| | 9/29/1994 | | 5.32 | 7.32 | 2.00 | 10.99 |
| | 11/23/1994 | | 5.03 | 6.13 | 1.10 | 11.35 |
| | 1/4/1995 | | 5.14 | 6.39 | 1.25 | 11.23 |
| | 2/8/1995 | | 5.67 | 6.71 | 1.04 | 10.72 |
| | 3/16/1995 | | 5.68 | 6.77 | 1.09 | 10.70 |
| | 3/20/1995 | | 4.76 | 6.19 | 1.43 | 11.60 |
| | 5/25/1995 | | 6.57 | 7.25 | 0.68 | 9.85 |
| | 9/20/1995 | | 4.76 | 6.19 | 1.43 | 11.60 |
| | 10/2/2003 | | 5.73 | 7.00 | 1.27 | 10.49 |
| | 11/25-26/2008 | 16.04 | 5.00 | 7.70 | 2.70 | 10.50 |
| | 3/5/2009 | | 5.83 | 7.82 | 1.99 | 9.81 |
| | 6/30/2009 | | 6.03 | 8.03 | 2.00 | 9.72 |
| | 9/23/2009 | | 6.25 | 8.18 | 1.93 | 9.51 |
| | 12/29/2009 | | 5.64 | 7.70 | 1.56 | 9.67 |
| | 4/28/2015 | | 5.22 | 6.50 | 1.28 | 10.63 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-6 | 8/28/1990 | 12.60 | 7.85 | 10.88 | 3.03 | 4.27 |
| | 7/23/1991 | | 6.92 | 10.11 | 3.19 | 5.17 |
| | 8/22/1991 | | 7.08 | 10.24 | 3.16 | 5.01 |
| | 9/26/1991 | | 7.61 | 9.98 | 2.37 | 4.61 |
| | 10/25-26/1991 | | 7.99 | 10.06 | 2.07 | 4.28 |
| | 11/26/1991 | | 8.72 | 11.06 | 2.34 | 3.51 |
| | 12/20/1991 | | 8.83 | 12.96 | 4.13 | 3.11 |
| | 1/20/1992 | | 7.98 | 11.05 | 3.07 | 4.13 |
| | 2/27-28/1992 | | 7.99 | 10.57 | 2.58 | 4.20 |
| | 3/23/1992 | | 8.27 | 10.87 | 2.60 | 3.91 |
| | 4/22/1992 | | 7.75 | 10.76 | 3.01 | 4.37 |
| | 5/27-28/1992 | | 8.34 | 10.77 | 2.43 | 3.87 |
| | 6/24/1992 | | 7.22 | 10.45 | 3.23 | 4.86 |
| | 7/27/1992 | | 7.93 | 10.35 | 2.42 | 4.28 |
| | 8/26/1992 | | 5.94 | 10.19 | 4.25 | 5.98 |
| | 9/29/1992 | | 7.21 | 10.31 | 3.10 | 4.89 |
| | 10/29/1992 | | 7.83 | 10.20 | 2.37 | 4.39 |
| | 11/25/1992 | | 7.31 | 10.24 | 2.93 | 4.82 |
| | 12/18/1992 | | 7.66 | 10.23 | 2.57 | 4.53 |
| | 1/28/1993 | | 7.43 | 10.25 | 2.82 | 4.72 |
| | 2/24/1993 | | 8.90 | 10.14 | 1.24 | 3.50 |
| | 3/30/1993 | | 7.22 | 10.50 | 3.28 | 4.86 |
| | 5/28/1993 | | 8.51 | 10.47 | 1.96 | 3.78 |
| | 8/9-10/1993 | | 8.90 | 11.98 | 3.08 | 3.21 |
| | 9/28/1993 | | 8.54 | 11.41 | 2.87 | 3.60 |
| | 10/29/1993 | | 8.44 | 11.18 | 2.74 | 3.72 |
| | 11/30/1993 | | 8.01 | 10.31 | 2.30 | 4.22 |
| | 12/27/1993 | | 8.49 | 10.64 | 2.15 | 3.77 |
| | 3/31/1994 | | 8.25 | 10.53 | 2.28 | 3.99 |
| | 9/9/1994 | | 7.11 | 10.05 | 2.94 | 5.02 |
| | 9/29/1994 | | 7.81 | 9.97 | 2.16 | 4.44 |
| | 11/23/1994 | | 7.49 | 10.03 | 2.54 | 4.70 |
| | 1/4/1995 | | 7.18 | 9.71 | 2.53 | 5.02 |
| | 2/8/1995 | | 8.45 | 10.02 | 1.57 | 3.90 |
| | 3/16/1995 | | 7.89 | 9.85 | 1.96 | 4.40 |
| | 3/20/1995 | | 7.11 | 10.06 | 2.95 | 5.02 |
| | 5/25/1995 | | 8.44 | 10.38 | 1.94 | 3.85 |
| | 9/20/1995 | | 7.11 | 10.06 | 2.95 | 5.02 |
| | 10/2/2003 | | 7.85 | 9.58 | 1.73 | 4.40 |
| | 11/25-26/2008 | 11.57 | 7.50 | 10.10 | 2.60 | 3.55 |
| | 3/5/2009 | | 8.89 | 11.35 | 2.46 | 2.19 |
| | 6/30/2009 | | 8.18 | 10.11 | 1.93 | 3.11 |
| | 9/23/2009 | | -- | 7.60 | -- | 3.97 |
| | 12/29/2009 | | 7.77 | 9.71 | 1.94 | 3.52 |
| | 04/28/2015 | | 7.35 | 9.40 | 2.05 | 3.92 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-7 | 8/28/1990 | 13.58 | -- | 9.11 | -- | 4.47 |
| | 7/23/1991 | | -- | 8.11 | -- | 5.47 |
| | 8/22/1991 | | -- | 8.18 | -- | 5.40 |
| | 9/26/1991 | | -- | 8.78 | -- | 4.80 |
| | 10/25-26/1991 | | -- | 9.18 | -- | 4.40 |
| | 11/26/1991 | | -- | 10.06 | -- | 3.52 |
| | 12/20/1991 | | -- | 10.28 | -- | 3.30 |
| | 1/20/1992 | | -- | 9.28 | -- | 4.30 |
| | 2/27-28/1992 | | -- | 9.11 | -- | 4.47 |
| | 3/23/1992 | | -- | 9.58 | -- | 4.00 |
| | 4/22/1992 | | -- | 8.96 | -- | 4.62 |
| | 5/27-28/1992 | | -- | 9.59 | -- | 3.99 |
| | 6/24/1992 | | -- | 8.50 | -- | 5.08 |
| | 7/27/1992 | | -- | 9.12 | -- | 4.46 |
| | 8/26/1992 | | -- | 7.37 | -- | 6.21 |
| | 9/29/1992 | | -- | 8.38 | -- | 5.20 |
| | 10/29/1992 | | -- | 9.11 | -- | 4.47 |
| | 11/25/1992 | | -- | 8.66 | -- | 4.92 |
| | 12/18/1992 | | -- | 8.83 | -- | 4.75 |
| | 1/28/1993 | | -- | 8.48 | -- | 5.10 |
| | 2/24/1993 | | -- | 9.94 | -- | 3.64 |
| | 3/30/1993 | | -- | 8.47 | -- | 5.11 |
| | 5/28/1993 | | -- | 9.69 | -- | 3.89 |
| | 8/9-10/1993 | | -- | 10.12 | -- | 3.46 |
| | 9/28/1993 | | -- | 9.92 | -- | 3.66 |
| | 10/29/1993 | | -- | 9.74 | -- | 3.84 |
| | 11/30/1993 | | -- | 9.02 | -- | 4.56 |
| | 12/27/1993 | | -- | 9.54 | -- | 4.04 |
| | 3/31/1994 | | -- | 9.22 | -- | 4.36 |
| | 9/9/1994 | | -- | 8.20 | -- | 5.38 |
| | 9/29/1994 | | -- | 8.68 | -- | 4.90 |
| | 11/23/1994 | | -- | 8.29 | -- | 5.29 |
| | 1/4/1995 | | -- | 8.23 | -- | 5.35 |
| | 2/8/1995 | | -- | 9.32 | -- | 4.26 |
| | 3/16/1995 | | -- | 8.81 | -- | 4.77 |
| | 3/20/1995 | | -- | 8.04 | -- | 5.54 |
| | 5/25/1995 | | -- | 9.55 | -- | 4.03 |
| | 9/20/1995 | | -- | 8.04 | -- | 5.54 |
| | 10/2/2003 | | -- | 8.80 | -- | 4.78 |
| | 11/25-26/2008 | 12.54 | -- | 8.10 | -- | 4.44 |
| | 3/6/2009 | | -- | 9.14 | -- | 3.40 |
| | 6/30/2009 | | -- | 8.60 | -- | 3.94 |
| | 9/23/2009 | | -- | 8.72 | -- | 3.82 |
| | 12/29/2009 | | -- | 7.94 | -- | 4.60 |
| | 5/1/2015 | | -- | 7.46 | -- | 5.08 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-8 | 8/28/1990 | 15.88 | 11.14 | 14.80 | 3.66 | 3.72 |
| | 7/23/1991 | | 10.20 | 13.45 | 3.25 | 4.77 |
| | 8/22/1991 | | 10.29 | 13.76 | 3.47 | 4.62 |
| | 9/26/1991 | | 10.89 | 13.85 | 2.96 | 4.16 |
| | 10/25-26/1991 | | 11.24 | 13.74 | 2.50 | 3.94 |
| | 11/26/1991 | | 12.02 | 15.03 | 3.01 | 3.02 |
| | 12/20/1991 | | 12.13 | 15.97 | 3.84 | 2.67 |
| | 1/20/1992 | | 11.27 | 14.88 | 3.61 | 3.60 |
| | 2/27-28/1992 | | 11.34 | 14.61 | 3.27 | 3.62 |
| | 3/23/1992 | | 11.60 | 14.69 | 3.09 | 3.41 |
| | 4/22/1992 | | 10.96 | 14.46 | 3.50 | 3.94 |
| | 5/27-28/1992 | | 11.59 | 14.26 | 2.67 | 3.54 |
| | 6/24/1992 | | 10.45 | 13.61 | 3.16 | 4.55 |
| | 7/27/1992 | | 11.09 | 14.36 | 3.27 | 3.87 |
| | 8/26/1992 | | 9.18 | 11.74 | 2.56 | 5.98 |
| | 9/29/1992 | | 10.16 | 13.29 | 3.13 | 4.84 |
| | 10/29/1992 | | 10.87 | 13.90 | 3.03 | 4.16 |
| | 11/25/1992 | | 10.45 | 12.61 | 2.16 | 4.83 |
| | 12/18/1992 | | 10.79 | 13.07 | 2.28 | 4.45 |
| | 1/28/1993 | | 10.49 | 12.09 | 1.60 | 4.94 |
| | 2/24/1993 | | 10.94 | 13.03 | 2.09 | 4.35 |
| | 3/30/1993 | | 10.36 | 11.69 | 1.33 | 5.15 |
| | 5/28/1993 | | 11.84 | 13.48 | 1.64 | 3.58 |
| | 8/9-10/1993 | | 12.23 | 15.89 | 3.66 | 2.63 |
| | 9/28/1993 | | 11.90 | 15.17 | 3.27 | 3.06 |
| | 10/29/1993 | | 11.76 | 14.85 | 3.09 | 3.25 |
| | 11/30/1993 | | 11.05 | 14.00 | 2.95 | 4.00 |
| | 12/27/1993 | | 11.59 | 14.25 | 2.66 | 3.55 |
| | 3/31/1994 | | 11.46 | 13.75 | 2.29 | 3.78 |
| | 9/9/1994 | | 10.45 | 12.25 | 1.80 | 5.17 |
| | 9/29/1994 | | 10.94 | 13.09 | 2.15 | 4.63 |
| | 11/23/1994 | | 10.87 | 11.62 | 0.75 | 4.90 |
| | 1/4/1995 | | 10.72 | 11.36 | 0.64 | 5.07 |
| | 2/8/1995 | | 11.81 | 13.02 | 1.21 | 3.89 |
| | 3/16/1995 | | 11.36 | 12.39 | 1.03 | 4.37 |
| | 5/25/1995 | | 12.00 | 12.89 | 0.89 | 3.75 |
| | 9/20/1995 | | 10.65 | 11.26 | 0.61 | 5.14 |
| | 10/2/2003 | | 11.18 | 11.83 | 0.65 | 4.61 |
| | 11/25-26/2008 | | 10.32 | 11.25 | 0.93 | 5.42 |
| | 3/5/2009 | | 13.38 | 13.96 | 0.58 | 2.42 |
| | 6/30/2009 | | 12.38 | 13.32 | 0.94 | 3.36 |
| | 9/23/2009 | | 12.01 | 12.67 | 0.66 | 3.77 |
| | 12/29/2009 | | 11.85 | 12.49 | 0.64 | 3.94 |
| | 3/24/2010 | | 12.17 | 12.97 | 0.80 | 3.59 |
| | 5/1/2015 | | 11.25 | 12.11 | 0.86 | 4.50 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-9 | 8/28/1990 | 14.09 | 11.04 | 13.28 | 2.24 | 2.62 |
| | 7/23/1991 | | 10.89 | 15.51 | 4.62 | 2.32 |
| | 8/22/1991 | | 11.09 | 14.66 | 3.57 | 2.32 |
| | 9/26/1991 | | 10.52 | 13.14 | 2.62 | 3.07 |
| | 10/25-26/1991 | | 10.76 | 13.40 | 2.64 | 2.83 |
| | 11/26/1991 | | 11.21 | 13.81 | 2.60 | 2.39 |
| | 12/20/1991 | | 11.71 | 15.75 | 4.04 | 1.61 |
| | 1/20/1992 | | 11.16 | 13.05 | 1.89 | 2.57 |
| | 2/27-28/1992 | | 11.31 | 14.25 | 2.94 | 2.22 |
| | 3/23/1992 | | 11.48 | 16.03 | 4.55 | 1.75 |
| | 4/22/1992 | | 11.07 | 14.02 | 2.95 | 2.46 |
| | 5/27-28/1992 | | 10.78 | 13.15 | 2.37 | 2.86 |
| | 6/24/1992 | | 10.93 | 14.12 | 3.19 | 2.55 |
| | 7/27/1992 | | 11.55 | 16.94 | 5.39 | 1.52 |
| | 8/26/1992 | | 10.36 | 12.88 | 2.52 | 3.25 |
| | 9/29/1992 | | 9.95 | 12.35 | 2.40 | 3.68 |
| | 10/29/1992 | | 10.56 | 12.65 | 2.09 | 3.13 |
| | 11/25/1992 | | 6.20 | 13.89 | 7.69 | 6.43 |
| | 12/18/1992 | | 11.21 | 14.03 | 2.82 | 2.34 |
| | 1/28/1993 | | 10.43 | 12.80 | 2.37 | 3.21 |
| | 2/24/1993 | | 10.79 | 13.12 | 2.33 | 2.86 |
| | 3/30/1993 | | 11.04 | 14.94 | 3.90 | 2.31 |
| | 5/28/1993 | | 11.59 | 15.82 | 4.23 | 1.70 |
| | 8/9-10/1993 | | 11.42 | 15.53 | 4.11 | 1.89 |
| | 9/28/1993 | | 11.48 | 14.57 | 3.09 | 2.02 |
| | 10/29/1993 | | 10.89 | 13.02 | 2.13 | 2.80 |
| | 11/30/1993 | | 10.80 | 10.8 | 12.65 | 1.85 |
| | 12/27/1993 | | 11.59 | 11.59 | 15.82 | 4.23 |
| | 3/31/1994 | | 11.02 | 11.02 | 14.56 | 3.54 |
| | 9/9/1994 | | 14.09 | -- | -- | 14.09 |
| | 9/29/1994 | | 11.21 | 11.21 | 15.56 | 4.35 |
| | 11/23/1994 | | 10.58 | 10.58 | 12.52 | 1.94 |
| | 1/4/1995 | | 10.29 | 10.29 | 12.38 | 2.09 |
| | 2/8/1995 | | 11.56 | 11.56 | 16.09 | 4.53 |
| | 3/16/1995 | | 10.94 | 10.94 | 13.78 | 2.84 |
| | 5/25/1995 | | 10.99 | 10.99 | 13.55 | 2.56 |
| | 9/30/1995 | | 10.52 | 10.52 | 12.81 | 2.29 |
| | 10/2/2003 | | 10.24 | 10.24 | 13.09 | 2.85 |
| | 11/25-26/2008 | | 10.50 | 10.50 | 13.10 | 2.60 |
| | 3/5/2009 | | 11.49 | 11.49 | 13.80 | 2.31 |
| | 6/30/2009 | | 10.73 | 10.73 | 13.51 | 2.78 |
| | 6/30/2009 | | 10.47 | 10.47 | 13.28 | 2.81 |
| | 9/23/2009 | | 10.20 | 10.20 | 13.33 | 3.13 |
| | 12/29/2009 | | 10.33 | 10.33 | 13.13 | 2.80 |
| | 3/24/2010 | | 11.07 | 11.07 | 14.55 | 3.48 |
| | 12/13/2010 | | 11.50 | 11.50 | 15.90 | 4.40 |
| | 4/28/2015 | | 10.29 | 13.41 | 3.12 | 3.34 |

| **Well ID** | **Date Measured** | **Casing Elevation** (Feet MSL)[4] | **Depth to Product** (Feet BTC) | **Depth to Groundwater** (Feet BTC) | **Product Thickness** (Feet) | **Groundwater Elevation** [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-10 | 8/28/1990 | 14.90 | 10.36 | 16.78 | 6.42 | 3.45 |
| | 7/23/1991 | | 10.92 | 16.94 | 6.02 | 2.96 |
| | 8/22/1991 | | 10.65 | 16.93 | 6.28 | 3.18 |
| | 9/26/1991 | | 10.48 | 16.78 | 6.30 | 3.35 |
| | 10/25-26/1991 | | 10.63 | 16.42 | 5.79 | 3.29 |
| | 11/26/1991 | | 11.44 | 16.53 | 5.09 | 2.59 |
| | 12/20/1991 | | 11.79 | 16.69 | 4.90 | 2.28 |
| | 1/20/1992 | | 10.76 | 16.29 | 5.53 | 3.20 |
| | 2/27-28/1992 | | 10.76 | 16.74 | 5.98 | 3.12 |
| | 3/23/1992 | | 11.29 | 16.96 | 5.67 | 2.65 |
| | 4/22/1992 | | 10.59 | 16.80 | 6.21 | 3.25 |
| | 5/27-28/1992 | | 11.04 | 16.84 | 5.80 | 2.87 |
| | 6/24/1992 | | 9.78 | 16.85 | 7.07 | 3.92 |
| | 7/27/1992 | | 10.81 | 16.90 | 6.09 | 3.05 |
| | 8/26/1992 | | 8.73 | 16.59 | 7.86 | 4.83 |
| | 9/29/1992 | | 9.67 | 16.86 | 7.19 | 4.01 |
| | 10/29/1992 | | 10.35 | 16.93 | 6.58 | 3.43 |
| | 11/25/1992 | | 10.14 | 16.15 | 6.01 | 3.74 |
| | 12/18/1992 | | 10.39 | 16.36 | 5.97 | 3.50 |
| | 1/28/1993 | | 9.88 | 16.31 | 6.43 | 3.93 |
| | 2/24/1993 | | 10.56 | 16.28 | 5.72 | 3.50 |
| | 3/30/1993 | | 10.18 | 17.89 | 7.71 | 3.59 |
| | 5/28/1993 | | 11.27 | 16.72 | 5.45 | 2.83 |
| | 8/9-10/1993 | | 11.85 | 16.48 | 4.63 | 2.37 |
| | 9/28/1993 | | 11.44 | 16.00 | 4.56 | 2.79 |
| | 10/29/1993 | | 11.15 | 15.29 | 4.14 | 3.15 |
| | 11/30/1993 | | 10.75 | 15.65 | 4.90 | 3.43 |
| | 12/27/1993 | | 11.43 | 16.29 | 4.86 | 2.76 |
| | 3/31/1994 | | 11.07 | 16.27 | 5.20 | 3.07 |
| | 9/9/1994 | | 9.65 | 16.12 | 6.47 | 4.31 |
| | 9/29/1994 | | 10.49 | 16.92 | 6.43 | 3.47 |
| | 11/23/1994 | | 10.11 | 16.55 | 6.44 | 3.85 |
| | 1/4/1995 | | 10.11 | 15.93 | 5.82 | 3.94 |
| | 2/8/1995 | | 11.51 | 16.73 | 5.22 | 2.63 |
| | 3/16/1995 | | 10.35 | 15.86 | 5.51 | 3.75 |
| | 5/25/1995 | | 10.96 | 15.24 | 4.28 | 3.32 |
| | 9/30/1995 | | 9.77 | 16.51 | 6.74 | 4.15 |
| | 10/2/2003 | | 10.58 | 15.22 | 4.64 | 3.64 |
| | 11/25-26/2008 | | 9.8 | 14.90 | 5.10 | 4.36 |
| | 3/5/2009 | | 11.58 | 14.60 | 3.02 | 2.88 |
| | 6/30/2009 | | 10.49 | 15.55 | 5.06 | 3.67 |
| | 9/23/2009 | | 9.99 | 15.18 | 5.19 | 4.15 |
| | 12/29/2009 | | 10.05 | 14.29 | 4.24 | 4.23 |
| | 3/24/2010 | | 10.75 | 15.00 | 4.25 | 3.53 |
| | 12/13/2010 | | 11.62 | 15.28 | 3.66 | 2.75 |
| | 4/28/2015 | | 9.94 | 14.43 | 4.49 | 4.30 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-11 | 8/28/1990 | 14.64 | 11.14 | 16.06 | 4.92 | 2.57 |
| | 7/23/1991 | | 11.06 | 16.51 | 5.45 | 2.54 |
| | 8/22/1991 | | 11.09 | 16.31 | 5.22 | 2.56 |
| | 9/26/1991 | | 10.75 | 14.63 | 3.88 | 3.15 |
| | 10/25-26/1991 | | 11.01 | 14.42 | 3.41 | 2.98 |
| | 11/26/1991 | | 11.29 | 16.00 | 4.71 | 2.46 |
| | 12/20/1991 | | 12.08 | 16.47 | 4.39 | 1.73 |
| | 1/20/1992 | | 11.19 | 14.19 | 3.00 | 2.88 |
| | 2/27-28/1992 | | 11.46 | 16.25 | 4.79 | 2.27 |
| | 3/23/1992 | | 11.60 | 16.78 | 5.18 | 2.06 |
| | 4/22/1992 | | 11.18 | 16.15 | 4.97 | 2.52 |
| | 5/27-28/1992 | | 11.03 | 14.76 | 3.73 | 2.90 |
| | 6/24/1992 | | 11.09 | 15.61 | 4.52 | 2.69 |
| | 7/27/1992 | | 11.56 | 16.56 | 5.00 | 2.13 |
| | 8/26/1992 | | 10.87 | 13.56 | 2.69 | 3.26 |
| | 9/29/1992 | | 10.22 | 13.19 | 2.97 | 3.86 |
| | 10/29/1992 | | 10.72 | 14.79 | 4.07 | 3.15 |
| | 11/25/1992 | | 11.02 | 13.97 | 2.95 | 3.06 |
| | 12/18/1992 | | 11.48 | 15.43 | 3.95 | 2.41 |
| | 1/28/1993 | | 10.53 | 13.69 | 3.16 | 3.51 |
| | 2/24/1993 | | 10.95 | 15.16 | 4.21 | 2.89 |
| | 3/30/1993 | | 11.05 | 16.26 | 5.21 | 2.6 |
| | 5/28/1993 | | 11.76 | 16.8 | 5.04 | 1.92 |
| | 8/9-10/1993 | | 12.94 | 16.48 | 3.54 | 1.03 |
| | 9/28/1993 | | 11.76 | 16.34 | 4.58 | 2.01 |
| | 10/29/1993 | | 11.12 | 14.06 | 2.94 | 2.96 |
| | 11/30/1993 | | 10.98 | 14.27 | 3.29 | 3.03 |
| | 12/27/1993 | | 11.65 | 16.72 | 5.07 | 2.03 |
| | 3/31/1994 | | 11.19 | 16.35 | 5.16 | 2.47 |
| | 9/9/1994 | | -- | 0.00 | -- | 14.64 |
| | 9/29/1994 | | 11.23 | 16.51 | 5.28 | 2.41 |
| | 11/23/1994 | | 10.79 | 14.94 | 4.15 | 3.06 |
| | 1/4/1995 | | 10.52 | 13.47 | 2.95 | 3.56 |
| | 2/8/1995 | | 11.54 | 17.06 | 5.52 | 2.05 |
| | 3/16/1995 | | 11.46 | 15.74 | 4.28 | 2.37 |
| | 5/25/1995 | | 11.31 | 14.8 | 3.49 | 2.67 |
| | 9/30/1995 | | 10.84 | 14.33 | 3.49 | 3.14 |
| | 10/2/2003 | | 10.75 | 13.4 | 2.65 | 3.36 |
| | 11/25-26/2008 | | 10.65 | 13.7 | 3.05 | 2.38 |
| | 3/5/2009 | | 11.55 | 14.85 | 3.3 | 1.43 |
| | 6/30/2009 | | 10.71 | 13.58 | 2.87 | 2.51 |
| | 6/30/2009 | | 10.5 | 13.79 | 3.29 | 2.66 |
| | 9/23/2009 10 | | 10.35 | 13.45 | 3.1 | 2.84 |
| | 9/23/2009 11 | | 9.98 | 12.85 | 2.87 | 3.24 |
| | 12/29/2009 | | 10.33 | 13.21 | 2.88 | 2.89 |
| | 3/24/2010 | | 11.04 | 13.95 | 2.91 | 2.18 |
| | 12/13/2010 | | 11.55 | 14.98 | 3.43 | 1.59 |
| | 4/28/2015 | | 10.51 | 12.35 | 1.84 | 3.86 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-12 | 8/28/1990 | 15.17 | 11.22 | 14.12 | 2.90 | 3.49 |
| | 7/23/1991 | | 10.43 | 13.41 | 2.98 | 4.26 |
| | 8/22/1991 | | 10.39 | 13.73 | 3.34 | 4.25 |
| | 9/26/1991 | | 3.90 | -- | -- | -- |
| | 10/25-26/1991 | | -- | -- | 3.11 | -- |
| | 11/26/1991 | | -- | -- | 1.30 | -- |
| | 12/20/1991 | | -- | -- | 1.48 | -- |
| | 1/20/1992 | | 9.52 | 10.29 | 0.77 | 5.53 |
| | 2/27-28/1992 | | 9.82 | 12.09 | 2.27 | 4.99 |
| | 3/23/1992 | | 10.12 | 12.22 | 2.1 | 4.71 |
| | 4/22/1992 | | 9.48 | 11.02 | 1.54 | 5.44 |
| | 5/27-28/1992 | | 9.47 | 11.25 | 1.78 | 5.42 |
| | 6/24/1992 | | 8.7 | 11.85 | 3.15 | 5.97 |
| | 7/27/1992 | | 9.56 | 12.39 | 2.83 | 5.16 |
| | 8/26/1992 | | 8.21 | 11 | 2.79 | 6.51 |
| | 9/29/1992 | | 8.26 | 10.88 | 2.62 | 6.49 |
| | 10/29/1992 | | 9.95 | 11.1 | 1.15 | 5.04 |
| | 11/25/1992 | | 8.84 | 11.27 | 2.43 | 5.94 |
| | 12/18/1992 | | -- | -- | -- | -- |
| | 1/28/1993 | | -- | -- | -- | -- |
| | 2/24/1993 | | -- | -- | -- | -- |
| | 3/30/1993 | | -- | -- | -- | -- |
| | 5/28/1993 | | -- | -- | | -- |
| | 8/9-10/1993 | | -- | -- | 1.9 | -- |
| | 9/28/1993 | | -- | -- | -- | -- |
| | 10/29/1993 | | -- | -- | -- | -- |
| | 11/30/1993 | | -- | -- | | -- |
| | 12/27/1993 | | -- | -- | 2.39 | -- |
| | 3/31/1994 | | -- | -- | 0.96 | -- |
| | 9/9/1994 | | -- | -- | 2.23 | -- |
| | 9/29/1994 | | -- | -- | 3.27 | -- |
| | 11/23/1994 | | -- | -- | 0.92 | -- |
| | 1/4/1995 | | -- | -- | 0.26 | -- |
| | 2/8/1995 | | -- | -- | -- | -- |
| | 3/16/1995 | | -- | -- | -- | -- |
| | 5/25/1995 | | -- | -- | 1.40 | -- |
| | 9/30/1995 | | -- | -- | -- | -- |
| | 11/25-26/2008 | | 8.75 | -- | 0.42 | -- |
| | 3/6/2009 | | 10.3 | 13.65 | 3.35 | 1.17 |
| | 6/30/2009 | | 9.12 | 14.24 | 5.12 | 2.14 |
| | 9/23/2009 10 | | 8.54 | 14.73 | 6.19 | 2.53 |
| | 9/23/2009 11 | | 8.43 | 14.76 | 6.33 | 2.62 |
| | 12/29/2009 | | 9.1 | 12.76 | 3.66 | 2.41 |
| | 3/24/2010 | | 9.62 | 12.76 | 3.14 | 1.98 |
| | 4/27/2015 | | 10.51 | 12.35 | 1.84 | 4.34 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-13 | 8/28/1990 | 13.79 | -- [12] | -- [12] | -- [12] | -- [12] |
| | 7/23/1991 | | 10.20 | 14.84 | 4.64 | 3.31 |
| | 8/22/1991 | | 9.80 | 13.50 | 3.70 | 3.77 |
| | 9/26/1991 | | 11.46 | 17.44 | 5.98 | 1.97 |
| | 10/25-26/1991 | | 11.55 | 17.53 | 5.98 | 1.88 |
| | 11/26/1991 | | 11.63 | -- | -- | -- |
| | 12/20/1991 | | 12.65 | 19.86 | 7.21 | 0.71 |
| | 1/20/1992 | | 10.28 | 12.59 | 2.31 | 3.37 |
| | 2/27-28/1992 | | 11.65 | 17.05 | 5.40 | 1.82 |
| | 3/23/1992 | | 11.21 | 17.82 | 6.61 | 2.18 |
| | 4/22/1992 | | 10.52 | 15.80 | 5.28 | 2.95 |
| | 5/27-28/1992 | | 10.48 | 14.30 | 3.82 | 3.08 |
| | 6/24/1992 | | 9.85 | 14.35 | 4.50 | 3.67 |
| | 7/27/1992 | | 12.25 | 17.09 | 4.84 | 1.25 |
| | 8/26/1992 | | 10.66 | 14.12 | 3.46 | 2.92 |
| | 9/29/1992 | | 9.35 | 13.08 | 3.73 | 4.22 |
| | 10/29/1992 | | 3.86 | | 3.86 | -- |
| | 11/25/1992 | | 10.75 | 14.03 | 3.28 | 2.84 |
| | 12/18/1992 | | -- | -- | -- | -- |
| | 1/28/1993 | | -- | -- | -- | -- |
| | 2/24/1993 | | -- | -- | -- | -- |
| | 3/30/1993 | | -- | -- | -- | -- |
| | 5/28/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 8/9-10/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 9/28/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 10/29/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 11/30/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 12/27/1993 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 3/31/1994 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 9/9/1994 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 9/29/1994 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 11/23/1994 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 1/4/1995 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 2/8/1995 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 3/16/1995 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 5/25/1995 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 9/30/1995 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 10/2/2003 | | -- [12] | -- [12] | -- [12] | -- [12] |
| | 11/25-26/2008 | 12.79 | 9.25 | 21.75 | 12.50 | 1.04 |
| | 3/5/2009 | | 9.60 | -- [12] | -- [12] | -- [12] |
| | 6/30/2009 | | 10.70 | 10.95 | 0.25 | 2.11 |
| | 9/23/2009 [10] | | 7.69 | 10.19 | 2.50 | 5.31 |
| | 12/29/2009 | | 9.75 | -- [12] | -- [12] | -- [12] |
| | 3/24/2010 | | 9.82 | -- [12] | -- [12] | -- [12] |
| | 4/27/2015 | | 9.68 | -- [12] | -- [12] | -- [12] |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-14 | 8/28/1990 | 13.51 | -- | 10.55 | -- | 2.96 |
| | 7/23/1991 | | -- | 10.43 | -- | 3.08 |
| | 8/22/1991 | | -- | 10.13 | -- | 3.38 |
| | 9/26/1991 | | -- | 12.2 | -- | 1.31 |
| | 10/25-26/1991 | | -- | 11.05 | -- | 2.46 |
| | 11/26/1991 | | -- | 11.26 | -- | 2.25 |
| | 12/20/1991 | | -- | 13.08 | -- | 0.43 |
| | 1/20/1992 | | -- | 10.04 | -- | 3.47 |
| | 2/27-28/1992 | | -- | 11.92 | -- | 1.59 |
| | 3/23/1992 | | -- | 11.59 | -- | 1.92 |
| | 4/22/1992 | | -- | 10.79 | -- | 2.72 |
| | 5/27-28/1992 | | -- | 10.63 | -- | 2.88 |
| | 6/24/1992 | | -- | 9.82 | -- | 3.69 |
| | 7/27/1992 | | -- | 11.86 | -- | 1.65 |
| | 8/26/1992 | | -- | 10.57 | -- | 2.94 |
| | 9/29/1992 | | -- | 9.33 | -- | 4.18 |
| | 10/29/1992 | | -- | 10.22 | -- | 3.29 |
| | 11/25/1992 | | -- | 10.95 | -- | 2.56 |
| | 12/18/1992 | | -- | 11.97 | -- | 1.54 |
| | 1/28/1993 | | -- | 9.81 | -- | 3.7 |
| | 2/24/1993 | | -- | 10.67 | -- | 2.84 |
| | 3/30/1993 | | -- | 10.53 | -- | 2.98 |
| | 5/28/1993 | | -- | 11.82 | -- | 1.69 |
| | 8/9-10/1993 | | -- | 11.42 | -- | 2.09 |
| | 9/28/1993 | | -- | 12.51 | -- | 1 |
| | 10/29/1993 | | -- | 11.05 | -- | 2.46 |
| | 11/30/1993 | | -- | 10.51 | -- | 3 |
| | 12/27/1993 | | -- | 11.86 | -- | 1.65 |
| | 3/31/1994 | | -- | 10.79 | -- | 2.72 |
| | 9/9/1994 | | -- | 9.71 | -- | 3.8 |
| | 9/29/1994 | | -- | 10.69 | -- | 2.82 |
| | 11/23/1994 | | -- | 9.95 | -- | 3.56 |
| | 1/4/1995 | | -- | 11.19 | -- | 2.32 |
| | 2/8/1995 | | -- | 11.95 | -- | 1.56 |
| | 3/16/1995 | | -- | 12.45 | -- | 1.06 |
| | 5/25/1995 | | -- | 10.75 | -- | 2.76 |
| | 9/30/1995 | | -- | 10.77 | -- | 2.74 |
| | 4/29/2015 | | 7.9 | 10.00 | 2.10 | 5.30 |

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-15 | 8/28/1990 | 16.44 | 10.48 | 13.45 | 2.97 | 5.34 |
| | 7/23/1991 | | 7.92 | 11.24 | 3.32 | 7.82 |
| | 8/22/1991 | | 8.04 | 11.54 | 3.50 | 7.67 |
| | 9/26/1991 | | 9.03 | 12.31 | 3.28 | 6.72 |
| | 10/25-26/1991 | | 9.68 | 12.83 | 3.15 | 6.10 |
| | 11/26/1991 | | 10.67 | 13.09 | 2.42 | 5.26 |
| | 12/20/1991 | | 11.20 | 12.75 | 1.55 | 4.91 |
| | 1/20/1992 | | 9.83 | 10.50 | 0.67 | 6.47 |
| | 2/27-28/1992 | | 9.59 | 10.66 | 1.07 | 6.63 |
| | 3/23/1992 | | 10.03 | 11.08 | 1.05 | 6.19 |
| | 4/22/1992 | | 9.65 | 10.65 | 1.00 | 6.58 |
| | 5/27-28/1992 | | 10.29 | 11.65 | 1.36 | 5.86 |
| | 6/24/1992 | | 8.92 | 10.40 | 1.48 | 7.21 |
| | 7/27/1992 | | 9.73 | 11.04 | 1.31 | 6.43 |
| | 8/26/1992 | | 7.74 | 9.93 | 2.19 | 8.24 |
| | 9/29/1992 | | 9.10 | 10.75 | 1.65 | 6.99 |
| | 10/29/1992 | | 9.51 | 10.98 | 1.47 | 6.62 |
| | 11/25/1992 | | 8.81 | 10.58 | 1.77 | 7.26 |
| | 12/18/1992 | | 9.93 | 10.02 | 0.09 | 6.49 |
| | 1/28/1993 | | 8.83 | 10.62 | 1.79 | 7.23 |
| | 2/24/1993 | | 9.40 | 11.91 | 2.51 | 6.51 |
| | 3/30/1993 | | 8.59 | 10.69 | 2.10 | 7.41 |
| | 5/28/1993 | | 9.99 | 12.10 | 2.11 | 6.01 |
| | 8/9-10/1993 | | 11.57 | 13.36 | 1.79 | 4.49 |
| | 9/28/1993 | | 10.64 | 12.61 | 1.97 | 5.39 |
| | 10/29/1993 | | 10.62 | 13.35 | 2.73 | 5.25 |
| | 11/30/1993 | | 9.51 | 11.60 | 2.09 | 6.49 |
| | 12/27/1993 | | 9.91 | 12.68 | 2.77 | 5.95 |
| | 3/31/1994 | | 9.37 | 11.75 | 2.38 | 6.57 |
| | 9/9/1994 | | 8.00 | 8.20 | 0.20 | 8.40 |
| | 9/29/1994 | | 8.34 | 12.06 | 3.72 | 7.32 |
| | 11/23/1994 | | 8.90 | 10.05 | 1.15 | 7.30 |
| | 1/4/1995 | | 8.69 | 10.31 | 1.62 | 7.41 |
| | 2/8/1995 | | 9.42 | 11.81 | 2.39 | 6.52 |
| | 3/16/1995 | | 9.13 | 11.88 | 2.75 | 6.73 |
| | 5/25/1995 | | 9.71 | 11.71 | 2.00 | 6.31 |
| | 9/30/1995 | | 7.77 | 11.61 | 3.84 | 7.86 |
| | 11/25-26/2008 | 15.38 | 9.00 | 12.10 | 3.10 | 5.76 |
| | 3/6/2009 | | 10.78 | 12.75 | 1.97 | 4.21 |
| | 6/30/2009 | | 9.46 | 11.36 | 1.90 | 5.64 |
| | 9/23/2009 | | 9.41 | 11.62 | 2.21 | 5.65 |
| | 12/29/2009 | | 8.93 | 11.21 | 2.28 | 6.12 |
| | 04/30/2015 | | 8.56 | 10.80 | 2.24 | 6.49 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-16 | 8/28/1990 | 14.78 | -- | 6.62 | -- | 8.16 |
| | 7/23/1991 | | -- | 4.85 | -- | 9.93 |
| | 8/22/1991 | | -- | 5.79 | -- | 8.99 |
| | 9/26/1991 | | -- | 6.82 | -- | 7.96 |
| | 10/25-26/1991 | | -- | 7.89 | -- | 6.89 |
| | 11/26/1991 | | -- | 9.7 | -- | 5.08 |
| | 12/20/1991 | | -- | 10.01 | -- | 4.77 |
| | 1/20/1992 | | -- | 7.55 | -- | 7.23 |
| | 2/27-28/1992 | | -- | 7.17 | -- | 7.61 |
| | 3/23/1992 | | -- | 8.1 | -- | 6.68 |
| | 4/22/1992 | | -- | 6.62 | -- | 8.16 |
| | 5/27-28/1992 | | -- | 8.14 | -- | 6.64 |
| | 6/24/1992 | | -- | 5.06 | -- | 9.72 |
| | 7/27/1992 | | -- | 6.44 | -- | 8.34 |
| | 8/26/1992 | | -- | 4.35 | -- | 10.43 |
| | 9/29/1992 | | -- | 6.29 | -- | 8.49 |
| | 10/29/1992 | | -- | 6.74 | -- | 8.04 |
| | 11/25/1992 | | -- | 5.84 | -- | 8.94 |
| | 12/18/1992 | | -- | 5.89 | -- | 8.89 |
| | 1/28/1993 | | -- | 6 | -- | 8.78 |
| | 2/24/1993 | | 6.52 | 6.92 | 0.4 | 8.26 |
| | 3/30/1993 | | -- | 5.4 | -- | 9.38 |
| | 5/28/1993 | | -- | 7.45 | -- | 7.33 |
| | 8/9-10/1993 | | -- | 9.4 | -- | 5.38 |
| | 9/28/1993 | | -- | 8.28 | -- | 6.5 |
| | 10/29/1993 | | -- | 9.1 | -- | 5.68 |
| | 11/30/1993 | | -- | 6.74 | -- | 8.04 |
| | 12/27/1993 | | -- | 7.29 | -- | 7.49 |
| | 3/31/1994 | | -- | 7.43 | -- | 7.35 |
| | 9/9/1994 | | -- | 0 | -- | 14.78 |
| | 9/29/1994 | | -- | 0 | -- | 14.78 |
| | 11/23/1994 | | -- | 0 | -- | 14.78 |
| | 1/4/1995 | | -- | -- | -- | -- |
| | 2/8/1995 | | -- | -- | -- | -- |
| | 3/16/1995 | | -- | -- | -- | -- |
| | 5/25/1995 | | -- | -- | -- | -- |
| | 9/30/1995 | | -- | -- | -- | -- |
| AW-17 | 8/28/1990 | 15.14 | -- | 10.59 | -- | 4.55 |
| | 7/23/1991 | | -- | 9.61 | -- | 5.53 |
| | 8/22/1991 | | -- | 9.70 | -- | 5.44 |
| | 9/26/1991 | | -- | 10.40 | -- | 4.74 |
| | 10/25-26/1991 | | -- | 10.75 | -- | 4.39 |
| | 11/26/1991 | | -- | 11.60 | -- | 3.54 |
| | 12/20/1991 | | -- | 11.84 | -- | 3.30 |
| | 01/20/1992 | Abandoned | | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-18 | 8/28/1990 | 14.06 | 6.94 | 7.58 | 0.64 | 7.06 |
| | 7/23/1991 | | 5.82 | 6.27 | 0.45 | 8.20 |
| | 8/22/1991 | | 6.00 | 6.46 | 0.46 | 8.02 |
| | 9/26/1991 | | 6.87 | 8.98 | 2.11 | 7.00 |
| | 10/25-26/1991 | | 7.26 | 10.60 | 3.34 | 6.50 |
| | 11/26/1991 | | 7.47 | 10.07 | 2.60 | 6.36 |
| | 12/20/1991 | | 7.72 | 10.16 | 2.44 | 6.12 |
| | 1/20/1992 | | 6.63 | 7.09 | 0.46 | 7.39 |
| | 2/27-28/1992 | | 6.46 | 6.83 | 0.37 | 7.57 |
| | 3/23/1992 | | 6.77 | 7.59 | 0.82 | 7.22 |
| | 4/22/1992 | | 6.18 | 6.78 | 0.6 | 7.83 |
| | 5/27-28/1992 | | 6.91 | 9.42 | 2.51 | 6.92 |
| | 6/24/1992 | | 5.99 | 6.24 | 0.25 | 8.05 |
| | 7/27/1992 | | 6.66 | 7.1 | 0.44 | 7.36 |
| | 8/26/1992 | | 5.59 | 5.8 | 0.21 | 8.45 |
| | 9/29/1992 | | 6.39 | 6.97 | 0.58 | 7.62 |
| | 10/29/1992 | | 6.51 | 7.11 | 0.6 | 7.5 |
| | 11/25/1992 | | 5.93 | 6.21 | 0.28 | 8.1 |
| | 12/18/1992 | | 5.99 | 6.26 | 0.27 | 8.05 |
| | 1/28/1993 | | 5.9 | 6.08 | 0.18 | 8.14 |
| | 2/24/1993 | | 6.2 | 6.42 | 0.22 | 7.84 |
| | 3/30/1993 | | 5.09 | 5.85 | 0.76 | 8.9 |
| | 5/28/1993 | | 6.61 | 9.12 | 2.51 | 7.22 |
| | 8/9-10/1993 | | 8.79 | 13.95 | 5.16 | 4.81 |
| | 9/28/1993 | | 7.48 | 11.29 | 3.81 | 6.24 |
| | 10/29/1993 | | 7.57 | 11.15 | 3.58 | 6.17 |
| | 11/30/1993 | | 6.4 | 7.45 | 1.05 | 7.57 |
| | 12/27/1993 | | 6.48 | 8.38 | 1.9 | 7.41 |
| | 3/31/1994 | | 6.35 | 7.33 | 0.98 | 7.62 |
| | 9/9/1994 | | 6.02 | 6.64 | 0.62 | 7.98 |
| | 9/29/1994 | | 6.08 | 9.06 | 2.98 | 7.71 |
| | 11/23/1994 | | 5.75 | 8.02 | 2.27 | 8.11 |
| | 1/4/1995 | | 5.61 | 7.87 | 2.26 | 8.25 |
| | 2/8/1995 | | 6.08 | 8.15 | 2.07 | 7.79 |
| | 3/16/1995 | | 5.82 | 8.19 | 2.37 | 8.03 |
| | 5/25/1995 | | 7.05 | 7.81 | 0.76 | 6.94 |
| | 9/30/1995 | | 6.08 | 7.43 | 1.35 | 7.86 |
| | 10/2/2003 | | 6.87 | 7.28 | 0.41 | 7.11 |
| | 11/25-26/2008 | | 5.65 | 7.35 | 1.7 | 6.93 |
| | 3/5/2009 | | 7.21 | 8.63 | 1.42 | 5.43 |
| | 6/30/2009 | | 6.41 | 7.28 | 0.87 | 6.38 |
| | 9/23/2009 | | 6.93 | 8.04 | 1.11 | 5.83 |
| | 12/29/2009 | | 5.99 | 6.75 | 0.76 | 6.82 |
| | 4/28/2015 | | 5.53 | 7.00 | 1.47 | 8.32 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-19 | 8/28/1990 | 16.52 | 12.14 | 13.38 | 1.24 | 4.19 |
| | 7/23/1991 | | 11.46 | 11.87 | 0.41 | 5.00 |
| | 8/22/1991 | | 11.58 | 12.03 | 0.45 | 4.87 |
| | 9/26/1991 | | 12.04 | 12.62 | 0.58 | 4.39 |
| | 10/25-26/1991 | | 12.24 | 12.78 | 0.54 | 4.20 |
| | 11/26/1991 | | 12.76 | 13.70 | 0.94 | 3.62 |
| | 8/28/1990 | 16.89 | -- | 12.14 | -- | 4.75 |
| | 7/23/1991 | | -- | 9.29 | -- | 7.60 |
| | 8/22/1991 | | -- | 9.85 | -- | 7.04 |
| | 5/1/2015 | | 11.40 | 11.80 | 0.4 | 5.43 |
| AW-20 | 9/26/1991 | 16.89 | -- | 11.54 | -- | 5.35 |
| | 10/25-26/1991 | | -- | 12.42 | -- | 4.47 |
| | 11/26/1991 | | -- | 13.20 | -- | 3.69 |
| | 12/20/1991 | | -- | 13.53 | -- | 3.36 |
| | 1/20/1992 | | -- | 11.16 | -- | 5.73 |
| | 2/27-28/1992 | | -- | 12.00 | -- | 4.89 |
| | 3/23/1992 | | -- | 4.21 | -- | 12.68 |
| | 4/22/1992 | | 11.50 | 11.51 | 0.01 | 5.39 |
| | 5/27-28/1992 | | -- | 12.76 | -- | 4.13 |
| | 6/24/1992 | | -- | 10.47 | -- | 6.42 |
| | 7/27/1992 | | -- | 12.05 | -- | 4.84 |
| | 8/26/1992 | | -- | 7.57 | -- | 9.32 |
| | 9/29/1992 | | -- | 10.30 | -- | 6.59 |
| | 10/29/1992 | | -- | 11.32 | -- | 5.57 |
| | 11/25/1992 | | -- | 10.02 | -- | 6.87 |
| | 12/18/1992 | | -- | 10.96 | -- | 5.93 |
| | 1/28/1993 | | -- | 9.04 | -- | 7.85 |
| | 2/24/1993 | | -- | 9.89 | -- | 7.00 |
| | 3/30/1993 | | -- | 9.01 | -- | 7.88 |
| | 5/28/1993 | | -- | 12.51 | -- | 4.38 |
| | 8/9-10/1993 | | -- | 13.67 | -- | 3.22 |
| | 9/28/1993 | | -- | 13.02 | -- | 3.87 |
| | 10/29/1993 | | -- | 12.95 | -- | 3.94 |
| | 11/30/1993 | | -- | 11.67 | -- | 5.22 |
| | 12/27/1993 | | -- | 12.62 | -- | 4.27 |
| | 3/31/1994 | | -- | 12.43 | -- | 4.46 |
| | 9/9/1994 | | -- | 11.61 | -- | 5.28 |
| | 9/29/1994 | | -- | 12.21 | -- | 4.68 |
| | 11/23/1994 | | -- | 11.50 | -- | 5.39 |
| | 1/4/1995 | | -- | 11.12 | -- | 5.77 |
| | 2/8/1995 | | -- | 12.63 | -- | 4.26 |
| | 3/16/1995 | | -- | 12.18 | -- | 4.71 |
| | 5/25/1995 | | -- | 12.85 | -- | 4.04 |
| | 9/30/1995 | | -- | 10.55 | -- | 6.34 |
| | 10/2/2003 | | -- | 11.68 | -- | 5.21 |
| | 11/25-26/2008 | 15.67 | -- | 8.85 | -- | 6.82 |
| | 3/5/2009 | | -- | 13.24 | -- | 2.43 |
| | 6/30/2009 | | -- | 12.07 | -- | 3.60 |
| | 9/23/2009 | | -- | 11.78 | -- | 3.89 |
| | 12/29/2009 | | -- | 11.29 | -- | 4.38 |
| | 3/24/2010 | | -- | 10.50 | -- | 5.17 |
| | 5/1/2015 | | -- | 11.17 | -- | 4.50 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-21 | 8/28/1990 | 14.12 | 11.55 | 12.06 | 0.51 | 2.47 |
| AW-22 | 8/28/1990 | 15.74 | 11.85 | 18.44 | 6.59 | 2.77 |
| | 7/23/1991 | | 11.06 | 19.87 | 8.81 | 3.18 |
| | 8/22/1991 | | 10.99 | 19.32 | 8.33 | 3.33 |
| | 9/26/1991 | | 11.45 | 18.41 | 6.96 | 3.11 |
| | 10/25-26/1991 | | 11.84 | 16.76 | 4.92 | 3.06 |
| | 11/26/1991 | | 12.63 | 16.52 | 3.89 | 2.45 |
| | 12/20/1991 | | 13.25 | 17.93 | 4.68 | 1.69 |
| | 1/20/1992 | | 12.40 | 14.49 | 2.09 | 2.98 |
| | 2/27-28/1992 | | 12.30 | 17.52 | 5.22 | 2.55 |
| | 3/23/1992 | | 12.60 | 18.11 | 5.51 | 2.20 |
| | 4/22/1992 | | 12.34 | 16.41 | 4.07 | 2.71 |
| | 5/27-28/1992 | | 12.09 | 15.79 | 3.70 | 3.02 |
| | 6/24/1992 | | 11.53 | 16.88 | 5.35 | 3.30 |
| | 7/27/1992 | | 12.13 | 17.15 | 5.02 | 2.76 |
| | 8/26/1992 | | 10.92 | 15.13 | 4.21 | 4.10 |
| | 9/29/1992 | | 11.24 | 14.26 | 3.02 | 3.99 |
| | 10/29/1992 | | 11.90 | 14.44 | 2.54 | 3.41 |
| | 11/25/1992 | | 11.78 | 13.89 | 2.11 | 3.60 |
| | 12/18/1992 | | 12.08 | 14.67 | 2.59 | 3.22 |
| | 1/28/1993 | | 11.43 | 14.08 | 2.65 | 3.86 |
| | 2/24/1993 | | 12.19 | 15.01 | 2.82 | 3.07 |
| | 3/30/1993 | | 11.91 | 14.50 | 2.59 | 3.39 |
| | 5/28/1993 | | 12.85 | 16.64 | 3.79 | 2.25 |
| | 8/9-10/1993 | | 13.18 | 16.87 | 3.69 | 1.93 |
| | 9/28/1993 | | 12.94 | 16.74 | 3.80 | 2.15 |
| | 10/29/1993 | | 12.44 | 15.24 | 2.80 | 2.82 |
| | 11/30/1993 | | 12.11 | 15.84 | 3.73 | 3.00 |
| | 12/27/1993 | | 12.73 | 17.85 | 5.12 | 2.14 |
| | 3/31/1994 | | 12.55 | 16.47 | 3.92 | 2.52 |
| | 9/9/1994 | | 11.15 | 14.78 | 3.63 | 3.97 |
| | 9/29/1994 | | 11.94 | 18.59 | 6.65 | 2.67 |
| | 11/23/1994 | | 11.40 | 17.17 | 5.77 | 3.36 |
| | 1/4/1995 | | 11.41 | 16.26 | 4.85 | 3.51 |
| | 2/8/1995 | | 12.84 | 18.76 | 5.92 | 1.89 |
| | 3/16/1995 | | 12.11 | 16.41 | 4.30 | 2.90 |
| | 5/25/1995 | | 12.40 | 25.45 | 13.05 | 1.12 |
| | 9/30/1995 | | 11.11 | 17.17 | 6.06 | 3.60 |
| | 10/2/2003 | | 11.30 | 15.55 | 4.25 | 3.59 |
| | 11/25-26/2008 | 15.13 | -- | 8.70 | -- | 6.43 |
| | 3/6/2009 | | -- | -- | -- | -- |
| | 6/30/2009 | | DRY | | | |
| | 9/23/2009 | | -- | -- | -- | -- |
| | 12/29/2009 | | Not Accessible - Blocked by Equipment | | | |
| | 3/24/2010 | | Not Accessible - Blocked by Equipment | | | |
| | 4/27/2015 | | 11.85 | 14.81 | 2.96 | 2.85 |

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-23 | 8/28/1990 | 16.26 | 6.08 | 10.45 | 4.37 | 9.31 |
| | 7/23/1991 | | 5.46 | 7.83 | 2.37 | 10.54 |
| | 8/22/1991 | | 5.15 | 8.26 | 3.11 | 10.77 |
| | 9/26/1991 | | 6.60 | 8.92 | 2.32 | 9.40 |
| | 10/25-26/1991 | | 7.29 | 8.91 | 1.62 | 8.79 |
| | 11/26/1991 | | 7.79 | 9.27 | 1.48 | 8.31 |
| | 12/20/1991 | | 8.28 | 10.04 | 1.76 | 7.79 |
| | 1/20/1992 | | 6.75 | 8.49 | 1.74 | 9.32 |
| | 2/27-28/1992 | | 6.03 | 8.19 | 2.16 | 9.99 |
| | 3/23/1992 | | 6.43 | 8.39 | 1.96 | 9.61 |
| | 4/22/1992 | | 5.92 | 8.00 | 2.08 | 10.11 |
| | 5/27-28/1992 | | 7.95 | 8.61 | 0.66 | 8.24 |
| | 6/24/1992 | | 5.26 | 7.99 | 2.73 | 10.70 |
| | 7/27/1992 | | 5.89 | 8.43 | 2.54 | 10.09 |
| | 8/26/1992 | | 3.45 | 7.94 | 4.49 | 12.32 |
| | 9/29/1992 | | 5.70 | 8.49 | 2.79 | 10.25 |
| | 10/29/1992 | | 6.39 | 8.59 | 2.20 | 9.63 |
| | 11/25/1992 | | 5.53 | 8.00 | 2.47 | 10.46 |
| | 12/18/1992 | | 6.15 | 7.85 | 1.70 | 9.92 |
| | 1/28/1993 | | 5.73 | 7.44 | 1.71 | 10.34 |
| | 2/24/1993 | | 6.24 | 7.90 | 1.66 | 9.84 |
| | 3/30/1993 | | 4.78 | 7.64 | 2.86 | 11.17 |
| | 5/28/1993 | | 6.87 | 8.21 | 1.34 | 9.24 |
| | 8/9-10/1993 | | 8.18 | 9.41 | 1.23 | 7.94 |
| | 9/28/1993 | | 7.28 | 8.20 | 0.92 | 8.88 |
| | 10/29/1993 | | 7.75 | 8.74 | 0.99 | 8.40 |
| | 11/30/1993 | | 6.34 | 7.95 | 1.61 | 9.74 |
| | 12/27/1993 | | 6.80 | 8.13 | 1.33 | 9.31 |
| | 3/31/1994 | | 6.40 | 7.71 | 1.31 | 9.72 |
| | 9/9/1994 | | 4.73 | 7.68 | 2.95 | 11.21 |
| | 9/29/1994 | | 5.93 | 8.01 | 2.08 | 10.10 |
| | 11/23/1994 | | 5.65 | 7.89 | 2.24 | 10.36 |
| | 1/4/1995 | | 5.73 | 7.56 | 1.83 | 10.33 |
| | 2/8/1995 | | 6.25 | 8.38 | 2.13 | 9.78 |
| | 3/16/1995 | | 6.32 | 8.12 | 1.80 | 9.74 |
| | 5/25/1995 | | 7.38 | 7.73 | 0.35 | 8.84 |
| | 9/30/1995 | | 5.22 | 8.92 | 3.70 | 10.63 |
| | 10/2/2003 | | 5.97 | 8.41 | 2.44 | 9.80 |
| | 11/25-26/2008 | 16.04 | 6.10 | 9.00 | 2.90 | 9.36 |
| | 3/5/2009 | | 7.24 | 8.55 | 1.31 | 8.54 |
| | 6/30/2009 | | 6.58 | 8.88 | 2.30 | 9.12 |
| | 9/23/2009 | | 6.79 | 9.40 | 2.61 | 8.87 |
| | 12/29/2009 | | 6.67 | 8.66 | 1.99 | 9.08 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-24 | 8/28/1990 | 12.38 | -- | 4.35 | -- | 8.03 |
| | 7/23/1991 | | -- | 3.03 | -- | 9.35 |
| | 8/22/1991 | | -- | 3.51 | -- | 8.87 |
| | 9/26/1991 | | -- | 4.78 | -- | 7.60 |
| | 10/25-26/1991 | | -- | 4.87 | -- | 7.51 |
| | 11/26/1991 | | -- | 5.25 | -- | 7.13 |
| | 12/20/1991 | | -- | 5.49 | -- | 6.89 |
| | 1/20/1992 | | -- | 3.64 | -- | 8.74 |
| | 2/27-28/1992 | | -- | 3.61 | -- | 8.77 |
| | 3/23/1992 | | -- | 3.64 | -- | 8.74 |
| | 4/22/1992 | | -- | 3.14 | -- | 9.24 |
| | 5/27-28/1992 | | -- | 4.90 | -- | 7.48 |
| | 6/24/1992 | | -- | 3.21 | -- | 9.17 |
| | 7/27/1992 | | -- | 4.55 | -- | 7.83 |
| | 8/26/1992 | | -- | 2.25 | -- | 10.13 |
| | 9/29/1992 | | -- | 3.19 | -- | 9.19 |
| | 10/29/1992 | | -- | 4.10 | -- | 8.28 |
| | 11/25/1992 | | -- | 3.00 | -- | 9.38 |
| | 12/18/1992 | | -- | 3.50 | -- | 8.88 |
| | 1/28/1993 | | -- | 3.52 | -- | 8.86 |
| | 2/24/1993 | | -- | 3.82 | -- | 8.56 |
| | 3/30/1993 | | -- | 2.88 | -- | 9.50 |
| | 5/28/1993 | | -- | 5.41 | -- | 6.97 |
| | 8/9-10/1993 | | -- | 6.88 | -- | 5.50 |
| | 9/28/1993 | | -- | 4.40 | -- | 7.98 |
| | 10/29/1993 | | -- | 4.76 | -- | 7.62 |
| | 11/30/1993 | | -- | 3.90 | -- | 8.48 |
| | 12/27/1993 | | -- | 3.89 | -- | 8.49 |
| | 3/31/1994 | | -- | 4.41 | -- | 7.97 |
| | 9/9/1994 | | -- | 3.22 | -- | 9.16 |
| | 9/29/1994 | | -- | 4.11 | -- | 8.27 |
| | 11/23/1994 | | -- | 3.60 | -- | 8.78 |
| | 1/4/1995 | | -- | 3.51 | -- | 8.87 |
| | 2/8/1995 | | -- | 4.19 | -- | 8.19 |
| | 3/16/1995 | | -- | 4.06 | -- | 8.32 |
| | 5/25/1995 | | -- | 5.20 | -- | 7.18 |
| | 9/30/1995 | | -- | 3.88 | -- | 8.50 |
| | 10/2/2003 | | -- | 4.57 | -- | 7.81 |
| | 11/25-26/2008 | 11.36 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 4.55 | -- | 6.81 |
| | 6/30/2009 | | -- | 4.70 | -- | 6.66 |
| | 9/23/2009 | | -- | 5.00 | -- | 6.36 |
| | 12/29/2009 | | Not Accessible - Under Water | | | |
| | 4/30/2015 | | -- | 3.51 | -- | 7.85 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-25 | 8/28/1990 | 14.55 | -- | 5.68 | -- | 8.87 |
| | 7/23/1991 | | -- | 4.57 | -- | 9.98 |
| | 8/22/1991 | | -- | 4.97 | -- | 9.58 |
| | 9/26/1991 | | -- | 6.11 | -- | 8.44 |
| | 10/25-26/1991 | | -- | 6.35 | -- | 8.20 |
| | 11/26/1991 | | -- | 6.66 | -- | 7.89 |
| | 12/20/1991 | | -- | 6.85 | -- | 7.70 |
| | 1/20/1992 | | -- | 5.17 | -- | 9.38 |
| | 2/27-28/1992 | | -- | 5.45 | -- | 9.10 |
| | 3/23/1992 | | -- | 5.70 | -- | 8.85 |
| | 4/22/1992 | | -- | 4.89 | -- | 9.66 |
| | 5/27-28/1992 | | -- | 6.29 | -- | 8.26 |
| | 6/24/1992 | | -- | 5.26 | -- | 9.29 |
| | 7/27/1992 | | -- | 5.78 | -- | 8.77 |
| | 8/26/1992 | | -- | 3.78 | -- | 10.77 |
| | 9/29/1992 | | -- | 5.44 | -- | 9.11 |
| | 10/29/1992 | | -- | 5.82 | -- | 8.73 |
| | 11/25/1992 | | -- | 4.55 | -- | 10.00 |
| | 12/18/1992 | | -- | 5.33 | -- | 9.22 |
| | 1/28/1993 | | -- | 5.21 | -- | 9.34 |
| | 2/24/1993 | | -- | 5.70 | -- | 8.85 |
| | 3/30/1993 | | -- | 4.41 | -- | 10.14 |
| | 5/28/1993 | | -- | 6.59 | -- | 7.96 |
| | 8/9-10/1993 | | -- | 7.32 | -- | 7.23 |
| | 9/28/1993 | | -- | 6.37 | -- | 8.18 |
| | 10/29/1993 | | -- | 6.55 | -- | 8.00 |
| | 11/30/1993 | | -- | 5.62 | -- | 8.93 |
| | 12/27/1993 | | -- | 5.85 | -- | 8.70 |
| | 3/31/1994 | | -- | 6.05 | -- | 8.50 |
| | 9/9/1994 | | -- | 4.77 | -- | 9.78 |
| | 9/29/1994 | | -- | 5.53 | -- | 9.02 |
| | 11/23/1994 | | 9.29 | 14.55 | 5.26 | 4.21 |
| | 1/4/1995 | | -- | 5.12 | -- | 9.43 |
| | 2/8/1995 | | -- | 5.83 | -- | 8.72 |
| | 3/16/1995 | | -- | 5.69 | -- | 8.86 |
| | 5/25/1995 | | -- | 6.50 | -- | 8.05 |
| | 9/30/1995 | | -- | 5.31 | -- | 9.24 |
| | 10/2/2003 | | -- | 5.78 | -- | 8.77 |
| | 11/25-26/2008 | 13.50 | -- | 4.50 | -- | 9.00 |
| | 3/5/2009 | | -- | 5.47 | -- | 8.03 |
| | 6/30/2009 | | -- | 5.67 | -- | 7.83 |
| | 9/23/2009 | | -- | 5.80 | -- | 7.70 |
| | 12/29/2009 | | -- | 4.18 | -- | 9.32 |
| | 4/30/2015 | | -- | 4.56 | -- | 8.94 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-26 | 8/28/1990 | 13.51 | -- | 4.86 | -- | 8.65 |
| | 7/23/1991 | | -- | 3.13 | -- | 10.38 |
| | 8/22/1991 | | -- | 3.51 | -- | 10.00 |
| | 9/26/1991 | | -- | 4.89 | -- | 8.62 |
| | 10/25-26/1991 | | -- | 5.57 | -- | 7.94 |
| | 11/26/1991 | | -- | 5.79 | -- | 7.72 |
| | 12/20/1991 | | -- | 6.02 | -- | 7.49 |
| | 1/20/1992 | | -- | 4.16 | -- | 9.35 |
| | 2/27-28/1992 | | -- | 3.88 | -- | 9.63 |
| | 3/23/1992 | | -- | 4.50 | -- | 9.01 |
| | 4/22/1992 | | -- | 3.11 | -- | 10.40 |
| | 5/27-28/1992 | | -- | 4.97 | -- | 8.54 |
| | 6/24/1992 | | -- | 3.66 | -- | 9.85 |
| | 7/27/1992 | | -- | 4.64 | -- | 8.87 |
| | 8/26/1992 | | -- | 2.43 | -- | 11.08 |
| | 9/29/1992 | | -- | 3.80 | -- | 9.71 |
| | 10/29/1992 | | -- | 4.25 | -- | 9.26 |
| | 11/25/1992 | | -- | 3.24 | -- | 10.27 |
| | 12/18/1992 | | -- | 3.98 | -- | 9.53 |
| | 1/28/1993 | | -- | 3.57 | -- | 9.94 |
| | 2/24/1993 | | -- | 4.20 | -- | 9.31 |
| | 3/30/1993 | | -- | 3.08 | -- | 10.43 |
| | 5/28/1993 | | -- | 5.54 | -- | 7.97 |
| | 8/9-10/1993 | | -- | 6.48 | -- | 7.03 |
| | 9/28/1993 | | -- | 5.48 | -- | 8.03 |
| | 10/29/1993 | | -- | 5.65 | -- | 7.86 |
| | 11/30/1993 | | -- | 4.50 | -- | 9.01 |
| | 12/27/1993 | | 4.68 | 4.69 | 0.01 | 8.83 |
| | 3/31/1994 | | -- | 4.96 | -- | 8.55 |
| | 9/9/1994 | | -- | 3.95 | -- | 9.56 |
| | 9/29/1994 | | -- | 4.77 | -- | 8.74 |
| | 11/23/1994 | | -- | 4.26 | -- | 9.25 |
| | 1/4/1995 | | -- | 4.09 | -- | 9.42 |
| | 2/8/1995 | | -- | 4.95 | -- | 8.56 |
| | 3/16/1995 | | -- | 4.81 | -- | 8.70 |
| | 5/25/1995 | | -- | 6.26 | -- | 7.25 |
| | 9/30/1995 | | -- | 4.34 | -- | 9.17 |
| | 10/2/2003 | | -- | 5.22 | -- | 8.29 |
| | 11/25-26/2008 | 12.47 | -- | 3.10 | -- | 9.37 |
| | 3/5/2009 | | -- | 4.35 | -- | 8.12 |
| | 6/30/2009 | | -- | 4.58 | -- | 7.89 |
| | 9/23/2009 | | -- | 4.70 | -- | 7.77 |
| | 12/29/2009 | | -- | 3.17 | -- | 9.30 |
| | 04/28/2015 | | -- | 3.63 | -- | 8.84 |

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-27 | 8/28/1990 | 14.58 | -- | 5.97 | -- | 8.61 |
| | 7/23/1991 | | -- | 4.70 | -- | 9.88 |
| | 8/22/1991 | | -- | 5.14 | -- | 9.44 |
| | 9/26/1991 | | -- | 6.30 | -- | 8.28 |
| | 10/25-26/1991 | | -- | 6.51 | -- | 8.07 |
| | 11/26/1991 | | -- | 6.78 | -- | 7.80 |
| | 12/20/1991 | | -- | 6.95 | -- | 7.63 |
| | 1/20/1992 | | -- | 4.98 | -- | 9.60 |
| | 2/27-28/1992 | | -- | 5.74 | -- | 8.84 |
| | 3/23/1992 | | -- | 6.00 | -- | 8.58 |
| | 4/22/1992 | | -- | 5.04 | -- | 9.54 |
| | 5/27-28/1992 | | -- | 6.51 | -- | 8.07 |
| | 6/24/1992 | | -- | 5.50 | -- | 9.08 |
| | 7/27/1992 | | -- | 5.96 | -- | 8.62 |
| | 8/26/1992 | | -- | 3.96 | -- | 10.62 |
| | 9/29/1992 | | -- | 5.64 | -- | 8.94 |
| | 10/29/1992 | | -- | 6.06 | -- | 8.52 |
| | 11/25/1992 | | -- | 4.54 | -- | 10.04 |
| | 12/18/1992 | | -- | 5.57 | -- | 9.01 |
| | 1/28/1993 | | 5.42 | 5.44 | 0.02 | 9.14 |
| | 2/24/1993 | | -- | 5.80 | -- | 8.78 |
| | 3/30/1993 | | -- | 4.79 | -- | 9.79 |
| | 5/28/1993 | | -- | 6.69 | -- | 7.89 |
| | 8/9-10/1993 | | -- | 7.29 | -- | 7.29 |
| | 9/28/1993 | | -- | 6.48 | -- | 8.10 |
| | 10/29/1993 | | 6.63 | 6.65 | 0.02 | 7.95 |
| | 11/30/1993 | | -- | 5.75 | -- | 8.83 |
| | 12/27/1993 | | -- | 5.95 | -- | 8.63 |
| | 3/31/1994 | | -- | 6.24 | -- | 8.34 |
| | 9/9/1994 | | -- | 4.76 | -- | 9.82 |
| | 9/29/1994 | | -- | 5.54 | -- | 9.04 |
| | 11/23/1994 | | -- | 5.43 | -- | 9.15 |
| | 1/4/1995 | | -- | 5.44 | -- | 9.14 |
| | 2/8/1995 | | -- | 5.96 | -- | 8.62 |
| | 3/16/1995 | | -- | 5.94 | -- | 8.64 |
| | 5/25/1995 | | -- | 6.76 | -- | 7.82 |
| | 9/30/1995 | | -- | 5.43 | -- | 9.15 |
| | 10/2/2003 | | -- | 6.13 | -- | 8.45 |
| | 11/25-26/2008 | | -- | 5.1 | -- | 8.42 |
| | 3/5/2009 | | -- | 5.65 | -- | 7.87 |
| | 6/30/2009 | | -- | 5.94 | -- | 7.58 |
| | 9/23/2009 | | -- | 6.06 | -- | 7.46 |
| | 12/29/2009 | | -- | 4.65 | -- | 8.87 |
| | 4/30/2015 | | -- | 4.57 | -- | 10.01 |

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-28 | 8/28/1990 | 14.92 | -- | 6.55 | -- | 8.37 |
| | 7/23/1991 | | -- | 4.92 | -- | 10.00 |
| | 8/22/1991 | | -- | 5.13 | -- | 9.79 |
| | 9/26/1991 | | -- | -- | -- | -- |
| | 10/25-26/1991 | | -- | -- | -- | -- |
| | 11/26/1991 | | -- | -- | -- | -- |
| | 12/20/1991 | | -- | 5.98 | -- | 8.94 |
| | 1/20/1992 | | -- | 3.95 | -- | -- |
| | 2/27-28/1992 | | -- | 3.74 | -- | 10.84 |
| | 3/23/1992 | | -- | 3.99 | -- | 10.93 |
| | 4/22/1992 | | -- | 3.07 | -- | 11.85 |
| | 5/27-28/1992 | | -- | 4.02 | -- | 10.56 |
| | 6/24/1992 | | -- | 3.21 | -- | 11.71 |
| | 7/27/1992 | | -- | 3.62 | -- | 11.30 |
| | 8/26/1992 | | -- | 2.16 | -- | 12.76 |
| | 9/29/1992 | | -- | 2.99 | -- | 11.93 |
| | 10/29/1992 | | -- | 3.24 | -- | 11.68 |
| | 11/25/1992 | | -- | 3.07 | -- | 11.85 |
| | 12/18/1992 | | -- | -- | -- | -- |
| | 1/28/1993 | | -- | -- | -- | -- |
| | 2/24/1993 | | -- | -- | -- | -- |
| | 3/30/1993 | | -- | -- | -- | -- |
| | 5/28/1993 | Well Not Present | | | | |
| | 8/9-10/1993 | 14.92 | -- | -- | -- | -- |
| | 9/28/1993 | | -- | -- | -- | -- |
| | 10/29/1993 | | -- | -- | -- | -- |
| | 11/30/1993 | | -- | -- | -- | -- |
| | 12/27/1993 | | -- | -- | -- | -- |
| | 3/31/1994 | | -- | -- | -- | -- |
| | 9/9/1994 | | -- | -- | -- | -- |
| | 9/29/1994 | | -- | -- | -- | -- |
| | 1/23/1994 | | -- | -- | -- | -- |
| | 1/4/1995 | | -- | -- | -- | -- |
| | 2/8/1995 | | -- | -- | -- | -- |
| | 3/16/1995 | | -- | -- | -- | -- |
| | 5/25/1995 | | -- | -- | -- | -- |
| | 9/30/1995 | | -- | -- | -- | -- |
| | 11/25-26/2008 | | -- | -- | -- | -- |
| | 3/6/2009 | | -- | -- | -- | -- |
| | 6/30/2009 | | -- | -- | -- | -- |
| | 9/23/2009 | | -- | -- | -- | -- |
| | 12/29/2009 | | -- | -- | -- | -- |
| | 3/24/2010 | | -- | -- | -- | -- |
| | 4/29/2015 | | -- | 3.75 | -- | 11.17 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-29 | 8/28/1990 | 13.73 | -- | 5.29 | -- | 8.44 |
| | 7/23/1991 | | -- | 3.95 | -- | 9.78 |
| | 8/22/1991 | | -- | 4.54 | -- | 9.19 |
| | 9/26/1991 | | -- | 5.68 | -- | 8.05 |
| | 10/25-26/1991 | | -- | 5.86 | -- | 7.87 |
| | 11/26/1991 | | -- | 5.98 | -- | 7.75 |
| | 12/20/1991 | | -- | 6.19 | -- | 7.54 |
| | 1/20/1992 | | -- | 4.10 | -- | 9.63 |
| | 2/27-28/1992 | | -- | 4.86 | -- | 8.87 |
| | 3/23/1992 | | -- | 5.12 | -- | 8.61 |
| | 4/22/1992 | | -- | 4.02 | -- | 9.71 |
| | 5/27-28/1992 | | -- | 5.85 | -- | 7.88 |
| | 6/24/1992 | | -- | 4.83 | -- | 8.90 |
| | 7/27/1992 | | -- | 5.39 | -- | 8.34 |
| | 8/26/1992 | | -- | 2.81 | -- | 10.92 |
| | 9/29/1992 | | -- | 4.90 | -- | 8.83 |
| | 10/29/1992 | | -- | 5.20 | -- | 8.53 |
| | 11/25/1992 | | -- | 3.74 | -- | 9.99 |
| | 12/18/1992 | | -- | 4.77 | -- | 8.96 |
| | 1/28/1993 | | -- | 4.65 | -- | 9.08 |
| | 2/24/1993 | | -- | 5.04 | -- | 8.69 |
| | 3/30/1993 | | -- | 4.05 | -- | 9.68 |
| | 5/28/1993 | | -- | 6.02 | -- | 7.71 |
| | 8/9-10/1993 | | -- | 6.76 | -- | 6.97 |
| | 9/28/1993 | | -- | 5.90 | -- | 7.83 |
| | 10/29/1993 | | -- | 6.04 | -- | 7.69 |
| | 11/30/1993 | | -- | 4.95 | -- | 8.78 |
| | 12/27/1993 | | -- | 5.05 | -- | 8.68 |
| | 3/31/1994 | | -- | 5.43 | -- | 8.30 |
| | 9/9/1994 | | -- | 3.98 | -- | 9.75 |
| | 9/29/1994 | | -- | 4.89 | -- | 8.84 |
| | 11/23/1994 | | -- | 4.75 | -- | 8.98 |
| | 1/4/1995 | | -- | 4.62 | -- | 9.11 |
| | 2/8/1995 | | -- | 5.17 | -- | 8.56 |
| | 3/16/1995 | | -- | 5.18 | -- | 8.55 |
| | 5/25/1995 | | -- | 6.23 | -- | 7.5 |
| | 9/30/1995 | | -- | 4.69 | -- | 9.04 |
| | 10/2/2003 | | -- | 5.56 | -- | 8.17 |
| | 11/25-26/2008 | | -- | 4.45 | -- | 8.23 |
| | 3/5/2009 | | -- | 4.6 | -- | 8.08 |
| | 6/30/2009 | | -- | 5.37 | -- | 7.31 |
| | 9/23/2009 | | -- | 5.41 | -- | 7.27 |
| | 12/29/2009 | | -- | 4.08 | -- | 8.6 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-30 | 8/28/1990 | 14.42 | -- | 6.25 | -- | 8.17 |
| | 7/23/1991 | | 3.42 | 3.45 | 0.03 | 10.99 |
| | 8/22/1991 | | 3.83 | 3.87 | 0.04 | 10.58 |
| | 9/26/1991 | | 5.55 | 5.58 | 0.03 | -- |
| | 10/25-26/1991 | | 6.13 | 6.15 | 0.02 | 8.29 |
| | 11/26/1991 | | -- | 6.48 | -- | 7.94 |
| | 12/20/1991 | | -- | 6.66 | -- | 7.76 |
| | 1/20/1992 | | -- | 5.25 | -- | 9.17 |
| | 2/27-28/1992 | | -- | 4.54 | -- | 9.88 |
| | 3/23/1992 | | -- | 4.80 | -- | 9.62 |
| | 4/22/1992 | | -- | 3.50 | -- | 10.92 |
| | 5/27-28/1992 | | -- | 5.56 | -- | 8.86 |
| | 6/24/1992 | | -- | 4.10 | -- | 10.32 |
| | 7/27/1992 | | -- | 4.73 | -- | 9.69 |
| | 8/26/1992 | | -- | 2.48 | -- | 11.94 |
| | 9/29/1992 | | -- | 4.21 | -- | 10.21 |
| | 10/29/1992 | | -- | 4.98 | -- | 9.44 |
| | 11/25/1992 | | -- | 3.87 | -- | 10.55 |
| | 12/18/1992 | | -- | 4.59 | -- | 9.83 |
| | 1/28/1993 | | -- | 4.11 | -- | 10.31 |
| | 2/24/1993 | | -- | 4.74 | -- | 9.68 |
| | 3/30/1993 | | -- | 3.40 | -- | 11.02 |
| | 5/28/1993 | | -- | 6.00 | -- | 8.42 |
| | 8/9-10/1993 | | -- | 7.09 | -- | 7.33 |
| | 9/28/1993 | | -- | 6.26 | -- | 8.16 |
| | 10/29/1993 | | -- | 6.51 | -- | 7.91 |
| | 11/30/1993 | | -- | 5.48 | -- | 8.94 |
| | 12/27/1993 | | -- | 5.75 | -- | 8.67 |
| | 3/31/1994 | | -- | 5.69 | -- | 8.73 |
| | 9/9/1994 | | -- | 4.9 | -- | 9.52 |
| | 9/29/1994 | | 8.44 | 9.03 | 0.59 | 5.86 |
| | 11/23/1994 | | -- | 4.85 | -- | 9.57 |
| | 1/4/1995 | | -- | 4.89 | -- | 9.53 |
| | 2/8/1995 | | -- | 5.53 | -- | 8.89 |
| | 3/16/1995 | | -- | 5.46 | -- | 8.96 |
| | 5/25/1995 | | -- | 6.51 | -- | 7.91 |
| | 9/30/1995 | | -- | 4.79 | -- | 9.63 |
| | 10/2/2003 | | -- | 5.95 | -- | 8.47 |
| | 11/25-26/2008 | | -- | 3.6 | -- | 9.8 |
| | 3/5/2009 | | -- | 5.33 | -- | 8.07 |
| | 6/30/2009 | | -- | 5.43 | -- | 7.97 |
| | 9/23/2009 | | -- | 5.37 | -- | 8.03 |
| | 12/29/2009 | | -- | 3.22 | -- | 10.18 |
| | 4/28/2015 | | -- | 4.34 | -- | 10.08 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-31 | 8/28/1990 | 14.55 | -- | 6.14 | -- | 8.41 |
| | 7/23/1991 | | -- | 4.63 | -- | 9.92 |
| | 8/22/1991 | | -- | 5.17 | -- | 9.38 |
| | 9/26/1991 | | -- | 6.55 | -- | 8.00 |
| | 10/25-26/1991 | | -- | 6.84 | -- | 7.71 |
| | 11/26/1991 | | -- | 7.17 | -- | 7.38 |
| | 12/20/1991 | | -- | 7.32 | -- | 7.23 |
| | 1/20/1992 | | -- | 5.09 | -- | 9.46 |
| | 3/23/1992 | | -- | 6.29 | -- | 8.26 |
| | 4/22/1992 | | -- | 4.89 | -- | 9.66 |
| | 5/27-28/1992 | | -- | 6.77 | -- | 7.78 |
| | 6/24/1992 | | -- | 5.55 | -- | 9.00 |
| | 7/27/1992 | | -- | 6.13 | -- | 8.42 |
| | 8/26/1992 | | -- | 3.58 | -- | 10.97 |
| | 9/29/1992 | | -- | 7.80 | -- | 6.75 |
| | 10/29/1992 | | -- | 6.18 | -- | 8.37 |
| | 11/25/1992 | | -- | 4.20 | -- | 10.35 |
| | 12/18/1992 | | -- | 5.72 | -- | 8.83 |
| | 1/28/1993 | | -- | 5.38 | -- | 9.17 |
| | 2/24/1993 | | -- | 5.91 | -- | 8.64 |
| | 3/30/1993 | | -- | 4.74 | -- | 9.81 |
| | 5/28/1993 | | -- | 6.81 | -- | 7.74 |
| | 8/9-10/1993 | | -- | 7.65 | -- | 6.90 |
| | 9/28/1993 | | -- | 7.02 | -- | 7.53 |
| | 10/29/1993 | | -- | 7.12 | -- | 7.43 |
| | 11/30/1993 | | -- | 5.87 | -- | 8.68 |
| | 12/27/1993 | | -- | 6.2 | -- | 8.35 |
| | 3/31/1994 | | -- | 6.37 | -- | 8.18 |
| | 9/9/1994 | | -- | 4.94 | -- | 9.61 |
| | 9/29/1994 | | -- | 5.66 | -- | 8.89 |
| | 11/23/1994 | | -- | 5.34 | -- | 9.21 |
| | 1/4/1995 | | -- | 5.34 | -- | 9.21 |
| | 2/8/1995 | | -- | 6.16 | -- | 8.39 |
| | 3/16/1995 | | -- | 6.01 | -- | 8.54 |
| | 5/25/1995 | | -- | 7.22 | -- | 7.33 |
| | 9/30/1995 | | -- | 5.28 | -- | 9.27 |
| | 10/2/2003 | | -- | 6.6 | -- | 7.95 |
| | 11/25-26/2008 | | -- | 2.3 | -- | 8 |
| | 3/5/2009 | | -- | 2.4 | -- | 7.9 |
| | 6/30/2009 | | -- | 2.33 | -- | 7.97 |
| | 9/23/2009 | | -- | 2.8 | -- | 7.5 |
| | 12/29/2009 | | -- | 1.78 | -- | 8.52 |
| | 5/1/2015 | | -- | 2.10 | -- | 12.45 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-32 | 8/28/1990 | 15.47 | 8.62 | 10.55 | 1.93 | 6.46 |
| | 7/23/1991 | | 7.21 | 9.00 | 1.79 | 7.90 |
| | 8/22/1991 | | 7.32 | 9.25 | 1.93 | 7.76 |
| | 9/26/1991 | | 9.29 | 10.33 | 1.04 | 5.97 |
| | 10/25-26/1991 | | 9.95 | 11.80 | 1.85 | 5.15 |
| | 11/26/1991 | | 10.81 | 13.16 | 2.35 | 4.19 |
| | 12/20/1991 | | 11.30 | 13.13 | 1.83 | 3.80 |
| | 1/20/1992 | | 8.93 | 9.83 | 0.90 | 6.36 |
| | 3/23/1992 | | 9.53 | 10.25 | 0.72 | 5.80 |
| | 4/22/1992 | | 7.63 | 8.56 | 0.93 | 7.65 |
| | 5/27-28/1992 | | 10.12 | 10.81 | 0.69 | 5.21 |
| | 6/24/1992 | | 7.93 | 9.19 | 1.26 | 7.29 |
| | 7/27/1992 | | 8.78 | 9.37 | 0.59 | 6.57 |
| | 8/26/1992 | | 6.74 | 7.35 | 0.61 | 8.61 |
| | 9/29/1992 | | 7.89 | 8.90 | 1.01 | 7.38 |
| | 10/29/1992 | | 8.54 | 9.01 | 0.47 | 6.84 |
| | 11/25/1992 | | 7.24 | 8.46 | 1.22 | 7.99 |
| | 12/18/1992 | | 8.16 | 8.69 | 0.53 | 7.20 |
| | 1/28/1993 | | 7.46 | 8.55 | 1.09 | 7.79 |
| | 2/24/1993 | | 8.20 | 8.94 | 0.74 | 7.12 |
| | 3/30/1993 | | 7.40 | 7.82 | 0.42 | 7.99 |
| | 5/28/1993 | | 10.14 | 11.92 | 1.78 | 4.97 |
| | 8/9-10/1993 | | 10.85 | 12.87 | 2.02 | 4.22 |
| | 9/28/1993 | | 9.83 | 10.76 | 0.93 | 5.45 |
| | 10/29/1993 | | 10.35 | 11.85 | 1.5 | 4.82 |
| | 11/30/1993 | | 8.66 | 9.46 | 0.8 | 6.65 |
| | 12/27/1993 | | 10.21 | 11.57 | 1.36 | 4.99 |
| | 3/31/1994 | | 9.85 | 10.4 | 0.55 | 5.51 |
| | 9/9/1994 | | 7.67 | 8.04 | 0.37 | 7.73 |
| | 9/29/1994 | | 7.79 | 8.18 | 0.39 | 7.6 |
| | 11/23/1994 | | 7.59 | 18.2 | 10.61 | 5.76 |
| | 1/4/1995 | | 7.69 | 7.98 | 0.29 | 7.72 |
| | 2/8/1995 | | 8.55 | 8.65 | 0.1 | 6.9 |
| | 3/16/1995 | | 8.48 | 8.96 | 0.48 | 6.89 |
| | 5/25/1995 | | 10.24 | 10.4 | 0.16 | 5.2 |
| | 9/30/1995 | | 7.83 | 8.82 | 0.99 | 7.44 |
| | 10/2/2003 | | 9.73 | 9.83 | 0.1 | 5.72 |
| | 11/25-26/2008 | | -- | 9.5 | -- | 4.89 |
| | 3/6/2009 | | -- | 10.79 | -- | 3.6 |
| | 6/30/2009 | | -- | 9.23 | -- | 5.16 |
| | 9/23/2009 | | -- | 9.67 | -- | 4.72 |
| | 12/29/2009 | | -- | 9.05 | -- | 5.34 |
| | 12/13/2010 | | 11.59 | 11.6 | 0.01 | 2.8 |
| | 4/30/2015 | | -- | 7.76 | -- | 7.71 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-33 | 8/28/1990 | 14.18 | -- | 5.97 | -- | 8.21 |
| | 7/23/1991 | | -- | 4.68 | -- | 9.50 |
| | 8/22/1991 | | -- | 5.16 | -- | 9.02 |
| | 9/26/1991 | | -- | 6.02 | -- | 8.16 |
| | 10/25-26/1991 | | -- | 6.38 | -- | 7.80 |
| | 11/26/1991 | | -- | 6.65 | -- | 7.53 |
| | 12/20/1991 | | -- | 6.59 | -- | 7.59 |
| | 1/20/1992 | | -- | 5.16 | -- | 9.02 |
| | 3/23/1992 | | -- | 5.83 | -- | 8.35 |
| | 4/22/1992 | | -- | 5.05 | -- | 9.13 |
| | 5/27-28/1992 | | -- | 6.27 | -- | 7.91 |
| | 6/24/1992 | | -- | 5.35 | -- | 8.83 |
| | 7/27/1992 | | -- | 5.70 | -- | 8.48 |
| | 8/26/1992 | | -- | 4.25 | -- | 9.93 |
| | 9/29/1992 | | -- | 5.45 | -- | 8.73 |
| | 11/25/1992 | | -- | 14.94 | -- | -0.76 |
| | 12/18/1992 | | -- | 5.53 | -- | 8.65 |
| | 1/28/1993 | | -- | 5.34 | -- | 8.84 |
| | 2/24/1993 | | -- | 5.63 | -- | 8.55 |
| | 3/30/1993 | | -- | 4.91 | -- | 9.27 |
| | 5/28/1993 | | -- | 6.33 | -- | 7.85 |
| | 8/9-10/1993 | | -- | 7.03 | -- | 7.15 |
| | 9/28/1993 | | -- | 6.27 | -- | 7.91 |
| | 10/29/1993 | | -- | 6.46 | -- | 7.72 |
| | 11/30/1993 | | -- | 5.75 | -- | 8.43 |
| | 12/27/1993 | | -- | 5.83 | -- | 8.35 |
| | 3/31/1994 | | -- | 5.79 | -- | 8.39 |
| | 9/9/1994 | | -- | 4.93 | -- | 9.25 |
| | 9/29/1994 | | 5.33 | 5.34 | 0.01 | 8.84 |
| | 11/23/1994 | | -- | 5.2 | -- | 8.98 |
| | 1/4/1995 | | -- | 5.21 | -- | 8.97 |
| | 2/8/1995 | | -- | 5.64 | -- | 8.54 |
| | 3/16/1995 | | -- | 5.64 | -- | 8.54 |
| | 5/25/1995 | | -- | 6.45 | -- | 7.73 |
| | 9/30/1995 | | -- | 5.11 | -- | 9.07 |
| | 10/2/2003 | | -- | 5.91 | -- | 8.27 |
| | 11/25-26/2008 | | -- | 5.32 | -- | 7.76 |
| | 3/5/2009 | | -- | 5.4 | -- | 7.68 |
| | 6/30/2009 | | -- | 5.31 | -- | 7.77 |
| | 9/23/2009 | | -- | 5.6 | -- | 7.48 |
| | 12/29/2009 | | -- | 4.58 | -- | 8.5 |
| | 4/30/2015 | | -- | 4.01 | -- | 10.17 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-34 | 8/28/1990 | 14.30 | 6.58 | 7.32 | 0.74 | 6.98 |
| | 7/23/1991 | | 5.39 | 5.99 | 0.60 | 8.82 |
| | 8/22/1991 | | 5.41 | 6.16 | 0.75 | 8.78 |
| | 9/26/1991 | | 6.17 | 7.12 | 0.95 | 7.99 |
| | 10/25-26/1991 | | 7.46 | 8.49 | 1.03 | 6.69 |
| | 11/26/1991 | | 8.84 | 10.03 | 1.19 | 5.28 |
| | 12/20/1991 | | 9.09 | 10.37 | 1.28 | 5.02 |
| | 1/20/1992 | | 6.35 | 6.98 | 0.63 | 7.86 |
| | 3/23/1992 | | 6.66 | 7.46 | 0.80 | 7.52 |
| | 4/22/1992 | | 6.50 | 6.80 | 0.30 | 7.76 |
| | 5/27-28/1992 | | 6.66 | 7.49 | 0.83 | 7.52 |
| | 6/24/1992 | | 5.75 | 6.24 | 0.49 | 8.48 |
| | 7/27/1992 | | 6.04 | 6.63 | 0.59 | 8.17 |
| | 8/26/1992 | | 4.96 | 5.95 | 0.99 | 9.19 |
| | 9/29/1992 | | 5.78 | 6.24 | 0.46 | 8.45 |
| | 11/25/1992 | | 6.21 | 6.48 | 0.27 | 8.05 |
| | 12/18/1992 | | 6.20 | 6.71 | 0.51 | 8.02 |
| | 1/28/1993 | | 6.06 | 6.36 | 0.30 | 8.20 |
| | 2/24/1993 | | 5.78 | 6.10 | 0.32 | 8.47 |
| | 3/30/1993 | | 5.83 | 6.12 | 0.29 | 8.43 |
| | 5/28/1993 | | 8.05 | 8.84 | 0.79 | 6.13 |
| | 8/9-10/1993 | | 9.74 | 10.85 | 1.11 | 4.39 |
| | 9/28/1993 | | 6.76 | 7.47 | 0.71 | 7.44 |
| | 10/29/1993 | | 7.42 | 7.93 | 0.51 | 6.81 |
| | 11/30/1993 | | 5.87 | 6.23 | 0.36 | 8.38 |
| | 12/27/1993 | | 6.48 | 7.1 | 0.62 | 7.73 |
| | 3/31/1994 | | 6.61 | 7.19 | 0.58 | 7.61 |
| | 9/9/1994 | | 5.75 | 6.28 | 0.53 | 8.47 |
| | 9/29/1994 | | 5.85 | 6.22 | 0.37 | 8.40 |
| | 11/23/1994 | | 5.83 | 6.17 | 0.34 | 8.42 |
| | 1/4/1995 | | 5.87 | 6.18 | 0.31 | 8.38 |
| | 2/8/1995 | | 6.33 | 6.66 | 0.33 | 7.92 |
| | 3/16/1995 | | 6.27 | 6.68 | 0.41 | 7.97 |
| | 5/25/1995 | | 8.21 | 8.75 | 0.54 | 6.01 |
| | 9/30/1995 | | 5.48 | 5.89 | 0.41 | 8.76 |
| | 9/30/1995 | | 5.48 | 5.89 | 0.41 | 8.76 |
| | 10/2/2003 | | -- | 7.53 | -- | 6.77 |
| | 11/25-26/2008 | | -- | 7.82 | -- | 6.48 |
| | 3/6/2009 | | -- | 9.13 | -- | 5.17 |
| | 6/30/2009 | | -- | 8.15 | -- | 6.15 |
| | 9/23/2009 | | -- | 8.28 | -- | 6.02 |
| | 12/29/2009 | | -- | 7.65 | -- | 6.65 |
| | 4/30/2015 | | -- | 6.2 | -- | 8.10 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-35 | 8/28/1990 | 15.03 | -- | 7.38 | -- | 7.65 |
| | 7/23/1991 | | -- | 5.45 | -- | 9.58 |
| | 8/22/1991 | | -- | 5.69 | -- | 9.34 |
| | 9/26/1991 | | -- | 6.65 | -- | 8.38 |
| | 10/25-26/1991 | | -- | 7.31 | -- | 7.72 |
| | 11/26/1991 | | -- | 7.85 | -- | 7.18 |
| | 12/20/1991 | | -- | 8.32 | -- | 6.71 |
| | 1/20/1992 | | -- | 7.36 | -- | 7.67 |
| | 3/23/1992 | | -- | 7.77 | -- | 7.26 |
| | 4/22/1992 | | -- | 7.50 | -- | 7.53 |
| | 5/27-28/1992 | | -- | 8.33 | -- | 6.70 |
| | 6/24/1992 | | -- | 6.82 | -- | 8.21 |
| | 7/27/1992 | | -- | 7.25 | -- | 7.78 |
| | 8/26/1992 | | -- | 5.46 | -- | 9.57 |
| | 9/29/1992 | | -- | 6.78 | -- | 8.25 |
| | 11/25/1992 | | -- | 7.38 | -- | 7.65 |
| | 12/18/1992 | | -- | 6.05 | -- | 8.98 |
| | 1/28/1993 | | -- | -- | -- | -- |
| | 2/24/1993 | | -- | -- | -- | -- |
| | 3/30/1993 | -- | -- | -- | -- | -- |
| | 5/28/1993 | -- | -- | -- | -- | -- |
| | 8/9-10/1993 | -- | -- | -- | -- | -- |
| | 9/28/1993 | -- | -- | -- | -- | -- |
| | 10/29/1993 | -- | -- | -- | -- | -- |
| | 11/30/1993 | -- | -- | -- | -- | -- |
| | 12/27/1993 | -- | -- | -- | -- | -- |
| | 3/31/1994 | -- | -- | -- | -- | -- |
| | 9/9/1994 | -- | -- | -- | -- | -- |
| | 9/29/1994 | -- | -- | -- | -- | -- |
| | 11/23/1994 | -- | -- | -- | -- | -- |
| | 1/4/1995 | Well Not Present | | | | |
| | 2/8/1995 | Well Not Present | | | | |
| | 3/16/1995 | Well Not Present | | | | |
| | 5/25/1995 | Well Not Present | | | | |
| | 9/30/1995 | 15.03 | -- | -- | -- | -- |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-36 | 8/28/1990 | 14.65 | 9.91 | 9.91 | <0.01 | 4.74 |
| | 7/23/1991 | | 6.09 | 7.71 | 1.62 | 8.33 |
| | 8/22/1991 | | 6.80 | 7.91 | 1.11 | 7.69 |
| | 9/26/1991 | | 7.76 | 8.88 | 1.12 | 6.73 |
| | 10/25-26/1991 | | 8.16 | 9.24 | 1.08 | 6.34 |
| | 11/26/1991 | | 8.50 | 9.58 | 1.08 | 6.00 |
| | 12/20/1991 | | 8.34 | 9.45 | 1.11 | 6.15 |
| | 1/20/1992 | | 6.80 | 7.79 | 0.99 | 7.71 |
| | 3/23/1992 | | 6.71 | 7.55 | 0.84 | 7.82 |
| | 4/22/1992 | | 5.41 | 6.11 | 0.70 | 9.14 |
| | 5/27-28/1992 | | 7.17 | 7.94 | 0.77 | 7.37 |
| | 6/24/1992 | | 5.93 | 6.62 | 0.69 | 8.62 |
| | 7/27/1992 | | 6.56 | 7.29 | 0.73 | 7.99 |
| | 8/26/1992 | | 4.74 | 4.03 | 0.71 | 10.01 |
| | 9/29/1992 | | 6.20 | 6.93 | 0.73 | 8.35 |
| | 11/25/1992 | | 4.89 | 5.46 | 0.57 | 9.68 |
| | 12/18/1992 | | 6.02 | 6.51 | 0.49 | 8.56 |
| | 1/28/1993 | | 5.48 | 5.94 | 0.46 | 9.11 |
| | 2/24/1993 | | 4.80 | 6.00 | 1.20 | 9.68 |
| | 3/30/1993 | | 4.74 | 5.22 | 0.48 | 9.84 |
| | 5/28/1993 | | 7.05 | 7.53 | 0.48 | 7.53 |
| | 8/9-10/1993 | | 8.39 | 9.17 | 0.78 | 6.15 |
| | 9/28/1993 | | 7.48 | 8.00 | 0.52 | 7.10 |
| | 10/29/1993 | | 6.84 | 7.33 | 0.49 | 7.74 |
| | 11/30/1993 | | 5.94 | 6.19 | 0.25 | 8.68 |
| | 12/27/1993 | | 6.29 | 6.62 | 0.33 | 8.31 |
| | 3/31/1994 | | 6.16 | 6.39 | 0.23 | 8.46 |
| | 9/9/1994 | | 5.1 | 5.27 | 0.17 | 9.53 |
| | 9/29/1994 | | 5.77 | 6.36 | 0.59 | 8.79 |
| | 11/23/1994 | | 5.35 | 5.47 | 0.12 | 9.28 |
| | 1/4/1995 | | 4.93 | 5.18 | 0.25 | 9.68 |
| | 2/8/1995 | | 6.04 | 6.28 | 0.24 | 8.57 |
| | 3/16/1995 | | 5.81 | 6.29 | 0.48 | 8.77 |
| | 5/25/1995 | | -- | DRY | -- | -- |
| | 9/30/1995 | | 5.39 | 5.51 | 0.12 | 9.24 |
| | 11/25-26/2008 | | -- | 4.35 | -- | 10.30 |
| | 3/6/2009 | | -- | 5.4 | -- | 9.25 |
| | 6/30/2009 | | -- | 5.81 | -- | 8.84 |
| | 9/23/2009 | | -- | 6 | -- | 8.65 |
| | 12/29/2009 | | -- | 4.31 | -- | 10.34 |
| | 4/28/2015 | | -- | 4.48 | -- | 10.17 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-37 | 8/28/1990 | 14.83 | -- | 10.96 | -- | 3.87 |
| | 7/23/1991 | | -- | 10.16 | -- | 4.67 |
| | 8/22/1991 | | Well Not Present | | | |
| | 9/26/1991 | | Well Not Present | | | |
| | 11/26/1991 | | Well Not Present | | | |
| | 12/20/1991 | | Well Not Present | | | |
| | 1/20/1992 | | Well Not Present | | | |
| | 3/23/1992 | | Well Not Present | | | |
| | 4/22/1992 | | Well Not Present | | | |
| | 5/27-28/1992 | | Well Not Present | | | |
| | 6/24/1992 | | Well Not Present | | | |
| | 7/27/1992 | | Well Not Present | | | |
| | 8/26/1992 | | Well Not Present | | | |
| | 9/29/1992 | | Well Not Present | | | |
| | 11/25/1992 | | Well Not Present | | | |
| | 12/18/1992 | | Well Not Present | | | |
| | 1/28/1993 | | Well Not Present | | | |
| | 1/28/1993 | | Well Not Present | | | |
| | 3/30/1993 | | Well Not Present | | | |
| | 5/28/1993 | | Well Not Present | | | |
| | 8/9-10/1993 | | Well Not Present | | | |
| | 9/28/1993 | | Well Not Present | | | |
| | 9/28/1993 | | Well Not Present | | | |
| | 11/30/1993 | | Well Not Present | | | |
| | 12/27/1993 | | Well Not Present | | | |
| | 3/31/1994 | | Well Not Present | | | |
| | 9/9/1994 | | Well Not Present | | | |
| | 9/29/1994 | | Well Not Present | | | |
| | 11/23/1994 | | Well Not Present | | | |
| | 1/4/1995 | | Well Not Present | | | |
| | 2/8/1995 | | Well Not Present | | | |
| | 3/16/1995 | | Well Not Present | | | |
| | 3/16/1995 | | Well Not Present | | | |
| | 9/30/1995 | | Well Not Present | | | |
| | 11/25-26/2008 | 14.33 | 10.32 | 11.20 | 0.88 | 3.83 |
| | 3/5/2009 | | 12.06 | 12.09 | 0.03 | 2.26 |
| | 6/30/2009 | | 11.43 | 11.57 | 0.14 | 2.88 |
| | 9/23/2009 | | 11.01 | 11.02 | 0.01 | 3.32 |
| | 12/29/2009 | | 10.89 | 10.95 | 0.06 | 3.43 |
| | 3/24/2010 | | 11.42 | 11.51 | 0.09 | 2.90 |
| | 5/01/2015 | | -- | 10.33 | -- | 4.00 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-38 | 8/28/1990 | 12.03 | 5.92 | 17.60 | 11.68 | 4.40 |
| | 7/23/1991 | | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 1/28/1993 | | 7.99 | 8.02 | 0.03 | 4.03 |
| | 3/30/1993 | | Recovery Well | | | |
| | 5/28/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/9/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 9/30/1995 | | Recovery Well | | | |
| | 5/02/2015 | | 4.02 | 4.98 | 0.96 | 7.87 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-39 | 8/28/1990 | 12.41 | 6.70 | 11.65 | 4.95 | 4.82 |
| | 7/23/1991 | | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 3/30/1993 | | Recovery Well | | | |
| | 5/28/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/9/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 9/30/1995 | | Recovery Well | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-40 | 8/28/1990 | 11.81 | 5.74 | 6.43 | 0.69 | 5.97 |
| | 7/23/1991 | | 4.33 | 4.80 | | 7.63 |
| | 8/22/1991 | | 4.10 | 4.54 | 0.44 | 7.64 |
| | 9/26/1991 | | 4.72 | 5.28 | 0.56 | 6.99 |
| | 10/25-26/1991 | | 4.74 | 5.28 | 0.54 | 6.98 |
| | 11/26/1991 | | 4.92 | 5.40 | 0.48 | 6.81 |
| | 12/20/1991 | | 5.10 | 5.57 | 0.47 | 6.63 |
| | 1/20/1992 | | 4.03 | 4.41 | 0.38 | 7.72 |
| | 3/23/1992 | | 4.49 | 4.98 | 0.49 | 7.24 |
| | 4/22/1992 | | 3.59 | 3.91 | 0.32 | 8.17 |
| | 5/27-28/1992 | | 4.80 | 5.27 | 0.47 | 6.93 |
| | 6/24/1992 | | 4.00 | 4.40 | 0.40 | 7.74 |
| | 7/27/1992 | | 4.41 | 4.78 | 0.37 | 7.34 |
| | 8/26/1992 | | 2.15 | 2.58 | 0.43 | 9.59 |
| | 9/29/1992 | | 4.01 | 4.30 | 0.29 | 7.75 |
| | 11/25/1992 | | 2.89 | 2.91 | 0.02 | 8.92 |
| | 12/18/1992 | | 3.92 | 4.07 | 0.15 | 7.86 |
| | 1/28/1993 | | 3.19 | 4.10 | 0.91 | 8.47 |
| | 2/24/1993 | | 4.17 | 4.43 | 0.26 | 7.60 |
| | 3/30/1993 | | 3.30 | 3.42 | 0.12 | 8.49 |
| | 5/28/1993 | | 5.04 | 5.38 | 0.34 | 6.71 |
| | 8/9-10/1993 | | 5.35 | 5.58 | 0.23 | 6.42 |
| | 9/28/1993 | | 4.70 | 4.92 | 0.22 | 7.07 |
| | 10/29/1993 | | 4.75 | 5.00 | 0.25 | 7.02 |
| | 11/30/1993 | | 4.00 | 4.11 | 0.11 | 7.79 |
| | 12/27/1993 | | 4.20 | 4.37 | 0.17 | 7.58 |
| | 3/31/1994 | | 4.58 | 4.64 | 0.06 | 7.22 |
| | 9/9/1994 | | -- | 3.00 | -- | 8.81 |
| | 9/29/1994 | | 6.32 | 3.69 | 2.63 | 5.94 |
| | 11/23/1994 | | -- | 3.66 | -- | 8.15 |
| | 1/4/1995 | | -- | 3.83 | -- | 7.98 |
| | 2/8/1995 | | -- | 4.35 | -- | 7.46 |
| | 3/16/1995 | | -- | 4.35 | -- | 7.46 |
| | 5/25/1995 | | -- | 5.03 | -- | 6.78 |
| | 9/30/1995 | | DRY | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-41 | 8/28/1990 | 16.14 | -- | 9.49 | -- | 6.65 |
| | 7/23/1991 | | -- | 4.68 | -- | 7.73 |
| | 8/22/1991 | | -- | 8.75 | -- | 7.39 |
| | 9/26/1991 | | -- | 9.38 | -- | 6.76 |
| | 10/25-26/1991 | | -- | 9.93 | -- | 6.21 |
| | 11/26/1991 | | -- | 9.93 | -- | 6.21 |
| | 12/20/1991 | | -- | 10.25 | -- | 5.89 |
| | 1/20/1992 | | -- | 5.89 | -- | 10.25 |
| | 3/23/1992 | | -- | 9.08 | -- | 7.06 |
| | 4/22/1992 | | -- | 8.38 | -- | 7.76 |
| | 5/27-28/1992 | | -- | 9.35 | -- | 6.79 |
| | 6/24/1992 | | -- | 8.72 | -- | 7.42 |
| | 7/27/1992 | | -- | 9.2 | -- | 6.94 |
| | 8/26/1992 | | -- | 7.74 | -- | 8.4 |
| | 9/29/1992 | | -- | 8.88 | -- | 7.26 |
| | 11/25/1992 | | -- | 8.52 | -- | 7.62 |
| | 12/18/1992 | | -- | 9.06 | -- | 7.08 |
| | 1/28/1993 | | -- | 8.82 | -- | 7.32 |
| | 2/24/1993 | | -- | 9.16 | -- | 6.98 |
| | 3/30/1993 | | -- | 8.45 | -- | 7.69 |
| | 5/28/1993 | | -- | 1.1 | -- | 15.04 |
| | 8/9-10/1993 | | -- | 10.51 | -- | 5.63 |
| | 9/28/1993 | | -- | 9.85 | -- | 6.29 |
| | 10/29/1993 | | -- | 9.85 | -- | 6.29 |
| | 11/30/1993 | | -- | 9.3 | -- | 6.84 |
| | 12/27/1993 | | -- | 9.37 | -- | 6.77 |
| | 3/31/1994 | | -- | 9.51 | -- | 6.63 |
| | 9/9/1994 | | -- | 8.87 | -- | 7.27 |
| | 9/29/1994 | | -- | 9.39 | -- | 6.75 |
| | 11/23/1994 | | -- | 9.07 | -- | 7.07 |
| | 1/4/1995 | | -- | 8.85 | -- | 7.29 |
| | 2/8/1995 | | -- | 9.53 | -- | 6.61 |
| | 3/16/1995 | | -- | 9.29 | -- | 6.85 |
| | 5/25/1995 | | -- | 8.61 | -- | 7.53 |
| | 9/30/1995 | | -- | 9.06 | -- | 7.08 |
| | 9/23/2009 | | -- | 9.28 | -- | 5.87 |
| | 12/29/2009 | | -- | 8.11 | -- | 7.04 |
| | 4/28/2015 | | -- | 8.14 | -- | 8.00 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-42 | 8/28/1990 | 11.29 | -- | 6.18 | -- | 5.11 |
| | 7/23/1991 | | -- | 5.71 | -- | 6.10 |
| | 8/22/1991 | | -- | 5.42 | -- | 5.87 |
| | 9/26/1991 | | -- | 6.28 | -- | 5.01 |
| | 10/25-26/1991 | | -- | 6.65 | -- | 4.64 |
| | 11/26/1991 | | -- | 7.43 | -- | 3.86 |
| | 12/20/1991 | | -- | 7.75 | -- | 3.54 |
| | 1/20/1992 | | -- | 6.29 | -- | 5 |
| | 3/23/1992 | | -- | 6.9 | -- | 4.39 |
| | 4/22/1992 | | -- | 6.17 | -- | 5.12 |
| | 5/27-28/1992 | | -- | 6.96 | -- | 4.33 |
| | 6/24/1992 | | -- | 5.99 | -- | 5.3 |
| | 7/27/1992 | | -- | 6.45 | -- | 4.84 |
| | 8/26/1992 | | -- | 5.1 | -- | 6.19 |
| | 9/29/1992 | | -- | 5.87 | -- | 5.42 |
| | 11/25/1992 | | -- | 5.82 | -- | 5.47 |
| | 12/18/1992 | | -- | 6.31 | -- | 4.98 |
| | 1/28/1993 | | -- | 5.46 | -- | 5.83 |
| | 2/24/1993 | | -- | 6.24 | -- | 5.05 |
| | 3/30/1993 | | -- | 5.13 | -- | 6.16 |
| | 5/28/1993 | | -- | 7.28 | -- | 4.01 |
| | 8/9-10/1993 | | -- | 7.54 | -- | 3.75 |
| | 9/28/1993 | | -- | 7.07 | -- | 4.22 |
| | 10/29/1993 | | -- | 6.7 | -- | 4.59 |
| | 11/30/1993 | | -- | 6.45 | -- | 4.84 |
| | 12/27/1993 | | -- | 6.99 | -- | 4.3 |
| | 3/31/1994 | | -- | 6.75 | -- | 4.54 |
| | 9/9/1994 | | -- | 5.55 | -- | 5.74 |
| | 9/29/1994 | | -- | 6.08 | -- | 5.21 |
| | 11/23/1994 | | -- | 5.75 | -- | 5.54 |
| | 1/4/1995 | | -- | 5.66 | -- | 5.63 |
| | 2/8/1995 | | -- | 6.54 | -- | 4.75 |
| | 3/16/1995 | | -- | 6.16 | -- | 5.13 |
| | 5/25/1995 | | -- | 7.12 | -- | 4.17 |
| | 9/30/1995 | | -- | 5.58 | -- | 5.71 |
| | 10/2/2003 | | -- | 6.5 | -- | 4.79 |
| | 11/25-26/2008 | | -- | 1.5 | -- | 7.93 |
| | 3/5/2009 | | -- | 1.49 | -- | 7.94 |
| | 6/30/2009 | | -- | 1.5 | -- | 7.93 |
| | 9/23/2009 | | -- | 1.94 | -- | 7.49 |
| | 12/29/2009 | | -- | 0.95 | -- | 8.48 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-43 | 8/28/1990 | 10.68 | -- | 3.35 | -- | 7.33 |
| | 7/23/1991 | | -- | 6.48 | -- | 9.66 |
| | 8/22/1991 | | -- | 1.22 | -- | 9.46 |
| | 9/26/1991 | | -- | 2.60 | -- | 8.08 |
| | 10/25-26/1991 | | -- | 2.92 | -- | 7.76 |
| | 11/26/1991 | | -- | 3.31 | -- | 7.37 |
| | 12/20/1991 | | -- | 3.47 | -- | 7.21 |
| | 1/20/1992 | | -- | 2.28 | -- | 8.4 |
| | 3/23/1992 | | -- | 1.6 | -- | 9.08 |
| | 4/22/1992 | | -- | 1.11 | -- | 9.57 |
| | 5/27-28/1992 | | -- | 2.42 | -- | 8.26 |
| | 6/24/1992 | | -- | 1.06 | -- | 9.62 |
| | 7/27/1992 | | -- | 1.46 | -- | 9.22 |
| | 8/26/1992 | | -- | 0.35 | -- | 10.33 |
| | 9/29/1992 | | -- | 1 | -- | 9.68 |
| | 11/25/1992 | | -- | 1.15 | -- | 9.53 |
| | 12/18/1992 | | -- | 1.51 | -- | 9.17 |
| | 1/28/1993 | | -- | 1.02 | -- | 9.66 |
| | 2/24/1993 | | -- | 1.59 | -- | 9.09 |
| | 3/30/1993 | | -- | 0.74 | -- | 9.94 |
| | 5/28/1993 | | -- | 2.8 | -- | 7.88 |
| | 8/9-10/1993 | | -- | 3.89 | -- | 6.79 |
| | 9/28/1993 | | -- | 3.21 | -- | 7.47 |
| | 10/29/1993 | | -- | 3.44 | -- | 7.24 |
| | 11/30/1993 | | -- | 2.39 | -- | 8.29 |
| | 12/27/1993 | | -- | 2.45 | -- | 8.23 |
| | 3/31/1994 | | -- | 2.3 | -- | 8.38 |
| | 9/9/1994 | | -- | 1.78 | -- | 8.9 |
| | 9/29/1994 | | -- | 2.09 | -- | 8.59 |
| | 11/23/1994 | | -- | 1.45 | -- | 9.23 |
| | 1/4/1995 | | -- | 1.59 | -- | 9.09 |
| | 2/8/1995 | | -- | 2.16 | -- | 8.52 |
| | 3/16/1995 | | -- | 2.11 | -- | 8.57 |
| | 5/25/1995 | | -- | 3.07 | -- | 7.61 |
| | 9/30/1995 | | -- | 1.48 | -- | 9.2 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-44 | 8/28/1990 | 14.30 | -- | 10.22 | -- | 4.08 |
| | 7/23/1991 | | -- | 7.29 | -- | 7.01 |
| | 8/22/1991 | | -- | 7.89 | -- | 6.41 |
| | 9/26/1991 | | -- | 9.10 | -- | 5.20 |
| | 10/25-26/1991 | | -- | 9.42 | -- | 4.88 |
| | 11/26/1991 | | -- | 9.93 | -- | 4.37 |
| | 12/20/1991 | | -- | 10.45 | -- | 3.85 |
| | 1/20/1992 | | -- | 9.09 | -- | 5.21 |
| | 3/23/1992 | | -- | 9.24 | -- | 5.06 |
| | 4/22/1992 | | -- | 6.82 | -- | 7.48 |
| | 5/27-28/1992 | | -- | 9.69 | -- | 4.61 |
| | 6/24/1992 | | -- | 7.89 | -- | 6.41 |
| | 7/27/1992 | | -- | 8.8 | -- | 5.5 |
| | 8/26/1992 | | -- | 3.55 | -- | 10.75 |
| | 9/29/1992 | | -- | 7.73 | -- | 6.57 |
| | 11/25/1992 | | -- | 6.58 | -- | 7.72 |
| | 12/18/1992 | | -- | 8.48 | -- | 5.82 |
| | 1/28/1993 | | -- | 7.07 | -- | 7.23 |
| | 2/24/1993 | | -- | 8.33 | -- | 5.97 |
| | 3/30/1993 | | -- | 6.57 | -- | 7.73 |
| | 5/28/1993 | | -- | 9.68 | -- | 4.62 |
| | 8/9-10/1993 | | -- | 10.86 | -- | 3.44 |
| | 9/28/1993 | | -- | 10.21 | -- | 4.09 |
| | 10/29/1993 | | -- | 9.98 | -- | 4.32 |
| | 11/30/1993 | | -- | 9.17 | -- | 5.13 |
| | 12/27/1993 | | -- | 10.12 | -- | 4.18 |
| | 3/31/1994 | | -- | 9.67 | -- | 4.63 |
| | 9/9/1994 | | -- | 8.66 | -- | 5.64 |
| | 9/29/1994 | | -- | 9.12 | -- | 5.18 |
| | 11/23/1994 | | -- | 8.55 | -- | 5.75 |
| | 1/4/1995 | | -- | 8.49 | -- | 5.81 |
| | 2/8/1995 | | -- | 9.87 | -- | 4.43 |
| | 3/16/1995 | | -- | 8.95 | -- | 5.35 |
| | 5/25/1995 | | -- | 10.01 | -- | 4.29 |
| | 9/30/1995 | | -- | 8.42 | -- | 5.88 |
| | 11/25-26/2008 | | -- | 9.1 | -- | 4.31 |
| | 3/5/2009 | | -- | 10.85 | -- | 2.56 |
| | 6/30/2009 | | -- | 10.2 | -- | 3.21 |
| | 9/23/2009 | | -- | 10.22 | -- | 3.19 |
| | 12/29/2009 | | -- | 8.51 | -- | 4.90 |
| | 4/30/2015 | | -- | 7.74 | -- | 6.56 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-45 | 7/23/1991 | 16.07 | 5.49 | -- | -- | -- |
| | 8/22/1991 | | 11.66 | 11.73 | 0.07 | 4.40 |
| | 9/26/1991 | | -- | 11.48 | -- | 4.59 |
| | 10/25-26/1991 | | -- | 11.59 | -- | 4.48 |
| | 11/26/1991 | | -- | 12.07 | -- | 4.00 |
| | 12/20/1991 | | 12.68 | 12.70 | 0.02 | 3.37 |
| | 1/20/1992 | | -- | 10.65 | -- | 5.42 |
| | 3/23/1992 | | -- | 12.30 | -- | 3.77 |
| | 4/22/1992 | | 12.01 | 12.04 | 0.03 | 4.06 |
| | 5/27-28/1992 | | 12.36 | 12.37 | 0.01 | 3.71 |
| | 6/24/1992 | | -- | 11.75 | -- | 4.32 |
| | 7/27/1992 | | -- | 11.18 | -- | 4.89 |
| | 8/26/1992 | | -- | 10.35 | -- | 5.72 |
| | 9/29/1992 | | -- | 10.79 | -- | 5.28 |
| | 11/25/1992 | | -- | 11.47 | -- | 4.6 |
| | 12/18/1992 | | -- | 11.94 | -- | 14.52 |
| | 1/28/1993 | | -- | 11.35 | -- | 4.72 |
| | 2/24/1993 | | -- | 11.69 | -- | 4.38 |
| | 3/30/1993 | | -- | 11.72 | -- | 4.35 |
| | 5/28/1993 | | -- | 12.37 | -- | 3.7 |
| | 8/9-10/1993 | | -- | 12.78 | -- | 3.29 |
| | 9/28/1993 | | -- | 12.36 | -- | 3.71 |
| | 10/29/1993 | | -- | 11.96 | -- | 4.11 |
| | 11/30/1993 | | -- | 11.65 | -- | 4.42 |
| | 12/27/1993 | | -- | 12.5 | -- | 3.57 |
| | 3/31/1994 | | -- | 12.15 | -- | 3.92 |
| | 9/9/1994 | | 10.83 | 11.23 | 0.4 | 4.84 |
| | 9/29/1994 | | 11.95 | 12.46 | 0.51 | 3.61 |
| | 11/23/1994 | | 11.36 | 11.69 | 0.33 | 4.38 |
| | 1/4/1995 | | 11.48 | 11.86 | 0.38 | 4.21 |
| | 2/8/1995 | | -- | 12.87 | -- | 3.2 |
| | 3/16/1995 | | 11.98 | 12.37 | 0.39 | 3.7 |
| | 5/25/1995 | | -- | DRY | -- | -- |
| | 9/30/1995 | | 11.72 | 12.03 | 0.31 | 4.30 |
| | 11/25-26/2008 | | 11.6 | 14 | 2.4 | 4.12 |
| | 3/6/2009 | | 12.75 | 14.9 | 2.15 | 3.01 |
| | 6/30/2009 | | 12.39 | 13.88 | 1.49 | 3.46 |
| | 9/23/2009 | | 12.13 | 13.76 | 1.63 | 3.70 |
| | 12/29/2009 | | 11.49 | 13.51 | 2.02 | 4.29 |
| | 3/24/2010 | | 12.27 | 13.9 | 1.63 | 3.56 |
| | 12/13/2010 | | 12.71 | 13.75 | 1.04 | 3.21 |
| | 4/30/2015 | | 11.15 | 11.25 | 0.1 | 4.91 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-46 | 7/23/1991 | 12.50 | -- | 9.80 | -- | 2.70 |
| | 8/22/1991 | | -- | -- | -- | -- |
| | 9/26/1991 | | -- | -- | -- | -- |
| | 11/26/1991 | | -- | -- | -- | -- |
| | 12/20/1991 | | -- | 11.53 | -- | 0.97 |
| | 1/20/1992 | | -- | 8.76 | -- | 3.74 |
| | 3/23/1992 | | -- | 9.85 | -- | 2.65 |
| | 4/22/1992 | | -- | 9.10 | -- | 3.40 |
| | 5/27-28/1992 | | -- | 9.50 | -- | 3.00 |
| | 6/24/1992 | | -- | 9.64 | -- | 2.86 |
| | 7/27/1992 | | -- | 11.38 | -- | 1.12 |
| | 8/26/1992 | | -- | 8.66 | -- | 3.84 |
| | 9/29/1992 | | -- | 8.11 | -- | 4.39 |
| | 11/25/1992 | | -- | 9.47 | -- | 3.03 |
| | 12/18/1992 | | 12.45 | 10.49 | 0.04 | 2.01 |
| | 1/28/1993 | | 8.81 | 8.83 | 0.02 | 3.67 |
| | 2/24/1993 | | 9.2 | 9.21 | 0.01 | 3.29 |
| | 3/30/1993 | | 9.53 | 9.54 | 0.01 | 2.96 |
| | 5/28/1993 | | -- | -- | -- | -- |
| | 8/9-10/1993 | | -- | -- | -- | -- |
| | 9/28/1993 | | -- | -- | -- | -- |
| | 10/29/1993 | | -- | 9.18 | -- | 3.32 |
| | 11/30/1993 | | -- | 9.05 | -- | 3.45 |
| | 12/27/1993 | | -- | 10.37 | -- | 2.13 |
| | 3/31/1994 | | -- | 9.5 | -- | 3 |
| | 9/9/1994 | | 8.28 | 8.3 | 0.02 | 4.22 |
| | 9/29/1994 | | 9.95 | 10.31 | 0.36 | 2.19 |
| | 11/23/1994 | | -- | 8.54 | -- | 3.96 |
| | 1/4/1995 | | -- | 8.29 | -- | 4.21 |
| | 2/8/1995 | | -- | 9.76 | -- | 2.74 |
| | 3/16/1995 | | -- | 9.54 | -- | 2.96 |
| | 5/25/1995 | | -- | 10.36 | -- | 2.14 |
| | 9/30/1995 | | -- | 8.15 | -- | 4.35 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-47 | 7/23/1991 | 11.89 | 6.40 | -- | -- | -- |
| | 8/22/1991 | | 6.62 | -- | -- | -- |
| | 9/26/1991 | | 8.75 | -- | -- | -- |
| | 10/25-26/1991 | | 7.93 | -- | -- | -- |
| | 11/26/1991 | | Well Not Present | | | |
| | 12/20/1991 | | Well Not Present | | | |
| | 1/20/1992 | | Well Not Present | | | |
| | 3/23/1992 | | Well Not Present | | | |
| | 4/22/1992 | | Well Not Present | | | |
| | 5/27-28/1992 | | Well Not Present | | | |
| | 6/24/1992 | | Well Not Present | | | |
| | 7/27/1992 | | Well Not Present | | | |
| | 8/26/1992 | | Well Not Present | | | |
| | 9/29/1992 | | Well Not Present | | | |
| | 11/25/1992 | | Well Not Present | | | |
| | 12/18/1992 | | Well Not Present | | | |
| | 1/28/1993 | | Well Not Present | | | |
| | 1/28/1993 | | Well Not Present | | | |
| | 3/30/1993 | | Well Not Present | | | |
| | 5/28/1993 | | Well Not Present | | | |
| | 9/28/1993 | | Well Not Present | | | |
| | 8/9-10/1993 | | Well Not Present | | | |
| | 9/28/1993 | | Well Not Present | | | |
| | 11/30/1993 | | Well Not Present | | | |
| | 12/27/1993 | | Well Not Present | | | |
| | 3/31/1994 | | Well Not Present | | | |
| | 9/9/1994 | | Well Not Present | | | |
| | 9/29/1994 | | Well Not Present | | | |
| | 11/23/1994 | | Well Not Present | | | |
| | 1/4/1995 | | Well Not Present | | | |
| | 2/8/1995 | | Well Not Present | | | |
| | 3/16/1995 | | Well Not Present | | | |
| | 3/16/1995 | | Well Not Present | | | |
| | 9/30/1995 | | Well Not Present | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-48 | 7/23/1991 | 12.10 | -- | -- | -- | 6.66 |
| | 8/22/1991 | | -- | 5.39 | -- | 6.71 |
| | 9/26/1991 | | -- | 5.84 | -- | 6.26 |
| | 10/25-26/1991 | | -- | 5.96 | -- | 6.14 |
| | 11/26/1991 | | -- | 6.53 | -- | 5.57 |
| | 12/20/1991 | | -- | 6.79 | -- | 5.31 |
| | 1/20/1992 | | 5.67 | 5.67 | -- | 6.43 |
| | 3/23/1992 | | 5.94 | 13.93 | 7.99 | -1.83 |
| | 4/22/1992 | | -- | 5.33 | -- | 6.77 |
| | 5/27-28/1992 | | -- | 5.95 | -- | 6.15 |
| | 6/24/1992 | | -- | 4.90 | -- | 7.20 |
| | 7/27/1992 | | -- | 5.23 | -- | 6.87 |
| | 8/26/1992 | | -- | 3.57 | -- | 8.53 |
| | 9/29/1992 | | -- | 4.62 | -- | 7.48 |
| | 11/25/1992 | | -- | 4.23 | -- | 7.87 |
| | 12/18/1992 | | -- | 4.71 | -- | 7.39 |
| | 1/28/1993 | | -- | 4.61 | -- | 7.49 |
| | 2/24/1993 | | -- | 4.95 | -- | 7.15 |
| | 3/30/1993 | | -- | 4.19 | -- | 7.91 |
| | 5/28/1993 | | -- | 5.49 | -- | 6.61 |
| | 8/9-10/1993 | | -- | 6.35 | -- | 5.75 |
| | 9/28/1993 | | -- | 5.26 | -- | 6.84 |
| | 10/29/1993 | | -- | 5.39 | -- | 6.71 |
| | 11/30/1993 | | -- | 4.6 | -- | 7.5 |
| | 12/27/1993 | | -- | 7.84 | -- | 4.26 |
| | 3/31/1994 | | -- | 4.87 | -- | 7.23 |
| | 9/9/1994 | | -- | 3.54 | -- | 8.56 |
| | 9/29/1994 | | -- | 4.41 | -- | 7.69 |
| | 11/23/1994 | | -- | 3.72 | -- | 8.38 |
| | 1/4/1995 | | -- | 3.46 | -- | 8.64 |
| | 2/8/1995 | | -- | 4.18 | -- | 7.92 |
| | 3/16/1995 | | -- | 4.13 | -- | 7.97 |
| | 5/25/1995 | | -- | 4.89 | -- | 7.21 |
| | 9/30/1995 | | -- | 3.77 | -- | 8.33 |
| | 10/2/2003 | | -- | 6.82 | -- | 5.28 |
| | 11/25-26/2008 | | -- | 5 | -- | 6.13 |
| | 3/5/2009 | | -- | 6.3 | -- | 4.83 |
| | 6/30/2009 | | -- | 5.1 | -- | 6.03 |
| | 9/23/2009 | | -- | 5.45 | -- | 5.68 |
| | 12/29/2009 | | -- | 4.98 | -- | 6.15 |
| | 5/1/2015 | | -- | 4.62 | -- | 7.48 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-49 | 7/23/1991 | 15.16 | 11.65 | 13.58 | 1.93 | 3.10 |
| | 8/22/1991 | | 11.68 | 13.45 | 1.77 | 3.11 |
| | 9/26/1991 | | 9.81 | 13.40 | 3.59 | 4.60 |
| | 10/25-26/1991 | | 12.03 | 13.40 | 1.37 | 2.84 |
| | 11/26/1991 | | 11.93 | 14.49 | 2.56 | 2.69 |
| | 12/20/1991 | | 12.81 | 17.01 | 4.20 | 1.47 |
| | 1/20/1992 | | 11.79 | 12.83 | 1.04 | 3.15 |
| | 3/23/1992 | | 12.43 | 15.01 | 2.58 | 2.19 |
| | 4/22/1992 | | 12.04 | 13.20 | 1.16 | 2.88 |
| | 5/27-28/1992 | | 12.02 | 14.26 | 2.24 | 2.67 |
| | 6/24/1992 | | 12.17 | 13.64 | 1.47 | 2.68 |
| | 7/27/1992 | | 11.84 | 16.12 | 4.28 | 2.42 |
| | 8/26/1992 | | 12.27 | 13.03 | 0.76 | 2.73 |
| | 9/29/1992 | | 11.03 | 11.57 | 0.54 | 4.02 |
| | 11/25/1992 | | 11.95 | 12.74 | 0.79 | 3.04 |
| | 12/18/1992 | | 12.53 | 13.86 | 1.33 | 2.35 |
| | 1/28/1993 | | 11.34 | 12.20 | 0.86 | 3.64 |
| | 2/24/1993 | | 11.68 | 13.02 | 1.34 | 3.20 |
| | 3/30/1993 | | 11.91 | 13.92 | 2.01 | 2.83 |
| | 5/28/1993 | | 12.70 | 15.89 | 3.19 | 1.79 |
| | 8/9-10/1993 | | 12.32 | 15.30 | 2.98 | 2.21 |
| | 9/28/1993 | | 12.68 | 15.83 | 3.15 | 1.82 |
| | 10/29/1993 | | 11.94 | 12.91 | 0.97 | 3.02 |
| | 11/30/1993 | | 11.74 | 12.72 | 0.98 | 3.21 |
| | 12/27/1993 | | 12.44 | 16.05 | 3.61 | 1.96 |
| | 3/31/1994 | | 11.94 | 13.55 | 1.61 | 2.88 |
| | 9/9/1994 | | 10.89 | 11.5 | 0.61 | 4.14 |
| | 9/29/1994 | | 12.05 | 15.05 | 3 | 2.48 |
| | 11/23/1994 | | 11.31 | 12.73 | 1.42 | 3.55 |
| | 1/4/1995 | | 11.22 | 12.16 | 0.94 | 3.74 |
| | 2/8/1995 | | 12.19 | 16.11 | 3.92 | 2.15 |
| | 3/16/1995 | | 12.27 | 13.26 | 0.99 | 2.68 |
| | 5/25/1995 | | 12.23 | 13.44 | 1.21 | 2.68 |
| | 9/30/1995 | | 11.64 | 13.28 | 1.64 | 3.18 |
| | 10/2/2003 | | 11.5 | 13 | 1.5 | 3.36 |
| | 11/25-26/2008 | | 12.9 | 15.4 | 2.5 | 2.10 |
| | 3/5/2009 | | 13.33 | 15.77 | 2.44 | 1.68 |
| | 6/30/2009 | | 12.92 | 15.57 | 2.65 | 2.19 |
| | 9/23/2009 | | 12.23 | 14.44 | 2.21 | 2.95 |
| | 12/29/2009 | | 12.29 | 14.85 | 2.56 | 2.84 |
| | 3/24/2010 | | 13.1 | 16.51 | 3.41 | 1.90 |
| | 4/28/2015 | | 12.43 | 14.32 | 1.89 | 2.45 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-50 | 7/23/1991 | 15.06 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 2/24/1993 | | 11.14 | 12.44 | 1.30 | 2.62 |
| | 3/30/1993 | | Recovery Well | | | |
| | 5/28/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/9/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 9/30/1995 | | Recovery Well | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-51 | 7/23/1991 | 13.77 | 9.67 | 14.04 | 4.37 | 3.53 |
| | 8/22/1991 | | 9.39 | 13.03 | 3.64 | 3.91 |
| | 9/26/1991 | | 11.04 | 19.40 | 8.36 | 1.64 |
| | 10/25-26/1991 | | 11.20 | 19.29 | 8.09 | 1.52 |
| | 11/26/1991 | | 10.31 | 13.74 | 3.43 | 3.01 |
| | 12/20/1991 | | 12.25 | 19.25 | 7.00 | 0.61 |
| | 1/20/1992 | | 10.09 | 12.57 | 2.48 | 3.36 |
| | 3/23/1992 | | 10.83 | 14.95 | 4.12 | 2.40 |
| | 4/22/1992 | | 10.22 | 13.73 | 3.51 | 3.09 |
| | 5/27-28/1992 | | 10.45 | 14.50 | 4.05 | 2.79 |
| | 6/24/1992 | | 9.22 | 12.71 | 3.49 | 4.10 |
| | 7/27/1992 | | 12.25 | 20.34 | 8.09 | 0.47 |
| | 8/26/1992 | | 10.58 | 18.40 | 7.82 | 2.17 |
| | 9/29/1992 | | 8.91 | 13.39 | 4.48 | 4.28 |
| | 11/25/1992 | | 10.57 | 18.03 | 7.46 | 2.23 |
| | 12/18/1992 | | 11.16 | 19.08 | 7.92 | 1.58 |
| | 1/28/1993 | | 9.40 | 13.43 | 4.03 | 3.85 |
| | 2/24/1993 | | 10.21 | 14.55 | 4.34 | 3.00 |
| | 3/30/1993 | | 10.00 | 14.98 | 4.98 | 3.12 |
| | 8/9-10/1993 | | 11.97 | 19.18 | 7.21 | 0.86 |
| | 9/28/1993 | | 11.97 | 19.64 | 7.67 | 0.80 |
| | 10/29/1993 | | 10.64 | 15.31 | 4.67 | 2.52 |
| | 11/30/1993 | | 10.20 | 13.95 | 3.75 | 3.08 |
| | 12/27/1993 | | 11.25 | 16.62 | 5.37 | 1.82 |
| | 3/31/1994 | | 9.96 | 13.19 | 3.23 | 3.39 |
| | 9/9/1994 | | 9.25 | 12.90 | 3.65 | 4.05 |
| | 9/29/1994 | | 10.28 | 15.31 | 5.03 | 2.84 |
| | 11/23/1994 | | 9.23 | 12.59 | 3.36 | 4.10 |
| | 1/4/1995 | | 10.55 | 17.89 | 7.34 | 2.27 |
| | 2/8/1995 | | 11.07 | 15.85 | 4.78 | 2.08 |
| | 3/16/1995 | | 11.8 | 19.99 | 8.19 | 0.91 |
| | 5/25/1995 | | 10.85 | 16.83 | 5.98 | 2.14 |
| | 12/12/1995 | | 10.92 | 15.46 | 4.54 | 2.26 |
| | 10/2/2003 | | 9.78 | 17.54 | 7.76 | 2.44 |
| | 11/25-26/2008 | | 9.65 | 18.7 | 9.05 | 1.29 |
| | 3/6/2009 | | 10.96 | 15.86 | 4.9 | 0.81 |
| | 6/30/2009 | | 9.77 | 18.38 | 8.61 | 1.95 |
| | 6/30/2009 | | 9.13 | 15.64 | 6.51 | 2.84 |
| | 9/23/2009 10 | | 9.3 | 17.5 | 8.2 | 2.47 |
| | 9/23/2009 11 | | 8.65 | 14.97 | 6.32 | 3.35 |
| | 12/29/2009 | | 9.45 | 19.66 | 10.21 | 2.08 |
| | 3/24/2010 | | 9.5 | 19.62 | 10.12 | 2.04 |
| | 12/13/2010 | | 10.28 | 17.46 | 7.18 | 1.42 |
| | 4/27/2015 | | 9.31 | 15.90 | 6.59 | 3.67 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-52 | 7/23/1991 | 16.51 | 11.92 | 15.95 | 4.03 | 4.07 |
| | 8/22/1991 | | 12.29 | 15.91 | 3.62 | 3.75 |
| | 9/26/1991 | | 12.43 | 16.00 | 3.57 | 3.62 |
| | 10/25-26/1991 | | 12.68 | 16.54 | 3.86 | 3.33 |
| | 11/26/1991 | | 13.19 | 16.26 | 3.07 | 2.92 |
| | 12/20/1991 | | 13.89 | 18.30 | 4.41 | 2.05 |
| | 1/20/1992 | | 12.45 | 17.34 | 4.89 | 3.42 |
| | 3/23/1992 | | 13.24 | 16.88 | 3.64 | 2.80 |
| | 4/22/1992 | | 12.63 | 16.05 | 3.42 | 3.44 |
| | 5/27-28/1992 | | 12.66 | 15.85 | 3.19 | 3.44 |
| | 6/24/1992 | | 11.78 | 15.54 | 3.76 | 4.24 |
| | 7/27/1992 | | 12.92 | 15.80 | 2.88 | 3.22 |
| | 8/26/1992 | | 11.55 | 16.54 | 4.99 | 4.31 |
| | 9/29/1992 | | 11.68 | 15.43 | 3.75 | 4.34 |
| | 11/25/1992 | | 12.22 | 15.83 | 3.61 | 3.82 |
| | 12/18/1992 | | 12.78 | 15.84 | 3.06 | 3.33 |
| | 1/28/1993 | | 11.97 | 15.45 | 3.48 | 4.09 |
| | 2/24/1993 | | 12.55 | 15.40 | 2.85 | 3.59 |
| | 3/30/1993 | | 12.51 | 15.60 | 3.09 | 3.60 |
| | 8/9-10/1993 | | 13.61 | 17.98 | 4.37 | 2.33 |
| | 9/28/1993 | | 13.42 | 17.57 | 4.15 | 2.55 |
| | 10/29/1993 | | 12.84 | 17.33 | 4.49 | 3.09 |
| | 11/30/1993 | | 12.67 | 15.68 | 3.01 | 3.45 |
| | 12/27/1993 | | 13.44 | 15.81 | 2.37 | 2.76 |
| | 3/31/1994 | | 12.89 | 15.61 | 2.72 | 3.27 |
| | 9/9/1994 | | 11.47 | 15.41 | 3.94 | 4.53 |
| | 9/29/1994 | | 12.69 | 15.41 | 2.72 | 3.47 |
| | 11/23/1994 | | 11.93 | 15.09 | 3.16 | 4.17 |
| | 1/4/1995 | | 12.21 | 15.42 | 3.21 | 3.88 |
| | 2/8/1995 | | 13.48 | 15.72 | 2.24 | 2.74 |
| | 3/16/1995 | | 12.96 | 15.82 | 2.86 | 3.18 |
| | 5/25/1995 | | 12.87 | 16.05 | 3.18 | 3.23 |
| | 12/12/1995 | | 13.01 | 15.63 | 2.62 | 3.16 |
| | 10/2/2003 | | 12.14 | 15.3 | 3.16 | 3.74 |
| | 11/25-26/2008 | | 12.2 | 14.75 | 2.55 | 3.03 |
| | 3/6/2009 | | 13.68 | 15.99 | 2.31 | 1.6 |
| | 6/30/2009 | | 12.58 | 15.62 | 3.04 | 2.72 |
| | 9/23/2009 | | 12.04 | 15.28 | 3.24 | 3.23 |
| | 12/29/2009 | | 12.24 | 14.72 | 2.48 | 3.14 |
| | 3/24/2010 | | 12.71 | 14.9 | 2.19 | 2.71 |
| | 4/27/2015 | | 11.95 | 13.91 | 1.96 | 4.27 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-53 | 7/23/1991 | 11.34 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 3/30/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | 15.06 | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/9/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 12/12/1995 | | Recovery Well | | | |
| | 10/2/2003 | 11.34 | 5.36 | 5.98 | 0.62 | 5.86 |
| | 11/25-26/2008 | 10.33 | 5.50 | 5.60 | 0.10 | 4.81 |
| | 3/5/2009 | | 6.36 | 6.50 | 0.14 | 3.94 |
| | 6/30/2009 | | 5.74 | 5.80 | 0.06 | 4.58 |
| | 9/23/2009 | | 5.62 | 5.64 | 0.02 | 4.71 |
| | 12/29/2009 | | -- | 5.12 | -- | 5.21 |
| | 04/29/2015 | | 4.95 | 5.25 | 0.30 | 5.34 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-54 | 7/23/1991 | 12.14 | 9.40 | 18.30 | 8.90 | 6.04 |
| | 8/22/1991 | | 5.50 | 13.92 | 8.42 | 5.63 |
| | 9/26/1991 | | 5.98 | 13.85 | 7.87 | 5.22 |
| | 10/25-26/1991 | | 6.19 | 12.60 | 6.41 | 5.18 |
| | 11/26/1991 | | 6.82 | 14.40 | 7.58 | 4.41 |
| | 12/20/1991 | | 7.04 | 14.09 | 7.05 | 4.25 |
| | 1/20/1992 | | 5.79 | 13.29 | 7.50 | 5.45 |
| | 3/23/1992 | | 5.92 | 13.89 | 7.97 | 5.26 |
| | 4/22/1992 | | 5.36 | 13.88 | 8.52 | 5.76 |
| | 5/27-28/1992 | | 6.02 | 13.95 | 7.93 | 5.17 |
| | 6/24/1992 | | 4.95 | 14.00 | 9.05 | 6.10 |
| | 7/27/1992 | | 5.05 | 13.85 | 8.80 | 6.03 |
| | 8/26/1992 | | 3.69 | 12.97 | 9.28 | 7.34 |
| | 9/29/1992 | | 4.71 | 13.94 | 9.23 | 6.32 |
| | 11/25/1992 | | 4.45 | 13.00 | 8.55 | 6.66 |
| | 12/18/1992 | | 4.71 | 14.93 | 10.22 | 6.20 |
| | 1/28/1993 | | 4.39 | 13.69 | 9.30 | 6.63 |
| | 2/24/1993 | | 4.59 | 13.83 | 9.24 | 6.44 |
| | 3/30/1993 | | 3.87 | 14.05 | 10.18 | 7.05 |
| | 8/9-10/1993 | | 6.25 | 14.51 | 8.26 | 4.90 |
| | 9/28/1993 | | 5.23 | 13.99 | 8.76 | 5.86 |
| | 10/29/1993 | | 5.03 | 13.60 | 8.57 | 6.08 |
| | 11/30/1993 | | 4.53 | 13.72 | 9.19 | 6.51 |
| | 12/27/1993 | | 4.88 | 13.90 | 9.02 | 6.18 |
| | 3/31/1994 | | 4.79 | 14.03 | 9.24 | 6.24 |
| | 9/9/1994 | | -- | 3.51 | -- | 8.63 |
| | 9/29/1994 | | 4.06 | 4.23 | 0.17 | 8.06 |
| | 11/23/1994 | | 3.59 | 11.81 | 8.22 | 7.56 |
| | 1/4/1995 | | 3.04 | 13.59 | 10.55 | 7.83 |
| | 2/8/1995 | | -- [7] | -- [7] | -- [7] | -- [7] |
| | 3/16/1995 | | 3.63 | 14.48 | 10.85 | 7.21 |
| | 5/25/1995 | | 4.50 | 0.00 | 4.50 | 8.18 |
| | 12/12/1995 | | 4.46 | 14.34 | 9.88 | 6.49 |
| | 10/2/2003 | | 4.92 | 15.62 | 10.70 | 5.08 |
| | 11/25-26/2008 | 10.66 | 2.50 | 16.40 | 13.90 | 5.38 |
| | 3/5/2009 | | 4.16 | 15.96 | 11.80 | 4.14 |
| | 6/30/2009 | | 3.66 | 7.40 | 3.74 | 6.45 |
| | 9/23/2009 | | 3.53 | 16.10 | 12.57 | 5.29 |
| | 12/29/2009 | | 2.52 | -- [7] | -- [7] | -- [7] |
| | 12/13/2010 | | 4.24 | 18.26 | 14.02 | 4.37 |
| | 05/01/2015 | | 3.90 | 14.00 | 10.10 | 5.29 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-55 | 7/23/1991 | 15.25 | 5.78 | 8.29 | 2.51 | 5.03 |
| | 8/22/1991 | | 9.73 | 12.64 | 2.91 | 4.91 |
| | 9/26/1991 | | 10.19 | 13.19 | 3.00 | 4.43 |
| | 10/25-26/1991 | | 10.56 | 13.38 | 2.82 | 4.10 |
| | 11/26/1991 | | 11.16 | 14.70 | 3.54 | 3.35 |
| | 12/20/1991 | | 11.40 | 15.08 | 3.68 | 3.08 |
| | 1/20/1992 | | 10.88 | 13.21 | 2.33 | 3.88 |
| | 3/23/1992 | | 10.97 | 14.09 | 3.12 | 3.62 |
| | 4/22/1992 | | 10.63 | 12.99 | 2.36 | 4.12 |
| | 5/27-28/1992 | | 10.94 | 13.90 | 2.96 | 3.69 |
| | 6/24/1992 | | 10.04 | 12.28 | 2.24 | 4.74 |
| | 7/27/1992 | | 10.55 | 13.46 | 2.91 | 4.09 |
| | 8/26/1992 | | 9.13 | 10.61 | 1.48 | 5.81 |
| | 9/29/1992 | | 10.02 | 12.41 | 2.39 | 4.73 |
| | 11/25/1992 | | 10.27 | 12.22 | 1.95 | 4.57 |
| | 12/18/1992 | | 10.50 | 12.53 | 2.03 | 4.32 |
| | 1/28/1993 | | 10.26 | 12.14 | 1.88 | 4.60 |
| | 2/24/1993 | | 10.68 | 12.81 | 2.13 | 4.12 |
| | 3/30/1993 | | 10.31 | 12.94 | 2.63 | 4.39 |
| | 8/9-10/1993 | | 11.56 | 14.98 | 3.42 | 2.97 |
| | 9/28/1993 | | 11.24 | 14.07 | 2.83 | 3.42 |
| | 10/29/1993 | | 11.15 | 13.63 | 2.48 | 3.58 |
| | 11/30/1993 | | 10.85 | 12.78 | 1.93 | 3.99 |
| | 12/27/1993 | | 11.19 | 13.70 | 2.51 | 3.53 |
| | 3/31/1994 | | 11.06 | 13.25 | 2.19 | 3.73 |
| | 9/9/1994 | | 10.09 | 11.04 | 0.95 | 4.96 |
| | 9/29/1994 | | 10.61 | 12.26 | 1.65 | 4.29 |
| | 11/23/1994 | | 10.41 | 11.70 | 1.29 | 4.57 |
| | 1/4/1995 | | 10.19 | 11.29 | 1.10 | 4.83 |
| | 2/8/1995 | | 11.18 | 12.98 | 1.80 | 3.69 |
| | 3/16/1995 | | 10.69 | 12.45 | 1.76 | 4.19 |
| | 5/25/1995 | | -- | DRY | -- | -- |
| | 12/12/1995 | | 11.11 | 13.39 | 2.28 | 3.66 |
| | 10/2/2003 | | 10.57 | 12.23 | 1.66 | 4.35 |
| | 11/25-26/2008 | 15.31 | 11.30 | 12.20 | 0.90 | 3.83 |
| | 3/5/2009 | | -- | 12.50 | -- | 2.81 |
| | 6/30/2009 | Abandoned | | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-56 | 7/23/1991 | 15.16 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 2/24/1993 | | 11.41 | 14.15 | 2.74 | 3.31 |
| | 3/30/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | 15.06 | Recovery Well | | | |
| | 9/9/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 12/12/1995 | | Recovery Well | | | |
| | 4/27/2015 | | 9.11 | 14.81 | 5.70 | 5.12 |
| TRUCK LOADING | 11/25-26/2008 | 12.65 | 9.30 | 14.60 | 5.30 | 2.29 |
| | 3/6/2009 | | 10.86 | 15.05 | 4.19 | 0.95 |
| | 6/30/2009 | | 9.53 | 15.32 | 5.79 | 2.27 |
| | 9/23/2009 | | 9.11 | 14.94 | 5.83 | 2.69 |
| | 12/29/2009 | | 9.42 | 15.72 | 6.30 | 2.31 |
| | 3/24/2010 | | 9.95 | 15.26 | 5.31 | 1.92 |
| | 12/13/2010 | | 10.89 | 15.93 | 5.04 | 1.02 |

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-57 | 7/23/1991 | 14.21 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 6/24/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 2/24/1993 | | 9.86 | 11.75 | 1.89 | 3.88 |
| | 3/30/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | 15.06 | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 12/12/1995 | | Recovery Well | | | |
| | 4/28/2015 | | 7.95 | 10.81 | 2.86 | 6.69 |
| TANK 3 | 11/25-26/2008 | 12.14 | 8.05 | 9.10 | 1.05 | 3.88 |
| | 3/5/2009 | | 9.75 | 11.19 | 1.44 | 2.10 |
| | 6/30/2009 | | 8.40 | 11.64 | 3.24 | 3.27 |
| | 9/23/2009 | | 8.05 | 10.99 | 2.94 | 3.66 |
| | 12/29/2009 | | 8.70 | 11.55 | 3.35 | 3.45 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-58 | 7/23/1991 | 13.25 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 2/24/1993 | | -- | 9.75 | -- | 3.50 |
| | 3/30/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | 15.06 | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 12/12/1995 | | Recovery Well | | | |
| | 5/1/2015 | | 7.67 | 7.83 | 0.16 | 7.37 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-59 | 7/23/1991 | 14.29 | Recovery Well | | | |
| | 8/22/1991 | | Recovery Well | | | |
| | 9/26/1991 | | Recovery Well | | | |
| | 10/25-26/1991 | | Recovery Well | | | |
| | 11/26/1991 | | Recovery Well | | | |
| | 12/20/1991 | | Recovery Well | | | |
| | 1/20/1992 | | Recovery Well | | | |
| | 2/27-28/1992 | | Recovery Well | | | |
| | 3/23/1992 | | Recovery Well | | | |
| | 4/22/1992 | | Recovery Well | | | |
| | 5/27-28/1992 | | Recovery Well | | | |
| | 7/27/1992 | | Recovery Well | | | |
| | 8/26/1992 | | Recovery Well | | | |
| | 9/29/1992 | | Recovery Well | | | |
| | 11/25/1992 | | Recovery Well | | | |
| | 12/18/1992 | | Recovery Well | | | |
| | 1/28/1993 | | Recovery Well | | | |
| | 2/24/1993 | | 11.14 | 11.15 | 0.01 | 3.14 |
| | 3/30/1993 | | Recovery Well | | | |
| | 8/9-10/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 9/28/1993 | | Recovery Well | | | |
| | 11/30/1993 | | Recovery Well | | | |
| | 12/27/1993 | | Recovery Well | | | |
| | 3/31/1994 | 15.06 | Recovery Well | | | |
| | 3/31/1994 | | Recovery Well | | | |
| | 9/29/1994 | | Recovery Well | | | |
| | 11/23/1994 | | Recovery Well | | | |
| | 1/4/1995 | | Recovery Well | | | |
| | 2/8/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 3/16/1995 | | Recovery Well | | | |
| | 12/12/1995 | | Recovery Well | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-60 | 7/23/1991 | 10.24 | -- | 5.98 | -- | 4.26 |
| | 8/22/1991 | | -- | 5.88 | -- | 4.36 |
| | 9/26/1991 | | -- | 11.42 | -- | -1.18 |
| | 10/25-26/1991 | | -- | 6.35 | -- | 3.89 |
| | 11/26/1991 | | -- | 9.42 | -- | 0.82 |
| | 12/20/1991 | | -- | 9.96 | -- | 0.28 |
| | 1/20/1992 | | -- | 7.19 | -- | 3.05 |
| | 2/27-28/1992 | | -- | 10.63 | -- | -0.39 |
| | 3/23/1992 | | -- | 7.56 | -- | 2.68 |
| | 4/22/1992 | | -- | 7.63 | -- | 2.61 |
| | 5/27-28/1992 | | -- | 8.49 | -- | 1.75 |
| | 7/27/1992 | | -- | 11.14 | -- | -0.90 |
| | 8/26/1992 | | -- | 11.13 | -- | -0.89 |
| | 9/29/1992 | | -- | 5.99 | -- | 4.25 |
| | 11/25/1992 | | -- | 10.73 | -- | -0.49 |
| | 12/18/1992 | | -- | 9.57 | -- | 0.67 |
| | 1/28/1993 | | -- | 6.69 | -- | 3.55 |
| | 2/24/1993 | | -- | 8.6 | -- | 1.64 |
| | 3/30/1993 | | -- | 6.87 | -- | 3.37 |
| | 8/9-10/1993 | | -- | 11.13 | -- | -0.89 |
| | 9/28/1993 | | -- | 11.57 | -- | -1.33 |
| | 10/29/1993 | | -- | 9.15 | -- | 1.09 |
| | 11/30/1993 | | -- | 8.65 | -- | 1.59 |
| | 12/27/1993 | | -- | 8.61 | -- | 1.63 |
| | 3/31/1994 | | -- | 6.2 | -- | 4.04 |
| | 9/9/1994 | | -- | 7.31 | -- | 2.93 |
| | 9/29/1994 | | -- | 7.09 | -- | 3.15 |
| | 11/23/1994 | | -- | 5.78 | -- | 4.46 |
| | 1/4/1995 | | -- | 10.46 | -- | -0.22 |
| | 2/8/1995 | | -- | 8.81 | -- | 1.43 |
| | 3/16/1995 | | -- | 11.28 | -- | -1.04 |
| | 5/25/1995 | | -- | 0 | -- | 10.24 |
| | 12/12/1995 | | -- | 9.43 | -- | 0.81 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-61 | 7/23/1991 | 9.87 | -- | 6.20 | -- | 3.67 |
| | 8/22/1991 | | 5.82 | 5.90 | 0.08 | 4.03 |
| | 9/26/1991 | | 9.75 | 10.14 | 0.39 | 0.04 |
| | 10/25-26/1991 | | 9.78 | 10.07 | 0.29 | 0.03 |
| | 11/26/1991 | | 7.10 | 7.12 | 0.02 | 2.77 |
| | 12/20/1991 | | -- | 9.20 | -- | 0.67 |
| | 1/20/1992 | | -- | 6.56 | -- | 3.31 |
| | 2/27-28/1992 | | 9.47 | 9.50 | 0.03 | 0.39 |
| | 3/23/1992 | | -- | 7.80 | -- | 2.07 |
| | 4/22/1992 | | -- | 7.12 | -- | 2.75 |
| | 5/27-28/1992 | | -- | 6.38 | -- | 3.49 |
| | 7/27/1992 | | 9.40 | 9.41 | 0.01 | 0.46 |
| | 8/26/1992 | | 9.10 | 9.22 | 0.12 | 0.65 |
| | 9/29/1992 | | -- | 5.43 | -- | 4.44 |
| | 11/25/1992 | | 8.85 | 8.88 | 0.03 | 0.99 |
| | 12/18/1992 | | -- | 9.37 | -- | 0.50 |
| | 1/28/1993 | | -- | 6.90 | -- | 2.97 |
| | 2/24/1993 | | -- | 7.46 | -- | 2.41 |
| | 3/30/1993 | | -- | 7.12 | -- | 2.75 |
| | 8/9-10/1993 | | -- | 11.76 | -- | -1.89 |
| | 9/28/1993 | | 9.74 | 9.76 | 0.02 | 0.13 |
| | 10/29/1993 | | 7.63 | 7.65 | 0.02 | 2.24 |
| | 11/30/1993 | | 7.28 | 7.31 | 0.03 | 2.59 |
| | 12/27/1993 | | 8.55 | 8.57 | 0.02 | 1.32 |
| | 3/31/1994 | | -- | 6.21 | -- | 3.66 |
| | 9/9/1994 | | -- | 6.24 | -- | 3.63 |
| | 9/29/1994 | | -- | 7.49 | -- | 2.38 |
| | 11/23/1994 | | -- | 5.8 | -- | 4.07 |
| | 1/4/1995 | | -- | 8.23 | -- | 1.64 |
| | 2/8/1995 | | -- | 8.32 | -- | 1.55 |
| | 3/16/1995 | | 10.18 | 10.19 | 0.01 | -0.31 |
| | 5/25/1995 | | -- | 6.45 | -- | 3.42 |
| | 12/12/1995 | | -- | 7.91 | -- | 1.96 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-62 | 7/23/1991 | 8.77 | 4.49 | 7.09 | 2.60 | 3.89 |
| | 8/22/1991 | | 4.09 | 6.62 | 2.53 | 4.30 |
| | 9/26/1991 | | 8.57 | 15.39 | 6.82 | -0.82 |
| | 10/25-26/1991 | | 8.52 | 15.55 | 7.03 | -0.80 |
| | 11/26/1991 | | 5.91 | 8.01 | 2.10 | 2.55 |
| | 12/20/1991 | | 8.25 | 12.65 | 4.40 | -0.14 |
| | 1/20/1992 | | 4.78 | 6.38 | 1.60 | 3.75 |
| | 2/27-28/1992 | | 8.54 | 14.83 | 6.29 | -0.71 |
| | 3/23/1992 | | 5.80 | 8.21 | 2.41 | 2.61 |
| | 4/22/1992 | | 5.18 | 8.81 | 3.63 | 3.05 |
| | 5/27-28/1992 | | 4.86 | 6.47 | 1.61 | 3.67 |
| | 7/27/1992 | | 8.49 | 15.43 | 6.94 | -0.76 |
| | 8/26/1992 | | 7.37 | 15.41 | 8.04 | 0.19 |
| | 9/29/1992 | | 3.59 | 6.88 | 3.29 | 4.69 |
| | 11/25/1992 | | 6.86 | 12.24 | 5.38 | 1.10 |
| | 12/18/1992 | | 7.39 | 13.19 | 5.80 | 0.51 |
| | 1/28/1993 | | 4.02 | 8.20 | 4.18 | 4.12 |
| | 2/24/1993 | | 5.64 | 10.16 | 4.52 | 2.45 |
| | 3/30/1993 | | 5.34 | 10.50 | 5.16 | 2.66 |
| | 8/9-10/1993 | | 8.17 | 11.48 | 3.31 | 0.10 |
| | 9/28/1993 | | 8.23 | 13.90 | 5.67 | -0.31 |
| | 10/29/1993 | | 5.95 | 9.01 | 3.06 | 2.36 |
| | 11/30/1993 | | 5.35 | 8.66 | 3.31 | 2.92 |
| | 12/27/1993 | | 6.83 | 7.36 | 0.53 | 1.86 |
| | 3/31/1994 | | 4.84 | 6.45 | 1.61 | 3.69 |
| | 9/9/1994 | | 4.56 | 6.32 | 1.76 | 3.95 |
| | 9/29/1994 | | 5.58 | 9.53 | 3.95 | 2.60 |
| | 11/23/1994 | | 3.99 | 5.90 | 1.91 | 4.49 |
| | 1/4/1995 | | 7.12 | 13.62 | 6.5 | 0.68 |
| | 2/8/1995 | | 6.87 | 10.71 | 3.84 | 1.32 |
| | 3/16/1995 | | 9.42 | 16.17 | 6.75 | -1.66 |
| | 5/25/1995 | | 4.69 | 6.03 | 1.34 | 3.88 |
| | 12/12/1995 | | 6.49 | 10.93 | 4.44 | 1.61 |
| | 10/2/2003 | | 4.12 | 5.47 | 1.35 | 4.38 |
| | 11/25-26/2008 | | -- | -- | -- | -- |
| | 11/25-26/2008 | | -- | -- | -- | -- |
| | 3/5/2009 | | -- | 9.86 | -- | -2.16 |
| | 6/30/2009 | | -- | NM | -- | -- |
| | 9/23/2009 [10] | | 8.33 | 10.38 | 2.05 | -0.93 |
| | 9/23/2009 [11] | | 3.7 | 5.41 | 1.71 | 3.75 |
| | 12/29/2009 | | 9.07 | 10.98 | 1.91 | -1.65 |
| | 3/24/2010 | | 9.9 | 12.5 | 2.6 | -2.58 |
| | 12/13/2010 | | 10.03 | 10.33 | 0.3 | -2.37 |
| | 5/1/2015 | | 6.28 | 8.13 | 1.85 | 2.22 |
| | 5/19/2015 | | 4.84 | 5.8 | 0.96 | 3.79 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-63 | 7/23/1991 | 9.10 | 5.85 | 5.94 | 0.09 | 3.24 |
| | 8/22/1991 | | 5.33 | 5.87 | 0.54 | 3.71 |
| | 9/26/1991 | | 8.49 | -- | -- | -- |
| | 10/25-26/1991 | | 8.63 | 8.74 | 0.11 | 0.46 |
| | 11/26/1991 | | 6.30 | 6.31 | 0.01 | 2.80 |
| | 12/20/1991 | | 9.39 | 9.41 | 0.02 | -0.29 |
| | 1/20/1992 | | -- | 5.78 | -- | 3.32 |
| | 2/27-28/1992 | | 8.40 | 8.42 | 0.02 | 0.70 |
| | 3/23/1992 | | 7.05 | 7.13 | 0.08 | 2.04 |
| | 4/22/1992 | | 6.25 | 6.32 | 0.07 | 2.84 |
| | 5/27-28/1992 | | -- | 6.65 | -- | 2.45 |
| | 7/27/1992 | | 9.05 | 9.70 | 0.65 | -0.02 |
| | 9/29/1992 | | 4.52 | 7.03 | 2.51 | 4.30 |
| | 11/25/1992 | | 7.55 | 9.88 | 2.33 | 1.29 |
| | 12/18/1992 | | 7.93 | 10.78 | 2.85 | 0.86 |
| | 1/28/1993 | | 5.10 | 7.18 | 2.08 | 3.77 |
| | 2/24/1993 | | 6.27 | 8.19 | 1.92 | 2.62 |
| | 3/30/1993 | | 6.20 | 7.81 | 1.61 | 2.72 |
| | 8/9-10/1993 | | 8.67 | 8.68 | 0.01 | 0.43 |
| | 9/28/1993 | | 8.69 | 8.73 | 0.04 | 0.41 |
| | 10/29/1993 | | 6.94 | 6.97 | 0.03 | 2.16 |
| | 11/30/1993 | | 6.69 | 6.76 | 0.07 | 2.40 |
| | 12/27/1993 | | 7.85 | 7.89 | 0.04 | 1.25 |
| | 3/31/1994 | | 5.87 | 5.90 | 0.03 | 3.23 |
| | 9/9/1994 | | 5.33 | 5.50 | 0.17 | 3.75 |
| | 9/29/1994 | | 7.06 | 7.78 | 0.72 | 1.96 |
| | 11/23/1994 | | 5.40 | 6.73 | 1.33 | 3.55 |
| | 1/4/1995 | | 6.77 | 9.30 | 2.53 | 2.05 |
| | 2/8/1995 | | 6.88 | 8.35 | 1.47 | 2.06 |
| | 3/16/1995 | | 8.05 | 11.19 | 3.14 | 0.70 |
| | 5/25/1995 | | 5.10 | 5.41 | 0.31 | 3.97 |
| | 12/12/1995 | | 6.75 | 8.52 | 1.77 | 2.16 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-64 | 7/23/1991 | 8.71 | 5.90 | 7.65 | 1.75 | 2.46 |
| | 8/22/1991 | | 5.51 | 7.38 | 1.87 | 2.83 |
| | 9/26/1991 | | 6.71 | 7.75 | 1.04 | 1.79 |
| | 10/25-26/1991 | | 6.80 | 8.90 | 2.10 | 1.49 |
| | 11/26/1991 | | 6.95 | 7.29 | 0.34 | 1.69 |
| | 12/20/1991 | | 7.98 | 13.92 | 5.94 | -0.46 |
| | 1/20/1992 | | 5.40 | 7.13 | 1.73 | 2.96 |
| | 2/27-28/1992 | | 7.20 | 8.72 | 1.52 | 1.21 |
| | 3/23/1992 | | 7.40 | 7.65 | 0.25 | 1.26 |
| | 4/22/1992 | | 6.03 | 7.30 | 1.27 | 2.43 |
| | 5/27-28/1992 | | 5.68 | 7.40 | 1.72 | 2.69 |
| | 7/27/1992 | | 7.83 | 15.74 | 7.91 | -0.70 |
| | 9/29/1992 | | 4.59 | 5.50 | 0.91 | 3.94 |
| | 11/25/1992 | | 5.28 | 6.87 | 1.59 | 3.11 |
| | 12/18/1992 | | 7.20 | 7.77 | 0.57 | 1.40 |
| | 1/28/1993 | | 5.09 | 5.66 | 0.57 | 3.51 |
| | 2/24/1993 | | 5.69 | 6.26 | 0.57 | 2.91 |
| | 3/30/1993 | | 6.12 | 7.11 | 0.99 | 2.39 |
| | 8/9-10/1993 | | 7.63 | 8.07 | 0.44 | 0.99 |
| | 9/28/1993 | | 7.53 | 8.96 | 1.43 | 0.89 |
| | 10/29/1993 | | 5.66 | 7.36 | 1.70 | 2.71 |
| | 11/30/1993 | | 5.48 | 6.71 | 1.23 | 2.98 |
| | 12/27/1993 | | 7.53 | 9.12 | 1.59 | 0.86 |
| | 3/31/1994 | | 11.95 | 16.86 | 4.91 | -4.22 |
| | 9/9/1994 | | 4.49 | 6.07 | 1.58 | 3.90 |
| | 9/29/1994 | | 7.04 | 7.62 | 0.58 | 1.55 |
| | 11/23/1994 | | 5.25 | 5.76 | 0.51 | 3.36 |
| | 1/4/1995 | | 5.45 | 5.93 | 0.48 | 3.16 |
| | 2/8/1995 | | -- | 7.36 | -- | 1.35 |
| | 3/16/1995 | | 7.06 | 8.20 | 1.14 | 1.42 |
| | 5/25/1995 | | 5.35 | 6.29 | 0.94 | 3.17 |
| | 12/12/1995 | | 6.19 | 6.81 | 0.62 | 2.40 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-65 | 7/23/1991 | 8.73 | -- | 5.87 | -- | 2.86 |
| | 8/22/1991 | | -- | 5.04 | -- | 3.69 |
| | 9/26/1991 | | -- | 8.95 | -- | -0.22 |
| | 10/25-26/1991 | | -- | 9.31 | -- | -0.58 |
| | 11/26/1991 | | -- | 5.04 | -- | 3.69 |
| | 12/20/1991 | | -- | 10.74 | -- | -2.01 |
| | 1/20/1992 | | -- | 5.20 | -- | 3.53 |
| | 2/27-28/1992 | | 8.85 | 8.97 | 0.12 | -0.14 |
| | 3/23/1992 | | -- | 6.20 | -- | 2.53 |
| | 4/22/1992 | | -- | 5.84 | -- | 2.89 |
| | 5/27-28/1992 | | 8.79 | 8.80 | 0.01 | -0.06 |
| | 7/27/1992 | | 11.25 | 11.28 | 0.03 | -2.53 |
| | 9/29/1992 | | | NA | -- | -- |
| | 11/25/1992 | | 8.31 | 8.33 | 0.02 | 0.42 |
| | 12/18/1992 | | -- | 9.59 | -- | -0.86 |
| | 1/28/1993 | | -- | 4.63 | -- | 4.10 |
| | 2/24/1993 | | -- | 5.74 | -- | 2.99 |
| | 3/30/1993 | | -- | 5.96 | -- | 2.77 |
| | 8/9-10/1993 | | -- | 5.08 | -- | 3.65 |
| | 9/28/1993 | | -- | 9.75 | -- | -1.02 |
| | 10/29/1993 | | 6.07 | 6.09 | 0.02 | 2.66 |
| | 11/30/1993 | | -- | 5.06 | -- | 3.67 |
| | 12/27/1993 | | -- | 8.47 | -- | 0.26 |
| | 3/31/1994 | | -- | 4.54 | -- | 4.19 |
| | 9/9/1994 | | -- | 0.00 | -- | 8.73 |
| | 9/29/1994 | | -- | 0.00 | -- | 8.73 |
| | 11/23/1994 | | 4.15 | 4.18 | 0.03 | 4.57 |
| | 1/4/1995 | | -- | 7.96 | -- | 0.77 |
| | 2/8/1995 | | -- | 7.05 | -- | 1.68 |
| | 3/16/1995 | | 10.97 | 11.01 | 0.04 | -2.28 |
| | 5/25/1995 | | -- | 6.97 | -- | 1.76 |
| | 12/12/1995 | | -- | 6.96 | -- | 1.77 |
| | 11/25-26/2008 | 13.26 | 11.05 | 15.90 | 4.85 | 1.24 |
| | 3/6/2009 | | 12.47 | 13.52 | 1.05 | 0.58 |
| | 6/30/2009 | | 11.08 | 13.50 | 2.42 | 1.83 |
| | 6/30/2009 | | 10.46 | 12.96 | 2.50 | 2.44 |
| | 9/23/2009 [10] | | 10.61 | 13.51 | 2.90 | 2.23 |
| | 12/29/2009 | | 10.86 | 13.68 | 2.82 | 2.00 |
| | 3/24/2010 | | 11.58 | 14.56 | 2.98 | 1.25 |
| | 12/13/2010 | | 11.96 | 14.62 | 2.66 | 0.91 |
| | 4/29/2015 | | 9.51 | 13.12 | 3.61 | 3.23 |
| AW-66 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-66A | 1/4/1995 | -- | -- | -- | -- | -- |
| | 2/8/1995 | -- | -- | -- | -- | -- |
| | 3/16/1995 | -- | -- | -- | -- | -- |
| | 3/16/1995 | -- | -- | -- | -- | -- |
| | 12/12/1995 | -- | -- | -- | -- | -- |

## Axeon Savannah Terminal

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-67 | 1/4/1995 | -- | -- | -- | -- | -- |
| | 2/8/1995 | -- | -- | -- | -- | -- |
| | 3/16/1995 | -- | -- | -- | -- | -- |
| | 3/16/1995 | -- | -- | -- | -- | -- |
| | 12/12/1995 | -- | -- | -- | -- | -- |
| | 10/2/2003 | 12.27 | -- | 7.23 | -- | 5.04 |
| | 11/25-26/2008 | 11.32 | -- | 11.00 | -- | 0.32 |
| | 3/60/09 | | -- | 12.30 | -- | -0.98 |
| | 6/30/2009 | | -- | 11.00 | -- | 0.32 |
| | 9/23/2009 [10] | | -- | 10.21 | -- | 1.11 |
| | 12/29/2009 | | -- | 8.07 | -- | 3.25 |
| | 3/24/2010 | | -- | 10.37 | -- | 0.95 |
| | 4/29/2015 | | -- | 5.80 | -- | 5.52 |
| AW-68 | 11/25-26/2008 | 13.80 | -- | -- | -- | -- |
| | 3/5/2009 | | -- | 13.04 | -- | 0.76 |
| | 6/30/2009 | | 12.18 | 14.44 | 2.26 | 1.29 |
| | 6/30/2009 | | 10.73 | 12.21 | 1.48 | 2.85 |
| | 12/29/2009 | | 11.43 | 16.84 | 5.41 | 1.57 |
| | 3/24/2010 | | 11.79 | 17.82 | 6.03 | 1.12 |
| | 12/13/2010 | | 11.89 | 17.14 | 5.25 | 1.14 |
| | 4/27/2015 | | 10.26 | -- | -- | -- |
| AW-69 | 1/4/1995 | -- | -- | -- | 0.47 | -- |
| | 2/8/1995 | -- | -- | -- | 0.04 | -- |
| | 3/16/1995 | -- | -- | -- | 0.03 | -- |
| | 3/16/1995 | -- | -- | -- | -- | -- |
| | 12/12/1995 | -- | -- | -- | 0.26 | -- |
| | 11/25-26/2008 | 9.44 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 8.09 | -- | 1.35 |
| | 6/30/2009 | | -- | 8.78 | -- | 0.66 |
| | 9/23/2009 [10] | | -- | 6.71 | -- | 2.73 |
| | 12/29/2009 | | -- | 6.41 | -- | 3.03 |
| | 3/24/2010 | | -- | 7.21 | -- | 2.23 |
| | 4/27/2015 | | -- | 5.84 | -- | 3.60 |
| AW-70 | 1/4/1995 | -- | -- | -- | 4.40 | -- |
| | 2/8/1995 | -- | -- | -- | 2.44 | -- |
| | 3/16/1995 | -- | -- | -- | 3.57 | -- |
| | 3/16/1995 | -- | -- | -- | 1.73 | -- |
| | 12/12/1995 | -- | -- | -- | 0.01 | -- |
| | 11/25-26/2008 | 12.25 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 12.11 | -- | 0.14 |
| | 6/30/2009 | | -- | 10.91 | -- | 1.34 |
| | 9/23/2009 [10] | | -- | 10.20 | -- | 2.05 |
| | 12/29/2009 | | -- | 10.73 | -- | 1.52 |
| | 3/24/2010 | | -- | 11.22 | -- | 1.03 |
| | 4/28/2015 | | -- | 8.85 | -- | 3.40 |
| AW-71 | 11/25-26/2008 | 13.29 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 12.58 | -- | 0.71 |
| | 6/30/2009 | | 10.87 | 10.94 | 0.07 | 2.41 |
| | 6/30/2009 | | 10.76 | 10.84 | 0.08 | 2.52 |
| | 12/29/2009 | | 10.46 | 10.70 | 0.24 | 2.79 |
| | 3/24/2010 | | 11.20 | 11.67 | 0.47 | 2.02 |
| | 4/27/2015 | | -- | 10.25 | -- | 3.04 |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| AW-72 | 11/25-26/2008 | 10.12 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 10.02 | -- | 0.10 |
| | 6/3/2009 | | -- | 9.05 | -- | 1.07 |
| | 9/23/2009 [10] | | -- | 8.45 | -- | 1.67 |
| | 12/29/2009 | | -- | 8.56 | -- | 1.56 |
| | 3/24/2010 | | -- | 9.01 | -- | 1.11 |
| | 4/29/2015 | | -- | 8.30 | -- | 1.82 |
| AW-73 | 11/25-26/2008 | 12.04 | -- | -- | -- | -- |
| | 3/6/2009 | | -- | 10.34 | -- | 1.70 |
| | 6/30/2009 | | -- | 9.45 | -- | 2.59 |
| | 9/23/2009 | | -- | 9.19 | -- | 2.85 |
| | 12/29/2009 | | -- | 8.71 | -- | 3.33 |
| | 3/24/2010 | | -- | 8.69 | -- | 3.35 |
| AW-74 | 3/5/2009 | 9.96 | -- | 10.57 | -- | -0.61 |
| | 6/30/2009 | | 9.79 | 12.77 | 2.98 | -0.27 |
| | 6/30/2009 | | 6.55 | 8.54 | 1.99 | 3.12 |
| | 12/29/2009 | | 9.65 | 13.11 | 3.46 | -0.20 |
| | 3/24/2010 | | 9.86 | 13.58 | 3.72 | -0.44 |
| | 12/13/2010 | | 8.72 | 13.12 | 4.40 | 0.60 |
| | 04/27/2015 | | 6.57 | 10.99 | 4.42 | 2.74 |
| AW-75 | 4/29/2015 | -- | -- | 9.57 | -- | -- |
| AW-76 | 4/29/2015 | -- | -- | 10.63 | -- | -- |
| AW-77 | 4/29/2015 | -- | -- | 6.60 | -- | -- |
| AW-78 | 4/29/2015 | -- | -- | 5.25 | -- | -- |
| AW-79 | 4/28/2015 | -- | -- | 5.56 | -- | -- |
| RAIL LOADING-S | 11/25-26/2008 | 12.30 | -- | 5.75 | -- | 6.55 |
| | 3/6/2009 | | -- | 6.78 | -- | 5.52 |
| | 6/30/2009 | | -- | 5.55 | -- | 6.75 |
| | 9/23/2009 | | -- | 5.87 | -- | 6.43 |
| | 12/29/2009 | | -- | 4.96 | -- | 7.34 |
| | 04/29/2015 | | -- | 3.45 | -- | 8.85 |
| RAIL LOADING-M | 11/25-26/2008 | -- | -- | -- | -- | -- |
| | 3/5/2009 | -- | -- | -- | -- | -- |
| | 6/30/2009 | -- | -- | -- | -- | -- |
| | 9/23/2009 | -- | -- | -- | -- | -- |
| | 12/29/2009 | Not Accessible - Blocked | | | | |

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| Well ID | Date Measured | Casing Elevation (Feet MSL)[4] | Depth to Product (Feet BTC) | Depth to Groundwater (Feet BTC) | Product Thickness (Feet) | Groundwater Elevation [5, 6, 7] (Feet MSL) |
|---|---|---|---|---|---|---|
| RAIL LOADING-N | 11/25-26/2008 | 12.61 | -- | 6.52 | -- | 6.09 |
| | 3/6/2009 | | -- | 7.71 | -- | 4.90 |
| | 6/30/2009 | | -- | 4.02 | -- | 8.59 |
| | 9/23/2009 | | -- | 6.68 | -- | 5.93 |
| | 12/29/2009 | | -- | 5.43 | -- | 7.18 |
| | 3/24/2010 | | -- | 6.56 | -- | 6.05 |
| | 4/29/2015 | | -- | 4.45 | -- | 8.16 |

***Notes:***

1. TOC Elevation - Top of casing elevation.
2. Feet MSL = Feet above mean sea level.
3. Feet BTC = Feet below top of casing.
4. Surveyed on March 5-6, 2009 and February 11, 2011.
5. Specific gravities prior to June 2009 were specified for each individual well in historical documents.
6. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
7. Specific gravities were determined for the folowing wells: AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567)
8. -- = Not available or not applicable.
9. Monitoring wells gauged in 2003 by S&ME.
10. Monitoring wells gauged during low tide.
11. Monitoring wells gauged during high tide.
12. Product too viscous to obtain a water or LNAPL thickness measurement.
13. The FIREHOUSE well is assumed to be well AW-62 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
14. The ADMIN well is assumed to be well AW-66 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
15. The TRUCK LOADING well is assumed to be well ARW-56 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
16. Recovery Wells (RW) are also referred to as AW wells (i.e AW-53 is RW-53) based on June 3, 1997 figures by Geraghty & Miller
17. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were present using the following equation and assuming the specific gravity detailed in notes 5 through 7.

(based on back-calculations from previous reports for this project):

where:

$hw = (p_g h_g)/p_w$

water level elevation = top of casing elevation + [$h_w$ - $d_w$];

$h_w$ = depth to groundwater correction; $p_w$ = density of water

$d_w$ = depth to groundwater measuring point; $h_g$ = product thickness.

$p_g$ = density of separate-phase hydrocarbons

# APPENDIX E

MILESTONE SCHEDULE

**Axeon Savannah Terminal**

7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157077

| *Task* | *Task Name* | *Start* | *Finish* |
|---|---|---|---|
| 1 | EPD Review of VRP Application | 8/10/2015 | 8/31/2015 |
| 2 | Identification of Regulated COCs | 8/10/2015 | 2/10/2016 |
| 3 | Source Zone Soil Profile and Slug Testing | 8/10/2015 | 2/10/2016 |
| 4 | Semi Annual Progress Report | 12/1/2015 | 12/31/2020 |
| 5 | On-site Horizontal / Vertical Delineation | 9/1/2015 | 9/1/2016 |
| 6 | Off-site Horizontal / Vertical Delineation | 9/1/2015 | 9/1/2017 |
| 7 | Vapor Intrusion Pathway Evaluation | 9/1/2015 | 9/1/2016 |
| 8 | Updated CSM with Final Remediation Plan | 9/4/2017 | 3/2/2018 |
| 9 | Remedial Activities | 10/1/2015 | 12/31/2020 |
| 10 | VRP Compliance Status Report | 1/1/2021 | 3/31/2021 |

# APPENDIX F

HISTORICAL DOCUMENTATION

# VOLUNTARY REMEDIATION PROGRAM APPLICATION

**AXEON SAVANNAH TERMINAL**
**7 Foundation Drive**
**Savannah, Chatham County, Georgia**

Terracon Project No. ES157077

## Historical Documentation

This VRP Application has been prepared based, in part, on information contained in numerous historical documents provided to Terracon. Brief summaries of the historical documents are contained in the sections below. The complete documents are available for review in Appendix F.

**Report #041789-10**
Amoco Oil Company
April 20, 1989

The above-referenced document was prepared by Amoco Oil Company on April 20, 1989 to document a release notification to the Georgia Department of Natural Resources (Georgia DNR). According to the letter, "2' – 4' of oil on the groundwater at the water table in a sector of [the] tank farm" was reported to the Georgia DNR in a telephone conversation on April 17, 1989. The letter states that the release "was not the result of any particular spills, but rather the gradual accumulation of 'residual oil' over several decades." Amoco Oil Company personnel were unaware of the release prior to the first quarter of 1989.

**"Gas Hole" by Riverbank**
Internal Memorandum
October 18, 1989

The "Gas Hole" by Riverbank memorandum was prepared by an Amoco shift supervisor in October 1989 to address the pumping requirements associated with a subterranean interceptor trench designed to capture free phase petroleum liquids. The hand written document indicates that fluid levels within the "gas hole" are to be checked daily and pumped until "gasoline" is depleted.

A document dated October 4, 1988 was attached to the above-referenced memorandum. This hand written document includes two figures detailing the operation and purpose of the interceptor trench. The document states that the interceptor trench was "installed some years ago as a means of diverting underground oil from following a downhill groundwater gradient to the river." The document states that the underground oil originated from "pipeline or tank leaks, spills, ditch drainage, etc." The necessity to pump the interceptor trench on a daily basis is emphasized as oil sheens have been observed on the Savannah River.

This document also contains a hand drawn schematic of the "gas hole" prepared in 1984. This schematic indicates that the interceptor trench is approximately 175 feet in length, 10 feet in width, and houses a 36-inch perforated pipe located approximately 9 feet below grade. The interceptor trench is filled with rock to a depth of 4 feet below grade, followed by fill dirt to grade surface.

**Recovery System Operation and Maintenance**
Bechtel Environmental, Inc.
March 1991

A Recovery System Operation and Maintenance (Summarized Version) document was prepared by Bechtel Environmental, Inc. in March 1991 for Amoco Oil Company. This document indicates that an active recovery system consisting of eight (8) recovery wells was initiated in November 1990. Fluids recovered from the recovery wells were transported to a temporary holding tank (Tank 50) via 3,500 feet of collector piping. The recovery system consisted of a total fluids pump, Bellows Liquid Level Control (BLLC), a remote valve assembly, and a control panel. The system was pneumatically operated using instrument air supplied to the control panels and plant air to the pumps. Although map quality is poor, it appears that the recovery wells were generally located within the northern portion of the tank farm and adjacent to the building structures.

**Estimated Areal Extent – Free Product Plumes**
Westinghouse Environmental and Geotechnical Services, Inc.
October 31, 1991

Westinghouse Environmental and Geotechnical Services, Inc. revised a drawing by Bechtel Environmental, Inc. to show the estimated extent of free product plumes based on May, June, and October 1991 measurements. This map identifies two separate plumes based on composition of the LNAPL body. Plume 1 encompasses the majority of the tank farm and appears to extend to the Savannah River. The plume is reportedly comprised of light gasoline, naptha with gasoline, crude oil, and some #6 fuel oil. Plume 2 is limited as compared with Plume 1 and consists primarily of diesel fuel. The map indicates that four hydrogeological cross sections were prepared; however, as of the date of this report, these cross section documents have not been located.

**Report of Site Evaluation and Remedial Alternatives Evaluation**
Geraghty & Miller, Inc.
August 16, 1995

A Report of Site Evaluation and Remedial Alternatives Evaluation was prepared by Geraghty & Miller, Inc. on August 16, 1995 for CITGO Asphalt Refining Company. As part of field activities associated with the preparation of this report, a total of 34 borings were installed throughout the site. Total depths of the borings ranged from 16 feet to 24 feet below grade. Five of the borings were converted to 4-inch diameter permanent monitoring wells. These wells (AW-66, AW-67, AW-68, AW-69, and AW-70) were installed with 15-foot long 0.010-slotted screens to total depths of 17 feet to 18 feet below grade.

Based on geologic logs prepared for the 1995 report, the general stratigraphic section consisted of thin silty-sandy silt at the surface, silty sands, clayey sands, and sandy clays from 0.5 feet to approximately 13 feet below grade, and silty sand to fine to coarse sand to total boring depth. Utilizing data from previous pumping tests, the hydraulic conductivity of the predominately sandy soils was determined to be approximately 30 feet per day (0.011 cm/sec).

The report indicates that the depth to groundwater is relatively shallow at the site and ranges from approximately 2 feet to 5 feet below grade. Groundwater levels are tidally influenced and daily fluctuation may be as much as one foot to two feet near the Savannah River. Seasonal fluctuations are reported to be as much as five feet. Based on groundwater data collected on November 5, 1994, the groundwater flow direction at the site is north-northeast towards the Savannah River with an overall hydraulic gradient of 0.0063 ft/ft.

**Poly Wall Location Map**
Horizontal Technologies, Inc.
January 1996

A map dated January 1996 by Horizontal Technologies, Inc. indicates the orientation of a 40-mil high-density polyethylene (HDPE) poly wall located along the downgradient edge of the site. The poly wall is reported to be a total of 1,500 feet in length and installed to a depth of approximately 20 feet below grade. The poly wall was installed in 1996 to prevent the migration of LNAPL into the Savannah River.

**Water Elevation/Hydrocarbon Thickness Monitoring Report**
S&ME, Inc.
October 31, 2003

A Water Elevation/Hydrocarbon Thickness Monitoring Report was prepared by S&ME, Inc. on October 31, 2003 for CITGO Asphalt Refining Co. Groundwater and product levels were measured in 38 monitoring wells at the site on October 2, 2003. The data indicated that LNAPL exists under a portion of the facility, primarily under the northeast section of the aboveground storage tank farm. The greatest LNAPL thicknesses were measured in AW-54 (10.70 feet) and AW-51 (7.76 feet).

LNAPL samples were collected from wells AW-10, AW-11, AW-15, AW-22, AW-51, AW-54 and submitted to Friedman & Bruya, Inc. of Seattle, Washington for fingerprinting analysis. The results were generally consistent for four of the six samples, indicating a mixture of light and middle distillates with varying degrees of weathering. One sample (AW-15) indicated only the presence of light distillates. The sample from AW-54 indicated the presence of only middle distillates such as diesel fuel or #2 fuel oil. The results of fingerprinting analysis are contained in the referenced report.

**Permit to Use Groundwater**
Georgia Environmental Protection Division
December 30, 2008

A Permit to Use Groundwater (Permit Number 025-0012) was issued to NuStar Asphalt Refining, LLC on December 30, 2008. The permit was issued to withdraw 0.100 million gallons per day (MGD) monthly average and 0.010 MGD annual average from one groundwater well on-site (USGS Well ID 36Q333). According to the permit, groundwater is withdrawn from the upper Floridan aquifer "for the purpose of a consumptive use as central water supply, cooling water, and process water for boiler feed water." The permit is set to expire on December 31, 2017.

**January through July 2009 Field Work Summary**
Conestoga-Rovers & Associates
November 10, 2009

Conestoga-Rovers & Associates (CRA) performed various field activities at the then NuStar Asphalt Refinery from January 2009 through July 2009. Field activities included the installation of seven groundwater monitoring/remediation wells, rehabilitation of nine existing wells, quarterly site fluid level measurements (March 2009 and June 2009), and the initial phases of a LNAPL recovery plan.

CRA attempted to use ground-penetrating radar (GPR) in an effort to clarify the location of the poly wall barrier. The attempt proved unsuccessful and a vacuum-assisted air-knife truck was utilized. Two trenches were created by removing soils to an approximate depth of 6 feet below grade; however, the poly wall was not located in either trench. The poly was located north of well AW-70 where approximately 9 feet of material was exposed and southeast of AW-65 at the fence line where a small portion was exposed.

Monitoring/recovery wells AW-68 through AW-74 were installed on February 17, 2009 through February 20, 2009 along the plant north side of the site near the Savannah River. All wells were constructed utilizing a 4-inch diameter, 0.020-slotted PVC screen from 5 feet to 20 feet below grade. No soil or groundwater samples were collected during well installation activities.

Well rehabilitation was performed on eight of the existing monitoring wells (AW-9, AW-11, AW-12, AW-13, AW-22, AW-67, AW-51, AW-65). Rehabilitation activities included extracting all of the fluids from the well using a vacuum extraction truck and scrubbing the well screen with a wire brush. The purpose of the rehabilitation was to free trapped sediment and LNAPL from the screen and well casing to allow for better extraction and fluid measurements during future monitoring and remediation events.

A continuous fluid level monitoring program was conducted from May 21, 2009 through May 26, 2009 within AW-67 (adjacent to the Savannah River), AW-73 (approximately 450 feet inland from the Savannah River), and AW-44 (approximately 1,500 feet inland from the Savannah River). Data from the Fort Pulaski monitoring station (approximately 18 miles downstream from the site) indicated that there are two tidal cycles per day and each cycle has an approximate 12-hour duration. The magnitude of the tide (high to low tide) is approximately seven feet to nine feet in the vicinity of the site.

Data compiled by the fluid level monitoring program indicated that for AW-67 (adjacent to the Savannah River) the tidally induced change in groundwater levels (high to low tide) was approximately three feet to six feet over each of the approximate 6-hour high to low tide cycles. At monitoring wells AW-73 and AW-44 located further inland, the tidally-induced change in groundwater levels was approximately 0.5 feet. The time delay between high tide (at the site) and peak groundwater levels at AW-67 (adjacent to the Savannah River) was approximately 2 hours to 2.25 hours. The time delay between low tide (at the site) and low groundwater levels at AW-67 was approximately 1.75 hours. Further inland, the time delay for high tide and low tide was approximately 0.5 hours.

Bail-down tests were performed on wells AW-9, AW-11, AW-12, AW-51, AW-65, AW-68, and AW-74. The observed recharge rates were too rapid to permit any meaningful graphical interpretation that would allow the estimation of LNAPL transmissivity and potential recovery rates.

On June 29, 2009, product samples were collected from AW-12, AW-13, AW-51, AW-65, and AW-68 to be analyzed for viscosity and specific gravity. The results from AW-12, AW-51, AW-65, and AW-68 were relatively similar, indicating specific gravity and viscosity values consistent with diesel-range LNAPL. The average LNAPL specific gravity at the site (with the exception of AW-13) is 0.854. The specific gravity of the product within AW-13 was determined to be 1.0826. The LNAPL in AW-13 is much more viscous than the LNAPL in other wells at the site and is consistent with #6 fuel oil and/or crude oils.

**Groundwater and LNAPL Gauging Event**
Ash Creek Associates, Inc.
September 7, 2010

A Groundwater and LNAPL Gauging Event for the first quarter of 2010 was prepared by Ash Creek Associates, Inc. for NuStar Terminals Operation Partnership L.P. Based on data collected during this event, groundwater elevations ranged from 2.58 feet below mean sea level (AW-62) adjacent to the Savannah River to 6.60 feet above mean sea level (AW-28) within the northeastern potion of the facility. The groundwater flow direction was determined to be from southwest to northeast towards the Savannah River. Evidence of groundwater mounding upgradient of the poly wall barrier was not observed. LNAPL thicknesses measured during the first quarter 2010 monitoring event were consistent with historical data. Thicknesses ranged from 0.09 feet (AW-37) to 10.10 feet (AW-51).

**Well Installation, SPH Gauging, and Remedial Options Evaluation Report**
Apex Companies, LLC
August 8, 2012

On August 8, 2012, Apex Companies, LLC submitted a report detailing monitoring well installation and decommissioning activities, LNAPL gauging, and bail-down tests completed at the site between December 2010 and January 2012. These activities were conducted to evaluate the need and potential options for LNAPL removal.

In April 2010, a petroleum sheen was observed on the Savannah River in the vicinity of the oil/water separator outfall. Initial response cleanup was performed by Moran Environmental Recovery, LLC (Moran) of Savannah, Georgia. Two containment booms and an oil-absorbent boom were deployed. The oil-absorbent boom spanned the area between the embankment southeast the firehouse and the northwestern corner of the dock. Collected petroleum impact water was transferred to a temporary storage tank on-site.

Winter Environmental (Winter) observed and documented assessment of the sheen and cleanup efforts. The petroleum sheen was analyzed and submitted for fingerprinting analysis. The analytical results indicated that the product on the Savannah River did not match product at the facility. The source of the sheen was never determined by the United States Coast Guard.

Monitoring wells AW-75 through AW-79 were installed along the waterfront to further evaluate the extent of LNAPL near the Savannah River. The lithology of the borings generally consisted of silty sand and sand with occasional lenses of clay to approximately 20 feet below grade. LNAPL was not detected within the newly installed monitoring wells shortly after installation.

Multiple bail-down tests were conducted on select monitoring wells during the study period. LNAPL thicknesses in the formation were estimated at approximately 0.1 foot and sustainable LNAPL recovery rates were estimated to range between 0.1 and 0.6 gallons per day

**Draft Remedial Design Report**
Apex Companies, LLC
June 14, 2013

A Draft Remedial Design Report (dated June 14, 2013) was prepared by Apex Companies, LLC for NuStar Asphalt Refining, LLC. The draft remedial design consisted of the installation and operation of 26 belt skimmers within recovery wells located along the water front area of the site. Apex Companies, LLC estimated that long-term operation of the belt skimmer system would recover LNAPL from a radius of approximately 20 feet around each recovery well. Extraction points were spaced at 40-foot intervals on the south side of the poly wall and three belt skimmers were proposed in the vicinity of downgradient well AW-62. This draft remedial design was not implemented at the site.

**Free Product Survey of Existing Monitoring Wells**
Terracon Consultants, Inc.
May 28, 2015

Terracon Consultants, Inc. (Terracon) conducted a well gauging event on April 27, 2015 through May 1, 2015. Fifty-eight (58) existing monitoring wells were located and gauged for depth to water and depth to product if applicable. LNAPL was detected in twenty-seven (27) monitoring wells. Detected LNAPL was confirmed and sampled utilizing dedicated, disposable bailers. Collected samples were delivered to the on-site laboratory for analysis. In conjunction with Terracon's activities, Moran Environmental Recovery (MER) was contracted to remove in-well LNAPL utilizing a vacuum extraction truck as an interim corrective action measure.

During the gauging event, AW-62 located downgradient (north) of the poly wall exhibited 1.85 feet of LNAPL. Well AW-62 was initially gauged on May 1, 2015 during a time in which the Savannah River was approximately 1 foot above mean sea level. Terracon mobilized to the site on May 19, 2015 to re-gauge the well. LNAPL was detected at a thickness of 0.96 feet at a tide level of 8 feet above mean sea level,

**Monthly Free Product Measurement and Removal Summary Report**
Terracon Consultants, Inc.
July 31, 2015

Terracon initiated weekly LNAPL gauging and removal activities at the Axeon facility in June 2015. This proactive LNAPL recovery program employs an aggressive fluid vapor recovery (AFVR) process utilizing a high-flow, high-vacuum system. By employing an AFVR well head system along with a high-vacuum truck, LNAPL recovery is maximized. From June 26, 2015 through July 30, 2015, LNAPL was gauged and removed via AFVR from monitoring wells AW-5, AW-6, AW-8 through AW-15, AW-18, AW-19, AW-22, AW-45, AW-49, AW-51 through AW-57, AW-62, AW-63, AW-65, AW-74, RW-38, and RW-58. As specified by Axeon, the objective of these activities was to remove in-well LNAPL from the water column only. Recovered LNAPL was transferred to an on-site aboveground storage tank for reuse.

Amoco Oil Company
Savannah Refinery
P.O. Box 1881
Savannah, Georgia 31498
912-964-6282

R.J. Baechle
Refinery Manager

April 20, 1989

Sgt. Greenlee
Ga. DNR
Emergency Operations Center
205 Butler St.
Atlanta, Ga. 30334

Re: Report #041789-10

Dear Sir:

This letter confirms my conversation on 4-17-89 with Corporal Griffen wherein I reported the presence of 2'-4' of oil on the groundwater at the water table in a sector of our tank farm. This was not the result of any particular spills, but rather the gradual accumulation of "residual oil" over several decades.

This information was developed by a recent in-house survey by our corporate groundwater management division. We were unaware of this condition prior to the first quarter of 1989. We intend to install facilities to remove the oil after appropriate communications and approvals from the GADNR.

Corporal Griffen advised that we will be contacted by another department of the GADNR. As mentioned, I can be contacted at (912) 966-4203.

Very truly yours,

J.M. Considine
Supervisor-Materials Management,
Environmental Control & Safety

JMC/sc

cc: J.G. Huddle - MC 1203
J.E. Miller, Amoco Production
R.J. Baechle
E.B. Smith

A5-00000056

10-18-89

Shift Supervisors

Re: "Gas Hole" by Riverbank

On October 18 the gage on the "Gas Hole" (underground culvert) was 0'-9½" oil and 0'-⅝" water. The "oil" appears to be contaminated gasoline; 43.2°API, ambient flash, and a gasoline odor. The Oct 18 day shift is pumping out the "gas hole". (probably 1,000 - 2,000 gallons)

It is important that we pump the "gas hole" daily until the gasoline is depleted. (Please record the gages during this period). If the gasoline ~~and~~ isn't depleted in a few days, it can indicate a LIVE LEAK "live leak" and will need to be checked.

Instructions are being re-issued to gage the "hole" weekly. Recent gages were taken on 5/1, 5/21, 7/20, 7/30, 9/24, 10/4, and today 10/18. The other readings indicated "no oil". Whatever "happed," must have happened between 10/4 and 10/18.

Please continue surveillance of this matter and keep me informed. Thanks!

Jack C.

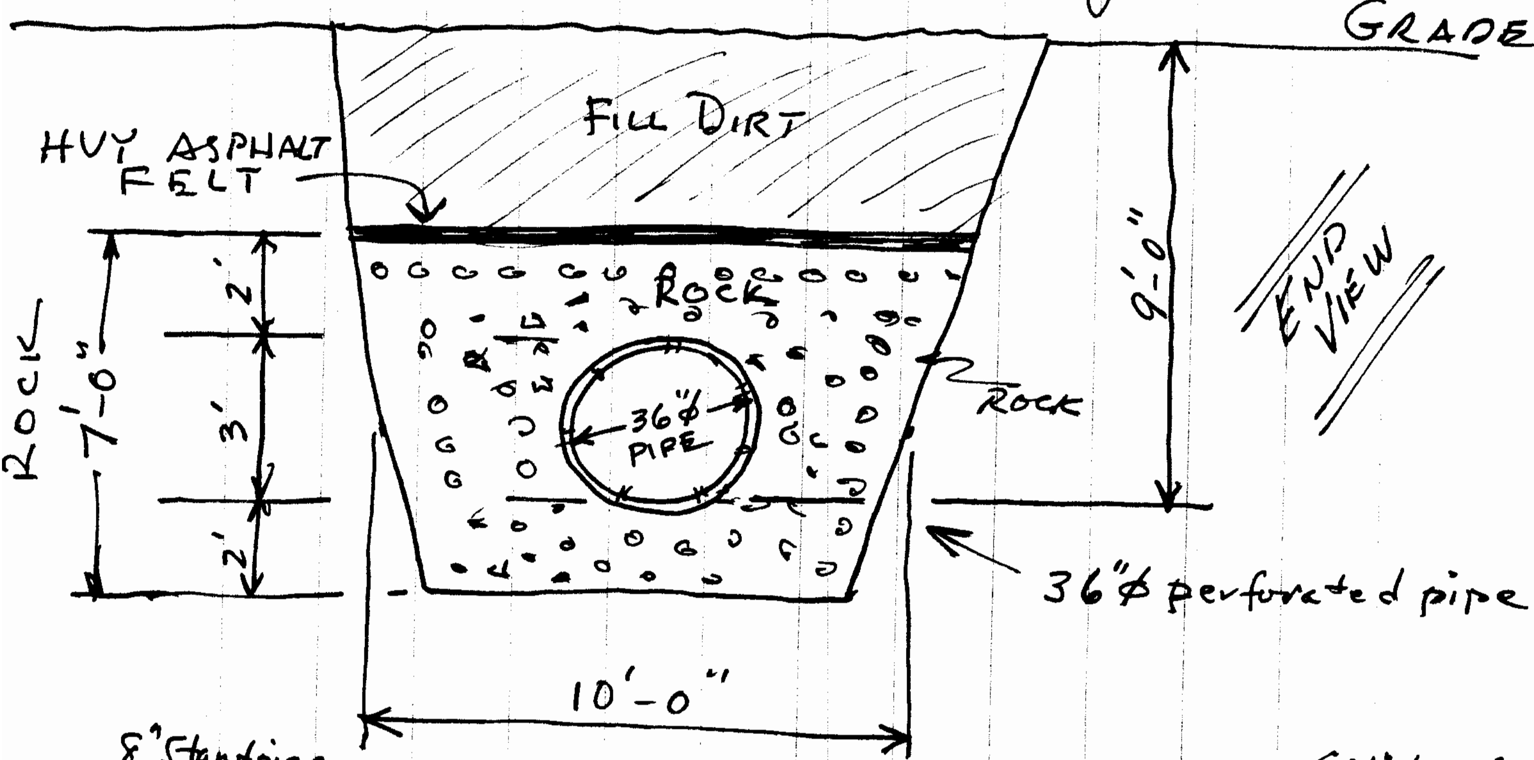
cc - EBS
- RAH
- HBW

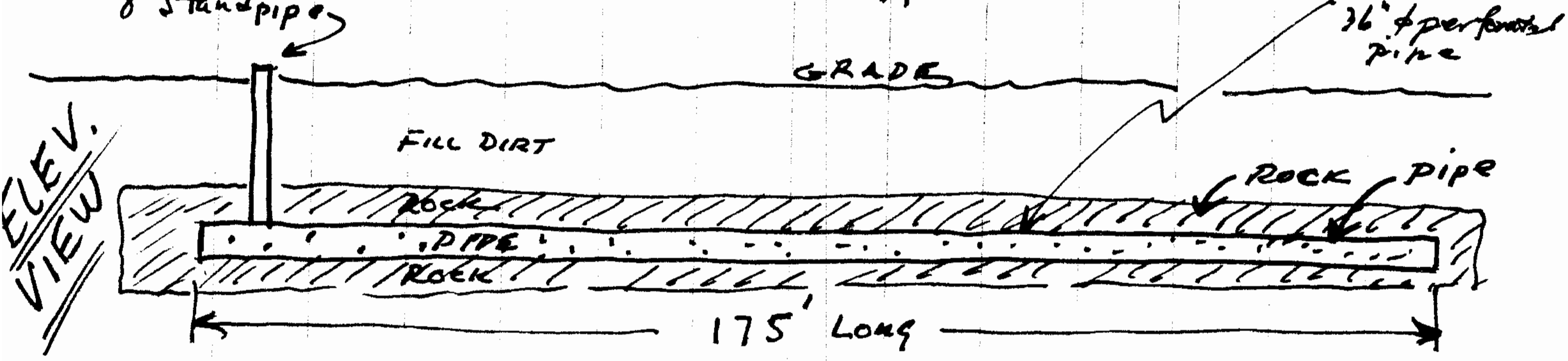
A5-00000179

FOR YOUR INFORMATION: 11-8-84

A 175' long interception culvert running parallel to river bank intercepts oil which is pumped out — and would otherwise seep thru river bank — into river

# Holding capacity of "Gas Hole"




3" Gasoline Gage in Gas Hole represents that depth of gasoline in the rock bed as well as inside the 36"∅ pipe.

$$\text{Vol.} = L \times W \times H \times 7.48 \text{ gals/cu ft.}$$

$$= 175' \times 10' \times \frac{3''}{12''} \times 7.48 = 3,272 \text{ GALLONS}$$

If rock occupies half of space, then

→ Gasoline vol. = 1600 gals ±

# "GAS HOLE" BY RIVERBANK

SHIFT SUPERVISORS
PUMPER-GAGERS
10-4-88

(THE URGENCY OF KEEPING THE OIL PUMPED OUT)

FIG. 1

GAGE OCT 4, '88
5 1/2" OIL, 2 1/2" $H_2O$

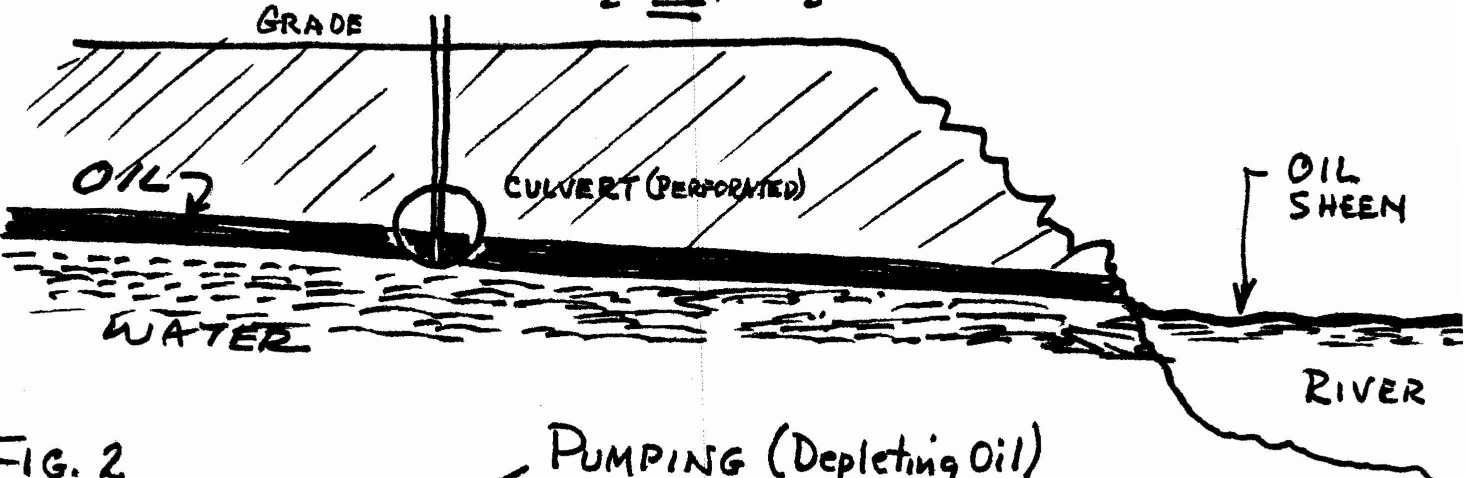
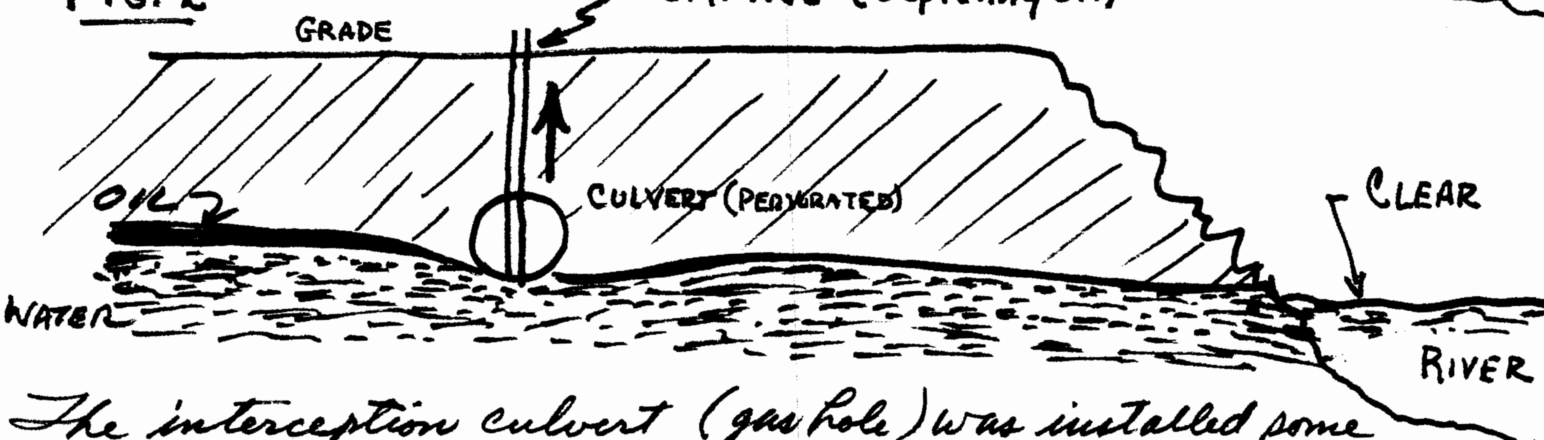



FIG. 2

PUMPING (Depleting Oil)

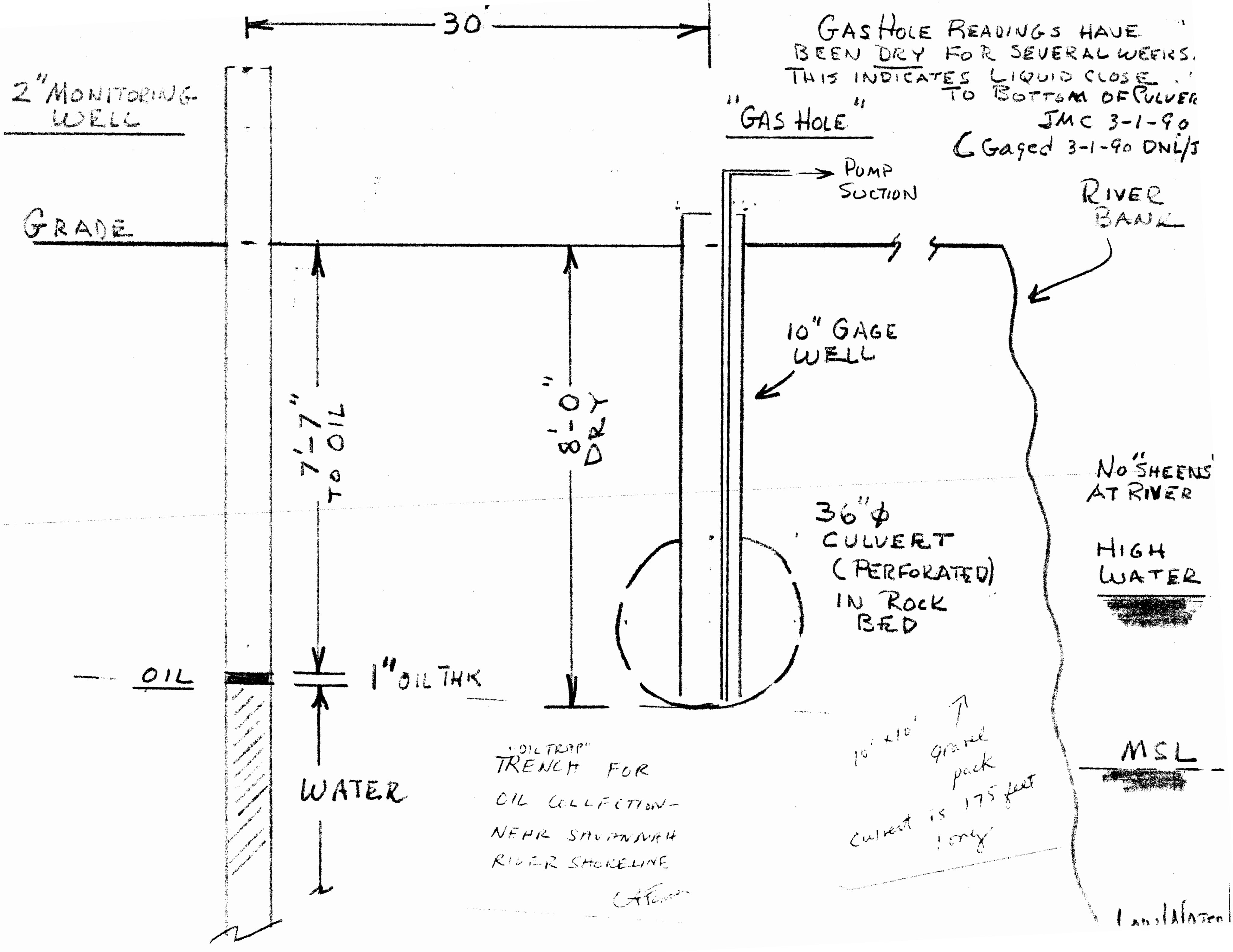



The interception culvert (gas hole) was installed some years ago as a means of diverting underground oil from following a downhill ground water gradient to the river. This underground oil originates from pipeline or tank leaks, spills, ditch drainage, etc. During prolonged periods of rain, the ground water rises and oil movement becomes more active. It is at these times that the oil level rises in the culvert (gas hole) and if it is not "pumped out," it will go to the river and form an oil sheen. This is the condition that currently exists.

This is why its so important to check the gas hole and keep it pumped out <u>every day</u> when necessary. The oil in the culvert Oct 4 is 41°API gravity, contains gasoline, and "flashes" at room temperature.

The culvert is 36"φ x 150'. 5" oil in the bottom could be 700-800 gallons oil in the pipe alone.

PLEASE GAGE AND PUMP EVERY DAY UNTIL PROBLEM UNDER CONTROL.


GAS HOLE READINGS HAVE BEEN DRY FOR SEVERAL WEEKS. THIS INDICATES LIQUID CLOSE TO BOTTOM OF CULVER
JMC 3-1-90
C Gaged 3-1-90 DNL/J
30'
2" MONITORING WELL
"GAS HOLE"
PUMP SUCTION
GRADE
RIVER BANK
10" GAGE WELL
7'-7" TO OIL
8'-0" DRY
36" ϕ CULVERT (PERFORATED) IN ROCK BED
NO "SHEENS" AT RIVER
HIGH WATER
OIL
1" OIL THK
WATER
"OIL TRAP" TRENCH FOR OIL COLLECTION - NEAR SAVANNAH RIVER SHORELINE
10' x 10' gravel pack
Culvert is 175 feet long
MSL

# RECOVERY SYSTEM OPERATION

# AND MAINTENANCE

# (SUMMARIZED VERSION)

AMOCO SAVANNAH REFINERY

SAVANNAH, GEORGIA

Prepared for

AMOCO OIL COMPANY

SAVANNAH, GEORGIA

MARCH 1991

BECHTEL ENVIRONMENTAL, INC.
HOUSTON, TEXAS

**RECOVERY SYSTEM OPERATIONS AND MAINTENANCE**

**AMOCO SAVANNAH REFINERY**

## I. Purpose

- The purpose of the recovery system is to remove petroleum product from the shallow subsurface.
- This document is a summarized version of the original document submitted to AMOCO prior to the initial startup of the system in November 1990. This summarized version should be used in conjunction with the original documents, including the operator's manual as provided by the manufacturer.
- The product to be recovered will be induced to flow to the recovery well by pumping fluids from the well. This will create a cone of depression which will allow the product to flow to the recovery well (Figure 1).

## II. System Layout

- Eight wells have been installed to recover product (see Figure 2).
- Approximately 3500 feet of collector pipe is in place to transport recovered fluids to Tank 50.
- Tank 50 serves as temporary holding tank.

## III. System Components and Operations

- A typical recovery system consists of a total fluids pump, Bellows Liquid Level Control (BLLC), remote valve assembly, and control panel. The system is pneumatically operated using instrument air supplied to the control panels, and plant air to the pumps (see Figure 3).
- The recovery system is manufactured by Ejector Systems, Inc. (ESI) and consists of the following (see Figure 4):
    - Pump inlet check valves
    - 0.81-gallon capacity vessel
    - 1/4-inch ID air line
    - 3/4-inch ID discharge line

- The BLLC (Figure 5) measures fluid level above pump inlet via bubbler line regulates air flow to the pump.

- The Remote Valve Assembly (Figure 6) regulates air flow to the BLLC and consists of:

    - Three way pilot valve
    - Bubbler regulator and gauge
    - Pump regulator and gauge

- The Control Panel (Figure 7) controls the fill cycle time and empty cycle time of the pumps. Cycle times are set in the control panel .

  The control panel activates the remote valve assembly.

## IV. System Maintenance

- System Shutdown:
  Turn on/off switch in control panel to off position

- ESI Pump:
  Pull and inspect every six months, inspect check valves and all hose connections for wear.

- BLLC:
  Inspect air line connections and vent valve for bleeding air on a weekly basis. Bleeding air during discharge cycle indicates warm or damage diaphragm in the vent valve.

- Remote Valve Assembly:
  Observe pressure readings on pump and bubbler gauges weekly. Pump pressures should range form 30 to 50 PSI. Bubbler pressure should range from 8 to 12. Inspect air line connections for leaks.

- Control Panel:
  Observe pressure readings on ejector (pilot) (F) and control (G) gauges weekly. Ejector pressure should range from 50 to 60 PSI. Control pressure should range from 50 to 60 PSI. If control panel does not cycle, the pneumatic relay switch may need lubricating. Inspect air connections for leaks.

- Flow Meter:
  Check operation of meter for rate and volume readings weekly.

- Wench Assembly:
  Lubricate with WD-40 or equivalent on monthly basis.

- Toll free telephone number for Ejector Systems, Inc. is **1-800-OIL-LEAK.**

FIGURES

# THEORY OF RECOVERY

The recovery of contaminants from groundwater requires the installation of a recovery well. The diameter and depth of the recovery well are determined following an analysis of site geology and nature of contamination.

Contaminants are induced to flow into the recovery well by pumping water to create a cone of depression. The size of the cone, defined by the radius of influence and the drawdown, depends on the hydraulic conductivity and corresponding pumping rate. The established cone of depression and resulting hydraulic gradient cause product and contaminated water to flow into the recovery well where they can be removed by pumping.

An ESI total fluids ejector allows the user to pump drawdown water and immiscible hydrocarbon with a single pump. Compressed air gently displaces the oil and water, resulting in no emulsification and quick and efficient topside separation.

The effluent from the total fluids ejector is typically pumped to a gravity oil/water separator where product is collected and stored for disposal or resale.

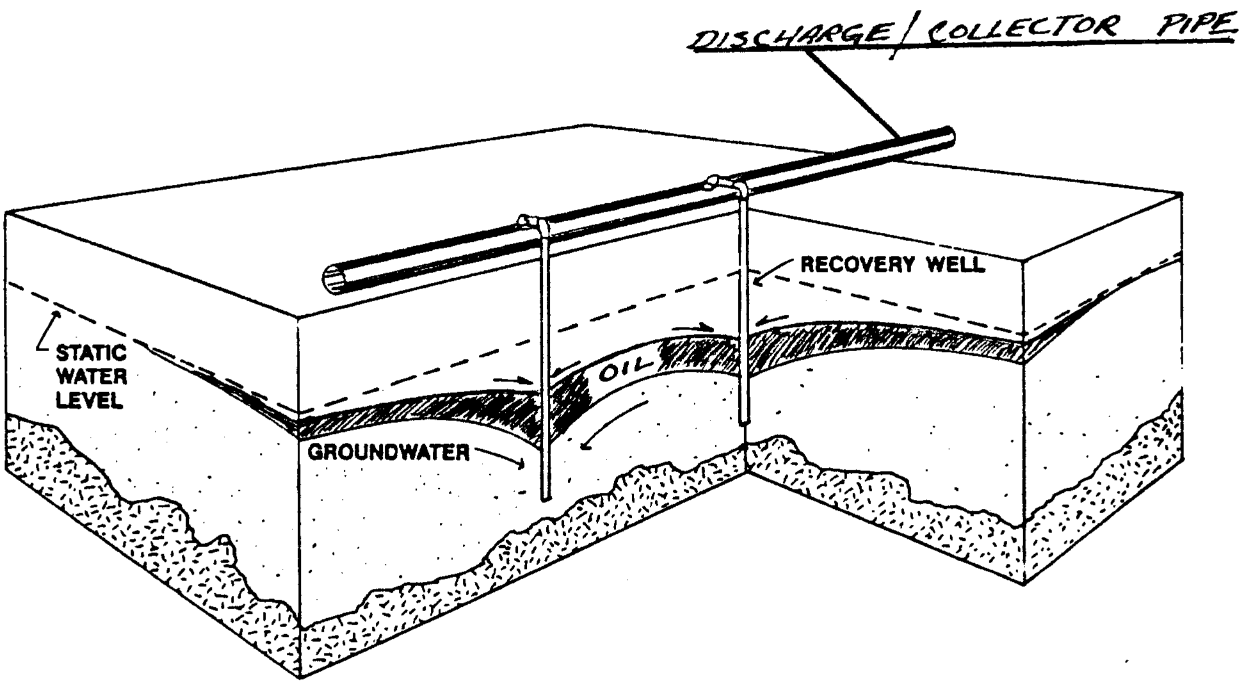
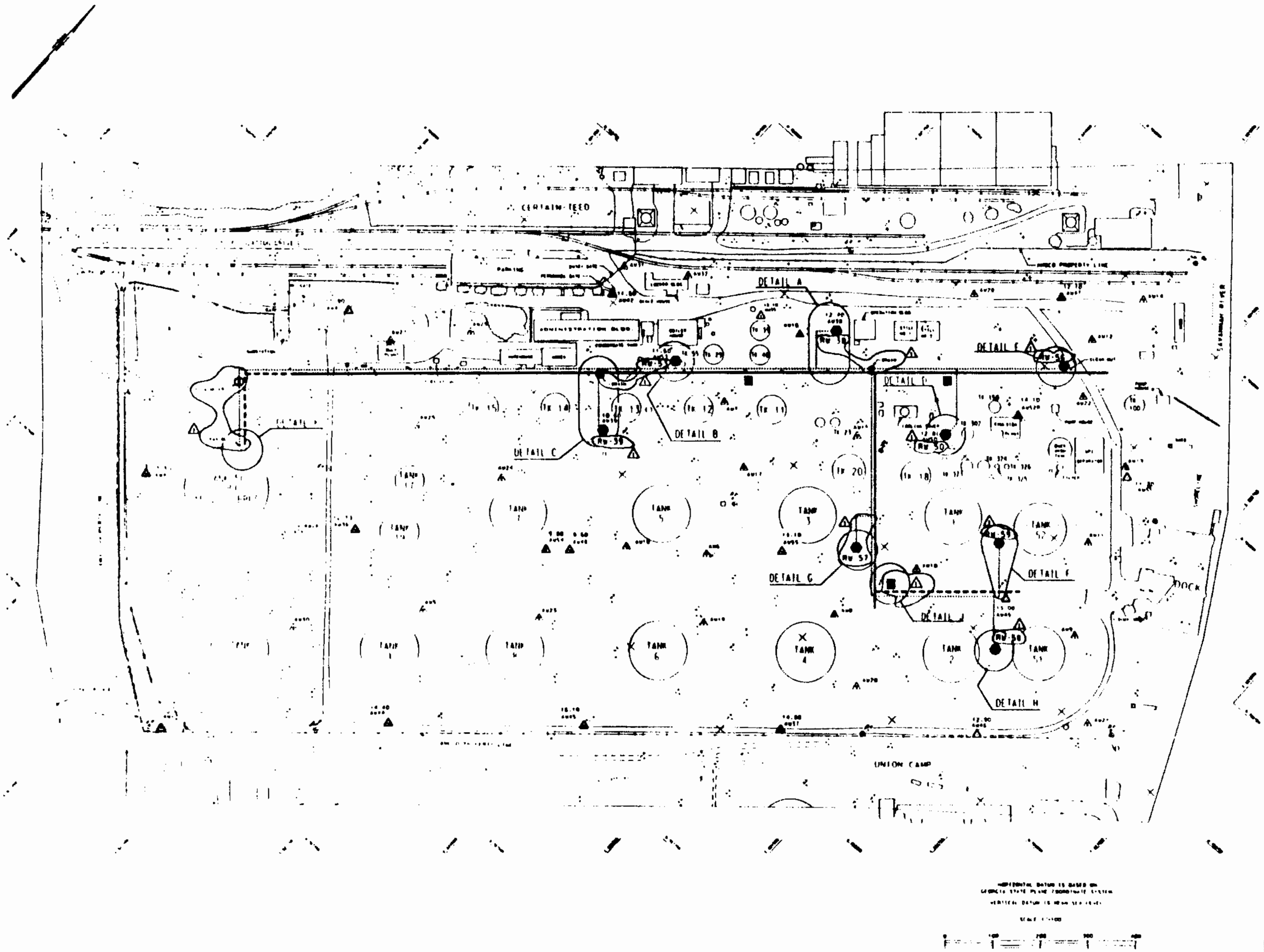



FIGURE 1




## GENERAL NOTES

1. HEADER AND BRANCH PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS
2. CLEAN OUT AND DRAIN FITTINGS SHALL BE PROVIDED AS SPECIFIED AND AS DIRECTED BY BECHTEL.
3. PRIOR TO AND DURING START-UP AND ACTUAL OPERATION, THE CLEAN-OUTS, VALVES, ETC SHALL BE OPENED AND /OR CLOSED AS APPROPRIATE TO PROVIDE EFFICIENT OPERATION OF THE SYSTEM.

## LEGEND

- EXISTING 4" RECOVERY WELLS
- EXISTING 4" MONITORING WELLS
- CONTROL PANEL
- EXISTING PIPERACK
- EXISTING SLEEPERS
- HEADER / BRANCH PIPE SYSTEM

| | | | |
|---|---|---|---|
| 1 | | AS BUILT | |
| 0 | 10/90 | ISSUED FOR CONSTRUCTION | SIGNATURES ON F |

SCALE 1"=100' ED TRUJILLO D. BRUFFY

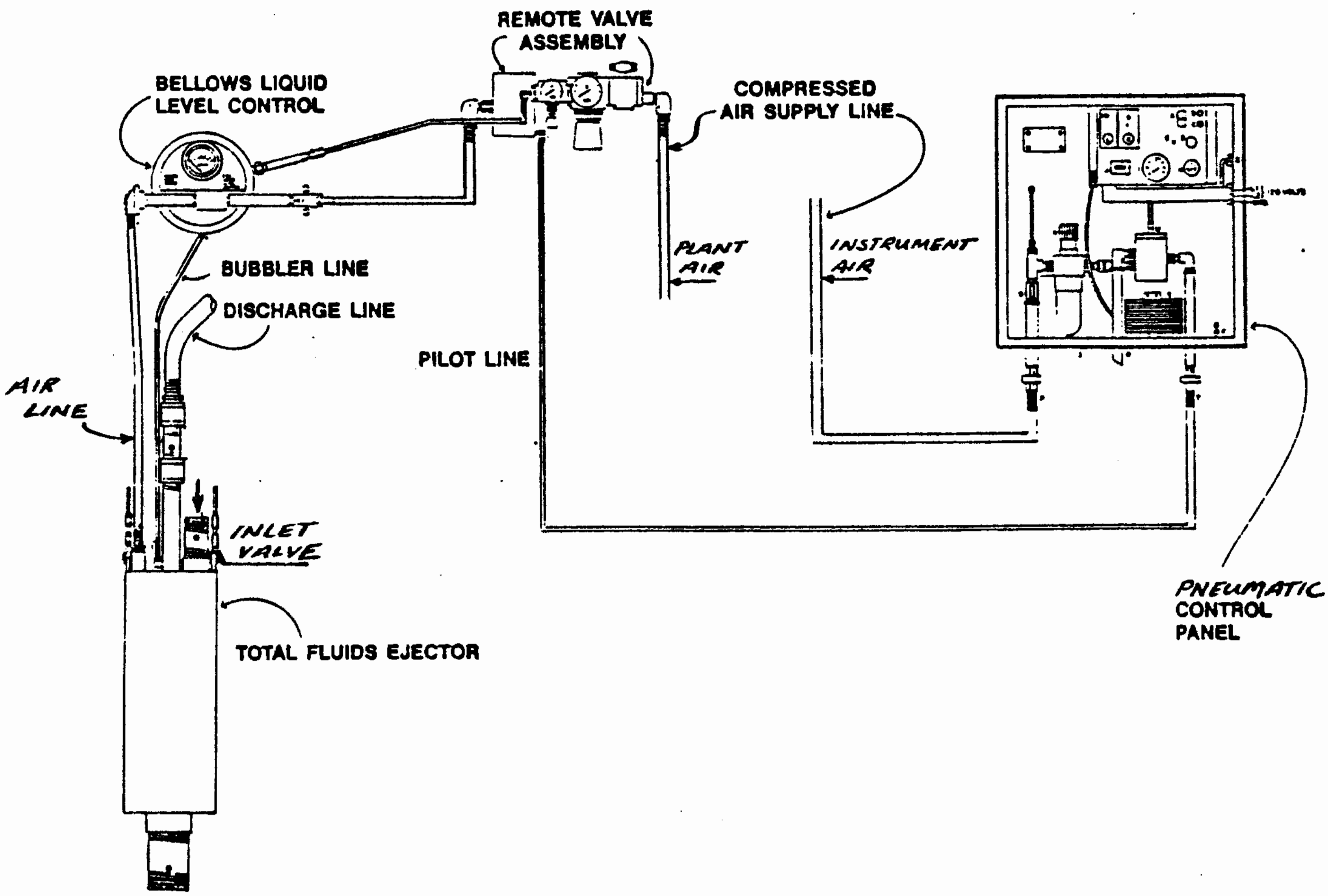
BECHTEL ENVIRONMENTAL, INC.
HOUSTON

AMOCO OIL COMPANY
SAVANNAH, GEORGIA

RECOVERY / MONITORING WELL LOCATION PLAN

| JOB No. | DRAWING No. |
|---|---|
| 20785 | SK-20785-01 |

FIGURE 2




**ESI TOTAL FLUIDS SYSTEM WITH REMOTE VALVE ASSEMBLY**

FIGURE 3

## EJECTOR OPERATION

The ejector operates cyclically. The ejector cycle consists of two phases, a fill/vent cycle (off-time) and an empty/discharge cycle (on-time).

In figure 1, air valve is "off," allowing the vessel to vent air, through line B, and fill through valves A. Valve C is kept closed by back pressure from discharge line.

As the air valve switches in figure 2, the vessel is pressurized through air line B. Valves A are forced closed as C opens and the vessel quickly empties.

As the vessel is emptied in figure 3, the air valve once again turns "off," and vents the vessel. Back pressure immediately closes C, and valves A open to fill as the cycle repeats.

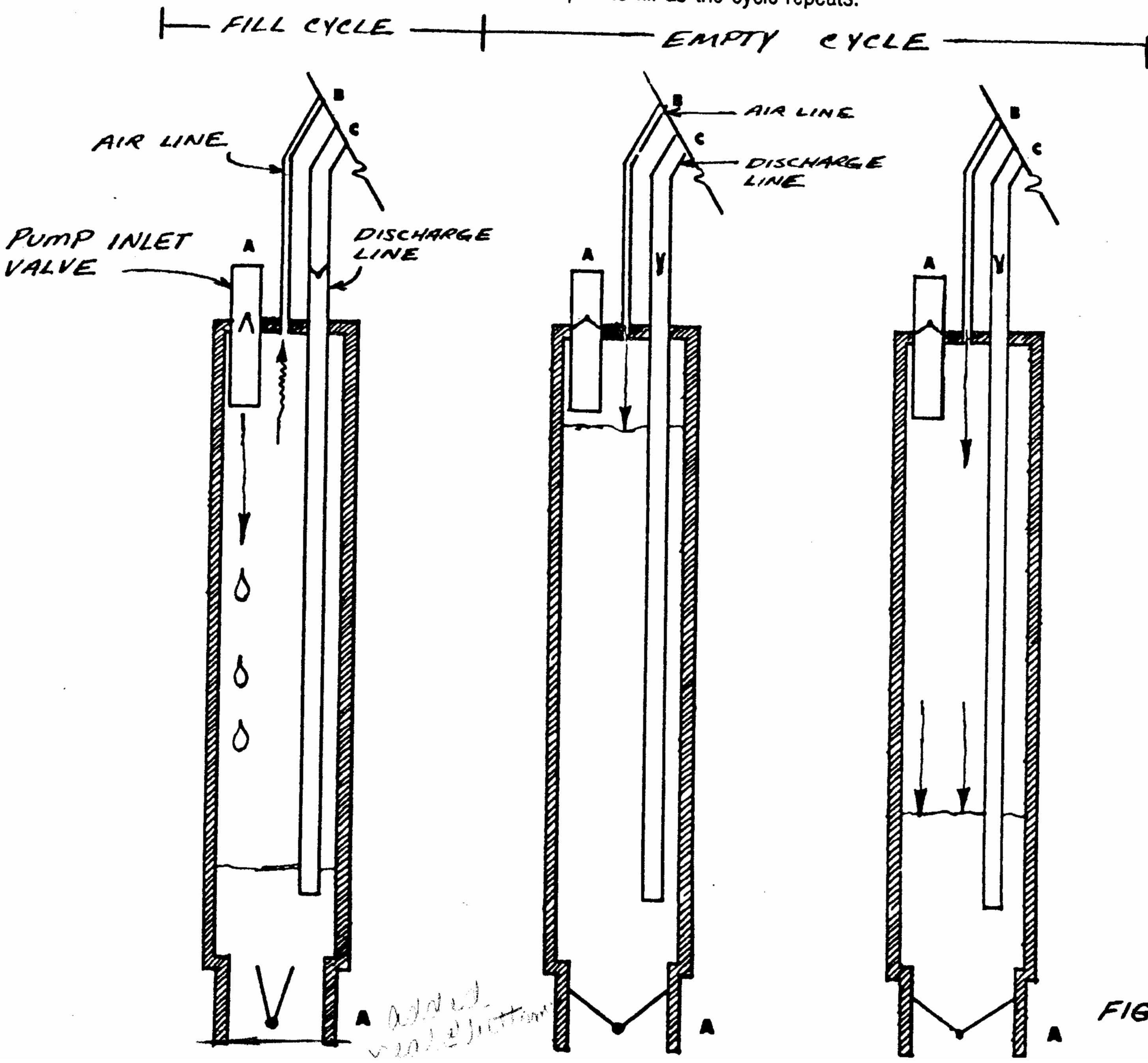



FIGURE 4

# BELLOWS LIQUID LEVEL CONTROL/VENT VALVE

The Bellows Liquid Level Control (BLLC) throttles the ejector pumping rate by restricting the high pressure air supply from the timer-controlled air valve, resulting in precise control of the well level with respect to the bubbler line location.

The BLLC is actuated by a change in back pressure in the bubbler line. When the liquid level over the bubbler line is sufficient, the pump will operate at full capacity as dictated by the control panel. As the liquid level in the well drops, the bubbler line will sense a decreased submergence level, resulting in a partial or complete restriction in the high pressure air line to the pump.

Well level is measured via the bubbler line and submergence is indicated on integral inches over intake gauge (0–60" water column). Typically, the well level will be maintained between 3"–7" over the end of the bubbler line.

In most cases, the bubbler line is attached 3/8" from the top of the ejector (see "Vacuum Fill Unit" and "Top Fill Ejector" for exceptions).

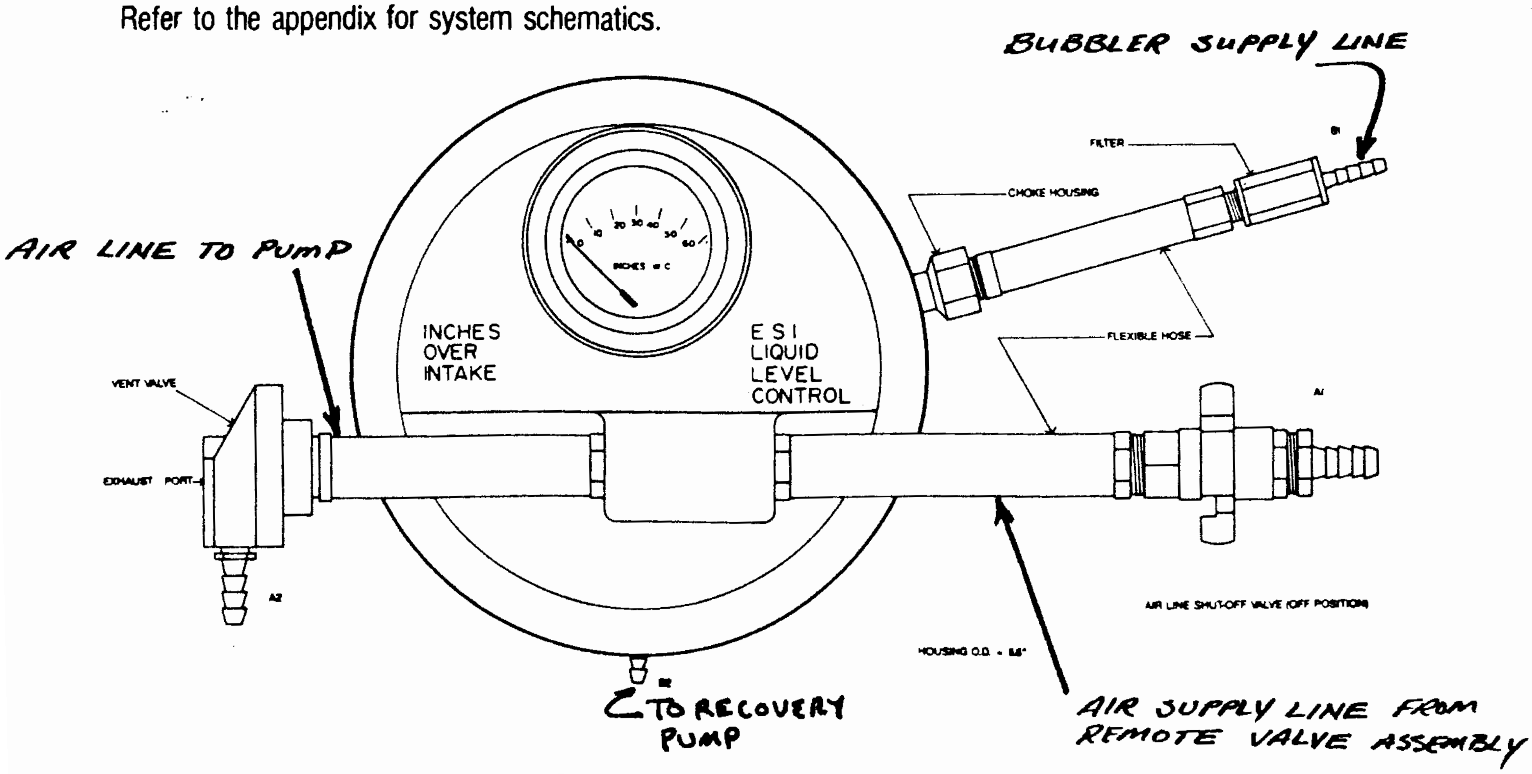
In multiple-well systems, Bellows Liquid Level Controls are located remote at each well head and act independently of one another.

The Bellows Liquid Level Control should be mounted so that the face of the level gauge is approximately vertical.

Air displaced during the fill cycle flows out the exhaust port of the vent valve.

At or near shut-off, small volumes of air may flow out the vent valve exhaust port during the discharge cycle.

Refer to the appendix for system schematics.




BUBBLER LINE CONNECTIONS
B1 SUPPLY (FROM CONTROL PANEL OR REMOTE VALVE)
B2 OUTPUT (TO EJECTOR)
AIR LINE CONNECTIONS
A1 SUPPLY (FROM CONTROL PANEL OR REMOTE VALVE)
A2 OUTPUT (TO EJECTOR)

FIGURE 5

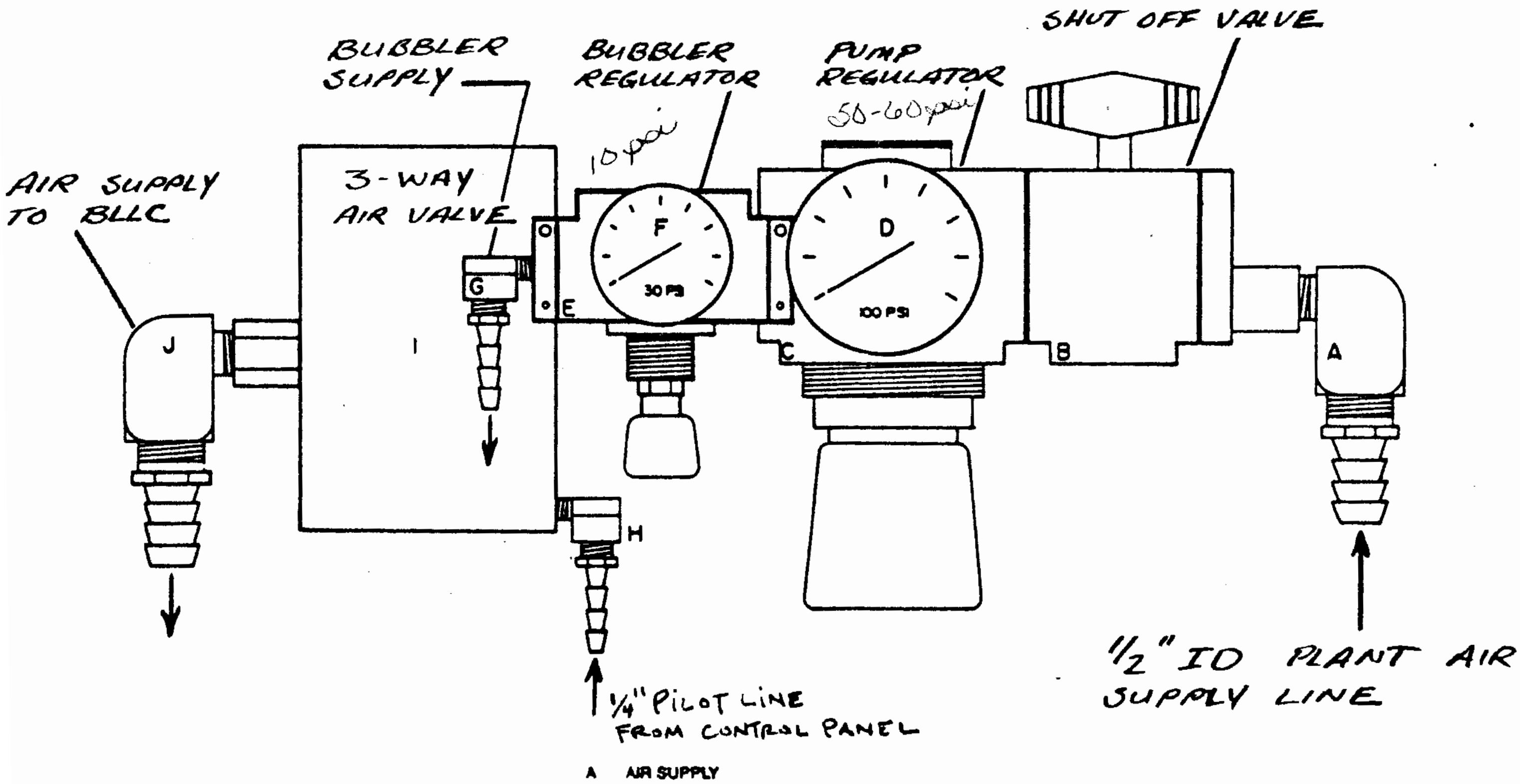
# REMOTE VALVE ASSEMBLY

A remote valve assembly consists of a three-way pilot actuated air valve, bubbler pressure regulator, ejector pressure regulator, and shut-off valve.

It is employed to reduce air consumption, increase control distance, and simplify the multiple-well balancing process. Remote valves can easily be retrofitted on existing systems.

An air source line (1/2" I.D., nominal) is run to each well along with a 1/4" pilot line originating from the main air valve in the control panel (see pages 37 and 38). Since the bubbler supply is generated at the remote valve, set the bubbler regulator in the control panel to 0 psig. Supply pressure recommendations are discussed in the control panel sections. Ejector pressure settings are discussed in the start-up section.

Start-up proceeds essentially as outlined in preceding sections with the exception that multiple-well balancing is accomplished by varying the ejector pressure from well-to-well. although the globe valves may still require some adjustment. The ejector pressure regulator in the control panel should be set at a pressure equal to the highest remote valve ejector pressure.



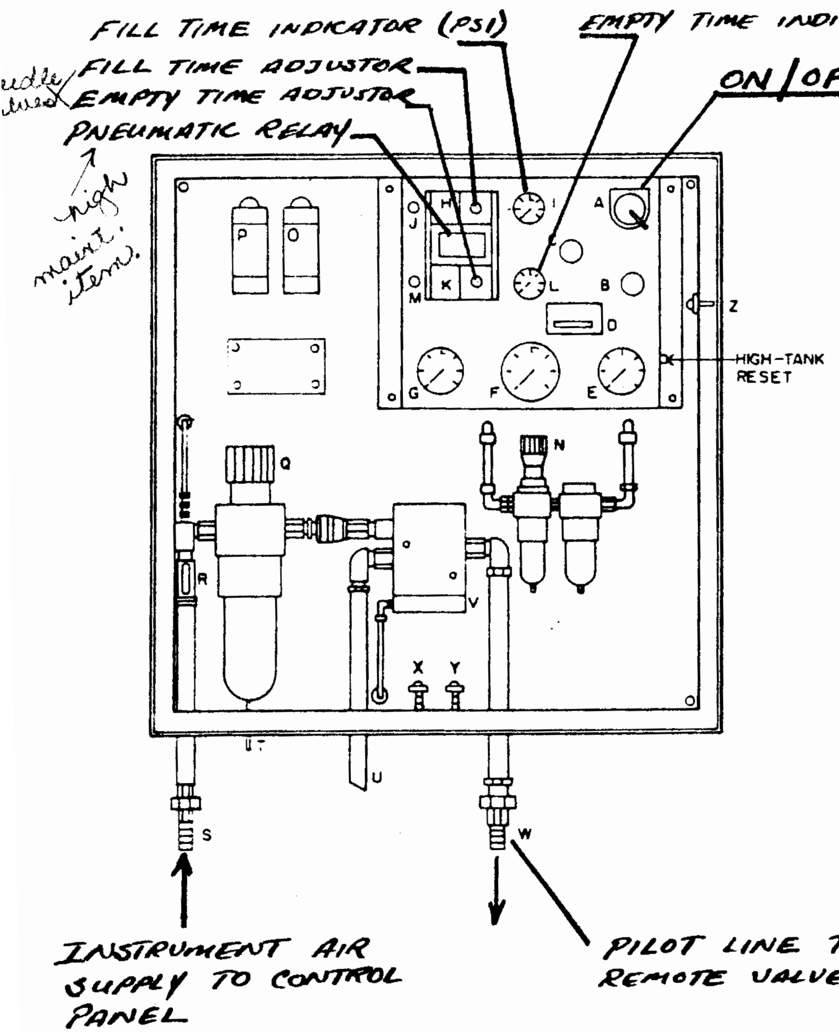

A AIR SUPPLY
B SHUT-OFF VALVE
C EJECTOR PRESSURE REGULATOR
D EJECTOR PRESSURE GAUGE
E REGULATOR (BUBBLER)
F BUBBLER PRESSURE GAUGE
G BUBBLER SUPPLY
H PILOT SIGNAL (FROM MAIN AIR VALVE)
I 3-WAY AIR VALVE
J EJECTOR AIR SUPPLY (TO BELLOWS)

FIGURE 6

# PNEUMATIC CONTROL PANEL

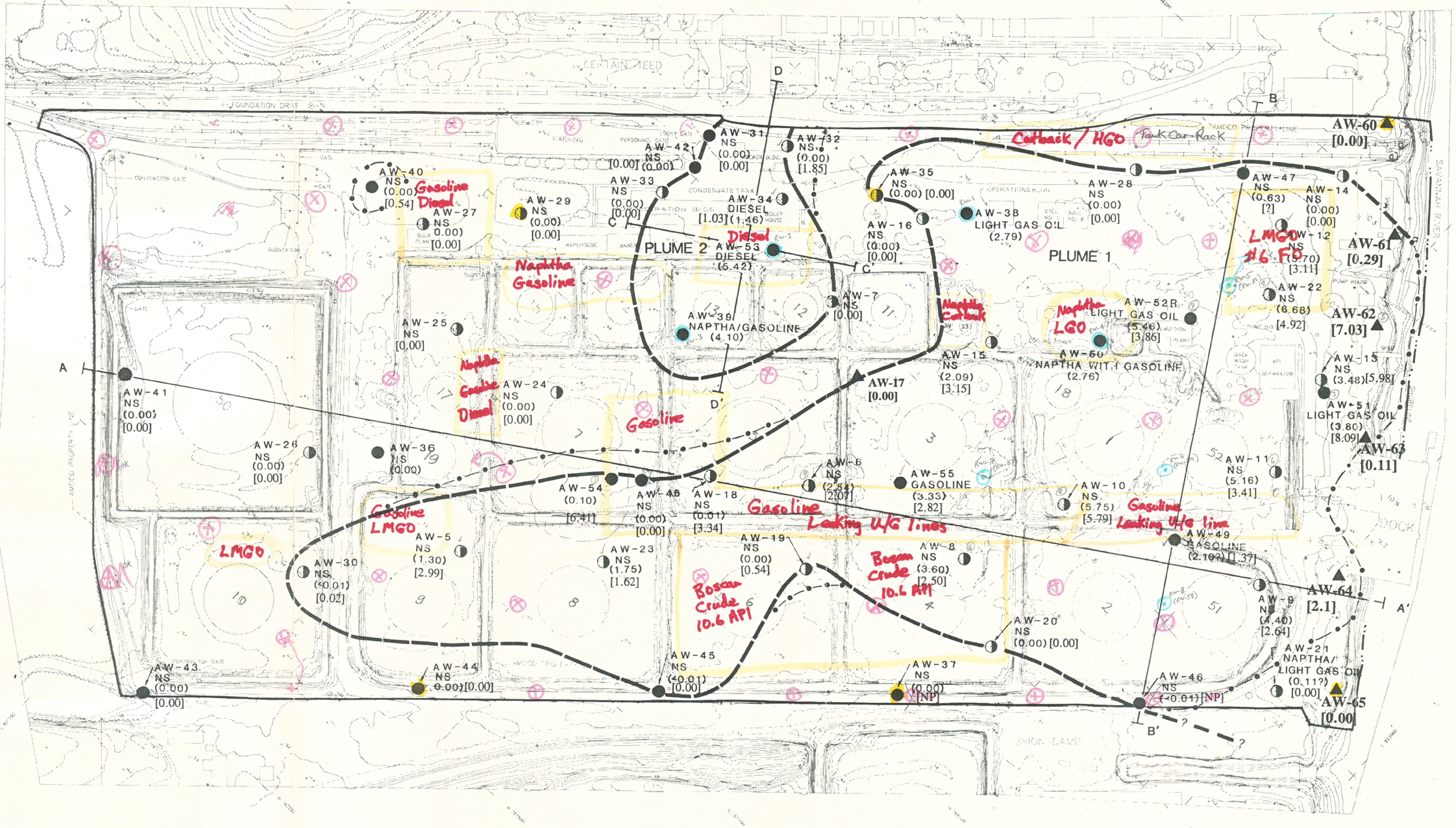
The input to the pneumatic control panel is a single air supply line. Incoming air should be supplied at a minimum pressure of total head + 30 psig or 55 psig, whichever is greater. Maximum permissible supply pressure is 175 psig. Nominal air supply line size is 0.5" I.D.

The ejector air supply line is typically 0.5" I.D., and the bubbler supply line is 0.25" I.D. (see "Remote Valve Assembly" for exceptions).




| | |
|---|---|
| A | ON/OFF PNEUMATIC SWITCH |
| B | BUBBLER PRESSURE REGULATOR |
| C | RED (FILL) — GREEN (EMPTY) INDICATOR |
| D | CYCLE COUNTER |
| E | BUBBLER PRESSURE GAUGE |
| F | EJECTOR PRESSURE GAUGE |
| G | CONTROL PRESSURE GAUGE |
| H | FILL TIMER |
| I | FILL TIME INDICATOR GAUGE 7 P.S.I. TRIP |
| J | FILL TIME MOMENTARY SWITCH |
| K | EMPTY TIMER |
| L | EMPTY TIME INDICATOR GAUGE 7 P.S.I. TRIP |
| M | EMPTY TIME MOMENTARY SWITCH |
| N | CONTROL PRESSURE REGULATOR |
| O | CONTROL VOLUME CHAMBER |
| P | OFF TIME VOLUME CHAMBER |
| Q | EJECTOR PRESSURE REGULATOR |
| R | SUPPLY PRESSURE SHUT-OFF VALVE |
| S | AIR SUPPLY |
| T | CONDENSATE DRAIN |
| U | VENT LINE |
| V | MAIN AIR VALVE |
| W | COMPRESSED AIR OUTPUT |
| X | BUBBLER SUPPLY |
| Y | SUPPLY — PORT P I/R — HIGH-TANK PROBE |
| Z | RETURN — PORT A — HIGH-TANK PROBE |

FIGURE 7




## EXPLANATION

AW-55 GASOLINE (3.33) — GROUND-WATER MONITORING WELL WITH PREDOMINANT FREE PRODUCT TYPE DETECTED IN SAMPLE COLLECTED 5/30/90 AND CORRESPONDING PRODUCT THICKNESS, IN FEET

AW-34 DIESEL (1.46) — PIEZOMETER WITH PREDOMINANT FREE PRODUCT TYPE DETECTED IN SAMPLE COLLECTED 5/30/90 WITH CORRESPONDING PRODUCT THICKNESS, IN FEET

AW-41, AW-22 NS (0.00) — GROUND-WATER MONITORING WELL OR PIEZOMETER NOT SAMPLED ON 5/30/90 WITH PRODUCT THICKNESS MEASURED 6/3/90

ESTIMATED AREAL EXTENT OF FREE PRODUCT PLUMES, QUERIED WHERE UNCERTAIN

A — A' CROSS-SECTION

HORIZONTAL DATUM IS BASED ON GEORGIA STATE PLANE COORDINATE SYSTEM

VERTICAL DATUM IS MEAN SEA LEVEL

SCALE 1"=100'

0 100 200 300 400

CONTOUR INTERVAL =1 FOOT

Westinghouse Environmental and Geotechnical Services, Inc.

REVISION OF BECHTEL ENVIRONMENTAL, INC. DRAWING TO SHOW ESTIMATED EXTENT OF FREE PRODUCT PLUMES BASED ON MAY AND JUNE MEASUREMENTS AND OCTOBER 1991 MEASUREMENTS

AMOCO SAVANNAH REFINERY
SAVANNAH, GEORGIA

JOB NO.: SVW-A-115 DATE: 10/31/91

## LEGEND

[0.00] INDICATES FREE PRODUCT MEASUREMENT OBTAINED BY WESTINGHOUSE ON OCTOBER 25-26, 1991

INDICATES CHANGE IN AREAL EXTENT OF FREE PRODUCT PLUME BASED ON OCTOBER 25-26, 1991 MEASUREMENTS

[?] INDICATES PRODUCT PRESENT, BUT THICKNESS UNCERTAIN

[NP] INDICATES WELL NOT PRESENT AT TIME OF OCTOBER SAMPLING

▲ AW MONITORING WELL INSTALLED AFTER MAY AND JUNE, 1991

BECHTEL ENVIRONMENTAL, INC.
HOUSTON

**Estimated Areal Extent - Free Product Plumes**

AMOCO Savannah Refinery
Savannah, Georgia

| JOB No. | DRAWING No. | REV. |
|---|---|---|
| 20785 | Plate 7 | |

GERAGHTY
& MILLER, INC.
*Environmental Services*

AUG ?? 1995

August 16, 1995

Mr. Tom Farrior
Savannah Refinery
Foundation Dr.
P.O. Box 1881
Savannah, GA 31402-1881

Re: Report of Site Evaluation and Remedial Alternatives Evaluation
CITGO Asphalt Refining Company
Savannah Refinery

Dear Tom:

Attached, as you requested, is the Report of Site Evaluation and Remedial Alternatives Evaluation for the Savannah Refinery site. This report combines the previous two reports and incorporates your review comments.

We hope this report meets your requirements and will contact you later this week to discuss this matter. Thank you for this opportunity to be of continued service to CITGO Asphalt Refining Company.

Sincerely,

GERAGHTY & MILLER, INC.

Michael A. Luckett

Michael A. Luckett, P.G.
Project Officer

2675 Paces Ferry Road, Suite 200 • Atlanta, Georgia 30339 • (404) 434-9666 • FAX (404) 434-8806

# SITE EVALUATION
# AND
# REMEDIAL ALTERNATIVES
# CITGO ASPHALT REFINING COMPANY
# SAVANNAH, GEORGIA

August 1995

Prepared for

CITGO Asphalt Refining Company
Savannah, Georgia

Prepared by

Geraghty & Miller, Inc.
*Environmental Services*
2675 Paces Ferry Road, Suite 200
Atlanta, Georgia 30339
(404) 434-9666

## LIST OF FIGURES

## EXECUTIVE SUMMARY

Citgo's overall remedial objectives are to minimize real, potential impacts; maintain control of the direction and time frame of the regulatory process; and minimize remediation system impacts on Refinery operations. These objectives may be accomplished by hydrocarbon contamination source reduction, contaminant migration control and proactive environmental management that will help maintain the confidence of the agency.

Remedial goals are based on the nature and extent of the contaminant and potential receptors. Remedial actions vary based on regulatory requirements and risk factors from no action to intrinsic remediation, such as natural biodegradation or pro-active remediation.

Factors affecting selection of remedial actions include regulatory criteria; risk factors - the nature and extent of contamination (extent, mobility/chemistry, and environmental/health effects), the presence of pathways (hydrogeology) and the presence of receptors (potential impacts); site hydrogeologic and hydraulic factors; waste/discharge/emission management; community/public relations/area land use; site use/plans; cost effectiveness; and time frame.

The presence of free-phase hydrocarbon routinely requires implementation of free-phase recovery as the first step in hydrocarbon remediation. A risk assessment approach could be used to characterize potential risk and to establish risk-based remedial goals. Potential risks associated with the free-phase and other hydrocarbon contaminant phases at the Savannah Asphalt Refinery may include potential migration off-site, contact with potential receptors, and/or impacts to the adjacent Savannah River. The Georgia In-stream Water Quality Standards would be the most likely criteria for the risk assessment

Design criteria for a free-product recovery system are : minimize potential off-site impacts; address State requirements; improved recovery effectiveness; reduce groundwater pumping rates; and reduce system maintenance. In addition the remedial system must address the extent of the site free-phase hydrocarbon occurrence and be consistent with the variations in site conditions, and be consistent with site specific hydrogeologic factors including changes of subsoil permeability with depth, and tidal influences.

Different remedial goals should be applied to different site areas. For "interior" areas, the goal is to recover free-phase hydrocarbon. For boundary areas the goal is to recover free-phase hydrocarbon and minimize potential migration.

The best approaches for the CITGO Refinery are "skimming" in the interior tank farm areas, and vacuum enhanced remediation (VER) near the water front and portions of the property boundary. The recovery operations should be implemented in a phased approach so that system performance evaluation can provide the basis for system additions/modification on a cost effective, as need basis.

In the interior areas, the product thicknesses are sufficient for skimming to work effectively to reduce the product occurrence. The interior areas should be effectively addressed using skimming systems because there is substantial hydrocarbon thickness and limited migration potential.

In the water front and boundary areas where hydraulic control of potential migration may be desirable, vacuum enhanced remediation (VER) should be the most effective remedial approach. Use of partially penetrating wells that minimize inflow from deeper, more permeable zones, should be used to limit the pumping of co-produced groundwater associated with the recovery of hydrocarbons.

## INTRODUCTION

Geraghty & Miller, Inc. (Geraghty & Miller) was retained by CITGO to perform site assessment and free-product recovery system conceptual design investigations at the CITGO Savannah Asphalt Refinery. The facilities include above ground storage tanks (ASTs) for asphaltic and motor fuel products; and docking and truck loading facilities. A site plan is presented in Figure 1.

The CITGO Asphalt Refinery is located on the west bank of the Savannah River in Savannah, Georgia. The site is in an industrialized area adjacent to the Savannah River which is a tidally influenced estuary at this location (Figure 1). In general, land surface at the site is relatively flat. The property has been used for industrial purposes since the early 1900's and was formerly a shipyard. Subsurface structures from the former facilities are believed to be present which may effect hydrocarbon migration and recovery.

Previous investigations identified the presence of free-phase petroleum hydrocarbons (free-product) on the water table in portions of the tank farm, and near the truck loading rack. During this current phase of work at the CITGO site, the limits of the horizontal extent of the free-product on the groundwater has been further delineated. These field activities have also provided the basis for a better understanding of the local hydrogeology, the adjacent tidal estuary (Savannah River), and the multi-layered subsoil hydrocarbon zones.

All of the field activities associated with this phase of work were performed to help in the conceptual design of a free-product recovery system with the following objectives:

1. minimize potential off-site impacts;
2. address State requirements;
3. improved recovery effectiveness;
4. reduce groundwater pumping rates; and
5. reduce system maintenance.

## METHODOLOGY

### SOIL BORINGS AND WELL INSTALLATION

A total of 34 borings were installed throughout the CITGO refinery area (Figure 2). Eight of these borings were advanced to total depths ranging from 16 feet below land surface (bls) to 24 feet bls. All eight of these borings were continuously sampled to accurately ascertain the local stratigraphy in this area. Continuously borings were sampled using standard split spoon practices (ASTM D 1586-84). The other 26 borings were advanced to depths of 12-13 feet bls.

Lithologic descriptions of all soil borings were compiled as drilling occurred. The continuously sampled borings were described in detail.

Soil borings were advanced using an all wheel drive, truck mounted, hollow-stem auger drill rig and drilling techniques. Thirty-three (33) of the borings were advanced utilizing 7-5/8 inch outer diameter (O.D.) hollow stem augers. One boring (TMW-9) was advanced utilizing hand augers due to the potential presence of unknown buried obstructions.

All sampling equipment was cleaned to remove residual sediment and free-product, if any, by scrubbing in a soap and potable water solution, followed by a potable water rinse. All augers were steam cleaned and pressure washed between use in each boring.

Upon completion of the boring, ten feet of 2-inch diameter, PVC, 0.010-inch machine slotted screen was placed in each boring through the augers to prevent formation collapse. Temporary 2-inch diameter PVC screens were installed in each boring to a maximum depth of 13 feet bls. The screen was adjusted to straddle the water table.

Upon completion of all gauging activities at the end of the week, each boring, except for those to be converted to permanent groundwater monitor wells, was abandoned utilizing bentonite pellets and natural fill.

Five of the 34 borings were converted to permanent 4-inch diameter, PVC groundwater monitoring wells. These wells were installed to total depths ranging from 17 to 18 feet bls.

The permanent wells were placed at locations where additional delineation of free-phase hydrocarbon was needed. The selection of locations for the permanent wells was based on the data from all temporary wells points, which were gauged, both with a oil/water interface probe and visually with a bailer. The choice of the borings to be converted to permanent groundwater monitor wells was based upon their location in reference to : 1) potential off-site movement of free-product; 2) replace wells previously destroyed; and 3) potential as possible recovery wells, for the reduction and control of potential off-site movement of free-product.

Temporary monitor wells TMW-12, TMW-7, TMW-18, TMW-20, and TMW-31 were converted to permanent monitor wells AW-66, AW-67, AW-68, AW-69, and AW-70, respectively.

These wells were installed as 4-inch diameter, schedule 40 PVC with 15-feet of 0.010 machine slotted screen. The original borings were reamed and deepened with a 10-inch outer diameter hollow-stem auger to a depth ranging from 17-feet bls to 18-feet bls. The well casing, sand pack (Foster-Dixiana FX-50), and bentonite pellets were installed through the augers. AW-68 and AW-69 were completed at the surface with 12-inch diameter, flush mounted manhole covers. The other three wells were completed as stick up with a protective casing and four, 4-inch diameter protective posts. The wells were then developed by pumping until a relatively sediment free discharge was obtained.

**GAUGING AND SAMPLING**

Depth-to-Product and Depth-to-Water measurements were gauged utilizing an electronic oil/water interface probe. After initial measurements, twelve (12) representative wells containing free-product were bailed down. Samples were collected from each of these wells for distillation analyses to identify the type of free-product at various areas of the site. The wells were allowed to recover approximately 24 hours and the free-product was then gauged again. All wells were gauged except for the newly installed wells that had not equilibrated before Geraghty & Miller personnel left the CITGO site.

## TIDAL MEASUREMENTS

Tidal influence gauging was conducted utilizing Hermit 1000B Data recorders with pressure transducers. Hermits were set up in three wells (AW-61, AW-20, and AW-17) to record changes in water-table elevation. A Hermit was also set up on the manway access over the fire water system intake on the river front. All data recorders were set to record simultaneously so that tidal influence in groundwater wells could be calibrated to tidal changes in the river.

## HYDROGEOLOGIC INVESTIGATION

### SITE HYDROGEOLOGY

Geologic logs of wells drilled previously at the site indicate that the site is underlain by silty sands, sand and clays approximately 300 feet thick. An upper silty sand unit is present over most of the site from near ground surface to depths of several feet. The underlying soils are predominantly sands extending to depths of more than 30 feet. The sand unit is underlain by clays that are reported to be greater than 100 feet thick..

In general, all borings advanced during this work encountered lithologies similar to those previously described. The only exception are the frequently encountered clayey-sands and clay zones observed throughout the refinery area. The general stratigraphic section, as observed from continuous split-spoon sampling, consisted of a thin silty-sandy silt at the surface; silty-sands, clayey-sands, and sandy-clays from 0.5 feet bls to approximately 13 feet bls; and silty-sand and fine to coarse sands were generally observed to the total depth explored with the exception of TMW-17, which encountered clay at approximately 16 feet bls. This clay continued to a total depth of 24 feet bls. A geologic cross section is presented in Figure 3. The sandy soils inhibited deeper drilling/sampling due to a "flowing sand" condition where the auger fills with the loose sands. Lithologic descriptions for borings converted to permanent groundwater monitor wells in Appendix A.

Information regarding the hydraulic conductivity of subsurface materials was obtained from previous pumping tests. The tests indicated that the hydraulic conductivity of the predominantly sandy soils is approximately 30 feet per day (ft/d).

### GROUNDWATER FLOW DIRECTION AND GRADIENT

The groundwater table relatively shallow ranging from approximately 2 to 5 feet deep. Groundwater levels are influenced by tidal fluctuations of the adjacent Savannah River. Short term daily fluctuation may be as much as one to two feet, near the river, and seasonal fluctuation may be up to five feet.

Part of the docking area has a sheet pile wall which may be a significant barrier to groundwater flow. Such walls may result in a water level elevation difference between the river level and the groundwater levels.

The interpreted groundwater flow direction on November 5, 1994 is North-Northeast toward the river. Some mounding of groundwater appears to be occurring in the area of Tank 9 and Tank 19. In this area there is evidence that the groundwater flowing to the west and north. This could be due to the extreme rainfall in the Savannah area during early October.

The gradient of the groundwater appears to change in the Tank 8 and 6 area changing from relatively steep to more gradual. The cross section presented in Figure 3 show a hydrogeologic change in the lithology that may be the cause of the change in the gradient. The change may also be associated with infiltration from the rainfall mentioned earlier. The gradient in the Tank 8 and 6 area is approximately 0.0229. The gradient closer to the river is approximately 0.0047. The gradient of the site overall, from the Tank 16 area to the river front, is approximately 0.0063 ft/ft.

Tidal influences of varying degrees were observed in groundwater wells AW-61 and AW-17. Tidal influence in AW-20 was negligible. AW-61 had considerable tidal influence with variances approaching several feet of change. AW-17 has small tidal influences of less than 0.5 feet of change. The response time of AW-61 and AW-17 to tidal in the river was approximately one-hour and two-hour, respectively.

Tidal graphs and water table contours are presented in Figures 4 and 5.

**FREE-PHASE HYDROCARBON OCCURRENCE**

The inferred horizontal extent of the free-product is presented in Figure 6.

Separate phase liquid hydrocarbons have been detected in the subsurface in several different portions of the site. For the purposes of this report, these areas have been divided in four (4) types of conditions described as areas 1, 2, 3, and 4. Each of these areas represents varying conditions and constraints that will affect remedial activities. The factors observed in the four areas include differences in permeability, type and amount of liquid hydrocarbon present, activities and operations in the general proximity, and availability of compressed air and fluid disposal connections.

Area 1 is the Tank 1, Tank 2, Tank 3, and Tank 4 area, and area to the north, which is subcentrally located on the site. The area is subject to moderate tidal influence from the Savannah River. Compressed air and fluid disposal connections are readily available. The separate phase liquid hydrocarbon which has been observed in this area is an approximately 0.75 foot to 6.75 foot thick layer of gasoline/light gas oil.

Area 2 is the Tank 7, Tank 8, Tank 9, and Tank 19 area of the Tank Farm which is furthest from the Savannah River that is subject to a minimal of tidal influence. Compressed air and fluid disposal connections are relatively remote. The liquid phase hydrocarbon observed in this area is a thick layer (approximately 0.6 to 7.5 feet) of diesel, and light gas oil. Hydrocarbon specific gravities in this area generally are higher, ranging from 0.84 to 0.91.

Area 3 is the waterfront along the Savannah River. This area is subject to considerable tidal influence. The observed hydrocarbon occurrence is similar to that of Area 1. The specific gravity of most of the free-product in the Area 3 is below 0.87 except a localized area near the oil/water separator that apparently contains heavier product with a specific gravity of approximately 0.94. The free-phase hydrocarbons observed in most of Area 3 are primarily diesel and naptha/gasoline/light gas oil.

Area 4 is surrounding the boiler house and adjacent to the property line on the northeast. Discussions with CITGO personnel suggested that this plume could be due to migration of free-product from adjacent properties. The area is subject to minimal of tidal influence. Compressed air and fluid disposal connections are relatively accessible. The liquid phase hydrocarbon that has been observed is an approximately six inch or less layer of diesel.

The "true' thickness of the free-product at the site ranges from 1 to 1/6 of the apparent (observed) thickness and averages 1/3 of the apparent thickness. The results of product bail down tests are presented in the Appendix B.

# REMEDIAL ALTERNATIVES EVALUATION

## INTRODUCTION

This section presents an evaluation of selected alternatives for remedial action at the Citgo Savannah Asphalt Refinery. Free phase hydrocarbons are presently underlying portions of the site; selected alternatives for remediation of the free phase hydrocarbon and other associated contaminant phases are discussed below.

The remedial alternative evaluation for the Savannah Asphalt Refinery is dependent on Citgo's risk management policy, site conditions, and regulatory requirements. We understand, based on our recent discussion with Citgo that the overall remedial objectives can be summarized as follows:

- minimize real, potential impacts;
- maintain control of the direction and time frame of the regulatory process; and
- minimize remediation system impacts on Refinery operations.

These objectives may be accomplished by:

- hydrocarbon contamination source reduction and contaminant migration control; and
- proactive environmental management that will help maintain the confidence of the agency.

Remedial goals are based on the nature and extent of the contaminant and the potential receptors. Goals may include contaminant source reduction/recovery including mobile liquid free-phase product, and residual/absorbed hydrocarbon (product that is held in the soil). Remedial goals may also include containment of mobile phases that could migrate including free-phase product, vapors and hydrocarbons dissolved in the groundwater.

Remedial actions vary based on regulatory requirements and risk factors from:

- no action; to
- intrinsic remediation such as natural biodegradation; or
- pro-active remediation.

Factors affecting selection of remedial actions include;

- regulatory criteria;
- risk factors - the nature and extent of contamination (extent, mobility/chemistry, and environmental/health effects), the presence of pathways (hydrogeology) and the presence of receptors (potential impacts);
- site hydrogeologic and hydraulic factors;
- waste/discharge/emission management;
- community/public relations/area land use;
- site use/plans;
- cost effectiveness; and
- time frame.

The following sections describe selected assessment and remedial action methods to address the environmental matters at the Savannah Refinery.

**RISK ASSESSMENT**

Risk-based criteria should be applied where regulatory criteria are inappropriate due to regulatory conservatism or site conditions (i.e. "nature, extent, pathways. receptors"; receptors may include utilities, subsurface structures, wells, surface water bodies, and/or third party properties).

The American Society for Testing Materials (ASTM) has developed the Risk-Based Corrective Action (RBCA) process. RBCA was developed to aid in cost-effective closure of hydrocarbon sites. The RBCA process is used to quickly determine if releases from a hydrocarbon site represent a risk to human health. If significant risks are not present, the site can be closed. Should risk be present, RBCA can be used to prioritize sites for remediation and to determine the level of remediation needed to reduce the risks. The USEPA has recommended to the states that they consider using the RBCA standard and its concepts in their laws on leaking underground storage tank sites. Once it is implemented, RBCA is a tool to focus remedial action on the most impacted sites. It can be used to determine the need for remediation and the urgency of action required.

Pros and cons of risk assessment include:

Pro - current "hot" trend, the cost effective way to manage environmental matters; establish reasonable goals if agency is unreasonable, and if site conditions are favorable.

Con - conservative analyses may focus on potential risks not yet of agency concern, including dissolved phase contaminant migration and surface water (river) impacts.

## REMEDIAL ACTIONS

### No Action

No action is appropriate where risk is low and no significant potential impacts are anticipated. No action, may or may not be accompanied by a monitoring program.

No action pros and cons are : advantages - low cost; disadvantages - does not address site free product and/or potential contaminant migration, and may cause loss of agency confidence.

### Bioremediation

Bioremediation is a desirable remedial method because it destroys the hydrocarbon contaminants, and produces little or no air emissions or water discharge. The most commonly used bioremediation techniques for hydrocarbon remediation currently are intrinsic bioremediation which is natural biodegradation. Intrinsic bioremediation is accompanied by a bio-monitoring program to document the occurrence and rate of degradation.

### Intrinsic Bioremediation

Intrinsic bioremediation is natural biodegradation. The term intrinsic bioremediation was coined by the J. Kerr at the USEPA Ada Laboratories who has done extensive work in this field of study. Intrinsic bioremediation may be either aerobic if enough oxygen is present in the subsurface, or may be anaerobic if the subsurface conditions are oxygen deficient. Figure 7 presents the bio-geochemical parameters that are indicators of natural intrinsic bioremediation. As shown, the presence of hydrocarbons causes the development of indigenous microbes that utilize hydrocarbons (benzene, toluene, ethyl benzene, and xylene (BTEX) and others), oxygen, sulfate, and nitrate. Reducing conditions (shown by declining REDOX) also occur, increasing the solubility of naturally abundant iron (Fe).

Intrinsic bioremediation is most appropriate to low risk, low permeability conditions with limited contamination extent.

The primary advantages are cost effectiveness and conservation of resources. Disadvantages are limited effectiveness in areas of free product occurrence and relatively slow remediation.

**Biosparging**

Biosparging is the introduction of relatively small volumes of air into the groundwater to enhance the dissolved oxygen content and enhance aerobic biodegradation of dissolved hydrocarbons (Figure 8).

This approach could be used to attenuate dissolved phase migration near the dissolved phase plume boundary (not currently delineated). This method, however, would not be effective in free product areas.

**Bioventing**

Bioventing (Figure 8 - addition of air to the subsurface vadose zone) is effective in moderate to high permeability conditions with biodegradable compounds.

The primary advantages are cost effectiveness and limited air emissions or water discharge. The primary disadvantage is that only the zone above the water table (vadose zone) is effectively addressed unless the bioventing is combined with groundwater pumping to lower the water table.

**FREE PRODUCT RECOVERY**

Free-product recovery systems to be evaluated include dual pump systems, total fluid systems, vacuum enhanced systems (VER), and skimming systems. Dual pump systems which incorporate a water table depression pump and product recovery pump are most appropriate for areas of high permeability and steep hydraulic gradient. Total fluids systems are applicable to a range of conditions but require additional water treatment since product and water are pumped together. Vacuum enhanced systems are applicable to lower permeability conditions where vacuum is necessary to enhance product recovery. Skimming systems are applicable to conditions where product thicknesses are significant and product migration potential is low.

**Skimming**

Skimming of free product is used for interim remediation where free-product is present in thicknesses of more than 1/8 inch (Figure 9). The primary advantages are no discharges of water or air emissions, and skimming systems can be quickly and cost effectively implemented. This method is effective for initial reduction of free-product.

The primary disadvantage is there is no hydraulic control to address potential migration and it is not effective for thicknesses less than 1/8 inch of product.

**Dual Pump Systems**

In high permeability conditions dual pump (Figure 10 - one pump for water and one pump for free-product) systems may be used to recover product and exercise hydraulic control.

The primary advantage is there is no need for oil/water separation. The disadvantage is high cost.

**Total Fluids Recovery System (Existing System)**

Where free-product migration is a concern in moderate permeability conditions, a single pump for product and groundwater (Figure 10 - total fluids) recovery system is appropriate.

The primary advantage is that this system offers hydraulic control to minimize contaminant migration.

The primary disadvantage is that the groundwater produced will require treatment , discharge and permitting.

Total fluids recovery systems have been installed for confinement/recovery. Groundwater and free product are being extracted from wells which were installed in the free-product areas. The systems consist of pneumatic "total fluids" (groundwater/product) pumps that recover groundwater/free-product which is pumped to an oil/water separator. Groundwater is discharged to the existing outfall and oil is stored in an adjacent AST.

Problems with these systems include:

- poor recovery;
- sand production;
- high maintenance; and
- high water production rates.

The pneumatic total fluid systems are cost effective for a variety of conditions, but are most effective in deep water table conditions with low to moderate flow rates.

The disadvantages for this site are:

- lack of easy depth adjustment to address tidal conditions;
- surging pump operation which tends to produce sand in some conditions, and
- production of groundwater from deeper, more permeable zones rather than concentrating on recovery of shallower zone free-product.

**Vacuum Enhanced Recovery**

For low to moderate permeability, vacuum enhanced remediation (Figure 11 - use of high vacuum to extract both fluids and vapor) is most effective.

The primary advantage is that this method addresses all hydrocarbon contamination phases including free-product (mobile liquid hydrocarbon), residual or adsorbed hydrocarbon in the soil, hydrocarbon vapor, and dissolved hydrocarbons in the groundwater.

The primary disadvantage is treatment and discharge of co-produced water and possibly air emissions.

## SOIL RESIDUAL/ADSORBED HYDROCARBON REMEDIATION

**Soil Venting**

Soil venting (Figure 11) is effective in moderate to high permeability conditions with volatile compounds. This method is fast and cost effective in moderate to high permeability soils.

The primary disadvantages are air emissions, and only the zone above the water table (vadose zone) is effectively addressed unless the venting is combined with groundwater pumping to lower the water table.

**Bioventing**

Bioventing (Figure 8 - addition of air to the subsurface vadose zone) is effective in moderate to high permeability conditions with biodegradable compounds.

The primary advantages are cost effectiveness and limited air emissions or water discharge.

The primary disadvantage is that only the zone above the water table (vadose zone) is effectively addressed unless the bioventing is combined with groundwater pumping to lower the water table.

## DISSOLVED HYDROCARBON REMEDIATION

### Air Sparging

In-situ air sparging (Figure 12) is effective in moderate to high permeability, homogeneous conditions. The method sparges volatiles from groundwater and enhances microbial activity in the groundwater.

Advantages include elimination of groundwater treatment and discharge. Could attenuate dissolved phase migration near dissolved phase plume boundary (not currently delineated).

Possible disadvantages include limited lateral extent, no hydraulic control, and difficulty controlling air injection. May produce vapors in free product areas.

### Pump and Treat

Pumping and treating groundwater (Figure 12) is a method for hydraulic control to minimize dissolved hydrocarbon migration in groundwater. This method may be used in moderate to high permeability conditions.

The primary disadvantages are that is does not remediate soil residual hydrocarbon contamination sources and is, thus, very slow. In addition co-produced water requires treatment and discharge.

## EXTRACTION METHODS AND APPROACHES

Vertical wells, horizontal wells, or trench/drains (Figure 13) may be used in clean up systems depending on site conditions. Wells are generally lower cost, easily installed and easily maintained, but may have a limited lateral influence. Close well spacing could be required for effectiveness.

Trenches and drains have effective lateral influence, but may be costly, difficult to install, difficult to place where needed, and difficult to maintain. They are best suited to variable (heterogeneous) conditions and lower permeability where their lateral effectiveness is most beneficial.

Horizontal wells are similar to trenches and drains except that the horizontal drilling technique allows placement of the wells in almost any location. Cost and maintenance however, may be disadvantages for this method.

Hydraulic or pneumatic fracturing are oil field stimulation techniques that can be used to enhance hydrocarbon recovery in low permeability soils. Best results are obtained by hydraulic fracturing methods that use sand/biodegradable "mud" mixtures, injected under relatively high pressure. This method may also be used in association with horizontal wells to enhance recovery. The relatively high cost of fracturing is a disadvantage that makes it most applicable in relatively high risk situations where the cost may be justified.

## SUMMARY OF SITE CONDITIONS

Site conditions that are of particular interest to be considered in this evaluation are:

- the adjacent tidal estuary (Savannah River); and
- multi-layered subsoil hydrocarbon zones.

### SITE HYDROGEOLOGY

Soil sampling indicates that the site is underlain by silty sands, sand and clays. An upper silty sand unit is present over most of the site from near ground surface to depths of several feet. The underlying soils are predominantly sands extending to depths of more than 30 feet. The sand unit is underlain by clays that are reported to be greater than 100 feet thick.

The hydraulic conductivity of the predominantly sandy soils is approximately 30 feet per day (ft/d).

### GROUNDWATER FLOW DIRECTION AND GRADIENT

The groundwater table is a few feet deep. Groundwater levels are influenced by tidal fluctuations of the adjacent Savannah River . Short term daily fluctuation may be as much as one to two feet, near the river, and seasonal fluctuation may be up to five feet.

Groundwater flow direction is toward the river at an overall gradient of approximately 0.0063.

### TIDAL INFLUENCE

Tidal influences of varying degrees were observed in groundwater wells at the site. Tidal influence in the interior areas was negligible. Near the river considerable tidal influence, approaching several feet, was observed.

### AREAS OF FREE-PHASE HYDROCARBON OCCURRENCE

Separate phase liquid hydrocarbons have been detected in the subsurface in several different portions of the site. For the purposes of this report, these areas have been divided in four (4) types of conditions described as areas 1, 2, 3, and 4. Each of these areas represents varying conditions and constraints that will affect remedial activities. The factors observed in the four areas include differences in permeability, type and amount of liquid hydrocarbon present, activities and operations in the general proximity, and availability of compressed air and fluid disposal connections.

Area 1 is the Tank 1, Tank 2, Tank 3, and Tank 4 area, and area to the north, which is subcentrally located on the site. The area is subject to moderate tidal influence from the Savannah River. The separate phase liquid hydrocarbon which has been observed in this area is an approximately 0.75 foot to 6.75 foot thick layer of gasoline/light gas oil.

Area 2 is the Tank 7, Tank 8, Tank 9, and Tank 19 area of the Tank Farm which is furthest from the Savannah River that is subject to a minimal of tidal influence. The liquid phase hydrocarbon observed in this area is a thick layer (approximately 0.6 to 7.5 feet) of diesel, and light gas oil. Hydrocarbon specific gravities in this area generally are higher, ranging from 0.84 to 0.91.

Area 3 is the waterfront along the Savannah River. This area is subject to considerable tidal influence. The observed hydrocarbon occurrence is similar to that of Area 1. The specific gravity of most of the free-product in the Area 3 is below 0.87 except a localized area near the oil/water separator that apparently contains heavier product with a specific gravity of approximately 0.94. The free-phase hydrocarbons observed in most of Area 3 are primarily diesel and naphtha/gasoline/light gas oil.

Area 4 is surrounding the boiler house and adjacent to the property line on the northeast. The area is subject to minimal of tidal influence. The liquid phase hydrocarbon that has been observed is approximately six inches or less of diesel fuel.

The “true’ thickness of the free-product at the site ranges from 1 to 1/6 of the apparent (observed) thickness and averages 1/3 of the apparent thickness.

## ENVIRONMENTAL MANAGEMENT STRATEGY

The presence of free-phase hydrocarbon in the subsurface in most circumstances requires implementation of free-phase recovery. This is usually the first step in hydrocarbon remediation and takes precedence over remediation of other contaminant phases (residual/adsorbed, or dissolved phase hydrocarbon). Accordingly, for this project , the initial scope of work focused on design of a free-product recovery system. That scope of work was based on the assumption that the conventional approach of initial free-phase hydrocarbon recovery, would be appropriate for the site. If, however, Citgo wishes to perform additional assessment to determine whether the hydrocarbon contamination at the site poses a significant environmental risk, then additional assessment could be performed.

### RISK ASSESSMENT

A risk assessment approach could be used to characterize potential risk and to establish risk-based remedial goals. This approach is not usually applied to cases where substantial free-product is present but could have some application if the site conditions are such that there is little or no potential for receptor impacts. Potential risks associated with the free-phase and other hydrocarbon contaminant phases at the Savannah Asphalt Refinery may include; potential migration off-site, contact with potential receptors, and/or impacts to the adjacent Savannah River. Based on current Georgia Environmental Protection Division (EPD) application of risk assessment for hydrocarbon contamination, the most important potential receptor would probably be considered to be the Savannah River. The Georgia In-stream Water Quality Standards would be the most likely criteria for the risk assessment evaluation of potential discharges to the Savannah River. These standards establish criteria for benzene, toluene, ethyl benzene, and xylene (BTEX) and polyaromatic hydrocarbons (PAHs) in surface water. Assessment of the site conditions could indicate potential risks associated with these contaminants at the site. The risk assessment would include:

Constituent Characterization

- Define Nature and Extent of Contamination
- Fate and Transport
- Estimate Exposure Point Concentrations

(Risk Assessment Cont.)

Toxicity Assessment

Identify Potential Toxic Effects

Identify Exposure Periods

Determine Toxicity Values for Non-Carcinogenic Effects

Determine Toxicity Values for Carcinogenic Effects

Exposure Characterization

Potentially Exposed Populations

Exposure Pathways

Estimate Intakes

Risk Characterization

Pathway Risk

Hazard Quotients and Hazard Index

Excess Lifetime Cancer Risk

Total Site Risk

**FREE-PRODUCT RECOVERY**

The presence of substantial free-product at the site may warrant implementation of free-phase hydrocarbon recovery as noted above. The design criteria for a free-product recovery system would be as follows:

1. minimize potential off-site impacts;
2. address State requirements;
3. improved recovery effectiveness;
4. reduce groundwater pumping rates; and
5. reduce system maintenance.

For a remedial system to be effective at the CITGO Refinery, it must address the variations in site conditions, and be consistent with site specific hydrogeologic factors including changes of subsoil permeability with depth, and tidal influences.

Different remedial goals should be applied to different site areas.

- For "interior" areas, the goal is to recover free-phase hydrocarbon.
- For boundary areas the goal is to recover free-phase hydrocarbon and minimize potential migration.

To achieve these goals the system must address the extent of the site free-phase hydrocarbon occurrence.

Additional remedial system design considerations include:

- cost effectiveness,
- minimizing co-produced water,
- low maintenance,
- incorporation of existing plant utilities, and
- compatibility with site operations.

## RECOMMENDATIONS

The remedial approaches which appear to be suitable for the CITGO Refinery are "skimming" in the interior tank farm areas, and vacuum enhanced remediation (VER) near the water front and portions of the property boundary. The recovery operations should be implemented in a phased approach so that system performance evaluation can provide the basis for system additions/modification on a cost effective, as need basis.

In the interior areas, Areas 1 and 2, the product thickness are sufficient for skimming to work effectively to reduce the product occurrence. The interior areas should be effectively addressed using skimming systems because there is substantial hydrocarbon thickness and limited migration potential.

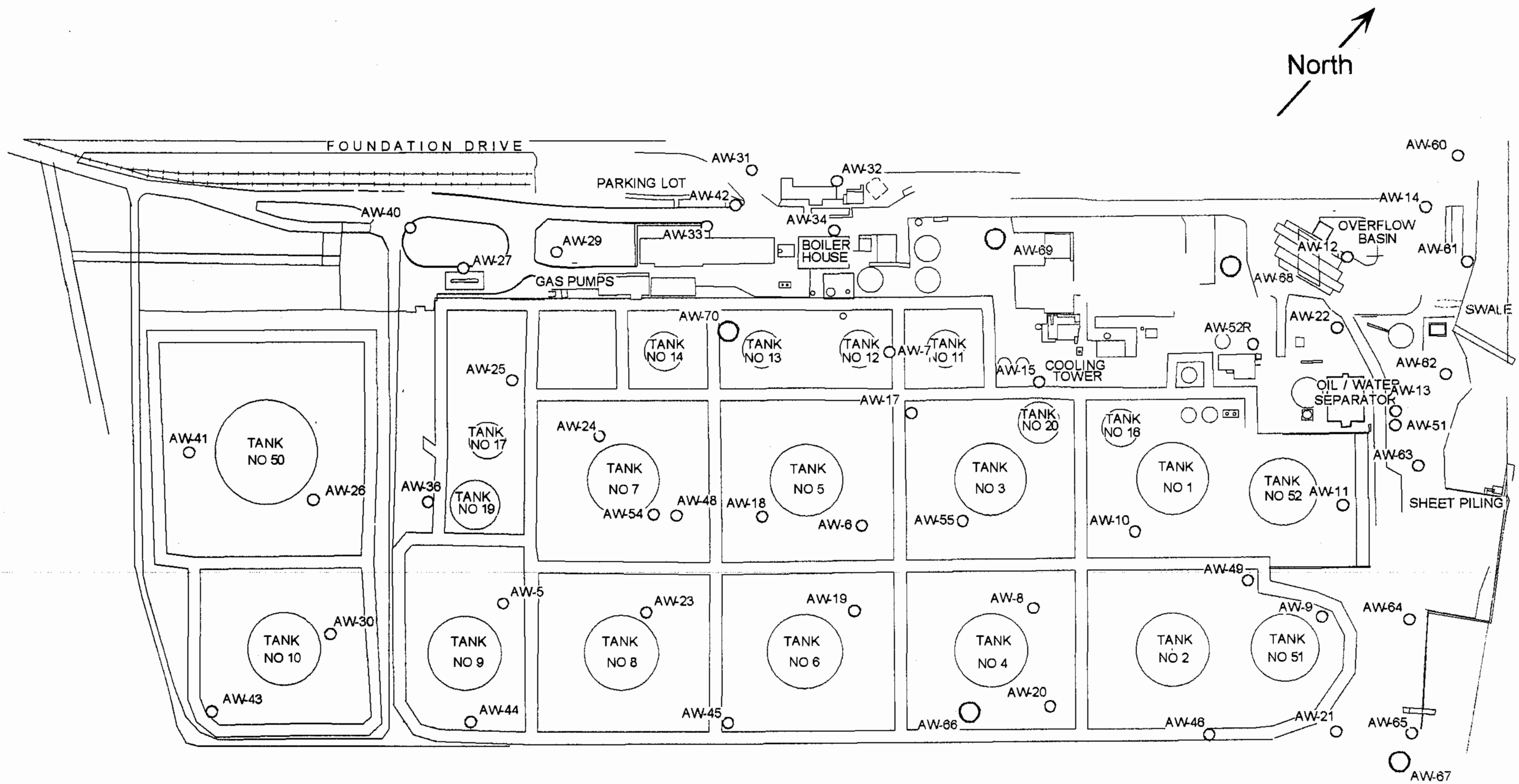
Skimming involves extraction of primarily free-phase hydrocarbons from the well. Little or no water is removed. Skimmer systems for the site will need to be designed to compensate for the fluctuations in the water level. The Clean Environment Selective Oil Skimmer (SOS) tidal model is recommended for the CITGO site .

In the water front and boundary areas where hydraulic control of potential migration may be desirable, vacuum enhanced remediation (VER) should be the most effective remedial approach. VER involves the application of limited vacuum to enhance the recovery of both product and water. VER is useful for applications where the effectiveness of conventional recovery methods is limited by low hydraulic conductivity and/or thin units that limit effective drawdown. For the CITGO refinery site, use of partially penetrating wells that minimize inflow from deeper, more permeable zones, should be used to limit the pumping of co-produced groundwater associated with the recovery of hydrocarbons.

The site specific factors for the CITGO Refinery, which suggest that VER would be applicable for site Areas 3 and 4, include:

- shallow, unconfined groundwater with free-phase hydrocarbon;
- hydrocarbon migration potential;
- tidal influences (in Area 3 up to four feet or more change in the water levels) on groundwater levels;
- moderate permeability, and limited saturated thickness; and
- existing surface development and site activity which limit access for lateral drains and/or extensive recovery wells.

VER involves the application of vacuum and the extraction of both groundwater and free-phase hydrocarbons. A combined VER system may result in greater efficiency than can be achieved without vacuum. The benefit of VER is enhancement of groundwater and separate phase liquid hydrocarbon recovery rates, and increased area of recovery system influence.




**Legend**

| | |
|---|---|
| AW-70 | New Groundwater Monitor Wells |
| AW-44 | Approximate location existing monitoring wells and temporary well points |

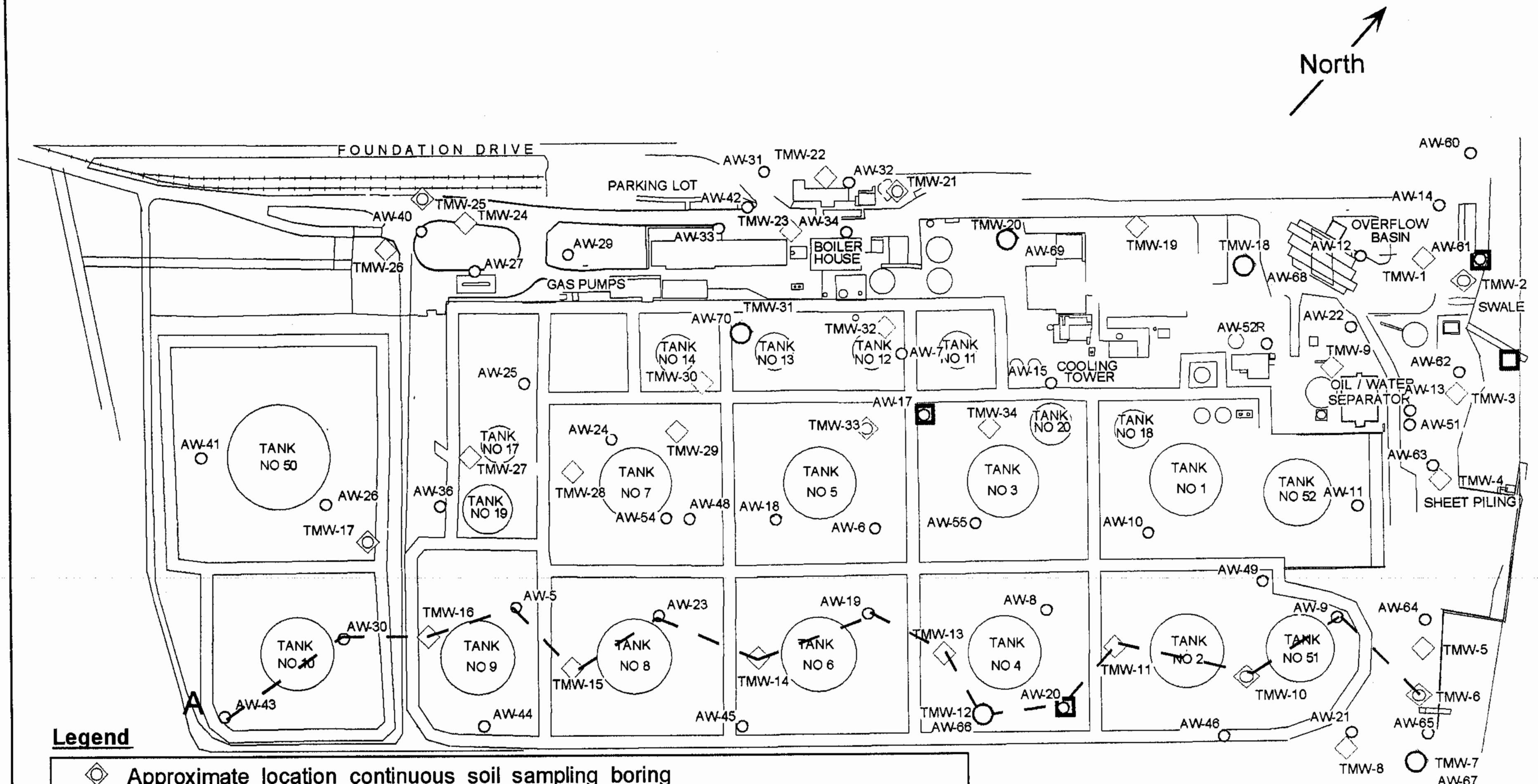
Scale
0 100 200

GERAGHTY & MILLER, INC.
*Environmental Services*

**SITE PLAN**

Citgo Asphalt Refinery
Savannah, Georgia

Figure
1




**Legend**

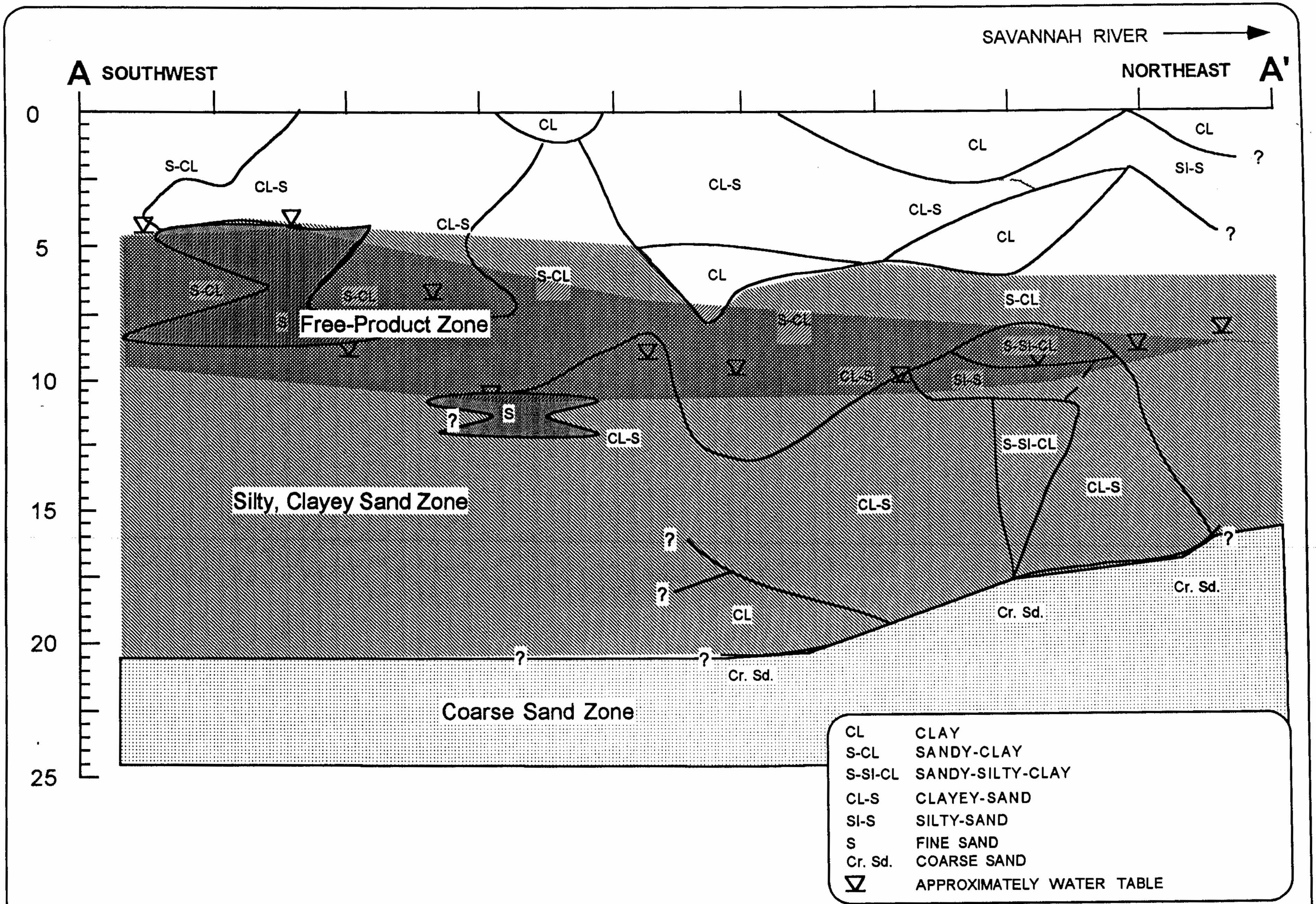
- TMW-2 Approximate location continuous soil sampling boring
- Approximate location free-phase hydrocarbon temporary well point
- Approximate location continuous water level monitoring station
- AW-70 New Groundwater Monitor Wells
- AW-44 Approximate location existing monitoring wells and temporary well points
- Hydrogeologic Cross-Section Location

GERAGHTY & MILLER, INC.
*Environmental Services*

## LOCATION OF BORINGS, WELLS, and LEVEL STATIONS

Citgo Asphalt Refinery
Savannah, Georgia

Figure 2



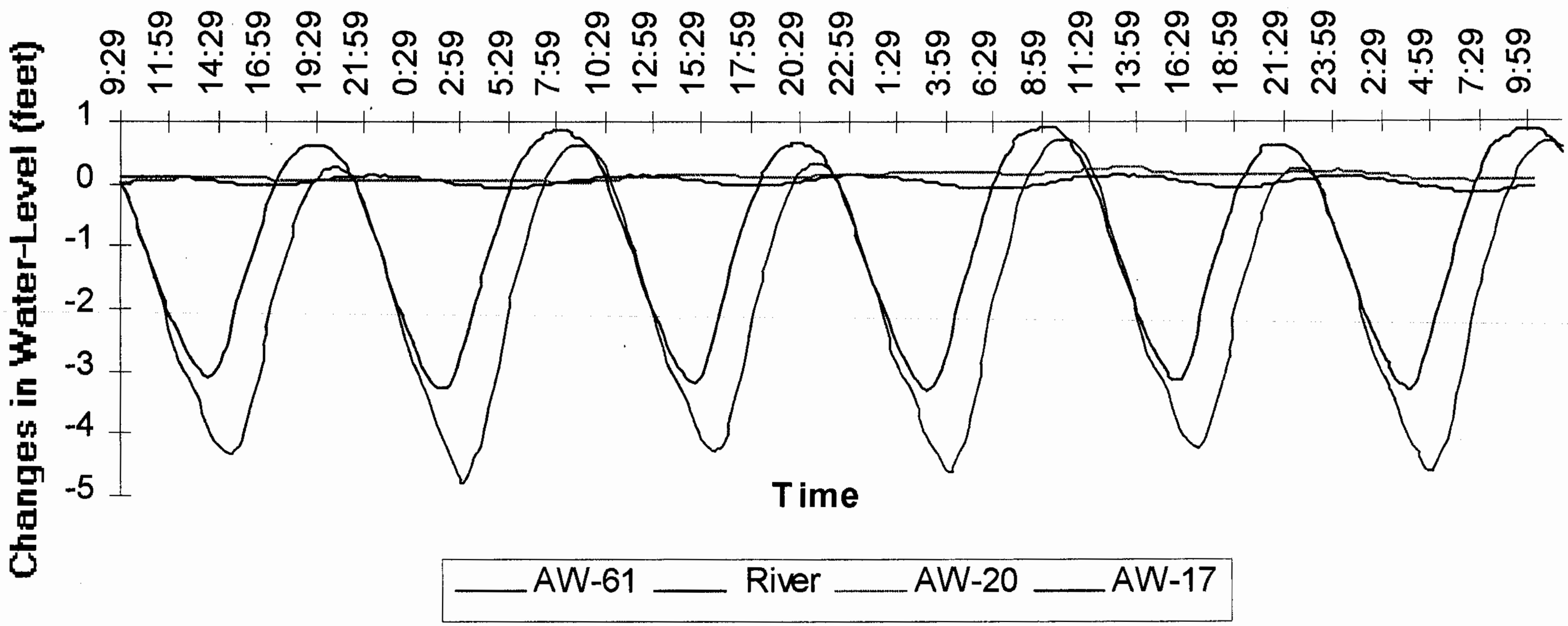

GERAGHTY & MILLER, INC.
*Environmental Services*

# HYDROGEOLOGIC CROSS-SECTION

Citgo Asphalt Refinery
Savannah, Georgia

Figure 3

## Changes in Groundwater-Level at AW-17, AW-20, and AW-61 Vs. Tidal Changes in the Savannah River

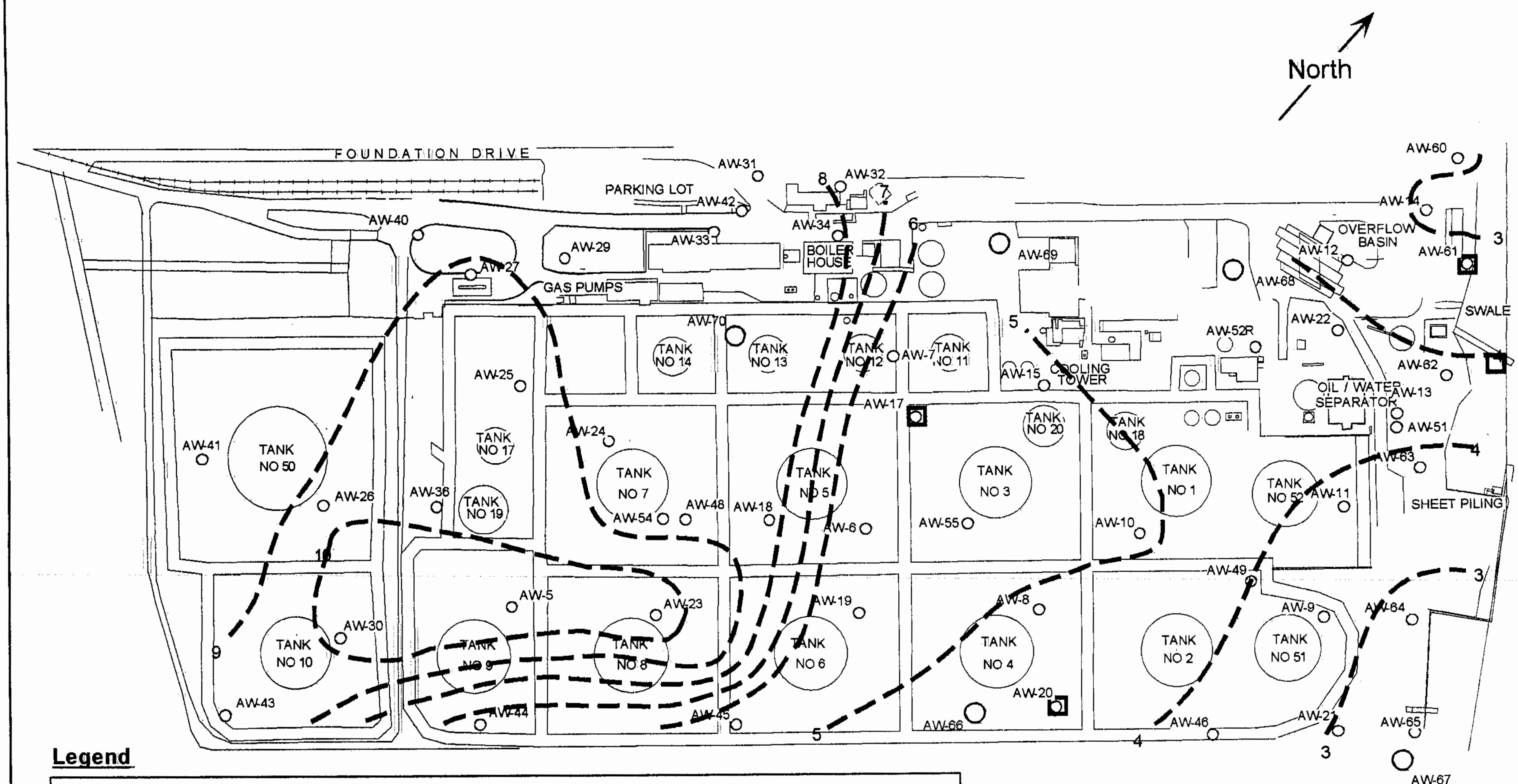



GERAGHTY & MILLER, INC. Environmental Services

**Water Level Fluctions**

Citgo Asphalt Refinery
Savannah, Georgia

Figure 4




## Legend

AW-70 New Groundwater Monitor Wells

AW-44 6.52 Approximate location existing monitoring wells and temporary well points w/ fluid elevation ( ft, msl) on November 5, 1994.

Fluid Contours with contour elevations ( 7 (ft, msl )).

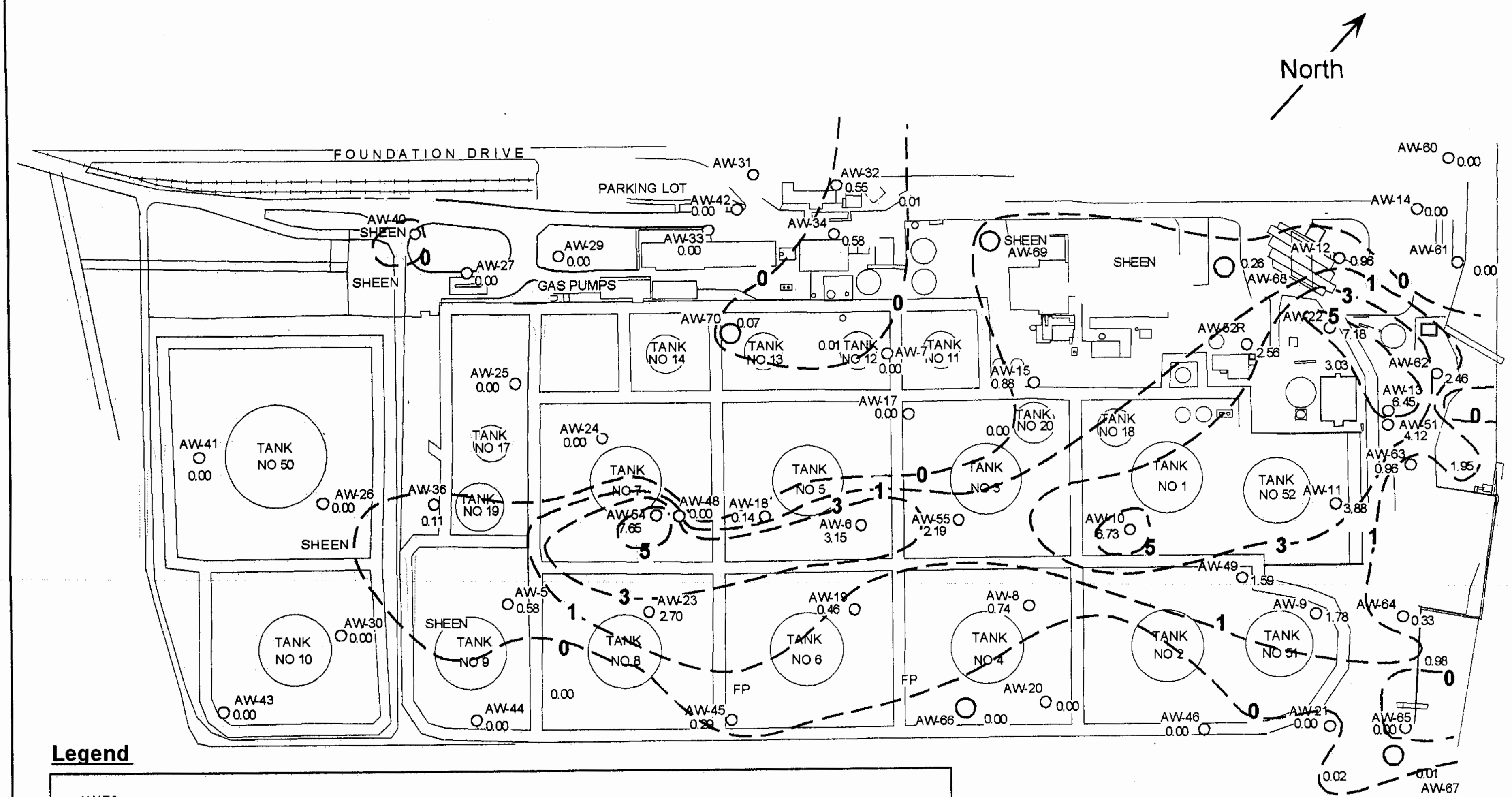
Approximate Horizontal Extent of Free-Phase Hydrocarbons on the Groundwater

Scale
0 100 200

GERAGHTY & MILLER, INC.
*Environmental Services*

**GROUNDWATER CONTOURS**
11/5/94
Citgo Asphalt Refinery
Savannah, Georgia

Figure
5




**Legend**

AW-70 ○ New Groundwater Monitor Wells

AW-44 ○ 6.52 Approximate location existing monitoring wells and temporary well points w/ fluid elevation ( ft, msl) on November 5, 1994.

Fluid Contours with contour elevations ( 7 (ft, msl )).

Approximate Horizontal Extent of Free-Phase Hydrocarbons on the Groundwater

Scale
0 100 200

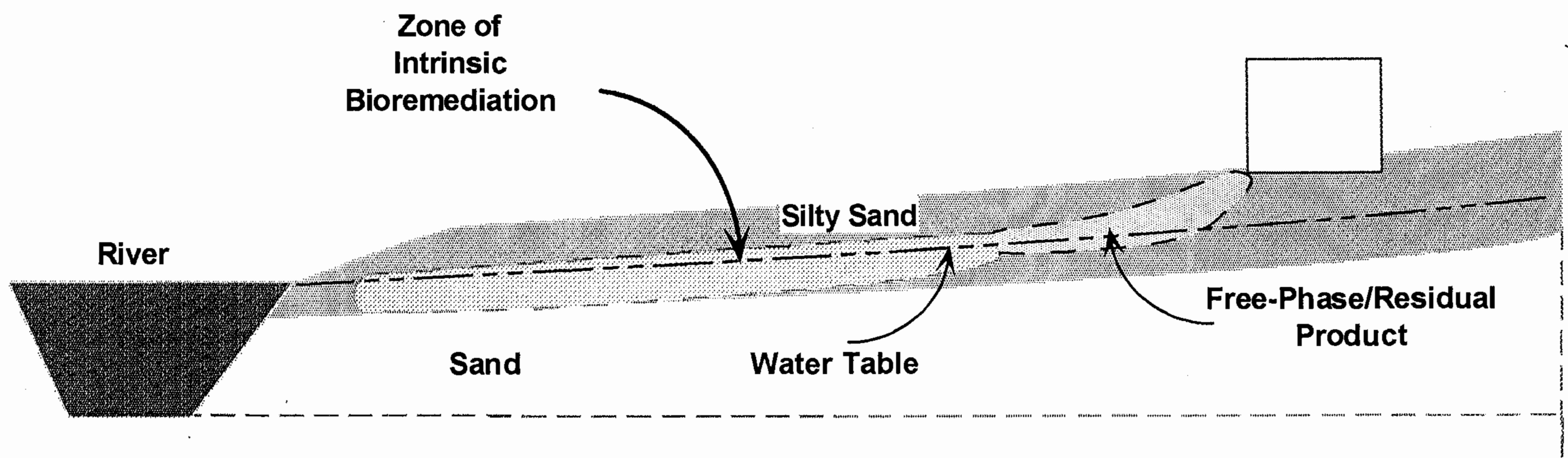
GERAGHTY & MILLER, INC.
*Environmental Services*

## HORIZONTAL EXTENT OF FREE-PRODUCT

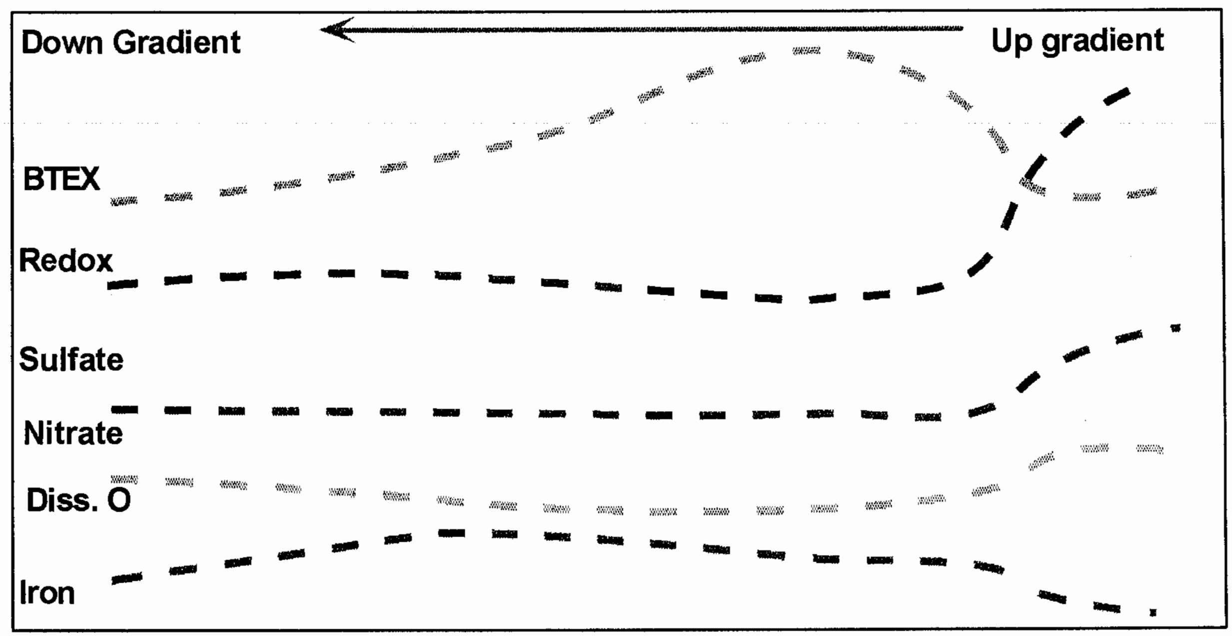
11/5/94

Citgo Asphalt Refinery
Savannah, Georgia

Figure
6




# Groundwater Bio-geochemistry Typical of Anaerobic Intrinsic Bioremediation




GERAGHTY & MILLER, INC.
*Environmental Services*

**Typical Intrinsic Anaerobic Bioremediation**

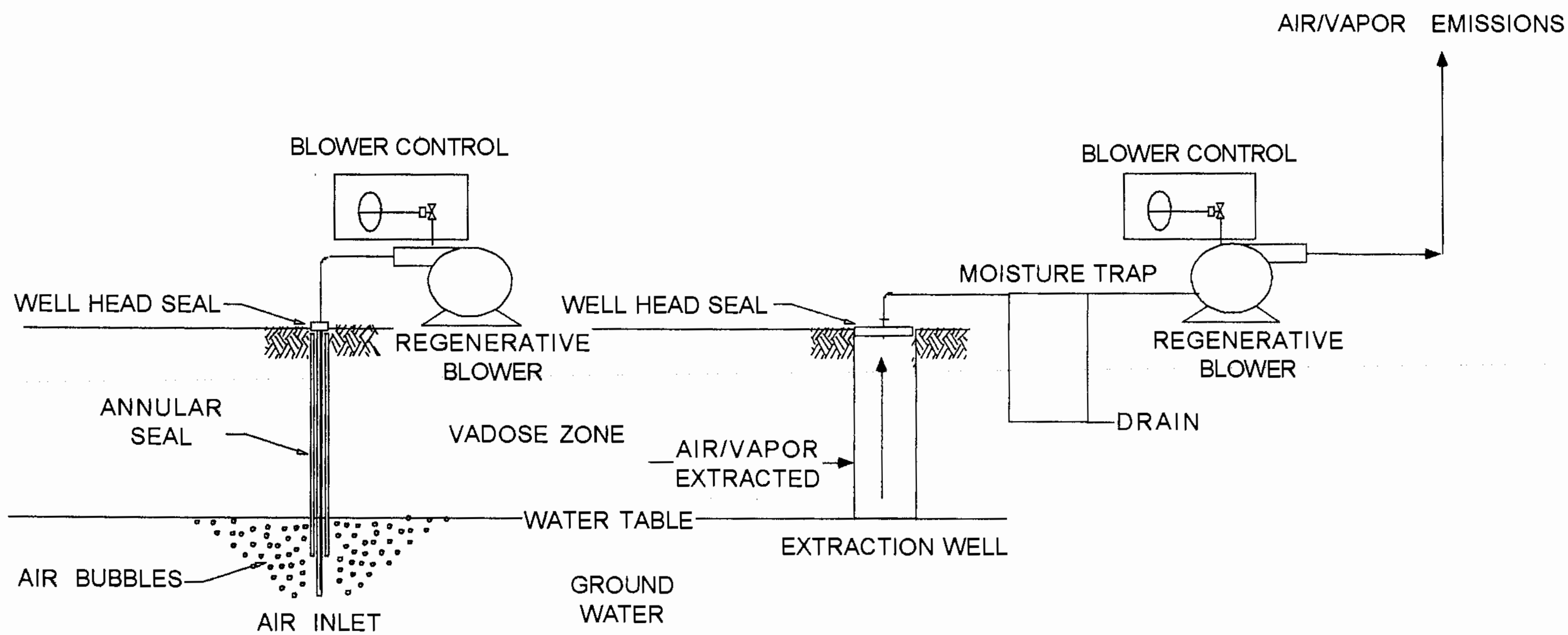
Citgo Savannah
Asphalt Refinery

Figure
7

## BIO-SPARGING/VENTING SYSTEMS

Bio-sparging systems inject a small amount of air into the groundwater to increase dissolved oxygen that enhances biodegradation of dissolved hydrocarbons in the groundwater.

Bio-sparging may be coupled with bio-venting to extract air/vapor to enhance bio-degradation in the vadose zone above the water table.

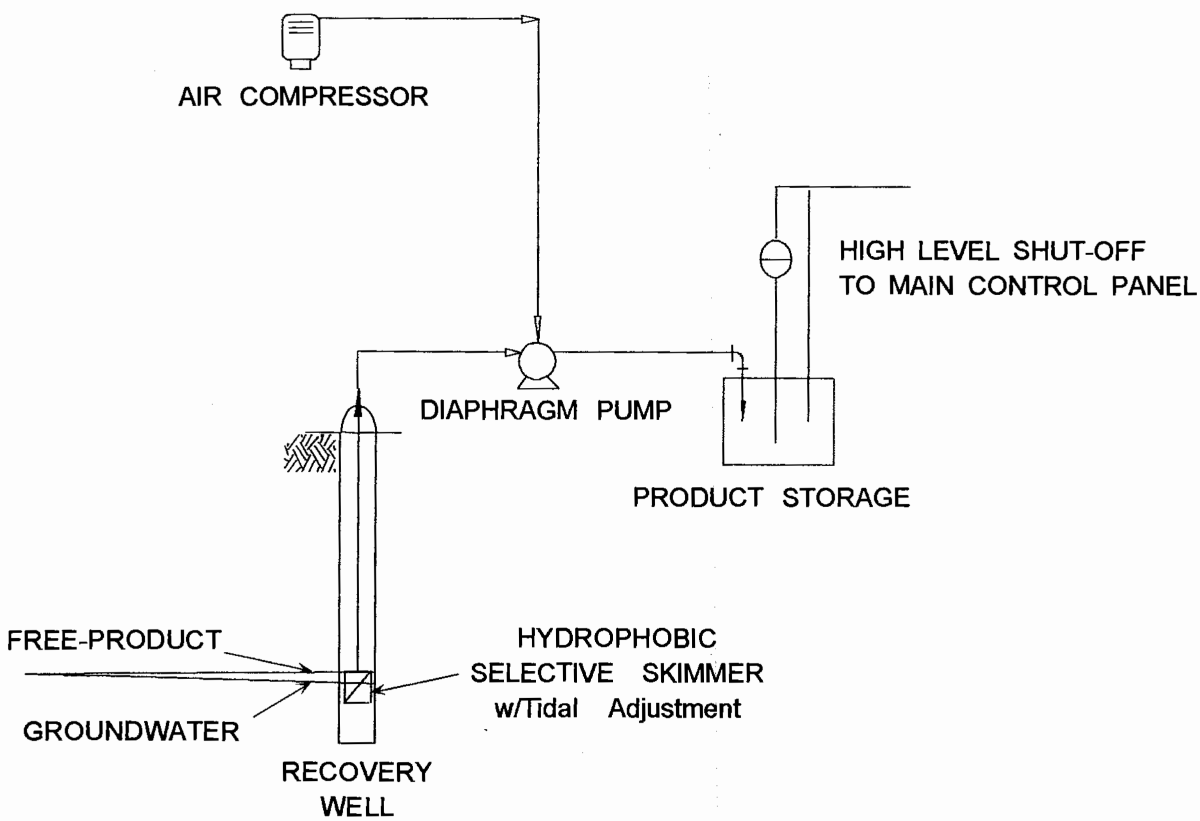



TYPICAL BIOSPARGING/BIOVENTING SYSTEM

| | | |
|---|---|---|
| GERAGHTY & MILLER, INC. *Environmental Services* | **Typical Biosparging/Bioventing System**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>8 |

# FREE-PRODUCT SKIMMING RECOVERY SYSTEM

"Skimming type" recovery systems are for conditions where it is not necessary to reverse the groundwater flow direction. Skimming systems may use a floating intake that allows product to enter but minimizes water intake(hydrophobic).

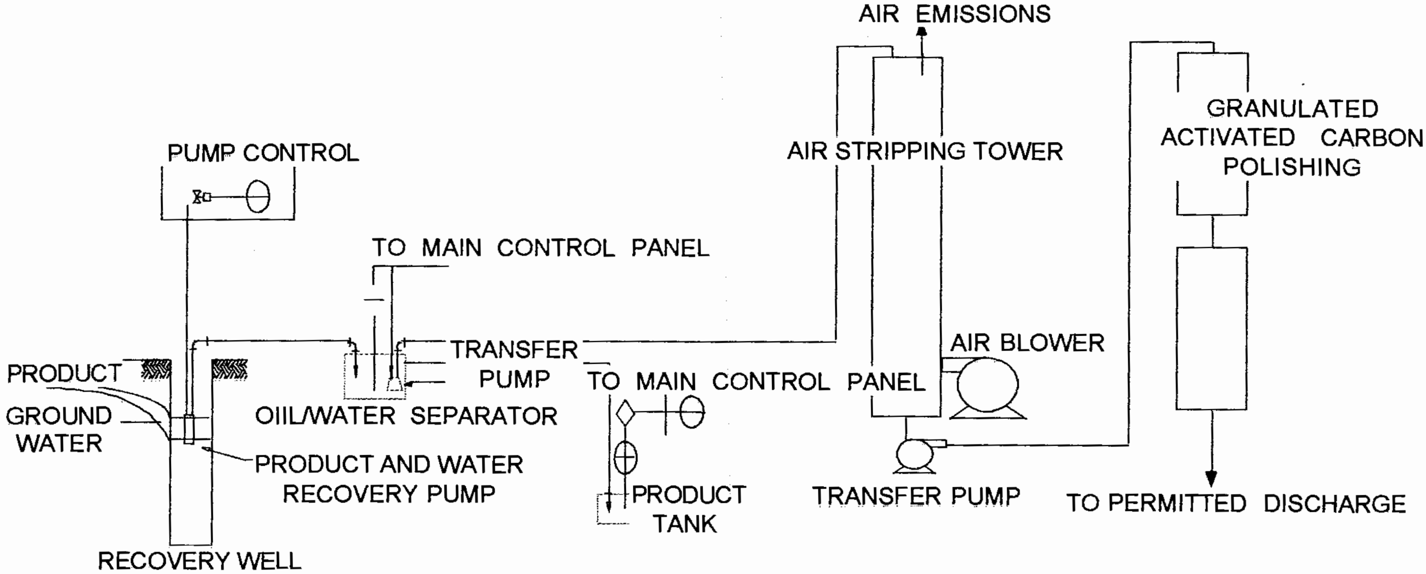



TYPICAL FREE-PRODUCT SKIMMING RECOVERY SYSTEM

| GERAGHTY & MILLER, INC. *Environmental Services* | **Product Recovery Skimming System**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>9 |
|---|---|---|

## SINGLE PUMP RECOVERY SYSTEMS

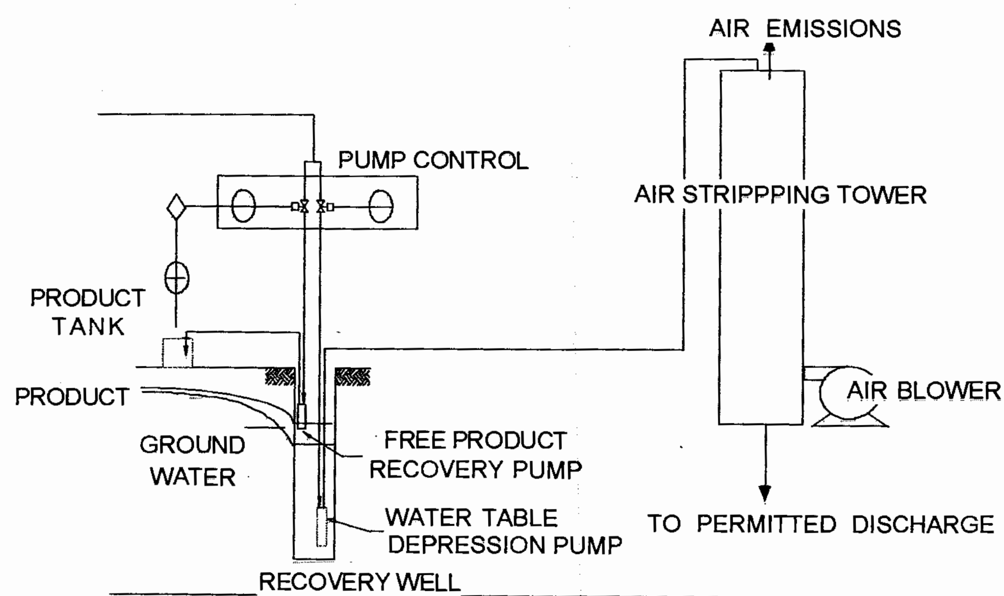
This system uses a single pump to recover water and product. The single pump system is necessary where water table depression is required to reverse the groundwater flow and cause the product to flow toward the recovery well.




TYPICAL SINGLE PUMP PRODUCT CONFINEMENT/RECOVERY SYSTEM

## DUAL PUMP RECOVERY SYSTEMS

The dual pump uses a water pump and product recovery pump to recover the floating free (mobile) petroleum. The dual pump system is necessary where water table depression is necessary to reverse the relative water level elevation and cause the product to flow toward the recovery wells.

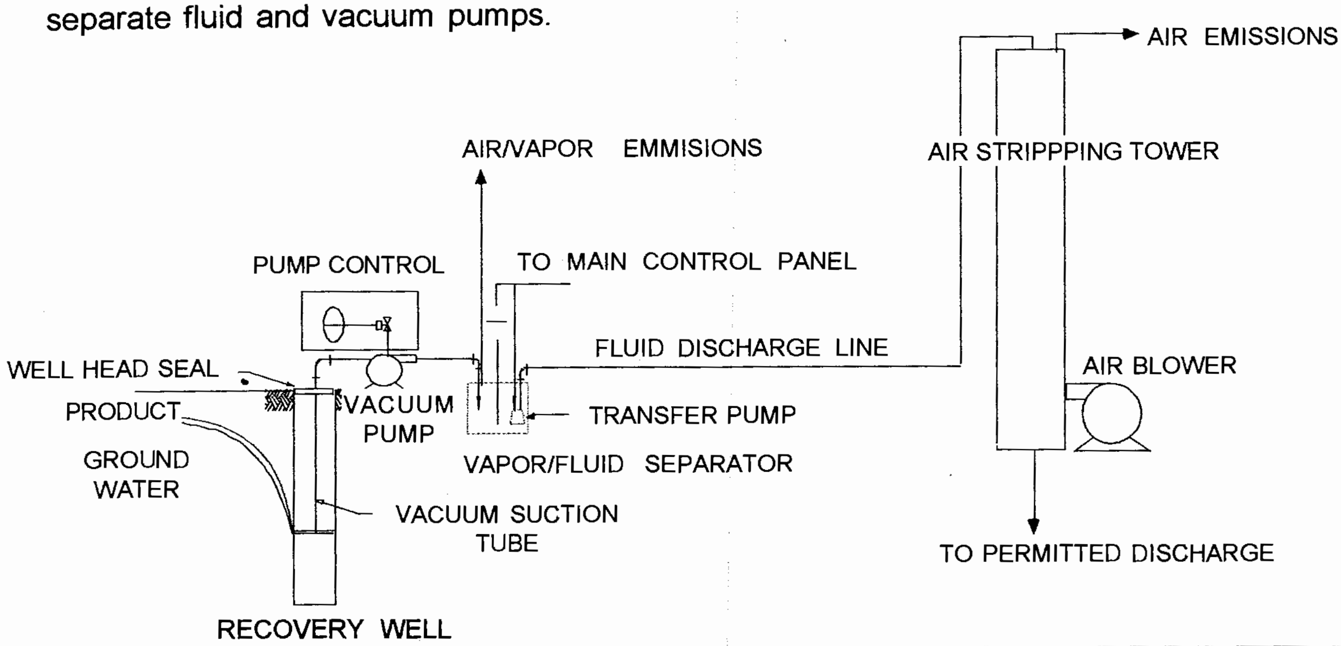



TYPICAL DUAL PUMP PRODUCT CONFINEMENT/RECOVERY SYSTEM

| | | |
|---|---|---|
| GERAGHTY & MILLER, INC. *Environmental Services* | **Single Pump & Dual Pump Recovery Systems**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>10 |

## VACUUM ENHANCED RECOVERY SYSTEMS

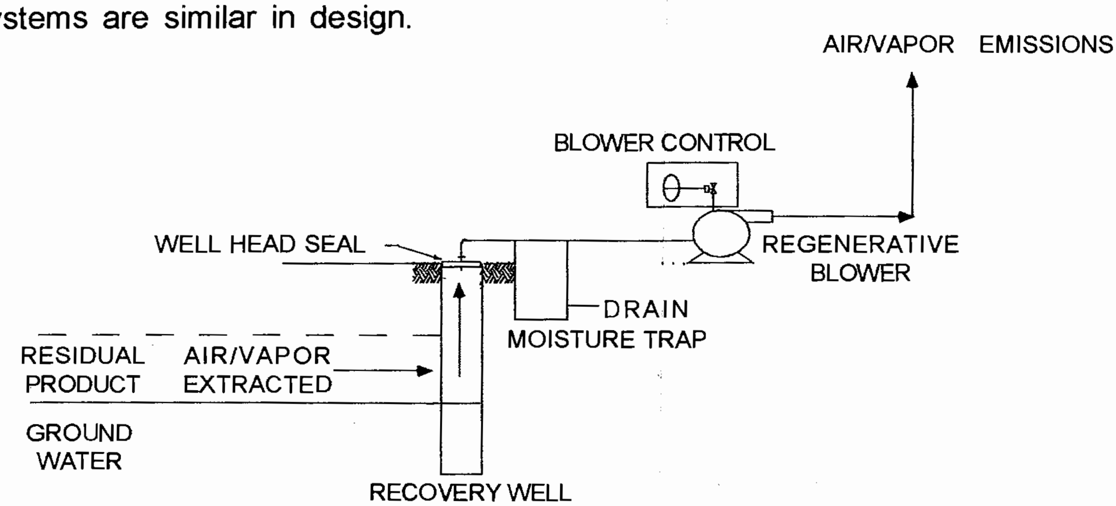
The vacuum enhanced recovery system is for moderated to low permeability conditions. The vacuum system recovers fluids and air/vapor using a single vacuum pump or separate fluid and vacuum pumps.




TYPICAL VACUUM ENHANCED PRODUCT CONFINEMENT/RECOVERY SYSTEM

## SOIL VENTING SYSTEMS

The soil venting system uses a regenerative blower to extract air/vapor. Bioventing systems are similar in design.

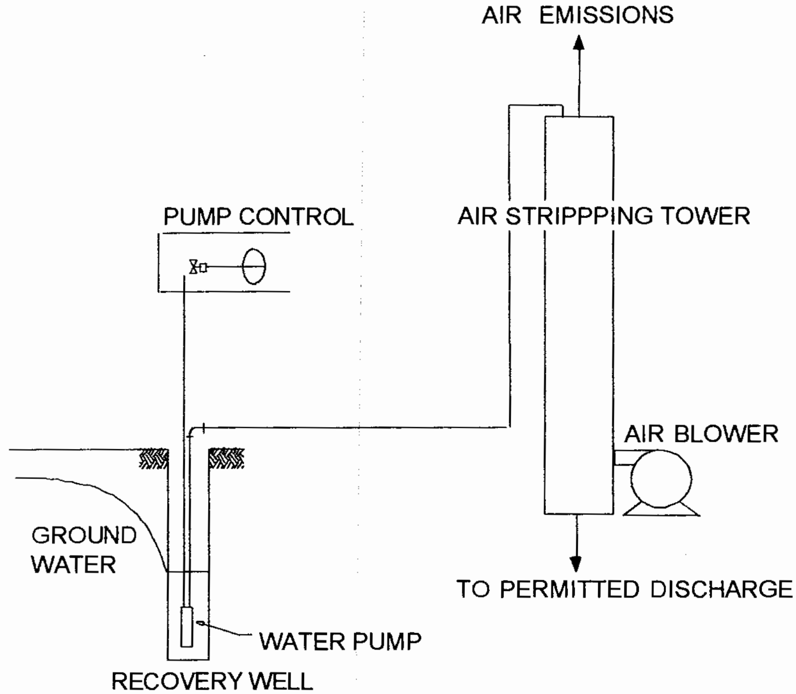



TYPICAL SOIL VENTING/BIOVENTING SYSTEM

| | | |
|---|---|---|
| GERAGHTY & MILLER, INC. *Environmental Services* | **Vacuum Enhanced & Soil Venting Systems**<br>Citgo Savannah Asphalt Refinery | Figure<br>11 |

## PUMP & TREAT SYSTEMS

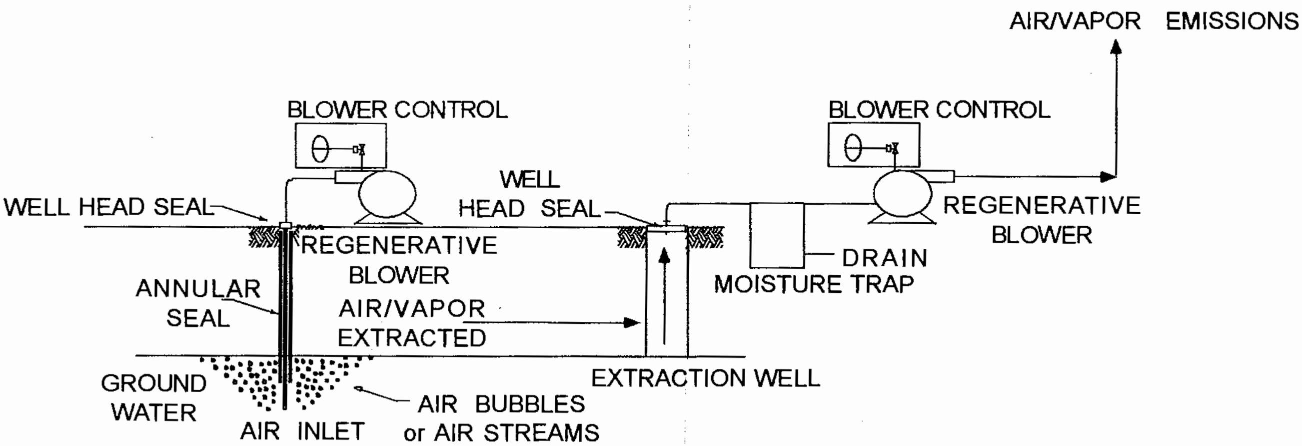
Pump and treat systems are used to contain hydrocarbons dissolved in the groundwater by creating a hydraulic gradient toward the recovery well.




TYPICAL PUMP & TREAT SYSTEM

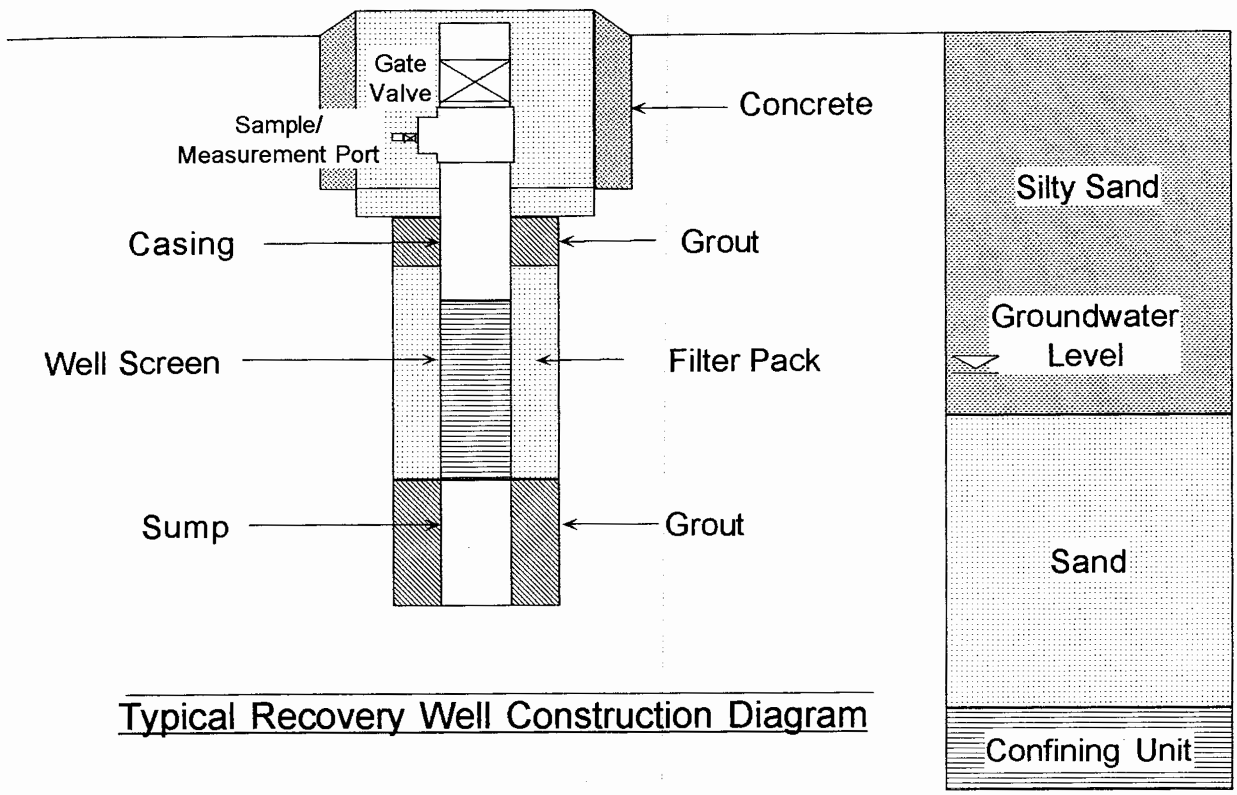
## AIR SPARGING SYSTEMS

Air sparging systems inject air into the groundwater to strip volatile hydrocarbons dissolved in the groundwater, and increase dissolved oxygen to enhance biodegradation of dissolved hydrocarbons.

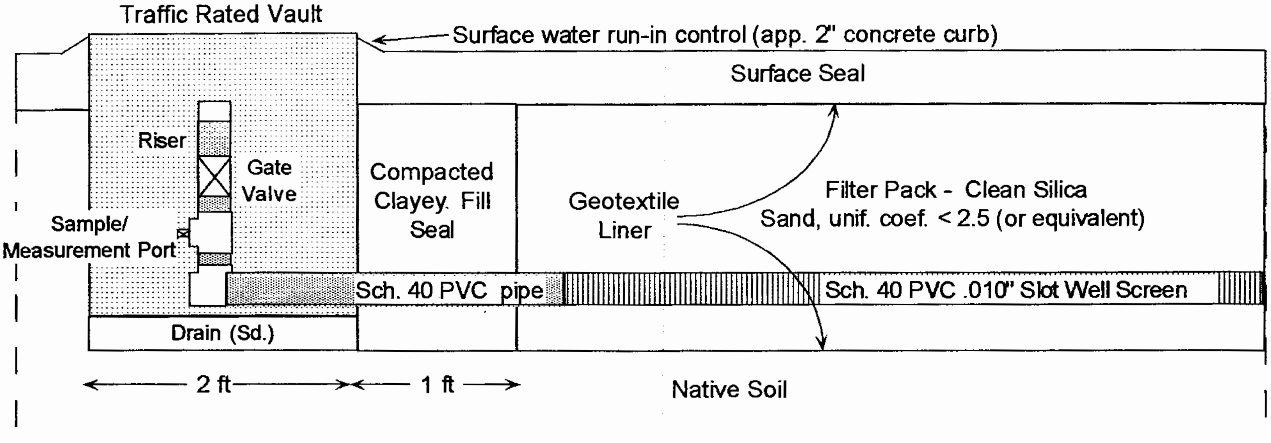



TYPICAL AIR SPARGING SYSTEM

| GERAGHTY & MILLER, INC. *Environmental Services* | **Pump and Treat & Air Sparge Systems**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>12 |
| --- | --- | --- |




Typical Recovery Well Construction Diagram




Typical Recovery Well Construction Diagram

GERAGHTY & MILLER, INC.
*Environmental Services*

**Vertical & Horizontal Extraction Systems**

Citgo Savannah
Asphalt Refinery

Figure 13

# APPENDIX A

# WELL LOGS

GERAGHTY & MILLER, INC.
*Environmental Services*

# MONITOR WELL LOG
AW-66



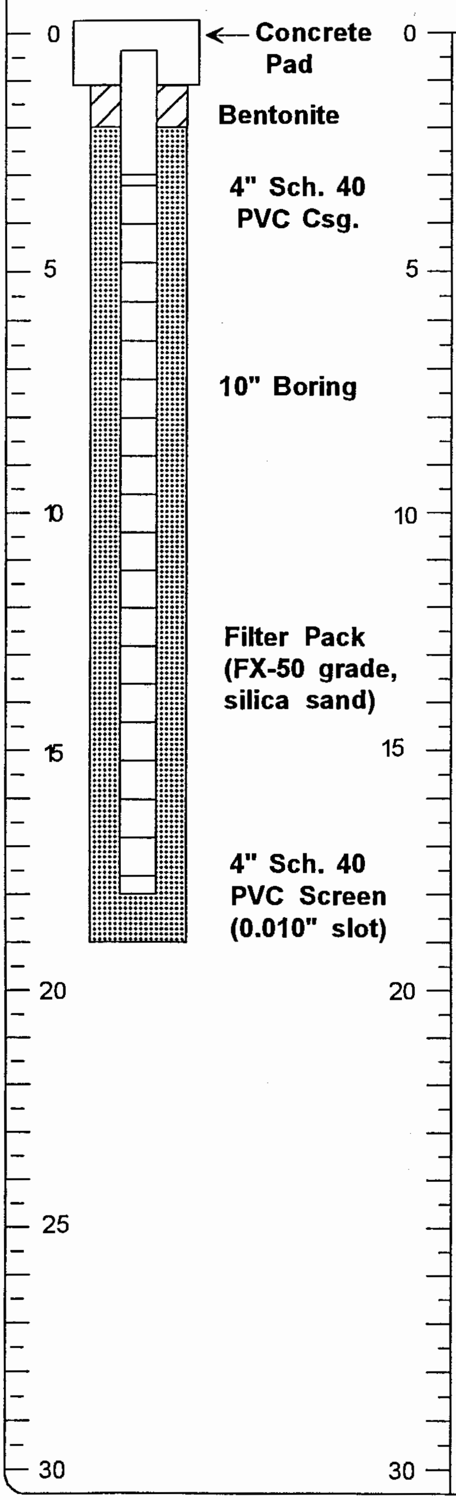
Well Location

See Site Plan

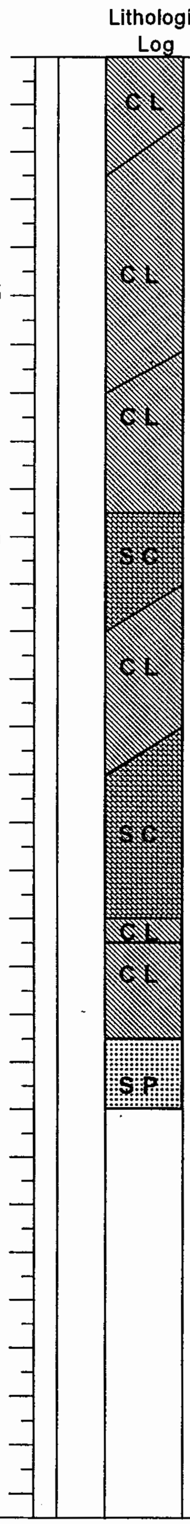
N

Project No.: GA0100.003
Date Drilled: 11/04/94
Logged by: Greg Wrenn
Drilling Meth.: HSA
Drilling Co.: Meldrim Drilling
Sample Meth.:

## WELL CONSTRUCTION




## DESCRIPTION




Brown, silty, sandy clay.

Grades dark reddish brown with trace sand.

Grades gray with increasing sand.

Gray, clayey fine sand.

Grades to sandy clay.

Grades to clayey sand.

Brown, mottled, sandy clay.

Gray clay.

Gray, fine-medium sand with a little clay.

Total depth of boring 22 feet.

GERAGHTY & MILLER, INC.
*Environmental Services*

# MONITOR WELL LOG
AW-67



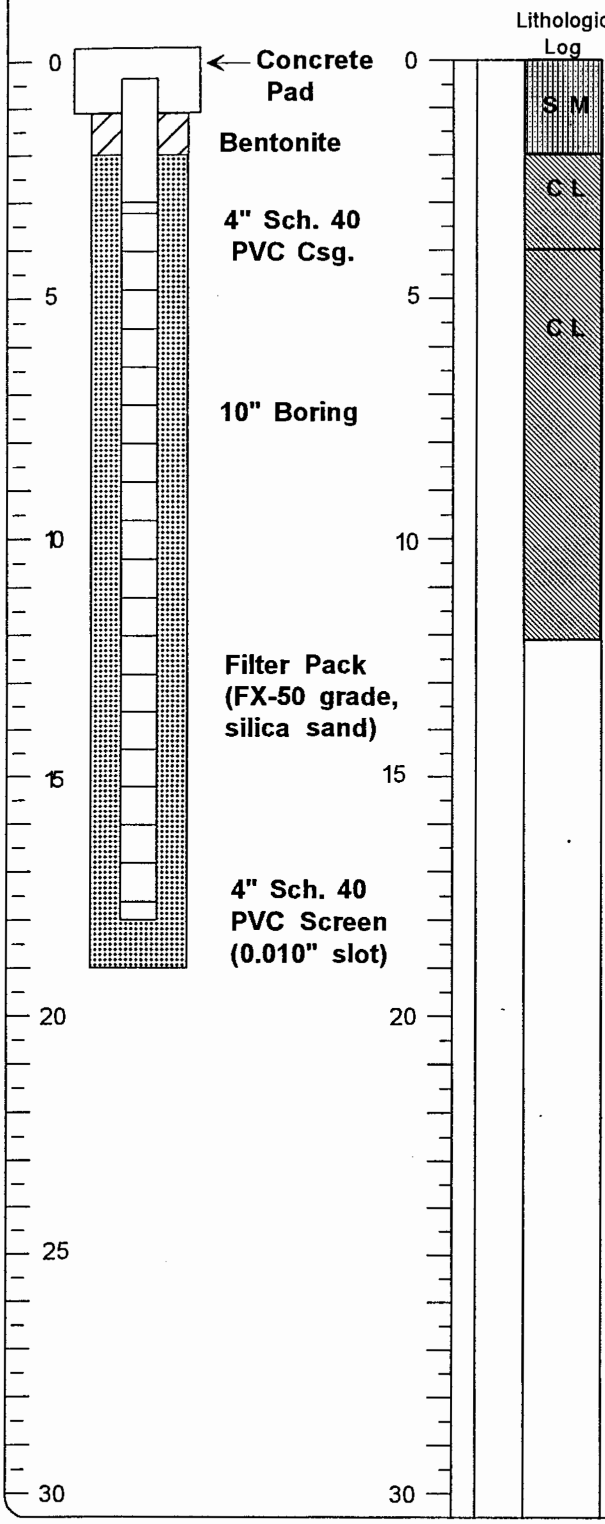
Well Location

See Site Plan

| | |
|---|---|
| Project No.: GA0100.003 | Date Drilled: 11/04/94 |
| Logged by: Greg Wrenn | Drilling Meth.: HSA |
| Drilling Co.: Meldrim Drilling | Sample Meth.: |

WELL CONSTRUCTION

DESCRIPTION




Top Soil.

Brown, silty clay.

Gray clay.

Not sampled.

Total depth 19 feet.

GERAGHTY & MILLER, INC.
*Environmental Services*

# MONITOR WELL LOG
AW-68



Well Location

See Site Plan

N

Project No.: GA0100.003

Logged by: Greg Wrenn

Drilling Co.: Meldrim Drilling

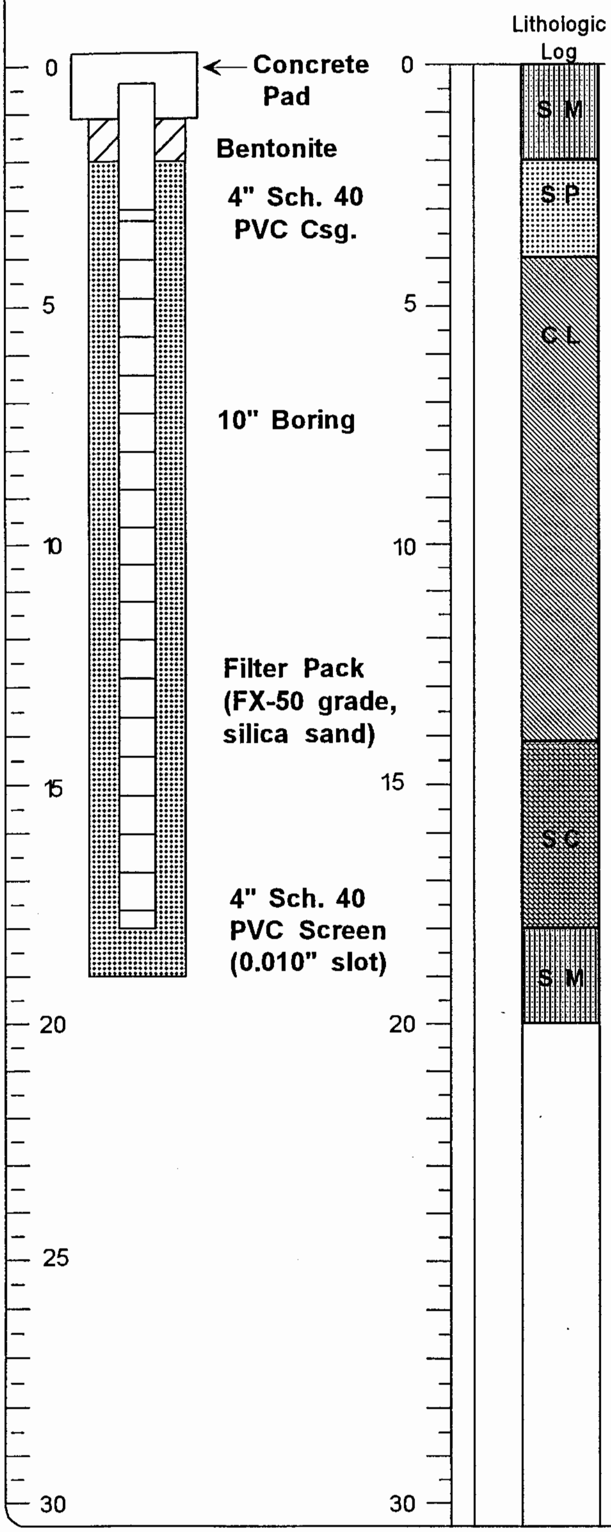
Date Drilled: 11/04/94

Drilling Meth.: HSA

Sample Meth.:

WELL CONSTRUCTION

DESCRIPTION




| Depth (ft) | Description |
|---|---|
| 0 | |
| | Brown, silty, sandy clay. |
| | Mottled yellow orange and gray, fine sand. |
| | Mottled red - gray clay with sand. |
| 10 | Grades sandy. |
| | Gray to white, clayey fine sand. |
| | Grades coarse. |
| | Gray-brown, silty coarse sand. |
| 20 | |
| | Total depth of boring 22 feet. |
| 30 | |

GERAGHTY & MILLER, INC.
*Environmental Services*

# MONITOR WELL LOG

AW-69



Well Location

See Site Plan

N

Project No.: GA0100.003

Date Drilled: 11/04/94

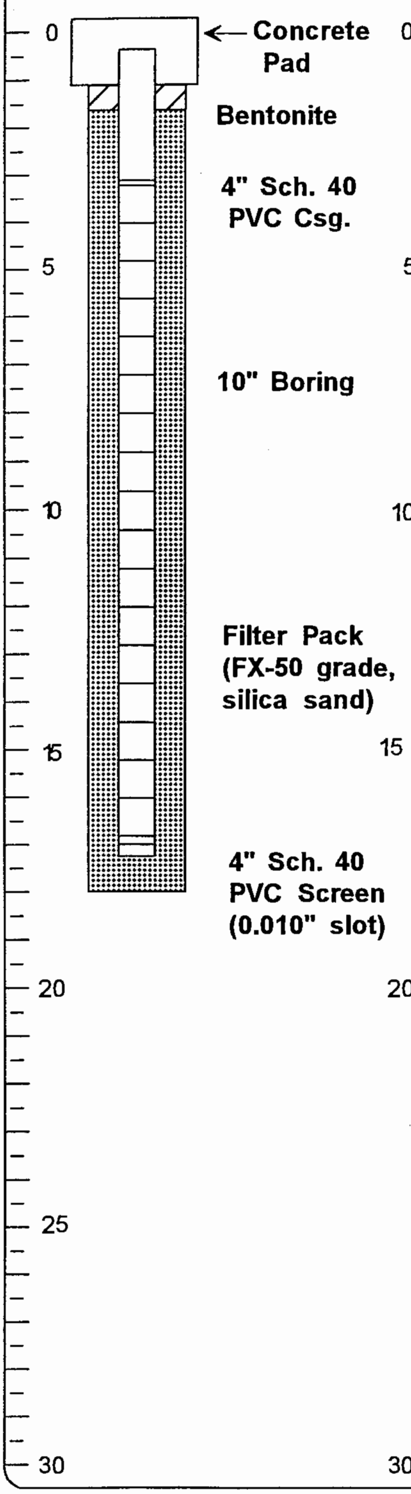
Logged by: Greg Wrenn

Drilling Meth.: HSA

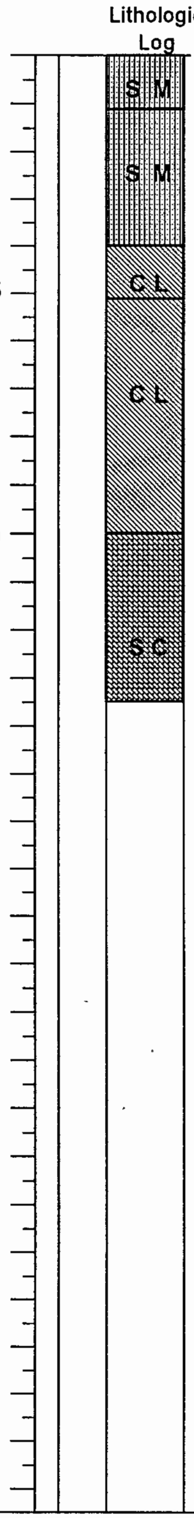
Drilling Co.: Meldrim Drilling

Sample Meth.:

WELL CONSTRUCTION




DESCRIPTION




Brown silty sand.

Light brown silty sand.

Gray, silty, clayey sand.

Brown, silty, clayey sand.

Gray, silty, clayey sand.

Not sampled.

Total depth of boring 18 feet.

GERAGHTY & MILLER, INC.
*Environmental Services*

# MONITOR WELL LOG

AW-70



Well Location

See Site Plan

N

Project No.: GA0100.003

Logged by: Greg Wrenn

Drilling Co.: Meldrim Drilling

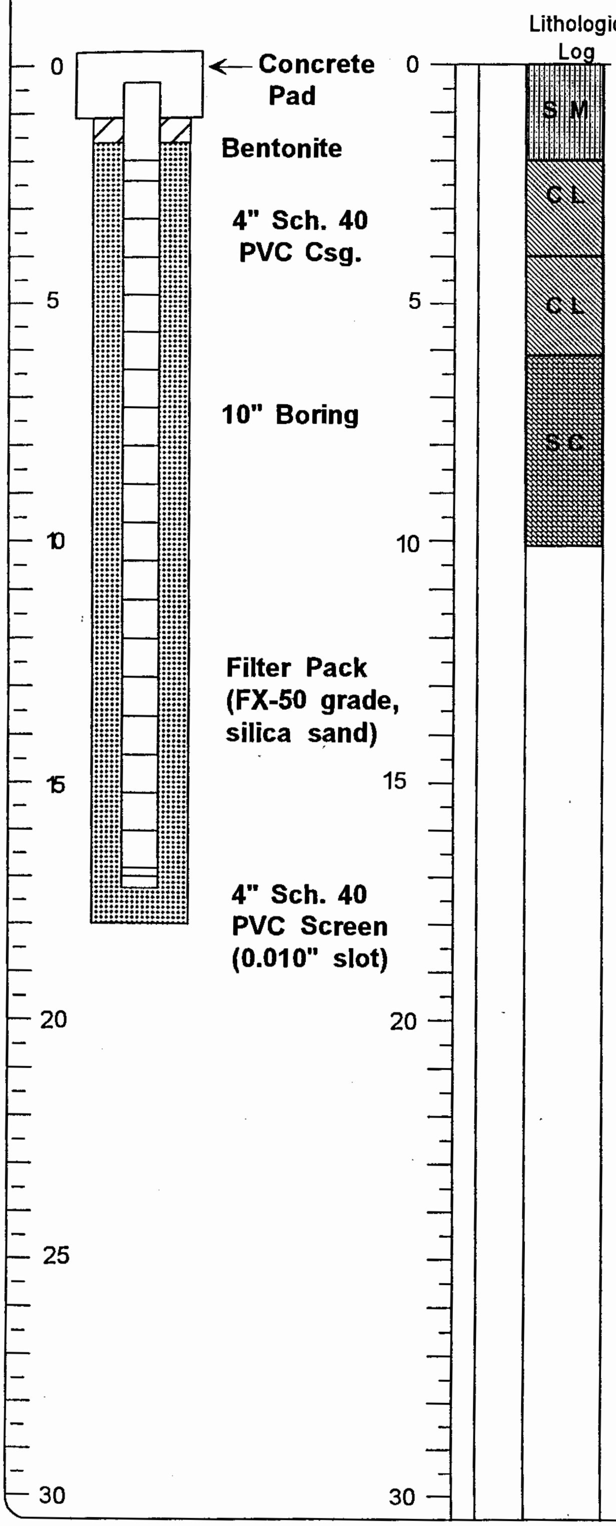
Date Drilled: 11/04/94

Drilling Meth.: HSA

Sample Meth.:

WELL CONSTRUCTION

DESCRIPTION




Brown silty sand.

Dark gray, sandy clay.

Mottled, brown-gray-orange sandy clay.

Greenish-gray clay with little firm sand.

Gray, clayey, fine sand.

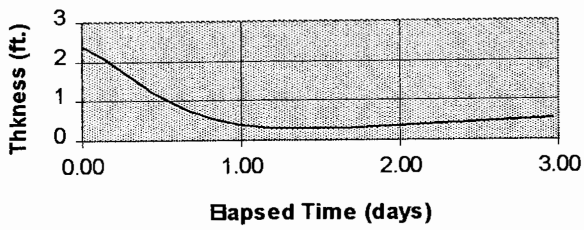
Not sampled.

Total depth of boring 18 feet.

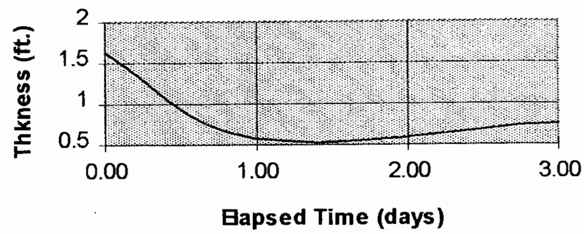
# APPENDIX B

## PRODUCT BAILDOWN TESTS

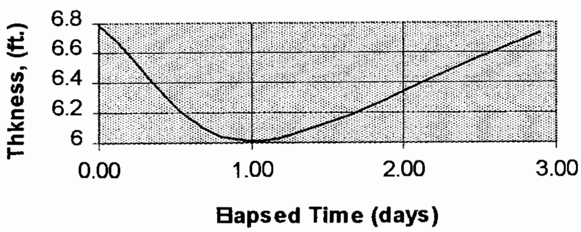
## AW-5 Product Bail Down



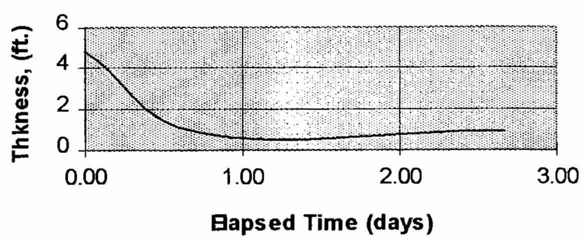

## AW-8 Product Bail Down



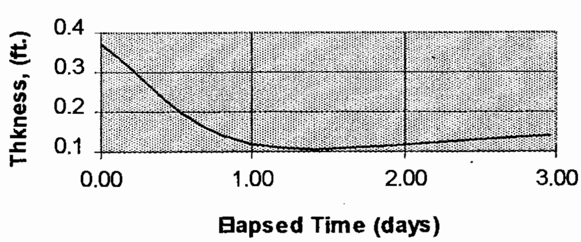

## AW-10 Product Bail Down



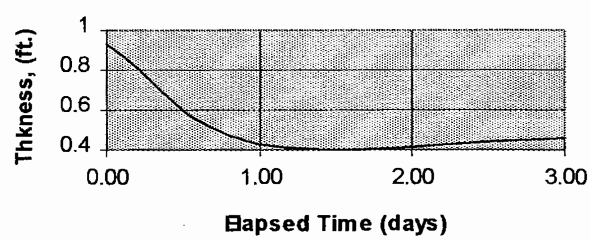

## AW-15 Product Bail Down



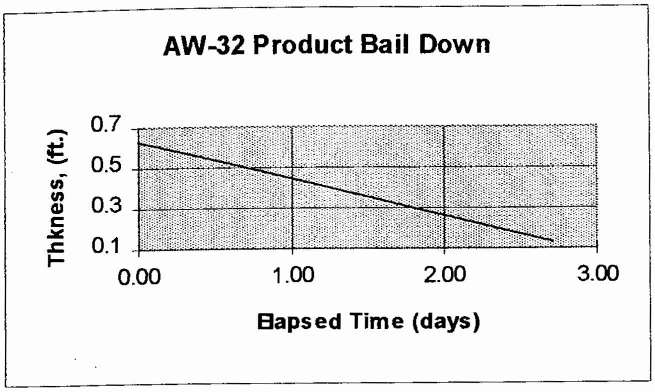

## AW-18 Product Bail Down

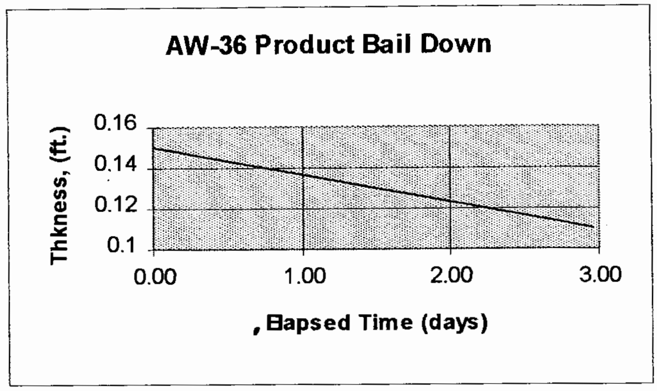


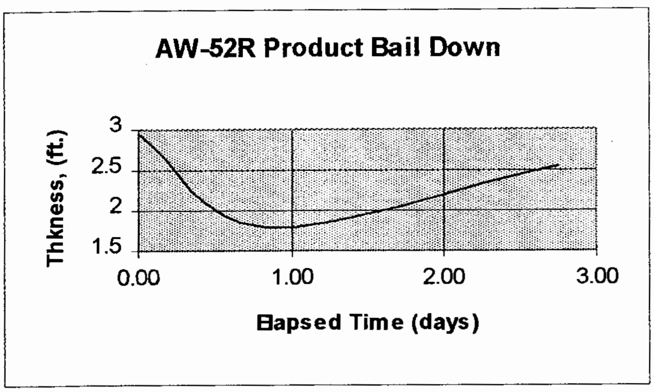

## AW-19 Product Bail Down

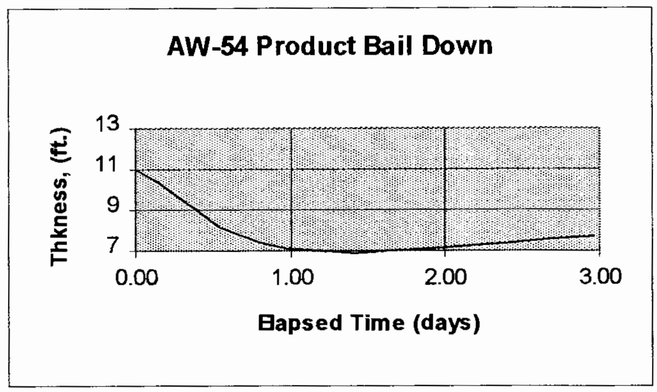


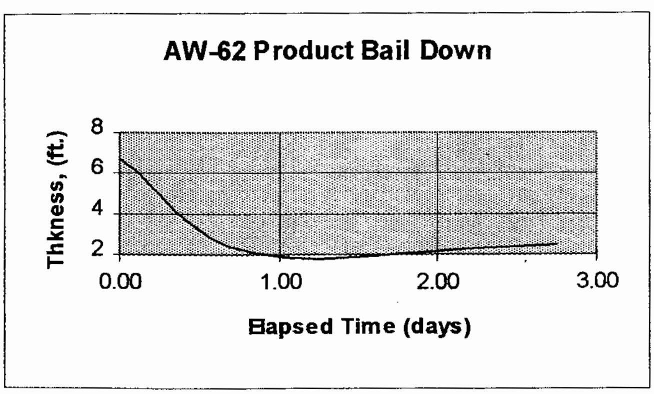

| GERAGHTY & MILLER, INC. *Environmental Services* | **Product Bail Down Tests**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>A-1 |
|---|---|---|

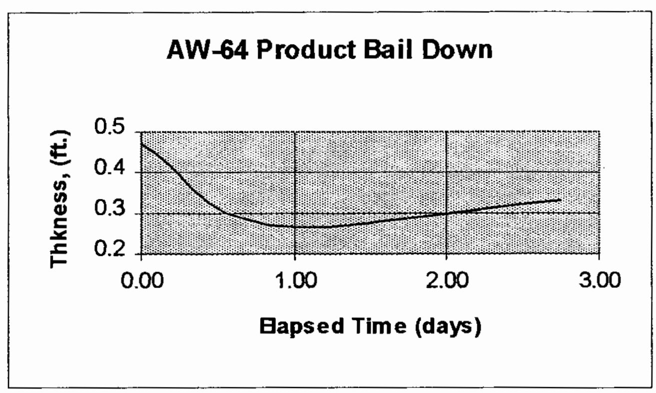


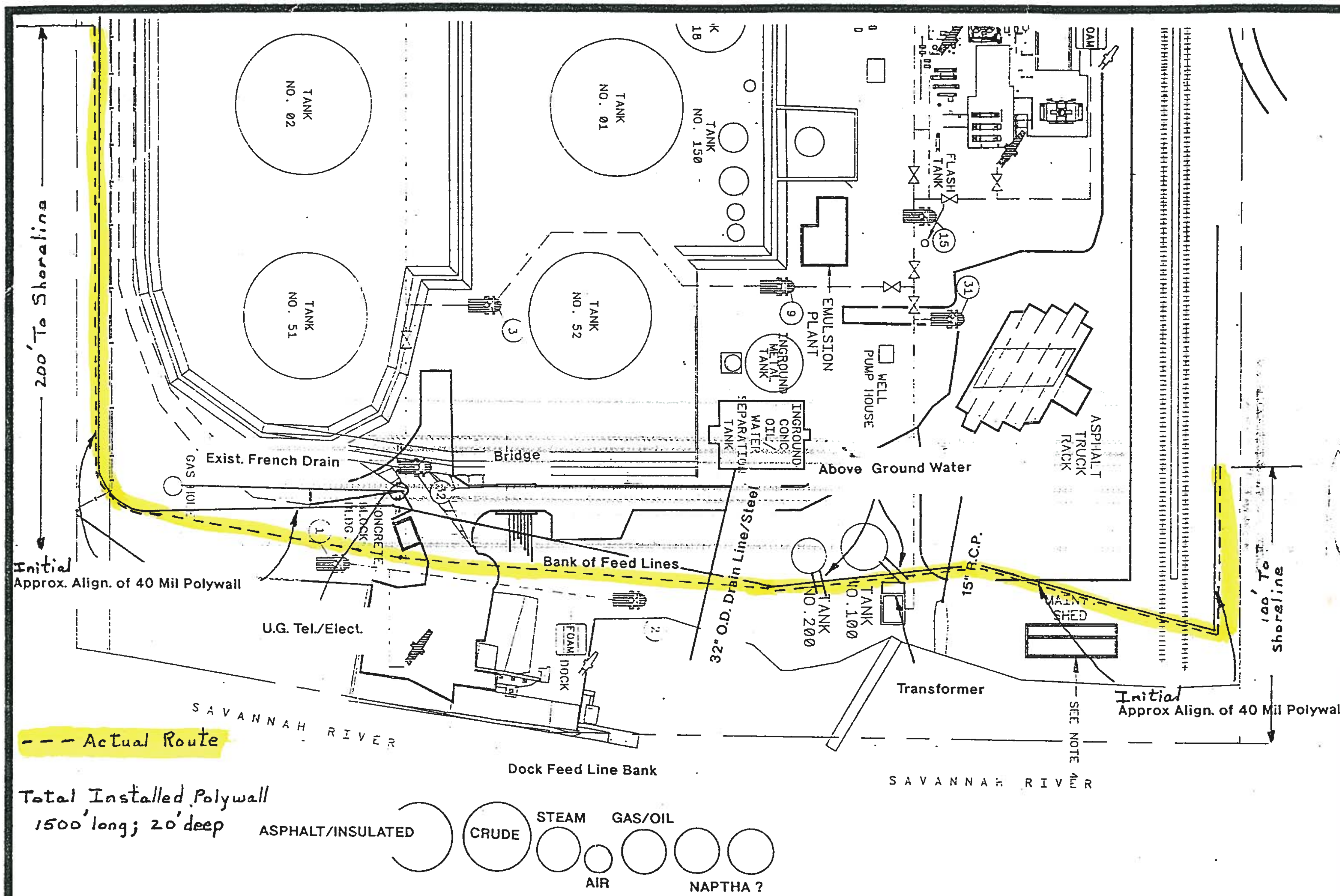




| | | |
|---|---|---|
| GERAGHTY & MILLER, INC. *Environmental Services* | **Product Bail Down Tests**<br>Citgo Savannah<br>Asphalt Refinery | Figure<br>A-2 |




# CITGO Asphalt Refining Company
# Savannah Georgia

HTI

Date: 1/96 Project: CITGO

HorizontalTechnologies,Inc.

October 31, 2003

CITGO Asphalt Refining Co.
Foundation Drive
P. O. Box 1881
Savannah, GA 31402-1881

Attention: Mr. Frank White

**Subject:** **WATER ELEVATION/HYDROCARBON THICKNESS MONITORING REPORT**
CITGO Asphalt Refinery
Foundation Drive
Savannah, Georgia
S&ME Project No. 1264-03-524

Dear Mr. White:

S&ME, Inc. (S&ME) has completed the monitoring of water levels and free product at the CITGO Asphalt Refinery in Savannah, Georgia. Enclosed please find a table summarizing the measurements of water and product levels, a Free Product Contour Map, a Groundwater Surface Map, and results of fingerprinting analysis of six product samples from various locations of the site.

S&ME appreciates the opportunity to be of service to you. If we can be of further assistance or answer any questions please contact us at (864) 574-2360 or via e-mail at Dklemm@smeinc.com.

Very truly yours,
**S&ME, Inc.**

David E. Klemm, P.G.
Project Hydrogeologist

S&ME, Inc.
155 Tradd Street
Spartanburg, South Carolina 29301

(864) 574-2360
(864) 576-8730 fax
(864) 232-8987 Greenville

www.smeinc.com

## LIQUID LEVEL MEASUREMENTS

On October 2, 2003 groundwater and product levels were measured in thirty-eight groundwater monitoring wells at the site. The water/product levels are summarized on Table 1. The data indicates that a free product plume exists under a large portion of the facility, primarily under the above ground storage tank farm. The greatest product thicknesses were measured in AS-54 at 10.70 feet and in AW-51 at 7.76 feet.

The free product data was input into a 2-dimensional computer contouring program (Surfer 8.0). The results were placed on a site plan to represent the spatial distribution of product at the site. The resulting Free Product Contour Map is attached as Figure 1.

The groundwater elevation for each well was calculated by subtracting the depth of the water from the top of casing (TOC) elevation. The groundwater elevations were density corrected for wells containing separate phase hydrocarbons. An estimated density correction of 0.8 was used based on the identified product types. The resulting groundwater elevations are shown on Table 1. The groundwater elevation data was input into the computer contouring program and the results were placed on the site map to represent the groundwater flow beneath the site. The resulting Groundwater Elevation Map is attached as Figure 2. The groundwater contours are somewhat erratic with a generalized groundwater flow direction from southwest to northeast toward the Savannah River.

## BAIL DOWN TESTS

S&ME attempted to perform bail-down tests on several wells in order to evaluate aquifer characteristics and free product recovery rates. Due to the high permeability of the soils at the site, the tests were not quantifiable, however indicated that high recovery rates of water and product are probable under pumping conditions.

## PRODUCT SAMPLING AND RESULTS

Product samples were collected for six wells at the site for "fingerprinting" analysis. The samples were collected from wells AW-10, AW-11, AW-15, AW-22, AW-51, and AW-54. The samples were delivered to Friedman & Bruya, Inc. in Seattle, Washington for analysis. The analytical information provides the boiling range and general chemical composition of the samples collected. A copy of the analytical reports are attached.

The results were generally consistent for four of the six samples indicating a mixture of light and middle distillates with varying degrees of weathering. One sample indicated only the presence of light distillates and one sample indicated only the presence of medium distillates. A summary of the sample results follows.

> The sample from AW-10 indicated a mixture of gasoline or a petroleum solvent, and a middle distillate such as diesel fuel or fuel oil. The gasoline range hydrocarbons did not appeared significantly weathered. The medium boiling point hydrocarbons appeared substantially degraded.
>
> The sample from AW-11 indicated a mixture of gasoline or a petroleum solvent, and a middle distillate such as diesel fuel or fuel oil. The gasoline range hydrocarbons appeared severely weathered. The medium boiling point hydrocarbons were less degraded.
>
> The sample from AW-15 indicated only light distillates such as gasoline or petroleum solvents. The low response for toluene, ethylbenzene, and xylenes indicates that any gasoline present has been extensively degraded.
>
> The sample from AW-22 indicated a mixture of gasoline or a petroleum solvent, and a middle distillate such as diesel fuel of fuel oil. The light distillate hydrocarbons appeared severely weathered. The medium distillate hydrocarbons had also undergone substantial degradation.
>
> The sample from AW-51 indicated a mixture of gasoline or a petroleum solvent, and a middle distillate such as diesel fuel of fuel oil. The gasoline range hydrocarbons appeared severely weathered. The medium boiling point hydrocarbons had also undergone substantial degradation.

> The sample from AW-54 indicated the presence of middle distillates such as diesel fuel or #2 fuel oil. The hydrocarbons had undergone substantial degradation.

Based on the information obtained, it appears that the majority of the separate phase hydrocarbons are similar to either gasoline or diesel fuel and should be recoverable with standard environmental extraction technologies. One well, AW-13, contained a product that was too viscous to obtain an accurate thickness measurement or collection of a sample for analysis. The product from AS-13 will not be recoverable using standard extraction technologies.

## WELL CONDITION

A survey of the monitoring wells condition was conducted during the monitoring event. A list of the wells and their respective condition is attached as Table 2.

## TABLE 1
### WATER LEVEL AND PRODUCT THICKNESS MEASUREMENTS
### CITGO ASPHALT REFINERY
### SAVANNAH, GEORGIA
S&ME Job Number 1264-03-524

| Well | Casing Elevation (MSL) | Date | Time | Liquid Level (Ft-TOC) | Water Level (Ft-TOC) | Product Thickness (Ft) | Specific Gravity | Corrected Elevation (Ft-MSL) |
|---|---|---|---|---|---|---|---|---|
| AW-5 | 16.47 | 10/2/2003 | 11:37 AM | 5.73 | 7.00 | 1.27 | 0.80 | 10.49 |
| AW-6 | 12.6 | 10/2/2003 | 12:15 PM | 7.85 | 9.58 | 1.73 | 0.80 | 4.40 |
| AW-7 | 13.58 | 10/2/2003 | 3:04 PM | 8.80 | 8.80 | 0.00 | 0.80 | 4.78 |
| AW-8 | 15.88 | 10/2/2003 | 12:37 PM | 11.18 | 11.83 | 0.65 | 0.80 | 4.57 |
| AW-9 | 14.09 | 10/2/2003 | 10:19 AM | 10.24 | 13.09 | 2.85 | 0.80 | 3.28 |
| AW-10 | 14.9 | 10/2/2003 | 12:45 PM | 10.58 | 15.22 | 4.64 | 0.80 | 3.39 |
| AW-11 | 14.64 | 10/2/2003 | 10:05 AM | 10.75 | 13.40 | 2.65 | 0.80 | 3.36 |
| AW-13 | 13.79 | 10/2/2003 | 9:35 AM | PRODUCT TOO VISCOUS TO OBTAIN WATER LEVEL | | | | |
| AW-15 | 16.44 | 10/2/2003 | 2:52 PM | 9.15 | 12.95 | 3.80 | 0.80 | 6.53 |
| AW-17 | 15.14 | 10/2/2003 | 2:59 PM | 10.50 | 10.50 | 0.00 | 0.80 | 4.64 |
| AW-18 | 14.06 | 10/2/2003 | 12:08 PM | 6.87 | 7.28 | 0.41 | 0.80 | 7.11 |
| AW-19 | 16.52 | 10/2/2003 | 12:20 PM | 12.05 | 12.80 | 0.75 | 0.80 | 4.32 |
| AW-20 | 16.89 | 10/2/2003 | 10:43 AM | 11.68 | 11.68 | 0.00 | 0.80 | 5.21 |
| AW-21 | 14.12 | 10/2/2003 | 10:29 AM | 10.95 | 13.74 | 2.79 | 0.80 | 2.61 |
| AW-22 | 15.74 | 10/2/2003 | 9:15 AM | 11.30 | 15.55 | 4.25 | 0.80 | 3.59 |
| AW-23 | 16.26 | 10/2/2003 | 11:44 AM | 5.97 | 8.41 | 2.44 | 0.80 | 9.80 |
| AW-24 | 12.38 | 10/2/2003 | 3:13 PM | 4.57 | 4.57 | 0.00 | 0.80 | 7.81 |
| AW-25 | 14.55 | 10/2/2003 | 3:19 PM | 5.78 | 5.78 | 0.00 | 0.80 | 8.77 |
| AW-26 | 13.51 | 10/2/2003 | 11:22 AM | 5.22 | 5.22 | 0.00 | 0.80 | 8.29 |
| AW-27 | 14.58 | 10/2/2003 | 3:25 PM | 6.13 | 6.13 | 0.00 | 0.80 | 8.45 |
| AW-29 | 13.73 | 10/2/2003 | 3:30 PM | 5.56 | 5.56 | 0.00 | 0.80 | 8.17 |
| AW-30 | 14.42 | 10/2/2003 | 11:04 AM | 5.95 | 5.95 | 0.00 | 0.80 | 8.47 |
| AW-31 | 14.55 | 10/2/2003 | 2:31 PM | 6.60 | 6.60 | 0.00 | 0.80 | 7.95 |
| AW-32 | 15.47 | 10/2/2003 | 2:38 PM | 9.73 | 9.83 | 0.10 | 0.80 | 5.72 |
| AW-33 | 14.18 | 10/2/2003 | 2:13 PM | 5.91 | 5.91 | 0.00 | 0.80 | 8.27 |
| AW-34 | 14.3 | 10/2/2003 | 2:44 PM | 7.53 | 7.53 | 0.00 | 0.80 | 6.77 |
| AW-41 | 16.14 | 10/2/2003 | 11:15 AM | 9.30 | 9.30 | 0.00 | 0.80 | 6.84 |
| AW-42 | 11.29 | 10/2/2003 | 2:25 PM | 6.50 | 6.50 | 0.00 | 0.80 | 4.79 |
| AW-48 | 12.1 | 10/2/2003 | 11:58 AM | 6.82 | 6.82 | 0.00 | 0.80 | 5.28 |
| AW-49 | 15.16 | 10/2/2003 | 10:13 AM | 11.50 | 13.00 | 1.50 | 0.80 | 3.36 |
| AW-51 | 13.77 | 10/2/2003 | 9:57 AM | 9.78 | 17.54 | 7.76 | 0.80 | 2.44 |
| AW-52R | 16.51 | 10/2/2003 | 9:22 AM | 12.14 | 15.30 | 3.16 | 0.80 | 3.74 |
| AW-53 | 11.34 | 10/2/2003 | 3:47 PM | 5.36 | 5.98 | 0.62 | 0.80 | 5.86 |
| AW-54 | 12.14 | 10/2/2003 | 11:52 AM | 4.92 | 15.62 | 10.70 | 0.80 | 5.08 |
| AW-55 | 15.25 | 10/2/2003 | 12:30 PM | 10.57 | 12.23 | 1.66 | 0.80 | 4.35 |
| AW-62 | 8.77 | 10/2/2003 | 4:33 PM | 4.12 | 5.47 | 1.35 | 0.80 | 4.38 |
| AW-66 | 11.77 | 10/2/2003 | 10:49 AM | 11.04 | 11.94 | 0.90 | 0.80 | 0.55 |
| AW-67 | 12.27 | 10/2/2003 | 4:45 PM | 7.23 | 7.23 | 0.00 | 0.80 | 5.04 |

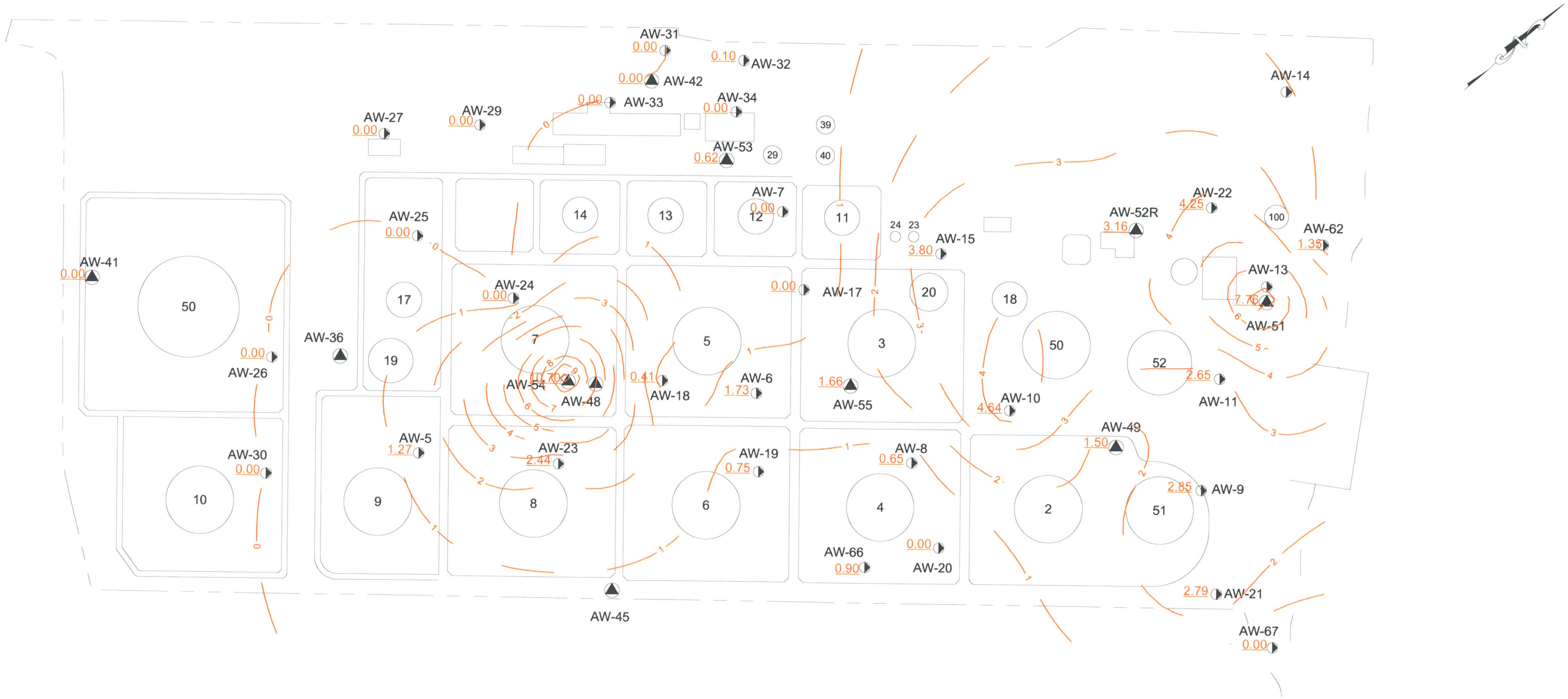
Notes:
(MSL) - Mean Sea Level
(TOC) - Top Of Casing
(Ft-TOC) - Measurement In Feet Below Top Of Casing
(Ft) - Measurement in Feet
(Ft-MSL) - Elevation in Feet Relative to Mean Sea Level

TABLE 2
MONITORING WELLS CONDITION
CITGO ASPHALT REFINERY
SAVANNAH, GEORGIA
S&ME Job Number 1264-03-524

| WELL | WELL CONDITION |
|---|---|
| AW-5 | Rusty casing. |
| AW-6 | Rusty casing but fine condition. |
| AW-7 | Excellent condition. |
| AW-8 | Rusy casing and the case cap is broken. |
| AW-9 | Casing broken. |
| AW-10 | Casing badly rusted away. |
| AW-11 | Outer case in poor condition. |
| AW-12 | Well not present |
| AW-13 | Good. |
| AW-14 | Well not present. |
| AW-15 | Excellent condition. |
| AW-16 | Well not present. |
| AW-17 | Case rusty but fine condition. |
| AW-18 | Good. |
| AW-19 | Case rusty but fine condition. |
| AW-20 | Good. |
| AW-21 | A little rust on the casing but overall fine condition. |
| AW-22 | Good. |
| AW-23 | Good. |
| AW-24 | Case rusty but fine condition. |
| AW-25 | Excellent condition. |
| AW-26 | Case rusty but fine condition. |
| AW-27 | Excellent condition. |
| AW-28 | Well not present. |
| AW-29 | Excellent condition. |
| AW-30 | Good. |
| AW-31 | Excellent condition. |
| AW-32 | Excellent condition. |
| AW-33 | Excellent condition. |
| AW-34 | Excellent condition. |
| AW-35 | Well not present. |
| AW-36 | Well not present. |
| AW-37 | Well not present. |
| AW-38 | Well not present. |
| AW-39 | Well not present. |
| AW-40 | Well not present. |
| AW-41 | Case rusty and cap broken. |
| AW-42 | Good. |
| AW-43 | Well not present. |
| AW-44 | Well not present. |
| AW-45 | Good. |
| AW-46 | Well not present. |
| AW-47 | Well not present. |
| AW-48 | Case cap broken. |
| AW-49 | Case rusty but fine condition. |
| AW-50 | Well not present. |

# TABLE 2
## MONITORING WELLS CONDITION
## CITGO ASPHALT REFINERY
## SAVANNAH, GEORGIA
S&ME Job Number 1264-03-524

| WELL | WELL CONDITION |
|---|---|
| AW-51 | Casing cap broken. |
| AW-52 | Case rusty but fine condition. |
| AW-53 | Good. |
| AW-54 | The top joint of the well is broken and is currently at an angle to the rest of the well. |
| AW-55 | Case cap broken. |
| AW-56 | Well not identified on site map. |
| AW-57 | Well not identified on site map. |
| AW-58 | Well not identified on site map. |
| AW-59 | Well not identified on site map. |
| AW-60 | Well not present. |
| AW-61 | Well not identified on site map. |
| AW-62 | Good. |
| AW-63 | Well not present. |
| AW-64 | Well not present. |
| AW-65 | Well not present. |
| AW-66 | Case rusty but fine condition. |
| AW-67 | Good. |
| AW-68 | Well not present. |
| AW-69 | Well not present. |
| AW-70 | Well not present. |




0.00 - Free Product Thickness in Feet

- Free Product Iso-pack Line

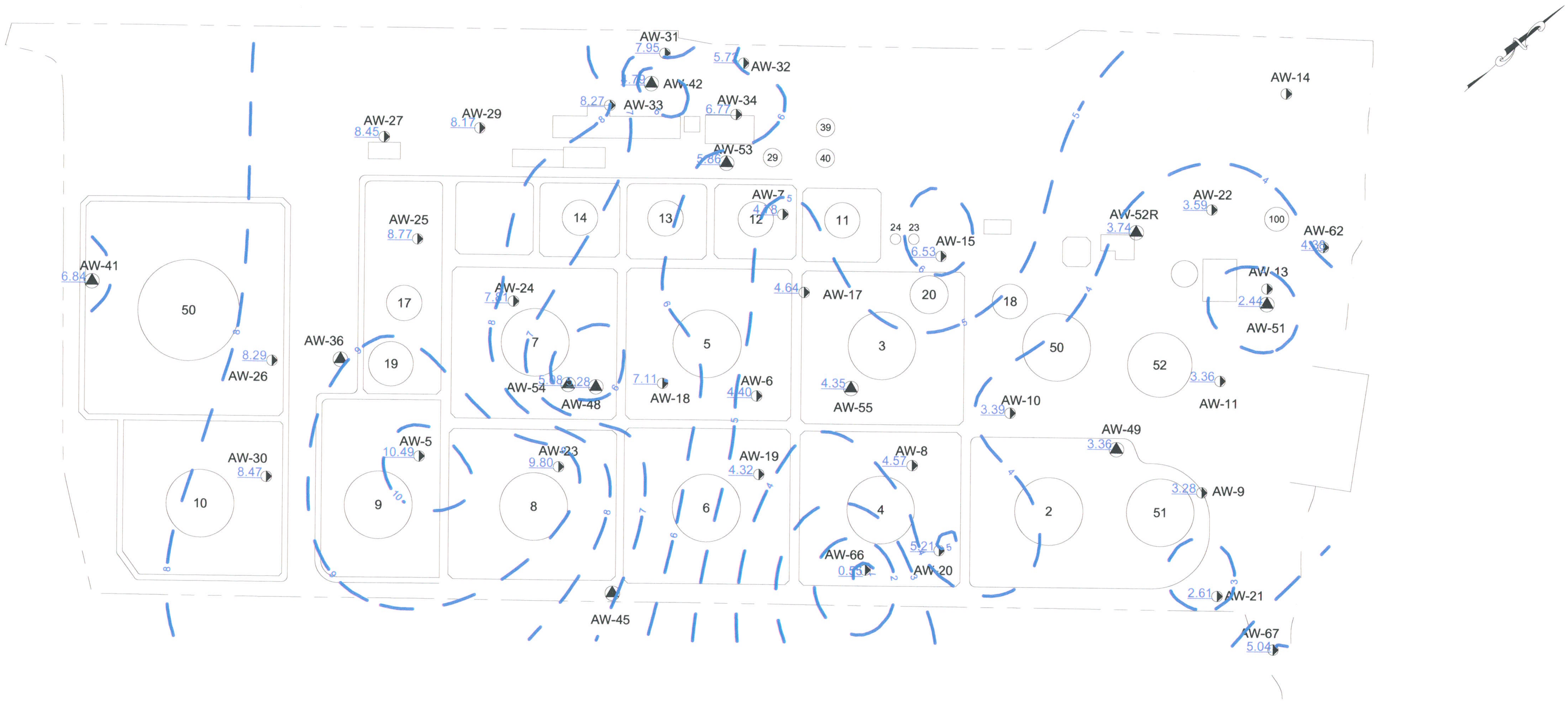
Product Levels Measured On October 02, 2003

**S&ME**
ENGINEERING · TESTING
ENVIRONMENTAL SERVICES

FREE PRODUCT CONTOUR MAP
**CITGO Petroleum Corporation**
Savannah, Georgia

CITGO

| | | |
|---|---|---|
| Scale : 1" = 200' | Drawn By: DK | Checked By: DK |
| Job # 1264-03-524 | October 31, 2003 | Figure 1 |




6.84 - Groundwater Elevation At Well

- Groundwater Contour Line

Groundwater Levels Measured On October 02, 2003

S&ME
ENGINEERING · TESTING
ENVIRONMENTAL SERVICES

GROUNDWATER SURFACE MAP
**CITGO Petroleum Corporation**
Savannah, Georgia

| | | |
|---|---|---|
| Scale : 1" = 200' | Drawn By: DK | Checked By: DK |
| Job # 1264-03-524 | October 31, 2003 | Figure 2 |

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

October 14, 2003

Denise McCoy, Project Manager
S&ME
7505 Waters Ave.
Savannah, GA 31406

Dear Ms. McCoy:

Included are the results from the testing of material submitted on October 7, 2003 from the Citgo Asphalt Refinery, 1264-03-524, F&BI 310057 project. The product samples submitted for forensic evaluation arrived in good condition. Upon arrival, the samples AW-11, AW-15, AW-22, AW-10, AW-51, and AW-54 were placed in a refrigerator maintained at 4°C until removed for sample processing.

The samples AW-11, AW-15, AW-22, AW-10, AW-51, and AW-54 were diluted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID) and an electron capture detector (ECD). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID and GC/ECD traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Kurt Johnson
Chemist

Enclosures
NAA1014R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-11 | The GC trace using the flame ionization detector (FID) showed the presence of low and medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of a low boiling material such as gasoline or a petroleum solvent and a middle distillate such as diesel fuel #2 or heating oil.<br><br>The low boiling compounds appear as a ragged pattern of peaks eluting from $n$-$C_7$ to $n$-$C_{13}$ showing a maximum near $n$-$C_8$. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that any gasoline present has undergone extensive degradation.<br><br>The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from $n$-$C_9$ to $n$-$C_{24}$ showing a maximum near $n$-$C_{15}$. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 270°C. Within this range, the dominant peaks present are indicative of normal alkanes. Secondary peaks are also present which are indicative of the isoprenoids including norpristane, pristane, and phytane. The relative abundance of the normal alkanes and isoprenoids indicates that little to no biological degradation has occurred to the majority of fuel. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-11 (continued) | The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-15 | The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds. The patterns displayed by these peaks are indicative of a low boiling material such as gasoline or a petroleum solvent.<br><br>The low boiling compounds appear as a ragged pattern of peaks eluting from $n$-$C_7$ to $n$-$C_{13}$ showing a maximum near $n$-$C_8$. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that any gasoline present has undergone extensive degradation.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-22 | The GC trace using the flame ionization detector (FID) showed the presence of low and medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of a low boiling material such as gasoline or a petroleum solvent and a middle distillate such as diesel fuel #2 or heating oil.<br><br>The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-$C_7$ to *n*-$C_{13}$ showing a maximum near *n*-$C_8$. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that any gasoline present has undergone extensive degradation.<br><br>The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from *n*-$C_9$ to *n*-$C_{24}$ showing a maximum near *n*-$C_{15}$. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 270°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-22 (continued) | The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-10 | The GC trace using the flame ionization detector (FID) showed the presence of low and medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of gasoline and a middle distillate such as diesel fuel #2 or heating oil.<br><br>The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-$C_7$ to *n*-$C_{13}$ showing a maximum near *n*-$C_8$. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed the presence of peaks, at varying levels, that are indicative of toluene, ethylbenzene, the xylenes, C3-benzenes, and methylnaphthalenes. These compounds are characteristic of the constituents commonly found in gasoline. The relative abundance of the volatile and semivolatile constituents present indicates that at least a portion of the fuel has not undergone substantial degradation.<br><br>The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from *n*-$C_9$ to *n*-$C_{24}$ showing a maximum near *n*-$C_{15}$. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 270°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-10 (continued) | The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-51 | The GC trace using the flame ionization detector (FID) showed the presence of low and medium boiling compounds. The patterns displayed by these peaks are indicative of a mixture of a low boiling material such as gasoline or a petroleum solvent and a middle distillate such as diesel fuel #2 or heating oil. |
| | The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-$C_7$ to *n*-$C_{13}$ showing a maximum near *n*-$C_8$. This correlates with a temperature range of approximately 100°C to 240°C with a maximum near 130°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that any gasoline present has undergone extensive degradation. |
| | The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from *n*-$C_9$ to *n*-$C_{24}$ showing a maximum near *n*-$C_{15}$. This correlates with a temperature range of approximately 150°C to 390°C with a maximum near 270°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation. |

Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

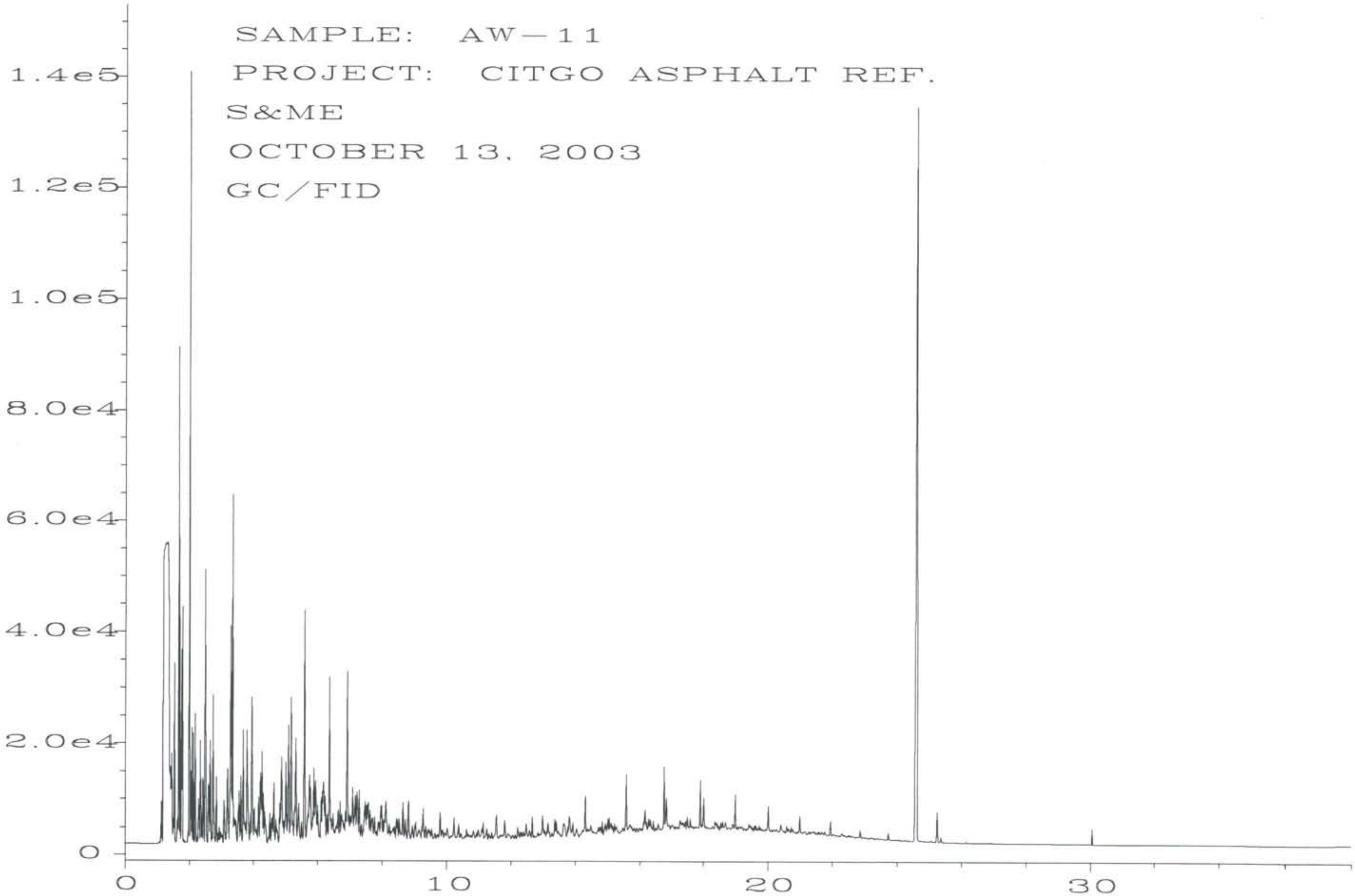
**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

| Sample ID | GC Characterization |
|---|---|
| AW-51 (continued) | The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |

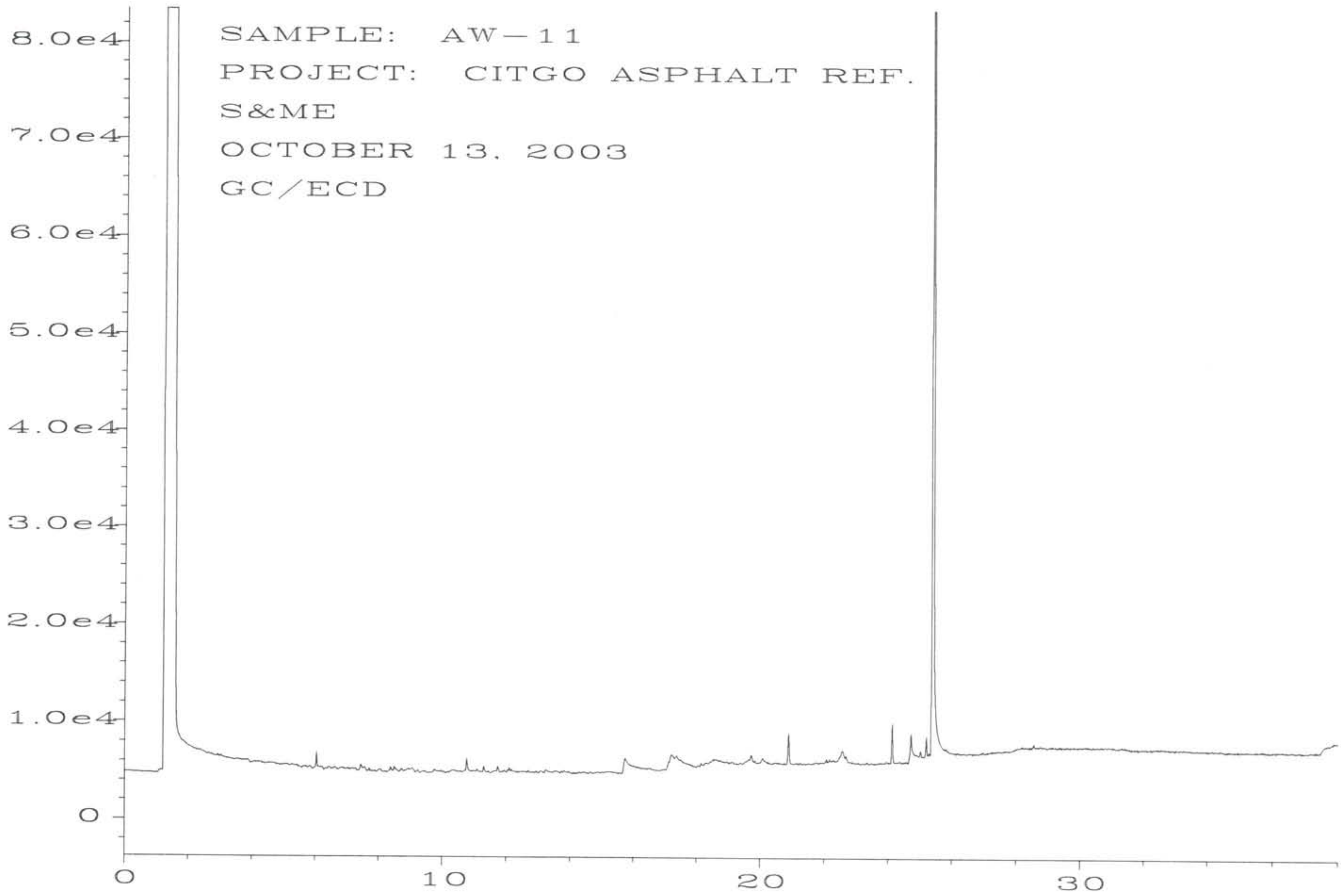
Date of Report: 10/14/03
Date Received: 10/07/03
Project: Citgo Asphalt Refinery, 1264-03-524, F&BI 310057
Date Extracted: 10/09/03
Date Analyzed: 10/13/03

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID) AND ELECTRON CAPTURE DETECTOR (ECD)**

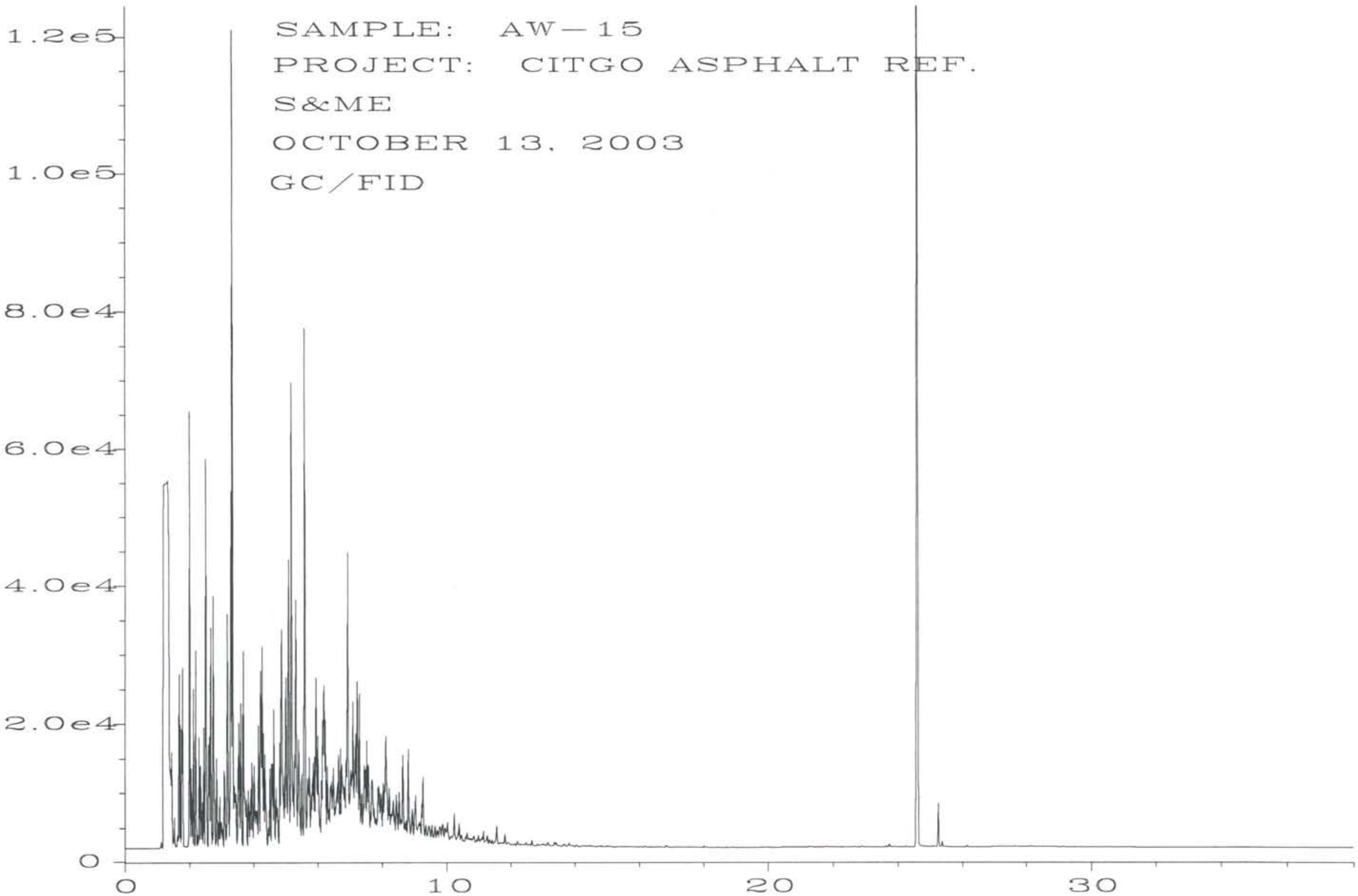
| Sample ID | GC Characterization |
|---|---|
| AW-54 | The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a middle distillate such as diesel fuel #2 or heating oil.<br><br>The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from $n$-$C_9$ to $n$-$C_{32}$ showing a maximum near $n$-$C_{15}$. This correlates with a temperature range of approximately 150°C to 470°C with a maximum near 270°C.<br><br>Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chlorendate. |



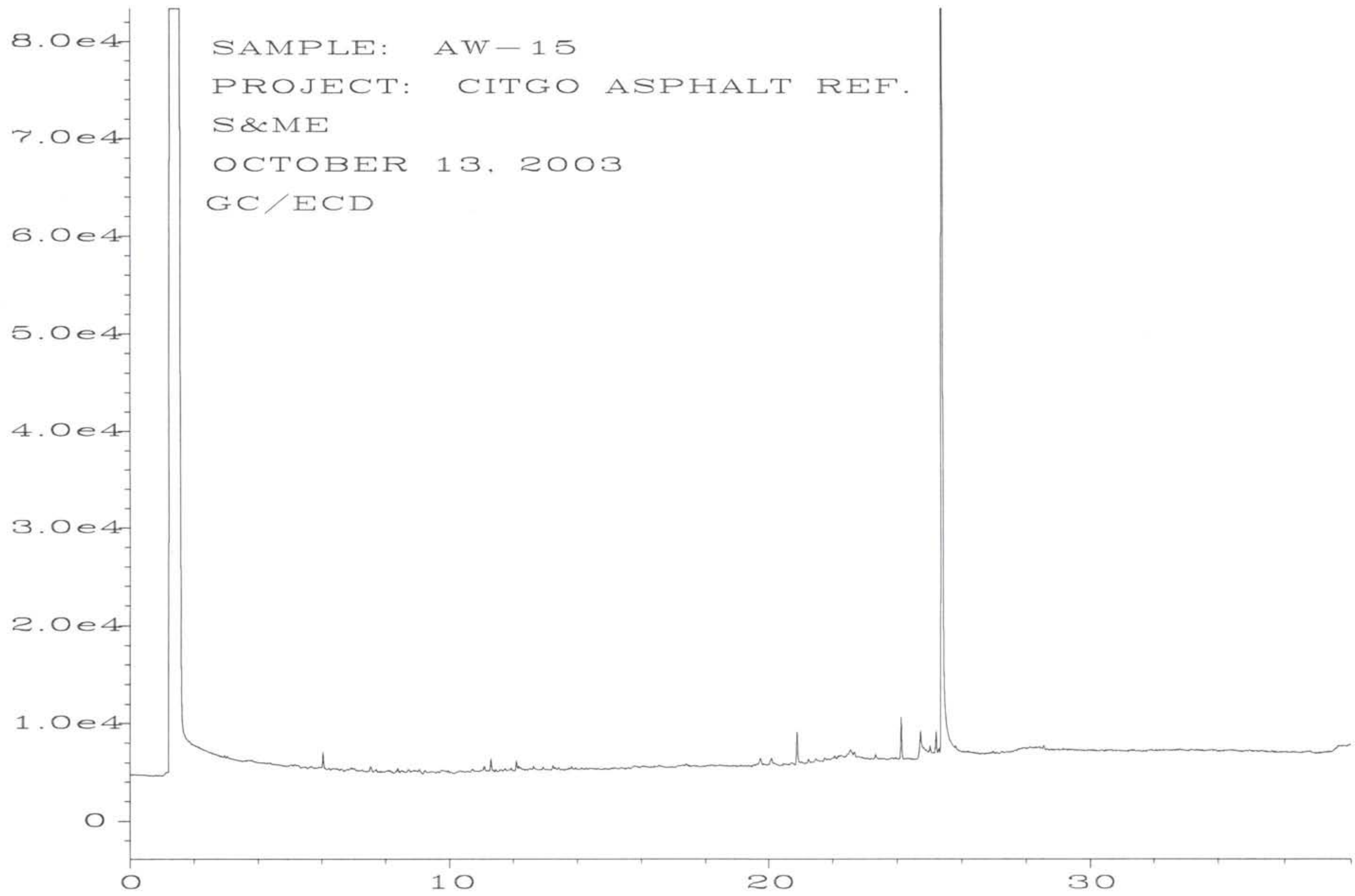

Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\016F0501.D



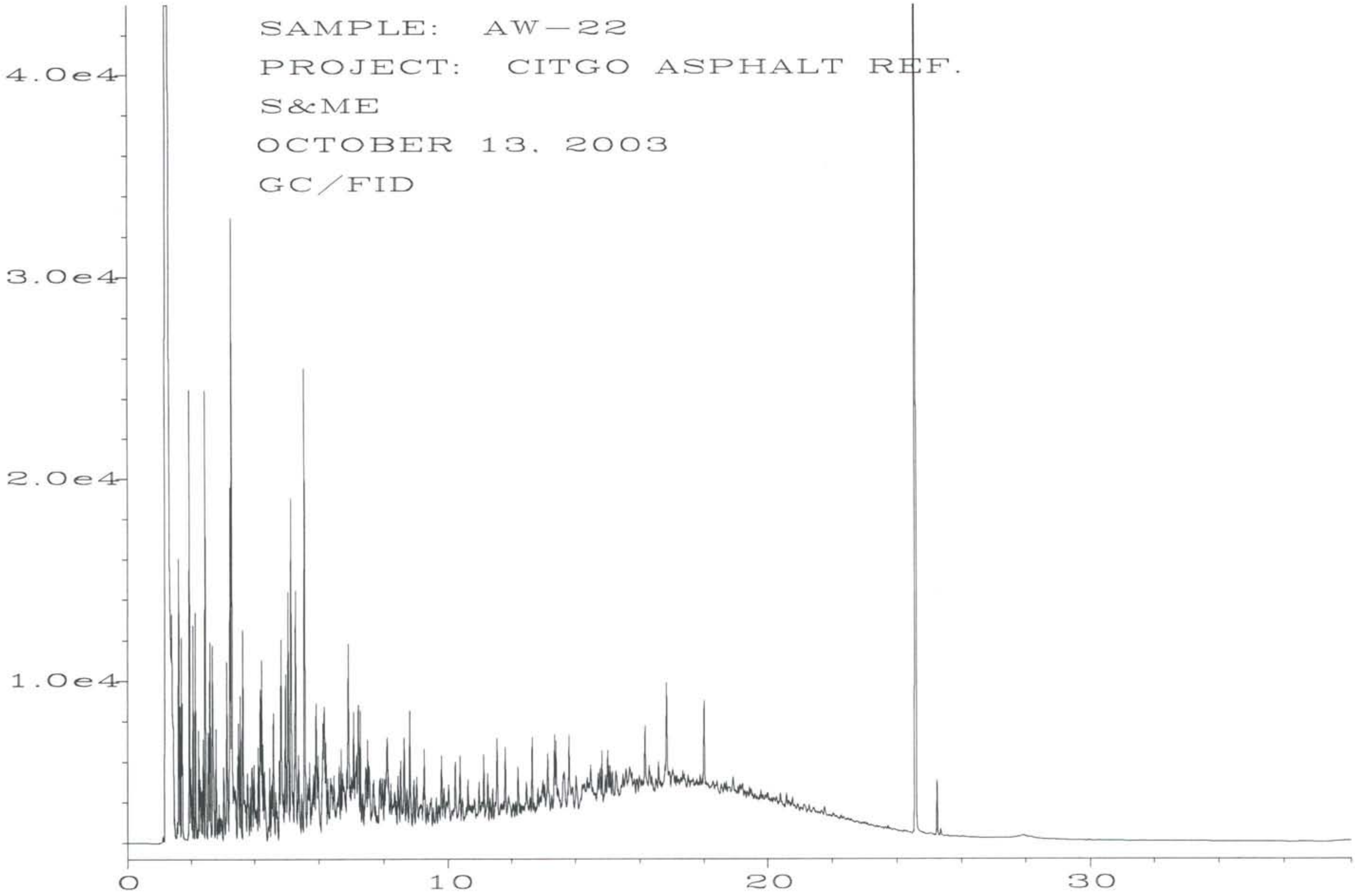

Sig. 2 in C:\HPCHEM\1\DATA\10—13—03\016R0501.D



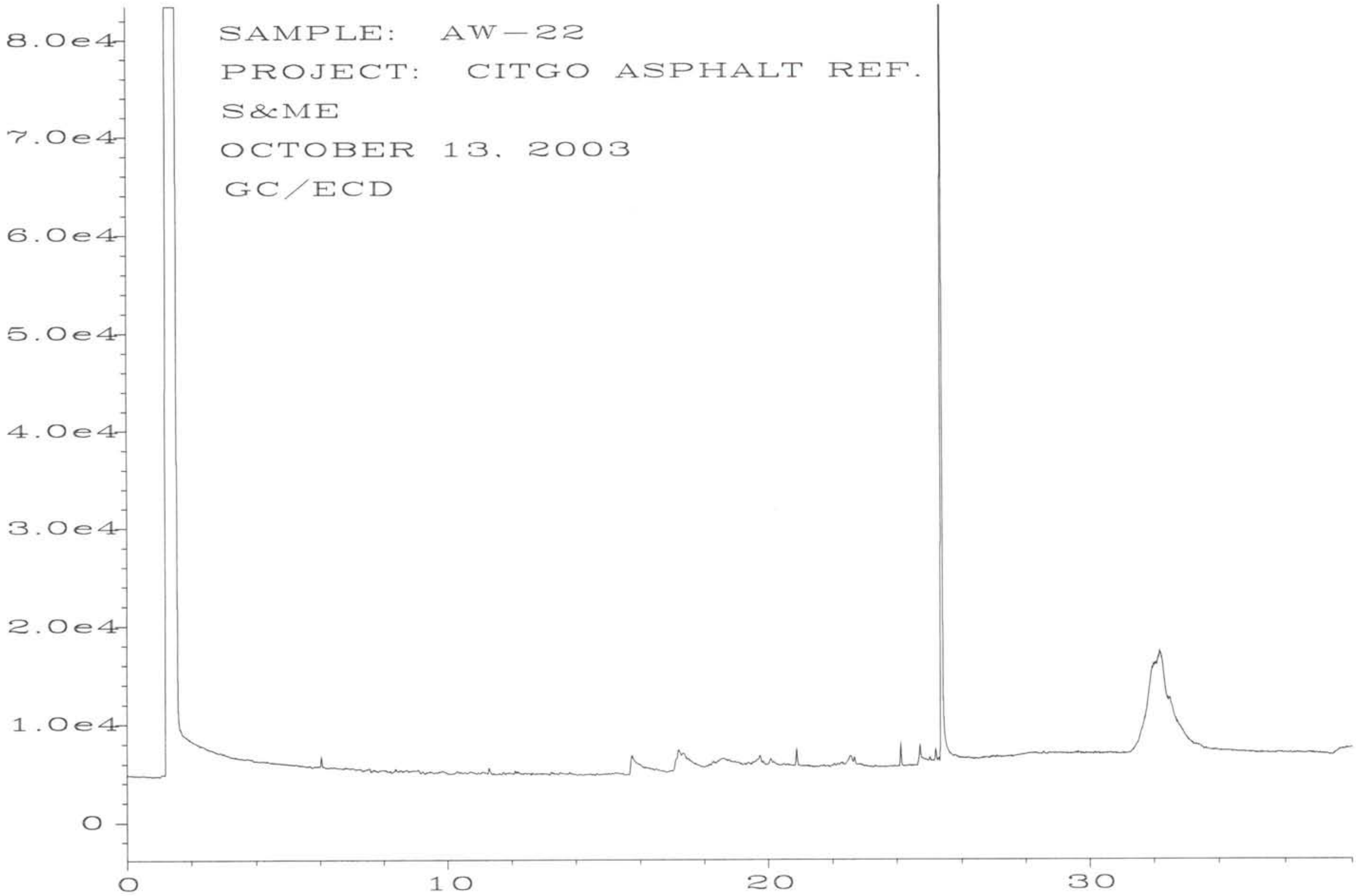
Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\017F0501.D



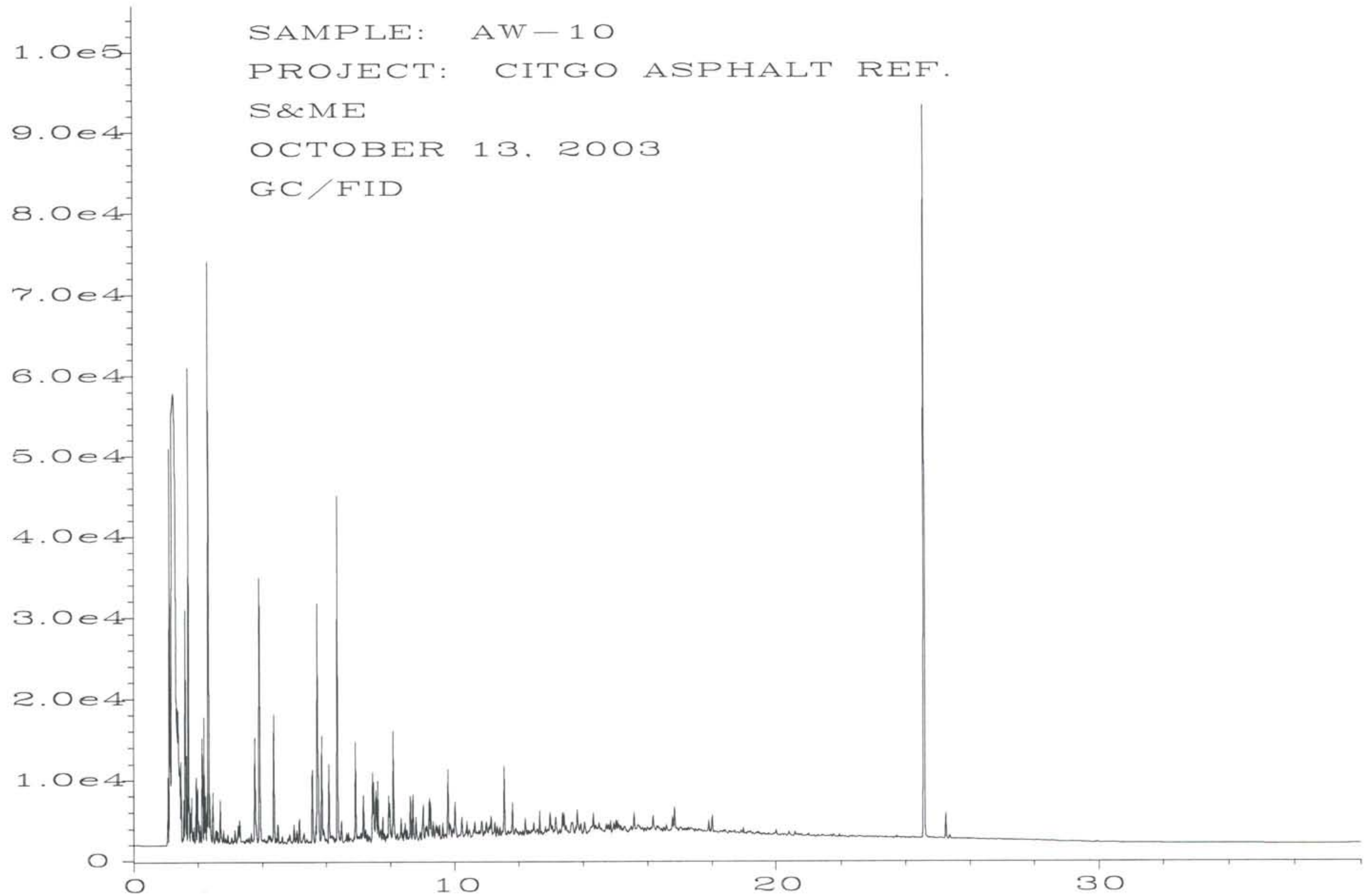
Sig. 2 in C:\HPCHEM\1\DATA\10—13—03\017R0501.D



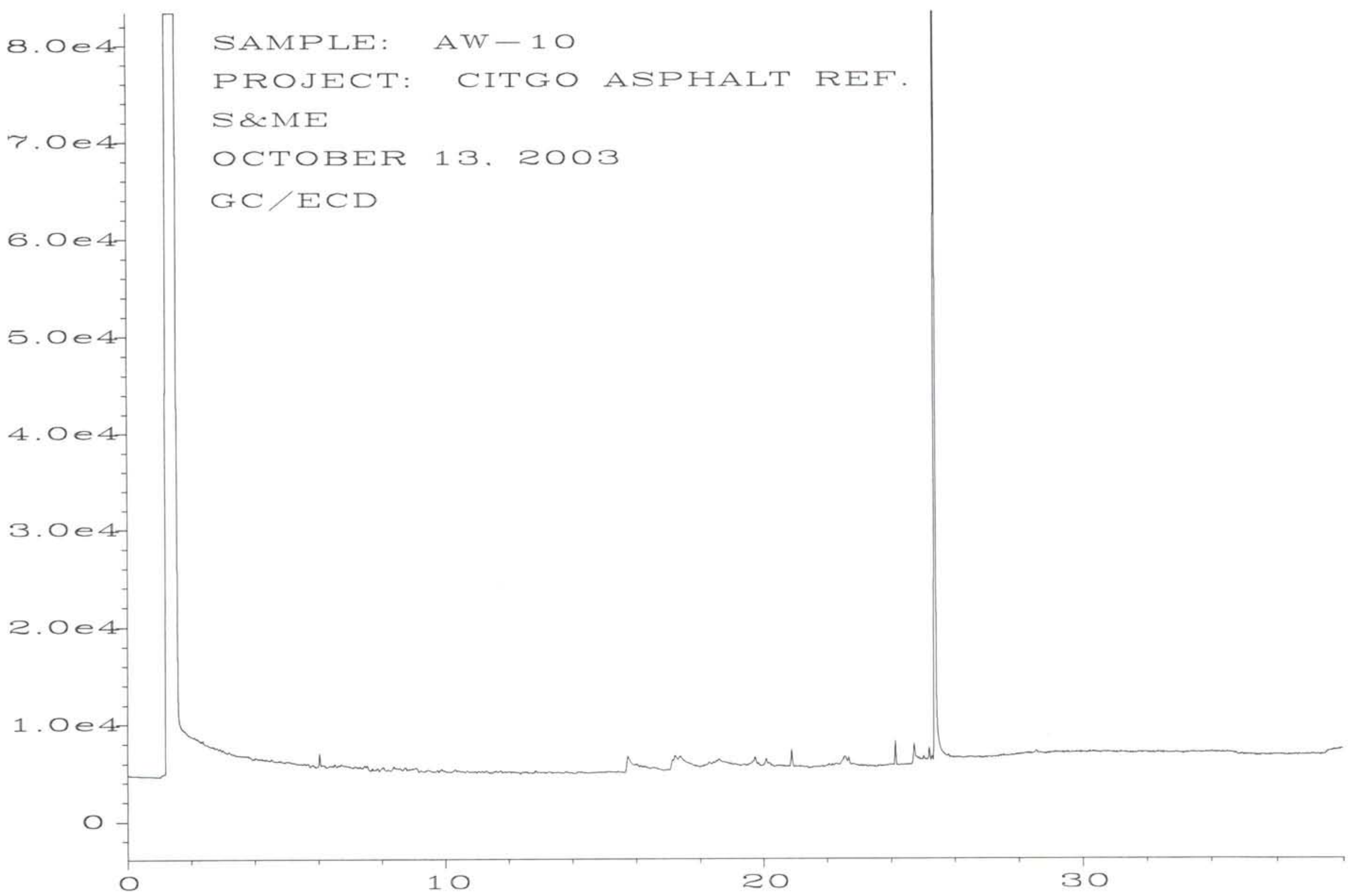

Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\018F0501.D



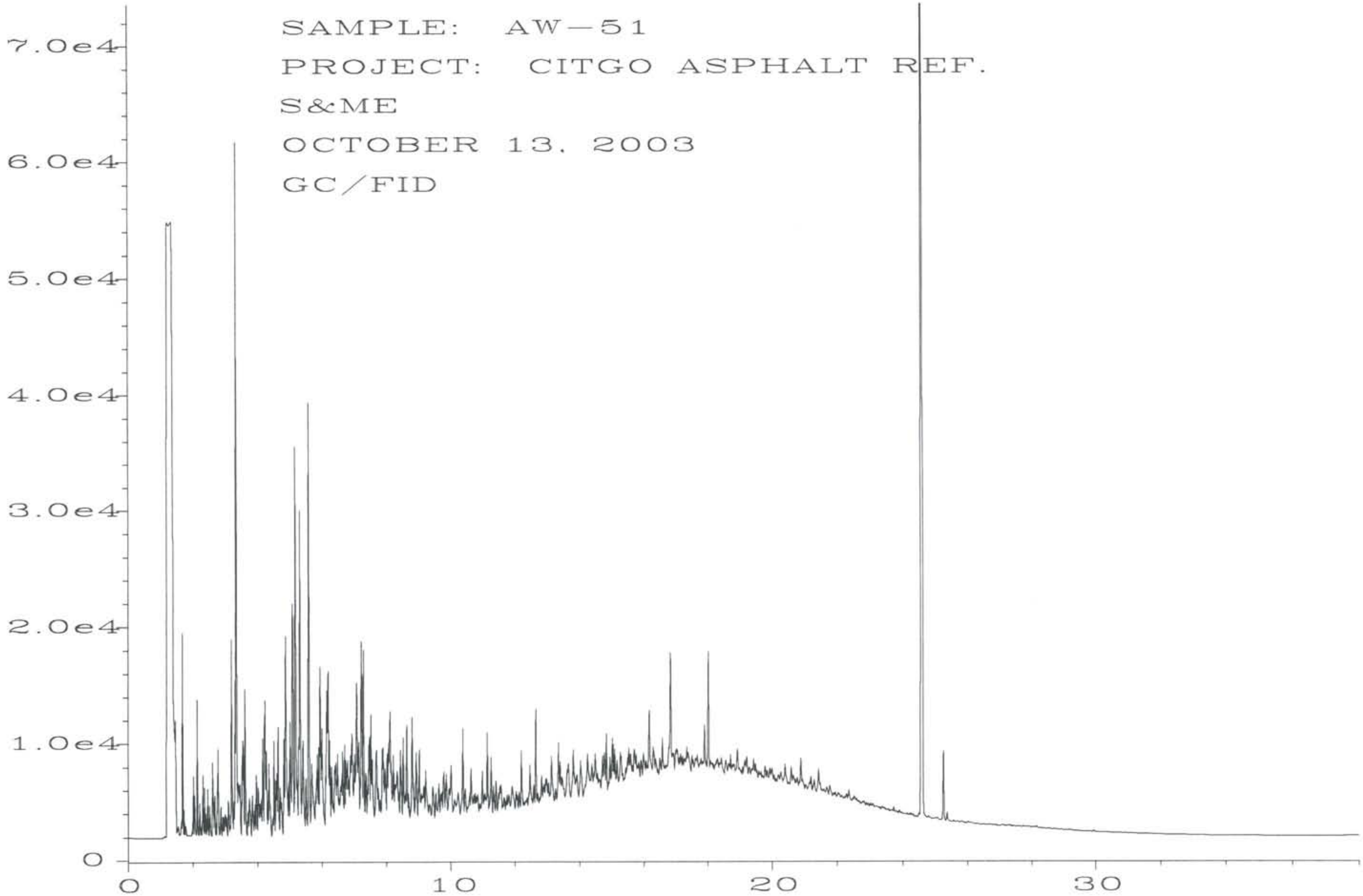

Sig. 2 in C:\HPCHEM\1\DATA\10-13-03\018R0501.D



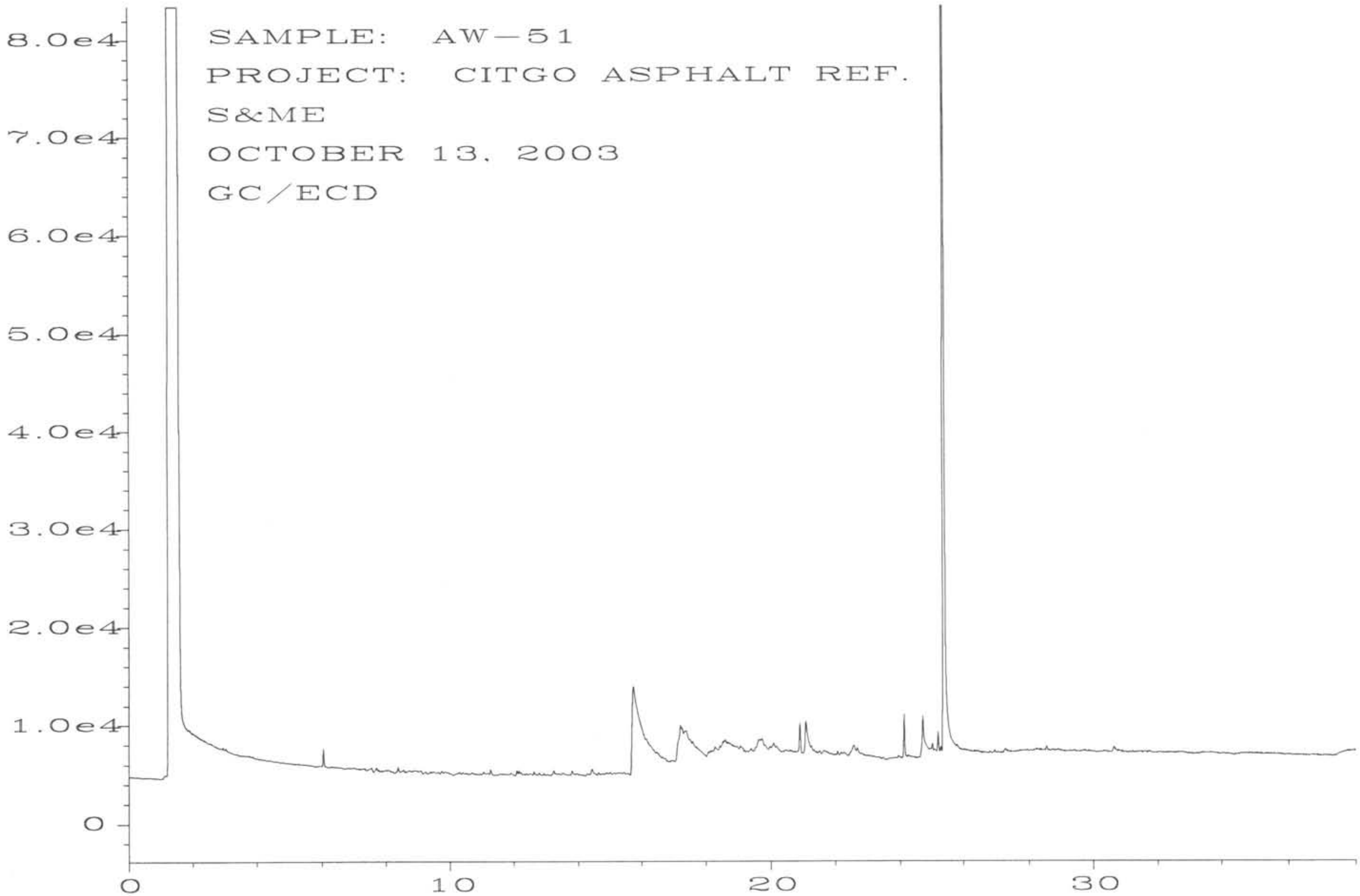

Sig. 1 in C:\HPCHEM\1\DATA\10—13—03\019F0501.D



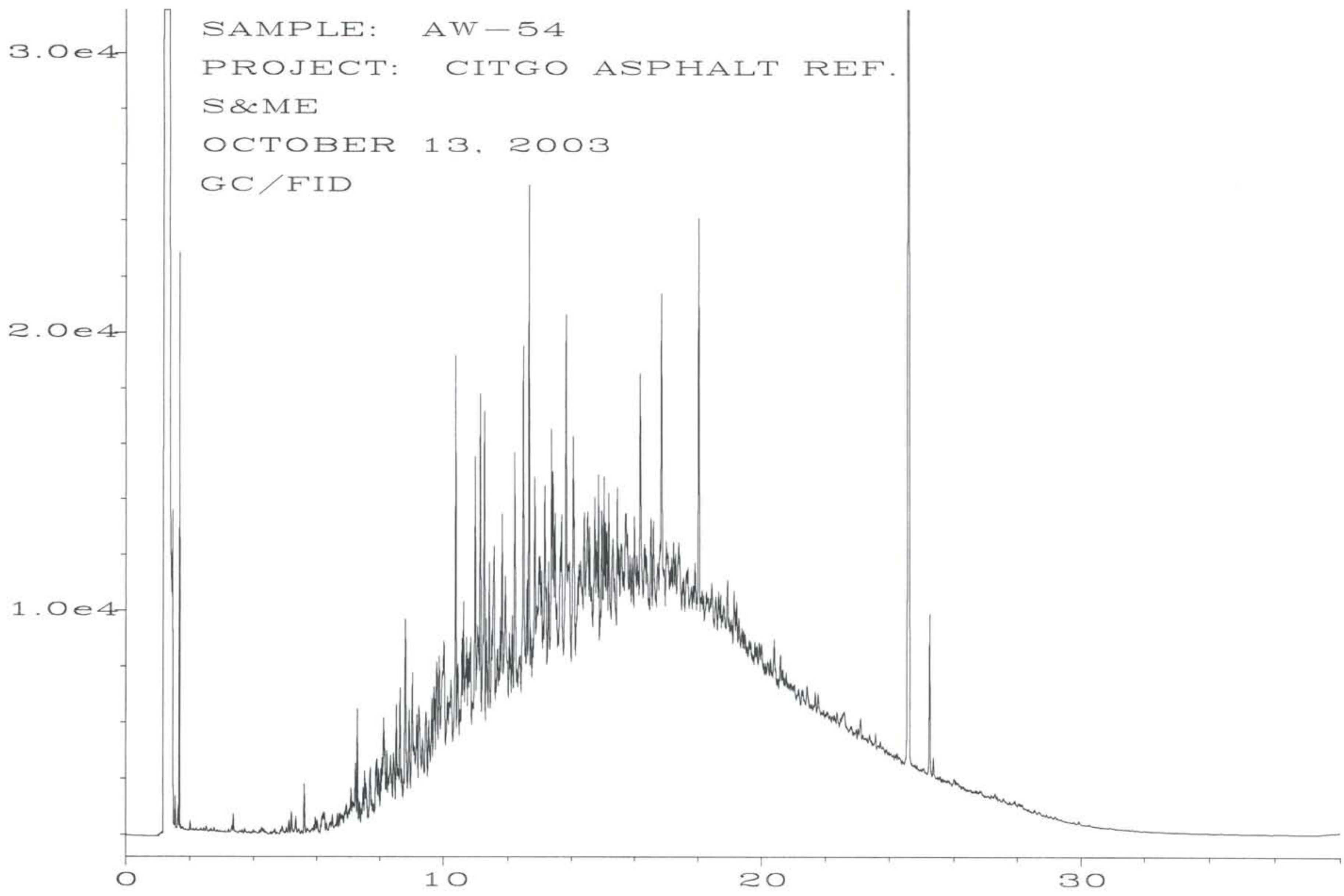

Sig. 2 in C:\HPCHEM\1\DATA\10-13-03\019R0501.D



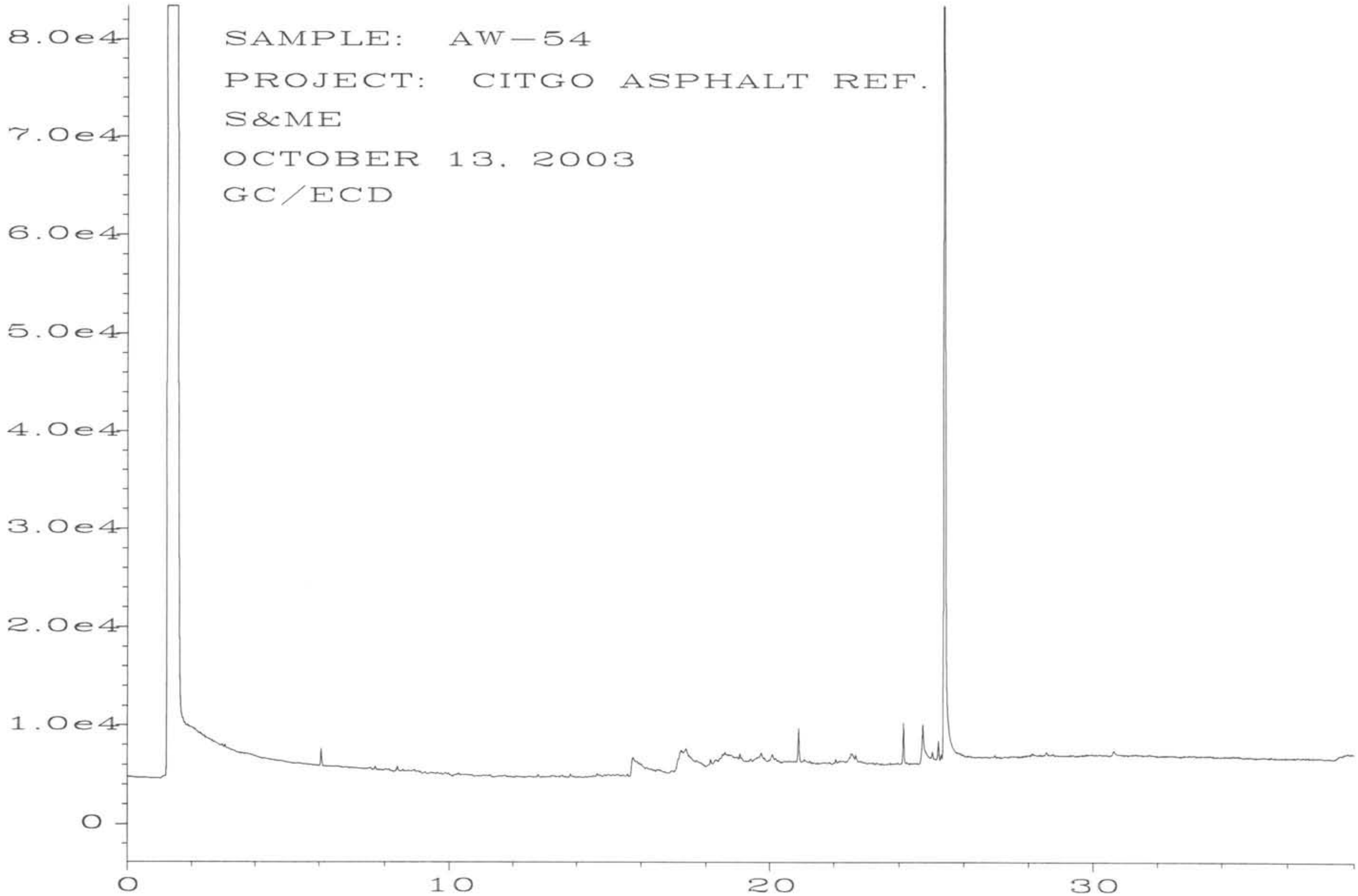

Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\020F0501.D



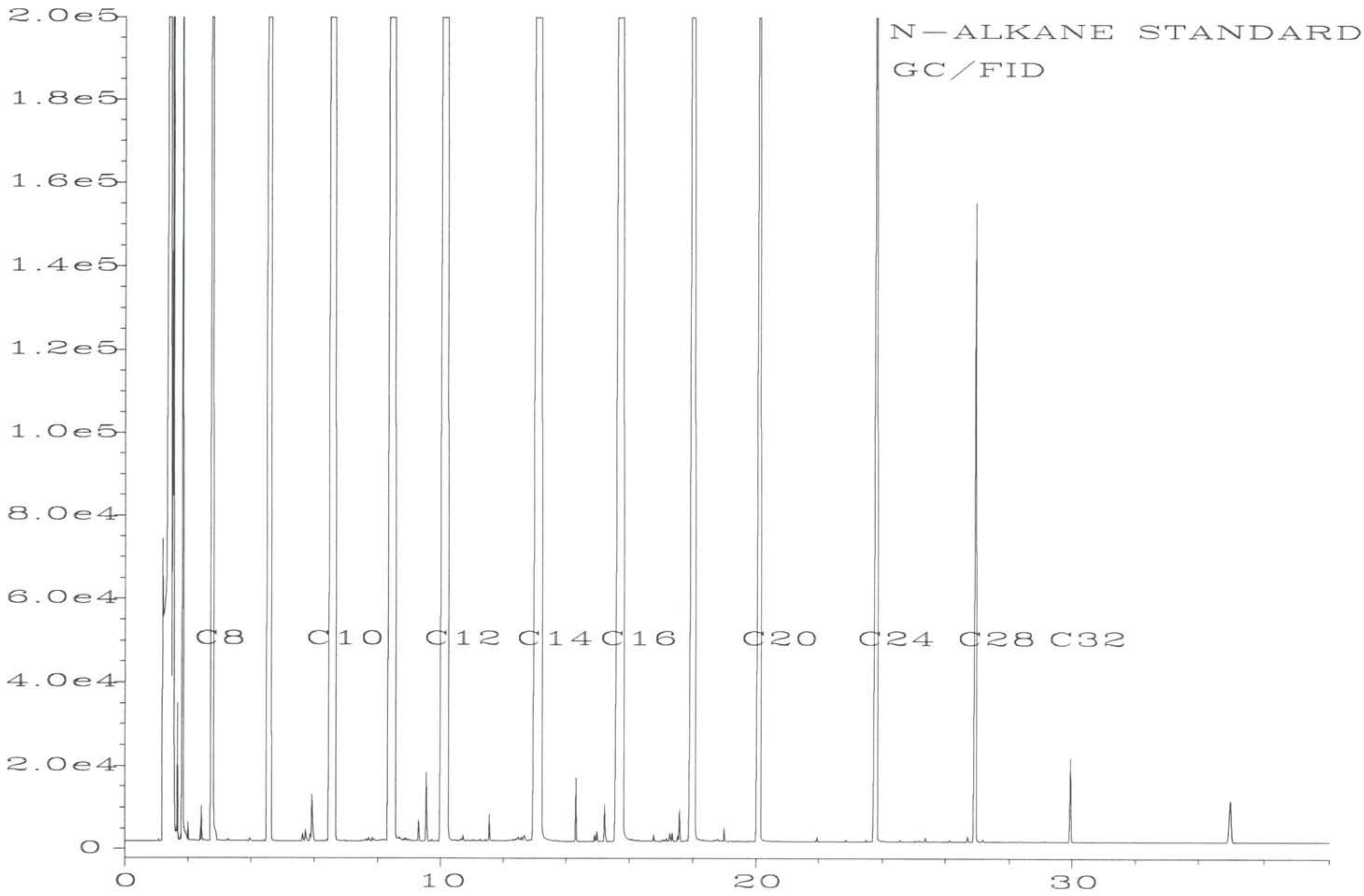

Sig. 2 in C:\HPCHEM\1\DATA\10-13-03\020R0501.D



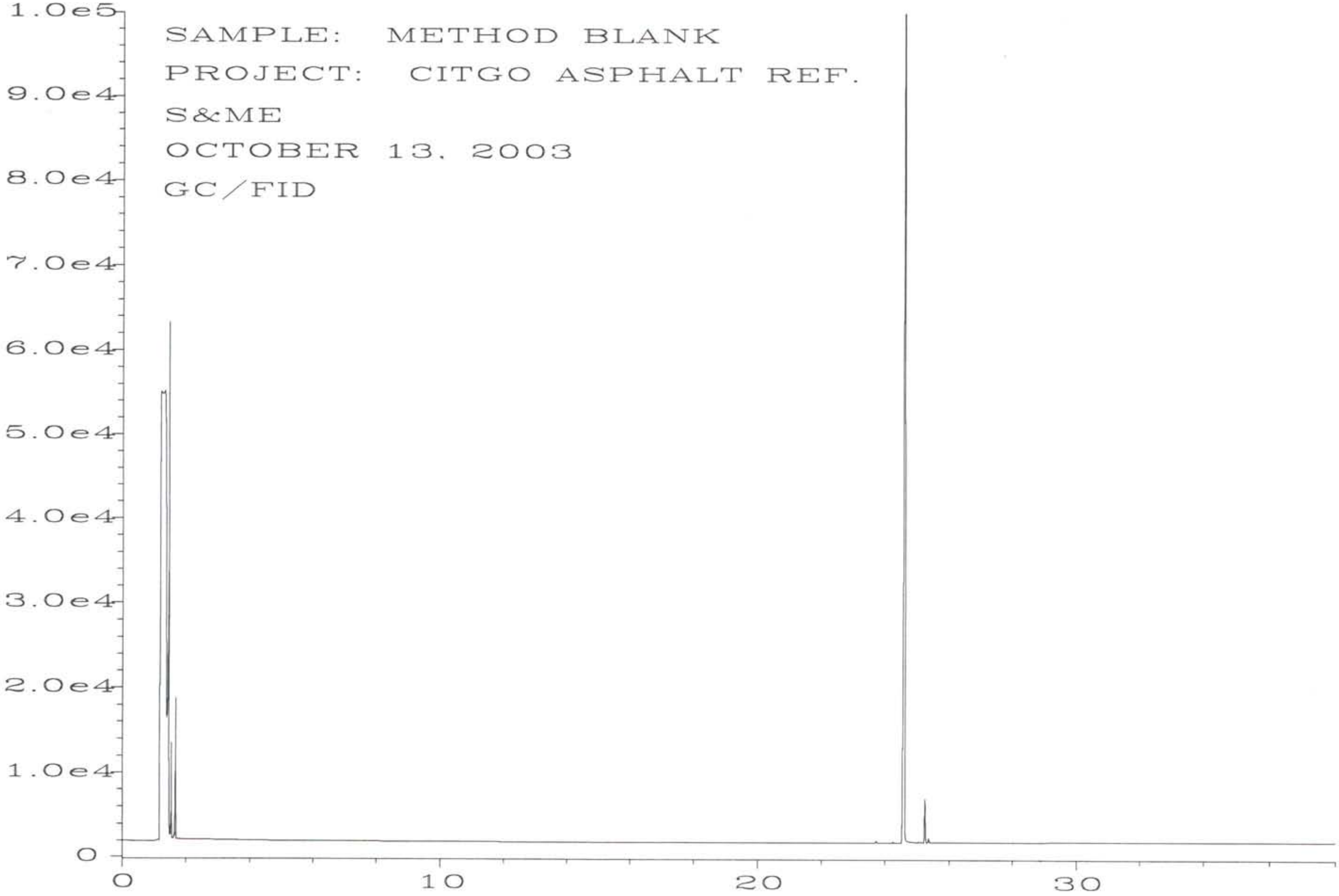

Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\021F0501.D



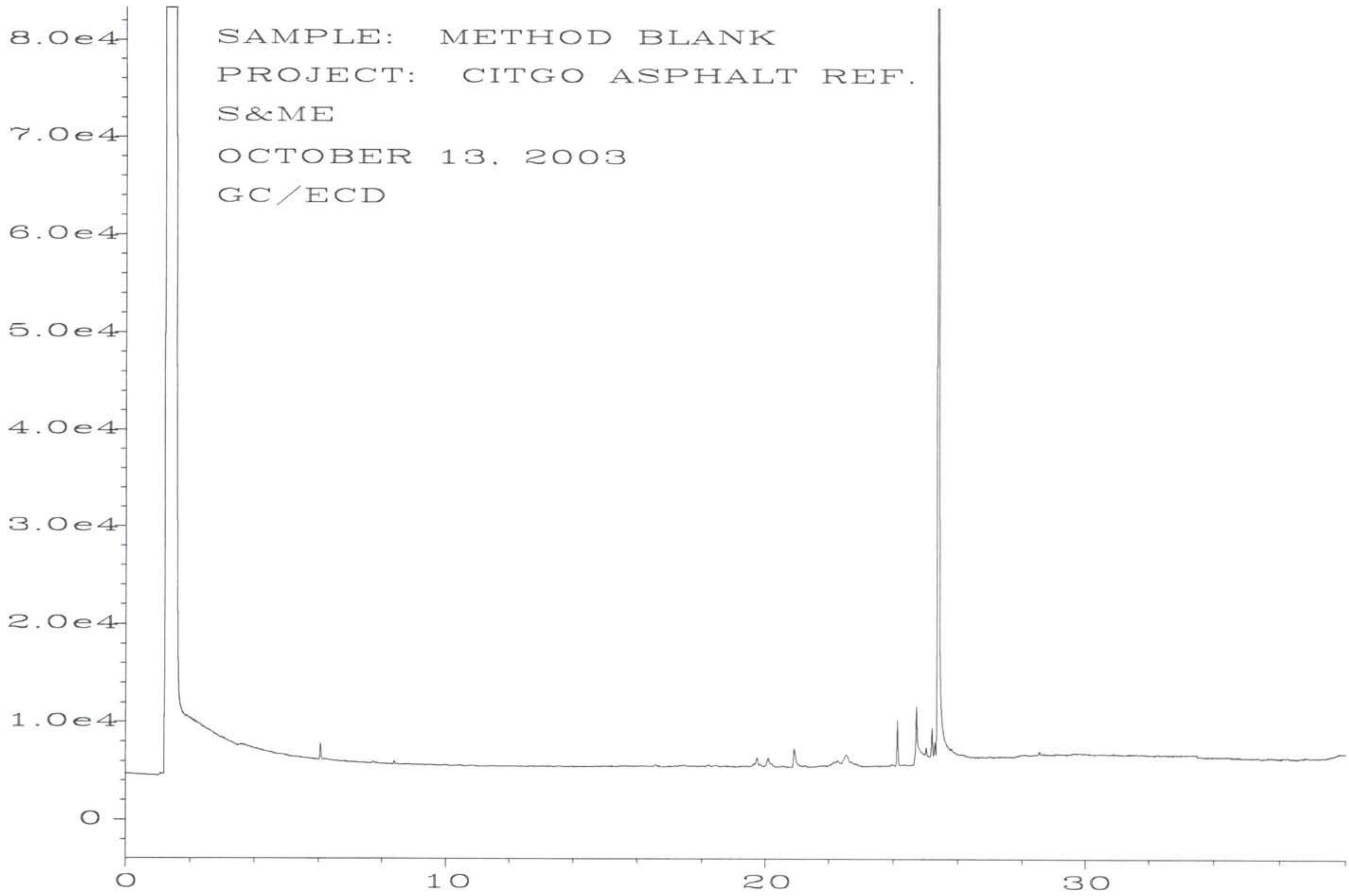

Sig. 2 in C:\HPCHEM\1\DATA\10-13-03\021R0501.D



Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\100F0801.D




Sig. 1 in C:\HPCHEM\1\DATA\10-13-03\002F0701.D



Sig. 2 in C:\HPCHEM\1\DATA\10-13-03\002R0701.D

310057

# SAMPLE CHAIN OF CUSTODY

KJ 10/07/03

C02

Send Report To Denise McCoy
Company S & ME
Address 7505 Waters Ave
City, State, ZIP Savannah, GA 31406
Phone # 912-353-8888 Fax # 912-353-8818

SAMPLERS (signature) Carolyn Sprague

PROJECT NAME/NO. Citgo Asphalt Refinery 1264-03-524

PO #

REMARKS

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

| LAB ID | Sample ID | Lab ID | Date | Time | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260 | SVOCs by 8270 | HFS * | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 A-B | AW-11 | AW-11 | 10/3 | 8:30 | Free product | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | * Run HFS only. Do not run other |
| 02 AB | AW-15 | AW-15 | 10/3 | 8:53 | Free product | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | analyses. per Denise McCoy |
| 03 AB | AW-22 | AW-22 | 10/3 | 9:22 | Free product | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | 10/7/03 |
| 04 AB | AW-10 | AW-10 | 10/3 | 9:46 | Free product | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 05 AB | AW-51 | AW-51 | 10/3 | 14:22 | Free product | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |
| 06 AB | AW-54 | AW-54 | 10/3 | 14:57 | Free prod | 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | |

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | Carolyn Sprague | Carolyn Sprague | S&ME | 10/3 | 16:14 |
| Received by: | Nhan Phan | Nhan Phan | F & BI | 10/07/03 | 9:20 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

FORMS\COC\COC.DOC

CONESTOGA-ROVERS & ASSOCIATES

1412 Oakbrook Drive, Suite #180
Norcross, Georgia 30093
Telephone: (770) 441-0027 Fax: (770) 441-2050
www.CRAworld.com

# MEMORANDUM

| | | | |
|---|---|---|---|
| TO: | Joe Aldridge, Remediation Manager/Frank White, Environmental Manager | REF. NO.: | 053244/kt/4 |
| FROM: | Dave Banchero/Brad Trytten | DATE: | November 10, 2009 |
| C.C.: | Brian Leroy | | |

**RE: NuStar Asphalt Refinery, Savannah, GA – January through July 2009 Fieldwork Summary**

## 1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) performed various field activities at the NuStar Asphalt Refinery in Savannah, Georgia (Site) from January through July 2009. Field activities included the installation of seven groundwater monitoring / remediation wells, rehabilitation of nine existing wells, quarterly Site fluid level measurements (March and June), and the initial phases of an LNAPL recovery plan. The purpose of this memorandum is to provide details of the fieldwork activities conducted by CRA during this period. A Site Plan is included as Figure 1. A Detailed Site Plan that highlights the area of the Site near the Savannah River is included as Figure 2.

## 2.0 POLYWALL BARRIER LOCATE, WELL INSTALLATIONS, AND WELL REHABILITATION

In February 2009, CRA performed well installation and well rehabilitation fieldwork at the Site, which included attempts to locate a previously installed Polywall barrier (Polywall). In March 2009, CRA performed oversight for the surveying of new wells.

### 2.1 Polywall Barrier Locate

According to historical documents provided to CRA, Horizontal Subsurface Systems, Inc. installed a 20-foot (ft) deep and approximately 1,500-ft long Polywall at the Site along the Savannah River. Details about the Polywall's location are vague and in an effort to find the Polywall during the well installation fieldwork, ground-penetrating radar (GPR) was used to locate the barrier, but was unsuccessful. A vacuum-assisted air-knife truck was then used to attempt to locate the Polywall near the Savannah River and the facility's dock. Two trenches were created by removing soils to an approximate depth of 6 ft below ground surface (bgs). One trench was located southeast of AW-74 and north of Tank 100, crossing the paved and grass areas. The other trench was located northeast of AW-69 toward the Savannah River. The Polywall was not located in either trench. The trenches were immediately back-filled with the excavated soil and compacted. The Polywall was found north of AW-70 where approximately 9 ft of it is exposed and southeast of AW-65 at the fence line where a small portion of it is exposed.

## 2.2 Well Installation

All proposed well locations were cleared for underground utilities using either an air-knife or hydroexcavation assisted vacuum truck to remove soils to 8 ft bgs. Utilities were not found in any of the proposed well locations.

From February 17 to February 20, 2009, CRA installed seven monitoring/recovery wells (AW-68 through AW-74) along the Plant North side of the Site near the Savannah River, as presented on Figure 1 and on Figure 2. Walker Hill Environmental of Mississippi (WHE) were subcontracted to install the wells using direct-push technology for soil coring, followed by a 10.5-inch outside diameter hollow stem auger for well installation. WHE was subcontracted due to the Department of Homeland Security requirement for possessing TWIC cards for access to restricted sites. All seven wells were constructed using 4-inch diameter PVC casing installed to a depth of 20 ft bgs. The screen interval of each well was from 20 ft bgs to 5 ft bgs with a 0.020 slot size with #2/12 graded silica sand used to create the sand pack to 2 ft above the top of the screen. A bentonite seal was placed above the sand pack. Wells AW-72, AW-73, and AW-74 are located in traffic areas and were completed with traffic-grade flush mount covers set in a concrete surface seal. The other wells were completed using metal stick-up well casings set in a concrete surface seal. The Stratigraphic and Instrumentation Logs for each well are included in Attachment A. No soil or groundwater samples were collected during the installation of the wells. During the well installation activities, an unidentified monitoring well was found near the Savannah River and the Refinery's Firehouse. The well was named "Firehouse Well" and was surveyed along with the new wells. Initial fluid level measurements are included in Table 2 and the "Firehouse Well" location is included on Figure 1 and Figure 2.

## 2.3 Well Rehabilitation

Well rehabilitation was performed on eight of the existing monitoring wells, including AW-9, AW-11, AW-12, AW-13, AW-22, AW-67, AW-51, and AW-65. Rehabilitation activities included extracting all of the fluids from the well using a vacuum extraction truck and scrubbing the screen of the well with a wire brush. The purpose of the rehabilitation was to free trapped sediment and LNAPL from the screen and well casing to allow for better extraction and fluid measurements during future monitoring and remediation events.

## 2.4 Surveying

The new wells, the Polywall, and the trenches were surveyed on March 9, 2009 by Gardner Smith Surveyors of Garden City, GA. The ground surface and top of casing elevations were tied into the existing survey and are included in Table 1. A copy of the final signed survey from Gardner Smith Surveyors is included in Attachment B. During the survey, three survey points of the exposed Polywall and six survey points along the trenches were recorded to mark their exact location and are included on Figure 2.

## 3.0 FIRST QUARTER 2009 SITE FLUID MEASUREMENTS

On March 5 and 6, 2009, fluid measurements were taken from 56 wells at the Site. General groundwater flow direction is to the northwest (plant north) and toward the Savannah River. These measurements were taken prior to any of CRA's tidal function studies and prior to the installation of transducers at the Site as discussed in Section 5.1; therefore, these measurements were not timed to coincide with any specific portion of the tide cycle. As described in the May 8, 2009 Work Plan for LNAPL Recovery Memo, transducers were installed at the Site to measure the tidal influence on groundwater. The first quarter 2009 fluid level measurements and corrected groundwater elevations are included in Table 2. The first quarter 2009 groundwater elevation contours with LNAPL thicknesses are presented on Figure 3.

## 4.0 WELL ABANDONMENT

On March 26, 2009, monitoring well AW-55 was abandoned and on May 21, 2009, monitoring well AW-17 was abandoned at the request of NuStar. Both wells were located in the vicinity of Tank 3, which was undergoing construction that required the wells to be removed. WHE was contracted by CRA to abandon both wells by over-drilling with a Geoprobe mounted hollow-stem auger to total depth of the well and then backfill the hole with bentonite-grout. AW-55 was over-drilled to 24.5 feet and AW-17 was over-drilled to 14 feet below ground surface. The waste generated from the abandonment of the wells was stored in 55-gallon drums and moved to the staging area onsite. It is CRA's understanding that the coordination of the drum transportation and waste disposal was handled by NuStar. The abandoned wells are shown on Figure 1.

## 5.0 LNAPL RECOVERY PILOT TEST AND TIDAL STUDIES

On May 18, 2009, NuStar approved CRA's Memo entitled "Proposed Scope of Work – Pilot-tests for LNAPL Recovery System". On May 20 and 21, 2009, CRA began the pilot-tests for the LNAPL Recovery System however, these activities have not yet been completed as described below.

### 5.1 Continuous Fluid Level Monitoring

Due to known tide-related river level changes at the Site, and because these changes may affect measured fluid levels in Site monitoring wells, it was recommended that a simple, continuous fluid level monitoring program be undertaken to determine the magnitude of the potential tide-related fluid level changes at the Site.

Three monitoring wells without free product were selected for continuous fluid (water) level monitoring. These selected wells are located on the south side of the Site and were:

- AW-67 - located adjacent to the Savannah River
- AW-73 - located approximately 450 feet inland from the Savannah River
- AW-44 - located approximately 1500 feet inland from the Savannah River

Pressure transducers (Solinst Levelogger Model 3001) were installed in these three monitoring wells on May 20, 2009 and set to begin recording at 08:00 May 21, 2009, at a frequency of once per minute. The pressure transducers were removed from the monitoring wells on May 26, 2009, providing a 5-day continuous water level record. Additional continuous tidal elevation data for the Savannah River was obtained from the NOAA Fort Pulaski monitoring station, located at the mouth of the Savannah River in the Fort Pulaski National Monument, approximately 18 miles downstream of the Site. In addition, peak high and low tide data (time and relative water level) were obtained for three locations along the Savannah River, two downstream and one upstream from the Site. However, geodetic elevations are not available for these stations and the water level data cannot be directly compared to the groundwater levels at the Site or the Fort Pulaski monitoring station.

The data recorded by the pressure transducers (time of day, height of water above transducer) were downloaded and compiled into spreadsheets (Attachment C, CD format). The tidal elevation data from the Fort Pulaski monitoring station was also compiled. These data were graphed, with the Site pressure transducer data presented as height of water above transducer, as depth to water measurements were not collected during the period of continuous monitoring. The Fort Pulaski tidal data was graphed as elevation relative to the North American Vertical Datum (NAVD88).

Figure 4 presents the pressure transducer and Fort Pulaski tidal data for the 5-day monitoring period. There are two tidal cycles per day, each cycle of approximately 12-hours duration. The magnitude of the tide (high to low tide) is approximately seven to nine feet at the mouth of the Savannah River and decreases only slightly upstream, beyond the Site. Therefore, the magnitude of the tides within the Savannah River at the Site are similar to the magnitude of the tides measured at the Fort Pulaski monitoring station.

The propagation of the tidal pressure wave and flow of water into or out of the soil is muted by the soil, resulting in a reduced tidal effect on the groundwater levels at the Site compared to levels in the Savannah River immediately adjacent to the Site. At monitoring well AW-67, located adjacent to the Savannah River, the tidally-induced change in groundwater levels (high to low tide) is approximately 3 to 6 feet over each of the approximate 6-hour high to low tide cycles. At monitoring well AW-73, the tidally-induced change in groundwater levels is approximately 0.5 feet. At monitoring well AW-44, located further inland, the tidally-induced change in groundwater levels is approximately 0.5 to 1 feet. The slightly greater response at AW-44 than AW-73 may be related to the greater depth of AW-44 (28.2 feet) versus AW-73 (21.4 feet), allowing the screened interval of AW-44 to intersect coarser-grained soils, which would more readily transmit the tidal water pressure wave/river water into or out of the soils.

The groundwater levels presented on Figure 4 also show an overall increase, primarily at AW-44, in response to a significant precipitation event that occurred during the early part of the continuous monitoring program.

Figure 5 presents the water level data over a 24-hour period (two high tides and two low tides), with different y-axis scales for the Site data and the Fort Pulaski tide data. The time delay between high tide (at the Site) and peak groundwater levels at AW-67 is approximately 2 to 2-1/4 hours. The time delay between low tide (at the Site) and low groundwater levels at AW-67 is approximately 1-3/4 hours.

As show on Figure 5, there is also a slight time delay for the propagation of the groundwater level changes from AW-67 (closest to the Savannah River) to the more distant monitoring wells AW-73 and AW-44. These time lags are approximately 1/2 hour.

The effects of fluctuating fluid levels on free product thickness are well-documented. Commonly, when groundwater levels rise, the free product is displaced into the unsaturated soil and conversely, when groundwater levels decline, free product can freely flow into the well from the soil, causing a much greater apparent free product thickness. These phenomena usually take place over extended periods of time (e.g., days) rather than hours. In this case, the short tidal cycles may or may not have significant effects on free product thicknesses, depending on local soil, water, and free product characteristics. The smearing effect caused by water table fluctuations in LNAPL impacted zones may be very pronounced closer toward the Savannah River, which has the potential to reduce the mobility and recoverability of the LNAPL in the area.

Using the publicly available tidal information and the data from the continuous fluid level monitoring, the following schedule was devised for future fluid measurements;

- Beginning at approximate low tide, fluid levels are collected rapidly and over a short period of time for the monitoring wells located near the Savannah River (e.g., AW-67, AW-65, AW-9, AW-70, AW-71, AW-11, AW-69, AW-51, AW-13, AW-68, AW-22, AW-74, AW-12, AW-72 and Truck Loading),
- Fluid levels are then collected in zones across the Site, working away from the river (e.g. Zone 1 is along the river using the above wells, Zone 2 is in the middle of the Site, and Zone 3 is the furthest from the river and collected last),
- Fluid levels are then measured again for selected wells with product located near the river after completion of the fluid level monitoring event to determine in free product thicknesses have changed significantly (e.g., AW-9, AW-71, AW-51, AW-68 and AW-74).

## 5.2 LNAPL Bail-down Tests

Bail-down testing is a field test method where a "slug" of LNAPL is removed from the well by one or more quick bails. The goal is to quickly remove as much of the LNAPL as possible from a well while minimizing the withdrawal of groundwater. During the recovery period, as LNAPL and water enter the well, the LNAPL/water interface will initially rise to maximum level, then decline. The LNAPL/air interface in the monitoring well will continue to rise while the LNAPL/water interface declines, and the LNAPL thickness recovers. The results of a successful bail-down test can provide estimates of LNAPL transmissivity and recovery potential.

Bail-down tests were performed on wells AW-9, AW-11, AW-12, AW-51, AW-65, AW-68, and AW-74. The field data sheets and graphs presenting the post-bailing LNAPL thickness monitoring are provided in Attachment D.

A bail-down test was attempted at well AW-13, however, due to the highly viscous LNAPL in AW-13, the bailer could not be easily submerged into the LNAPL and groundwater, and eventually became clogged; therefore the bail-down test could not completed. Previous depth to water measurements at AW-13 could not be taken due to the high viscosity of the LNAPL present in the well, resulting in the conclusions that either the interface probe was coated with LNAPL (preventing determination of the presence of water) or the well did not contain any water. During the attempted bail-down test, the bailer was partially submerged into the LNAPL/groundwater, recovered, and then drained approximately six inches of water and four inches of LNAPL. This shows that the well is not full of LNAPL, but instead the 4" layer of thick LNAPL coats the probe and does not allow a groundwater measurement to be taken.

The bail-down tests performed at the remaining wells indicated that the LNAPL recharge rate is rapid. The observed recharge rates were too rapid to permit any meaningful graphical interpretation that would allow the estimation of LNAPL transmissivity and potential recovery rates. Due to the rapid LNAPL recharge rates observed, longer duration recovery tests using a more active recovery technique (e.g., skimming) would be needed to develop estimates of long-term potential recovery rates.

### 5.3 Skimmer Pump Installation

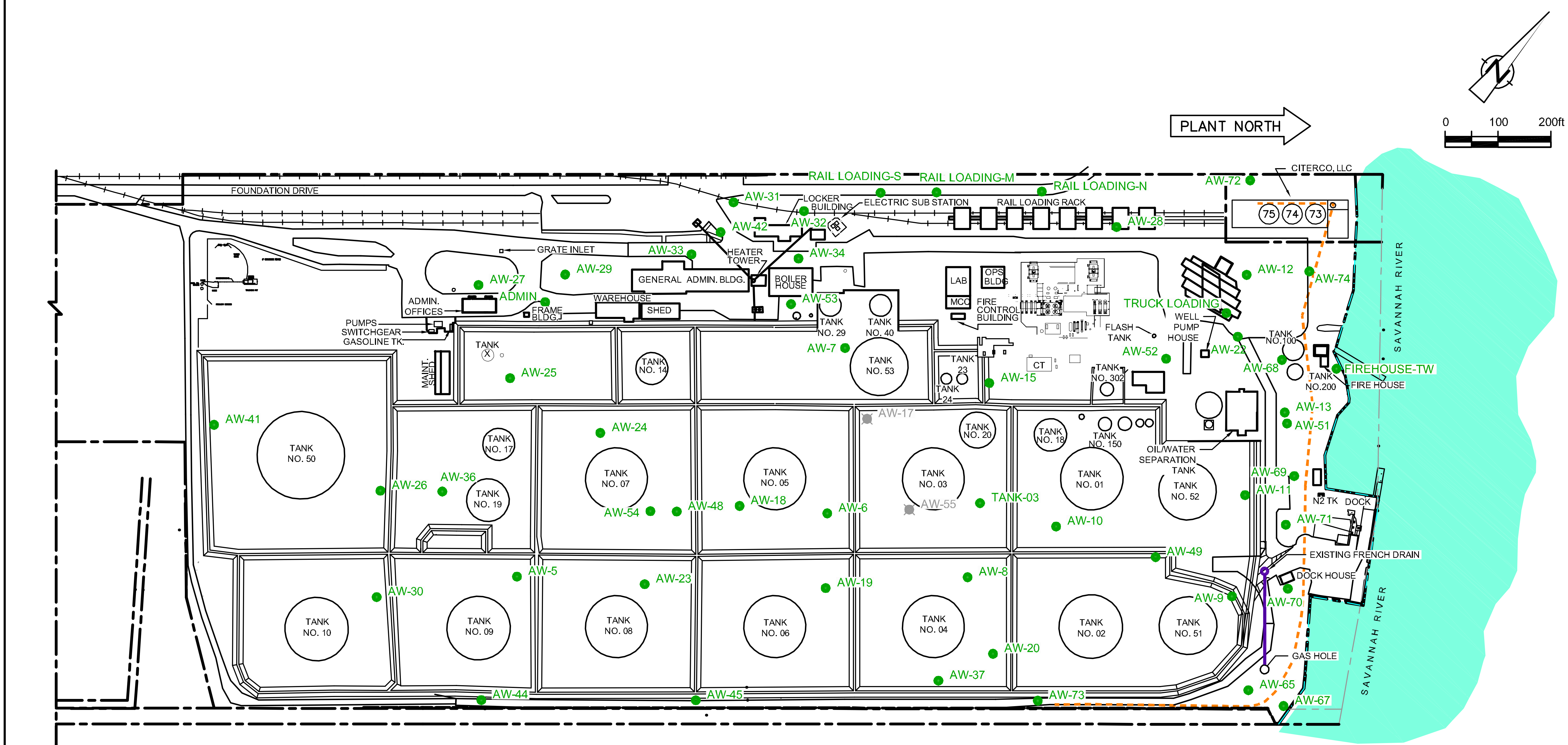
At the request of NuStar, the pilot-scale skimmer pump was not installed at the Site.

### 5.4 Viscosity and Specific Gravity Analysis

On June 29, 2009, product samples were collected from AW-12, AW-13, AW-51, AW-65, and AW-68 for laboratory analysis of viscosity and specific gravity (SG). A summary of the results and the laboratory results are included as Attachment E. The results from AW-12, AW-51, AW-65, and AW-68 were relatively consistent, indicating specific gravity and viscosity values consistent with a diesel-range LNAPL (kerosene and jet fuel would also be expected to have values in approximately the same range). Field observations show that the LNAPL from the majority of the wells at the Site have similar characteristics to these wells. The average SG at the site (with the exception of AW-13 at 1.0826) is 0.854, which is the value used to correct the groundwater elevation at the Site for all of the wells that did not have specific gravity determinations. Consequently, based on the LNAPL physical properties, various common LNAPL recovery techniques would be applicable at the Site. However, it should be noted that finer-grained soils, subsurface heterogeneities, and/or hydraulic conditions may limit the recoverability of an LNAPL plume regardless of LNAPL physical parameters.

The general appearance and characteristics of the LNAPL in AW-13 is of a much more viscous product than in other wells at the Site, therefore, as expected the results varied from rest of the Site with the viscosity and SG being significantly higher. The SG and viscosity values for the LNAPL present in this well are more consistent with a No. 6 fuel oil and/or some crude oils. It is expected that recovery of this LNAPL using most conventional hydraulic recovery techniques would be extremely limited and problematic. Excavation or some type of enhanced recovery technique (e.g., soil heating) would likely be needed in order to implement an effective recovery strategy here. Further investigations would likely be required to determine an adequate remedial strategy for this material.

FIGURES




LEGEND

POLYWALL BARRIER

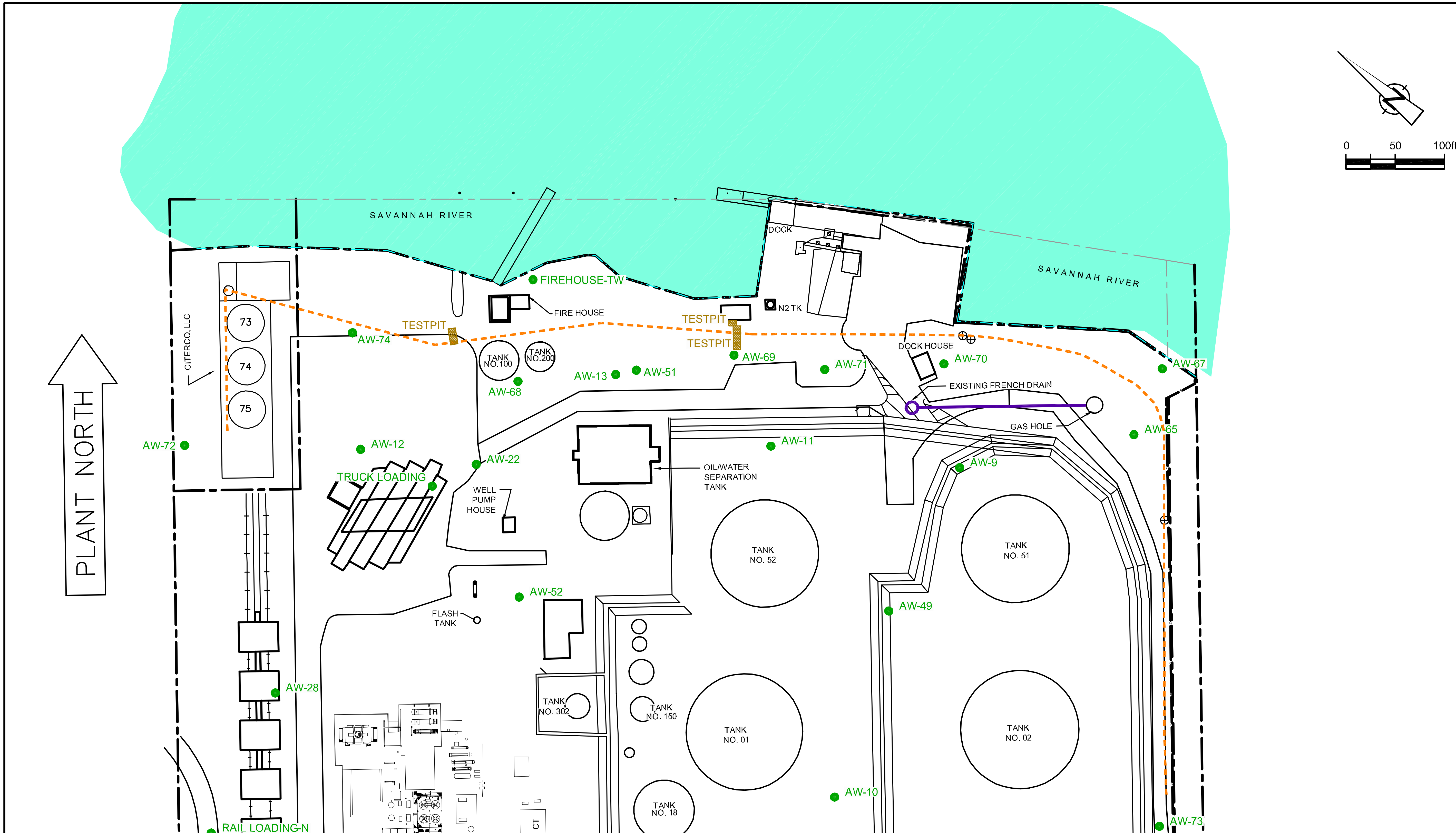
AW-52 WELL LOCATION

AW-55 ABANDONED WELL LOCATION

figure 1

SITE PLAN
NUSTAR SAVANNAH REFINERY
*Savannah, Georgia*

53244-22(MEMO004)GN-WA002 SEP 23/2009



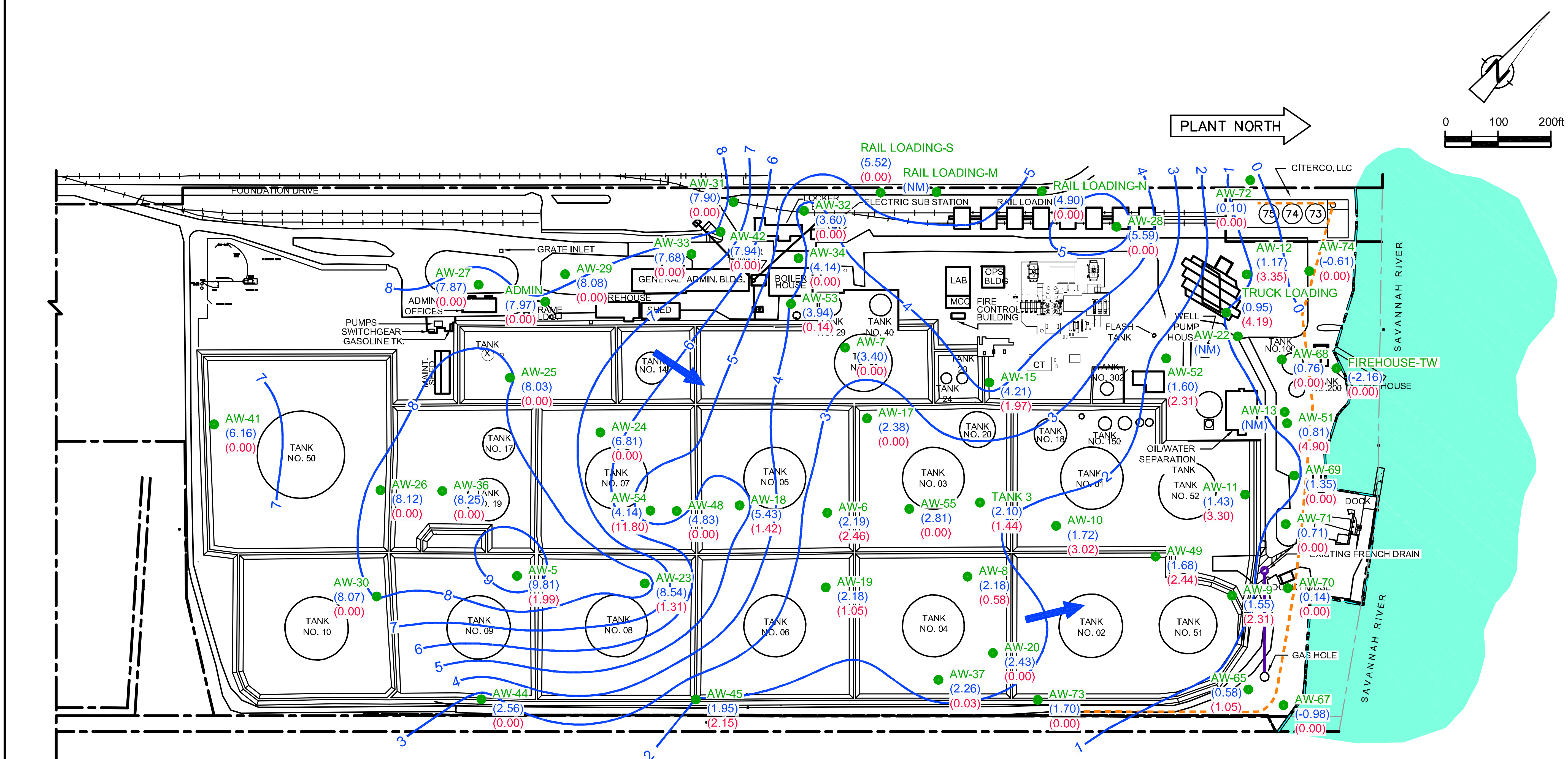

LEGEND

| | |
|---|---|
| | POLYWALL BARRIER |
| TESTPIT | TEST PIT LOCATION |
| AW-52 | WELL LOCATION |
| | POLYWALL SURVEY |

figure 2

DETAILED SITE PLAN
NUSTAR SAVANNAH REFINERY
*Savannah, Georgia*

53244-22(MEMO004)GN-WA003 NOV 10/2009




## LEGEND

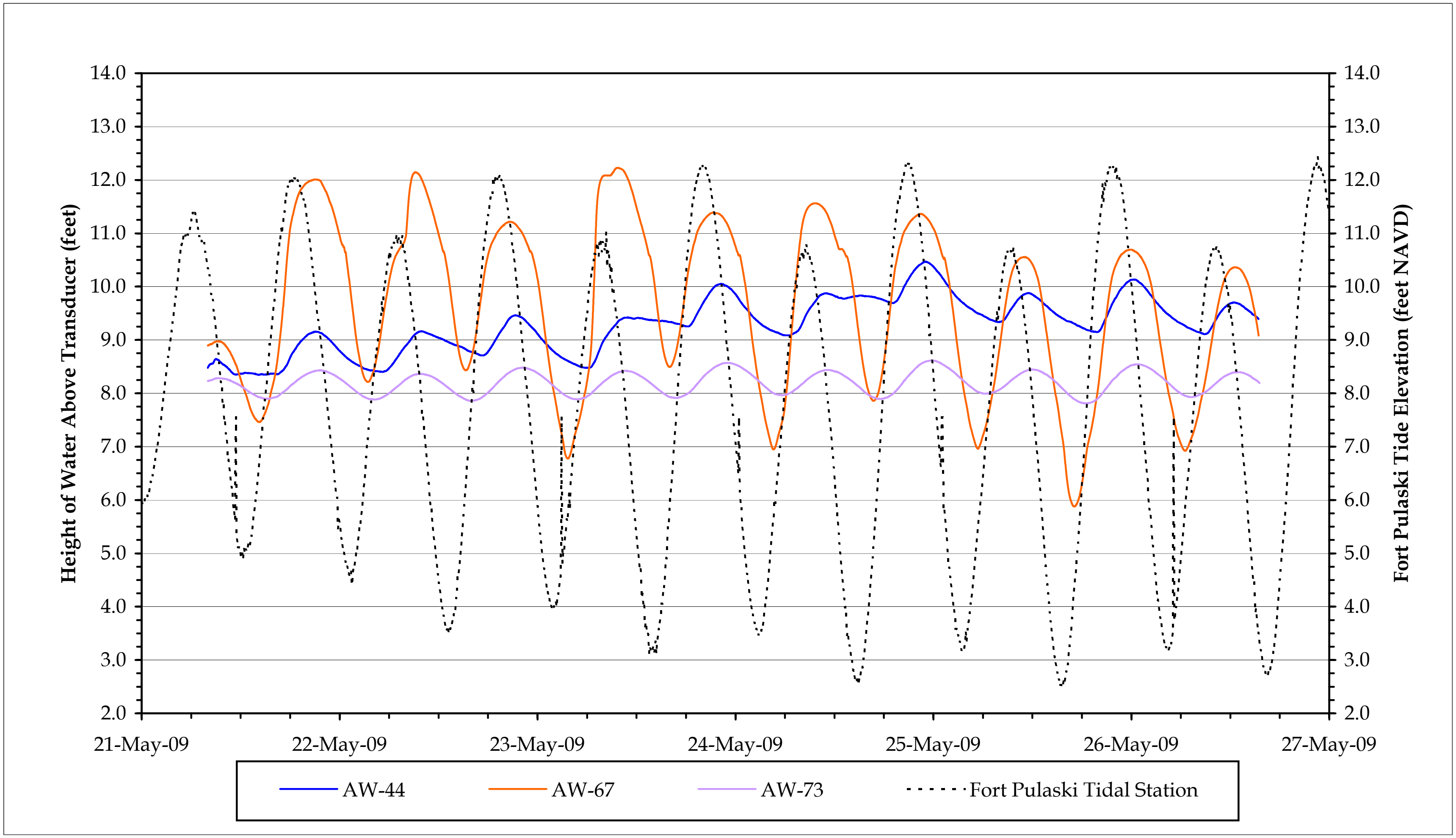
| | |
|---|---|
| AW-45 ● | WELL LOCATION |
| (1.95) | CORRECTED GROUNDWATER ELEVATION (FEET AMSL) |
| (2.15) | LNAPL THICKNESS (FEET) |
| (NM) | NOT MEASURED |
| - - - - | POLYWALL BARRIER |
| —2— | GROUNDWATER ELEVATION CONTOUR |
| ➡ | GROUNDWATER FLOW DIRECTION |

NOTE: SPECIFIC GRAVITY OF 0.80 USED TO CORRECT FOR LNAPL THICKNESS.

figure 3

CORRECTED GROUNDWATER ELEVATION CONTOURS
MARCH 2009
NUSTAR SAVANNAH REFINERY
*Savannah, Georgia*

53244-22(MEMO004)GN-WA004 SEP 23/2009




Note: Fort Pulaski Tidal Station is located in Fort Pulaski National Monument, at mouth of Savannah River, approximately 11 miles downstream of the Terminal.

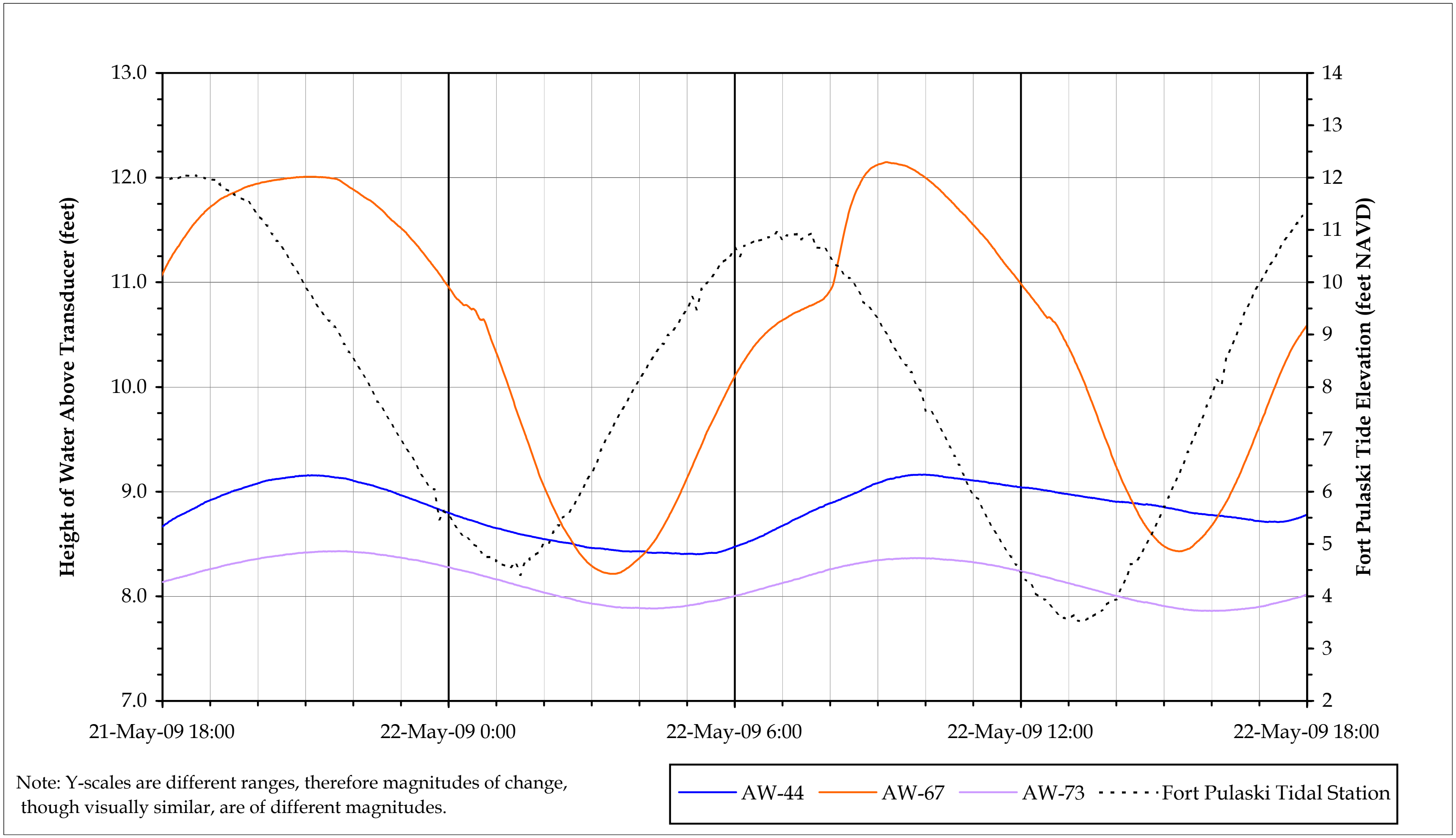
**figure 4**

**HEIGHT OF WATER ABOVE TRANSDUCERS**

**TIDAL INFLUENCE ON GROUNDWATER ELEVATION STUDY**

**NUSTAR SAVANNAH ASPHALT REFINERY**

***Savannah, Georgia***




Note: Fort Pulaski Tidal Station is located in Fort Pulaski National Monument, at mouth of Savannah River, approximately 11 miles downstream of the Terminal.

**figure 5**

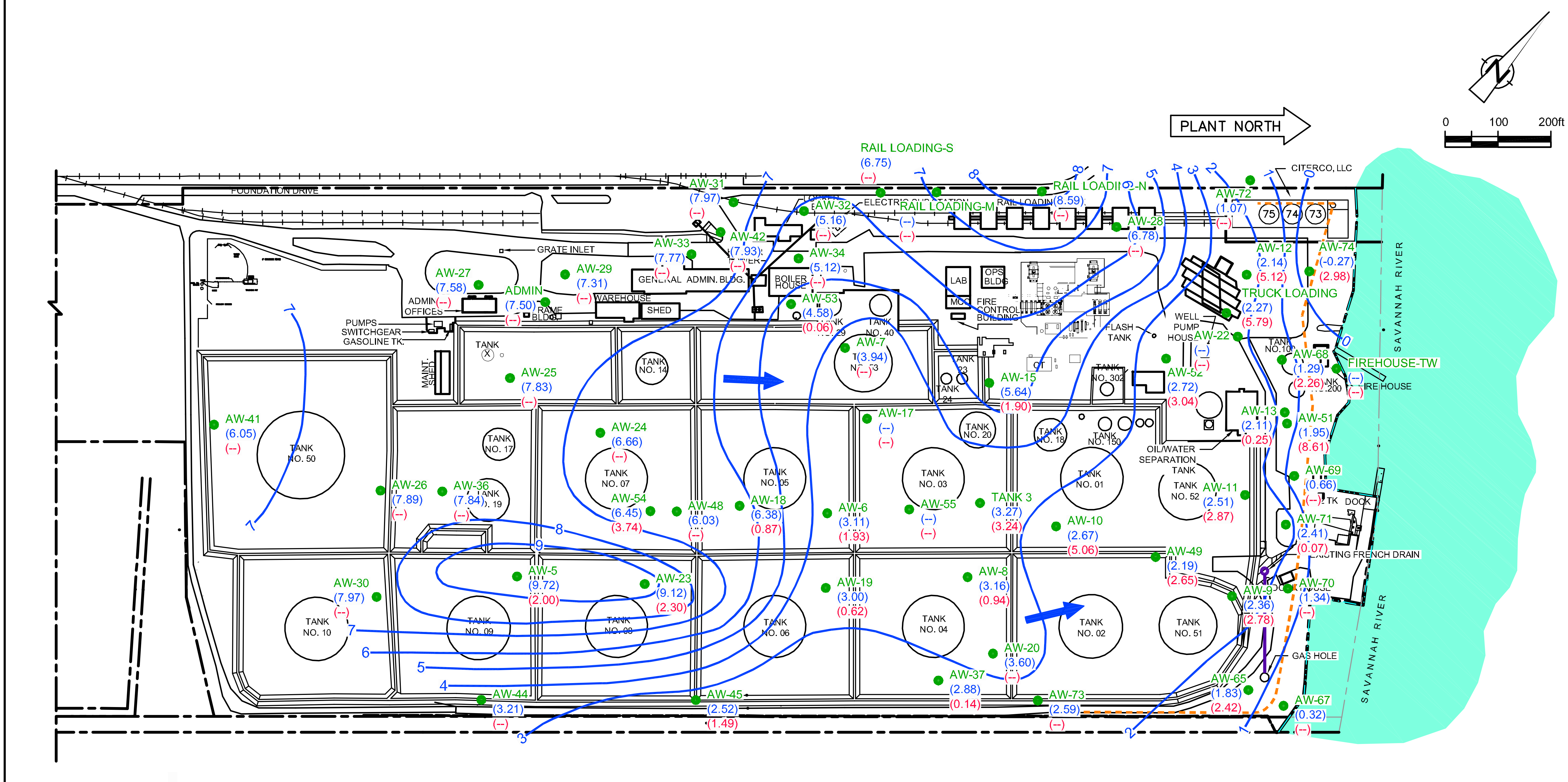
**HEIGHT OF WATER ABOVE TRANSDUCERS**

**TIDAL INFLUENCE ON GROUNDWATER ELEVATION STUDY**

**NUSTAR SAVANNAH ASPHALT REFINERY**

***Savannah, Georgia***

CRA 53244 I:\Hg\50001 to 54999\53244 NuStar Savannah\May 2009 tidal data\053244 - Water Level and Tidal data



## LEGEND

| | |
|---|---|
| AW-45 ● | WELL LOCATION |
| (9.72) | JUNE 30, 2009 CORRECTED GROUNDWATER ELEVATION (FEET AMSL) |
| (2.00) | JUNE 30, 2009 LNAPL THICKNESS (FEET) |
| (NM) | NOT MEASURED |
| - - - - | POLYWALL BARRIER |
| —2— | GROUNDWATER ELEVATION CONTOUR |
| ➡ | GROUNDWATER FLOW DIRECTION |

NOTE: SPECIFIC GRAVITY OF 0.854 USED TO CORRECT FOR LNAPL THICKNESS, EXCEPT FOR AW-12, AW-13, AW-51, AW-65, AND AW-68, WHICH USED WELL-SPECIFIC VALUES.

figure 6

CORRECTED GROUNDWATER ELEVATION CONTOURS
JUNE 2009
NUSTAR SAVANNAH REFINERY
*Savannah, Georgia*

53244-22(MEMO004)GN-WA001 SEP 23/2009

TABLES

**TABLE 1**

**WELL DATA**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**

| *Nustar Well ID* | *Ground Elevation [1] (ft AMSL)* | *TOC Elevation [1] (ft AMSL)* | *Well Diameter [1] (inches)* | *Northing [1] (NAD83)* | *Easting [1] (NAD83)* | *Flushmount/ Stickup* | *Total Depth [1] (ft BTOC)* |
|---|---|---|---|---|---|---|---|
| AW-5 | 11.97 | 16.04 | 2 | 767868.5796 | 977836.4537 | | 12.42 |
| AW-6 | 9.53 | 11.57 | 2 | 768344.5761 | 978199.3509 | | 14.55 |
| AW-7 | 9.47 | 12.54 | 2 | 768601.9674 | 978019.2353 | S | 17.27 |
| AW-8 | 12.63 | 15.68 | 2 | 768428.3676 | 978478.4895 | | 16.40 |
| AW-9 | 10.78 | 13.50 | 2 | 768730.1217 | 978878.4539 | S | 16.01 |
| AW-10 | 11.38 | 13.90 | 2 | 768610.5852 | 978541.3852 | S | 17.41 |
| AW-11 | 11.42 | 13.64 | 2 | 768890.3759 | 978771.3408 | S | 17.63 |
| AW-12 | 12.43 | 12.14 | 2 | 769205.7908 | 978499.5186 | F | 15.75 |
| AW-13 | 10.35 | 12.79 | 2 | 769057.4278 | 978724.8903 | S | 22.04 |
| AW-14 | | | | DESTROYED | | | |
| AW-15 | 13.56 | 15.38 | 2 | 768731.6963 | 978267.8982 | | 19.50 |
| AW-16 | | | | NOT FOUND | | | |
| AW-17[2] | 11.93 | 14.09 | 2 | 768528.515 | 978138.4422 | | 16.10 |
| AW-18 | 9.60 | 12.92 | 2 | 768246.1891 | 978065.3606 | | 14.66 |
| AW-19 | 12.66 | 15.50 | 2 | 768236.4797 | 978290.0828 | | 17.92 |
| AW-20 | 12.70 | 15.67 | 2 | 768351.0008 | 978609.8473 | | 18.60 |
| AW-22 | 12.33 | 15.13 | 2 | 769106.5265 | 978563.8028 | S | 9.80 |
| AW-23 | 12.30 | 16.04 | 2 | 768016.8335 | 978027.6547 | | 16.17 |
| AW-24 | 8.23 | 11.36 | 2 | 768176.8438 | 977776.4344 | | 11.87 |
| AW-25 | 10.37 | 13.50 | 2 | 768142.3259 | 977579.8326 | | 15.06 |
| AW-26 | 9.45 | 12.47 | 2 | 767820.8923 | 977535.2908 | | 12.11 |
| AW-27 | 11.57 | 13.52 | 2 | 768235.5848 | 977419.0923 | S | 15.26 |
| AW-28 | | 11.18 | 2 | 769111.8921 | 978254.9161 | F | 12.56 |
| AW-29 | 10.37 | 12.68 | 2 | 768358.2258 | 977529.4149 | S | 15.31 |
| AW-30 | 10.60 | 13.40 | 2 | 767664.9136 | 977662.2447 | | 14.98 |
| AW-31 | 10.71 | 10.30 | 2 | 768670.3231 | 977679.1261 | | 11.25 |
| AW-32 | 11.00 | 14.39 | 2 | 768745.4584 | 977790.3031 | | 17.92 |
| AW-33 | 10.63 | 13.08 | 2 | 768544.2021 | 977683.9678 | | 13.00 |
| AW-34 | 10.80 | 13.27 | 2 | 768671.4025 | 977841.4877 | S | 13.94 |
| AW-35 | | | | NOT FOUND | | | |
| AW-36 | 11.80 | 13.65 | 4 | 767896.6305 | 977624.3904 | | 31.81 |
| AW-37 | 12.31 | 14.33 | 4 | 768244.897 | 978565.5613 | | 20.39 |
| AW-38 | | | | NOT FOUND | | | |
| AW-40 | | | | NOT FOUND | | | |
| AW-41 | 13.29 | 15.15 | 4 | 767707.6038 | 977216.5396 | | 31.95 |
| AW-42 | 9.73 | 9.43 | 4 | 768611.9441 | 977697.9767 | | 24.95 |
| AW-44 | 13.64 | 13.41 | 4 | 767648.5938 | 977939.4092 | F | 28.20 |
| AW-45 | 15.39 | 15.13 | 4 | 767915.3385 | 978244.7561 | F | 33.28 |
| AW-46 | | | | NOT FOUND | | | |
| AW-47 | | | | NOT FOUND | | | |
| AW-48 | 9.10 | 11.13 | 4 | 768159.9407 | 977982.8832 | | 29.50 |
| AW-49 | 12.08 | 15.50 | 4 | 768690.9747 | 978720.9542 | S | 29.71 |
| AW-50 | | | | NOT FOUND | | | |
| AW-51 | 10.53 | 12.75 | 4 | 769044.338 | 978741.8643 | S | 27.90 |
| AW-52 | 13.30 | 15.74 | 4 | 768986.0817 | 978489.2288 | | 28.00 |
| AW-53 | 10.79 | 10.33 | 4 | 768597.1581 | 977887.6791 | F | 23.69 |
| AW-54 | 8.49 | 10.66 | 4 | 768127.7469 | 977944.9531 | | 25.00 |
| AW-55[2] | 11.72 | 15.31 | 4 | 768452.0095 | 978311.4857 | | 27.74 |
| AW-62 | | | | | | | |
| AW-65 | 10.42 | 13.26 | 2 | 768616.987 | 979018.5317 | S | 16.66 |
| AW-67 | 9.10 | 11.32 | 4 | 768638.2838 | 979088.1506 | S | 19.52 |
| AW-68 | 10.98 | 13.80 | 4 | 769128.64 | 978655.51 | S | 23.15 |
| AW-69 | 9.98 | 9.44 | 4 | 768978.68 | 978817.5 | S | 19.62 |
| AW-70 | 9.28 | 12.25 | 4 | 768810.45 | 978948.45 | S | 24.30 |
| AW-71 | 10.49 | 13.29 | 4 | 768898.99 | 978866.05 | S | 22.78 |
| AW-72 | 10.48 | 10.12 | 4 | 769344.6 | 978387.16 | F | 20.24 |
| AW-73 | 12.63 | 12.04 | 4 | 768339.99 | 978731.97 | F | 21.35 |
| AW-74 | 10.33 | 9.96 | 4 | 769288.53 | 978584.37 | F | NM |

**TABLE 1**

**WELL DATA**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**

| *Nustar Well ID* | *Ground Elevation* [1] *(ft AMSL)* | *TOC Elevation* [1] *(ft AMSL)* | *Well Diameter* [1] *(inches)* | *Northing* [1] *(NAD83)* | *Easting* [1] *(NAD83)* | *Flushmount/ Stickup* | *Total Depth* [1] *(ft BTOC)* |
|---|---|---|---|---|---|---|---|
| ADMIN | 10.91 | 10.72 | 2 | 768294.0684 | 977535.2655 | | 12.02 |
| FIREHOUSE | 8.00 | 7.70 | 2 | 769183.79 | 978743.97 | F | 24.40 |
| RAIL LOADING-N | 10.89 | 12.61 | 2 | 769069.4497 | 978104.435 | | 10.62 |
| RAIL LOADING-S | 10.92 | 12.30 | 2 | 768866.9154 | 977876.597 | | 10.40 |
| Tank-03 | 11.63 | 12.14 | 4 | 768549.3104 | 978404.024 | | 20.95 |
| TRUCK LOADING | 12.83 | 12.65 | 4 | 769126.1029 | 978518.2714 | F | 19.54 |
| RAIL LOADING-M | 11.03 | broken | 2 | 768937.1293 | 977955.6365 | | broken |

Notes:
[1] Surveyed on March 5-6, 2009
[2] Abandoned
ft AMSL - feet Above Mean Sea Level (NAVD 88)
ft BTOC - feet Below Top of Casing elevation
F - Flushmount
S - Stickup
RAIL LOADING-M: Well casing damaged/blocked

**TABLE 2**

**GROUNDWATER ELEVATION AND LNAPL THICKNESS**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**
**MARCH 9, 2009**

| *NuStar Well ID* | *Ground Elevation (ft. AMSL)* | *Top of Casing Elevation (ft. AMSL)* | *Total Depth (ft btoc)* | *Depth to Product (ft btoc)* | *Depth to Groundwater (ft btoc)* | *Product Thickness (ft)* | *Groundwater Elevation (ft. AMSL)* |
|---|---|---|---|---|---|---|---|
| AW-5 | 11.97 | 16.04 | 12.42 | 5.83 | 7.82 | 1.99 | 9.81 |
| AW-6 | 9.53 | 11.57 | 14.55 | 8.89 | 11.35 | 2.46 | 2.19 |
| AW-7 | 9.47 | 12.54 | 17.27 | -- | 9.14 | 0.00 | 3.40 |
| AW-8 | 12.63 | 15.68 | 16.4 | 13.38 | 13.96 | 0.58 | 2.18 |
| AW-9 | 10.78 | 13.50 | 16.01 | 11.49 | 13.80 | 2.31 | 1.55 |
| AW-10 | 11.38 | 13.90 | 17.41 | 11.58 | 14.60 | 3.02 | 1.72 |
| AW-11 | 11.42 | 13.64 | 17.63 | 11.55 | 14.85 | 3.30 | 1.43 |
| AW-12 | 12.43 | 12.14 | 15.75 | 10.30 | 13.65 | 3.35 | 1.17 |
| AW-13 | 10.35 | 12.79 | 22.04 | 9.60 | (1) | -- | NM |
| AW-15 | 13.56 | 15.38 | 19.5 | 10.78 | 12.75 | 1.97 | 4.21 |
| AW-17 | 11.93 | 14.09 | 16.1 | -- | 11.71 | 0.00 | 2.38 |
| AW-18 | 9.60 | 12.92 | 14.66 | 7.21 | 8.63 | 1.42 | 5.43 |
| AW-19 | 12.66 | 15.50 | 17.92 | 13.11 | 14.16 | 1.05 | 2.18 |
| AW-20 | 12.70 | 15.67 | 18.6 | -- | 13.24 | 0.00 | 2.43 |
| AW-22 | 12.33 | 15.13 | 9.8 | -- | -- | -- | NM |
| AW-23 | 12.30 | 16.04 | 16.17 | 7.24 | 8.55 | 1.31 | 8.54 |
| AW-24 | 8.23 | 11.36 | 11.87 | -- | 4.55 | 0.00 | 6.81 |
| AW-25 | 10.37 | 13.50 | 15.06 | -- | 5.47 | 0.00 | 8.03 |
| AW-26 | 9.45 | 12.47 | 12.11 | -- | 4.35 | 0.00 | 8.12 |
| AW-27 | 11.57 | 13.52 | 15.26 | -- | 5.65 | 0.00 | 7.87 |
| AW-28 | -- | 11.18 | 12.56 | -- | 5.59 | 0.00 | 5.59 |
| AW-29 | 10.37 | 12.68 | 15.31 | -- | 4.60 | 0.00 | 8.08 |
| AW-30 | 10.60 | 13.40 | 14.98 | -- | 5.33 | 0.00 | 8.07 |
| AW-31 | 10.71 | 10.30 | 11.25 | -- | 2.40 | 0.00 | 7.90 |
| AW-32 | 11.00 | 14.39 | 17.92 | -- | 10.79 | 0.00 | 3.60 |
| AW-33 | 10.63 | 13.08 | 13 | -- | 5.40 | 0.00 | 7.68 |
| AW-34 | 10.80 | 13.27 | 13.94 | -- | 9.13 | 0.00 | 4.14 |
| AW-36 | 11.80 | 13.65 | 31.81 | -- | 5.40 | 0.00 | 8.25 |
| AW-37 | 12.31 | 14.33 | 20.39 | 12.06 | 12.09 | 0.03 | 2.26 |
| AW-41 | 13.29 | 15.15 | 31.95 | -- | 8.99 | 0.00 | 6.16 |
| AW-42 | 9.73 | 9.43 | 24.95 | -- | 1.49 | 0.00 | 7.94 |
| AW-44 | 13.64 | 13.41 | 28.2 | -- | 10.85 | 0.00 | 2.56 |
| AW-45 | 15.39 | 15.13 | 33.28 | 12.75 | 14.90 | 2.15 | 1.95 |
| AW-48 | 9.10 | 11.13 | 29.5 | -- | 6.30 | 0.00 | 4.83 |
| AW-49 | 12.08 | 15.50 | 29.71 | 13.33 | 15.77 | 2.44 | 1.68 |
| AW-51 | 10.53 | 12.75 | 27.9 | 10.96 | 15.86 | 4.90 | 0.81 |
| AW-52 | 13.30 | 15.74 | 28 | 13.68 | 15.99 | 2.31 | 1.60 |
| AW-53 | 10.79 | 10.33 | 23.69 | 6.36 | 6.50 | 0.14 | 3.94 |
| AW-54 | 8.49 | 10.66 | 25 | 4.16 | 15.96 | 11.80 | 4.14 |
| AW-55 | 11.72 | 15.31 | 27.74 | -- | 12.50 | 0.00 | 2.81 |
| AW-65 | 10.42 | 13.26 | 16.66 | 12.47 | 13.52 | 1.05 | 0.58 |
| AW-67 | 9.10 | 11.32 | 19.52 | -- | 12.30 | 0.00 | -0.98 |
| AW-68 | 10.98 | 13.80 | 23.15 | 13.04 | 13.04 | 0.00 | 0.76 |
| AW-69 | 9.98 | 9.44 | 19.62 | -- | 8.09 | 0.00 | 1.35 |
| AW-70 | 9.28 | 12.25 | 24.3 | -- | 12.11 | 0.00 | 0.14 |
| AW-71 | 10.49 | 13.29 | 22.78 | -- | 12.58 | 0.00 | 0.71 |
| AW-72 | 10.48 | 10.12 | 20.24 | -- | 10.02 | 0.00 | 0.10 |
| AW-73 | 12.63 | 12.04 | 21.35 | -- | 10.34 | 0.00 | 1.70 |
| AW-74 | 10.33 | 9.96 | NM | 10.57 | 10.57 | 0.00 | -0.61 |

**TABLE 2**

**GROUNDWATER ELEVATION AND LNAPL THICKNESS**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**
**MARCH 9, 2009**

| *NuStar Well ID* | *Ground Elevation (ft. AMSL)* | *Top of Casing Elevation (ft. AMSL)* | *Total Depth (ft btoc)* | *Depth to Product (ft btoc)* | *Depth to Groundwater (ft btoc)* | *Product Thickness (ft)* | *Groundwater Elevation (ft. AMSL)* |
|---|---|---|---|---|---|---|---|
| *Renamed "Unknown" Well Locations* | | | | | | | |
| ADMIN | 10.91 | 10.72 | 12.02 | -- | 2.75 | 0.00 | 7.97 |
| RAIL LOADING-S | 10.92 | 12.30 | 10.4 | -- | 6.78 | 0.00 | 5.52 |
| RAIL LOADING-M | 11.03 | broken | broken | broken | broken | -- | NM |
| RAIL LOADING-N | 10.89 | 12.61 | 10.62 | -- | 7.71 | 0.00 | 4.90 |
| TRUCK LOADING | 12.83 | 12.65 | 19.54 | 10.86 | 15.05 | 4.19 | 0.95 |
| TANK 3 | 11.63 | 12.14 | 20.95 | 9.75 | 11.19 | 1.44 | 2.10 |
| FIREHOUSE | 8.00 | 7.70 | 24.4 | -- | 9.86 | 0.00 | -2.16 |

Notes:
NM - Not Measured.
ft AMSL - feet Above Mean Sea Level (NAVD 88).
NAD 83 - Georgia State Plane NAD 83 datum.
ft btoc - feet below top of casing.
(1)--probe coated with thick substance and not able to detect level of water.

**TABLE 3**

**GROUNDWATER ELEVATION AND LNAPL THICKNESS**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**
*DATE: JUNE 30, 2009*

| *Nustar Well ID* | *Date* | *Time* | *TOC Elevation (ft AMSL) (1)* | *Well Diameter (inches)* | *Total Depth (ft BTOC)* | *Depth to Product (ft BTOC)* | *Depth to Groundwater (ft BTOC)* | *Product Thickness (ft)* | *Corrected Groundwater Elevation (ft AMSL)* |
|---|---|---|---|---|---|---|---|---|---|
| AW-5 | 6/30/2009 | 14:54 | 16.04 | 2 | -- | 6.03 | 8.03 | 2.00 | 9.72 (2) |
| AW-6 | 6/30/2009 | 13:13 | 11.57 | 2 | -- | 8.18 | 10.11 | 1.93 | 3.11 (2) |
| AW-8 | 6/30/2009 | 12:52 | 15.68 | 2 | -- | 12.38 | 13.32 | 0.94 | 3.16 (2) |
| AW-7 | 6/30/2009 | 12:35 | 12.54 | 2 | -- | -- | 8.60 | -- | 3.94 |
| AW-9 | 6/30/2009 | 9:51 | 13.50 | 2 | -- | 10.73 | 13.51 | 2.78 | 2.36 (2) |
| AW-9 (4) | 6/30/2009 | 16:13 | 13.50 | 2 | -- | 10.47 | 13.28 | 2.81 | 2.62 (2) |
| AW-10 | 6/30/2009 | 12:37 | 13.90 | 4 | -- | 10.49 | 15.55 | 5.06 | 2.67 (2) |
| AW-11 | 6/30/2009 | 9:58 | 13.64 | 2 | -- | 10.71 | 13.58 | 2.87 | 2.51 (2) |
| AW-11 (4) | 6/30/2009 | 16:18 | 13.64 | 2 | -- | 10.50 | 13.79 | 3.29 | 2.66 (2) |
| AW-12 | 6/30/2009 | 10:17 | 12.14 | 2 | -- | 9.12 | 14.24 | 5.12 | 2.14 (3) |
| AW-13 | 6/30/2009 | 10:40 | 12.79 | 2 | -- | 10.70 | 10.95 | 0.25 | 2.11 (3) |
| AW-15 | 6/30/2009 | 13:43 | 15.38 | 2 | -- | 9.46 | 11.36 | 1.90 | 5.64 (2) |
| AW-17 | NM | -- | -- | -- | -- | -- | -- | -- | -- |
| AW-18 | 6/30/2009 | 13:18 | 12.92 | 2 | -- | 6.41 | 7.28 | 0.87 | 6.38 (2) |
| AW-19 | 6/30/2009 | 13:07 | 15.50 | 2 | -- | 12.41 | 13.03 | 0.62 | 3.00 (2) |
| AW-20 | 6/30/2009 | 12:25 | 15.67 | 2 | -- | -- | 12.07 | -- | 3.60 |
| AW-22 | 6/30/2009 | 9:26 | 15.13 | 2 | -- | -- | -- | -- | -- |
| AW-23 | 6/30/2009 | 14:36 | 16.04 | 2 | -- | 6.58 | 8.88 | 2.30 | 9.12 (2) |
| AW-24 | 6/30/2009 | 14:55 | 11.36 | 2 | -- | -- | 4.70 | -- | 6.66 |
| AW-25 | 6/30/2009 | 14:20 | 13.50 | 2 | -- | -- | 5.67 | -- | 7.83 |
| AW-26 | 6/30/2009 | 14:30 | 12.47 | 2 | -- | -- | 4.58 | -- | 7.89 |
| AW-27 | 6/30/2009 | 13:50 | 13.52 | 2 | -- | -- | 5.94 | -- | 7.58 |
| AW-28 | 6/30/2009 | 13:03 | 11.18 | 2 | -- | -- | 4.40 | -- | 6.78 |
| AW-29 | 6/30/2009 | 13:42 | 12.68 | 2 | -- | -- | 5.37 | -- | 7.31 |
| AW-30 | 6/30/2009 | 14:39 | 13.40 | 2 | -- | -- | 5.43 | -- | 7.97 |
| AW-31 | 6/30/2009 | 13:27 | 10.30 | 2 | -- | -- | 2.33 | -- | 7.97 |
| AW-32 | 6/30/2009 | 13:20 | 14.39 | 2 | -- | -- | 9.23 | -- | 5.16 |
| AW-33 | 6/30/2009 | 13:36 | 13.08 | 2 | -- | -- | 5.31 | -- | 7.77 |
| AW-34 | 6/30/2009 | 12:44 | 13.27 | 2 | -- | -- | 8.15 | -- | 5.12 |
| AW-36 | 6/30/2009 | 14:25 | 13.65 | 4 | -- | -- | 5.81 | -- | 7.84 |
| AW-37 | 6/30/2009 | 13:00 | 14.33 | 4 | -- | 11.43 | 11.57 | 0.14 | 2.88 (2) |
| AW-41 | 6/30/2009 | 14:34 | 15.15 | 4 | -- | -- | 9.10 | -- | 6.05 |
| AW-42 | 6/30/2009 | 13:32 | 9.43 | 4 | -- | -- | 1.50 | -- | 7.93 |
| AW-44 | 6/30/2009 | 14:46 | 13.41 | 4 | -- | -- | 10.20 | -- | 3.21 |
| AW-45 | 6/30/2009 | 11:58 | 15.13 | 4 | -- | 12.39 | 13.88 | 1.49 | 2.52 (2) |
| AW-48 | 6/30/2009 | 15:02 | 11.13 | 4 | -- | -- | 5.10 | -- | 6.03 |
| AW-49 | 6/30/2009 | 12:29 | 15.50 | 4 | -- | 12.92 | 15.57 | 2.65 | 2.19 (2) |
| AW-51 | 6/30/2009 | 9:42 | 12.75 | 4 | -- | 9.77 | 18.38 | 8.61 | 1.95 (3) |
| AW-51 (4) | 6/30/2009 | 16:30 | 12.75 | 4 | -- | 9.13 | 15.64 | 6.51 | 2.84 (3) |
| AW-52 | 6/30/2009 | 13:53 | 15.74 | 4 | -- | 12.58 | 15.62 | 3.04 | 2.72 (2) |
| AW-53 | 6/30/2009 | 13:29 | 10.33 | 4 | -- | 5.74 | 5.80 | 0.06 | 4.58 (2) |
| AW-54 | 6/30/2009 | 14:25 | 10.66 | 4 | -- | 3.66 | 7.40 | 3.74 | 6.45 (2) |
| AW-55 | NM | -- | 15.31 | 4 | -- | -- | -- | -- | -- |
| AW-65 | 6/30/2009 | 9:25 | 13.26 | 2 | -- | 11.08 | 13.50 | 2.42 | 1.83 (3) |
| AW-65 (4) | 6/30/2009 | 15:55 | 13.26 | 2 | -- | 10.46 | 12.96 | 2.50 | 2.44 (3) |
| AW-67 | 6/30/2009 | 9:35 | 11.32 | 4 | -- | -- | 11.00 | -- | 0.32 |
| AW-68 | 6/30/2009 | 10:04 | 13.80 | 4 | -- | 12.18 | 14.44 | 2.26 | 1.29 (3) |
| AW-68 (4) | 6/30/2009 | 16:36 | 13.80 | 4 | -- | 10.73 | 12.21 | 1.48 | 2.85 (3) |
| AW-69 | 6/30/2009 | 9:50 | 9.44 | 4 | -- | -- | 8.78 | -- | 0.66 |
| AW-70 | 6/30/2009 | 9:41 | 12.25 | 4 | -- | -- | 10.91 | -- | 1.34 |
| AW-71 | 6/30/2009 | 9:43 | 13.29 | 4 | -- | 10.87 | 10.94 | 0.07 | 2.41 (2) |
| AW-71 (4) | 6/30/2009 | 16:23 | 13.29 | 4 | -- | 10.76 | 10.84 | 0.08 | 2.52 (2) |
| AW-72 | 6/30/2009 | 9:19 | 10.12 | 4 | -- | -- | 9.05 | -- | 1.07 |
| AW-73 | 6/30/2009 | 11:50 | 12.04 | 4 | -- | -- | 9.45 | -- | 2.59 |
| AW-74 | 6/30/2009 | 10:33 | 9.96 | 4 | -- | 9.79 | 12.77 | 2.98 | -0.27 (2) |
| AW-74 (4) | 6/30/2009 | 16:43 | 9.96 | 4 | -- | 6.55 | 8.54 | 1.99 | 3.12 (2) |
| | | | | | | | | | |
| ADMIN | 6/30/2009 | 13:45 | 10.72 | 2 | -- | -- | 3.22 | -- | 7.50 |
| FIREHOUSE | NM | | 7.70 | 2 | -- | -- | -- | -- | -- |
| RAIL LOADING-M | NM | | -- | 2 | -- | -- | -- | -- | -- |
| RAIL LOADING-N | 6/30/2009 | 13:08 | 12.61 | 2 | -- | -- | 4.02 | -- | 8.59 |
| RAIL LOADING-S | 6/30/2009 | 13:12 | 12.30 | 2 | -- | -- | 5.55 | -- | 6.75 |
| Tank-03 | 6/30/2009 | 12:42 | 12.14 | 4 | -- | 8.40 | 11.64 | 3.24 | 3.27 (2) |
| TRUCK LOADING | 6/30/2009 | 10:11 | 12.65 | 4 | -- | 9.53 | 15.32 | 5.79 | 2.27 (2) |

Notes:
(1) Surveyed on March 5-6, 2009
(2) LNAPL specific gravity varied from 0.8275 to 0.8806, with one value of 1.0826. The average value of 0.854 was used to correct groundwater elevations.
(3) Different LNAPL specific gravity values used. AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567), AW-68 (0.8526)
(4) Additonal fluid level measurement taken to evaluate ranges in fluid levels and elevations near the Savannah River.
NM- Well was not measured during the current gauging event
ft AMSL - feet Above Mean Sea Level (NAVD 88)
ft BTOC - feet Below Top of Casing elevation
RAIL LOADING-M: Well casing damaged/blocked

**TABLE 4**

**SUMMARY OF GROUNDWATER ELEVATION AND LNAPL THICKNESS**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**

| *Nustar Well ID* | *Date* | *Time* | *TOC Elevation (ft AMSL) (1)* | *Depth to Product (ft BTOC)* | *Depth to Groundwater (ft BTOC)* | *Product Thickness (ft)* | *Corrected Groundwater Elevation (ft AMSL)* |
|---|---|---|---|---|---|---|---|
| AW-5 | 3/5/2009 | 15:34 | 16.04 | 5.83 | 7.82 | 1.99 | 9.81 |
| | 6/30/2009 | 14:54 | 16.04 | 6.03 | 8.03 | 2.00 | 9.72 (2) |
| AW-6 | 3/5/2009 | 14:50 | 11.57 | 8.89 | 11.35 | 2.46 | 2.19 |
| | 6/30/2009 | 13:13 | 11.57 | 8.18 | 10.11 | 1.93 | 3.11 (2) |
| AW-7 | 3/6/2009 | 16:35 | 12.54 | -- | 9.14 | -- | 3.40 |
| | 6/30/2009 | 12:35 | 12.54 | -- | 8.60 | -- | 3.94 |
| AW-8 | 3/5/2009 | 14:29 | 15.68 | 13.38 | 13.96 | 0.58 | 2.18 |
| | 6/30/2009 | 12:52 | 15.68 | 12.38 | 13.32 | 0.94 | 3.16 (2) |
| AW-9 | 3/5/2009 | 13:47 | 13.50 | 11.49 | 13.80 | 2.31 | 1.55 |
| | 6/30/2009 | 9:51 | 13.50 | 10.73 | 13.51 | 2.78 | 2.36 (2) |
| | 6/30/2009 (4) | 16:13 | 13.50 | 10.47 | 13.28 | 2.81 | 2.62 (2) |
| AW-10 | 3/5/2009 | 14:00 | 13.90 | 11.58 | 14.60 | 3.02 | 1.72 |
| | 6/30/2009 | 12:37 | 13.90 | 10.49 | 15.55 | 5.06 | 2.67 (2) |
| AW-11 | 3/5/2009 | 16:48 | 13.64 | 11.55 | 14.85 | 3.30 | 1.43 |
| | 6/30/2009 | 9:58 | 13.64 | 10.71 | 13.58 | 2.87 | 2.51 (2) |
| | 6/30/2009 (4) | 16:18 | 13.64 | 10.50 | 13.79 | 3.29 | 2.66 (2) |
| AW-12 | 3/6/2009 | 12:32 | 12.14 | 10.30 | 13.65 | 3.35 | 1.17 |
| | 6/30/2009 | 10:17 | 12.14 | 9.12 | 14.24 | 5.12 | 2.27 (3) |
| AW-13 | 3/5/2009 | 13:00 | 12.79 | 9.60 | -- | -- | -- |
| | 6/30/2009 | 10:40 | 12.79 | 10.70 | 10.95 | 0.25 | 2.05 (3) |
| AW-15 | 3/6/2009 | 16:41 | 15.38 | 10.78 | 12.75 | 1.97 | 4.21 |
| | 6/30/2009 | 13:43 | 15.38 | 9.46 | 11.36 | 1.90 | 5.64 (2) |
| AW-17 | 3/5/2009 | 14:14 | 14.09 | -- | 11.71 | -- | 2.38 |
| | 6/30/2009 | | ABANDONED | | | | |
| AW-18 | 3/5/2009 | 14:54 | 12.92 | 7.21 | 8.63 | 1.42 | 5.43 |
| | 6/30/2009 | 13:18 | 12.92 | 6.41 | 7.28 | 0.87 | 6.38 (2) |
| AW-19 | 3/5/2009 | 14:45 | 15.50 | 13.11 | 14.16 | 1.05 | 2.18 |
| | 6/30/2009 | 13:07 | 15.50 | 12.41 | 13.03 | 0.62 | 3.00 (2) |
| AW-20 | 3/5/2009 | 14:25 | 15.67 | -- | 13.24 | -- | 2.43 |
| | 6/30/2009 | 12:25 | 15.67 | -- | 12.07 | -- | 3.60 |
| AW-22 | 3/6/2009 | 12:46 | 15.13 | -- | -- | -- | 6.81 |
| | 6/30/2009 | 9:26 | 15.13 | -- | DRY | -- | -- |
| AW-23 | 3/5/2009 | 15:27 | 16.04 | 7.24 | 8.55 | 1.31 | 8.54 |
| | 6/30/2009 | 14:36 | 16.04 | 6.58 | 8.88 | 2.30 | 9.12 (2) |
| AW-24 | 3/6/2009 | 0:00 | 11.36 | -- | 4.55 | -- | -- |
| | 6/30/2009 | 14:55 | 11.36 | -- | 4.70 | -- | -- |
| AW-25 | 3/5/2009 | 16:04 | 13.50 | -- | 5.47 | -- | 8.03 |
| | 6/30/2009 | 14:20 | 13.50 | -- | 5.67 | -- | 7.83 |
| AW-26 | 3/5/2009 | 15:52 | 12.47 | -- | 4.35 | -- | 8.12 |
| | 6/30/2009 | 14:30 | 12.47 | -- | 4.58 | -- | 7.89 |
| AW-27 | 3/5/2009 | 16:08 | 13.52 | -- | 5.65 | -- | 7.87 |
| | 6/30/2009 | 13:50 | 13.52 | -- | 5.94 | -- | 7.58 |
| AW-28 | 3/6/2009 | 12:20 | 11.18 | -- | 5.59 | -- | 5.59 |
| | 6/30/2009 | 13:03 | 11.18 | -- | 4.40 | -- | 6.78 |
| AW-29 | 3/5/2009 | 16:14 | 12.68 | -- | 4.60 | -- | 8.08 |
| | 6/30/2009 | 13:42 | 12.68 | -- | 5.37 | -- | 7.31 |
| AW-30 | 3/5/2009 | 15:40 | 13.40 | -- | 5.33 | -- | 8.07 |
| | 6/30/2009 | 14:39 | 13.40 | -- | 5.43 | -- | 7.97 |
| AW-31 | 3/5/2009 | 9:00 | 10.30 | -- | 2.40 | -- | 7.90 |
| | 6/30/2009 | 13:27 | 10.30 | -- | 2.33 | -- | 7.97 |
| AW-32 | 3/6/2009 | 11:21 | 14.39 | -- | 10.79 | -- | 3.60 |
| | 6/30/2009 | 13:20 | 14.39 | -- | 9.23 | -- | 5.16 |
| AW-33 | 3/5/2009 | 9:18 | 13.08 | -- | 5.40 | -- | 7.68 |
| | 6/30/2009 | 13:36 | 13.08 | -- | 5.31 | -- | 7.77 |
| AW-34 | 3/6/2009 | 11:15 | 13.27 | -- | 9.13 | -- | 4.14 |
| | 6/30/2009 | 12:44 | 13.27 | -- | 8.15 | -- | 5.12 |
| AW-36 | 3/6/2009 | 15:46 | 13.65 | -- | 5.40 | -- | 8.25 |
| | 6/30/2009 | 14:25 | 13.65 | -- | 5.81 | -- | 7.84 |
| AW-37 | 3/5/2009 | 14:33 | 14.33 | 12.06 | 12.09 | 0.03 | 2.26 |
| | 6/30/2009 | 13:00 | 14.33 | 11.43 | 11.57 | 0.14 | 2.88 (2) |
| AW-41 | 3/5/2009 | 15:57 | 15.15 | -- | 8.99 | -- | 6.16 |
| | 6/30/2009 | 14:34 | 15.15 | -- | 9.10 | -- | 6.05 |
| AW-42 | 3/5/2009 | 17:07 | 9.43 | -- | 1.49 | -- | 7.94 |
| | 6/30/2009 | 13:32 | 9.43 | -- | 1.50 | -- | 7.93 |
| AW-44 | 3/5/2009 | 9:47 | 13.41 | -- | 10.85 | -- | 2.56 |
| | 6/30/2009 | 14:46 | 13.41 | -- | 10.20 | -- | 3.21 |

**TABLE 4**

**SUMMARY OF GROUNDWATER ELEVATION AND LNAPL THICKNESS**
**NUSTAR SAVANNAH REFINERY**
**SAVANNAH, GEORGIA**

| *Nustar Well ID* | *Date* | *Time* | *TOC Elevation (ft AMSL) (1)* | *Depth to Product (ft BTOC)* | *Depth to Groundwater (ft BTOC)* | *Product Thickness (ft)* | *Corrected Groundwater Elevation (ft AMSL)* |
|---|---|---|---|---|---|---|---|
| AW-45 | 3/6/2009 | 9:25 | 15.13 | 12.75 | 14.90 | 2.15 | 1.95 |
| | 6/30/2009 | 11:58 | 15.13 | 12.39 | 13.88 | 1.49 | 2.52 (2) |
| AW-48 | 3/5/2009 | 15:16 | 11.13 | -- | 6.30 | -- | 4.83 |
| | 6/30/2009 | 15:02 | 11.13 | -- | 5.10 | -- | 6.03 |
| AW-49 | 3/5/2009 | 13:55 | 15.50 | 13.33 | 15.77 | 2.44 | 1.68 |
| | 6/30/2009 | 12:29 | 15.50 | 12.92 | 15.57 | 2.65 | 2.19 (2) |
| AW-51 | 3/6/2009 | 13:20 | 12.75 | 10.96 | 15.86 | 4.90 | 0.81 |
| | 6/30/2009 | 9:42 | 12.75 | 9.77 | 18.38 | 8.61 | 1.72 (3) |
| | 6/30/2009 (4) | 16:30 | 12.75 | 9.13 | 15.64 | 6.51 | 2.67 (3) |
| AW-52 | 3/6/2009 | 12:56 | 15.74 | 13.68 | 15.99 | 2.31 | 1.60 |
| | 6/30/2009 | 13:53 | 15.74 | 12.58 | 15.62 | 3.04 | 2.72 (2) |
| AW-53 | 3/5/2009 | 16:23 | 10.33 | 6.36 | 6.50 | 0.14 | 3.94 |
| | 6/30/2009 | 13:29 | 10.33 | 5.74 | 5.80 | 0.06 | 4.58 (2) |
| AW-54 | 3/5/2009 | 15:00 | 10.66 | 4.16 | 15.96 | 11.80 | 4.14 |
| | 6/30/2009 | 14:25 | 10.66 | 3.66 | 7.40 | 3.74 | 6.45 (2) |
| AW-55 | 3/5/2009 | 14:10 | 15.31 | -- | 12.50 | -- | 2.81 |
| | 6/30/2009 | | | | ABANDONED | | |
| AW-65 | 3/6/2009 | 13:20 | 13.26 | 12.47 | 13.52 | 1.05 | 0.58 |
| | 6/30/2009 | 9:25 | 13.26 | 11.08 | 13.50 | 2.42 | 1.83 (3) |
| | 6/30/2009 (4) | 15:55 | 13.26 | 10.46 | 12.96 | 2.50 | 2.44 (3) |
| AW-67 | 3/6/2009 | 13:41 | 11.32 | -- | 12.30 | -- | -0.98 |
| | 6/30/2009 | 9:35 | 11.32 | -- | 11.00 | -- | 0.32 |
| AW-68 | 3/5/2009 | 0:00 | 13.80 | 13.04 | 13.04 | -- | 0.76 |
| | 6/30/2009 | 10:04 | 13.80 | 12.18 | 14.44 | 2.26 | 1.29 (3) |
| | 6/30/2009 (4) | 16:36 | 13.80 | 10.73 | 12.21 | 1.48 | 2.85 (3) |
| AW-69 | 3/6/2009 | 0:00 | 9.44 | -- | 8.09 | -- | 1.35 |
| | 6/30/2009 | 9:50 | 9.44 | -- | 8.78 | -- | 0.66 |
| AW-70 | 3/6/2009 | 0:00 | 12.25 | -- | 12.11 | -- | 0.14 |
| | 6/30/2009 | 9:41 | 12.25 | -- | 10.91 | -- | 1.34 |
| AW-71 | 3/6/2009 | 0:00 | 13.29 | -- | 12.58 | -- | 0.71 |
| | 6/30/2009 | 9:43 | 13.29 | 10.87 | 10.94 | 0.07 | 2.41 (2) |
| | 6/30/2009 (4) | 16:23 | 13.29 | 10.76 | 10.84 | 0.08 | 2.52 (2) |
| AW-72 | 3/6/2009 | 0:00 | 10.12 | -- | 10.02 | -- | 0.10 |
| | 6/30/2009 | 9:19 | 10.12 | -- | 9.05 | -- | 1.07 |
| AW-73 | 3/6/2009 | 0:00 | 12.04 | -- | 10.34 | -- | 1.70 |
| | 6/30/2009 | 11:50 | 12.04 | -- | 9.45 | -- | 2.59 |
| AW-74 | 3/5/2009 | 0:00 | 9.96 | 10.57 | 10.57 | -- | -0.61 |
| | 6/30/2009 | 10:33 | 9.96 | 9.79 | 12.77 | 2.98 | -0.27 (2) |
| | 6/30/2009 (4) | 16:43 | 9.96 | 6.55 | 8.54 | 1.99 | 3.12 (2) |
| | | | | | | | |
| ADMIN | 3/5/2009 | 16:12 | 10.72 | -- | 2.75 | -- | 7.97 |
| | 6/30/2009 | 13:45 | 10.72 | -- | 3.22 | -- | -- |
| FIREHOUSE | 3/5/2009 | 0:00 | 7.70 | -- | 9.86 | -- | -- |
| | 6/30/2009 | 23:59 | 7.70 | -- | NM | -- | -- |
| RAIL LOADING-M | 3/5/2009 | -- | -- | -- | NM | -- | -- |
| | 6/30/2009 | -- | -- | -- | NM | -- | -- |
| RAIL LOADING-N | 3/6/2009 | 11:30 | 12.61 | -- | 7.71 | -- | 4.90 |
| | 6/30/2009 | 13:08 | 12.61 | -- | 4.02 | -- | -- |
| RAIL LOADING-S | 3/6/2009 | 11:25 | 12.30 | -- | 6.78 | -- | 5.52 |
| | 6/30/2009 | 13:12 | 12.30 | -- | 5.55 | -- | -- |
| Tank-03 | 3/5/2009 | 14:05 | 12.14 | 9.75 | 11.19 | 1.44 | 2.10 |
| | 6/30/2009 | 12:42 | 12.14 | 8.40 | 11.64 | 3.24 | 3.27 (2) |
| TRUCK LOADING | 3/6/2009 | 12:42 | 12.65 | 10.86 | 15.05 | 4.19 | 0.95 |
| | 6/30/2009 | 10:11 | 12.65 | 9.53 | 15.32 | 5.79 | 2.27 (2) |

Notes:
(1) Surveyed on March 5-6, 2009
(2) LNAPL specific gravity varied from 0.8275 to 0.8806, with one value of 1.0826. The average value of 0.854 was used to correct groundwater elevations for the June 2009 monitoring event. All previous data used an assumed specific gravity of 0.80.
(3) Different LNAPL specific gravity values used. AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567), AW-68 (0.8526)
(4) Additonal fluid level measurement taken to evaluate ranges in fluid levels and elevations near the Savannah River.
NM- Well was not measured during the current gauging event
ft AMSL - feet Above Mean Sea Level (NAVD 88)
ft BTOC - feet Below Top of Casing elevation
RAIL LOADING-M: Well casing damaged/blocked

ATTACHMENTS

ATTACHMENT A

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

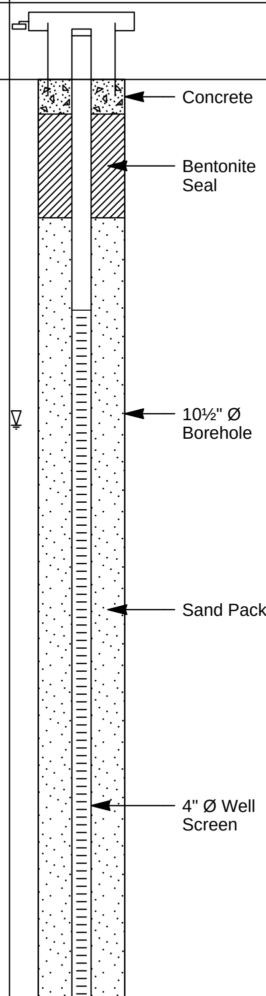


PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-68
DATE COMPLETED: February 17, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | SAMPLE NUMBER | SAMPLE INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | TOP OF CASING | 13.80 | | | | | |
| | GROUND SURFACE | 10.98 | | | | | |
| 0 | CL-CLAY, sandy, tan to brown (hydroexcavation) | | | | | | |
| 7.5 | - groundwater/LNAPL encountered at 7.5ft BGS | | | | | | |
| 9 | SM-SAND, silty, medium grained, gray to green, saturated | 1.98 | 9-16' | P/S | | | 1.6 |
| 16 | - no recovery from 16.0 to 20.0ft BGS | | | P/S | | | |
| | | | | P/S | | | |
| 20 | END OF BOREHOLE @ 20.0ft BGS | -9.02 | | | | | |

MONITOR WELL




WELL DETAILS
Screened interval:
5.98 to -9.02ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
10.48 to 7.98ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
7.98 to -9.02ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ⊽ 2/17/09

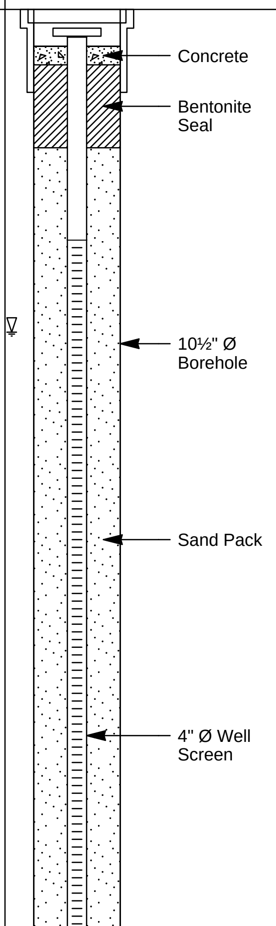
# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-69
DATE COMPLETED: February 18, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | SAMPLE NUMBER | INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 9.98 | | | | | |
| | TOP OF CASING | 9.44 | | | | | |
| 0 | CL-CLAY, sandy, tan to gray (hydroexcavation) | | 0-8.5' | | | | 0 |
| 7.0 | - saturated at 7.0ft BGS | | | | | | |
| 8.5 | - end hydroexcavation at 8.5ft BGS | | | P/S | | | |
| 10.0 | SM-SAND, silty, fine grained, gray, saturated | -0.02 | | P/S | | | |
| 12.0 | - gray to green at 12.0ft BGS | | | P/S | | | |
| 18.0 | SP-SAND, very coarse grained, dark green to gray, black staining, hydrocarbon odor | -8.02 | | | | | |
| 20.0 | END OF BOREHOLE @ 20.0ft BGS | -10.02 | | | | | |




WELL DETAILS
Screened interval:
4.98 to -10.02ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
9.48 to 6.98ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
6.98 to -10.02ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ∇ 2/18/09

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



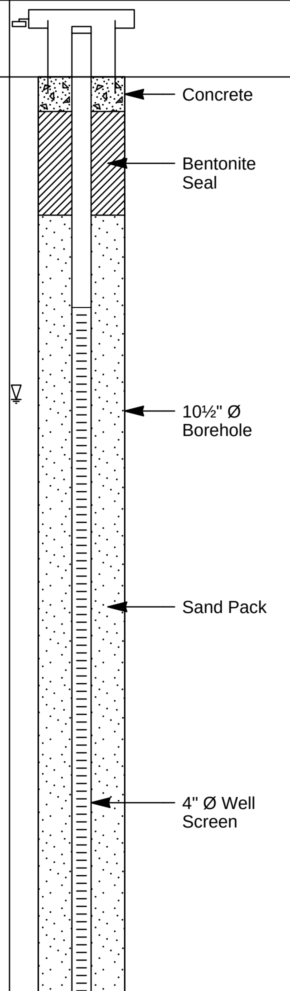
PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-70
DATE COMPLETED: February 17, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | SAMPLE NUMBER | SAMPLE INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | TOP OF CASING | 12.25 | | | | | |
| | GROUND SURFACE | 9.28 | | | | | |
| 0–7 | CL-CLAY, sandy, tan to gray (hydroexcavation) | | 0-10.5' | | | | 0 |
| 7 | SM-SAND, silty, fine grained, gray to green, saturated | 2.28 | | | | | |
| | - end hydroexcavation at 10.5ft BGS | | | P/S | | | |
| | | | | P/S | | | |
| 18 | SP-SAND, very coarse grained, gray to green, saturated | -8.72 | | P/S | | | |
| 20 | END OF BOREHOLE @ 20.0ft BGS | -10.72 | | | | | |

Depth scale: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28

MONITOR WELL




WELL DETAILS
Screened interval:
4.28 to -10.72ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
8.78 to 6.28ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
6.28 to -10.72ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ 2/17/09

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

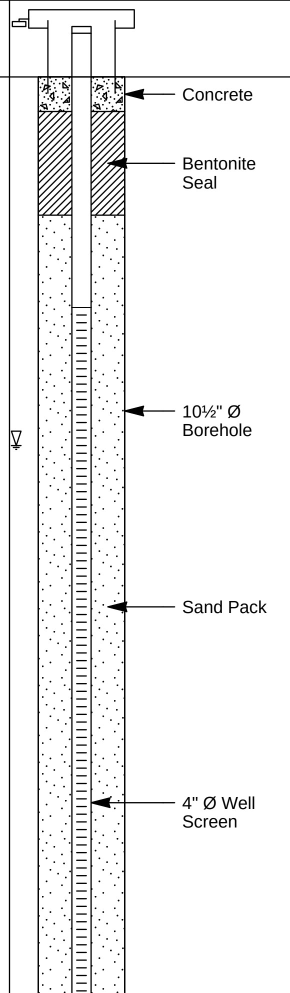


PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-71
DATE COMPLETED: February 18, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | SAMPLE NUMBER | SAMPLE INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | TOP OF CASING | 13.29 | | | | | |
| | GROUND SURFACE | 10.49 | | | | | |
| 0 | CL-CLAY, silty, tan to brown (hydroexcavation) | | | | | | |
| 4 | | | 0-8' | | | | 0 |
| 5.0 | SM-SAND, silty, fine grained, gray | 5.49 | | | | | |
| 8 | - saturated, end hydroexcavation at 8.0ft BGS | | | | | | |
| 8–10 | | | | P/S | | | |
| 12 | - hydrocarbon staining and hydrocarbon odor at 12.0ft BGS | | | | | | |
| 12–14 | | | | P/S | | | |
| 16 | SP-SAND, very coarse grained, gray to green, saturated | -5.51 | | | | | |
| 16–20 | | | | P/S | | | |
| 20 | END OF BOREHOLE @ 20.0ft BGS | -9.51 | | | | | |

MONITOR WELL




WELL DETAILS
Screened interval:
5.49 to -9.51ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
9.99 to 7.49ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
7.49 to -9.51ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ 2/18/09

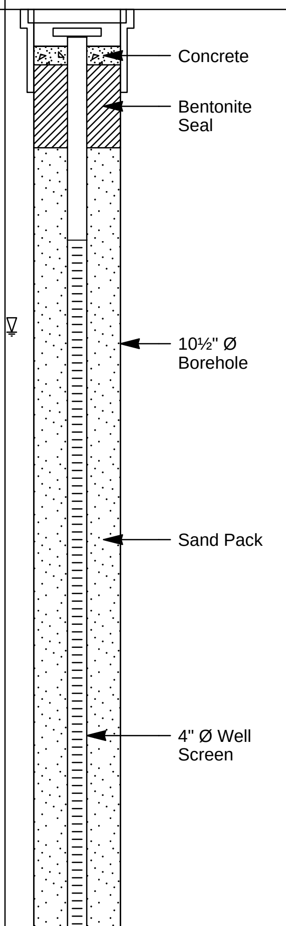
# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-72
DATE COMPLETED: February 18, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | SAMPLE NUMBER | SAMPLE INTERVAL | SAMPLE REC (ft) | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 10.48 | | | | | |
| | TOP OF CASING | 10.12 | | | | | |
| 0 | CL-CLAY, silty, tan to brown (hydroexcavation) | | | | | | |
| 4 | SM-SAND, silty, fine grained, tan (hydroexcavation) | 6.48 | 0-8.5' | | | | 0 |
| 7 | - saturated at 7.0ft BGS | | | | | | |
| 8.5 | - end hydroexcavation at 8.5ft BGS | | | P/S | | | |
| 11.5 | - tan and gray, hydrocarbon odor at 11.5ft BGS | | | P/S | | | |
| | | | | P/S | | | |
| 20 | END OF BOREHOLE @ 20.0ft BGS | -9.52 | | | | | |

MONITOR WELL




WELL DETAILS
Screened interval:
5.48 to -9.52ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
9.98 to 7.48ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
7.48 to -9.52ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ∇ 2/18/09

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)



PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-73
DATE COMPLETED: February 19, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | MONITOR WELL | SAMPLE NUMBER | INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 12.63 | | | | | | |
| | TOP OF CASING | 12.04 | | | | | | |
| 0 | CL-CLAY, silty, tan to brown (air knife) | | Concrete; Bentonite Seal | 0-8' | | | | 0 |
| 7.0 | SM-SAND, silty, fine grained, tan, saturated<br>- end air knife at 8.0ft BGS | 5.63 | 10½" Ø Borehole; Sand Pack; 4" Ø Well Screen | | P/S (8-12); P/S (12-16); P/S (16-20) | | | |
| 18.0 | SP-SAND, very coarse grained, gray, saturated | -5.37 | | | | | | |
| 20.0 | END OF BOREHOLE @ 20.0ft BGS | -7.37 | | | | | | |

WELL DETAILS
Screened interval:
7.63 to -7.37ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
12.13 to 9.63ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
9.63 to -7.37ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ⊻ 2/19/09

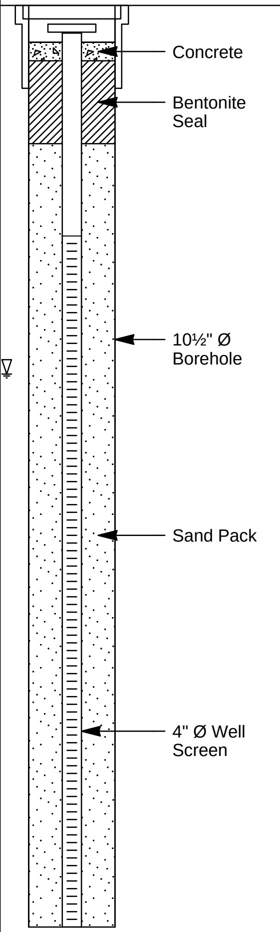
# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: NuStar Savannah Asphalt Refinery
PROJECT NUMBER: 053244
CLIENT: NuStar Energy, L.P.
LOCATION: Savannah, Georgia
DRILLING CONTRACTOR: WHE Drillers

HOLE DESIGNATION: AW-74
DATE COMPLETED: February 17, 2009
DRILLING METHOD: DPT/10½" OD HSA
FIELD PERSONNEL: S. Christ
DRILLER: J. Thornhill

| DEPTH ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | MONITOR WELL | SAMPLE NUMBER | SAMPLE INTERVAL | REC (ft) | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|---|
| | GROUND SURFACE<br>TOP OF CASING | 10.33<br>9.96 | | | | | | |
| 0 | CL-CLAY, silty, tan to brown (air knife) | | | | | | | |
| 3.00 | SM-SAND, fine grained, gray, slight hydrocarbon odor | 7.33 | | | | | | |
| ~4 | | | | 0-8.5' | | | | 0 |
| 8 | - saturated at 8.0ft BGS<br>- end air knife at 8.5ft BGS | | | | | | | |
| ~9–11 | | | | | P/S | | | |
| ~11–15 | | | | | P/S | | | |
| 16.00 | SP-SAND, very coarse grained, gray, saturated | -5.67 | | | | | | |
| ~17–20 | | | | | P/S | | | |
| 20.00 | END OF BOREHOLE @ 20.0ft BGS | -9.67 | | | | | | |




WELL DETAILS
Screened interval:
5.33 to -9.67ft AMSL
5.00 to 20.00ft BGS
Length: 15ft
Diameter: 4in
Slot Size: 0.020
Material: PVC
Seal:
9.83 to 7.33ft AMSL
0.50 to 3.00ft BGS
Material: Bentonite
Sand Pack:
7.33 to -9.67ft AMSL
3.00 to 20.00ft BGS
Material: 12/20 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ∇ 2/17/09

OVERBURDEN LOG 53244 CHI.GPJ CRA_CORP.GDT 7/7/09

ATTACHMENT B

| Well ID | Survey Point No. | Northing | Easting | Top of Casing El. (NAVD 88) | Ground El. at Well (NAVD 88) |
|---|---|---|---|---|---|
| AW-30 | 100 | 767664.91 | 977662.24 | 13.40 | 10.60 |
| AW-36 | 101 | 767896.63 | 977624.39 | 13.65 | 11.80 |
| AW-5 | 102 | 767868.58 | 977836.45 | 16.04 | 11.97 |
| AW-26 | 103 | 767820.89 | 977535.29 | 12.47 | 9.45 |
| AW-23 | 104 | 768016.83 | 978027.65 | 16.04 | 12.30 |
| AW-41 | 105 | 767707.60 | 977216.54 | 15.15 | 13.29 |
| AW-27 | 106 | 768235.58 | 977419.09 | 13.52 | 11.57 |
| AW-29 | 107 | 768358.23 | 977529.41 | 12.68 | 10.37 |
| UNKNOWN | 108 | 768294.07 | 977535.27 | 10.72 | 10.91 |
| AW-25 | 109 | 768142.33 | 977579.83 | 13.50 | 10.37 |
| AW-24 | 110 | 768176.84 | 977776.43 | 11.36 | 8.23 |
| AW-33 | 111 | 768670.32 | 977679.13 | 10.30 | 10.71 |
| AW-42 | 112 | 768611.94 | 977697.98 | 9.43 | 9.73 |
| AW-33 | 113 | 768544.20 | 977683.97 | 13.08 | 10.63 |
| AW-34 | 114 | 768671.40 | 977841.49 | 13.27 | 10.80 |
| AW-32 | 115 | 768745.46 | 977790.30 | 14.39 | 11.00 |
| UNKNOWN | 116 | 768866.92 | 977876.60 | 12.30 | 10.92 |
| UNKNOWN | 117 | 768937.13 | 977955.64 | 13.09 | 11.03 |
| UNKNOWN | 118 | 769069.45 | 978104.44 | 12.61 | 10.89 |
| AW-12 | 119 | 769205.79 | 978499.52 | 12.14 | 12.43 |
| AW-22 | 120 | 769106.53 | 978563.80 | 15.13 | 12.33 |
| UNKNOWN | 121 | 769126.10 | 978518.27 | 12.65 | 12.83 |
| AW-52 | 122 | 768986.08 | 978489.23 | 15.74 | 13.30 |
| AW-28 | 123 | 769111.89 | 978254.92 | 11.18 | |
| AW-13 | 125 | 769057.43 | 978724.89 | 12.79 | 10.35 |
| AW-51 | 126 | 769044.34 | 978741.86 | 12.75 | 10.53 |
| AW-11 | 127 | 768890.38 | 978771.34 | 13.64 | 11.42 |
| AW-10 | 128 | 768610.59 | 978541.39 | 13.90 | 11.38 |
| AW-49 | 129 | 768690.97 | 978720.95 | 15.50 | 12.08 |
| AW-9 | 130 | 768730.12 | 978878.45 | 13.50 | 10.78 |
| AW-21 | 131 | 768616.99 | 979018.53 | 13.26 | 10.42 |
| UNKNOWN | 132 | 768638.28 | 979088.15 | 11.32 | 9.10 |
| AW-54 | 134 | 768127.75 | 977944.95 | 10.66 | 8.49 |
| AW-48 | 135 | 768159.94 | 977982.88 | 11.13 | 9.10 |
| AW-18 | 136 | 768246.19 | 978065.36 | 12.92 | 9.60 |
| AW-7 | 137 | 768601.97 | 978019.24 | 12.54 | 9.47 |
| AW-53 | 138 | 768597.16 | 977887.68 | 10.33 | 10.79 |
| AW-15 | 139 | 768731.70 | 978267.90 | 15.38 | 13.56 |
| AW-17 | 140 | 768528.52 | 978138.44 | 14.09 | 11.93 |
| AW-55 | 141 | 768452.01 | 978311.49 | 15.31 | 11.72 |
| AW-6 | 142 | 768344.58 | 978199.35 | 11.57 | 9.53 |
| AW-19 | 143 | 768236.48 | 978290.08 | 15.50 | 12.66 |
| AW-8 | 144 | 768428.37 | 978478.49 | 15.68 | 12.63 |
| AW-20 | 145 | 768351.00 | 978609.85 | 15.67 | 12.70 |
| AW-37 | 146 | 768244.90 | 978565.56 | 14.33 | 12.31 |
| AW-45 | 147 | 767915.34 | 978244.76 | 15.13 | 15.39 |
| AW-44 | 148 | 767648.59 | 977939.41 | 13.41 | 13.64 |
| UNKNOWN | 149 | 768549.31 | 978404.02 | 12.14 | 11.63 |
| AW-35 | Not Found | | | | |
| AW-16 | Not Found | | | | |
| AW-38 | Not Found | | | | |
| AW-50 | Not Found | | | | |
| AW-46 | Not Found | | | | |
| AW-47 | Not Found | | | | |
| AW-40 | Not Found | | | | |
| AW-14 | Destroyed | | | | |
| AW-72 | 6 | 769344.60 | 978387.16 | 10.12 | 10.48 |
| AW-68 | 501 | 769128.64 | 978655.51 | 13.80 | 10.98 |
| AW-69 | 502 | 768978.68 | 978817.50 | 9.44 | 9.98 |
| FIREHOUSE-TW | 503 | 769183.79 | 978743.97 | 7.70 | 8.00 |
| AW-71 | 508 | 768898.99 | 978866.05 | 13.29 | 10.49 |
| AW-70 | 509 | 768810.45 | 978948.45 | 12.25 | 9.28 |
| AW-73 | 515 | 768339.99 | 978731.97 | 12.04 | 12.63 |
| AW-74 | 516 | 769288.53 | 978584.37 | 9.96 | 10.33 |

| | | | |
|---|---|---|---|
| TRENCH | 504 | 769002.45 | 978843.51 |
| TRENCH | 505 | 768998.80 | 978839.23 |
| TRENCH | 506 | 768995.53 | 978842.03 |
| TRENCH | 507 | 768980.20 | 978823.66 |
| TRENCH | 517 | 769214.83 | 978652.97 |
| TRENCH | 518 | 769202.24 | 978642.23 |
| POLY WALL | 511 | 768805.67 | 978985.46 |
| POLY WALL | 512 | 768814.40 | 978982.80 |
| POLY WALL | 514 | 768537.17 | 978972.43 |

N

NORTH BASED ON GRID GA EAST ZONE


200 100 0 200 400

GRAPHIC SCALE

NOTES:

1. AERIAL PHOTO - 2007 NAIP TRUE COLOR PHOTO.
2. THIS SURVEY WAS PERFORMED ON MARCH 9, 2009 USING STANDARD GPS, TOTAL STATION, AND DIFFERENTIAL LEVELING TECHNIQUES.
3. ALL COORDINATES SHOWN ARE BASED ON NAD 83 GEORGIA EAST ZONE.
4. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 88.

LEGEND:

AW-44 MONITORING WELL ID
(116) SURVEY POINT NO.

GEORGIA REGISTERED No. 2285 3/15/09 LAND SURVEYOR MICHAEL J. GARDNER

MICHAEL J. GARDNER
GA.R.L.S. No.: 2285

A SURVEY OF:
NuSTAR MONITORING WELLS
CHATHAM COUNTY, GA

DRAWN BY: DLJ DATE: 3-15-09

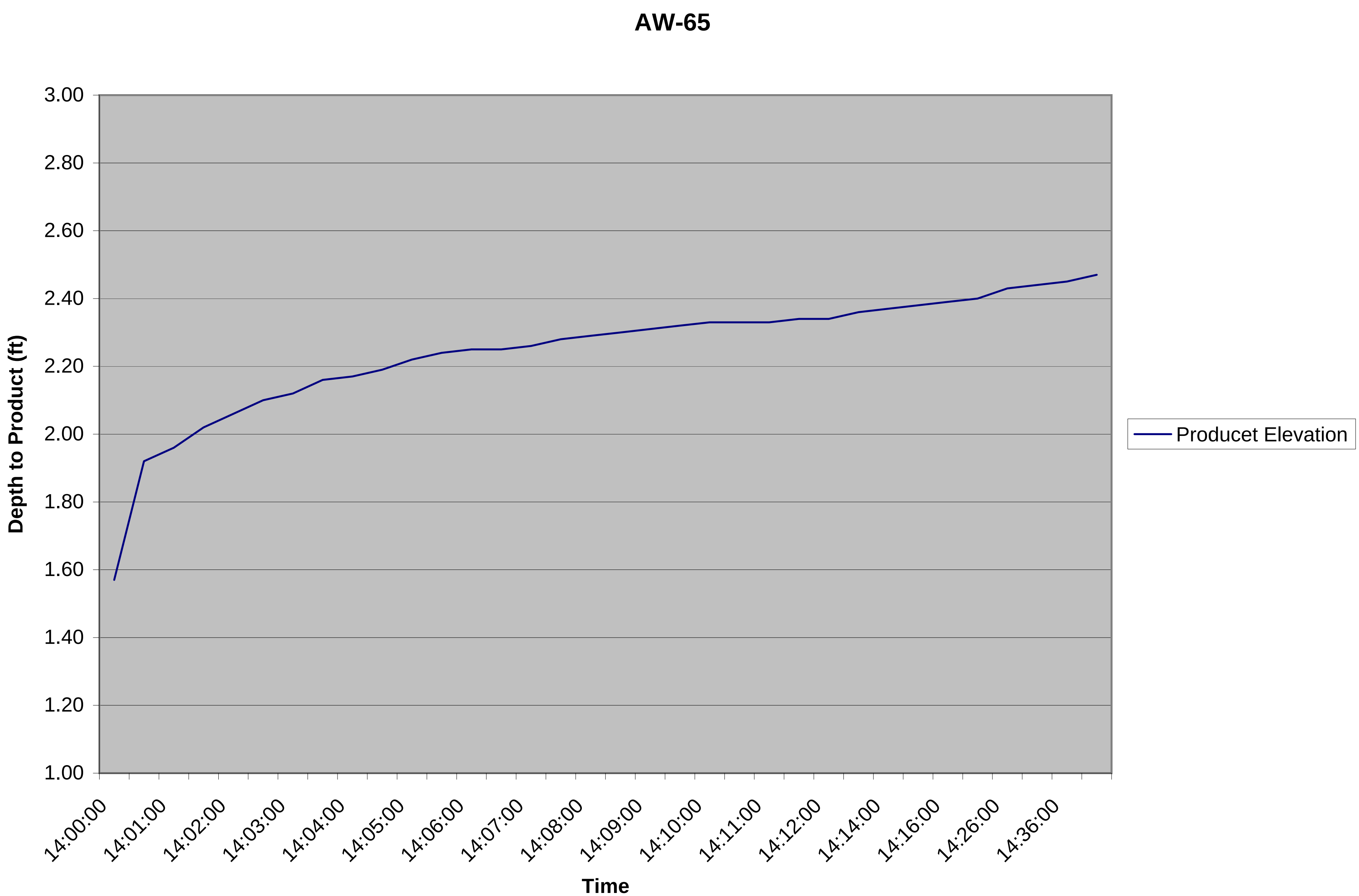
MICHAEL JIM GARDNER, LAND SURVEYOR
120 VARNEDOE AVE.
GARDEN CITY, GEORGIA 31408

ATTACHMENT C

ATTACHMENT D

| | |
|---|---|
| AW-65 | 5/20/09 @ 1352 |
| Initial DTP | 10.73 |
| Initial DTW | 12.34 |
| Initial PE | 2.53 |
| Initial GWE | 0.92 |
| Thickness | 1.66 |
| Product Removed | 2' of product with 1' of water (2"x36" bailer) |
| TOC Elevation | 13.26 |
| Well Diameter | 2" |

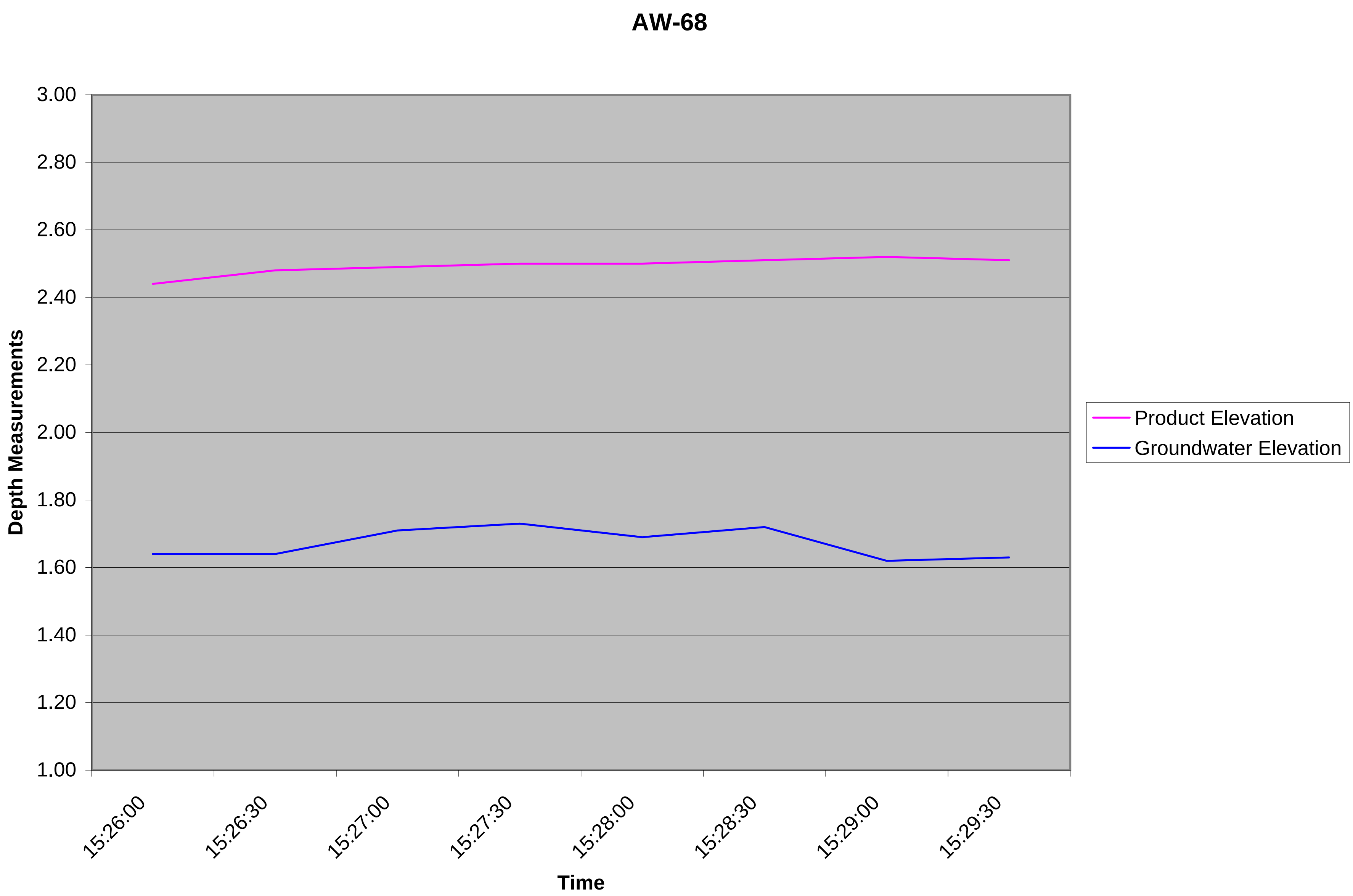
| Time | DTP | DTW | PE | GWE | |
|---|---|---|---|---|---|
| 14:00:00 | 11.69 | -- | 1.57 | -- | |
| 14:00:30 | 11.34 | -- | 1.92 | -- | |
| 14:01:00 | 11.30 | -- | 1.96 | -- | |
| 14:01:30 | 11.24 | -- | 2.02 | -- | |
| 14:02:00 | 11.20 | -- | 2.06 | -- | |
| 14:02:30 | 11.16 | -- | 2.10 | -- | |
| 14:03:00 | 11.14 | -- | 2.12 | -- | |
| 14:03:30 | 11.10 | -- | 2.16 | -- | |
| 14:04:00 | 11.09 | -- | 2.17 | -- | |
| 14:04:30 | 11.07 | -- | 2.19 | -- | |
| 14:05:00 | 11.04 | -- | 2.22 | -- | |
| 14:05:30 | 11.02 | -- | 2.24 | -- | |
| 14:06:00 | 11.01 | -- | 2.25 | -- | |
| **14:06:30** | **11.01** | -- | 2.25 | -- | |
| 14:07:00 | 11.00 | -- | 2.26 | -- | |
| 14:07:30 | 10.98 | -- | 2.28 | -- | |
| 14:08:00 | 10.97 | -- | 2.29 | -- | |
| 14:08:30 | 10.96 | -- | 2.30 | -- | |
| 14:09:00 | 10.95 | -- | 2.31 | -- | |
| 14:09:30 | 10.94 | -- | 2.32 | -- | |
| 14:10:00 | 10.93 | -- | 2.33 | -- | |
| 14:10:30 | 10.93 | -- | 2.33 | -- | |
| 14:11:00 | 10.93 | -- | 2.33 | -- | |
| 14:11:30 | 10.92 | -- | 2.34 | -- | |
| 14:12:00 | 10.92 | -- | 2.34 | -- | Reading changed from every 30 sec to every min. |
| 14:13:00 | 10.90 | -- | 2.36 | -- | |
| 14:14:00 | 10.89 | -- | 2.37 | -- | |
| 14:15:00 | 10.88 | -- | 2.38 | -- | |
| 14:16:00 | 10.87 | -- | 2.39 | -- | |
| 14:21:00 | 10.86 | -- | 2.40 | -- | Reading changed from every min to every 5 min. |
| 14:26:00 | 10.83 | -- | 2.43 | -- | |
| 14:31:00 | 10.82 | -- | 2.44 | -- | |
| 14:36:00 | 10.81 | -- | 2.45 | -- | |
| 14:41:00 | 10.79 | -- | 2.47 | -- | |



AW-65
Depth to Product (ft)
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
14:00:00
14:01:00
14:02:00
14:03:00
14:04:00
14:05:00
14:06:00
14:07:00
14:08:00
14:09:00
14:10:00
14:11:00
14:12:00
14:14:00
14:16:00
14:26:00
14:36:00
Time
Producet Elevation

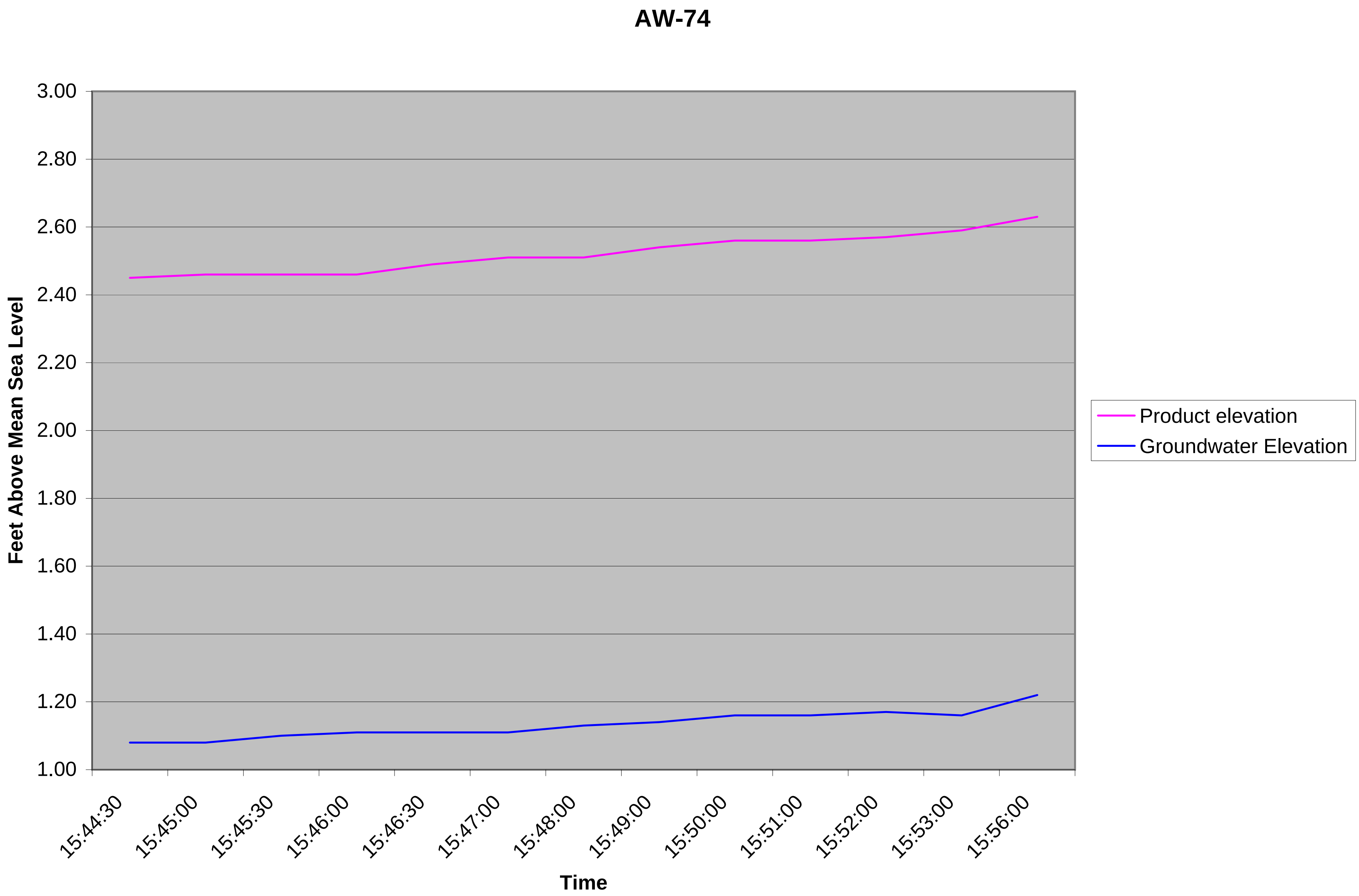
| | |
|---|---|
| AW-68 | 5/20/09 @ 1510 |
| Initial DTP | 11.30 |
| Initial DTW | 12.14 |
| Initial PE | 2.50 |
| Initial GWE | 1.66 |
| Thickness | 0.84 |
| Product Removed | 1' of product (2"x36" bailer) |
| TOC Elevation | 13.80 |
| Well Diameter | 4" |

| Time | DTP | DTW | PE | GWE |
|---|---|---|---|---|
| 15:26:00 | 11.36 | 12.16 | 2.44 | 1.64 |
| 15:26:30 | 11.32 | 12.16 | 2.48 | 1.64 |
| 15:27:00 | 11.31 | 12.09 | 2.49 | 1.71 |
| 15:27:30 | 11.30 | 12.07 | 2.50 | 1.73 |
| 15:28:00 | 11.30 | 12.11 | 2.50 | 1.69 |
| 15:28:30 | 11.29 | 12.08 | 2.51 | 1.72 |
| 15:29:00 | 11.28 | 12.18 | 2.52 | 1.62 |
| 15:29:30 | 11.29 | 12.17 | 2.51 | 1.63 |


AW-68
Depth Measurements
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
15:26:00
15:26:30
15:27:00
15:27:30
15:28:00
15:28:30
15:29:00
15:29:30
Time
Product Elevation
Groundwater Elevation

| | |
|---|---|
| AW-74 | 5/20/09 @ 1540 |
| Initial DTP | 7.55 |
| Initial DTW | 9.02 |
| Initial PE | 2.41 |
| Initial GWE | 0.94 |
| Thickness | 1.47 |
| Product Removed | 1.2' of product and 4" of water (2"x36" bailer) |
| TOC Elevation | 9.96 |
| Well Diameter | 4" |

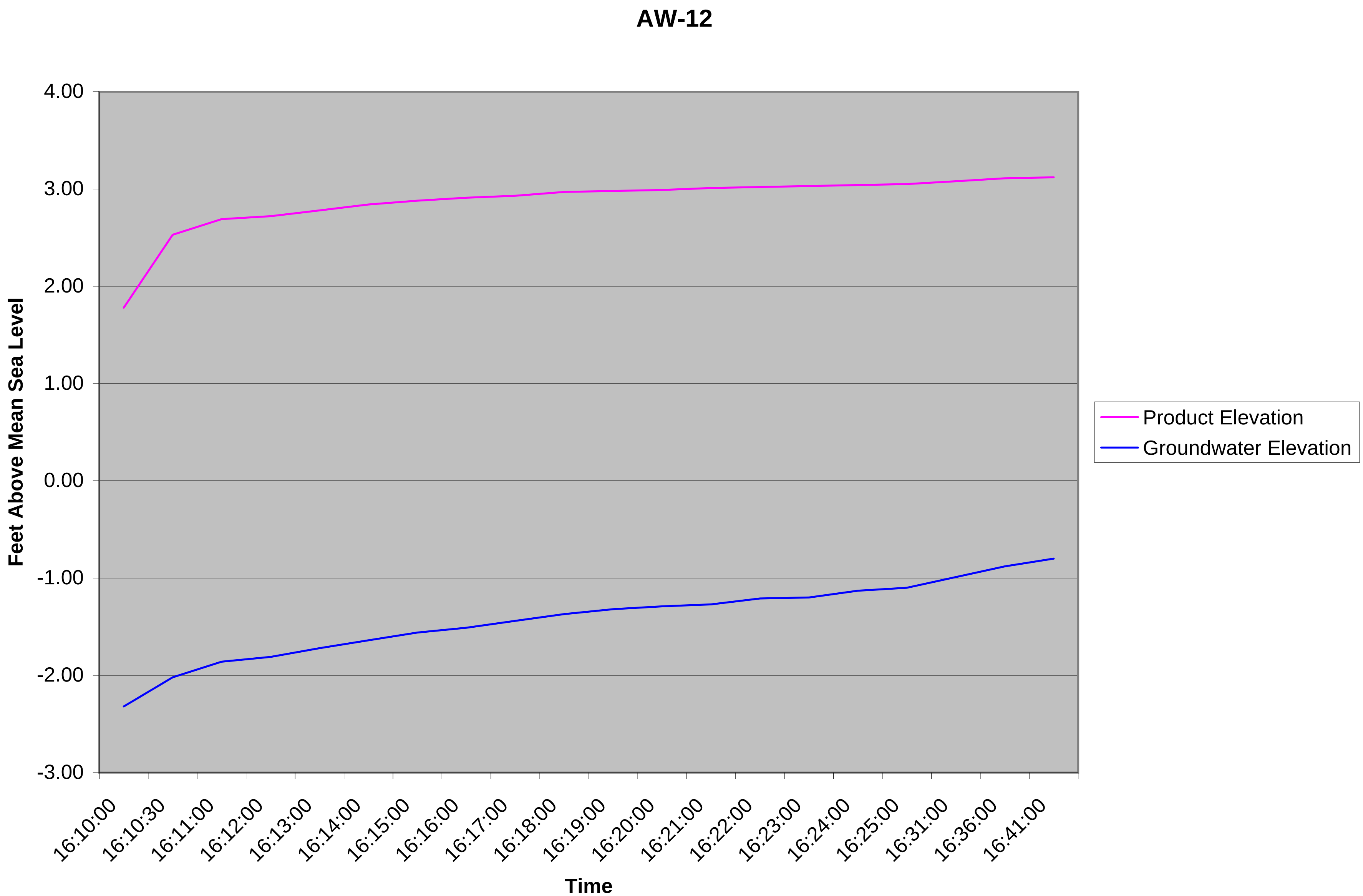
| Time | DTP | DTW | PE | GWE |
|---|---|---|---|---|
| 15:44:30 | 7.51 | 8.88 | 2.45 | 1.08 |
| 15:45:00 | 7.50 | 8.88 | 2.46 | 1.08 |
| 15:45:30 | 7.50 | 8.86 | 2.46 | 1.10 |
| 15:46:00 | 7.50 | 8.85 | 2.46 | 1.11 |
| 15:46:30 | 7.47 | 8.85 | 2.49 | 1.11 |
| 15:47:00 | 7.45 | 8.85 | 2.51 | 1.11 |
| 15:48:00 | 7.45 | 8.83 | 2.51 | 1.13 |
| 15:49:00 | 7.42 | 8.82 | 2.54 | 1.14 |
| 15:50:00 | 7.40 | 8.80 | 2.56 | 1.16 |
| 15:51:00 | **7.40** | **8.80** | 2.56 | 1.16 |
| 15:52:00 | 7.39 | 8.79 | 2.57 | 1.17 |
| 15:53:00 | 7.37 | 8.80 | 2.59 | 1.16 |
| 15:56:00 | 7.33 | 8.74 | 2.63 | 1.22 |



AW-74
3.00
2.80
2.60
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
Feet Above Mean Sea Level
15:44:30
15:45:00
15:45:30
15:46:00
15:46:30
15:47:00
15:48:00
15:49:00
15:50:00
15:51:00
15:52:00
15:53:00
15:56:00
Time
Product elevation
Groundwater Elevation

| | |
|---|---|
| AW-12 | 5/20/09 @ 16:03 |
| Initial DTP | 8.95 |
| Initial DTW | 14.65 |
| Initial PE | 3.18 |
| Initial GWE | -2.52 |
| Thickness | 5.70 |
| Product Removed | 2 full bailers (with approximately 4" of water) |
| TOC Elevation | 12.13 ft AMSL |
| Well Diameter | 2" |

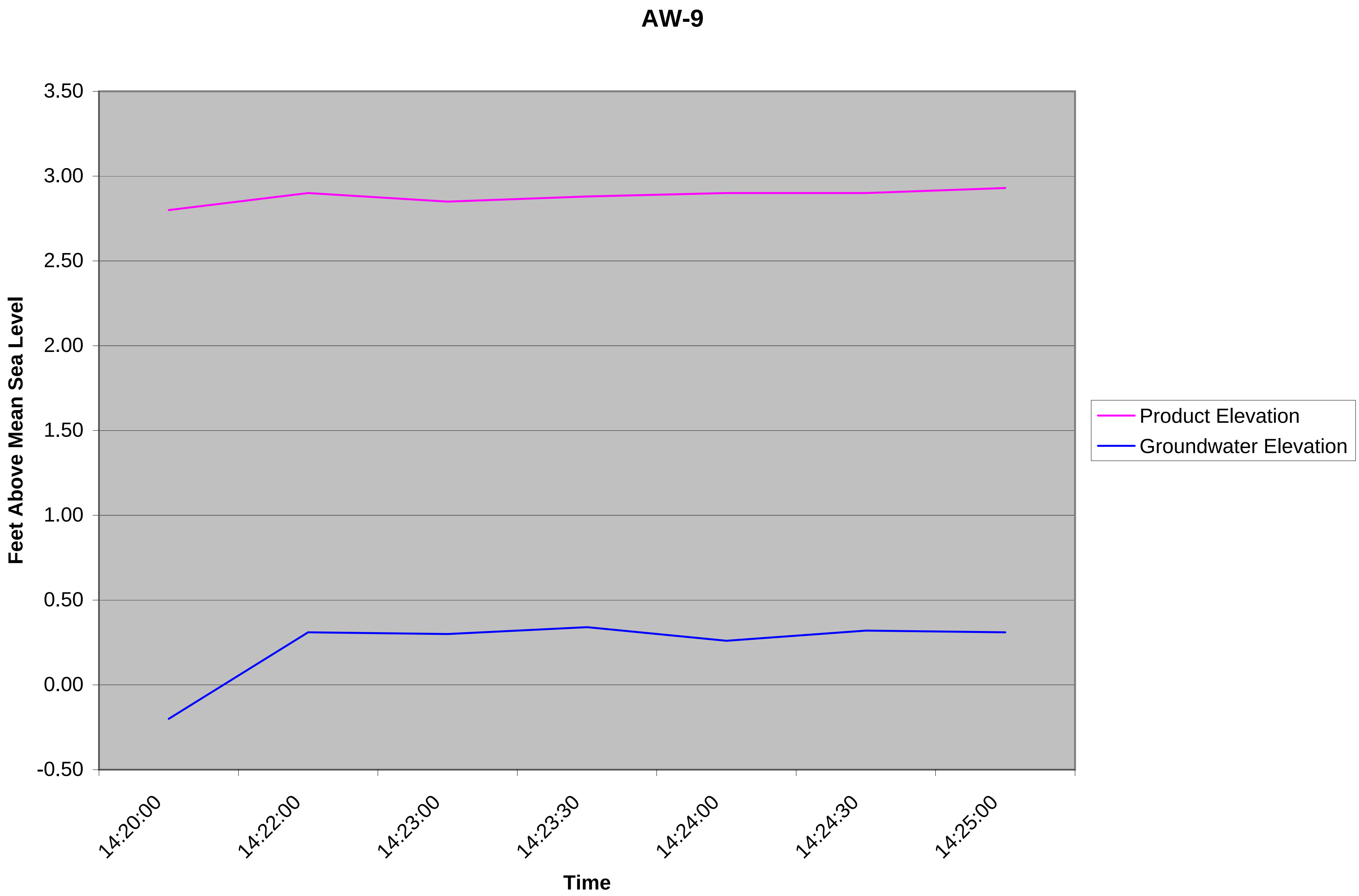
| Time | DTP | DTW | PE | GWE |
|---|---|---|---|---|
| 16:10:00 | 10.35 | 14.45 | 1.78 | -2.32 |
| 16:10:30 | 9.60 | 14.15 | 2.53 | -2.02 |
| 16:11:00 | 9.44 | 13.99 | 2.69 | -1.86 |
| 16:12:00 | 9.41 | 13.94 | 2.72 | -1.81 |
| 16:13:00 | 9.35 | 13.85 | 2.78 | -1.72 |
| 16:14:00 | 9.29 | 13.77 | 2.84 | -1.64 |
| 16:15:00 | 9.25 | 13.69 | 2.88 | -1.56 |
| 16:16:00 | 9.22 | 13.64 | 2.91 | -1.51 |
| 16:17:00 | 9.20 | 13.57 | 2.93 | -1.44 |
| 16:18:00 | 9.16 | 13.50 | 2.97 | -1.37 |
| 16:19:00 | 9.15 | 13.45 | 2.98 | -1.32 |
| 16:20:00 | 9.14 | 13.42 | 2.99 | -1.29 |
| 16:21:00 | 9.12 | 13.40 | 3.01 | -1.27 |
| 16:22:00 | 9.11 | 13.34 | 3.02 | -1.21 |
| 16:23:00 | 9.10 | 13.33 | 3.03 | -1.20 |
| 16:24:00 | 9.09 | 13.26 | 3.04 | -1.13 |
| 16:25:00 | 9.08 | 13.23 | 3.05 | -1.10 |
| 16:31:00 | 9.05 | 13.12 | 3.08 | -0.99 |
| 16:36:00 | 9.02 | 13.01 | 3.11 | -0.88 |
| 16:41:00 | 9.01 | 12.93 | 3.12 | -0.80 |



AW-12
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
Feet Above Mean Sea Level
16:10:00
16:10:30
16:11:00
16:12:00
16:13:00
16:14:00
16:15:00
16:16:00
16:17:00
16:18:00
16:19:00
16:20:00
16:21:00
16:22:00
16:23:00
16:24:00
16:25:00
16:31:00
16:36:00
16:41:00
Time
Product Elevation
Groundwater Elevation

| | |
|---|---|
| AW-9 | 5/21/09 @ 14:00 |
| Initial DTP | 10.45 |
| Initial DTW | 13.30 |
| Initial PE | 3.05 |
| Initial GWE | 0.20 |
| Thickness | 2.85 |
| Product Removed | 1.5' of product (2"x36" bailer) |
| TOC Elevation | 13.50 |
| Well Diameter | 2" |

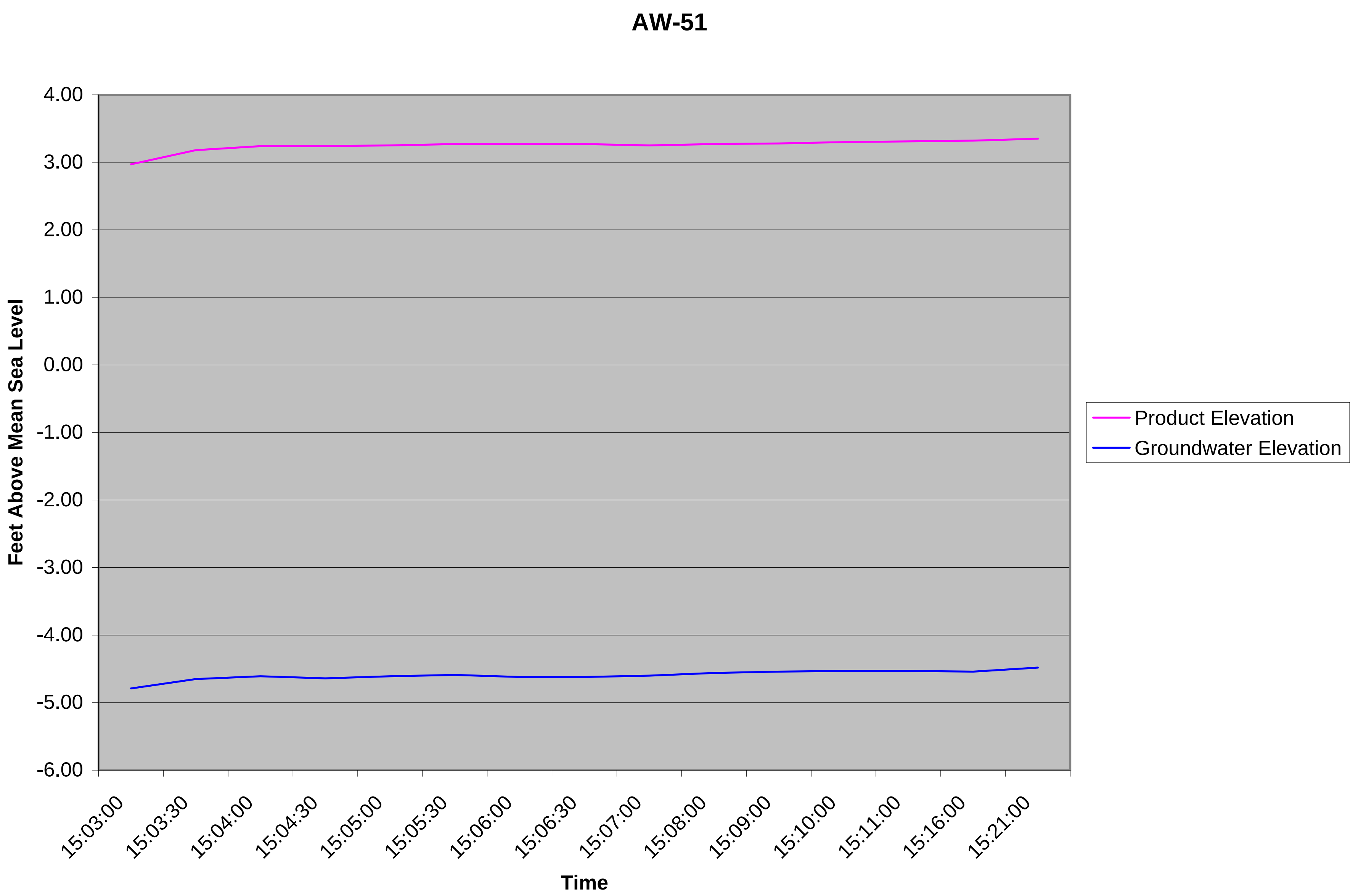
| Time | DTP | DTW | Product Elevation | Groundwater Elevation |
|---|---|---|---|---|
| 14:20:00 | 10.70 | 13.70 | 2.80 | -0.20 |
| 14:22:00 | 10.60 | 13.19 | 2.90 | 0.31 |
| 14:23:00 | 10.65 | 13.20 | 2.85 | 0.30 |
| 14:23:30 | 10.62 | 13.16 | 2.88 | 0.34 |
| 14:24:00 | 10.60 | 13.24 | 2.90 | 0.26 |
| 14:24:30 | 10.60 | 13.18 | 2.90 | 0.32 |
| 14:25:00 | 10.57 | 13.19 | 2.93 | 0.31 |


AW-9
Feet Above Mean Sea Level
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-0.50
14:20:00
14:22:00
14:23:00
14:23:30
14:24:00
14:24:30
14:25:00
Time
Product Elevation
Groundwater Elevation

| | |
|---|---|
| AW-51 | 5/21/09 @ 14:51 |
| Initial DTP | 9.38 |
| Initial DTW | 18.18 |
| Initial PE | 3.37 |
| Initial GWE | -5.43 |
| Thickness | 8.8 ft |
| Product Removed | 3 bailers (2"x36" bailer) |
| TOC Elevation | 12.75 |
| Well Diameter | 4" |

| Time | DTP | DTW | Product Elevation | Groundwater Elevation |
|---|---|---|---|---|
| 15:03:00 | 9.78 | 17.54 | 2.97 | -4.79 |
| 15:03:30 | 9.57 | 17.4 | 3.18 | -4.65 |
| 15:04:00 | 9.51 | 17.36 | 3.24 | -4.61 |
| 15:04:30 | 9.51 | 17.39 | 3.24 | -4.64 |
| 15:05:00 | 9.50 | 17.36 | 3.25 | -4.61 |
| 15:05:30 | 9.48 | 17.34 | 3.27 | -4.59 |
| 15:06:00 | 9.48 | 17.37 | 3.27 | -4.62 |
| 15:06:30 | 9.48 | 17.37 | 3.27 | -4.62 |
| 15:07:00 | 9.50 | 17.35 | 3.25 | -4.60 |
| 15:08:00 | 9.48 | 17.31 | 3.27 | -4.56 |
| 15:09:00 | 9.47 | 17.29 | 3.28 | -4.54 |
| 15:10:00 | 9.45 | 17.28 | 3.30 | -4.53 |
| 15:11:00 | 9.44 | 17.28 | 3.31 | -4.53 |
| 15:16:00 | 9.43 | 17.29 | 3.32 | -4.54 |
| 15:21:00 | 9.40 | 17.23 | 3.35 | -4.48 |

## AW-51



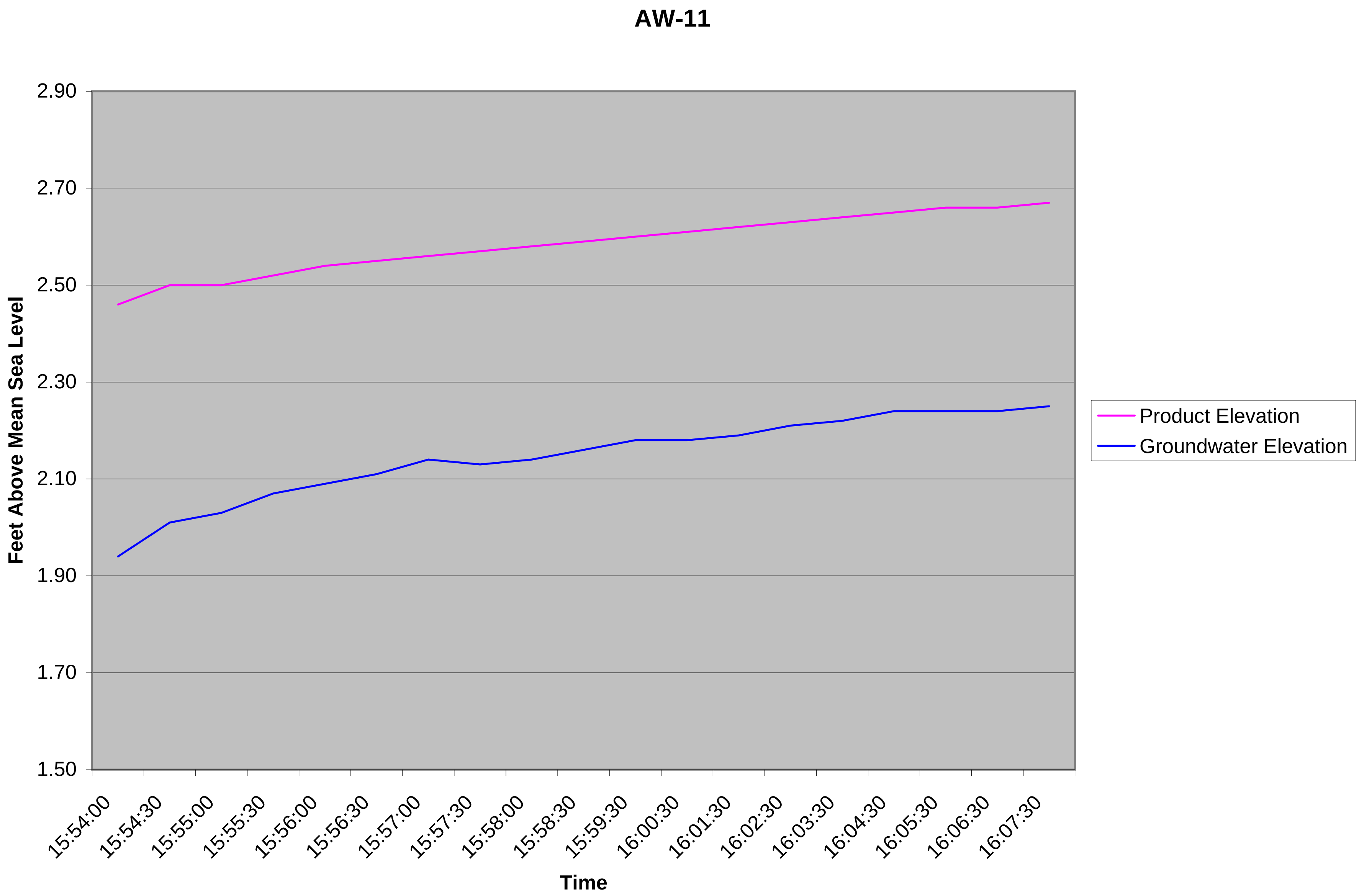
AW-51
4.00
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
Feet Above Mean Sea Level
15:03:00
15:03:30
15:04:00
15:04:30
15:05:00
15:05:30
15:06:00
15:06:30
15:07:00
15:08:00
15:09:00
15:10:00
15:11:00
15:16:00
15:21:00
Time
Product Elevation
Groundwater Elevation

| | |
|---|---|
| AW-13 | 5/21/09 @ 15:27 |
| Initial DTP | 10.10 |
| Initial DTW | -- |
| Initial PE | 2.69 |
| Initial GWE | -- |
| Thickness | -- |
| Product Removed | 3" |
| TOC Elevation | 12.79 |
| Well Diameter | 2" |

No readings were taken. Product ws too thick to allow the bailer to sink and water reading could not be taken. NOTE: Previously, it was assumed that this well had a very large column of product because no water readings have ever been recorded; however, when the bailer was forced into the product , only 3" were recovered on top of the groundwater.

| | |
|---|---|
| AW-11 | 5/21/09 @ 15:49 |
| Initial DTP | 10.95 |
| Initial DTW | 11.50 |
| Initial PE | 2.69 |
| Initial GWE | 2.14 |
| Thickness | 0.55' |
| Product Removed | ~ 6" (2"x36" bailer) |
| TOC Elevation | 13.64 |
| Well Diameter | 2" |

| Time | DTP | DTW | Product Elevation | Groundwater Elevation |
|---|---|---|---|---|
| 15:54:00 | 11.18 | 11.70 | 2.46 | 1.94 |
| 15:54:30 | 11.14 | 11.63 | 2.50 | 2.01 |
| 15:55:00 | 11.14 | 11.61 | 2.50 | 2.03 |
| 15:55:30 | 11.12 | 11.57 | 2.52 | 2.07 |
| 15:56:00 | 11.10 | 11.55 | 2.54 | 2.09 |
| 15:56:30 | 11.09 | 11.53 | 2.55 | 2.11 |
| 15:57:00 | 11.08 | 11.50 | 2.56 | 2.14 |
| 15:57:30 | 11.07 | 11.51 | 2.57 | 2.13 |
| 15:58:00 | 11.06 | 11.50 | 2.58 | 2.14 |
| 15:58:30 | 11.05 | 11.48 | 2.59 | 2.16 |
| 15:59:30 | 11.04 | 11.46 | 2.60 | 2.18 |
| 16:00:30 | 11.03 | 11.46 | 2.61 | 2.18 |
| 16:01:30 | 11.02 | 11.45 | 2.62 | 2.19 |
| 16:02:30 | 11.01 | 11.43 | 2.63 | 2.21 |
| 16:03:30 | 11.00 | 11.42 | 2.64 | 2.22 |
| 16:04:30 | 10.99 | 11.40 | 2.65 | 2.24 |
| 16:05:30 | 10.98 | 11.40 | 2.66 | 2.24 |
| 16:06:30 | 10.98 | 11.40 | 2.66 | 2.24 |
| 16:07:30 | 10.97 | 11.39 | 2.67 | 2.25 |


AW-11
Feet Above Mean Sea Level
2.90
2.70
2.50
2.30
2.10
1.90
1.70
1.50
15:54:00
15:54:30
15:55:00
15:55:30
15:56:00
15:56:30
15:57:00
15:57:30
15:58:00
15:58:30
15:59:30
16:00:30
16:01:30
16:02:30
16:03:30
16:04:30
16:05:30
16:06:30
16:07:30
Time
Product Elevation
Groundwater Elevation

ATTACHMENT E

SAMPLE KEY AND SUMMARY OF RESULTS

NUSTAR SAVANNAH REFINERY
SAMPLE KEY
*JUNE 29, 2009*

| *Sample ID* | *Well ID* | *Viscosity (cSt @ 40° C)* | *Specific Gravity (@ 60° F)* | *NOTES* |
|---|---|---|---|---|
| LNAPL-062909-KDH-001 | AW-65 | 2.04 | 0.8567 | dark, thin, strong odor |
| LNAPL-062909-KDH-002 | AW-51 | 4.05 | 0.8806 | dark, thin, odor, thicker than AW-65 |
| LNAPL-062909-KDH-003 | AW-13 | 1411 | 1.0826 | black, extremely thick, strong odor |
| LNAPL-062909-KDH-004 | AW-68 | 3.62 | 0.8526 | very dark and thin with strong odor |
| LNAPL-062909-KDH-005 | AW-12 | 2.45 | 0.8275 | very dark, very thin, with strong odor |

**ALS Laboratory Group**
ANALYTICAL CHEMISTRY & TESTING SERVICES

## Environmental Division

17-Jul-2009

Brian LeRoy
NuStar Energy, L.P.
2330 North Loop 1604 West
PO Box 781609
San Antonio, TX 78278

Tel: (770) 441-0027
Fax:

Re: 53244 Savannah Refinery

Work Order: **0907097**

Dear Brian,

ALS Laboratory Group received 5 samples on 03-Jul-2009 09:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is .

If you have any questions regarding this report, please feel free to call me.

Sincerely,

JayLynn F Thibault

Electronically approved by: Glenda H. Ramos

JayLynn F Thibault
Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
Certificate No: T104704231-08-TX

## ALS Laboratory Group

Date: 17-Jul-09

**Client:** NuStar Energy, L.P.
**Project:** 53244 Savannah Refinery
**Work Order:** **0907097**

# Work Order Sample Summary

| Lab Samp ID | Client Sample ID | Matrix | Tag Number | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| 0907097-01 | LNAPL-062909-KDH-001 | Solid | | 6/29/2009 17:45 | 7/3/2009 09:15 | ☐ |
| 0907097-02 | LNAPL-062909-KDH-002 | Solid | | 6/29/2009 18:10 | 7/3/2009 09:15 | ☐ |
| 0907097-03 | LNAPL-062909-KDH-003 | Solid | | 6/29/2009 18:18 | 7/3/2009 09:15 | ☐ |
| 0907097-04 | LNAPL-062909-KDH-004 | Solid | | 6/29/2009 18:38 | 7/3/2009 09:15 | ☐ |
| 0907097-05 | LNAPL-062909-KDH-005 | Solid | | 6/29/2009 18:55 | 7/3/2009 09:15 | ☐ |

## ALS Laboratory Group

*Date: 17-Jul-09*

| | |
|---|---|
| **Client:** | NuStar Energy, L.P. |
| **Project:** | 53244 Savannah Refinery |
| **Work Order:** | 0907097 |

## Case Narrative

The analysis for Specific Gravity and Viscosity on a liquid were subcontracted to Texas Oil Tech in Houston, TX. See the attached report for the results.

# Certificate of Analysis

SINCE 1985
*Quality Controlled Through Analysis*

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

| | | | |
|---|---|---|---|
| CLIENT: | ALS Laboratories | REQUESTED BY: | Ms. JayLynn Thibault |
| SAMPLE: | 0907097-01A (LNAPL-062909-KDH-001) | REPORT DATE: | July 17, 2009 |
| LABORATORY NO: | 55817-01 R | PURCHASE ORDER NO: | 10-2116491 |

**TEST** **RESULT**

| | Results | Reporting Limits |
|---|---|---|
| | | |
| Viscosity, Kinematic @ 40° C, ASTM D 445, cSt ................ | 2.04 | 1.0 |
| | | |
| Specific Gravity @ 60 °F, ASTM D 1429 .............. | 0.8567 | 0.5 |
| | | |

Respectfully submitted
For Texas OilTech Laboratories, L.P.

A. Phil Sorurbakhsh
Director of Laboratory Operations

# Certificate of Analysis

SINCE 1985
*Quality Controlled Through Analysis*

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

| | | | |
|---|---|---|---|
| CLIENT: | ALS Laboratories | REQUESTED BY: | Ms. JayLynn Thibault |
| SAMPLE: | 0907097-02A (LNAPL-062909-KDH-002) | REPORT DATE: | July 17, 2009 |
| LABORATORY NO: | 55817-02 R | PURCHASE ORDER NO: | 10-2116491 |

**TEST** **RESULT**

| | Results | Reporting Limits |
|---|---|---|
| | | |
| Viscosity, Kinematic @ 40° C, ASTM D 445, cSt ................ | 4.05 | 1.0 |
| | | |
| Specific Gravity @ 60 °F, ASTM D 1429 ............... | 0.8806 | 0.5 |
| | | |

Respectfully submitted
For Texas OilTech Laboratories, L.P.

A. Phil Sorurbakhsh
Director of Laboratory Operations

# Certificate of Analysis

SINCE 1985

*Quality Controlled Through Analysis*

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

| | | | |
|---|---|---|---|
| **CLIENT:** | ALS Laboratories | **REQUESTED BY:** | Ms. JayLynn Thibault |
| **SAMPLE:** | 0907097-03A (LNAPL-062909-KDH-003) | **REPORT DATE:** | July 17, 2009 |
| **LABORATORY NO:** | 55817-03 R | **PURCHASE ORDER NO:** | 10-2116491 |

**TEST** **RESULT**

| | ***Results*** | ***Reporting Limits*** |
|---|---|---|
| | | |
| Viscosity, Kinematic @ 40° C, ASTM D 445, cSt ................ | 1,411 | 1.0 |
| | | |
| Specific Gravity @ 60 °F, ASTM D 1429 ............... | 1.0826 | 0.5 |
| | | |

Respectfully submitted
For Texas OilTech Laboratories, L.P.

A. Phil Sorurbakhsh
Director of Laboratory Operations

# Certificate of Analysis

SINCE 1985

*Quality Controlled Through Analysis*

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

| | | | |
|---|---|---|---|
| CLIENT: | ALS Laboratories | REQUESTED BY: | Ms. JayLynn Thibault |
| SAMPLE: | 0907097-04A (LNAPL-062909-KDH-004) | REPORT DATE: | July 17, 2009 |
| LABORATORY NO: | 55817-04 R | PURCHASE ORDER NO: | 10-2116491 |

**TEST** **RESULT**

| | *Results* | *Reporting Limits* |
|---|---|---|
| | | |
| Viscosity, Kinematic @ 40° C, ASTM D 445, cSt ................ | 3.62 | 1.0 |
| | | |
| Specific Gravity @ 60 °F, ASTM D 1429 ............... | 0.8526 | 0.5 |
| | | |

Respectfully submitted
For Texas OilTech Laboratories, L.P.

A. Phil Sorurbakhsh
Director of Laboratory Operations

# Certificate of Analysis

SINCE 1985
*Quality Controlled Through Analysis*

10630 FALLSTONE RD. HOUSTON, TEXAS 77099
P.O. BOX 741905, HOUSTON, TEXAS 77274

TEL: (281) 495-2400
FAX: (281) 495-2410

| | | | |
|---|---|---|---|
| **CLIENT:** | ALS Laboratories | **REQUESTED BY:** | Ms. JayLynn Thibault |
| **SAMPLE:** | 0907097-05A (LNAPL-062909-KDH-005) | **REPORT DATE:** | July 17, 2009 |
| **LABORATORY NO:** | 55817-05 R | **PURCHASE ORDER NO:** | 10-2116491 |

**TEST** **RESULT**

| | ***Results*** | ***Reporting Limits*** |
|---|---|---|
| | | |
| Viscosity, Kinematic @ 40° C, ASTM D 445, cSt ................ | 2.45 | 1.0 |
| | | |
| Specific Gravity @ 60 °F, ASTM D 1429 ............... | 0.8275 | 0.5 |
| | | |

Respectfully submitted
For Texas OilTech Laboratories, L.P.

A. Phil Sorurbakhsh
Director of Laboratory Operations

☒ **ALS Laboratory Group**
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

# Chain of Custody Form

Page 1 of 1

☐ **ALS Laboratory Group**
3352 128th Ave.
Holland, MI 49424-9263
Tel: +1 616 399 6070
Fax: +1 616 399 6185

| ALS Project Manager: | | ALS Work Order #: 0907057 |
|---|---|---|

| Customer Information | | Project Information | | Parameter/Method Request for Analysis | |
|---|---|---|---|---|---|
| Purchase Order | | Project Name | Savannah Refinery | A | LNAPL Viscosity |
| Work Order | | Project Number | 053244 | B | LNAPL Specific Gravity |
| Company Name | NuStar Energy, L.P. | Bill To Company | NuStar Energy, L.P. | C | |
| Send Report To | BRIAN LEROY | Invoice Attn | Joe Aldridge | D | |
| Address | 2330 North Loop 1604 West<br>P.O. BOX 781609 | Address | 2330 North Loop 1604 West<br>P.O. Box 781609 | E<br>F | |
| City/State/Zip | San Antonio, TX 78248 | City/State/Zip | San Antonio, TX 78248 | G | |
| Phone | (210) 918-2723 | Phone | (210) 918-2723 | H | |
| Fax | | Fax | | I | |
| e-Mail Address | | e-Mail Address | | J | |

| No. | Sample Description | Date | Time | Matrix | Pres. | # Bottles | A | B | C | D | E | F | G | H | I | J | Hold |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | LNAPL-062909-KDH-001 | 6/29/09 | 1745 | LNAPL | 8 | 2 | X | X | | | | | | | | | |
| 2 | LNAPL-062909-KDH-002 | | 1810 | | | | | | | | | | | | | | |
| 3 | LNAPL-062909-KDH-003 | | 1818 | | | | | | | | | | | | | | |
| 4 | LNAPL-062909-KDH-004 | | 1838 | | | | | | | | | | | | | | |
| 5 | LNAPL-062909-KDH-005 | | 1855 | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |

Sampler(s) Please Print & Sign: KANDICE HERALD Kandice Herald

Shipment Method: FedEx

Required Turnaround Time: (Check Box) ☐ Other ______ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

| Relinquished by: | Date: | Time: | Received by: |
|---|---|---|---|
| Kandice Herald | 7/2/09 | 1800 | |
| Relinquished by: | Date: 7/3/09 | Time: 09:15 | Received by (Laboratory): [signature] |
| Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory): |

Notes:

| Cooler ID | Cooler Temp | QC Package: (Check One Box Below) |
|---|---|---|
| | | ☐ Level II Std QC ☐ TRRP Checklist<br>☐ Level III Std QC/Raw Date ☐ TRRP Level IV<br>☐ Level IV SW846/CLP<br>☐ Other ______ |

Preservative Key: 1-HCl 2-$HNO_3$ 3-$H_2SO_4$ 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Laboratory Group.
2. Unless otherwise agreed in a formal contract, services provided by ALS Laboratory Group are expressly limited to the terms and conditions stated on the reverse.

ALS Laboratory Group

## Sample Receipt Checklist

Client Name: **NUSTAR ENERGY**

Date/Time Received: **03-Jul-09 09:15**

Work Order: **0907097**

Received by: **RDH**

Checklist completed by: Raymond N Gamboa (eSignature) — Date: 06-Jul-09

Reviewed by: Jay Lynn F Thibault (eSignature) — Date: 09-Jul-09

Matrices: Solid

Carrier name: FedEx

| Question | Yes | No | Not Present / N/A |
| --- | --- | --- | --- |
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

Temperature(s)/Thermometer(s): 3.3c | 002

Cooler(s)/Kit(s):

| Question | Yes | No | N/A |
| --- | --- | --- | --- |
| Water - VOA vials have zero headspace? | ☐ | ☐ | No VOA vials submitted ☑ |
| Water - pH acceptable upon receipt? | ☐ | ☐ | N/A ☑ |
| pH adjusted? | ☐ | ☐ | N/A ☑ |

pH adjusted by: -

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

W.O. #0907097

From: Origin ID: MULA (770) 441-0027
Kyndra Thomas
CONESTOGA-ROVERS & ASSOCIATES
1412 OAKBROOK DRIVE
SUITE 180
NORCROSS, GA 30093

FedEx Express

E

Ship Date: 02JUL09
ActWgt: 25.0 LB
CAD: 5295429/INET9060
Account#: S ********

Dims: 12 X 14 X 20 IN

Delivery Address Bar Code

SHIP TO: (281) 530-5656 BILL SENDER
Mr. Joe Aldridge
ALS Laboratory Group
10450 STANCLIFF RD STE 210

HOUSTON, TX 77099

Ref # 053244
Invoice #
PO #
Dept #

FRI - 03JUL A

TRK# 0201 7967 4759 4607 PRIORITY OVERNIGH

77099
TX-US
IAH

AB JGQA

CRA
Conestoga-Rovers & Ass
(770) 441-0027
DATE: 7/2/09 SIGNATU

sociates

RE: Kendra Herall

RN
7/3/09

# *Groundwater and LNAPL Gauging Event*
# *First Quarter 2010*
# *NuStar Asphalt Refining LLC*
# *Savannah Asphalt Refinery*
# *Savannah, Georgia*

Prepared for:
NuStar Terminals Operations Partnership L.P.

September 7, 2010
1634-00

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

# Groundwater and LNAPL Gauging Event
# First Quarter 2010
# NuStar Asphalt Refining LLC
# Savannah Asphalt Refinery
# Savannah, Georgia

**Prepared for:**
**NuStar Terminals Operations Partnership L.P.**

**September 7, 2010**
**1634-00**


*Ashleigh K. Fines*
*Project Manager, Geology Group*

AMANDA L SPENCER
GEORGIA REGISTERED PROFESSIONAL GEOLOGIST
PG002009

*Amanda L. Spencer, R.G.*
*Principal Hydrogeologist*

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Portland
(360) 567-3977 Vancouver
(503) 943-6357 Fax
www.ashcreekassociates.com

# *Table of Contents*



## Tables



## Figures



## Appendices

# 1.0 Introduction

This quarterly groundwater and light non-aqueous phase liquid (LNAPL) gauging report has been prepared by Ash Creek Associates, Inc. (Ash Creek) for NuStar Energy, L.P. (NuStar). The purpose of this report is to summarize the groundwater monitoring activities completed during the first quarter 2010 at the NuStar Asphalt Refining, LLC Savannah Asphalt Refinery (Facility) in Savannah, Georgia (Figure 1). Figure 2 presents a site vicinity plan.

The Facility is owned and operated by NuStar Asphalt Refining, LLC (Refining). Refining has operated the Facility since purchase on March 20, 2008. Historical documents identified Amoco Oil Corporation (Amoco) as the operator from at least 1989 through a portion of 1993, and CITGO Asphalt Refining (CITGO) as operator from 1993 until acquisition by NuStar in 2008.

The Facility is located in an industrial area adjacent to the western bank of the Savannah River. The property has been used for industrial purposes since the early 1900s and as a refinery since the early 1920s. Currently, the Facility is equipped with several aboveground storage tanks (ASTs) of varying sizes and associated above/below ground piping.

# 2.0 Background

LNAPL was identified in the subsurface at the Facility in the first quarter of 1989. A subsequent investigation indicated that the presence of LNAPL on the water table with thicknesses ranging from two to four feet was not the result of any particular spills, but rather the gradual accumulation of "residual oil" over several decades (Amoco, 1989).

In November 1990, Amoco installed and began operation of a recovery system. The system was comprised of eight recovery wells (RW-38, RW-39, RW-53, and RW-56 through RW-59) installed with pneumatic pumps, approximately 3,500 feet of discharge piping, and a 157,000-barrel tank, Tank 50, to store and separate the recovered fluids. Based on historical documents, the system operated until May 12, 1998 (S&ME, 1998). The total volume recovered during operation was not identified in historical documents.

A "Polywall" barrier consisting of a polymer membrane was installed at the Facility in 1996 to prevent the migration of LNAPL into the Savannah River. According to available information, the barrier is approximately 1,500 feet long horizontally and 20 feet long vertically. The Polywall was apparently installed to depths ranging from approximately 2.0 to 22.0 feet below ground surface, based on historical data. Based on lithologic information for wells installed near the polywall, the wall is not keyed into an underlying low permeability layer and the base of the polywall terminates in a sand layer as shown on Figure 3. Therefore, while the wall will retain LNAPL, deeper groundwater can flow beneath the wall, and mounding of groundwater behind the wall will not occur. The exact location of the polywall is currently not known; however, the approximate location is shown on Figure 2.

Additionally, a "French Drain" and "Gas Hole" are reportedly present in the southeastern portion of the Facility. The French Drain is a buried product collection system that is approximately 175 feet long, and the Gas Hole is a sump connected to the east end of the French Drain for removal of the collected LNAPL. Historical documents indicate the presence of the French Drain and Gas Hole as early as 1984 (Savannah Refinery, 1989). The French Drain and Gas Hole are no longer operated.

Figure 4 presents the approximate locations of the recovery system, the Polywall, French Drain and Gas Hole.

# *3.0 Groundwater Monitoring Field Activities*

First quarter 2010 groundwater monitoring activities were conducted on March 24, 2010. Activities included collection of water level and LNAPL measurements from 27 on-site monitoring wells to assess LNAPL thicknesses and to monitor the effectiveness of the Polywall. In addition, two bail-down tests on the LNAPL were conducted to assess the mobility of LNAPL. A bail-down test was conducted on well AW-62, also referred to as the Firehouse well, which is located on the river side of the Polywall on March 24, 2010. On April 19, 2010, a bail-down test was conducted on well AW-51 located on the Facility side of the Polywall.

## 3.1 Groundwater Elevations and LNAPL Thicknesses

Groundwater level measurements were collected by Professional Services Industries Inc. (PSI) on March 24, 2010. Depth to groundwater and LNAPL, if present, were measured to the nearest 0.01 foot using an electric oil/water interface probe. Depth to groundwater, groundwater elevations, and LNAPL thickness data are presented in Table 1.

Groundwater was encountered at depths ranging from 4.58 to 19.62 feet below the top of casing (TOC) during this monitoring event. Well AW-22 was blocked by equipment and could not be gauged. Water level measurements were completed between 9:30 a.m. and 1:30 p.m. During the gauging activities, the water level in the adjacent Savannah River increased by 3.5 feet. River stage data were extracted from the nearest National Oceanographic and Atmospheric Administration (NOAA) tide station (Fort Pulaski – Georgia), which is located approximately 15 miles downstream of the Facility.

Groundwater elevations ranged from 2.58 feet below mean sea level (MSL) in well AW-62, located near the Savannah River, to 6.60 feet above MSL at AW-28, located in the northeastern portion of the Facility. Groundwater contours were constructed using the corrected groundwater elevations and are shown on

Figure 5. As presented on Figure 5, groundwater flow is generally from southwest to northeast towards the Savannah River, and supports that groundwater mounding behind the wall is not occurring.

LNAPL thicknesses measured in 18 wells ranged from 0.09 (AW-37) to 10.10 (AW-51) feet. Figure 6 presents the first quarter 2010 LNAPL thicknesses and the maximum historical thicknesses observed at each well location. Thicknesses measured during the first quarter 2010 event were consistent with previous events. Historical groundwater elevations and LNAPL thicknesses are presented as Appendix A.

## 3.2 Bail-down Test

On March 24, 2010, a bail-down test was performed on well AW-62. The field data sheet is presented as Appendix B, and graphs presenting the post-bailing LNAPL thickness monitoring are provided in Appendix C. Depth to groundwater and LNAPL was gauged in AW-62 followed by hand bailing of the LNAPL to a sheen or to the extent practical. This procedure was conducted every hour for three consecutive recovery intervals.

Approximately 2.6 feet of LNAPL was measured in the well at the start of the test (which equates to 1.7 gallons in the 4-inch-diameter well). The LNAPL was removed to a thickness of 0.2 foot in five minutes. The LNAPL in the well recovered to a thickness of 0.4 foot in an hour. After one hour, the incoming tide increased the water level in the well such that an accurate measure of the LNAPL recovery was no longer possible.

On April 19, 2010, a bail-down test was conducted on well AW-51 just prior to low tide in order to maximize the available time to complete the test. The initial thickness of the product was approximately 8 feet or a volume of approximately five gallons in the well casing. Approximately 11 gallons of product were removed continuously from the well using a bailer over an approximate 20-minute period, and product continued to recharge into the well throughout the removal. In addition to the 5 gallons of LNAPL in the casing, the volume of product in the filter pack at the initiation of the test is estimated at four gallons, assuming an 8-inch-diameter annulus with a sand filter pack. Therefore, the 11 gallons of LNAPL evacuated during the test are adequate to have removed the LNAPL from both the well and filter pack and be further supplied by the formation at the end of the bail-down test. After the removal was complete, the product thickness recovered to one foot thick within 15 minutes and to 1.5 feet within two hours of the test. The ebb tide was complete by this time and further measurements of product recovery would be influenced by water level increases in the well, so were not collected.

The results of the bail-down tests suggest that the volume and mobility of the LNAPL behind the Polywall is sufficient to cost effectively support an active LNAPL recovery system such as automatic thinners in wells, a recovery trench, and other similar methods. The bail-down test at well AW-62 suggests that the LNAPL on the river side of the Polywall has more limited mobility but the influence of the tidal fluctuations on the results is unclear. Additional assessment across a tidal cycle would be needed to better assess the volume and mobility of the LNAPL outside the well and would assist in the selection and design of a recovery system on the facility side of the Polywall.

## ***4.0 Future Activities***

Quarterly groundwater gauging for the remainder of 2010 will be conducted in September and December, respectively. Ash Creek proposes a bail-down test on well AW-62 during an outgoing tide to determine if tidal influence affects the recharge rate of LNAPL observed.

Following each quarterly gauging event, a letter report will be submitted to NuStar containing the most recent collected data and any derivations from the monitoring program.

## ***5.0 References***


Amoco Oil Company, 1989. *Letter to Georgia Department of Natural Resources, Re: Report #041789-10.* April 20, 1989.

Conestoga-Rovers & Associates (CRA), 2009. *Memorandum regarding NuStar Asphalt Refinery, Savannah, Georgia - January through July 2009 Fieldwork Summary.* October 16, 2009.

Bechtel Environmental, Inc., 1991. *Recovery Systems Operation and Maintenance (Summarized Version), Amoco Savannah Refinery, Savannah, Georgia.* March 1991.

S&ME, 1998. *Letter to CITGO Asphalt Refining Co., Subject: Hydrocarbon Thickness Monitoring S&ME Project No. 1144-93-093.*

Savannah Refinery, 1989. *Letter to Shift Supervisors, Re: "Gas Hole" by Riverbank.* October 18, 1989.

Table 1 — Groundwater Elevation and LNAPL Thickness Data - First Quarter 2010
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-8 | 3/24/2010 | 15.68 | 12.97 | 3.39 | 12.17 | 0.80 |
| AW-9 | 3/24/2010 | 13.50 | 14.55 | 1.92 | 11.07 | 3.48 |
| AW-10 | 3/24/2010 | 13.90 | 15.00 | 2.53 | 10.75 | 4.25 |
| AW-11 | 3/24/2010 | 13.64 | 13.95 | 2.18 | 11.04 | 2.91 |
| AW-12 | 3/24/2010 | 12.14 | 12.76 | 1.98 | 9.62 | 3.14 |
| AW-13 | 3/24/2010 | 12.79 | -- [12] | -- [12] | 9.82 | -- [12] |
| AW-19 | 3/24/2010 | 15.50 | 12.95 | 2.99 | 12.44 | 0.51 |
| AW-20 | 3/24/2010 | 15.67 | 10.50 | 5.17 | -- | -- |
| AW-22 | 3/24/2010 | 15.13 | Not Accessible - Blocked by Equipment | | | |
| AW-28 | 3/24/2010 | 11.18 | 4.58 | 6.60 | -- | -- |
| AW-37 | 3/24/2010 | 14.33 | 11.51 | 2.90 | 11.42 | 0.09 |
| AW-45 | 3/24/2010 | 15.13 | 13.90 | 2.62 | 12.27 | 1.63 |
| AW-49 | 3/24/2010 | 15.50 | 16.51 | 1.90 | 13.10 | 3.41 |
| AW-51 | 3/24/2010 | 12.75 | 19.62 | 2.04 | 9.50 | 10.12 |
| AW-52 | 3/24/2010 | 15.74 | 14.90 | 2.71 | 12.71 | 2.19 |
| AW-56 [9, 10] | 3/24/2010 | 12.65 | 15.26 | 1.92 | 9.95 | 5.31 |
| AW-62 [11] | 3/24/2010 | 7.70 | 12.50 | -2.58 | 9.90 | 2.60 |
| AW-65 | 3/24/2010 | 13.26 | 14.56 | 1.25 | 11.58 | 2.98 |
| AW-67 | 3/24/2010 | 11.32 | 10.37 | 0.95 | -- | -- |
| AW-68 | 3/24/2010 | 13.80 | 17.82 | 1.12 | 11.79 | 6.03 |
| AW-69 | 3/24/2010 | 9.44 | 7.21 | 2.23 | -- | -- |
| AW-70 | 3/24/2010 | 12.25 | 11.22 | 1.03 | -- | -- |
| AW-71 | 3/24/2010 | 13.29 | 11.67 | 2.02 | 11.20 | 0.47 |
| AW-72 | 3/24/2010 | 10.12 | 9.01 | 1.11 | -- | -- |
| AW-73 | 3/24/2010 | 12.04 | 8.69 | 3.35 | -- | -- |
| AW-74 | 3/24/2010 | 9.96 | 13.58 | -0.44 | 9.86 | 3.72 |
| RAIL LOADING-N | 3/24/2010 | 12.61 | 6.56 | 6.05 | -- | -- |

*Notes:*

1. TOC Elevation - Top of casing elevation.
2. Feet MSL = Feet above mean sea level.
3. Feet BTC = Feet below top of casing.
4. Surveyed on March 5-6, 2009.
5. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
6. Specific gravities were determined for the folowing wells: AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567),
7. -- = Not available or not applicable.
8. Product too viscous to obtain a water or LNAPL thickness measurement.
9. The TRUCK LOADING well is assumed to be well AW-56 (RW-56) based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
10. Former recovery well. Referred to as RW wells (i.e AW-53 is RW-53) during operation from 1991 through 1998.
11. The FIREHOUSE well is assumed to be well AW-62 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
12. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were present using the following equation and assuming the specific gravity detailed in notes 5 and 6. (based on back-calculations from previous reports for this project):

$$h_w = \frac{p_g\, h_g}{p_w}$$

where:

water level elevation = top of casing elevation + [$h_w$ - $d_w$];

$h_w$ = depth to groundwater correction; $p_w$ = density of water; and

$d_w$ = depth to groundwater measuring point; $h_g$ = product thickness.

$p_g$ = density of separate-phase hydrocarbons;


**Note:** Base map prepared from USGS 7.5-minute quadrangle of Garden City, GA, dated 1980 and Savannah, GA-SC, dated 1978 as provided by TerraServer-USA.

0 2,000 4,000

Approximate Scale in Feet


GEORGIA

N

# Facility Location Map

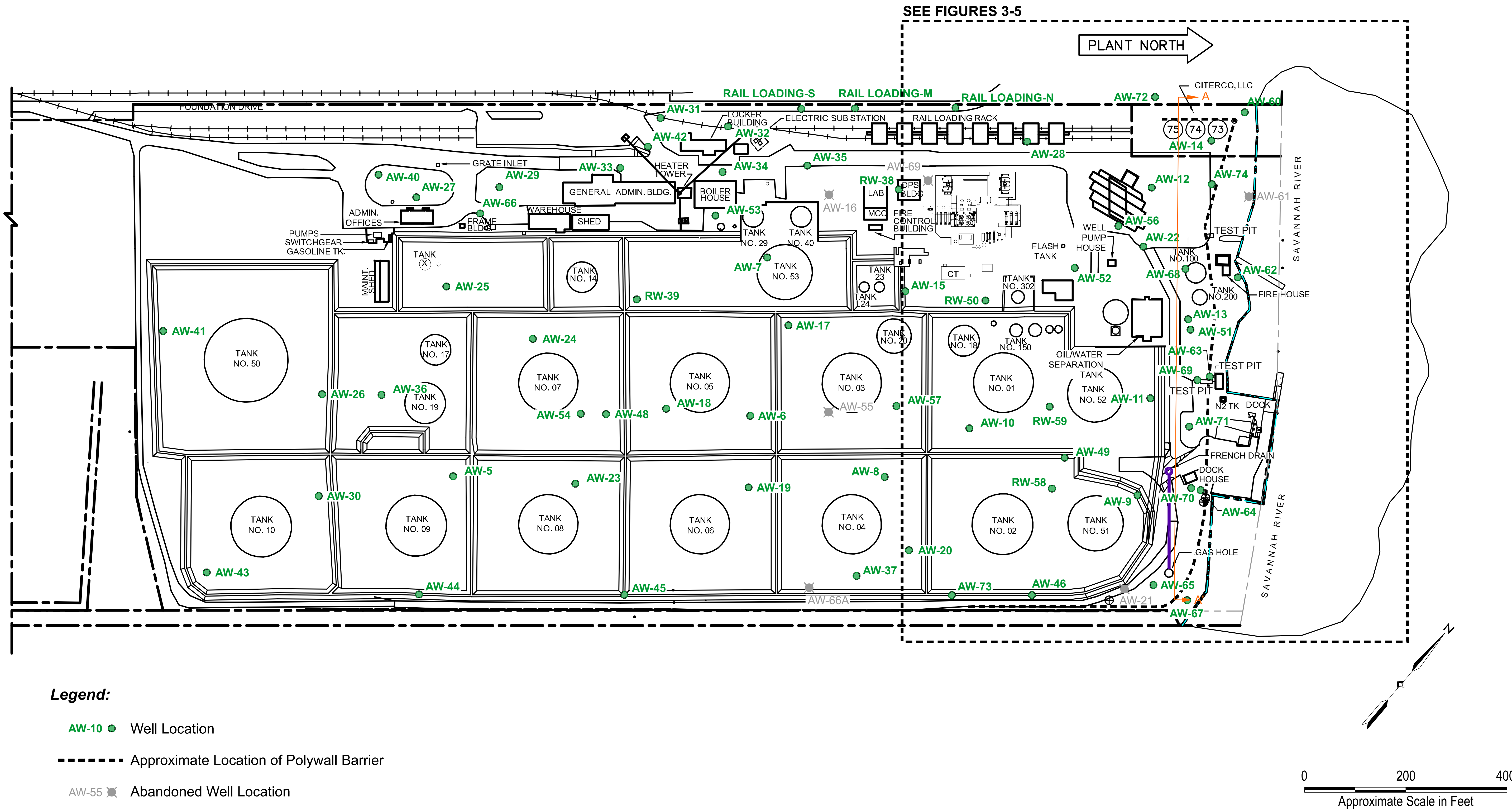
NuStar Savannah Refinery

NuStar Asphalt Refining LLC

Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| August 2010 | | 1 |




***Legend:***

AW-10 ● Well Location

Approximate Location of Polywall Barrier

AW-55 Abandoned Well Location

⊕ Polywall Survey

TEST PIT ▭ Test Pit Location

Property Boundary

A A' Cross-Section Location

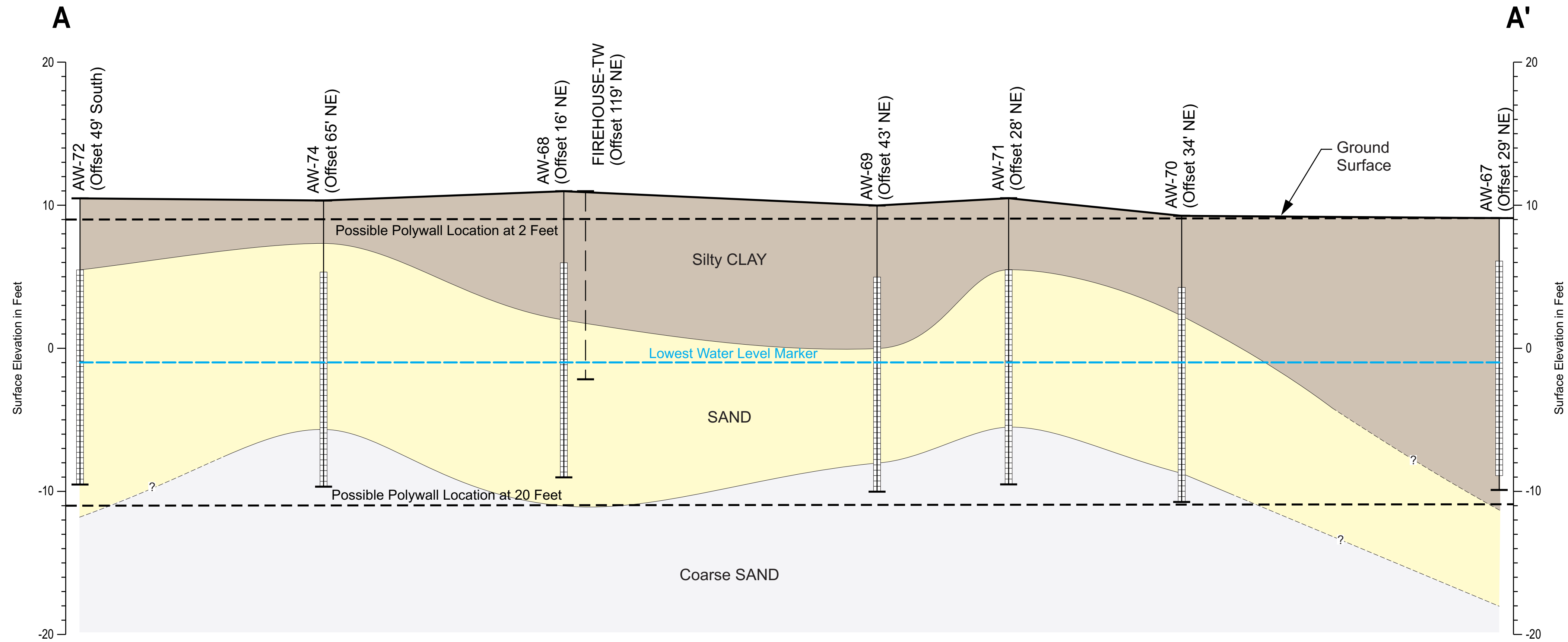
***NOTE:*** Base map provided by CRA (1-2009)

# Facility Site Plan

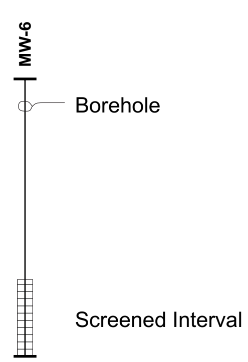
NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| August 2010 | | 2 |




*Legend:*

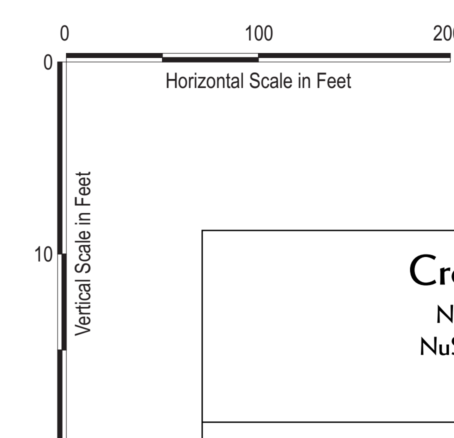



GEOLOGIC DESCRIPTIONS:

CLAYS: Clays, ranging in color from brown to gray, silty clays to sandy clays.

SAND: Sands, ranging in color from tan to gray-green. Clean, fine sand to silty, medium-grained sand. Silty or clayey and very fine to medium-grained.

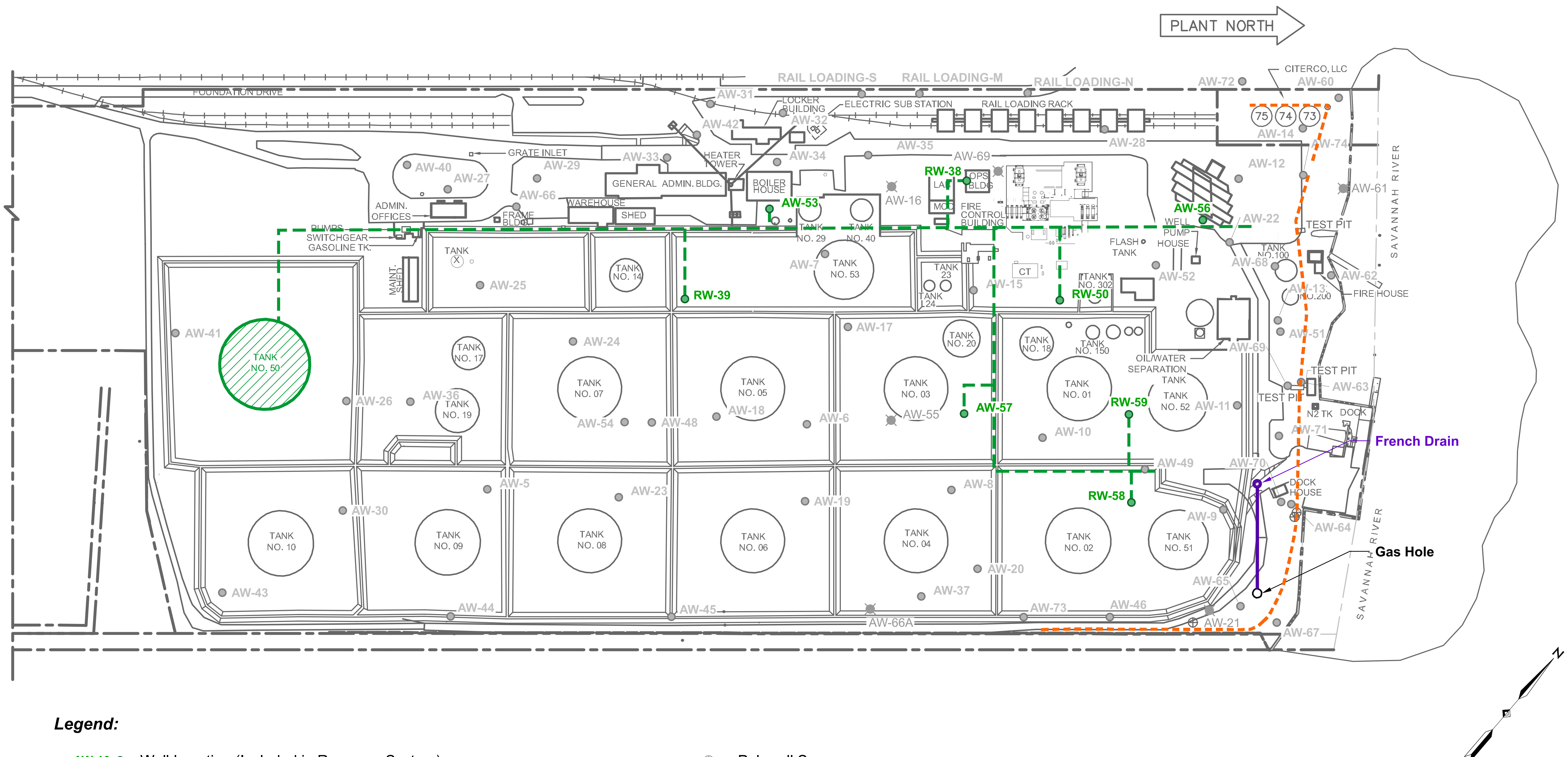
Coarse SAND: Sands, gray in color, coarse.




# Cross-Section A-A'

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure |
|---|---|---|---|
| | August 2010 | | 3 |




*Legend:*

| | | | |
|---|---|---|---|
| AW-10 ● | Well Location (Included in Recovery System) | ⊕ | Polywall Survey |
| — — — | Historical Recovery System Piping (Approximate) | TEST PIT ▭ | Test Pit Location |
| ◯ | Historical Tank Location (Included in Recovery System) | — - — | Property Boundary |
| - - - - | Approximate Location of Polywall Barrier | | |
| AW-45 ● | Well Location | | |
| AW-55 ✕ | Abandoned Well Location | | |

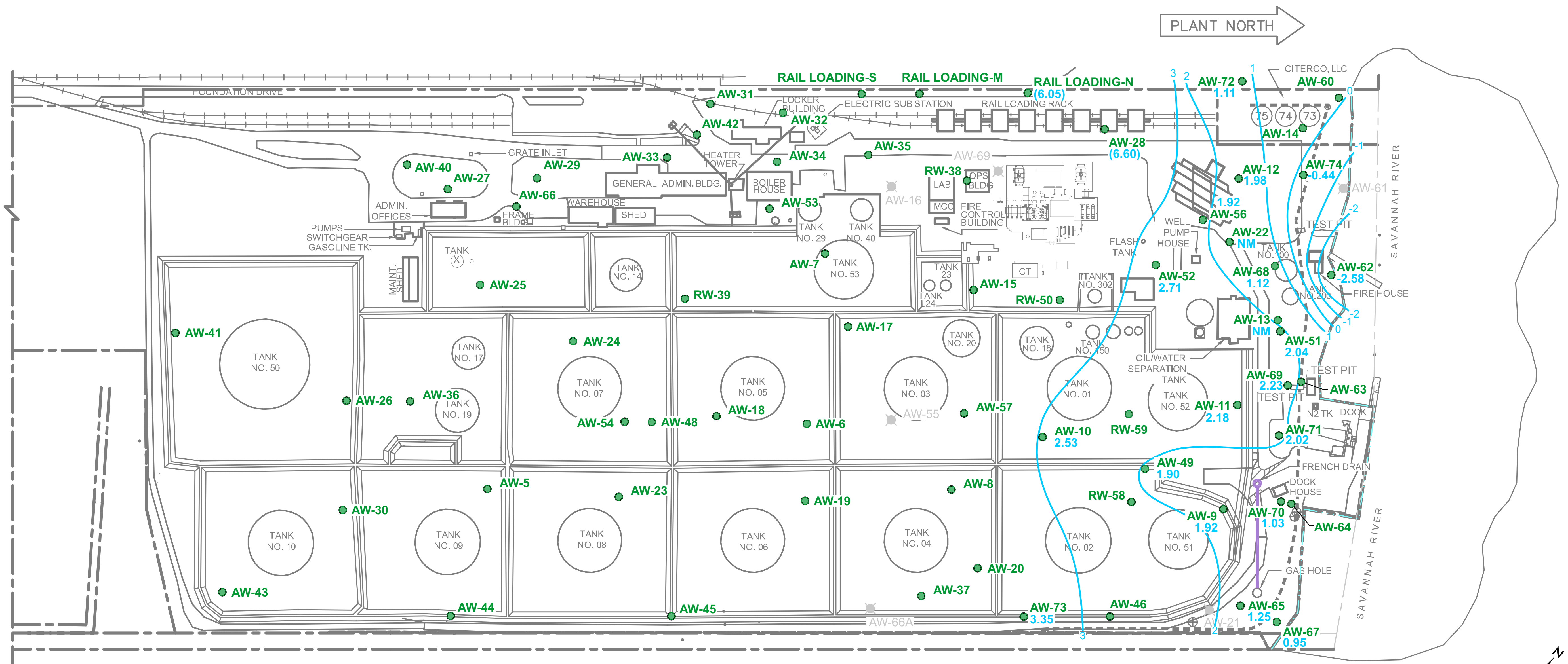
0 200 400
Approximate Scale in Feet

**NOTE:** Base map provided by CRA (1-2009)

# Remediation and Recovery Systems

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure |
|---|---|---|---|
| | August 2010 | | 4 |




**Legend:**

| | |
|---|---|
| AW-52 ● 2.71 | Well Location<br>Groundwater Elevation in Feet |
| (6.05) | Not Used in Groundwater Contouring |
| NM | Not Measured |
| -2 | Groundwater Elevation Contour in Feet (MSL) |
| - - - - - | Approximate Location of Polywall Barrier |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

0 200 400
Approximate Scale in Feet

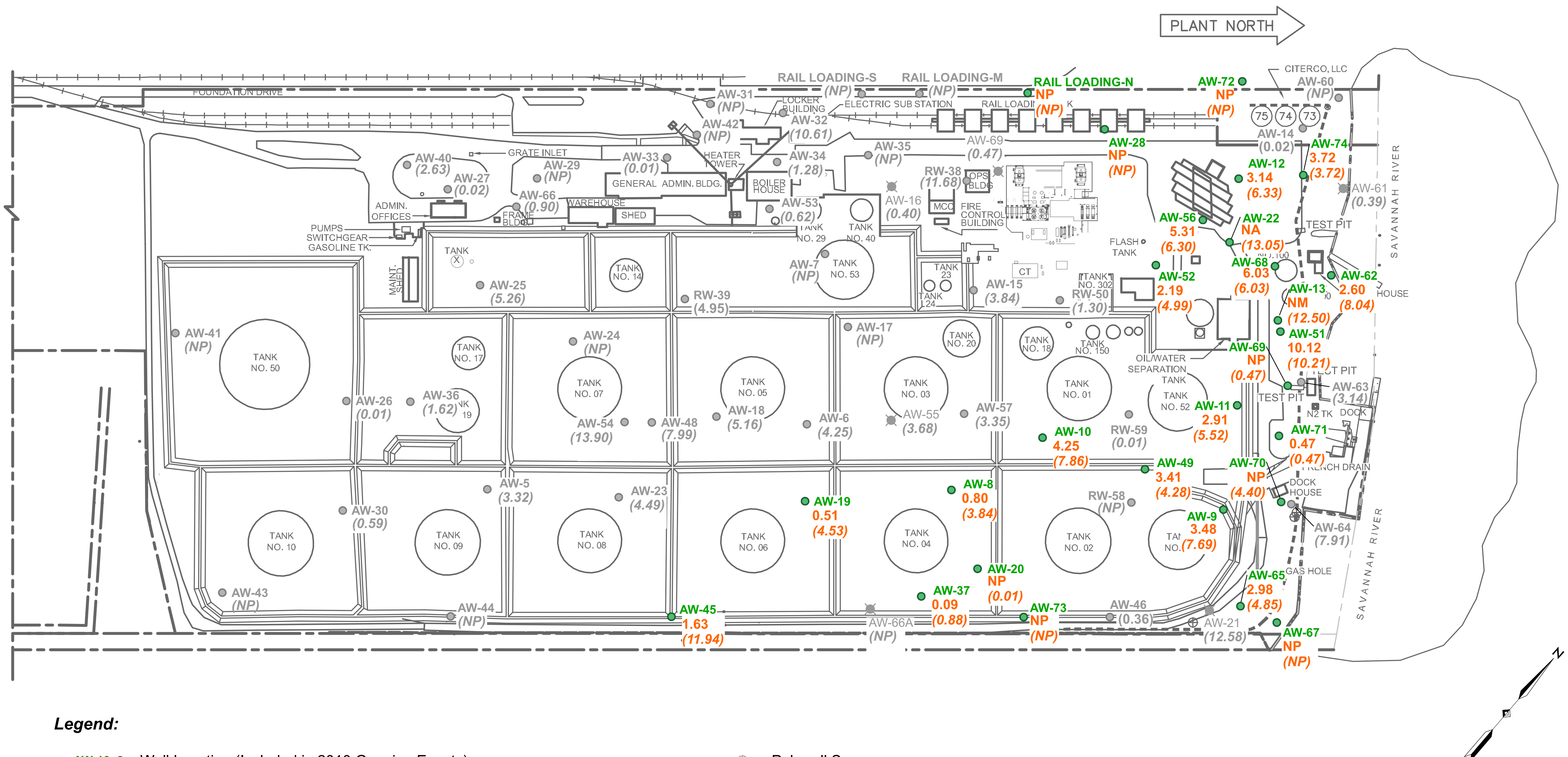
**NOTE:** Base map provided by CRA (1-2009)

# Groundwater Elevations - March 24, 2010

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| August 2010 | | 5 |




*Legend:*

| | |
|---|---|
| AW-10 ● | Well Location (Included in 2010 Gauging Events) |
| AW-45 ● | Well Location (Not Included in 2010 Gauging Events) |
| 1.82<br>(2.40) | March 24, 2010 Non Aqueous Phase Liquid (LNAPL) Thickness in Feet<br>Maximum Observed SPH Thickness in Feet |
| NA | Not Accessible |
| NM | Not Measured; Product Too Viscous |
| NP | No Product |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| - - - - - | Polywall Barrier |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

0 200 400
Approximate Scale in Feet

**NOTE:** Base map provided by CRA (1-2009)

# Site Plan with LNAPL Thicknesses

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| August 2010 | | 6 |

# *Appendix A*

## Historical Groundwater Elevations and LNAPL Thicknesses

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-5 | 8/28/1990 | 16.47 | 7.64 | 9.79 | 6.60 | 1.04 |
| AW-5 | 7/23/1991 | 16.47 | 7.21 | 12.07 | 4.16 | 3.05 |
| AW-5 | 8/22/1991 | 16.47 | 7.70 | 11.82 | 4.38 | 3.32 |
| AW-5 | 9/26/1991 | 16.47 | 8.70 | 10.32 | 5.93 | 2.77 |
| AW-5 | 10/25-26/1991 | 16.47 | 9.60 | 9.62 | 6.61 | 2.99 |
| AW-5 | 11/26/1991 | 16.47 | 9.74 | 9.30 | 6.95 | 2.79 |
| AW-5 | 12/20/1991 | 16.47 | 10.01 | 8.96 | 7.29 | 2.72 |
| AW-5 | 1/20/1992 | 16.47 | 7.75 | 10.06 | 6.29 | 1.46 |
| AW-5 | 2/27-28/1992 | 16.47 | 7.25 | 11.15 | 5.15 | 2.10 |
| AW-5 | 3/23/1992 | 16.47 | 7.65 | 10.80 | 5.50 | 2.15 |
| AW-5 | 4/22/1992 | 16.47 | 7.29 | 11.55 | 4.71 | 2.58 |
| AW-5 | 5/27-28/1992 | 16.47 | 8.28 | 10.15 | 6.15 | 2.13 |
| AW-5 | 6/24/1992 | 16.47 | 7.32 | 11.79 | 4.45 | 2.87 |
| AW-5 | 7/27/1992 | 16.47 | 7.75 | 10.98 | 5.29 | 2.46 |
| AW-5 | 8/26/1992 | 16.47 | 4.81 | 13.00 | 3.35 | 1.46 |
| AW-5 | 9/29/1992 | 16.47 | 7.42 | 11.24 | 5.04 | 2.38 |
| AW-5 | 10/29/1992 | 16.47 | 7.80 | 10.54 | 5.77 | 2.03 |
| AW-5 | 11/25/1992 | 16.47 | 7.40 | 11.23 | 5.05 | 2.35 |
| AW-5 | 12/18/1992 | 16.47 | 7.30 | 11.07 | 5.23 | 2.07 |
| AW-5 | 1/28/1993 | 16.47 | 7.11 | 11.60 | 4.67 | 2.44 |
| AW-5 | 2/24/1993 | 16.47 | 7.48 | 11.10 | 5.19 | 2.29 |
| AW-5 | 3/30/1993 | 16.47 | 6.78 | 12.39 | 3.85 | 2.93 |
| AW-5 | 5/28/1993 | 16.47 | 8.46 | 10.00 | 6.30 | 2.16 |
| AW-5 | 8/9-10/1993 | 16.47 | 10.03 | 8.73 | 7.54 | 2.49 |
| AW-5 | 9/28/1993 | 16.47 | 9.91 | 9.37 | 6.86 | 3.05 |
| AW-5 | 10/29/1993 | 16.47 | 9.49 | 9.04 | 7.25 | 2.24 |
| AW-5 | 11/30/1993 | 16.47 | 7.18 | 10.50 | 5.86 | 1.32 |
| AW-5 | 12/27/1993 | 16.47 | 7.49 | 10.20 | 6.16 | 1.33 |
| AW-5 | 3/31/1994 | 16.47 | 7.55 | 10.59 | 5.74 | 1.81 |
| AW-5 | 9/9/1994 | 16.47 | 6.82 | 11.41 | 4.91 | 1.91 |
| AW-5 | 9/29/1994 | 16.47 | 7.32 | 10.99 | 5.32 | 2.00 |
| AW-5 | 11/23/1994 | 16.47 | 6.13 | 11.35 | 5.03 | 1.10 |
| AW-5 | 1/4/1995 | 16.47 | 6.39 | 11.23 | 5.14 | 1.25 |
| AW-5 | 2/8/1995 | 16.47 | 6.71 | 10.72 | 5.67 | 1.04 |
| AW-5 | 3/16/1995 | 16.47 | 6.77 | 10.70 | 5.68 | 1.09 |
| AW-5 | 3/20/1995 | 16.47 | 6.19 | 11.60 | 4.76 | 1.43 |
| AW-5 | 5/25/1995 | 16.47 | 7.25 | 9.85 | 6.57 | 0.68 |
| AW-5 | 9/20/1995 | 16.47 | 6.19 | 11.60 | 4.76 | 1.43 |
| AW-5 | 10/2/2003 | 16.47 | 7.00 | 10.49 | 5.73 | 1.27 |
| AW-5 | 11/25-26/2008 | 16.04 | 7.70 | 10.50 | 5.00 | 2.70 |
| AW-5 | 3/5/2009 | 16.04 | 7.82 | 9.81 | 5.83 | 1.99 |
| AW-5 | 6/30/2009 | 16.04 | 8.03 | 9.72 | 6.03 | 2.00 |
| AW-5 | 9/23/2009 | 16.04 | 8.18 | 9.51 | 6.25 | 1.93 |
| AW-5 | 12/29/2009 | 16.04 | 7.70 | 9.67 | 5.64 | 1.56 |
| AW-6 | 8/28/1990 | 12.60 | 10.88 | 4.27 | 7.85 | 3.03 |
| AW-6 | 7/23/1991 | 12.60 | 10.11 | 5.17 | 6.92 | 3.19 |
| AW-6 | 8/22/1991 | 12.60 | 10.24 | ` | 7.08 | 3.16 |
| AW-6 | 9/26/1991 | 12.60 | 9.98 | 4.61 | 7.61 | 2.37 |
| AW-6 | 10/25-26/1991 | 12.60 | 10.06 | 4.28 | 7.99 | 2.07 |
| AW-6 | 11/26/1991 | 12.60 | 11.06 | 3.51 | 8.72 | 2.34 |
| AW-6 | 12/20/1991 | 12.60 | 12.96 | 3.11 | 8.83 | 4.13 |
| AW-6 | 1/20/1992 | 12.60 | 11.05 | 4.13 | 7.98 | 3.07 |
| AW-6 | 2/27-28/1992 | 12.60 | 10.57 | 4.20 | 7.99 | 2.58 |
| AW-6 | 3/23/1992 | 12.60 | 10.87 | 3.91 | 8.27 | 2.60 |
| AW-6 | 4/22/1992 | 12.60 | 10.76 | 4.37 | 7.75 | 3.01 |
| AW-6 | 5/27-28/1992 | 12.60 | 10.77 | 3.87 | 8.34 | 2.43 |
| AW-6 | 6/24/1992 | 12.60 | 10.45 | 4.86 | 7.22 | 3.23 |
| AW-6 | 7/27/1992 | 12.60 | 10.35 | 4.28 | 7.93 | 2.42 |
| AW-6 | 8/26/1992 | 12.60 | 10.19 | 5.98 | 5.94 | 4.25 |
| AW-6 | 9/29/1992 | 12.60 | 10.31 | 4.89 | 7.21 | 3.10 |
| AW-6 | 10/29/1992 | 12.60 | 10.20 | 4.39 | 7.83 | 2.37 |
| AW-6 | 11/25/1992 | 12.60 | 10.24 | 4.82 | 7.31 | 2.93 |
| AW-6 | 12/18/1992 | 12.60 | 10.23 | 4.53 | 7.66 | 2.57 |
| AW-6 | 1/28/1993 | 12.60 | 10.25 | 4.72 | 7.43 | 2.82 |
| AW-6 | 2/24/1993 | 12.60 | 10.14 | 3.50 | 8.90 | 1.24 |
| AW-6 | 3/30/1993 | 12.60 | 10.50 | 4.86 | 7.22 | 3.28 |
| AW-6 | 5/28/1993 | 12.60 | 10.47 | 3.78 | 8.51 | 1.96 |
| AW-6 | 8/9-10/1993 | 12.60 | 11.98 | 3.21 | 8.90 | 3.08 |
| AW-6 | 9/28/1993 | 12.60 | 11.41 | 3.60 | 8.54 | 2.87 |
| AW-6 | 10/29/1993 | 12.60 | 11.18 | 3.72 | 8.44 | 2.74 |
| AW-6 | 11/30/1993 | 12.60 | 10.31 | 4.22 | 8.01 | 2.30 |
| AW-6 | 12/27/1993 | 12.60 | 10.64 | 3.77 | 8.49 | 2.15 |
| AW-6 | 3/31/1994 | 12.60 | 10.53 | 3.99 | 8.25 | 2.28 |
| AW-6 | 9/9/1994 | 12.60 | 10.05 | 5.02 | 7.11 | 2.94 |
| AW-6 | 9/29/1994 | 12.60 | 9.97 | 4.44 | 7.81 | 2.16 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-6 | 11/23/1994 | 12.60 | 10.03 | 4.70 | 7.49 | 2.54 |
| AW-6 | 1/4/1995 | 12.60 | 9.71 | 5.02 | 7.18 | 2.53 |
| AW-6 | 2/8/1995 | 12.60 | 10.02 | 3.90 | 8.45 | 1.57 |
| AW-6 | 3/16/1995 | 12.60 | 9.85 | 4.40 | 7.89 | 1.96 |
| AW-6 | 3/20/1995 | 12.60 | 10.06 | 5.02 | 7.11 | 2.95 |
| AW-6 | 5/25/1995 | 12.60 | 10.38 | 3.85 | 8.44 | 1.94 |
| AW-6 | 9/20/1995 | 12.60 | 10.06 | 5.02 | 7.11 | 2.95 |
| AW-6 | 10/2/2003 | 12.60 | 9.58 | 4.40 | 7.85 | 1.73 |
| AW-6 | 11/25-26/2008 | 11.57 | 10.10 | 3.55 | 7.50 | 2.60 |
| AW-6 | 3/5/2009 | 11.57 | 11.35 | 2.19 | 8.89 | 2.46 |
| AW-6 | 6/30/2009 | 11.57 | 10.11 | 3.11 | 8.18 | 1.93 |
| AW-6 | 9/23/2009 | 11.57 | 7.60 | 3.97 | -- | -- |
| AW-6 | 12/29/2009 | 11.57 | 9.71 | 3.52 | 7.77 | 1.94 |
| AW-7 | 8/28/1990 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 7/23/1991 | 13.58 | 8.11 | 5.47 | -- | -- |
| AW-7 | 8/22/1991 | 13.58 | 8.18 | 5.40 | -- | -- |
| AW-7 | 9/26/1991 | 13.58 | 8.78 | 4.80 | -- | -- |
| AW-7 | 10/25-26/1991 | 13.58 | 9.18 | 4.40 | -- | -- |
| AW-7 | 11/26/1991 | 13.58 | 10.06 | 3.52 | -- | -- |
| AW-7 | 12/20/1991 | 13.58 | 10.28 | 3.30 | -- | -- |
| AW-7 | 1/20/1992 | 13.58 | 9.28 | 4.30 | -- | -- |
| AW-7 | 2/27-28/1992 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 3/23/1992 | 13.58 | 9.58 | 4.00 | -- | -- |
| AW-7 | 4/22/1992 | 13.58 | 8.96 | 4.62 | -- | -- |
| AW-7 | 5/27-28/1992 | 13.58 | 9.59 | 3.99 | -- | -- |
| AW-7 | 6/24/1992 | 13.58 | 8.50 | 5.08 | -- | -- |
| AW-7 | 7/27/1992 | 13.58 | 9.12 | 4.46 | -- | -- |
| AW-7 | 8/26/1992 | 13.58 | 7.37 | 6.21 | -- | -- |
| AW-7 | 9/29/1992 | 13.58 | 8.38 | 5.20 | -- | -- |
| AW-7 | 10/29/1992 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 11/25/1992 | 13.58 | 8.66 | 4.92 | -- | -- |
| AW-7 | 12/18/1992 | 13.58 | 8.83 | 4.75 | -- | -- |
| AW-7 | 1/28/1993 | 13.58 | 8.48 | 5.10 | -- | -- |
| AW-7 | 2/24/1993 | 13.58 | 9.94 | 3.64 | -- | -- |
| AW-7 | 3/30/1993 | 13.58 | 8.47 | 5.11 | -- | -- |
| AW-7 | 5/28/1993 | 13.58 | 9.69 | 3.89 | -- | -- |
| AW-7 | 8/9-10/1993 | 13.58 | 10.12 | 3.46 | -- | -- |
| AW-7 | 9/28/1993 | 13.58 | 9.92 | 3.66 | -- | -- |
| AW-7 | 10/29/1993 | 13.58 | 9.74 | 3.84 | -- | -- |
| AW-7 | 11/30/1993 | 13.58 | 9.02 | 4.56 | -- | -- |
| AW-7 | 12/27/1993 | 13.58 | 9.54 | 4.04 | -- | -- |
| AW-7 | 3/31/1994 | 13.58 | 9.22 | 4.36 | -- | -- |
| AW-7 | 9/9/1994 | 13.58 | 8.20 | 5.38 | -- | -- |
| AW-7 | 9/29/1994 | 13.58 | 8.68 | 4.90 | -- | -- |
| AW-7 | 11/23/1994 | 13.58 | 8.29 | 5.29 | -- | -- |
| AW-7 | 1/4/1995 | 13.58 | 8.23 | 5.35 | -- | -- |
| AW-7 | 2/8/1995 | 13.58 | 9.32 | 4.26 | -- | -- |
| AW-7 | 3/16/1995 | 13.58 | 8.81 | 4.77 | -- | -- |
| AW-7 | 3/20/1995 | 13.58 | 8.04 | 5.54 | -- | -- |
| AW-7 | 5/25/1995 | 13.58 | 9.55 | 4.03 | -- | -- |
| AW-7 | 9/20/1995 | 13.58 | 8.04 | 5.54 | -- | -- |
| AW-7 | 10/2/2003 | 13.58 | 8.80 | 4.78 | -- | -- |
| AW-7 | 11/25-26/2008 | 12.54 | 8.10 | 4.44 | -- | -- |
| AW-7 | 3/6/2009 | 12.54 | 9.14 | 3.40 | -- | -- |
| AW-7 | 6/30/2009 | 12.54 | 8.60 | 3.94 | -- | -- |
| AW-7 | 9/23/2009 | 12.54 | 8.72 | 3.82 | -- | -- |
| AW-7 | 12/29/2009 | 12.54 | 7.94 | 4.60 | -- | -- |
| AW-8 | 8/28/1990 | 15.88 | 14.80 | 3.72 | 11.14 | 3.66 |
| AW-8 | 7/23/1991 | 15.88 | 13.45 | 4.77 | 10.20 | 3.25 |
| AW-8 | 8/22/1991 | 15.88 | 13.76 | 4.62 | 10.29 | 3.47 |
| AW-8 | 9/26/1991 | 15.88 | 13.85 | 4.16 | 10.89 | 2.96 |
| AW-8 | 10/25-26/1991 | 15.88 | 13.74 | 3.94 | 11.24 | 2.50 |
| AW-8 | 11/26/1991 | 15.88 | 15.03 | 3.02 | 12.02 | 3.01 |
| AW-8 | 12/20/1991 | 15.88 | 15.97 | 2.67 | 12.13 | 3.84 |
| AW-8 | 1/20/1992 | 15.88 | 14.88 | 3.60 | 11.27 | 3.61 |
| AW-8 | 2/27-28/1992 | 15.88 | 14.61 | 3.62 | 11.34 | 3.27 |
| AW-8 | 3/23/1992 | 15.88 | 14.69 | 3.41 | 11.60 | 3.09 |
| AW-8 | 4/22/1992 | 15.88 | 14.46 | 3.94 | 10.96 | 3.50 |
| AW-8 | 5/27-28/1992 | 15.88 | 14.26 | 3.54 | 11.59 | 2.67 |
| AW-8 | 6/24/1992 | 15.88 | 13.61 | 4.55 | 10.45 | 3.16 |
| AW-8 | 7/27/1992 | 15.88 | 14.36 | 3.87 | 11.09 | 3.27 |
| AW-8 | 8/26/1992 | 15.88 | 11.74 | 5.98 | 9.18 | 2.56 |
| AW-8 | 9/29/1992 | 15.88 | 13.29 | 4.84 | 10.16 | 3.13 |
| AW-8 | 10/29/1992 | 15.88 | 13.90 | 4.16 | 10.87 | 3.03 |
| AW-8 | 11/25/1992 | 15.88 | 12.61 | 4.83 | 10.45 | 2.16 |
| AW-8 | 12/18/1992 | 15.88 | 13.07 | 4.45 | 10.79 | 2.28 |
| AW-8 | 1/28/1993 | 15.88 | 12.09 | 4.94 | 10.49 | 1.60 |
| AW-8 | 2/24/1993 | 15.88 | 13.03 | 4.35 | 10.94 | 2.09 |
| AW-8 | 3/30/1993 | 15.88 | 11.69 | 5.15 | 10.36 | 1.33 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-8 | 5/28/1993 | 15.88 | 13.48 | 3.58 | 11.84 | 1.64 |
| AW-8 | 8/9-10/1993 | 15.88 | 15.89 | 2.63 | 12.23 | 3.66 |
| AW-8 | 9/28/1993 | 15.88 | 15.17 | 3.06 | 11.90 | 3.27 |
| AW-8 | 10/29/1993 | 15.88 | 14.85 | 3.25 | 11.76 | 3.09 |
| AW-8 | 11/30/1993 | 15.88 | 14.00 | 4.00 | 11.05 | 2.95 |
| AW-8 | 12/27/1993 | 15.88 | 14.25 | 3.55 | 11.59 | 2.66 |
| AW-8 | 3/31/1994 | 15.88 | 13.75 | 3.78 | 11.46 | 2.29 |
| AW-8 | 9/9/1994 | 15.88 | 12.25 | 4.93 | 10.45 | 1.80 |
| AW-8 | 9/29/1994 | 15.88 | 13.09 | 4.34 | 10.94 | 2.15 |
| AW-8 | 11/23/1994 | 15.88 | 11.62 | 4.80 | 10.87 | 0.75 |
| AW-8 | 1/4/1995 | 15.88 | 11.36 | 4.98 | 10.72 | 0.64 |
| AW-8 | 2/8/1995 | 15.88 | 13.02 | 3.73 | 11.81 | 1.21 |
| AW-8 | 3/16/1995 | 15.88 | 12.39 | 4.23 | 11.36 | 1.03 |
| AW-8 | 5/25/1995 | 15.88 | 12.89 | 3.63 | 12.00 | 0.89 |
| AW-8 | 9/20/1995 | 15.88 | 11.26 | 5.06 | 10.65 | 0.61 |
| AW-8 | 10/2/2003 | 15.88 | 11.83 | 4.57 | 11.18 | 0.65 |
| AW-8 | 11/25-26/2008 | 15.68 | 11.25 | 5.17 | 10.32 | 0.93 |
| AW-8 | 3/5/2009 | 15.68 | 13.96 | 2.18 | 13.38 | 0.58 |
| AW-8 | 6/30/2009 | 15.68 | 13.32 | 3.16 | 12.38 | 0.94 |
| AW-8 | 9/23/2009 | 15.68 | 12.67 | 3.57 | 12.01 | 0.66 |
| AW-8 | 12/29/2009 | 15.68 | 12.49 | 3.74 | 11.85 | 0.64 |
| AW-8 | 3/24/2010 | 15.68 | 12.97 | 3.39 | 12.17 | 0.80 |
| AW-9 | 8/28/1990 | 14.09 | 13.28 | 2.62 | 11.04 | 2.24 |
| AW-9 | 7/23/1991 | 14.09 | 15.51 | 2.32 | 10.89 | 4.62 |
| AW-9 | 8/22/1991 | 14.09 | 14.66 | 2.32 | 11.09 | 3.57 |
| AW-9 | 9/26/1991 | 14.09 | 13.14 | 3.07 | 10.52 | 2.62 |
| AW-9 | 10/25-26/1991 | 14.09 | 13.40 | 2.83 | 10.76 | 2.64 |
| AW-9 | 11/26/1991 | 14.09 | 13.81 | 2.39 | 11.21 | 2.60 |
| AW-9 | 12/20/1991 | 14.09 | 15.75 | 1.61 | 11.71 | 4.04 |
| AW-9 | 1/20/1992 | 14.09 | 13.05 | 2.57 | 11.16 | 1.89 |
| AW-9 | 2/27-28/1992 | 14.09 | 14.25 | 2.22 | 11.31 | 2.94 |
| AW-9 | 3/23/1992 | 14.09 | 16.03 | 1.75 | 11.48 | 4.55 |
| AW-9 | 4/22/1992 | 14.09 | 14.02 | 2.46 | 11.07 | 2.95 |
| AW-9 | 5/27-28/1992 | 14.09 | 13.15 | 2.86 | 10.78 | 2.37 |
| AW-9 | 6/24/1992 | 14.09 | 14.12 | 2.55 | 10.93 | 3.19 |
| AW-9 | 7/27/1992 | 14.09 | 16.94 | 1.52 | 11.55 | 5.39 |
| AW-9 | 8/26/1992 | 14.09 | 12.88 | 3.25 | 10.36 | 2.52 |
| AW-9 | 9/29/1992 | 14.09 | 12.35 | 3.68 | 9.95 | 2.40 |
| AW-9 | 10/29/1992 | 14.09 | 12.65 | 3.13 | 10.56 | 2.09 |
| AW-9 | 11/25/1992 | 14.09 | 13.89 | 6.43 | 6.20 | 7.69 |
| AW-9 | 12/18/1992 | 14.09 | 14.03 | 2.34 | 11.21 | 2.82 |
| AW-9 | 1/28/1993 | 14.09 | 12.80 | 3.21 | 10.43 | 2.37 |
| AW-9 | 2/24/1993 | 14.09 | 13.12 | 2.86 | 10.79 | 2.33 |
| AW-9 | 3/30/1993 | 14.09 | 14.94 | 2.31 | 11.04 | 3.90 |
| AW-9 | 5/28/1993 | 14.09 | 15.82 | 1.70 | 11.59 | 4.23 |
| AW-9 | 8/9-10/1993 | 14.09 | 15.53 | 1.89 | 11.42 | 4.11 |
| AW-9 | 9/28/1993 | 14.09 | 14.57 | 2.02 | 11.48 | 3.09 |
| AW-9 | 10/29/1993 | 14.09 | 13.02 | 2.80 | 10.89 | 2.13 |
| AW-9 | 11/30/1993 | 14.09 | 12.65 | 2.94 | 10.80 | 1.85 |
| AW-9 | 12/27/1993 | 14.09 | 15.82 | 1.70 | 11.59 | 4.23 |
| AW-9 | 3/31/1994 | 14.09 | 14.56 | 2.40 | 11.02 | 3.54 |
| AW-9 | 9/9/1994 | 14.09 | -- | 14.09 | 14.09 | -- |
| AW-9 | 9/29/1994 | 14.09 | 15.56 | 2.05 | 11.21 | 4.35 |
| AW-9 | 11/23/1994 | 14.09 | 12.52 | 3.14 | 10.58 | 1.94 |
| AW-9 | 1/4/1995 | 14.09 | 12.38 | 3.40 | 10.29 | 2.09 |
| AW-9 | 2/8/1995 | 14.09 | 16.09 | 1.67 | 11.56 | 4.53 |
| AW-9 | 3/16/1995 | 14.09 | 13.78 | 2.61 | 10.94 | 2.84 |
| AW-9 | 5/25/1995 | 14.09 | 13.55 | 2.61 | 10.99 | 2.56 |
| AW-9 | 9/30/1995 | 14.09 | 12.81 | 3.13 | 10.52 | 2.29 |
| AW-9 | 10/2/2003 | 14.09 | 13.09 | 3.28 | 10.24 | 2.85 |
| AW-9 | 11/25-26/2008 | 13.50 | 13.10 | 2.48 | 10.50 | 2.60 |
| AW-9 | 3/5/2009 | 13.50 | 13.80 | 1.55 | 11.49 | 2.31 |
| AW-9 | 6/30/2009 | 13.50 | 13.51 | 2.36 | 10.73 | 2.78 |
| AW-9 | 6/30/2009 | 13.50 | 13.28 | 2.62 | 10.47 | 2.81 |
| AW-9 | 9/23/2009 | 13.50 | 13.33 | 2.84 | 10.20 | 3.13 |
| AW-9 | 12/29/2009 | 13.50 | 13.13 | 2.76 | 10.33 | 2.80 |
| AW-9 | 3/24/2010 | 13.50 | 14.55 | 1.92 | 11.07 | 3.48 |
| AW-10 | 8/28/1990 | 14.90 | 16.78 | 3.45 | 10.36 | 6.42 |
| AW-10 | 7/23/1991 | 14.9 | 16.94 | 2.96 | 10.92 | 6.02 |
| AW-10 | 8/22/1991 | 14.9 | 16.93 | 3.18 | 10.65 | 6.28 |
| AW-10 | 9/26/1991 | 14.9 | 16.78 | 3.35 | 10.48 | 6.30 |
| AW-10 | 10/25-26/1991 | 14.90 | 16.42 | 3.29 | 10.63 | 5.79 |
| AW-10 | 11/26/1991 | 14.9 | 16.53 | 2.59 | 11.44 | 5.09 |
| AW-10 | 12/20/1991 | 14.9 | 16.69 | 2.28 | 11.79 | 4.90 |
| AW-10 | 1/20/1992 | 14.9 | 16.29 | 3.20 | 10.76 | 5.53 |
| AW-10 | 2/27-28/1992 | 14.90 | 16.74 | 3.12 | 10.76 | 5.98 |
| AW-10 | 3/23/1992 | 14.90 | 16.96 | 2.65 | 11.29 | 5.67 |
| AW-10 | 4/22/1992 | 14.90 | 16.80 | 3.25 | 10.59 | 6.21 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-10 | 5/27-28/1992 | 14.90 | 16.84 | 2.87 | 11.04 | 5.80 |
| AW-10 | 6/24/1992 | 14.90 | 16.85 | 3.92 | 9.78 | 7.07 |
| AW-10 | 7/27/1992 | 14.90 | 16.90 | 3.05 | 10.81 | 6.09 |
| AW-10 | 8/26/1992 | 14.90 | 16.59 | 4.83 | 8.73 | 7.86 |
| AW-10 | 9/29/1992 | 14.90 | 16.86 | 4.01 | 9.67 | 7.19 |
| AW-10 | 10/29/1992 | 14.90 | 16.93 | 3.43 | 10.35 | 6.58 |
| AW-10 | 11/25/1992 | 14.90 | 16.15 | 3.74 | 10.14 | 6.01 |
| AW-10 | 12/18/1992 | 14.90 | 16.36 | 3.50 | 10.39 | 5.97 |
| AW-10 | 1/28/1993 | 14.90 | 16.31 | 3.93 | 9.88 | 6.43 |
| AW-10 | 2/24/1993 | 14.90 | 16.28 | 3.37 | 10.56 | 5.72 |
| AW-10 | 3/30/1993 | 14.90 | 17.89 | 3.41 | 10.18 | 7.71 |
| AW-10 | 5/28/1993 | 14.90 | 16.72 | 2.70 | 11.27 | 5.45 |
| AW-10 | 8/9-10/1993 | 14.90 | 16.48 | 2.26 | 11.85 | 4.63 |
| AW-10 | 9/28/1993 | 14.90 | 16.00 | 2.68 | 11.44 | 4.56 |
| AW-10 | 10/29/1993 | 14.90 | 15.29 | 3.05 | 11.15 | 4.14 |
| AW-10 | 11/30/1993 | 14.90 | 15.65 | 3.32 | 10.75 | 4.90 |
| AW-10 | 12/27/1993 | 14.90 | 16.29 | 2.64 | 11.43 | 4.86 |
| AW-10 | 3/31/1994 | 14.90 | 16.27 | 2.95 | 11.07 | 5.20 |
| AW-10 | 9/9/1994 | 14.90 | 16.12 | 4.15 | 9.65 | 6.47 |
| AW-10 | 9/29/1994 | 14.90 | 16.92 | 3.32 | 10.49 | 6.43 |
| AW-10 | 11/23/1994 | 14.90 | 16.55 | 3.70 | 10.11 | 6.44 |
| AW-10 | 1/4/1995 | 14.90 | 15.93 | 3.80 | 10.11 | 5.82 |
| AW-10 | 2/8/1995 | 14.90 | 16.73 | 2.50 | 11.51 | 5.22 |
| AW-10 | 3/16/1995 | 14.90 | 15.86 | 3.61 | 10.35 | 5.51 |
| AW-10 | 5/25/1995 | 14.90 | 15.24 | 3.21 | 10.96 | 4.28 |
| AW-10 | 9/30/1995 | 14.90 | 16.51 | 3.98 | 9.77 | 6.74 |
| AW-10 | 10/2/2003 | 14.90 | 15.22 | 3.39 | 10.58 | 4.64 |
| AW-10 | 11/25-26/2008 | 13.90 | 14.90 | 3.08 | 9.80 | 5.10 |
| AW-10 | 3/5/2009 | 13.90 | 14.60 | 1.72 | 11.58 | 3.02 |
| AW-10 | 6/30/2009 | 13.90 | 15.55 | 2.67 | 10.49 | 5.06 |
| AW-10 | 9/23/2009 | 13.90 | 15.18 | 3.15 | 9.99 | 5.19 |
| AW-10 | 12/29/2009 | 13.90 | 14.29 | 3.23 | 10.05 | 4.24 |
| AW-10 | 3/24/2010 | 13.90 | 15.00 | 2.53 | 10.75 | 4.25 |
| AW-11 | 8/28/1990 | 14.64 | 16.06 | 2.57 | 11.14 | 4.92 |
| AW-11 | 7/23/1991 | 14.64 | 16.51 | 2.54 | 11.06 | 5.45 |
| AW-11 | 8/22/1991 | 14.64 | 16.31 | 2.56 | 11.09 | 5.22 |
| AW-11 | 9/26/1991 | 14.64 | 14.63 | 3.15 | 10.75 | 3.88 |
| AW-11 | 10/25-26/1991 | 14.64 | 14.42 | 2.98 | 11.01 | 3.41 |
| AW-11 | 11/26/1991 | 14.64 | 16.00 | 2.46 | 11.29 | 4.71 |
| AW-11 | 12/20/1991 | 14.64 | 16.47 | 1.73 | 12.08 | 4.39 |
| AW-11 | 1/20/1992 | 14.64 | 14.19 | 2.88 | 11.19 | 3.00 |
| AW-11 | 2/27-28/1992 | 14.64 | 16.25 | 2.27 | 11.46 | 4.79 |
| AW-11 | 3/23/1992 | 14.64 | 16.78 | 2.06 | 11.60 | 5.18 |
| AW-11 | 4/22/1992 | 14.64 | 16.15 | 2.52 | 11.18 | 4.97 |
| AW-11 | 5/27-28/1992 | 14.64 | 14.76 | 2.90 | 11.03 | 3.73 |
| AW-11 | 6/24/1992 | 14.64 | 15.61 | 2.69 | 11.09 | 4.52 |
| AW-11 | 7/27/1992 | 14.64 | 16.56 | 2.13 | 11.56 | 5.00 |
| AW-11 | 8/26/1992 | 14.64 | 13.56 | 3.26 | 10.87 | 2.69 |
| AW-11 | 9/29/1992 | 14.64 | 13.19 | 3.86 | 10.22 | 2.97 |
| AW-11 | 10/29/1992 | 14.64 | 14.79 | 3.15 | 10.72 | 4.07 |
| AW-11 | 11/25/1992 | 14.64 | 13.97 | 3.06 | 11.02 | 2.95 |
| AW-11 | 12/18/1992 | 14.64 | 15.43 | 2.41 | 11.48 | 3.95 |
| AW-11 | 1/28/1993 | 14.64 | 13.69 | 3.51 | 10.53 | 3.16 |
| AW-11 | 2/24/1993 | 14.64 | 15.16 | 2.89 | 10.95 | 4.21 |
| AW-11 | 3/30/1993 | 14.64 | 16.26 | 2.60 | 11.05 | 5.21 |
| AW-11 | 5/28/1993 | 14.64 | 16.80 | 1.92 | 11.76 | 5.04 |
| AW-11 | 8/9-10/1993 | 14.64 | 16.48 | 1.03 | 12.94 | 3.54 |
| AW-11 | 9/28/1993 | 14.64 | 16.34 | 2.01 | 11.76 | 4.58 |
| AW-11 | 10/29/1993 | 14.64 | 14.06 | 2.96 | 11.12 | 2.94 |
| AW-11 | 11/30/1993 | 14.64 | 14.27 | 3.03 | 10.98 | 3.29 |
| AW-11 | 12/27/1993 | 14.64 | 16.72 | 2.03 | 11.65 | 5.07 |
| AW-11 | 3/31/1994 | 14.64 | 16.35 | 2.47 | 11.19 | 5.16 |
| AW-11 | 9/9/1994 | 14.64 | 0.00 | 14.64 | -- | -- |
| AW-11 | 9/29/1994 | 14.64 | 16.51 | 2.41 | 11.23 | 5.28 |
| AW-11 | 11/23/1994 | 14.64 | 14.94 | 3.06 | 10.79 | 4.15 |
| AW-11 | 1/4/1995 | 14.64 | 13.47 | 3.56 | 10.52 | 2.95 |
| AW-11 | 2/8/1995 | 14.64 | 17.06 | 2.05 | 11.54 | 5.52 |
| AW-11 | 3/16/1995 | 14.64 | 15.74 | 2.37 | 11.46 | 4.28 |
| AW-11 | 5/25/1995 | 14.64 | 14.80 | 2.67 | 11.31 | 3.49 |
| AW-11 | 9/30/1995 | 14.64 | 14.33 | 3.14 | 10.84 | 3.49 |
| AW-11 | 10/2/2003 | 14.64 | 13.40 | 3.36 | 10.75 | 2.65 |
| AW-11 | 11/25-26/2008 | 13.64 | 13.70 | 2.38 | 10.65 | 3.05 |
| AW-11 | 3/5/2009 | 13.64 | 14.85 | 1.43 | 11.55 | 3.30 |
| AW-11 | 6/30/2009 | 13.64 | 13.58 | 2.51 | 10.71 | 2.87 |
| AW-11 | 6/30/2009 | 13.64 | 13.79 | 2.66 | 10.50 | 3.29 |
| AW-11 | 9/23/2009[10] | 13.64 | 13.45 | 2.84 | 10.35 | 3.10 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-11 | 9/23/2009[11] | 13.64 | 12.85 | 3.24 | 9.98 | 2.87 |
| AW-11 | 12/29/2009 | 13.64 | 13.21 | 2.89 | 10.33 | 2.88 |
| AW-11 | 3/24/2010 | 13.64 | 13.95 | 2.18 | 11.04 | 2.91 |
| AW-12 | 8/28/1990 | 15.17 | 14.12 | 3.49 | 11.22 | 2.90 |
| AW-12 | 7/23/1991 | 15.17 | 13.41 | 4.26 | 10.43 | 2.98 |
| AW-12 | 8/22/1991 | 15.17 | 13.73 | 4.25 | 10.39 | 3.34 |
| AW-12 | 9/26/1991 | 15.17 | -- | -- | 3.90 | -- |
| AW-12 | 10/25-26/1991 | -- | -- | -- | -- | 3.11 |
| AW-12 | 11/26/1991 | 15.17 | -- | -- | -- | 1.30 |
| AW-12 | 12/20/1991 | 15.17 | -- | -- | -- | 1.48 |
| AW-12 | 1/20/1992 | 15.17 | 10.29 | 5.53 | 9.52 | 0.77 |
| AW-12 | 2/27-28/1992 | 15.17 | 12.09 | 4.99 | 9.82 | 2.27 |
| AW-12 | 3/23/1992 | 15.17 | 12.22 | 4.71 | 10.12 | 2.10 |
| AW-12 | 4/22/1992 | 15.17 | 11.02 | 5.44 | 9.48 | 1.54 |
| AW-12 | 5/27-28/1992 | 15.17 | 11.25 | 5.42 | 9.47 | 1.78 |
| AW-12 | 6/24/1992 | 15.17 | 11.85 | 5.97 | 8.70 | 3.15 |
| AW-12 | 7/27/1992 | 15.17 | 12.39 | 5.16 | 9.56 | 2.83 |
| AW-12 | 8/26/1992 | 15.17 | 11.00 | 6.51 | 8.21 | 2.79 |
| AW-12 | 9/29/1992 | 15.17 | 10.88 | 6.49 | 8.26 | 2.62 |
| AW-12 | 10/29/1992 | 15.17 | 11.10 | 5.04 | 9.95 | 1.15 |
| AW-12 | 11/25/1992 | 15.17 | 11.27 | 5.94 | 8.84 | 2.43 |
| AW-12 | 12/18/1992 | -- | -- | -- | -- | -- |
| AW-12 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-12 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-12 | 5/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 8/9-10/1993 | -- | -- | -- | -- | 1.90 |
| AW-12 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-12 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-12 | 12/27/1993 | -- | -- | -- | -- | 2.39 |
| AW-12 | 3/31/1994 | -- | -- | -- | -- | 0.96 |
| AW-12 | 9/9/1994 | -- | -- | -- | -- | 2.23 |
| AW-12 | 9/29/1994 | -- | -- | -- | -- | 3.27 |
| AW-12 | 11/23/1994 | -- | -- | -- | -- | 0.92 |
| AW-12 | 1/4/1995 | -- | -- | -- | -- | 0.26 |
| AW-12 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-12 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-12 | 5/25/1995 | -- | -- | -- | -- | 1.40 |
| AW-12 | 9/30/1995 | -- | -- | -- | -- | -- |
| AW-12 | 11/25-26/2008 | 9.17 | -- | -- | 8.75 | 0.42 |
| AW-12 | 3/6/2009 | 12.14 | 13.65 | 1.17 | 10.30 | 3.35 |
| AW-12 | 6/30/2009 | 12.14 | 14.24 | 2.14 | 9.12 | 5.12 |
| AW-12 | 9/23/2009[10] | 12.14 | 14.73 | 2.53 | 8.54 | 6.19 |
| AW-12 | 9/23/2009[11] | 12.14 | 14.76 | 2.62 | 8.43 | 6.33 |
| AW-12 | 12/29/2009 | 12.14 | 12.76 | 2.41 | 9.10 | 3.66 |
| AW-12 | 3/24/2010 | 12.14 | 12.76 | 1.98 | 9.62 | 3.14 |
| AW-13 | 8/28/1990 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 7/23/1991 | 13.79 | 14.84 | 3.31 | 10.20 | 4.64 |
| AW-13 | 8/22/1991 | 13.79 | 13.50 | 3.77 | 9.80 | 3.70 |
| AW-13 | 9/26/1991 | 13.79 | 17.44 | 1.97 | 11.46 | 5.98 |
| AW-13 | 10/25-26/1991 | 13.79 | 17.53 | 1.88 | 11.55 | 5.98 |
| AW-13 | 11/26/1991 | 13.79 | -- | -- | 11.63 | -- |
| AW-13 | 12/20/1991 | 13.79 | 19.86 | 0.71 | 12.65 | 7.21 |
| AW-13 | 1/20/1992 | 13.79 | 12.59 | 3.37 | 10.28 | 2.31 |
| AW-13 | 2/27-28/1992 | 13.79 | 17.05 | 1.82 | 11.65 | 5.40 |
| AW-13 | 3/23/1992 | 13.79 | 17.82 | 2.18 | 11.21 | 6.61 |
| AW-13 | 4/22/1992 | 13.79 | 15.80 | 2.95 | 10.52 | 5.28 |
| AW-13 | 5/27-28/1992 | 13.79 | 14.30 | 3.08 | 10.48 | 3.82 |
| AW-13 | 6/24/1992 | 13.79 | 14.35 | 3.67 | 9.85 | 4.50 |
| AW-13 | 7/27/1992 | 13.79 | 17.09 | 1.25 | 12.25 | 4.84 |
| AW-13 | 8/26/1992 | 13.79 | 14.12 | 2.92 | 10.66 | 3.46 |
| AW-13 | 9/29/1992 | 13.79 | 13.08 | 4.22 | 9.35 | 3.73 |
| AW-13 | 10/29/1992 | 13.79 | | -- | 3.86 | 3.86 |
| AW-13 | 11/25/1992 | 13.79 | 14.03 | 2.84 | 10.75 | 3.28 |
| AW-13 | 12/18/1992 | 13.79 | -- | -- | -- | -- |
| AW-13 | 1/28/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 2/24/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 3/30/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 5/28/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 8/9-10/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/28/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 10/29/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/30/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 12/27/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-13 | 3/31/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/9/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/29/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/23/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 1/4/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 2/8/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 3/16/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 5/25/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/30/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 10/2/2003 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/25-26/2008 | 12.79 | 21.75 | 1.04 | 9.25 | 12.50 |
| AW-13 | 3/5/2009 | 12.79 | --[12] | --[12] | 9.60 | --[12] |
| AW-13 | 6/30/2009 | 12.79 | 10.95 | 2.11 | 10.70 | 0.25 |
| AW-13 | 9/23/2009[10] | 12.79 | 10.19 | 5.31 | 7.69 | 2.50 |
| AW-13 | 9/23/2009[11] | 12.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 12/29/2009 | 12.79 | --[12] | --[12] | 9.75 | --[12] |
| AW-13 | 3/24/2010 | 12.79 | --[12] | --[12] | 9.82 | --[12] |
| AW-14 | 8/28/1990 | 13.51 | 10.55 | 2.96 | -- | -- |
| AW-14 | 7/23/1991 | 13.51 | 10.43 | 3.08 | -- | -- |
| AW-14 | 8/22/1991 | 13.51 | 10.13 | 3.38 | -- | -- |
| AW-14 | 9/26/1991 | 13.51 | 12.20 | 1.31 | -- | -- |
| AW-14 | 10/25-26/1991 | 13.51 | 11.05 | 2.46 | -- | -- |
| AW-14 | 11/26/1991 | 13.51 | 11.26 | 2.25 | -- | -- |
| AW-14 | 12/20/1991 | 13.51 | 13.08 | 0.43 | -- | -- |
| AW-14 | 1/20/1992 | 13.51 | 10.04 | 3.47 | -- | -- |
| AW-14 | 2/27-28/1992 | 13.51 | 11.92 | 1.59 | -- | -- |
| AW-14 | 3/23/1992 | 13.51 | 11.59 | 1.92 | -- | -- |
| AW-14 | 4/22/1992 | 13.51 | 10.79 | 2.72 | -- | -- |
| AW-14 | 5/27-28/1992 | 13.51 | 10.63 | 2.88 | -- | -- |
| AW-14 | 6/24/1992 | 13.51 | 9.82 | 3.69 | -- | -- |
| AW-14 | 7/27/1992 | 13.51 | 11.86 | 1.65 | -- | -- |
| AW-14 | 8/26/1992 | 13.51 | 10.57 | 2.94 | -- | -- |
| AW-14 | 9/29/1992 | 13.51 | 9.33 | 4.18 | -- | -- |
| AW-14 | 10/29/1992 | 13.51 | 10.22 | 3.29 | -- | -- |
| AW-14 | 11/25/1992 | 13.51 | 10.95 | 2.56 | -- | -- |
| AW-14 | 12/18/1992 | 13.51 | 11.97 | 1.54 | -- | -- |
| AW-14 | 1/28/1993 | 13.51 | 9.81 | 3.72 | 9.79 | 0.02 |
| AW-14 | 2/24/1993 | 13.51 | 10.67 | 2.84 | -- | -- |
| AW-14 | 3/30/1993 | 13.51 | 10.53 | 2.98 | -- | -- |
| AW-14 | 5/28/1993 | 13.51 | 11.82 | 1.69 | -- | -- |
| AW-14 | 8/9-10/1993 | 13.51 | 11.42 | 2.09 | -- | -- |
| AW-14 | 9/28/1993 | 13.51 | 12.51 | 1.00 | -- | -- |
| AW-14 | 10/29/1993 | 13.51 | 11.05 | 2.46 | -- | -- |
| AW-14 | 11/30/1993 | 13.51 | 10.51 | 3.00 | -- | -- |
| AW-14 | 12/27/1993 | 13.51 | 11.86 | 1.65 | -- | -- |
| AW-14 | 3/31/1994 | 13.51 | 10.79 | 2.72 | -- | -- |
| AW-14 | 9/9/1994 | 13.51 | 9.71 | 3.80 | -- | -- |
| AW-14 | 9/29/1994 | 13.51 | 10.69 | 2.82 | -- | -- |
| AW-14 | 11/23/1994 | 13.51 | 9.95 | 3.56 | -- | -- |
| AW-14 | 1/4/1995 | 13.51 | 11.19 | 2.32 | -- | -- |
| AW-14 | 2/8/1995 | 13.51 | 11.95 | 1.56 | -- | -- |
| AW-14 | 3/16/1995 | 13.51 | 12.45 | 1.06 | -- | -- |
| AW-14 | 5/25/1995 | 13.51 | 0.00 | 13.51 | -- | -- |
| AW-14 | 9/30/1995 | 13.51 | 10.77 | 2.74 | -- | -- |
| AW-15 | 8/28/1990 | 16.44 | 13.45 | 5.34 | 10.48 | 2.97 |
| AW-15 | 7/23/1991 | 16.44 | 11.24 | 7.82 | 7.92 | 3.32 |
| AW-15 | 8/22/1991 | 16.44 | 11.54 | 7.67 | 8.04 | 3.50 |
| AW-15 | 9/26/1991 | 16.44 | 12.31 | 6.72 | 9.03 | 3.28 |
| AW-15 | 10/25-26/1991 | 16.44 | 12.83 | 6.10 | 9.68 | 3.15 |
| AW-15 | 11/26/1991 | 16.44 | 13.09 | 5.26 | 10.67 | 2.42 |
| AW-15 | 12/20/1991 | 16.44 | 12.75 | 4.91 | 11.20 | 1.55 |
| AW-15 | 1/20/1992 | 16.44 | 10.50 | 6.47 | 9.83 | 0.67 |
| AW-15 | 2/27-28/1992 | 16.44 | 10.66 | 6.63 | 9.59 | 1.07 |
| AW-15 | 3/23/1992 | 16.44 | 11.08 | 6.19 | 10.03 | 1.05 |
| AW-15 | 4/22/1992 | 16.44 | 10.65 | 6.58 | 9.65 | 1.00 |
| AW-15 | 5/27-28/1992 | 16.44 | 11.65 | 5.86 | 10.29 | 1.36 |
| AW-15 | 6/24/1992 | 16.44 | 10.40 | 7.21 | 8.92 | 1.48 |
| AW-15 | 7/27/1992 | 16.44 | 11.04 | 6.43 | 9.73 | 1.31 |
| AW-15 | 8/26/1992 | 16.44 | 9.93 | 8.24 | 7.74 | 2.19 |
| AW-15 | 9/29/1992 | 16.44 | 10.75 | 6.99 | 9.10 | 1.65 |
| AW-15 | 10/29/1992 | 16.44 | 10.98 | 6.62 | 9.51 | 1.47 |
| AW-15 | 11/25/1992 | 16.44 | 10.58 | 7.26 | 8.81 | 1.77 |
| AW-15 | 12/18/1992 | 16.44 | 10.02 | 6.49 | 9.93 | 0.09 |
| AW-15 | 1/28/1993 | 16.44 | 10.62 | 7.23 | 8.83 | 1.79 |
| AW-15 | 2/24/1993 | 16.44 | 11.91 | 6.51 | 9.40 | 2.51 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-15 | 3/30/1993 | 16.44 | 10.69 | 7.41 | 8.59 | 2.10 |
| AW-15 | 5/28/1993 | 16.44 | 12.10 | 6.01 | 9.99 | 2.11 |
| AW-15 | 8/9-10/1993 | 16.44 | 13.36 | 4.49 | 11.57 | 1.79 |
| AW-15 | 9/28/1993 | 16.44 | 12.61 | 5.39 | 10.64 | 1.97 |
| AW-15 | 10/29/1993 | 16.44 | 13.35 | 5.25 | 10.62 | 2.73 |
| AW-15 | 11/30/1993 | 16.44 | 11.60 | 6.49 | 9.51 | 2.09 |
| AW-15 | 12/27/1993 | 16.44 | 12.68 | 5.95 | 9.91 | 2.77 |
| AW-15 | 3/31/1994 | 16.44 | 11.75 | 6.57 | 9.37 | 2.38 |
| AW-15 | 9/9/1994 | 16.44 | 8.20 | 8.40 | 8.00 | 0.20 |
| AW-15 | 9/29/1994 | 16.44 | 12.06 | 7.32 | 8.34 | 3.72 |
| AW-15 | 11/23/1994 | 16.44 | 10.05 | 7.30 | 8.90 | 1.15 |
| AW-15 | 1/4/1995 | 16.44 | 10.31 | 7.41 | 8.69 | 1.62 |
| AW-15 | 2/8/1995 | 16.44 | 11.81 | 6.52 | 9.42 | 2.39 |
| AW-15 | 3/16/1995 | 16.44 | 11.88 | 6.73 | 9.13 | 2.75 |
| AW-15 | 5/25/1995 | 16.44 | 11.71 | 6.31 | 9.71 | 2.00 |
| AW-15 | 9/30/1995 | 16.44 | 11.61 | 7.86 | 7.77 | 3.84 |
| AW-15 | 11/25-26/2008 | 15.38 | 12.10 | 5.76 | 9.00 | 3.10 |
| AW-15 | 3/6/2009 | 15.38 | 12.75 | 4.21 | 10.78 | 1.97 |
| AW-15 | 6/30/2009 | 15.38 | 11.36 | 5.64 | 9.46 | 1.90 |
| AW-15 | 9/23/2009 | 15.38 | 11.62 | 5.65 | 9.41 | 2.21 |
| AW-15 | 12/29/2009 | 15.38 | 11.21 | 6.12 | 8.93 | 2.28 |
| AW-16 | 8/28/1990 | 14.78 | 6.62 | 8.16 | -- | -- |
| AW-16 | 7/23/1991 | 14.78 | 4.85 | 9.93 | -- | -- |
| AW-16 | 8/22/1991 | 14.78 | 5.79 | 8.99 | -- | -- |
| AW-16 | 9/26/1991 | 14.78 | 6.82 | 7.96 | -- | -- |
| AW-16 | 10/25-26/1991 | 14.78 | 7.89 | 6.89 | -- | -- |
| AW-16 | 11/26/1991 | 14.78 | 9.70 | 5.08 | -- | -- |
| AW-16 | 12/20/1991 | 14.78 | 10.01 | 4.77 | -- | -- |
| AW-16 | 1/20/1992 | 14.78 | 7.55 | 7.23 | -- | -- |
| AW-16 | 2/27-28/1992 | 14.78 | 7.17 | 7.61 | -- | -- |
| AW-16 | 3/23/1992 | 14.78 | 8.10 | 6.68 | -- | -- |
| AW-16 | 4/22/1992 | 14.78 | 6.62 | 8.16 | -- | -- |
| AW-16 | 5/27-28/1992 | 14.78 | 8.14 | 6.64 | -- | -- |
| AW-16 | 6/24/1992 | 14.78 | 5.06 | 9.72 | -- | -- |
| AW-16 | 7/27/1992 | 14.78 | 6.44 | 8.34 | -- | -- |
| AW-16 | 8/26/1992 | 14.78 | 4.35 | 10.43 | -- | -- |
| AW-16 | 9/29/1992 | 14.78 | 6.29 | 8.49 | -- | -- |
| AW-16 | 10/29/1992 | 14.78 | 6.74 | 8.04 | -- | -- |
| AW-16 | 11/25/1992 | 14.78 | 5.84 | 8.94 | -- | -- |
| AW-16 | 12/18/1992 | 14.78 | 5.89 | 8.89 | -- | -- |
| AW-16 | 1/28/1993 | 14.78 | 6.00 | 8.78 | -- | -- |
| AW-16 | 2/24/1993 | 14.78 | 6.52 | 8.26 | 6.92 | 0.40 |
| AW-16 | 3/30/1993 | 14.78 | 5.40 | 9.38 | -- | -- |
| AW-16 | 5/28/1993 | 14.78 | 7.45 | 7.33 | -- | -- |
| AW-16 | 8/9-10/1993 | 14.78 | 9.40 | 5.38 | -- | -- |
| AW-16 | 9/28/1993 | 14.78 | 8.28 | 6.50 | -- | -- |
| AW-16 | 10/29/1993 | 14.78 | 9.10 | 5.68 | -- | -- |
| AW-16 | 11/30/1993 | 14.78 | 6.74 | 8.04 | -- | -- |
| AW-16 | 12/27/1993 | 14.78 | 7.29 | 7.49 | -- | -- |
| AW-16 | 3/31/1994 | 14.78 | 7.43 | 7.35 | -- | -- |
| AW-16 | 9/9/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 9/29/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 11/23/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 1/4/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 2/8/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 3/16/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 5/25/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 9/30/1995 | 14.78 | -- | -- | -- | -- |
| AW-17 | 8/28/1990 | 15.14 | 10.59 | 4.55 | -- | -- |
| AW-17 | 7/23/1991 | 15.14 | 9.61 | 5.53 | -- | -- |
| AW-17 | 8/22/1991 | 15.14 | 9.70 | 5.44 | -- | -- |
| AW-17 | 9/26/1991 | 15.14 | 10.40 | 4.74 | -- | -- |
| AW-17 | 10/25-26/1991 | 15.14 | 10.75 | 4.39 | -- | -- |
| AW-17 | 11/26/1991 | 15.14 | 11.60 | 3.54 | -- | -- |
| AW-17 | 12/20/1991 | 15.14 | 11.84 | 3.30 | -- | -- |
| AW-17 | 1/20/1992 | 15.14 | 10.42 | 4.72 | -- | -- |
| AW-17 | 2/27-28/1992 | 15.14 | 10.67 | 4.47 | -- | -- |
| AW-17 | 3/23/1992 | 15.14 | 11.80 | 3.34 | -- | -- |
| AW-17 | 4/22/1992 | 15.14 | 10.19 | 4.95 | -- | -- |
| AW-17 | 5/27-28/1992 | 15.14 | 11.15 | 3.99 | -- | -- |
| AW-17 | 6/24/1992 | 15.14 | 9.90 | 5.24 | -- | -- |
| AW-17 | 7/27/1992 | 15.14 | 10.69 | 4.45 | -- | -- |
| AW-17 | 8/26/1992 | 15.14 | 8.53 | 6.61 | -- | -- |
| AW-17 | 9/29/1992 | 15.14 | 10.02 | 5.12 | -- | -- |
| AW-17 | 10/29/1992 | 15.14 | 10.63 | 4.51 | -- | -- |
| AW-17 | 11/25/1992 | 15.14 | 9.86 | 5.28 | -- | -- |
| AW-17 | 12/18/1992 | 15.14 | 10.35 | 4.79 | -- | -- |
| AW-17 | 1/28/1993 | 15.14 | 10.02 | 5.12 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-17 | 2/24/1993 | 15.14 | 10.56 | 4.58 | -- | -- |
| AW-17 | 3/30/1993 | 15.14 | 9.85 | 5.29 | -- | -- |
| AW-17 | 5/28/1993 | 15.14 | 11.38 | 3.76 | -- | -- |
| AW-17 | 8/9-10/1993 | 15.14 | 11.92 | 3.22 | -- | -- |
| AW-17 | 9/28/1993 | 15.14 | 11.52 | 3.62 | -- | -- |
| AW-17 | 10/29/1993 | 15.14 | 11.35 | 3.79 | -- | -- |
| AW-17 | 11/30/1993 | 15.14 | 10.53 | 4.61 | -- | -- |
| AW-17 | 12/27/1993 | 15.14 | 11.21 | 3.93 | -- | -- |
| AW-17 | 3/31/1994 | 15.14 | 10.98 | 4.16 | -- | -- |
| AW-17 | 9/9/1994 | 15.14 | 9.52 | 5.62 | -- | -- |
| AW-17 | 9/29/1994 | 15.14 | 10.33 | 4.82 | -- | -- |
| AW-17 | 11/23/1994 | 15.14 | 10.08 | 5.06 | -- | -- |
| AW-17 | 1/4/1995 | 15.14 | 9.85 | 5.29 | -- | -- |
| AW-17 | 2/8/1995 | 15.14 | 10.79 | 4.35 | -- | -- |
| AW-17 | 3/16/1995 | 15.14 | 10.39 | 4.75 | -- | -- |
| AW-17 | 5/25/1995 | 15.14 | 11.40 | 3.74 | -- | -- |
| AW-17 | 9/30/1995 | 15.14 | 9.69 | 5.45 | -- | -- |
| AW-17 | 10/2/2003 | 15.14 | 10.50 | 4.64 | -- | -- |
| AW-17 | 11/25-26/2008 | 14.09 | 10.00 | 4.09 | -- | -- |
| AW-17 | 3/5/2009 | 14.09 | 11.71 | 2.38 | -- | -- |
| AW-17 | 6/30/2009 | | | Abandoned | | |
| AW-18 | 8/28/1990 | 14.06 | 7.58 | 7.06 | 6.94 | 0.64 |
| AW-18 | 7/23/1991 | 14.06 | 6.27 | 8.20 | 5.82 | 0.45 |
| AW-18 | 8/22/1991 | 14.06 | 6.46 | 8.02 | 6.00 | 0.46 |
| AW-18 | 9/26/1991 | 14.06 | 8.98 | 7.00 | 6.87 | 2.11 |
| AW-18 | 10/25-26/1991 | 14.06 | 10.60 | 6.50 | 7.26 | 3.34 |
| AW-18 | 11/26/1991 | 14.06 | 10.07 | 6.36 | 7.47 | 2.60 |
| AW-18 | 12/20/1991 | 14.06 | 10.16 | 6.12 | 7.72 | 2.44 |
| AW-18 | 1/20/1992 | 14.06 | 7.09 | 7.39 | 6.63 | 0.46 |
| AW-18 | 2/27-28/1992 | 14.06 | 6.83 | 7.57 | 6.46 | 0.37 |
| AW-18 | 3/23/1992 | 14.06 | 7.59 | 7.22 | 6.77 | 0.82 |
| AW-18 | 4/22/1992 | 14.06 | 6.78 | 7.83 | 6.18 | 0.60 |
| AW-18 | 5/27-28/1992 | 14.06 | 9.42 | 6.92 | 6.91 | 2.51 |
| AW-18 | 6/24/1992 | 14.06 | 6.24 | 8.05 | 5.99 | 0.25 |
| AW-18 | 7/27/1992 | 14.06 | 7.10 | 7.36 | 6.66 | 0.44 |
| AW-18 | 8/26/1992 | 14.06 | 5.80 | 8.45 | 5.59 | 0.21 |
| AW-18 | 9/29/1992 | 14.06 | 6.97 | 7.62 | 6.39 | 0.58 |
| AW-18 | 10/29/1992 | 14.06 | 7.11 | 7.50 | 6.51 | 0.60 |
| AW-18 | 11/25/1992 | 14.06 | 6.21 | 8.10 | 5.93 | 0.28 |
| AW-18 | 12/18/1992 | 14.06 | 6.26 | 8.05 | 5.99 | 0.27 |
| AW-18 | 1/28/1993 | 14.06 | 6.08 | 8.14 | 5.90 | 0.18 |
| AW-18 | 2/24/1993 | 14.06 | 6.42 | 7.84 | 6.20 | 0.22 |
| AW-18 | 3/30/1993 | 14.06 | 5.85 | 8.90 | 5.09 | 0.76 |
| AW-18 | 5/28/1993 | 14.06 | 9.12 | 7.22 | 6.61 | 2.51 |
| AW-18 | 8/9-10/1993 | 14.06 | 13.95 | 4.81 | 8.79 | 5.16 |
| AW-18 | 9/28/1993 | 14.06 | 11.29 | 6.24 | 7.48 | 3.81 |
| AW-18 | 10/29/1993 | 14.06 | 11.15 | 6.17 | 7.57 | 3.58 |
| AW-18 | 11/30/1993 | 14.06 | 7.45 | 7.57 | 6.40 | 1.05 |
| AW-18 | 12/27/1993 | 14.06 | 8.38 | 7.41 | 6.48 | 1.90 |
| AW-18 | 3/31/1994 | 14.06 | 7.33 | 7.62 | 6.35 | 0.98 |
| AW-18 | 9/9/1994 | 14.06 | 6.64 | 7.98 | 6.02 | 0.62 |
| AW-18 | 9/29/1994 | 14.06 | 9.06 | 7.71 | 6.08 | 2.98 |
| AW-18 | 11/23/1994 | 14.06 | 8.02 | 8.11 | 5.75 | 2.27 |
| AW-18 | 1/4/1995 | 14.06 | 7.87 | 8.25 | 5.61 | 2.26 |
| AW-18 | 2/8/1995 | 14.06 | 8.15 | 7.79 | 6.08 | 2.07 |
| AW-18 | 3/16/1995 | 14.06 | 8.19 | 8.03 | 5.82 | 2.37 |
| AW-18 | 5/25/1995 | 14.06 | 7.81 | 6.94 | 7.05 | 0.76 |
| AW-18 | 9/30/1995 | 14.06 | 7.43 | 7.86 | 6.08 | 1.35 |
| AW-18 | 10/2/2003 | 14.06 | 7.28 | 7.11 | 6.87 | 0.41 |
| AW-18 | 11/25-26/2008 | 12.92 | 7.35 | 6.93 | 5.65 | 1.70 |
| AW-18 | 3/5/2009 | 12.92 | 8.63 | 5.43 | 7.21 | 1.42 |
| AW-18 | 6/30/2009 | 12.92 | 7.28 | 6.38 | 6.41 | 0.87 |
| AW-18 | 9/23/2009 | 12.92 | 8.04 | 5.83 | 6.93 | 1.11 |
| AW-18 | 12/29/2009 | 12.92 | 6.75 | 6.82 | 5.99 | 0.76 |
| AW-19 | 8/28/1990 | 16.52 | 13.38 | 4.19 | 12.14 | 1.24 |
| AW-19 | 7/23/1991 | 16.52 | 11.87 | 5.00 | 11.46 | 0.41 |
| AW-19 | 8/22/1991 | 16.52 | 12.03 | 4.87 | 11.58 | 0.45 |
| AW-19 | 9/26/1991 | 16.52 | 12.62 | 4.39 | 12.04 | 0.58 |
| AW-19 | 10/25-26/1991 | 16.52 | 12.78 | 4.20 | 12.24 | 0.54 |
| AW-19 | 11/26/1991 | 16.52 | 13.70 | 3.62 | 12.76 | 0.94 |
| AW-19 | 12/20/1991 | 16.52 | 14.29 | 3.39 | 12.92 | 1.37 |
| AW-19 | 1/20/1992 | 16.52 | 13.58 | 4.06 | 12.26 | 1.32 |
| AW-19 | 2/27-28/1992 | 16.52 | 13.64 | 4.13 | 12.17 | 1.47 |
| AW-19 | 3/23/1992 | 16.52 | 13.79 | 3.92 | 12.39 | 1.40 |
| AW-19 | 4/22/1992 | 16.52 | 13.25 | 4.31 | 12.03 | 1.22 |
| AW-19 | 5/27-28/1992 | 16.52 | 13.74 | 4.00 | 12.31 | 1.43 |
| AW-19 | 6/24/1992 | 16.52 | 12.79 | 4.78 | 11.56 | 1.23 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-19 | 7/27/1992 | 16.52 | 18.10 | 2.27 | 13.57 | 4.53 |
| AW-19 | 8/26/1992 | 16.52 | 11.55 | 5.87 | 10.49 | 1.06 |
| AW-19 | 9/29/1992 | 16.52 | 12.66 | 4.88 | 11.46 | 1.20 |
| AW-19 | 10/29/1992 | 16.52 | 13.02 | 4.58 | 11.75 | 1.27 |
| AW-19 | 11/25/1992 | 16.52 | 12.62 | 4.81 | 11.55 | 1.07 |
| AW-19 | 12/18/1992 | 16.52 | 12.99 | 4.50 | 11.85 | 1.14 |
| AW-19 | 1/28/1993 | 16.52 | 12.67 | 4.73 | 11.63 | 1.04 |
| AW-19 | 2/24/1993 | 16.52 | 13.25 | 4.29 | 12.05 | 1.20 |
| AW-19 | 3/30/1993 | 16.52 | 12.54 | 4.81 | 11.56 | 0.98 |
| AW-19 | 5/28/1993 | 16.52 | 13.77 | 3.82 | 12.51 | 1.26 |
| AW-19 | 8/9-10/1993 | 16.52 | 15.13 | 3.28 | 12.91 | 2.22 |
| AW-19 | 9/28/1993 | 16.52 | 14.55 | 3.67 | 12.55 | 2.00 |
| AW-19 | 10/29/1993 | 16.52 | 14.31 | 3.80 | 12.44 | 1.87 |
| AW-19 | 11/30/1993 | 16.52 | 13.65 | 4.23 | 12.05 | 1.60 |
| AW-19 | 12/27/1993 | 16.52 | 14.13 | 3.76 | 12.52 | 1.61 |
| AW-19 | 3/31/1994 | 16.52 | 13.49 | 3.96 | 12.40 | 1.09 |
| AW-19 | 9/9/1994 | 16.52 | 12.46 | 4.89 | 11.48 | 0.98 |
| AW-19 | 9/29/1994 | 16.52 | 13.12 | 4.34 | 12.01 | 1.11 |
| AW-19 | 11/23/1994 | 16.52 | 12.39 | 4.63 | 11.80 | 0.59 |
| AW-19 | 1/4/1995 | 16.52 | 12.05 | 4.90 | 11.55 | 0.50 |
| AW-19 | 2/8/1995 | 16.52 | 13.39 | 3.82 | 12.58 | 0.81 |
| AW-19 | 3/16/1995 | 16.52 | 12.62 | 4.30 | 12.15 | 0.47 |
| AW-19 | 5/25/1995 | 16.52 | 13.38 | 3.77 | 12.64 | 0.74 |
| AW-19 | 9/30/1995 | 16.52 | 12.03 | 4.88 | 11.57 | 0.46 |
| AW-19 | 10/2/2003 | 16.52 | 12.80 | 4.32 | 12.05 | 0.75 |
| AW-19 | 11/25-26/2008 | 15.50 | 12.30 | 3.60 | 11.80 | 0.50 |
| AW-19 | 3/5/2009 | 15.50 | 14.16 | 2.18 | 13.11 | 1.05 |
| AW-19 | 6/30/2009 | 15.50 | 13.03 | 3.00 | 12.41 | 0.62 |
| AW-19 | 9/23/2009 | 15.50 | 13.12 | 2.40 | 13.10 | 0.02 |
| AW-19 | 12/29/2009 | 15.50 | 12.00 | 3.52 | 11.98 | 0.02 |
| AW-19 | 3/24/2010 | 15.50 | 12.95 | 2.99 | 12.44 | 0.51 |
| AW-20 | 8/28/1990 | 16.89 | 12.14 | 4.75 | -- | -- |
| AW-20 | 7/23/1991 | 16.89 | 9.29 | 7.60 | -- | -- |
| AW-20 | 8/22/1991 | 16.89 | 9.85 | 7.04 | -- | -- |
| AW-20 | 9/26/1991 | 16.89 | 11.54 | 5.35 | -- | -- |
| AW-20 | 10/25-26/1991 | 16.89 | 12.42 | 4.47 | -- | -- |
| AW-20 | 11/26/1991 | 16.89 | 13.20 | 3.69 | -- | -- |
| AW-20 | 12/20/1991 | 16.89 | 13.53 | 3.36 | -- | -- |
| AW-20 | 1/20/1992 | 16.89 | 11.16 | 5.73 | -- | -- |
| AW-20 | 2/27-28/1992 | 16.89 | 12.00 | 4.89 | -- | -- |
| AW-20 | 3/23/1992 | 16.89 | 4.21 | 12.68 | -- | -- |
| AW-20 | 4/22/1992 | 16.89 | 11.51 | 5.39 | 11.50 | 0.01 |
| AW-20 | 5/27-28/1992 | 16.89 | 12.76 | 4.13 | -- | -- |
| AW-20 | 6/24/1992 | 16.89 | 10.47 | 6.42 | -- | -- |
| AW-20 | 7/27/1992 | 16.89 | 12.05 | 4.84 | -- | -- |
| AW-20 | 8/26/1992 | 16.89 | 7.57 | 9.32 | -- | -- |
| AW-20 | 9/29/1992 | 16.89 | 10.30 | 6.59 | -- | -- |
| AW-20 | 10/29/1992 | 16.89 | 11.32 | 5.57 | -- | -- |
| AW-20 | 11/25/1992 | 16.89 | 10.02 | 6.87 | -- | -- |
| AW-20 | 12/18/1992 | 16.89 | 10.96 | 5.93 | -- | -- |
| AW-20 | 1/28/1993 | 16.89 | 9.04 | 7.85 | -- | -- |
| AW-20 | 2/24/1993 | 16.89 | 9.89 | 7.00 | -- | -- |
| AW-20 | 3/30/1993 | 16.89 | 9.01 | 7.88 | -- | -- |
| AW-20 | 5/28/1993 | 16.89 | 12.51 | 4.38 | -- | -- |
| AW-20 | 8/9-10/1993 | 16.89 | 13.67 | 3.22 | -- | -- |
| AW-20 | 9/28/1993 | 16.89 | 13.02 | 3.87 | -- | -- |
| AW-20 | 10/29/1993 | 16.89 | 12.95 | 3.94 | -- | -- |
| AW-20 | 11/30/1993 | 16.89 | 11.67 | 5.22 | -- | -- |
| AW-20 | 12/27/1993 | 16.89 | 12.62 | 4.27 | -- | -- |
| AW-20 | 3/31/1994 | 16.89 | 12.43 | 4.46 | -- | -- |
| AW-20 | 9/9/1994 | 16.89 | 11.61 | 5.28 | -- | -- |
| AW-20 | 9/29/1994 | 16.89 | 12.21 | 4.68 | -- | -- |
| AW-20 | 11/23/1994 | 16.89 | 11.50 | 5.39 | -- | -- |
| AW-20 | 1/4/1995 | 16.89 | 11.12 | 5.77 | -- | -- |
| AW-20 | 2/8/1995 | 16.89 | 12.63 | 4.26 | -- | -- |
| AW-20 | 3/16/1995 | 16.89 | 12.18 | 4.71 | -- | -- |
| AW-20 | 5/25/1995 | 16.89 | 12.85 | 4.04 | -- | -- |
| AW-20 | 9/30/1995 | 16.89 | 10.55 | 6.34 | -- | -- |
| AW-20 | 10/2/2003 | 16.89 | 11.68 | 5.21 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-20 | 11/25-26/2008 | 15.67 | 8.85 | 6.82 | -- | -- |
| AW-20 | 3/5/2009 | 15.67 | 13.24 | 2.43 | -- | -- |
| AW-20 | 6/30/2009 | 15.67 | 12.07 | 3.60 | -- | -- |
| AW-20 | 9/23/2009 | 15.67 | 11.78 | 3.89 | -- | -- |
| AW-20 | 12/29/2009 | 15.67 | 11.29 | 4.38 | -- | -- |
| AW-20 | 3/24/2010 | 15.67 | 10.50 | 5.17 | -- | -- |
| AW-21 | 8/28/1990 | 14.12 | 12.06 | 2.47 | 11.55 | 0.51 |
| AW-21 | 7/23/1991 | 14.12 | 12.01 | 2.11 | -- | -- |
| AW-21 | 8/22/1991 | 14.12 | 11.35 | 2.84 | 11.27 | 0.08 |
| AW-21 | 9/26/1991 | 14.12 | 11.67 | 2.45 | -- | -- |
| AW-21 | 10/25-26/1991 | 14.12 | 11.92 | 2.20 | -- | -- |
| AW-21 | 11/26/1991 | 14.12 | 11.22 | 2.90 | -- | -- |
| AW-21 | 12/20/1991 | 14.12 | 13.34 | 0.88 | 13.22 | 0.12 |
| AW-21 | 1/20/1992 | 14.12 | 10.89 | 3.27 | 10.84 | 0.05 |
| AW-21 | 2/27-28/1992 | 14.12 | 12.17 | 1.95 | -- | -- |
| AW-21 | 3/23/1992 | 14.12 | 12.54 | 1.61 | 12.50 | 0.04 |
| AW-21 | 4/22/1992 | 14.12 | 11.45 | 2.67 | -- | -- |
| AW-21 | 5/27-28/1992 | 14.12 | 11.09 | 3.11 | 10.99 | 0.10 |
| AW-21 | 6/24/1992 | 14.12 | 10.44 | 3.68 | -- | -- |
| AW-21 | 7/27/1992 | 14.12 | 13.40 | 0.76 | 13.35 | 0.05 |
| AW-21 | 8/26/1992 | 14.12 | 11.05 | 3.27 | 10.80 | 0.25 |
| AW-21 | 9/29/1992 | 14.12 | 10.15 | 4.18 | 9.89 | 0.26 |
| AW-21 | 10/29/1992 | 14.12 | 10.60 | 3.53 | 10.59 | 0.01 |
| AW-21 | 11/25/1992 | 14.12 | 11.27 | 2.85 | -- | -- |
| AW-21 | 12/18/1992 | 14.12 | 12.58 | 12.11 | 14.12 | 12.58 |
| AW-21 | 1/28/1993 | 14.12 | 10.59 | 3.53 | -- | -- |
| AW-21 | 2/24/1993 | 14.12 | 11.04 | 3.09 | 11.03 | 0.01 |
| AW-21 | 3/30/1993 | 14.12 | 12.01 | 2.29 | 11.80 | 0.21 |
| AW-21 | 5/28/1993 | 14.12 | 13.13 | 1.01 | 13.11 | 0.02 |
| AW-21 | 8/9-10/1993 | 14.12 | 12.64 | 2.29 | 11.68 | 0.96 |
| AW-21 | 9/28/1993 | 14.12 | 12.22 | 2.37 | 11.66 | 0.56 |
| AW-21 | 10/29/1993 | 14.12 | 11.05 | 3.14 | 10.97 | 0.08 |
| AW-21 | 11/30/1993 | 14.12 | 10.83 | 3.29 | -- | -- |
| AW-21 | 12/27/1993 | 14.12 | 12.92 | 1.20 | -- | -- |
| AW-21 | 3/31/1994 | 14.12 | 11.25 | 2.89 | 11.23 | 0.02 |
| AW-21 | 9/9/1994 | 14.12 | 10.26 | 4.12 | 9.94 | 0.32 |
| AW-21 | 9/29/1994 | 14.12 | 12.59 | 1.67 | 12.41 | 0.18 |
| AW-21 | 11/23/1994 | 14.12 | 10.54 | 3.60 | 10.51 | 0.03 |
| AW-21 | 1/4/1995 | 14.12 | 10.98 | 3.14 | -- | -- |
| AW-21 | 2/8/1995 | 14.12 | 12.59 | 1.66 | 12.43 | 0.16 |
| AW-21 | 3/16/1995 | 14.12 | 12.97 | 1.74 | 12.23 | 0.74 |
| AW-21 | 5/25/1995 | 14.12 | 11.34 | 2.95 | 11.13 | 0.21 |
| AW-21 | 9/30/1995 | 14.12 | 11.86 | 2.26 | -- | -- |
| AW-21 | 10/2/2003 | 14.12 | 13.74 | 2.61 | 10.95 | 2.79 |
| AW-22 | 8/28/1990 | 15.74 | 18.44 | 2.77 | 11.85 | 6.59 |
| AW-22 | 7/23/1991 | 15.74 | 19.87 | 3.18 | 11.06 | 8.81 |
| AW-22 | 8/22/1991 | 15.74 | 19.32 | 3.33 | 10.99 | 8.33 |
| AW-22 | 9/26/1991 | 15.74 | 18.41 | 3.11 | 11.45 | 6.96 |
| AW-22 | 10/25-26/1991 | 15.74 | 16.76 | 3.06 | 11.84 | 4.92 |
| AW-22 | 11/26/1991 | 15.74 | 16.52 | 2.45 | 12.63 | 3.89 |
| AW-22 | 12/20/1991 | 15.74 | 17.93 | 1.69 | 13.25 | 4.68 |
| AW-22 | 1/20/1992 | 15.74 | 14.49 | 2.98 | 12.40 | 2.09 |
| AW-22 | 2/27-28/1992 | 15.74 | 17.52 | 2.55 | 12.30 | 5.22 |
| AW-22 | 3/23/1992 | 15.74 | 18.11 | 2.20 | 12.60 | 5.51 |
| AW-22 | 4/22/1992 | 15.74 | 16.41 | 2.71 | 12.34 | 4.07 |
| AW-22 | 5/27-28/1992 | 15.74 | 15.79 | 3.02 | 12.09 | 3.70 |
| AW-22 | 6/24/1992 | 15.74 | 16.88 | 3.30 | 11.53 | 5.35 |
| AW-22 | 7/27/1992 | 15.74 | 17.15 | 2.76 | 12.13 | 5.02 |
| AW-22 | 8/26/1992 | 15.74 | 15.13 | 4.10 | 10.92 | 4.21 |
| AW-22 | 9/29/1992 | 15.74 | 14.26 | 3.99 | 11.24 | 3.02 |
| AW-22 | 10/29/1992 | 15.74 | 14.44 | 3.41 | 11.90 | 2.54 |
| AW-22 | 11/25/1992 | 15.74 | 13.89 | 3.60 | 11.78 | 2.11 |
| AW-22 | 12/18/1992 | 15.74 | 14.67 | 3.22 | 12.08 | 2.59 |
| AW-22 | 1/28/1993 | 15.74 | 14.08 | 3.86 | 11.43 | 2.65 |
| AW-22 | 2/24/1993 | 15.74 | 15.01 | 3.07 | 12.19 | 2.82 |
| AW-22 | 3/30/1993 | 15.74 | 14.50 | 3.39 | 11.91 | 2.59 |
| AW-22 | 5/28/1993 | 15.74 | 16.64 | 2.25 | 12.85 | 3.79 |
| AW-22 | 8/9-10/1993 | 15.74 | 16.87 | 1.93 | 13.18 | 3.69 |
| AW-22 | 9/28/1993 | 15.74 | 16.74 | 2.15 | 12.94 | 3.80 |
| AW-22 | 10/29/1993 | 15.74 | 15.24 | 2.82 | 12.44 | 2.80 |
| AW-22 | 11/30/1993 | 15.74 | 15.84 | 3.00 | 12.11 | 3.73 |
| AW-22 | 12/27/1993 | 15.74 | 17.85 | 2.14 | 12.73 | 5.12 |
| AW-22 | 3/31/1994 | 15.74 | 16.47 | 2.52 | 12.55 | 3.92 |
| AW-22 | 9/9/1994 | 15.74 | 14.78 | 3.97 | 11.15 | 3.63 |
| AW-22 | 9/29/1994 | 15.74 | 18.59 | 2.67 | 11.94 | 6.65 |
| AW-22 | 11/23/1994 | 15.74 | 17.17 | 3.36 | 11.40 | 5.77 |
| AW-22 | 1/4/1995 | 15.74 | 16.26 | 3.51 | 11.41 | 4.85 |
| AW-22 | 2/8/1995 | 15.74 | 18.76 | 1.89 | 12.84 | 5.92 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-22 | 3/16/1995 | 15.74 | 16.41 | 2.90 | 12.11 | 4.30 |
| AW-22 | 5/25/1995 | 15.74 | 25.45 | 1.12 | 12.40 | 13.05 |
| AW-22 | 9/30/1995 | 15.74 | 17.17 | 3.60 | 11.11 | 6.06 |
| AW-22 | 10/2/2003 | 15.74 | 15.55 | 3.59 | 11.30 | 4.25 |
| AW-22 | 11/25-26/2008 | 15.13 | 8.70 | 6.43 | -- | -- |
| AW-22 | 3/6/2009 | 15.13 | -- | -- | -- | -- |
| AW-22 | 6/30/2009 | 15.13 | DRY | | | |
| AW-22 | 9/23/2009 | 15.13 | -- | -- | -- | -- |
| AW-22 | 12/29/2009 | 15.13 | Not Accessible - Blocked by Equipment | | | |
| AW-22 | 3/24/2010 | 15.13 | Not Accessible - Blocked by Equipment | | | |
| AW-23 | 8/28/1990 | 16.26 | 10.45 | 9.31 | 6.08 | 4.37 |
| AW-23 | 7/23/1991 | 16.26 | 7.83 | 10.54 | 5.46 | 2.37 |
| AW-23 | 8/22/1991 | 16.26 | 8.26 | 10.77 | 5.15 | 3.11 |
| AW-23 | 9/26/1991 | 16.26 | 8.92 | 9.40 | 6.60 | 2.32 |
| AW-23 | 10/25-26/1991 | 16.26 | 8.91 | 8.79 | 7.29 | 1.62 |
| AW-23 | 11/26/1991 | 16.26 | 9.27 | 8.31 | 7.79 | 1.48 |
| AW-23 | 12/20/1991 | 16.26 | 10.04 | 7.79 | 8.28 | 1.76 |
| AW-23 | 1/20/1992 | 16.26 | 8.49 | 9.32 | 6.75 | 1.74 |
| AW-23 | 2/27-28/1992 | 16.26 | 8.19 | 9.99 | 6.03 | 2.16 |
| AW-23 | 3/23/1992 | 16.26 | 8.39 | 9.61 | 6.43 | 1.96 |
| AW-23 | 4/22/1992 | 16.26 | 8.00 | 10.11 | 5.92 | 2.08 |
| AW-23 | 5/27-28/1992 | 16.26 | 8.61 | 8.24 | 7.95 | 0.66 |
| AW-23 | 6/24/1992 | 16.26 | 7.99 | 10.70 | 5.26 | 2.73 |
| AW-23 | 7/27/1992 | 16.26 | 8.43 | 10.09 | 5.89 | 2.54 |
| AW-23 | 8/26/1992 | 16.26 | 7.94 | 12.32 | 3.45 | 4.49 |
| AW-23 | 9/29/1992 | 16.26 | 8.49 | 10.25 | 5.70 | 2.79 |
| AW-23 | 10/29/1992 | 16.26 | 8.59 | 9.63 | 6.39 | 2.20 |
| AW-23 | 11/25/1992 | 16.26 | 8.00 | 10.46 | 5.53 | 2.47 |
| AW-23 | 12/18/1992 | 16.26 | 7.85 | 9.92 | 6.15 | 1.70 |
| AW-23 | 1/28/1993 | 16.26 | 7.44 | 10.34 | 5.73 | 1.71 |
| AW-23 | 2/24/1993 | 16.26 | 7.90 | 9.84 | 6.24 | 1.66 |
| AW-23 | 3/30/1993 | 16.26 | 7.64 | 11.17 | 4.78 | 2.86 |
| AW-23 | 5/28/1993 | 16.26 | 8.21 | 9.24 | 6.87 | 1.34 |
| AW-23 | 8/9-10/1993 | 16.26 | 9.41 | 7.94 | 8.18 | 1.23 |
| AW-23 | 9/28/1993 | 16.26 | 8.20 | 8.88 | 7.28 | 0.92 |
| AW-23 | 10/29/1993 | 16.26 | 8.74 | 8.40 | 7.75 | 0.99 |
| AW-23 | 11/30/1993 | 16.26 | 7.95 | 9.74 | 6.34 | 1.61 |
| AW-23 | 12/27/1993 | 16.26 | 8.13 | 9.31 | 6.80 | 1.33 |
| AW-23 | 3/31/1994 | 16.26 | 7.71 | 9.72 | 6.40 | 1.31 |
| AW-23 | 9/9/1994 | 16.26 | 7.68 | 11.21 | 4.73 | 2.95 |
| AW-23 | 9/29/1994 | 16.26 | 8.01 | 10.10 | 5.93 | 2.08 |
| AW-23 | 11/23/1994 | 16.26 | 7.89 | 10.36 | 5.65 | 2.24 |
| AW-23 | 1/4/1995 | 16.26 | 7.56 | 10.33 | 5.73 | 1.83 |
| AW-23 | 2/8/1995 | 16.26 | 8.38 | 9.78 | 6.25 | 2.13 |
| AW-23 | 3/16/1995 | 16.26 | 8.12 | 9.74 | 6.32 | 1.80 |
| AW-23 | 5/25/1995 | 16.26 | 7.73 | 8.84 | 7.38 | 0.35 |
| AW-23 | 9/30/1995 | 16.26 | 8.92 | 10.63 | 5.22 | 3.70 |
| AW-23 | 10/2/2003 | 16.26 | 8.41 | 9.80 | 5.97 | 2.44 |
| AW-23 | 11/25-26/2008 | 16.04 | 9.00 | 9.36 | 6.10 | 2.90 |
| AW-23 | 3/5/2009 | 16.04 | 8.55 | 8.54 | 7.24 | 1.31 |
| AW-23 | 6/30/2009 | 16.04 | 8.88 | 9.12 | 6.58 | 2.30 |
| AW-23 | 9/23/2009 | 16.04 | 9.40 | 8.87 | 6.79 | 2.61 |
| AW-23 | 12/29/2009 | 16.04 | 8.66 | 9.08 | 6.67 | 1.99 |
| AW-24 | 8/28/1990 | 12.38 | 4.35 | 8.03 | -- | -- |
| AW-24 | 7/23/1991 | 12.38 | 3.03 | 9.35 | -- | -- |
| AW-24 | 8/22/1991 | 12.38 | 3.51 | 8.87 | -- | -- |
| AW-24 | 9/26/1991 | 12.38 | 4.78 | 7.60 | -- | -- |
| AW-24 | 10/25-26/1991 | 12.38 | 4.87 | 7.51 | -- | -- |
| AW-24 | 11/26/1991 | 12.38 | 5.25 | 7.13 | -- | -- |
| AW-24 | 12/20/1991 | 12.38 | 5.49 | 6.89 | -- | -- |
| AW-24 | 1/20/1992 | 12.38 | 3.64 | 8.74 | -- | -- |
| AW-24 | 2/27-28/1992 | 12.38 | 3.61 | 8.77 | -- | -- |
| AW-24 | 3/23/1992 | 12.38 | 3.64 | 8.74 | -- | -- |
| AW-24 | 4/22/1992 | 12.38 | 3.14 | 9.24 | -- | -- |
| AW-24 | 5/27-28/1992 | 12.38 | 4.90 | 7.48 | -- | -- |
| AW-24 | 6/24/1992 | 12.38 | 3.21 | 9.17 | -- | -- |
| AW-24 | 7/27/1992 | 12.38 | 4.55 | 7.83 | -- | -- |
| AW-24 | 8/26/1992 | 12.38 | 2.25 | 10.13 | -- | -- |
| AW-24 | 9/29/1992 | 12.38 | 3.19 | 9.19 | -- | -- |
| AW-24 | 10/29/1992 | 12.38 | 4.10 | 8.28 | -- | -- |
| AW-24 | 11/25/1992 | 12.38 | 3.00 | 9.38 | -- | -- |
| AW-24 | 12/18/1992 | 12.38 | 3.50 | 8.88 | -- | -- |
| AW-24 | 1/28/1993 | 12.38 | 3.52 | 8.86 | -- | -- |
| AW-24 | 2/24/1993 | 12.38 | 3.82 | 8.56 | -- | -- |
| AW-24 | 3/30/1993 | 12.38 | 2.88 | 9.50 | -- | -- |
| AW-24 | 5/28/1993 | 12.38 | 5.41 | 6.97 | -- | -- |
| AW-24 | 8/9-10/1993 | 12.38 | 6.88 | 5.50 | -- | -- |
| AW-24 | 9/28/1993 | 12.38 | 4.40 | 7.98 | -- | -- |
| AW-24 | 10/29/1993 | 12.38 | 4.76 | 7.62 | -- | -- |
| AW-24 | 11/30/1993 | 12.38 | 3.90 | 8.48 | -- | -- |
| AW-24 | 12/27/1993 | 12.38 | 3.89 | 8.49 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-24 | 3/31/1994 | 12.38 | 4.41 | 7.97 | -- | -- |
| AW-24 | 9/9/1994 | 12.38 | 3.22 | 9.16 | -- | -- |
| AW-24 | 9/29/1994 | 12.38 | 4.11 | 8.27 | -- | -- |
| AW-24 | 11/23/1994 | 12.38 | 3.60 | 8.78 | -- | -- |
| AW-24 | 1/4/1995 | 12.38 | 3.51 | 8.87 | -- | -- |
| AW-24 | 2/8/1995 | 12.38 | 4.19 | 8.19 | -- | -- |
| AW-24 | 3/16/1995 | 12.38 | 4.06 | 8.32 | -- | -- |
| AW-24 | 5/25/1995 | 12.38 | 5.20 | 7.18 | -- | -- |
| AW-24 | 9/30/1995 | 12.38 | 3.88 | 8.50 | -- | -- |
| AW-24 | 10/2/2003 | 12.38 | 4.57 | 7.81 | -- | -- |
| AW-24 | 11/25-26/2008 | 11.36 | -- | -- | -- | -- |
| AW-24 | 3/6/2009 | 11.36 | 4.55 | 6.81 | -- | -- |
| AW-24 | 6/30/2009 | 11.36 | 4.70 | 6.66 | -- | -- |
| AW-24 | 9/23/2009 | 11.36 | 5.00 | 6.36 | -- | -- |
| AW-24 | 12/29/2009 | 11.36 | Not Accessible - Under Water | | | |
| AW-25 | 8/28/1990 | 14.55 | 5.68 | 8.87 | -- | -- |
| AW-25 | 7/23/1991 | 14.55 | 4.57 | 9.98 | -- | -- |
| AW-25 | 8/22/1991 | 14.55 | 4.97 | 9.58 | -- | -- |
| AW-25 | 9/26/1991 | 14.55 | 6.11 | 8.44 | -- | -- |
| AW-25 | 10/25-26/1991 | 14.55 | 6.35 | 8.20 | -- | -- |
| AW-25 | 11/26/1991 | 14.55 | 6.66 | 7.89 | -- | -- |
| AW-25 | 12/20/1991 | 14.55 | 6.85 | 7.70 | -- | -- |
| AW-25 | 1/20/1992 | 14.55 | 5.17 | 9.38 | -- | -- |
| AW-25 | 2/27-28/1992 | 14.55 | 5.45 | 9.10 | -- | -- |
| AW-25 | 3/23/1992 | 14.55 | 5.70 | 8.85 | -- | -- |
| AW-25 | 4/22/1992 | 14.55 | 4.89 | 9.66 | -- | -- |
| AW-25 | 5/27-28/1992 | 14.55 | 6.29 | 8.26 | -- | -- |
| AW-25 | 6/24/1992 | 14.55 | 5.26 | 9.29 | -- | -- |
| AW-25 | 7/27/1992 | 14.55 | 5.78 | 8.77 | -- | -- |
| AW-25 | 8/26/1992 | 14.55 | 3.78 | 10.77 | -- | -- |
| AW-25 | 9/29/1992 | 14.55 | 5.44 | 9.11 | -- | -- |
| AW-25 | 10/29/1992 | 14.55 | 5.82 | 8.73 | -- | -- |
| AW-25 | 11/25/1992 | 14.55 | 4.55 | 10.00 | -- | -- |
| AW-25 | 12/18/1992 | 14.55 | 5.33 | 9.22 | -- | -- |
| AW-25 | 1/28/1993 | 14.55 | 5.21 | 9.34 | -- | -- |
| AW-25 | 2/24/1993 | 14.55 | 5.70 | 8.85 | -- | -- |
| AW-25 | 3/30/1993 | 14.55 | 4.41 | 10.14 | -- | -- |
| AW-25 | 5/28/1993 | 14.55 | 6.59 | 7.96 | -- | -- |
| AW-25 | 8/9-10/1993 | 14.55 | 7.32 | 7.23 | -- | -- |
| AW-25 | 9/28/1993 | 14.55 | 6.37 | 8.18 | -- | -- |
| AW-25 | 10/29/1993 | 14.55 | 6.55 | 8.00 | -- | -- |
| AW-25 | 11/30/1993 | 14.55 | 5.62 | 8.93 | -- | -- |
| AW-25 | 12/27/1993 | 14.55 | 5.85 | 8.70 | -- | -- |
| AW-25 | 3/31/1994 | 14.55 | 6.05 | 8.50 | -- | -- |
| AW-25 | 9/9/1994 | 14.55 | 4.77 | 9.78 | -- | -- |
| AW-25 | 9/29/1994 | 14.55 | 5.53 | 9.02 | -- | -- |
| AW-25 | 11/23/1994 | 14.55 | 14.55 | 4.21 | 9.29 | 5.26 |
| AW-25 | 1/4/1995 | 14.55 | 5.12 | 9.43 | -- | -- |
| AW-25 | 2/8/1995 | 14.55 | 5.83 | 8.72 | -- | -- |
| AW-25 | 3/16/1995 | 14.55 | 5.69 | 8.86 | -- | -- |
| AW-25 | 5/25/1995 | 14.55 | 6.50 | 8.05 | -- | -- |
| AW-25 | 9/30/1995 | 14.55 | 5.31 | 9.24 | -- | -- |
| AW-25 | 10/2/2003 | 14.55 | 5.78 | 8.77 | -- | -- |
| AW-25 | 11/25-26/2008 | 13.50 | 4.50 | 9.00 | -- | -- |
| AW-25 | 3/5/2009 | 13.50 | 5.47 | 8.03 | -- | -- |
| AW-25 | 6/30/2009 | 13.50 | 5.67 | 7.83 | -- | -- |
| AW-25 | 9/23/2009 | 13.50 | 5.80 | 7.70 | -- | -- |
| AW-25 | 12/29/2009 | 13.50 | 4.18 | 9.32 | -- | -- |
| AW-26 | 8/28/1990 | 13.51 | 4.86 | 8.65 | -- | -- |
| AW-26 | 7/23/1991 | 13.51 | 3.13 | 10.38 | -- | -- |
| AW-26 | 8/22/1991 | 13.51 | 3.51 | 10.00 | -- | -- |
| AW-26 | 9/26/1991 | 13.51 | 4.89 | 8.62 | -- | -- |
| AW-26 | 10/25-26/1991 | 13.51 | 5.57 | 7.94 | -- | -- |
| AW-26 | 11/26/1991 | 13.51 | 5.79 | 7.72 | -- | -- |
| AW-26 | 12/20/1991 | 13.51 | 6.02 | 7.49 | -- | -- |
| AW-26 | 1/20/1992 | 13.51 | 4.16 | 9.35 | -- | -- |
| AW-26 | 2/27-28/1992 | 13.51 | 3.88 | 9.63 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-26 | 3/23/1992 | 13.51 | 4.50 | 9.01 | -- | -- |
| AW-26 | 4/22/1992 | 13.51 | 3.11 | 10.40 | -- | -- |
| AW-26 | 5/27-28/1992 | 13.51 | 4.97 | 8.54 | -- | -- |
| AW-26 | 6/24/1992 | 13.51 | 3.66 | 9.85 | -- | -- |
| AW-26 | 7/27/1992 | 13.51 | 4.64 | 8.87 | -- | -- |
| AW-26 | 8/26/1992 | 13.51 | 2.43 | 11.08 | -- | -- |
| AW-26 | 9/29/1992 | 13.51 | 3.80 | 9.71 | -- | -- |
| AW-26 | 10/29/1992 | 13.51 | 4.25 | 9.26 | -- | -- |
| AW-26 | 11/25/1992 | 13.51 | 3.24 | 10.27 | -- | -- |
| AW-26 | 12/18/1992 | 13.51 | 3.98 | 9.53 | -- | -- |
| AW-26 | 1/28/1993 | 13.51 | 3.57 | 9.94 | -- | -- |
| AW-26 | 2/24/1993 | 13.51 | 4.20 | 9.31 | -- | -- |
| AW-26 | 3/30/1993 | 13.51 | 3.08 | 10.43 | -- | -- |
| AW-26 | 5/28/1993 | 13.51 | 5.54 | 7.97 | -- | -- |
| AW-26 | 8/9-10/1993 | 13.51 | 6.48 | 7.03 | -- | -- |
| AW-26 | 9/28/1993 | 13.51 | 5.48 | 8.03 | -- | -- |
| AW-26 | 10/29/1993 | 13.51 | 5.65 | 7.86 | -- | -- |
| AW-26 | 11/30/1993 | 13.51 | 4.50 | 9.01 | -- | -- |
| AW-26 | 12/27/1993 | 13.51 | 4.69 | 8.83 | 4.68 | 0.01 |
| AW-26 | 3/31/1994 | 13.51 | 4.96 | 8.55 | -- | -- |
| AW-26 | 9/9/1994 | 13.51 | 3.95 | 9.56 | -- | -- |
| AW-26 | 9/29/1994 | 13.51 | 4.77 | 8.74 | -- | -- |
| AW-26 | 11/23/1994 | 13.51 | 4.26 | 9.25 | -- | -- |
| AW-26 | 1/4/1995 | 13.51 | 4.09 | 9.42 | -- | -- |
| AW-26 | 2/8/1995 | 13.51 | 4.95 | 8.56 | -- | -- |
| AW-26 | 3/16/1995 | 13.51 | 4.81 | 8.70 | -- | -- |
| AW-26 | 5/25/1995 | 13.51 | 6.26 | 7.25 | -- | -- |
| AW-26 | 9/30/1995 | 13.51 | 4.34 | 9.17 | -- | -- |
| AW-26 | 10/2/2003 | 13.51 | 5.22 | 8.29 | -- | -- |
| AW-26 | 11/25-26/2008 | 12.47 | 3.10 | 9.37 | -- | -- |
| AW-26 | 3/5/2009 | 12.47 | 4.35 | 8.12 | -- | -- |
| AW-26 | 6/30/2009 | 12.47 | 4.58 | 7.89 | -- | -- |
| AW-26 | 9/23/2009 | 12.47 | 4.70 | 7.77 | -- | -- |
| AW-26 | 12/29/2009 | 12.47 | 3.17 | 9.30 | -- | -- |
| AW-27 | 8/28/1990 | 14.58 | 5.97 | 8.61 | -- | -- |
| AW-27 | 7/23/1991 | 14.58 | 4.70 | 9.88 | -- | -- |
| AW-27 | 8/22/1991 | 14.58 | 5.14 | 9.44 | -- | -- |
| AW-27 | 9/26/1991 | 14.58 | 6.30 | 8.28 | -- | -- |
| AW-27 | 10/25-26/1991 | 14.58 | 6.51 | 8.07 | -- | -- |
| AW-27 | 11/26/1991 | 14.58 | 6.78 | 7.80 | -- | -- |
| AW-27 | 12/20/1991 | 14.58 | 6.95 | 7.63 | -- | -- |
| AW-27 | 1/20/1992 | 14.58 | 4.98 | 9.60 | -- | -- |
| AW-27 | 2/27-28/1992 | 14.58 | 5.74 | 8.84 | -- | -- |
| AW-27 | 3/23/1992 | 14.58 | 6.00 | 8.58 | -- | -- |
| AW-27 | 4/22/1992 | 14.58 | 5.04 | 9.54 | -- | -- |
| AW-27 | 5/27-28/1992 | 14.58 | 6.51 | 8.07 | -- | -- |
| AW-27 | 6/24/1992 | 14.58 | 5.50 | 9.08 | -- | -- |
| AW-27 | 7/27/1992 | 14.58 | 5.96 | 8.62 | -- | -- |
| AW-27 | 8/26/1992 | 14.58 | 3.96 | 10.62 | -- | -- |
| AW-27 | 9/29/1992 | 14.58 | 5.64 | 8.94 | -- | -- |
| AW-27 | 10/29/1992 | 14.58 | 6.06 | 8.52 | -- | -- |
| AW-27 | 11/25/1992 | 14.58 | 4.54 | 10.04 | -- | -- |
| AW-27 | 12/18/1992 | 14.58 | 5.57 | 9.01 | -- | -- |
| AW-27 | 1/28/1993 | 14.58 | 5.44 | 9.14 | 5.42 | 0.02 |
| AW-27 | 2/24/1993 | 14.58 | 5.80 | 8.78 | -- | -- |
| AW-27 | 3/30/1993 | 14.58 | 4.79 | 9.79 | -- | -- |
| AW-27 | 5/28/1993 | 14.58 | 6.69 | 7.89 | -- | -- |
| AW-27 | 8/9-10/1993 | 14.58 | 7.29 | 7.29 | -- | -- |
| AW-27 | 9/28/1993 | 14.58 | 6.48 | 8.10 | -- | -- |
| AW-27 | 10/29/1993 | 14.58 | 6.65 | 7.95 | 6.63 | 0.02 |
| AW-27 | 11/30/1993 | 14.58 | 5.75 | 8.83 | -- | -- |
| AW-27 | 12/27/1993 | 14.58 | 5.95 | 8.63 | -- | -- |
| AW-27 | 3/31/1994 | 14.58 | 6.24 | 8.34 | -- | -- |
| AW-27 | 9/9/1994 | 14.58 | 4.76 | 9.82 | -- | -- |
| AW-27 | 9/29/1994 | 14.58 | 5.54 | 9.04 | -- | -- |
| AW-27 | 11/23/1994 | 14.58 | 5.43 | 9.15 | -- | -- |
| AW-27 | 1/4/1995 | 14.58 | 5.44 | 9.14 | -- | -- |
| AW-27 | 2/8/1995 | 14.58 | 5.96 | 8.62 | -- | -- |
| AW-27 | 3/16/1995 | 14.58 | 5.94 | 8.64 | -- | -- |
| AW-27 | 5/25/1995 | 14.58 | 6.76 | 7.82 | -- | -- |
| AW-27 | 9/30/1995 | 14.58 | 5.43 | 9.15 | -- | -- |
| AW-27 | 10/2/2003 | 14.58 | 6.13 | 8.45 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-27 | 11/25-26/2008 | 13.52 | 5.10 | 8.42 | -- | -- |
| AW-27 | 3/5/2009 | 13.52 | 5.65 | 7.87 | -- | -- |
| AW-27 | 6/30/2009 | 13.52 | 5.94 | 7.58 | -- | -- |
| AW-27 | 9/23/2009 | 13.52 | 6.06 | 7.46 | -- | -- |
| AW-27 | 12/29/2009 | 13.52 | 4.65 | 8.87 | -- | -- |
| AW-28 | 8/28/1990 | 14.92 | 6.55 | 8.37 | -- | -- |
| AW-28 | 7/23/1991 | 14.92 | 4.92 | 10.00 | -- | -- |
| AW-28 | 8/22/1991 | 14.92 | 5.13 | 9.79 | -- | -- |
| AW-28 | 9/26/1991 | 14.92 | -- | -- | -- | -- |
| AW-28 | 10/25-26/1991 | -- | -- | -- | -- | -- |
| AW-28 | 11/26/1991 | 14.92 | -- | -- | -- | -- |
| AW-28 | 12/20/1991 | 14.92 | 5.98 | 8.94 | -- | -- |
| AW-28 | 1/20/1992 | 14.92 | 3.95 | -- | -- | -- |
| AW-28 | 2/27-28/1992 | 14.58 | 3.74 | 10.84 | -- | -- |
| AW-28 | 3/23/1992 | 14.92 | 3.99 | 10.93 | -- | -- |
| AW-28 | 4/22/1992 | 14.92 | 3.07 | 11.85 | -- | -- |
| AW-28 | 5/27-28/1992 | 14.58 | 4.02 | 10.56 | -- | -- |
| AW-28 | 6/24/1992 | 14.92 | 3.21 | 11.71 | -- | -- |
| AW-28 | 7/27/1992 | 14.92 | 3.62 | 11.30 | -- | -- |
| AW-28 | 8/26/1992 | 14.92 | 2.16 | 12.76 | -- | -- |
| AW-28 | 9/29/1992 | 14.92 | 2.99 | 11.93 | -- | -- |
| AW-28 | 10/29/1992 | 14.92 | 3.24 | 11.68 | -- | -- |
| AW-28 | 11/25/1992 | 14.92 | 3.07 | 11.85 | -- | -- |
| AW-28 | 12/18/1992 | 14.92 | -- | -- | -- | -- |
| AW-28 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-28 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-28 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-28 | 5/28/1993 | Well Not Present | | | | |
| AW-28 | 8/9-10/1993 | -- | -- | -- | -- | -- |
| AW-28 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-28 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-28 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-28 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-28 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-28 | 9/9/1994 | -- | -- | -- | -- | -- |
| AW-28 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-28 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-28 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-28 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-28 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-28 | 5/25/1995 | -- | -- | -- | -- | -- |
| AW-28 | 9/30/1995 | -- | -- | -- | -- | -- |
| AW-28 | 11/25-26/2008 | 11.18 | 4.55 | 6.63 | -- | -- |
| AW-28 | 3/6/2009 | 11.18 | 5.59 | 5.59 | -- | -- |
| AW-28 | 6/30/2009 | 11.18 | 4.40 | 6.78 | -- | -- |
| AW-28 | 9/23/2009 | 11.18 | 4.60 | 6.58 | -- | -- |
| AW-28 | 12/29/2009 | 11.18 | 4.01 | 7.17 | -- | -- |
| AW-28 | 3/24/2010 | 11.18 | 4.58 | 6.60 | -- | -- |
| AW-29 | 8/28/1990 | 13.73 | 5.29 | 8.44 | -- | -- |
| AW-29 | 7/23/1991 | 13.73 | 3.95 | 9.78 | -- | -- |
| AW-29 | 8/22/1991 | 13.73 | 4.54 | 9.19 | -- | -- |
| AW-29 | 9/26/1991 | 13.73 | 5.68 | 8.05 | -- | -- |
| AW-29 | 10/25-26/1991 | 13.73 | 5.86 | 7.87 | -- | -- |
| AW-29 | 11/26/1991 | 13.73 | 5.98 | 7.75 | -- | -- |
| AW-29 | 12/20/1991 | 13.73 | 6.19 | 7.54 | -- | -- |
| AW-29 | 1/20/1992 | 13.73 | 4.10 | 9.63 | -- | -- |
| AW-29 | 2/27-28/1992 | 13.73 | 4.86 | 8.87 | -- | -- |
| AW-29 | 3/23/1992 | 13.73 | 5.12 | 8.61 | -- | -- |
| AW-29 | 4/22/1992 | 13.73 | 4.02 | 9.71 | -- | -- |
| AW-29 | 5/27-28/1992 | 13.73 | 5.85 | 7.88 | -- | -- |
| AW-29 | 6/24/1992 | 13.73 | 4.83 | 8.90 | -- | -- |
| AW-29 | 7/27/1992 | 13.73 | 5.39 | 8.34 | -- | -- |
| AW-29 | 8/26/1992 | 13.73 | 2.81 | 10.92 | -- | -- |
| AW-29 | 9/29/1992 | 13.73 | 4.90 | 8.83 | -- | -- |
| AW-29 | 10/29/1992 | 13.73 | 5.20 | 8.53 | -- | -- |
| AW-29 | 11/25/1992 | 13.73 | 3.74 | 9.99 | -- | -- |
| AW-29 | 12/18/1992 | 13.73 | 4.77 | 8.96 | -- | -- |
| AW-29 | 1/28/1993 | 13.73 | 4.65 | 9.08 | -- | -- |
| AW-29 | 2/24/1993 | 13.73 | 5.04 | 8.69 | -- | -- |
| AW-29 | 3/30/1993 | 13.73 | 4.05 | 9.68 | -- | -- |
| AW-29 | 5/28/1993 | 13.73 | 6.02 | 7.71 | -- | -- |
| AW-29 | 8/9-10/1993 | 13.73 | 6.76 | 6.97 | -- | -- |
| AW-29 | 9/28/1993 | 13.73 | 5.90 | 7.83 | -- | -- |
| AW-29 | 10/29/1993 | 13.73 | 6.04 | 7.69 | -- | -- |
| AW-29 | 11/30/1993 | 13.73 | 4.95 | 8.78 | -- | -- |
| AW-29 | 12/27/1993 | 13.73 | 5.05 | 8.68 | -- | -- |
| AW-29 | 3/31/1994 | 13.73 | 5.43 | 8.30 | -- | -- |
| AW-29 | 9/9/1994 | 13.73 | 3.98 | 9.75 | -- | -- |
| AW-29 | 9/29/1994 | 13.73 | 4.89 | 8.84 | -- | -- |
| AW-29 | 11/23/1994 | 13.73 | 4.75 | 8.98 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-29 | 1/4/1995 | 13.73 | 4.62 | 9.11 | -- | -- |
| AW-29 | 2/8/1995 | 13.73 | 5.17 | 8.56 | -- | -- |
| AW-29 | 3/16/1995 | 13.73 | 5.18 | 8.55 | -- | -- |
| AW-29 | 5/25/1995 | 13.73 | 6.23 | 7.50 | -- | -- |
| AW-29 | 9/30/1995 | 13.73 | 4.69 | 9.04 | -- | -- |
| AW-29 | 10/2/2003 | 13.73 | 5.56 | 8.17 | -- | -- |
| AW-29 | 11/25-26/2008 | 12.68 | 4.45 | 8.23 | -- | -- |
| AW-29 | 3/5/2009 | 12.68 | 4.60 | 8.08 | -- | -- |
| AW-29 | 6/30/2009 | 12.68 | 5.37 | 7.31 | -- | -- |
| AW-29 | 9/23/2009 | 12.68 | 5.41 | 7.27 | -- | -- |
| AW-29 | 12/29/2009 | 12.68 | 4.08 | 8.60 | -- | -- |
| AW-30 | 8/28/1990 | 14.42 | 6.25 | 8.17 | -- | -- |
| AW-30 | 7/23/1991 | 14.42 | 3.45 | 10.99 | 3.42 | 0.03 |
| AW-30 | 8/22/1991 | 14.42 | 3.87 | 10.58 | 3.83 | 0.04 |
| AW-30 | 9/26/1991 | 14.42 | 5.58 | -- | 5.55 | 0.03 |
| AW-30 | 10/25-26/1991 | 14.42 | 6.15 | 8.29 | 6.13 | 0.02 |
| AW-30 | 11/26/1991 | 14.42 | 6.48 | 7.94 | -- | -- |
| AW-30 | 12/20/1991 | 14.42 | 6.66 | 7.76 | -- | -- |
| AW-30 | 1/20/1992 | 14.42 | 5.25 | 9.17 | -- | -- |
| AW-30 | 2/27-28/1992 | 14.42 | 4.54 | 9.88 | -- | -- |
| AW-30 | 3/23/1992 | 14.42 | 4.80 | 9.62 | -- | -- |
| AW-30 | 4/22/1992 | 14.42 | 3.50 | 10.92 | -- | -- |
| AW-30 | 5/27-28/1992 | 14.42 | 5.56 | 8.86 | -- | -- |
| AW-30 | 6/24/1992 | 14.42 | 4.10 | 10.32 | -- | -- |
| AW-30 | 7/27/1992 | 14.42 | 4.73 | 9.69 | -- | -- |
| AW-30 | 8/26/1992 | 14.42 | 2.48 | 11.94 | -- | -- |
| AW-30 | 9/29/1992 | 14.42 | 4.21 | 10.21 | -- | -- |
| AW-30 | 10/29/1992 | 14.42 | 4.98 | 9.44 | -- | -- |
| AW-30 | 11/25/1992 | 14.42 | 3.87 | 10.55 | -- | -- |
| AW-30 | 12/18/1992 | 14.42 | 4.59 | 9.83 | -- | -- |
| AW-30 | 1/28/1993 | 14.42 | 4.11 | 10.31 | -- | -- |
| AW-30 | 2/24/1993 | 14.42 | 4.74 | 9.68 | -- | -- |
| AW-30 | 3/30/1993 | 14.42 | 3.40 | 11.02 | -- | -- |
| AW-30 | 5/28/1993 | 14.42 | 6.00 | 8.42 | -- | -- |
| AW-30 | 8/9-10/1993 | 14.42 | 7.09 | 7.33 | -- | -- |
| AW-30 | 9/28/1993 | 14.42 | 6.26 | 8.16 | -- | -- |
| AW-30 | 10/29/1993 | 14.42 | 6.51 | 7.91 | -- | -- |
| AW-30 | 11/30/1993 | 14.42 | 5.48 | 8.94 | -- | -- |
| AW-30 | 12/27/1993 | 14.42 | 5.75 | 8.67 | -- | -- |
| AW-30 | 3/31/1994 | 14.42 | 5.69 | 8.73 | -- | -- |
| AW-30 | 9/9/1994 | 14.42 | 4.90 | 9.52 | -- | -- |
| AW-30 | 9/29/1994 | 14.42 | 9.03 | 5.86 | 8.44 | 0.59 |
| AW-30 | 11/23/1994 | 14.42 | 4.85 | 9.57 | -- | -- |
| AW-30 | 1/4/1995 | 14.42 | 4.89 | 9.53 | -- | -- |
| AW-30 | 2/8/1995 | 14.42 | 5.53 | 8.89 | -- | -- |
| AW-30 | 3/16/1995 | 14.42 | 5.46 | 8.96 | -- | -- |
| AW-30 | 5/25/1995 | 14.42 | 6.51 | 7.91 | -- | -- |
| AW-30 | 9/30/1995 | 14.42 | 4.79 | 9.63 | -- | -- |
| AW-30 | 10/2/2003 | 14.42 | 5.95 | 8.47 | -- | -- |
| AW-30 | 11/25-26/2008 | 13.40 | 3.60 | 9.80 | -- | -- |
| AW-30 | 3/5/2009 | 13.40 | 5.33 | 8.07 | -- | -- |
| AW-30 | 6/30/2009 | 13.40 | 5.43 | 7.97 | -- | -- |
| AW-30 | 9/23/2009 | 13.40 | 5.37 | 8.03 | -- | -- |
| AW-30 | 12/29/2009 | 13.40 | 3.22 | 10.18 | -- | -- |
| AW-31 | 8/28/1990 | 14.55 | 6.14 | 8.41 | -- | -- |
| AW-31 | 7/23/1991 | 14.55 | 4.63 | 9.92 | -- | -- |
| AW-31 | 8/22/1991 | 14.55 | 5.17 | 9.38 | -- | -- |
| AW-31 | 9/26/1991 | 14.55 | 6.55 | 8.00 | -- | -- |
| AW-31 | 10/25-26/1991 | 14.55 | 6.84 | 7.71 | -- | -- |
| AW-31 | 11/26/1991 | 14.55 | 7.17 | 7.38 | -- | -- |
| AW-31 | 12/20/1991 | 14.55 | 7.32 | 7.23 | -- | -- |
| AW-31 | 1/20/1992 | 14.55 | 5.09 | 9.46 | -- | -- |
| AW-31 | 3/23/1992 | 14.55 | 6.29 | 8.26 | -- | -- |
| AW-31 | 4/22/1992 | 14.55 | 4.89 | 9.66 | -- | -- |
| AW-31 | 5/27-28/1992 | 14.55 | 6.77 | 7.78 | -- | -- |
| AW-31 | 6/24/1992 | 14.55 | 5.55 | 9.00 | -- | -- |
| AW-31 | 7/27/1992 | 14.55 | 6.13 | 8.42 | -- | -- |
| AW-31 | 8/26/1992 | 14.55 | 3.58 | 10.97 | -- | -- |
| AW-31 | 9/29/1992 | 14.55 | 7.80 | 6.75 | -- | -- |
| AW-31 | 10/29/1992 | 14.55 | 6.18 | 8.37 | -- | -- |
| AW-31 | 11/25/1992 | 14.55 | 4.20 | 10.35 | -- | -- |
| AW-31 | 12/18/1992 | 14.55 | 5.72 | 8.83 | -- | -- |
| AW-31 | 1/28/1993 | 14.55 | 5.38 | 9.17 | -- | -- |
| AW-31 | 2/24/1993 | 14.55 | 5.91 | 8.64 | -- | -- |
| AW-31 | 3/30/1993 | 14.55 | 4.74 | 9.81 | -- | -- |
| AW-31 | 5/28/1993 | 14.55 | 6.81 | 7.74 | -- | -- |
| AW-31 | 8/9-10/1993 | 14.55 | 7.65 | 6.90 | -- | -- |
| AW-31 | 9/28/1993 | 14.55 | 7.02 | 7.53 | -- | -- |
| AW-31 | 10/29/1993 | 14.55 | 7.12 | 7.43 | -- | -- |
| AW-31 | 11/30/1993 | 14.55 | 5.87 | 8.68 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-31 | 12/27/1993 | 14.55 | 6.20 | 8.35 | -- | -- |
| AW-31 | 3/31/1994 | 14.55 | 6.37 | 8.18 | -- | -- |
| AW-31 | 9/9/1994 | 14.55 | 4.94 | 9.61 | -- | -- |
| AW-31 | 9/29/1994 | 14.55 | 5.66 | 8.89 | -- | -- |
| AW-31 | 11/23/1994 | 14.55 | 5.34 | 9.21 | -- | -- |
| AW-31 | 1/4/1995 | 14.55 | 5.34 | 9.21 | -- | -- |
| AW-31 | 2/8/1995 | 14.55 | 6.16 | 8.39 | -- | -- |
| AW-31 | 3/16/1995 | 14.55 | 6.01 | 8.54 | -- | -- |
| AW-31 | 5/25/1995 | 14.55 | 7.22 | 7.33 | -- | -- |
| AW-31 | 9/30/1995 | 14.55 | 5.28 | 9.27 | -- | -- |
| AW-31 | 10/2/2003 | 14.55 | 6.60 | 7.95 | -- | -- |
| AW-31 | 11/25-26/2008 | 10.30 | 2.30 | 8.00 | -- | -- |
| AW-31 | 3/5/2009 | 10.30 | 2.40 | 7.90 | -- | -- |
| AW-31 | 6/30/2009 | 10.30 | 2.33 | 7.97 | -- | -- |
| AW-31 | 9/23/2009 | 10.30 | 2.80 | 7.50 | -- | -- |
| AW-31 | 12/29/2009 | 10.30 | 1.78 | 8.52 | -- | -- |
| AW-32 | 8/28/1990 | 15.47 | 10.55 | 6.46 | 8.62 | 1.93 |
| AW-32 | 7/23/1991 | 15.47 | 9.00 | 7.90 | 7.21 | 1.79 |
| AW-32 | 8/22/1991 | 15.47 | 9.25 | 7.76 | 7.32 | 1.93 |
| AW-32 | 9/26/1991 | 15.47 | 10.33 | 5.97 | 9.29 | 1.04 |
| AW-32 | 10/25-26/1991 | 15.47 | 11.80 | 5.15 | 9.95 | 1.85 |
| AW-32 | 11/26/1991 | 15.47 | 13.16 | 4.19 | 10.81 | 2.35 |
| AW-32 | 12/20/1991 | 15.47 | 13.13 | 3.80 | 11.30 | 1.83 |
| AW-32 | 1/20/1992 | 15.47 | 9.83 | 6.36 | 8.93 | 0.90 |
| AW-32 | 3/23/1992 | 15.47 | 10.25 | 5.80 | 9.53 | 0.72 |
| AW-32 | 4/22/1992 | 15.47 | 8.56 | 7.65 | 7.63 | 0.93 |
| AW-32 | 5/27-28/1992 | 15.47 | 10.81 | 5.21 | 10.12 | 0.69 |
| AW-32 | 6/24/1992 | 15.47 | 9.19 | 7.29 | 7.93 | 1.26 |
| AW-32 | 7/27/1992 | 15.47 | 9.37 | 6.57 | 8.78 | 0.59 |
| AW-32 | 8/26/1992 | 15.47 | 7.35 | 8.61 | 6.74 | 0.61 |
| AW-32 | 9/29/1992 | 15.47 | 8.90 | 7.38 | 7.89 | 1.01 |
| AW-32 | 10/29/1992 | 15.47 | 9.01 | 6.84 | 8.54 | 0.47 |
| AW-32 | 11/25/1992 | 15.47 | 8.46 | 7.99 | 7.24 | 1.22 |
| AW-32 | 12/18/1992 | 15.47 | 8.69 | 7.20 | 8.16 | 0.53 |
| AW-32 | 1/28/1993 | 15.47 | 8.55 | 7.79 | 7.46 | 1.09 |
| AW-32 | 2/24/1993 | 15.47 | 8.94 | 7.12 | 8.20 | 0.74 |
| AW-32 | 3/30/1993 | 15.47 | 7.82 | 7.99 | 7.40 | 0.42 |
| AW-32 | 5/28/1993 | 15.47 | 11.92 | 4.97 | 10.14 | 1.78 |
| AW-32 | 8/9-10/1993 | 15.47 | 12.87 | 4.22 | 10.85 | 2.02 |
| AW-32 | 9/28/1993 | 15.47 | 10.76 | 5.45 | 9.83 | 0.93 |
| AW-32 | 10/29/1993 | 15.47 | 11.85 | 4.82 | 10.35 | 1.50 |
| AW-32 | 11/30/1993 | 15.47 | 9.46 | 6.65 | 8.66 | 0.80 |
| AW-32 | 12/27/1993 | 15.47 | 11.57 | 4.99 | 10.21 | 1.36 |
| AW-32 | 3/31/1994 | 15.47 | 10.40 | 5.51 | 9.85 | 0.55 |
| AW-32 | 9/9/1994 | 15.47 | 8.04 | 7.73 | 7.67 | 0.37 |
| AW-32 | 9/29/1994 | 15.47 | 8.18 | 7.60 | 7.79 | 0.39 |
| AW-32 | 11/23/1994 | 15.47 | 18.20 | 5.76 | 7.59 | 10.61 |
| AW-32 | 1/4/1995 | 15.47 | 7.98 | 7.72 | 7.69 | 0.29 |
| AW-32 | 2/8/1995 | 15.47 | 8.65 | 6.90 | 8.55 | 0.10 |
| AW-32 | 3/16/1995 | 15.47 | 8.96 | 6.89 | 8.48 | 0.48 |
| AW-32 | 5/25/1995 | 15.47 | 10.40 | 5.20 | 10.24 | 0.16 |
| AW-32 | 9/30/1995 | 15.47 | 8.82 | 7.44 | 7.83 | 0.99 |
| AW-32 | 10/2/2003 | 15.47 | 9.83 | 5.72 | 9.73 | 0.10 |
| AW-32 | 11/25-26/2008 | 14.39 | 9.50 | 4.89 | -- | -- |
| AW-32 | 3/6/2009 | 14.39 | 10.79 | 3.60 | -- | -- |
| AW-32 | 6/30/2009 | 14.39 | 9.23 | 5.16 | -- | -- |
| AW-32 | 9/23/2009 | 14.39 | 9.67 | 4.72 | -- | -- |
| AW-32 | 12/29/2009 | 14.39 | 9.05 | 5.34 | -- | -- |
| AW-33 | 8/28/1990 | 14.18 | 5.97 | 8.21 | -- | -- |
| AW-33 | 7/23/1991 | 14.18 | 4.68 | 9.50 | -- | -- |
| AW-33 | 8/22/1991 | 14.18 | 5.16 | 9.02 | -- | -- |
| AW-33 | 9/26/1991 | 14.18 | 6.02 | 8.16 | -- | -- |
| AW-33 | 10/25-26/1991 | 14.18 | 6.38 | 7.80 | -- | -- |
| AW-33 | 11/26/1991 | 14.18 | 6.65 | 7.53 | -- | -- |
| AW-33 | 12/20/1991 | 14.18 | 6.59 | 7.59 | -- | -- |
| AW-33 | 1/20/1992 | 14.18 | 5.16 | 9.02 | -- | -- |
| AW-33 | 3/23/1992 | 14.18 | 5.83 | 8.35 | -- | -- |
| AW-33 | 4/22/1992 | 14.18 | 5.05 | 9.13 | -- | -- |
| AW-33 | 5/27-28/1992 | 14.18 | 6.27 | 7.91 | -- | -- |
| AW-33 | 6/24/1992 | 14.18 | 5.35 | 8.83 | -- | -- |
| AW-33 | 7/27/1992 | 14.18 | 5.70 | 8.48 | -- | -- |
| AW-33 | 8/26/1992 | 14.18 | 4.25 | 9.93 | -- | -- |
| AW-33 | 9/29/1992 | 14.18 | 5.45 | 8.73 | -- | -- |
| AW-33 | 11/25/1992 | 14.18 | 14.94 | -0.76 | -- | -- |
| AW-33 | 12/18/1992 | 14.18 | 5.53 | 8.65 | -- | -- |
| AW-33 | 1/28/1993 | 14.18 | 5.34 | 8.84 | -- | -- |
| AW-33 | 2/24/1993 | 14.18 | 5.63 | 8.55 | -- | -- |
| AW-33 | 3/30/1993 | 14.18 | 4.91 | 9.27 | -- | -- |
| AW-33 | 5/28/1993 | 14.18 | 6.33 | 7.85 | -- | -- |
| AW-33 | 8/9-10/1993 | 14.18 | 7.03 | 7.15 | -- | -- |
| AW-33 | 9/28/1993 | 14.18 | 6.27 | 7.91 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-33 | 10/29/1993 | 14.18 | 6.46 | 7.72 | -- | -- |
| AW-33 | 11/30/1993 | 14.18 | 5.75 | 8.43 | -- | -- |
| AW-33 | 12/27/1993 | 14.18 | 5.83 | 8.35 | -- | -- |
| AW-33 | 3/31/1994 | 14.18 | 5.79 | 8.39 | -- | -- |
| AW-33 | 9/9/1994 | 14.18 | 4.93 | 9.25 | -- | -- |
| AW-33 | 9/29/1994 | 14.18 | 5.34 | 8.84 | 5.33 | 0.01 |
| AW-33 | 11/23/1994 | 14.18 | 5.20 | 8.98 | -- | -- |
| AW-33 | 1/4/1995 | 14.18 | 5.21 | 8.97 | -- | -- |
| AW-33 | 2/8/1995 | 14.18 | 5.64 | 8.54 | -- | -- |
| AW-33 | 3/16/1995 | 14.18 | 5.64 | 8.54 | -- | -- |
| AW-33 | 5/25/1995 | 14.18 | 6.45 | 7.73 | -- | -- |
| AW-33 | 9/30/1995 | 14.18 | 5.11 | 9.07 | -- | -- |
| AW-33 | 10/2/2003 | 14.18 | 5.91 | 8.27 | -- | -- |
| AW-33 | 11/25-26/2008 | 13.08 | 5.32 | 7.76 | -- | -- |
| AW-33 | 3/5/2009 | 13.08 | 5.40 | 7.68 | -- | -- |
| AW-33 | 6/30/2009 | 13.08 | 5.31 | 7.77 | -- | -- |
| AW-33 | 9/23/2009 | 13.08 | 5.60 | 7.48 | -- | -- |
| AW-33 | 12/29/2009 | 13.08 | 4.58 | 8.50 | -- | -- |
| AW-34 | 8/28/1990 | 14.30 | 7.32 | 6.98 | 6.58 | 0.74 |
| AW-34 | 7/23/1991 | 14.30 | 5.99 | 8.82 | 5.39 | 0.60 |
| AW-34 | 8/22/1991 | 14.30 | 6.16 | 8.78 | 5.41 | 0.75 |
| AW-34 | 9/26/1991 | 14.30 | 7.12 | 7.99 | 6.17 | 0.95 |
| AW-34 | 10/25-26/1991 | 14.30 | 8.49 | 6.69 | 7.46 | 1.03 |
| AW-34 | 11/26/1991 | 14.30 | 10.03 | 5.28 | 8.84 | 1.19 |
| AW-34 | 12/20/1991 | 14.30 | 10.37 | 5.02 | 9.09 | 1.28 |
| AW-34 | 1/20/1992 | 14.30 | 6.98 | 7.86 | 6.35 | 0.63 |
| AW-34 | 3/23/1992 | 14.30 | 7.46 | 7.52 | 6.66 | 0.80 |
| AW-34 | 4/22/1992 | 14.30 | 6.80 | 7.76 | 6.50 | 0.30 |
| AW-34 | 5/27-28/1992 | 14.30 | 7.49 | 7.52 | 6.66 | 0.83 |
| AW-34 | 6/24/1992 | 14.30 | 6.24 | 8.48 | 5.75 | 0.49 |
| AW-34 | 7/27/1992 | 14.30 | 6.63 | 8.17 | 6.04 | 0.59 |
| AW-34 | 8/26/1992 | 14.30 | 5.95 | 9.19 | 4.96 | 0.99 |
| AW-34 | 9/29/1992 | 14.30 | 6.24 | 8.45 | 5.78 | 0.46 |
| AW-34 | 11/25/1992 | 14.30 | 6.48 | 8.05 | 6.21 | 0.27 |
| AW-34 | 12/18/1992 | 14.30 | 6.71 | 8.02 | 6.20 | 0.51 |
| AW-34 | 1/28/1993 | 14.30 | 6.36 | 8.20 | 6.06 | 0.30 |
| AW-34 | 2/24/1993 | 14.30 | 6.10 | 8.47 | 5.78 | 0.32 |
| AW-34 | 3/30/1993 | 14.30 | 6.12 | 8.43 | 5.83 | 0.29 |
| AW-34 | 5/28/1993 | 14.30 | 8.84 | 6.13 | 8.05 | 0.79 |
| AW-34 | 8/9-10/1993 | 14.30 | 10.85 | 4.39 | 9.74 | 1.11 |
| AW-34 | 9/28/1993 | 14.30 | 7.47 | 7.43 | 6.76 | 0.71 |
| AW-34 | 10/29/1993 | 14.30 | 7.93 | 6.80 | 7.42 | 0.51 |
| AW-34 | 11/30/1993 | 14.30 | 6.23 | 8.38 | 5.87 | 0.36 |
| AW-34 | 12/27/1993 | 14.30 | 7.10 | 7.73 | 6.48 | 0.62 |
| AW-34 | 3/31/1994 | 14.30 | 7.19 | 7.60 | 6.61 | 0.58 |
| AW-34 | 9/9/1994 | 14.30 | 6.28 | 8.47 | 5.75 | 0.53 |
| AW-34 | 9/29/1994 | 14.30 | 6.22 | 8.39 | 5.85 | 0.37 |
| AW-34 | 11/23/1994 | 14.30 | 6.17 | 8.42 | 5.83 | 0.34 |
| AW-34 | 1/4/1995 | 14.30 | 6.18 | 8.38 | 5.87 | 0.31 |
| AW-34 | 2/8/1995 | 14.30 | 6.66 | 7.92 | 6.33 | 0.33 |
| AW-34 | 3/16/1995 | 14.30 | 6.68 | 7.97 | 6.27 | 0.41 |
| AW-34 | 5/25/1995 | 14.30 | 8.75 | 6.01 | 8.21 | 0.54 |
| AW-34 | 9/30/1995 | 14.30 | 5.89 | 8.76 | 5.48 | 0.41 |
| AW-34 | 9/30/1995 | 14.30 | 5.89 | 8.76 | 5.48 | 0.41 |
| AW-34 | 10/2/2003 | 14.30 | 7.53 | 6.77 | -- | -- |
| AW-34 | 11/25-26/2008 | 13.27 | 7.82 | 5.45 | -- | -- |
| AW-34 | 3/6/2009 | 13.27 | 9.13 | 4.14 | -- | -- |
| AW-34 | 6/30/2009 | 13.27 | 8.15 | 5.12 | -- | -- |
| AW-34 | 9/23/2009 | 13.27 | 8.28 | 4.99 | -- | -- |
| AW-34 | 12/29/2009 | 13.27 | 7.65 | 5.62 | -- | -- |
| AW-35 | 8/28/1990 | 15.03 | 7.38 | 7.65 | -- | -- |
| AW-35 | 7/23/1991 | 15.03 | 5.45 | 9.58 | -- | -- |
| AW-35 | 8/22/1991 | 15.03 | 5.69 | 9.34 | -- | -- |
| AW-35 | 9/26/1991 | 15.03 | 6.65 | 8.38 | -- | -- |
| AW-35 | 10/25-26/1991 | 15.03 | 7.31 | 7.72 | -- | -- |
| AW-35 | 11/26/1991 | 15.03 | 7.85 | 7.18 | -- | -- |
| AW-35 | 12/20/1991 | 15.03 | 8.32 | 6.71 | -- | -- |
| AW-35 | 1/20/1992 | 15.03 | 7.36 | 7.67 | -- | -- |
| AW-35 | 3/23/1992 | 15.03 | 7.77 | 7.26 | -- | -- |
| AW-35 | 4/22/1992 | 15.03 | 7.50 | 7.53 | -- | -- |
| AW-35 | 5/27-28/1992 | 15.03 | 8.33 | 6.70 | -- | -- |
| AW-35 | 6/24/1992 | 15.03 | 6.82 | 8.21 | -- | -- |
| AW-35 | 7/27/1992 | 15.03 | 7.25 | 7.78 | -- | -- |
| AW-35 | 8/26/1992 | 15.03 | 5.46 | 9.57 | -- | -- |
| AW-35 | 9/29/1992 | 15.03 | 6.78 | 8.25 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-35 | 11/25/1992 | 15.03 | 7.38 | 7.65 | -- | -- |
| AW-35 | 12/18/1992 | 15.03 | 6.05 | 8.98 | -- | -- |
| AW-35 | 1/28/1993 | 15.03 | -- | -- | -- | -- |
| AW-35 | 2/24/1993 | 15.03 | -- | -- | -- | -- |
| AW-35 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-35 | 5/28/1993 | -- | -- | -- | -- | -- |
| AW-35 | 8/9-10/1993 | -- | -- | -- | -- | -- |
| AW-35 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-35 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-35 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-35 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-35 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-35 | 9/9/1994 | -- | -- | -- | -- | -- |
| AW-35 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-35 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-35 | 1/4/1995 | Well Not Present | | | | |
| AW-35 | 2/8/1995 | Well Not Present | | | | |
| AW-35 | 3/16/1995 | Well Not Present | | | | |
| AW-35 | 5/25/1995 | Well Not Present | | | | |
| AW-35 | 9/30/1995 | 15.03 | -- | -- | -- | -- |
| AW-36 | 8/28/1990 | 14.65 | 9.91 | 4.74 | 9.91 | <0.01 |
| AW-36 | 7/23/1991 | 14.65 | 7.71 | 8.33 | 6.09 | 1.62 |
| AW-36 | 8/22/1991 | 14.65 | 7.91 | 7.69 | 6.80 | 1.11 |
| AW-36 | 9/26/1991 | 14.65 | 8.88 | 6.73 | 7.76 | 1.12 |
| AW-36 | 10/25-26/1991 | 14.65 | 9.24 | 6.34 | 8.16 | 1.08 |
| AW-36 | 11/26/1991 | 14.65 | 9.58 | 6.00 | 8.50 | 1.08 |
| AW-36 | 12/20/1991 | 14.65 | 9.45 | 6.15 | 8.34 | 1.11 |
| AW-36 | 1/20/1992 | 14.65 | 7.79 | 7.71 | 6.80 | 0.99 |
| AW-36 | 3/23/1992 | 14.65 | 7.55 | 7.82 | 6.71 | 0.84 |
| AW-36 | 4/22/1992 | 14.65 | 6.11 | 9.14 | 5.41 | 0.70 |
| AW-36 | 5/27-28/1992 | 14.65 | 7.94 | 7.37 | 7.17 | 0.77 |
| AW-36 | 6/24/1992 | 14.65 | 6.62 | 8.62 | 5.93 | 0.69 |
| AW-36 | 7/27/1992 | 14.65 | 7.29 | 7.99 | 6.56 | 0.73 |
| AW-36 | 8/26/1992 | 14.65 | 4.03 | 10.01 | 4.74 | 0.71 |
| AW-36 | 9/29/1992 | 14.65 | 6.93 | 8.35 | 6.20 | 0.73 |
| AW-36 | 11/25/1992 | 14.65 | 5.46 | 9.68 | 4.89 | 0.57 |
| AW-36 | 12/18/1992 | 14.65 | 6.51 | 8.56 | 6.02 | 0.49 |
| AW-36 | 1/28/1993 | 14.65 | 5.94 | 9.11 | 5.48 | 0.46 |
| AW-36 | 2/24/1993 | 14.65 | 6.00 | 9.68 | 4.80 | 1.20 |
| AW-36 | 3/30/1993 | 14.65 | 5.22 | 9.84 | 4.74 | 0.48 |
| AW-36 | 5/28/1993 | 14.65 | 7.53 | 7.53 | 7.05 | 0.48 |
| AW-36 | 8/9-10/1993 | 14.65 | 9.17 | 6.15 | 8.39 | 0.78 |
| AW-36 | 9/28/1993 | 14.65 | 8.00 | 7.10 | 7.48 | 0.52 |
| AW-36 | 10/29/1993 | 14.65 | 7.33 | 7.74 | 6.84 | 0.49 |
| AW-36 | 11/30/1993 | 14.65 | 6.19 | 8.68 | 5.94 | 0.25 |
| AW-36 | 12/27/1993 | 14.65 | 6.62 | 8.31 | 6.29 | 0.33 |
| AW-36 | 3/31/1994 | 14.65 | 6.39 | 8.46 | 6.16 | 0.23 |
| AW-36 | 9/9/1994 | 14.65 | 5.27 | 9.53 | 5.10 | 0.17 |
| AW-36 | 9/29/1994 | 14.65 | 6.36 | 8.79 | 5.77 | 0.59 |
| AW-36 | 11/23/1994 | 14.65 | 5.47 | 9.28 | 5.35 | 0.12 |
| AW-36 | 1/4/1995 | 14.65 | 5.18 | 9.69 | 4.93 | 0.25 |
| AW-36 | 2/8/1995 | 14.65 | 6.28 | 8.58 | 6.04 | 0.24 |
| AW-36 | 3/16/1995 | 14.65 | 6.29 | 8.77 | 5.81 | 0.48 |
| AW-36 | 5/25/1995 | 14.65 | DRY | -- | -- | -- |
| AW-36 | 9/30/1995 | 14.65 | 5.51 | 9.24 | 5.39 | 0.12 |
| AW-36 | 11/25-26/2008 | 13.65 | 4.35 | 9.30 | -- | -- |
| AW-36 | 3/6/2009 | 13.65 | 5.40 | 8.25 | -- | -- |
| AW-36 | 6/30/2009 | 13.65 | 5.81 | 7.84 | -- | -- |
| AW-36 | 9/23/2009 | 13.65 | 6.00 | 7.65 | -- | -- |
| AW-36 | 12/29/2009 | 13.65 | 4.31 | 9.34 | -- | -- |
| AW-37 | 8/28/1990 | 14.83 | 10.96 | 3.87 | -- | -- |
| AW-37 | 7/23/1991 | 14.83 | 10.16 | 4.67 | -- | -- |
| AW-37 | 8/22/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 9/26/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 11/26/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 12/20/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 1/20/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 3/23/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 4/22/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 5/27-28/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 6/24/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 7/27/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 8/26/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 9/29/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 11/25/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 12/18/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 1/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 1/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 3/30/1993 | 14.83 | Well Not Present | | | |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-37 | 5/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 8/9-10/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 9/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 9/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 11/30/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 12/27/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 3/31/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 9/9/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 9/29/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 11/23/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 1/4/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 2/8/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 3/16/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 3/16/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 9/30/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 11/25-26/2008 | 14.33 | 11.20 | 3.83 | 10.32 | 0.88 |
| AW-37 | 3/5/2009 | 14.33 | 12.09 | 2.26 | 12.06 | 0.03 |
| AW-37 | 6/30/2009 | 14.33 | 11.57 | 2.88 | 11.43 | 0.14 |
| AW-37 | 9/23/2009 | 14.33 | 11.02 | 3.32 | 11.01 | 0.01 |
| AW-37 | 12/29/2009 | 14.33 | 10.95 | 3.43 | 10.89 | 0.06 |
| AW-37 | 3/24/2010 | 14.33 | 11.51 | 2.90 | 11.42 | 0.09 |
| AW-38 | 8/28/1990 | 12.03 | 17.60 | 4.40 | 5.92 | 11.68 |
| AW-38 | 7/23/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 8/22/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 9/26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 10/25-26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 11/26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 12/20/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 1/20/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 3/23/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 4/22/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 5/27-28/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 6/24/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 7/27/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 8/26/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 9/29/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 11/25/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 12/18/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 1/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 1/28/1993 | 12.03 | 8.02 | 4.03 | 7.99 | 0.03 |
| AW-38 | 3/30/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 5/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 8/9-10/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 9/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 9/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 11/30/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 12/27/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 3/31/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 9/9/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 9/29/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 11/23/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 1/4/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 2/8/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 3/16/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 3/16/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 9/30/1995 | 12.03 | Recovery Well | | | |
| AW-39 | 8/28/1990 | 12.41 | 11.65 | 4.82 | 6.70 | 4.95 |
| AW-39 | 7/23/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 8/22/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 9/26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 10/25-26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 11/26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 12/20/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 1/20/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 3/23/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 4/22/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 5/27-28/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 6/24/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 7/27/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 8/26/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 9/29/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 11/25/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 12/18/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 1/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 1/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 3/30/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 5/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 8/9-10/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 9/28/1993 | 12.41 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-39 | 9/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 11/30/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 12/27/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 3/31/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 9/9/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 9/29/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 11/23/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 1/4/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 2/8/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 3/16/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 3/16/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 9/30/1995 | 12.41 | Recovery Well | | | |
| AW-40 | 8/28/1990 | 11.81 | 6.43 | 5.97 | 5.74 | 0.69 |
| AW-40 | 7/23/1991 | 11.81 | 4.80 | 7.63 | 4.33 | 0.47 |
| AW-40 | 8/22/1991 | 11.81 | 4.54 | 7.64 | 4.10 | 0.44 |
| AW-40 | 9/26/1991 | 11.81 | 5.28 | 6.99 | 4.72 | 0.56 |
| AW-40 | 10/25-26/1991 | 11.81 | 5.28 | 6.98 | 4.74 | 0.54 |
| AW-40 | 11/26/1991 | 11.81 | 5.40 | 6.81 | 4.92 | 0.48 |
| AW-40 | 12/20/1991 | 11.81 | 5.57 | 6.63 | 5.10 | 0.47 |
| AW-40 | 1/20/1992 | 11.81 | 4.41 | 7.72 | 4.03 | 0.38 |
| AW-40 | 3/23/1992 | 11.81 | 4.98 | 7.24 | 4.49 | 0.49 |
| AW-40 | 4/22/1992 | 11.81 | 3.91 | 8.17 | 3.59 | 0.32 |
| AW-40 | 5/27-28/1992 | 11.81 | 5.27 | 6.93 | 4.80 | 0.47 |
| AW-40 | 6/24/1992 | 11.81 | 4.40 | 7.74 | 4.00 | 0.40 |
| AW-40 | 7/27/1992 | 11.81 | 4.78 | 7.34 | 4.41 | 0.37 |
| AW-40 | 8/26/1992 | 11.81 | 2.58 | 9.59 | 2.15 | 0.43 |
| AW-40 | 9/29/1992 | 11.81 | 4.30 | 7.75 | 4.01 | 0.29 |
| AW-40 | 11/25/1992 | 11.81 | 2.91 | 8.92 | 2.89 | 0.02 |
| AW-40 | 12/18/1992 | 11.81 | 4.07 | 7.86 | 3.92 | 0.15 |
| AW-40 | 1/28/1993 | 11.81 | 4.10 | 8.47 | 3.19 | 0.91 |
| AW-40 | 2/24/1993 | 11.81 | 4.43 | 7.60 | 4.17 | 0.26 |
| AW-40 | 3/30/1993 | 11.81 | 3.42 | 8.49 | 3.30 | 0.12 |
| AW-40 | 5/28/1993 | 11.81 | 5.38 | 6.71 | 5.04 | 0.34 |
| AW-40 | 8/9-10/1993 | 11.81 | 5.58 | 6.42 | 5.35 | 0.23 |
| AW-40 | 9/28/1993 | 11.81 | 4.92 | 7.07 | 4.70 | 0.22 |
| AW-40 | 10/29/1993 | 11.81 | 5.00 | 7.02 | 4.75 | 0.25 |
| AW-40 | 11/30/1993 | 11.81 | 4.11 | 7.79 | 4.00 | 0.11 |
| AW-40 | 12/27/1993 | 11.81 | 4.37 | 7.58 | 4.20 | 0.17 |
| AW-40 | 3/31/1994 | 11.81 | 4.64 | 7.22 | 4.58 | 0.06 |
| AW-40 | 9/9/1994 | 11.81 | 3.00 | 8.81 | -- | -- |
| AW-40 | 9/29/1994 | 11.81 | 3.69 | 5.94 | 6.32 | 2.63 |
| AW-40 | 11/23/1994 | 11.81 | 3.66 | 8.15 | -- | -- |
| AW-40 | 1/4/1995 | 11.81 | 3.83 | 7.98 | -- | -- |
| AW-40 | 2/8/1995 | 11.81 | 4.35 | 7.46 | -- | -- |
| AW-40 | 3/16/1995 | 11.81 | 4.35 | 7.46 | -- | -- |
| AW-40 | 5/25/1995 | 11.81 | 5.03 | 6.78 | -- | -- |
| AW-40 | 9/30/1995 | 11.81 | DRY | | | |
| AW-41 | 8/28/1990 | 16.14 | 9.49 | 6.65 | -- | -- |
| AW-41 | 7/23/1991 | 16.14 | 4.68 | 7.73 | -- | -- |
| AW-41 | 8/22/1991 | 16.14 | 8.75 | 7.39 | -- | -- |
| AW-41 | 9/26/1991 | 16.14 | 9.38 | 6.76 | -- | -- |
| AW-41 | 10/25-26/1991 | 16.14 | 9.93 | 6.21 | -- | -- |
| AW-41 | 11/26/1991 | 16.14 | 9.93 | 6.21 | -- | -- |
| AW-41 | 12/20/1991 | 16.14 | 10.25 | 5.89 | -- | -- |
| AW-41 | 1/20/1992 | 16.14 | 5.89 | 10.25 | -- | -- |
| AW-41 | 3/23/1992 | 16.14 | 9.08 | 7.06 | -- | -- |
| AW-41 | 4/22/1992 | 16.14 | 8.38 | 7.76 | -- | -- |
| AW-41 | 5/27-28/1992 | 16.14 | 9.35 | 6.79 | -- | -- |
| AW-41 | 6/24/1992 | 16.14 | 8.72 | 7.42 | -- | -- |
| AW-41 | 7/27/1992 | 16.14 | 9.20 | 6.94 | -- | -- |
| AW-41 | 8/26/1992 | 16.14 | 7.74 | 8.40 | -- | -- |
| AW-41 | 9/29/1992 | 16.14 | 8.88 | 7.26 | -- | -- |
| AW-41 | 11/25/1992 | 16.14 | 8.52 | 7.62 | -- | -- |
| AW-41 | 12/18/1992 | 16.14 | 9.06 | 7.08 | -- | -- |
| AW-41 | 1/28/1993 | 16.14 | 8.82 | 7.32 | -- | -- |
| AW-41 | 2/24/1993 | 16.14 | 9.16 | 6.98 | -- | -- |
| AW-41 | 3/30/1993 | 16.14 | 8.45 | 7.69 | -- | -- |
| AW-41 | 5/28/1993 | 16.14 | 1.10 | 15.04 | -- | -- |
| AW-41 | 8/9-10/1993 | 16.14 | 10.51 | 5.63 | -- | -- |
| AW-41 | 9/28/1993 | 16.14 | 9.85 | 6.29 | -- | -- |
| AW-41 | 10/29/1993 | 16.14 | 9.85 | 6.29 | -- | -- |
| AW-41 | 11/30/1993 | 16.14 | 9.30 | 6.84 | -- | -- |
| AW-41 | 12/27/1993 | 16.14 | 9.37 | 6.77 | -- | -- |
| AW-41 | 3/31/1994 | 16.14 | 9.51 | 6.63 | -- | -- |
| AW-41 | 9/9/1994 | 16.14 | 8.87 | 7.27 | -- | -- |
| AW-41 | 9/29/1994 | 16.14 | 9.39 | 6.75 | -- | -- |
| AW-41 | 11/23/1994 | 16.14 | 9.07 | 7.07 | -- | -- |
| AW-41 | 1/4/1995 | 16.14 | 8.85 | 7.29 | -- | -- |
| AW-41 | 2/8/1995 | 16.14 | 9.53 | 6.61 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-41 | 3/16/1995 | 16.14 | 9.29 | 6.85 | -- | -- |
| AW-41 | 5/25/1995 | 16.14 | 8.61 | 7.53 | -- | -- |
| AW-41 | 9/30/1995 | 16.14 | 9.06 | 7.08 | -- | -- |
| AW-41 | 9/23/2009 | 15.15 | 9.28 | 5.87 | -- | -- |
| AW-41 | 12/29/2009 | 15.15 | 8.11 | 7.04 | -- | -- |
| AW-42 | 8/28/1990 | 11.29 | 6.18 | 5.11 | -- | -- |
| AW-42 | 7/23/1991 | 11.29 | 5.71 | 6.10 | -- | -- |
| AW-42 | 8/22/1991 | 11.29 | 5.42 | 5.87 | -- | -- |
| AW-42 | 9/26/1991 | 11.29 | 6.28 | 5.01 | -- | -- |
| AW-42 | 10/25-26/1991 | 11.29 | 6.65 | 4.64 | -- | -- |
| AW-42 | 11/26/1991 | 11.29 | 7.43 | 3.86 | -- | -- |
| AW-42 | 12/20/1991 | 11.29 | 7.75 | 3.54 | -- | -- |
| AW-42 | 1/20/1992 | 11.29 | 6.29 | 5.00 | -- | -- |
| AW-42 | 3/23/1992 | 11.29 | 6.90 | 4.39 | -- | -- |
| AW-42 | 4/22/1992 | 11.29 | 6.17 | 5.12 | -- | -- |
| AW-42 | 5/27-28/1992 | 11.29 | 6.96 | 4.33 | -- | -- |
| AW-42 | 6/24/1992 | 11.29 | 5.99 | 5.30 | -- | -- |
| AW-42 | 7/27/1992 | 11.29 | 6.45 | 4.84 | -- | -- |
| AW-42 | 8/26/1992 | 11.29 | 5.10 | 6.19 | -- | -- |
| AW-42 | 9/29/1992 | 11.29 | 5.87 | 5.42 | -- | -- |
| AW-42 | 11/25/1992 | 11.29 | 5.82 | 5.47 | -- | -- |
| AW-42 | 12/18/1992 | 11.29 | 6.31 | 4.98 | -- | -- |
| AW-42 | 1/28/1993 | 11.29 | 5.46 | 5.83 | -- | -- |
| AW-42 | 2/24/1993 | 11.29 | 6.24 | 5.05 | -- | -- |
| AW-42 | 3/30/1993 | 11.29 | 5.13 | 6.16 | -- | -- |
| AW-42 | 5/28/1993 | 11.29 | 7.28 | 4.01 | -- | -- |
| AW-42 | 8/9-10/1993 | 11.29 | 7.54 | 3.75 | -- | -- |
| AW-42 | 9/28/1993 | 11.29 | 7.07 | 4.22 | -- | -- |
| AW-42 | 10/29/1993 | 11.29 | 6.70 | 4.59 | -- | -- |
| AW-42 | 11/30/1993 | 11.29 | 6.45 | 4.84 | -- | -- |
| AW-42 | 12/27/1993 | 11.29 | 6.99 | 4.30 | -- | -- |
| AW-42 | 3/31/1994 | 11.29 | 6.75 | 4.54 | -- | -- |
| AW-42 | 9/9/1994 | 11.29 | 5.55 | 5.74 | -- | -- |
| AW-42 | 9/29/1994 | 11.29 | 6.08 | 5.21 | -- | -- |
| AW-42 | 11/23/1994 | 11.29 | 5.75 | 5.54 | -- | -- |
| AW-42 | 1/4/1995 | 11.29 | 5.66 | 5.63 | -- | -- |
| AW-42 | 2/8/1995 | 11.29 | 6.54 | 4.75 | -- | -- |
| AW-42 | 3/16/1995 | 11.29 | 6.16 | 5.13 | -- | -- |
| AW-42 | 5/25/1995 | 11.29 | 7.12 | 4.17 | -- | -- |
| AW-42 | 9/30/1995 | 11.29 | 5.58 | 5.71 | -- | -- |
| AW-42 | 10/2/2003 | 11.29 | 6.50 | 4.79 | -- | -- |
| AW-42 | 11/25-26/2008 | 9.43 | 1.50 | 7.93 | -- | -- |
| AW-42 | 3/5/2009 | 9.43 | 1.49 | 7.94 | -- | -- |
| AW-42 | 6/30/2009 | 9.43 | 1.50 | 7.93 | -- | -- |
| AW-42 | 9/23/2009 | 9.43 | 1.94 | 7.49 | -- | -- |
| AW-42 | 12/29/2009 | 9.43 | 0.95 | 8.48 | -- | -- |
| AW-43 | 8/28/1990 | 10.68 | 3.35 | 7.33 | -- | -- |
| AW-43 | 7/23/1991 | 10.68 | 6.48 | 9.66 | -- | -- |
| AW-43 | 8/22/1991 | 10.68 | 1.22 | 9.46 | -- | -- |
| AW-43 | 9/26/1991 | 10.68 | 2.60 | 8.08 | -- | -- |
| AW-43 | 10/25-26/1991 | 10.68 | 2.92 | 7.76 | -- | -- |
| AW-43 | 11/26/1991 | 10.68 | 3.31 | 7.37 | -- | -- |
| AW-43 | 12/20/1991 | 10.68 | 3.47 | 7.21 | -- | -- |
| AW-43 | 1/20/1992 | 10.68 | 2.28 | 8.40 | -- | -- |
| AW-43 | 3/23/1992 | 10.68 | 1.60 | 9.08 | -- | -- |
| AW-43 | 4/22/1992 | 10.68 | 1.11 | 9.57 | -- | -- |
| AW-43 | 5/27-28/1992 | 10.68 | 2.42 | 8.26 | -- | -- |
| AW-43 | 6/24/1992 | 10.68 | 1.06 | 9.62 | -- | -- |
| AW-43 | 7/27/1992 | 10.68 | 1.46 | 9.22 | -- | -- |
| AW-43 | 8/26/1992 | 10.68 | 0.35 | 10.33 | -- | -- |
| AW-43 | 9/29/1992 | 10.68 | 1.00 | 9.68 | -- | -- |
| AW-43 | 11/25/1992 | 10.68 | 1.15 | 9.53 | -- | -- |
| AW-43 | 12/18/1992 | 10.68 | 1.51 | 9.17 | -- | -- |
| AW-43 | 1/28/1993 | 10.68 | 1.02 | 9.66 | -- | -- |
| AW-43 | 2/24/1993 | 10.68 | 1.59 | 9.09 | -- | -- |
| AW-43 | 3/30/1993 | 10.68 | 0.74 | 9.94 | -- | -- |
| AW-43 | 5/28/1993 | 10.68 | 2.80 | 7.88 | -- | -- |
| AW-43 | 8/9-10/1993 | 10.68 | 3.89 | 6.79 | -- | -- |
| AW-43 | 9/28/1993 | 10.68 | 3.21 | 7.47 | -- | -- |
| AW-43 | 10/29/1993 | 10.68 | 3.44 | 7.24 | -- | -- |
| AW-43 | 11/30/1993 | 10.68 | 2.39 | 8.29 | -- | -- |
| AW-43 | 12/27/1993 | 10.68 | 2.45 | 8.23 | -- | -- |
| AW-43 | 3/31/1994 | 10.68 | 2.30 | 8.38 | -- | -- |
| AW-43 | 9/9/1994 | 10.68 | 1.78 | 8.90 | -- | -- |
| AW-43 | 9/29/1994 | 10.68 | 2.09 | 8.59 | -- | -- |
| AW-43 | 11/23/1994 | 10.68 | 1.45 | 9.23 | -- | -- |
| AW-43 | 1/4/1995 | 10.68 | 1.59 | 9.09 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-43 | 2/8/1995 | 10.68 | 2.16 | 8.52 | -- | -- |
| AW-43 | 3/16/1995 | 10.68 | 2.11 | 8.57 | -- | -- |
| AW-43 | 5/25/1995 | 10.68 | 3.07 | 7.61 | -- | -- |
| AW-43 | 9/30/1995 | 10.68 | 1.48 | 9.20 | -- | -- |
| AW-44 | 8/28/1990 | 14.30 | 10.22 | 4.08 | -- | -- |
| AW-44 | 7/23/1991 | 14.30 | 7.29 | 7.01 | -- | -- |
| AW-44 | 8/22/1991 | 14.30 | 7.89 | 6.41 | -- | -- |
| AW-44 | 9/26/1991 | 14.30 | 9.10 | 5.20 | -- | -- |
| AW-44 | 10/25-26/1991 | 14.30 | 9.42 | 4.88 | -- | -- |
| AW-44 | 11/26/1991 | 14.30 | 9.93 | 4.37 | -- | -- |
| AW-44 | 12/20/1991 | 14.30 | 10.45 | 3.85 | -- | -- |
| AW-44 | 1/20/1992 | 14.30 | 9.09 | 5.21 | -- | -- |
| AW-44 | 3/23/1992 | 14.30 | 9.24 | 5.06 | -- | -- |
| AW-44 | 4/22/1992 | 14.30 | 6.82 | 7.48 | -- | -- |
| AW-44 | 5/27-28/1992 | 14.30 | 9.69 | 4.61 | -- | -- |
| AW-44 | 6/24/1992 | 14.30 | 7.89 | 6.41 | -- | -- |
| AW-44 | 7/27/1992 | 14.30 | 8.80 | 5.50 | -- | -- |
| AW-44 | 8/26/1992 | 14.30 | 3.55 | 10.75 | -- | -- |
| AW-44 | 9/29/1992 | 14.30 | 7.73 | 6.57 | -- | -- |
| AW-44 | 11/25/1992 | 14.30 | 6.58 | 7.72 | -- | -- |
| AW-44 | 12/18/1992 | 14.30 | 8.48 | 5.82 | -- | -- |
| AW-44 | 1/28/1993 | 14.30 | 7.07 | 7.23 | -- | -- |
| AW-44 | 2/24/1993 | 14.30 | 8.33 | 5.97 | -- | -- |
| AW-44 | 3/30/1993 | 14.30 | 6.57 | 7.73 | -- | -- |
| AW-44 | 5/28/1993 | 14.30 | 9.68 | 4.62 | -- | -- |
| AW-44 | 8/9-10/1993 | 14.30 | 10.86 | 3.44 | -- | -- |
| AW-44 | 9/28/1993 | 14.30 | 10.21 | 4.09 | -- | -- |
| AW-44 | 10/29/1993 | 14.30 | 9.98 | 4.32 | -- | -- |
| AW-44 | 11/30/1993 | 14.30 | 9.17 | 5.13 | -- | -- |
| AW-44 | 12/27/1993 | 14.30 | 10.12 | 4.18 | -- | -- |
| AW-44 | 3/31/1994 | 14.30 | 9.67 | 4.63 | -- | -- |
| AW-44 | 9/9/1994 | 14.30 | 8.66 | 5.64 | -- | -- |
| AW-44 | 9/29/1994 | 14.30 | 9.12 | 5.18 | -- | -- |
| AW-44 | 11/23/1994 | 14.30 | 8.55 | 5.75 | -- | -- |
| AW-44 | 1/4/1995 | 14.30 | 8.49 | 5.81 | -- | -- |
| AW-44 | 2/8/1995 | 14.30 | 9.87 | 4.43 | -- | -- |
| AW-44 | 3/16/1995 | 14.30 | 8.95 | 5.35 | -- | -- |
| AW-44 | 5/25/1995 | 14.30 | 10.01 | 4.29 | -- | -- |
| AW-44 | 9/30/1995 | 14.30 | 8.42 | 5.88 | -- | -- |
| AW-44 | 11/25-26/2008 | 13.41 | 9.10 | 4.31 | -- | -- |
| AW-44 | 3/5/2009 | 13.41 | 10.85 | 2.56 | -- | -- |
| AW-44 | 6/30/2009 | 13.41 | 10.20 | 3.21 | -- | -- |
| AW-44 | 9/23/2009 | 13.41 | 10.22 | 3.19 | -- | -- |
| AW-44 | 12/29/2009 | 13.41 | 8.51 | 4.90 | -- | -- |
| AW-45 | 7/23/1991 | 16.07 | -- | -- | 5.49 | -- |
| AW-45 | 8/22/1991 | 16.07 | 11.73 | 4.40 | 11.66 | 0.07 |
| AW-45 | 9/26/1991 | 16.07 | 11.48 | 4.59 | -- | -- |
| AW-45 | 10/25-26/1991 | 16.07 | 11.59 | 4.48 | -- | -- |
| AW-45 | 11/26/1991 | 16.07 | 12.07 | 4.00 | -- | -- |
| AW-45 | 12/20/1991 | 16.07 | 12.70 | 3.37 | 12.68 | 0.02 |
| AW-45 | 1/20/1992 | 16.07 | 10.65 | 5.42 | -- | -- |
| AW-45 | 3/23/1992 | 16.07 | 12.30 | 3.77 | -- | -- |
| AW-45 | 4/22/1992 | 16.07 | 12.04 | 4.06 | 12.01 | 0.03 |
| AW-45 | 5/27-28/1992 | 16.07 | 12.37 | 3.71 | 12.36 | 0.01 |
| AW-45 | 6/24/1992 | 16.07 | 11.75 | 4.32 | -- | -- |
| AW-45 | 7/27/1992 | 16.07 | 11.18 | 4.89 | -- | -- |
| AW-45 | 8/26/1992 | 16.07 | 10.35 | 5.72 | -- | -- |
| AW-45 | 9/29/1992 | 16.07 | 10.79 | 5.28 | -- | -- |
| AW-45 | 11/25/1992 | 16.07 | 11.47 | 4.60 | -- | -- |
| AW-45 | 12/18/1992 | 16.07 | 11.94 | 14.52 | -- | 11.94 |
| AW-45 | 1/28/1993 | 16.07 | 11.35 | 4.72 | -- | -- |
| AW-45 | 2/24/1993 | 16.07 | 11.69 | 4.38 | -- | -- |
| AW-45 | 3/30/1993 | 16.07 | 11.72 | 4.35 | -- | -- |
| AW-45 | 5/28/1993 | 16.07 | 12.37 | 3.70 | -- | -- |
| AW-45 | 8/9-10/1993 | 16.07 | 12.78 | 3.29 | -- | -- |
| AW-45 | 9/28/1993 | 16.07 | 12.36 | 3.71 | -- | -- |
| AW-45 | 10/29/1993 | 16.07 | 11.96 | 4.11 | -- | -- |
| AW-45 | 11/30/1993 | 16.07 | 11.65 | 4.42 | -- | -- |
| AW-45 | 12/27/1993 | 16.07 | 12.50 | 3.57 | -- | -- |
| AW-45 | 3/31/1994 | 16.07 | 12.15 | 3.92 | -- | -- |
| AW-45 | 9/9/1994 | 16.07 | 11.23 | 4.84 | 10.83 | 0.40 |
| AW-45 | 9/29/1994 | 16.07 | 12.46 | 3.61 | 11.95 | 0.51 |
| AW-45 | 11/23/1994 | 16.07 | 11.69 | 4.38 | 11.36 | 0.33 |
| AW-45 | 1/4/1995 | 16.07 | 11.86 | 4.21 | 11.48 | 0.38 |
| AW-45 | 2/8/1995 | 16.07 | 12.87 | 3.20 | -- | -- |
| AW-45 | 3/16/1995 | 16.07 | 12.37 | 3.70 | 11.98 | 0.39 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-45 | 5/25/1995 | 16.07 | DRY | -- | -- | -- |
| AW-45 | 9/30/1995 | 16.07 | 12.03 | 4.04 | 11.72 | 0.31 |
| AW-45 | 11/25-26/2008 | 15.13 | 14.00 | 3.05 | 11.60 | 2.40 |
| AW-45 | 3/6/2009 | 15.13 | 14.90 | 1.95 | 12.75 | 2.15 |
| AW-45 | 6/30/2009 | 15.13 | 13.88 | 2.52 | 12.39 | 1.49 |
| AW-45 | 9/23/2009 | 15.13 | 13.76 | 2.76 | 12.13 | 1.63 |
| AW-45 | 12/29/2009 | 15.13 | 13.51 | 3.35 | 11.49 | 2.02 |
| AW-45 | 3/24/2010 | 15.13 | 13.90 | 2.62 | 12.27 | 1.63 |
| AW-46 | 7/23/1991 | 12.50 | 9.80 | 2.70 | -- | -- |
| AW-46 | 8/22/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 9/26/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 11/26/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 12/20/1991 | 12.50 | 11.53 | 0.97 | -- | -- |
| AW-46 | 1/20/1992 | 12.50 | 8.76 | 3.74 | -- | -- |
| AW-46 | 3/23/1992 | 12.50 | 9.85 | 2.65 | -- | -- |
| AW-46 | 4/22/1992 | 12.50 | 9.10 | 3.40 | -- | -- |
| AW-46 | 5/27-28/1992 | 12.50 | 9.50 | 3.00 | -- | -- |
| AW-46 | 6/24/1992 | 12.50 | 9.64 | 2.86 | -- | -- |
| AW-46 | 7/27/1992 | 12.50 | 11.38 | 1.12 | -- | -- |
| AW-46 | 8/26/1992 | 12.50 | 8.66 | 3.84 | -- | -- |
| AW-46 | 9/29/1992 | 12.50 | 8.11 | 4.39 | -- | -- |
| AW-46 | 11/25/1992 | 12.50 | 9.47 | 3.03 | -- | -- |
| AW-46 | 12/18/1992 | 12.50 | 10.49 | 2.01 | 10.45 | 0.04 |
| AW-46 | 1/28/1993 | 12.50 | 8.83 | 3.67 | 8.81 | 0.02 |
| AW-46 | 2/24/1993 | 12.50 | 9.21 | 3.29 | 9.20 | 0.01 |
| AW-46 | 3/30/1993 | 12.50 | 9.54 | 2.96 | 9.53 | 0.01 |
| AW-46 | 5/28/1993 | 12.50 | -- | -- | -- | -- |
| AW-46 | 8/9-10/1993 | 12.50 | -- | -- | 0.00 | -- |
| AW-46 | 9/28/1993 | 12.50 | -- | -- | -- | -- |
| AW-46 | 10/29/1993 | 12.50 | 9.18 | 3.32 | -- | -- |
| AW-46 | 11/30/1993 | 12.50 | 9.05 | 3.45 | -- | -- |
| AW-46 | 12/27/1993 | 12.50 | 10.37 | 2.13 | -- | -- |
| AW-46 | 3/31/1994 | 12.50 | 9.50 | 3.00 | -- | -- |
| AW-46 | 9/9/1994 | 12.50 | 8.30 | 4.22 | 8.28 | 0.02 |
| AW-46 | 9/29/1994 | 12.50 | 10.31 | 2.19 | 9.95 | 0.36 |
| AW-46 | 11/23/1994 | 12.50 | 8.54 | 3.96 | -- | -- |
| AW-46 | 1/4/1995 | 12.50 | 8.29 | 4.21 | -- | -- |
| AW-46 | 2/8/1995 | 12.50 | 9.76 | 2.74 | -- | -- |
| AW-46 | 3/16/1995 | 12.50 | 9.54 | 2.96 | -- | -- |
| AW-46 | 5/25/1995 | 12.50 | 10.36 | 2.14 | -- | -- |
| AW-46 | 9/30/1995 | 12.50 | 8.15 | 4.35 | -- | -- |
| AW-47 | 7/23/1991 | 11.89 | -- | -- | 6.40 | -- |
| AW-47 | 8/22/1991 | 11.89 | -- | -- | 6.62 | -- |
| AW-47 | 9/26/1991 | 11.89 | -- | -- | 8.75 | -- |
| AW-47 | 10/25-26/1991 | 11.89 | -- | -- | 7.93 | -- |
| AW-47 | 11/26/1991 | 11.89 | Well Not Present | | | |
| AW-47 | 12/20/1991 | 11.89 | Well Not Present | | | |
| AW-47 | 1/20/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 3/23/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 4/22/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 5/27-28/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 6/24/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 7/27/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 8/26/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 9/29/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 11/25/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 12/18/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 1/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 1/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 3/30/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 5/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 9/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 8/9-10/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 9/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 11/30/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 12/27/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 3/31/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 9/9/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 9/29/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 11/23/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 1/4/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 2/8/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 3/16/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 3/16/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 9/30/1995 | 11.89 | Well Not Present | | | |
| AW-48 | 7/23/1991 | 12.10 | -- | 6.66 | -- | -- |
| AW-48 | 8/22/1991 | 12.10 | 5.39 | 6.71 | -- | -- |
| AW-48 | 9/26/1991 | 12.10 | 5.84 | 6.26 | -- | -- |
| AW-48 | 10/25-26/1991 | 12.1 | 5.96 | 6.14 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-48 | 11/26/1991 | 12.10 | 6.53 | 5.57 | -- | -- |
| AW-48 | 12/20/1991 | 12.10 | 6.79 | 5.31 | -- | -- |
| AW-48 | 1/20/1992 | 12.10 | 5.67 | 6.43 | 5.67 | -- |
| AW-48 | 3/23/1992 | 12.10 | 13.93 | -1.83 | 5.94 | 7.99 |
| AW-48 | 4/22/1992 | 12.10 | 5.33 | 6.77 | -- | -- |
| AW-48 | 5/27-28/1992 | 12.10 | 5.95 | 6.15 | -- | -- |
| AW-48 | 6/24/1992 | 12.10 | 4.90 | 7.20 | -- | -- |
| AW-48 | 7/27/1992 | 12.10 | 5.23 | 6.87 | -- | -- |
| AW-48 | 8/26/1992 | 12.10 | 3.57 | 8.53 | -- | -- |
| AW-48 | 9/29/1992 | 12.10 | 4.62 | 7.48 | -- | -- |
| AW-48 | 11/25/1992 | 12.10 | 4.23 | 7.87 | -- | -- |
| AW-48 | 12/18/1992 | 12.10 | 4.71 | 7.39 | -- | -- |
| AW-48 | 1/28/1993 | 12.10 | 4.61 | 7.49 | -- | -- |
| AW-48 | 2/24/1993 | 12.10 | 4.95 | 7.15 | -- | -- |
| AW-48 | 3/30/1993 | 12.10 | 4.19 | 7.91 | -- | -- |
| AW-48 | 5/28/1993 | 12.10 | 5.49 | 6.61 | -- | -- |
| AW-48 | 8/9-10/1993 | 12.10 | 6.35 | 5.75 | -- | -- |
| AW-48 | 9/28/1993 | 12.10 | 5.26 | 6.84 | -- | -- |
| AW-48 | 10/29/1993 | 12.10 | 5.39 | 6.71 | -- | -- |
| AW-48 | 11/30/1993 | 12.10 | 4.60 | 7.50 | -- | -- |
| AW-48 | 12/27/1993 | 12.10 | 7.84 | 4.26 | -- | -- |
| AW-48 | 3/31/1994 | 12.10 | 4.87 | 7.23 | -- | -- |
| AW-48 | 9/9/1994 | 12.10 | 3.54 | 8.56 | -- | -- |
| AW-48 | 9/29/1994 | 12.10 | 4.41 | 7.69 | -- | -- |
| AW-48 | 11/23/1994 | 12.10 | 3.72 | 8.38 | -- | -- |
| AW-48 | 1/4/1995 | 12.10 | 3.46 | 8.64 | -- | -- |
| AW-48 | 2/8/1995 | 12.10 | 4.18 | 7.92 | -- | -- |
| AW-48 | 3/16/1995 | 12.10 | 4.13 | 7.97 | -- | -- |
| AW-48 | 5/25/1995 | 12.10 | 4.89 | 7.21 | -- | -- |
| AW-48 | 9/30/1995 | 12.10 | 3.77 | 8.33 | -- | -- |
| AW-48 | 10/2/2003 | 12.10 | 6.82 | 5.28 | -- | -- |
| AW-48 | 11/25-26/2008 | 11.13 | 5.00 | 6.13 | -- | -- |
| AW-48 | 3/5/2009 | 11.13 | 6.30 | 4.83 | -- | -- |
| AW-48 | 6/30/2009 | 11.13 | 5.10 | 6.03 | -- | -- |
| AW-48 | 9/23/2009 | 11.13 | 5.45 | 5.68 | -- | -- |
| AW-48 | 12/29/2009 | 11.13 | 4.98 | 6.15 | -- | -- |
| AW-49 | 7/23/1991 | 15.16 | 13.58 | 3.10 | 11.65 | 1.93 |
| AW-49 | 8/22/1991 | 15.16 | 13.45 | 3.11 | 11.68 | 1.77 |
| AW-49 | 9/26/1991 | 15.16 | 13.40 | 4.60 | 9.81 | 3.59 |
| AW-49 | 10/25-26/1991 | 15.16 | 13.40 | 2.84 | 12.03 | 1.37 |
| AW-49 | 11/26/1991 | 15.16 | 14.49 | 2.69 | 11.93 | 2.56 |
| AW-49 | 12/20/1991 | 15.16 | 17.01 | 1.47 | 12.81 | 4.20 |
| AW-49 | 1/20/1992 | 15.16 | 12.83 | 3.15 | 11.79 | 1.04 |
| AW-49 | 3/23/1992 | 15.16 | 15.01 | 2.19 | 12.43 | 2.58 |
| AW-49 | 4/22/1992 | 15.16 | 13.20 | 2.88 | 12.04 | 1.16 |
| AW-49 | 5/27-28/1992 | 15.16 | 14.26 | 2.67 | 12.02 | 2.24 |
| AW-49 | 6/24/1992 | 15.16 | 13.64 | 2.68 | 12.17 | 1.47 |
| AW-49 | 7/27/1992 | 15.16 | 16.12 | 2.42 | 11.84 | 4.28 |
| AW-49 | 8/26/1992 | 15.16 | 13.03 | 2.73 | 12.27 | 0.76 |
| AW-49 | 9/29/1992 | 15.16 | 11.57 | 4.02 | 11.03 | 0.54 |
| AW-49 | 11/25/1992 | 15.16 | 12.74 | 3.04 | 11.95 | 0.79 |
| AW-49 | 12/18/1992 | 15.16 | 13.86 | 2.35 | 12.53 | 1.33 |
| AW-49 | 1/28/1993 | 15.16 | 12.20 | 3.64 | 11.34 | 0.86 |
| AW-49 | 2/24/1993 | 15.16 | 13.02 | 3.20 | 11.68 | 1.34 |
| AW-49 | 3/30/1993 | 15.16 | 13.92 | 2.83 | 11.91 | 2.01 |
| AW-49 | 5/28/1993 | 15.16 | 15.89 | 1.79 | 12.70 | 3.19 |
| AW-49 | 8/9-10/1993 | 15.16 | 15.30 | 2.21 | 12.32 | 2.98 |
| AW-49 | 9/28/1993 | 15.16 | 15.83 | 1.82 | 12.68 | 3.15 |
| AW-49 | 10/29/1993 | 15.16 | 12.91 | 3.02 | 11.94 | 0.97 |
| AW-49 | 11/30/1993 | 15.16 | 12.72 | 3.21 | 11.74 | 0.98 |
| AW-49 | 12/27/1993 | 15.16 | 16.05 | 1.96 | 12.44 | 3.61 |
| AW-49 | 3/31/1994 | 15.16 | 13.55 | 2.88 | 11.94 | 1.61 |
| AW-49 | 9/9/1994 | 15.16 | 11.50 | 4.14 | 10.89 | 0.61 |
| AW-49 | 9/29/1994 | 15.16 | 15.05 | 2.48 | 12.05 | 3.00 |
| AW-49 | 11/23/1994 | 15.16 | 12.73 | 3.55 | 11.31 | 1.42 |
| AW-49 | 1/4/1995 | 15.16 | 12.16 | 3.74 | 11.22 | 0.94 |
| AW-49 | 2/8/1995 | 15.16 | 16.11 | 2.15 | 12.19 | 3.92 |
| AW-49 | 3/16/1995 | 15.16 | 13.26 | 2.68 | 12.27 | 0.99 |
| AW-49 | 5/25/1995 | 15.16 | 13.44 | 2.68 | 12.23 | 1.21 |
| AW-49 | 9/30/1995 | 15.16 | 13.28 | 3.18 | 11.64 | 1.64 |
| AW-49 | 10/2/2003 | 15.16 | 13.00 | 3.36 | 11.50 | 1.50 |
| AW-49 | 11/25-26/2008 | 15.50 | 15.40 | 2.10 | 12.90 | 2.50 |
| AW-49 | 3/5/2009 | 15.50 | 15.77 | 1.68 | 13.33 | 2.44 |
| AW-49 | 6/30/2009 | 15.50 | 15.57 | 2.19 | 12.92 | 2.65 |
| AW-49 | 9/23/2009 | 15.50 | 14.44 | 2.95 | 12.23 | 2.21 |
| AW-49 | 12/29/2009 | 15.50 | 14.85 | 2.84 | 12.29 | 2.56 |
| AW-49 | 3/24/2010 | 15.50 | 16.51 | 1.90 | 13.10 | 3.41 |
| AW-50 | 7/23/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 8/22/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 9/26/1991 | 15.06 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-50 | 10/25-26/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 11/26/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 12/20/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 1/20/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 3/23/1992 | 11.89 | Recovery Well | | | |
| AW-50 | 4/22/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 5/27-28/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 6/24/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 7/27/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 8/26/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 9/29/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 11/25/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 12/18/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 1/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 2/24/1993 | 15.06 | 12.44 | 2.62 | 11.14 | 1.30 |
| AW-50 | 3/30/1993 | 11.89 | Recovery Well | | | |
| AW-50 | 5/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 8/9-10/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 11/30/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 12/27/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 9/30/1995 | 15.06 | Recovery Well | | | |
| AW-51 | 7/23/1991 | 13.77 | 14.04 | 3.53 | 9.67 | 4.37 |
| AW-51 | 8/22/1991 | 13.77 | 13.03 | 3.91 | 9.39 | 3.64 |
| AW-51 | 9/26/1991 | 13.77 | 19.40 | 1.64 | 11.04 | 8.36 |
| AW-51 | 10/25-26/1991 | 13.77 | 19.29 | 1.52 | 11.20 | 8.09 |
| AW-51 | 11/26/1991 | 13.77 | 13.74 | 3.01 | 10.31 | 3.43 |
| AW-51 | 12/20/1991 | 13.77 | 19.25 | 0.61 | 12.25 | 7.00 |
| AW-51 | 1/20/1992 | 13.77 | 12.57 | 3.36 | 10.09 | 2.48 |
| AW-51 | 3/23/1992 | 13.77 | 14.95 | 2.40 | 10.83 | 4.12 |
| AW-51 | 4/22/1992 | 13.77 | 13.73 | 3.09 | 10.22 | 3.51 |
| AW-51 | 5/27-28/1992 | 13.77 | 14.50 | 2.79 | 10.45 | 4.05 |
| AW-51 | 6/24/1992 | 13.77 | 12.71 | 4.10 | 9.22 | 3.49 |
| AW-51 | 7/27/1992 | 13.77 | 20.34 | 0.47 | 12.25 | 8.09 |
| AW-51 | 8/26/1992 | 13.77 | 18.40 | 2.17 | 10.58 | 7.82 |
| AW-51 | 9/29/1992 | 13.77 | 13.39 | 4.28 | 8.91 | 4.48 |
| AW-51 | 11/25/1992 | 13.77 | 18.03 | 2.23 | 10.57 | 7.46 |
| AW-51 | 12/18/1992 | 13.77 | 19.08 | 1.58 | 11.16 | 7.92 |
| AW-51 | 1/28/1993 | 13.77 | 13.43 | 3.85 | 9.40 | 4.03 |
| AW-51 | 2/24/1993 | 13.77 | 14.55 | 3.00 | 10.21 | 4.34 |
| AW-51 | 3/30/1993 | 13.77 | 14.98 | 3.12 | 10.00 | 4.98 |
| AW-51 | 8/9-10/1993 | 13.77 | 19.18 | 0.86 | 11.97 | 7.21 |
| AW-51 | 9/28/1993 | 13.77 | 19.64 | 0.80 | 11.97 | 7.67 |
| AW-51 | 10/29/1993 | 13.77 | 15.31 | 2.52 | 10.64 | 4.67 |
| AW-51 | 11/30/1993 | 13.77 | 13.95 | 3.08 | 10.20 | 3.75 |
| AW-51 | 12/27/1993 | 13.77 | 16.62 | 1.82 | 11.25 | 5.37 |
| AW-51 | 3/31/1994 | 13.77 | 13.19 | 3.39 | 9.96 | 3.23 |
| AW-51 | 9/9/1994 | 13.77 | 12.90 | 4.05 | 9.25 | 3.65 |
| AW-51 | 9/29/1994 | 13.77 | 15.31 | 2.84 | 10.28 | 5.03 |
| AW-51 | 11/23/1994 | 13.77 | 12.59 | 4.10 | 9.23 | 3.36 |
| AW-51 | 1/4/1995 | 13.77 | 17.89 | 2.27 | 10.55 | 7.34 |
| AW-51 | 2/8/1995 | 13.77 | 15.85 | 2.08 | 11.07 | 4.78 |
| AW-51 | 3/16/1995 | 13.77 | 19.99 | 0.91 | 11.80 | 8.19 |
| AW-51 | 5/25/1995 | 13.77 | 16.83 | 2.14 | 10.85 | 5.98 |
| AW-51 | 12/12/1995 | 13.77 | 15.46 | 2.26 | 10.92 | 4.54 |
| AW-51 | 10/2/2003 | 13.77 | 17.54 | 2.44 | 9.78 | 7.76 |
| AW-51 | 11/25-26/2008 | 12.75 | 18.70 | 1.29 | 9.65 | 9.05 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-51 | 3/6/2009 | 12.75 | 15.86 | 0.81 | 10.96 | 4.90 |
| AW-51 | 6/30/2009 | 12.75 | 18.38 | 1.95 | 9.77 | 8.61 |
| AW-51 | 6/30/2009 | 12.75 | 15.64 | 2.84 | 9.13 | 6.51 |
| AW-51 | 9/23/2009[10] | 12.75 | 17.50 | 2.47 | 9.30 | 8.20 |
| AW-51 | 9/23/2009[11] | 12.75 | 14.97 | 3.35 | 8.65 | 6.32 |
| AW-51 | 12/29/2009 | 12.75 | 19.66 | 2.08 | 9.45 | 10.21 |
| AW-51 | 3/24/2010 | 12.75 | 19.62 | 2.04 | 9.50 | 10.12 |
| AW-52 | 7/23/1991 | 16.51 | 15.95 | 4.07 | 11.92 | 4.03 |
| AW-52 | 8/22/1991 | 16.51 | 15.91 | 3.75 | 12.29 | 3.62 |
| AW-52 | 9/26/1991 | 16.51 | 16.00 | 3.62 | 12.43 | 3.57 |
| AW-52 | 10/25-26/1991 | 16.51 | 16.54 | 3.33 | 12.68 | 3.86 |
| AW-52 | 11/26/1991 | 16.51 | 16.26 | 2.92 | 13.19 | 3.07 |
| AW-52 | 12/20/1991 | 16.51 | 18.30 | 2.05 | 13.89 | 4.41 |
| AW-52 | 1/20/1992 | 16.51 | 17.34 | 3.42 | 12.45 | 4.89 |
| AW-52 | 3/23/1992 | 16.51 | 16.88 | 2.80 | 13.24 | 3.64 |
| AW-52 | 4/22/1992 | 16.51 | 16.05 | 3.44 | 12.63 | 3.42 |
| AW-52 | 5/27-28/1992 | 16.51 | 15.85 | 3.44 | 12.66 | 3.19 |
| AW-52 | 6/24/1992 | 16.51 | 15.54 | 4.24 | 11.78 | 3.76 |
| AW-52 | 7/27/1992 | 16.51 | 15.80 | 3.22 | 12.92 | 2.88 |
| AW-52 | 8/26/1992 | 16.51 | 16.54 | 4.31 | 11.55 | 4.99 |
| AW-52 | 9/29/1992 | 16.51 | 15.43 | 4.34 | 11.68 | 3.75 |
| AW-52 | 11/25/1992 | 16.51 | 15.83 | 3.82 | 12.22 | 3.61 |
| AW-52 | 12/18/1992 | 16.51 | 15.84 | 3.33 | 12.78 | 3.06 |
| AW-52 | 1/28/1993 | 16.51 | 15.45 | 4.09 | 11.97 | 3.48 |
| AW-52 | 2/24/1993 | 16.51 | 15.40 | 3.59 | 12.55 | 2.85 |
| AW-52 | 3/30/1993 | 16.51 | 15.60 | 3.60 | 12.51 | 3.09 |
| AW-52 | 8/9-10/1993 | 16.51 | 17.98 | 2.33 | 13.61 | 4.37 |
| AW-52 | 9/28/1993 | 16.51 | 17.57 | 2.55 | 13.42 | 4.15 |
| AW-52 | 10/29/1993 | 16.51 | 17.33 | 3.09 | 12.84 | 4.49 |
| AW-52 | 11/30/1993 | 16.51 | 15.68 | 3.45 | 12.67 | 3.01 |
| AW-52 | 12/27/1993 | 16.51 | 15.81 | 2.76 | 13.44 | 2.37 |
| AW-52 | 3/31/1994 | 16.51 | 15.61 | 3.27 | 12.89 | 2.72 |
| AW-52 | 9/9/1994 | 16.51 | 15.41 | 4.53 | 11.47 | 3.94 |
| AW-52 | 9/29/1994 | 16.51 | 15.41 | 3.47 | 12.69 | 2.72 |
| AW-52 | 11/23/1994 | 16.51 | 15.09 | 4.17 | 11.93 | 3.16 |
| AW-52 | 1/4/1995 | 16.51 | 15.42 | 3.88 | 12.21 | 3.21 |
| AW-52 | 2/8/1995 | 16.51 | 15.72 | 2.74 | 13.48 | 2.24 |
| AW-52 | 3/16/1995 | 16.51 | 15.82 | 3.18 | 12.96 | 2.86 |
| AW-52 | 5/25/1995 | 16.51 | 16.05 | 3.23 | 12.87 | 3.18 |
| AW-52 | 12/12/1995 | 16.51 | 15.63 | 3.16 | 13.01 | 2.62 |
| AW-52R | 10/2/2003 | 16.51 | 15.30 | 3.74 | 12.14 | 3.16 |
| AW-52 | 11/25-26/2008 | 15.74 | 14.75 | 3.03 | 12.20 | 2.55 |
| AW-52 | 3/6/2009 | 15.74 | 15.99 | 1.60 | 13.68 | 2.31 |
| AW-52 | 6/30/2009 | 15.74 | 15.62 | 2.72 | 12.58 | 3.04 |
| AW-52 | 9/23/2009 | 15.74 | 15.28 | 3.23 | 12.04 | 3.24 |
| AW-52 | 12/29/2009 | 15.74 | 14.72 | 3.14 | 12.24 | 2.48 |
| AW-52 | 3/24/2010 | 15.74 | 14.90 | 2.71 | 12.71 | 2.19 |
| AW-53 | 7/23/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 8/22/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 9/26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 10/25-26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 11/26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 12/20/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 1/20/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 3/23/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 4/22/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 5/27-28/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 6/24/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 7/27/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 8/26/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 9/29/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 11/25/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 12/18/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 1/28/1993 | 11.34 | Recovery Well | | | |
| AW-53 | 3/30/1993 | 11.89 | Recovery Well | | | |
| AW-53 | 8/9-10/1993 | 11.34 | Recovery Well | | | |
| AW-53 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 11/30/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 12/27/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 2/8/1995 | 15.06 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-53 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 10/2/2003 | 11.34 | 5.98 | 5.86 | 5.36 | 0.62 |
| AW-53 | 11/25-26/2008 | 10.33 | 5.60 | 4.81 | 5.50 | 0.10 |
| AW-53 | 3/5/2009 | 10.33 | 6.50 | 3.94 | 6.36 | 0.14 |
| AW-53 | 6/30/2009 | 10.33 | 5.80 | 4.58 | 5.74 | 0.06 |
| AW-53 | 9/23/2009 | 10.33 | 5.64 | 4.71 | 5.62 | 0.02 |
| AW-53 | 12/29/2009 | 10.33 | 5.12 | 5.21 | -- | -- |
| AW-54 | 7/23/1991 | 12.14 | 18.30 | 6.04 | 9.40 | 8.90 |
| AW-54 | 8/22/1991 | 12.14 | 13.92 | 5.63 | 5.50 | 8.42 |
| AW-54 | 9/26/1991 | 12.14 | 13.85 | 5.22 | 5.98 | 7.87 |
| AW-54 | 10/25-26/1991 | 12.14 | 12.60 | 5.18 | 6.19 | 6.41 |
| AW-54 | 11/26/1991 | 12.14 | 14.40 | 4.41 | 6.82 | 7.58 |
| AW-54 | 12/20/1991 | 12.14 | 14.09 | 4.25 | 7.04 | 7.05 |
| AW-54 | 1/20/1992 | 12.14 | 13.29 | 5.45 | 5.79 | 7.50 |
| AW-54 | 3/23/1992 | 12.14 | 13.89 | 5.26 | 5.92 | 7.97 |
| AW-54 | 4/22/1992 | 12.14 | 13.88 | 5.76 | 5.36 | 8.52 |
| AW-54 | 5/27-28/1992 | 12.14 | 13.95 | 5.17 | 6.02 | 7.93 |
| AW-54 | 6/24/1992 | 12.14 | 14.00 | 6.10 | 4.95 | 9.05 |
| AW-54 | 7/27/1992 | 12.14 | 13.85 | 6.03 | 5.05 | 8.80 |
| AW-54 | 8/26/1992 | 12.14 | 12.97 | 7.34 | 3.69 | 9.28 |
| AW-54 | 9/29/1992 | 12.14 | 13.94 | 6.32 | 4.71 | 9.23 |
| AW-54 | 11/25/1992 | 12.14 | 13.00 | 6.66 | 4.45 | 8.55 |
| AW-54 | 12/18/1992 | 12.14 | 14.93 | 6.20 | 4.71 | 10.22 |
| AW-54 | 1/28/1993 | 12.14 | 13.69 | 6.63 | 4.39 | 9.30 |
| AW-54 | 2/24/1993 | 12.14 | 13.83 | 6.44 | 4.59 | 9.24 |
| AW-54 | 3/30/1993 | 12.14 | 14.05 | 7.05 | 3.87 | 10.18 |
| AW-54 | 8/9-10/1993 | 12.14 | 14.51 | 4.90 | 6.25 | 8.26 |
| AW-54 | 9/28/1993 | 12.14 | 13.99 | 5.86 | 5.23 | 8.76 |
| AW-54 | 10/29/1993 | 12.14 | 13.60 | 6.08 | 5.03 | 8.57 |
| AW-54 | 11/30/1993 | 12.14 | 13.72 | 6.51 | 4.53 | 9.19 |
| AW-54 | 12/27/1993 | 12.14 | 13.90 | 6.18 | 4.88 | 9.02 |
| AW-54 | 3/31/1994 | 12.14 | 14.03 | 6.24 | 4.79 | 9.24 |
| AW-54 | 9/9/1994 | 12.14 | 3.51 | 8.63 | -- | -- |
| AW-54 | 9/29/1994 | 12.14 | 4.23 | 8.06 | 4.06 | 0.17 |
| AW-54 | 11/23/1994 | 12.14 | 11.81 | 7.56 | 3.59 | 8.22 |
| AW-54 | 1/4/1995 | 12.14 | 13.59 | 7.83 | 3.04 | 10.55 |
| AW-54 | 2/8/1995 | 12.14 | -- [7] | -- [7] | -- [7] | -- [7] |
| AW-54 | 3/16/1995 | 12.14 | 14.48 | 7.21 | 3.63 | 10.85 |
| AW-54 | 5/25/1995 | 12.14 | 0.00 | 8.18 | 4.50 | 4.50 |
| AW-54 | 12/12/1995 | 12.14 | 14.34 | 6.49 | 4.46 | 9.88 |
| AW-54 | 10/2/2003 | 12.14 | 15.62 | 5.08 | 4.92 | 10.70 |
| AW-54 | 11/25-26/2008 | 10.66 | 16.40 | 5.38 | 2.50 | 13.90 |
| AW-54 | 3/5/2009 | 10.66 | 15.96 | 4.14 | 4.16 | 11.80 |
| AW-54 | 6/30/2009 | 10.66 | 7.40 | 6.45 | 3.66 | 3.74 |
| AW-54 | 9/23/2009 | 10.66 | 16.10 | 5.29 | 3.53 | 12.57 |
| AW-54 | 12/29/2009 | 10.66 | -- [7] | -- [7] | 2.52 | -- [7] |
| AW-55 | 7/23/1991 | 15.25 | 8.29 | 5.03 | 5.78 | 2.51 |
| AW-55 | 8/22/1991 | 15.25 | 12.64 | 4.91 | 9.73 | 2.91 |
| AW-55 | 9/26/1991 | 15.25 | 13.19 | 4.43 | 10.19 | 3.00 |
| AW-55 | 10/25-26/1991 | 15.25 | 13.38 | 4.10 | 10.56 | 2.82 |
| AW-55 | 11/26/1991 | 15.25 | 14.70 | 3.35 | 11.16 | 3.54 |
| AW-55 | 12/20/1991 | 15.25 | 15.08 | 3.08 | 11.40 | 3.68 |
| AW-55 | 1/20/1992 | 15.25 | 13.21 | 3.88 | 10.88 | 2.33 |
| AW-55 | 3/23/1992 | 15.25 | 14.09 | 3.62 | 10.97 | 3.12 |
| AW-55 | 4/22/1992 | 15.25 | 12.99 | 4.12 | 10.63 | 2.36 |
| AW-55 | 5/27-28/1992 | 15.25 | 13.90 | 3.69 | 10.94 | 2.96 |
| AW-55 | 6/24/1992 | 15.25 | 12.28 | 4.74 | 10.04 | 2.24 |
| AW-55 | 7/27/1992 | 15.25 | 13.46 | 4.09 | 10.55 | 2.91 |
| AW-55 | 8/26/1992 | 15.25 | 10.61 | 5.81 | 9.13 | 1.48 |
| AW-55 | 9/29/1992 | 15.25 | 12.41 | 4.73 | 10.02 | 2.39 |
| AW-55 | 11/25/1992 | 15.25 | 12.22 | 4.57 | 10.27 | 1.95 |
| AW-55 | 12/18/1992 | 15.25 | 12.53 | 4.32 | 10.50 | 2.03 |
| AW-55 | 1/28/1993 | 15.25 | 12.14 | 4.60 | 10.26 | 1.88 |
| AW-55 | 2/24/1993 | 15.25 | 12.81 | 4.12 | 10.68 | 2.13 |
| AW-55 | 3/30/1993 | 15.25 | 12.94 | 4.39 | 10.31 | 2.63 |
| AW-55 | 8/9-10/1993 | 15.25 | 14.98 | 2.97 | 11.56 | 3.42 |
| AW-55 | 9/28/1993 | 15.25 | 14.07 | 3.42 | 11.24 | 2.83 |
| AW-55 | 10/29/1993 | 15.25 | 13.63 | 3.58 | 11.15 | 2.48 |
| AW-55 | 11/30/1993 | 15.25 | 12.78 | 3.99 | 10.85 | 1.93 |
| AW-55 | 12/27/1993 | 15.25 | 13.70 | 3.53 | 11.19 | 2.51 |
| AW-55 | 3/31/1994 | 15.25 | 13.25 | 3.73 | 11.06 | 2.19 |
| AW-55 | 9/9/1994 | 15.25 | 11.04 | 4.96 | 10.09 | 0.95 |
| AW-55 | 9/29/1994 | 15.25 | 12.26 | 4.29 | 10.61 | 1.65 |
| AW-55 | 11/23/1994 | 15.25 | 11.70 | 4.57 | 10.41 | 1.29 |
| AW-55 | 1/4/1995 | 15.25 | 11.29 | 4.83 | 10.19 | 1.10 |
| AW-55 | 2/8/1995 | 15.25 | 12.98 | 3.69 | 11.18 | 1.80 |
| AW-55 | 3/16/1995 | 15.25 | 12.45 | 4.19 | 10.69 | 1.76 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-55 | 5/25/1995 | 15.25 | DRY | -- | -- | -- |
| AW-55 | 12/12/1995 | 15.25 | 13.39 | 3.66 | 11.11 | 2.28 |
| AW-55 | 10/2/2003 | 15.25 | 12.23 | 4.35 | 10.57 | 1.66 |
| AW-55 | 11/25-26/2008 | 15.31 | 12.20 | 3.83 | 11.30 | 0.90 |
| AW-55 | 3/5/2009 | 15.31 | 12.50 | 2.81 | -- | -- |
| AW-55 | 6/30/2009 | Abandoned | | | | |
| AW-56 | 7/23/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 8/22/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 9/26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 10/25-26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 11/26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 12/20/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 1/20/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 3/23/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 4/22/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 5/27-28/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 6/24/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 7/27/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 8/26/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 9/29/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 11/25/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 12/18/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 1/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 2/24/1993 | 15.16 | 14.15 | 3.31 | 11.41 | 2.74 |
| AW-56 | 3/30/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 8/9-10/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 9/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 9/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 11/30/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 12/27/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 12/12/1995 | 15.06 | Recovery Well | | | |
| TRUCK LOADING | 11/25-26/2008 | 12.65 | 14.60 | 2.29 | 9.30 | 5.30 |
| TRUCK LOADING | 3/6/2009 | 12.65 | 15.05 | 0.95 | 10.86 | 4.19 |
| TRUCK LOADING | 6/30/2009 | 12.65 | 15.32 | 2.27 | 9.53 | 5.79 |
| TRUCK LOADING | 9/23/2009 | 12.65 | 14.94 | 2.69 | 9.11 | 5.83 |
| TRUCK LOADING | 12/29/2009 | 12.65 | 15.72 | 2.31 | 9.42 | 6.30 |
| TRUCK LOADING | 3/24/2010 | 12.65 | 15.26 | 1.92 | 9.95 | 5.31 |
| AW-57 | 7/23/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 8/22/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 9/26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 10/25-26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 11/26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 12/20/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 1/20/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 3/23/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 4/22/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 5/27-28/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 6/24/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 7/27/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 8/26/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 9/29/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 11/25/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 12/18/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 1/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 2/24/1993 | 14.21 | 11.75 | 3.88 | 9.86 | 1.89 |
| AW-57 | 3/30/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 8/9-10/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 9/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 9/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 11/30/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 12/27/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 12/12/1995 | 15.06 | Recovery Well | | | |
| TANK 3 | 11/25-26/2008 | 12.14 | 9.10 | 3.88 | 8.05 | 1.05 |
| TANK 3 | 3/5/2009 | 12.14 | 11.19 | 2.10 | 9.75 | 1.44 |
| TANK 3 | 6/30/2009 | 12.14 | 11.64 | 3.27 | 8.40 | 3.24 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| TANK 3 | 9/23/2009 | 12.14 | 10.99 | 3.66 | 8.05 | 2.94 |
| TANK 3 | 12/29/2009 | 12.14 | 11.55 | 3.45 | 8.70 | 3.35 |
| AW-58 | 7/23/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 8/22/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 9/26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 10/25-26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 11/26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 12/20/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 1/20/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 3/23/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 4/22/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 5/27-28/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 7/27/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 8/26/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 9/29/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 11/25/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 12/18/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 1/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 2/24/1993 | 13.25 | 9.75 | 3.50 | -- | -- |
| AW-58 | 3/30/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 8/9-10/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 9/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 9/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 11/30/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 12/27/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 7/23/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 8/22/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 9/26/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 10/25-26/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 11/26/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 12/20/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 1/20/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 2/27-28/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 3/23/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 4/22/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 5/27-28/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 7/27/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 8/26/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 9/29/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 11/25/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 12/18/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 1/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 2/24/1993 | 14.29 | 11.15 | 3.14 | 11.14 | 0.01 |
| AW-59 | 3/30/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 8/9-10/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 9/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 9/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 11/30/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 12/27/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-60 | 7/23/1991 | 10.24 | 5.98 | 4.26 | -- | -- |
| AW-60 | 8/22/1991 | 10.24 | 5.88 | 4.36 | -- | -- |
| AW-60 | 9/26/1991 | 10.24 | 11.42 | -1.18 | -- | -- |
| AW-60 | 10/25-26/1991 | 10.24 | 6.35 | 3.89 | -- | -- |
| AW-60 | 11/26/1991 | 10.24 | 9.42 | 0.82 | -- | -- |
| AW-60 | 12/20/1991 | 10.24 | 9.96 | 0.28 | -- | -- |
| AW-60 | 1/20/1992 | 10.24 | 7.19 | 3.05 | -- | -- |
| AW-60 | 2/27-28/1992 | 10.24 | 10.63 | -0.39 | -- | -- |
| AW-60 | 3/23/1992 | 10.24 | 7.56 | 2.68 | -- | -- |
| AW-60 | 4/22/1992 | 10.24 | 7.63 | 2.61 | -- | -- |
| AW-60 | 5/27-28/1992 | 10.24 | 8.49 | 1.75 | -- | -- |
| AW-60 | 7/27/1992 | 10.24 | 11.14 | -0.90 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-60 | 8/26/1992 | 10.24 | 11.13 | -0.89 | -- | -- |
| AW-60 | 9/29/1992 | 10.24 | 5.99 | 4.25 | -- | -- |
| AW-60 | 11/25/1992 | 10.24 | 10.73 | -0.49 | -- | -- |
| AW-60 | 12/18/1992 | 10.24 | 9.57 | 0.67 | -- | -- |
| AW-60 | 1/28/1993 | 10.24 | 6.69 | 3.55 | -- | -- |
| AW-60 | 2/24/1993 | 10.24 | 8.60 | 1.64 | -- | -- |
| AW-60 | 3/30/1993 | 10.24 | 6.87 | 3.37 | -- | -- |
| AW-60 | 8/9-10/1993 | 10.24 | 11.13 | -0.89 | -- | -- |
| AW-60 | 9/28/1993 | 10.24 | 11.57 | -1.33 | -- | -- |
| AW-60 | 10/29/1993 | 10.24 | 9.15 | 1.09 | -- | -- |
| AW-60 | 11/30/1993 | 10.24 | 8.65 | 1.59 | -- | -- |
| AW-60 | 12/27/1993 | 10.24 | 8.61 | 1.63 | -- | -- |
| AW-60 | 3/31/1994 | 10.24 | 6.20 | 4.04 | -- | -- |
| AW-60 | 9/9/1994 | 10.24 | 7.31 | 2.93 | -- | -- |
| AW-60 | 9/29/1994 | 10.24 | 7.09 | 3.15 | -- | -- |
| AW-60 | 11/23/1994 | 10.24 | 5.78 | 4.46 | -- | -- |
| AW-60 | 1/4/1995 | 10.24 | 10.46 | -0.22 | -- | -- |
| AW-60 | 2/8/1995 | 10.24 | 8.81 | 1.43 | -- | -- |
| AW-60 | 3/16/1995 | 10.24 | 11.28 | -1.04 | -- | -- |
| AW-60 | 5/25/1995 | 10.24 | 0.00 | 10.24 | -- | -- |
| AW-60 | 12/12/1995 | 10.24 | 9.43 | 0.81 | -- | -- |
| AW-61 | 7/23/1991 | 9.87 | 6.20 | 3.67 | -- | -- |
| AW-61 | 8/22/1991 | 9.87 | 5.90 | 4.03 | 5.82 | 0.08 |
| AW-61 | 9/26/1991 | 9.87 | 10.14 | 0.04 | 9.75 | 0.39 |
| AW-61 | 10/25-26/1991 | 9.87 | 10.07 | 0.03 | 9.78 | 0.29 |
| AW-61 | 11/26/1991 | 9.87 | 7.12 | 2.77 | 7.10 | 0.02 |
| AW-61 | 12/20/1991 | 9.87 | 9.20 | 0.67 | -- | -- |
| AW-61 | 1/20/1992 | 9.87 | 6.56 | 3.31 | -- | -- |
| AW-61 | 2/27-28/1992 | 9.87 | 9.50 | 0.39 | 9.47 | 0.03 |
| AW-61 | 3/23/1992 | 9.87 | 7.80 | 2.07 | -- | -- |
| AW-61 | 4/22/1992 | 9.87 | 7.12 | 2.75 | -- | -- |
| AW-61 | 5/27-28/1992 | 9.87 | 6.38 | 3.49 | -- | -- |
| AW-61 | 7/27/1992 | 9.87 | 9.41 | 0.46 | 9.40 | 0.01 |
| AW-61 | 8/26/1992 | 9.87 | 9.22 | 0.65 | 9.10 | 0.12 |
| AW-61 | 9/29/1992 | 9.87 | 5.43 | 4.44 | -- | -- |
| AW-61 | 11/25/1992 | 9.87 | 8.88 | 0.99 | 8.85 | 0.03 |
| AW-61 | 12/18/1992 | 9.87 | 9.37 | 0.50 | -- | -- |
| AW-61 | 1/28/1993 | 9.87 | 6.90 | 2.97 | -- | -- |
| AW-61 | 2/24/1993 | 9.87 | 7.46 | 2.41 | -- | -- |
| AW-61 | 3/30/1993 | 9.87 | 7.12 | 2.75 | -- | -- |
| AW-61 | 8/9-10/1993 | 9.87 | 11.76 | -1.89 | -- | -- |
| AW-61 | 9/28/1993 | 9.87 | 9.76 | 0.13 | 9.74 | 0.02 |
| AW-61 | 10/29/1993 | 9.87 | 7.65 | 2.24 | 7.63 | 0.02 |
| AW-61 | 11/30/1993 | 9.87 | 7.31 | 2.59 | 7.28 | 0.03 |
| AW-61 | 12/27/1993 | 9.87 | 8.57 | 1.32 | 8.55 | 0.02 |
| AW-61 | 3/31/1994 | 9.87 | 6.21 | 3.66 | -- | -- |
| AW-61 | 9/9/1994 | 9.87 | 6.24 | 3.63 | -- | -- |
| AW-61 | 9/29/1994 | 9.87 | 7.49 | 2.38 | -- | -- |
| AW-61 | 11/23/1994 | 9.87 | 5.80 | 4.07 | -- | -- |
| AW-61 | 1/4/1995 | 9.87 | 8.23 | 1.64 | -- | -- |
| AW-61 | 2/8/1995 | 9.87 | 8.32 | 1.55 | -- | -- |
| AW-61 | 3/16/1995 | 9.87 | 10.19 | -0.31 | 10.18 | 0.01 |
| AW-61 | 5/25/1995 | 9.87 | 6.45 | 3.42 | -- | -- |
| AW-61 | 12/12/1995 | 9.87 | 7.91 | 1.96 | -- | -- |
| AW-62 | 7/23/1991 | 8.77 | 7.09 | 3.89 | 4.49 | 2.60 |
| AW-62 | 8/22/1991 | 8.77 | 6.62 | 4.30 | 4.09 | 2.53 |
| AW-62 | 9/26/1991 | 8.77 | 15.39 | -0.82 | 8.57 | 6.82 |
| AW-62 | 10/25-26/1991 | 8.77 | 15.55 | -0.80 | 8.52 | 7.03 |
| AW-62 | 11/26/1991 | 8.77 | 8.01 | 2.55 | 5.91 | 2.10 |
| AW-62 | 12/20/1991 | 8.77 | 12.65 | -0.14 | 8.25 | 4.40 |
| AW-62 | 1/20/1992 | 8.77 | 6.38 | 3.75 | 4.78 | 1.60 |
| AW-62 | 2/27-28/1992 | 8.77 | 14.83 | -0.71 | 8.54 | 6.29 |
| AW-62 | 3/23/1992 | 8.77 | 8.21 | 2.61 | 5.80 | 2.41 |
| AW-62 | 4/22/1992 | 8.77 | 8.81 | 3.05 | 5.18 | 3.63 |
| AW-62 | 5/27-28/1992 | 8.77 | 6.47 | 3.67 | 4.86 | 1.61 |
| AW-62 | 7/27/1992 | 8.77 | 15.43 | -0.76 | 8.49 | 6.94 |
| AW-62 | 8/26/1992 | 8.77 | 15.41 | 0.19 | 7.37 | 8.04 |
| AW-62 | 9/29/1992 | 8.77 | 6.88 | 4.69 | 3.59 | 3.29 |
| AW-62 | 11/25/1992 | 8.77 | 12.24 | 1.10 | 6.86 | 5.38 |
| AW-62 | 12/18/1992 | 8.77 | 13.19 | 0.51 | 7.39 | 5.80 |
| AW-62 | 1/28/1993 | 8.77 | 8.20 | 4.12 | 4.02 | 4.18 |
| AW-62 | 2/24/1993 | 8.77 | 10.16 | 2.45 | 5.64 | 4.52 |
| AW-62 | 3/30/1993 | 8.77 | 10.50 | 2.66 | 5.34 | 5.16 |
| AW-62 | 8/9-10/1993 | 8.77 | 11.48 | 0.10 | 8.17 | 3.31 |
| AW-62 | 9/28/1993 | 8.77 | 13.90 | -0.31 | 8.23 | 5.67 |
| AW-62 | 10/29/1993 | 8.77 | 9.01 | 2.36 | 5.95 | 3.06 |
| AW-62 | 11/30/1993 | 8.77 | 8.66 | 2.92 | 5.35 | 3.31 |
| AW-62 | 12/27/1993 | 8.77 | 7.36 | 1.86 | 6.83 | 0.53 |
| AW-62 | 3/31/1994 | 8.77 | 6.45 | 3.69 | 4.84 | 1.61 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-62 | 9/9/1994 | 8.77 | 6.32 | 3.95 | 4.56 | 1.76 |
| AW-62 | 9/29/1994 | 8.77 | 9.53 | 2.60 | 5.58 | 3.95 |
| AW-62 | 11/23/1994 | 8.77 | 5.90 | 4.49 | 3.99 | 1.91 |
| AW-62 | 1/4/1995 | 8.77 | 13.62 | 0.68 | 7.12 | 6.50 |
| AW-62 | 2/8/1995 | 8.77 | 10.71 | 1.32 | 6.87 | 3.84 |
| AW-62 | 3/16/1995 | 8.77 | 16.17 | -1.66 | 9.42 | 6.75 |
| AW-62 | 5/25/1995 | 8.77 | 6.03 | 3.88 | 4.69 | 1.34 |
| AW-62 | 12/12/1995 | 8.77 | 10.93 | 1.61 | 6.49 | 4.44 |
| AW-62 | 10/2/2003 | 8.77 | 5.47 | 4.38 | 4.12 | 1.35 |
| AW-62 | 11/25-26/2008 | -- | -- | -- | -- | -- |
| FIREHOUSE [13] | 11/25-26/2008 | 7.70 | -- | -- | -- | -- |
| FIREHOUSE | 3/5/2009 | 7.70 | 9.86 | -2.16 | -- | -- |
| FIREHOUSE | 6/30/2009 | 7.70 | NM | -- | -- | -- |
| FIREHOUSE | 9/23/2009 [10] | 7.70 | 10.38 | -0.93 | 8.33 | 2.05 |
| FIREHOUSE | 9/23/2009 [11] | 7.70 | 5.41 | 3.75 | 3.70 | 1.71 |
| FIREHOUSE | 12/29/2009 | 7.70 | 10.98 | -1.65 | 9.07 | 1.91 |
| FIREHOUSE | 3/24/2010 | 7.70 | 12.50 | -2.58 | 9.90 | 2.60 |
| AW-63 | 7/23/1991 | 9.10 | 5.94 | 3.24 | 5.85 | 0.09 |
| AW-63 | 8/22/1991 | 9.10 | 5.87 | 3.71 | 5.33 | 0.54 |
| AW-63 | 9/26/1991 | 9.10 | -- | -- | 8.49 | -- |
| AW-63 | 10/25-26/1991 | 9.10 | 8.74 | 0.46 | 8.63 | 0.11 |
| AW-63 | 11/26/1991 | 9.10 | 6.31 | 2.80 | 6.30 | 0.01 |
| AW-63 | 12/20/1991 | 9.10 | 9.41 | -0.29 | 9.39 | 0.02 |
| AW-63 | 1/20/1992 | 9.10 | 5.78 | 3.32 | -- | -- |
| AW-63 | 2/27-28/1992 | 9.10 | 8.42 | 0.70 | 8.40 | 0.02 |
| AW-63 | 3/23/1992 | 9.10 | 7.13 | 2.04 | 7.05 | 0.08 |
| AW-63 | 4/22/1992 | 9.10 | 6.32 | 2.84 | 6.25 | 0.07 |
| AW-63 | 5/27-28/1992 | 9.10 | 6.65 | 2.45 | -- | -- |
| AW-63 | 7/27/1992 | 9.10 | 9.70 | -0.02 | 9.05 | 0.65 |
| AW-63 | 9/29/1992 | 9.10 | 7.03 | 4.30 | 4.52 | 2.51 |
| AW-63 | 11/25/1992 | 9.10 | 9.88 | 1.29 | 7.55 | 2.33 |
| AW-63 | 12/18/1992 | 9.10 | 10.78 | 0.86 | 7.93 | 2.85 |
| AW-63 | 1/28/1993 | 9.10 | 7.18 | 3.77 | 5.10 | 2.08 |
| AW-63 | 2/24/1993 | 9.10 | 8.19 | 2.62 | 6.27 | 1.92 |
| AW-63 | 3/30/1993 | 9.10 | 7.81 | 2.72 | 6.20 | 1.61 |
| AW-63 | 8/9-10/1993 | 9.10 | 8.68 | 0.43 | 8.67 | 0.01 |
| AW-63 | 9/28/1993 | 9.10 | 8.73 | 0.41 | 8.69 | 0.04 |
| AW-63 | 10/29/1993 | 9.10 | 6.97 | 2.16 | 6.94 | 0.03 |
| AW-63 | 11/30/1993 | 9.10 | 6.76 | 2.40 | 6.69 | 0.07 |
| AW-63 | 12/27/1993 | 9.10 | 7.89 | 1.25 | 7.85 | 0.04 |
| AW-63 | 3/31/1994 | 9.10 | 5.90 | 3.23 | 5.87 | 0.03 |
| AW-63 | 9/9/1994 | 9.10 | 5.50 | 3.75 | 5.33 | 0.17 |
| AW-63 | 9/29/1994 | 9.10 | 7.78 | 1.96 | 7.06 | 0.72 |
| AW-63 | 11/23/1994 | 9.10 | 6.73 | 3.55 | 5.40 | 1.33 |
| AW-63 | 1/4/1995 | 9.10 | 9.30 | 2.05 | 6.77 | 2.53 |
| AW-63 | 2/8/1995 | 9.10 | 8.35 | 2.06 | 6.88 | 1.47 |
| AW-63 | 3/16/1995 | 9.10 | 11.19 | 0.70 | 8.05 | 3.14 |
| AW-63 | 5/25/1995 | 9.10 | 5.41 | 3.97 | 5.10 | 0.31 |
| AW-63 | 12/12/1995 | 9.10 | 8.52 | 2.16 | 6.75 | 1.77 |
| AW-64 | 7/23/1991 | 8.71 | 7.65 | 2.46 | 5.90 | 1.75 |
| AW-64 | 8/22/1991 | 8.71 | 7.38 | 2.83 | 5.51 | 1.87 |
| AW-64 | 9/26/1991 | 8.71 | 7.75 | 1.79 | 6.71 | 1.04 |
| AW-64 | 10/25-26/1991 | 8.71 | 8.90 | 1.49 | 6.80 | 2.10 |
| AW-64 | 11/26/1991 | 8.71 | 7.29 | 1.69 | 6.95 | 0.34 |
| AW-64 | 12/20/1991 | 8.71 | 13.92 | -0.46 | 7.98 | 5.94 |
| AW-64 | 1/20/1992 | 8.71 | 7.13 | 2.96 | 5.40 | 1.73 |
| AW-64 | 2/27-28/1992 | 8.71 | 8.72 | 1.21 | 7.20 | 1.52 |
| AW-64 | 3/23/1992 | 8.71 | 7.65 | 1.26 | 7.40 | 0.25 |
| AW-64 | 4/22/1992 | 8.71 | 7.30 | 2.43 | 6.03 | 1.27 |
| AW-64 | 5/27-28/1992 | 8.71 | 7.40 | 2.69 | 5.68 | 1.72 |
| AW-64 | 7/27/1992 | 8.71 | 15.74 | -0.70 | 7.83 | 7.91 |
| AW-64 | 9/29/1992 | 8.71 | 5.50 | 3.94 | 4.59 | 0.91 |
| AW-64 | 11/25/1992 | 8.71 | 6.87 | 3.11 | 5.28 | 1.59 |
| AW-64 | 12/18/1992 | 8.71 | 7.77 | 1.40 | 7.20 | 0.57 |
| AW-64 | 1/28/1993 | 8.71 | 5.66 | 3.51 | 5.09 | 0.57 |
| AW-64 | 2/24/1993 | 8.71 | 6.26 | 2.91 | 5.69 | 0.57 |
| AW-64 | 3/30/1993 | 8.71 | 7.11 | 2.39 | 6.12 | 0.99 |
| AW-64 | 8/9-10/1993 | 8.71 | 8.07 | 0.99 | 7.63 | 0.44 |
| AW-64 | 9/28/1993 | 8.71 | 8.96 | 0.89 | 7.53 | 1.43 |
| AW-64 | 10/29/1993 | 8.71 | 7.36 | 2.71 | 5.66 | 1.70 |
| AW-64 | 11/30/1993 | 8.71 | 6.71 | 2.98 | 5.48 | 1.23 |
| AW-64 | 12/27/1993 | 8.71 | 9.12 | 0.86 | 7.53 | 1.59 |
| AW-64 | 3/31/1994 | 8.71 | 16.86 | -4.22 | 11.95 | 4.91 |
| AW-64 | 9/9/1994 | 8.71 | 6.07 | 3.90 | 4.49 | 1.58 |
| AW-64 | 9/29/1994 | 8.71 | 7.62 | 1.55 | 7.04 | 0.58 |
| AW-64 | 11/23/1994 | 8.71 | 5.76 | 3.36 | 5.25 | 0.51 |
| AW-64 | 1/4/1995 | 8.71 | 5.93 | 3.16 | 5.45 | 0.48 |
| AW-64 | 2/8/1995 | 8.71 | 7.36 | 1.35 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-64 | 3/16/1995 | 8.71 | 8.20 | 1.42 | 7.06 | 1.14 |
| AW-64 | 5/25/1995 | 8.71 | 6.29 | 3.17 | 5.35 | 0.94 |
| AW-64 | 12/12/1995 | 8.71 | 6.81 | 2.40 | 6.19 | 0.62 |
| AW-65 | 7/23/1991 | 8.73 | 5.87 | 2.86 | -- | -- |
| AW-65 | 8/22/1991 | 8.73 | 5.04 | 3.69 | -- | -- |
| AW-65 | 9/26/1991 | 8.73 | 8.95 | -0.22 | -- | -- |
| AW-65 | 10/25-26/1991 | 8.73 | 9.31 | -0.58 | -- | -- |
| AW-65 | 11/26/1991 | 8.73 | 5.04 | 3.69 | -- | -- |
| AW-65 | 12/20/1991 | 8.73 | 10.74 | -2.01 | -- | -- |
| AW-65 | 1/20/1992 | 8.73 | 5.20 | 3.53 | -- | -- |
| AW-65 | 2/27-28/1992 | 8.73 | 8.97 | -0.14 | 8.85 | 0.12 |
| AW-65 | 3/23/1992 | 8.73 | 6.20 | 2.53 | -- | -- |
| AW-65 | 4/22/1992 | 8.73 | 5.84 | 2.89 | -- | -- |
| AW-65 | 5/27-28/1992 | 8.73 | 8.80 | -0.06 | 8.79 | 0.01 |
| AW-65 | 7/27/1992 | 8.73 | 11.28 | -2.53 | 11.25 | 0.03 |
| AW-65 | 9/29/1992 | 8.73 | NA | -- |  | -- |
| AW-65 | 11/25/1992 | 8.73 | 8.33 | 0.42 | 8.31 | 0.02 |
| AW-65 | 12/18/1992 | 8.73 | 9.59 | -0.86 | -- | -- |
| AW-65 | 1/28/1993 | 8.73 | 4.63 | 4.10 | -- | -- |
| AW-65 | 2/24/1993 | 8.73 | 5.74 | 2.99 | -- | -- |
| AW-65 | 3/30/1993 | 8.73 | 5.96 | 2.77 | -- | -- |
| AW-65 | 8/9-10/1993 | 8.73 | 5.08 | 3.65 | -- | -- |
| AW-65 | 9/28/1993 | 8.73 | 9.75 | -1.02 | -- | -- |
| AW-65 | 10/29/1993 | 8.73 | 6.09 | 2.66 | 6.07 | 0.02 |
| AW-65 | 11/30/1993 | 8.73 | 5.06 | 3.67 | -- | -- |
| AW-65 | 12/27/1993 | 8.73 | 8.47 | 0.26 | -- | -- |
| AW-65 | 3/31/1994 | 8.73 | 4.54 | 4.19 | -- | -- |
| AW-65 | 9/9/1994 | 8.73 | 0.00 | 8.73 | -- | -- |
| AW-65 | 9/29/1994 | 8.73 | 0.00 | 8.73 | -- | -- |
| AW-65 | 11/23/1994 | 8.73 | 4.18 | 4.57 | 4.15 | 0.03 |
| AW-65 | 1/4/1995 | 8.73 | 7.96 | 0.77 | -- | -- |
| AW-65 | 2/8/1995 | 8.73 | 7.05 | 1.68 | -- | -- |
| AW-65 | 3/16/1995 | 8.73 | 11.01 | -2.28 | 10.97 | 0.04 |
| AW-65 | 5/25/1995 | 8.73 | 6.97 | 1.76 | -- | -- |
| AW-65 | 12/12/1995 | 8.73 | 6.96 | 1.77 | -- | -- |
| AW-65 | 11/25-26/2008 | 13.26 | 15.90 | 1.24 | 11.05 | 4.85 |
| AW-65 | 3/6/2009 | 13.26 | 13.52 | 0.58 | 12.47 | 1.05 |
| AW-65 | 6/30/2009 | 13.26 | 13.50 | 1.83 | 11.08 | 2.42 |
| AW-65 | 6/30/2009 | 13.26 | 12.96 | 2.44 | 10.46 | 2.50 |
| AW-65 | 9/23/2009 [10] | 13.26 | 13.51 | 2.23 | 10.61 | 2.90 |
| AW-65 | 9/23/2009 [11] | 13.26 | 12.73 | 3.20 | 9.61 | 3.12 |
| AW-65 | 12/29/2009 | 13.26 | 13.68 | 2.00 | 10.86 | 2.82 |
| AW-65 | 3/24/2010 | 13.26 | 14.56 | 1.25 | 11.58 | 2.98 |
| AW-66 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-66 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-66 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-66 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-66 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-66 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-66 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-66 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-66 | 9/9/1994 | -- | -- | -- | -- | -- |
| AW-66 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-66 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-66 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-66 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-66 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66 | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-66 | 10/2/2003 | 11.77 | 11.94 | 0.55 | 11.04 | 0.90 |
| ADMIN | 11/25-26/2008 | 10.72 | 2.10 | 8.62 | -- | -- |
| ADMIN | 3/5/2009 | 10.72 | 2.75 | 7.97 | -- | -- |
| ADMIN | 6/30/2009 | 10.72 | 3.22 | 7.50 | -- | -- |
| ADMIN | 9/23/2009 | 10.72 | 3.33 | 7.39 | -- | -- |
| ADMIN | 12/29/2009 | 10.72 | 1.87 | 8.85 | -- | -- |
| AW-66A | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-66A | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-66A | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66A | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66A | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-67 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-67 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-67 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-67 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-67 | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-67 | 10/2/2003 | 12.27 | 7.23 | 5.04 | -- | -- |
| AW-67 | 11/25-26/2008 | 11.32 | 11.00 | 0.32 | -- | -- |
| AW-67 | 3/60/09 | 11.32 | 12.30 | -0.98 | -- | -- |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-67 | 6/30/2009 | 11.32 | 11.00 | 0.32 | -- | -- |
| AW-67 | 9/23/2009[10] | 11.32 | 10.21 | 1.11 | -- | -- |
| AW-67 | 9/23/2009[11] | 11.32 | 7.19 | 4.13 | -- | -- |
| AW-67 | 12/29/2009 | 11.32 | 8.07 | 3.25 | -- | -- |
| AW-67 | 3/24/2010 | 11.32 | 10.37 | 0.95 | -- | -- |
| AW-68 | 11/25-26/2008 | 13.80 | -- | -- | -- | -- |
| AW-68 | 3/5/2009 | 13.80 | 13.04 | 0.76 | -- | -- |
| AW-68 | 6/30/2009 | 13.80 | 14.44 | 1.29 | 12.18 | 2.26 |
| AW-68 | 6/30/2009 | 13.80 | 12.21 | 2.85 | 10.73 | 1.48 |
| AW-68 | 9/23/2009[10] | 13.80 | 14.80 | 2.03 | 11.25 | 3.55 |
| AW-68 | 9/23/2009[11] | 13.80 | 12.88 | 3.29 | 10.10 | 2.78 |
| AW-68 | 12/29/2009 | 13.80 | 16.84 | 1.57 | 11.43 | 5.41 |
| AW-68 | 3/24/2010 | 13.80 | 17.82 | 1.12 | 11.79 | 6.03 |
| AW-69 | 1/4/1995 | -- | -- | -- | -- | 0.47 |
| AW-69 | 2/8/1995 | -- | -- | -- | -- | 0.04 |
| AW-69 | 3/16/1995 | -- | -- | -- | -- | 0.03 |
| AW-69 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-69 | 12/12/1995 | -- | -- | -- | -- | 0.26 |
| AW-69 | 11/25-26/2008 | 9.44 | -- | -- | -- | -- |
| AW-69 | 3/6/2009 | 9.44 | 8.09 | 1.35 | -- | -- |
| AW-69 | 6/30/2009 | 9.44 | 8.78 | 0.66 | -- | -- |
| AW-69 | 9/23/2009[10] | 9.44 | 6.71 | 2.73 | -- | -- |
| AW-69 | 9/23/2009[11] | 9.44 | 6.38 | 3.06 | -- | -- |
| AW-69 | 12/29/2009 | 9.44 | 6.41 | 3.03 | -- | -- |
| AW-69 | 3/24/2010 | 9.44 | 7.21 | 2.23 | -- | -- |
| AW-70 | 1/4/1995 | -- | -- | -- | -- | 4.40 |
| AW-70 | 2/8/1995 | -- | -- | -- | -- | 2.44 |
| AW-70 | 3/16/1995 | -- | -- | -- | -- | 3.57 |
| AW-70 | 3/16/1995 | -- | -- | -- | -- | 1.73 |
| AW-70 | 12/12/1995 | -- | -- | -- | -- | 0.01 |
| AW-70 | 11/25-26/2008 | 12.25 | -- | -- | -- | -- |
| AW-70 | 3/6/2009 | 12.25 | 12.11 | 0.14 | -- | -- |
| AW-70 | 6/30/2009 | 12.25 | 10.91 | 1.34 | -- | -- |
| AW-70 | 9/23/2009[10] | 12.25 | 10.20 | 2.05 | -- | -- |
| AW-70 | 9/23/2009[11] | 12.25 | 9.05 | 3.20 | -- | -- |
| AW-70 | 12/29/2009 | 12.25 | 10.73 | 1.52 | -- | -- |
| AW-70 | 3/24/2010 | 12.25 | 11.22 | 1.03 | -- | -- |
| AW-71 | 11/25-26/2008 | 13.29 | -- | -- | -- | -- |
| AW-71 | 3/6/2009 | 13.29 | 12.58 | 0.71 | -- | -- |
| AW-71 | 6/30/2009 | 13.29 | 10.94 | 2.41 | 10.87 | 0.07 |
| AW-71 | 6/30/2009 | 13.29 | 10.84 | 2.52 | 10.76 | 0.08 |
| AW-71 | 9/23/2009[10] | 13.29 | 10.92 | 2.63 | 10.62 | 0.30 |
| AW-71 | 9/23/2009[11] | 13.29 | 10.27 | 3.05 | 10.24 | 0.03 |
| AW-71 | 12/29/2009 | 13.29 | 10.70 | 2.79 | 10.46 | 0.24 |
| AW-71 | 3/24/2010 | 13.29 | 11.67 | 2.02 | 11.20 | 0.47 |
| AW-72 | 11/25-26/2008 | 10.12 | -- | -- | -- | -- |
| AW-72 | 3/6/2009 | 10.12 | 10.02 | 0.10 | -- | -- |
| AW-72 | 6/3/2009 | 10.12 | 9.05 | 1.07 | -- | -- |
| AW-72 | 9/23/2009[10] | 10.12 | 8.45 | 1.67 | -- | -- |
| AW-72 | 9/23/2009[11] | 10.12 | 6.97 | 3.15 | -- | -- |
| AW-72 | 12/29/2009 | 10.12 | 8.56 | 1.56 | -- | -- |
| AW-72 | 3/24/2010 | 10.12 | 9.01 | 1.11 | -- | -- |
| AW-73 | 11/25-26/2008 | 12.04 | -- | -- | -- | -- |
| AW-73 | 3/6/2009 | 12.04 | 10.34 | 1.70 | -- | -- |
| AW-73 | 6/30/2009 | 12.04 | 9.45 | 2.59 | -- | -- |
| AW-73 | 9/23/2009 | 12.04 | 9.19 | 2.85 | -- | -- |
| AW-73 | 12/29/2009 | 12.04 | 8.71 | 3.33 | -- | -- |
| AW-73 | 3/24/2010 | 12.04 | 8.69 | 3.35 | -- | -- |
| AW-74 | 3/5/2009 | 9.96 | 10.57 | -0.61 | -- | -- |
| AW-74 | 6/30/2009 | 9.96 | 12.77 | -0.27 | 9.79 | 2.98 |
| AW-74 | 6/30/2009 | 9.96 | 8.54 | 3.12 | 6.55 | 1.99 |

*Please refer to notes at end of table.*

Table 1 Groundwater Elevation and LNAPL Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-74 | 9/23/2009[10] | 9.96 | 11.01 | 0.88 | 8.75 | 2.26 |
| AW-74 | 9/23/2009[11] | 9.96 | 7.91 | 3.62 | 6.07 | 1.84 |
| AW-74 | 12/29/2009 | 9.96 | 13.11 | -0.20 | 9.65 | 3.46 |
| AW-74 | 3/24/2010 | 9.96 | 13.58 | -0.44 | 9.86 | 3.72 |
| RAIL LOADING-S | 11/25-26/2008 | 12.30 | 5.75 | 6.55 | -- | -- |
| RAIL LOADING-S | 3/6/2009 | 12.30 | 6.78 | 5.52 | -- | -- |
| RAIL LOADING-S | 6/30/2009 | 12.30 | 5.55 | 6.75 | -- | -- |
| RAIL LOADING-S | 9/23/2009 | 12.30 | 5.87 | 6.43 | -- | -- |
| RAIL LOADING-S | 12/29/2009 | 12.30 | 4.96 | 7.34 | -- | -- |
| RAIL LOADIN-M | 11/25-26/2008 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 3/5/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 6/30/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 9/23/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 12/29/2009 | Not Accessible - Blocked | | | | |
| RAIL LOADING-N | 11/25-26/2008 | 12.61 | 6.52 | 6.09 | -- | -- |
| RAIL LOADING-N | 3/6/2009 | 12.61 | 7.71 | 4.90 | -- | -- |
| RAIL LOADING-N | 6/30/2009 | 12.61 | 4.02 | 8.59 | -- | -- |
| RAIL LOADING-N | 9/23/2009 | 12.61 | 6.68 | 5.93 | -- | -- |
| RAIL LOADING-N | 12/29/2009 | 12.61 | 5.43 | 7.18 | -- | -- |
| RAIL LOADING-N | 3/24/2010 | 12.61 | 6.56 | 6.05 | -- | -- |

*Notes:*
1. TOC Elevation - Top of casing elevation
2. Feet MSL = Feet above mean sea level
3. Feet BTC = Feet below top of casing
4. Surveyed on March 5-6, 2009.
5. Specific gravities prior to June 2009 were specified for each individual well in historical documents
6. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
7. Specific gravities were determined for the folowing wells: AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567),
8. -- = Not available or not applicable.
9. Monitoring wells gauged in 2003 by S&ME.
10. Monitoring wells gauged during low tide.
11. Monitoring wells gauged during high tide.
12. Product too viscous to obtain a water or LNAPL thickness measurement
13. The FIREHOUSE well is assumed to be well AW-62 based on figures contained in the August 1995 Geraghty & Miller, Inc *Site Evaluation and Remedial Alternatives*.
14. The ADMIN well is assumed to be well AW-66 based on figures contained in the August 1995 Geraghty & Miller, Inc *Site Evaluation and Remedial Alternatives*.
15. The TRUCK LOADING well is assumed to be well ARW-56 based on figures contained in the August 1995 Geraghty & Miller, Inc *Site Evaluation and Remedial Alternatives*.
16. Recovery Wells (RW) are also referred to as AW wells (i.e AW-53 is RW-53) based on June 3, 1997 figures by Geraghty & Miller, Inc.
17. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were present using the following equation and assuming the specific gravity detailed in notes 5 through 7 (based on back-calculations from previous reports for this project)

$$h_w = \frac{p_g h_g}{p_w}$$

where:

water level elevation = top of casing elevation + [$h_w$ - $d_w$];

$h_w$ = depth to groundwater correction;

$p_w$ = density of water; and

$d_w$ = depth to groundwater measuring point;

$h_g$ = product thickness.

$p_g$ = density of separate-phase hydrocarbons;

# *Appendix B*

## Field Data Sheets

## WELL GAGING DATA SHEET

Ash Creek Associates, Inc.

| | | | |
|---|---|---|---|
| Client: | | Job Number: | |
| Project: | No Star Savannah | Date: | 3-24-10 |
| Weather: | | Sampler: | A. Smith |
| | | Time In/Out: | |

### WATER LEVEL DATA

| Well I.D. | Time | Depth to Free Product (feet) | Depth to Water (feet) | Depth to Well Bottom (feet) | Product Thickness (feet) | Water Column Height (feet) | Notes/Other Remarks |
|---|---|---|---|---|---|---|---|
| FIREHOUSE | 1030 | 9.90 | 12.50 | 24.34 | 2.60 | 11.84 | |
| RAIL-N | 1245 | — | 6.56 | 10.36 | — | 3.80 | |
| TRUCK-L | 0955 | 9.95 | 15.26 | 19.43 | 5.31 | 4.17 | |
| AW-8 | 1150 | 12.17 | 12.97 | 16.43 | 0.80 | 3.46 | |
| AW-9 | 1110 | 11.07 | 14.55 | 16.38 | 3.48 | 1.83 | |
| AW-10 | 1120 | 10.75 | 15.00 | 17.38 | 4.25 | 3.43 | |
| AW-11 | 1100 | 11.04 | 13.95 | 17.68 | 2.91 | 3.73 | |
| AW-12 | 0950 | 9.62 | 12.76 | 15.92 | 3.14 | 3.16 | |
| AW-13 | 1010 | 9.82 | — | 22.02 | — | — | PRODUCT TOO THICK, NO WATER READING POSS. |
| AW-19 | 1200 | 12.44 | 12.95 | 17.97 | 0.51 | 5.02 | |
| AW-20 | 1140 | — | 10.50 | 18.62 | — | 8.12 | |
| AW-22 | 10:00 | — | — | — | — | — | BLOCKED. NO MEASURE. |
| AW-28 | 1250 | — | 4.58 | 12.56 | — | 7.98 | |
| AW-37 | 1145 | 11.42 | 11.51 | 20.36 | 0.09 | 8.85 | |
| AW-45 | 1205 | 12.27 | 13.90 | 32.88 | 1.63 | 18.98 | |
| AW-49 | 1115 | 13.10 | 16.51 | 28.92 | 3.41 | 12.41 | |
| AW-51 | 1020 | 9.50 | 19.62 | 27.20 | 10.12 | 7.58 | |
| AW-52 | 1005 | 12.71 | 14.90 | 27.40 | 2.19 | 12.50 | |
| AW-65 | 1305 | 11.58 | 14.56 | 16.64 | 2.98 | 2.08 | |
| AW-67 | 1300 | — | 10.37 | 19.44 | — | 9.07 | |
| AW-68 | 0930 | 11.79 | 17.82 | 23.13 | 6.03 | 5.31 | |
| AW-69 | 1045 | — | 7.21 | 19.63 | — | 12.42 | |
| AW-70 | 1105 | — | 11.22 | 24.28 | — | 13.06 | |
| AW-71 | 1050 | 11.20 | 11.67 | 22.85 | 0.47 | 11.18 | |
| AW-72 | 1240 | — | 9.01 | 20.20 | — | 11.19 | |
| AW-73 | 1310 | — | 8.69 | 20.30 | — | 11.61 | |
| AW-74 | 0940 | 9.86 | 13.58 | 19.88 | 3.72 | 6.30 | |

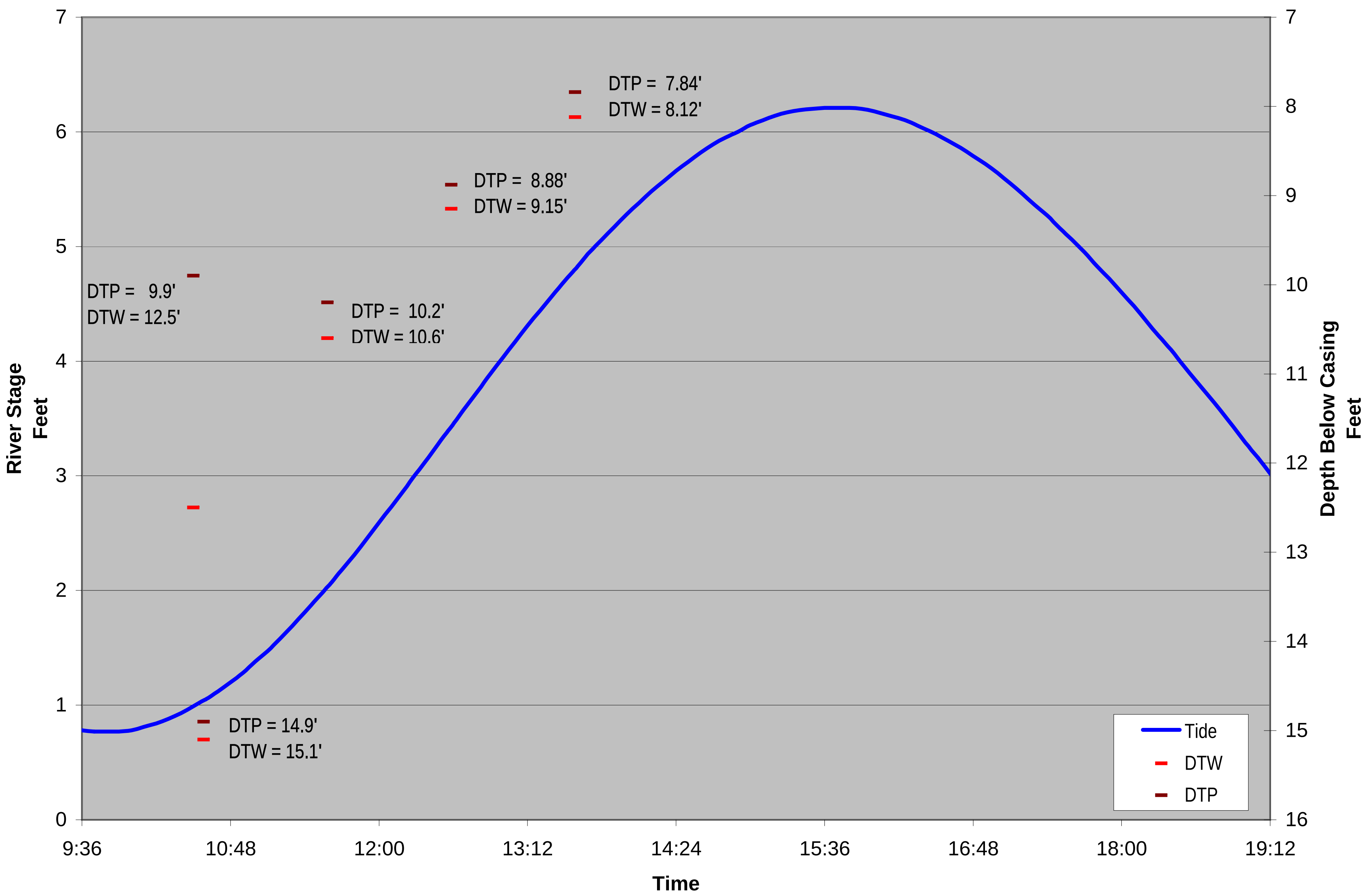
# *Appendix C*

## Bail-Down Test and Representative Graph

**Firehouse Well Baildown Test** **3/24/2010**

| Time | DTP | DTW | SPH thickness | Comments |
|---|---|---|---|---|
| 1030 | 9.9 | 12.5 | 2.6 | Initial Reading |
| 1035 | 14.9 | 15.1 | 0.2 | Reading after baildown |
| 1135 | 10.2 | 10.6 | 0.4 | 1st recovery reading |
| 1235 | 8.88 | 9.15 | 0.27 | 2nd recovery reading |
| 1335 | 7.84 | 8.12 | 0.28 | 3rd recovery reading |

Incoming tide during entire test



DTP = 7.84'
DTW = 8.12'
DTP = 8.88'
DTW = 9.15'
DTP = 9.9'
DTW = 12.5'
DTP = 10.2'
DTW = 10.6'
DTP = 14.9'
DTW = 15.1'
Tide
DTW
DTP
River Stage Feet
Depth Below Casing Feet
Time
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
9:36
10:48
12:00
13:12
14:24
15:36
16:48
18:00
19:12

# *Well Installation, SPH Gauging, and Remedial Options Evaluation Report*
# *NuStar Asphalt Refining, LLC*
# *Savannah Asphalt Refinery*
# *Savannah, Georgia*

Prepared for:
NuStar Asphalt Refining, LLC

August 8, 2012
1634-03

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

# Well Installation, SPH Gauging, and Remedial Options Evaluation Report
# NuStar Asphalt Refining, LLC
# Savannah Asphalt Refinery
# Savannah, Georgia

**Prepared for:**
**NuStar Asphalt Refining, LLC**

**August 8, 2012**
**1634-03**


*Chris Breemer*
*Principal*

*Mike Stevens*
*Senior Associate Engineer*

AMANDA L SPENCER
GEORGIA REGISTERED PROFESSIONAL GEOLOGIST
PG002009

*Amanda Spencer, R.G.*
*Principal*

3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Portland
(360) 567-3977 Vancouver
(503) 943-6357 Fax
www.ashcreekassociates.com

# Table of Contents



## Tables

## Figures



## Appendices

# *1.0 Introduction*

This Well Installation and Separate-Phase Hydrocarbon (SPH) Gauging Report was completed on behalf of NuStar Asphalt Refining LLC (NuStar) for the Savannah Refinery (the Site), located at 7 Foundation Drive in Savannah, Georgia. The purpose of this report is to summarize monitoring well installation and decommissioning activities, SPH gauging, and bail-down tests completed at the Site between December 2010 and January 2012, and to evaluate the need and possible options for SPH removal. The Site location is shown on Figure 1 and the Site plan is shown on Figure 2.

## 1.1 Objectives

The objectives of the work were to: (1) evaluate the extent of SPH at the Site, particularly at the east side of the Site, near the Savannah River; (2) obtain the data necessary to evaluate the recoverability of SPH in the subsurface and to develop design parameters for an SPH removal system; and (3) decommission monitoring wells that interfered with planned construction activities at the Site.

## 1.2 Report Organization

This Report is organized as follows:

- Background (Section 2) – A description of the Site, geology, hydrogeology, and a brief summary of past environmental work at the Site;
- Methods and Procedures (Section 3) – A description of the methods and procedures employed during the monitoring well installations and development, gauging, bail-down tests, and decommissioning;
- Results (Section 4) – A discussion of the results of the well installations and gauging, and an interpretation of the bail-down data; and
- Evaluation of SPH Removal Options (Section 5) – An evaluation of options for removal of SPH from the vicinity of the Savannah River and the eastern boundary of the Site.

# *2.0 Background*

This section discusses the Site setting, geology and hydrogeology, and presents a summary of prior environmental investigation activities at the Site.

## 2.1 Site Description

NuStar has owned and operated the Site since March 2008. Amoco Oil Corporation (Amoco) operated the Site from at least 1989 through a portion of 1993, and CITGO Asphalt Refining (CITGO) operated the Site from 1993 until acquisition by NuStar in 2008.

The Site is located in an industrial area adjacent to the south bank of the Savannah River. The property has been used for industrial purposes since the early 1900s and as a refinery since the early 1920s. Currently, the Site is equipped with a number of aboveground storage tanks (ASTs) of varying sizes, with associated above/below ground piping, a process area, and administration buildings. Pertinent Site features are shown on Figure 2.

## 2.2 Geology and Hydrogeology

The Site is located in the Coastal Plain physiographic province of Georgia. The regional surface geology consists of sand, silt, and clay of the Pleistocene-age Pamlico shoreline complex, according to Lawton et al (1976). These unconsolidated surface materials are part of a regional unconfined water-bearing unit that is present at the ground surface along much of the South Carolina and Georgia coastlines and is informally known as the Surficial Aquifer. The Surficial Aquifer is approximately 50 feet thick at the Site, according to Williams and Gill (2010).

The Surficial Aquifer is underlain by a Miocene/Oligocene-age confining unit that consists of low-permeability, phosphatic clayey sand and phosphatic sandy clay. The confining unit is approximately 100 feet thick at the Site, based on cross sections prepared by Williams and Gill (2010) and is encountered at depths between approximately 50 and 150 feet bgs. The Floridan Aquifer System, which consists of Eocene-age limestone and dolomite, underlies the confining unit. The Floridan Aquifer System is the primary water-bearing unit for portions of Georgia, South Carolina, and Florida.

Depth to groundwater at the Site typically ranges between approximately 4 and 20 feet below the ground surface (bgs). Groundwater typically occurs in the sands and silts, which correspond to the regional Surficial Aquifer. The hydraulic gradient across the Site is approximately 0.002 to 0.006 foot per foot (ft/ft) to the northeast, toward the Savannah River.

The Site is adjacent to a tidally influenced reach of the Savannah River. The mean tidal range for the Savannah River at the National Oceanic and Atmospheric Administration (NOAA) Savannah tide station (3 miles southeast of the Site) is 7.9 feet (NOAA, 2011). Tidal effects on groundwater elevations at the Site were evaluated in 2009. Water levels in monitoring well AW-67, adjacent to the Savannah River, exhibited 3 to 6 feet of change over each tidal cycle. Water levels in wells farther from the river (i.e., wells AW-44 and AW-73) exhibited 0.5 to 1 foot of change over each tidal cycle (CRA, 2009). The 2009 data indicate that tidal influences on groundwater elevation dissipate rapidly with distance from the river.

## 2.3 Previous Environmental Activities

SPH was identified in the subsurface at the Site by 1989. A subsequent investigation concluded that SPH present on the water table was not the result of any particular spills, but rather the gradual accumulation of "residual oil" over several decades (Amoco, 1989).

### *2.3.1 Historical Product Recovery Efforts*

In November 1990, Amoco installed and began operation of a recovery system. The system was comprised of eight recovery wells (RW-38, RW-39, RW-53, and RW-56 through RW-59), installed with pneumatic pumps, approximately 3,500 feet of discharge piping, and a 157,000-barrel tank (Tank 50), to store and separate the recovered fluids. The recovery system operated until May 12, 1998 (S&ME, 1998). The total volume recovered during operation was not identified in historical documents.

A "French Drain" and sump are present at the northeastern portion of the Site, as shown on Figure 3. The French Drain is a buried product collection system that is reportedly 175 feet long. The sump, formerly referred to as the "Gas Hole," is connected to the east end of the French Drain, which was historically used for removal of the collected SPH. Historical documents indicate the French Drain and sump were constructed as early as 1984 (Savannah Refinery, 1989). The French Drain and sump are no longer operated. Figures 3 and 4 show the approximate location of the recovery system, the French Drain, and the sump.

### *2.3.2 Polywall Barrier*

A "Polywall" barrier, consisting of a 40-mm high-density polyethylene (HDPE) membrane, was installed at the Site in 1996 to prevent the migration of SPH into the Savannah River. According to available information, the barrier is approximately 1,500 feet long horizontally and 20 feet long vertically, with joints at 180-foot intervals. The Polywall was reportedly installed to a depth of approximately 20 to 22 feet bgs, and the top of the barrier ranges between the ground surface and approximately 2 feet bgs. Based on lithologic information for wells installed near the Polywall, the wall terminates in a sand layer. Therefore, while the wall will retain SPH, deeper groundwater can flow beneath the wall, and mounding of groundwater should be limited. Investigations were conducted in 2009 to confirm the location of the Polywall (CRA, 2009). The locations of portions of the Polywall were identified based on surface exposures; however, the exact location of much of the Polywall could only be estimated. The approximate location of the Polywall is shown on Figure 3.

The Polywall is penetrated in at least one location, by the outfall pipe for the Site oil/water separator. The outfall pipe is approximately 7 feet deep near the Polywall, which is below groundwater during some tidal/seasonal intervals. The methods used to seal the Polywall around the outfall pipe penetration are unknown. Information describing other Polywall penetrations, if any, is unavailable.

### *2.3.3 Product Evaluation*

Samples of SPH were collected from monitoring wells AW-10, AW-11, AW-15, AW-22, AW-51, and AW-54 in 2003 and submitted for forensic analyses (S&ME, 2003). The analytical data indicated that SPH consists of a mixture of lightly to extensively degraded gasoline or a petroleum solvent and a middle distillate, such as diesel fuel or fuel oil.

In 2009, SPH samples were collected from wells AW-12, AW-13, AW-51, AW-65, and AW-68 for analysis of viscosity and specific gravity. The SPH samples from wells AW-12, AW-51, AW-65, and AW-68 exhibited kinematic viscosities ranging between 2.04 and 4.05 centistokes (cSt; 40 degrees Celsius). The SPH sample from well AW-13 exhibited a viscosity of 1411 cSt. Specific gravity ranged between 0.82 and 0.88, except at well AW-13, which exhibited a specific gravity of 1.08. The viscosities exhibited by samples from wells AW-12, AW-51, AW-65, and AW-68 were consistent with diesel-range hydrocarbons. The viscosity exhibited by the sample from well AW-13 was more consistent with a No. 6 fuel oil and/or some crude oils (CRA, 2009).

### *2.3.4 Bail-Down Tests at AW-51and AW-62*

On March 24, 2010, a bail-down test was performed on well AW-62 (Ash Creek, 2010), which is located downgradient (north) of the Polywall. Approximately 2.6 feet of SPH were measured in the well at the start of the test (which equates to 1.7 gallons in the 4-inch-diameter well). The SPH was removed to a thickness of 0.2 foot in 5 minutes. The SPH in the well recovered to a thickness of 0.4 foot in an hour. After one hour, the incoming tide increased the water level in the well such that an accurate measure of the SPH recovery was no longer possible.

On April 19, 2010, a bail-down test was conducted on well AW-51 just prior to low tide to maximize the available time to complete the test. Well AW-51 is located upgradient (south) of the Polywall. The initial thickness of the SPH was approximately 8 feet, which is equivalent to approximately 5 gallons. Approximately 11 gallons of product were removed from the well using a bailer over an approximate 20-minute period, and SPH continued to recharge into the well throughout the removal. In addition to the 5 gallons of SPH in the casing, the volume of product in the filter pack at the initiation of the test was estimated at 4 gallons, assuming an 8-inch-diameter annulus with a sand filter pack. Therefore, the 11 gallons of SPH evacuated during the test are adequate to have removed the SPH from both the well and filter pack and be further supplied by the formation at the end of the bail-down test. After the removal was complete, the SPH thickness recovered to 1 foot thick within 15 minutes and to 1.5 feet within 2 hours of the test.

### 2.3.5 Sheen on River – 2010

Petroleum sheen was observed on the Savannah River in April 2010, in the vicinity of the oil/water separator outfall. Initial response cleanup was performed by Moran Environmental Recovery, LLC (Moran) of Savannah, Georgia, under contract with the Refinery. Two containment booms and an oil-absorbent boom were deployed. The oil-absorbent boom spanned the area between the embankment southeast of monitoring well AW-62 and the northwestern corner of the dock, mitigating migration of sheen away from the Site and into navigable portions of the river. Moran boat crews were utilized to assist in boom deployment and maintenance and to monitor the river outside of the boom containment area. Pumps were used to collect and transfer petroleum impacted water to a temporary storage tank located southeast of monitoring well AW-62. The outfall and monitoring wells are shown on Figure 3.

Winter Environmental (Winter), under subcontract to Ash Creek Associates, Inc. (Ash Creek), observed and documented assessment of the sheen and cleanup efforts on April 17, 19, and 20, 2010. Winter performed inspections of the oil/water separator system (oil/water separator, associated piping, and outfall) and collected depth to water/SPH measurements on monitoring wells AW-13, AW-51, AW-62 and AW-69. Wells were selected for inspection based on proximity to the oil/water separator and associated piping (AW-13, AW-51 and AW-69) and based on their location on the riverside of the Polywall (AW-62). With the exception of well AW-69, the wells contained measurable thicknesses of SPH. Based on inspection and correspondence with Site staff, Winter determined that the oil/water separator is located approximately 140 feet from the river and that effluent gravity flows from the separator to the river via a 30-inch concrete sewer pipe. Inspection of the outfall indicated that groundwater was infiltrating into the outfall pipe approximately 50 feet from the riverside. A subsequent video inspection of the pipe, conducted by a contractor working on behalf of the Refinery, confirmed that groundwater was infiltrating into the pipe.

During the initial assessment on April 17, 2010, Winter collected samples of SPH from monitoring wells AW-51 and AW-62, the outfall, and the oil/water separator (sample identification "OWS"), and obtained one sample of the petroleum sheen observed on the river (sample identification "River Water") collected by Moran on April 16, 2010. Samples were submitted to Friedman and Bruya, Inc. (F&B) of Seattle, Washington, for forensic evaluation (fingerprint) by capillary gas chromatography using a flame ionization detector (FID). Copies of the laboratory data report (Appendix A) are included in this report.

F&B reported that the River Water and OWS samples contained petroleum hydrocarbons indicative of a residual fuel oil, such as fuel oil No. 4, No. 6, or similar materials. Samples from two monitoring wells, AW-51 and AW-62, contained petroleum hydrocarbons indicative of gasoline or similar material, as well as a middle distillate such as diesel fuel No. 2 or heating oil. The concentrations of petroleum constituents in the outfall water sample were insufficient for a fingerprint analysis; however, analysis (using Environmental Protection Agency [EPA] Method 8015M), indicated that the outfall sample contained diesel- and oil-range hydrocarbons at concentrations of 33 and 10 milligrams per liter (mg/L), respectively.

Two additional water samples were collected from the river at the outfall (sample identification "Outfall Inlet") and the oil/water separator sump (sample identification "Sump") on April 19 and 20, 2010, respectively. The samples were submitted to F&B for forensic analyses. The laboratory reported that the sump sample contained petroleum hydrocarbons indicative of a residual fuel oil that closely resembled the results obtained from the Outfall Inlet sample. The concentration of petroleum constituents in the outfall sample was insufficient for chemical fingerprinting.

Observations and analytical data suggest that the sheen observed on the Savannah River in 2010 was related to the oil/water separator and leaking outfall pipe, rather than migration of SPH from the subsurface.

# 3.0 Methods and Procedures

Five additional monitoring wells were installed along the waterfront to further evaluate the extent of SPH at the Site near the Savannah River. The well installation and gauging activities were conducted during three phases between December 13, 2010 and January 2012 to accommodate refinery permitting requirements, minimize disruptions to refinery operations, and to obtain follow-up SPH thickness data to assist in the design of an SPH removal system. The well locations are shown on Figures 2 and 3.

The first phase, completed between December 13 and 17, 2010, included:

(1) measuring depth to water and SPH thicknesses in 12 monitoring wells;

(2) installation of groundwater monitoring wells AW-75 and AW-77; and

(3) decommissioning of monitoring well AW-23.

The second phase, completed between January 31 and February 5, 2011, included:

(1) installation of monitoring wells AW-76, AW-78, and AW-79;

(2) measuring depth to water and SPH thickness in the five new wells;

(3) conducting bail-down tests at six wells; and

(4) decommissioning monitoring well AW-29.

The third phase, completed between November 30, 2011 and January 5, 2012, included:

(1) performance of bail-down tests at eight wells, at approximately two- to three-week intervals.

## 3.1 Phase I Groundwater Elevations and SPH Thicknesses

Groundwater level measurements were collected by Ash Creek on December 13, 2010. Depth to groundwater and SPH, if present, were measured to the nearest 0.01 foot using an electric oil/water interface probe. General procedures for the well gauging are described in Standard Operating Procedures (SOPs) 2.11 and 2.16, included in Appendix B. Depth to groundwater, groundwater elevations, and SPH thickness data are presented in Table 1.

Groundwater was encountered at depths ranging from 10.33 to 17.46 feet below the top of casing (TOC) during the December 13, 2010 monitoring event. Water level measurements were completed between 3:00 p.m. and 5:45 p.m. During the gauging activities, the water level in the Savannah River increased by approximately 2.75 feet, according to data from the nearest NOAA tide station (Savannah), which is located approximately 3 miles southeast (downstream) of the Site.

Groundwater elevations ranged from -2.37 feet mean sea level (MSL) in well AW-62, located near the Savannah River, to 2.27 feet MSL at AW-45, located in the central portion of the Site. Groundwater contours were constructed using the corrected groundwater elevations and are shown on Figure 5. As presented on Figure 5, groundwater flow is generally from southwest to northeast, towards the Savannah River, although groundwater exhibits some easterly and westerly flow components near the Polywall.

SPH thicknesses measured in 12 wells ranged from 0.01 (AW-32) to 14.02 (AW-54) feet. Monitoring wells located south (upgradient) of the Polywall contained as much as 14.02 feet of SPH. Monitoring well AW-62, located north of the Polywall, contained 0.30 foot of SPH. Figure 6 presents the December 2010 SPH thicknesses and the maximum historical thicknesses observed at each well location. Thicknesses measured in the December 2010 event were consistent with previous events. Historical groundwater elevations and SPH thicknesses are summarized in Appendix C.

## 3.2 Well Drilling Preparatory Activities

Ash Creek notified the Georgia Utilities Protection Center of the proposed well installation activities prior to both mobilizations. Additionally, a private utility locator, Ground Hound Detection Services (GHD), was retained by Ash Creek to assess for the presence of underground utilities in the vicinity of the borings.

## 3.3 Lithologic Logging and Field Screening

Well installations were completed by Drilling Solutions, Inc., under subcontract to and under the oversight of Ash Creek, using a combination direct-push/hollow-stem auger drill rig. The upper 5 feet of each boring was cleared, prior to drilling, using an air knife. Soil lithology was logged continuously for the entire depth of each boring. Soil cores were screened every 2 to 3 feet for the presence of volatile organic compounds (VOCs) using a photoionization detector (PID), and for SPH using sheen tests. The lithologic logs and field screening results are included in Appendix D.

## 3.4 Groundwater Monitoring Well Installations and Development

The borings completed at locations AW-75 through AW-79 were converted into groundwater monitoring wells. The groundwater monitoring wells were constructed using 2-inch-diameter schedule 40 PVC casing. Well screens (0.010-inch slot-size) were installed in the interval between 4 and 19 feet bgs. The screened intervals were selected to account for potential water table fluctuations consistent with those observed at the Site during historical monitoring events. The wells were developed by Drilling Solutions by over-pumping and surging to remove excess turbidity and improve hydraulic communication with the adjacent water-bearing zone. Well construction logs are contained in Appendix D. General procedures for the installations and development are described in the SOPs 2.1, 2.4, 2.13 and 2.14, included in Appendix B.

## 3.5 New Groundwater Monitoring Well Gauging

New monitoring wells AW-75 through AW-79 were gauged by Ash Creek between January 31 and February 5, 2011. The measured depths to groundwater for the new wells are shown in Table 2. Groundwater samples were not collected from the wells for laboratory analysis.

## 3.6 Monitoring Well Survey

Following completion of the monitoring well installations, Gardner Smith Surveyors, Inc., a Georgia-licensed land surveyor, completed a survey of the newly-installed groundwater monitoring wells. The survey included determination of the horizontal locations and elevations of wells AW-75 through AW-79. Horizontal control was provided by the State Plane Coordinate System and vertical control was provided by the North American Vertical Datum of 1988 (NAVD 88). Previously installed wells AW-62, AW-71, and AW-75 were also surveyed to integrate those wells into the monitoring well network.

## 3.7 Phase II and III Bail-Down Tests

The Phase II bail-down event consisted of a three-day bail down test that was performed at six wells between February 3 and 5, 2011. The Phase III event consisted of three one-day bail-down tests, performed at eight wells at two- to three-week intervals, between November 2011 and January 2012. The Phase II test was performed to obtain data for a preliminary evaluation of the feasibility of SPH removal at the Site. The Phase III test was performed to obtain additional data for a more in-depth evaluation of the long-term feasibility of SPH removal at the Site. During each phase, bail-down test wells were selected based on the historical presence of SPH in those wells and/or their proximity to the Polywall.

### *3.7.1 Phase II Bail-Down Tests*

The Phase II test consisted of SPH purging and recovery measurements at wells AW-10, AW-11, AW-51, AW-56, AW-68, and AW-74. Approximately 1.8 to 5.5 feet of SPH (equivalent to approximately 1 to

5.8 gallons) were present in each of the wells at the start of the test. SPH were initially removed from the wells on February 3, 2011, and the SPH recovery rate was measured through February 5, 2011. The volume of SPH evacuated during the bail-down test appear sufficient to have removed the SPH from the combined wells and filter packs, indicating that the SPH recharge rates observed at the end of the bail-down tests were representative of SPH in the surrounding formation. The initial SPH thicknesses in wells AW-10, AW-11, AW-51, AW-56, AW-68, and AW-74 prior to the February 2011 bail-down tests are shown on Figure 7. The volumes of SPH removed and the recovery rates are documented on field data sheets, included in Appendix E, and in graphs included in Appendix F.

### *3.7.2 Phase III Bail-Down Tests*

The Phase III bail-down tests consisted of purging and measurements of SPH thickness at wells AW-10, AW-11, AW-45, AW-51, AW-56, AW-62, AW-65, and AW-74, during three one-day events. The events were performed on November 30, 2011, December 12, 2011, and January 5, 2012. During each event, the thickness of SPH was initially measured, SPH was purged from the wells, and then two to three follow-up measurements were performed to assess the SPH recovery rates. The duration of each Phase III bail-down test was limited to a single day because the goal of the Phase III testing was to evaluate the general Site response to repeated extraction of SPH over an extended period (i.e., November 2011 through January 2012), rather than the response to a one-time SPH removal event.

The thickness of SPH in the monitoring wells ranged between 0.48 and 5.18 feet on November 30, 2011; 0.24 to 4.16 feet on December 12, 2011; and 0.40 to 4.63 feet on January 5, 2012. Similar to the Phase II test, the volume of SPH removed from each well was more than the volume contained in the well, so SPH recovery is expected to be representative of the surrounding formation. The volumes of SPH removed and the recovery rates are tabulated in Appendix E.

## 3.8 Well Decommissioning

Monitoring wells AW-23 and AW-29 were decommissioned by Drilling Solutions, Inc. by over-drilling on December 13, 2010 and January 31, 2011, respectively. The over-drilled borings were backfilled with hydrated bentonite. Drill cuttings were contained in 55-gallon drums and disposed of as discussed in Section 3.9.

## 3.9 Investigation Derived Waste

The investigation-derived waste (IDW), consisting of soil, purged SPH/water, and decontamination water, was placed in properly labeled drums. Personal protective equipment (PPE) was disposed of in appropriate garbage receptacles. The IDW soil was characterized as non-hazardous waste. Based on the benzene concentrations, the mixed purged SPH/decontamination water was characterized as hazardous waste. The IDW soil was transported to the Waste Management Superior Landfill in Savannah, Georgia for disposal on

March 24, 2011. The SPH/decontamination water was transported to the Chemical Waste Management Emelle, Alabama facility for disposal on March 1, 2011. SPH and purge water during the Phase III bail-down event was managed and disposed of by contractors working on behalf of the refinery.

# 4.0 Results

This section provides the results of the field activities, including lithology encountered, field screening results, and bail-down test data.

## 4.1 Lithology

Lithology generally consisted of silty sand and sand with occasional lenses of clay between the ground surface and approximately 20 feet bgs. Gravelly sand was encountered in the upper 5 feet of boring AW-75 and AW-77. Medium sand was encountered in the upper 5 feet of boring AW-78 and between 16 and 20 feet in boring AW-79. The soil was generally brown to reddish-brown, with some gray coloration. Greenish-gray to black-colored soil was encountered between approximately 6 and 12 feet bgs in borings AW-76 through AW-79, the depth interval that corresponds to the typical depth to groundwater in that portion of the Site. Lithologic logs are presented in Appendix D.

## 4.2 Field Screening Observations

Field screening results for each exploration are presented in the lithologic logs in Appendix D. As noted above, PID screening and sheen tests were conducted on soil cores every 2 to 3 feet of each boring. VOCs were not detected by the PID in boring AW-75, and VOC concentrations did not exceed 85 parts per million (ppm) in boring AW-77. PID readings were higher in borings AW-76, AW-78, and AW-79. In boring AW-76, PID readings ranged between approximately 100 and 500 ppm in the interval between 7 and 19 feet. In borings AW-78 and AW-79, PID readings were highest in the interval between 6 and 10 feet. Overall, PID readings up to 1,945 ppm were measured in soil approximately 9 to 10 feet bgs in boring AW-78. In general, the soil intervals that exhibited elevated PID readings correspond to the approximate groundwater interface. Sheen on soil was generally observed in the depth intervals that correspond to the highest PID readings.

## 4.3 Extent of SPH

SPH was present in monitoring wells south (upgradient) of the Polywall at thicknesses ranging between 0.01 and 14.02 feet, with the greatest thickness of SPH measured in well AW-54. The SPH data collected south of the Polywall were generally consistent with historically collected data and indicate that SPH are widespread in the subsurface south of the Polywall.

North of the Polywall, the extent of SPH appears limited. SPH was absent from new monitoring wells AW-75 through AW-79 shortly after installation. During the Phase III bail-down testing, the SPH thickness in monitoring well AW-62 ranged from 0.24 to 0.54 foot. The thickness of SPH in well AW-62 was the lowest amount measured since 1991. Prior to the December 2010 gauging event, SPH thickness in well AW-62 has fluctuated between approximately 1 and 7 feet, with no obvious overall increasing or decreasing trends. It is unclear if the SPH at well AW-62 consists of residual SPH that was present in that area prior to installation of the Polywall or if the SPH is migrating from sources upgradient of the Polywall. The only known penetration through the Polywall is the oil/water separator outfall. Well AW-77 is located between the outfall and well AW-62. The absence of SPH from well AW-77 suggests that SPH observed in well AW-62 are not migrating to that area as a result of leakage through the Polywall at the outfall penetration. The presence of limited SPH north (downgradient) of the Polywall, relative to levels measured south of the Polywall, suggests that the Polywall is limiting or preventing the migration of SPH from the Site toward the Savannah River.

## 4.4 Estimate of Recoverability of SPH

Based on data collected during the Phase I and II bail-down tests, conducted in April 2010 and February 2011, the SPH thicknesses in the formation around the tested wells were typically on the order of about 0.1 foot (and less than 0.5 foot in all wells), and sustainable SPH recovery rates at individual wells are expected to range between approximately 0.1 and 0.3 gallon per day (higher initially and then decreasing with time). During the three-day Phase II bail-down test, SPH was removed from the wells and surrounding sandpack, and multiple instances of SPH removal and recovery were used in each well to assess both the volumetric rate of SPH recovery and the stable SPH thickness. These assessments were made by estimating the asymptotes of the plots of SPH recovery rate and thickness (included in Appendix F), which represent the SPH thickness in the formation outside of the well filter pack and the recovery rate initially attributed to that thickness. Approximately five tidal cycles occurred over the duration of the February 2011 bail-down tests; therefore, the bail-down data are useful for evaluating the overall recoverability of SPH during both rising and falling tides.

Observations made during the subsequent Phase III bail-down tests suggest that SPH thicknesses were somewhat thicker than seen during Phase II (perhaps as a result of seasonal fluctuations or variable groundwater elevations), with several wells showing short-term recovery thicknesses of more than 1 foot. Short-term recovery rates were also quicker than seen during Phase II – translating to sustainable extraction rates that are estimated to be on the order of 0.1 to 0.6 gallon per day. Detailed evaluation of the recovery rate data, however, was limited by the limited duration of the Phase III SPH extraction sessions.

The results of the bail-down tests suggest that the volume and mobility of the SPH at the Site are sufficient to warrant the design and operation of an SPH recovery system. Effective SPH recovery systems may include belt skimmers (in wells and/or recovery trenches), pneumatic skimmers, or other methods.

## 4.5 Conclusions

Monitoring wells AW-75 through AW-79 were installed, SPH thicknesses were gauged, and bail-down tests were conducted to obtain the data necessary to evaluate the extent of SPH at the northern portion of the Site and to design an effective SPH recovery system. No SPH was observed in the newly installed wells, suggesting that significant SPH is not migrating from the Site to the waterfront area in the vicinity of the new wells. The distance between monitoring wells downgradient of the Polywall ranges between 100 and 300 feet; therefore, it is possible that SPH is present in the subsurface at unexplored areas.

A limited amount of SPH (0.24 to 0.54 foot) was detected in well AW-62, which is north (downgradient) of the Polywall. The presence of SPH in well AW-62 is consistent with previous SPH gauging events, although the measured thickness is less than amounts measured since 1991. It is unclear if the limited amount of SPH measured in well AW-62 is the result of leakage through the Polywall or is associated with residual SPH that was present in that area prior to construction of the Polywall.

In general, SPH thicknesses north of the Polywall are small relative to thicknesses measured south (upgradient) of the Polywall. The relative difference of SPH thicknesses north and south of the barrier suggests that the Polywall is currently effective for preventing or limiting the migration of SPH toward the Savannah River. The service life of the Polywall is unclear, due to the limited information available about the design and installation of the Polywall and because empirical data describing the general durability of HDPE geomembranes (particularly in contact with SPH and dissolved petroleum constituents) are limited (Rowe and Sangam, 2002). Based on the uncertainty about the long-term effectiveness of the Polywall, the presence of extensive SPH at the Site, and the proximity of the Site to the Savannah River, SPH removal efforts are likely warranted.

# ***5.0 Evaluation of SPH Removal Options***

Initial SPH recovery rates in monitoring wells are expected to range between 0.1 and 0.6 gallon per day per well, an amount sufficient to warrant the design of an SPH recovery system. An SPH recovery system should be designed to reduce the amount of SPH the south of the Polywall, in the vicinity of well AW-62, and at the east side of the site, near well AW-45. Conceptually, a recovery system consisting of skimmers (pneumatic or belt) installed in recovery wells and/or trenches near the Polywall may be an effective approach for removing SPH from the subsurface and reducing the risk of migration to the Savannah River. The actual design of the system should be determined based on overall project goals, refinery requirements/limitations, and subsurface conditions.

## 5.1 Purpose

The purpose of the system installation being considered for the Site is to recover SPH that has accumulated: (1) on the south (upgradient) side of the Polywall; (2) north of the Polywall, in the vicinity of well AW-62; and (3) at the east side of the Site, in the vicinity of well AW-45 (collectively, the "treatment area"). The purpose of removing SPH is to reduce the potential for SPH leakage through or around the Polywall and to minimize the potential for SPH impacts to the Savannah River and other off-site property.

Other areas of the Site that have measurable thicknesses of SPH are not included in the scope of this removal evaluation because SPH in those areas present a lesser risk of impacts to off-site property and other remedial alternatives may be more appropriate for addressing petroleum hydrocarbons in soil and groundwater in those areas.

## 5.2 Design Considerations

Based on the results of the SPH bail-down tests completed in Site monitoring wells, the SPH is estimated to be present in Site soil at thicknesses that are as much as 0.5 to 1.0 foot (apparently varying with season and/or water levels). Initial recovery rates from a single well point were estimated at rates of 0.1 to 0.6 gallon per day. A wide range of SPH recovery equipment is available that can address SPH under these conditions, including passive submerged skimmers, active submerged skimmers, above-grade skimmers (i.e., belt skimmers), and pumped fluid recovery (submerged or applied-vacuum pumping). The observed viscosity of the SPH would require specialty equipment for submerged skimmers (passive or active), but such equipment is available. Significant tidal fluctuations (as much as 6 feet) have been observed in monitoring wells representative of portions of the target SPH recovery area (particularly north of the Polywall).

## 5.3 Remedial Alternative Screening

A description of several alternatives for removing SPH at the treatment area is presented below, along with a discussion of implementability and costs. For comparison purposes, the costs for the following remedial alternatives have been estimated based on the assumption that: (1) there will be negligible SPH recharge from inland (south) areas of the Site to the general remediation area; and (2) the proposed alternatives are not intended to remediate conditions outside of the deployment area (i.e., the alternatives will not address conditions in the tank fields). If significant SPH recharge from inland areas occurs, the timeframe and costs for remediation will increase; however, the relative effectiveness of the following alternatives will remain unchanged. The remedial alternatives, screening presented below is summarized in Table 3.

### 5.3.1 Alternative 1 - Passive Skimming

Under this alternative, passive SPH skimmers would be installed in recovery wells, which would be spaced at approximately 20-foot intervals in the treatment area. The passive skimmers do not require electricity or a source of compressed air; therefore, no aboveground structures would be required. SPH that accumulates in the skimmers would be manually removed and emptied into holding tanks or drums at regular intervals.

The effectiveness of passive skimming equipment is limited because: (1) the capture radius is small; and (2) equipment is not available that will cover the full range of groundwater level fluctuations (particularly for viscous petroleum products). Skimmers are ineffective when water levels drop below the unit and when the units are submerged. The water level fluctuations would require that the vertical positions of the skimmers in the wells be frequently adjusted. This alternative would have minimal impact above ground once the installation was complete (wellheads can be completed in small sub-grade vaults/monuments).

Due to the relatively inefficient SPH recovery expected from passive skimmers, the SPH recovery period is anticipated to be in the range of 20 years. The estimated cost for installation, operation, and maintenance of Alternative 1 is $816,000.

### 5.3.2 Alternative 2 - Active Skimming

Under this alternative, pneumatically driven SPH skimmers would be installed in recovery wells, which would be spaced at approximately 40-foot intervals in the treatment area. The skimmers would pump recovered SPH to holding tanks for periodic recovery and disposal. The pumps will require a source of pressurized air (compressors or pressurized air tanks). A compressor could service multiple skimmers. Shallow trenching would be required for installation air delivery and SPH recovery systems.

The effectiveness of active skimming equipment would be limited because: (1) active skimming equipment is not available that will cover the full range of groundwater level fluctuations (particularly for viscous petroleum products). Skimmers are ineffective when water levels drop below the unit and when the units are submerged. The water level fluctuations would require that the vertical positions of the skimmers in the wells be frequently adjusted. This alternative would have minor impacts above ground once installation is complete (wellheads can be completed in small vaults/monuments and compressor/tank units can be housed in small shed structures.

The SPH recovery period is anticipated to be in the range of 15 years. The estimated cost for installation, operation, and maintenance of Alternative 2 is $846,000.

### 5.3.3 Alternative 3 – Gallery Trench

Under this alternative, a trench would be excavated along the upgradient side of Polywall; porous backfill and perforated piping would be installed in the trench to capture SPH and direct it to manhole sumps, spaced at approximately 100-foot intervals. Due to large fluctuations in groundwater levels, a piping network capable of addressing 6 feet of water level fluctuation would be necessary. Large skimmers would collect SPH from the sumps and store it in temporary holding tanks. The skimmers would require a source of electricity and monthly maintenance.

Excavation of a gallery trench would present significant logistical challenges, given the extensive aboveground and underground infrastructure near the Polywall and the presence of shallow, impacted groundwater. Excavated soil may require off-site disposal as a solid waste. Dewatering would likely be required during excavation, requiring costly treatment and disposal of extracted groundwater and SPH. This alternative would have minor aboveground impacts after the trench was constructed and backfilled, including skimmers in approximately 8 small sheds.

This alternative would not address SPH in the vicinity of monitoring well AW-45 or downgradient of the Polywall, near well AW-62. SPH in those areas could be addressed using a limited version of alternatives 1, 2, or 5.

The SPH recovery period for the gallery trench alternative is assumed to be 10 years. Annual costs include skimmer power, monthly maintenance, and disposal of recovered SPH. The estimated cost for installation, operation, and maintenance of Alternative 3 is $842,000. If Alternative 3 was augmented by treatment systems near wells AW-45 and AW-62, using limited versions of Alternatives 1, 2, or 5, total costs would approach $922,000.

### 5.3.4 Alternative 4 – Total Fluids/Groundwater Extraction

Under this alternative, extraction wells and pumps would be installed along the upgradient side of the Polywall at approximately 100-foot intervals, and near wells AW-45 and AW-62. The volume of removed fluids is assumed between 100 and 200 gallons per minute (gpm; will require pilot testing to verify prior to a design). Water and SPH extracted from the wells would be processed using a high-efficiency oil-water separator and air-stripper. Treated water would be discharged to the Savannah River under a National Pollution Discharge Elimination System (NPDES) permit (if practicable). Recovered SPH would be stored in a tank, pending off-site disposal. Piping and trenching would be required from wells to the treatment system. The pumps would require a source of electricity and monthly maintenance.

Infrastructure for the processing of extracted water does not currently exist at the Site. The inclusion of groundwater pumping or total-fluids pumping could accelerate the SPH recovery and could require fewer extraction points than an SPH-only recovery system, as the radius of influence of the extraction point may be greater. However, the cost for handling and treating the extracted groundwater, particularly during high tide stages, would be large (both for installation and ongoing operation). The most cost-effective approach for disposing of treated groundwater would be to discharge it to the Savannah River under an NPDES permit. The availability and conditions of an NPDES permit for discharge of treated water are unclear. If an NPDES permit is available, and tertiary treatment is required (i.e., activated carbon), costs would increase. If an NPDES permit is unavailable, off-site disposal of recovered water would be required, which would significantly increase costs.

The SPH recovery period for this alternative is assumed to be 6 years. Annual costs include pump/treatment system power, monthly maintenance, discharge sampling/reporting, and disposal of recovered SPH. The estimated cost for installation, operation, and maintenance of Alternative 4 is $759,000.

### *5.3.5 Alternative 5 – Belt Skimmers*

Under this alternative, belt skimmers would be installed in recovery wells spaced approximately 40 feet apart at the treatment area. Belt skimmers are especially effective at removing heavier SPH (such as present at the Site) and will operate across the range of water levels at the Site. The capacity of belt skimmers to operate across a wide range of water levels minimizes operations and maintenance requirements. The belt skimmers would be housed in small aboveground structures located at each recovery well. Recovered SPH would be discharged to holding drums, also stored in the small structures, for periodic recovery and disposal. The pumps will require a source of electricity. Shallow trenching would be required to provide electrical power to each unit. The units operate independently; therefore, shut-downs only affect a single unit.

This alternative would result in minor disruptions to Facility operations during installation and would have minor impacts above-ground once installation is complete (wellheads can be completed in small vaults/monuments and compressor/tank units can be housed in small shed structures. Shallow trenching would be required to provide electrical power to each unit.

The SPH recovery period is anticipated to be in the range of 10 years. Annual costs include electrical power, monthly maintenance, and disposal of recovered SPH. The estimated cost for installation, operation, and maintenance of Alternative 5 is $618,000.

### *5.3.6 Selection of Alternative*

Given the considerations of available SPH recovery equipment discussed above, the most applicable technology for meeting the design scope and purpose would be belt skimmers. Belt skimmers are capable of handling large fluctuations in groundwater elevation, are well-suited to viscous SPH, and would likely require less operations and maintenance than other SPH removal equipment. The costs for installation of belt skimmers are also significantly lower than a total-fluids or groundwater extraction system.

## 5.4 Conceptual Design

Long-term operation of a belt skimmer system is expected to recover SPH from a radius of at least 20 feet around an individual extraction well. The basis of the SPH recovery system is therefore based on a series of extraction points on 40-foot centers on the upgradient side of the Polywall; at least one belt skimmer north of the Polywall, near well AW-62; and six extraction points on 40-foot centers, adjacent to the eastern property boundary, near well AW-45. A conceptual belt skimmer system layout and schematic design are shown on Figures 8 and 9. The specific locations for each extraction well would be determined based on facility infrastructure and access limitations and in coordination with refinery personnel. The actual number of extraction wells would be refined based on subsurface explorations conducted during the installation of the recovery system. The modular nature of the belt-skimmer equipment (being comprised of individual units) also allows for adaptation of the system to a variety of operating conditions – such as implementing the system in phases (allowing data collected in earlier phases to refine the implementation of later phases) or adding/removing skimmer units as needed to reflect changing site conditions.

Each extraction point would include the following components:

- Installing a 4-inch-diameter extraction well to a depth of approximately 20 feet bgs and screened across the full range of expected depths to groundwater. The well screen would be coarse-slotted screen (0.020 or greater) to accommodate the viscous SPH. The well casing would stick up about a foot from the ground surface to penetrate the floor of the containment shed (discussed below).
- Assembling a ventilated shed over each of the well casings to enclose the belt skimmer (for protection from inclement weather, corrosion, and accidental damage). The sheds (nominally 4 feet by 6 feet) would be designed for hurricane-strength winds and would be securely attached to the ground. The penetration of the well casing through the floor of the shed would be sealed to prevent the release of a potential spill to the ground beneath the shed. The shed would be well ventilated to prevent the potential for vapor accumulation (such as with screened wall sections). An indicator light would be mounted on the outside of the shed to provide notification of a full product drum.
- Installing a belt skimmer (such as the Abanaki PetroXtractor), including a petroleum-compatible drum for collecting recovered SPH, a redundant high-level shut-off for the belt skimmer, and secondary containment for the SPH collection drum. The skimmer equipment would be intrinsically explosion proof. The skimming belt length would be installed to cover the full range of likely groundwater depths.
- Installing electrical power for each unit (consisting of 115VAC single-phase power). The specific source of electrical power would be coordinated with the facility.

Each belt skimmer unit would operate independently, and would shut off when the associated SPH collection drum is full (and an indicator light would be triggered for visual identification of system status). Maintenance of the system would require collection of the recovered SPH (possibly by routine vacuum truck service), periodic preventative maintenance of the skimmer equipment, and repair/replacement as needed.

The estimated costs for installation of the belt skimmer system are on the order of $300,000, broken down as follows:

- $3,000 for the installation of each of 28 extraction wells ($84,000 total);
- $5,000 for each belt skimmer unit (up to $140,000 total, depending on the implementation approach);
- $1,500 each for the shed and installation of each unit ($42,000); and
- $40,000 for electrical supply.

Variations of the installation program (*i.e.,* a phased approach or an adaptive installation of fewer skimmers initially) would reduce the initial capital cost but may extend the duration of the SPH recovery period. The expected costs for installation and operations and maintenance of the selected product removal system, and a phase installation approach can be further refined as part of a remedial design report.

# 6.0 References


Amoco Oil Company, 1989. *Letter to Georgia Department of Natural Resources, Re: Report #041789-10.* April 20, 1989.

Ash Creek Associates, Inc, 2010. *Groundwater and LNAPL Gauging Event, First Quarter 2010, NuStar Asphalt Refining, LLC, Savannah, Georgia.* September, 2010.

Bechtel Environmental, Inc., 1991. *Recovery Systems Operation and Maintenance (Summarized Version), Amoco Savannah Refinery, Savannah, Georgia.* March 1991.

Conestoga-Rovers & Associates (CRA), 2009. *Memorandum regarding NuStar Asphalt Refinery, Savannah, Georgia - January through July 2009 Fieldwork Summary.* October 16, 2009.

Lawton, D.E. et al, 1976. *Geologic Map of Georgia: Georgia Department of Natural Resources, Scale 1:500,000.*

National Oceanic and Atmospheric Administration (NOAA), 2008. *Tidal Station Location and Ranges.* Revised November 3, 2008. http://tidesandcurrents.noaa.gov/tides09/tab2ec3b.html#79

Rowe, R.K. and Sangam, H.P., 2002. *Durability of HDPE Geomembranes*. Geotextiles and Geomembranes: vol. 20, pp. 77-95.

S&ME, 1998. *Letter to CITGO Asphalt Refining Co., Subject: Hydrocarbon Thickness Monitoring S&ME Project No. 1144-93-093.*

S&ME, 2003. *Water Elevation/Hydrocarbon Thickness Monitoring Report, Citgo Asphalt Refinery, Foundation Drive, Savannah, Georgia.* October 31, 2003.

Savannah Refinery, 1989. *Letter to Shift Supervisors, Re: "Gas Hole" by Riverbank.* October 18, 1989.

Williams, L.J. and Gill, H.E., 2010. *Revised Hydrogeologic Framework of the Floridan Aquifer System in the Northern Coastal Area of Georgia and Adjacent Parts of South Carolina; U.S. Geological Survey Scientific Investigations Report 2010-5158.*

Table 1 — Groundwater Elevation and SPH Thickness Data - December 2010
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5] (Feet MSL) | Depth to Product[8] (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-9 | 12/13/2010 | 13.50 | 15.90 | 1.36 | 11.50 | 4.40 |
| AW-10 | 12/13/2010 | 13.90 | 15.28 | 1.75 | 11.62 | 3.66 |
| AW-11 | 12/13/2010 | 13.64 | 14.98 | 1.59 | 11.55 | 3.43 |
| AW-32 | 12/13/2010 | 14.39 | 11.60 | 2.80 | 11.59 | 0.01 |
| AW-45 | 12/13/2010 | 15.13 | 13.75 | 2.27 | 12.71 | 1.04 |
| AW-51 | 12/13/2010 | 12.75 | 17.46 | 1.42 | 10.28 | 7.18 |
| AW-54 | 12/13/2010 | 10.66 | 18.26 | 4.37 | 4.24 | 14.02 |
| AW-56 [6,7] | 12/13/2010 | 12.65 | 15.93 | 1.02 | 10.89 | 5.04 |
| AW-62 [7] | 12/13/2010 | 7.70 | 10.33 | -2.37 | 10.03 | 0.30 |
| AW-65 | 12/13/2010 | 13.26 | 14.62 | 0.91 | 11.96 | 2.66 |
| AW-68 | 12/13/2010 | 13.80 | 17.14 | 1.14 | 11.89 | 5.25 |
| AW-74 | 12/13/2010 | 9.96 | 13.12 | 0.60 | 8.72 | 4.40 |

*Notes:*
1. TOC Elevation - Top of casing elevation.
2. Feet MSL = Feet above mean sea level.
3. Feet BTC = Feet below top of casing.
4. Surveyed on March 5-6, 2009 and February 11, 2011.
5. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
6. The TRUCK LOADING well is assumed to be well AW-56 (RW-56) based on figures contained in the August 1995 Geraghty & Miller, Inc *Site Evaluation and Remedial Alternatives* .
7. The FIREHOUSE well is assumed to be well AW-62 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
8. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were presen using the following equation and assuming the specific gravity detailed in note 5. (based on back-calculations from previous reports for this project):

$$h_w = \frac{p_g\ h_g}{p_w}$$

where:
water level elevation = top of casing elevation + [$h_w$ - $d_w$];
$h_w$ = depth to groundwater correction;
$d_w$ = depth to groundwater measuring point;
$p_g$ = density of separate-phase hydrocarbons;
$p_w$ = density of water; and
$h_g$ = product thickness.

Table 2 — Groundwater Elevation and SPH Thickness Data - January/February 2011
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-10 | 2/3/2011 | 13.90 | 14.10 | -0.20 | 11.33 | 2.77 |
| AW-11 | 2/3/2011 | 13.64 | 14.05 | -0.41 | 11.35 | 2.70 |
| AW-51 | 2/2/2011 | 12.75 | 15.57 | -2.82 | 10.08 | 5.49 |
| AW-56 | 2/2/2011 | 12.65 | 15.19 | -2.54 | 10.57 | 4.62 |
| AW-65 | 2/4/2011 | 13.26 | 12.67 | 0.59 | 10.84 | 1.83 |
| AW-68 | 2/4/2011 | 13.80 | 12.91 | 0.89 | 11.97 | 0.94 |
| AW-74 | 2/2/2011 | 9.96 | 11.40 | -1.44 | 10.52 | 0.88 |
| AW-75 | 1/31/2011 | 9.72 | 10.51 | -0.79 | -- | -- |
| AW-76 | 2/5/2011 | 10.12 | 10.08 | 0.04 | -- | -- |
| AW-77 | 2/5/2011 | 8.20 | 13.51 | -5.31 | -- | -- |
| AW-78 | 2/5/2011 | 9.01 | 6.35 | 2.66 | -- | -- |
| AW-79 | 2/5/2011 | 7.73 | 9.73 | -2.00 | -- | -- |

*Notes:*
1. TOC Elevation - Top of casing elevation.
2. Feet MSL = Feet above mean sea level.
3. Feet BTC = Feet below top of casing.
4. Surveyed on March 5-6, 2009 and February 11, 2011.
5. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
6. -- = Not available or not applicable.
7. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were presen using the following equation and assuming the specific gravity detailed in note 5. (based on back-calculations from previous reports for this project):

$$h_w = \frac{p_g \, h_g}{p_w}$$

where:

water level elevation = top of casing elevation + [$h_w$ - $d_w$];
$h_w$ = depth to groundwater correction;
$d_w$ = depth to groundwater measuring point;
$p_g$ = density of separate-phase hydrocarbons;
$p_w$ = density of water; and
$h_g$ = product thickness.


***Note:*** Base map prepared from USGS 7.5-minute quadrangle of Garden City, GA, dated 1980 and Savannah, GA-SC, dated 1978 as provided by TerraServer-USA.

0 2,000 4,000

Approximate Scale in Feet


GEORGIA

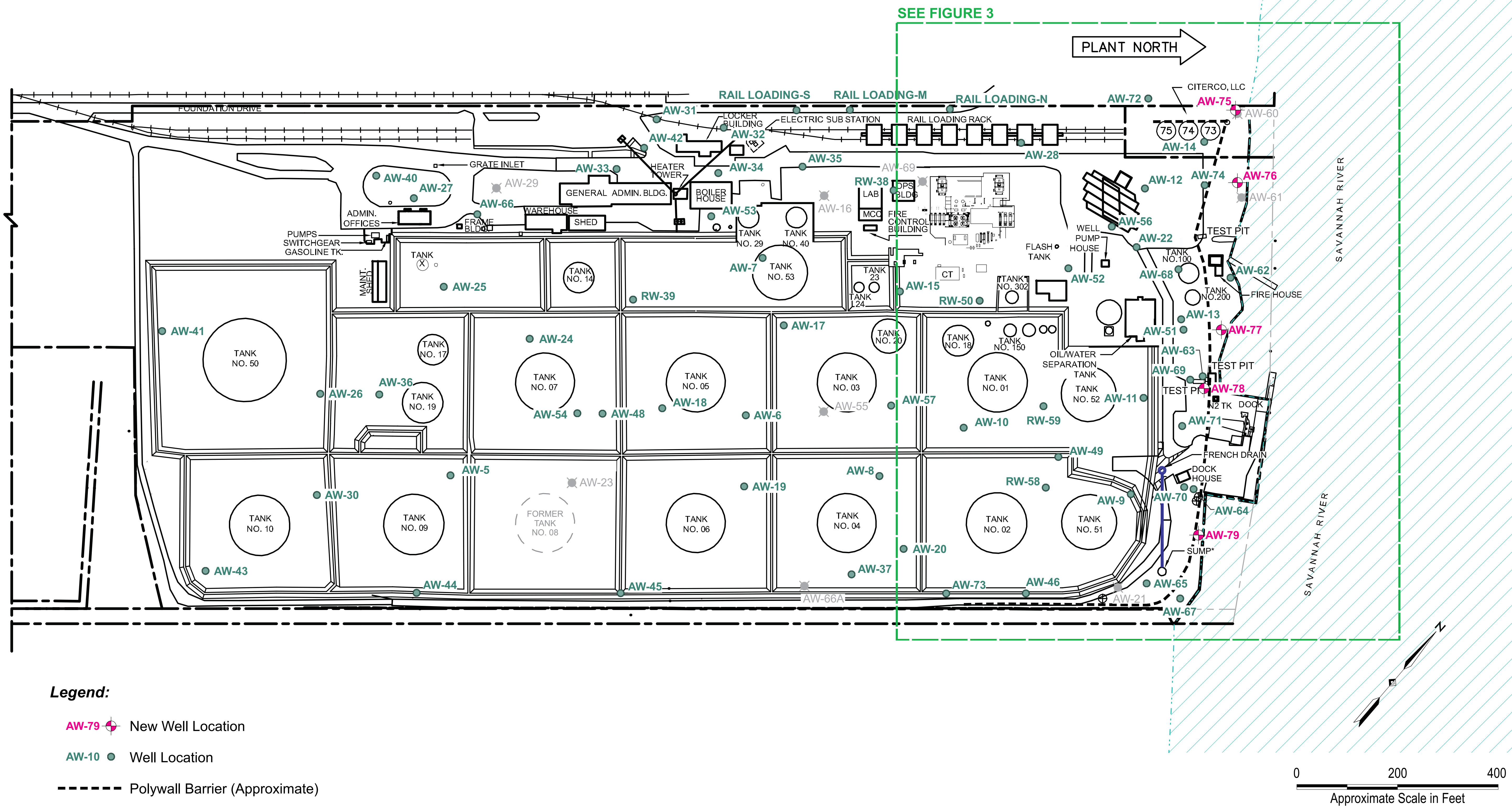
N

# Site Location Map

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | 1 |




***Legend:***

- AW-79 New Well Location
- AW-10 Well Location
- Polywall Barrier (Approximate)
- AW-55 Abandoned Well Location
- Polywall Survey
- TEST PIT Test Pit Location
- Property Boundary

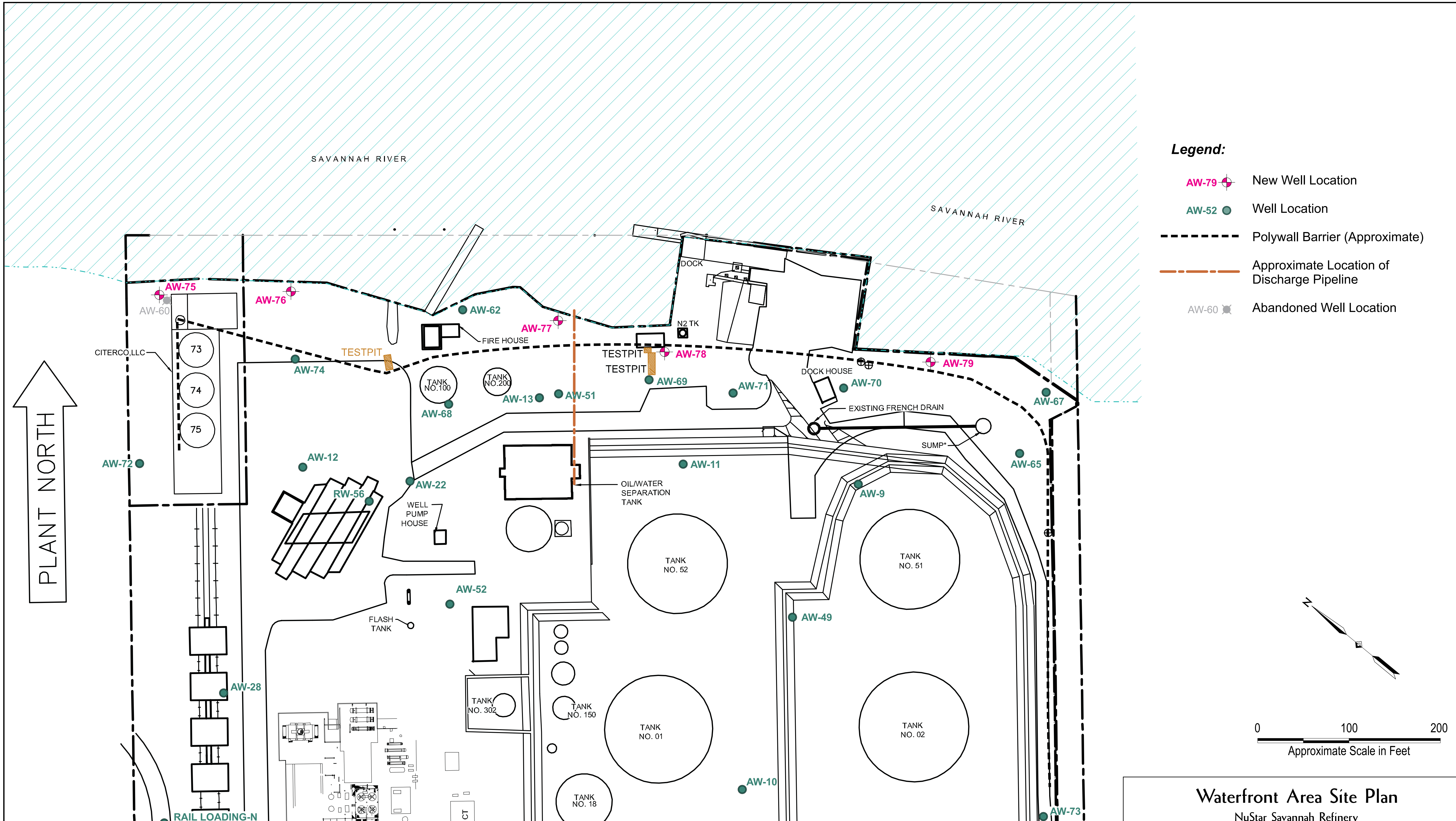
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | 2 |



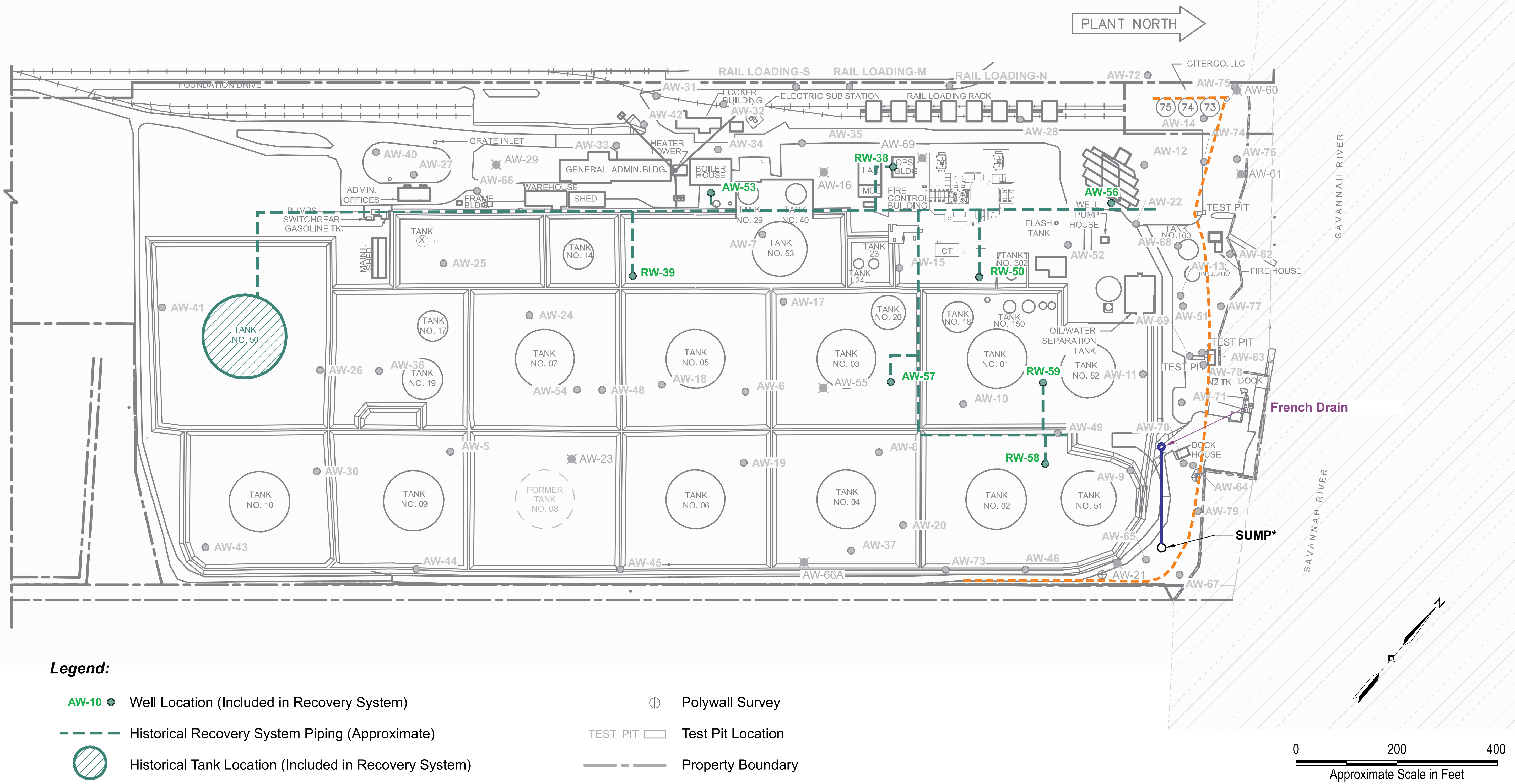

# Waterfront Area Site Plan

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | 3 |

**NOTES:**
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".




## Legend:

- AW-10 ● Well Location (Included in Recovery System)
- Historical Recovery System Piping (Approximate)
- Historical Tank Location (Included in Recovery System)
- Polywall Barrier (Approximate)
- AW-45 ● Well Location
- AW-55 Abandoned Well Location
- ⊕ Polywall Survey
- TEST PIT Test Pit Location
- Property Boundary

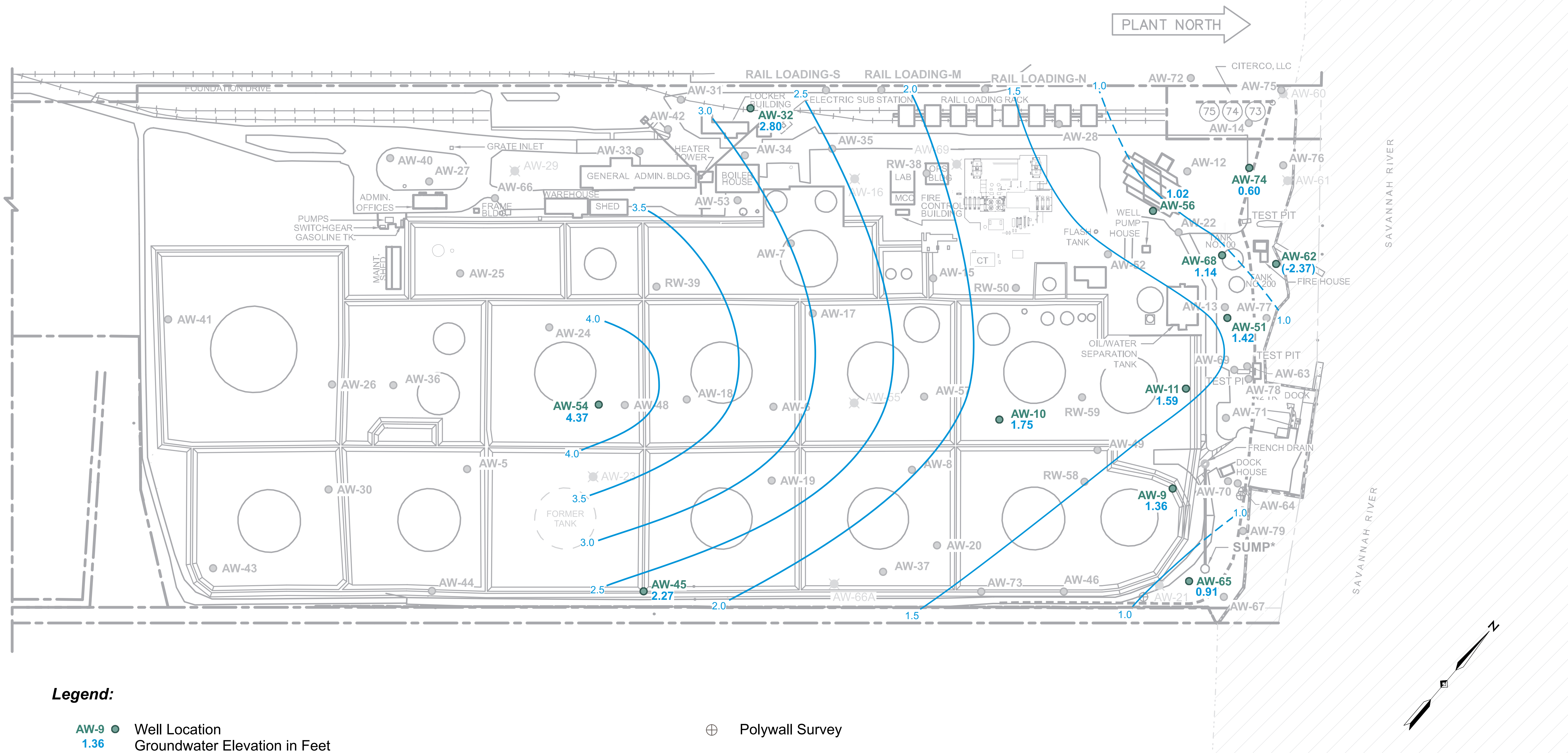
**NOTES:**
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Former Remediation and Recovery Systems

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | 4 |




***Legend:***

| | |
|---|---|
| AW-9 1.36 | Well Location<br>Groundwater Elevation in Feet |
| (-2.37) | Not Used in Groundwater Contouring |
| 4.0 | Groundwater Elevation Contour in Feet (MSL)<br>(Dashed Where Inferred) |
| AW-55 | Abandoned Well Location |
| | Polywall Survey |
| | Polywall Barrier (Approximate) |
| TEST PIT | Test Pit Location |
| | Property Boundary |

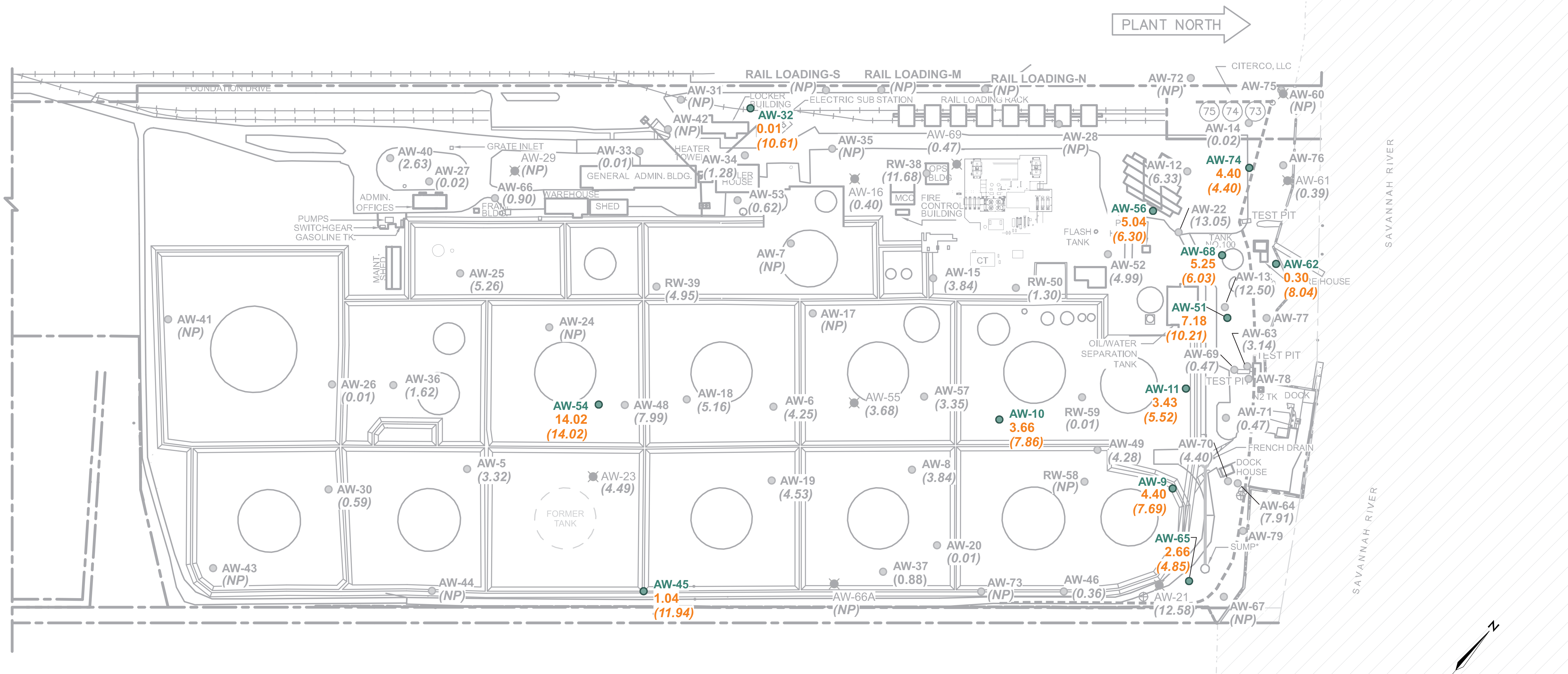
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

**Groundwater Elevations - December 13, 2010**

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| | August 2012 | 5 |




***Legend:***

| | |
|---|---|
| AW-10 ● | Well Location (Included in 12/13/2010 Gauging Event) |
| AW-45 ● | Well Location (Not Included in 12/13/2010 Gauging Event) |
| 3.66<br>(7.86) | December 13, 2010 Separate-Phase Hydrocarbon (SPH) Thickness in Feet<br>Maximum Observed SPH Thickness in Feet |
| NP | No Product |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| - - - - | Polywall Barrier (Approximate) |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

0 200 400
Approximate Scale in Feet

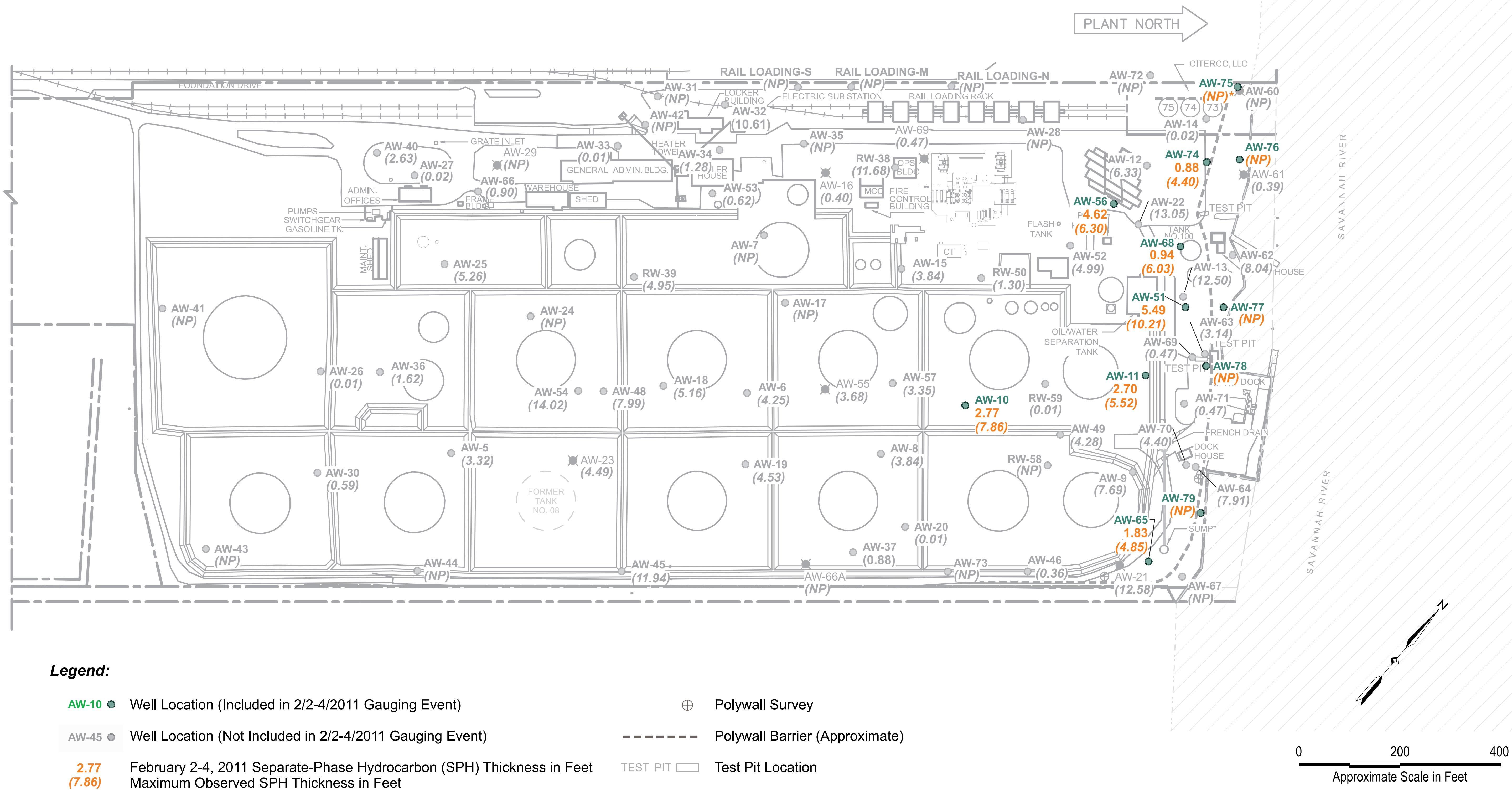
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan with SPH Thicknesses - December 2010

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| | August 2012 | 6 |




***Legend:***

| | |
|---|---|
| AW-10 ● | Well Location (Included in 2/2-4/2011 Gauging Event) |
| AW-45 ● | Well Location (Not Included in 2/2-4/2011 Gauging Event) |
| 2.77 (7.86) | February 2-4, 2011 Separate-Phase Hydrocarbon (SPH) Thickness in Feet<br>Maximum Observed SPH Thickness in Feet |
| NP | No Product |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| - - - - - | Polywall Barrier (Approximate) |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

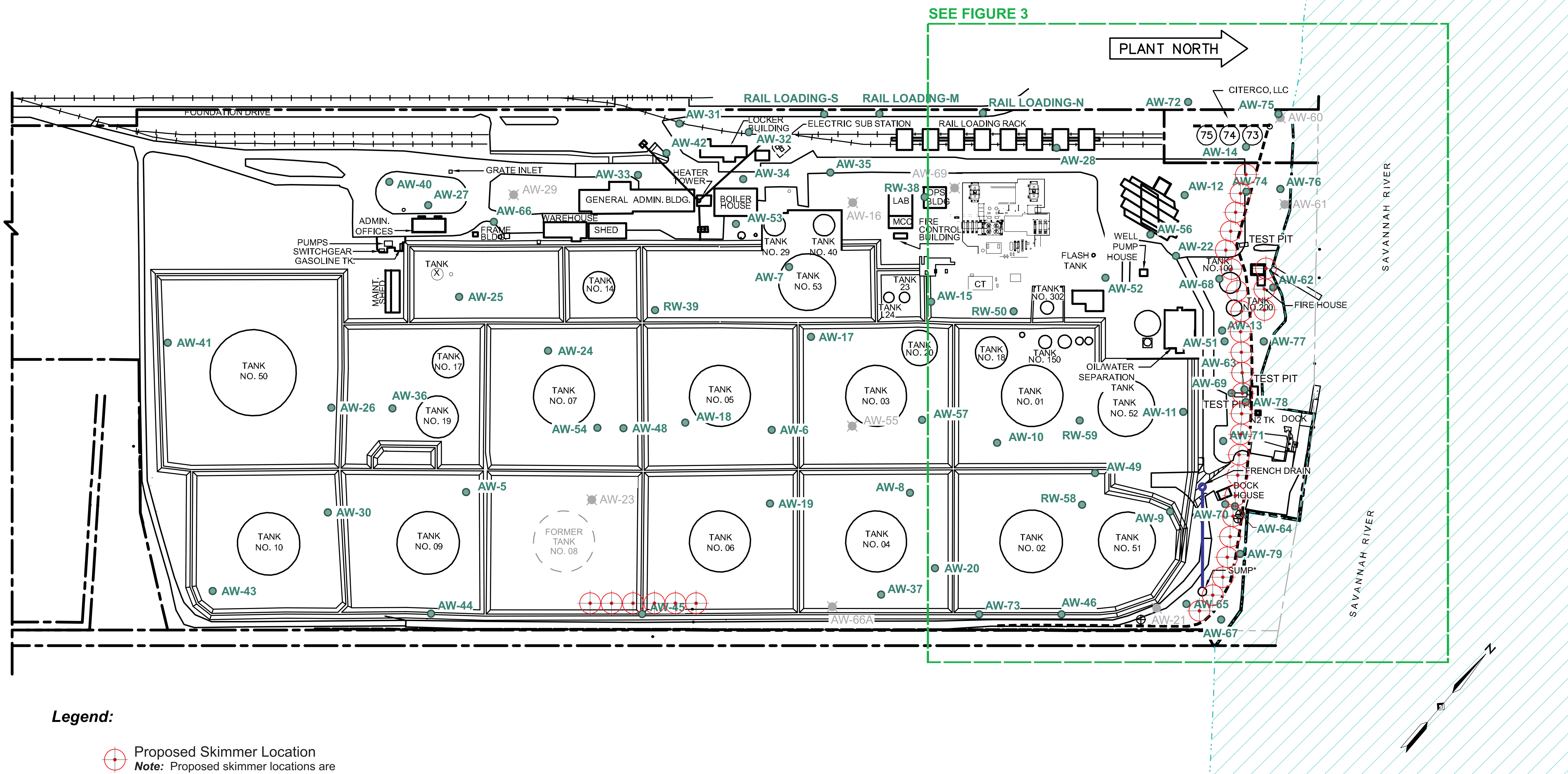
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan with SPH Thicknesses - February 2011

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| | August 2012 | 7 |




0 200 400

Approximate Scale in Feet

**Legend:**

Proposed Skimmer Location

***Note:*** Proposed skimmer locations are conceptual. Actual locations will be modified based on facility infrastructure and other limitations.

AW-10 Well Location

Polywall Barrier (Approximate)

AW-55 Abandoned Well Location

Polywall Survey

TEST PIT Test Pit Location

Property Boundary

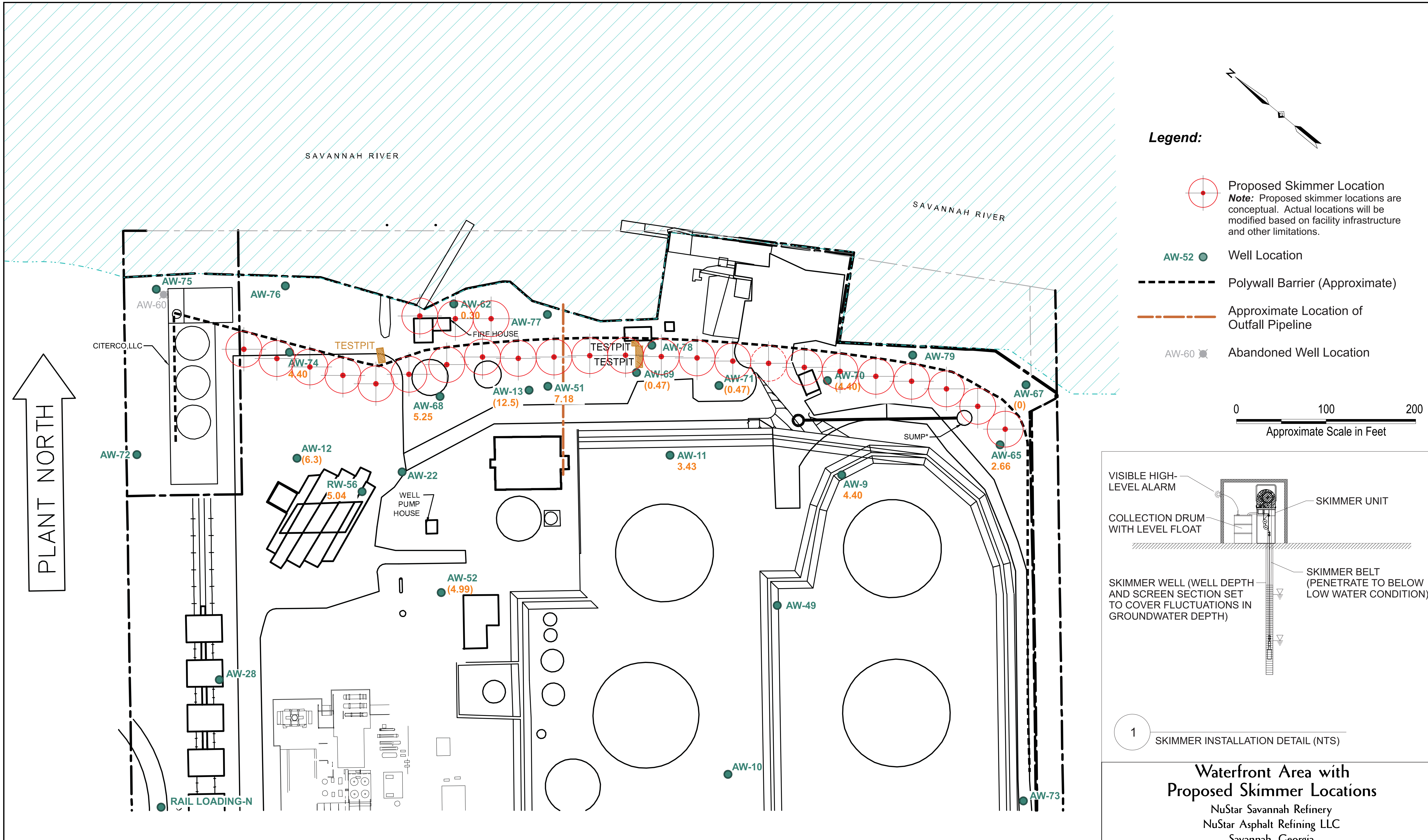
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan with Proposed Skimmer Locations

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | 8 |




**NOTES:**
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Waterfront Area with Proposed Skimmer Locations

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| | August 2012 | 9 |

# *Appendix A*

## Laboratory Forensic Evaluation Reports

R E N R , NC.

EN R N EN L C E S S

a e E. ruya, Ph. .
Char ene orro , .S.
e ena rav ina, .S.
ra ey . en on, .S.
urt ohn on, .S.

3012 1 th venue e t
Seatt e, 9 119 2029
EL 20 2 5 2 2
20 2 3 5044
e ai f i i o e ia. o

April 21, 2010

Amanda Spencer, Project Manager
Ash Creek Associates, Inc.
3015 SW 1st Avenue
Portland, OR 97201-4707

Dear Ms. Spencer:

Included are the results from the testing of material submitted on April 20, 2010 from the NuStar Savannah, GA, F&BI 004198 project. The product and water samples submitted for forensic evaluation arrived in good condition. Upon arrival, the samples AW-62, AW-51, OWS, River Water, and Out Fall were placed in a refrigerator maintained at 4°C until removed for sample processing.

The samples AW-62, AW-51, OWS, River Water, and Out Fall were diluted/extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Bradley T Benson

Bradley T. Benson
Chemist

Enclosures
c: Kirsten White, Ashleigh Fines, Nicole LaFranchise
es/BTB
ASA0421R.DOC

Date of Report: 04/21/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/20/10
Date Analyzed: 04/20/10

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)**

| Sample ID | GC Characterization |
|---|---|
| AW-62 | The GC trace using the flame ionization detector (FID) showed the presence of a mixture of low and medium boiling compounds. The patterns displayed by these peaks are indicative of gasoline or similar materials as well as a middle distillate such as diesel fuel No. 2 or heating oil. |

The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-$C_7$ to *n*-$C_{12}$. This correlates with a temperature range of approximately 100°C to 220°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that, if present, the gasoline present has undergone extensive degradation.

The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from *n*-$C_{12}$ to *n*-$C_{26}$ showing a maximum near *n*-$C_{18}$. This correlates with a temperature range of approximately 220°C to 410°C with a maximum near 320°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation.

The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

Date of Report: 04/21/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/20/10
Date Analyzed: 04/20/10

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)**

| Sample ID | GC Characterization |
|---|---|
| AW-51 | The GC trace using the flame ionization detector (FID) showed the presence of a mixture of low and medium boiling compounds. The patterns displayed by these peaks are indicative of gasoline or similar materials as well as a middle distillate such as diesel fuel No. 2 or heating oil.<br><br>The low boiling compounds appear as a ragged pattern of peaks eluting from *n*-$C_7$ to *n*-$C_{12}$. This correlates with a temperature range of approximately 100°C to 220°C. Within this range, the GC/FID trace showed a low level or absence of peaks which are indicative of toluene, ethylbenzene, and the xylenes. The low level or absence of these constituents indicates that, if present, the gasoline present has undergone extensive degradation.<br><br>The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from *n*-$C_{12}$ to *n*-$C_{26}$ showing a maximum near *n*-$C_{18}$. This correlates with a temperature range of approximately 220°C to 410°C with a maximum near 320°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |

Date of Report: 04/21/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/20/10
Date Analyzed: 04/20/10

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)**

| Sample ID | GC Characterization |
|---|---|
| OWS | The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a residual fuel oil such as fuel oil No. 4, No. 6 or similar materials.<br><br>The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from $n$-$C_{14}$ to $n$-$C_{32}$ showing a maximum near $n$-$C_{21}$. This correlates with a temperature range of approximately 250°C to 470°C with a maximum near 360°C.<br><br>Within this range, peaks are present which are indicative of normal alkanes as well as isoprenoids. The relative abundance of the normal alkanes and isoprenoids indicates that a mixture of degraded and relatively undegraded fuel may be present in the sample.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |

Date of Report: 04/21/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/20/10
Date Analyzed: 04/20/10

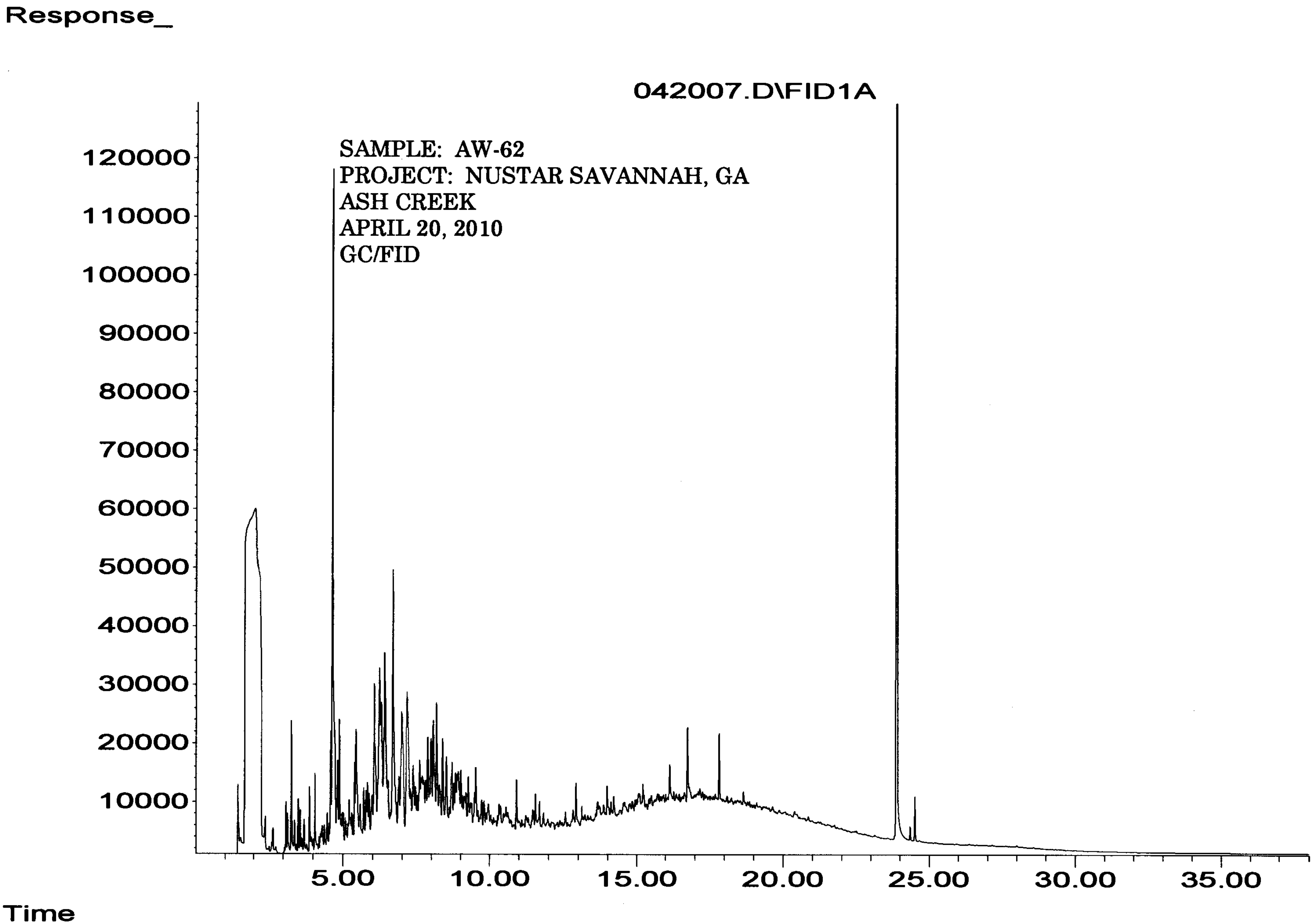
**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)**

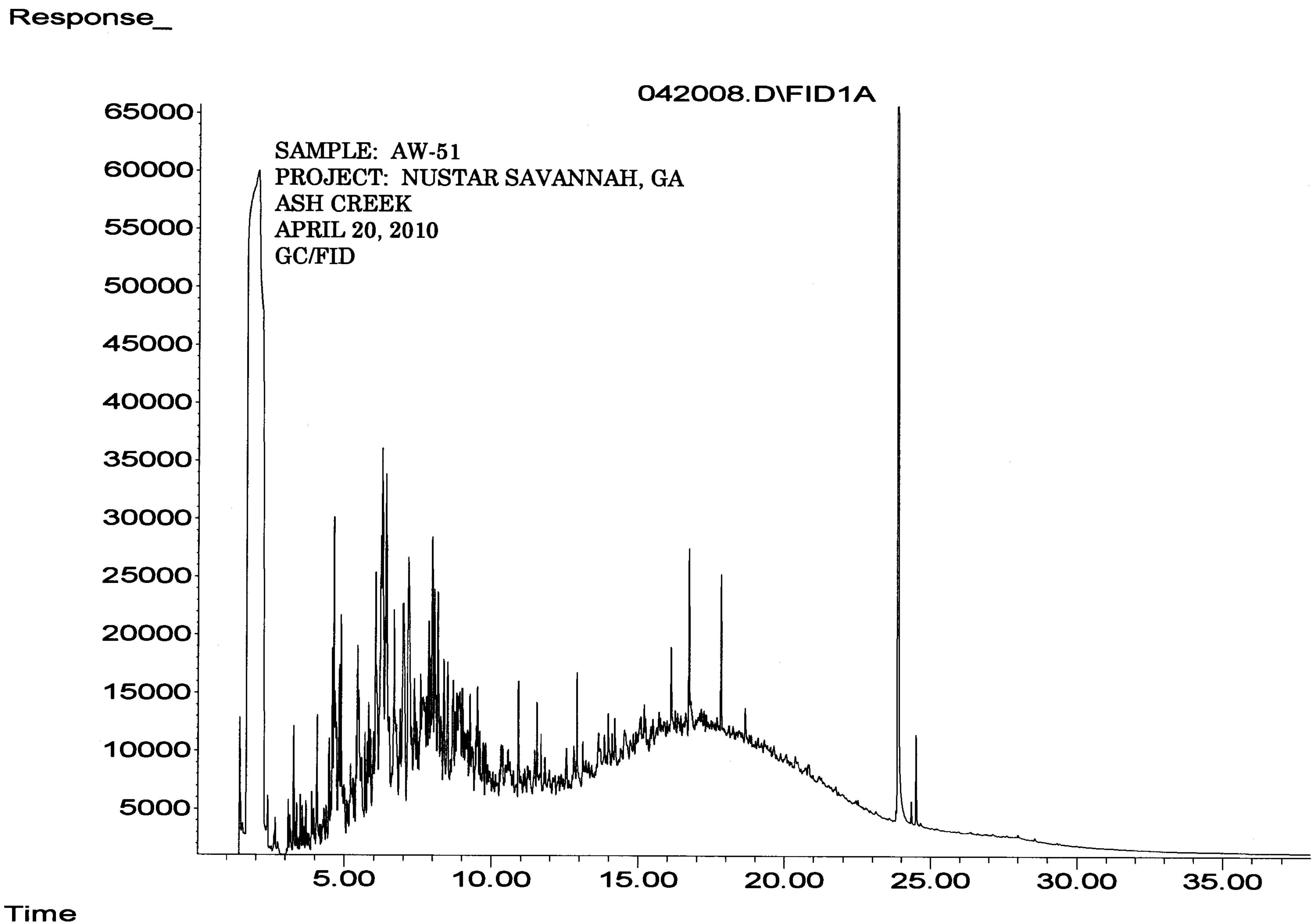
| Sample ID | GC Characterization |
|---|---|
| River Water | The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a residual fuel oil such as fuel oil No. 4, No. 6 or similar materials. |
| | The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from $n$-$C_{11}$ to $n$-$C_{32}$ showing a maximum near $n$-$C_{21}$. This correlates with a temperature range of approximately 200°C to 470°C with a maximum near 360°C. |
| | Within this range, peaks are present which are indicative of normal alkanes as well as isoprenoids. The relative abundance of the normal alkanes and isoprenoids indicates that a mixture of degraded and relatively undegraded fuel may be present in the sample. |
| | The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |

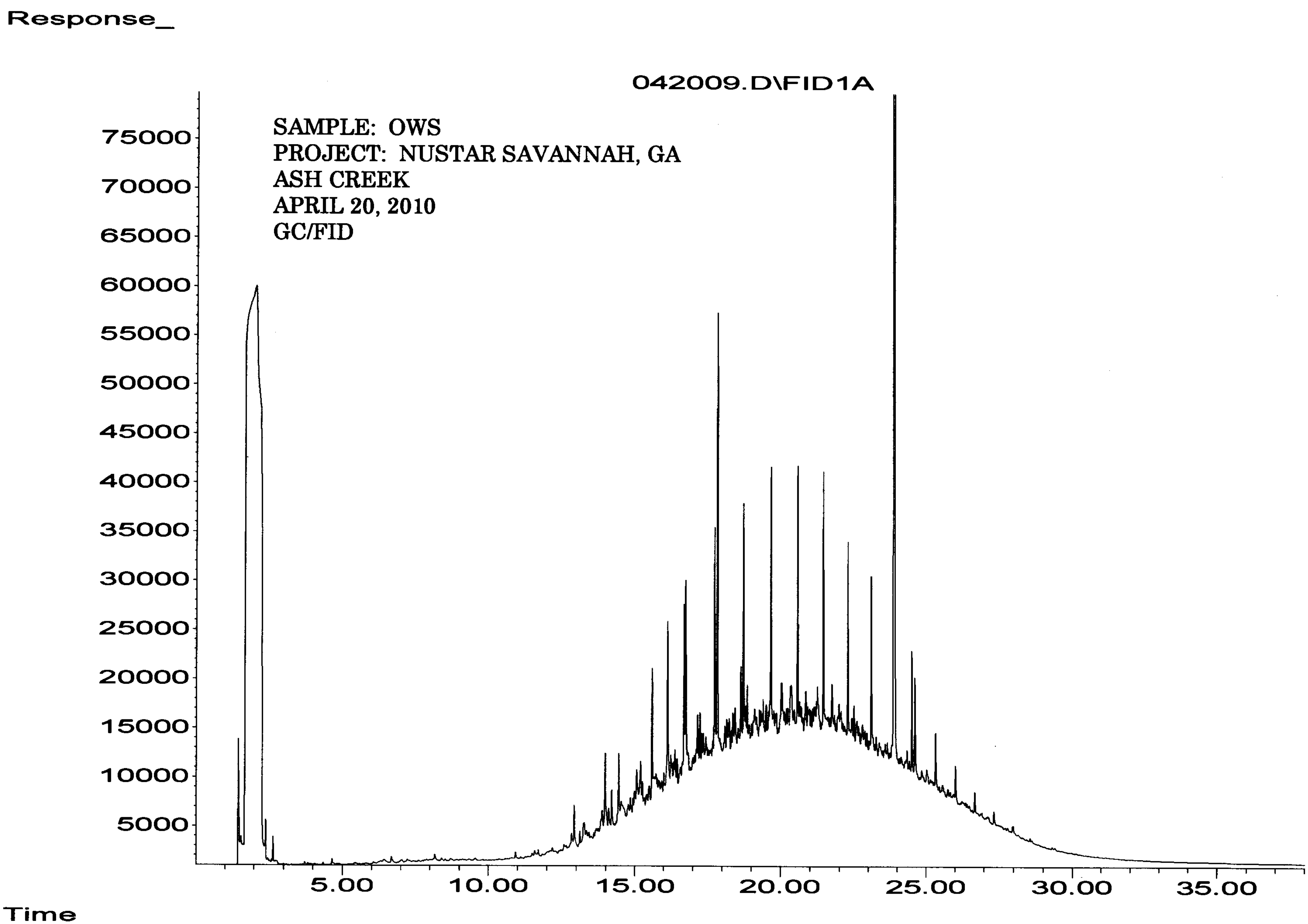
Date of Report: 04/21/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/20/10
Date Analyzed: 04/20/10

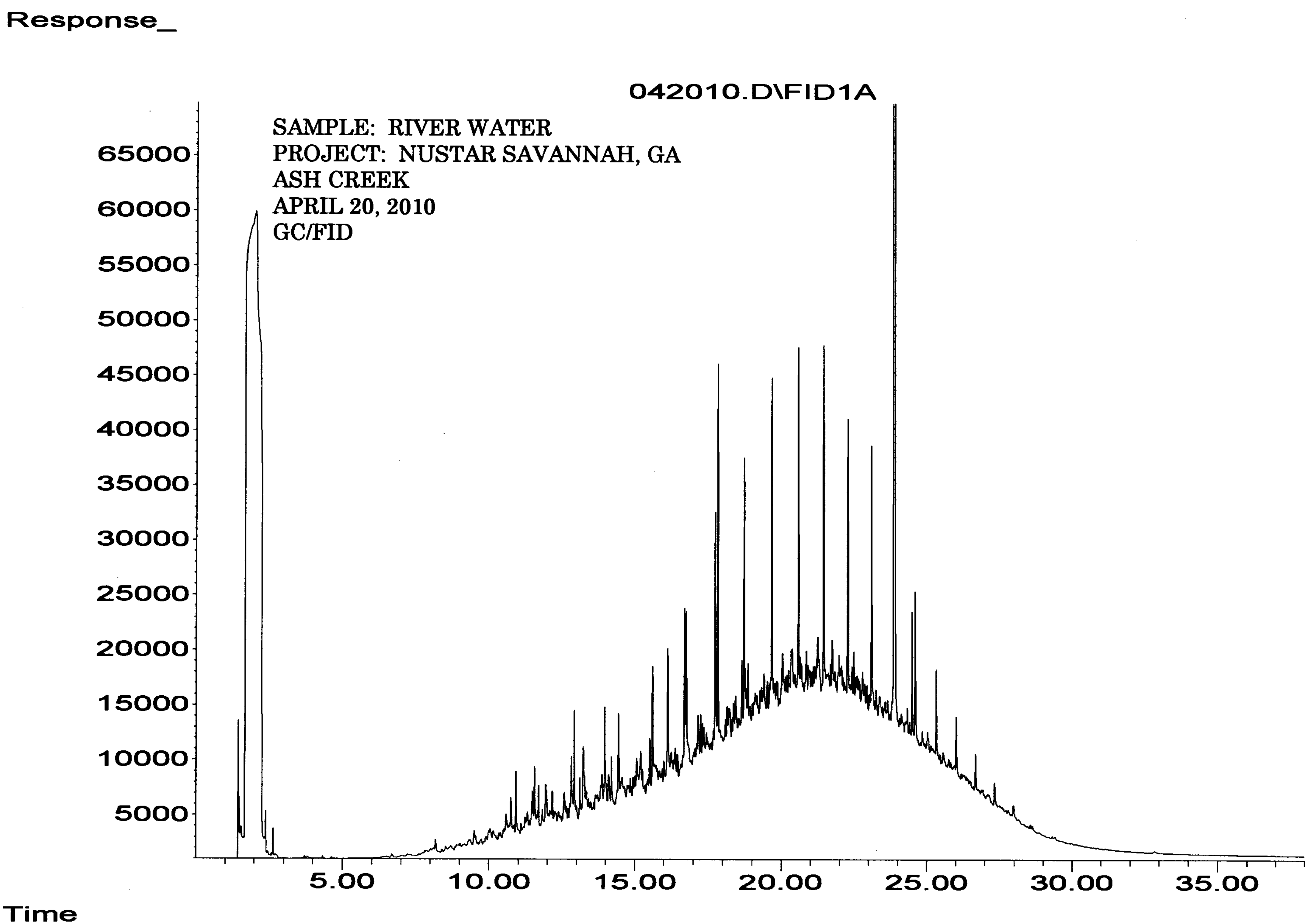
**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLE**
**FOR FORENSIC EVALUATION**
**BY CAPILLARY GAS CHROMATOGRAPHY**
**USING A FLAME IONIZATION DETECTOR (FID)**

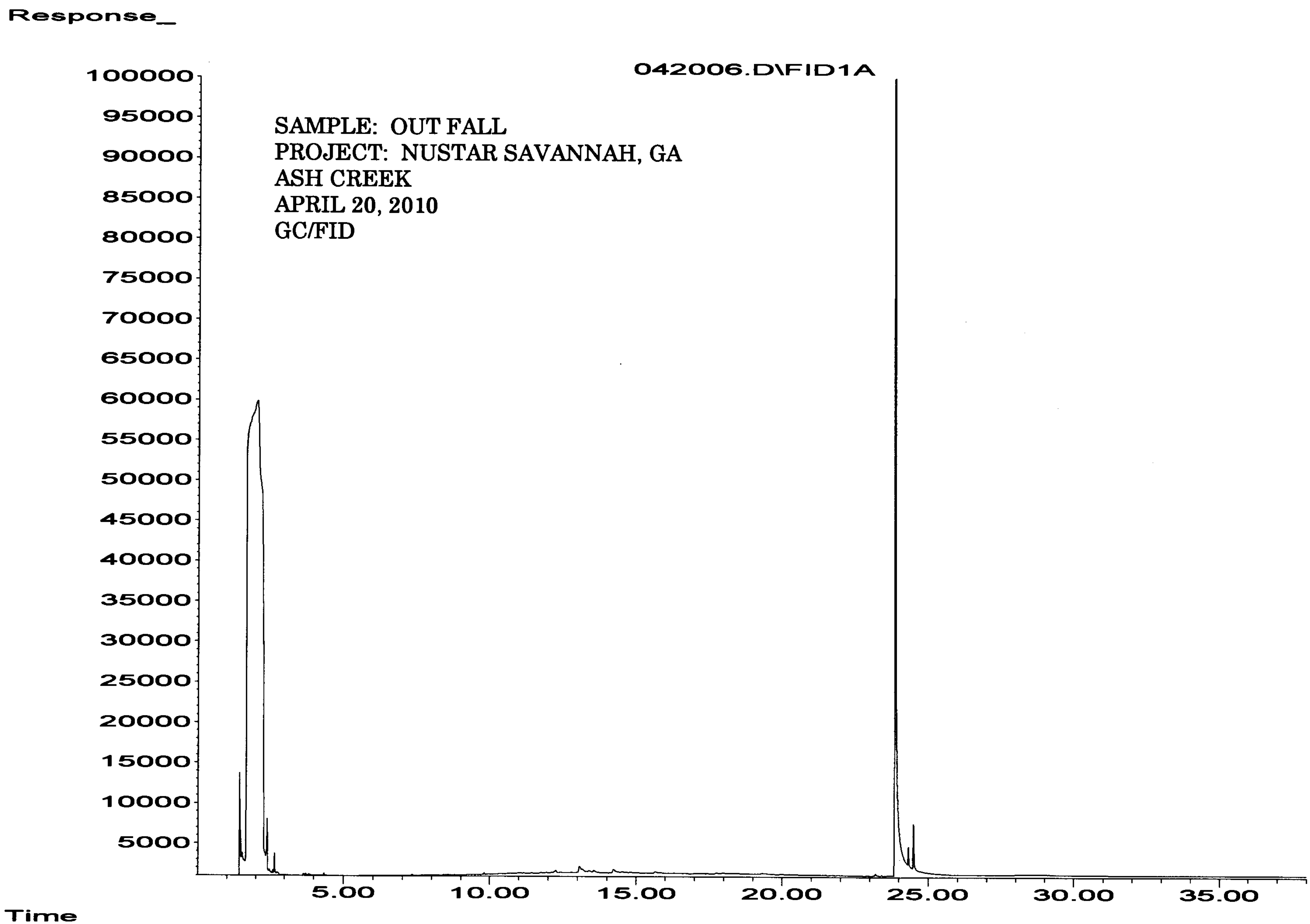
| Sample ID | GC Characterization |
|---|---|
| Out Fall | The GC trace using the flame ionization detector (FID) showed the absence of low, medium, and high boiling compounds. The detection limits for this analysis are approximately 50, 100, and 250 ppm for gasoline, diesel, and motor oil, respectively.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |

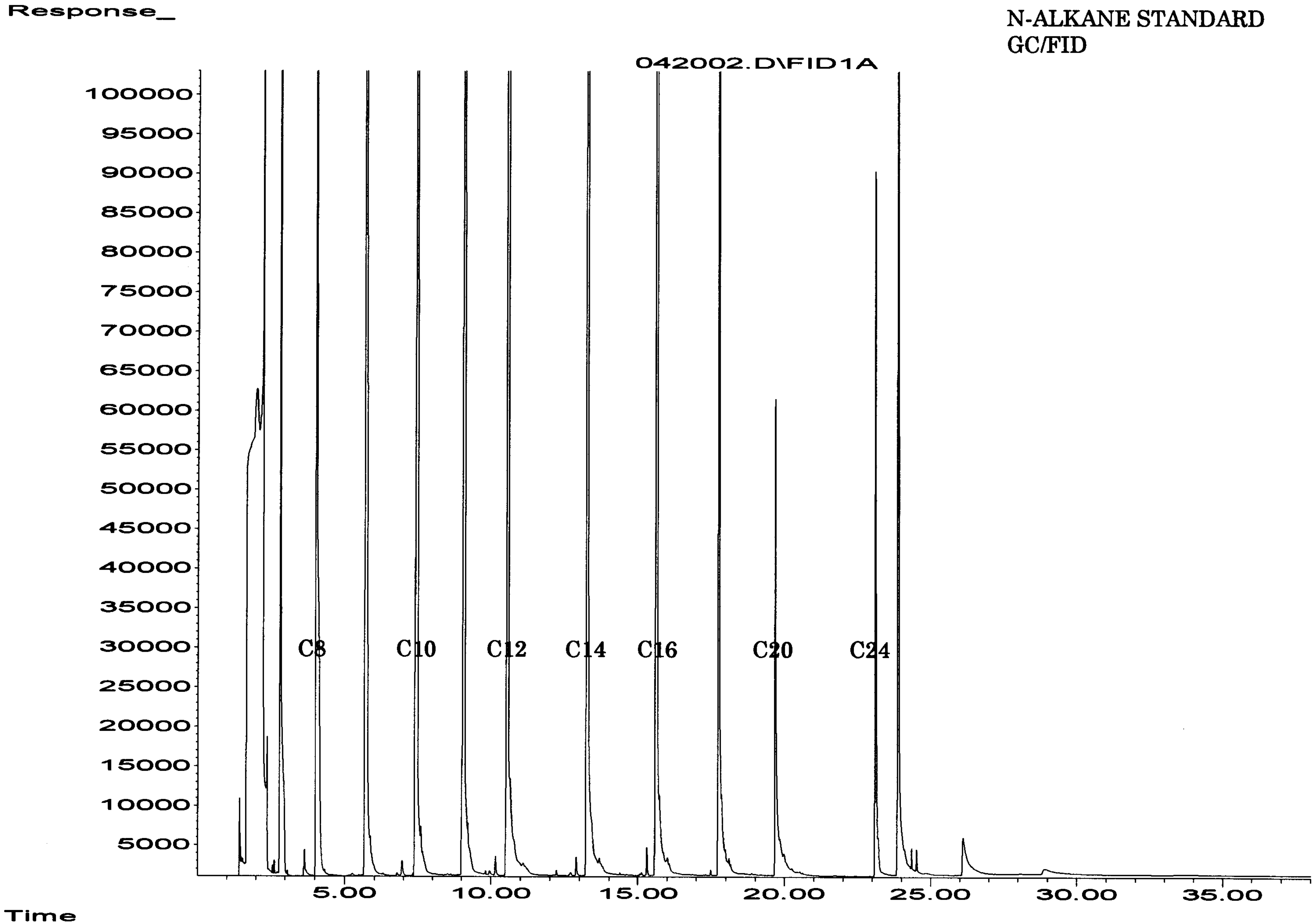

Response_
042007.D\FID1A
SAMPLE: AW-62
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
042008.D\FID1A
SAMPLE: AW-51
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time

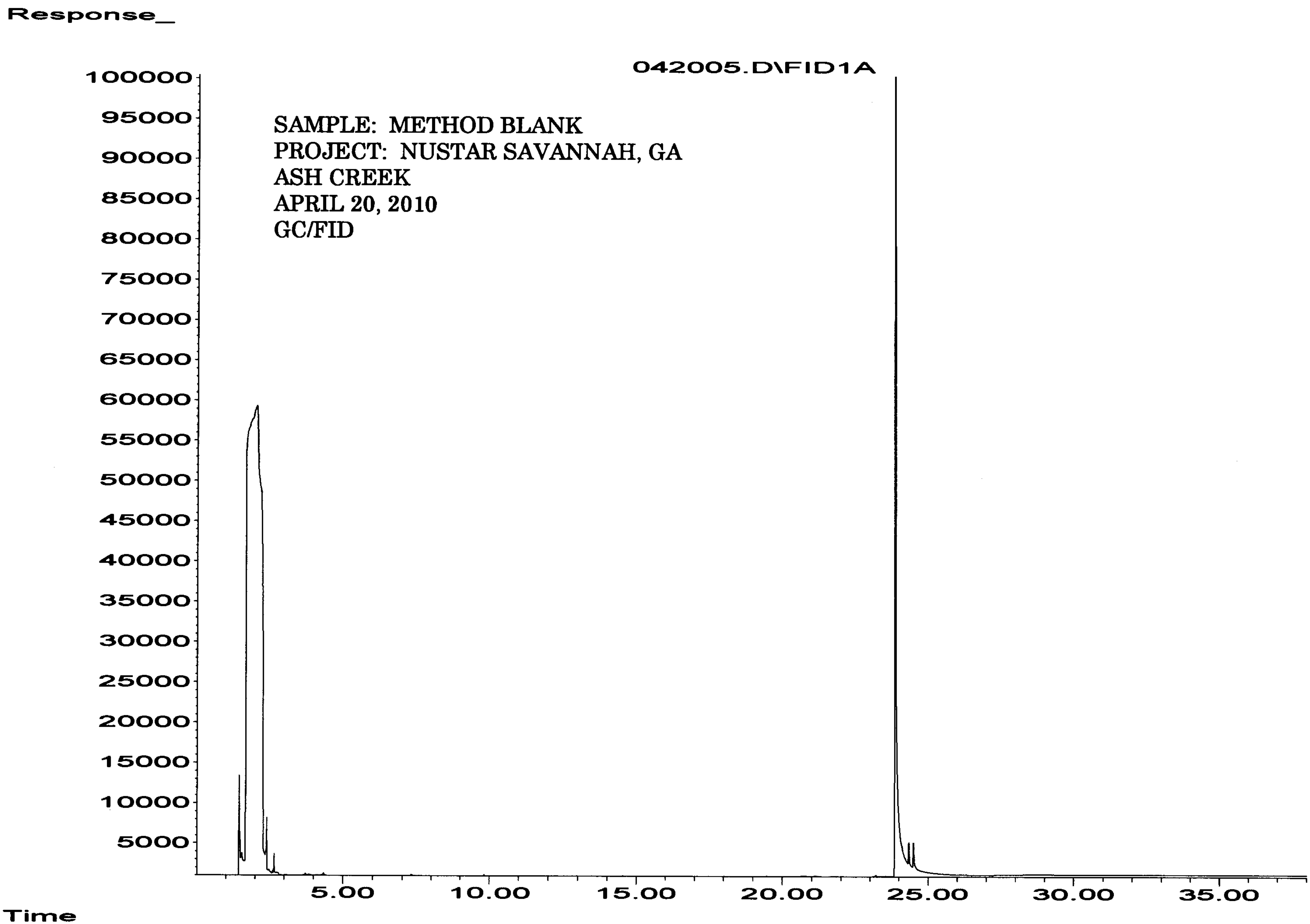

Response_
042009.D\FID1A
SAMPLE: OWS
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
042010.D\FID1A
SAMPLE: RIVER WATER
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
042006.D\FID1A
SAMPLE: OUT FALL
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time



N-ALKANE STANDARD
GC/FID
042002.D\FID1A
Response_
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
C8
C10
C12
C14
C16
C20
C24
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
042005.D\FID1A
SAMPLE: METHOD BLANK
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 20, 2010
GC/FID
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time

AES

ANALYTICAL ENVIRONMENTAL SERVICES, INC 004198 [redacted]

3785 Presidential Parkway, Atlanta GA 30340-3704

TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

# CHAIN OF CUSTODY MP 04/20/10 [redacted]

Work Order: D04

Date: 4-19-10 Page 1 of 1

COMPANY: Winter Environmental

ADDRESS: 3350 Green Pointe Parkway Suite 300 Norcross GA 30092

PHONE: 404 965 2323

FAX:

SAMPLED BY: Joe King

SIGNATURE:

**Visit our website www.aesatlanta.com to check on the status of your results, place bottle orders, etc.**

ANALYSIS REQUESTED / PRESERVATION (See codes)

| # | SAMPLE ID | SAMPLED DATE | SAMPLED TIME | Grab | Composite | Matrix (See codes) | [illegible] | Lab ID | REMARKS WP 4/20/10 | No # of Containers |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | AW-62 | 4-17-10 | 1435 | X | | O | X | 01 A,B | sample label: Firehouse-TW | |
| 2 | AW-51 | 4-17-10 | 1035 | X | | O | X | 02 | | |
| 3 | OWS | 4-17-10 | 745 | X | | O | X | 03 | | |
| 4 | River Water | 4-16-10 | 1800 | X | | O | X | 04 | | |
| 5 | Outfall | 4-17-10 | 1530 | X | | O | X | 05 | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |

**Samples received at 2 °C**

| RELINQUISHED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| 1 [signature] | 4-19-10 1510 | 1 [signature] | 4-20-10 08:45 |
| 2 | | 2 | |
| 3 | | 3 | |

SPECIAL INSTRUCTIONS/COMMENTS

SHIPMENT METHOD
OUT VIA
IN VIA
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER ______

PROJECT INFORMATION

PROJECT NAME: [illegible] Savannah GA

PROJECT #:

SITE ADDRESS:

SEND REPORT TO: Amanda Spence

INVOICE TO (IF DIFFERENT FROM ABOVE): [illegible] Spence@ashcreekassociates.com

QUOTE #: ______ PO#: ______

RECEIPT

Total # of Containers

Turnaround Time Request
- ○ Standard 5 Business Days
- ○ 2 Business Day Rush
- ● Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other Rush

STATE PROGRAM (if any) ______

E-mail? Y/N Fax? Y/N

DATA PACKAGE: I II III IV

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S/M+I = Sodium Bisulfate/Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

R E N R , NC.

EN R N EN L C E S S

a e E. ruya, Ph. .
Char ene orro , .S.
e ena rav ina, .S.
ra ey . en on, .S.
urt ohn on, .S.

3012 1 th venue e t
Seatt e, 9 119 2029
EL 20 2 5 2 2
20 2 3 5044
e ai f i i o e ia. o

April 23, 2010

Amanda Spencer, Project Manager
Ash Creek Associates, Inc.
3015 SW 1st Avenue
Portland, OR 97201-4707

Dear Ms. Spencer:

Included are the results from the additional testing of material submitted on April 20, 2010 from the NuStar Savannah, GA, F&BI 004198 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Bradley T. Benson
Chemist

Enclosures
c: Kirsten White, Ashleigh Fines, Nicole LaFranchise
es/BTB
ASA0423R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 20, 2010 by Friedman & Bruya, Inc. from the Ash Creek Associates, Inc. NuStar Savannah, GA, F&BI 004198 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Ash Creek Associates, Inc. |
|---|---|
| 004198-01 | AW-62 |
| 004198-02 | AW-51 |
| 004198-03 | OWS |
| 004198-04 | River Water |
| 004198-05 | Out Fall |

All quality control requirements were acceptable.

Date of Report: 04/23/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198
Date Extracted: 04/22/10
Date Analyzed: 04/23/10

**RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING EPA METHOD 8015M**

Results Reported as ug/L (ppb)

| Sample ID<br>Laboratory ID | Diesel Range<br>($C_{10}$-$C_{25}$) | Motor Oil Range<br>($C_{25}$-$C_{36}$) | Surrogate (% Recovery)<br>(Limit 50-150) |
|---|---|---|---|
| Out Fall<br>004198-05 1/10 | 33,000 | 10,000 | 92 |
| Method Blank<br>00-0574 MB2 | <50 | <250 | 87 |

Date of Report: 04/23/10
Date Received: 04/20/10
Project: NuStar Savannah, GA, F&BI 004198

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING EPA METHOD 8015M**

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Diesel Extended | ug/L (ppb) | 2,500 | 115 | 109 | 63-142 | 5 |

# Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

ANALYTICAL ENVIRONMENTAL SERVICES, INC 004198
3785 Presidential Parkway, Atlanta GA 30340-3704
AES TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY MP 04/20/10 Work Order: D04

Date: 4-19-10 Page 1 of 1

COMPANY: Winter Environmental

ADDRESS: 3350 Green Pointe Parkway, Suite 200, Norcross GA 30092

PHONE: 404 965 2323

FAX:

SAMPLED BY: Joe King

SIGNATURE: Joe D King

Visit our website **www.aesatlanta.com** to check on the status of your results, place bottle orders, etc.

ANALYSIS REQUESTED: Finger Print; Diesel/M.O.; Lab ID

| # | SAMPLE ID | DATE (SAMPLED) | TIME (SAMPLED) | Grab | Composite | Matrix (See codes) | Finger Print | Diesel/M.O. | Lab ID | REMARKS (MP 4/20/10) | No # of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PRESERVATION (See codes) | | | | | | | I | | | | |
| 1 | AW-62 | 4-17-10 | 1435 | X | | O | X | | 01AB | sample label: Firehouse -TW | |
| 2 | AW-51 | 4-17-10 | 1635 | X | | O | X | | 02 | | |
| 3 | OWS | 4-17-10 | 1745 | X | | O | X | | 03 | √ added per A.F | |
| 4 | River Water | 4-16-10 | 1600 | X | | O | X | | 04 | 4/22/10 | |
| 5 | Out Fall | 4-17-10 | 1830 | X | | O | X | √ | 05 | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |

**Samples received at 2 °C**

| RELINQUISHED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| 1: Joe D King | 4-19-10 1510 | 1 [signature] | 4-20-10 08:45 |
| 2: | | 2 | |
| 3: | | 3 | |

PROJECT INFORMATION

PROJECT NAME: NuStar Savannah GA

PROJECT #:

SITE ADDRESS:

SEND REPORT TO: Amanda Spencer

INVOICE TO (IF DIFFERENT FROM ABOVE): A.Spencer@ashcreekassociates.com

QUOTE #: PO#:

RECEIPT

Total # of Containers

Turnaround Time Request
- ○ Standard 5 Business Days
- ○ 2 Business Day Rush
- ● Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other Rush

STATE PROGRAM (if any):

E-mail? Y/N; Fax? Y/N

DATA PACKAGE: I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD
OUT VIA
IN VIA
CLIENT FedEx UPS MAIL COURIER
GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.
SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water

PRESERVATIVE CODES: H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S M+I = Sodium Bisulfate Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

R E N R , NC.

EN R N EN L C E S S

a e E. ruya, Ph. .
Char ene orro , .S.
e ena rav ina, .S.
ra ey . en on, .S.
urt ohn on, .S.

3012 1 th venue e t
Seatt e, 9 119 2029
EL 20 2 5 2 2
20 2 3 5044
e ai f i i o e ia. o

April 23, 2010

Amanda Spencer, Project Manager
Ash Creek Associates, Inc.
3015 SW 1st Avenue
Portland, OR 97201-4707

Dear Ms. Spencer:

Included are the results from the testing of material submitted on April 22, 2010 from the NuStar Savannah Refinery Sump Sample PO. 1634-00, F&BI 004231 project. The sludge sample submitted for forensic evaluation arrived in good condition. Upon arrival, the sample NuStar-M/M Outfall Box (Sump) was placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample NuStar-M/M Outfall Box (Sump) was extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Bradley T Benson

Bradley T. Benson
Chemist

Enclosures
c: Kirsten White, Ashleigh Fines. Nicole LaFranchise
es/KJ
ASA0423R.DOC

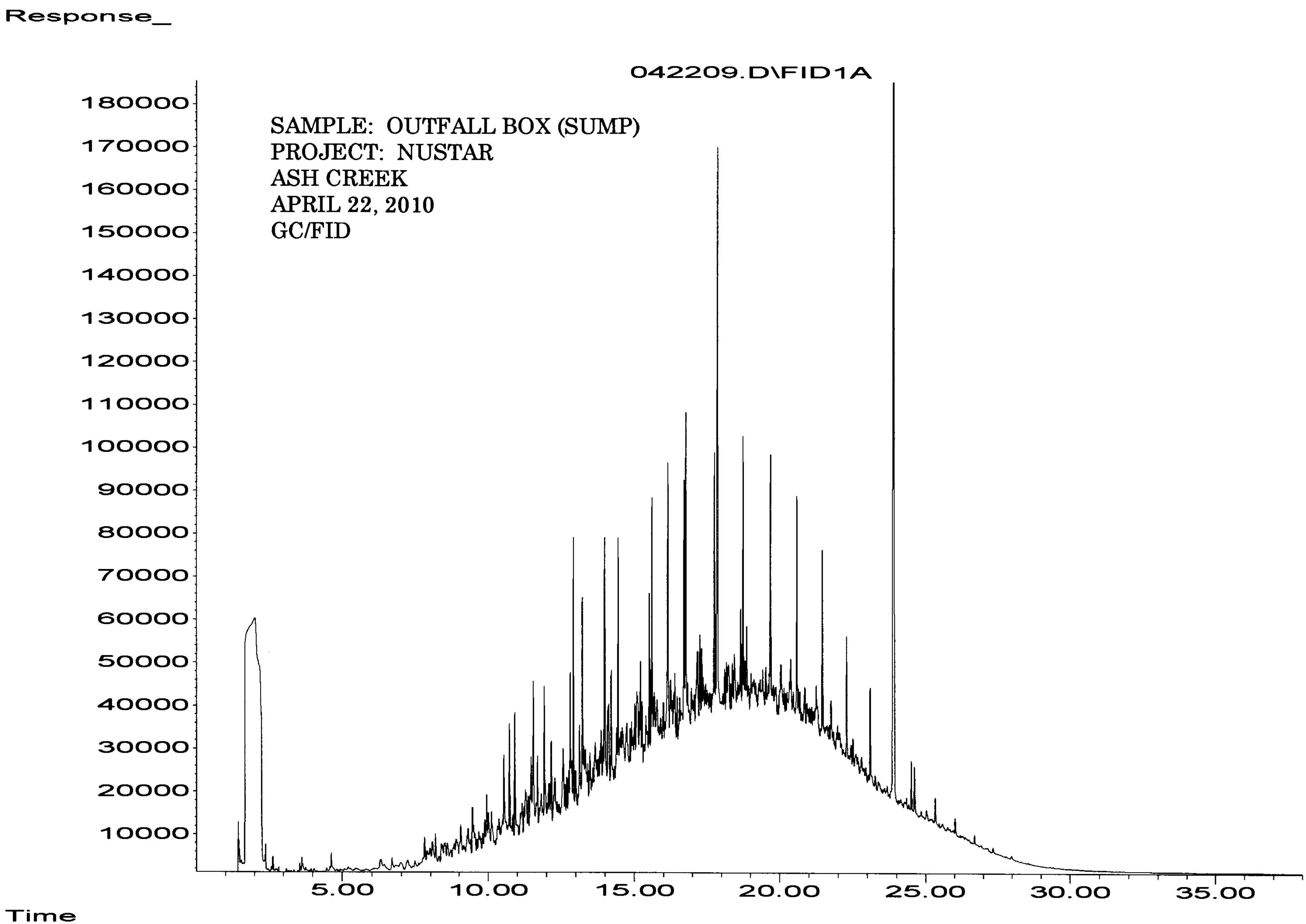
RE N R , NC.

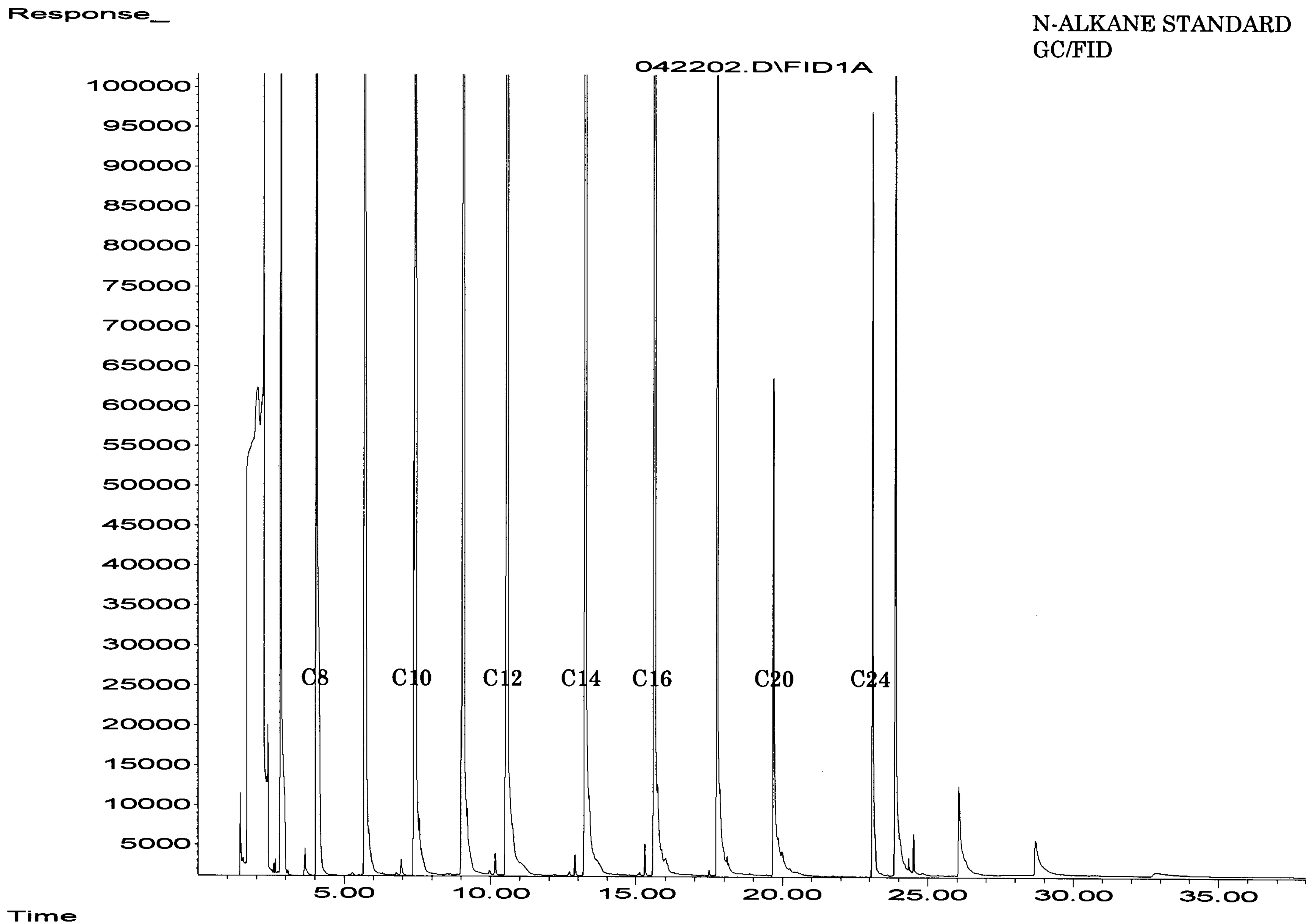
EN R N EN LC E S S

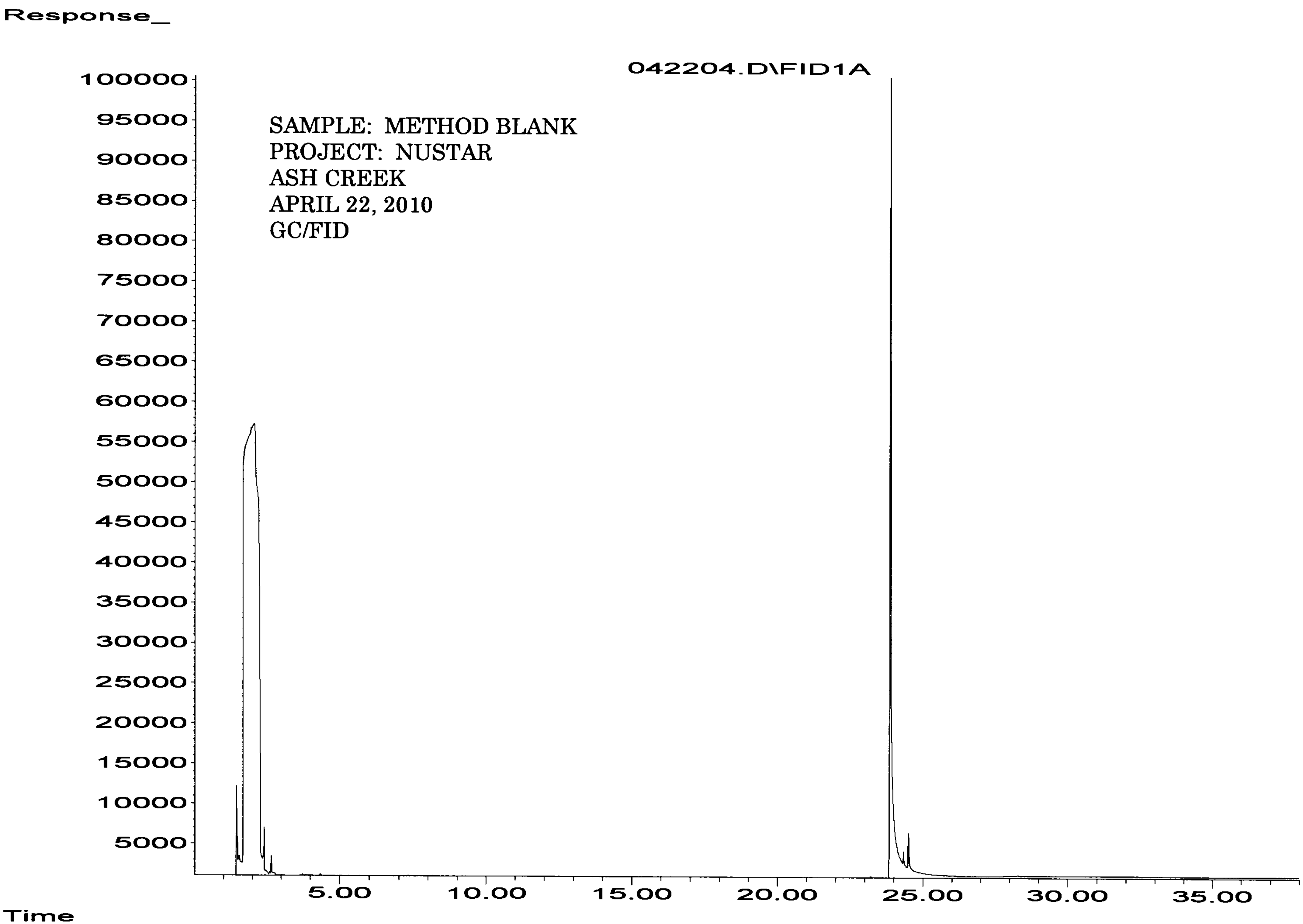
Date of Report: 04/23/10
Date Received: 04/22/10
Project: NuStar Savannah Refinery Sump Sample PO. 1634-00, F&BI 004231
Date Extracted: 04/22/10
Date Analyzed: 04/22/10

**RESULTS FROM THE ANALYSIS OF THE SLUDGE SAMPLE FOR FORENSIC EVALUATION BY CAPILLARY GAS CHROMATOGRAPHY USING A FLAME IONIZATION DETECTOR (FID)**

| Sample ID | GC Characterization |
|---|---|
| NuStar-M/M Outfall Box (Sump) | The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a residual fuel oil such as fuel oil No. 4, No. 6 or similar materials.<br><br>The medium boiling compounds appear as a regular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from $n$-$C_{11}$ to $n$-$C_{32}$ showing a maximum near $n$-$C_{21}$. This correlates with a temperature range of approximately 200°C to 470°C with a maximum near 360°C.<br><br>Within this range, peaks are present which are indicative of normal alkanes as well as isoprenoids. The relative abundance of the normal alkanes and isoprenoids indicates that a mixture of degraded and relatively undegraded fuel may be present in the sample.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |


Response_
042209.D\FID1A
SAMPLE: OUTFALL BOX (SUMP)
PROJECT: NUSTAR
ASH CREEK
APRIL 22, 2010
GC/FID
180000
170000
160000
150000
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
N-ALKANE STANDARD
GC/FID
042202.D\FID1A
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
C8
C10
C12
C14
C16
C20
C24
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time



Response_
042204.D\FID1A
SAMPLE: METHOD BLANK
PROJECT: NUSTAR
ASH CREEK
APRIL 22, 2010
GC/FID
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time

004231

MP 04/22/10 D02

# CHAIN OF CUSTODY

Send Report To

Company__Ash Creek Associates__________________

Address____3015 SW First Avenue__________________

City, State, ZIP_____Portland, Or 97201-4707______

Phone #____503-924-4704____Fax #____503-943-6357__

SAMPLERS (signature) [redacted]

| PROJECT NAME/NO. | PO # |
|---|---|
| NuStar Savannah Refinery Sump Sample | 1634-00 |

REMARKS

Page # 1 of 1

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- X RUSH___24-HR__________

Rush charges authorized by:
___Amanda Spencer, Ash Creek____

SAMPLE DISPOSA'
- ☐ Dispose after 30 days
- ☐ Return samples
- X Will call with instructions

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of containers | TPH-Diesel | TPH-Gasoline | BTEX by 8021B | VOCs by 8260 | SVOCs by 8270 | HFS | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | ANALYSES REQUESTED | | | | | | | | | | | | |
| Nustar - M/M | 01 | 4/20/10 | 1500 | Product | 1 | | | | | | X | | | | | | | Sump Sample |
| Outfall box (sump) | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | L. M. Bristow | NuStar Asphalt | 4/21/10 | 0900 |
| Received by: | Nhan Phan | Fe BI | 4/22/10 | 10:20 |
| Relinquished by: | | | | |
| Received by: | | | | |

Samples received at 13 °C

FORMS\COC\COC.DOC

R E N R , NC.

EN R N EN L C E S S

a e E. ruya, Ph. .
Char ene orro , .S.
e ena rav ina, .S.
ra ey . en on, .S.
urt ohn on, .S.

3012 1 th venue e t
Seatt e, 9 119 2029
EL 20 2 5 2 2
20 2 3 5044
e ai f i i o e ia. o

April 22, 2010

Amanda Spencer, Project Manager
Ash Creek Associates, Inc.
3015 SW 1st Avenue
Portland, OR 97201-4707

Dear Ms. Spencer:

Included are the results from the testing of material submitted on April 21, 2010 from the NuStar Savannah, GA, F&BI 004204 project. The water sample submitted for forensic evaluation arrived in good condition. Upon arrival, the sample Outfall Inlet was placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample Outfall Inlet was extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.

Bradley T Benson

Bradley T. Benson
Chemist

Enclosures
c: Kirsten White, Ashleigh Fines, Nicole LaFranchise
es/KJ
ASA0422R.DOC

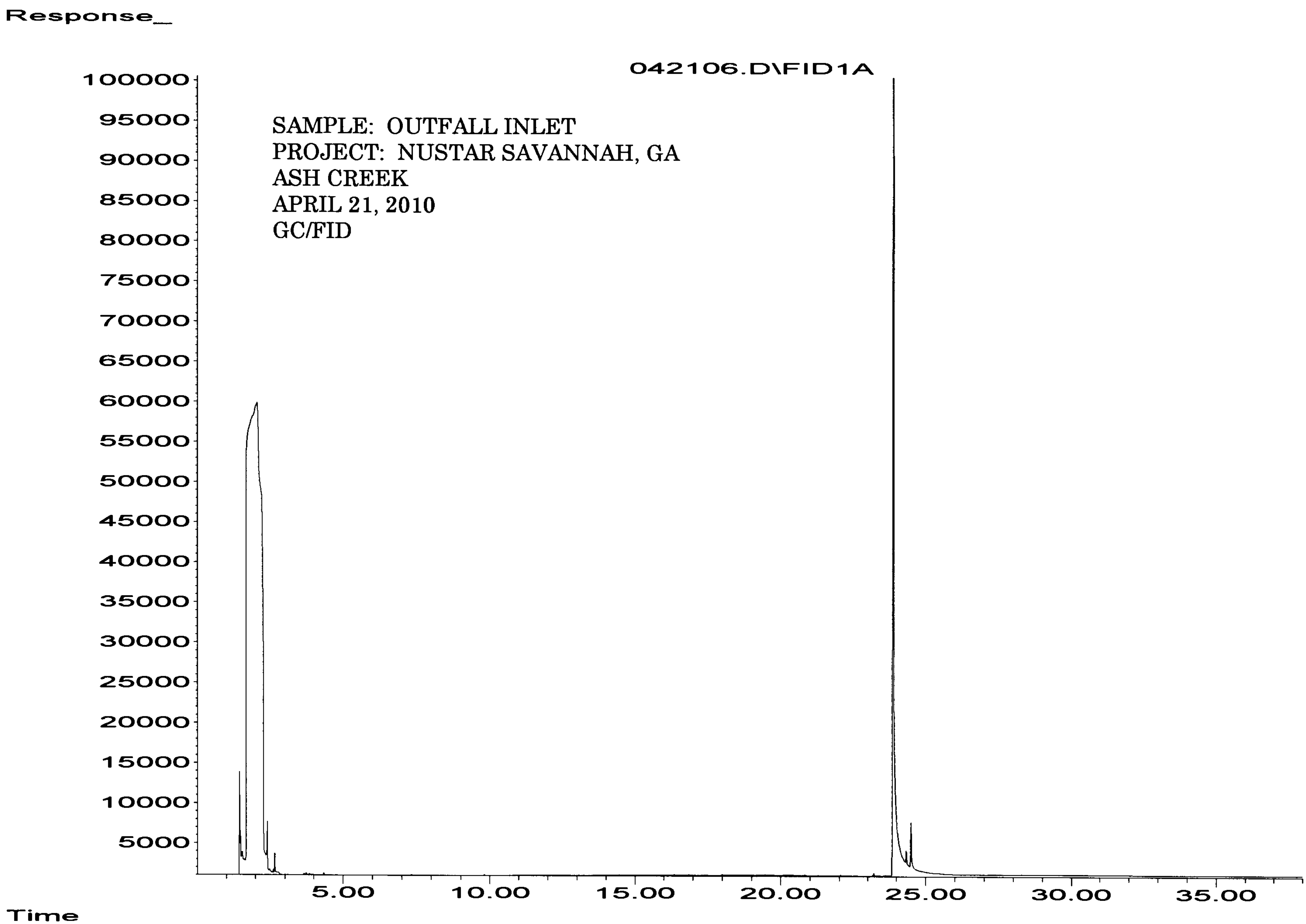
R E N R , NC.

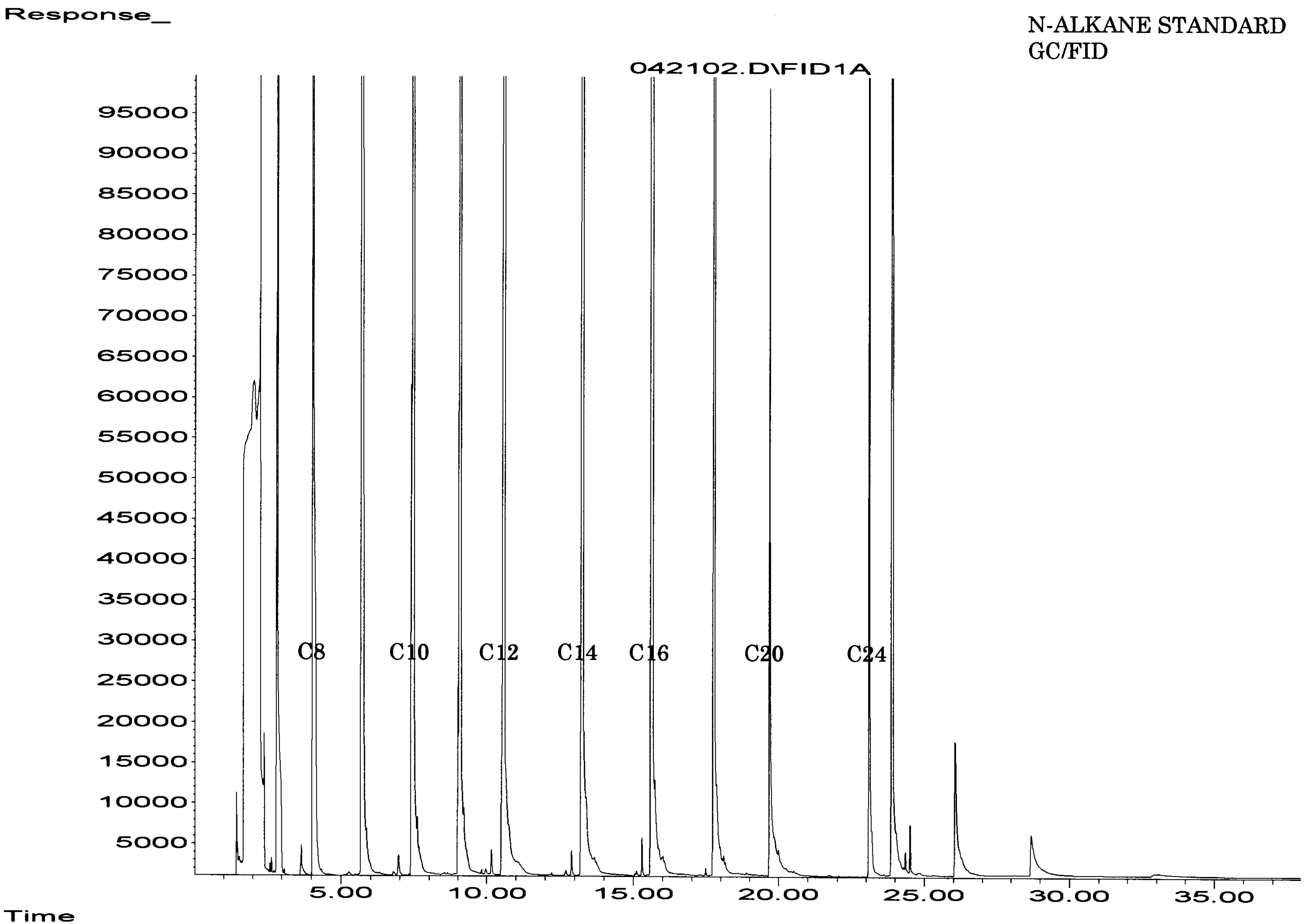
EN R N EN L C E S S

Date of Report: 04/22/10
Date Received: 04/21/10
Project: NuStar Savannah, GA, F&BI 004204
Date Extracted: 04/21/10
Date Analyzed: 04/21/10

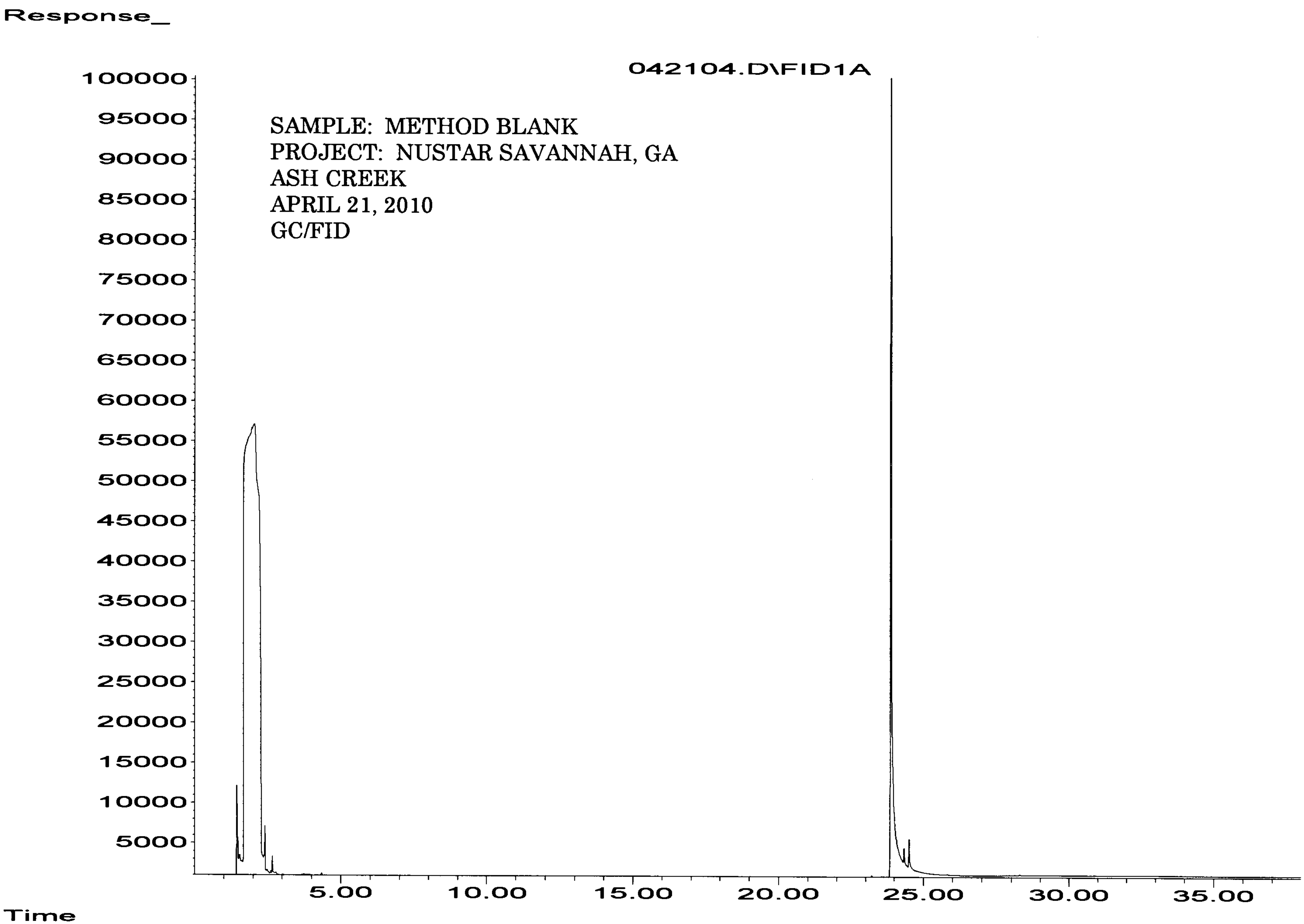
**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLE
FOR FORENSIC EVALUATION
BY CAPILLARY GAS CHROMATOGRAPHY
USING A FLAME IONIZATION DETECTOR (FID)**

| Sample ID | GC Characterization |
| --- | --- |
| Outfall Inlet | The GC trace using the flame ionization detector (FID) showed the absence of low, medium, and high boiling compounds. The detection limits for this analysis are approximately 50, 100, and 250 ppm for gasoline, diesel, and motor oil, respectively.<br><br>The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. |


Response_
042106.D\FID1A
SAMPLE: OUTFALL INLET
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 21, 2010
GC/FID
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time



Response_
N-ALKANE STANDARD
GC/FID
042102.D\FID1A
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
C8
C10
C12
C14
C16
C20
C24
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time


Response_
042104.D\FID1A
SAMPLE: METHOD BLANK
PROJECT: NUSTAR SAVANNAH, GA
ASH CREEK
APRIL 21, 2010
GC/FID
100000
95000
90000
85000
80000
75000
70000
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
5.00
10.00
15.00
20.00
25.00
30.00
35.00
Time

ANALYTICAL ENVIRONMENTAL SERVICES, INC 004204

AES

3785 Presidential Parkway, Atlanta GA 30340-3704

TEL.: (770) 457-8177 / TOLL-FREE (800) 972-4889 / FAX: (770) 457-8188

CHAIN OF CUSTODY MP 04-21-10

Work Order: D02

Date: 4-19-10 Page 1 of 1

| | |
|---|---|
| COMPANY: Winter Environmental | ADDRESS: 3350 Green Pointe Parkway Suite 200 Norcross GA 30092 |
| PHONE: 404 965 2323 | FAX: 404 223 6251 |
| SAMPLED BY: JDK | SIGNATURE: |

ANALYSIS REQUESTED: Enterprise; Lab ID

Visit our website **www.aesatlanta.com** to check on the status of your results, place bottle orders, etc.

| # | SAMPLE ID | SAMPLED DATE | SAMPLED TIME | Grab | Composite | Matrix (See codes) | Enterprise | Lab ID | REMARKS | No # of Containers |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Outfall inlet | 4-19-10 | 1645 | ✓ | | WW | X | 01A,B | | 2 |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |

PRESERVATION (See codes)

**Samples received at 1 °C**

| RELINQUISHED BY | DATE/TIME | RECEIVED BY | DATE/TIME |
|---|---|---|---|
| 1: [signature] | 4-20-10 1245 | 1: [signature] | 4-21-10 09:55 |
| 2: | | 2: | |
| 3: | | 3: | |

PROJECT INFORMATION

PROJECT NAME: Nustar Savannah GA

PROJECT #: 100666

SITE ADDRESS:

SEND REPORT TO: Amanda Spencer

INVOICE TO (IF DIFFERENT FROM ABOVE): aspencer@ashcreekassociates.com

QUOTE #: PO#:

RECEIPT

Total # of Containers: 2

Turnaround Time Request
- ○ Standard 5 Business Days
- ○ 2 Business Day Rush
- ● Next Business Day Rush
- ○ Same Day Rush (auth req.)
- ○ Other Rush

STATE PROGRAM (if any):

E-mail? Y/N; Fax? Y/N

DATA PACKAGE I II III IV

SPECIAL INSTRUCTIONS/COMMENTS:

SHIPMENT METHOD

OUT VIA

IN VIA

CLIENT FedEx UPS MAIL COURIER

GREYHOUND OTHER

SAMPLES RECEIVED AFTER 3PM OR SATURDAY ARE CONSIDERED AS RECEIVED ON THE NEXT BUSINESS DAY; IF NO TAT IS MARKED ON COC AES WILL PROCEED AS STANDARD TAT.

SAMPLES ARE DISPOSED OF 30 DAYS AFTER COMPLETION OF REPORT UNLESS OTHER ARRANGEMENTS ARE MADE.

MATRIX CODES A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) DW = Drinking Water (Blanks) O = Other (specify) WW = Waste Water

PRESERVATIVE CODES H+I = Hydrochloric acid + ice I = Ice only N = Nitric acid S+I = Sulfuric acid + ice S M+I = Sodium Bisulfate Methanol + ice O = Other (specify) NA = None

White Copy - Original; Yellow Copy - Client

# *Appendix B*

## Standard Operating Procedures

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides instructions for standard field screening. Field screening results are used to aid in the selection of soil samples for chemical analysis. This procedure is applicable during all Ash Creek Associates (ACA) soil sampling operations.

Standard field screening techniques include the use of a photoionization detector (PID) to assess for volatile organic compounds (VOCs), for the presence of separate-phase petroleum hydrocarbons using a sheen test. These methods will not detect all potential contaminants, so selection of screening techniques shall be based on an understanding of the site history. The PID is not compound or concentration-specific, but it can provide a qualitative indication of the presence of VOCs. PID measurements are affected by other field parameters such as temperature and soil moisture. Other field screening methods, such as screening for dense non-aqueous phase liquid (DNAPL) using dye or UV light, are not considered "standard" and will be detailed in the site-specific sampling and analysis plan (SAP).

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- PID with calibration gas (record daily calibration/calibration check in field notes);
- Plastic resealable bags (for PID measurement); and
- Glass jars or stainless steel bowls (for sheen testing).

## 3. METHODOLOGY

Each soil sample will be field screened for VOCs using a PID and for the presence of separate-phase petroleum hydrocarbons using a sheen test. If the presence of DNAPL is suspected, then screening using dye and UV light may also to be completed. For information regarding screening using dye or UV light, refer to the site specific sampling and analysis plan.

PID lamps come in multiple sizes, typically 9.8, 10.6, and 11.7 electron volts (eV). The eV rating for the lamp must be greater than the ionization potential (in eV) of a compound in order for the PID to detect the compound. For petroleum hydrocarbons, a lamp of at least 9.8 eV should be used. For typical chlorinated alkenes (dichloroethene, trichloroethene, tetrachloroethene, or vinyl chloride.), a lamp of at least 10.6 eV should be used. The compatibility of the lamp size with the site constituents should be verified prior to the field event and will be detailed in the site-specific SAP.

PID Calibration Procedure: The PID used on-site should be calibrated daily or more frequently if needed. Calibration of the PID should be documented in field notes. Calibrations procedures should be conducted according to the manufacturer's instructions. .

<u>PID Screening Procedure:</u>

- Place a representative portion (approximately one ounce) of freshly exposed, uncompacted soil into a clean resealable plastic bag.
- Seal the bag and break up the soil to expose vapors from the soil matrix.
- Allow the bag to sit to reach ambient temperature. Note: Ambient temperature and weather conditions/humidity should be recorded in field notes. Changes in ambient temperature and weather during the field work should also be recorded, as temperature and humidity can affect PID readings.
- Carefully insert the intake port of the PID into the plastic bag.
- Record the PID measurement in the field notes or boring logs.

<u>Sheen Test Procedure:</u>

- Following the PID screen, place approximately one ounce of freshly exposed, uncompacted soil into a clean glass jar or stainless steel bowl.

- Add enough water to cover the sample.
- Observe the water surface for signs of discoloration/sheen and characterize

| | |
|---|---|
| No Sheen (NS) | No visible sheen on the water surface |
| Biogenic Film (BF) | Dull, platy/blocky or foamy film. |
| Slight Sheen (SS) | Light sheen with irregular spread, not rapid. May have small spots of color/iridescence. Majority of water surface not covered by sheen. |
| Moderate Sheen (MS) | Medium to heavy coverage, some color/iridescence, spread is irregular to flowing. Sheen covering a large portion of water surface. |
| Heavy Sheen (HS) | Heavy sheen coverage with color/iridescence, spread is rapid, entire water surface covered with sheen. Separate-phase hydrocarbons may be evident during sheen test. |

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for observing and sampling from push-probes (i.e., GeoProbe™). Subsurface soil cores may be obtained using this system for purposes of determining subsurface soil conditions and for obtaining soil samples for physical and/or chemical evaluation. Grab groundwater samples may be collected using temporary well screens. Soil vapor samples may be obtained using temporary well points. Shallow (less than 50 feet), small-diameter (2-inch max) pre-packed wells may also be installed using push-probe equipment. This procedure is applicable during all Ash Creek Associates (ACA) push-probe activities.

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, measuring tape, spatula, and buckets/drums
- Sampling equipment (water level probe, pumps, tubing) and laboratory-supplied sample containers
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

## 3. METHODOLOGY

<u>Coring Procedure (Conducted by Drilling Subcontractor):</u>

The sampling procedure includes driving a 2-inch outside-diameter, 5-foot-long, push-probe soil sampler to the desired depth using a combination of hydraulic pressure and mechanical hammer blows. When the sampling depth is reached, the pin attaching the sampler's tip is released (if a tip is used), which allows the tip to slide inside the sampler (Macro-Core Sampler with removable plastic liner). The sampler is driven the length of the sampler to collect a soil core, which is then withdrawn from the exploration. When the sampler is retrieved from the borehole the drive head/cutting shoe is detached and the liner is removed. Soil cores are collected continuously to the full depth of the exploration unless otherwise specified in a project-specific sampling and analysis plan (SAP). Verify that the subcontractor decontaminates the sampling device (per SOP 1.2) prior to its initial use and following collection of each soil sample.

<u>Logging and Soil Sample Collection:</u>

Remove the soil core from the sampler for field screening, description, and placement into sample jars. Soil samples will be collected for field screening and possible chemical analysis on two foot intervals unless otherwise specified in a project-specific SAP. The sampling interval will be determined in the field based on recovery, soil variability, and evidence of contamination. Complete field screening as specified in SOP-2.1. Soil samples should be collected using different procedures for volatile on non-volatile analyses, as follows.

- Volatile Analyses. Sampling for volatile organics analysis (VOA) is different than other routine physical or chemical testing because of the potential loss of volatiles during sampling. To limit volatile loss, the soil sample must be obtained as quickly and as directly as possible. If a VOA sample is to collected as part of a multiple analyte sample, the VOA sample portion will be obtained first. The VOA sample should be obtained from a discrete portion of the entire collected sample and should not be composited or homogenized. Sample bottles should be filled to capacity, with no headspace. Specific procedures for collecting VOA samples using the EPA Method 5035 are discussed in SOP 2.7.

- Other Analyses. Soil samples for non-volatile analyses will be thoroughly homogenized in a stainless steel bowl prior to bottling. Sample homogenizing is accomplished by manually mixing the entire soil sample in the stainless steel bowl with a clean sampling tool until a uniform mixture is achieved. The sample jar should be filled completely.

Any extra soil generated during probing activities will be placed in Department of Transportation (DOT) approved drums.

Grab Groundwater Sample Collection:

Collect grab groundwater samples using a sampling attachment with a 4 to 5-foot-long temporary screen (specify to drillers whether to use decontaminated stainless steel or disposable PVC. Also, specify whether a filter pack is necessary based on field observations). Obtain samples using a peristaltic pump unless otherwise specified in the SAP with new tubing for each boring. Record field parameters (e.g., temperature, conductivity, and pH) prior to sampling.

Backfilling the Excavation (Conducted by Drilling Subcontractor):

After sampling activities are completed, abandon each exploration in accordance with Oregon Water Resources Department (OWRD) regulations and procedures. The abandonment procedure typically consists of filling the exploration with granular bentonite and hydrating the bentonite with water. Match the surface completion to the surrounding materials.

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for manual removal of light non-aqueous phase liquid (LNAPL); also referred to as separate phase hydrocarbons [SPH]) from groundwater monitoring wells. LNAPL compounds are typically petroleum hydrocarbons which are lighter than water (i.e., float). This procedure is applicable during all Ash Creek Associates (ACA) manual LNAPL removal activities. Project manager instruction or an approved work plan dictate action levels for all manual LNAPL removal activities.

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, tools, keys, and buckets/drums
- Product interface probe, sampling bailer, peristaltic pump, and tubing
- Field documentation materials
- Decontamination materials
- Personal protective equipment (as required by project Health and Safety Plan)

## 3. METHODOLOGY

LNAPL/Water Level Measurement:

Measurements of the depth to LNAPL and water will be made to the nearest 0.01 foot using an electronic oil/water interface probe in accordance with ACA SOP 2.16 (water level measurement).

Removal by Pumping:

Use an appropriate pump (e.g. peristaltic) in conjunction with an oil/water interface probe to manually remove the LNAPL. This allows the operator to judge the depth of the suction hose relative to the oil-water interface and manipulate the depth of the hose so that the floating product is preferentially extracted (i.e., minimizing the amount of water removed). Lower the suction hose into the well and remove the LNAPL until the interface probe indicates only a sheen is present. Estimate the volume of LNAPL removed and record it in the field notes. Purged LNAPL and water will be placed in Department of Transportation (DOT) approved drums.

Removal by Bailing:

Lower the sampling bailer (with ball check valve) to the desired depth by suspending the bailer on a rope. When removed from the well, the bailer should contain a discrete volume of LNAPL floating on water. Empty the water portion of the bailer into a bucket by manually activating the check ball on the bailer. Empty the LNAPL portion of the bailer into a second bucket in the same manner. Continue to remove the LNAPL until only a sheen is present (measured using the interface probe). Estimate the volume of LNAPL removed and record it in the field notes. Purged LNAPL and water will be placed in DOT-approved drums.

O&M Passive Skimmer:

Remove the passive skimmer from the well by pulling up the cable suspending the skimmer in the well. Once removed, wipe down the outside of the skimmer and empty the contents into a bucket. While the skimmer is out of the well, measure the remaining LNAPL thickness and purge as necessary. Record the total volume of LNAPL removed from the well. Lower the skimmer back into the well, adjusting the cable as necessary to ensure the screen is centered on the top of the water table. Purged LNAPL and water will be placed in DOT-approved drums.

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for installing monitoring wells (using conventional PVC or pre-packed well screens). A pre-packed well screen generally consists of 5-foot sections of an inner PVC well screen and an outer stainless steel wire mesh. The sand filter pack is housed between the inner screen and outer wire mesh. Well installations are typically completed using push probe drilling to save time and cost but may include many other techniques for drilling a borehole to install the well. This procedure is applicable during all Ash Creek Associates (ACA) drilling activities for installation of monitoring wells.

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Field documentation materials
- Personal protective equipment (as required by project Health and Safety Plan)

## 3. METHODOLOGY

The soil boring for the monitoring well will be completed in accordance with SOP-2.4.

Installation/Construction of Monitoring Well:

Filter Pack. Wells will be constructed of flush-threaded Schedule 40 PVC casing connected to a conventional PVC well screen or pre-packed well screen, placed at the bottom of the boring. A clean silica sand pack will be placed between the boring wall and the PVC screen/riser (i.e., the annulus) from the bottom of the well to approximately one to two feet above the screened interval. Prior to installation of the seal, the well will be surged using a surge block or similar technique. The depth to sand will be measured prior to setting the bentonite seal.

Seal. A bentonite seal, 1 to 2 feet thick, will be placed above the sand. The bentonite will be hydrated and allowed to sit for a minimum of 30 minutes for proper hydration and sealing. The depth to the top of the seal will be measured prior to placing grout. In Washington State and some California counties, the bentonite seal may be placed to within 1 foot of the ground surface in place of grout (per local/state regulations).

Grout. A cement-bentonite slurry will be placed above the bentonite seal following proper hydration. The cement-bentonite slurry will be placed to within 1 foot of the ground surface.

Surface Seal. A concrete surface seal will secure a flush-mounted, traffic-rated monument, or a bollard protected stove-pipe stickup. A locking cap and lock will secure the wellhead, and tamper-resistant bolts (either pentagonal or Allen wrench) will secure a monument cover if a flush-mounted monument is used for surface completion. Flush-mounted surface completions will be completed slightly above grade to prevent the ponding of water in, and around, the monument. All monuments will be permanently marked with well identification numbers. The identification number should be marked on the well (e.g., punched into monument ring, written on the well casing and/or cap with permanent marker, etc.). A survey point should also be added to the well casing (e.g., v-notch cut in PVC).

Documentation:

The field geologist will document the well construction activities. Details to be noted include the following:

- Length of well components;
- Measurements of bentonite, sand, and concrete depths;
- Types, brands, and amounts of materials used;
- Documentation of decontamination; and
- Any deviation from standard procedures or problems during the installation activities.

The drilling contractor will be responsible for conforming to all applicable regulations pertaining to well construction.

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for developing monitoring wells following construction; however, this procedure is also applicable for the redevelopment of existing monitoring wells. Monitoring wells will be allowed to sit for a minimum of 48 hours following completion, or applicable local or state regulated waiting period, before initiating the well development process. This procedure is applicable during all Ash Creek Associates (ACA) well development activities.

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Field documentation materials
- Well Purge Equipment (i.e., High flow centrifugal down-hole pump or bailer)
- Multi-parameter meter (temperature, pH, and conductivity)
- Decontamination materials
- Drums and/or high-capacity tank for storage of purged water
- Personal protective equipment (as required by project Health and Safety Plan)

## 3. METHODOLOGY

The well will be set up in a manner such that the volume of water generated can be easily determined and field parameters can be collected. The development activities will be completed to maximize the removal of sediment from the well casing.

<u>Procedures:</u>

- Measure depth to water (DTW) and total depth of the well prior to development and calculate the casing volume.
- Field parameters (temperature, pH, and conductivity) will be measured for each casing volume removed.
- Purge water will be placed in Department of Transportation (DOT) approved drums or high-capacity tank.
- After the removal of eight casing volumes, field parameters will be monitored for stability.

The well will be considered developed after a minimum of 10 casing volumes have been removed, field parameters have stabilized, and purged water is as free of sediment as possible. Field parameters will be considered stable if temperature, pH, and conductivity are within 10% for three consecutive casing volumes. Wells will also be considered developed if the well is pumped dry during the development process. Consult the project-specific SAP for additional parameters and stabilization criteria.

<u>Documentation:</u>

The field representative will document the well development activities. Details to be noted include the following:

- Depths to water;
- Total depth of the well;
- Purging type and rate;
- Field parameters; and
- Total volume of water purged.

## 1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes procedures for the collection of groundwater level measurements and separate phase hydrocarbon (SPH) measurements. Measurements may be collected as an independent event or in conjunction with groundwater sampling or SPH removal. This SOP is applicable for all Ash Creek Associates (ACA) sites and projects.

## 2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Water level or oil/water interface probe (as appropriate);
- Field documentation materials;
- Decontamination materials;
- Bailers or tape/paste (to confirm unusual SPH detections) and
- Personal protective equipment (PPE; as required by project Health and Safety Plan).

## 3. METHODOLOGY

**Preparation.** Obtain and review table of well construction details and historical groundwater and SPH levels/thicknesses. Bring tables into the field for ready reference.

**Field Procedure.** Water level and SPH measurements should be collected upon arrival at the site. Appropriate PPE (as required by the project-specific Health and Safety Plan) should be worn during measurement activities. During groundwater sampling events, measurements should be collected (1) prior to, during, and after purging and sampling. Water level measurements during low-flow sampling are conducted to ensure that drawdown is not occurring during purging/sampling. Low-flow sampling methods are described in SOP 2.5. The following procedures should be followed when collecting groundwater level and SPH measurements from wells:

<u>No SPH in monitoring well</u>

1. The electronic probe should be tested to ensure proper instrument response. If response is inadequate, replace batteries or repair probe as needed.
2. Well covers and caps will be opened and the water level allowed to equilibrate under atmospheric conditions. Observe for indications that water levels may not be at equilibrium such as:
   a. Escaping air upon loosening of well cap; or
   b. Water level above the top of the well screen.

   For either of these conditions, equilibrium should be verified by repeating water level measurements over five-minute intervals until successive equal measurements are obtained. Otherwise allow water levels to equilibrate for a minimum of five minutes before measurements are taken. Unless otherwise indicated in the work scope of site-specific sampling plan, water level measurements should be taken from the least contaminated wells first to avoid cross-contamination.
3. Locate the reference point on the well riser pipe.
4. Slowly lower the probe until the probe signal indicates that water has been contacted.
5. Record the depth-to-water (DTW) probe reading at the reference point. Measurements should be collected to the nearest 0.01 foot.
6. Withdraw the probe and repeat steps 5 and 6. Measurements should agree within a precision of 0.01 feet. Repeat if needed until a precision of 0.01 feet is obtained.
7. If the work scope or site specific sampling plan requires that the depth-to-bottom (DTB) of monitoring wells is measured, then the probe should be lowered to the bottom of the well and the DTB reading at the reference point should be measured to the nearest 0.01 foot.
8. Remove probe and decontaminate probe and leader that have come in contact with well water using alcohol wipes.

SPH in monitoring well

1. Repeat above steps 1 through 5.
2. Slowly lower the oil/water interface probe until the signal indicates that SPH has been contacted (generally a steady tone and signal light).
3. Record the depth-to-product (DTP) probe reading at the reference point. Measurements should be collected to the nearest 0.01 foot.
4. Continue lowering the probe until the signal indicates that water has been contacted (generally an intermittent tone and signal light).
5. Record the DTW probe reading at the reference point. Measurements should be collected to the nearest 0.01 foot.
6. Withdraw the probe and repeat steps 5 and 6. Measurements should agree within a precision of 0.01 feet. Repeat if needed until a precision of 0.01 feet is obtained.
7. Remove probe and initially decontaminate using alcohol wipes then wash/scrub in a detergent (Alconox®) solution, rinse with tap water, and a final deionized water rinse. Describe in field notes unusual characteristics of SPH that may bias thickness readings (e.g. unusually viscous product).
8. If unusual SPH thicknesses are detected (e.g. SPH is detected in well with no prior history of SPH or thicknesses are greater than prior detections), verify presence/thickness using alternative technique (e.g. bailer, tape and water/petroleum colorimetric paste).

# Appendix C

## Historical Groundwater Elevations and SPH Thicknesses

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-5 | 8/28/1990 | 16.47 | 7.64 | 9.79 | 6.60 | 1.04 |
| AW-5 | 7/23/1991 | 16.47 | 7.21 | 12.07 | 4.16 | 3.05 |
| AW-5 | 8/22/1991 | 16.47 | 7.70 | 11.82 | 4.38 | 3.32 |
| AW-5 | 9/26/1991 | 16.47 | 8.70 | 10.32 | 5.93 | 2.77 |
| AW-5 | 10/25-26/1991 | 16.47 | 9.60 | 9.62 | 6.61 | 2.99 |
| AW-5 | 11/26/1991 | 16.47 | 9.74 | 9.30 | 6.95 | 2.79 |
| AW-5 | 12/20/1991 | 16.47 | 10.01 | 8.96 | 7.29 | 2.72 |
| AW-5 | 1/20/1992 | 16.47 | 7.75 | 10.06 | 6.29 | 1.46 |
| AW-5 | 2/27-28/1992 | 16.47 | 7.25 | 11.15 | 5.15 | 2.10 |
| AW-5 | 3/23/1992 | 16.47 | 7.65 | 10.80 | 5.50 | 2.15 |
| AW-5 | 4/22/1992 | 16.47 | 7.29 | 11.55 | 4.71 | 2.58 |
| AW-5 | 5/27-28/1992 | 16.47 | 8.28 | 10.15 | 6.15 | 2.13 |
| AW-5 | 6/24/1992 | 16.47 | 7.32 | 11.79 | 4.45 | 2.87 |
| AW-5 | 7/27/1992 | 16.47 | 7.75 | 10.98 | 5.29 | 2.46 |
| AW-5 | 8/26/1992 | 16.47 | 4.81 | 13.00 | 3.35 | 1.46 |
| AW-5 | 9/29/1992 | 16.47 | 7.42 | 11.24 | 5.04 | 2.38 |
| AW-5 | 10/29/1992 | 16.47 | 7.80 | 10.54 | 5.77 | 2.03 |
| AW-5 | 11/25/1992 | 16.47 | 7.40 | 11.23 | 5.05 | 2.35 |
| AW-5 | 12/18/1992 | 16.47 | 7.30 | 11.07 | 5.23 | 2.07 |
| AW-5 | 1/28/1993 | 16.47 | 7.11 | 11.60 | 4.67 | 2.44 |
| AW-5 | 2/24/1993 | 16.47 | 7.48 | 11.10 | 5.19 | 2.29 |
| AW-5 | 3/30/1993 | 16.47 | 6.78 | 12.39 | 3.85 | 2.93 |
| AW-5 | 5/28/1993 | 16.47 | 8.46 | 10.00 | 6.30 | 2.16 |
| AW-5 | 8/9-10/1993 | 16.47 | 10.03 | 8.73 | 7.54 | 2.49 |
| AW-5 | 9/28/1993 | 16.47 | 9.91 | 9.37 | 6.86 | 3.05 |
| AW-5 | 10/29/1993 | 16.47 | 9.49 | 9.04 | 7.25 | 2.24 |
| AW-5 | 11/30/1993 | 16.47 | 7.18 | 10.50 | 5.86 | 1.32 |
| AW-5 | 12/27/1993 | 16.47 | 7.49 | 10.20 | 6.16 | 1.33 |
| AW-5 | 3/31/1994 | 16.47 | 7.55 | 10.59 | 5.74 | 1.81 |
| AW-5 | 9/9/1994 | 16.47 | 6.82 | 11.41 | 4.91 | 1.91 |
| AW-5 | 9/29/1994 | 16.47 | 7.32 | 10.99 | 5.32 | 2.00 |
| AW-5 | 11/23/1994 | 16.47 | 6.13 | 11.35 | 5.03 | 1.10 |
| AW-5 | 1/4/1995 | 16.47 | 6.39 | 11.23 | 5.14 | 1.25 |
| AW-5 | 2/8/1995 | 16.47 | 6.71 | 10.72 | 5.67 | 1.04 |
| AW-5 | 3/16/1995 | 16.47 | 6.77 | 10.70 | 5.68 | 1.09 |
| AW-5 | 3/20/1995 | 16.47 | 6.19 | 11.60 | 4.76 | 1.43 |
| AW-5 | 5/25/1995 | 16.47 | 7.25 | 9.85 | 6.57 | 0.68 |
| AW-5 | 9/20/1995 | 16.47 | 6.19 | 11.60 | 4.76 | 1.43 |
| AW-5 | 10/2/2003 | 16.47 | 7.00 | 10.49 | 5.73 | 1.27 |
| AW-5 | 11/25-26/2008 | 16.04 | 7.70 | 10.50 | 5.00 | 2.70 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-5 | 3/5/2009 | 16.04 | 7.82 | 9.81 | 5.83 | 1.99 |
| AW-5 | 6/30/2009 | 16.04 | 8.03 | 9.72 | 6.03 | 2.00 |
| AW-5 | 9/23/2009 | 16.04 | 8.18 | 9.51 | 6.25 | 1.93 |
| AW-5 | 12/29/2009 | 16.04 | 7.70 | 9.67 | 5.64 | 1.56 |
| AW-6 | 8/28/1990 | 12.60 | 10.88 | 4.27 | 7.85 | 3.03 |
| AW-6 | 7/23/1991 | 12.60 | 10.11 | 5.17 | 6.92 | 3.19 |
| AW-6 | 8/22/1991 | 12.60 | 10.24 | 5.01 | 7.08 | 3.16 |
| AW-6 | 9/26/1991 | 12.60 | 9.98 | 4.61 | 7.61 | 2.37 |
| AW-6 | 10/25-26/1991 | 12.60 | 10.06 | 4.28 | 7.99 | 2.07 |
| AW-6 | 11/26/1991 | 12.60 | 11.06 | 3.51 | 8.72 | 2.34 |
| AW-6 | 12/20/1991 | 12.60 | 12.96 | 3.11 | 8.83 | 4.13 |
| AW-6 | 1/20/1992 | 12.60 | 11.05 | 4.13 | 7.98 | 3.07 |
| AW-6 | 2/27-28/1992 | 12.60 | 10.57 | 4.20 | 7.99 | 2.58 |
| AW-6 | 3/23/1992 | 12.60 | 10.87 | 3.91 | 8.27 | 2.60 |
| AW-6 | 4/22/1992 | 12.60 | 10.76 | 4.37 | 7.75 | 3.01 |
| AW-6 | 5/27-28/1992 | 12.60 | 10.77 | 3.87 | 8.34 | 2.43 |
| AW-6 | 6/24/1992 | 12.60 | 10.45 | 4.86 | 7.22 | 3.23 |
| AW-6 | 7/27/1992 | 12.60 | 10.35 | 4.28 | 7.93 | 2.42 |
| AW-6 | 8/26/1992 | 12.60 | 10.19 | 5.98 | 5.94 | 4.25 |
| AW-6 | 9/29/1992 | 12.60 | 10.31 | 4.89 | 7.21 | 3.10 |
| AW-6 | 10/29/1992 | 12.60 | 10.20 | 4.39 | 7.83 | 2.37 |
| AW-6 | 11/25/1992 | 12.60 | 10.24 | 4.82 | 7.31 | 2.93 |
| AW-6 | 12/18/1992 | 12.60 | 10.23 | 4.53 | 7.66 | 2.57 |
| AW-6 | 1/28/1993 | 12.60 | 10.25 | 4.72 | 7.43 | 2.82 |
| AW-6 | 2/24/1993 | 12.60 | 10.14 | 3.50 | 8.90 | 1.24 |
| AW-6 | 3/30/1993 | 12.60 | 10.50 | 4.86 | 7.22 | 3.28 |
| AW-6 | 5/28/1993 | 12.60 | 10.47 | 3.78 | 8.51 | 1.96 |
| AW-6 | 8/9-10/1993 | 12.60 | 11.98 | 3.21 | 8.90 | 3.08 |
| AW-6 | 9/28/1993 | 12.60 | 11.41 | 3.60 | 8.54 | 2.87 |
| AW-6 | 10/29/1993 | 12.60 | 11.18 | 3.72 | 8.44 | 2.74 |
| AW-6 | 11/30/1993 | 12.60 | 10.31 | 4.22 | 8.01 | 2.30 |
| AW-6 | 12/27/1993 | 12.60 | 10.64 | 3.77 | 8.49 | 2.15 |
| AW-6 | 3/31/1994 | 12.60 | 10.53 | 3.99 | 8.25 | 2.28 |
| AW-6 | 9/9/1994 | 12.60 | 10.05 | 5.02 | 7.11 | 2.94 |
| AW-6 | 9/29/1994 | 12.60 | 9.97 | 4.44 | 7.81 | 2.16 |
| AW-6 | 11/23/1994 | 12.60 | 10.03 | 4.70 | 7.49 | 2.54 |
| AW-6 | 1/4/1995 | 12.60 | 9.71 | 5.02 | 7.18 | 2.53 |
| AW-6 | 2/8/1995 | 12.60 | 10.02 | 3.90 | 8.45 | 1.57 |
| AW-6 | 3/16/1995 | 12.60 | 9.85 | 4.40 | 7.89 | 1.96 |
| AW-6 | 3/20/1995 | 12.60 | 10.06 | 5.02 | 7.11 | 2.95 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-6 | 5/25/1995 | 12.60 | 10.38 | 3.85 | 8.44 | 1.94 |
| AW-6 | 9/20/1995 | 12.60 | 10.06 | 5.02 | 7.11 | 2.95 |
| AW-6 | 10/2/2003 | 12.60 | 9.58 | 4.40 | 7.85 | 1.73 |
| AW-6 | 11/25-26/2008 | 11.57 | 10.10 | 3.55 | 7.50 | 2.60 |
| AW-6 | 3/5/2009 | 11.57 | 11.35 | 2.19 | 8.89 | 2.46 |
| AW-6 | 6/30/2009 | 11.57 | 10.11 | 3.11 | 8.18 | 1.93 |
| AW-6 | 9/23/2009 | 11.57 | 7.60 | 3.97 | -- | -- |
| AW-6 | 12/29/2009 | 11.57 | 9.71 | 3.52 | 7.77 | 1.94 |
| AW-7 | 8/28/1990 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 7/23/1991 | 13.58 | 8.11 | 5.47 | -- | -- |
| AW-7 | 8/22/1991 | 13.58 | 8.18 | 5.40 | -- | -- |
| AW-7 | 9/26/1991 | 13.58 | 8.78 | 4.80 | -- | -- |
| AW-7 | 10/25-26/1991 | 13.58 | 9.18 | 4.40 | -- | -- |
| AW-7 | 11/26/1991 | 13.58 | 10.06 | 3.52 | -- | -- |
| AW-7 | 12/20/1991 | 13.58 | 10.28 | 3.30 | -- | -- |
| AW-7 | 1/20/1992 | 13.58 | 9.28 | 4.30 | -- | -- |
| AW-7 | 2/27-28/1992 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 3/23/1992 | 13.58 | 9.58 | 4.00 | -- | -- |
| AW-7 | 4/22/1992 | 13.58 | 8.96 | 4.62 | -- | -- |
| AW-7 | 5/27-28/1992 | 13.58 | 9.59 | 3.99 | -- | -- |
| AW-7 | 6/24/1992 | 13.58 | 8.50 | 5.08 | -- | -- |
| AW-7 | 7/27/1992 | 13.58 | 9.12 | 4.46 | -- | -- |
| AW-7 | 8/26/1992 | 13.58 | 7.37 | 6.21 | -- | -- |
| AW-7 | 9/29/1992 | 13.58 | 8.38 | 5.20 | -- | -- |
| AW-7 | 10/29/1992 | 13.58 | 9.11 | 4.47 | -- | -- |
| AW-7 | 11/25/1992 | 13.58 | 8.66 | 4.92 | -- | -- |
| AW-7 | 12/18/1992 | 13.58 | 8.83 | 4.75 | -- | -- |
| AW-7 | 1/28/1993 | 13.58 | 8.48 | 5.10 | -- | -- |
| AW-7 | 2/24/1993 | 13.58 | 9.94 | 3.64 | -- | -- |
| AW-7 | 3/30/1993 | 13.58 | 8.47 | 5.11 | -- | -- |
| AW-7 | 5/28/1993 | 13.58 | 9.69 | 3.89 | -- | -- |
| AW-7 | 8/9-10/1993 | 13.58 | 10.12 | 3.46 | -- | -- |
| AW-7 | 9/28/1993 | 13.58 | 9.92 | 3.66 | -- | -- |
| AW-7 | 10/29/1993 | 13.58 | 9.74 | 3.84 | -- | -- |
| AW-7 | 11/30/1993 | 13.58 | 9.02 | 4.56 | -- | -- |
| AW-7 | 12/27/1993 | 13.58 | 9.54 | 4.04 | -- | -- |
| AW-7 | 3/31/1994 | 13.58 | 9.22 | 4.36 | -- | -- |
| AW-7 | 9/9/1994 | 13.58 | 8.20 | 5.38 | -- | -- |
| AW-7 | 9/29/1994 | 13.58 | 8.68 | 4.90 | -- | -- |
| AW-7 | 11/23/1994 | 13.58 | 8.29 | 5.29 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-7 | 1/4/1995 | 13.58 | 8.23 | 5.35 | -- | -- |
| AW-7 | 2/8/1995 | 13.58 | 9.32 | 4.26 | -- | -- |
| AW-7 | 3/16/1995 | 13.58 | 8.81 | 4.77 | -- | -- |
| AW-7 | 3/20/1995 | 13.58 | 8.04 | 5.54 | -- | -- |
| AW-7 | 5/25/1995 | 13.58 | 9.55 | 4.03 | -- | -- |
| AW-7 | 9/20/1995 | 13.58 | 8.04 | 5.54 | -- | -- |
| AW-7 | 10/2/2003 | 13.58 | 8.80 | 4.78 | -- | -- |
| AW-7 | 11/25-26/2008 | 12.54 | 8.10 | 4.44 | -- | -- |
| AW-7 | 3/6/2009 | 12.54 | 9.14 | 3.40 | -- | -- |
| AW-7 | 6/30/2009 | 12.54 | 8.60 | 3.94 | -- | -- |
| AW-7 | 9/23/2009 | 12.54 | 8.72 | 3.82 | -- | -- |
| AW-7 | 12/29/2009 | 12.54 | 7.94 | 4.60 | -- | -- |
| AW-8 | 8/28/1990 | 15.88 | 14.80 | 3.72 | 11.14 | 3.66 |
| AW-8 | 7/23/1991 | 15.88 | 13.45 | 4.77 | 10.20 | 3.25 |
| AW-8 | 8/22/1991 | 15.88 | 13.76 | 4.62 | 10.29 | 3.47 |
| AW-8 | 9/26/1991 | 15.88 | 13.85 | 4.16 | 10.89 | 2.96 |
| AW-8 | 10/25-26/1991 | 15.88 | 13.74 | 3.94 | 11.24 | 2.50 |
| AW-8 | 11/26/1991 | 15.88 | 15.03 | 3.02 | 12.02 | 3.01 |
| AW-8 | 12/20/1991 | 15.88 | 15.97 | 2.67 | 12.13 | 3.84 |
| AW-8 | 1/20/1992 | 15.88 | 14.88 | 3.60 | 11.27 | 3.61 |
| AW-8 | 2/27-28/1992 | 15.88 | 14.61 | 3.62 | 11.34 | 3.27 |
| AW-8 | 3/23/1992 | 15.88 | 14.69 | 3.41 | 11.60 | 3.09 |
| AW-8 | 4/22/1992 | 15.88 | 14.46 | 3.94 | 10.96 | 3.50 |
| AW-8 | 5/27-28/1992 | 15.88 | 14.26 | 3.54 | 11.59 | 2.67 |
| AW-8 | 6/24/1992 | 15.88 | 13.61 | 4.55 | 10.45 | 3.16 |
| AW-8 | 7/27/1992 | 15.88 | 14.36 | 3.87 | 11.09 | 3.27 |
| AW-8 | 8/26/1992 | 15.88 | 11.74 | 5.98 | 9.18 | 2.56 |
| AW-8 | 9/29/1992 | 15.88 | 13.29 | 4.84 | 10.16 | 3.13 |
| AW-8 | 10/29/1992 | 15.88 | 13.90 | 4.16 | 10.87 | 3.03 |
| AW-8 | 11/25/1992 | 15.88 | 12.61 | 4.83 | 10.45 | 2.16 |
| AW-8 | 12/18/1992 | 15.88 | 13.07 | 4.45 | 10.79 | 2.28 |
| AW-8 | 1/28/1993 | 15.88 | 12.09 | 4.94 | 10.49 | 1.60 |
| AW-8 | 2/24/1993 | 15.88 | 13.03 | 4.35 | 10.94 | 2.09 |
| AW-8 | 3/30/1993 | 15.88 | 11.69 | 5.15 | 10.36 | 1.33 |
| AW-8 | 5/28/1993 | 15.88 | 13.48 | 3.58 | 11.84 | 1.64 |
| AW-8 | 8/9-10/1993 | 15.88 | 15.89 | 2.63 | 12.23 | 3.66 |
| AW-8 | 9/28/1993 | 15.88 | 15.17 | 3.06 | 11.90 | 3.27 |
| AW-8 | 10/29/1993 | 15.88 | 14.85 | 3.25 | 11.76 | 3.09 |
| AW-8 | 11/30/1993 | 15.88 | 14.00 | 4.00 | 11.05 | 2.95 |
| AW-8 | 12/27/1993 | 15.88 | 14.25 | 3.55 | 11.59 | 2.66 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-8 | 3/31/1994 | 15.88 | 13.75 | 3.78 | 11.46 | 2.29 |
| AW-8 | 9/9/1994 | 15.88 | 12.25 | 4.93 | 10.45 | 1.80 |
| AW-8 | 9/29/1994 | 15.88 | 13.09 | 4.34 | 10.94 | 2.15 |
| AW-8 | 11/23/1994 | 15.88 | 11.62 | 4.80 | 10.87 | 0.75 |
| AW-8 | 1/4/1995 | 15.88 | 11.36 | 4.98 | 10.72 | 0.64 |
| AW-8 | 2/8/1995 | 15.88 | 13.02 | 3.73 | 11.81 | 1.21 |
| AW-8 | 3/16/1995 | 15.88 | 12.39 | 4.23 | 11.36 | 1.03 |
| AW-8 | 5/25/1995 | 15.88 | 12.89 | 3.63 | 12.00 | 0.89 |
| AW-8 | 9/20/1995 | 15.88 | 11.26 | 5.06 | 10.65 | 0.61 |
| AW-8 | 10/2/2003 | 15.88 | 11.83 | 4.57 | 11.18 | 0.65 |
| AW-8 | 11/25-26/2008 | 15.68 | 11.25 | 5.17 | 10.32 | 0.93 |
| AW-8 | 3/5/2009 | 15.68 | 13.96 | 2.18 | 13.38 | 0.58 |
| AW-8 | 6/30/2009 | 15.68 | 13.32 | 3.16 | 12.38 | 0.94 |
| AW-8 | 9/23/2009 | 15.68 | 12.67 | 3.57 | 12.01 | 0.66 |
| AW-8 | 12/29/2009 | 15.68 | 12.49 | 3.74 | 11.85 | 0.64 |
| AW-8 | 3/24/2010 | 15.68 | 12.97 | 3.39 | 12.17 | 0.80 |
| AW-9 | 8/28/1990 | 14.09 | 13.28 | 2.62 | 11.04 | 2.24 |
| AW-9 | 7/23/1991 | 14.09 | 15.51 | 2.32 | 10.89 | 4.62 |
| AW-9 | 8/22/1991 | 14.09 | 14.66 | 2.32 | 11.09 | 3.57 |
| AW-9 | 9/26/1991 | 14.09 | 13.14 | 3.07 | 10.52 | 2.62 |
| AW-9 | 10/25-26/1991 | 14.09 | 13.40 | 2.83 | 10.76 | 2.64 |
| AW-9 | 11/26/1991 | 14.09 | 13.81 | 2.39 | 11.21 | 2.60 |
| AW-9 | 12/20/1991 | 14.09 | 15.75 | 1.61 | 11.71 | 4.04 |
| AW-9 | 1/20/1992 | 14.09 | 13.05 | 2.57 | 11.16 | 1.89 |
| AW-9 | 2/27-28/1992 | 14.09 | 14.25 | 2.22 | 11.31 | 2.94 |
| AW-9 | 3/23/1992 | 14.09 | 16.03 | 1.75 | 11.48 | 4.55 |
| AW-9 | 4/22/1992 | 14.09 | 14.02 | 2.46 | 11.07 | 2.95 |
| AW-9 | 5/27-28/1992 | 14.09 | 13.15 | 2.86 | 10.78 | 2.37 |
| AW-9 | 6/24/1992 | 14.09 | 14.12 | 2.55 | 10.93 | 3.19 |
| AW-9 | 7/27/1992 | 14.09 | 16.94 | 1.52 | 11.55 | 5.39 |
| AW-9 | 8/26/1992 | 14.09 | 12.88 | 3.25 | 10.36 | 2.52 |
| AW-9 | 9/29/1992 | 14.09 | 12.35 | 3.68 | 9.95 | 2.40 |
| AW-9 | 10/29/1992 | 14.09 | 12.65 | 3.13 | 10.56 | 2.09 |
| AW-9 | 11/25/1992 | 14.09 | 13.89 | 6.43 | 6.20 | 7.69 |
| AW-9 | 12/18/1992 | 14.09 | 14.03 | 2.34 | 11.21 | 2.82 |
| AW-9 | 1/28/1993 | 14.09 | 12.80 | 3.21 | 10.43 | 2.37 |
| AW-9 | 2/24/1993 | 14.09 | 13.12 | 2.86 | 10.79 | 2.33 |
| AW-9 | 3/30/1993 | 14.09 | 14.94 | 2.31 | 11.04 | 3.90 |
| AW-9 | 5/28/1993 | 14.09 | 15.82 | 1.70 | 11.59 | 4.23 |
| AW-9 | 8/9-10/1993 | 14.09 | 15.53 | 1.89 | 11.42 | 4.11 |
| AW-9 | 9/28/1993 | 14.09 | 14.57 | 2.02 | 11.48 | 3.09 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-9 | 10/29/1993 | 14.09 | 13.02 | 2.80 | 10.89 | 2.13 |
| AW-9 | 11/30/1993 | 14.09 | 12.65 | 2.94 | 10.80 | 1.85 |
| AW-9 | 12/27/1993 | 14.09 | 15.82 | 1.70 | 11.59 | 4.23 |
| AW-9 | 3/31/1994 | 14.09 | 14.56 | 2.40 | 11.02 | 3.54 |
| AW-9 | 9/9/1994 | 14.09 | -- | 14.09 | 14.09 | -- |
| AW-9 | 9/29/1994 | 14.09 | 15.56 | 2.05 | 11.21 | 4.35 |
| AW-9 | 11/23/1994 | 14.09 | 12.52 | 3.14 | 10.58 | 1.94 |
| AW-9 | 1/4/1995 | 14.09 | 12.38 | 3.40 | 10.29 | 2.09 |
| AW-9 | 2/8/1995 | 14.09 | 16.09 | 1.67 | 11.56 | 4.53 |
| AW-9 | 3/16/1995 | 14.09 | 13.78 | 2.61 | 10.94 | 2.84 |
| AW-9 | 5/25/1995 | 14.09 | 13.55 | 2.61 | 10.99 | 2.56 |
| AW-9 | 9/30/1995 | 14.09 | 12.81 | 3.13 | 10.52 | 2.29 |
| AW-9 | 10/2/2003 | 14.09 | 13.09 | 3.28 | 10.24 | 2.85 |
| AW-9 | 11/25-26/2008 | 13.50 | 13.10 | 2.48 | 10.50 | 2.60 |
| AW-9 | 3/5/2009 | 13.50 | 13.80 | 1.55 | 11.49 | 2.31 |
| AW-9 | 6/30/2009 | 13.50 | 13.51 | 2.36 | 10.73 | 2.78 |
| AW-9 | 6/30/2009 | 13.50 | 13.28 | 2.62 | 10.47 | 2.81 |
| AW-9 | 9/23/2009 | 13.50 | 13.33 | 2.84 | 10.20 | 3.13 |
| AW-9 | 12/29/2009 | 13.50 | 13.13 | 2.76 | 10.33 | 2.80 |
| AW-9 | 3/24/2010 | 13.50 | 14.55 | 1.92 | 11.07 | 3.48 |
| AW-9 | 12/13/2010 | 13.50 | 15.90 | 1.36 | 11.50 | 4.40 |
| AW-10 | 8/28/1990 | 14.90 | 16.78 | 3.45 | 10.36 | 6.42 |
| AW-10 | 7/23/1991 | 14.9 | 16.94 | 2.96 | 10.92 | 6.02 |
| AW-10 | 8/22/1991 | 14.9 | 16.93 | 3.18 | 10.65 | 6.28 |
| AW-10 | 9/26/1991 | 14.9 | 16.78 | 3.35 | 10.48 | 6.30 |
| AW-10 | 10/25-26/1991 | 14.90 | 16.42 | 3.29 | 10.63 | 5.79 |
| AW-10 | 11/26/1991 | 14.9 | 16.53 | 2.59 | 11.44 | 5.09 |
| AW-10 | 12/20/1991 | 14.9 | 16.69 | 2.28 | 11.79 | 4.90 |
| AW-10 | 1/20/1992 | 14.9 | 16.29 | 3.20 | 10.76 | 5.53 |
| AW-10 | 2/27-28/1992 | 14.90 | 16.74 | 3.12 | 10.76 | 5.98 |
| AW-10 | 3/23/1992 | 14.90 | 16.96 | 2.65 | 11.29 | 5.67 |
| AW-10 | 4/22/1992 | 14.90 | 16.80 | 3.25 | 10.59 | 6.21 |
| AW-10 | 5/27-28/1992 | 14.90 | 16.84 | 2.87 | 11.04 | 5.80 |
| AW-10 | 6/24/1992 | 14.90 | 16.85 | 3.92 | 9.78 | 7.07 |
| AW-10 | 7/27/1992 | 14.90 | 16.90 | 3.05 | 10.81 | 6.09 |
| AW-10 | 8/26/1992 | 14.90 | 16.59 | 4.83 | 8.73 | 7.86 |
| AW-10 | 9/29/1992 | 14.90 | 16.86 | 4.01 | 9.67 | 7.19 |
| AW-10 | 10/29/1992 | 14.90 | 16.93 | 3.43 | 10.35 | 6.58 |
| AW-10 | 11/25/1992 | 14.90 | 16.15 | 3.74 | 10.14 | 6.01 |
| AW-10 | 12/18/1992 | 14.90 | 16.36 | 3.50 | 10.39 | 5.97 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-10 | 1/28/1993 | 14.90 | 16.31 | 3.93 | 9.88 | 6.43 |
| AW-10 | 2/24/1993 | 14.90 | 16.28 | 3.37 | 10.56 | 5.72 |
| AW-10 | 3/30/1993 | 14.90 | 17.89 | 3.41 | 10.18 | 7.71 |
| AW-10 | 5/28/1993 | 14.90 | 16.72 | 2.70 | 11.27 | 5.45 |
| AW-10 | 8/9-10/1993 | 14.90 | 16.48 | 2.26 | 11.85 | 4.63 |
| AW-10 | 9/28/1993 | 14.90 | 16.00 | 2.68 | 11.44 | 4.56 |
| AW-10 | 10/29/1993 | 14.90 | 15.29 | 3.05 | 11.15 | 4.14 |
| AW-10 | 11/30/1993 | 14.90 | 15.65 | 3.32 | 10.75 | 4.90 |
| AW-10 | 12/27/1993 | 14.90 | 16.29 | 2.64 | 11.43 | 4.86 |
| AW-10 | 3/31/1994 | 14.90 | 16.27 | 2.95 | 11.07 | 5.20 |
| AW-10 | 9/9/1994 | 14.90 | 16.12 | 4.15 | 9.65 | 6.47 |
| AW-10 | 9/29/1994 | 14.90 | 16.92 | 3.32 | 10.49 | 6.43 |
| AW-10 | 11/23/1994 | 14.90 | 16.55 | 3.70 | 10.11 | 6.44 |
| AW-10 | 1/4/1995 | 14.90 | 15.93 | 3.80 | 10.11 | 5.82 |
| AW-10 | 2/8/1995 | 14.90 | 16.73 | 2.50 | 11.51 | 5.22 |
| AW-10 | 3/16/1995 | 14.90 | 15.86 | 3.61 | 10.35 | 5.51 |
| AW-10 | 5/25/1995 | 14.90 | 15.24 | 3.21 | 10.96 | 4.28 |
| AW-10 | 9/30/1995 | 14.90 | 16.51 | 3.98 | 9.77 | 6.74 |
| AW-10 | 10/2/2003 | 14.90 | 15.22 | 3.39 | 10.58 | 4.64 |
| AW-10 | 11/25-26/2008 | 13.90 | 14.90 | 3.08 | 9.80 | 5.10 |
| AW-10 | 3/5/2009 | 13.90 | 14.60 | 1.72 | 11.58 | 3.02 |
| AW-10 | 6/30/2009 | 13.90 | 15.55 | 2.67 | 10.49 | 5.06 |
| AW-10 | 9/23/2009 | 13.90 | 15.18 | 3.15 | 9.99 | 5.19 |
| AW-10 | 12/29/2009 | 13.90 | 14.29 | 3.23 | 10.05 | 4.24 |
| AW-10 | 3/24/2010 | 13.90 | 15.00 | 2.53 | 10.75 | 4.25 |
| AW-10 | 12/13/2010 | 13.90 | 15.28 | 1.75 | 11.62 | 3.66 |
| AW-11 | 8/28/1990 | 14.64 | 16.06 | 2.57 | 11.14 | 4.92 |
| AW-11 | 7/23/1991 | 14.64 | 16.51 | 2.54 | 11.06 | 5.45 |
| AW-11 | 8/22/1991 | 14.64 | 16.31 | 2.56 | 11.09 | 5.22 |
| AW-11 | 9/26/1991 | 14.64 | 14.63 | 3.15 | 10.75 | 3.88 |
| AW-11 | 10/25-26/1991 | 14.64 | 14.42 | 2.98 | 11.01 | 3.41 |
| AW-11 | 11/26/1991 | 14.64 | 16.00 | 2.46 | 11.29 | 4.71 |
| AW-11 | 12/20/1991 | 14.64 | 16.47 | 1.73 | 12.08 | 4.39 |
| AW-11 | 1/20/1992 | 14.64 | 14.19 | 2.88 | 11.19 | 3.00 |
| AW-11 | 2/27-28/1992 | 14.64 | 16.25 | 2.27 | 11.46 | 4.79 |
| AW-11 | 3/23/1992 | 14.64 | 16.78 | 2.06 | 11.60 | 5.18 |
| AW-11 | 4/22/1992 | 14.64 | 16.15 | 2.52 | 11.18 | 4.97 |
| AW-11 | 5/27-28/1992 | 14.64 | 14.76 | 2.90 | 11.03 | 3.73 |
| AW-11 | 6/24/1992 | 14.64 | 15.61 | 2.69 | 11.09 | 4.52 |
| AW-11 | 7/27/1992 | 14.64 | 16.56 | 2.13 | 11.56 | 5.00 |
| AW-11 | 8/26/1992 | 14.64 | 13.56 | 3.26 | 10.87 | 2.69 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-11 | 9/29/1992 | 14.64 | 13.19 | 3.86 | 10.22 | 2.97 |
| AW-11 | 10/29/1992 | 14.64 | 14.79 | 3.15 | 10.72 | 4.07 |
| AW-11 | 11/25/1992 | 14.64 | 13.97 | 3.06 | 11.02 | 2.95 |
| AW-11 | 12/18/1992 | 14.64 | 15.43 | 2.41 | 11.48 | 3.95 |
| AW-11 | 1/28/1993 | 14.64 | 13.69 | 3.51 | 10.53 | 3.16 |
| AW-11 | 2/24/1993 | 14.64 | 15.16 | 2.89 | 10.95 | 4.21 |
| AW-11 | 3/30/1993 | 14.64 | 16.26 | 2.60 | 11.05 | 5.21 |
| AW-11 | 5/28/1993 | 14.64 | 16.80 | 1.92 | 11.76 | 5.04 |
| AW-11 | 8/9-10/1993 | 14.64 | 16.48 | 1.03 | 12.94 | 3.54 |
| AW-11 | 9/28/1993 | 14.64 | 16.34 | 2.01 | 11.76 | 4.58 |
| AW-11 | 10/29/1993 | 14.64 | 14.06 | 2.96 | 11.12 | 2.94 |
| AW-11 | 11/30/1993 | 14.64 | 14.27 | 3.03 | 10.98 | 3.29 |
| AW-11 | 12/27/1993 | 14.64 | 16.72 | 2.03 | 11.65 | 5.07 |
| AW-11 | 3/31/1994 | 14.64 | 16.35 | 2.47 | 11.19 | 5.16 |
| AW-11 | 9/9/1994 | 14.64 | 0.00 | 14.64 | -- | -- |
| AW-11 | 9/29/1994 | 14.64 | 16.51 | 2.41 | 11.23 | 5.28 |
| AW-11 | 11/23/1994 | 14.64 | 14.94 | 3.06 | 10.79 | 4.15 |
| AW-11 | 1/4/1995 | 14.64 | 13.47 | 3.56 | 10.52 | 2.95 |
| AW-11 | 2/8/1995 | 14.64 | 17.06 | 2.05 | 11.54 | 5.52 |
| AW-11 | 3/16/1995 | 14.64 | 15.74 | 2.37 | 11.46 | 4.28 |
| AW-11 | 5/25/1995 | 14.64 | 14.80 | 2.67 | 11.31 | 3.49 |
| AW-11 | 9/30/1995 | 14.64 | 14.33 | 3.14 | 10.84 | 3.49 |
| AW-11 | 10/2/2003 | 14.64 | 13.40 | 3.36 | 10.75 | 2.65 |
| AW-11 | 11/25-26/2008 | 13.64 | 13.70 | 2.38 | 10.65 | 3.05 |
| AW-11 | 3/5/2009 | 13.64 | 14.85 | 1.43 | 11.55 | 3.30 |
| AW-11 | 6/30/2009 | 13.64 | 13.58 | 2.51 | 10.71 | 2.87 |
| AW-11 | 6/30/2009 | 13.64 | 13.79 | 2.66 | 10.50 | 3.29 |
| AW-11 | 9/23/2009 [10] | 13.64 | 13.45 | 2.84 | 10.35 | 3.10 |
| AW-11 | 9/23/2009 [11] | 13.64 | 12.85 | 3.24 | 9.98 | 2.87 |
| AW-11 | 12/29/2009 | 13.64 | 13.21 | 2.89 | 10.33 | 2.88 |
| AW-11 | 3/24/2010 | 13.64 | 13.95 | 2.18 | 11.04 | 2.91 |
| AW-11 | 12/13/2010 | 13.64 | 14.98 | 1.59 | 11.55 | 3.43 |
| AW-12 | 8/28/1990 | 15.17 | 14.12 | 3.49 | 11.22 | 2.90 |
| AW-12 | 7/23/1991 | 15.17 | 13.41 | 4.26 | 10.43 | 2.98 |
| AW-12 | 8/22/1991 | 15.17 | 13.73 | 4.25 | 10.39 | 3.34 |
| AW-12 | 9/26/1991 | 15.17 | -- | -- | 3.90 | -- |
| AW-12 | 10/25-26/1991 | -- | -- | -- | -- | 3.11 |
| AW-12 | 11/26/1991 | 15.17 | -- | -- | -- | 1.30 |
| AW-12 | 12/20/1991 | 15.17 | -- | -- | -- | 1.48 |
| AW-12 | 1/20/1992 | 15.17 | 10.29 | 5.53 | 9.52 | 0.77 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-12 | 2/27-28/1992 | 15.17 | 12.09 | 4.99 | 9.82 | 2.27 |
| AW-12 | 3/23/1992 | 15.17 | 12.22 | 4.71 | 10.12 | 2.10 |
| AW-12 | 4/22/1992 | 15.17 | 11.02 | 5.44 | 9.48 | 1.54 |
| AW-12 | 5/27-28/1992 | 15.17 | 11.25 | 5.42 | 9.47 | 1.78 |
| AW-12 | 6/24/1992 | 15.17 | 11.85 | 5.97 | 8.70 | 3.15 |
| AW-12 | 7/27/1992 | 15.17 | 12.39 | 5.16 | 9.56 | 2.83 |
| AW-12 | 8/26/1992 | 15.17 | 11.00 | 6.51 | 8.21 | 2.79 |
| AW-12 | 9/29/1992 | 15.17 | 10.88 | 6.49 | 8.26 | 2.62 |
| AW-12 | 10/29/1992 | 15.17 | 11.10 | 5.04 | 9.95 | 1.15 |
| AW-12 | 11/25/1992 | 15.17 | 11.27 | 5.94 | 8.84 | 2.43 |
| AW-12 | 12/18/1992 | -- | -- | -- | -- | -- |
| AW-12 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-12 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-12 | 5/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 8/9-10/1993 | -- | -- | -- | -- | 1.90 |
| AW-12 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-12 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-12 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-12 | 12/27/1993 | -- | -- | -- | -- | 2.39 |
| AW-12 | 3/31/1994 | -- | -- | -- | -- | 0.96 |
| AW-12 | 9/9/1994 | -- | -- | -- | -- | 2.23 |
| AW-12 | 9/29/1994 | -- | -- | -- | -- | 3.27 |
| AW-12 | 11/23/1994 | -- | -- | -- | -- | 0.92 |
| AW-12 | 1/4/1995 | -- | -- | -- | -- | 0.26 |
| AW-12 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-12 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-12 | 5/25/1995 | -- | -- | -- | -- | 1.40 |
| AW-12 | 9/30/1995 | -- | -- | -- | -- | -- |
| AW-12 | 11/25-26/2008 | 9.17 | -- | -- | 8.75 | 0.42 |
| AW-12 | 3/6/2009 | 12.14 | 13.65 | 1.17 | 10.30 | 3.35 |
| AW-12 | 6/30/2009 | 12.14 | 14.24 | 2.14 | 9.12 | 5.12 |
| AW-12 | 9/23/2009 [10] | 12.14 | 14.73 | 2.53 | 8.54 | 6.19 |
| AW-12 | 9/23/2009 [11] | 12.14 | 14.76 | 2.62 | 8.43 | 6.33 |
| AW-12 | 12/29/2009 | 12.14 | 12.76 | 2.41 | 9.10 | 3.66 |
| AW-12 | 3/24/2010 | 12.14 | 12.76 | 1.98 | 9.62 | 3.14 |
| AW-13 | 8/28/1990 | 13.79 | -- [12] | -- [12] | -- [12] | -- [12] |
| AW-13 | 7/23/1991 | 13.79 | 14.84 | 3.31 | 10.20 | 4.64 |
| AW-13 | 8/22/1991 | 13.79 | 13.50 | 3.77 | 9.80 | 3.70 |
| AW-13 | 9/26/1991 | 13.79 | 17.44 | 1.97 | 11.46 | 5.98 |
| AW-13 | 10/25-26/1991 | 13.79 | 17.53 | 1.88 | 11.55 | 5.98 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-13 | 11/26/1991 | 13.79 | -- | -- | 11.63 | -- |
| AW-13 | 12/20/1991 | 13.79 | 19.86 | 0.71 | 12.65 | 7.21 |
| AW-13 | 1/20/1992 | 13.79 | 12.59 | 3.37 | 10.28 | 2.31 |
| AW-13 | 2/27-28/1992 | 13.79 | 17.05 | 1.82 | 11.65 | 5.40 |
| AW-13 | 3/23/1992 | 13.79 | 17.82 | 2.18 | 11.21 | 6.61 |
| AW-13 | 4/22/1992 | 13.79 | 15.80 | 2.95 | 10.52 | 5.28 |
| AW-13 | 5/27-28/1992 | 13.79 | 14.30 | 3.08 | 10.48 | 3.82 |
| AW-13 | 6/24/1992 | 13.79 | 14.35 | 3.67 | 9.85 | 4.50 |
| AW-13 | 7/27/1992 | 13.79 | 17.09 | 1.25 | 12.25 | 4.84 |
| AW-13 | 8/26/1992 | 13.79 | 14.12 | 2.92 | 10.66 | 3.46 |
| AW-13 | 9/29/1992 | 13.79 | 13.08 | 4.22 | 9.35 | 3.73 |
| AW-13 | 10/29/1992 | 13.79 | | -- | 3.86 | 3.86 |
| AW-13 | 11/25/1992 | 13.79 | 14.03 | 2.84 | 10.75 | 3.28 |
| AW-13 | 12/18/1992 | 13.79 | -- | -- | -- | -- |
| AW-13 | 1/28/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 2/24/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 3/30/1993 | 13.79 | -- | -- | -- | -- |
| AW-13 | 5/28/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 8/9-10/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/28/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 10/29/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/30/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 12/27/1993 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 3/31/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/9/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/29/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/23/1994 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 1/4/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 2/8/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 3/16/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 5/25/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 9/30/1995 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 10/2/2003 | 13.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 11/25-26/2008 | 12.79 | 21.75 | 1.04 | 9.25 | 12.50 |
| AW-13 | 3/5/2009 | 12.79 | --[12] | --[12] | 9.60 | --[12] |
| AW-13 | 6/30/2009 | 12.79 | 10.95 | 2.11 | 10.70 | 0.25 |
| AW-13 | 9/23/2009[10] | 12.79 | 10.19 | 5.31 | 7.69 | 2.50 |
| AW-13 | 9/23/2009[11] | 12.79 | --[12] | --[12] | --[12] | --[12] |
| AW-13 | 12/29/2009 | 12.79 | --[12] | --[12] | 9.75 | --[12] |
| AW-13 | 3/24/2010 | 12.79 | --[12] | --[12] | 9.82 | --[12] |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-14 | 8/28/1990 | 13.51 | 10.55 | 2.96 | -- | -- |
| AW-14 | 7/23/1991 | 13.51 | 10.43 | 3.08 | -- | -- |
| AW-14 | 8/22/1991 | 13.51 | 10.13 | 3.38 | -- | -- |
| AW-14 | 9/26/1991 | 13.51 | 12.20 | 1.31 | -- | -- |
| AW-14 | 10/25-26/1991 | 13.51 | 11.05 | 2.46 | -- | -- |
| AW-14 | 11/26/1991 | 13.51 | 11.26 | 2.25 | -- | -- |
| AW-14 | 12/20/1991 | 13.51 | 13.08 | 0.43 | -- | -- |
| AW-14 | 1/20/1992 | 13.51 | 10.04 | 3.47 | -- | -- |
| AW-14 | 2/27-28/1992 | 13.51 | 11.92 | 1.59 | -- | -- |
| AW-14 | 3/23/1992 | 13.51 | 11.59 | 1.92 | -- | -- |
| AW-14 | 4/22/1992 | 13.51 | 10.79 | 2.72 | -- | -- |
| AW-14 | 5/27-28/1992 | 13.51 | 10.63 | 2.88 | -- | -- |
| AW-14 | 6/24/1992 | 13.51 | 9.82 | 3.69 | -- | -- |
| AW-14 | 7/27/1992 | 13.51 | 11.86 | 1.65 | -- | -- |
| AW-14 | 8/26/1992 | 13.51 | 10.57 | 2.94 | -- | -- |
| AW-14 | 9/29/1992 | 13.51 | 9.33 | 4.18 | -- | -- |
| AW-14 | 10/29/1992 | 13.51 | 10.22 | 3.29 | -- | -- |
| AW-14 | 11/25/1992 | 13.51 | 10.95 | 2.56 | -- | -- |
| AW-14 | 12/18/1992 | 13.51 | 11.97 | 1.54 | -- | -- |
| AW-14 | 1/28/1993 | 13.51 | 9.81 | 3.72 | 9.79 | 0.02 |
| AW-14 | 2/24/1993 | 13.51 | 10.67 | 2.84 | -- | -- |
| AW-14 | 3/30/1993 | 13.51 | 10.53 | 2.98 | -- | -- |
| AW-14 | 5/28/1993 | 13.51 | 11.82 | 1.69 | -- | -- |
| AW-14 | 8/9-10/1993 | 13.51 | 11.42 | 2.09 | -- | -- |
| AW-14 | 9/28/1993 | 13.51 | 12.51 | 1.00 | -- | -- |
| AW-14 | 10/29/1993 | 13.51 | 11.05 | 2.46 | -- | -- |
| AW-14 | 11/30/1993 | 13.51 | 10.51 | 3.00 | -- | -- |
| AW-14 | 12/27/1993 | 13.51 | 11.86 | 1.65 | -- | -- |
| AW-14 | 3/31/1994 | 13.51 | 10.79 | 2.72 | -- | -- |
| AW-14 | 9/9/1994 | 13.51 | 9.71 | 3.80 | -- | -- |
| AW-14 | 9/29/1994 | 13.51 | 10.69 | 2.82 | -- | -- |
| AW-14 | 11/23/1994 | 13.51 | 9.95 | 3.56 | -- | -- |
| AW-14 | 1/4/1995 | 13.51 | 11.19 | 2.32 | -- | -- |
| AW-14 | 2/8/1995 | 13.51 | 11.95 | 1.56 | -- | -- |
| AW-14 | 3/16/1995 | 13.51 | 12.45 | 1.06 | -- | -- |
| AW-14 | 5/25/1995 | 13.51 | 0.00 | 13.51 | -- | -- |
| AW-14 | 9/30/1995 | 13.51 | 10.77 | 2.74 | -- | -- |
| AW-15 | 8/28/1990 | 16.44 | 13.45 | 5.34 | 10.48 | 2.97 |
| AW-15 | 7/23/1991 | 16.44 | 11.24 | 7.82 | 7.92 | 3.32 |
| AW-15 | 8/22/1991 | 16.44 | 11.54 | 7.67 | 8.04 | 3.50 |
| AW-15 | 9/26/1991 | 16.44 | 12.31 | 6.72 | 9.03 | 3.28 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-15 | 10/25-26/1991 | 16.44 | 12.83 | 6.10 | 9.68 | 3.15 |
| AW-15 | 11/26/1991 | 16.44 | 13.09 | 5.26 | 10.67 | 2.42 |
| AW-15 | 12/20/1991 | 16.44 | 12.75 | 4.91 | 11.20 | 1.55 |
| AW-15 | 1/20/1992 | 16.44 | 10.50 | 6.47 | 9.83 | 0.67 |
| AW-15 | 2/27-28/1992 | 16.44 | 10.66 | 6.63 | 9.59 | 1.07 |
| AW-15 | 3/23/1992 | 16.44 | 11.08 | 6.19 | 10.03 | 1.05 |
| AW-15 | 4/22/1992 | 16.44 | 10.65 | 6.58 | 9.65 | 1.00 |
| AW-15 | 5/27-28/1992 | 16.44 | 11.65 | 5.86 | 10.29 | 1.36 |
| AW-15 | 6/24/1992 | 16.44 | 10.40 | 7.21 | 8.92 | 1.48 |
| AW-15 | 7/27/1992 | 16.44 | 11.04 | 6.43 | 9.73 | 1.31 |
| AW-15 | 8/26/1992 | 16.44 | 9.93 | 8.24 | 7.74 | 2.19 |
| AW-15 | 9/29/1992 | 16.44 | 10.75 | 6.99 | 9.10 | 1.65 |
| AW-15 | 10/29/1992 | 16.44 | 10.98 | 6.62 | 9.51 | 1.47 |
| AW-15 | 11/25/1992 | 16.44 | 10.58 | 7.26 | 8.81 | 1.77 |
| AW-15 | 12/18/1992 | 16.44 | 10.02 | 6.49 | 9.93 | 0.09 |
| AW-15 | 1/28/1993 | 16.44 | 10.62 | 7.23 | 8.83 | 1.79 |
| AW-15 | 2/24/1993 | 16.44 | 11.91 | 6.51 | 9.40 | 2.51 |
| AW-15 | 3/30/1993 | 16.44 | 10.69 | 7.41 | 8.59 | 2.10 |
| AW-15 | 5/28/1993 | 16.44 | 12.10 | 6.01 | 9.99 | 2.11 |
| AW-15 | 8/9-10/1993 | 16.44 | 13.36 | 4.49 | 11.57 | 1.79 |
| AW-15 | 9/28/1993 | 16.44 | 12.61 | 5.39 | 10.64 | 1.97 |
| AW-15 | 10/29/1993 | 16.44 | 13.35 | 5.25 | 10.62 | 2.73 |
| AW-15 | 11/30/1993 | 16.44 | 11.60 | 6.49 | 9.51 | 2.09 |
| AW-15 | 12/27/1993 | 16.44 | 12.68 | 5.95 | 9.91 | 2.77 |
| AW-15 | 3/31/1994 | 16.44 | 11.75 | 6.57 | 9.37 | 2.38 |
| AW-15 | 9/9/1994 | 16.44 | 8.20 | 8.40 | 8.00 | 0.20 |
| AW-15 | 9/29/1994 | 16.44 | 12.06 | 7.32 | 8.34 | 3.72 |
| AW-15 | 11/23/1994 | 16.44 | 10.05 | 7.30 | 8.90 | 1.15 |
| AW-15 | 1/4/1995 | 16.44 | 10.31 | 7.41 | 8.69 | 1.62 |
| AW-15 | 2/8/1995 | 16.44 | 11.81 | 6.52 | 9.42 | 2.39 |
| AW-15 | 3/16/1995 | 16.44 | 11.88 | 6.73 | 9.13 | 2.75 |
| AW-15 | 5/25/1995 | 16.44 | 11.71 | 6.31 | 9.71 | 2.00 |
| AW-15 | 9/30/1995 | 16.44 | 11.61 | 7.86 | 7.77 | 3.84 |
| AW-15 | 11/25-26/2008 | 15.38 | 12.10 | 5.76 | 9.00 | 3.10 |
| AW-15 | 3/6/2009 | 15.38 | 12.75 | 4.21 | 10.78 | 1.97 |
| AW-15 | 6/30/2009 | 15.38 | 11.36 | 5.64 | 9.46 | 1.90 |
| AW-15 | 9/23/2009 | 15.38 | 11.62 | 5.65 | 9.41 | 2.21 |
| AW-15 | 12/29/2009 | 15.38 | 11.21 | 6.12 | 8.93 | 2.28 |
| AW-16 | 8/28/1990 | 14.78 | 6.62 | 8.16 | -- | -- |
| AW-16 | 7/23/1991 | 14.78 | 4.85 | 9.93 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-16 | 8/22/1991 | 14.78 | 5.79 | 8.99 | -- | -- |
| AW-16 | 9/26/1991 | 14.78 | 6.82 | 7.96 | -- | -- |
| AW-16 | 10/25-26/1991 | 14.78 | 7.89 | 6.89 | -- | -- |
| AW-16 | 11/26/1991 | 14.78 | 9.70 | 5.08 | -- | -- |
| AW-16 | 12/20/1991 | 14.78 | 10.01 | 4.77 | -- | -- |
| AW-16 | 1/20/1992 | 14.78 | 7.55 | 7.23 | -- | -- |
| AW-16 | 2/27-28/1992 | 14.78 | 7.17 | 7.61 | -- | -- |
| AW-16 | 3/23/1992 | 14.78 | 8.10 | 6.68 | -- | -- |
| AW-16 | 4/22/1992 | 14.78 | 6.62 | 8.16 | -- | -- |
| AW-16 | 5/27-28/1992 | 14.78 | 8.14 | 6.64 | -- | -- |
| AW-16 | 6/24/1992 | 14.78 | 5.06 | 9.72 | -- | -- |
| AW-16 | 7/27/1992 | 14.78 | 6.44 | 8.34 | -- | -- |
| AW-16 | 8/26/1992 | 14.78 | 4.35 | 10.43 | -- | -- |
| AW-16 | 9/29/1992 | 14.78 | 6.29 | 8.49 | -- | -- |
| AW-16 | 10/29/1992 | 14.78 | 6.74 | 8.04 | -- | -- |
| AW-16 | 11/25/1992 | 14.78 | 5.84 | 8.94 | -- | -- |
| AW-16 | 12/18/1992 | 14.78 | 5.89 | 8.89 | -- | -- |
| AW-16 | 1/28/1993 | 14.78 | 6.00 | 8.78 | -- | -- |
| AW-16 | 2/24/1993 | 14.78 | 6.52 | 8.26 | 6.92 | 0.40 |
| AW-16 | 3/30/1993 | 14.78 | 5.40 | 9.38 | -- | -- |
| AW-16 | 5/28/1993 | 14.78 | 7.45 | 7.33 | -- | -- |
| AW-16 | 8/9-10/1993 | 14.78 | 9.40 | 5.38 | -- | -- |
| AW-16 | 9/28/1993 | 14.78 | 8.28 | 6.50 | -- | -- |
| AW-16 | 10/29/1993 | 14.78 | 9.10 | 5.68 | -- | -- |
| AW-16 | 11/30/1993 | 14.78 | 6.74 | 8.04 | -- | -- |
| AW-16 | 12/27/1993 | 14.78 | 7.29 | 7.49 | -- | -- |
| AW-16 | 3/31/1994 | 14.78 | 7.43 | 7.35 | -- | -- |
| AW-16 | 9/9/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 9/29/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 11/23/1994 | 14.78 | 0.00 | 14.78 | -- | -- |
| AW-16 | 1/4/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 2/8/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 3/16/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 5/25/1995 | 14.78 | -- | -- | -- | -- |
| AW-16 | 9/30/1995 | 14.78 | -- | -- | -- | -- |
| AW-17 | 8/28/1990 | 15.14 | 10.59 | 4.55 | -- | -- |
| AW-17 | 7/23/1991 | 15.14 | 9.61 | 5.53 | -- | -- |
| AW-17 | 8/22/1991 | 15.14 | 9.70 | 5.44 | -- | -- |
| AW-17 | 9/26/1991 | 15.14 | 10.40 | 4.74 | -- | -- |
| AW-17 | 10/25-26/1991 | 15.14 | 10.75 | 4.39 | -- | -- |
| AW-17 | 11/26/1991 | 15.14 | 11.60 | 3.54 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-17 | 12/20/1991 | 15.14 | 11.84 | 3.30 | -- | -- |
| AW-17 | 1/20/1992 | 15.14 | 10.42 | 4.72 | -- | -- |
| AW-17 | 2/27-28/1992 | 15.14 | 10.67 | 4.47 | -- | -- |
| AW-17 | 3/23/1992 | 15.14 | 11.80 | 3.34 | -- | -- |
| AW-17 | 4/22/1992 | 15.14 | 10.19 | 4.95 | -- | -- |
| AW-17 | 5/27-28/1992 | 15.14 | 11.15 | 3.99 | -- | -- |
| AW-17 | 6/24/1992 | 15.14 | 9.90 | 5.24 | -- | -- |
| AW-17 | 7/27/1992 | 15.14 | 10.69 | 4.45 | -- | -- |
| AW-17 | 8/26/1992 | 15.14 | 8.53 | 6.61 | -- | -- |
| AW-17 | 9/29/1992 | 15.14 | 10.02 | 5.12 | -- | -- |
| AW-17 | 10/29/1992 | 15.14 | 10.63 | 4.51 | -- | -- |
| AW-17 | 11/25/1992 | 15.14 | 9.86 | 5.28 | -- | -- |
| AW-17 | 12/18/1992 | 15.14 | 10.35 | 4.79 | -- | -- |
| AW-17 | 1/28/1993 | 15.14 | 10.02 | 5.12 | -- | -- |
| AW-17 | 2/24/1993 | 15.14 | 10.56 | 4.58 | -- | -- |
| AW-17 | 3/30/1993 | 15.14 | 9.85 | 5.29 | -- | -- |
| AW-17 | 5/28/1993 | 15.14 | 11.38 | 3.76 | -- | -- |
| AW-17 | 8/9-10/1993 | 15.14 | 11.92 | 3.22 | -- | -- |
| AW-17 | 9/28/1993 | 15.14 | 11.52 | 3.62 | -- | -- |
| AW-17 | 10/29/1993 | 15.14 | 11.35 | 3.79 | -- | -- |
| AW-17 | 11/30/1993 | 15.14 | 10.53 | 4.61 | -- | -- |
| AW-17 | 12/27/1993 | 15.14 | 11.21 | 3.93 | -- | -- |
| AW-17 | 3/31/1994 | 15.14 | 10.98 | 4.16 | -- | -- |
| AW-17 | 9/9/1994 | 15.14 | 9.52 | 5.62 | -- | -- |
| AW-17 | 9/29/1994 | 15.14 | 10.33 | 4.82 | -- | -- |
| AW-17 | 11/23/1994 | 15.14 | 10.08 | 5.06 | -- | -- |
| AW-17 | 1/4/1995 | 15.14 | 9.85 | 5.29 | -- | -- |
| AW-17 | 2/8/1995 | 15.14 | 10.79 | 4.35 | -- | -- |
| AW-17 | 3/16/1995 | 15.14 | 10.39 | 4.75 | -- | -- |
| AW-17 | 5/25/1995 | 15.14 | 11.40 | 3.74 | -- | -- |
| AW-17 | 9/30/1995 | 15.14 | 9.69 | 5.45 | -- | -- |
| AW-17 | 10/2/2003 | 15.14 | 10.50 | 4.64 | -- | -- |
| AW-17 | 11/25-26/2008 | 14.09 | 10.00 | 4.09 | -- | -- |
| AW-17 | 3/5/2009 | 14.09 | 11.71 | 2.38 | -- | -- |
| AW-17 | 6/30/2009 | Abandoned | | | | |
| AW-18 | 8/28/1990 | 14.06 | 7.58 | 7.06 | 6.94 | 0.64 |
| AW-18 | 7/23/1991 | 14.06 | 6.27 | 8.20 | 5.82 | 0.45 |
| AW-18 | 8/22/1991 | 14.06 | 6.46 | 8.02 | 6.00 | 0.46 |
| AW-18 | 9/26/1991 | 14.06 | 8.98 | 7.00 | 6.87 | 2.11 |
| AW-18 | 10/25-26/1991 | 14.06 | 10.60 | 6.50 | 7.26 | 3.34 |
| AW-18 | 11/26/1991 | 14.06 | 10.07 | 6.36 | 7.47 | 2.60 |
| AW-18 | 12/20/1991 | 14.06 | 10.16 | 6.12 | 7.72 | 2.44 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-18 | 1/20/1992 | 14.06 | 7.09 | 7.39 | 6.63 | 0.46 |
| AW-18 | 2/27-28/1992 | 14.06 | 6.83 | 7.57 | 6.46 | 0.37 |
| AW-18 | 3/23/1992 | 14.06 | 7.59 | 7.22 | 6.77 | 0.82 |
| AW-18 | 4/22/1992 | 14.06 | 6.78 | 7.83 | 6.18 | 0.60 |
| AW-18 | 5/27-28/1992 | 14.06 | 9.42 | 6.92 | 6.91 | 2.51 |
| AW-18 | 6/24/1992 | 14.06 | 6.24 | 8.05 | 5.99 | 0.25 |
| AW-18 | 7/27/1992 | 14.06 | 7.10 | 7.36 | 6.66 | 0.44 |
| AW-18 | 8/26/1992 | 14.06 | 5.80 | 8.45 | 5.59 | 0.21 |
| AW-18 | 9/29/1992 | 14.06 | 6.97 | 7.62 | 6.39 | 0.58 |
| AW-18 | 10/29/1992 | 14.06 | 7.11 | 7.50 | 6.51 | 0.60 |
| AW-18 | 11/25/1992 | 14.06 | 6.21 | 8.10 | 5.93 | 0.28 |
| AW-18 | 12/18/1992 | 14.06 | 6.26 | 8.05 | 5.99 | 0.27 |
| AW-18 | 1/28/1993 | 14.06 | 6.08 | 8.14 | 5.90 | 0.18 |
| AW-18 | 2/24/1993 | 14.06 | 6.42 | 7.84 | 6.20 | 0.22 |
| AW-18 | 3/30/1993 | 14.06 | 5.85 | 8.90 | 5.09 | 0.76 |
| AW-18 | 5/28/1993 | 14.06 | 9.12 | 7.22 | 6.61 | 2.51 |
| AW-18 | 8/9-10/1993 | 14.06 | 13.95 | 4.81 | 8.79 | 5.16 |
| AW-18 | 9/28/1993 | 14.06 | 11.29 | 6.24 | 7.48 | 3.81 |
| AW-18 | 10/29/1993 | 14.06 | 11.15 | 6.17 | 7.57 | 3.58 |
| AW-18 | 11/30/1993 | 14.06 | 7.45 | 7.57 | 6.40 | 1.05 |
| AW-18 | 12/27/1993 | 14.06 | 8.38 | 7.41 | 6.48 | 1.90 |
| AW-18 | 3/31/1994 | 14.06 | 7.33 | 7.62 | 6.35 | 0.98 |
| AW-18 | 9/9/1994 | 14.06 | 6.64 | 7.98 | 6.02 | 0.62 |
| AW-18 | 9/29/1994 | 14.06 | 9.06 | 7.71 | 6.08 | 2.98 |
| AW-18 | 11/23/1994 | 14.06 | 8.02 | 8.11 | 5.75 | 2.27 |
| AW-18 | 1/4/1995 | 14.06 | 7.87 | 8.25 | 5.61 | 2.26 |
| AW-18 | 2/8/1995 | 14.06 | 8.15 | 7.79 | 6.08 | 2.07 |
| AW-18 | 3/16/1995 | 14.06 | 8.19 | 8.03 | 5.82 | 2.37 |
| AW-18 | 5/25/1995 | 14.06 | 7.81 | 6.94 | 7.05 | 0.76 |
| AW-18 | 9/30/1995 | 14.06 | 7.43 | 7.86 | 6.08 | 1.35 |
| AW-18 | 10/2/2003 | 14.06 | 7.28 | 7.11 | 6.87 | 0.41 |
| AW-18 | 11/25-26/2008 | 12.92 | 7.35 | 6.93 | 5.65 | 1.70 |
| AW-18 | 3/5/2009 | 12.92 | 8.63 | 5.43 | 7.21 | 1.42 |
| AW-18 | 6/30/2009 | 12.92 | 7.28 | 6.38 | 6.41 | 0.87 |
| AW-18 | 9/23/2009 | 12.92 | 8.04 | 5.83 | 6.93 | 1.11 |
| AW-18 | 12/29/2009 | 12.92 | 6.75 | 6.82 | 5.99 | 0.76 |
| AW-19 | 8/28/1990 | 16.52 | 13.38 | 4.19 | 12.14 | 1.24 |
| AW-19 | 7/23/1991 | 16.52 | 11.87 | 5.00 | 11.46 | 0.41 |
| AW-19 | 8/22/1991 | 16.52 | 12.03 | 4.87 | 11.58 | 0.45 |
| AW-19 | 9/26/1991 | 16.52 | 12.62 | 4.39 | 12.04 | 0.58 |
| AW-19 | 10/25-26/1991 | 16.52 | 12.78 | 4.20 | 12.24 | 0.54 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-19 | 11/26/1991 | 16.52 | 13.70 | 3.62 | 12.76 | 0.94 |
| AW-19 | 12/20/1991 | 16.52 | 14.29 | 3.39 | 12.92 | 1.37 |
| AW-19 | 1/20/1992 | 16.52 | 13.58 | 4.06 | 12.26 | 1.32 |
| AW-19 | 2/27-28/1992 | 16.52 | 13.64 | 4.13 | 12.17 | 1.47 |
| AW-19 | 3/23/1992 | 16.52 | 13.79 | 3.92 | 12.39 | 1.40 |
| AW-19 | 4/22/1992 | 16.52 | 13.25 | 4.31 | 12.03 | 1.22 |
| AW-19 | 5/27-28/1992 | 16.52 | 13.74 | 4.00 | 12.31 | 1.43 |
| AW-19 | 6/24/1992 | 16.52 | 12.79 | 4.78 | 11.56 | 1.23 |
| AW-19 | 7/27/1992 | 16.52 | 18.10 | 2.27 | 13.57 | 4.53 |
| AW-19 | 8/26/1992 | 16.52 | 11.55 | 5.87 | 10.49 | 1.06 |
| AW-19 | 9/29/1992 | 16.52 | 12.66 | 4.88 | 11.46 | 1.20 |
| AW-19 | 10/29/1992 | 16.52 | 13.02 | 4.58 | 11.75 | 1.27 |
| AW-19 | 11/25/1992 | 16.52 | 12.62 | 4.81 | 11.55 | 1.07 |
| AW-19 | 12/18/1992 | 16.52 | 12.99 | 4.50 | 11.85 | 1.14 |
| AW-19 | 1/28/1993 | 16.52 | 12.67 | 4.73 | 11.63 | 1.04 |
| AW-19 | 2/24/1993 | 16.52 | 13.25 | 4.29 | 12.05 | 1.20 |
| AW-19 | 3/30/1993 | 16.52 | 12.54 | 4.81 | 11.56 | 0.98 |
| AW-19 | 5/28/1993 | 16.52 | 13.77 | 3.82 | 12.51 | 1.26 |
| AW-19 | 8/9-10/1993 | 16.52 | 15.13 | 3.28 | 12.91 | 2.22 |
| AW-19 | 9/28/1993 | 16.52 | 14.55 | 3.67 | 12.55 | 2.00 |
| AW-19 | 10/29/1993 | 16.52 | 14.31 | 3.80 | 12.44 | 1.87 |
| AW-19 | 11/30/1993 | 16.52 | 13.65 | 4.23 | 12.05 | 1.60 |
| AW-19 | 12/27/1993 | 16.52 | 14.13 | 3.76 | 12.52 | 1.61 |
| AW-19 | 3/31/1994 | 16.52 | 13.49 | 3.96 | 12.40 | 1.09 |
| AW-19 | 9/9/1994 | 16.52 | 12.46 | 4.89 | 11.48 | 0.98 |
| AW-19 | 9/29/1994 | 16.52 | 13.12 | 4.34 | 12.01 | 1.11 |
| AW-19 | 11/23/1994 | 16.52 | 12.39 | 4.63 | 11.80 | 0.59 |
| AW-19 | 1/4/1995 | 16.52 | 12.05 | 4.90 | 11.55 | 0.50 |
| AW-19 | 2/8/1995 | 16.52 | 13.39 | 3.82 | 12.58 | 0.81 |
| AW-19 | 3/16/1995 | 16.52 | 12.62 | 4.30 | 12.15 | 0.47 |
| AW-19 | 5/25/1995 | 16.52 | 13.38 | 3.77 | 12.64 | 0.74 |
| AW-19 | 9/30/1995 | 16.52 | 12.03 | 4.88 | 11.57 | 0.46 |
| AW-19 | 10/2/2003 | 16.52 | 12.80 | 4.32 | 12.05 | 0.75 |
| AW-19 | 11/25-26/2008 | 15.50 | 12.30 | 3.60 | 11.80 | 0.50 |
| AW-19 | 3/5/2009 | 15.50 | 14.16 | 2.18 | 13.11 | 1.05 |
| AW-19 | 6/30/2009 | 15.50 | 13.03 | 3.00 | 12.41 | 0.62 |
| AW-19 | 9/23/2009 | 15.50 | 13.12 | 2.40 | 13.10 | 0.02 |
| AW-19 | 12/29/2009 | 15.50 | 12.00 | 3.52 | 11.98 | 0.02 |
| AW-19 | 3/24/2010 | 15.50 | 12.95 | 2.99 | 12.44 | 0.51 |
| AW-20 | 8/28/1990 | 16.89 | 12.14 | 4.75 | -- | -- |
| AW-20 | 7/23/1991 | 16.89 | 9.29 | 7.60 | -- | -- |
| AW-20 | 8/22/1991 | 16.89 | 9.85 | 7.04 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-20 | 9/26/1991 | 16.89 | 11.54 | 5.35 | -- | -- |
| AW-20 | 10/25-26/1991 | 16.89 | 12.42 | 4.47 | -- | -- |
| AW-20 | 11/26/1991 | 16.89 | 13.20 | 3.69 | -- | -- |
| AW-20 | 12/20/1991 | 16.89 | 13.53 | 3.36 | -- | -- |
| AW-20 | 1/20/1992 | 16.89 | 11.16 | 5.73 | -- | -- |
| AW-20 | 2/27-28/1992 | 16.89 | 12.00 | 4.89 | -- | -- |
| AW-20 | 3/23/1992 | 16.89 | 4.21 | 12.68 | -- | -- |
| AW-20 | 4/22/1992 | 16.89 | 11.51 | 5.39 | 11.50 | 0.01 |
| AW-20 | 5/27-28/1992 | 16.89 | 12.76 | 4.13 | -- | -- |
| AW-20 | 6/24/1992 | 16.89 | 10.47 | 6.42 | -- | -- |
| AW-20 | 7/27/1992 | 16.89 | 12.05 | 4.84 | -- | -- |
| AW-20 | 8/26/1992 | 16.89 | 7.57 | 9.32 | -- | -- |
| AW-20 | 9/29/1992 | 16.89 | 10.30 | 6.59 | -- | -- |
| AW-20 | 10/29/1992 | 16.89 | 11.32 | 5.57 | -- | -- |
| AW-20 | 11/25/1992 | 16.89 | 10.02 | 6.87 | -- | -- |
| AW-20 | 12/18/1992 | 16.89 | 10.96 | 5.93 | -- | -- |
| AW-20 | 1/28/1993 | 16.89 | 9.04 | 7.85 | -- | -- |
| AW-20 | 2/24/1993 | 16.89 | 9.89 | 7.00 | -- | -- |
| AW-20 | 3/30/1993 | 16.89 | 9.01 | 7.88 | -- | -- |
| AW-20 | 5/28/1993 | 16.89 | 12.51 | 4.38 | -- | -- |
| AW-20 | 8/9-10/1993 | 16.89 | 13.67 | 3.22 | -- | -- |
| AW-20 | 9/28/1993 | 16.89 | 13.02 | 3.87 | -- | -- |
| AW-20 | 10/29/1993 | 16.89 | 12.95 | 3.94 | -- | -- |
| AW-20 | 11/30/1993 | 16.89 | 11.67 | 5.22 | -- | -- |
| AW-20 | 12/27/1993 | 16.89 | 12.62 | 4.27 | -- | -- |
| AW-20 | 3/31/1994 | 16.89 | 12.43 | 4.46 | -- | -- |
| AW-20 | 9/9/1994 | 16.89 | 11.61 | 5.28 | -- | -- |
| AW-20 | 9/29/1994 | 16.89 | 12.21 | 4.68 | -- | -- |
| AW-20 | 11/23/1994 | 16.89 | 11.50 | 5.39 | -- | -- |
| AW-20 | 1/4/1995 | 16.89 | 11.12 | 5.77 | -- | -- |
| AW-20 | 2/8/1995 | 16.89 | 12.63 | 4.26 | -- | -- |
| AW-20 | 3/16/1995 | 16.89 | 12.18 | 4.71 | -- | -- |
| AW-20 | 5/25/1995 | 16.89 | 12.85 | 4.04 | -- | -- |
| AW-20 | 9/30/1995 | 16.89 | 10.55 | 6.34 | -- | -- |
| AW-20 | 10/2/2003 | 16.89 | 11.68 | 5.21 | -- | -- |
| AW-20 | 11/25-26/2008 | 15.67 | 8.85 | 6.82 | -- | -- |
| AW-20 | 3/5/2009 | 15.67 | 13.24 | 2.43 | -- | -- |
| AW-20 | 6/30/2009 | 15.67 | 12.07 | 3.60 | -- | -- |
| AW-20 | 9/23/2009 | 15.67 | 11.78 | 3.89 | -- | -- |
| AW-20 | 12/29/2009 | 15.67 | 11.29 | 4.38 | -- | -- |
| AW-20 | 3/24/2010 | 15.67 | 10.50 | 5.17 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-21 | 8/28/1990 | 14.12 | 12.06 | 2.47 | 11.55 | 0.51 |
| AW-21 | 7/23/1991 | 14.12 | 12.01 | 2.11 | -- | -- |
| AW-21 | 8/22/1991 | 14.12 | 11.35 | 2.84 | 11.27 | 0.08 |
| AW-21 | 9/26/1991 | 14.12 | 11.67 | 2.45 | -- | -- |
| AW-21 | 10/25-26/1991 | 14.12 | 11.92 | 2.20 | -- | -- |
| AW-21 | 11/26/1991 | 14.12 | 11.22 | 2.90 | -- | -- |
| AW-21 | 12/20/1991 | 14.12 | 13.34 | 0.88 | 13.22 | 0.12 |
| AW-21 | 1/20/1992 | 14.12 | 10.89 | 3.27 | 10.84 | 0.05 |
| AW-21 | 2/27-28/1992 | 14.12 | 12.17 | 1.95 | -- | -- |
| AW-21 | 3/23/1992 | 14.12 | 12.54 | 1.61 | 12.50 | 0.04 |
| AW-21 | 4/22/1992 | 14.12 | 11.45 | 2.67 | -- | -- |
| AW-21 | 5/27-28/1992 | 14.12 | 11.09 | 3.11 | 10.99 | 0.10 |
| AW-21 | 6/24/1992 | 14.12 | 10.44 | 3.68 | -- | -- |
| AW-21 | 7/27/1992 | 14.12 | 13.40 | 0.76 | 13.35 | 0.05 |
| AW-21 | 8/26/1992 | 14.12 | 11.05 | 3.27 | 10.80 | 0.25 |
| AW-21 | 9/29/1992 | 14.12 | 10.15 | 4.18 | 9.89 | 0.26 |
| AW-21 | 10/29/1992 | 14.12 | 10.60 | 3.53 | 10.59 | 0.01 |
| AW-21 | 11/25/1992 | 14.12 | 11.27 | 2.85 | -- | -- |
| AW-21 | 12/18/1992 | 14.12 | 12.58 | 12.11 | 14.12 | 12.58 |
| AW-21 | 1/28/1993 | 14.12 | 10.59 | 3.53 | -- | -- |
| AW-21 | 2/24/1993 | 14.12 | 11.04 | 3.09 | 11.03 | 0.01 |
| AW-21 | 3/30/1993 | 14.12 | 12.01 | 2.29 | 11.80 | 0.21 |
| AW-21 | 5/28/1993 | 14.12 | 13.13 | 1.01 | 13.11 | 0.02 |
| AW-21 | 8/9-10/1993 | 14.12 | 12.64 | 2.29 | 11.68 | 0.96 |
| AW-21 | 9/28/1993 | 14.12 | 12.22 | 2.37 | 11.66 | 0.56 |
| AW-21 | 10/29/1993 | 14.12 | 11.05 | 3.14 | 10.97 | 0.08 |
| AW-21 | 11/30/1993 | 14.12 | 10.83 | 3.29 | -- | -- |
| AW-21 | 12/27/1993 | 14.12 | 12.92 | 1.20 | -- | -- |
| AW-21 | 3/31/1994 | 14.12 | 11.25 | 2.89 | 11.23 | 0.02 |
| AW-21 | 9/9/1994 | 14.12 | 10.26 | 4.12 | 9.94 | 0.32 |
| AW-21 | 9/29/1994 | 14.12 | 12.59 | 1.67 | 12.41 | 0.18 |
| AW-21 | 11/23/1994 | 14.12 | 10.54 | 3.60 | 10.51 | 0.03 |
| AW-21 | 1/4/1995 | 14.12 | 10.98 | 3.14 | -- | -- |
| AW-21 | 2/8/1995 | 14.12 | 12.59 | 1.66 | 12.43 | 0.16 |
| AW-21 | 3/16/1995 | 14.12 | 12.97 | 1.74 | 12.23 | 0.74 |
| AW-21 | 5/25/1995 | 14.12 | 11.34 | 2.95 | 11.13 | 0.21 |
| AW-21 | 9/30/1995 | 14.12 | 11.86 | 2.26 | -- | -- |
| AW-21 | 10/2/2003 | 14.12 | 13.74 | 2.61 | 10.95 | 2.79 |
| AW-22 | 8/28/1990 | 15.74 | 18.44 | 2.77 | 11.85 | 6.59 |
| AW-22 | 7/23/1991 | 15.74 | 19.87 | 3.18 | 11.06 | 8.81 |
| AW-22 | 8/22/1991 | 15.74 | 19.32 | 3.33 | 10.99 | 8.33 |
| AW-22 | 9/26/1991 | 15.74 | 18.41 | 3.11 | 11.45 | 6.96 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-22 | 10/25-26/1991 | 15.74 | 16.76 | 3.06 | 11.84 | 4.92 |
| AW-22 | 11/26/1991 | 15.74 | 16.52 | 2.45 | 12.63 | 3.89 |
| AW-22 | 12/20/1991 | 15.74 | 17.93 | 1.69 | 13.25 | 4.68 |
| AW-22 | 1/20/1992 | 15.74 | 14.49 | 2.98 | 12.40 | 2.09 |
| AW-22 | 2/27-28/1992 | 15.74 | 17.52 | 2.55 | 12.30 | 5.22 |
| AW-22 | 3/23/1992 | 15.74 | 18.11 | 2.20 | 12.60 | 5.51 |
| AW-22 | 4/22/1992 | 15.74 | 16.41 | 2.71 | 12.34 | 4.07 |
| AW-22 | 5/27-28/1992 | 15.74 | 15.79 | 3.02 | 12.09 | 3.70 |
| AW-22 | 6/24/1992 | 15.74 | 16.88 | 3.30 | 11.53 | 5.35 |
| AW-22 | 7/27/1992 | 15.74 | 17.15 | 2.76 | 12.13 | 5.02 |
| AW-22 | 8/26/1992 | 15.74 | 15.13 | 4.10 | 10.92 | 4.21 |
| AW-22 | 9/29/1992 | 15.74 | 14.26 | 3.99 | 11.24 | 3.02 |
| AW-22 | 10/29/1992 | 15.74 | 14.44 | 3.41 | 11.90 | 2.54 |
| AW-22 | 11/25/1992 | 15.74 | 13.89 | 3.60 | 11.78 | 2.11 |
| AW-22 | 12/18/1992 | 15.74 | 14.67 | 3.22 | 12.08 | 2.59 |
| AW-22 | 1/28/1993 | 15.74 | 14.08 | 3.86 | 11.43 | 2.65 |
| AW-22 | 2/24/1993 | 15.74 | 15.01 | 3.07 | 12.19 | 2.82 |
| AW-22 | 3/30/1993 | 15.74 | 14.50 | 3.39 | 11.91 | 2.59 |
| AW-22 | 5/28/1993 | 15.74 | 16.64 | 2.25 | 12.85 | 3.79 |
| AW-22 | 8/9-10/1993 | 15.74 | 16.87 | 1.93 | 13.18 | 3.69 |
| AW-22 | 9/28/1993 | 15.74 | 16.74 | 2.15 | 12.94 | 3.80 |
| AW-22 | 10/29/1993 | 15.74 | 15.24 | 2.82 | 12.44 | 2.80 |
| AW-22 | 11/30/1993 | 15.74 | 15.84 | 3.00 | 12.11 | 3.73 |
| AW-22 | 12/27/1993 | 15.74 | 17.85 | 2.14 | 12.73 | 5.12 |
| AW-22 | 3/31/1994 | 15.74 | 16.47 | 2.52 | 12.55 | 3.92 |
| AW-22 | 9/9/1994 | 15.74 | 14.78 | 3.97 | 11.15 | 3.63 |
| AW-22 | 9/29/1994 | 15.74 | 18.59 | 2.67 | 11.94 | 6.65 |
| AW-22 | 11/23/1994 | 15.74 | 17.17 | 3.36 | 11.40 | 5.77 |
| AW-22 | 1/4/1995 | 15.74 | 16.26 | 3.51 | 11.41 | 4.85 |
| AW-22 | 2/8/1995 | 15.74 | 18.76 | 1.89 | 12.84 | 5.92 |
| AW-22 | 3/16/1995 | 15.74 | 16.41 | 2.90 | 12.11 | 4.30 |
| AW-22 | 5/25/1995 | 15.74 | 25.45 | 1.12 | 12.40 | 13.05 |
| AW-22 | 9/30/1995 | 15.74 | 17.17 | 3.60 | 11.11 | 6.06 |
| AW-22 | 10/2/2003 | 15.74 | 15.55 | 3.59 | 11.30 | 4.25 |
| AW-22 | 11/25-26/2008 | 15.13 | 8.70 | 6.43 | -- | -- |
| AW-22 | 3/6/2009 | 15.13 | -- | -- | -- | -- |
| AW-22 | 6/30/2009 | 15.13 | DRY | | | |
| AW-22 | 9/23/2009 | 15.13 | -- | -- | -- | -- |
| AW-22 | 12/29/2009 | 15.13 | Not Accessible - Blocked by Equipment | | | |
| AW-22 | 3/24/2010 | 15.13 | Not Accessible - Blocked by Equipment | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-23 | 8/28/1990 | 16.26 | 10.45 | 9.31 | 6.08 | 4.37 |
| AW-23 | 7/23/1991 | 16.26 | 7.83 | 10.54 | 5.46 | 2.37 |
| AW-23 | 8/22/1991 | 16.26 | 8.26 | 10.77 | 5.15 | 3.11 |
| AW-23 | 9/26/1991 | 16.26 | 8.92 | 9.40 | 6.60 | 2.32 |
| AW-23 | 10/25-26/1991 | 16.26 | 8.91 | 8.79 | 7.29 | 1.62 |
| AW-23 | 11/26/1991 | 16.26 | 9.27 | 8.31 | 7.79 | 1.48 |
| AW-23 | 12/20/1991 | 16.26 | 10.04 | 7.79 | 8.28 | 1.76 |
| AW-23 | 1/20/1992 | 16.26 | 8.49 | 9.32 | 6.75 | 1.74 |
| AW-23 | 2/27-28/1992 | 16.26 | 8.19 | 9.99 | 6.03 | 2.16 |
| AW-23 | 3/23/1992 | 16.26 | 8.39 | 9.61 | 6.43 | 1.96 |
| AW-23 | 4/22/1992 | 16.26 | 8.00 | 10.11 | 5.92 | 2.08 |
| AW-23 | 5/27-28/1992 | 16.26 | 8.61 | 8.24 | 7.95 | 0.66 |
| AW-23 | 6/24/1992 | 16.26 | 7.99 | 10.70 | 5.26 | 2.73 |
| AW-23 | 7/27/1992 | 16.26 | 8.43 | 10.09 | 5.89 | 2.54 |
| AW-23 | 8/26/1992 | 16.26 | 7.94 | 12.32 | 3.45 | 4.49 |
| AW-23 | 9/29/1992 | 16.26 | 8.49 | 10.25 | 5.70 | 2.79 |
| AW-23 | 10/29/1992 | 16.26 | 8.59 | 9.63 | 6.39 | 2.20 |
| AW-23 | 11/25/1992 | 16.26 | 8.00 | 10.46 | 5.53 | 2.47 |
| AW-23 | 12/18/1992 | 16.26 | 7.85 | 9.92 | 6.15 | 1.70 |
| AW-23 | 1/28/1993 | 16.26 | 7.44 | 10.34 | 5.73 | 1.71 |
| AW-23 | 2/24/1993 | 16.26 | 7.90 | 9.84 | 6.24 | 1.66 |
| AW-23 | 3/30/1993 | 16.26 | 7.64 | 11.17 | 4.78 | 2.86 |
| AW-23 | 5/28/1993 | 16.26 | 8.21 | 9.24 | 6.87 | 1.34 |
| AW-23 | 8/9-10/1993 | 16.26 | 9.41 | 7.94 | 8.18 | 1.23 |
| AW-23 | 9/28/1993 | 16.26 | 8.20 | 8.88 | 7.28 | 0.92 |
| AW-23 | 10/29/1993 | 16.26 | 8.74 | 8.40 | 7.75 | 0.99 |
| AW-23 | 11/30/1993 | 16.26 | 7.95 | 9.74 | 6.34 | 1.61 |
| AW-23 | 12/27/1993 | 16.26 | 8.13 | 9.31 | 6.80 | 1.33 |
| AW-23 | 3/31/1994 | 16.26 | 7.71 | 9.72 | 6.40 | 1.31 |
| AW-23 | 9/9/1994 | 16.26 | 7.68 | 11.21 | 4.73 | 2.95 |
| AW-23 | 9/29/1994 | 16.26 | 8.01 | 10.10 | 5.93 | 2.08 |
| AW-23 | 11/23/1994 | 16.26 | 7.89 | 10.36 | 5.65 | 2.24 |
| AW-23 | 1/4/1995 | 16.26 | 7.56 | 10.33 | 5.73 | 1.83 |
| AW-23 | 2/8/1995 | 16.26 | 8.38 | 9.78 | 6.25 | 2.13 |
| AW-23 | 3/16/1995 | 16.26 | 8.12 | 9.74 | 6.32 | 1.80 |
| AW-23 | 5/25/1995 | 16.26 | 7.73 | 8.84 | 7.38 | 0.35 |
| AW-23 | 9/30/1995 | 16.26 | 8.92 | 10.63 | 5.22 | 3.70 |
| AW-23 | 10/2/2003 | 16.26 | 8.41 | 9.80 | 5.97 | 2.44 |
| AW-23 | 11/25-26/2008 | 16.04 | 9.00 | 9.36 | 6.10 | 2.90 |
| AW-23 | 3/5/2009 | 16.04 | 8.55 | 8.54 | 7.24 | 1.31 |
| AW-23 | 6/30/2009 | 16.04 | 8.88 | 9.12 | 6.58 | 2.30 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-23 | 9/23/2009 | 16.04 | 9.40 | 8.87 | 6.79 | 2.61 |
| AW-23 | 12/29/2009 | 16.04 | 8.66 | 9.08 | 6.67 | 1.99 |
| AW-24 | 8/28/1990 | 12.38 | 4.35 | 8.03 | -- | -- |
| AW-24 | 7/23/1991 | 12.38 | 3.03 | 9.35 | -- | -- |
| AW-24 | 8/22/1991 | 12.38 | 3.51 | 8.87 | -- | -- |
| AW-24 | 9/26/1991 | 12.38 | 4.78 | 7.60 | -- | -- |
| AW-24 | 10/25-26/1991 | 12.38 | 4.87 | 7.51 | -- | -- |
| AW-24 | 11/26/1991 | 12.38 | 5.25 | 7.13 | -- | -- |
| AW-24 | 12/20/1991 | 12.38 | 5.49 | 6.89 | -- | -- |
| AW-24 | 1/20/1992 | 12.38 | 3.64 | 8.74 | -- | -- |
| AW-24 | 2/27-28/1992 | 12.38 | 3.61 | 8.77 | -- | -- |
| AW-24 | 3/23/1992 | 12.38 | 3.64 | 8.74 | -- | -- |
| AW-24 | 4/22/1992 | 12.38 | 3.14 | 9.24 | -- | -- |
| AW-24 | 5/27-28/1992 | 12.38 | 4.90 | 7.48 | -- | -- |
| AW-24 | 6/24/1992 | 12.38 | 3.21 | 9.17 | -- | -- |
| AW-24 | 7/27/1992 | 12.38 | 4.55 | 7.83 | -- | -- |
| AW-24 | 8/26/1992 | 12.38 | 2.25 | 10.13 | -- | -- |
| AW-24 | 9/29/1992 | 12.38 | 3.19 | 9.19 | -- | -- |
| AW-24 | 10/29/1992 | 12.38 | 4.10 | 8.28 | -- | -- |
| AW-24 | 11/25/1992 | 12.38 | 3.00 | 9.38 | -- | -- |
| AW-24 | 12/18/1992 | 12.38 | 3.50 | 8.88 | -- | -- |
| AW-24 | 1/28/1993 | 12.38 | 3.52 | 8.86 | -- | -- |
| AW-24 | 2/24/1993 | 12.38 | 3.82 | 8.56 | -- | -- |
| AW-24 | 3/30/1993 | 12.38 | 2.88 | 9.50 | -- | -- |
| AW-24 | 5/28/1993 | 12.38 | 5.41 | 6.97 | -- | -- |
| AW-24 | 8/9-10/1993 | 12.38 | 6.88 | 5.50 | -- | -- |
| AW-24 | 9/28/1993 | 12.38 | 4.40 | 7.98 | -- | -- |
| AW-24 | 10/29/1993 | 12.38 | 4.76 | 7.62 | -- | -- |
| AW-24 | 11/30/1993 | 12.38 | 3.90 | 8.48 | -- | -- |
| AW-24 | 12/27/1993 | 12.38 | 3.89 | 8.49 | -- | -- |
| AW-24 | 3/31/1994 | 12.38 | 4.41 | 7.97 | -- | -- |
| AW-24 | 9/9/1994 | 12.38 | 3.22 | 9.16 | -- | -- |
| AW-24 | 9/29/1994 | 12.38 | 4.11 | 8.27 | -- | -- |
| AW-24 | 11/23/1994 | 12.38 | 3.60 | 8.78 | -- | -- |
| AW-24 | 1/4/1995 | 12.38 | 3.51 | 8.87 | -- | -- |
| AW-24 | 2/8/1995 | 12.38 | 4.19 | 8.19 | -- | -- |
| AW-24 | 3/16/1995 | 12.38 | 4.06 | 8.32 | -- | -- |
| AW-24 | 5/25/1995 | 12.38 | 5.20 | 7.18 | -- | -- |
| AW-24 | 9/30/1995 | 12.38 | 3.88 | 8.50 | -- | -- |
| AW-24 | 10/2/2003 | 12.38 | 4.57 | 7.81 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-24 | 11/25-26/2008 | 11.36 | -- | -- | -- | -- |
| AW-24 | 3/6/2009 | 11.36 | 4.55 | 6.81 | -- | -- |
| AW-24 | 6/30/2009 | 11.36 | 4.70 | 6.66 | -- | -- |
| AW-24 | 9/23/2009 | 11.36 | 5.00 | 6.36 | -- | -- |
| AW-24 | 12/29/2009 | 11.36 | Not Accessible - Under Water | | | |
| AW-25 | 8/28/1990 | 14.55 | 5.68 | 8.87 | -- | -- |
| AW-25 | 7/23/1991 | 14.55 | 4.57 | 9.98 | -- | -- |
| AW-25 | 8/22/1991 | 14.55 | 4.97 | 9.58 | -- | -- |
| AW-25 | 9/26/1991 | 14.55 | 6.11 | 8.44 | -- | -- |
| AW-25 | 10/25-26/1991 | 14.55 | 6.35 | 8.20 | -- | -- |
| AW-25 | 11/26/1991 | 14.55 | 6.66 | 7.89 | -- | -- |
| AW-25 | 12/20/1991 | 14.55 | 6.85 | 7.70 | -- | -- |
| AW-25 | 1/20/1992 | 14.55 | 5.17 | 9.38 | -- | -- |
| AW-25 | 2/27-28/1992 | 14.55 | 5.45 | 9.10 | -- | -- |
| AW-25 | 3/23/1992 | 14.55 | 5.70 | 8.85 | -- | -- |
| AW-25 | 4/22/1992 | 14.55 | 4.89 | 9.66 | -- | -- |
| AW-25 | 5/27-28/1992 | 14.55 | 6.29 | 8.26 | -- | -- |
| AW-25 | 6/24/1992 | 14.55 | 5.26 | 9.29 | -- | -- |
| AW-25 | 7/27/1992 | 14.55 | 5.78 | 8.77 | -- | -- |
| AW-25 | 8/26/1992 | 14.55 | 3.78 | 10.77 | -- | -- |
| AW-25 | 9/29/1992 | 14.55 | 5.44 | 9.11 | -- | -- |
| AW-25 | 10/29/1992 | 14.55 | 5.82 | 8.73 | -- | -- |
| AW-25 | 11/25/1992 | 14.55 | 4.55 | 10.00 | -- | -- |
| AW-25 | 12/18/1992 | 14.55 | 5.33 | 9.22 | -- | -- |
| AW-25 | 1/28/1993 | 14.55 | 5.21 | 9.34 | -- | -- |
| AW-25 | 2/24/1993 | 14.55 | 5.70 | 8.85 | -- | -- |
| AW-25 | 3/30/1993 | 14.55 | 4.41 | 10.14 | -- | -- |
| AW-25 | 5/28/1993 | 14.55 | 6.59 | 7.96 | -- | -- |
| AW-25 | 8/9-10/1993 | 14.55 | 7.32 | 7.23 | -- | -- |
| AW-25 | 9/28/1993 | 14.55 | 6.37 | 8.18 | -- | -- |
| AW-25 | 10/29/1993 | 14.55 | 6.55 | 8.00 | -- | -- |
| AW-25 | 11/30/1993 | 14.55 | 5.62 | 8.93 | -- | -- |
| AW-25 | 12/27/1993 | 14.55 | 5.85 | 8.70 | -- | -- |
| AW-25 | 3/31/1994 | 14.55 | 6.05 | 8.50 | -- | -- |
| AW-25 | 9/9/1994 | 14.55 | 4.77 | 9.78 | -- | -- |
| AW-25 | 9/29/1994 | 14.55 | 5.53 | 9.02 | -- | -- |
| AW-25 | 11/23/1994 | 14.55 | 14.55 | 4.21 | 9.29 | 5.26 |
| AW-25 | 1/4/1995 | 14.55 | 5.12 | 9.43 | -- | -- |
| AW-25 | 2/8/1995 | 14.55 | 5.83 | 8.72 | -- | -- |
| AW-25 | 3/16/1995 | 14.55 | 5.69 | 8.86 | -- | -- |
| AW-25 | 5/25/1995 | 14.55 | 6.50 | 8.05 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-25 | 9/30/1995 | 14.55 | 5.31 | 9.24 | -- | -- |
| AW-25 | 10/2/2003 | 14.55 | 5.78 | 8.77 | -- | -- |
| AW-25 | 11/25-26/2008 | 13.50 | 4.50 | 9.00 | -- | -- |
| AW-25 | 3/5/2009 | 13.50 | 5.47 | 8.03 | -- | -- |
| AW-25 | 6/30/2009 | 13.50 | 5.67 | 7.83 | -- | -- |
| AW-25 | 9/23/2009 | 13.50 | 5.80 | 7.70 | -- | -- |
| AW-25 | 12/29/2009 | 13.50 | 4.18 | 9.32 | -- | -- |
| AW-26 | 8/28/1990 | 13.51 | 4.86 | 8.65 | -- | -- |
| AW-26 | 7/23/1991 | 13.51 | 3.13 | 10.38 | -- | -- |
| AW-26 | 8/22/1991 | 13.51 | 3.51 | 10.00 | -- | -- |
| AW-26 | 9/26/1991 | 13.51 | 4.89 | 8.62 | -- | -- |
| AW-26 | 10/25-26/1991 | 13.51 | 5.57 | 7.94 | -- | -- |
| AW-26 | 11/26/1991 | 13.51 | 5.79 | 7.72 | -- | -- |
| AW-26 | 12/20/1991 | 13.51 | 6.02 | 7.49 | -- | -- |
| AW-26 | 1/20/1992 | 13.51 | 4.16 | 9.35 | -- | -- |
| AW-26 | 2/27-28/1992 | 13.51 | 3.88 | 9.63 | -- | -- |
| AW-26 | 3/23/1992 | 13.51 | 4.50 | 9.01 | -- | -- |
| AW-26 | 4/22/1992 | 13.51 | 3.11 | 10.40 | -- | -- |
| AW-26 | 5/27-28/1992 | 13.51 | 4.97 | 8.54 | -- | -- |
| AW-26 | 6/24/1992 | 13.51 | 3.66 | 9.85 | -- | -- |
| AW-26 | 7/27/1992 | 13.51 | 4.64 | 8.87 | -- | -- |
| AW-26 | 8/26/1992 | 13.51 | 2.43 | 11.08 | -- | -- |
| AW-26 | 9/29/1992 | 13.51 | 3.80 | 9.71 | -- | -- |
| AW-26 | 10/29/1992 | 13.51 | 4.25 | 9.26 | -- | -- |
| AW-26 | 11/25/1992 | 13.51 | 3.24 | 10.27 | -- | -- |
| AW-26 | 12/18/1992 | 13.51 | 3.98 | 9.53 | -- | -- |
| AW-26 | 1/28/1993 | 13.51 | 3.57 | 9.94 | -- | -- |
| AW-26 | 2/24/1993 | 13.51 | 4.20 | 9.31 | -- | -- |
| AW-26 | 3/30/1993 | 13.51 | 3.08 | 10.43 | -- | -- |
| AW-26 | 5/28/1993 | 13.51 | 5.54 | 7.97 | -- | -- |
| AW-26 | 8/9-10/1993 | 13.51 | 6.48 | 7.03 | -- | -- |
| AW-26 | 9/28/1993 | 13.51 | 5.48 | 8.03 | -- | -- |
| AW-26 | 10/29/1993 | 13.51 | 5.65 | 7.86 | -- | -- |
| AW-26 | 11/30/1993 | 13.51 | 4.50 | 9.01 | -- | -- |
| AW-26 | 12/27/1993 | 13.51 | 4.69 | 8.83 | 4.68 | 0.01 |
| AW-26 | 3/31/1994 | 13.51 | 4.96 | 8.55 | -- | -- |
| AW-26 | 9/9/1994 | 13.51 | 3.95 | 9.56 | -- | -- |
| AW-26 | 9/29/1994 | 13.51 | 4.77 | 8.74 | -- | -- |
| AW-26 | 11/23/1994 | 13.51 | 4.26 | 9.25 | -- | -- |
| AW-26 | 1/4/1995 | 13.51 | 4.09 | 9.42 | -- | -- |
| AW-26 | 2/8/1995 | 13.51 | 4.95 | 8.56 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-26 | 3/16/1995 | 13.51 | 4.81 | 8.70 | -- | -- |
| AW-26 | 5/25/1995 | 13.51 | 6.26 | 7.25 | -- | -- |
| AW-26 | 9/30/1995 | 13.51 | 4.34 | 9.17 | -- | -- |
| AW-26 | 10/2/2003 | 13.51 | 5.22 | 8.29 | -- | -- |
| AW-26 | 11/25-26/2008 | 12.47 | 3.10 | 9.37 | -- | -- |
| AW-26 | 3/5/2009 | 12.47 | 4.35 | 8.12 | -- | -- |
| AW-26 | 6/30/2009 | 12.47 | 4.58 | 7.89 | -- | -- |
| AW-26 | 9/23/2009 | 12.47 | 4.70 | 7.77 | -- | -- |
| AW-26 | 12/29/2009 | 12.47 | 3.17 | 9.30 | -- | -- |
| AW-27 | 8/28/1990 | 14.58 | 5.97 | 8.61 | -- | -- |
| AW-27 | 7/23/1991 | 14.58 | 4.70 | 9.88 | -- | -- |
| AW-27 | 8/22/1991 | 14.58 | 5.14 | 9.44 | -- | -- |
| AW-27 | 9/26/1991 | 14.58 | 6.30 | 8.28 | -- | -- |
| AW-27 | 10/25-26/1991 | 14.58 | 6.51 | 8.07 | -- | -- |
| AW-27 | 11/26/1991 | 14.58 | 6.78 | 7.80 | -- | -- |
| AW-27 | 12/20/1991 | 14.58 | 6.95 | 7.63 | -- | -- |
| AW-27 | 1/20/1992 | 14.58 | 4.98 | 9.60 | -- | -- |
| AW-27 | 2/27-28/1992 | 14.58 | 5.74 | 8.84 | -- | -- |
| AW-27 | 3/23/1992 | 14.58 | 6.00 | 8.58 | -- | -- |
| AW-27 | 4/22/1992 | 14.58 | 5.04 | 9.54 | -- | -- |
| AW-27 | 5/27-28/1992 | 14.58 | 6.51 | 8.07 | -- | -- |
| AW-27 | 6/24/1992 | 14.58 | 5.50 | 9.08 | -- | -- |
| AW-27 | 7/27/1992 | 14.58 | 5.96 | 8.62 | -- | -- |
| AW-27 | 8/26/1992 | 14.58 | 3.96 | 10.62 | -- | -- |
| AW-27 | 9/29/1992 | 14.58 | 5.64 | 8.94 | -- | -- |
| AW-27 | 10/29/1992 | 14.58 | 6.06 | 8.52 | -- | -- |
| AW-27 | 11/25/1992 | 14.58 | 4.54 | 10.04 | -- | -- |
| AW-27 | 12/18/1992 | 14.58 | 5.57 | 9.01 | -- | -- |
| AW-27 | 1/28/1993 | 14.58 | 5.44 | 9.14 | 5.42 | 0.02 |
| AW-27 | 2/24/1993 | 14.58 | 5.80 | 8.78 | -- | -- |
| AW-27 | 3/30/1993 | 14.58 | 4.79 | 9.79 | -- | -- |
| AW-27 | 5/28/1993 | 14.58 | 6.69 | 7.89 | -- | -- |
| AW-27 | 8/9-10/1993 | 14.58 | 7.29 | 7.29 | -- | -- |
| AW-27 | 9/28/1993 | 14.58 | 6.48 | 8.10 | -- | -- |
| AW-27 | 10/29/1993 | 14.58 | 6.65 | 7.95 | 6.63 | 0.02 |
| AW-27 | 11/30/1993 | 14.58 | 5.75 | 8.83 | -- | -- |
| AW-27 | 12/27/1993 | 14.58 | 5.95 | 8.63 | -- | -- |
| AW-27 | 3/31/1994 | 14.58 | 6.24 | 8.34 | -- | -- |
| AW-27 | 9/9/1994 | 14.58 | 4.76 | 9.82 | -- | -- |
| AW-27 | 9/29/1994 | 14.58 | 5.54 | 9.04 | -- | -- |
| AW-27 | 11/23/1994 | 14.58 | 5.43 | 9.15 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-27 | 1/4/1995 | 14.58 | 5.44 | 9.14 | -- | -- |
| AW-27 | 2/8/1995 | 14.58 | 5.96 | 8.62 | -- | -- |
| AW-27 | 3/16/1995 | 14.58 | 5.94 | 8.64 | -- | -- |
| AW-27 | 5/25/1995 | 14.58 | 6.76 | 7.82 | -- | -- |
| AW-27 | 9/30/1995 | 14.58 | 5.43 | 9.15 | -- | -- |
| AW-27 | 10/2/2003 | 14.58 | 6.13 | 8.45 | -- | -- |
| AW-27 | 11/25-26/2008 | 13.52 | 5.10 | 8.42 | -- | -- |
| AW-27 | 3/5/2009 | 13.52 | 5.65 | 7.87 | -- | -- |
| AW-27 | 6/30/2009 | 13.52 | 5.94 | 7.58 | -- | -- |
| AW-27 | 9/23/2009 | 13.52 | 6.06 | 7.46 | -- | -- |
| AW-27 | 12/29/2009 | 13.52 | 4.65 | 8.87 | -- | -- |
| AW-28 | 8/28/1990 | 14.92 | 6.55 | 8.37 | -- | -- |
| AW-28 | 7/23/1991 | 14.92 | 4.92 | 10.00 | -- | -- |
| AW-28 | 8/22/1991 | 14.92 | 5.13 | 9.79 | -- | -- |
| AW-28 | 9/26/1991 | 14.92 | -- | -- | -- | -- |
| AW-28 | 10/25-26/1991 | -- | -- | -- | -- | -- |
| AW-28 | 11/26/1991 | 14.92 | -- | -- | -- | -- |
| AW-28 | 12/20/1991 | 14.92 | 5.98 | 8.94 | -- | -- |
| AW-28 | 1/20/1992 | 14.92 | 3.95 | -- | -- | -- |
| AW-28 | 2/27-28/1992 | 14.58 | 3.74 | 10.84 | -- | -- |
| AW-28 | 3/23/1992 | 14.92 | 3.99 | 10.93 | -- | -- |
| AW-28 | 4/22/1992 | 14.92 | 3.07 | 11.85 | -- | -- |
| AW-28 | 5/27-28/1992 | 14.58 | 4.02 | 10.56 | -- | -- |
| AW-28 | 6/24/1992 | 14.92 | 3.21 | 11.71 | -- | -- |
| AW-28 | 7/27/1992 | 14.92 | 3.62 | 11.30 | -- | -- |
| AW-28 | 8/26/1992 | 14.92 | 2.16 | 12.76 | -- | -- |
| AW-28 | 9/29/1992 | 14.92 | 2.99 | 11.93 | -- | -- |
| AW-28 | 10/29/1992 | 14.92 | 3.24 | 11.68 | -- | -- |
| AW-28 | 11/25/1992 | 14.92 | 3.07 | 11.85 | -- | -- |
| AW-28 | 12/18/1992 | 14.92 | -- | -- | -- | -- |
| AW-28 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-28 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-28 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-28 | 5/28/1993 | Well Not Present | | | | |
| AW-28 | 8/9-10/1993 | -- | -- | -- | -- | -- |
| AW-28 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-28 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-28 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-28 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-28 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-28 | 9/9/1994 | -- | -- | -- | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-28 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-28 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-28 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-28 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-28 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-28 | 5/25/1995 | -- | -- | -- | -- | -- |
| AW-28 | 9/30/1995 | -- | -- | -- | -- | -- |
| AW-28 | 11/25-26/2008 | 11.18 | 4.55 | 6.63 | -- | -- |
| AW-28 | 3/6/2009 | 11.18 | 5.59 | 5.59 | -- | -- |
| AW-28 | 6/30/2009 | 11.18 | 4.40 | 6.78 | -- | -- |
| AW-28 | 9/23/2009 | 11.18 | 4.60 | 6.58 | -- | -- |
| AW-28 | 12/29/2009 | 11.18 | 4.01 | 7.17 | -- | -- |
| AW-28 | 3/24/2010 | 11.18 | 4.58 | 6.60 | -- | -- |
| AW-29 | 8/28/1990 | 13.73 | 5.29 | 8.44 | -- | -- |
| AW-29 | 7/23/1991 | 13.73 | 3.95 | 9.78 | -- | -- |
| AW-29 | 8/22/1991 | 13.73 | 4.54 | 9.19 | -- | -- |
| AW-29 | 9/26/1991 | 13.73 | 5.68 | 8.05 | -- | -- |
| AW-29 | 10/25-26/1991 | 13.73 | 5.86 | 7.87 | -- | -- |
| AW-29 | 11/26/1991 | 13.73 | 5.98 | 7.75 | -- | -- |
| AW-29 | 12/20/1991 | 13.73 | 6.19 | 7.54 | -- | -- |
| AW-29 | 1/20/1992 | 13.73 | 4.10 | 9.63 | -- | -- |
| AW-29 | 2/27-28/1992 | 13.73 | 4.86 | 8.87 | -- | -- |
| AW-29 | 3/23/1992 | 13.73 | 5.12 | 8.61 | -- | -- |
| AW-29 | 4/22/1992 | 13.73 | 4.02 | 9.71 | -- | -- |
| AW-29 | 5/27-28/1992 | 13.73 | 5.85 | 7.88 | -- | -- |
| AW-29 | 6/24/1992 | 13.73 | 4.83 | 8.90 | -- | -- |
| AW-29 | 7/27/1992 | 13.73 | 5.39 | 8.34 | -- | -- |
| AW-29 | 8/26/1992 | 13.73 | 2.81 | 10.92 | -- | -- |
| AW-29 | 9/29/1992 | 13.73 | 4.90 | 8.83 | -- | -- |
| AW-29 | 10/29/1992 | 13.73 | 5.20 | 8.53 | -- | -- |
| AW-29 | 11/25/1992 | 13.73 | 3.74 | 9.99 | -- | -- |
| AW-29 | 12/18/1992 | 13.73 | 4.77 | 8.96 | -- | -- |
| AW-29 | 1/28/1993 | 13.73 | 4.65 | 9.08 | -- | -- |
| AW-29 | 2/24/1993 | 13.73 | 5.04 | 8.69 | -- | -- |
| AW-29 | 3/30/1993 | 13.73 | 4.05 | 9.68 | -- | -- |
| AW-29 | 5/28/1993 | 13.73 | 6.02 | 7.71 | -- | -- |
| AW-29 | 8/9-10/1993 | 13.73 | 6.76 | 6.97 | -- | -- |
| AW-29 | 9/28/1993 | 13.73 | 5.90 | 7.83 | -- | -- |
| AW-29 | 10/29/1993 | 13.73 | 6.04 | 7.69 | -- | -- |
| AW-29 | 11/30/1993 | 13.73 | 4.95 | 8.78 | -- | -- |
| AW-29 | 12/27/1993 | 13.73 | 5.05 | 8.68 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-29 | 3/31/1994 | 13.73 | 5.43 | 8.30 | -- | -- |
| AW-29 | 9/9/1994 | 13.73 | 3.98 | 9.75 | -- | -- |
| AW-29 | 9/29/1994 | 13.73 | 4.89 | 8.84 | -- | -- |
| AW-29 | 11/23/1994 | 13.73 | 4.75 | 8.98 | -- | -- |
| AW-29 | 1/4/1995 | 13.73 | 4.62 | 9.11 | -- | -- |
| AW-29 | 2/8/1995 | 13.73 | 5.17 | 8.56 | -- | -- |
| AW-29 | 3/16/1995 | 13.73 | 5.18 | 8.55 | -- | -- |
| AW-29 | 5/25/1995 | 13.73 | 6.23 | 7.50 | -- | -- |
| AW-29 | 9/30/1995 | 13.73 | 4.69 | 9.04 | -- | -- |
| AW-29 | 10/2/2003 | 13.73 | 5.56 | 8.17 | -- | -- |
| AW-29 | 11/25-26/2008 | 12.68 | 4.45 | 8.23 | -- | -- |
| AW-29 | 3/5/2009 | 12.68 | 4.60 | 8.08 | -- | -- |
| AW-29 | 6/30/2009 | 12.68 | 5.37 | 7.31 | -- | -- |
| AW-29 | 9/23/2009 | 12.68 | 5.41 | 7.27 | -- | -- |
| AW-29 | 12/29/2009 | 12.68 | 4.08 | 8.60 | -- | -- |
| AW-30 | 8/28/1990 | 14.42 | 6.25 | 8.17 | -- | -- |
| AW-30 | 7/23/1991 | 14.42 | 3.45 | 10.99 | 3.42 | 0.03 |
| AW-30 | 8/22/1991 | 14.42 | 3.87 | 10.58 | 3.83 | 0.04 |
| AW-30 | 9/26/1991 | 14.42 | 5.58 | -- | 5.55 | 0.03 |
| AW-30 | 10/25-26/1991 | 14.42 | 6.15 | 8.29 | 6.13 | 0.02 |
| AW-30 | 11/26/1991 | 14.42 | 6.48 | 7.94 | -- | -- |
| AW-30 | 12/20/1991 | 14.42 | 6.66 | 7.76 | -- | -- |
| AW-30 | 1/20/1992 | 14.42 | 5.25 | 9.17 | -- | -- |
| AW-30 | 2/27-28/1992 | 14.42 | 4.54 | 9.88 | -- | -- |
| AW-30 | 3/23/1992 | 14.42 | 4.80 | 9.62 | -- | -- |
| AW-30 | 4/22/1992 | 14.42 | 3.50 | 10.92 | -- | -- |
| AW-30 | 5/27-28/1992 | 14.42 | 5.56 | 8.86 | -- | -- |
| AW-30 | 6/24/1992 | 14.42 | 4.10 | 10.32 | -- | -- |
| AW-30 | 7/27/1992 | 14.42 | 4.73 | 9.69 | -- | -- |
| AW-30 | 8/26/1992 | 14.42 | 2.48 | 11.94 | -- | -- |
| AW-30 | 9/29/1992 | 14.42 | 4.21 | 10.21 | -- | -- |
| AW-30 | 10/29/1992 | 14.42 | 4.98 | 9.44 | -- | -- |
| AW-30 | 11/25/1992 | 14.42 | 3.87 | 10.55 | -- | -- |
| AW-30 | 12/18/1992 | 14.42 | 4.59 | 9.83 | -- | -- |
| AW-30 | 1/28/1993 | 14.42 | 4.11 | 10.31 | -- | -- |
| AW-30 | 2/24/1993 | 14.42 | 4.74 | 9.68 | -- | -- |
| AW-30 | 3/30/1993 | 14.42 | 3.40 | 11.02 | -- | -- |
| AW-30 | 5/28/1993 | 14.42 | 6.00 | 8.42 | -- | -- |
| AW-30 | 8/9-10/1993 | 14.42 | 7.09 | 7.33 | -- | -- |
| AW-30 | 9/28/1993 | 14.42 | 6.26 | 8.16 | -- | -- |
| AW-30 | 10/29/1993 | 14.42 | 6.51 | 7.91 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-30 | 11/30/1993 | 14.42 | 5.48 | 8.94 | -- | -- |
| AW-30 | 12/27/1993 | 14.42 | 5.75 | 8.67 | -- | -- |
| AW-30 | 3/31/1994 | 14.42 | 5.69 | 8.73 | -- | -- |
| AW-30 | 9/9/1994 | 14.42 | 4.90 | 9.52 | -- | -- |
| AW-30 | 9/29/1994 | 14.42 | 9.03 | 5.86 | 8.44 | 0.59 |
| AW-30 | 11/23/1994 | 14.42 | 4.85 | 9.57 | -- | -- |
| AW-30 | 1/4/1995 | 14.42 | 4.89 | 9.53 | -- | -- |
| AW-30 | 2/8/1995 | 14.42 | 5.53 | 8.89 | -- | -- |
| AW-30 | 3/16/1995 | 14.42 | 5.46 | 8.96 | -- | -- |
| AW-30 | 5/25/1995 | 14.42 | 6.51 | 7.91 | -- | -- |
| AW-30 | 9/30/1995 | 14.42 | 4.79 | 9.63 | -- | -- |
| AW-30 | 10/2/2003 | 14.42 | 5.95 | 8.47 | -- | -- |
| AW-30 | 11/25-26/2008 | 13.40 | 3.60 | 9.80 | -- | -- |
| AW-30 | 3/5/2009 | 13.40 | 5.33 | 8.07 | -- | -- |
| AW-30 | 6/30/2009 | 13.40 | 5.43 | 7.97 | -- | -- |
| AW-30 | 9/23/2009 | 13.40 | 5.37 | 8.03 | -- | -- |
| AW-30 | 12/29/2009 | 13.40 | 3.22 | 10.18 | -- | -- |
| AW-31 | 8/28/1990 | 14.55 | 6.14 | 8.41 | -- | -- |
| AW-31 | 7/23/1991 | 14.55 | 4.63 | 9.92 | -- | -- |
| AW-31 | 8/22/1991 | 14.55 | 5.17 | 9.38 | -- | -- |
| AW-31 | 9/26/1991 | 14.55 | 6.55 | 8.00 | -- | -- |
| AW-31 | 10/25-26/1991 | 14.55 | 6.84 | 7.71 | -- | -- |
| AW-31 | 11/26/1991 | 14.55 | 7.17 | 7.38 | -- | -- |
| AW-31 | 12/20/1991 | 14.55 | 7.32 | 7.23 | -- | -- |
| AW-31 | 1/20/1992 | 14.55 | 5.09 | 9.46 | -- | -- |
| AW-31 | 3/23/1992 | 14.55 | 6.29 | 8.26 | -- | -- |
| AW-31 | 4/22/1992 | 14.55 | 4.89 | 9.66 | -- | -- |
| AW-31 | 5/27-28/1992 | 14.55 | 6.77 | 7.78 | -- | -- |
| AW-31 | 6/24/1992 | 14.55 | 5.55 | 9.00 | -- | -- |
| AW-31 | 7/27/1992 | 14.55 | 6.13 | 8.42 | -- | -- |
| AW-31 | 8/26/1992 | 14.55 | 3.58 | 10.97 | -- | -- |
| AW-31 | 9/29/1992 | 14.55 | 7.80 | 6.75 | -- | -- |
| AW-31 | 10/29/1992 | 14.55 | 6.18 | 8.37 | -- | -- |
| AW-31 | 11/25/1992 | 14.55 | 4.20 | 10.35 | -- | -- |
| AW-31 | 12/18/1992 | 14.55 | 5.72 | 8.83 | -- | -- |
| AW-31 | 1/28/1993 | 14.55 | 5.38 | 9.17 | -- | -- |
| AW-31 | 2/24/1993 | 14.55 | 5.91 | 8.64 | -- | -- |
| AW-31 | 3/30/1993 | 14.55 | 4.74 | 9.81 | -- | -- |
| AW-31 | 5/28/1993 | 14.55 | 6.81 | 7.74 | -- | -- |
| AW-31 | 8/9-10/1993 | 14.55 | 7.65 | 6.90 | -- | -- |
| AW-31 | 9/28/1993 | 14.55 | 7.02 | 7.53 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-31 | 10/29/1993 | 14.55 | 7.12 | 7.43 | -- | -- |
| AW-31 | 11/30/1993 | 14.55 | 5.87 | 8.68 | -- | -- |
| AW-31 | 12/27/1993 | 14.55 | 6.20 | 8.35 | -- | -- |
| AW-31 | 3/31/1994 | 14.55 | 6.37 | 8.18 | -- | -- |
| AW-31 | 9/9/1994 | 14.55 | 4.94 | 9.61 | -- | -- |
| AW-31 | 9/29/1994 | 14.55 | 5.66 | 8.89 | -- | -- |
| AW-31 | 11/23/1994 | 14.55 | 5.34 | 9.21 | -- | -- |
| AW-31 | 1/4/1995 | 14.55 | 5.34 | 9.21 | -- | -- |
| AW-31 | 2/8/1995 | 14.55 | 6.16 | 8.39 | -- | -- |
| AW-31 | 3/16/1995 | 14.55 | 6.01 | 8.54 | -- | -- |
| AW-31 | 5/25/1995 | 14.55 | 7.22 | 7.33 | -- | -- |
| AW-31 | 9/30/1995 | 14.55 | 5.28 | 9.27 | -- | -- |
| AW-31 | 10/2/2003 | 14.55 | 6.60 | 7.95 | -- | -- |
| AW-31 | 11/25-26/2008 | 10.30 | 2.30 | 8.00 | -- | -- |
| AW-31 | 3/5/2009 | 10.30 | 2.40 | 7.90 | -- | -- |
| AW-31 | 6/30/2009 | 10.30 | 2.33 | 7.97 | -- | -- |
| AW-31 | 9/23/2009 | 10.30 | 2.80 | 7.50 | -- | -- |
| AW-31 | 12/29/2009 | 10.30 | 1.78 | 8.52 | -- | -- |
| AW-32 | 8/28/1990 | 15.47 | 10.55 | 6.46 | 8.62 | 1.93 |
| AW-32 | 7/23/1991 | 15.47 | 9.00 | 7.90 | 7.21 | 1.79 |
| AW-32 | 8/22/1991 | 15.47 | 9.25 | 7.76 | 7.32 | 1.93 |
| AW-32 | 9/26/1991 | 15.47 | 10.33 | 5.97 | 9.29 | 1.04 |
| AW-32 | 10/25-26/1991 | 15.47 | 11.80 | 5.15 | 9.95 | 1.85 |
| AW-32 | 11/26/1991 | 15.47 | 13.16 | 4.19 | 10.81 | 2.35 |
| AW-32 | 12/20/1991 | 15.47 | 13.13 | 3.80 | 11.30 | 1.83 |
| AW-32 | 1/20/1992 | 15.47 | 9.83 | 6.36 | 8.93 | 0.90 |
| AW-32 | 3/23/1992 | 15.47 | 10.25 | 5.80 | 9.53 | 0.72 |
| AW-32 | 4/22/1992 | 15.47 | 8.56 | 7.65 | 7.63 | 0.93 |
| AW-32 | 5/27-28/1992 | 15.47 | 10.81 | 5.21 | 10.12 | 0.69 |
| AW-32 | 6/24/1992 | 15.47 | 9.19 | 7.29 | 7.93 | 1.26 |
| AW-32 | 7/27/1992 | 15.47 | 9.37 | 6.57 | 8.78 | 0.59 |
| AW-32 | 8/26/1992 | 15.47 | 7.35 | 8.61 | 6.74 | 0.61 |
| AW-32 | 9/29/1992 | 15.47 | 8.90 | 7.38 | 7.89 | 1.01 |
| AW-32 | 10/29/1992 | 15.47 | 9.01 | 6.84 | 8.54 | 0.47 |
| AW-32 | 11/25/1992 | 15.47 | 8.46 | 7.99 | 7.24 | 1.22 |
| AW-32 | 12/18/1992 | 15.47 | 8.69 | 7.20 | 8.16 | 0.53 |
| AW-32 | 1/28/1993 | 15.47 | 8.55 | 7.79 | 7.46 | 1.09 |
| AW-32 | 2/24/1993 | 15.47 | 8.94 | 7.12 | 8.20 | 0.74 |
| AW-32 | 3/30/1993 | 15.47 | 7.82 | 7.99 | 7.40 | 0.42 |
| AW-32 | 5/28/1993 | 15.47 | 11.92 | 4.97 | 10.14 | 1.78 |
| AW-32 | 8/9-10/1993 | 15.47 | 12.87 | 4.22 | 10.85 | 2.02 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-32 | 9/28/1993 | 15.47 | 10.76 | 5.45 | 9.83 | 0.93 |
| AW-32 | 10/29/1993 | 15.47 | 11.85 | 4.82 | 10.35 | 1.50 |
| AW-32 | 11/30/1993 | 15.47 | 9.46 | 6.65 | 8.66 | 0.80 |
| AW-32 | 12/27/1993 | 15.47 | 11.57 | 4.99 | 10.21 | 1.36 |
| AW-32 | 3/31/1994 | 15.47 | 10.40 | 5.51 | 9.85 | 0.55 |
| AW-32 | 9/9/1994 | 15.47 | 8.04 | 7.73 | 7.67 | 0.37 |
| AW-32 | 9/29/1994 | 15.47 | 8.18 | 7.60 | 7.79 | 0.39 |
| AW-32 | 11/23/1994 | 15.47 | 18.20 | 5.76 | 7.59 | 10.61 |
| AW-32 | 1/4/1995 | 15.47 | 7.98 | 7.72 | 7.69 | 0.29 |
| AW-32 | 2/8/1995 | 15.47 | 8.65 | 6.90 | 8.55 | 0.10 |
| AW-32 | 3/16/1995 | 15.47 | 8.96 | 6.89 | 8.48 | 0.48 |
| AW-32 | 5/25/1995 | 15.47 | 10.40 | 5.20 | 10.24 | 0.16 |
| AW-32 | 9/30/1995 | 15.47 | 8.82 | 7.44 | 7.83 | 0.99 |
| AW-32 | 10/2/2003 | 15.47 | 9.83 | 5.72 | 9.73 | 0.10 |
| AW-32 | 11/25-26/2008 | 14.39 | 9.50 | 4.89 | -- | -- |
| AW-32 | 3/6/2009 | 14.39 | 10.79 | 3.60 | -- | -- |
| AW-32 | 6/30/2009 | 14.39 | 9.23 | 5.16 | -- | -- |
| AW-32 | 9/23/2009 | 14.39 | 9.67 | 4.72 | -- | -- |
| AW-32 | 12/29/2009 | 14.39 | 9.05 | 5.34 | -- | -- |
| AW-32 | 12/13/2010 | 14.39 | 11.60 | 2.80 | 11.59 | 0.01 |
| AW-33 | 8/28/1990 | 14.18 | 5.97 | 8.21 | -- | -- |
| AW-33 | 7/23/1991 | 14.18 | 4.68 | 9.50 | -- | -- |
| AW-33 | 8/22/1991 | 14.18 | 5.16 | 9.02 | -- | -- |
| AW-33 | 9/26/1991 | 14.18 | 6.02 | 8.16 | -- | -- |
| AW-33 | 10/25-26/1991 | 14.18 | 6.38 | 7.80 | -- | -- |
| AW-33 | 11/26/1991 | 14.18 | 6.65 | 7.53 | -- | -- |
| AW-33 | 12/20/1991 | 14.18 | 6.59 | 7.59 | -- | -- |
| AW-33 | 1/20/1992 | 14.18 | 5.16 | 9.02 | -- | -- |
| AW-33 | 3/23/1992 | 14.18 | 5.83 | 8.35 | -- | -- |
| AW-33 | 4/22/1992 | 14.18 | 5.05 | 9.13 | -- | -- |
| AW-33 | 5/27-28/1992 | 14.18 | 6.27 | 7.91 | -- | -- |
| AW-33 | 6/24/1992 | 14.18 | 5.35 | 8.83 | -- | -- |
| AW-33 | 7/27/1992 | 14.18 | 5.70 | 8.48 | -- | -- |
| AW-33 | 8/26/1992 | 14.18 | 4.25 | 9.93 | -- | -- |
| AW-33 | 9/29/1992 | 14.18 | 5.45 | 8.73 | -- | -- |
| AW-33 | 11/25/1992 | 14.18 | 14.94 | -0.76 | -- | -- |
| AW-33 | 12/18/1992 | 14.18 | 5.53 | 8.65 | -- | -- |
| AW-33 | 1/28/1993 | 14.18 | 5.34 | 8.84 | -- | -- |
| AW-33 | 2/24/1993 | 14.18 | 5.63 | 8.55 | -- | -- |
| AW-33 | 3/30/1993 | 14.18 | 4.91 | 9.27 | -- | -- |
| AW-33 | 5/28/1993 | 14.18 | 6.33 | 7.85 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-33 | 8/9-10/1993 | 14.18 | 7.03 | 7.15 | -- | -- |
| AW-33 | 9/28/1993 | 14.18 | 6.27 | 7.91 | -- | -- |
| AW-33 | 10/29/1993 | 14.18 | 6.46 | 7.72 | -- | -- |
| AW-33 | 11/30/1993 | 14.18 | 5.75 | 8.43 | -- | -- |
| AW-33 | 12/27/1993 | 14.18 | 5.83 | 8.35 | -- | -- |
| AW-33 | 3/31/1994 | 14.18 | 5.79 | 8.39 | -- | -- |
| AW-33 | 9/9/1994 | 14.18 | 4.93 | 9.25 | -- | -- |
| AW-33 | 9/29/1994 | 14.18 | 5.34 | 8.84 | 5.33 | 0.01 |
| AW-33 | 11/23/1994 | 14.18 | 5.20 | 8.98 | -- | -- |
| AW-33 | 1/4/1995 | 14.18 | 5.21 | 8.97 | -- | -- |
| AW-33 | 2/8/1995 | 14.18 | 5.64 | 8.54 | -- | -- |
| AW-33 | 3/16/1995 | 14.18 | 5.64 | 8.54 | -- | -- |
| AW-33 | 5/25/1995 | 14.18 | 6.45 | 7.73 | -- | -- |
| AW-33 | 9/30/1995 | 14.18 | 5.11 | 9.07 | -- | -- |
| AW-33 | 10/2/2003 | 14.18 | 5.91 | 8.27 | -- | -- |
| AW-33 | 11/25-26/2008 | 13.08 | 5.32 | 7.76 | -- | -- |
| AW-33 | 3/5/2009 | 13.08 | 5.40 | 7.68 | -- | -- |
| AW-33 | 6/30/2009 | 13.08 | 5.31 | 7.77 | -- | -- |
| AW-33 | 9/23/2009 | 13.08 | 5.60 | 7.48 | -- | -- |
| AW-33 | 12/29/2009 | 13.08 | 4.58 | 8.50 | -- | -- |
| AW-34 | 8/28/1990 | 14.30 | 7.32 | 6.98 | 6.58 | 0.74 |
| AW-34 | 7/23/1991 | 14.30 | 5.99 | 8.82 | 5.39 | 0.60 |
| AW-34 | 8/22/1991 | 14.30 | 6.16 | 8.78 | 5.41 | 0.75 |
| AW-34 | 9/26/1991 | 14.30 | 7.12 | 7.99 | 6.17 | 0.95 |
| AW-34 | 10/25-26/1991 | 14.30 | 8.49 | 6.69 | 7.46 | 1.03 |
| AW-34 | 11/26/1991 | 14.30 | 10.03 | 5.28 | 8.84 | 1.19 |
| AW-34 | 12/20/1991 | 14.30 | 10.37 | 5.02 | 9.09 | 1.28 |
| AW-34 | 1/20/1992 | 14.30 | 6.98 | 7.86 | 6.35 | 0.63 |
| AW-34 | 3/23/1992 | 14.30 | 7.46 | 7.52 | 6.66 | 0.80 |
| AW-34 | 4/22/1992 | 14.30 | 6.80 | 7.76 | 6.50 | 0.30 |
| AW-34 | 5/27-28/1992 | 14.30 | 7.49 | 7.52 | 6.66 | 0.83 |
| AW-34 | 6/24/1992 | 14.30 | 6.24 | 8.48 | 5.75 | 0.49 |
| AW-34 | 7/27/1992 | 14.30 | 6.63 | 8.17 | 6.04 | 0.59 |
| AW-34 | 8/26/1992 | 14.30 | 5.95 | 9.19 | 4.96 | 0.99 |
| AW-34 | 9/29/1992 | 14.30 | 6.24 | 8.45 | 5.78 | 0.46 |
| AW-34 | 11/25/1992 | 14.30 | 6.48 | 8.05 | 6.21 | 0.27 |
| AW-34 | 12/18/1992 | 14.30 | 6.71 | 8.02 | 6.20 | 0.51 |
| AW-34 | 1/28/1993 | 14.30 | 6.36 | 8.20 | 6.06 | 0.30 |
| AW-34 | 2/24/1993 | 14.30 | 6.10 | 8.47 | 5.78 | 0.32 |
| AW-34 | 3/30/1993 | 14.30 | 6.12 | 8.43 | 5.83 | 0.29 |
| AW-34 | 5/28/1993 | 14.30 | 8.84 | 6.13 | 8.05 | 0.79 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-34 | 8/9-10/1993 | 14.30 | 10.85 | 4.39 | 9.74 | 1.11 |
| AW-34 | 9/28/1993 | 14.30 | 7.47 | 7.43 | 6.76 | 0.71 |
| AW-34 | 10/29/1993 | 14.30 | 7.93 | 6.80 | 7.42 | 0.51 |
| AW-34 | 11/30/1993 | 14.30 | 6.23 | 8.38 | 5.87 | 0.36 |
| AW-34 | 12/27/1993 | 14.30 | 7.10 | 7.73 | 6.48 | 0.62 |
| AW-34 | 3/31/1994 | 14.30 | 7.19 | 7.60 | 6.61 | 0.58 |
| AW-34 | 9/9/1994 | 14.30 | 6.28 | 8.47 | 5.75 | 0.53 |
| AW-34 | 9/29/1994 | 14.30 | 6.22 | 8.39 | 5.85 | 0.37 |
| AW-34 | 11/23/1994 | 14.30 | 6.17 | 8.42 | 5.83 | 0.34 |
| AW-34 | 1/4/1995 | 14.30 | 6.18 | 8.38 | 5.87 | 0.31 |
| AW-34 | 2/8/1995 | 14.30 | 6.66 | 7.92 | 6.33 | 0.33 |
| AW-34 | 3/16/1995 | 14.30 | 6.68 | 7.97 | 6.27 | 0.41 |
| AW-34 | 5/25/1995 | 14.30 | 8.75 | 6.01 | 8.21 | 0.54 |
| AW-34 | 9/30/1995 | 14.30 | 5.89 | 8.76 | 5.48 | 0.41 |
| AW-34 | 9/30/1995 | 14.30 | 5.89 | 8.76 | 5.48 | 0.41 |
| AW-34 | 10/2/2003 | 14.30 | 7.53 | 6.77 | -- | -- |
| AW-34 | 11/25-26/2008 | 13.27 | 7.82 | 5.45 | -- | -- |
| AW-34 | 3/6/2009 | 13.27 | 9.13 | 4.14 | -- | -- |
| AW-34 | 6/30/2009 | 13.27 | 8.15 | 5.12 | -- | -- |
| AW-34 | 9/23/2009 | 13.27 | 8.28 | 4.99 | -- | -- |
| AW-34 | 12/29/2009 | 13.27 | 7.65 | 5.62 | -- | -- |
| AW-35 | 8/28/1990 | 15.03 | 7.38 | 7.65 | -- | -- |
| AW-35 | 7/23/1991 | 15.03 | 5.45 | 9.58 | -- | -- |
| AW-35 | 8/22/1991 | 15.03 | 5.69 | 9.34 | -- | -- |
| AW-35 | 9/26/1991 | 15.03 | 6.65 | 8.38 | -- | -- |
| AW-35 | 10/25-26/1991 | 15.03 | 7.31 | 7.72 | -- | -- |
| AW-35 | 11/26/1991 | 15.03 | 7.85 | 7.18 | -- | -- |
| AW-35 | 12/20/1991 | 15.03 | 8.32 | 6.71 | -- | -- |
| AW-35 | 1/20/1992 | 15.03 | 7.36 | 7.67 | -- | -- |
| AW-35 | 3/23/1992 | 15.03 | 7.77 | 7.26 | -- | -- |
| AW-35 | 4/22/1992 | 15.03 | 7.50 | 7.53 | -- | -- |
| AW-35 | 5/27-28/1992 | 15.03 | 8.33 | 6.70 | -- | -- |
| AW-35 | 6/24/1992 | 15.03 | 6.82 | 8.21 | -- | -- |
| AW-35 | 7/27/1992 | 15.03 | 7.25 | 7.78 | -- | -- |
| AW-35 | 8/26/1992 | 15.03 | 5.46 | 9.57 | -- | -- |
| AW-35 | 9/29/1992 | 15.03 | 6.78 | 8.25 | -- | -- |
| AW-35 | 11/25/1992 | 15.03 | 7.38 | 7.65 | -- | -- |
| AW-35 | 12/18/1992 | 15.03 | 6.05 | 8.98 | -- | -- |
| AW-35 | 1/28/1993 | 15.03 | -- | -- | -- | -- |
| AW-35 | 2/24/1993 | 15.03 | -- | -- | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-35 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-35 | 5/28/1993 | -- | -- | -- | -- | -- |
| AW-35 | 8/9-10/1993 | -- | -- | -- | -- | -- |
| AW-35 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-35 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-35 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-35 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-35 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-35 | 9/9/1994 | -- | -- | -- | -- | -- |
| AW-35 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-35 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-35 | 1/4/1995 | Well Not Present | | | | |
| AW-35 | 2/8/1995 | Well Not Present | | | | |
| AW-35 | 3/16/1995 | Well Not Present | | | | |
| AW-35 | 5/25/1995 | Well Not Present | | | | |
| AW-35 | 9/30/1995 | 15.03 | -- | -- | -- | -- |
| AW-36 | 8/28/1990 | 14.65 | 9.91 | 4.74 | 9.91 | <0.01 |
| AW-36 | 7/23/1991 | 14.65 | 7.71 | 8.33 | 6.09 | 1.62 |
| AW-36 | 8/22/1991 | 14.65 | 7.91 | 7.69 | 6.80 | 1.11 |
| AW-36 | 9/26/1991 | 14.65 | 8.88 | 6.73 | 7.76 | 1.12 |
| AW-36 | 10/25-26/1991 | 14.65 | 9.24 | 6.34 | 8.16 | 1.08 |
| AW-36 | 11/26/1991 | 14.65 | 9.58 | 6.00 | 8.50 | 1.08 |
| AW-36 | 12/20/1991 | 14.65 | 9.45 | 6.15 | 8.34 | 1.11 |
| AW-36 | 1/20/1992 | 14.65 | 7.79 | 7.71 | 6.80 | 0.99 |
| AW-36 | 3/23/1992 | 14.65 | 7.55 | 7.82 | 6.71 | 0.84 |
| AW-36 | 4/22/1992 | 14.65 | 6.11 | 9.14 | 5.41 | 0.70 |
| AW-36 | 5/27-28/1992 | 14.65 | 7.94 | 7.37 | 7.17 | 0.77 |
| AW-36 | 6/24/1992 | 14.65 | 6.62 | 8.62 | 5.93 | 0.69 |
| AW-36 | 7/27/1992 | 14.65 | 7.29 | 7.99 | 6.56 | 0.73 |
| AW-36 | 8/26/1992 | 14.65 | 4.03 | 10.01 | 4.74 | 0.71 |
| AW-36 | 9/29/1992 | 14.65 | 6.93 | 8.35 | 6.20 | 0.73 |
| AW-36 | 11/25/1992 | 14.65 | 5.46 | 9.68 | 4.89 | 0.57 |
| AW-36 | 12/18/1992 | 14.65 | 6.51 | 8.56 | 6.02 | 0.49 |
| AW-36 | 1/28/1993 | 14.65 | 5.94 | 9.11 | 5.48 | 0.46 |
| AW-36 | 2/24/1993 | 14.65 | 6.00 | 9.68 | 4.80 | 1.20 |
| AW-36 | 3/30/1993 | 14.65 | 5.22 | 9.84 | 4.74 | 0.48 |
| AW-36 | 5/28/1993 | 14.65 | 7.53 | 7.53 | 7.05 | 0.48 |
| AW-36 | 8/9-10/1993 | 14.65 | 9.17 | 6.15 | 8.39 | 0.78 |
| AW-36 | 9/28/1993 | 14.65 | 8.00 | 7.10 | 7.48 | 0.52 |
| AW-36 | 10/29/1993 | 14.65 | 7.33 | 7.74 | 6.84 | 0.49 |
| AW-36 | 11/30/1993 | 14.65 | 6.19 | 8.68 | 5.94 | 0.25 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-36 | 12/27/1993 | 14.65 | 6.62 | 8.31 | 6.29 | 0.33 |
| AW-36 | 3/31/1994 | 14.65 | 6.39 | 8.46 | 6.16 | 0.23 |
| AW-36 | 9/9/1994 | 14.65 | 5.27 | 9.53 | 5.10 | 0.17 |
| AW-36 | 9/29/1994 | 14.65 | 6.36 | 8.79 | 5.77 | 0.59 |
| AW-36 | 11/23/1994 | 14.65 | 5.47 | 9.28 | 5.35 | 0.12 |
| AW-36 | 1/4/1995 | 14.65 | 5.18 | 9.69 | 4.93 | 0.25 |
| AW-36 | 2/8/1995 | 14.65 | 6.28 | 8.58 | 6.04 | 0.24 |
| AW-36 | 3/16/1995 | 14.65 | 6.29 | 8.77 | 5.81 | 0.48 |
| AW-36 | 5/25/1995 | 14.65 | DRY | -- | -- | -- |
| AW-36 | 9/30/1995 | 14.65 | 5.51 | 9.24 | 5.39 | 0.12 |
| AW-36 | 11/25-26/2008 | 13.65 | 4.35 | 9.30 | -- | -- |
| AW-36 | 3/6/2009 | 13.65 | 5.40 | 8.25 | -- | -- |
| AW-36 | 6/30/2009 | 13.65 | 5.81 | 7.84 | -- | -- |
| AW-36 | 9/23/2009 | 13.65 | 6.00 | 7.65 | -- | -- |
| AW-36 | 12/29/2009 | 13.65 | 4.31 | 9.34 | -- | -- |
| AW-37 | 8/28/1990 | 14.83 | 10.96 | 3.87 | -- | -- |
| AW-37 | 7/23/1991 | 14.83 | 10.16 | 4.67 | -- | -- |
| AW-37 | 8/22/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 9/26/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 11/26/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 12/20/1991 | 14.83 | Well Not Present | | | |
| AW-37 | 1/20/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 3/23/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 4/22/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 5/27-28/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 6/24/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 7/27/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 8/26/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 9/29/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 11/25/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 12/18/1992 | 14.83 | Well Not Present | | | |
| AW-37 | 1/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 1/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 3/30/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 5/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 8/9-10/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 9/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 9/28/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 11/30/1993 | 14.83 | Well Not Present | | | |
| AW-37 | 12/27/1993 | 14.83 | Well Not Present | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-37 | 3/31/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 9/9/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 9/29/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 11/23/1994 | 14.83 | Well Not Present | | | |
| AW-37 | 1/4/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 2/8/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 3/16/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 3/16/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 9/30/1995 | 14.83 | Well Not Present | | | |
| AW-37 | 11/25-26/2008 | 14.33 | 11.20 | 3.83 | 10.32 | 0.88 |
| AW-37 | 3/5/2009 | 14.33 | 12.09 | 2.26 | 12.06 | 0.03 |
| AW-37 | 6/30/2009 | 14.33 | 11.57 | 2.88 | 11.43 | 0.14 |
| AW-37 | 9/23/2009 | 14.33 | 11.02 | 3.32 | 11.01 | 0.01 |
| AW-37 | 12/29/2009 | 14.33 | 10.95 | 3.43 | 10.89 | 0.06 |
| AW-37 | 3/24/2010 | 14.33 | 11.51 | 2.90 | 11.42 | 0.09 |
| AW-38 | 8/28/1990 | 12.03 | 17.60 | 4.40 | 5.92 | 11.68 |
| AW-38 | 7/23/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 8/22/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 9/26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 10/25-26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 11/26/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 12/20/1991 | 12.03 | Recovery Well | | | |
| AW-38 | 1/20/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 3/23/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 4/22/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 5/27-28/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 6/24/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 7/27/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 8/26/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 9/29/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 11/25/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 12/18/1992 | 12.03 | Recovery Well | | | |
| AW-38 | 1/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 1/28/1993 | 12.03 | 8.02 | 4.03 | 7.99 | 0.03 |
| AW-38 | 3/30/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 5/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 8/9-10/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 9/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 9/28/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 11/30/1993 | 12.03 | Recovery Well | | | |
| AW-38 | 12/27/1993 | 12.03 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-38 | 3/31/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 9/9/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 9/29/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 11/23/1994 | 12.03 | Recovery Well | | | |
| AW-38 | 1/4/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 2/8/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 3/16/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 3/16/1995 | 12.03 | Recovery Well | | | |
| AW-38 | 9/30/1995 | 12.03 | Recovery Well | | | |
| AW-39 | 8/28/1990 | 12.41 | 11.65 | 4.82 | 6.70 | 4.95 |
| AW-39 | 7/23/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 8/22/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 9/26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 10/25-26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 11/26/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 12/20/1991 | 12.41 | Recovery Well | | | |
| AW-39 | 1/20/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 3/23/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 4/22/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 5/27-28/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 6/24/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 7/27/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 8/26/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 9/29/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 11/25/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 12/18/1992 | 12.41 | Recovery Well | | | |
| AW-39 | 1/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 1/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 3/30/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 5/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 8/9-10/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 9/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 9/28/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 11/30/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 12/27/1993 | 12.41 | Recovery Well | | | |
| AW-39 | 3/31/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 9/9/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 9/29/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 11/23/1994 | 12.41 | Recovery Well | | | |
| AW-39 | 1/4/1995 | 12.41 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-39 | 2/8/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 3/16/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 3/16/1995 | 12.41 | Recovery Well | | | |
| AW-39 | 9/30/1995 | 12.41 | Recovery Well | | | |
| AW-40 | 8/28/1990 | 11.81 | 6.43 | 5.97 | 5.74 | 0.69 |
| AW-40 | 7/23/1991 | 11.81 | 4.80 | 7.63 | 4.33 | 0.47 |
| AW-40 | 8/22/1991 | 11.81 | 4.54 | 7.64 | 4.10 | 0.44 |
| AW-40 | 9/26/1991 | 11.81 | 5.28 | 6.99 | 4.72 | 0.56 |
| AW-40 | 10/25-26/1991 | 11.81 | 5.28 | 6.98 | 4.74 | 0.54 |
| AW-40 | 11/26/1991 | 11.81 | 5.40 | 6.81 | 4.92 | 0.48 |
| AW-40 | 12/20/1991 | 11.81 | 5.57 | 6.63 | 5.10 | 0.47 |
| AW-40 | 1/20/1992 | 11.81 | 4.41 | 7.72 | 4.03 | 0.38 |
| AW-40 | 3/23/1992 | 11.81 | 4.98 | 7.24 | 4.49 | 0.49 |
| AW-40 | 4/22/1992 | 11.81 | 3.91 | 8.17 | 3.59 | 0.32 |
| AW-40 | 5/27-28/1992 | 11.81 | 5.27 | 6.93 | 4.80 | 0.47 |
| AW-40 | 6/24/1992 | 11.81 | 4.40 | 7.74 | 4.00 | 0.40 |
| AW-40 | 7/27/1992 | 11.81 | 4.78 | 7.34 | 4.41 | 0.37 |
| AW-40 | 8/26/1992 | 11.81 | 2.58 | 9.59 | 2.15 | 0.43 |
| AW-40 | 9/29/1992 | 11.81 | 4.30 | 7.75 | 4.01 | 0.29 |
| AW-40 | 11/25/1992 | 11.81 | 2.91 | 8.92 | 2.89 | 0.02 |
| AW-40 | 12/18/1992 | 11.81 | 4.07 | 7.86 | 3.92 | 0.15 |
| AW-40 | 1/28/1993 | 11.81 | 4.10 | 8.47 | 3.19 | 0.91 |
| AW-40 | 2/24/1993 | 11.81 | 4.43 | 7.60 | 4.17 | 0.26 |
| AW-40 | 3/30/1993 | 11.81 | 3.42 | 8.49 | 3.30 | 0.12 |
| AW-40 | 5/28/1993 | 11.81 | 5.38 | 6.71 | 5.04 | 0.34 |
| AW-40 | 8/9-10/1993 | 11.81 | 5.58 | 6.42 | 5.35 | 0.23 |
| AW-40 | 9/28/1993 | 11.81 | 4.92 | 7.07 | 4.70 | 0.22 |
| AW-40 | 10/29/1993 | 11.81 | 5.00 | 7.02 | 4.75 | 0.25 |
| AW-40 | 11/30/1993 | 11.81 | 4.11 | 7.79 | 4.00 | 0.11 |
| AW-40 | 12/27/1993 | 11.81 | 4.37 | 7.58 | 4.20 | 0.17 |
| AW-40 | 3/31/1994 | 11.81 | 4.64 | 7.22 | 4.58 | 0.06 |
| AW-40 | 9/9/1994 | 11.81 | 3.00 | 8.81 | -- | -- |
| AW-40 | 9/29/1994 | 11.81 | 3.69 | 5.94 | 6.32 | 2.63 |
| AW-40 | 11/23/1994 | 11.81 | 3.66 | 8.15 | -- | -- |
| AW-40 | 1/4/1995 | 11.81 | 3.83 | 7.98 | -- | -- |
| AW-40 | 2/8/1995 | 11.81 | 4.35 | 7.46 | -- | -- |
| AW-40 | 3/16/1995 | 11.81 | 4.35 | 7.46 | -- | -- |
| AW-40 | 5/25/1995 | 11.81 | 5.03 | 6.78 | -- | -- |
| AW-40 | 9/30/1995 | 11.81 | DRY | | | |
| AW-41 | 8/28/1990 | 16.14 | 9.49 | 6.65 | -- | -- |
| AW-41 | 7/23/1991 | 16.14 | 4.68 | 7.73 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-41 | 8/22/1991 | 16.14 | 8.75 | 7.39 | -- | -- |
| AW-41 | 9/26/1991 | 16.14 | 9.38 | 6.76 | -- | -- |
| AW-41 | 10/25-26/1991 | 16.14 | 9.93 | 6.21 | -- | -- |
| AW-41 | 11/26/1991 | 16.14 | 9.93 | 6.21 | -- | -- |
| AW-41 | 12/20/1991 | 16.14 | 10.25 | 5.89 | -- | -- |
| AW-41 | 1/20/1992 | 16.14 | 5.89 | 10.25 | -- | -- |
| AW-41 | 3/23/1992 | 16.14 | 9.08 | 7.06 | -- | -- |
| AW-41 | 4/22/1992 | 16.14 | 8.38 | 7.76 | -- | -- |
| AW-41 | 5/27-28/1992 | 16.14 | 9.35 | 6.79 | -- | -- |
| AW-41 | 6/24/1992 | 16.14 | 8.72 | 7.42 | -- | -- |
| AW-41 | 7/27/1992 | 16.14 | 9.20 | 6.94 | -- | -- |
| AW-41 | 8/26/1992 | 16.14 | 7.74 | 8.40 | -- | -- |
| AW-41 | 9/29/1992 | 16.14 | 8.88 | 7.26 | -- | -- |
| AW-41 | 11/25/1992 | 16.14 | 8.52 | 7.62 | -- | -- |
| AW-41 | 12/18/1992 | 16.14 | 9.06 | 7.08 | -- | -- |
| AW-41 | 1/28/1993 | 16.14 | 8.82 | 7.32 | -- | -- |
| AW-41 | 2/24/1993 | 16.14 | 9.16 | 6.98 | -- | -- |
| AW-41 | 3/30/1993 | 16.14 | 8.45 | 7.69 | -- | -- |
| AW-41 | 5/28/1993 | 16.14 | 1.10 | 15.04 | -- | -- |
| AW-41 | 8/9-10/1993 | 16.14 | 10.51 | 5.63 | -- | -- |
| AW-41 | 9/28/1993 | 16.14 | 9.85 | 6.29 | -- | -- |
| AW-41 | 10/29/1993 | 16.14 | 9.85 | 6.29 | -- | -- |
| AW-41 | 11/30/1993 | 16.14 | 9.30 | 6.84 | -- | -- |
| AW-41 | 12/27/1993 | 16.14 | 9.37 | 6.77 | -- | -- |
| AW-41 | 3/31/1994 | 16.14 | 9.51 | 6.63 | -- | -- |
| AW-41 | 9/9/1994 | 16.14 | 8.87 | 7.27 | -- | -- |
| AW-41 | 9/29/1994 | 16.14 | 9.39 | 6.75 | -- | -- |
| AW-41 | 11/23/1994 | 16.14 | 9.07 | 7.07 | -- | -- |
| AW-41 | 1/4/1995 | 16.14 | 8.85 | 7.29 | -- | -- |
| AW-41 | 2/8/1995 | 16.14 | 9.53 | 6.61 | -- | -- |
| AW-41 | 3/16/1995 | 16.14 | 9.29 | 6.85 | -- | -- |
| AW-41 | 5/25/1995 | 16.14 | 8.61 | 7.53 | -- | -- |
| AW-41 | 9/30/1995 | 16.14 | 9.06 | 7.08 | -- | -- |
| AW-41 | 9/23/2009 | 15.15 | 9.28 | 5.87 | -- | -- |
| AW-41 | 12/29/2009 | 15.15 | 8.11 | 7.04 | -- | -- |
| AW-42 | 8/28/1990 | 11.29 | 6.18 | 5.11 | -- | -- |
| AW-42 | 7/23/1991 | 11.29 | 5.71 | 6.10 | -- | -- |
| AW-42 | 8/22/1991 | 11.29 | 5.42 | 5.87 | -- | -- |
| AW-42 | 9/26/1991 | 11.29 | 6.28 | 5.01 | -- | -- |
| AW-42 | 10/25-26/1991 | 11.29 | 6.65 | 4.64 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-42 | 11/26/1991 | 11.29 | 7.43 | 3.86 | -- | -- |
| AW-42 | 12/20/1991 | 11.29 | 7.75 | 3.54 | -- | -- |
| AW-42 | 1/20/1992 | 11.29 | 6.29 | 5.00 | -- | -- |
| AW-42 | 3/23/1992 | 11.29 | 6.90 | 4.39 | -- | -- |
| AW-42 | 4/22/1992 | 11.29 | 6.17 | 5.12 | -- | -- |
| AW-42 | 5/27-28/1992 | 11.29 | 6.96 | 4.33 | -- | -- |
| AW-42 | 6/24/1992 | 11.29 | 5.99 | 5.30 | -- | -- |
| AW-42 | 7/27/1992 | 11.29 | 6.45 | 4.84 | -- | -- |
| AW-42 | 8/26/1992 | 11.29 | 5.10 | 6.19 | -- | -- |
| AW-42 | 9/29/1992 | 11.29 | 5.87 | 5.42 | -- | -- |
| AW-42 | 11/25/1992 | 11.29 | 5.82 | 5.47 | -- | -- |
| AW-42 | 12/18/1992 | 11.29 | 6.31 | 4.98 | -- | -- |
| AW-42 | 1/28/1993 | 11.29 | 5.46 | 5.83 | -- | -- |
| AW-42 | 2/24/1993 | 11.29 | 6.24 | 5.05 | -- | -- |
| AW-42 | 3/30/1993 | 11.29 | 5.13 | 6.16 | -- | -- |
| AW-42 | 5/28/1993 | 11.29 | 7.28 | 4.01 | -- | -- |
| AW-42 | 8/9-10/1993 | 11.29 | 7.54 | 3.75 | -- | -- |
| AW-42 | 9/28/1993 | 11.29 | 7.07 | 4.22 | -- | -- |
| AW-42 | 10/29/1993 | 11.29 | 6.70 | 4.59 | -- | -- |
| AW-42 | 11/30/1993 | 11.29 | 6.45 | 4.84 | -- | -- |
| AW-42 | 12/27/1993 | 11.29 | 6.99 | 4.30 | -- | -- |
| AW-42 | 3/31/1994 | 11.29 | 6.75 | 4.54 | -- | -- |
| AW-42 | 9/9/1994 | 11.29 | 5.55 | 5.74 | -- | -- |
| AW-42 | 9/29/1994 | 11.29 | 6.08 | 5.21 | -- | -- |
| AW-42 | 11/23/1994 | 11.29 | 5.75 | 5.54 | -- | -- |
| AW-42 | 1/4/1995 | 11.29 | 5.66 | 5.63 | -- | -- |
| AW-42 | 2/8/1995 | 11.29 | 6.54 | 4.75 | -- | -- |
| AW-42 | 3/16/1995 | 11.29 | 6.16 | 5.13 | -- | -- |
| AW-42 | 5/25/1995 | 11.29 | 7.12 | 4.17 | -- | -- |
| AW-42 | 9/30/1995 | 11.29 | 5.58 | 5.71 | -- | -- |
| AW-42 | 10/2/2003 | 11.29 | 6.50 | 4.79 | -- | -- |
| AW-42 | 11/25-26/2008 | 9.43 | 1.50 | 7.93 | -- | -- |
| AW-42 | 3/5/2009 | 9.43 | 1.49 | 7.94 | -- | -- |
| AW-42 | 6/30/2009 | 9.43 | 1.50 | 7.93 | -- | -- |
| AW-42 | 9/23/2009 | 9.43 | 1.94 | 7.49 | -- | -- |
| AW-42 | 12/29/2009 | 9.43 | 0.95 | 8.48 | -- | -- |
| AW-43 | 8/28/1990 | 10.68 | 3.35 | 7.33 | -- | -- |
| AW-43 | 7/23/1991 | 10.68 | 6.48 | 9.66 | -- | -- |
| AW-43 | 8/22/1991 | 10.68 | 1.22 | 9.46 | -- | -- |
| AW-43 | 9/26/1991 | 10.68 | 2.60 | 8.08 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-43 | 10/25-26/1991 | 10.68 | 2.92 | 7.76 | -- | -- |
| AW-43 | 11/26/1991 | 10.68 | 3.31 | 7.37 | -- | -- |
| AW-43 | 12/20/1991 | 10.68 | 3.47 | 7.21 | -- | -- |
| AW-43 | 1/20/1992 | 10.68 | 2.28 | 8.40 | -- | -- |
| AW-43 | 3/23/1992 | 10.68 | 1.60 | 9.08 | -- | -- |
| AW-43 | 4/22/1992 | 10.68 | 1.11 | 9.57 | -- | -- |
| AW-43 | 5/27-28/1992 | 10.68 | 2.42 | 8.26 | -- | -- |
| AW-43 | 6/24/1992 | 10.68 | 1.06 | 9.62 | -- | -- |
| AW-43 | 7/27/1992 | 10.68 | 1.46 | 9.22 | -- | -- |
| AW-43 | 8/26/1992 | 10.68 | 0.35 | 10.33 | -- | -- |
| AW-43 | 9/29/1992 | 10.68 | 1.00 | 9.68 | -- | -- |
| AW-43 | 11/25/1992 | 10.68 | 1.15 | 9.53 | -- | -- |
| AW-43 | 12/18/1992 | 10.68 | 1.51 | 9.17 | -- | -- |
| AW-43 | 1/28/1993 | 10.68 | 1.02 | 9.66 | -- | -- |
| AW-43 | 2/24/1993 | 10.68 | 1.59 | 9.09 | -- | -- |
| AW-43 | 3/30/1993 | 10.68 | 0.74 | 9.94 | -- | -- |
| AW-43 | 5/28/1993 | 10.68 | 2.80 | 7.88 | -- | -- |
| AW-43 | 8/9-10/1993 | 10.68 | 3.89 | 6.79 | -- | -- |
| AW-43 | 9/28/1993 | 10.68 | 3.21 | 7.47 | -- | -- |
| AW-43 | 10/29/1993 | 10.68 | 3.44 | 7.24 | -- | -- |
| AW-43 | 11/30/1993 | 10.68 | 2.39 | 8.29 | -- | -- |
| AW-43 | 12/27/1993 | 10.68 | 2.45 | 8.23 | -- | -- |
| AW-43 | 3/31/1994 | 10.68 | 2.30 | 8.38 | -- | -- |
| AW-43 | 9/9/1994 | 10.68 | 1.78 | 8.90 | -- | -- |
| AW-43 | 9/29/1994 | 10.68 | 2.09 | 8.59 | -- | -- |
| AW-43 | 11/23/1994 | 10.68 | 1.45 | 9.23 | -- | -- |
| AW-43 | 1/4/1995 | 10.68 | 1.59 | 9.09 | -- | -- |
| AW-43 | 2/8/1995 | 10.68 | 2.16 | 8.52 | -- | -- |
| AW-43 | 3/16/1995 | 10.68 | 2.11 | 8.57 | -- | -- |
| AW-43 | 5/25/1995 | 10.68 | 3.07 | 7.61 | -- | -- |
| AW-43 | 9/30/1995 | 10.68 | 1.48 | 9.20 | -- | -- |
| AW-44 | 8/28/1990 | 14.30 | 10.22 | 4.08 | -- | -- |
| AW-44 | 7/23/1991 | 14.30 | 7.29 | 7.01 | -- | -- |
| AW-44 | 8/22/1991 | 14.30 | 7.89 | 6.41 | -- | -- |
| AW-44 | 9/26/1991 | 14.30 | 9.10 | 5.20 | -- | -- |
| AW-44 | 10/25-26/1991 | 14.30 | 9.42 | 4.88 | -- | -- |
| AW-44 | 11/26/1991 | 14.30 | 9.93 | 4.37 | -- | -- |
| AW-44 | 12/20/1991 | 14.30 | 10.45 | 3.85 | -- | -- |
| AW-44 | 1/20/1992 | 14.30 | 9.09 | 5.21 | -- | -- |
| AW-44 | 3/23/1992 | 14.30 | 9.24 | 5.06 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) 4 | Depth to Groundwater (Feet BTC) | Groundwater Elevation 5, 6, 7 (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-44 | 4/22/1992 | 14.30 | 6.82 | 7.48 | -- | -- |
| AW-44 | 5/27-28/1992 | 14.30 | 9.69 | 4.61 | -- | -- |
| AW-44 | 6/24/1992 | 14.30 | 7.89 | 6.41 | -- | -- |
| AW-44 | 7/27/1992 | 14.30 | 8.80 | 5.50 | -- | -- |
| AW-44 | 8/26/1992 | 14.30 | 3.55 | 10.75 | -- | -- |
| AW-44 | 9/29/1992 | 14.30 | 7.73 | 6.57 | -- | -- |
| AW-44 | 11/25/1992 | 14.30 | 6.58 | 7.72 | -- | -- |
| AW-44 | 12/18/1992 | 14.30 | 8.48 | 5.82 | -- | -- |
| AW-44 | 1/28/1993 | 14.30 | 7.07 | 7.23 | -- | -- |
| AW-44 | 2/24/1993 | 14.30 | 8.33 | 5.97 | -- | -- |
| AW-44 | 3/30/1993 | 14.30 | 6.57 | 7.73 | -- | -- |
| AW-44 | 5/28/1993 | 14.30 | 9.68 | 4.62 | -- | -- |
| AW-44 | 8/9-10/1993 | 14.30 | 10.86 | 3.44 | -- | -- |
| AW-44 | 9/28/1993 | 14.30 | 10.21 | 4.09 | -- | -- |
| AW-44 | 10/29/1993 | 14.30 | 9.98 | 4.32 | -- | -- |
| AW-44 | 11/30/1993 | 14.30 | 9.17 | 5.13 | -- | -- |
| AW-44 | 12/27/1993 | 14.30 | 10.12 | 4.18 | -- | -- |
| AW-44 | 3/31/1994 | 14.30 | 9.67 | 4.63 | -- | -- |
| AW-44 | 9/9/1994 | 14.30 | 8.66 | 5.64 | -- | -- |
| AW-44 | 9/29/1994 | 14.30 | 9.12 | 5.18 | -- | -- |
| AW-44 | 11/23/1994 | 14.30 | 8.55 | 5.75 | -- | -- |
| AW-44 | 1/4/1995 | 14.30 | 8.49 | 5.81 | -- | -- |
| AW-44 | 2/8/1995 | 14.30 | 9.87 | 4.43 | -- | -- |
| AW-44 | 3/16/1995 | 14.30 | 8.95 | 5.35 | -- | -- |
| AW-44 | 5/25/1995 | 14.30 | 10.01 | 4.29 | -- | -- |
| AW-44 | 9/30/1995 | 14.30 | 8.42 | 5.88 | -- | -- |
| AW-44 | 11/25-26/2008 | 13.41 | 9.10 | 4.31 | -- | -- |
| AW-44 | 3/5/2009 | 13.41 | 10.85 | 2.56 | -- | -- |
| AW-44 | 6/30/2009 | 13.41 | 10.20 | 3.21 | -- | -- |
| AW-44 | 9/23/2009 | 13.41 | 10.22 | 3.19 | -- | -- |
| AW-44 | 12/29/2009 | 13.41 | 8.51 | 4.90 | -- | -- |
| AW-45 | 7/23/1991 | 16.07 | -- | -- | 5.49 | -- |
| AW-45 | 8/22/1991 | 16.07 | 11.73 | 4.40 | 11.66 | 0.07 |
| AW-45 | 9/26/1991 | 16.07 | 11.48 | 4.59 | -- | -- |
| AW-45 | 10/25-26/1991 | 16.07 | 11.59 | 4.48 | -- | -- |
| AW-45 | 11/26/1991 | 16.07 | 12.07 | 4.00 | -- | -- |
| AW-45 | 12/20/1991 | 16.07 | 12.70 | 3.37 | 12.68 | 0.02 |
| AW-45 | 1/20/1992 | 16.07 | 10.65 | 5.42 | -- | -- |
| AW-45 | 3/23/1992 | 16.07 | 12.30 | 3.77 | -- | -- |
| AW-45 | 4/22/1992 | 16.07 | 12.04 | 4.06 | 12.01 | 0.03 |
| AW-45 | 5/27-28/1992 | 16.07 | 12.37 | 3.71 | 12.36 | 0.01 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-45 | 6/24/1992 | 16.07 | 11.75 | 4.32 | -- | -- |
| AW-45 | 7/27/1992 | 16.07 | 11.18 | 4.89 | -- | -- |
| AW-45 | 8/26/1992 | 16.07 | 10.35 | 5.72 | -- | -- |
| AW-45 | 9/29/1992 | 16.07 | 10.79 | 5.28 | -- | -- |
| AW-45 | 11/25/1992 | 16.07 | 11.47 | 4.60 | -- | -- |
| AW-45 | 12/18/1992 | 16.07 | 11.94 | 14.52 | -- | 11.94 |
| AW-45 | 1/28/1993 | 16.07 | 11.35 | 4.72 | -- | -- |
| AW-45 | 2/24/1993 | 16.07 | 11.69 | 4.38 | -- | -- |
| AW-45 | 3/30/1993 | 16.07 | 11.72 | 4.35 | -- | -- |
| AW-45 | 5/28/1993 | 16.07 | 12.37 | 3.70 | -- | -- |
| AW-45 | 8/9-10/1993 | 16.07 | 12.78 | 3.29 | -- | -- |
| AW-45 | 9/28/1993 | 16.07 | 12.36 | 3.71 | -- | -- |
| AW-45 | 10/29/1993 | 16.07 | 11.96 | 4.11 | -- | -- |
| AW-45 | 11/30/1993 | 16.07 | 11.65 | 4.42 | -- | -- |
| AW-45 | 12/27/1993 | 16.07 | 12.50 | 3.57 | -- | -- |
| AW-45 | 3/31/1994 | 16.07 | 12.15 | 3.92 | -- | -- |
| AW-45 | 9/9/1994 | 16.07 | 11.23 | 4.84 | 10.83 | 0.40 |
| AW-45 | 9/29/1994 | 16.07 | 12.46 | 3.61 | 11.95 | 0.51 |
| AW-45 | 11/23/1994 | 16.07 | 11.69 | 4.38 | 11.36 | 0.33 |
| AW-45 | 1/4/1995 | 16.07 | 11.86 | 4.21 | 11.48 | 0.38 |
| AW-45 | 2/8/1995 | 16.07 | 12.87 | 3.20 | -- | -- |
| AW-45 | 3/16/1995 | 16.07 | 12.37 | 3.70 | 11.98 | 0.39 |
| AW-45 | 5/25/1995 | 16.07 | DRY | -- | -- | -- |
| AW-45 | 9/30/1995 | 16.07 | 12.03 | 4.04 | 11.72 | 0.31 |
| AW-45 | 11/25-26/2008 | 15.13 | 14.00 | 3.05 | 11.60 | 2.40 |
| AW-45 | 3/6/2009 | 15.13 | 14.90 | 1.95 | 12.75 | 2.15 |
| AW-45 | 6/30/2009 | 15.13 | 13.88 | 2.52 | 12.39 | 1.49 |
| AW-45 | 9/23/2009 | 15.13 | 13.76 | 2.76 | 12.13 | 1.63 |
| AW-45 | 12/29/2009 | 15.13 | 13.51 | 3.35 | 11.49 | 2.02 |
| AW-45 | 3/24/2010 | 15.13 | 13.90 | 2.62 | 12.27 | 1.63 |
| AW-45 | 12/13/2010 | 16.07 | 13.75 | 3.21 | 12.71 | 1.04 |
| AW-46 | 7/23/1991 | 12.50 | 9.80 | 2.70 | -- | -- |
| AW-46 | 8/22/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 9/26/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 11/26/1991 | 12.50 | -- | -- | -- | -- |
| AW-46 | 12/20/1991 | 12.50 | 11.53 | 0.97 | -- | -- |
| AW-46 | 1/20/1992 | 12.50 | 8.76 | 3.74 | -- | -- |
| AW-46 | 3/23/1992 | 12.50 | 9.85 | 2.65 | -- | -- |
| AW-46 | 4/22/1992 | 12.50 | 9.10 | 3.40 | -- | -- |
| AW-46 | 5/27-28/1992 | 12.50 | 9.50 | 3.00 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-46 | 6/24/1992 | 12.50 | 9.64 | 2.86 | -- | -- |
| AW-46 | 7/27/1992 | 12.50 | 11.38 | 1.12 | -- | -- |
| AW-46 | 8/26/1992 | 12.50 | 8.66 | 3.84 | -- | -- |
| AW-46 | 9/29/1992 | 12.50 | 8.11 | 4.39 | -- | -- |
| AW-46 | 11/25/1992 | 12.50 | 9.47 | 3.03 | -- | -- |
| AW-46 | 12/18/1992 | 12.50 | 10.49 | 2.01 | 10.45 | 0.04 |
| AW-46 | 1/28/1993 | 12.50 | 8.83 | 3.67 | 8.81 | 0.02 |
| AW-46 | 2/24/1993 | 12.50 | 9.21 | 3.29 | 9.20 | 0.01 |
| AW-46 | 3/30/1993 | 12.50 | 9.54 | 2.96 | 9.53 | 0.01 |
| AW-46 | 5/28/1993 | 12.50 | -- | -- | -- | -- |
| AW-46 | 8/9-10/1993 | 12.50 | -- | -- | 0.00 | -- |
| AW-46 | 9/28/1993 | 12.50 | -- | -- | -- | -- |
| AW-46 | 10/29/1993 | 12.50 | 9.18 | 3.32 | -- | -- |
| AW-46 | 11/30/1993 | 12.50 | 9.05 | 3.45 | -- | -- |
| AW-46 | 12/27/1993 | 12.50 | 10.37 | 2.13 | -- | -- |
| AW-46 | 3/31/1994 | 12.50 | 9.50 | 3.00 | -- | -- |
| AW-46 | 9/9/1994 | 12.50 | 8.30 | 4.22 | 8.28 | 0.02 |
| AW-46 | 9/29/1994 | 12.50 | 10.31 | 2.19 | 9.95 | 0.36 |
| AW-46 | 11/23/1994 | 12.50 | 8.54 | 3.96 | -- | -- |
| AW-46 | 1/4/1995 | 12.50 | 8.29 | 4.21 | -- | -- |
| AW-46 | 2/8/1995 | 12.50 | 9.76 | 2.74 | -- | -- |
| AW-46 | 3/16/1995 | 12.50 | 9.54 | 2.96 | -- | -- |
| AW-46 | 5/25/1995 | 12.50 | 10.36 | 2.14 | -- | -- |
| AW-46 | 9/30/1995 | 12.50 | 8.15 | 4.35 | -- | -- |
| AW-47 | 7/23/1991 | 11.89 | -- | -- | 6.40 | -- |
| AW-47 | 8/22/1991 | 11.89 | -- | -- | 6.62 | -- |
| AW-47 | 9/26/1991 | 11.89 | -- | -- | 8.75 | -- |
| AW-47 | 10/25-26/1991 | 11.89 | -- | -- | 7.93 | -- |
| AW-47 | 11/26/1991 | 11.89 | Well Not Present | | | |
| AW-47 | 12/20/1991 | 11.89 | Well Not Present | | | |
| AW-47 | 1/20/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 3/23/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 4/22/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 5/27-28/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 6/24/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 7/27/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 8/26/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 9/29/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 11/25/1992 | 11.89 | Well Not Present | | | |
| AW-47 | 12/18/1992 | 11.89 | Well Not Present | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-47 | 1/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 1/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 3/30/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 5/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 9/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 8/9-10/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 9/28/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 11/30/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 12/27/1993 | 11.89 | Well Not Present | | | |
| AW-47 | 3/31/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 9/9/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 9/29/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 11/23/1994 | 11.89 | Well Not Present | | | |
| AW-47 | 1/4/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 2/8/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 3/16/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 3/16/1995 | 11.89 | Well Not Present | | | |
| AW-47 | 9/30/1995 | 11.89 | Well Not Present | | | |
| AW-48 | 7/23/1991 | 12.10 | -- | 6.66 | -- | -- |
| AW-48 | 8/22/1991 | 12.10 | 5.39 | 6.71 | -- | -- |
| AW-48 | 9/26/1991 | 12.10 | 5.84 | 6.26 | -- | -- |
| AW-48 | 10/25-26/1991 | 12.1 | 5.96 | 6.14 | -- | -- |
| AW-48 | 11/26/1991 | 12.10 | 6.53 | 5.57 | -- | -- |
| AW-48 | 12/20/1991 | 12.10 | 6.79 | 5.31 | -- | -- |
| AW-48 | 1/20/1992 | 12.10 | 5.67 | 6.43 | 5.67 | -- |
| AW-48 | 3/23/1992 | 12.10 | 13.93 | -1.83 | 5.94 | 7.99 |
| AW-48 | 4/22/1992 | 12.10 | 5.33 | 6.77 | -- | -- |
| AW-48 | 5/27-28/1992 | 12.10 | 5.95 | 6.15 | -- | -- |
| AW-48 | 6/24/1992 | 12.10 | 4.90 | 7.20 | -- | -- |
| AW-48 | 7/27/1992 | 12.10 | 5.23 | 6.87 | -- | -- |
| AW-48 | 8/26/1992 | 12.10 | 3.57 | 8.53 | -- | -- |
| AW-48 | 9/29/1992 | 12.10 | 4.62 | 7.48 | -- | -- |
| AW-48 | 11/25/1992 | 12.10 | 4.23 | 7.87 | -- | -- |
| AW-48 | 12/18/1992 | 12.10 | 4.71 | 7.39 | -- | -- |
| AW-48 | 1/28/1993 | 12.10 | 4.61 | 7.49 | -- | -- |
| AW-48 | 2/24/1993 | 12.10 | 4.95 | 7.15 | -- | -- |
| AW-48 | 3/30/1993 | 12.10 | 4.19 | 7.91 | -- | -- |
| AW-48 | 5/28/1993 | 12.10 | 5.49 | 6.61 | -- | -- |
| AW-48 | 8/9-10/1993 | 12.10 | 6.35 | 5.75 | -- | -- |
| AW-48 | 9/28/1993 | 12.10 | 5.26 | 6.84 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-48 | 10/29/1993 | 12.10 | 5.39 | 6.71 | -- | -- |
| AW-48 | 11/30/1993 | 12.10 | 4.60 | 7.50 | -- | -- |
| AW-48 | 12/27/1993 | 12.10 | 7.84 | 4.26 | -- | -- |
| AW-48 | 3/31/1994 | 12.10 | 4.87 | 7.23 | -- | -- |
| AW-48 | 9/9/1994 | 12.10 | 3.54 | 8.56 | -- | -- |
| AW-48 | 9/29/1994 | 12.10 | 4.41 | 7.69 | -- | -- |
| AW-48 | 11/23/1994 | 12.10 | 3.72 | 8.38 | -- | -- |
| AW-48 | 1/4/1995 | 12.10 | 3.46 | 8.64 | -- | -- |
| AW-48 | 2/8/1995 | 12.10 | 4.18 | 7.92 | -- | -- |
| AW-48 | 3/16/1995 | 12.10 | 4.13 | 7.97 | -- | -- |
| AW-48 | 5/25/1995 | 12.10 | 4.89 | 7.21 | -- | -- |
| AW-48 | 9/30/1995 | 12.10 | 3.77 | 8.33 | -- | -- |
| AW-48 | 10/2/2003 | 12.10 | 6.82 | 5.28 | -- | -- |
| AW-48 | 11/25-26/2008 | 11.13 | 5.00 | 6.13 | -- | -- |
| AW-48 | 3/5/2009 | 11.13 | 6.30 | 4.83 | -- | -- |
| AW-48 | 6/30/2009 | 11.13 | 5.10 | 6.03 | -- | -- |
| AW-48 | 9/23/2009 | 11.13 | 5.45 | 5.68 | -- | -- |
| AW-48 | 12/29/2009 | 11.13 | 4.98 | 6.15 | -- | -- |
| AW-49 | 7/23/1991 | 15.16 | 13.58 | 3.10 | 11.65 | 1.93 |
| AW-49 | 8/22/1991 | 15.16 | 13.45 | 3.11 | 11.68 | 1.77 |
| AW-49 | 9/26/1991 | 15.16 | 13.40 | 4.60 | 9.81 | 3.59 |
| AW-49 | 10/25-26/1991 | 15.16 | 13.40 | 2.84 | 12.03 | 1.37 |
| AW-49 | 11/26/1991 | 15.16 | 14.49 | 2.69 | 11.93 | 2.56 |
| AW-49 | 12/20/1991 | 15.16 | 17.01 | 1.47 | 12.81 | 4.20 |
| AW-49 | 1/20/1992 | 15.16 | 12.83 | 3.15 | 11.79 | 1.04 |
| AW-49 | 3/23/1992 | 15.16 | 15.01 | 2.19 | 12.43 | 2.58 |
| AW-49 | 4/22/1992 | 15.16 | 13.20 | 2.88 | 12.04 | 1.16 |
| AW-49 | 5/27-28/1992 | 15.16 | 14.26 | 2.67 | 12.02 | 2.24 |
| AW-49 | 6/24/1992 | 15.16 | 13.64 | 2.68 | 12.17 | 1.47 |
| AW-49 | 7/27/1992 | 15.16 | 16.12 | 2.42 | 11.84 | 4.28 |
| AW-49 | 8/26/1992 | 15.16 | 13.03 | 2.73 | 12.27 | 0.76 |
| AW-49 | 9/29/1992 | 15.16 | 11.57 | 4.02 | 11.03 | 0.54 |
| AW-49 | 11/25/1992 | 15.16 | 12.74 | 3.04 | 11.95 | 0.79 |
| AW-49 | 12/18/1992 | 15.16 | 13.86 | 2.35 | 12.53 | 1.33 |
| AW-49 | 1/28/1993 | 15.16 | 12.20 | 3.64 | 11.34 | 0.86 |
| AW-49 | 2/24/1993 | 15.16 | 13.02 | 3.20 | 11.68 | 1.34 |
| AW-49 | 3/30/1993 | 15.16 | 13.92 | 2.83 | 11.91 | 2.01 |
| AW-49 | 5/28/1993 | 15.16 | 15.89 | 1.79 | 12.70 | 3.19 |
| AW-49 | 8/9-10/1993 | 15.16 | 15.30 | 2.21 | 12.32 | 2.98 |
| AW-49 | 9/28/1993 | 15.16 | 15.83 | 1.82 | 12.68 | 3.15 |
| AW-49 | 10/29/1993 | 15.16 | 12.91 | 3.02 | 11.94 | 0.97 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-49 | 11/30/1993 | 15.16 | 12.72 | 3.21 | 11.74 | 0.98 |
| AW-49 | 12/27/1993 | 15.16 | 16.05 | 1.96 | 12.44 | 3.61 |
| AW-49 | 3/31/1994 | 15.16 | 13.55 | 2.88 | 11.94 | 1.61 |
| AW-49 | 9/9/1994 | 15.16 | 11.50 | 4.14 | 10.89 | 0.61 |
| AW-49 | 9/29/1994 | 15.16 | 15.05 | 2.48 | 12.05 | 3.00 |
| AW-49 | 11/23/1994 | 15.16 | 12.73 | 3.55 | 11.31 | 1.42 |
| AW-49 | 1/4/1995 | 15.16 | 12.16 | 3.74 | 11.22 | 0.94 |
| AW-49 | 2/8/1995 | 15.16 | 16.11 | 2.15 | 12.19 | 3.92 |
| AW-49 | 3/16/1995 | 15.16 | 13.26 | 2.68 | 12.27 | 0.99 |
| AW-49 | 5/25/1995 | 15.16 | 13.44 | 2.68 | 12.23 | 1.21 |
| AW-49 | 9/30/1995 | 15.16 | 13.28 | 3.18 | 11.64 | 1.64 |
| AW-49 | 10/2/2003 | 15.16 | 13.00 | 3.36 | 11.50 | 1.50 |
| AW-49 | 11/25-26/2008 | 15.50 | 15.40 | 2.10 | 12.90 | 2.50 |
| AW-49 | 3/5/2009 | 15.50 | 15.77 | 1.68 | 13.33 | 2.44 |
| AW-49 | 6/30/2009 | 15.50 | 15.57 | 2.19 | 12.92 | 2.65 |
| AW-49 | 9/23/2009 | 15.50 | 14.44 | 2.95 | 12.23 | 2.21 |
| AW-49 | 12/29/2009 | 15.50 | 14.85 | 2.84 | 12.29 | 2.56 |
| AW-49 | 3/24/2010 | 15.50 | 16.51 | 1.90 | 13.10 | 3.41 |
| AW-50 | 7/23/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 8/22/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 9/26/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 10/25-26/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 11/26/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 12/20/1991 | 15.06 | Recovery Well | | | |
| AW-50 | 1/20/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 3/23/1992 | 11.89 | Recovery Well | | | |
| AW-50 | 4/22/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 5/27-28/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 6/24/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 7/27/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 8/26/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 9/29/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 11/25/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 12/18/1992 | 15.06 | Recovery Well | | | |
| AW-50 | 1/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 2/24/1993 | 15.06 | 12.44 | 2.62 | 11.14 | 1.30 |
| AW-50 | 3/30/1993 | 11.89 | Recovery Well | | | |
| AW-50 | 5/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 8/9-10/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 9/28/1993 | 15.06 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-50 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 11/30/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 12/27/1993 | 15.06 | Recovery Well | | | |
| AW-50 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-50 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-50 | 9/30/1995 | 15.06 | Recovery Well | | | |
| AW-51 | 7/23/1991 | 13.77 | 14.04 | 3.53 | 9.67 | 4.37 |
| AW-51 | 8/22/1991 | 13.77 | 13.03 | 3.91 | 9.39 | 3.64 |
| AW-51 | 9/26/1991 | 13.77 | 19.40 | 1.64 | 11.04 | 8.36 |
| AW-51 | 10/25-26/1991 | 13.77 | 19.29 | 1.52 | 11.20 | 8.09 |
| AW-51 | 11/26/1991 | 13.77 | 13.74 | 3.01 | 10.31 | 3.43 |
| AW-51 | 12/20/1991 | 13.77 | 19.25 | 0.61 | 12.25 | 7.00 |
| AW-51 | 1/20/1992 | 13.77 | 12.57 | 3.36 | 10.09 | 2.48 |
| AW-51 | 3/23/1992 | 13.77 | 14.95 | 2.40 | 10.83 | 4.12 |
| AW-51 | 4/22/1992 | 13.77 | 13.73 | 3.09 | 10.22 | 3.51 |
| AW-51 | 5/27-28/1992 | 13.77 | 14.50 | 2.79 | 10.45 | 4.05 |
| AW-51 | 6/24/1992 | 13.77 | 12.71 | 4.10 | 9.22 | 3.49 |
| AW-51 | 7/27/1992 | 13.77 | 20.34 | 0.47 | 12.25 | 8.09 |
| AW-51 | 8/26/1992 | 13.77 | 18.40 | 2.17 | 10.58 | 7.82 |
| AW-51 | 9/29/1992 | 13.77 | 13.39 | 4.28 | 8.91 | 4.48 |
| AW-51 | 11/25/1992 | 13.77 | 18.03 | 2.23 | 10.57 | 7.46 |
| AW-51 | 12/18/1992 | 13.77 | 19.08 | 1.58 | 11.16 | 7.92 |
| AW-51 | 1/28/1993 | 13.77 | 13.43 | 3.85 | 9.40 | 4.03 |
| AW-51 | 2/24/1993 | 13.77 | 14.55 | 3.00 | 10.21 | 4.34 |
| AW-51 | 3/30/1993 | 13.77 | 14.98 | 3.12 | 10.00 | 4.98 |
| AW-51 | 8/9-10/1993 | 13.77 | 19.18 | 0.86 | 11.97 | 7.21 |
| AW-51 | 9/28/1993 | 13.77 | 19.64 | 0.80 | 11.97 | 7.67 |
| AW-51 | 10/29/1993 | 13.77 | 15.31 | 2.52 | 10.64 | 4.67 |
| AW-51 | 11/30/1993 | 13.77 | 13.95 | 3.08 | 10.20 | 3.75 |
| AW-51 | 12/27/1993 | 13.77 | 16.62 | 1.82 | 11.25 | 5.37 |
| AW-51 | 3/31/1994 | 13.77 | 13.19 | 3.39 | 9.96 | 3.23 |
| AW-51 | 9/9/1994 | 13.77 | 12.90 | 4.05 | 9.25 | 3.65 |
| AW-51 | 9/29/1994 | 13.77 | 15.31 | 2.84 | 10.28 | 5.03 |
| AW-51 | 11/23/1994 | 13.77 | 12.59 | 4.10 | 9.23 | 3.36 |
| AW-51 | 1/4/1995 | 13.77 | 17.89 | 2.27 | 10.55 | 7.34 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-51 | 2/8/1995 | 13.77 | 15.85 | 2.08 | 11.07 | 4.78 |
| AW-51 | 3/16/1995 | 13.77 | 19.99 | 0.91 | 11.80 | 8.19 |
| AW-51 | 5/25/1995 | 13.77 | 16.83 | 2.14 | 10.85 | 5.98 |
| AW-51 | 12/12/1995 | 13.77 | 15.46 | 2.26 | 10.92 | 4.54 |
| AW-51 | 10/2/2003 | 13.77 | 17.54 | 2.44 | 9.78 | 7.76 |
| AW-51 | 11/25-26/2008 | 12.75 | 18.70 | 1.29 | 9.65 | 9.05 |
| AW-51 | 3/6/2009 | 12.75 | 15.86 | 0.81 | 10.96 | 4.90 |
| AW-51 | 6/30/2009 | 12.75 | 18.38 | 1.95 | 9.77 | 8.61 |
| AW-51 | 6/30/2009 | 12.75 | 15.64 | 2.84 | 9.13 | 6.51 |
| AW-51 | 9/23/2009 [10] | 12.75 | 17.50 | 2.47 | 9.30 | 8.20 |
| AW-51 | 9/23/2009 [11] | 12.75 | 14.97 | 3.35 | 8.65 | 6.32 |
| AW-51 | 12/29/2009 | 12.75 | 19.66 | 2.08 | 9.45 | 10.21 |
| AW-51 | 3/24/2010 | 12.75 | 19.62 | 2.04 | 9.50 | 10.12 |
| AW-51 | 12/13/2010 | 12.75 | 17.46 | 1.42 | 10.28 | 7.18 |
| AW-52 | 7/23/1991 | 16.51 | 15.95 | 4.07 | 11.92 | 4.03 |
| AW-52 | 8/22/1991 | 16.51 | 15.91 | 3.75 | 12.29 | 3.62 |
| AW-52 | 9/26/1991 | 16.51 | 16.00 | 3.62 | 12.43 | 3.57 |
| AW-52 | 10/25-26/1991 | 16.51 | 16.54 | 3.33 | 12.68 | 3.86 |
| AW-52 | 11/26/1991 | 16.51 | 16.26 | 2.92 | 13.19 | 3.07 |
| AW-52 | 12/20/1991 | 16.51 | 18.30 | 2.05 | 13.89 | 4.41 |
| AW-52 | 1/20/1992 | 16.51 | 17.34 | 3.42 | 12.45 | 4.89 |
| AW-52 | 3/23/1992 | 16.51 | 16.88 | 2.80 | 13.24 | 3.64 |
| AW-52 | 4/22/1992 | 16.51 | 16.05 | 3.44 | 12.63 | 3.42 |
| AW-52 | 5/27-28/1992 | 16.51 | 15.85 | 3.44 | 12.66 | 3.19 |
| AW-52 | 6/24/1992 | 16.51 | 15.54 | 4.24 | 11.78 | 3.76 |
| AW-52 | 7/27/1992 | 16.51 | 15.80 | 3.22 | 12.92 | 2.88 |
| AW-52 | 8/26/1992 | 16.51 | 16.54 | 4.31 | 11.55 | 4.99 |
| AW-52 | 9/29/1992 | 16.51 | 15.43 | 4.34 | 11.68 | 3.75 |
| AW-52 | 11/25/1992 | 16.51 | 15.83 | 3.82 | 12.22 | 3.61 |
| AW-52 | 12/18/1992 | 16.51 | 15.84 | 3.33 | 12.78 | 3.06 |
| AW-52 | 1/28/1993 | 16.51 | 15.45 | 4.09 | 11.97 | 3.48 |
| AW-52 | 2/24/1993 | 16.51 | 15.40 | 3.59 | 12.55 | 2.85 |
| AW-52 | 3/30/1993 | 16.51 | 15.60 | 3.60 | 12.51 | 3.09 |
| AW-52 | 8/9-10/1993 | 16.51 | 17.98 | 2.33 | 13.61 | 4.37 |
| AW-52 | 9/28/1993 | 16.51 | 17.57 | 2.55 | 13.42 | 4.15 |
| AW-52 | 10/29/1993 | 16.51 | 17.33 | 3.09 | 12.84 | 4.49 |
| AW-52 | 11/30/1993 | 16.51 | 15.68 | 3.45 | 12.67 | 3.01 |
| AW-52 | 12/27/1993 | 16.51 | 15.81 | 2.76 | 13.44 | 2.37 |
| AW-52 | 3/31/1994 | 16.51 | 15.61 | 3.27 | 12.89 | 2.72 |
| AW-52 | 9/9/1994 | 16.51 | 15.41 | 4.53 | 11.47 | 3.94 |
| AW-52 | 9/29/1994 | 16.51 | 15.41 | 3.47 | 12.69 | 2.72 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-52 | 11/23/1994 | 16.51 | 15.09 | 4.17 | 11.93 | 3.16 |
| AW-52 | 1/4/1995 | 16.51 | 15.42 | 3.88 | 12.21 | 3.21 |
| AW-52 | 2/8/1995 | 16.51 | 15.72 | 2.74 | 13.48 | 2.24 |
| AW-52 | 3/16/1995 | 16.51 | 15.82 | 3.18 | 12.96 | 2.86 |
| AW-52 | 5/25/1995 | 16.51 | 16.05 | 3.23 | 12.87 | 3.18 |
| AW-52 | 12/12/1995 | 16.51 | 15.63 | 3.16 | 13.01 | 2.62 |
| AW-52R | 10/2/2003 | 16.51 | 15.30 | 3.74 | 12.14 | 3.16 |
| AW-52 | 11/25-26/2008 | 15.74 | 14.75 | 3.03 | 12.20 | 2.55 |
| AW-52 | 3/6/2009 | 15.74 | 15.99 | 1.60 | 13.68 | 2.31 |
| AW-52 | 6/30/2009 | 15.74 | 15.62 | 2.72 | 12.58 | 3.04 |
| AW-52 | 9/23/2009 | 15.74 | 15.28 | 3.23 | 12.04 | 3.24 |
| AW-52 | 12/29/2009 | 15.74 | 14.72 | 3.14 | 12.24 | 2.48 |
| AW-52 | 3/24/2010 | 15.74 | 14.90 | 2.71 | 12.71 | 2.19 |
| AW-53 | 7/23/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 8/22/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 9/26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 10/25-26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 11/26/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 12/20/1991 | 11.34 | Recovery Well | | | |
| AW-53 | 1/20/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 3/23/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 4/22/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 5/27-28/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 6/24/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 7/27/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 8/26/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 9/29/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 11/25/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 12/18/1992 | 11.34 | Recovery Well | | | |
| AW-53 | 1/28/1993 | 11.34 | Recovery Well | | | |
| AW-53 | 3/30/1993 | 11.89 | Recovery Well | | | |
| AW-53 | 8/9-10/1993 | 11.34 | Recovery Well | | | |
| AW-53 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 9/28/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 11/30/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 12/27/1993 | 15.06 | Recovery Well | | | |
| AW-53 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-53 | 11/23/1994 | 15.06 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-53 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-53 | 10/2/2003 | 11.34 | 5.98 | 5.86 | 5.36 | 0.62 |
| AW-53 | 11/25-26/2008 | 10.33 | 5.60 | 4.81 | 5.50 | 0.10 |
| AW-53 | 3/5/2009 | 10.33 | 6.50 | 3.94 | 6.36 | 0.14 |
| AW-53 | 6/30/2009 | 10.33 | 5.80 | 4.58 | 5.74 | 0.06 |
| AW-53 | 9/23/2009 | 10.33 | 5.64 | 4.71 | 5.62 | 0.02 |
| AW-53 | 12/29/2009 | 10.33 | 5.12 | 5.21 | -- | -- |
| AW-54 | 7/23/1991 | 12.14 | 18.30 | 6.04 | 9.40 | 8.90 |
| AW-54 | 8/22/1991 | 12.14 | 13.92 | 5.63 | 5.50 | 8.42 |
| AW-54 | 9/26/1991 | 12.14 | 13.85 | 5.22 | 5.98 | 7.87 |
| AW-54 | 10/25-26/1991 | 12.14 | 12.60 | 5.18 | 6.19 | 6.41 |
| AW-54 | 11/26/1991 | 12.14 | 14.40 | 4.41 | 6.82 | 7.58 |
| AW-54 | 12/20/1991 | 12.14 | 14.09 | 4.25 | 7.04 | 7.05 |
| AW-54 | 1/20/1992 | 12.14 | 13.29 | 5.45 | 5.79 | 7.50 |
| AW-54 | 3/23/1992 | 12.14 | 13.89 | 5.26 | 5.92 | 7.97 |
| AW-54 | 4/22/1992 | 12.14 | 13.88 | 5.76 | 5.36 | 8.52 |
| AW-54 | 5/27-28/1992 | 12.14 | 13.95 | 5.17 | 6.02 | 7.93 |
| AW-54 | 6/24/1992 | 12.14 | 14.00 | 6.10 | 4.95 | 9.05 |
| AW-54 | 7/27/1992 | 12.14 | 13.85 | 6.03 | 5.05 | 8.80 |
| AW-54 | 8/26/1992 | 12.14 | 12.97 | 7.34 | 3.69 | 9.28 |
| AW-54 | 9/29/1992 | 12.14 | 13.94 | 6.32 | 4.71 | 9.23 |
| AW-54 | 11/25/1992 | 12.14 | 13.00 | 6.66 | 4.45 | 8.55 |
| AW-54 | 12/18/1992 | 12.14 | 14.93 | 6.20 | 4.71 | 10.22 |
| AW-54 | 1/28/1993 | 12.14 | 13.69 | 6.63 | 4.39 | 9.30 |
| AW-54 | 2/24/1993 | 12.14 | 13.83 | 6.44 | 4.59 | 9.24 |
| AW-54 | 3/30/1993 | 12.14 | 14.05 | 7.05 | 3.87 | 10.18 |
| AW-54 | 8/9-10/1993 | 12.14 | 14.51 | 4.90 | 6.25 | 8.26 |
| AW-54 | 9/28/1993 | 12.14 | 13.99 | 5.86 | 5.23 | 8.76 |
| AW-54 | 10/29/1993 | 12.14 | 13.60 | 6.08 | 5.03 | 8.57 |
| AW-54 | 11/30/1993 | 12.14 | 13.72 | 6.51 | 4.53 | 9.19 |
| AW-54 | 12/27/1993 | 12.14 | 13.90 | 6.18 | 4.88 | 9.02 |
| AW-54 | 3/31/1994 | 12.14 | 14.03 | 6.24 | 4.79 | 9.24 |
| AW-54 | 9/9/1994 | 12.14 | 3.51 | 8.63 | -- | -- |
| AW-54 | 9/29/1994 | 12.14 | 4.23 | 8.06 | 4.06 | 0.17 |
| AW-54 | 11/23/1994 | 12.14 | 11.81 | 7.56 | 3.59 | 8.22 |
| AW-54 | 1/4/1995 | 12.14 | 13.59 | 7.83 | 3.04 | 10.55 |
| AW-54 | 2/8/1995 | 12.14 | -- [7] | -- [7] | -- [7] | -- [7] |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-54 | 3/16/1995 | 12.14 | 14.48 | 7.21 | 3.63 | 10.85 |
| AW-54 | 5/25/1995 | 12.14 | 0.00 | 8.18 | 4.50 | 4.50 |
| AW-54 | 12/12/1995 | 12.14 | 14.34 | 6.49 | 4.46 | 9.88 |
| AW-54 | 10/2/2003 | 12.14 | 15.62 | 5.08 | 4.92 | 10.70 |
| AW-54 | 11/25-26/2008 | 10.66 | 16.40 | 5.38 | 2.50 | 13.90 |
| AW-54 | 3/5/2009 | 10.66 | 15.96 | 4.14 | 4.16 | 11.80 |
| AW-54 | 6/30/2009 | 10.66 | 7.40 | 6.45 | 3.66 | 3.74 |
| AW-54 | 9/23/2009 | 10.66 | 16.10 | 5.29 | 3.53 | 12.57 |
| AW-54 | 12/29/2009 | 10.66 | -- [7] | -- [7] | 2.52 | -- [7] |
| AW-54 | 12/13/2010 | 10.66 | 18.26 | 4.37 | 4.24 | 14.02 |
| AW-55 | 7/23/1991 | 15.25 | 8.29 | 5.03 | 5.78 | 2.51 |
| AW-55 | 8/22/1991 | 15.25 | 12.64 | 4.91 | 9.73 | 2.91 |
| AW-55 | 9/26/1991 | 15.25 | 13.19 | 4.43 | 10.19 | 3.00 |
| AW-55 | 10/25-26/1991 | 15.25 | 13.38 | 4.10 | 10.56 | 2.82 |
| AW-55 | 11/26/1991 | 15.25 | 14.70 | 3.35 | 11.16 | 3.54 |
| AW-55 | 12/20/1991 | 15.25 | 15.08 | 3.08 | 11.40 | 3.68 |
| AW-55 | 1/20/1992 | 15.25 | 13.21 | 3.88 | 10.88 | 2.33 |
| AW-55 | 3/23/1992 | 15.25 | 14.09 | 3.62 | 10.97 | 3.12 |
| AW-55 | 4/22/1992 | 15.25 | 12.99 | 4.12 | 10.63 | 2.36 |
| AW-55 | 5/27-28/1992 | 15.25 | 13.90 | 3.69 | 10.94 | 2.96 |
| AW-55 | 6/24/1992 | 15.25 | 12.28 | 4.74 | 10.04 | 2.24 |
| AW-55 | 7/27/1992 | 15.25 | 13.46 | 4.09 | 10.55 | 2.91 |
| AW-55 | 8/26/1992 | 15.25 | 10.61 | 5.81 | 9.13 | 1.48 |
| AW-55 | 9/29/1992 | 15.25 | 12.41 | 4.73 | 10.02 | 2.39 |
| AW-55 | 11/25/1992 | 15.25 | 12.22 | 4.57 | 10.27 | 1.95 |
| AW-55 | 12/18/1992 | 15.25 | 12.53 | 4.32 | 10.50 | 2.03 |
| AW-55 | 1/28/1993 | 15.25 | 12.14 | 4.60 | 10.26 | 1.88 |
| AW-55 | 2/24/1993 | 15.25 | 12.81 | 4.12 | 10.68 | 2.13 |
| AW-55 | 3/30/1993 | 15.25 | 12.94 | 4.39 | 10.31 | 2.63 |
| AW-55 | 8/9-10/1993 | 15.25 | 14.98 | 2.97 | 11.56 | 3.42 |
| AW-55 | 9/28/1993 | 15.25 | 14.07 | 3.42 | 11.24 | 2.83 |
| AW-55 | 10/29/1993 | 15.25 | 13.63 | 3.58 | 11.15 | 2.48 |
| AW-55 | 11/30/1993 | 15.25 | 12.78 | 3.99 | 10.85 | 1.93 |
| AW-55 | 12/27/1993 | 15.25 | 13.70 | 3.53 | 11.19 | 2.51 |
| AW-55 | 3/31/1994 | 15.25 | 13.25 | 3.73 | 11.06 | 2.19 |
| AW-55 | 9/9/1994 | 15.25 | 11.04 | 4.96 | 10.09 | 0.95 |
| AW-55 | 9/29/1994 | 15.25 | 12.26 | 4.29 | 10.61 | 1.65 |
| AW-55 | 11/23/1994 | 15.25 | 11.70 | 4.57 | 10.41 | 1.29 |
| AW-55 | 1/4/1995 | 15.25 | 11.29 | 4.83 | 10.19 | 1.10 |
| AW-55 | 2/8/1995 | 15.25 | 12.98 | 3.69 | 11.18 | 1.80 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-55 | 3/16/1995 | 15.25 | 12.45 | 4.19 | 10.69 | 1.76 |
| AW-55 | 5/25/1995 | 15.25 | DRY | -- | -- | -- |
| AW-55 | 12/12/1995 | 15.25 | 13.39 | 3.66 | 11.11 | 2.28 |
| AW-55 | 10/2/2003 | 15.25 | 12.23 | 4.35 | 10.57 | 1.66 |
| AW-55 | 11/25-26/2008 | 15.31 | 12.20 | 3.83 | 11.30 | 0.90 |
| AW-55 | 3/5/2009 | 15.31 | 12.50 | 2.81 | -- | -- |
| AW-55 | 6/30/2009 | Abandoned | | | | |
| AW-56 | 7/23/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 8/22/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 9/26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 10/25-26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 11/26/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 12/20/1991 | 15.16 | Recovery Well | | | |
| AW-56 | 1/20/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 3/23/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 4/22/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 5/27-28/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 6/24/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 7/27/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 8/26/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 9/29/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 11/25/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 12/18/1992 | 15.16 | Recovery Well | | | |
| AW-56 | 1/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 2/24/1993 | 15.16 | 14.15 | 3.31 | 11.41 | 2.74 |
| AW-56 | 3/30/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 8/9-10/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 9/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 9/28/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 11/30/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 12/27/1993 | 15.16 | Recovery Well | | | |
| AW-56 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 9/9/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-56 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-56 | 12/12/1995 | 15.06 | Recovery Well | | | |
| TRUCK LOADING | 11/25-26/2008 | 12.65 | 14.60 | 2.29 | 9.30 | 5.30 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| TRUCK LOADING | 3/6/2009 | 12.65 | 15.05 | 0.95 | 10.86 | 4.19 |
| TRUCK LOADING | 6/30/2009 | 12.65 | 15.32 | 2.27 | 9.53 | 5.79 |
| TRUCK LOADING | 9/23/2009 | 12.65 | 14.94 | 2.69 | 9.11 | 5.83 |
| TRUCK LOADING | 12/29/2009 | 12.65 | 15.72 | 2.31 | 9.42 | 6.30 |
| TRUCK LOADING | 3/24/2010 | 12.65 | 15.26 | 1.92 | 9.95 | 5.31 |
| TRUCK LOADING | 12/13/2010 | 12.65 | 15.93 | 1.02 | 10.89 | 5.04 |
| AW-57 | 7/23/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 8/22/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 9/26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 10/25-26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 11/26/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 12/20/1991 | 14.21 | Recovery Well | | | |
| AW-57 | 1/20/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 3/23/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 4/22/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 5/27-28/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 6/24/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 7/27/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 8/26/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 9/29/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 11/25/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 12/18/1992 | 14.21 | Recovery Well | | | |
| AW-57 | 1/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 2/24/1993 | 14.21 | 11.75 | 3.88 | 9.86 | 1.89 |
| AW-57 | 3/30/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 8/9-10/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 9/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 9/28/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 11/30/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 12/27/1993 | 14.21 | Recovery Well | | | |
| AW-57 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-57 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-57 | 12/12/1995 | 15.06 | Recovery Well | | | |
| TANK 3 | 11/25-26/2008 | 12.14 | 9.10 | 3.88 | 8.05 | 1.05 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| TANK 3 | 3/5/2009 | 12.14 | 11.19 | 2.10 | 9.75 | 1.44 |
| TANK 3 | 6/30/2009 | 12.14 | 11.64 | 3.27 | 8.40 | 3.24 |
| TANK 3 | 9/23/2009 | 12.14 | 10.99 | 3.66 | 8.05 | 2.94 |
| TANK 3 | 12/29/2009 | 12.14 | 11.55 | 3.45 | 8.70 | 3.35 |
| AW-58 | 7/23/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 8/22/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 9/26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 10/25-26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 11/26/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 12/20/1991 | 13.25 | Recovery Well | | | |
| AW-58 | 1/20/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 3/23/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 4/22/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 5/27-28/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 7/27/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 8/26/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 9/29/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 11/25/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 12/18/1992 | 13.25 | Recovery Well | | | |
| AW-58 | 1/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 2/24/1993 | 13.25 | 9.75 | 3.50 | -- | -- |
| AW-58 | 3/30/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 8/9-10/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 9/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 9/28/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 11/30/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 12/27/1993 | 13.25 | Recovery Well | | | |
| AW-58 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-58 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-58 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 7/23/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 8/22/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 9/26/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 10/25-26/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 11/26/1991 | 14.29 | Recovery Well | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-59 | 12/20/1991 | 14.29 | Recovery Well | | | |
| AW-59 | 1/20/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 2/27-28/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 3/23/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 4/22/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 5/27-28/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 7/27/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 8/26/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 9/29/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 11/25/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 12/18/1992 | 14.29 | Recovery Well | | | |
| AW-59 | 1/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 2/24/1993 | 14.29 | 11.15 | 3.14 | 11.14 | 0.01 |
| AW-59 | 3/30/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 8/9-10/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 9/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 9/28/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 11/30/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 12/27/1993 | 14.29 | Recovery Well | | | |
| AW-59 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 3/31/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 9/29/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 11/23/1994 | 15.06 | Recovery Well | | | |
| AW-59 | 1/4/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 2/8/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 3/16/1995 | 15.06 | Recovery Well | | | |
| AW-59 | 12/12/1995 | 15.06 | Recovery Well | | | |
| AW-60 | 7/23/1991 | 10.24 | 5.98 | 4.26 | -- | -- |
| AW-60 | 8/22/1991 | 10.24 | 5.88 | 4.36 | -- | -- |
| AW-60 | 9/26/1991 | 10.24 | 11.42 | -1.18 | -- | -- |
| AW-60 | 10/25-26/1991 | 10.24 | 6.35 | 3.89 | -- | -- |
| AW-60 | 11/26/1991 | 10.24 | 9.42 | 0.82 | -- | -- |
| AW-60 | 12/20/1991 | 10.24 | 9.96 | 0.28 | -- | -- |
| AW-60 | 1/20/1992 | 10.24 | 7.19 | 3.05 | -- | -- |
| AW-60 | 2/27-28/1992 | 10.24 | 10.63 | -0.39 | -- | -- |
| AW-60 | 3/23/1992 | 10.24 | 7.56 | 2.68 | -- | -- |
| AW-60 | 4/22/1992 | 10.24 | 7.63 | 2.61 | -- | -- |
| AW-60 | 5/27-28/1992 | 10.24 | 8.49 | 1.75 | -- | -- |
| AW-60 | 7/27/1992 | 10.24 | 11.14 | -0.90 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-60 | 8/26/1992 | 10.24 | 11.13 | -0.89 | -- | -- |
| AW-60 | 9/29/1992 | 10.24 | 5.99 | 4.25 | -- | -- |
| AW-60 | 11/25/1992 | 10.24 | 10.73 | -0.49 | -- | -- |
| AW-60 | 12/18/1992 | 10.24 | 9.57 | 0.67 | -- | -- |
| AW-60 | 1/28/1993 | 10.24 | 6.69 | 3.55 | -- | -- |
| AW-60 | 2/24/1993 | 10.24 | 8.60 | 1.64 | -- | -- |
| AW-60 | 3/30/1993 | 10.24 | 6.87 | 3.37 | -- | -- |
| AW-60 | 8/9-10/1993 | 10.24 | 11.13 | -0.89 | -- | -- |
| AW-60 | 9/28/1993 | 10.24 | 11.57 | -1.33 | -- | -- |
| AW-60 | 10/29/1993 | 10.24 | 9.15 | 1.09 | -- | -- |
| AW-60 | 11/30/1993 | 10.24 | 8.65 | 1.59 | -- | -- |
| AW-60 | 12/27/1993 | 10.24 | 8.61 | 1.63 | -- | -- |
| AW-60 | 3/31/1994 | 10.24 | 6.20 | 4.04 | -- | -- |
| AW-60 | 9/9/1994 | 10.24 | 7.31 | 2.93 | -- | -- |
| AW-60 | 9/29/1994 | 10.24 | 7.09 | 3.15 | -- | -- |
| AW-60 | 11/23/1994 | 10.24 | 5.78 | 4.46 | -- | -- |
| AW-60 | 1/4/1995 | 10.24 | 10.46 | -0.22 | -- | -- |
| AW-60 | 2/8/1995 | 10.24 | 8.81 | 1.43 | -- | -- |
| AW-60 | 3/16/1995 | 10.24 | 11.28 | -1.04 | -- | -- |
| AW-60 | 5/25/1995 | 10.24 | 0.00 | 10.24 | -- | -- |
| AW-60 | 12/12/1995 | 10.24 | 9.43 | 0.81 | -- | -- |
| AW-61 | 7/23/1991 | 9.87 | 6.20 | 3.67 | -- | -- |
| AW-61 | 8/22/1991 | 9.87 | 5.90 | 4.03 | 5.82 | 0.08 |
| AW-61 | 9/26/1991 | 9.87 | 10.14 | 0.04 | 9.75 | 0.39 |
| AW-61 | 10/25-26/1991 | 9.87 | 10.07 | 0.03 | 9.78 | 0.29 |
| AW-61 | 11/26/1991 | 9.87 | 7.12 | 2.77 | 7.10 | 0.02 |
| AW-61 | 12/20/1991 | 9.87 | 9.20 | 0.67 | -- | -- |
| AW-61 | 1/20/1992 | 9.87 | 6.56 | 3.31 | -- | -- |
| AW-61 | 2/27-28/1992 | 9.87 | 9.50 | 0.39 | 9.47 | 0.03 |
| AW-61 | 3/23/1992 | 9.87 | 7.80 | 2.07 | -- | -- |
| AW-61 | 4/22/1992 | 9.87 | 7.12 | 2.75 | -- | -- |
| AW-61 | 5/27-28/1992 | 9.87 | 6.38 | 3.49 | -- | -- |
| AW-61 | 7/27/1992 | 9.87 | 9.41 | 0.46 | 9.40 | 0.01 |
| AW-61 | 8/26/1992 | 9.87 | 9.22 | 0.65 | 9.10 | 0.12 |
| AW-61 | 9/29/1992 | 9.87 | 5.43 | 4.44 | -- | -- |
| AW-61 | 11/25/1992 | 9.87 | 8.88 | 0.99 | 8.85 | 0.03 |
| AW-61 | 12/18/1992 | 9.87 | 9.37 | 0.50 | -- | -- |
| AW-61 | 1/28/1993 | 9.87 | 6.90 | 2.97 | -- | -- |
| AW-61 | 2/24/1993 | 9.87 | 7.46 | 2.41 | -- | -- |
| AW-61 | 3/30/1993 | 9.87 | 7.12 | 2.75 | -- | -- |
| AW-61 | 8/9-10/1993 | 9.87 | 11.76 | -1.89 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-61 | 9/28/1993 | 9.87 | 9.76 | 0.13 | 9.74 | 0.02 |
| AW-61 | 10/29/1993 | 9.87 | 7.65 | 2.24 | 7.63 | 0.02 |
| AW-61 | 11/30/1993 | 9.87 | 7.31 | 2.59 | 7.28 | 0.03 |
| AW-61 | 12/27/1993 | 9.87 | 8.57 | 1.32 | 8.55 | 0.02 |
| AW-61 | 3/31/1994 | 9.87 | 6.21 | 3.66 | -- | -- |
| AW-61 | 9/9/1994 | 9.87 | 6.24 | 3.63 | -- | -- |
| AW-61 | 9/29/1994 | 9.87 | 7.49 | 2.38 | -- | -- |
| AW-61 | 11/23/1994 | 9.87 | 5.80 | 4.07 | -- | -- |
| AW-61 | 1/4/1995 | 9.87 | 8.23 | 1.64 | -- | -- |
| AW-61 | 2/8/1995 | 9.87 | 8.32 | 1.55 | -- | -- |
| AW-61 | 3/16/1995 | 9.87 | 10.19 | -0.31 | 10.18 | 0.01 |
| AW-61 | 5/25/1995 | 9.87 | 6.45 | 3.42 | -- | -- |
| AW-61 | 12/12/1995 | 9.87 | 7.91 | 1.96 | -- | -- |
| AW-62 | 7/23/1991 | 8.77 | 7.09 | 3.89 | 4.49 | 2.60 |
| AW-62 | 8/22/1991 | 8.77 | 6.62 | 4.30 | 4.09 | 2.53 |
| AW-62 | 9/26/1991 | 8.77 | 15.39 | -0.82 | 8.57 | 6.82 |
| AW-62 | 10/25-26/1991 | 8.77 | 15.55 | -0.80 | 8.52 | 7.03 |
| AW-62 | 11/26/1991 | 8.77 | 8.01 | 2.55 | 5.91 | 2.10 |
| AW-62 | 12/20/1991 | 8.77 | 12.65 | -0.14 | 8.25 | 4.40 |
| AW-62 | 1/20/1992 | 8.77 | 6.38 | 3.75 | 4.78 | 1.60 |
| AW-62 | 2/27-28/1992 | 8.77 | 14.83 | -0.71 | 8.54 | 6.29 |
| AW-62 | 3/23/1992 | 8.77 | 8.21 | 2.61 | 5.80 | 2.41 |
| AW-62 | 4/22/1992 | 8.77 | 8.81 | 3.05 | 5.18 | 3.63 |
| AW-62 | 5/27-28/1992 | 8.77 | 6.47 | 3.67 | 4.86 | 1.61 |
| AW-62 | 7/27/1992 | 8.77 | 15.43 | -0.76 | 8.49 | 6.94 |
| AW-62 | 8/26/1992 | 8.77 | 15.41 | 0.19 | 7.37 | 8.04 |
| AW-62 | 9/29/1992 | 8.77 | 6.88 | 4.69 | 3.59 | 3.29 |
| AW-62 | 11/25/1992 | 8.77 | 12.24 | 1.10 | 6.86 | 5.38 |
| AW-62 | 12/18/1992 | 8.77 | 13.19 | 0.51 | 7.39 | 5.80 |
| AW-62 | 1/28/1993 | 8.77 | 8.20 | 4.12 | 4.02 | 4.18 |
| AW-62 | 2/24/1993 | 8.77 | 10.16 | 2.45 | 5.64 | 4.52 |
| AW-62 | 3/30/1993 | 8.77 | 10.50 | 2.66 | 5.34 | 5.16 |
| AW-62 | 8/9-10/1993 | 8.77 | 11.48 | 0.10 | 8.17 | 3.31 |
| AW-62 | 9/28/1993 | 8.77 | 13.90 | -0.31 | 8.23 | 5.67 |
| AW-62 | 10/29/1993 | 8.77 | 9.01 | 2.36 | 5.95 | 3.06 |
| AW-62 | 11/30/1993 | 8.77 | 8.66 | 2.92 | 5.35 | 3.31 |
| AW-62 | 12/27/1993 | 8.77 | 7.36 | 1.86 | 6.83 | 0.53 |
| AW-62 | 3/31/1994 | 8.77 | 6.45 | 3.69 | 4.84 | 1.61 |
| AW-62 | 9/9/1994 | 8.77 | 6.32 | 3.95 | 4.56 | 1.76 |
| AW-62 | 9/29/1994 | 8.77 | 9.53 | 2.60 | 5.58 | 3.95 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-62 | 11/23/1994 | 8.77 | 5.90 | 4.49 | 3.99 | 1.91 |
| AW-62 | 1/4/1995 | 8.77 | 13.62 | 0.68 | 7.12 | 6.50 |
| AW-62 | 2/8/1995 | 8.77 | 10.71 | 1.32 | 6.87 | 3.84 |
| AW-62 | 3/16/1995 | 8.77 | 16.17 | -1.66 | 9.42 | 6.75 |
| AW-62 | 5/25/1995 | 8.77 | 6.03 | 3.88 | 4.69 | 1.34 |
| AW-62 | 12/12/1995 | 8.77 | 10.93 | 1.61 | 6.49 | 4.44 |
| AW-62 | 10/2/2003 | 8.77 | 5.47 | 4.38 | 4.12 | 1.35 |
| AW-62 | 11/25-26/2008 | -- | -- | -- | -- | -- |
| FIREHOUSE [13] | 11/25-26/2008 | 7.70 | -- | -- | -- | -- |
| FIREHOUSE | 3/5/2009 | 7.70 | 9.86 | -2.16 | -- | -- |
| FIREHOUSE | 6/30/2009 | 7.70 | NM | -- | -- | -- |
| FIREHOUSE | 9/23/2009 [10] | 7.70 | 10.38 | -0.93 | 8.33 | 2.05 |
| FIREHOUSE | 9/23/2009 [11] | 7.70 | 5.41 | 3.75 | 3.70 | 1.71 |
| FIREHOUSE | 12/29/2009 | 7.70 | 10.98 | -1.65 | 9.07 | 1.91 |
| FIREHOUSE | 3/24/2010 | 7.70 | 12.50 | -2.58 | 9.90 | 2.60 |
| FIREHOUSE | 12/13/2010 | 7.70 | 10.33 | -2.37 | 10.03 | 0.30 |
| AW-63 | 7/23/1991 | 9.10 | 5.94 | 3.24 | 5.85 | 0.09 |
| AW-63 | 8/22/1991 | 9.10 | 5.87 | 3.71 | 5.33 | 0.54 |
| AW-63 | 9/26/1991 | 9.10 | -- | -- | 8.49 | -- |
| AW-63 | 10/25-26/1991 | 9.10 | 8.74 | 0.46 | 8.63 | 0.11 |
| AW-63 | 11/26/1991 | 9.10 | 6.31 | 2.80 | 6.30 | 0.01 |
| AW-63 | 12/20/1991 | 9.10 | 9.41 | -0.29 | 9.39 | 0.02 |
| AW-63 | 1/20/1992 | 9.10 | 5.78 | 3.32 | -- | -- |
| AW-63 | 2/27-28/1992 | 9.10 | 8.42 | 0.70 | 8.40 | 0.02 |
| AW-63 | 3/23/1992 | 9.10 | 7.13 | 2.04 | 7.05 | 0.08 |
| AW-63 | 4/22/1992 | 9.10 | 6.32 | 2.84 | 6.25 | 0.07 |
| AW-63 | 5/27-28/1992 | 9.10 | 6.65 | 2.45 | -- | -- |
| AW-63 | 7/27/1992 | 9.10 | 9.70 | -0.02 | 9.05 | 0.65 |
| AW-63 | 9/29/1992 | 9.10 | 7.03 | 4.30 | 4.52 | 2.51 |
| AW-63 | 11/25/1992 | 9.10 | 9.88 | 1.29 | 7.55 | 2.33 |
| AW-63 | 12/18/1992 | 9.10 | 10.78 | 0.86 | 7.93 | 2.85 |
| AW-63 | 1/28/1993 | 9.10 | 7.18 | 3.77 | 5.10 | 2.08 |
| AW-63 | 2/24/1993 | 9.10 | 8.19 | 2.62 | 6.27 | 1.92 |
| AW-63 | 3/30/1993 | 9.10 | 7.81 | 2.72 | 6.20 | 1.61 |
| AW-63 | 8/9-10/1993 | 9.10 | 8.68 | 0.43 | 8.67 | 0.01 |
| AW-63 | 9/28/1993 | 9.10 | 8.73 | 0.41 | 8.69 | 0.04 |
| AW-63 | 10/29/1993 | 9.10 | 6.97 | 2.16 | 6.94 | 0.03 |
| AW-63 | 11/30/1993 | 9.10 | 6.76 | 2.40 | 6.69 | 0.07 |
| AW-63 | 12/27/1993 | 9.10 | 7.89 | 1.25 | 7.85 | 0.04 |
| AW-63 | 3/31/1994 | 9.10 | 5.90 | 3.23 | 5.87 | 0.03 |
| AW-63 | 9/9/1994 | 9.10 | 5.50 | 3.75 | 5.33 | 0.17 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-63 | 9/29/1994 | 9.10 | 7.78 | 1.96 | 7.06 | 0.72 |
| AW-63 | 11/23/1994 | 9.10 | 6.73 | 3.55 | 5.40 | 1.33 |
| AW-63 | 1/4/1995 | 9.10 | 9.30 | 2.05 | 6.77 | 2.53 |
| AW-63 | 2/8/1995 | 9.10 | 8.35 | 2.06 | 6.88 | 1.47 |
| AW-63 | 3/16/1995 | 9.10 | 11.19 | 0.70 | 8.05 | 3.14 |
| AW-63 | 5/25/1995 | 9.10 | 5.41 | 3.97 | 5.10 | 0.31 |
| AW-63 | 12/12/1995 | 9.10 | 8.52 | 2.16 | 6.75 | 1.77 |
| AW-64 | 7/23/1991 | 8.71 | 7.65 | 2.46 | 5.90 | 1.75 |
| AW-64 | 8/22/1991 | 8.71 | 7.38 | 2.83 | 5.51 | 1.87 |
| AW-64 | 9/26/1991 | 8.71 | 7.75 | 1.79 | 6.71 | 1.04 |
| AW-64 | 10/25-26/1991 | 8.71 | 8.90 | 1.49 | 6.80 | 2.10 |
| AW-64 | 11/26/1991 | 8.71 | 7.29 | 1.69 | 6.95 | 0.34 |
| AW-64 | 12/20/1991 | 8.71 | 13.92 | -0.46 | 7.98 | 5.94 |
| AW-64 | 1/20/1992 | 8.71 | 7.13 | 2.96 | 5.40 | 1.73 |
| AW-64 | 2/27-28/1992 | 8.71 | 8.72 | 1.21 | 7.20 | 1.52 |
| AW-64 | 3/23/1992 | 8.71 | 7.65 | 1.26 | 7.40 | 0.25 |
| AW-64 | 4/22/1992 | 8.71 | 7.30 | 2.43 | 6.03 | 1.27 |
| AW-64 | 5/27-28/1992 | 8.71 | 7.40 | 2.69 | 5.68 | 1.72 |
| AW-64 | 7/27/1992 | 8.71 | 15.74 | -0.70 | 7.83 | 7.91 |
| AW-64 | 9/29/1992 | 8.71 | 5.50 | 3.94 | 4.59 | 0.91 |
| AW-64 | 11/25/1992 | 8.71 | 6.87 | 3.11 | 5.28 | 1.59 |
| AW-64 | 12/18/1992 | 8.71 | 7.77 | 1.40 | 7.20 | 0.57 |
| AW-64 | 1/28/1993 | 8.71 | 5.66 | 3.51 | 5.09 | 0.57 |
| AW-64 | 2/24/1993 | 8.71 | 6.26 | 2.91 | 5.69 | 0.57 |
| AW-64 | 3/30/1993 | 8.71 | 7.11 | 2.39 | 6.12 | 0.99 |
| AW-64 | 8/9-10/1993 | 8.71 | 8.07 | 0.99 | 7.63 | 0.44 |
| AW-64 | 9/28/1993 | 8.71 | 8.96 | 0.89 | 7.53 | 1.43 |
| AW-64 | 10/29/1993 | 8.71 | 7.36 | 2.71 | 5.66 | 1.70 |
| AW-64 | 11/30/1993 | 8.71 | 6.71 | 2.98 | 5.48 | 1.23 |
| AW-64 | 12/27/1993 | 8.71 | 9.12 | 0.86 | 7.53 | 1.59 |
| AW-64 | 3/31/1994 | 8.71 | 16.86 | -4.22 | 11.95 | 4.91 |
| AW-64 | 9/9/1994 | 8.71 | 6.07 | 3.90 | 4.49 | 1.58 |
| AW-64 | 9/29/1994 | 8.71 | 7.62 | 1.55 | 7.04 | 0.58 |
| AW-64 | 11/23/1994 | 8.71 | 5.76 | 3.36 | 5.25 | 0.51 |
| AW-64 | 1/4/1995 | 8.71 | 5.93 | 3.16 | 5.45 | 0.48 |
| AW-64 | 2/8/1995 | 8.71 | 7.36 | 1.35 | -- | -- |
| AW-64 | 3/16/1995 | 8.71 | 8.20 | 1.42 | 7.06 | 1.14 |
| AW-64 | 5/25/1995 | 8.71 | 6.29 | 3.17 | 5.35 | 0.94 |
| AW-64 | 12/12/1995 | 8.71 | 6.81 | 2.40 | 6.19 | 0.62 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-65 | 7/23/1991 | 8.73 | 5.87 | 2.86 | -- | -- |
| AW-65 | 8/22/1991 | 8.73 | 5.04 | 3.69 | -- | -- |
| AW-65 | 9/26/1991 | 8.73 | 8.95 | -0.22 | -- | -- |
| AW-65 | 10/25-26/1991 | 8.73 | 9.31 | -0.58 | -- | -- |
| AW-65 | 11/26/1991 | 8.73 | 5.04 | 3.69 | -- | -- |
| AW-65 | 12/20/1991 | 8.73 | 10.74 | -2.01 | -- | -- |
| AW-65 | 1/20/1992 | 8.73 | 5.20 | 3.53 | -- | -- |
| AW-65 | 2/27-28/1992 | 8.73 | 8.97 | -0.14 | 8.85 | 0.12 |
| AW-65 | 3/23/1992 | 8.73 | 6.20 | 2.53 | -- | -- |
| AW-65 | 4/22/1992 | 8.73 | 5.84 | 2.89 | -- | -- |
| AW-65 | 5/27-28/1992 | 8.73 | 8.80 | -0.06 | 8.79 | 0.01 |
| AW-65 | 7/27/1992 | 8.73 | 11.28 | -2.53 | 11.25 | 0.03 |
| AW-65 | 9/29/1992 | 8.73 | NA | -- |  | -- |
| AW-65 | 11/25/1992 | 8.73 | 8.33 | 0.42 | 8.31 | 0.02 |
| AW-65 | 12/18/1992 | 8.73 | 9.59 | -0.86 | -- | -- |
| AW-65 | 1/28/1993 | 8.73 | 4.63 | 4.10 | -- | -- |
| AW-65 | 2/24/1993 | 8.73 | 5.74 | 2.99 | -- | -- |
| AW-65 | 3/30/1993 | 8.73 | 5.96 | 2.77 | -- | -- |
| AW-65 | 8/9-10/1993 | 8.73 | 5.08 | 3.65 | -- | -- |
| AW-65 | 9/28/1993 | 8.73 | 9.75 | -1.02 | -- | -- |
| AW-65 | 10/29/1993 | 8.73 | 6.09 | 2.66 | 6.07 | 0.02 |
| AW-65 | 11/30/1993 | 8.73 | 5.06 | 3.67 | -- | -- |
| AW-65 | 12/27/1993 | 8.73 | 8.47 | 0.26 | -- | -- |
| AW-65 | 3/31/1994 | 8.73 | 4.54 | 4.19 | -- | -- |
| AW-65 | 9/9/1994 | 8.73 | 0.00 | 8.73 | -- | -- |
| AW-65 | 9/29/1994 | 8.73 | 0.00 | 8.73 | -- | -- |
| AW-65 | 11/23/1994 | 8.73 | 4.18 | 4.57 | 4.15 | 0.03 |
| AW-65 | 1/4/1995 | 8.73 | 7.96 | 0.77 | -- | -- |
| AW-65 | 2/8/1995 | 8.73 | 7.05 | 1.68 | -- | -- |
| AW-65 | 3/16/1995 | 8.73 | 11.01 | -2.28 | 10.97 | 0.04 |
| AW-65 | 5/25/1995 | 8.73 | 6.97 | 1.76 | -- | -- |
| AW-65 | 12/12/1995 | 8.73 | 6.96 | 1.77 | -- | -- |
| AW-65 | 11/25-26/2008 | 13.26 | 15.90 | 1.24 | 11.05 | 4.85 |
| AW-65 | 3/6/2009 | 13.26 | 13.52 | 0.58 | 12.47 | 1.05 |
| AW-65 | 6/30/2009 | 13.26 | 13.50 | 1.83 | 11.08 | 2.42 |
| AW-65 | 6/30/2009 | 13.26 | 12.96 | 2.44 | 10.46 | 2.50 |
| AW-65 | 9/23/2009 [10] | 13.26 | 13.51 | 2.23 | 10.61 | 2.90 |
| AW-65 | 9/23/2009 [11] | 13.26 | 12.73 | 3.20 | 9.61 | 3.12 |
| AW-65 | 12/29/2009 | 13.26 | 13.68 | 2.00 | 10.86 | 2.82 |
| AW-65 | 3/24/2010 | 13.26 | 14.56 | 1.25 | 11.58 | 2.98 |
| AW-65 | 12/13/2010 | 13.26 | 14.62 | 0.91 | 11.96 | 2.66 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-66 | 1/28/1993 | -- | -- | -- | -- | -- |
| AW-66 | 2/24/1993 | -- | -- | -- | -- | -- |
| AW-66 | 3/30/1993 | -- | -- | -- | -- | -- |
| AW-66 | 9/28/1993 | -- | -- | -- | -- | -- |
| AW-66 | 10/29/1993 | -- | -- | -- | -- | -- |
| AW-66 | 11/30/1993 | -- | -- | -- | -- | -- |
| AW-66 | 12/27/1993 | -- | -- | -- | -- | -- |
| AW-66 | 3/31/1994 | -- | -- | -- | -- | -- |
| AW-66 | 9/9/1994 | -- | -- | -- | -- | -- |
| AW-66 | 9/29/1994 | -- | -- | -- | -- | -- |
| AW-66 | 11/23/1994 | -- | -- | -- | -- | -- |
| AW-66 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-66 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-66 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66 | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-66 | 10/2/2003 | 11.77 | 11.94 | 0.55 | 11.04 | 0.90 |
| ADMIN | 11/25-26/2008 | 10.72 | 2.10 | 8.62 | -- | -- |
| ADMIN | 3/5/2009 | 10.72 | 2.75 | 7.97 | -- | -- |
| ADMIN | 6/30/2009 | 10.72 | 3.22 | 7.50 | -- | -- |
| ADMIN | 9/23/2009 | 10.72 | 3.33 | 7.39 | -- | -- |
| ADMIN | 12/29/2009 | 10.72 | 1.87 | 8.85 | -- | -- |
| AW-66A | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-66A | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-66A | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66A | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-66A | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-67 | 1/4/1995 | -- | -- | -- | -- | -- |
| AW-67 | 2/8/1995 | -- | -- | -- | -- | -- |
| AW-67 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-67 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-67 | 12/12/1995 | -- | -- | -- | -- | -- |
| AW-67 | 10/2/2003 | 12.27 | 7.23 | 5.04 | -- | -- |
| AW-67 | 11/25-26/2008 | 11.32 | 11.00 | 0.32 | -- | -- |
| AW-67 | 3/60/09 | 11.32 | 12.30 | -0.98 | -- | -- |
| AW-67 | 6/30/2009 | 11.32 | 11.00 | 0.32 | -- | -- |
| AW-67 | 9/23/2009 [10] | 11.32 | 10.21 | 1.11 | -- | -- |
| AW-67 | 9/23/2009 [11] | 11.32 | 7.19 | 4.13 | -- | -- |
| AW-67 | 12/29/2009 | 11.32 | 8.07 | 3.25 | -- | -- |
| AW-67 | 3/24/2010 | 11.32 | 10.37 | 0.95 | -- | -- |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL)[4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation[5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-68 | 11/25-26/2008 | 13.80 | -- | -- | -- | -- |
| AW-68 | 3/5/2009 | 13.80 | 13.04 | 0.76 | -- | -- |
| AW-68 | 6/30/2009 | 13.80 | 14.44 | 1.29 | 12.18 | 2.26 |
| AW-68 | 6/30/2009 | 13.80 | 12.21 | 2.85 | 10.73 | 1.48 |
| AW-68 | 9/23/2009[10] | 13.80 | 14.80 | 2.03 | 11.25 | 3.55 |
| AW-68 | 9/23/2009[11] | 13.80 | 12.88 | 3.29 | 10.10 | 2.78 |
| AW-68 | 12/29/2009 | 13.80 | 16.84 | 1.57 | 11.43 | 5.41 |
| AW-68 | 3/24/2010 | 13.80 | 17.82 | 1.12 | 11.79 | 6.03 |
| AW-68 | 12/13/2010 | 13.80 | 17.14 | 1.14 | 11.89 | 5.25 |
| AW-69 | 1/4/1995 | -- | -- | -- | -- | 0.47 |
| AW-69 | 2/8/1995 | -- | -- | -- | -- | 0.04 |
| AW-69 | 3/16/1995 | -- | -- | -- | -- | 0.03 |
| AW-69 | 3/16/1995 | -- | -- | -- | -- | -- |
| AW-69 | 12/12/1995 | -- | -- | -- | -- | 0.26 |
| AW-69 | 11/25-26/2008 | 9.44 | -- | -- | -- | -- |
| AW-69 | 3/6/2009 | 9.44 | 8.09 | 1.35 | -- | -- |
| AW-69 | 6/30/2009 | 9.44 | 8.78 | 0.66 | -- | -- |
| AW-69 | 9/23/2009[10] | 9.44 | 6.71 | 2.73 | -- | -- |
| AW-69 | 9/23/2009[11] | 9.44 | 6.38 | 3.06 | -- | -- |
| AW-69 | 12/29/2009 | 9.44 | 6.41 | 3.03 | -- | -- |
| AW-69 | 3/24/2010 | 9.44 | 7.21 | 2.23 | -- | -- |
| AW-70 | 1/4/1995 | -- | -- | -- | -- | 4.40 |
| AW-70 | 2/8/1995 | -- | -- | -- | -- | 2.44 |
| AW-70 | 3/16/1995 | -- | -- | -- | -- | 3.57 |
| AW-70 | 3/16/1995 | -- | -- | -- | -- | 1.73 |
| AW-70 | 12/12/1995 | -- | -- | -- | -- | 0.01 |
| AW-70 | 11/25-26/2008 | 12.25 | -- | -- | -- | -- |
| AW-70 | 3/6/2009 | 12.25 | 12.11 | 0.14 | -- | -- |
| AW-70 | 6/30/2009 | 12.25 | 10.91 | 1.34 | -- | -- |
| AW-70 | 9/23/2009[10] | 12.25 | 10.20 | 2.05 | -- | -- |
| AW-70 | 9/23/2009[11] | 12.25 | 9.05 | 3.20 | -- | -- |
| AW-70 | 12/29/2009 | 12.25 | 10.73 | 1.52 | -- | -- |
| AW-70 | 3/24/2010 | 12.25 | 11.22 | 1.03 | -- | -- |
| AW-71 | 11/25-26/2008 | 13.29 | -- | -- | -- | -- |
| AW-71 | 3/6/2009 | 13.29 | 12.58 | 0.71 | -- | -- |
| AW-71 | 6/30/2009 | 13.29 | 10.94 | 2.41 | 10.87 | 0.07 |
| AW-71 | 6/30/2009 | 13.29 | 10.84 | 2.52 | 10.76 | 0.08 |
| AW-71 | 9/23/2009[10] | 13.29 | 10.92 | 2.63 | 10.62 | 0.30 |
| AW-71 | 9/23/2009[11] | 13.29 | 10.27 | 3.05 | 10.24 | 0.03 |
| AW-71 | 12/29/2009 | 13.29 | 10.70 | 2.79 | 10.46 | 0.24 |
| AW-71 | 3/24/2010 | 13.29 | 11.67 | 2.02 | 11.20 | 0.47 |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| AW-72 | 11/25-26/2008 | 10.12 | -- | -- | -- | -- |
| AW-72 | 3/6/2009 | 10.12 | 10.02 | 0.10 | -- | -- |
| AW-72 | 6/3/2009 | 10.12 | 9.05 | 1.07 | -- | -- |
| AW-72 | 9/23/2009 [10] | 10.12 | 8.45 | 1.67 | -- | -- |
| AW-72 | 9/23/2009 [11] | 10.12 | 6.97 | 3.15 | -- | -- |
| AW-72 | 12/29/2009 | 10.12 | 8.56 | 1.56 | -- | -- |
| AW-72 | 3/24/2010 | 10.12 | 9.01 | 1.11 | -- | -- |
| AW-73 | 11/25-26/2008 | 12.04 | -- | -- | -- | -- |
| AW-73 | 3/6/2009 | 12.04 | 10.34 | 1.70 | -- | -- |
| AW-73 | 6/30/2009 | 12.04 | 9.45 | 2.59 | -- | -- |
| AW-73 | 9/23/2009 | 12.04 | 9.19 | 2.85 | -- | -- |
| AW-73 | 12/29/2009 | 12.04 | 8.71 | 3.33 | -- | -- |
| AW-73 | 3/24/2010 | 12.04 | 8.69 | 3.35 | -- | -- |
| AW-74 | 3/5/2009 | 9.96 | 10.57 | -0.61 | -- | -- |
| AW-74 | 6/30/2009 | 9.96 | 12.77 | -0.27 | 9.79 | 2.98 |
| AW-74 | 6/30/2009 | 9.96 | 8.54 | 3.12 | 6.55 | 1.99 |
| AW-74 | 9/23/2009 [10] | 9.96 | 11.01 | 0.88 | 8.75 | 2.26 |
| AW-74 | 9/23/2009 [11] | 9.96 | 7.91 | 3.62 | 6.07 | 1.84 |
| AW-74 | 12/29/2009 | 9.96 | 13.11 | -0.20 | 9.65 | 3.46 |
| AW-74 | 3/24/2010 | 9.96 | 13.58 | -0.44 | 9.86 | 3.72 |
| AW-74 | 12/13/2010 | 9.96 | 13.12 | 0.60 | 8.72 | 4.40 |
| RAIL LOADING-S | 11/25-26/2008 | 12.30 | 5.75 | 6.55 | -- | -- |
| RAIL LOADING-S | 3/6/2009 | 12.30 | 6.78 | 5.52 | -- | -- |
| RAIL LOADING-S | 6/30/2009 | 12.30 | 5.55 | 6.75 | -- | -- |
| RAIL LOADING-S | 9/23/2009 | 12.30 | 5.87 | 6.43 | -- | -- |
| RAIL LOADING-S | 12/29/2009 | 12.30 | 4.96 | 7.34 | -- | -- |
| RAIL LOADIN-M | 11/25-26/2008 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 3/5/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 6/30/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 9/23/2009 | -- | -- | -- | -- | -- |
| RAIL LOADIN-M | 12/29/2009 | Not Accessible - Blocked | | | | |

*Please refer to notes at end of table.*

Table C-1 Groundwater Elevation and SPH Thickness Data
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| Well ID | Date | Casing Elevation (Feet MSL) [4] | Depth to Groundwater (Feet BTC) | Groundwater Elevation [5, 6, 7] (Feet MSL) | Depth to Product (Feet BTC) | Product Thickness (Feet) |
|---|---|---|---|---|---|---|
| RAIL LOADING-N | 11/25-26/2008 | 12.61 | 6.52 | 6.09 | -- | -- |
| RAIL LOADING-N | 3/6/2009 | 12.61 | 7.71 | 4.90 | -- | -- |
| RAIL LOADING-N | 6/30/2009 | 12.61 | 4.02 | 8.59 | -- | -- |
| RAIL LOADING-N | 9/23/2009 | 12.61 | 6.68 | 5.93 | -- | -- |
| RAIL LOADING-N | 12/29/2009 | 12.61 | 5.43 | 7.18 | -- | -- |
| RAIL LOADING-N | 3/24/2010 | 12.61 | 6.56 | 6.05 | -- | -- |

*Notes:*

1. TOC Elevation - Top of casing elevation.
2. Feet MSL = Feet above mean sea level.
3. Feet BTC = Feet below top of casing.
4. Surveyed on March 5-6, 2009 and February 11, 2011.
5. Specific gravities prior to June 2009 were specified for each individual well in historical documents.
6. The average specific gravity of 0.854 gram per cubic centimeter was determined during June 2009 by Conestoga-Rover and Associates (CRA).
7. Specific gravities were determined for the folowing wells: AW-12 (0.8275), AW-13 (1.0826), AW-51 (0.8806), AW-65 (0.8567),
8. -- = Not available or not applicable.
9. Monitoring wells gauged in 2003 by S&ME.
10. Monitoring wells gauged during low tide.
11. Monitoring wells gauged during high tide.
12. Product too viscous to obtain a water or LNAPL thickness measurement.
13. The FIREHOUSE well is assumed to be well AW-62 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
14. The ADMIN well is assumed to be well AW-66 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
15. The TRUCK LOADING well is assumed to be well ARW-56 based on figures contained in the August 1995 Geraghty & Miller, Inc. *Site Evaluation and Remedial Alternatives* .
16. Recovery Wells (RW) are also referred to as AW wells (i.e AW-53 is RW-53) based on June 3, 1997 figures by Geraghty & Miller,
17. Groundwater elevations were corrected in wells where measurable separate-phase petroleum hydrocarbons were present using the following equation and assuming the specific gravity detailed in notes 5 through 7. (based on back-calculations from previous reports for this project):

$$h_w = \frac{p_g\, h_g}{p_w}$$

where:

water level elevation = top of casing elevation + [$h_w$ - $d_w$];

$h_w$ = depth to groundwater correction; $p_w$ = density of water; and

$d_w$ = depth to groundwater measuring point; $h_g$ = product thickness.

$p_g$ = density of separate-phase hydrocarbons;

# Appendix D

## Boring Logs and Well Construction Information

## *Sample Descriptions*

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, and grain size, and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
MAJOR CONSTITUENT with additional remarks; color, moisture, minor constituents, density/consistency.

## Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and push probe explorations is estimated based on visual observation and is presented parenthetically on test pit and push probe exploration logs.

| SAND and GRAVEL Density | Standard Penetration Resistance in Blows/Foot |
|---|---|
| Very loose | 0 - 4 |
| Loose | 4 - 10 |
| Medium dense | 10 - 30 |
| Dense | 30 - 50 |
| Very dense | >50 |

| SILT or CLAY Density | Standard Penetration Resistance in Blows/Foot | Approximate Shear Strength in TSF |
|---|---|---|
| Very soft | 0 - 2 | <0.125 |
| Soft | 2 - 4 | 0.125 - 0.25 |
| Medium stiff | 4 - 8 | 0.25 - 0.5 |
| Stiff | 8 - 15 | 0.5 - 1.0 |
| Very Stiff | 15 - 30 | 1.0 - 2.0 |
| Hard | >30 | >2.0 |

## Moisture

| | |
|---|---|
| Dry | Little perceptible moisture. |
| Sl. Moist | Some perceptible moisture, probably below optimum. |
| Moist | Probably near optimum moisture content. |
| Wet | Much perceptible moisture, probably above optimum. |

## Minor Constituents

| Minor Constituents | Estimated Percentage |
|---|---|
| Not identified in description | 0 - 5 |
| Slightly (clayey, silty, etc.) | 5 - 12 |
| Clayey, silty, sandy, gravelly | 12 - 30 |
| Very (clayey, silty, etc.) | 30 - 50 |

## Sampling Symbols

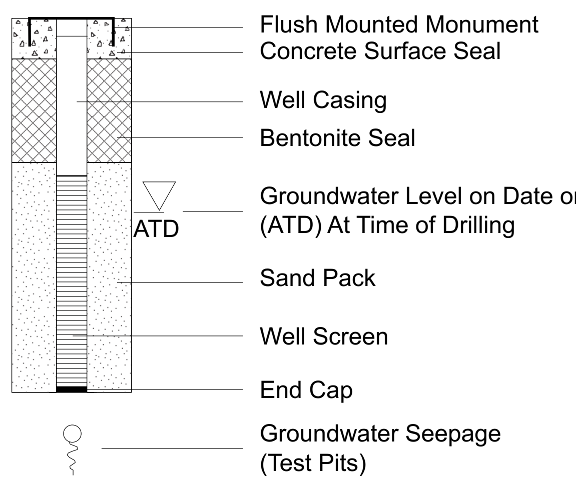
BORING AND PUSH-PROBE SYMBOLS

- Recovery
- No Recovery
- Temporarily Screened Interval
- PID Photoionization Detector Reading
- W Water Sample
- Sample Submitted for Chemical Analysis
- NS No Sheen
- SS Slight Sheen
- MS Moderate Sheen
- HS Heavy Sheen
- BF Biogenic Film

TEST PIT SOIL SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

## Groundwater Observations and Monitoring Well Construction




# Key to Exploration Logs

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

| Project Number | 1634-03 | Figure |
|---|---|---|
| August 2012 | | Key |

Ash Creek Associates
A Division of Apex Companies, LLC
APEX

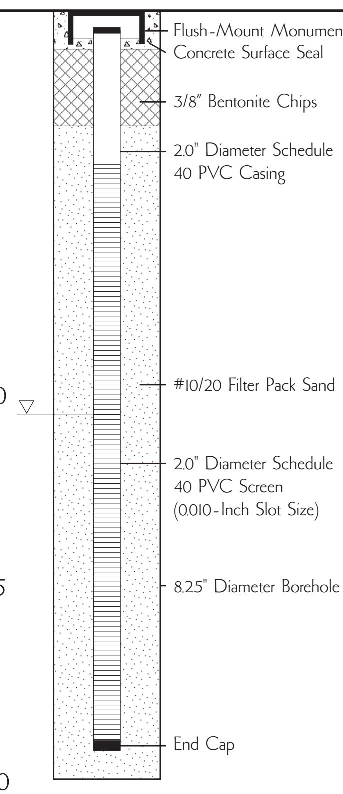
NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Boring Number: **AW-75**

Project Number: **1634-00**
Logged By: M. Whitson
Date: December 16, 2010
Site Conditions: Cloudy (50's)
Drilling Contractor: Drilling Solutions, Inc.
Drilling Equipment: Geoprobe 66DT
Sampler Type: Dual Tube
Depth to Water (ATD): 10.5'
Surface Elevation: 9.72'

| Depth, feet | Core Interval/Recovery | Laboratory Sample ID | PID | Sheen | Lithologic Description |
|---|---|---|---|---|---|
| 0–5 | Air Knife | | <5 | NS | Gravelly SAND; medium brown, slightly moist, medium-grained sand (~75%), gravel and chunks of asphalt (~25%), medium dense. |
| 5 | | | <5 | NS | Becomes silty SAND; stained medium gray in areas, moist, fine-grained sand (~75%), low plastic silt (~25%). No visible staining. |
| | | | <5 | NS | Silty CLAY; medium gray, moist, low plastic, stiff. |
| 10 | | | <5 | NS | Silty SAND; medium reddish brown with some gray mottling, moist, medium-grained sand (80-85%), low plastic silt (15-20%), medium dense. Becomes wet. |
| | | | <5 | NS | 2-3-inch CLAY lens. 2-3-inch CLAY lens. |
| 15 | | | | | No recovery, loose sands. |
| 20 | | | | | Bottom of Boring at 20.0' BGS. |

Well Construction Details and Notes:



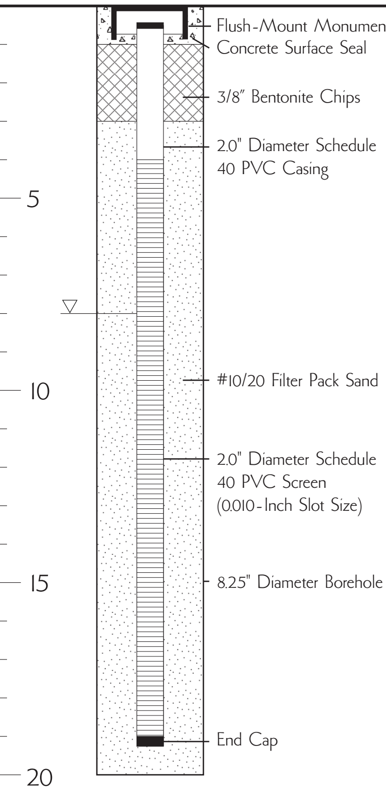
Ash Creek Associates
A Division of Apex Companies, LLC
APEX

**NuStar Savannah Refinery**
**NuStar Asphalt Refining LLC**
**Savannah, Georgia**

| | |
|---|---|
| Boring Number: | **AW-76** |
| Project Number: | **1634-00** |
| Logged By: | M. Whitson |
| Date: | February 05, 2011 |
| Site Conditions: | Rain/Fog (40's to 50's) |
| Drilling Contractor: | Drilling Solutions, Inc. |
| Drilling Equipment: | Geoprobe 66DT |
| Sampler Type: | Dual Tube |
| Depth to Water (ATD): | 8.0' |
| Surface Elevation: | 10.12' |

| Depth, feet | Core Interval/Recovery | Laboratory Sample ID | PID | Sheen | Lithologic Description |
|---|---|---|---|---|---|
| 0 | Air Knife | | | | Silty SAND; medium brown, moist, medium-grained sand (~65%), silt (~35%), loose. |
| | | | | | Concrete block (~6-8"). |
| 5 | | | <5 | NS | Becomes silty SAND with clay; medium light gray with green and brown mottling, fine to very fine-grained sand (~75%), low plastic silt (~15%), low plastic clay (10%), medium dense. |
| | | | 253 | SS | Becomes silty SAND, no clay. |
| | | | | | Becomes wet. |
| | | | 5.3 | SS | Becomes medium-grained. |
| 10 | | | | | |
| | | | 592 | SS | Becomes stained grayish black. |
| | | | | | 2-3-inch CLAY lens. |
| 15 | | | | | |
| | | | 259 | NS | Becomes brown. |
| | | | 142 | NS | Becomes light greenish gray. |
| 20 | | | | | Bottom of Boring at 20.0' BGS. |
| 25 | | | | | |
| 30 | | | | | |
| 35 | | | | | |

Well Construction Details and Notes:



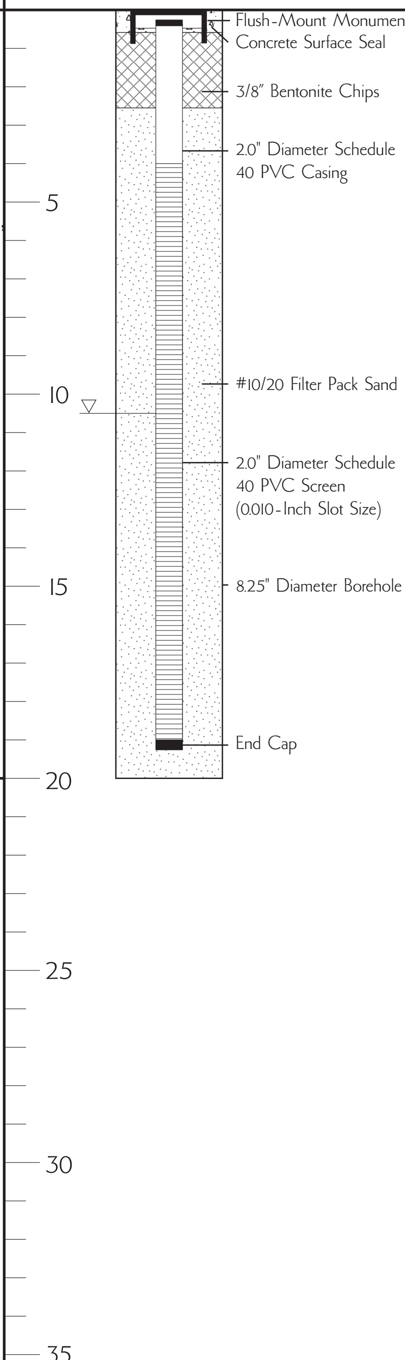
Ash Creek Associates
A Division of Apex Companies, LLC
APEX

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | |
|---|---|
| Boring Number: | **AW-77** |
| Project Number: | **1634-00** |
| Logged By: | M. Whitson |
| Date: | December 15, 2010 |
| Site Conditions: | Partly Cloudy (40's) |
| Drilling Contractor: | Drilling Solutions, Inc. |
| Drilling Equipment: | Geoprobe 66DT |
| Sampler Type: | Dual Tube |
| Depth to Water (ATD): | 10.5' |
| Surface Elevation: | 8.20' |

| Depth, feet | Core Interval/Recovery | Laboratory Sample ID | PID | Sheen | Lithologic Description |
|---|---|---|---|---|---|
| 0–5 | Air Knife | | <5 | NS | Gravelly SAND; medium reddish brown, moist, fine to medium-grained sand (~60%), gravels (~40%), medium dense with areas of hardpan. |
| 5 | | | <5 | NS | Becomes silty SAND with gravel; brown to gray with black staining, moist, fine to very fine sand (60%), silt (30%), gravel (10%), loose to medium dense. |
| ~9 | | | 84.5 | NS | Becomes gray mottled brown and black, wet, no gravel. |
| 10 | | | 23.6 | NS | |
| ~12 | | | <5 | NS | |
| ~17 | | | <5 | NS | |
| ~18 | | | | | Becomes medium to coarse-grained, no silt. |
| 20 | | | | | Bottom of Boring at 20.0' BGS. |

## Well Construction Details and Notes:



Ash Creek Associates
A Division of Apex Companies, LLC
APEX

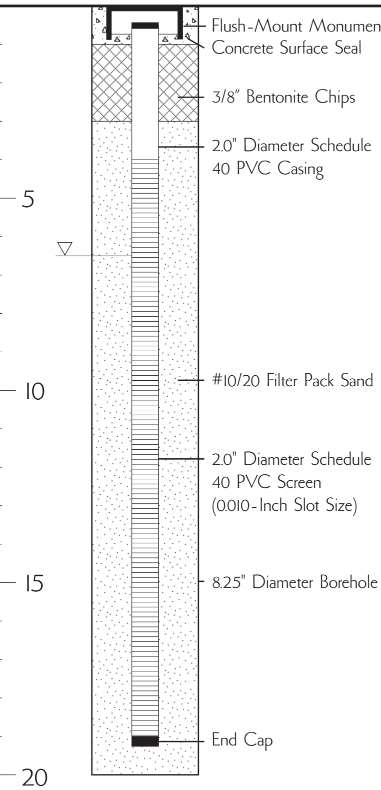
NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | |
|---|---|
| Boring Number: | **AW-78** |
| Project Number: | **1634-00** |
| Logged By: | M. Whitson |
| Date: | February 4, 2011 |
| Site Conditions: | Light Rain (40's) |
| Drilling Contractor: | Drilling Solutions, Inc. |
| Drilling Equipment: | Geoprobe 66DT |
| Sampler Type: | Dual Tube |
| Depth to Water (ATD): | 6.5' |
| Surface Elevation: | 9.01' |

# Lithologic Description

| Depth, feet | Core Interval/Recovery | Laboratory Sample ID | PID | Sheen | Lithologic Description |
|---|---|---|---|---|---|
| 0 | Air Knife | | | | SAND; medium brown, moist, medium-grained sand (>95%), fines (<5%), medium dense. |
| 5 | | | | | Becomes silty SAND with clay; medium gray, moist, fine to medium-grained sand (~70%), low plastic silt (~20%), low plastic clay (~10%). |
| | | | 1,028 | SS | Becomes wet. |
| | | | | | Becomes medium dense. |
| | | | 1,945 | MS | Becomes mottled greenish gray, fine to medium-grained, fines (<5%). |
| 10 | | | 6.0 | NS | Becomes silty SAND; light greenish gray, fine to very fine-grained sand (~80%), low plastic silt (~20%). |
| | | | <5 | NS | Becomes light tan, low plastic clay (~5%). |
| 15 | | | <5 | NS | Becomes light greenish gray, coarse grained, fines (<5%), loose to medium dense. |
| | | | <5 | NS | 2-inch CLAY lens, medium light brown. |
| | | | | | Becomes medium grained. |
| | | | <5 | NS | Becomes black. |
| | | | <5 | NS | |
| 20 | | | | | Bottom of Boring at 20.0' BGS. |
| 25 | | | | | |
| 30 | | | | | |
| 35 | | | | | |

Well Construction Details and Notes:



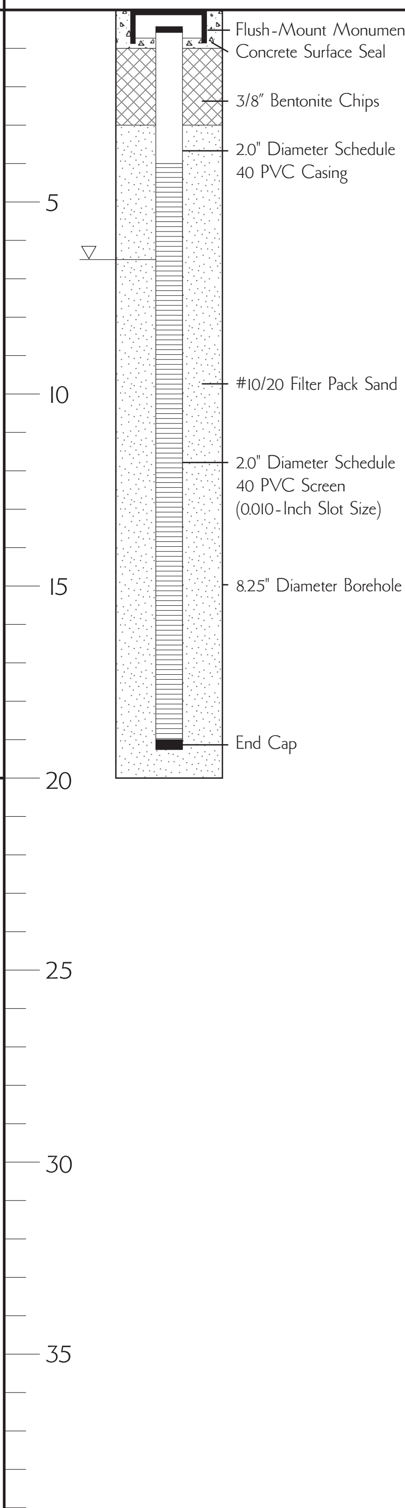
Ash Creek Associates
A Division of Apex Companies, LLC
APEX

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | |
|---|---|
| Boring Number: | **AW-79** |
| Project Number: | **1634-00** |
| Logged By: | M. Whitson |
| Date: | February 4, 2011 |
| Site Conditions: | Overcast (30's to 40's) |
| Drilling Contractor: | Drilling Solutions, Inc. |
| Drilling Equipment: | Geoprobe 66DT |
| Sampler Type: | Dual Tube |
| Depth to Water (ATD): | 6.5' |
| Surface Elevation: | 7.73' |

| Depth, feet | Core Interval/Recovery | Laboratory Sample ID | PID | Sheen | Lithologic Description |
|---|---|---|---|---|---|
| | Air Knife | | <5 | NS | Silty SAND; medium brown, moist, fine to medium-grained sand (~80%), low plastic silt (~20%), loose. |
| | | | | | Rocks and debris (gravel to boulder size). |
| | | | 26.8 | NS | Becomes silty SAND with clay; light gray, very fine to fine-grained sand (~65%), low plastic silt (~25%), low plastic clay (~10%). |
| 5 | | | | | Becomes wet, stained dark gray (6-inches). |
| | | | 424 | MS | |
| | | | 17.2 | NS | Becomes medium grained, sand increases (~80%), silt decreases (~15%), clay decreases (~5%). |
| 10 | | | | | Becomes silty SAND; no clay, very loose. |
| | | | 96.3 | SS | |
| | | | 5.7 | NS | Becomes SAND; medium gray, moist, fine-grained, medium dense. |
| 15 | | | | | |
| | | | 5.1 | NS | Becomes medium-grained. |
| | | | | | Becomes coarse-grained. |
| | | | <5 | NS | |
| 20 | | | | | Bottom of Boring at 20.0' BGS. |
| 25 | | | | | |
| 30 | | | | | |
| 35 | | | | | |

Well Construction Details and Notes:



# *Appendix E*

## Field Data Sheets

# WELL GAGING DATA SHEET

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| | | | |
|---|---|---|---|
| | | Job Number: | |
| Client: | NUSTAR ENERGY | Date: | 02/01/2011 |
| Project: | SAVANNAH ASPHALT | Sampler: | M. WHITSON |
| Weather: | FOG (40's-50's) | Time In/Out: | 0705/1000 |

## WATER LEVEL DATA

| Well I.D. | Time | Depth to Free Product (feet) | Depth to Water (feet) | Depth to Well Bottom (feet) | Product Thickness (feet) | Water Column Height (feet) | Notes/Other Remarks |
|---|---|---|---|---|---|---|---|
| AW-11 | 0845 | 11.22' | 14.12' | | 3.90' | | GASOLINE ODOR |
| AW-20 | 0853 | -- | 12.51' | | NP | | |
| AW-37 | 0900 | -- | 11.68' | | NP | | STRONG ODOR |
| AW-57 | 0945 | 9.35' | 11.28' | | 1.93' | | " |

**WELL GAGING DATA SHEET** PAGE 1 OF 1

| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | | | | |
|---|---|---|---|---|
| | | | Job Number: | 1634-00 |
| | Client: | NUSTAR ENERGY | Date: | 12/13/2010 |
| | Project: | SAVANNAH, GA | Sampler: | M. WHITSON |
| | Weather: | CLOUDY (40'S) | Time In/Out: | |

**WATER LEVEL DATA**

| Well I.D. | Time | Depth to Free Product (feet) | Depth to Water (feet) | Depth to Well Bottom (feet) | Product Thickness (feet) | Water Column Height (feet) | Notes/Other Remarks |
|---|---|---|---|---|---|---|---|
| AW-45 | 1500 | 12.71 | 13.75 | | 1.04 | | LV/LIGHT BROWN |
| AW-65 | 1520 | 11.96 | 14.62 | | 2.66 | | MV / DARK BROWN |
| AW-9 | 1530 | 11.50 | 15.90 | | 4.40 | | MV/LV / MED BROWN |
| AW-10 | 1540 | 11.62 | 15.28 | | 3.66 | | MV / DARK BROWN |
| AW-11 | 1550 | 11.55 | 14.98 | | 3.43 | | MV/LV / MED. BROWN |
| AW-51 | 1600 | 10.28 | 17.46 | | 7.18 | | HV / BLACK |
| AW-68 | 1610 | 11.89 | 17.14 | | 5.25 | | HV / BLACK |
| AW-74 | 1615 | 8.72 | 13.12 | | 4.40 | | MV/LV / MED. BROWN |
| AW-62 | 1620 | | | | | | UNABLE TO LOCATE |
| AW-56 | 1620 | 10.89 | 15.93 | | 5.04 | | MV / DARK BROWN |
| AW-32 | 1625 | 11.59 | 11.60 | | 0.01 | | MV/LV / MED BROWN |
| AW-54 | 1640 | 4.24 | 18.26 | ~~14.02'~~ | 14.02 | | MV/HV / M-DARK BRWN |
| AW-62 | 1745 | 10.03 | 10.33 | ~~0.30'~~ | 0.30 | | MV / M-D BROWN |
| | | | | | | | |
| LNAPL | PURGE/ | BAIL DOWN | DATA W/ | | RECOVERY | | 12/14/2010 |
| | | | | INITIAL | FINAL | | |
| AW-65 | 1612 | | | 2.44 | 0.02 | | PURGED 2.0 GALLONS |
| AW-10 | 1810 | | | 3.64 | 0.02 | | PURGED 2.5 GALLONS |
| AW-11 | 1539 | | | 3.25 | 0.02 | | PURGED 2.5 GALLONS |
| AW-51 | 1244 | | | 8.07 | 0.01 | | PURGED 11 GALLONS |
| AW-74 | 1502 | | | 3.94 | 0.02 | | PURGED 6.25 GALLONS |
| AW-56 | 1543 | | | 4.99 | 0.03 | | PURGED 5.25 GALLONS |
| | | | | | | | |
| AW-65 | 1612 | | | | 0.02 | | |
| | 1616 | | | | 0.28 | | |
| | 1623 | | | | 0.37 | | |
| | 1630 | | | | 0.52 | | |
| | 1312 | | | | 0.82 | | 12/15/2010 MEASUREMENT |
| | | | | | | | |
| AW-10 | 1810 | | | | 0.02 | | |
| | 1819 | | | | 0.11 | | |
| | 1824 | | | | 0.18 | | |
| | 1829 | | | | 0.22 | | |

LV = LOW VISCOSITY MV = MEDIUM VISCOSITY HV = HIGH VISCOSITY

## WELL GAGING DATA SHEET



Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| | | | |
|---|---|---|---|
| | | Job Number: | |
| Client: | | Date: | |
| Project: | | Sampler: | |
| Weather: | | Time In/Out: | |

### WATER LEVEL DATA

| Well I.D. | Time | Depth to Free Product (feet) | Depth to Water (feet) | Depth to Well Bottom (feet) | Product Thickness (feet) | Water Column Height (feet) | Notes/Other Remarks |
|---|---|---|---|---|---|---|---|
| AW-10 | 1834 | | | | 0.25 | | |
| | 1322 | | | | 2.15 | | 12/15/10 MEASUREMENT |
| | 1815 | | | | 2.22 | | " |
| | | | | | | | |
| AW-11 | 1539 | | | | 0.02 | | |
| | 1745 | | | | 0.07 | | |
| | 1815 | | | | 0.45 | | |
| | 1843 | | | | 0.77 | | |
| | 1318 | | | | 3.00 | | 12/15/10 MEASUREMENT |
| | 1810 | | | | 3.01 | | " |
| | | | | | | | |
| AW-51 | 1244 | | | | 0.01 | | |
| | 1314 | | | | 0.37 | | |
| | 1325 | | | | 0.44 | | |
| | 1409 | | | | 0.59 | | |
| | 1422 | | | | 0.60 | | |
| | 1517 | | | | 0.73 | | |
| | 1308 | | | | 2.30 | | 12/15/10 MEASUREMENT |
| | 1748 | | | | 2.29 | | " |
| | | | | | | | |
| AW-74 | 1502 | | | | 0.02 | | |
| | 1512 | | | | 0.24 | | |
| | 1521 | | | | 0.32 | | |
| | 1528 | | | | 0.38 | | |
| | 1258 | | | | 0.58 | | 12/15/10 MEASUREMENT |
| | 1803 | | | | 0.76 | | " |
| | | | | | | | |
| AW-56 | 1543 | | | | 0.03 | | |
| | 1549 | | | | 0.16 | | |
| | 1555 | | | | 0.28 | | |
| | 1600 | | | | 0.38 | | |
| | 1303 | | | | 1.66 | | 12/15/10 MEASUREMENT |
| | 1754 | | | | 1.48 | | " |

# WELL GAGING DATA SHEET

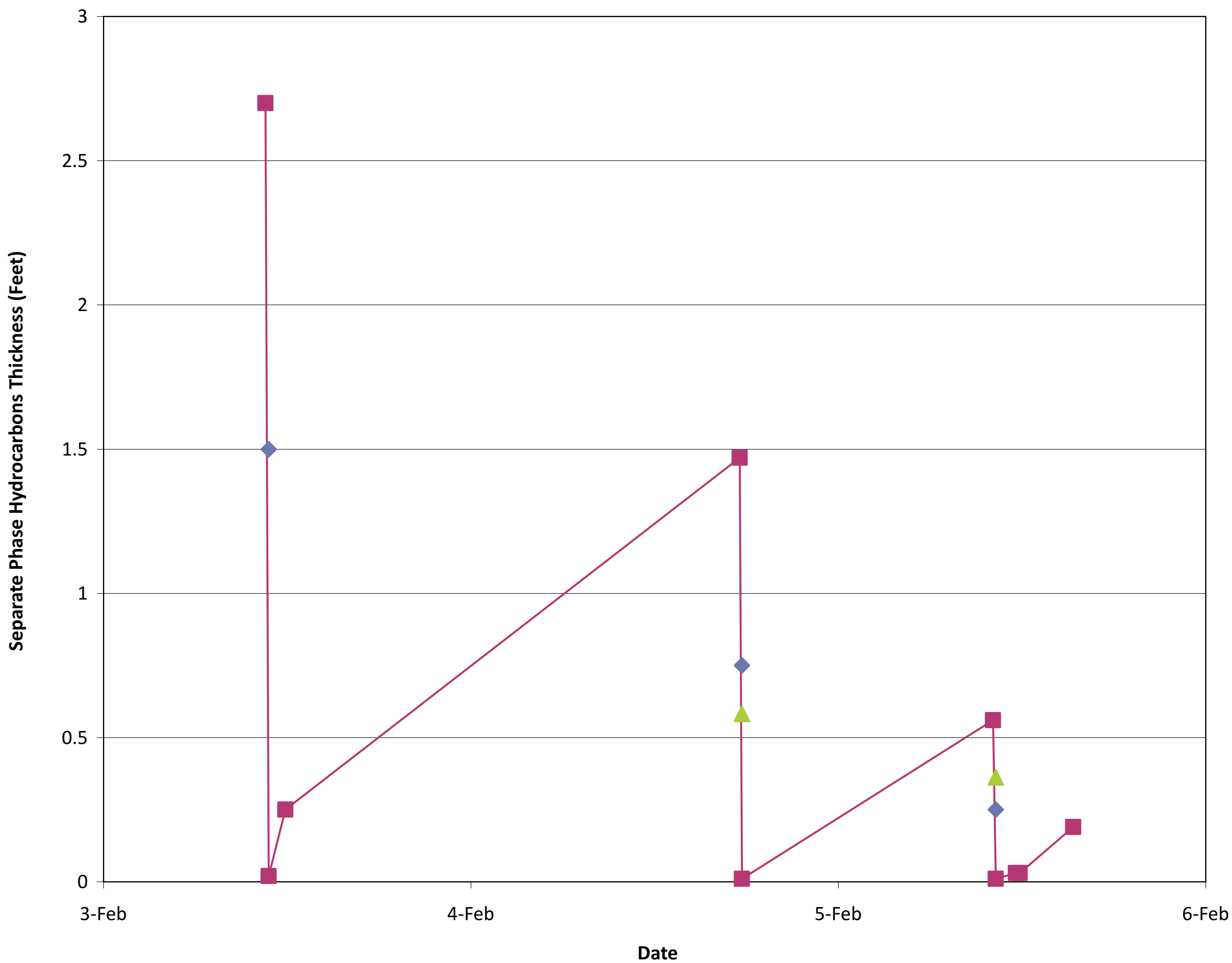
| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | | | | |
|---|---|---|---|---|
| | | | Job Number: | 1634-00 |
| | Client: | NUSTAR ENERGY | Date: | 12/17/2010 |
| | Project: | SAVANNAH, GA | Sampler: | M. WHITSON |
| | Weather: | CLOUDY (40's-50's) | Time In/Out: | |

## WATER LEVEL DATA

| Well I.D. | Time | Depth to Free Product (feet) | Depth to Water (feet) | Depth to Well Bottom (feet) | Product Thickness (feet) | Water Column Height (feet) | Notes/Other Remarks |
|---|---|---|---|---|---|---|---|
| AW-75 | 1335 | -- | 10.22 | | -- | | NEW WELL LOCATION |
| AW-77 | 1208 | -- | 10.20 | | -- | | 〃 |
| AW-74 | 1250 | 10.78 | 11.71 | | 0.93 | | |
| AW-56 | 1255 | 11.41 | 14.19 | | 2.78 | | |
| AW-51 | 1300 | 11.34 | 14.44 | | 3.10 | | |
| AW-10 | 1305 | 11.81 | 15.15 | | 3.34 | | |
| AW-11 | 1310 | 11.70 | 14.96 | | 3.26 | | |
| AW-65 | 1315 | 12.74 | 13.43 | | 0.69 | | |

# *Appendix F*

## Bail-Down Test Graphs




***Legend:***

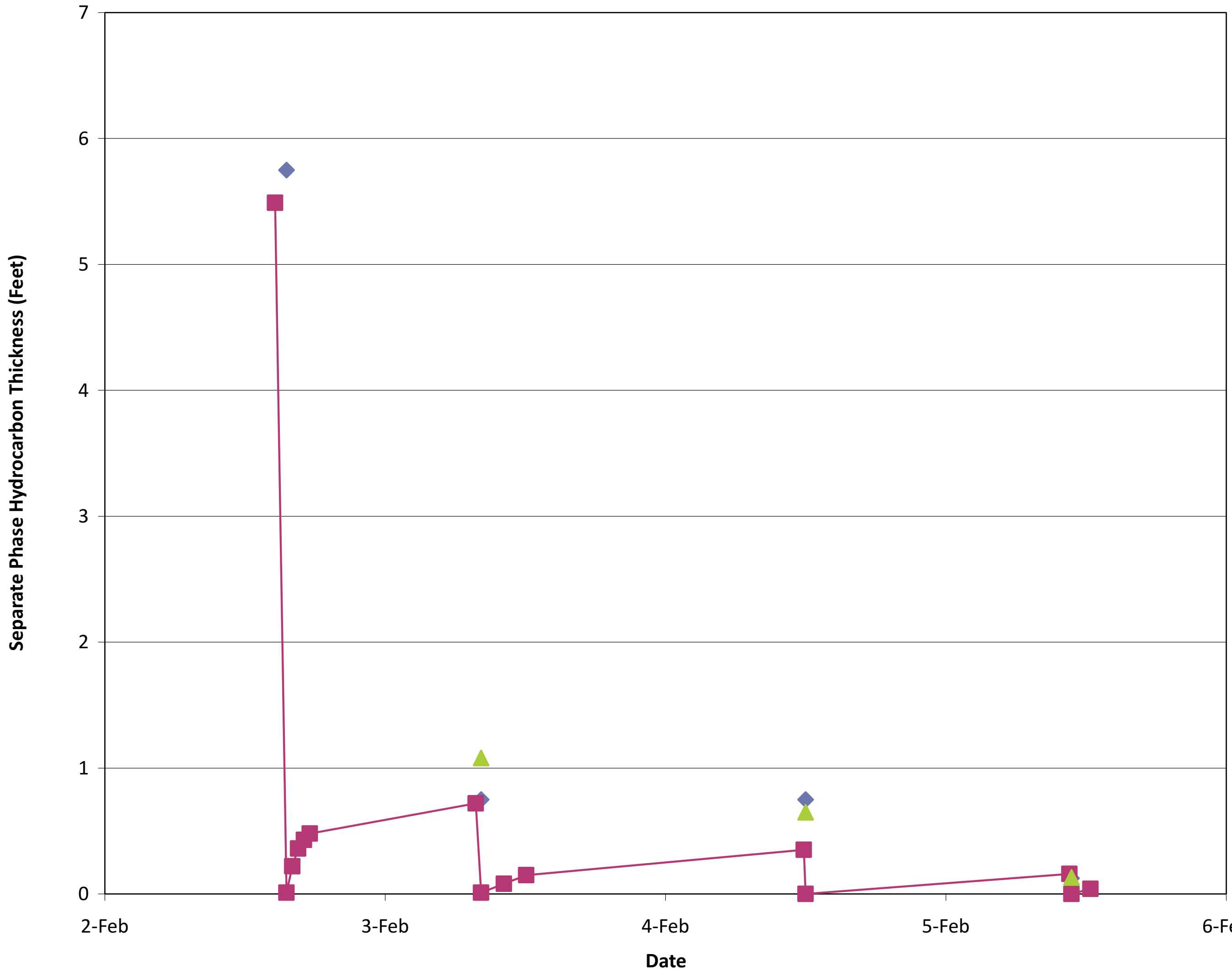
- Separate Phase Hydrocarbons Thickness (Feet)
- Removal Amount (Gallons)
- Removal Rate (Gallons per Day)

# Monitoring Well AW-11 Bail Down Test

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| May 2011 | | F-1 |



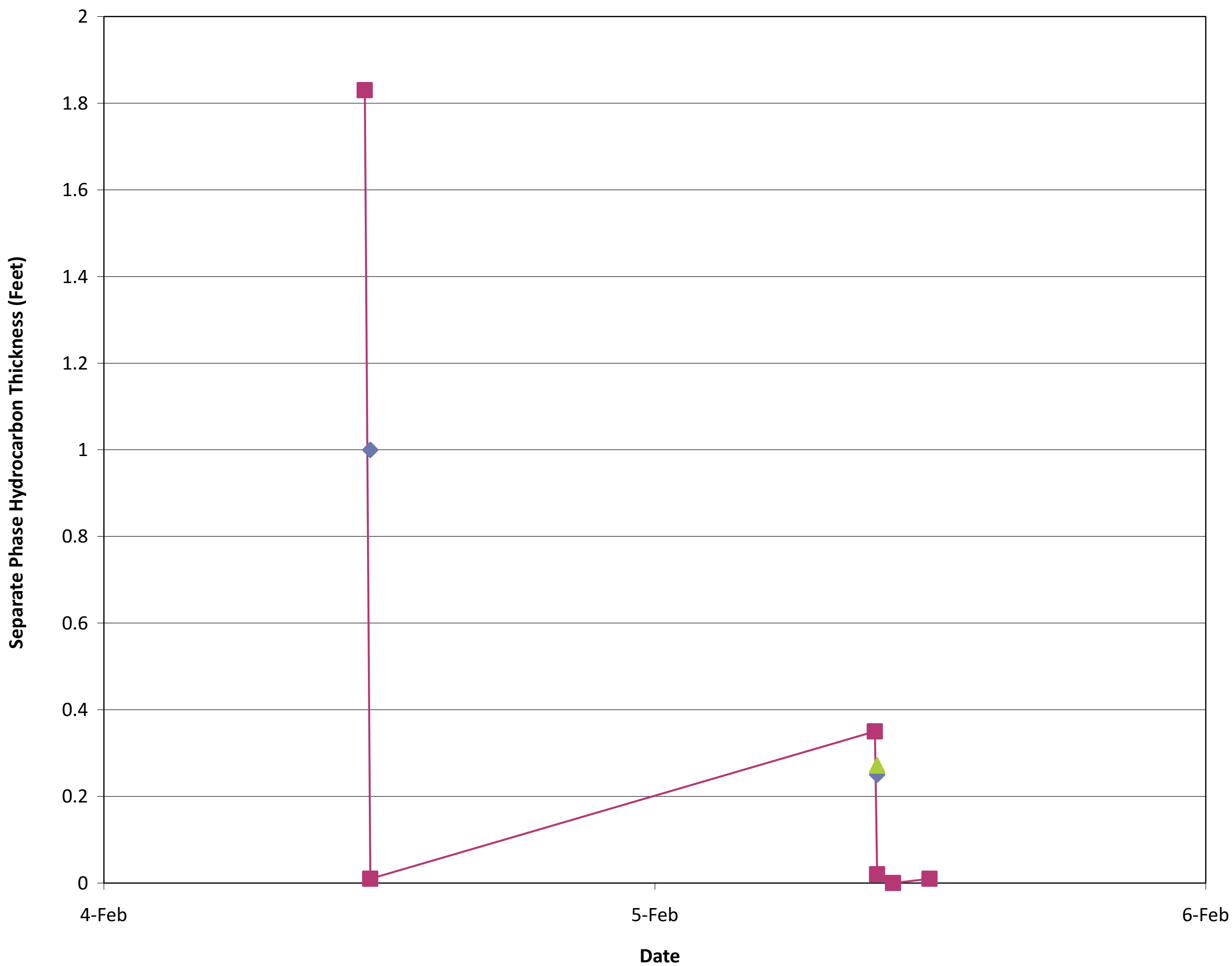

***Legend:***

- Separate Phase Hydrocarbons Thickness (Feet)
- Removal Amount (Gallons)
- Removal Rate (Gallons per Day)

# Monitoring Well AW-51 Bail Down Test

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure F-2 |
|---|---|---|---|
| | May 2011 | | |



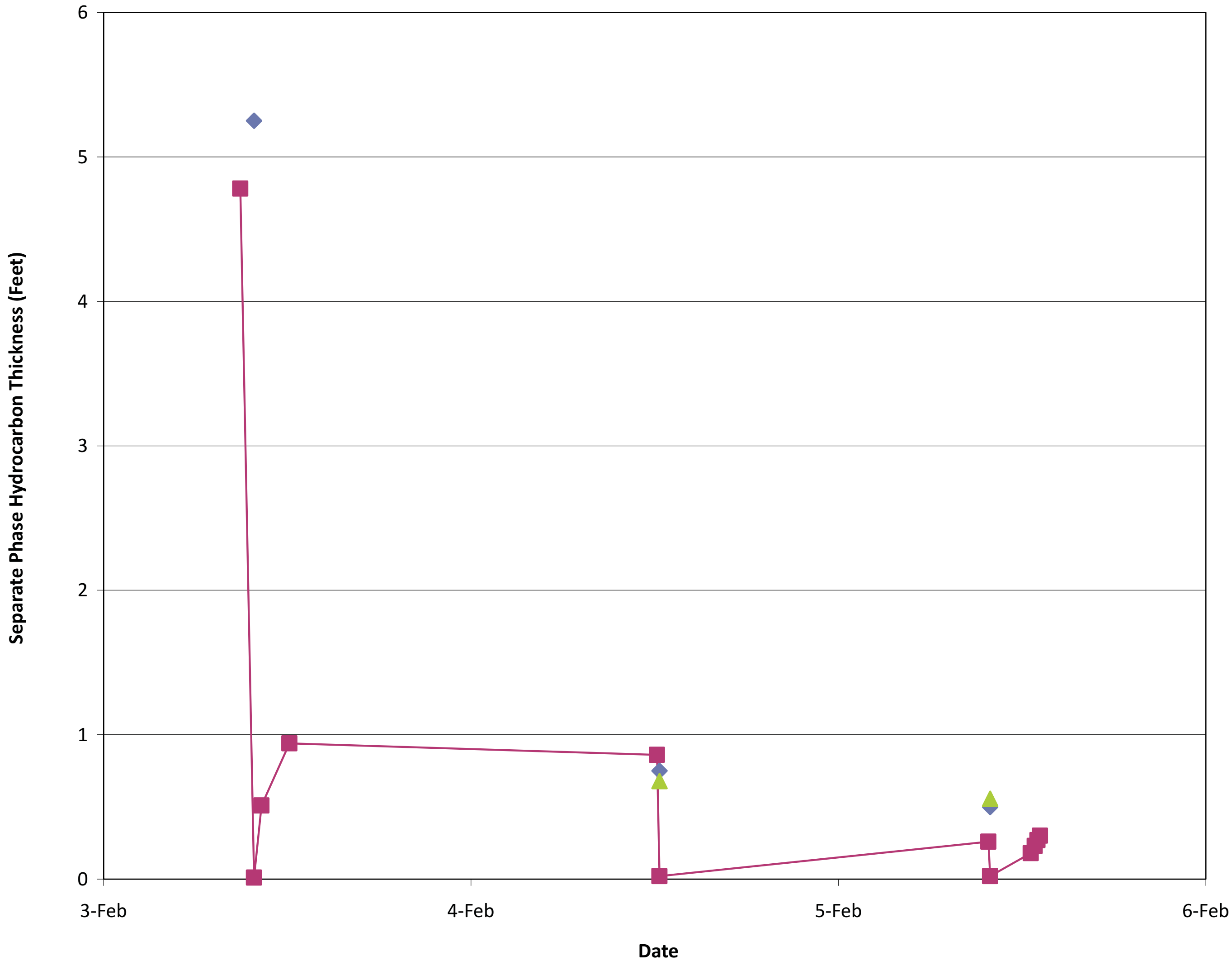

***Legend:***

- Separate Phase Hydrocarbons Thickness (Feet)
- Removal Amount (Gallons)
- Removal Rate (Gallons per Day)

# Monitoring Well AW-65 Bail Down Test

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | | |
|---|---|---|
| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number 1634-00 | Figure |
| | May 2011 | F-3 |




**Legend:**

Separate Phase Hydrocarbons Thickness (Feet)

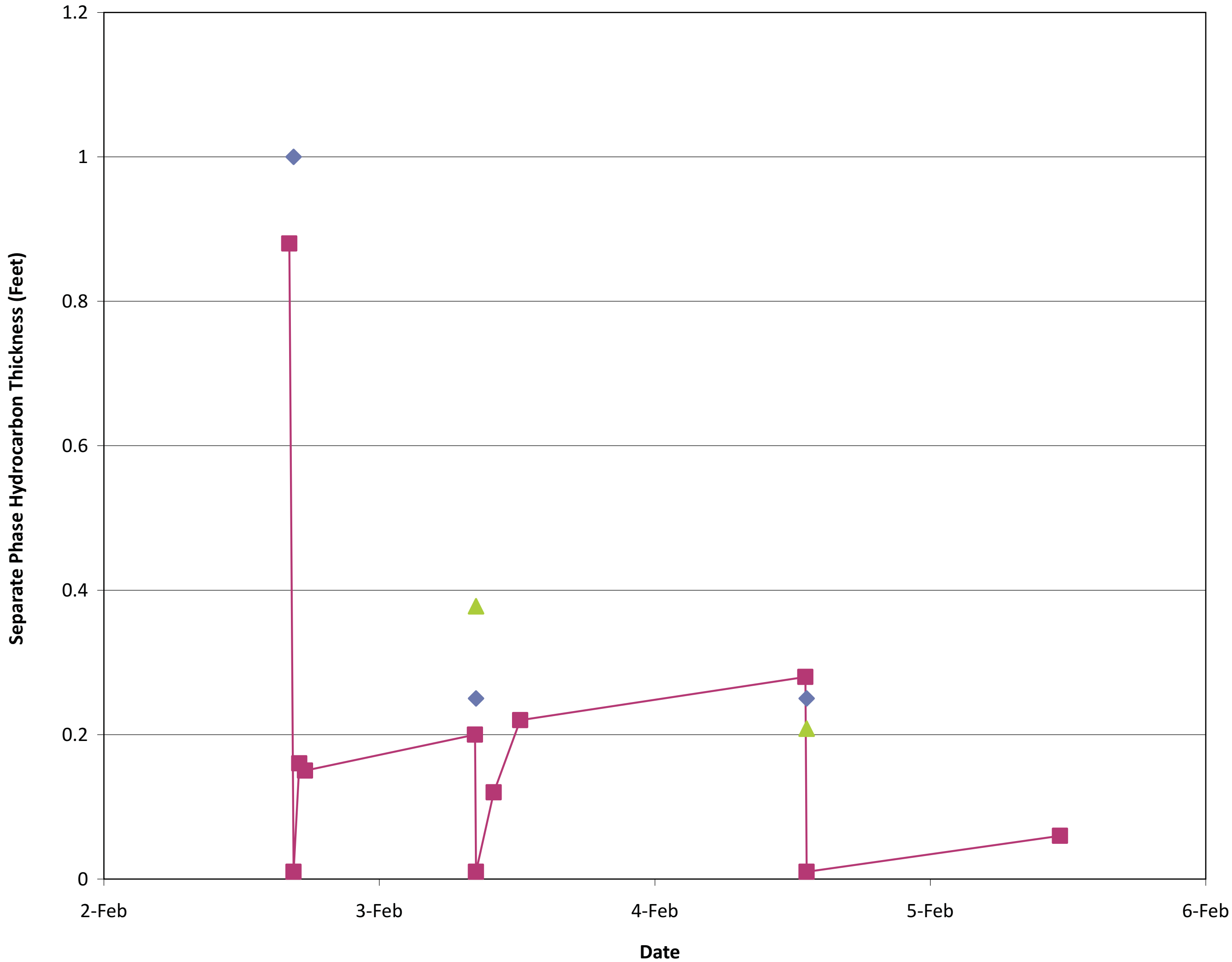
Removal Amount (Gallons)

Removal Rate (Gallons per Day)

# Monitoring Well AW-68 Bail Down Test

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | | | |
|---|---|---|---|
| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure F-4 |
| | May 2011 | | |




***Legend:***

- Separate Phase Hydrocarbons Thickness (Feet)
- Removal Amount (Gallons)
- Removal Rate (Gallons per Day)

# Monitoring Well AW-74 Bail Down Test

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | | | |
|---|---|---|---|
| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure |
| | May 2011 | | F-5 |

ENVIRONMENTAL PROTECTION DIVISION
DEPARTMENT OF NATURAL RESOURCES
STATE OF GEORGIA

# PERMIT TO USE GROUNDWATER

| | | |
|---|---|---|
| PERMIT NUMBER | **025-0012** | DATE: **December 30, 2008** |
| PERMITTEE'S NAME | **NuStar Asphalt Refining, LLC** | |
| PERMITTEE'S ADDRESS | **P.O. Box 1881, Savannah, Georgia 31402-1881 –** | **Chatham County** |

In accordance with the Provisions of the Groundwater Use Act, (O.C.G.A § 12-5-90 et seq.) as amended, and the Rules and Regulations for Groundwater Use, Chapter 391-3-2, promulgated pursuant thereto, this Permit is issued to withdraw, obtain, or utilize a maximum system wide total of groundwater in the amount of:

**0.100** million gallons per day monthly average and **0.010** million gallons per day annual average;

from **one** well located at **Savannah, Georgia – Chatham County** for the purpose of a consumptive use as **central water supply, cooling water, and process water for boiler feed water.**

This Permit is conditioned upon the permittee complying with the following:

## STANDARD CONDITIONS

(1) The provisions of the Groundwater Use Act, as amended, or any of the Rules and Regulations promulgated pursuant thereto;

(2) The Permit shall not be transferred except with the approval of the Georgia Environmental Protection Division (EPD);

(3) As otherwise designated by EPD, the Groundwater Use Report shall be submitted MONTHLY in accordance with the following schedule:

- Production between the first day of the month and the last day of the month shall be submitted to EPD by the 10th day of the following month (ex. January 1st through January 31st groundwater use data shall be reported to the EPD by February 10th).

(4) The use of groundwater is limited to the quantities and purpose of the water herein specified.

## SPECIAL CONDITIONS

(5) This Permit is valid for ground water withdrawal from the **Upper Floridan** Aquifer. No other aquifer can be used without the approval of the EPD.

(5) If multiple aquifers are designated in Special Condition (5) above, groundwater use of each aquifer shall be reported separately. Each aquifer shall be identified on the Groundwater Use Report, as well as listing the well or wells that are producing in each aquifer. If a well is producing in more than one aquifer, it is to be noted. The Groundwater Use Report shall be submitted in accordance with the schedule outlined in Standard Condition (3) of this permit.

(6) The replacement of any permitted well must receive prior approval from the EPD.

And the additional attached conditions (8 through 19), which are hereby made a part of this Permit.

In accordance with the letter dated **June 22, 2007** and in conformity with the statements and supporting data entered therein or attached thereto, all of which are filed with the EPD of the Department of Natural Resources and are hereby made part of this Permit.

This permit is effective from the date first above written and is subject to revocation on evidence of noncompliance with any of the provisions of the Groundwater Use Act, as amended, or any of the Rules and Regulations promulgated pursuant thereto; or with any representation made in the above mentioned application or the statements and supporting data entered therein or attached thereto; or with any condition of this permit.

Absent prior revocation in accordance with the above language, this Permit shall expire on the **31st day of December 2017**.

| | | |
|---|---|---|
| DIRECTOR'S SIGNATURE | DATE: | Director |
| | December 30, 2008 | Environmental Protection Division<br>Department of Natural Resources |

# SPECIAL CONDITIONS

(8) This groundwater use permit and any future modifications or re-issuances of such, is conditional upon an active implementation of the relevant EPD-approved Water Conservation Plan. EPD will be conducting periodic inspections and tracking the standard Water Conservation Progress Report updates to ensure that water conservation efforts are implemented.

(9) A Water Conservation Progress Report must be submitted to EPD on or before the **31st of December 2012** and every five years thereafter. This Progress Report should include any actions and/or improvements made to conserve water and reduce water losses (e.g., leak detection and leak repair, meter installation and calibration, and meter replacement, etc.) The Water Conservation Progress Report must also include a comparison of water loss trends as well as a comparison of gallons of water used per unit of product produced for each of the five years presented in the report.

(10) In accordance with the Groundwater Use Rules, 391-3-2-.08(2), a permit holder shall analyze a raw groundwater sample for specific conductance on an annual basis. Analysis for specific conductance shall be conducted in accordance with 40 Code of Federal Regulations, Part 141.89. A raw groundwater sample shall be collected for every five permitted wells (i.e., if you have between one and five permitted wells, collect one raw groundwater sample for analysis; if you have between six and ten permitted wells, collect a raw groundwater sample from two of the permitted wells, etc.). The groundwater samples shall be collected from the highest yielding wells. The results shall be submitted to EPD on corporate letterhead and shall include the date sampled, well number, temperature of water sample at time of testing, the specific conductance result, and the units of measurement.

(11) The groundwater use permit and any future modifications or re-issuances of such is conditional upon an active implementation of the appropriate provisions outlined in the Georgia Drought Management Plan, which was approved by the Georgia Dept. of Natural Resources Board on March 26, 2003. The permit holder will abide by its Drought Contingency Plan and, in addition, defer to the Georgia Drought Management Plan and the Outdoor Water Use Restrictions contained therein, when that plan is more stringent.

(12) The EPD has produced the '**Coastal Georgia Water & Wastewater Plan for Managing Salt Water Intrusion**' (the Plan). The Plan has identified an array of water conservation, efficiency, and reuse requirements for public and private water providers in Chatham, Effingham, and Bryan counties and surrounding political jurisdictions. The Permittee is required to fully implement and otherwise comply with ALL appropriate requirements identified in the Plan.

(13) Potential use of an alternate water supply from the Lower Floridan aquifer must meet all current policy requirements for water withdrawal permitting approval and include the enumeration of potential Upper Floridan-Lower Floridan production off-sets.

(14) NuStar Asphalt Refining, LLC (NuStar) shall **perform an audit** of the facility's water system and identify locations where practices can be employed to conserve water. A copy of the audit findings along with an acceptable water conservation implementation schedule must be submitted to the EPD's District Office for review and concurrence no later than **June 30, 2009.**

(15) NuStar shall adopt a **water leak detection and repair program** and submit a copy of that program to the EPD's District Office for concurrence no later than **June 30, 2009**. The program must be updated at intervals determined by the Director.

(16) NuStar shall adopt a **metering, meter calibration, repair, and replacement program** and submit a copy of that program to the EPD's District Office for concurrence no later than **December 31, 2008.** The adopted metering program shall include a schedule for installing meters for all water supply sources that are not currently metered. This program must be updated at intervals determined by the Director.

(17) NuStar shall conduct a **reuse feasibility study** in accordance with the guidelines provided by the EPD and reported to the EPD's District Office for review and concurrence no later than **December 31, 2009**.

(18) NuStar shall **evaluate alternate water sources** as a substitute for the groundwater used. This assessment shall be conducted in accordance with the guidelines provided by the EPD and reported to the EPD's District Office for concurrence no later than **December 31, 2009.**

## SPECIAL CONDITIONS - Continued

(19) NuStar shall maximize its use of **recycled or reclaimed water** to supply its internal operation needs as well as its outdoor watering requirements beginning no later than **December 31, 2012.**

## PERMIT MODIFICATION

The permittee may seek modification of any of the terms of an unexpired permit upon written request to the Director. The EPD has the authority to modify any groundwater withdrawal permit at any time.

**DRAFT**

# *Remedial Design Report NuStar Asphalt Refining, LLC Savannah Terminal Savannah, Georgia*

Prepared for:
NuStar Asphalt Refining, LLC

June 14, 2013
1634-03

**DRAFT**

# *Remedial Design Report*
# *NuStar Asphalt Refining, LLC*
# *Savannah Asphalt Refinery*
# *Savannah, Georgia*

Prepared for:
NuStar Asphalt Refining, LLC

June 14, 2013
1634-03


**DRAFT**

*Herbert F. Clough, P.E.*
*Principal Engineer*

**DRAFT**

*Mike Stevens*
*Senior Associate Engineer*

**DRAFT**

*Amanda L. Spencer, R.G.*
*Principal Hydrogeologist*

# Table of Contents



## Figures

## Appendices

# 1.0 Introduction

Apex Companies, LLC (Apex) has prepared this Remedial Design Report on behalf of NuStar Asphalt Refining, LLC (NuStar) for the Savannah Refinery (the Site), located at 7 Foundation Drive in Savannah, Georgia (Figures 1 and 2). An interim remedial action is planned to remove mobile separate-phase petroleum hydrocarbons (SPH) from the Site subsurface. Based on a previous review of suitable technologies for SPH removal at the Site (Ash Creek, 2012), belt skimmers were identified as the most feasible removal technology. This Design Report details the proposed implementation of a belt skimmer SPH recovery system at the Site.

# 2.0 Background

This section discusses the Site setting, geology and hydrogeology, and presents a summary of prior environmental investigation activities at the Site.

## 2.1 Site Description

NuStar has owned and operated the Site since March 2008. Amoco Oil Corporation (Amoco) operated the Site from at least 1989 through a portion of 1993, and CITGO Asphalt Refining (CITGO) operated the Site from 1993 until acquisition by NuStar in 2008.

The Site is located in an industrial area adjacent to the south bank of the Savannah River. The property has been used for industrial purposes since the early 1900s and as a refinery since the early 1920s. Currently, the Site maintains a number of aboveground storage tanks (ASTs) of varying sizes, with associated above/below ground piping, a process area, and administration buildings. Pertinent Site features are shown on Figure 2.

## 2.2 Geology and Hydrogeology

The Site is located in the Coastal Plain physiographic province of Georgia. The regional surface geology consists of sand, silt, and clay of the Pleistocene-age Pamlico shoreline complex, according to Lawton et al (1976). These unconsolidated surface materials are part of a regional unconfined water-bearing unit that is present at the ground surface along much of the South Carolina and Georgia coastlines and is informally known as the Surficial Aquifer. The Surficial Aquifer is approximately 50 feet thick at the Site, according to Williams and Gill (2010).

The Surficial Aquifer is underlain by a Miocene/Oligocene-age confining unit that consists of low-permeability, phosphatic clayey sand and sandy clay. The confining unit is approximately 100 feet thick at the Site, based on cross sections prepared by Williams and Gill (2010) and is encountered at depths between approximately 50 and 150 feet bgs. The Floridan Aquifer System, which consists of Eocene-age limestone and dolomite, underlies the confining unit. The Floridan Aquifer System is the primary water-bearing unit for portions of Georgia, South Carolina, and Florida.

Depth to groundwater at the Site typically ranges between approximately 4 and 20 feet below the ground surface (bgs). Groundwater typically occurs in the sands and silts, which correspond to the regional Surficial Aquifer. The hydraulic gradient across the Site is approximately 0.002 to 0.006 foot per foot (ft/ft) to the northeast, toward the Savannah River.

The Site is adjacent to a tidally influenced reach of the Savannah River. The mean tidal range for the Savannah River at the National Oceanic and Atmospheric Administration (NOAA) Savannah tide station (3 miles southeast of the Site) is 7.9 feet (NOAA, 2011). Tidal effects on groundwater elevations at the Site were evaluated in 2009. Water levels in monitoring well AW-67, adjacent to the Savannah River, exhibited 3 to 6 feet of change over each tidal cycle. Water levels in wells farther from the river (e.g., well AW-73 located approximately 500 feet from the river) exhibited 0.5 to 1 foot of change over each tidal cycle (CRA, 2009). The 2009 data indicate that tidal influences on groundwater elevation dissipate rapidly with distance from the river.

## 2.3 Previous Environmental Activities

SPH was identified in the subsurface at the Site by 1989. A subsequent investigation concluded that SPH present on the water table were not the result of any particular spills, but rather the gradual accumulation of “residual oil” over several decades (Amoco, 1989).

### *2.3.1 Historical Product Recovery Efforts*

In November 1990, Amoco installed and began operation of a recovery system. The system was comprised of eight recovery wells (RW-38, RW-39, RW-53, and RW-56 through RW-59) installed with pneumatic pumps, approximately 3,500 feet of discharge piping, and a 157,000-barrel tank (Tank 50), to store and separate the recovered fluids. The recovery system operated until May 12, 1998 (S&ME, 1998). The total volume recovered during operation was not identified in historical documents.

A “French Drain” and sump are present at the northeastern portion of the Site, as shown on Figure 3. The French Drain is a buried product collection system that is reportedly 175 feet long. The sump, formerly referred to as the “Gas Hole,” is connected to the east end of the French Drain, which was historically used for removal of the collected SPH. Historical documents indicate the French Drain and sump were constructed as early as 1984 (Savannah Refinery, 1989). The French Drain and sump are no longer operated. Figure 3 shows the approximate location of the recovery system, the French Drain, and the sump.

### 2.3.2 Polywall Barrier

A “Polywall” barrier, consisting of a 40-mm high-density polyethylene (HDPE) membrane, was installed at the Site in 1996 to prevent the migration of SPH into the Savannah River. According to available information, the barrier is approximately 1,500 feet long horizontally and 20 feet long vertically, with joints at 180-foot intervals. The Polywall was reportedly installed to a depth of approximately 20 to 22 feet bgs, and the top of the barrier ranges between the ground surface and approximately 2 feet bgs. Based on lithologic information for wells installed near the Polywall, the wall terminates in a sand layer. Therefore, while the wall will retain SPH, deeper groundwater can flow beneath the wall, and mounding of groundwater should be limited. Investigations were conducted in 2009 to confirm the location of the Polywall (CRA, 2009). The locations of portions of the Polywall were identified based on surface exposures; however, the exact location of much of the Polywall could only be estimated. The approximate location of the Polywall is shown on Figure 3.

The Polywall is penetrated in at least one location by the outfall pipe for the Site oil/water separator. The outfall pipe is approximately 7 feet deep near the Polywall, which is below groundwater during some tidal/seasonal intervals. The methods used to seal the Polywall around the outfall pipe penetration are unknown. Information describing other Polywall penetrations, if any, is unavailable.

### 2.3.3 Product Evaluation

Samples of SPH were collected from monitoring wells AW-10, AW-11, AW-15, AW-22, AW-51, and AW-54 in 2003 and submitted for forensic analyses (S&ME, 2003). The analytical data indicated that SPH consists of a mixture of lightly to extensively degraded gasoline or a petroleum solvent and a middle distillate, such as diesel fuel or fuel oil.

In 2009, SPH samples were collected from wells AW-12, AW-13, AW-51, AW-65, and AW-68 for analysis of viscosity and specific gravity. The SPH samples from wells AW-12, AW-51, AW-65, and AW-68 exhibited kinematic viscosities ranging between 2.04 and 4.05 centistokes (cSt; 40 degrees Celsius). The SPH sample from well AW-13 exhibited a viscosity of 1,411 cSt. Specific gravity ranged between 0.82 and 0.88, except at well AW-13, which exhibited a specific gravity of 1.08. The viscosities exhibited by samples from wells AW-12, AW-51, AW-65, and AW-68 were consistent with diesel-range hydrocarbons. The viscosity exhibited by the sample from well AW-13 was more consistent with a No. 6 fuel oil and/or some crude oils (CRA, 2009).

### 2.3.4 Bail-Down Tests at AW-51 and AW-62

On March 24, 2010, a bail-down test was performed on well AW-62 (Ash Creek, 2010), which is located downgradient (north) of the Polywall. Approximately 2.6 feet of SPH were measured in the well at the start of the test (which equates to 1.7 gallons in the 4-inch-diameter well). The SPH was removed to a thickness of 0.2 foot in 5 minutes. The SPH in the well recovered to a thickness of 0.4 foot in an hour. After one hour, the incoming tide increased the water level in the well such that an accurate measure of the SPH recovery was no longer possible.

On April 19, 2010, a bail-down test was conducted on well AW-51 just prior to low tide to maximize the available time to complete the test. Well AW-51 is located upgradient (south) of the Polywall. The initial thickness of the SPH was approximately 8 feet, which is equivalent to approximately 5 gallons. Approximately 11 gallons of product were removed from the well using a bailer over an approximate 20-minute period, and SPH continued to recharge into the well throughout the removal. In addition to the 5 gallons of SPH in the casing, the volume of product in the filter pack at the initiation of the test was estimated at 4 gallons, assuming an 8-inch-diameter annulus with a sand filter pack. Therefore, the 11 gallons of SPH evacuated during the test are adequate to have removed the SPH from both the well and filter pack and be further supplied by the formation at the end of the bail-down test. After the removal was complete, the SPH thickness recovered to 1 foot thick within 15 minutes and to 1.5 feet within 2 hours of the test.

### *2.3.5 Sheen on River – 2010*

Petroleum sheen was observed on the Savannah River in April 2010, in the vicinity of the oil/water separator outfall. Initial response cleanup was performed by Moran Environmental Recovery, LLC (Moran) of Savannah, Georgia, under contract with the Refinery (Ash Creek, 2010). The outfall and monitoring wells are shown on Figure 3.

Following the initial response, an assessment was conducted to identify the source of the sheen. Winter Environmental (Winter), under subcontract to Apex (formerly Ash Creek Associates, Inc. [Ash Creek]), performed inspections of the oil/water separator system (oil/water separator, associated piping, and outfall) and collected depth to water/SPH measurements on monitoring wells AW-13, AW-51, AW-62 and AW-69. Wells were selected for inspection based on proximity to the oil/water separator and associated piping (AW-13, AW-51 and AW-69) and based on their location on the riverside of the Polywall (AW-62). Winter collected samples of SPH from monitoring wells AW-51 and AW-62, the outfall, and the oil/water separator (sample identification “OWS”), and the petroleum sheen observed on the river. Samples were submitted to Friedman and Bruya, Inc. (F&B) of Seattle, Washington, for forensic evaluation (fingerprint) by capillary gas chromatography using a flame ionization detector (FID). F&B reported that the River Water and OWS samples contained petroleum hydrocarbons that were forensically similar and were indicative of a residual fuel oil, such as fuel oil No. 4, No. 6, or similar material. The samples from two monitoring wells, AW-51 and AW-62, were not consistent with the OWS and river samples and contained petroleum hydrocarbons indicative of gasoline and diesel fuel No. 2 or heating oil. Observations and analytical data suggest that the sheen observed on the Savannah River in 2010 was related to the oil/water separator and leaking outfall pipe, rather than migration of SPH from the subsurface.

# 3.0 Description of SPH Recovery System

The belt skimmer SPH recovery system will consist of 26 belt skimmers installed in recovery wells located along the waterfront area of the Site. Belt skimmers are especially effective at removing heavier SPH (such as present at the Site) and will operate across the range of water levels at the Site. The capacity of belt skimmers to operate across a wide range of water levels minimizes operations and maintenance requirements. The belt skimmers will be housed in small aboveground structures located at each recovery well. Recovered SPH will be discharged to holding drums, also stored in the small structures, for periodic recovery and disposal. The units operate independently; therefore, shut-downs only affect a single unit.

As shown on Figure 4, SPH has been identified across much of the northern portion of the Site on the south (facility-side) of the Polywall and in an apparently localized area north of the Polywall near well AW-62. Long-term operation of the belt skimmer system is expected to recover SPH from a radius of approximately 20 feet around an individual recovery well. Therefore, the SPH recovery system is based on a series of extraction points on 40-foot centers on the south side of the Polywall and three belt skimmer north of the Polywall, near well AW-62.

Each extraction point would include the following components:

- A 4-inch-diameter extraction well to a depth of approximately 20 feet bgs and screened across the full range of expected depths to groundwater.
- A belt skimmer, including a petroleum-compatible drum for collecting recovered SPH, a redundant high-level shut-off for the belt skimmer, and secondary containment for the SPH collection drum. The skimmer equipment would be intrinsically explosion proof. The skimming belt length would be installed to cover the full range of likely groundwater depths.
- A ventilated shed over each of the well casings to enclose the belt skimmer and the SPH collection drum for protection from inclement weather, corrosion, and accidental damage.
- Installing electrical power for each unit (consisting of 115VAC single-phase power). The specific source of electrical power would be coordinated with the facility.

Each belt skimmer unit would operate independently and would shut off when the associated SPH collection drum is full. Maintenance of the system would require collection of the recovered SPH (possibly by routine vacuum truck service), periodic preventative maintenance of the skimmer equipment, and repair/replacement as needed.

The modular nature of the belt-skimmer equipment (being comprised of individual units) also allows for adaptation of the system to a variety of operating conditions – such as implementing the system in phases (allowing data collected in earlier phases to refine the implementation of later phases) or adding/removing skimmer units as needed to reflect changing site conditions.

## 3.2 Contractors, Subcontractors and Vendors

The following table identifies the types of contractors, subcontractors, and vendors that will be needed to install and implement the system.

| Contractors, Subcontractors And Vendors | Role |
|---|---|
| Engineering Contractor (Apex) | Prepare engineering design report; identify, screen, and procure subcontractors and vendors; coordinate field activities, equipment and materials; coordinate subcontractors and vendors; provide construction oversight and documentation; conduct and/or coordinate startup activities; prepare final installation report ("As-Built" report) |
| Driller | Well Installation |
| Utility Locator | Clear subsurface installations |
| Air knife operator | Initiate each boring to clear for utilities |
| Remediation subcontractor | Install belt skimmers and other system components; install needed trenches for conduit or piping, install sheds and hook up system |
| Electrician | Plan and install electrical components of the system |
| Vendor for belt skimmers | Provide belt skimmers, controls, and accumulation drums |
| Vendor for skimmer sheds | Provide skimmer sheds |
| Vendor for waste storage | Provide containers for installation-derived waste |
| Operations and Maintenance (O&M) subcontractor | Conduct system O&M following startup |

## 3.3 Sequencing

The following presents the sequencing for the installation and startup of the remedial system:

1. Prepare Remedial Design Report (i.e., this report).
2. Prepare Electrical Plan – Apex engineer will work with assigned NuStar operations personnel and electrical subcontractor and/or NuStar terminal electrician to develop a detailed electrical plan identifying power needs and existing hookups, electrical conduit installation plan, installation plan for control panels, power drops, and other pertinent wiring, and any other electrical element identified by the NuStar electrician as being pertinent to the plan.
3. Procurement – Apex will coordinate the procurement of the various subcontractors. Some will be simple phone bids (e.g., vendors, and utility clearance and air knife contractors) following a screening step to ensure that the subcontractor meets the NuStar Savannah Terminal health and

safety, TRIR, and drug testing requirements. Potential remediation contractors will be provided this design plan and a procurement sheet to complete with their estimated cost. Potential drillers will be provided a written scope of work and a brief procurement sheet to identify their assumptions and estimated cost. If possible, two to three bids will be obtained in each subcontractor category.

4. Preparatory Activities – this step includes identifying equipment staging and soil/waste storage areas; preparing the Site Health and Safety Plan, and securing appropriate access if any off-site staging will be needed.
5. Utility Clearance – the utility locate subcontractor will clear subsurface installation locations of potential subgrade utilities. To optimize the success of this step, the NuStar operations person and Apex should work closely with the utility locate subcontractor to assist in identifying known subgrade structures and, if possible, to provide facility blueprints identifying utility and other subgrade features.
6. Well Installations – the air knife subcontractor will work in concert with the well driller to sequentially install the wells: the air knife subcontractor will first air knife the wellbore to a depth of 5 to 8 feet, depending upon the location of the well and the potential for subgrade piping. The well driller will then drill to the desired well depth at the air knifed location and complete the installation of the well. It is anticipated that all 28 wells would be installed in one mobilization to reduce mobilization costs, but this is flexible and the installation schedule can be developed to limit impacts on site operations.
7. Belt Skimmer Installations – once the well installations are complete, the belt skimmers can be installed by the remediation subcontractor. The installations can be phased or completed in one mobilization, as determined by NuStar. One mobilization will reduce mobilization costs and decrease the time for achieving SPH removal across the waterfront. On the other hand, phasing the installations will allow a subset of units to be installed and operated, and the information obtained from operating the smaller subset can be used to optimize the design of the remaining units. Additionally, the installations can be phased around site operations to minimize disruptions.
8. Electrical Connections – the electrical conduit, control panels, and power units will be installed and/or connected by the electrical subcontractor (or facility electrician, whichever NuStar prefers).
9. System Startup – upon completion of the electrical plan, the system will be started and monitored to verify it is operating as designed. It is anticipated that startup activities will be completed in 1 to 10 days, depending upon the number of units initially installed.
10. As-Built Report Preparation – an As-Built report will be prepared and provided to NuStar when startup has been completed and the system has been operating for a period of three to five months.

# 4.0 Design Considerations

Design considerations for the belt skimmer removal system are summarized below.

## 4.1 Skimmer Wells

The tidal influences on groundwater elevations in the SPH recovery area have been shown to be on the order of 6 feet, and overall fluctuations in groundwater elevation (seasonal and tidal) have been as high as 11 feet in wells along the north side of the Site. Therefore, the design of the wells includes the following considerations:

- Depth sufficient to address low-water conditions (as low as 20 feet bgs);
- Balance between a well diameter sufficient to allow installation of belt skimmer but cost effective to drill and construct. A 4-inch-diameter well best meets these criteria, as it optimizes recovery relative to installation costs to install larger diameter wells to accommodate wider belt skimmers.
- Screen length sufficient to keep fluctuating water level within screened interval.
- Screen slot size and filter pack compatible with the surrounding formation as wells as relatively viscous fluids.

The optimal spacing of the wells correlates to SPH thickness as depression of the SPH surface in the vicinity of the skimming well will induce flow toward the well. Based on experience at other sites under similar circumstances, it is expected that effective SPH removal from a well (such as with the belt skimmer units) will reduce the SPH thickness over at least a 20-foot radius from the well. Such reduction would continue until thicknesses become too low to induce spreading (e.g., less than 0.1 inch). However, the rate of recovery is dependent on the SPH thickness and will decrease as the thickness decreases

## 4.2 Belt Skimmers

Petroleum SPH tend to be hydrophobic and have lower surface tensions than water. This allows the use of a hydrophobic medium to preferentially pick up SPH floating on a water surface. A belt skimmer makes use of these phenomena to pass a loop of the skimming medium (the “belt”) through the oil/water interface, picking up the SPH with little adhered water. The SPH is scraped off of the belt and into an above-ground storage container as the belt continues to cycle back into the water. Considerations for a belt skimmer unit include:

- Sizing and specification of the belt material to be compatible with the skimming wells (4-inch-diameter) and the SPH.
- Length of the belt needs to be sufficient to allow the full range of groundwater fluctuation.

- The design of the belt skimmer unit should be compatible with the use in a well (i.e., narrow belts with long vertical drops), should include controls for the management of the collected SPH, and should be intended for long-term use.
- The skimmer motor shall be rated as explosion proof (Class 1, Division 2).

## 4.3 SPH Storage, Protection, and Containment

The skimmed SPH will drain into a purpose-specific 55-gallon drum adjacent to the skimmer unit. Each skimmer unit and drum will be contained in an enclosure (shed) to protect the equipment and provide secondary containment of the accumulated SPH. The skimmer system will include controls that will prevent overfilling of the drum, as described in Section 4.4. Considerations for the storage and containment components include:

- The storage drum shall be made of materials compatible with the long-term storage of petroleum products.
- The enclosure shall have a sealed floor and a minimum storage capacity of 55 gallons (i.e., for a 4-foot by 8-foot shed, a perimeter lip of 3 inches around the edge of the floor).
- The floor shall also be sealed around the well casing (or well casing extension).
- The enclosure shall meet the requirements Georgia State International Building Code Appendix N (Disaster Resilient Construction) and the International Building Code section 1609 for a Class I structure. The design wind speed for the structure is at least 140 mph.
- The enclosure shall be anchored to the ground at each corner with suitably-sized auger ground anchors.
- The enclosure shall have perimeter vents or other means of passive ventilation to prevent the accumulation of vapors.
- Traffic barricades (such as concrete ecology blocks) will be placed around enclosures located in or near traffic areas to provide protection from vehicles.

## 4.4 Power and Controls

Controls on each skimmer unit will manage the operation of the belt skimmer such that indicator lights will provide visible warning that the drum is nearly full and will shut down the belt skimmer if the drum capacity is reached. Considerations for power and controls for each unit include:

- Power to the system shall be consistent with the requirements of the belt skimmer unit (115VAC, single phase, fractional hp TEFC) and shall be provided by an on-site power source as identified by the facility manager. Power shall be installed by a licensed electrician to each of the 26 skimmer locations.

- The SPH collection drum shall include three float switches – set at 75 percent, 90 percent, and 95 percent of the drum capacity, respectively. The 75-percent switch will trigger a warning light, the 90-percent switch will shut down the belt skimmer, and the 95-percent switch will shut power off to the skimmer system.
- An indicator light shall be installed on the exterior of the shed enclosure (visible from the upland side of the shed) to provide visible indication that the drum should be emptied – triggered by the 75-percent float switch.
- The control for the 90-percent float switch shall be provided by the manufacturer and shall shut off the belt skimmer motor.
- The control for the 95-percent float switch shall interrupt power to the skimmer system when triggered. This condition shall trigger a relay that needs to be manually reset.
- The electrical disconnect and alarm reset button (high level alarm) shall be located on the outside of the enclosure shed, visible from the upland side of the shed.

# *5.0 Remedial Action Design and Implementation*

## 5.1 Preparatory Activities

Underground Utility Locates. Apex will notify the Georgia Utilities Protection Center of the proposed well installation activities prior to mobilization. Additionally, a private utility locator will be retained by Apex to assess for the presence of underground utilities in the vicinity of the borings. The upper 5 to 8 feet of each boring will also be cleared, prior to drilling, using an air knife.

Health and Safety Plan. A site-specific Health and Safety Plan (HASP) for Apex personnel involved with the project will be prepared in accordance with the Occupational Safety and Health Act (OSHA) and 29 CFR 1910.120. Subcontractors are required to prepare and follow their own site-specific HASP. Apex will provide a summary of the anticipated chemical hazards to subcontractors for their health and safety planning.

Waste Profiling. Wastes generated during installation activities will be managed in accordance with the Media Management plan previously prepared for the facility (Ash Creek, 2010). A copy of the Media Management Plan is contained in Appendix A.

Permitting. Electrical permits will be obtained by the remediation subcontractor. No other permits are needed for system installation.

Site Work Areas. Work zones will be established by placing cones and/or barricades around the work zone boundary. It is not anticipated that facility traffic will be affected by the work zones.

**Erosion and Sediment Controls.** Biofilter bags and filter fabric will be used to protect catch basins in the vicinity of active work areas or disturbed soil.

## 5.2 SPH Skimmer System Installation

Each of the 26 SPH skimmer systems will be installed as an independent unit and will include the installation of a skimming well, a belt skimmer unit (with SPH storage and controls), and an enclosure shed to provide protection and containment for the skimmer unit. The SPH skimmer system is shown in plan view on Figures 5 through 8, and Figure 9 shows a system schematic and details.

### *5.2.1 Skimming Well Installations and Development*

SPH skimming wells will be installed in each of the 26 exploration locations identified on Figure 5. The orientation of the proposed well locations is intended to provide continuous coverage of SPH recovery across the length of the waterfront side of the facility – on the upgradient side of the Polywall. The wells will be installed in accordance with Georgia Water Well Standards Act, O.C.G.A §12-5-134 and the Guidance for the Design and Installation of Monitoring Wells (EPA, 2013).

The skimming wells will be constructed from 4-inch-diameter PVC with 15 feet of well screen, set such that the top of the well screen is likely to be consistently above the seasonally affected groundwater table. The wells will be finished at the ground surface with flush monuments unless the belt skimmer units are to be installed directly after well installation, in which case the casing will extend approximately 6 inches above grade. The wells will be surged following installation and then will be allowed to set for at least 24 hours prior to initiating well development. The wells will be developed by bailing and/or over-pumping to remove excess turbidity and improve hydraulic communication with the adjacent water-bearing zone. Given the shallow soil lithology at the Site (sands and silts), traditional drilling equipment will be adequate to complete the explorations (i.e., hollow-stem auger or sonic drilling methods). An Apex representative will observe and document the drilling activities and subsurface conditions encountered.

**Lithologic Logging, Field Screening, and Soil Sampling.** Observations of soil lithology will be made from the soil cuttings removed during the advancement of the borings. The field geologist or engineer will describe the observations of soil type, noting any indications of volatile contamination based on visual inspection, and will describe the lithologic characteristics using the Unified Soil Classification System (USCS) in general accordance with ASTM 2487/2488. Other features such as sorting, sedimentary features, mineralogy, degree of weathering, and contacts with other soil types will be noted, if relevant. Soil samples will not be collected for field screening or sampling for laboratory analysis.

**Locating.** Following completion of the skimming well installations, the horizontal locations of each SVE well will be recorded using a high-accuracy, handheld global positioning system (GPS) device (i.e., Trimble© GeoXH™).

### *5.2.2 Skimmer Units and Controls*

The Abanaki Petroextractor series of commercially available SPH belt-skimmers meet the criteria described in Section 3. The units will include explosion-proof electrical systems, intrinsic monitoring of the fluid level in the accumulation drum (set to shut off the belt skimmer motor when the drum is 90 percent full), and a belt unit sized to fit in the skimming well with about 2 feet of gap between the bottom belt pulley and the bottom of the well. An equipment sheet for the selected unit is included in Appendix B.

The accumulation drum will be outfitted with a float switch that will be triggered when the volume of recovered SPH reaches 75 percent of drum capacity and will activate an amber indicator light on the outside of the enclosure shed. A separate float switch will be set at 95 percent of the drum storage capacity and when triggered will disconnect power to the skimmer unit – a failsafe trigger to keep the skimmer from overfilling the drum in the event of an unexpected condition. The float switches will be attached to the lid of the accumulation drum (which can be removed to allow pumping out the SPH from the drum).

The skimmer unit enclosure will be installed over the well. If the well was installed flush mount, a casing extension will be installed such that the casing extension will terminate 6 inches above the interior floor height of the enclosure. The floor will be sealed around the casing to provide containment within the shed. The skimmer unit and associated accumulation drum will be placed in the enclosure, oriented to match the location of the well casing. Power to the skimmer unit will be provided by a licensed electrician familiar with the facility – it is anticipated that power drops to each unit may include above-ground and buried conduit as appropriate for each system location.

### *5.2.3 Site Restoration*

Following the installation of each unit, and after the power drop to each unit is complete, disturbed areas will be restored to pre-work conditions to the extent practicable. This will include reseeding grassy areas and repaving/patching asphalt surfaces to match the surrounding area.

## 5.3 Environmental Oversight During Installation

Apex will provide environmental oversight during the installation activities, including maintaining field documentation throughout the duration of the activities to document progress. At a minimum, daily field documentation will consist of a summary of installation progress, photographs, and well logs.

### 5.4 Waste Management

The investigation-derived waste (IDW), consisting of soil, purged SPH/water, and decontamination water, will be placed in properly labeled drums and temporarily stored at the facility at a location designated by facility management. Personal protective equipment (PPE) will be disposed of in appropriate garbage receptacles. Samples of the collected IDW will be collected from each media (soil and SPH/water) for waste characterization. Based on prior work at the facility, it is expected that the IDW soil will be characterized as non-hazardous waste and the mixed SPH/ water will be characterized as hazardous waste. Following receipt of the waste characterization samples, the waste determination will be completed and the wastes will be disposed of appropriately.

## *6.0 System Startup and Operation*

### 6.1 Startup Activities

After each of the 26 SPH skimmer systems are installed and power is available, the system will be inspected for completeness and will be activated when all design conditions have been met. At a minimum, Apex staff will observe the first day of operation of each system to ensure proper operation. As part of the inspection and initial operation, each of the float switches will also be manually tripped to test each alarm condition (i.e., activation of the indicator light, shut-down of the skimmer motor, and interruption of system power).

### 6.2 Skimmer System Operation and Maintenance Activities

During normal operation, SPH will accumulate in the skimmer drums. When the fluid level in the drum reaches 75 percent of its capacity, the light on the outside of the enclosure shed will activate – providing visual indication that the drum needs to be emptied. Routine maintenance of the skimmer systems will include regular visits to the facility by an operations and maintenance (O&M) subcontractor outfitted with or accompanied by a vacuum truck (or similar means to efficiently remove the SPH from the drums). The O&M subcontractor will inspect each skimmer unit and remove SPH from drums that have reached the indicator fluid level. The volume of the recovered SPH will be recorded and the SPH then sent to an oil recycler or other approved disposal site.

The unit inspections will include observation and documentation of the general condition of the unit, observations of spills or unintentional releases, proper function of the skimmer unit, and other conditions that may affect the operation or effectiveness of the unit. It is anticipated that the accumulation drums will fill relatively frequently during the initial months of operation, but this frequency is expected to reduce with continued operation. It is also anticipated that the SPH removal rate will vary from unit to unit, and some units will require more frequent servicing than others.

While the operation of the skimmer systems is straightforward, these are mechanical systems and the skimmer systems will require periodic maintenance to function properly. These maintenance activities may include, but are not limited to, replacement of the belt material, and repair/replacement of motors or other moving parts. With this in mind, a brief O&M manual documenting the maintenance tasks, frequency and procedures will be prepared for the O&M subcontractor's use.

## 6.3 Performance Monitoring and Contingency

Periodic measurements of SPH thickness in area monitoring wells (together with the cumulative volume of removed SPH) will be used to track the effectiveness of the recovery system. If recovery volumes become insignificant (i.e., a recovery rate of less than 10 gallons per year) in individual unit, then these units may be turned off and the SPH thickness in the skimming well measured in subsequent site monitoring events to assess whether the thickness rebounds to significant thicknesses (i.e., greater than 0.1 feet). If the thickness remains low then continued operation of that skimmer may not be necessary.

Operation of the belt skimmer recovery system will provide continued information that can be used to optimize the system's recovery. If monitoring of the system suggests that SPH is present between skimmer units that is not accessible with the current layout, additional units or a reconfiguration of the skimmer recovery system may be proposed in the future. The modular nature of the skimmer systems allows for the ability to move units to new locations with relative ease and minimal expense.

# 7.0 References

Amoco Oil Company, 1989. *Letter to Georgia Department of Natural Resources, Re: Report #041789-10.* April 20, 1989.

Ash Creek Associates, Inc. (Ash Creek), 2010. *Groundwater and LNAPL Gauging Event, First Quarter 2010, NuStar Asphalt Refining, LLC, Savannah, Georgia.* September, 2010.

Ash Creek, 2012. Well Installation, SPH Gauging, and Remedial Options Evaluation Report, *NuStar Asphalt Refining, LLC, Savannah Asphalt Refinery, Savannah, Georgia*. August 8, 2012.

Conestoga-Rovers & Associates (CRA), 2009. *Memorandum regarding NuStar Asphalt Refinery, Savannah, Georgia - January through July 2009 Fieldwork Summary.* October 16, 2009.

Lawton, D.E. et al, 1976. *Geologic Map of Georgia: Georgia Department of Natural Resources, Scale 1:500,000.*

National Oceanic and Atmospheric Administration (NOAA), 2008. *Tidal Station Location and Ranges.* Revised November 3, 2008. http://tidesandcurrents.noaa.gov/tides09/tab2ec3b.html#79

S&ME, 1998. *Letter to CITGO Asphalt Refining Co., Subject: Hydrocarbon Thickness Monitoring S&ME Project No. 1144-93-093.*

S&ME, 2003. *Water Elevation/Hydrocarbon Thickness Monitoring Report, Citgo Asphalt Refinery, Foundation Drive, Savannah, Georgia.* October 31, 2003.

Savannah Refinery, 1989. *Letter to Shift Supervisors, Re: "Gas Hole" by Riverbank.* October 18, 1989.

Williams, L.J. and Gill, H.E., 2010. *Revised Hydrogeologic Framework of the Floridan Aquifer System in the Northern Coastal Area of Georgia and Adjacent Parts of South Carolina; U.S. Geological Survey Scientific Investigations Report 2010-5158.*


**Note:** Base map prepared from USGS 7.5-minute quadrangle of Garden City, GA, dated 1980 and Savannah, GA-SC, dated 1978 as provided by TerraServer-USA.

0 2,000 4,000
Approximate Scale in Feet

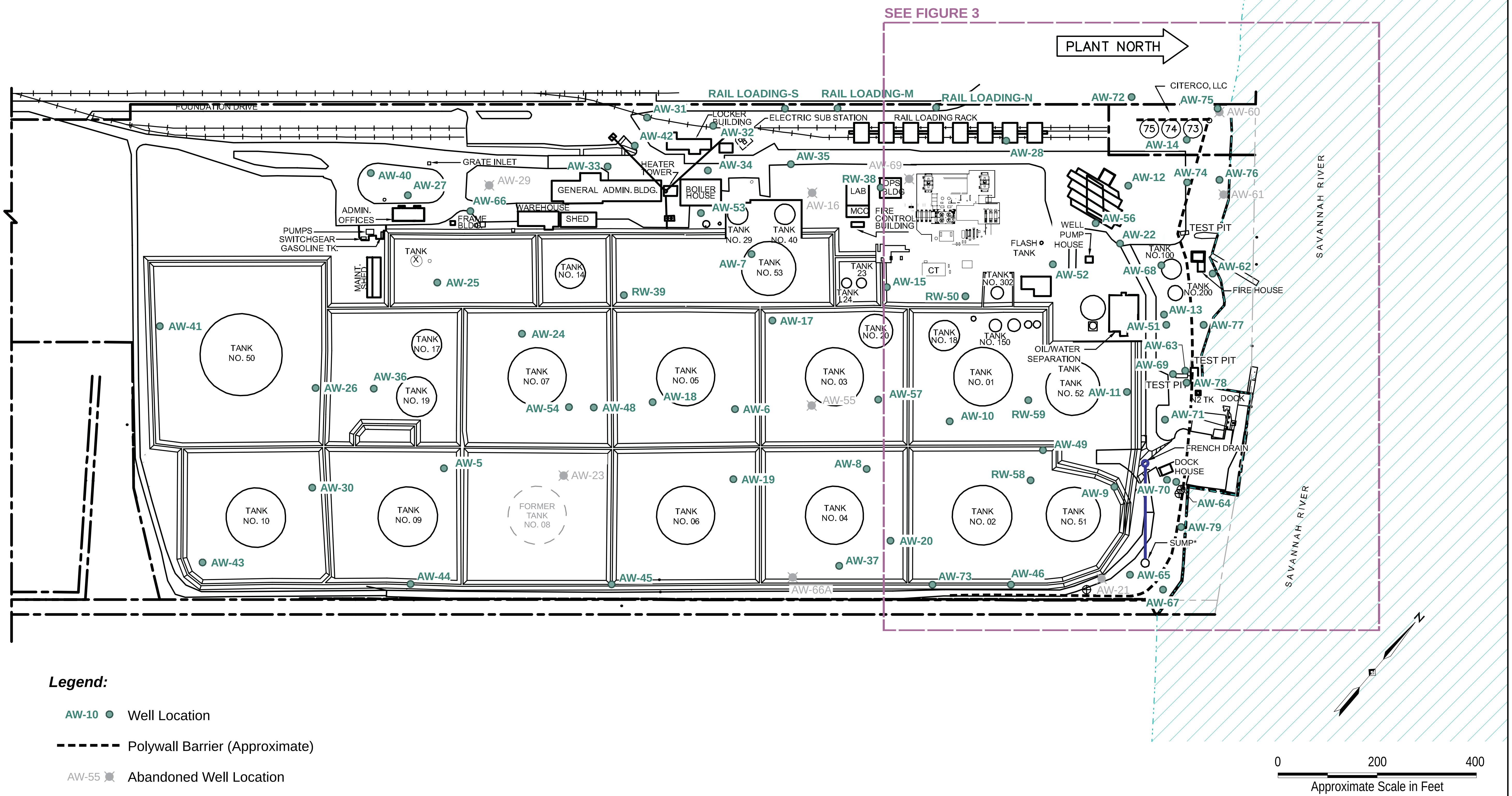

N

# Site Location Map

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

| Project Number | 1634-03 | Figure |
|---|---|---|
| June 2013 | | 1 |




***Legend:***

- AW-10 ● Well Location
- Polywall Barrier (Approximate)
- AW-55 Abandoned Well Location
- ⊕ Polywall Survey
- TEST PIT ▭ Test Pit Location
- Property Boundary

***NOTES:***

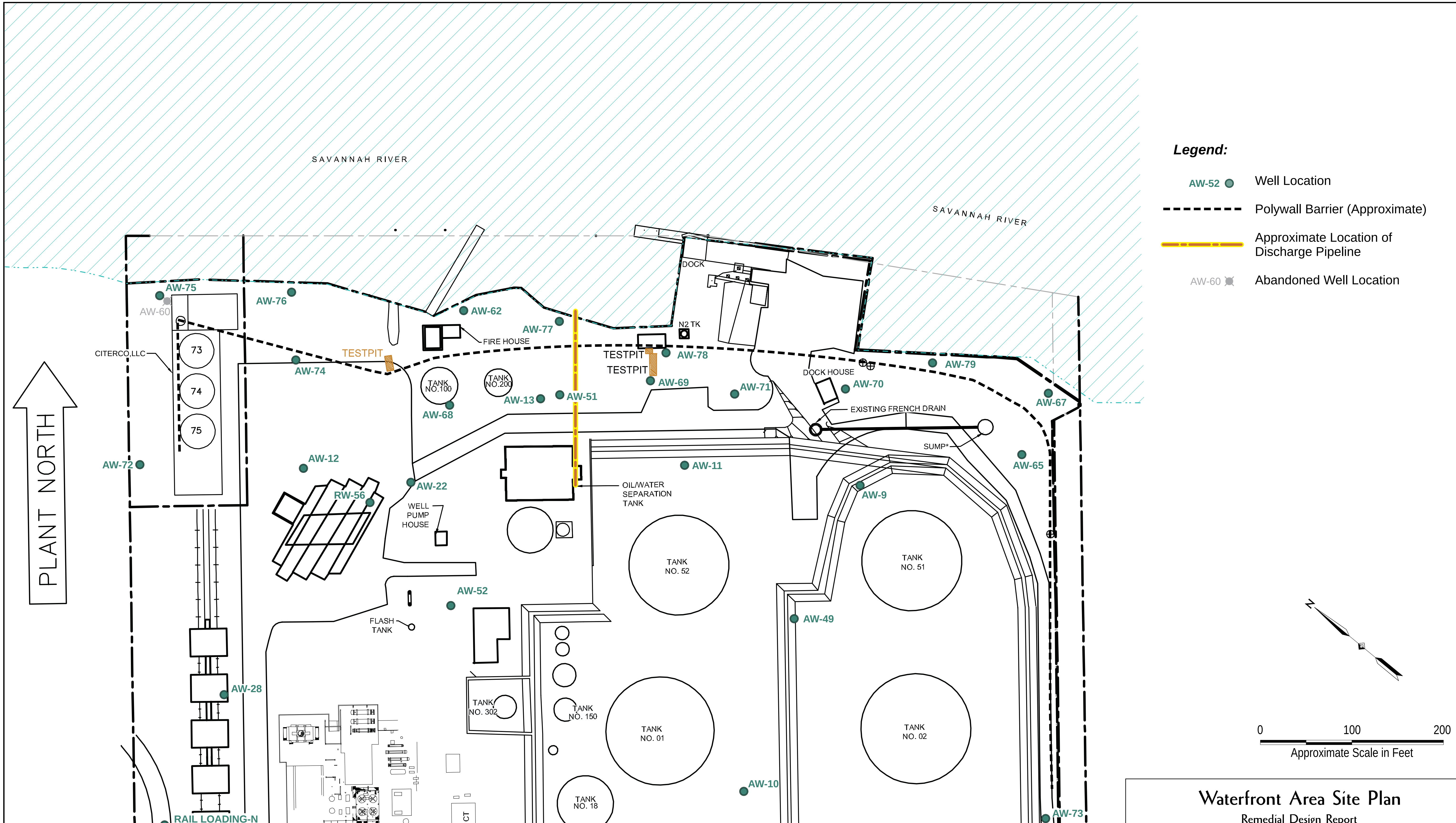
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

| Project Number | 1634-03 | Figure |
|---|---|---|
| | June 2013 | 2 |



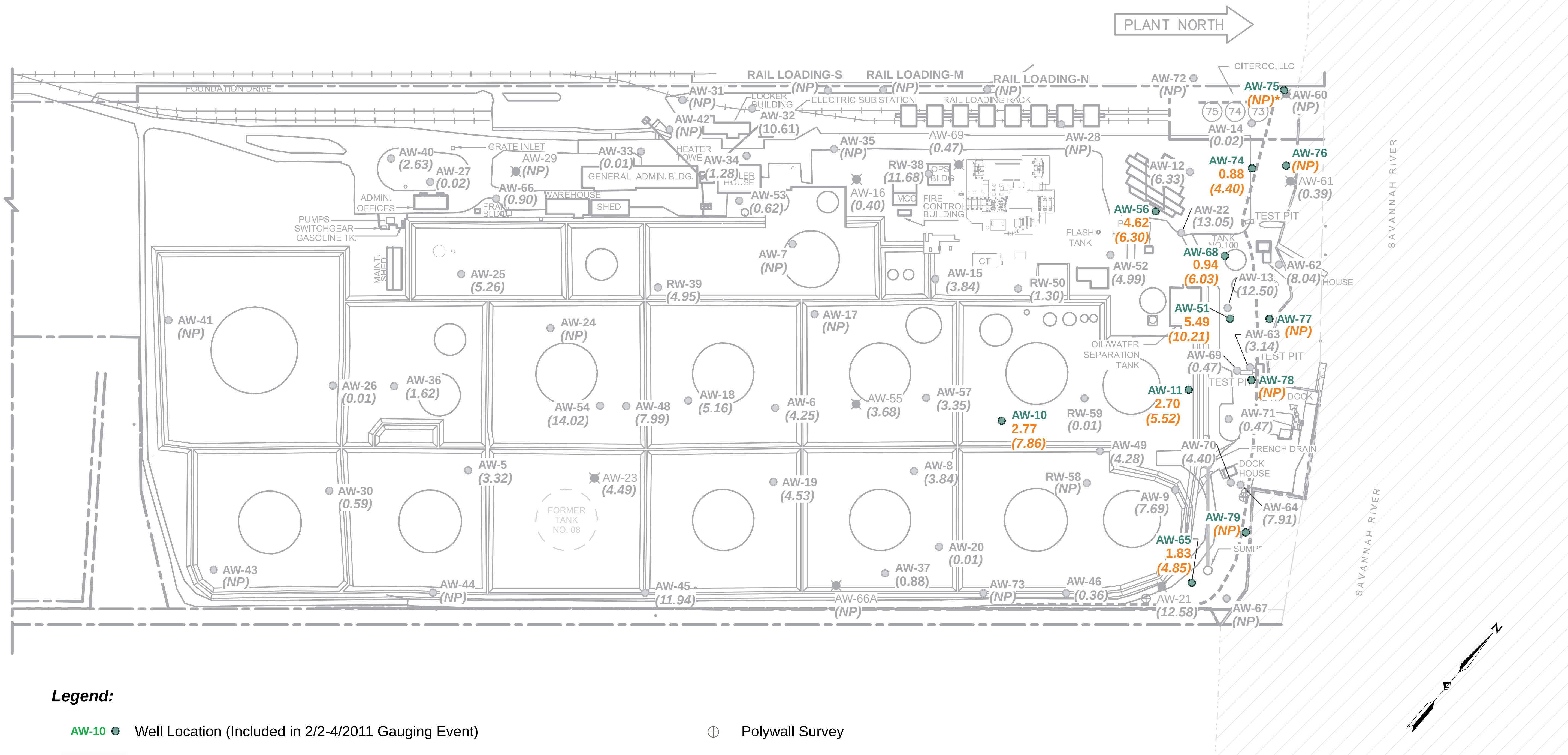

**NOTES:**
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Waterfront Area Site Plan

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

| Project Number | 1634-03 | Figure |
|---|---|---|
| June 2013 | | 3 |




0 200 400

Approximate Scale in Feet

**Legend:**

| | |
|---|---|
| AW-10 ● | Well Location (Included in 2/2-4/2011 Gauging Event) |
| AW-45 ● | Well Location (Not Included in 2/2-4/2011 Gauging Event) |
| 2.77<br>(7.86) | February 2-4, 2011 Separate-Phase Hydrocarbon (SPH) Thickness in Feet<br>Maximum Observed SPH Thickness in Feet |
| NP | No Product |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| - - - - | Polywall Barrier (Approximate) |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

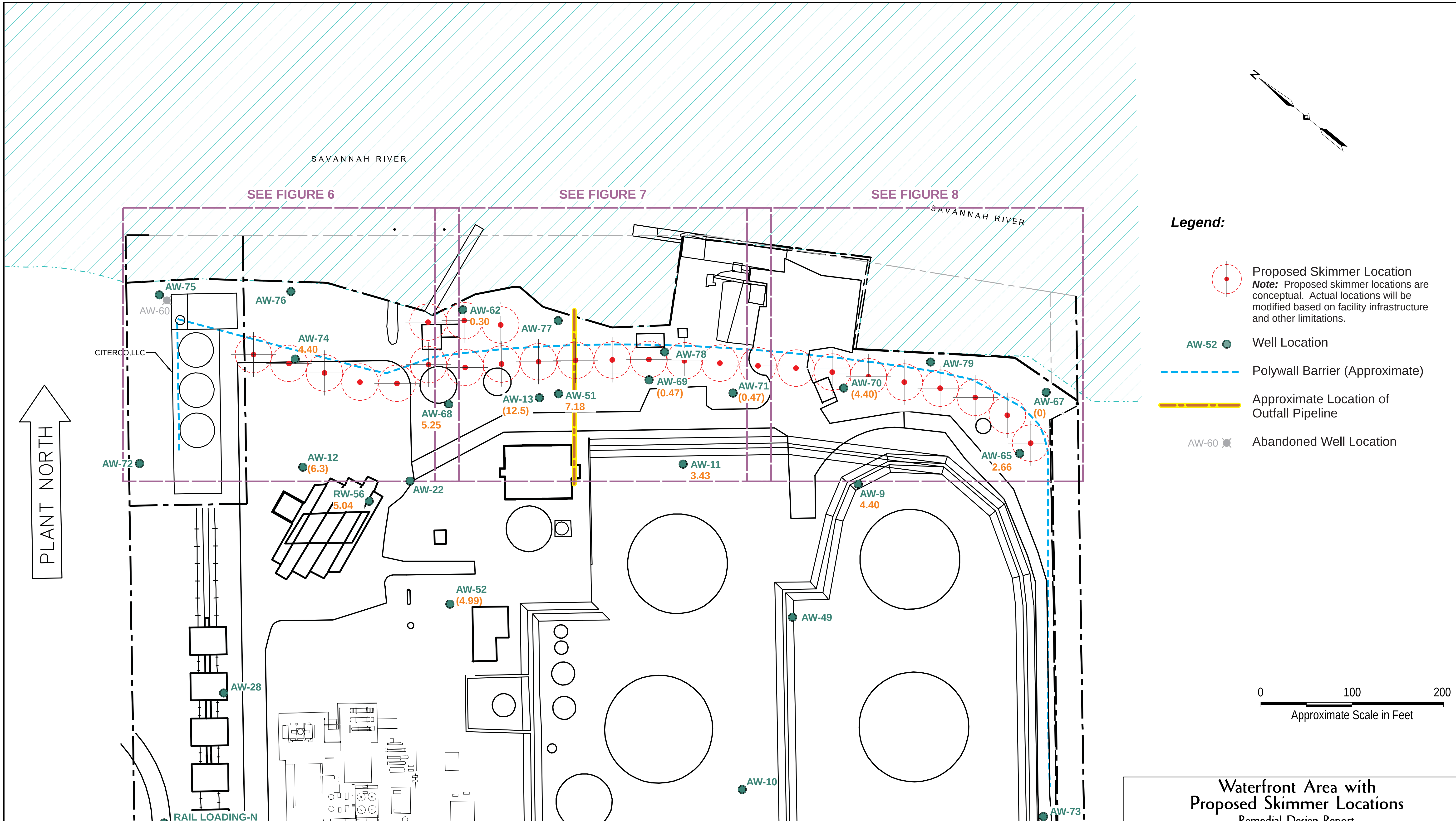
***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Site Plan with SPH Thicknesses - February 2011

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

| Project Number | 1634-03 | Figure |
|---|---|---|
| June 2013 | | 4 |

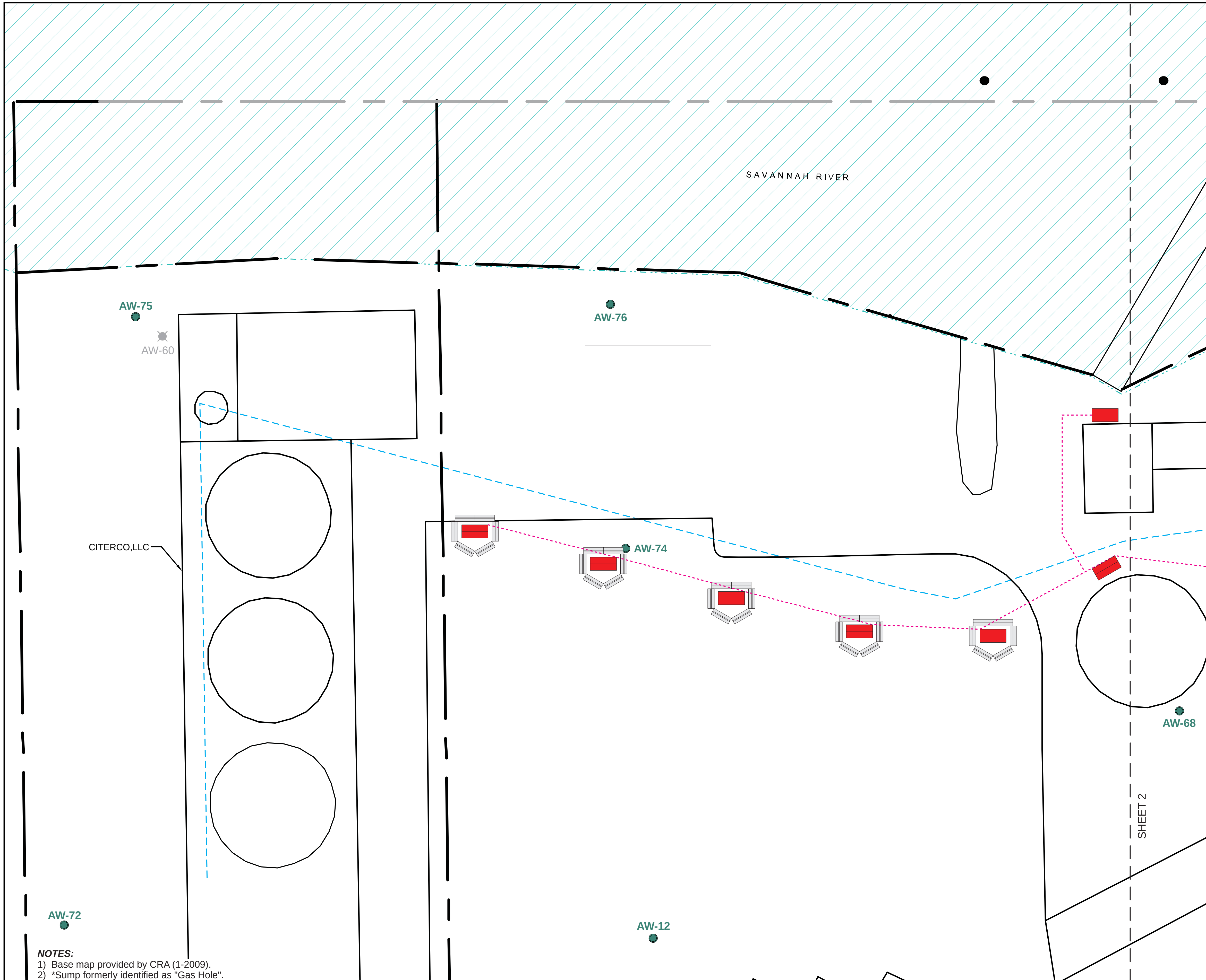



***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Waterfront Area with Proposed Skimmer Locations

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

| APEX | Apex Companies, LLC<br>3015 SW First Avenue<br>Portland, Oregon 97201 | Project Number | 1634-03 | Figure |
|---|---|---|---|---|
| | | June 2013 | | 5 |




***Legend:***

- Proposed Location of Skimmer Shed
  ***Note:*** Proposed skimmer locations are conceptual. Actual locations will be modified based on facility infrastructure and other limitations.
- AW-52 Monitoring Well Location
- Polywall Barrier (Approximate)
- Conceptual Path of Electrical Conduit
- Ecology Block (Traffic Barricade)
- AW-60 Abandoned Well Location

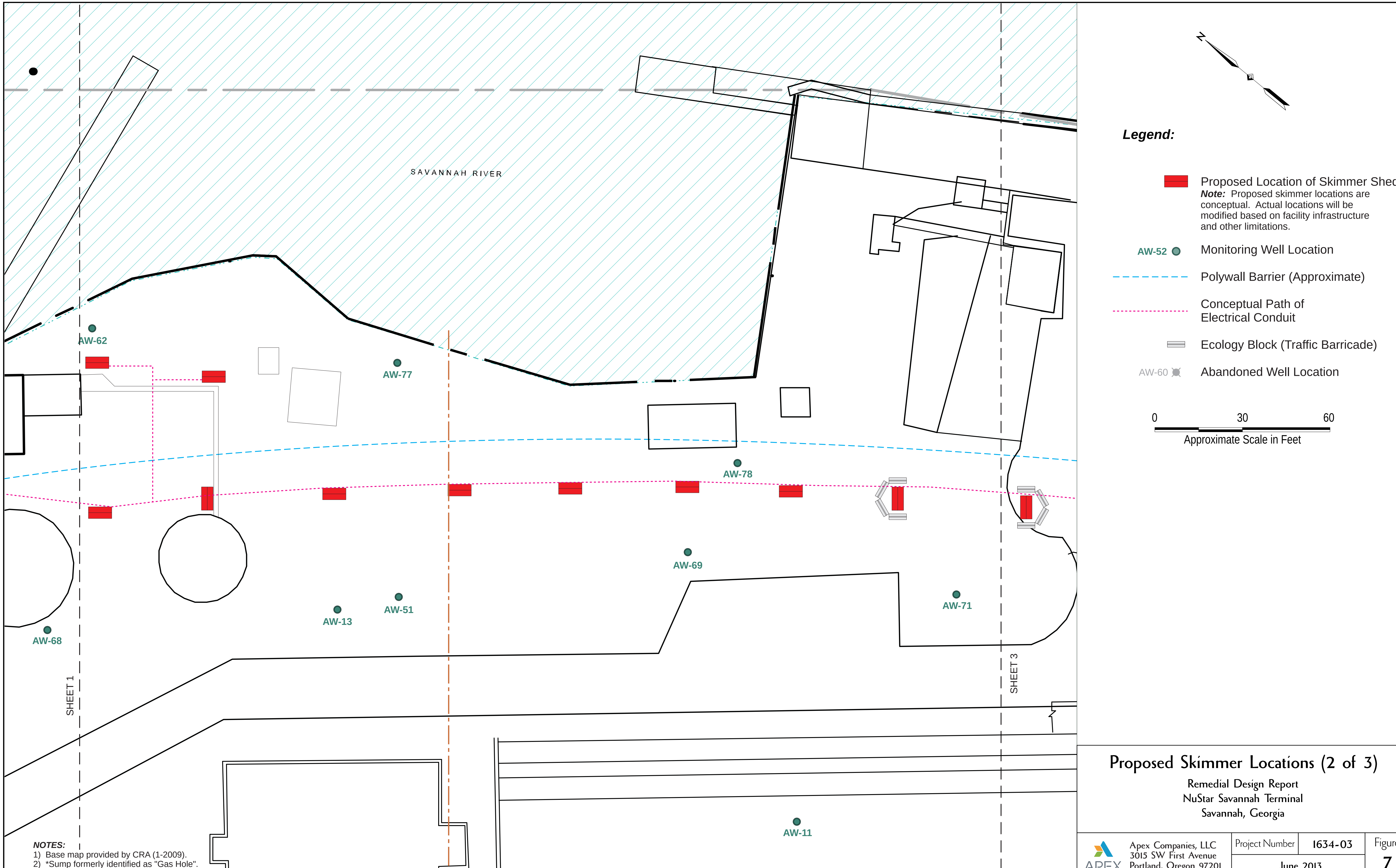
0 30 60
Approximate Scale in Feet

# Proposed Skimmer Locations (1 of 3)

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia


APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201


| | | |
|---|---|---|
| Project Number | 1634-03 | Figure |
| June 2013 | | 6 |



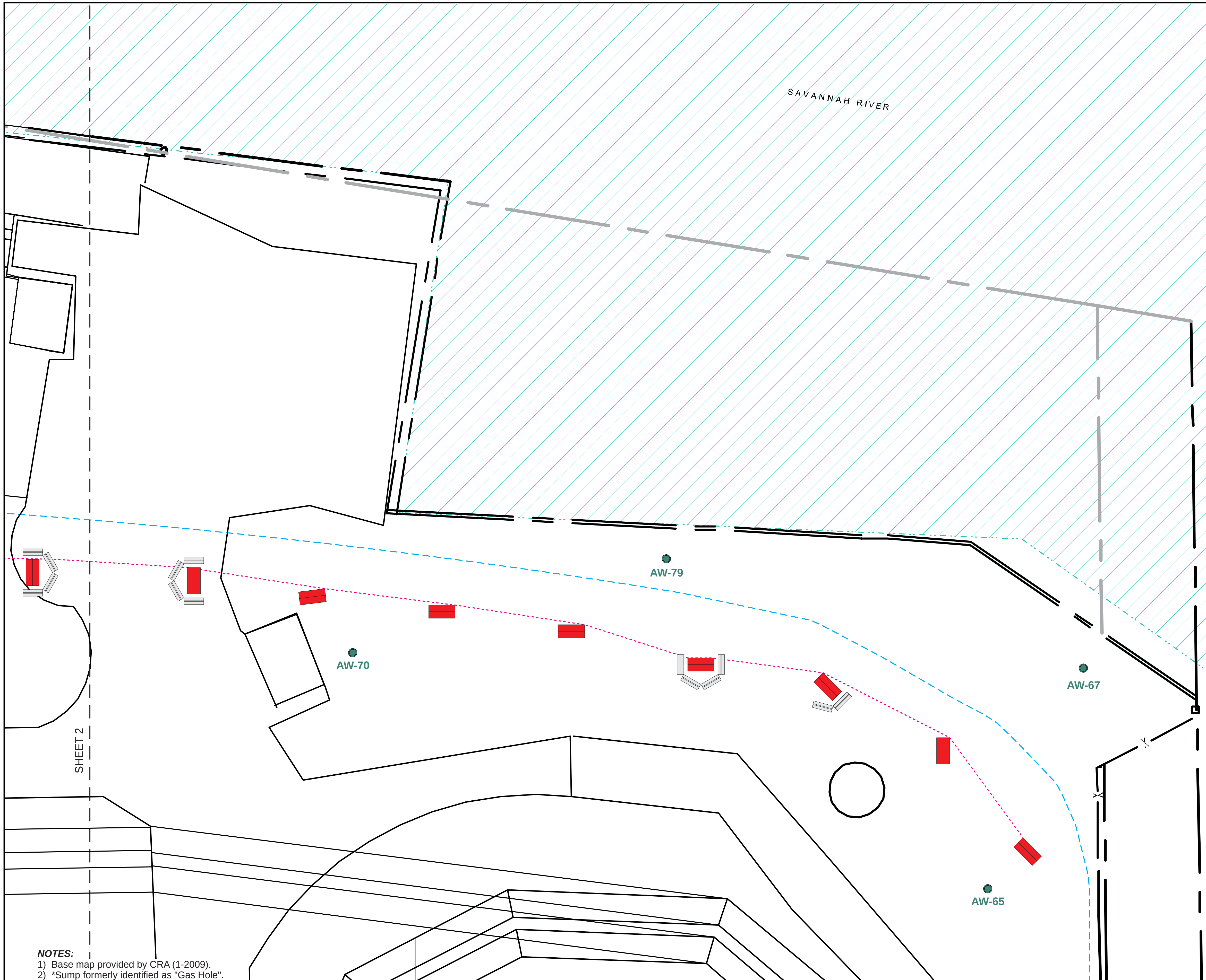

***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

# Proposed Skimmer Locations (2 of 3)

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

| Project Number | 1634-03 | Figure |
|---|---|---|
| June 2013 | | 7 |




***Legend:***

- Proposed Location of Skimmer Shed
  ***Note:*** Proposed skimmer locations are conceptual. Actual locations will be modified based on facility infrastructure and other limitations.
- AW-52 Monitoring Well Location
- Polywall Barrier (Approximate)
- Conceptual Path of Electrical Conduit
- Ecology Block (Traffic Barricade)
- AW-60 Abandoned Well Location

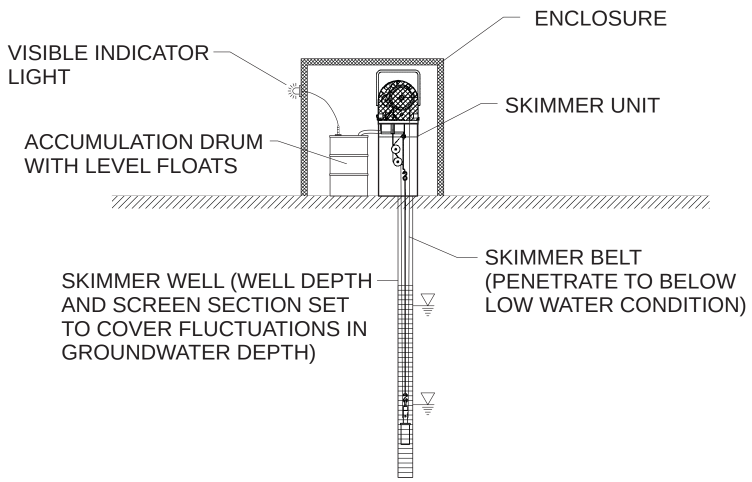
0 30 60
Approximate Scale in Feet

***NOTES:***
1) Base map provided by CRA (1-2009).
2) *Sump formerly identified as "Gas Hole".

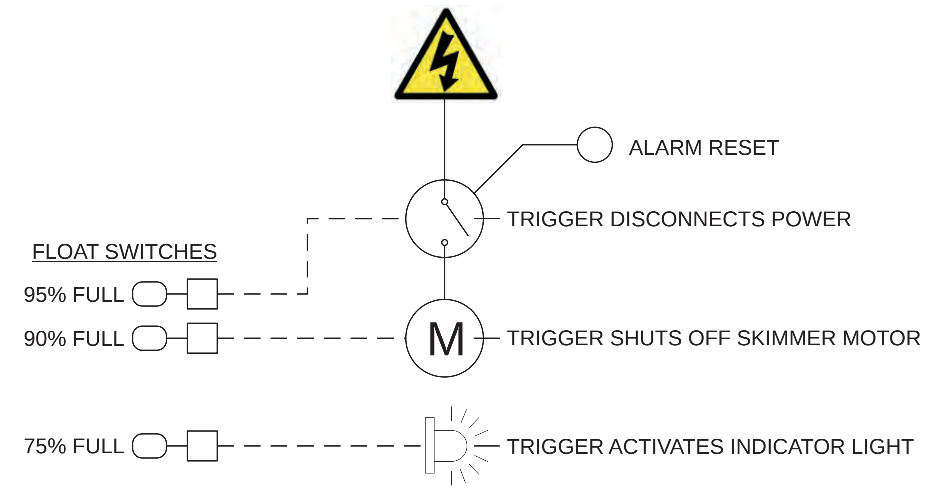
# Proposed Skimmer Locations (3 of 3)

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia

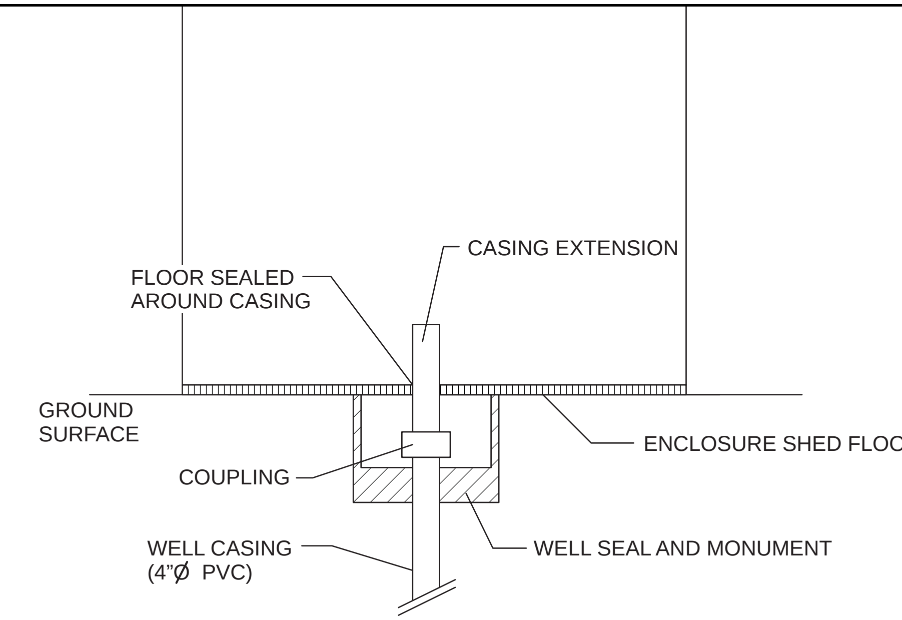
| | | | |
|---|---|---|---|
| APEX Apex Companies, LLC 3015 SW First Avenue Portland, Oregon 97201 | Project Number | 1634-03 | Figure 8 |
| | June 2013 | | |



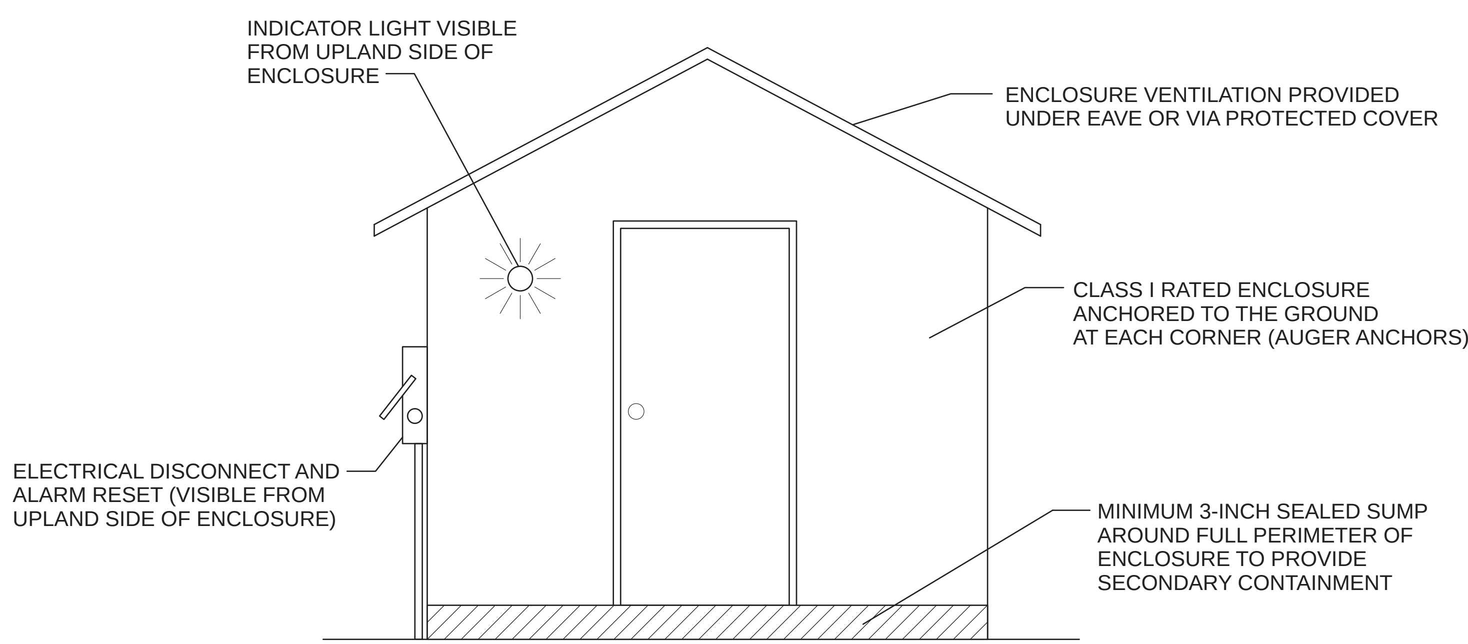

1 SKIMMER SYSTEM SCHEMATIC (NTS)




2 CONTROL SCHEMATIC (NTS)




3 WELLHEAD SEAL DETAIL (NTS)




4 ENCLOSURE PROFILE (NTS)

# Skimmer System Details

Remedial Design Report
NuStar Savannah Terminal
Savannah, Georgia


APEX
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201


| | | |
|---|---|---|
| Project Number | 1634-03 | Figure |
| June 2013 | | 9 |

# *Appendix A*

## Media Management Plan

*Media Management Plan*
*NuStar Asphalt Refining, LLC*
*Savannah Asphalt Refinery*
*Savannah, Georgia*

Prepared for:
NuStar Asphalt Refining, LLC

October 22, 2010
1634-02

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

*Media Management Plan*
*NuStar Asphalt Refining, LLC*
*Savannah Asphalt Refinery*
*Savannah, Georgia*

Prepared for:
NuStar Asphalt Refining, LLC

October 22, 2010
1634-02


*Chris Breemer*
*Senior Associate*

*Amanda L. Spencer, R.G.*
*Principal Hydrogeologist*

# Table of Contents

# Executive Summary

Ash Creek Associates, Inc. prepared this Soil and Groundwater Management Plan to provide guidance for the management of petroleum-impacted soil and groundwater during construction activities at the NuStar Asphalt Refining, LLC (NuStar) asphalt refinery in Savannah, Georgia (Site). Soil and groundwater at the Site contain petroleum hydrocarbons. Light non-aqueous phase liquid (LNAPL) has been measured in shallow groundwater and impacted soil has been observed in the vicinity of proposed aboveground storage tank (AST) 54. Special management of soil and groundwater is required during future construction of AST 54. The steps required to properly manage excavated soil and removed groundwater are summarized below.

## Soil Management Summary

1. Collect soil samples prior to excavation, using hand tools and/or a direct-push drill rig.
2. Submit soil samples to an accredited laboratory for analysis of BTEX, PAHs, and leachable metals.
3. Compare laboratory data to Georgia Department of Natural Resources, Environmental Protection Division (EPD) UST Program Threshold Levels (Table 1).
4. Designate soil that exceeds Threshold Levels as impacted and other soil as non-impacted.
5. Identify (on plans and in the field) impacted and non-impacted soil.
6. Submit a waste profile form to the selected disposal facility (Superior Landfill) to obtain a permit.
7. Provide soil manifests to the transporters.
8. Transport impacted soil to the disposal facility during construction activities.
9. Place non-impacted soil suitable for re-use (in accordance with Table 1) at designated on-site locations.

## Groundwater Management Summary

1. Determine the method that will be used to dewater the excavation (sumps or well points).
2. Identify an on-site staging area for water storage tanks.
3. Obtain tanks, pumps, and hoses that are sufficient for dewatering the excavation, transporting the water to the staging area, storing the water pending characterization and off-site transport, and transferring water to trucks (if not equipped with internal vacuum systems).
4. Determine if water will be disposed of under the facility NPDES Industrial Stormwater permit or will be transported off-site for disposal. Contact the NuStar Remediation Manager if NPDES discharge is preferred. Otherwise, use the following guidance.
5. Retain a NuStar-approved vendor to transport and dispose of the water. Determine the vendor-specific waste characterization requirements.
6. If well points are the selected de-watering method, install them prior to construction. If sumps are the selected de-watering method, excavate them when construction reaches a depth sufficient to encounter groundwater.

7. Pump fluids from the sumps or well points to temporary storage tanks at a rate sufficient to remove water from the excavation.
8. Direct the NuStar-approved vendor to transport water from the tanks to the disposal facility.
9. Collect manifests.

Details for each step are provided in the following sections.

# 1.0 Introduction

Ash Creek Associates, Inc. (Ash Creek) prepared this Soil and Groundwater Management Plan (Plan) to provide guidance for the management of petroleum-impacted soil and groundwater during construction activities at the NuStar Asphalt Refining, LLC (NuStar) asphalt refinery in Savannah, Georgia (the Site). The guidance presented herein is general in nature. Addenda to this Plan may be necessary to provide project-specific media management guidance.

This Plan is intended to be used by environmental professionals assisting the construction team with environmental issues during construction. This plan is divided into the following categories for construction guidance: Soil Management, Groundwater Management, and Worker Protection.

# 2.0 Site Description & Proposed Activities

The Site (Figures 1 and 2) consists of an approximate 43-acre property, located at 7 Foundation Road, Savannah, Georgia. It is bordered on the east by the Savannah River, the south and north by industrial facilities, and the west by vacant land. The Site facilities include above ground storage tanks (ASTs) of varying sizes and associated above/below ground piping.

Beginning in December 2010, the facility plans to build a new AST (number 54) at the former location of AST number 8. Construction plans indicate that it may be necessary to excavate to a depth of 7 feet below ground surface to complete an approximate 150-foot-diameter foundation for AST 54. Preliminary construction estimates indicate that 3,000 to 5,000 cubic yards of soil may be excavated during construction activities. Petroleum hydrocarbons are widespread in the subsurface at the Site; therefore, the excavated soil will require special management.

In 2009, monitoring well AW-23, located near the proposed AST 54 area, contained light non-aqueous phase liquid (LNAPL) at thicknesses ranging from 1.3 to 2.6 feet. The LNAPL was generally encountered at the 6.5 to 7.5 depth interval. Therefore, groundwater may be encountered during AST 54 excavation activities during construction, which may be petroleum impacted and/or contain LNAPL. Consequently, soil and groundwater will require special management during construction activities.

# 3.0 Soil Management

Based on previous environmental assessment activities, as well as facility process knowledge, soil encountered during construction may contain petroleum hydrocarbons. Explorations and sampling can be conducted at proposed excavation locations to confirm whether soil contains petroleum hydrocarbons. A representative of the Georgia Department of Natural Resources, Environmental Protection Division (EPD), Underground Storage Tank (UST) Program stated that soil can be characterized either *in-situ* prior to construction, or from stockpiles. To expedite the construction process, soil in the proposed excavation area should be characterized *in-situ* prior to construction.

### *3.1 Pre-Construction Soil Characterization*

Pre-construction soil characterization activities should be conducted to determine: 1) which areas of the proposed construction zone can be excavated for potential re-use or haul-off as clean fill; and 2) which areas must be transported to a landfill for disposal as contaminated media.

Soil characterization should be conducted prior to proposed excavation activities to characterize the soil in the construction zone. According to the EPD UST Program, soil should be collected at a rate of one soil sample per 200 cubic yards of soil. To achieve this sampling rate, 15 to 25 samples should be collected in the proposed construction zone (assuming 3,000 to 5,000 cubic yards of soil are excavated). The borings can be completed using either a hand-auger or mobile direct-push drill rig. Suggested boring locations in the conceptual construction zone are shown on Figure 3.

Assuming a 150-foot-diameter footing for the proposed AST, the borings may be spaced approximately 20 to 30 feet apart, in the footprint of the proposed footing. The borings should be completed to a depth equal to the proposed excavation depth. A minimum of one soil sample should be collected from each boring at the depth interval which exhibits the maximum field evidence of petroleum impacts, based on photoionization detector (PID) data and/or olfactory/visual evidence of petroleum contamination, or the bottom of the boring, if no evidence of petroleum impacts is observed.

The soil samples should be submitted to a State of Georgia certified laboratory for the following analyses:

1. Benzene, tolune, ethylbenzene, and xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method 5035/8260B; and
2. Polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270.

For landfilling characterization purposes, a subset of samples (2 to 3, or approximately 10 percent) that exhibit the highest concentrations of petroleum hydrocarbons should be submitted for follow-up analysis of:

3. Leachable Resource Conservation and Recovery Act (RCRA)-8 metals by EPA Method 1311/6010.

The laboratory data should be compared to Threshold Levels promulgated under Georgia Underground Storage Tank (GUST) Rule 391-3-15-.09(3), summarized in Table 1, to determine which samples represent soil that can be re-used at the Site and which represent soil that must be transported off-site for disposal.

Soil represented by samples containing concentrations exceeding one or more Threshold Levels should be disposed of off-site at a NuStar-approved landfill.

The environmental professional using this plan should use the laboratory data and Threshold Levels (Table 1) to identify zones on the construction plans in which soil is: 1) suitable for re-use, or 2) will require off-site disposal upon excavation. Details regarding landfill disposal procedures and onsite re-use are provided in the following sections of this Plan.

### *3.2 Soil Disposal Location*

For the purposes of this Plan, it was assumed that soil requiring landfill disposal will be disposed of at the Waste Management Superior Landfill, located at 3001 Little Neck Road, Savannah, Georgia. Contact information is presented in Appendix A.

Prior to disposal, Waste Management will require a submission of a completed waste profile form. An example profile form is included in Appendix B. The waste profile form can be obtained by calling the Superior Landfill or visiting their website. The waste profile form will include data about the source and volume of the soil, as well as the chemical constituents. Waste Management will require laboratory data describing the BTEX concentrations in soil, and possibly data describing leachable metals concentrations, for the profile (these analyses were included in the analytical suite described in Section 3.1 – Pre-Construction Soil Characterization). The waste profile form should be submitted to Waste Management prior to excavation activities. Waste Management will issue a soil disposal permit and approval code, based on the profile.

#### *3.2.1 Soil Disposal Activities*

Once an area of soil in the construction zone is determined to require off-site disposal upon excavation activities, the impacted area should be marked. Excavated soil can be direct-loaded into trucks for delivery to the landfill or stockpiled for later loading and delivery to the landfill. Stockpiled soil should be placed: 1) on other soil that is also scheduled for excavation and off-site disposal, 2) on plastic sheeting, or 3) in roll-off bins. Stockpiled soil should be covered and bermed (using hay bails or other materials) when not in use to prevent runoff during precipitation. Soil that contains COI at concentrations exceeding the Threshold Levels shown in Table 1 should not be stockpiled on the Site for more than 90 days.

Soil may be transported off-site in trucks or in roll-off bins. Following loading, trucks should be brushed to remove soil or other debris. A wheel wash station, or other system, may be necessary to prevent tracking of soil from the Site. Trucks should not leave the Site if soil or fluids are leaking.

Drivers will be required to present the Waste Management-issued manifest, with approval code prior to disposal of soil at the Superior Landfill. Waste Management will issue a disposal manifest to each driver after soil is delivered. The environmental professional, or designated representative, should obtain copies of every manifest, on a daily basis, from the drivers.

### *3.2.2 On-Site Soil Re-Use*

Soil may be stockpiled or re-used at the Site if chemical concentrations are less than the applicable Threshold Levels summarized in Table 1. Soil that does not contain detectable levels of benzene, toluene, ethylbenzene, xylenes (BTEX) and PAHs may be handled as ordinary soil.

Soil designated as appropriate for re-use may be placed at locations identified by the Refinery Manager. Soil that is re-used at the Site should only be placed in a manner and at locations that will not: 1) erode, 2) impact sensitive areas, 3) contact groundwater. No soil should be re-used along the river bank area.

# *4.0 Groundwater Management*

Groundwater beneath much of the Site contains petroleum hydrocarbons. Groundwater and/or LNAPL are likely to be encountered during excavations for proposed AST 54. The volume of water/LNAPL that will be generated is difficult to estimate. However, assuming a 7-foot excavation depth, 50 to 200 gallons per minute (GPM) may enter the excavation. It will be necessary to remove the water to construct the AST footing.

Water can be removed: 1) by installing temporary well points in the vicinity of the excavation and pumping from the well points to temporarily lower the water table, or 2) excavating sumps at selected locations at the perimeter of the excavation and pumping from the sumps. Option 1 can lower the water table significantly below the base of the excavation, but it will generate more groundwater/LNAPL. Due to the reduced water generation, Option 2 is the preferred approach if the water table can be lowered an amount sufficient for construction.

Pumps and hoses will be necessary to remove the water from the excavation area and to move it to a designated temporary staging area. The staging area should be in a location that does not interfere with construction but allows truck access to remove the water. The temporary staging area should be equipped with one or more frac tanks for temporary storage of extracted groundwater. Storage tanks are available from Baker Tanks, in Augusta, Georgia, or other vendors. Contact information for Baker Tanks is presented in Appendix A. The Refinery Manager should designate locations appropriate for temporary storage of water.

## *4.1 Groundwater Characterization*

Groundwater may be characterized before or after it is removed from the ground. Characterization typically consists of collection of a water sample and submission of the sample to a NuStar-approved water disposal firm or laboratory for chemical analyses. A sample can be collected before construction by collecting groundwater from AW-23, a monitoring well near proposed AST 54 (Figure 3), or by advancing a temporary boring in the proposed excavation area and collecting a groundwater sample. Alternatively, a sample can be collected at the start of construction by placing extracted groundwater in a storage tank and collecting a sample of the stored water.

The water sample should be submitted to a NuStar-approved water disposal company for characterization. The water characterization requirements vary, depending on whether the water is disposed of at an off-site facility or through the onsite stormwater outfall. Each disposal option, and required characterization tests are described below.

### *4.2 Off-Site Disposal of Groundwater*

Extracted groundwater (and LNAPL) may be transported to and disposed of at an off-site facility that is licensed to accept the water. EQ-The Environmental Quality Company (EQ), based in Atlanta, Georgia, is a NuStar-approved vendor that likely has the capacity to transport and dispose of the fluids. If EQ is selected to transport and dispose of water, they will request submission of a profile form and a water sample (typically 2-liter volume). EQ will analyze the water, normally in 24- to 48-hours, for the profile and to confirm that it does not contain constituents at concentrations that will adversely affect their treatment system. Other water disposal facilities may have similar profiling requirements.

After the water profile is complete and approved by EQ, or another selected transport/disposal company, the selected company will issue a permit for disposal of the water. The water may be transported off-site in tank trucks or vacuum trucks. Temporary storage tanks will be necessary to stage the water for off-site shipment. The water can be transferred from the tanks to trucks using portable pumps or vacuum systems integrated into the trucks. Following loading, trucks should inspected for leakage. Trucks should not leave the Site if fluids are leaking from the truck.

Drivers will be required to present the disposal manifest prior to disposal of water at the selected facility. A disposal manifest will be provided to each driver after fluids are delivered. The environmental professional, or designated representative, should obtain copies of every manifest, on a daily basis, from the drivers. Contact information is presented in Appendix A.

### *4.3 Discharge of Groundwater Through the Stormwater Conveyance System*

The Site maintains a National Pollution Discharge Elimination System (NPDES) Industrial Stormwater permit. The permit authorizes the discharge of uncontaminated groundwater through the permitted outfall, if the water meets all permit criteria. The NuStar Remediation Manager should be contacted for guidance prior to discharge of excavation water through the NPDES permit-approved outfall.

# *5.0 Worker Protection*

Workers that are exposed to soil or groundwater that contains petroleum hydrocarbons should comply with health and safety requirements established by the Site Safety Officer.

Table 1 Soil Threshold Levels
NuStar Savannah Asphalt Refinery
Savannah, Georgia

| | |
|---|---|
| *Volatile Organic Compounds (mg/kg)* [1] | |
| Benzene | 0.005[d] |
| Toluene | 0.4 |
| Ethylbenzene | 0.37 |
| Xylenes | 20 |
| *Polynuclear Aromatic Hydrocarbons (mg/kg)* [1] | |
| Acenaphthene | N/A[e] |
| Anthracene | N/A[e] |
| Benz(a)anthracene | N/A[e] |
| Benzo(a)pyrene | 0.660 [d] |
| Benzo(b)fluoranthene | 0.820[d] |
| Benzo(g.h.i)perylene | N/A[e] |
| Benzo(k)fluoranthene | 1.6 |
| Chrysene | 0.660[d] |
| Dibenz(a,h)anthracene | 1.50[d] |
| Fluoranthene | N/A[e] |
| Fluorene | N/A[e] |
| Indeno(1,2,3-c,d)pyrene | 0.660[d] |
| Naphthalene | N/A[e] |
| Phenanthrene | N/A[e] |
| Pyrene | N/A[e] |

*Notes:*

1. Table A Soil Threshold Levels for Average or Higher Groundwater Pollution Susceptibility Area [GUST Rule 391-3-15-.09(3)].
2. d = Estimated Quantitation Limit. The health-based threshold level is less than the laboratory method limit of detection.
3. e = Not applicable. The health-based threshold level exceeds the expected soil concentration under free product conditions.
4. mg/kg = Milligrams per kilogram.


***Note:*** Base map prepared from USGS 7.5-minute quadrangle of Garden City, GA, dated 1980 and Savannah, GA-SC, dated 1978 as provided by TerraServer-USA.

0 2,000 4,000
Approximate Scale in Feet

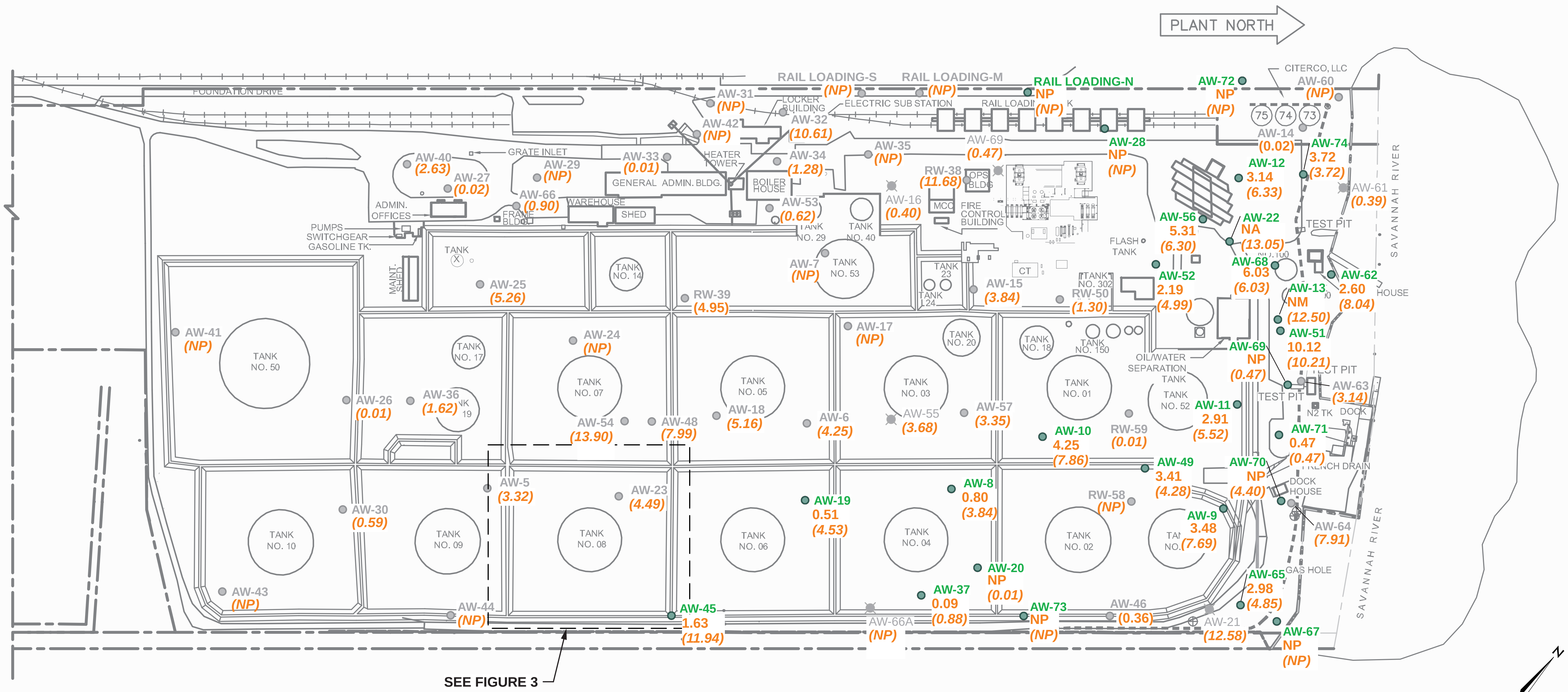

GEORGIA

N

# Facility Location Map

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

| | | | |
|---|---|---|---|
| Ash Creek Associates, Inc. Environmental and Geotechnical Consultants | Project Number | 1634-00 | Figure 1 |
| | October 2010 | | |




***Legend:***

| | |
|---|---|
| AW-10 ● | Well Location (Included in 2010 Gauging Events) |
| AW-45 ● | Well Location (Not Included in 2010 Gauging Events) |
| 1.82<br>(2.40) | March 24, 2010 Non Aqueous Phase Liquid (LNAPL) Thickness in Feet<br>Maximum Observed SPH Thickness in Feet |
| NA | Not Accessible |
| NM | Not Measured; Product Too Viscous |
| NP | No Product |
| AW-55 | Abandoned Well Location |
| ⊕ | Polywall Survey |
| - - - - | Polywall Barrier |
| TEST PIT | Test Pit Location |
| — - — | Property Boundary |

0 200 400
Approximate Scale in Feet

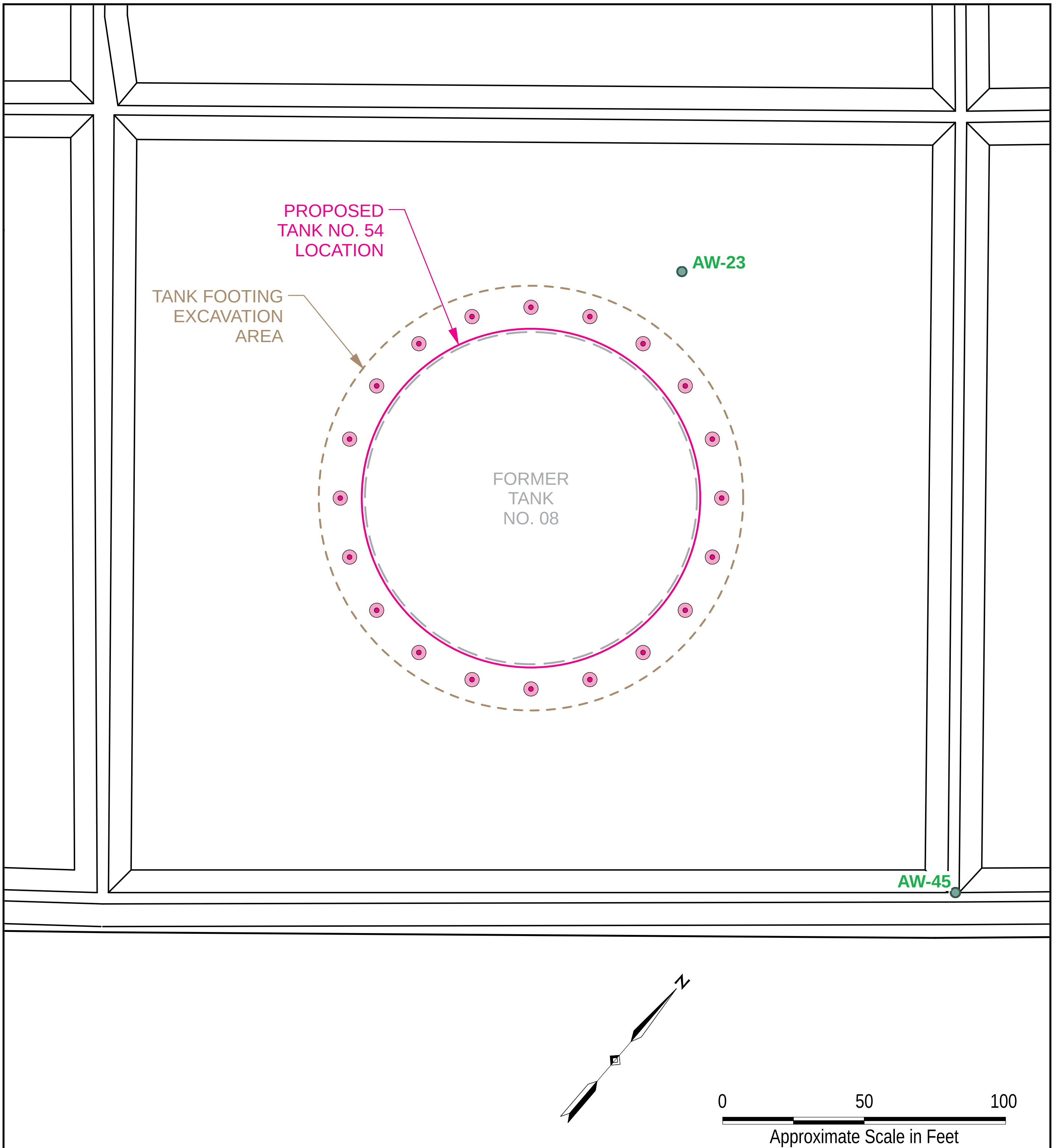
**NOTE:** Base map provided by CRA (1-2009)

# Site Plan with LNAPL Thicknesses

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| October 2010 | | 2 |




***Legend:***

Proposed Soil Boring Location

AW-23 Well Location

***NOTE:*** Base map provided by CRA (1-2009)

# Conceptual Soil Characterization Plan

NuStar Savannah Refinery
NuStar Asphalt Refining LLC
Savannah, Georgia

Ash Creek Associates, Inc.
Environmental and Geotechnical Consultants

| Project Number | 1634-00 | Figure |
|---|---|---|
| October 2010 | | 3 |

# Appendix A

## Vendor Contact Information

# ***Vendor Contact Information***

Baker Tanks
4016 Mike Padgett Hwy
Augusta, GA 30906
Phone: (706) 796-7656

EQ- The Environmental Quality Corporation
Contact: Cord Trammel
EQ-The Environmental Quality Co.
Cell (678) 951-4426
Fax (770) 993-6929
cord.trammell@eqonline.com

Waste Management – Superior Landfill
3001 Little Neck Road
Savannah, GA 31419
205-652-9721

# *Appendix B*

## Sample Waste Profile Forms

WASTE MANAGEMENT

# Generator's Non-hazardous Waste Profile Sheet

Requested Disposal Facility: ____________________ Profile Number: ____________________

❑ Renewal for Profile Number: ____________________ Waste Approval Expiration Date: ____________________

❑ Check here if there are multiple generating locations for this waste. Attach additional locations.

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

1. Generator Name: ____________________
2. Site Address: ____________________
3. City/ZIP: ____________________
4. State: ____________________
5. County: ____________________
6. Contact Name/Title: ____________________
7. Email Address: ____________________
8. Phone: ____________________ 9. FAX: ____________________
10. NAICS Code: ____________________
11. Generator USEPA ID #: ____________________
12. State ID# (if applicable): ____________________

## B. Customer Information ❑ same as above

P. O. Number: ____________________

1. Customer Name: ____________________
2. Billing Address: ____________________
3. City, State and ZIP: ____________________
4. Contact Name: ____________________
5. Contact Email: ____________________
6. Phone: ____________________ FAX: ____________________
7. Transporter Name: ____________________
8. Transporter ID # (if appl.): ____________________
9. Transporter Address: ____________________
10. City, State and ZIP: ____________________

## C. Waste Stream Information

1. DESCRIPTION
   a. Common Waste Name: ____________________
      State Waste Code(s): ____________________
   b. Describe Process Generating Waste or Source of Contamination:
   c. Typical Color(s): ____________________
   d. Strong Odor? ❑ Yes ❑ No Describe: ____________________
   e. Physical State at 70°F: ❑ Solid ❑ Liquid ❑ Powder ❑ Semi-Solid or Sludge ❑ Other: ____________________
   f. Layers? ❑ Single layer ❑ Multi- layer ❑ NA
   g. Water Reactive? ❑ Yes ❑ No If Yes, Describe: ____________________
   h. Free Liquid Range (%): _______ to _______ ❑ NA(solid)
   i. pH Range: _______ to _______ ❑ NA(solid)
   j. Liquid Flash Point: ❑ < 140°F ❑ 140°- 199°F ❑ ≥ 200°F ❑ NA(solid)
   k. Flammable Solid: ❑ Yes ❑ No
   l. Physical Constituents: List all constituents of waste stream - (e.g. Soil 0-80%, Wood 0-20%): ❑ (See Attached)

| Constituents (Total Composition Must be ≥ 100%) | Lower Range | Unit of Measure | Upper Range | Unit of Measure |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |

2. ESTIMATED QUANTITY OF WASTE AND SHIPPING INFORMATION
   a. ❑ One Time Event ❑ Base ❑ Repeat Event
   b. Estimated Annual Quantity: ____________ ❑ Tons ❑ Cubic Yards ❑ Drums ❑ Gallons ❑ Other (specify): ____________
   c. Shipping Frequency: ____________ Units per ❑ Month ❑ Quarter ❑ Year ❑ One Time ❑ Other
   d. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If yes, answer e.) ❑ Yes ❑ No
   e. USDOT Shipping Description (if applicable): ____________________
3. SAFETY REQUIREMENTS (Handling, PPE, etc.): ____________________

WASTE MANAGEMENT

# Generator's Non-hazardous Waste Profile Sheet

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

1. Waste Identification:
   a. Does the waste meet the definition of a USEPA listed or characteristic hazardous waste as defined by 40 CFR Part 261? ❑ Yes ❑ No
      1. If yes, please complete a hazardous waste profile.
   b. Does the waste meet the definition of a state hazardous waste other than identified in D.1.a? ❑ Yes ❑ No
      1. If yes, please complete a hazardous waste profile.
2. Is this waste included in one or more of categories below (Check all that apply)? If yes, attach supporting documentation. ❑ Yes ❑ No
   - ❑ Delisted Hazardous Waste
   - ❑ Excluded Wastes Under 40CFR 261.4
   - ❑ Treated Hazardous Waste Debris
   - ❑ Treated Characteristic Hazardous Waste
3. Is the waste from a Federal (40 CFR 300, Appendix B) or state mandated clean-up? If yes, see instructions. ❑ Yes ❑ No
4. Does the waste represented by this waste profile sheet contain radioactive material? ❑ Yes ❑ No
   a. If yes, is disposal regulated by the Nuclear Regulatory Commission? ❑ Yes ❑ No
   b. If yes, is disposal regulated by a State Agency for radioactive waste/NORM? ❑ Yes ❑ No
5. Does the waste represented by this waste profile sheet contain Polychlorinated Biphenyls (PCBs)? ❑ Yes ❑ No
   (If yes, list in Chemical Composition - C.1.l)
   a. If yes, are the PCBs regulated by 40 CFR 761? ❑ Yes ❑ No
   b. If yes, is it remediation waste from a project being performed under the Self-Implementing option provided in 40 CFR 761.61(a)? ❑ Yes ❑ No
   c. If yes, were the PCBs imported into the US? ❑ Yes ❑ No
6. Does the waste contain untreated, regulated medical or infectious waste? ❑ Yes ❑ No
7. Does the waste contain asbestos? ❑ Yes ❑ No
   a. If Yes, ❑ Friable ❑ Non Friable
8. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? ❑ Yes ❑ No
   a. If yes, does the waste contain <500 ppmw VOHAPs at the point of determination? ❑ Yes ❑ No

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

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

1. Information submitted in this profile and all attached documents contain true and accurate descriptions of the waste material;
2. Relevant information within the possession of the Generator regarding known or suspected hazards pertaining to this waste has been disclosed to WM/the Contractor;
3. Analytical data attached pertaining to the profiled waste was derived from testing a representative sample in accordance with 40 CFR 261.20(c) or equivalent rules; and
4. Changes that occur in the character of the waste (i.e. changes in the process or new analytical) will be identified by the Generator and disclosed to WM (and the Contractor if applicable) prior to providing the waste to WM (and the contractor if applicable).
5. Check all that apply:
   - ❑ a. Attached analytical pertains to the waste. Identify laboratory & sample ID #'s and parameters tested: ______________________ # Pages: ____________
   - ❑ b. Only the analysis identified on the attachment pertain to the waste (identify by laboratory & sample ID #'s and parameters tested). Attachment #: ______________________
   - ❑ c. Additional information necessary to characterize the profiled waste has been attached (other then analytical, such as MSDS). Indicate the number of attached pages: ____________
   - ❑ d. I am an agent signing on behalf of the Generator, and the delegation of authority to me from the Generator for this signature is available upon request.

Certification Signature: ______________________ Title: ______________________

Company Name: ______________________ Name (Print): ______________________

Date: ______________________

Tracking #

# WASTE CHARACTERIZATION REPORT

☐ ***I authorize EQ – The Environmental Quality Company to choose the appropriate facility and method of waste management from the technologies offered at the EQ facilities identified below.***

| | | |
|---|---|---|
| ☐ **Michigan Disposal Waste Treatment Plant** (Stabilization and Treatment) | 49350 N. I-94 Service Drive, Belleville, MI 48111<br>Phone: 800-592-5489 Fax: 800-592-5329 | EPA ID # MID 000 724 831 |
| ☐ **Wayne Disposal, Inc. Site #2 Landfill** (Hazardous & PCB Waste Landfill) | 49350 N. I-94 Service Drive, Belleville, MI 48111<br>Phone: 800-592-5489 Fax: 800-592-5329 | EPA ID # MID 048 090 633 |
| ☐ **EQ Detroit, Inc.** (Stabilization, Wastewater Treatment) | 1923 Frederick Street, Detroit, MI 48211<br>Phone: (313) 923-0080 Fax: 313-923-3375 | EPA ID # MID 980 991 566 |
| ☐ **EQ Resource Recovery, Inc.** (Solvent Recycling, Fuel Blending, WW Treatment) | 36345 Van Born Road, Romulus, MI 48174<br>Phone: 866-373-8357 Fax: 734-326-4033 | EPA ID # MID 060 975 844 |
| ☐ **EQ North Carolina** (Stabilization, Treatment, Labpack Decommissioning) | 1005 Investment Blvd, Apex, NC27502<br>Phone: 919-363-4700 Fax: 919-363-4714 | EPA ID # NCD 982 170 292 |
| ☐ **EQ Florida, Inc.** (Drum Consolidation, Labpack Decommissioning) | 7202 East 8th Ave, Tampa, FL 33619<br>Phone: 813-623-5463 Fax: 813-628-0842 | EPA ID # FLD 981 932 494 |
| ☐ **EQ Transfer & Processing** (Drum Transfer/Universal Waste Handling) | 2000 Ferry Street, Detroit, MI 48211<br>Phone: 313-923-0080 Fax: 313-922-8419 | EPA ID # MIK 939 928 313 |
| ☐ **EQ Indianapolis** (Drum Transfer/Non-Hazardous Waste Processing) | 4000 West 10th Street, Indianapolis, IN 46222<br>Phone: 317-247-7160 Fax: 317-247-7170 | EPA ID # IND 161 049 309 |
| ☐ **EQ Atlanta** (Drum Transfer/Non-Hazardous Waste Processing) | 5600 Fulton Industrial Blvd SW, Atlanta, GA 30336<br>Phone: 404-494-3520 Fax: 404-494-3560 | EPA ID # GAR 000 039 776 |
| ☐ **EQ Augusta, Inc.** (Wastewater Treatment) | 3920 Goshen Industrial Blvd, Augusta, GA 30906<br>Phone: 706-771-9100 Fax: 706-771-9124 | EPA ID # GAR 000 011 817 |

## Waste Common Name:

### *Section 1 – Generator & Customer Information*

SIC/NAICS*

**Generator EPA ID #**

Generator

Facility Address

City S tate Zip

County

**Mailing Address**

City S tate Zip

**Generator Contact**

Title

Phone Fax

*For a list of NAICS codes, please refer to Section 9 of the EQ Resource Guide.

***Internal Use Only: EQ Division***

EQ Customer No.

**Invoicing Company**

Address

City S tate Zip

Country

**Invoicing Contact**

Phone Fax

**Technical Contact**

Phone Fax

Mobile P ager

E-mail

### *Section 2 – Shipping & Packaging Information*

2.1) Shipping Volume & Frequency

☐ One Time Only ☐ Year ☐ Quarter ☐ Month

2.2) DOT Shipping Name

2.3) Is this waste surcharge exempt? ☐ Yes ☐ No

If yes, please attach a surcharge exemption form, found in Section 2 of the EQ Resource Guide.

2.4) Packaging (**check all that apply**)

☐ Bulk Solid ($Yd^3$ < 2000 $lbs/yd^3$)
☐ Bulk Solid (Ton >2000 $lbs/yd^3$)
☐ Bulk Liquids (Gallon)
☐ Totes, Size
☐ Cubic Yard Boxes/Bags
☐ Drums, Size
☐ Other (palletized, 5 gal. Pail, etc.)

Quoted bulk disposal charges for solid materials will be billed by the cubic yard, if the waste density is less than 2,000lbs./cubic yard. If waste density is greater than 2,000 lbs./cubic yard, then bulk disposal charges will be billed by the ton, regardless of the approved container.

## *Section 3 – Physical Characteristics*

3.1) Color 3.2) Odor

3.3) Does this waste contain any "Potentially Odorous Constituents" as defined in the EQ Resource Guide? (Section 3) ☐ Yes ☐ No

3.4) Physical State at 70°F: ☐ Solid ☐ Dust/Powder ☐ Liquid ☐ Sludge

3.5) What is the pH of this waste? ☐ ≤2 ☐ 2.1-4.9 ☐ 5-10 ☐ 10.1-12.4 ☐ ≥12.5

3.6) What is the flash point of this waste? ☐ <90°F ☐ 90-140°F ☐ 140-199°F ☐ >200°F

3.7) Does this waste contain? **(check all that apply)** ☐ **None** ☐ Free Liquids ☐ Oily Residue ☐ Metal Fines

☐ Biodegradable Sorbants ☐ Amines ☐ Ammonia ☐ Water Reactive ☐ Biohazard ☐ Aluminum

☐ Shock Sensitive Waste ☐ Reactive Waste ☐ Radioactive Waste ☐ Explosives ☐ Pyrophoric Waste ☐ Isocyanates

☐ Asbestos – non-friable ☐ Asbestos – friable ☐ Dioxins ☐ Furans

## *Section 4 – Waste Composition and Generating Process*

4.1) Describe the physical composition of the waste (i.e., soil, water, PPE, debris, key chemical compounds, etc.)

to % to %

to % to %

**Total: 100%**

4.2) Provide a *detailed* description of the process generating this waste (attach flow diagram if available).

## *Section 5 – Is This Hazardous Waste?*

*Please refer to Section 5 of the EQ Resource Guide for a list of waste codes*

**As determined by 40 CFR, Part 261 and State Rules:** **Please list applicable waste code(s):**

5.1) Is this an EPA RCRA listed hazardous waste (F, K, P or U)? ☐ Yes ☐ No

5.2) Is this an EPA RCRA characteristic hazardous waste (D001-D043)? ☐ Yes ☐ No

5.3) Do any State Hazardous Waste Codes apply? ☐ Yes ☐ No

5.4) Is this waste intended for wastewater treatment? ☐ Yes* ☐ No

***If you answered 'no' to 5.1, 5.2, and 5.3, please skip to Section 7. *If you answered 'yes' to 5.4, please attach the Waste Characterization Report Addendum found in Section 7 of the EQ Resource Guide.***

## *Section 6 – Hazardous Wastes*

6.1) Does this waste exceed Land Disposal Restriction levels? ☐ Yes ☐ No

6.1a) If this waste stream is greater than 50% soil, does it meet the alternative soil treatment standards of 40 CFR 268.49? ☐ Yes ☐ No

6.1b) Does this waste contain greater than 50% debris, by volume? (Debris is greater than 2.5 inches in size.) ☐ Yes ☐ No

6.2) Is the waste an oxidizer (D001)? ☐ Yes ☐ No

6.3) Does this waste contain reactive cyanide ≥ 250 ppm (D003)? ☐ Yes ☐ No

6.4) Does this waste contain reactive sulfide ≥ 500 ppm (D003)? ☐ Yes ☐ No

6.5) Please indicate which constituent concentrations are below or above the regulatory level. Please indicate the basis used in the determination. Either "Below" or "Above" **MUST** be checked for each constituent.

**Based On:** ☐ **Generator Knowledge** ☐ **Analysis*** ☐ **MSDS***

***Please attach a copy. Analysis or MSDS are required for EQFL Non-hazardous wastes.**

| Code | | Regulatory Level TCLP (mg/l) | Concentration (if above) | Code | | Regulatory Level TCLP (mg/l) | Concentration (if above) |
|---|---|---|---|---|---|---|---|
| D004 | Arsenic | 5 | ☐ Below ☐ Above | D024 | m-Cresol | 200 | ☐ Below ☐ Above |
| D005 | Barium | 100 | ☐ Below ☐ Above | D025 | p-Cresol | 200 | ☐ Below ☐ Above |
| D006 | Cadmium | 1 | ☐ Below ☐ Above | D026 | Cresols | 200 | ☐ Below ☐ Above |
| D007 | Chromium | 5 | ☐ Below ☐ Above | D027 | 1,4-Dichlorobenzene | 7.5 | ☐ Below ☐ Above |
| D008 | Lead | 5 | ☐ Below ☐ Above | D028 | 1,2-Dicholoroethane | 0.5 | ☐ Below ☐ Above |
| D009 | Mercury | 0.2 | ☐ Below ☐ Above | D029 | 1,1-Dichloroethylene | 0.7 | ☐ Below ☐ Above |
| D010 | Selenium | 1 | ☐ Below ☐ Above | D030 | 2,4-Dinitrotoluene | 0.13 | ☐ Below ☐ Above |
| D011 | Silver | 5 | ☐ Below ☐ Above | D031 | Heptachlor | 0.008 | ☐ Below ☐ Above |
| D012 | Endrin | 0.02 | ☐ Below ☐ Above | D032 | Hexachlorobenzene | 0.13 | ☐ Below ☐ Above |
| D013 | Lindane | 0.4 | ☐ Below ☐ Above | D033 | Hexachlorobutadiene | 0.5 | ☐ Below ☐ Above |
| D014 | Methoxychlor | 10 | ☐ Below ☐ Above | D034 | Hexachloroethane | 3.0 | ☐ Below ☐ Above |
| D015 | Toxaphene | 0.5 | ☐ Below ☐ Above | D035 | Methyl Ethyl Ketone | 200 | ☐ Below ☐ Above |
| D016 | 2,4-D | 10 | ☐ Below ☐ Above | D036 | Nitrobenzene | 2 | ☐ Below ☐ Above |
| D017 | 2,4,5-TP (Silvex) | 1 | ☐ Below ☐ Above | D037 | Pentachlorophenol | 100 | ☐ Below ☐ Above |
| D018 | Benzene | 0.5 | ☐ Below ☐ Above | D038 | Pyridine | 5 | ☐ Below ☐ Above |
| D019 | Carbon Tetrachloride | 0.5 | ☐ Below ☐ Above | D039 | Tetrachloroethylene | 0.7 | ☐ Below ☐ Above |
| D020 | Chlordane | 0.03 | ☐ Below ☐ Above | D040 | Trichloroethylene | 0.5 | ☐ Below ☐ Above |
| D021 | Chlorobenzene | 100 | ☐ Below ☐ Above | D041 | 2,4,5-Trichlorophenol | 400 | ☐ Below ☐ Above |
| D022 | Chloroform | 6.0 | ☐ Below ☐ Above | D042 | 2,4,6-Trichlorophenol | 2 | ☐ Below ☐ Above |
| D023 | o-Cresol | 200 | ☐ Below ☐ Above | D043 | Vinyl Chloride | 0.2 | ☐ Below ☐ Above |

6.6) If this is a characteristic hazardous waste, does it contain underlying hazardous constituents? ☐ Yes ☐ No

If yes, please list the constituents in Section 11.

## *Section 7 – Non-Hazardous Wastes*

*For a complete list of non-hazardous waste codes, please refer to Section 7 of the EQ Resource Guide*

**Please list applicable waste code:**

7.1) Is this a Michigan non-hazardous liquid industrial waste? ☐ Yes ☐ No
7.2) Is this a Universal waste? ☐ Yes ☐ No
7.3) Is this a Recyclable Commodity? (e.g.: computer monitors, free mercury, etc.) ☐ Yes ☐ No
7.4) Is this waste a recoverable petroleum product? ☐ Yes* ☐ No
7.5) Is this waste used oil as defined by 40 CFR Part 279? ☐ Yes* ☐ No

***If you answered 'yes' to questions 7.4 or 7.5 please attach the Waste Characterization Report Addendum found in Section 7 of the EQ Resource Guide.***

## *Section 8 – TSCA Information*

8.1) What is the concentration of PCBs in the waste? ☐ None ☐ 0-5 ppm ☐ 6-49 ppm ☐ 50-499 ppm ☐ 500+ ppm
8.2) Does the waste contain PCB contamination from a source with a concentration ≥ 50 ppm? ☐ Yes ☐ No

***If you answered "no" to 8.1 and 8.2, please skip to Section 9.***

8.3) Has this waste been processed into a non-liquid form? ☐ Yes ☐ No
If yes, what was the concentration of PCBs prior to processing? ☐ N/A ☐ 0-499 ppm ☐ 500+ ppm
8.4) Is the non-liquid PCB waste in the form of soil, rags, debris, or other contaminated media? ☐ Yes ☐ No
8.5) Are you a PCB capacitor manufacturer or a PCB equipment manufacturer? ☐ Yes ☐ No
8.6) Has the PCB Article (e.g., transformer, hydraulic machine, PCB-contaminated electrical equipment) been drained/flushed of all PCBs and decontaminated in accordance with 40 CFR 761.60(b)? ☐ N/A ☐ Yes ☐ No

## *Section 9 – Clean Air Act Information*

| NESHAP SIC* | | |
|---|---|---|
| 2812 | 2836 | 2875 |
| 2813 | 2841 | 2879 |
| 2816 | 2842 | 2891 |
| 2819 | 2843 | 2892 |
| 2821 | 2844 | 2893 |
| 2822 | 2851 | 2895 |
| 2823 | 2861 | 2899 |
| 2824 | 2865 | 2911 |
| 2833 | 2869 | 3312 |
| 2834 | 2873 | 4953 |
| 2835 | 2874 | 9511 |

9.1) Is this waste subject to regulation under 40 CFR, Part 63, Subpart DD or 40 CFR, Part 264, Subpart CC (RCRA)? ☐ Yes ☐ No
(Does the waste contain >500 ppm Volatile Organic Hazardous Air Pollutants – VOHAP's or Volatile Organic Compounds – VOC's?)
*For a complete list of VOHAP's, please see Section 11 of the EQ Resource Guide*
9.2) Is the site, or waste, subject to any other MACT or NESHAP? ☐ Yes, please specify: ☐ No
9.3) Does this waste stream contain Benzene? ☐ Yes ☐ No

***If you answered "no" to 9.3, please skip to Section 10.***

9.4) Does the waste stream come from a facility with one of the SIC/NAICS codes listed under the Benzene NESHAP identified in 40 CFR 61, Subpart FF? ☐ Yes ☐ No
9.5) Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) ≥10 Mg/year? ☐ Yes ☐ No
For assistance in calculating the TAB, please see the TAB Worksheet in Section 9 of the EQ Resource Guide.

***If you answered "no" to question 9.4 and 9.5, please skip to Section 10.***

9.6) Does the waste contain >10% water? ☐ Yes ☐ No
9.7) What is the TAB quantity for your facility? ________________Mg/Year
9.8) Does the waste contain >1.0 mg/kg total Benzene? ☐ Yes ☐ No
9.9) What is the total Benzene concentration in your waste? ______________Percent or _________ ppmw.

***(Supporting analysis must be attached. Do not use TCLP analytical results. Acceptable laboratory methods include 8020, 8240, 8260, 602 and 624.)***

*For a list of NAICS codes, please refer to Section 9 of the EQ Resource Guide.

## *Section 10 – Fuel Blending Information*

10.1) Is this waste intended for fuel blending? ☐ Yes* ☐ No

*If yes, Heat value (BTU/lb.) Chlorine (%) Water (%) Solids (%)

10.2) Is this waste intended for reclamation? ☐ Yes ☐ No (5-Gallon Sample required for all reclaim waste streams)

## *Section 11 – Constituent Information*

Please identify your waste constituents from these four categories: ***Underlying Hazardous Constituents (UHC's), Volatile Organic Hazardous Air Pollutants (VOHAP's), Volatile Organic Compounds (VOC's) and Toxic Release Inventory Constituents (TRI)***

| Constituent | Concentration | UHC? | Constituent | Concentration | UHC? |
|---|---|---|---|---|---|
| | | ☐ Yes ☐ No | | | ☐ Yes ☐ No |
| | | ☐ Yes ☐ No | | | ☐ Yes ☐ No |
| | | ☐ Yes ☐ No | | | ☐ Yes ☐ No |
| | | ☐ Yes ☐ No | | | ☐ Yes ☐ No |
| | | ☐ Yes ☐ No | | | ☐ Yes ☐ No |

*Please see Section 11 of the EQ Resource Guide for a list of UHC's, VOHAP's and VOC's. For a complete list of TRI constituents, please refer to 40 CFR 372.65.*

## *Section 12 – Certification*

I certify that all information (including attachments) is complete and factual and is an accurate representation of the known and suspected hazards, pertaining to the waste described herein. I authorize EQ's Resource Team to add supplemental information to the waste approval file, provided I am contacted and give verbal permission. I authorize EQ's Resource Team to obtain a sample from any waste shipment for purposes of verification and confirmation. I agree that, if EQ approves the waste described herein, all such wastes that are transported, delivered, or tendered to EQ by Generator or on Generator's behalf shall be subject to, and Generator shall be bound by, the attached Standard Terms and Conditions.

Generator Signature ____________________________________ Printed Name

Company Title Date

*The generator's signature MUST appear on the EQ Waste Characterization Report. If the generator has authorized a third party to certify this document, a written notice (on generator letterhead) must accompany this submittal. Although the EQ Resource Team is authorized to make certain modifications to the information provided on this form, the addition or removal of waste codes and waste constituents must be documented by the generator.*

# STANDARD TERMS AND CONDITIONS

The Agreement between the Customer and EQ – The Environmental Quality Company and/or its member companies (hereinafter "EQ") related to or associated with Delivered Waste, as herein defined, shall be governed by the following Standard Terms and Conditions in addition to the terms and conditions contained in any Waste Characterization Report, Customer Approval Quote Confirmation, Generator Approval Notification, Notice of Waste Approval Expiration, and/or Credit Agreement associated with such Delivered Waste.

The Customer may use its standard forms (such as purchase orders, acknowledgments of orders, and invoices) to administer its dealings under this Agreement for convenience purposes, but all provisions thereof in conflict with these terms and conditions shall be deemed stricken.

**Definitions**

The following definitions shall apply for purposes of this Agreement:

**"Acceptable Waste"** shall mean any hazardous waste, as defined under applicable State or federal law, determined by EQ as acceptable for treatment and/or disposal in accordance with this Agreement.

**"Delivered Wastes"** shall mean all wastes (i) which are transported, delivered, or tendered to EQ by the Customer; (ii) which the Customer has arranged for the transport, delivery or tender to EQ; or (iii) ) which are transported, delivered, or tendered to EQ under a Credit Agreement between the Customer and EQ.

**"Non-Conforming Wastes"** shall mean wastes that (a) are not in accordance in all material respects with the warranties, descriptions, specifications or limitations stated in the Waste Characterization Report and this Agreement; (b) have constituents or components of a type or concentration not specifically identified in the Waste Characterization Report (i) which increase the nature or extent of the hazard and risk undertaken by EQ in treating and/or disposing of the waste, or (ii) for whose treatment and/or disposal a Waste Management Facility is not designed or permitted, or (iii) which increase the cost of treatment and/or disposal of waste beyond that specified in EQ's price quote; or (c) are not properly packaged, labeled, described, or placarded, or otherwise not in compliance with United States Department of Transportation and United States Environmental Protection Agency regulations.

**Control of Operations.**

EQ shall have sole control over all aspects of the operation of any treatment and/or disposal facility of EQ receiving Delivered Wastes under this Agreement (hereinafter, "Waste Management Facility"), including, without limitation, maintaining EQ's desired volume of Acceptable Wastes being delivered to any Waste Management Facility by the Customer or any other person or entity.

**Identification of Waste.**

For each waste material to be transported, delivered, or tendered to EQ under this Agreement, the Customer shall provide, or cause to be provided, to EQ a representative sample of the waste material and a completed Waste Characterization Report containing a physical and chemical description or analysis of such waste material, which description shall conform with any and all guidelines for waste acceptance provided by EQ. On the basis of EQ's analysis of such representative sample of the waste material and such Waste Characterization Report, EQ will determine whether such wastes are Acceptable Wastes. EQ does not make any guarantee that it will handle any waste material or any particular quantity or type of waste material, and EQ reserves the right to the decline to transport, treat and/or dispose of waste material. The Customer shall promptly furnish to EQ any information regarding known, suspected or planned changes in the composition of the waste material. Further, the Customer shall promptly inform EQ of any change in the characteristic or condition of the waste material which becomes known to the Customer subsequent to the date of the Waste Characterization Report.

**Non-Conforming Wastes.**

In the event that EQ at any time discovers that any Delivered Waste is Non-Conforming Waste, EQ may reject or revoke its acceptance of the Non-Conforming Waste. The Customer shall have seven (7) days to direct an alternative lawful manner of disposition of the waste, unless it is necessary by reason of law or otherwise to move the Non-Conforming Waste prior to expiration of the seven (7) day period. If the Customer does not direct an alternative disposal, at its option, EQ may return any such Non-Conforming Wastes to the Customer, and the Customer shall pay or reimburse EQ for all costs and expenses incurred by EQ in connection with the receipt, handling, sampling, analyses, transportation and return to the Customer of such Non-Conforming Wastes. If it is impossible or impractical for EQ to return the Non-Conforming Waste to the Customer, the Customer shall reimburse EQ for all costs, of any type or nature whatsoever, incurred by EQ, solely because such Delivered Waste was Non-Conforming Waste (including, but not limited to, all costs associated with any remedial steps necessary, due to the nature of the Non-Conforming Waste, in connection with material with which the Non-Conforming Waste may have been commingled and all expenses and charges for analyzing, handling, locating, preparing for transporting, storing and disposing of any Non-Conforming Waste).

**Customer Warranty - Acceptable Wastes.**

All Delivered Wastes shall be Acceptable Wastes and shall conform in all material respects to the description and specifications contained in the Waste Characterization Report. The information set forth in the Waste Characterization Report or any manifest, placard or label associated with any Delivered Wastes, or otherwise represented by the Customer or the generator (if other than the Customer) to EQ, is and shall be true, accurate and complete as of the date of receipt of the involved waste by EQ.

**Customer Warranty - Title to Wastes.**

Either the Customer or the generator (if other than the Customer) shall hold clear title, free of any all liens, claims, encumbrances, and charges to Delivered Waste until such waste is accepted by EQ.

**Customer Warranty - Compliance with Laws.**

The Customer shall comply with all applicable federal, state and local environmental statutes, regulations, and other governmental requirements, as well as directives issued by EQ from time to time, governing the transportation, treatment and/or disposal of Acceptable Wastes, including, but not limited to, all packaging, manifesting, containerization, placarding and labeling requirements.

**Customer Warranty - Updating Information.**

If the Customer receives information that Delivered Waste or other hazardous waste described in the Waste Characterization Report, or some component of such waste, presents or may present a hazard or risk to persons, property or the environment which was not disclosed to EQ, or if the Customer or generator (if other than the Customer) has changed the process by which such waste results, the Customer shall promptly report such information to EQ in writing.

**Customer Indemnity.**

The Customer shall indemnify, defend and hold harmless EQ, and its affiliated or related companies, and all of their respective present or future officers, directors, shareholders, employees and agents from and against any and all losses, damages, liabilities, penalties, fines, forfeitures, demands, claims, causes of action, suits, costs and expenses (including, but not limited to, reasonable costs of defense, settlement, and reasonable attorneys' fees), which may be asserted against any or all of them by any person or any governmental agency, or which any or all of them may hereafter suffer, incur, be responsible for or pay out, as a result of or in connection with bodily injuries (including, but not limited to, death, sickness, disease and emotional or mental distress) to any person (including EQ's employees), damage (including, but not limited to, loss of use) to any property (public or private), or any requirements to conduct or incur expense for investigative, removal or remedial expenses in connection with contamination of or adverse effect on the environment, or any violation or alleged violation of any statues, ordinances, orders, rules or regulations of any governmental entity or agency, caused or arising out of (i) a breach of this Agreement by the Customer, (ii) the failure of any warranty of the Customer to be true, accurate and complete, or (iii) any willful or negligent act or omission of the Customer, or its employees or agents in connection with the performance of this Agreement.

**Force Majeure**

EQ shall not be liable for any failure to accept, receive, handle, treat, and/or dispose of Delivered Waste due to an act of God, fire, casualty, flood, war, strike, lockout, labor trouble, failure of public utilities, equipment failure, facility shutdown, injunction, accident, epidemic, riot, insurrection, destruction of operation or transportation facilities, the inability to procure materials, equipment, or sufficient personnel or energy in order to meet operational needs without the necessity of allocation, the failure or inability to obtain any governmental approvals or to meet Environmental Requirements (including, but not limited to voluntary or involuntary compliance with any act, exercise, assertion, or requirement of any governmental authority) which may temporarily or permanently prohibit operations of EQ, the Customer, or the Generator, or any other circumstances beyond the control of EQ which prevents or delays performance of any of its obligations under this Agreement.

**Governing Laws**

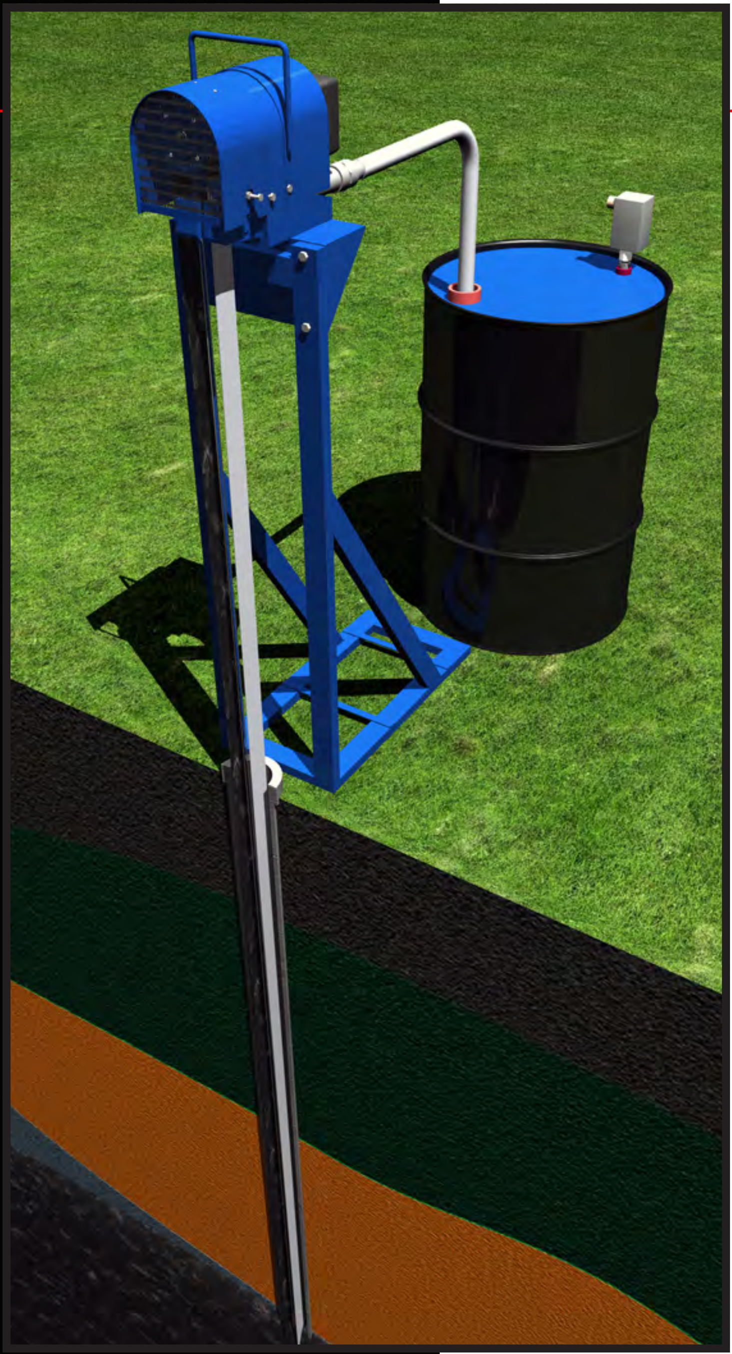
This Agreement shall in all respects be governed by and shall be construed in accordance with the laws of the State of Michigan applied to contracts executed and performed wholly within such state.

# *Appendix B*

## Equipment Sheets

WELL OIL SKIMMER

# PetroXtractor®



## Oil Skimming for Wells and Other Small Openings

- Ideal for removal of floating oil and other hydrocarbon liquids from existing recovery or monitoring wells
- Can be installed in well casings as small as 2 in. ID
- Elevates skimmed oil 100 feet or more for easy discharge into 55 gallon drum
- Removes up to 12 gph of oil from water

## General Description

The Abanaki PetroXtractor® is a dependable and cost effective means of removing oil, fuel, and other floating hydrocarbons from water where access to the fluid surface is limited. It provides efficient remediation of groundwater contaminated by oil, using existing recovery and monitoring wells. Often, the PetroXtractor® working alone will reduce oil or fuel content to an acceptable E.P.A. level. Models are available for two inch, four inch, and six inch ID well casings, with removal rates up to 12 gph. Depths of 100 feet or more can be accommodated without the use of pumps.

The PetroXtractor® is an oil skimmer that makes use of the differences in specific gravity and surface tension between oil and water. These physical characteristics allow the unit's continuous belt to attract floating oil in the well. After picking up the oil, the belt travels over the head pulley on the drive unit and through tandem wiper blades. The oil is then scraped off both sides of the belt and discharged through a 1-1/4" ID hose. The unique

Go With
The Pro!

Skimmerman™

## The PetroXtractor Advantages

- Allows existing monitoring wells to be used as recovery wells
- Portable — can be easily hand-carried from well to well
- A single unit separates oil and elevates it up to 100 feet without a pump
- Maintains skimming efficiency with fluctuating water level
- Tail pulley is tethered to the frame to prevent accidental loss of belt and tail pulley in the well casing
- Easy mounting, fast cleaning with minimal maintenance
- Belt materials to fit any application
- Many options available to customize unit for your application

ABANAKI

bearingless design of the tail pulley (immersed in the well water) with its tethered frame allows it to perform three important functions: it keeps proper tension on the belt, prevents accidental loss down the well, and keeps the belt centered in the casing.

The PetroXtractor® can be installed in existing wells by mounting it on a flat surface above the well casing. Skimmer operation consists of merely lowering the belt and tail pulley into the casing until the pulley is fully immersed, placing the discharge hose in a container, and switching the unit on.

## Where To Use The PetroXtractor

The PetroXtractor is designed for those applications that have a limited access area and a deep drop between the mounting surface and the surface of the liquid. The unit can be used anywhere electric power, compressed air, or 12VDC is available. Vapor tight enclosures, explosion proof, or pneumatic motors are available for areas where combustible fumes may be present.

**PetroXtractor in optional Poly-Shelter**

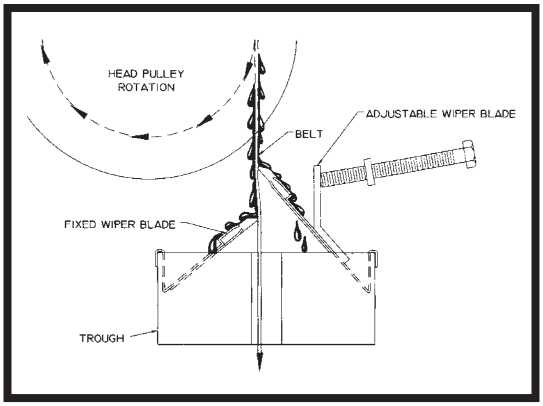
## Key Features of the PetroXtractor

- Small mounting and operating area
- Chip resistant powder coated finish
- Customized belt lengths and materials
- Easily mounted on flat surface
- Belt and wipers impervious to oils and fuels
- Weighted and tethered tail pulley
- Fast cleaning with minimal maintenance
- Can be customized to application needs

## Rugged Construction for Harsh Conditions

The PetroXtractor will provide many years of trouble-free service. A tough power train keeps the PetroXtractor running under the most severe conditions.

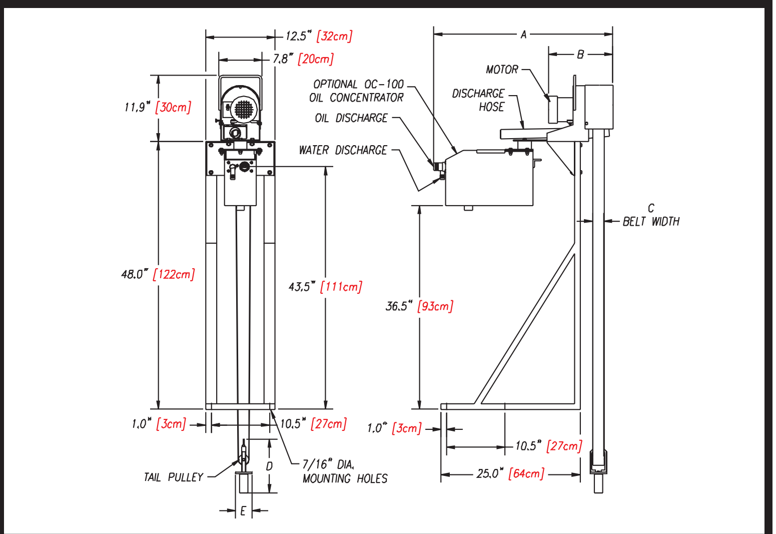
**Tail Pulley Detail**



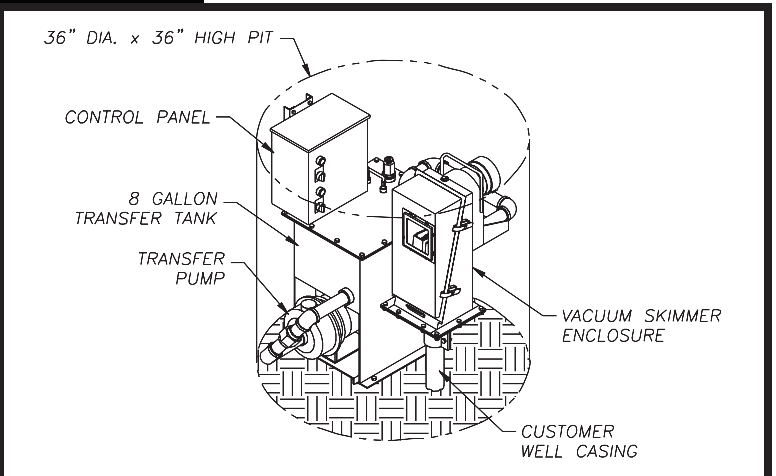

**Wiper Blade Detail**

WELL OIL SKIMMER

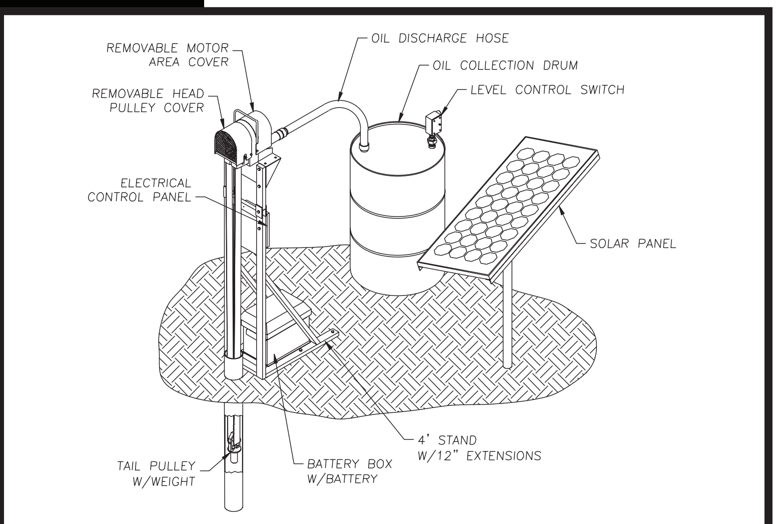
# PetroXtractor®




**Installation Dimensions**




**Optional Below Grade Mounting Kit**




**Optional Solar Unit Power**

## Applications

- Groundwater monitoring wells
- Recovery wells
- Underground tanks
- Limited access areas

## Abanaki's Oil Concentrators®

The Oil Concentrator® is an option available on all ABANAKI oil skimmers. Under most operating conditions ABANAKI oil skimmers will pick up oil with less than 5% water. But as surface oil is reduced to a thin layer (1/16 to 1/8 inch thick), more water or coolant may also be picked up along with the oil. When used in tandem with the oil skimmer, an Oil Concentrator will solve this problem, and provides virtually complete oil/water separation, saving money and improving the efficiency of the skimmer.

Based on the principle of gravity separation, the Oil Concentrator uses no electricity, timers, sensors, pumps, or other moving parts. The Oil Concentrator sits behind the skimmer and receives its discharged oil. The unit comes complete with a mounting bracket, removable sludge screen and a drain plug to ease clean up. For higher viscosity oils or low temperature applications, a thermostatically controlled heater is available as an option.

Optional equipment shown in some views.

WELL OIL SKIMMER

# PetroXtractor®

Abanaki has thousands of skimmers installed worldwide at leading companies such as...

American Cyanamid
Armstrong World Industries
Bethlehem Steel
Boeing
Bureau of Reclamation
Caterpillar
Chevron
Clean Harbors
Corning
Dow Chemical
Eaton
Flying J
Ford Motor
General Electric
IT Corp.
Henry Filters
Industrial Environmental Products
John Deere
Kaiser Aluminum
Kemron Environmental
McLaren Hart
Monroe Auto Equipment
New York Power Authority
Nissan Motor
Outboard Marine
TRW
United Airlines
US Gypsum
US Repeating Arms
USS Great Lakes Fleet
U.S. Army Corp. of Engrs.
Westinghouse Electric

## Other Oil Skimming Products From Abanaki

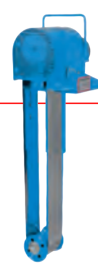
### Model 8²®

For Most Applications
Single 8-inch wide belt (20.3 cm)
Any length belt
Capacity: 40 GPH (151.4 LPH)

### Model MB®

For High Volume
Two to five 8-inch belts (20.3 cm)
Any length belts
Capacity: to 200 GPH (757.1 LPH)

### Tote-It® Portable



Portable for Moderate Capacity Applications
Single belt: 2-inch or 4-inch (5.1 or 10.2 cm)
Belt length: 1´- 6˝ to 5´-0˝ (45.2 to 152.4 cm)
Capacity: 6 GPH - 2˝ belt (15.1 LPH - 5.1 cm belt)
12 GPH - 4˝ belt (22.7 LPH - 10.2 cm belt)

### Mighty Mini®

Small Applications (Parts Washers, CNC Machines, 55 Gal. Drums)
Single belt: 1-inch or 2-inch (25.4 or 50.8 mm)
Belt length: 6˝, 12˝, 18˝, 24˝ (153, 305, 458, 610 mm)
Capacity: 1 GPH - 1˝ belt (3.81 LPH)
2 GPH - 2˝ belt (5.71 LPH)

## Specifications:

| | |
|---|---|
| Oil Removal Rate | Model PX-A: 3 gph (11 lph) with 1 in.(2.5 cm) wide belt<br>Model PX-B: 6 gph (23 lph) with 2 in.(5 cm) wide belt<br>Model PX-C:12 gph (45 lph) with 4 in.(10 cm) wide belt<br>(Removal rate is based on 30 weight oil or gasoline in water.) |
| Motor | Fractional hp TEFC, 115VAC, single phase, 60 Hz gear motor, including 8 foot cord with electrical plug<br>Optional: 50 Hz; 3-phase; explosion proof; 12VDC or pneumatic |
| Belt Width (Specify) | PX-A (1 in. (2.5 cm) for 2 in. (5 cm) ID casing<br>PX-B (2 in. (5 cm)) for 4 in. (10 cm) ID casing<br>PX-C (4 in. (10 cm)) for 6 in. (15 cm) ID casing |
| Belt Material | Specify specially engineered polymer or LFO (Fuzzy) Poly. When in doubt, consult factory for advice on the best belt for your application. |
| Wiper Material | UHC or Ceramic |
| Mounting Method | Flat base mount with oil discharge through a 1-1/4 in. (3.1cm) ID hose |
| Mounting Area | See installation drawing or ask factory rep for more info. |
| Weights[1] | Complete assembly without tail pulley or belt:<br>Model PX-A: 30 lbs. (13.6 Kg.)<br>Model PX-B: 31 lbs. (14 Kg.)<br>Model PX-C: 38 lbs. (17 Kg.)<br>PX-A Tail pulley: 2 lbs. ( 1.3 Kg.)<br>PX-B Tail Pulley: 3 lbs. ( 2.7 Kg.)<br>PX-C Tail Pulley: 4.5 lbs. (4.1 Kg.) |
| Options (Specify) | • Above-ground mounting stand<br>• Stainless steel construction<br>• On-Off float switches to fit 3/4 in.(1.8 cm) bung of discharge drum. (Available in standard or explosion proof.)<br>• Oil Concentrator® for virtually water-free oil discharge. (Available in standard or explosion proof.)<br>• Reinforced poly-shelters for protection of skimmer<br>• 24 hour timer to start/stop PetroXtractor at specified intervals (standard or explosion proof)<br>• Vapor tight enclosures<br>• Below grade transfer package<br>• For unique applications consult factory rep to customize. |
| Specification Notes: | 1. The PetroXtractor is UPS shippable.<br>2. Consult factory for recommendations covering operating conditions not listed here. |

ABANAKI® OIL SKIMMERS

**USA:** 17387 Munn Road • Chagrin Falls, Ohio 44023
**800-358-SKIM (7546)** • (440) 543-7400 • FAX: (440) 543-7404
**UK:** Unit 13 • Avondale Business Centre • Woodland Way • Bristol BS15 1AW
0117 9616679 • FAX: 0117 9616687
**www.abanaki.com**

May 28, 2015

Axeon Specialty Products
7 Foundation Drive
Savannah, Georgia 31408

Attn: Mr. Dusty Crisler
P: (912) 966 6608
F: (912) 918 7112
E: dusty.crisler@axeonsp.com

**Re: Free Product Survey of Existing Monitoring Wells**
Axeon Specialty Products, Savannah Plant Facility
7 Foundation Drive
Savannah, Chatham County, Georgia
Terracon Project No. ES157043

Dear Mr. Crisler:

Terracon Consultants, Inc., (Terracon) has completed a survey of light non-aqueous phase liquids (LNAPL or "free product") in all existing, locateable, on-site monitoring wells for the Axeon facility in Savannah, Georgia. Terracon was able to locate fifty eight (58) of the seventy (70) presumed existing wells, twenty seven (27) of which contained free product. Each of the wells was gauged from the top of casing (TOC) for depth to water (DTW), depth to free product (DTF), and free product thickness. The free product encountered has been removed from the monitoring wells and deposited into an on-site storage tank. A sample of free product from each well delivered to the on-site laboratory for analysis.

## 1.0 PROJECT INFORMATION

It is Terracon's understanding that the client plans on implementing a petroleum recovery system at its Savannah Plant facility. This recovery system is intended to remove the LNAPLs from the soil and groundwater at the site. In order to optimize the design of this proposed recovery system, the client required information on the location and magnitude of LNAPLs in the groundwater at the site.

There is currently a subterranean poly-wall installed along the Savannah River on the north end of the site. This poly-wall was designed to prevent the migration of petroleum products into the Savannah River via groundwater flow. A number of the on-site monitoring wells lay down-gradient of the poly-wall and serve as confirmation points as to the effectiveness of the poly-wall. Please refer to the Figure 1 for the location of the wells which lie down-gradient of the poly-wall.

## 2.0 FIELD WORK

Terracon mobilized to the site for the first sampling event from April 27 through May 1, 2015. Terracon was accompanied by a Moran Environmental Recovery (MER) vacuum truck rig for free product removal. Axeon provided Terracon with a map of the facility dated 2012, which showed the locations of seventy (70) presumed to be existing monitoring wells. Using a Solinst® Model 122 Oil/Water Interface Meter, Terracon gauged each identified monitoring well, recording the depth from TOC to the top of the free product (where applicable) and the top of the water column (often depressed by LNAPL). Any LNAPL encountered was visually confirmed and sampled utilizing a dedicated, disposable hand bailer with colorless nylon string. Following the discovery, confirmation, and sampling of LNAPL in each well, the MER vacuum truck was utilized to remove the LNAPL from the well. At the end of each day's activities, all samples were delivered to the client's on-site laboratory for analysis.

During the April sampling event, Terracon was able to locate fifty four (54) of the seventy (70) presumed existing wells. Twenty five (25) of these wells contained LNAPL, and twenty nine (29) contained no detectable LNAPL.

Terracon returned to the site on May 19 and 20, 2015 with a Teknetics® Delta 4000 handheld metal detector in an effort to locate the remaining sixteen (16) monitoring wells. Using the metal detector and hand digging tools, Terracon was able to locate four (4) of the remaining monitoring wells. Terracon utilized an identical procedure from the first event to gauge and sample these wells. Two (2) of the four (4) wells identified during the this second event contained detectable levels of LNAPL; however, MER was not contracted to vacuum these wells, as the LNAPL was removed via hand bailers and placed into the sample containers.

## 3.0 FINDINGS

A total of fifty eight (58) of the seventy (70) presumed existing monitoring wells have been located and gauged. Twenty seven (27) of these wells contained detectable LNAPL, which was sampled and then removed from each of the well casings. Thirty one (31) of the located wells did not contain detectable LNAPL. Please refer to Table 1 for a list of the wells and the amount of LNAPL encountered in each well. A total of twelve (12) wells could not be located. It is Terracon's opinion that these twelve (12) wells have either been abandoned and covered, or destroyed, since the drafting of the provided 2012 site map. Figure 1 is a recreation of the provided site map, showing the location of each monitoring well.

It should be noted that one well (AW-62) on the down-gradient (north) side of the subterranean poly-wall was discovered to contain detectable levels of LNAPL. This well was gauged and purged during each of Terracon's two sampling events. AW-62 was first gauged on May 1, 2015, at approximately 3:30pm. During the initial gauging, AW-62 was found to contain 1.85

feet of LNAPL (FP=6.28 feet, DTW=8.13 feet). At this time, the tide level in the Savannah River (according to the national oceanic and atmospheric administration's website) was approximately one (1) foot above mean sea level. AW-62 was gauged again on May 19 at approximately 9:30am. In the eighteen (18) days since the purging of this well, it had re-accumulated 0.96 feet of LNAPL (FP=4.84 feet, DTW=5.80 feet). The tide level during the final gauging of AW-62 was approximately eight (8) feet above mean sea level.

Sincerely,
**Terracon Consultants, Inc.**

J. Cory McManus IV
Staff Environmental Scientist

William S. Anderson III, P.E.
Senior Environmental Engineer
Senior Principal

Attached: Table 1: Free Product Measurements
Figure 1: Monitoring Well Location Diagram

**Axeon Specialty Products - Savannah Plant**

7 Foundation Drive
Savannah, Chatham County, Georgia

## Table 1: FREE PRODUCT MEASUREMENTS

| Well Number | Date Measured | Depth to Free Product (ft) | Depth to Water (ft) | Product Thickness (ft) |
|---|---|---|---|---|
| AW-5 | 4/28/2015 | 5.22 | 6.50 | 1.28 |
| AW-6 | 4/28/2015 | 7.35 | 9.40 | 2.05 |
| AW-7 | 5/1/2015 | N/A | 7.46 | N/A |
| AW-8 | 5/1/2015 | 11.25 | 12.11 | 0.86 |
| AW-9 | 4/28/2015 | 10.29 | 13.41 | 3.12 |
| AW-10 | 4/28/2015 | 9.94 | 14.43 | 4.49 |
| AW-11 | 4/28/2015 | 10.51 | 12.35 | 1.84 |
| AW-12 | 4/27/2015 | 8.46 | 14.64 | 6.18 |
| AW-13 | 4/27/2015 | 9.68 | Unknown | Unknown |
| AW-14 | 4/29/2015 | 7.9 | 10.00 | 2.10 |
| AW-15 | 4/30/2015 | 8.56 | 10.80 | 2.24 |
| AW-17 | Well not located | | | |
| AW-18 | 4/28/2015 | 5.53 | 7.00 | 1.47 |
| AW-19 | 5/1/2015 | 11.4 | 11.80 | 0.40 |
| AW-20 | 5/1/2015 | N/A | 11.17 | N/A |
| AW-22 | 4/27/2015 | 11.85 | 14.81 | 2.96 |
| AW-24 | 4/30/2015 | N/A | 3.51 | N/A |
| AW-25 | 4/30/2015 | N/A | 4.56 | N/A |
| AW-26 | 4/28/2015 | N/A | 3.63 | N/A |
| AW-27 | 4/30/2015 | N/A | 4.57 | N/A |
| AW-28 | 4/29/2015 | N/A | 3.75 | N/A |
| AW-30 | 4/28/2015 | N/A | 4.34 | N/A |
| AW-31 | 5/1/2015 | N/A | 2.10 | N/A |
| AW-32 | 4/30/2015 | N/A | 7.76 | N/A |
| AW-33 | 4/30/2015 | N/A | 4.01 | N/A |
| AW-34 | 4/30/2015 | N/A | 6.20 | N/A |
| AW-35 | Well not located | | | |
| AW-36 | 4/28/2015 | N/A | 4.48 | N/A |
| AW-37 | 5/1/2015 | N/A | 10.33 | N/A |
| AW-40 | Well not located | | | |
| AW-41 | 4/28/2015 | N/A | 8.14 | N/A |
| AW-42 | Water expelled upward upon cap removal, no free product | | | |
| AW-43 | Well not located | | | |
| AW-44 | 4/30/2015 | N/A | 7.74 | N/A |
| AW-45 | 4/30/2015 | 11.15 | 11.25 | 0.10 |
| AW-46 | Well not located | | | |

| Well Number | Date Measured | Depth to Free Product (ft) | Depth to Water (ft) | Product Thickness (ft) |
|---|---|---|---|---|
| AW-48 | 5/1/2015 | N/A | 4.62 | N/A |
| AW-49 | 4/28/2015 | 12.43 | 14.32 | 1.89 |
| AW-51 | 4/27/2015 | 9.31 | 15.90 | 6.59 |
| AW-52 | 4/27/2015 | 11.95 | 13.91 | 1.96 |
| AW-53 | 4/29/2015 | 4.95 | 5.25 | 0.30 |
| AW-54 | 5/1/2015 | 3.9 | 14.00 | 10.10 |
| AW-56 | 4/27/2015 | 9.11 | 14.91 | 5.80 |
| AW-57 | 4/28/2015 | 7.95 | 10.81 | 2.86 |
| AW-62 | 5/1/2015 | 6.28 | 8.13 | 1.85 |
| | 5/19/2015 | 4.84 | 5.80 | 0.96 |
| AW-63 | Well not located | | | |
| AW-64 | Well not located | | | |
| AW-65 | 4/29/2015 | 9.51 | 13.12 | 3.61 |
| AW-66 | Well not located | | | |
| AW-67 | 4/29/2015 | N/A | 5.80 | N/A |
| AW-68 | 4/27/2015 | 10.26 | Unknown | Unknown |
| AW-69 | 4/27/2015 | N/A | 5.84 | N/A |
| AW-70 | 4/28/2015 | N/A | 8.85 | N/A |
| AW-71 | 4/27/2015 | N/A | 10.25 | N/A |
| AW-72 | 4/29/2015 | N/A | 8.30 | N/A |
| AW-73 | Well not located | | | |
| AW-74 | 4/27/2015 | 6.57 | 10.99 | 4.42 |
| AW-75 | 4/29/2015 | N/A | 9.57 | N/A |
| AW-76 | 4/29/2015 | N/A | 10.63 | N/A |
| AW-77 | 4/29/2015 | N/A | 6.60 | N/A |
| AW-78 | 4/29/2015 | N/A | 5.25 | N/A |
| AW-79 | 4/28/2015 | N/A | 5.56 | N/A |
| Rail Load. M | Found broken, in standing water (No product present) | | | |
| Rail Load. N | 4/29/2015 | N/A | 4.45 | N/A |
| Rail Load. S | 4/29/2015 | N/A | 3.45 | N/A |
| RW-39 | Well not located | | | |
| RW-38 | 5/2/2015 | 4.02 | 4.98 | 0.96 |
| RW-50 | Well not located | | | |
| RW-58 | 5/1/2015 | 7.67 | 7.83 | 0.16 |
| RW-59 | Well not located | | | |

**NOTES:**
Wells containing free product are shown in red
Unlocatable wells are shown in faded text
N/A = Not Applicable

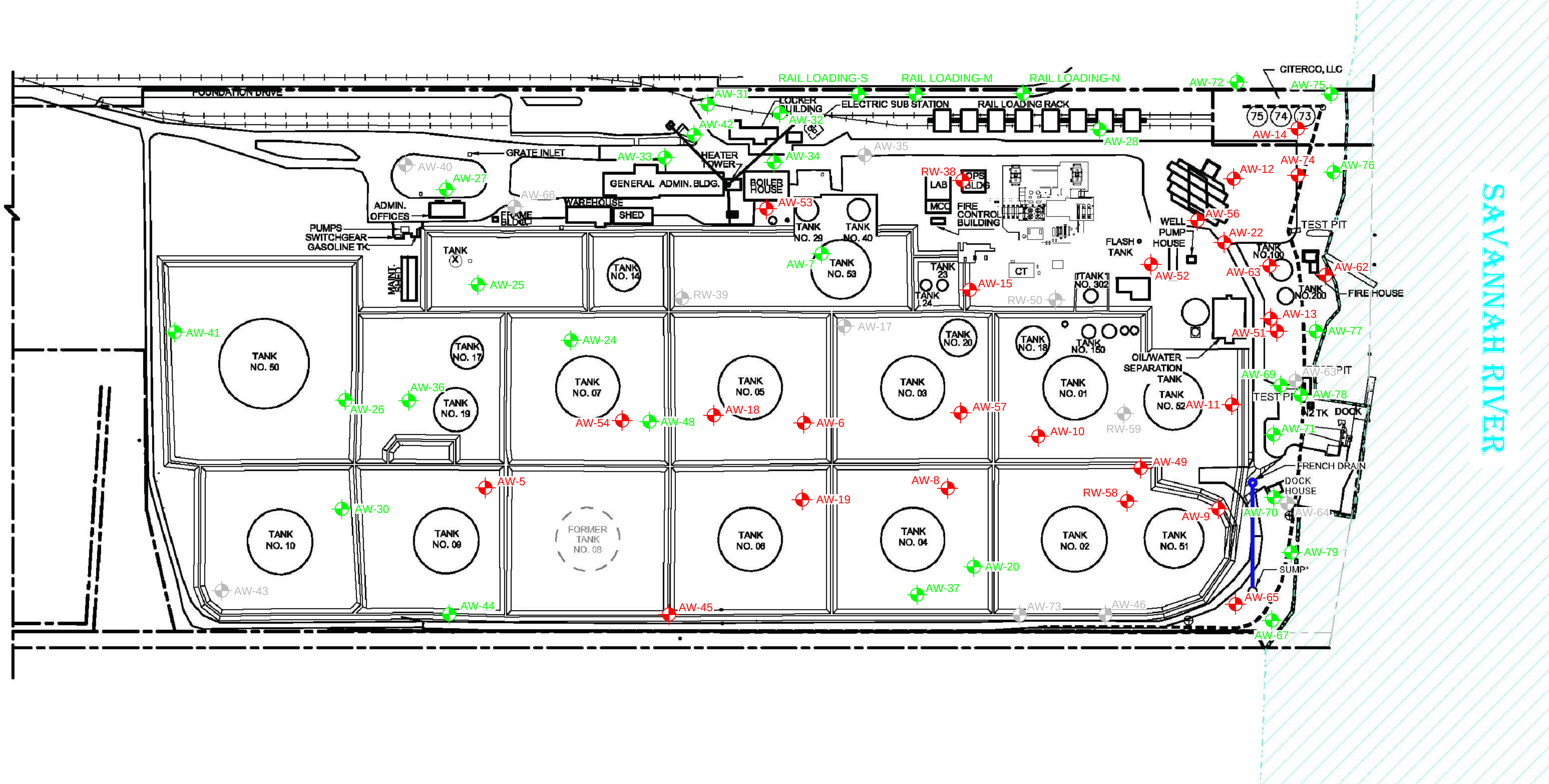
Prepared by: J. Cory McManus Date: 5/27/2015
Reviewed by: William S. Anderson, PE Date: 5/28/2015

## EXPLANATION

- LOCATION OF WELL WITH NO DETECTABLE LNAPL
- LOCATION OF WELL CONTAINING DETECTABLE AMOUNTS OF LNAPL
- WELL WHICH COULD NOT BE LOCATED
- POLY-WALL

Note:
Base map was taken from the site plan for NuStar Savannah Refinery, dated August 2012, created by Ash Creek Associates, and provided to Terracon by Axeon Specialty Products.

N




0 100' 200'
1" = 200'
APPROXIMATE SCALE IN FEET

| | | | |
|---|---|---|---|
| Project Mngr: | WSA | Project No. | ES157043 |
| Drawn By: | JCM | Scale: | 1" = 200' |
| Checked By: | SPL | File Name: | ES157043.dwg |
| Approved By: | WSA | Date: | May 27, 2015 |

Terracon
Consulting Engineers & Scientists
2201 Rowland Avenue Savannah, Georgia 31404
Phone (912) 629 4000 Fax. (912) 629 4001

**MONITORING WELL LOCATION DIAGRAM**

**Axeon Specialty Products**
Savannah Plant
7 Foundation Drive
Savannah, Chatham County,Georgia

Figure
1

July 31, 2015

Axeon Specialty Products
7 Foundation Drive
Savannah, Georgia 31408

Attn: Mr. Dusty Crisler
P: (912) 966 6608
E: dusty.crisler@axeonsp.com

**Re: Monthly Free Product Measurement and Removal Summary Report**
Axeon Savannah Plant Facility
7 Foundation Drive
Savannah, Georgia
Terracon Project No. ES157043

Dear Mr. Crisler:

Terracon Consultants, Inc., (Terracon) appreciates the opportunity to submit this letter report for the free product gauging and removal work currently being conducted on select on-site monitoring wells at the Axeon facility in Savannah, Georgia.

This letter report contains the project information, and a summary of our work completed to date.

# 1.0 PROJECT INFORMATION

### Site Location

| ITEM | DESCRIPTION |
|---|---|
| **Location** | 7 Foundation Drive, Savannah, Georgia 31408. |
| **Existing improvements** | Aboveground storage tanks, marine terminal dock and associated structures, office/administration buildings, maintenance/warehouse facilities, parking areas, etc. |
| **Current ground cover** | Asphalt, concrete, and grass. |
| **Existing topography** | Generally level area. |

## 2.0 FIELD ACTIVITES

Terracon has provided the following services:

- Conducted a weekly site visit at the facility to identify and confirm the location of the twenty seven (27) on-site groundwater monitoring wells which contain free product.

- Gauge and record at each well location the depth to free product and depth to water in the well. SWS, a subcontractor, has collected and removed the free product from the wells that have had free product with a Vac truck and stinger pipe. The free product has been disposed of in an on-site tote/tank at the Axeon property.

- Weekly tables have been prepared with field notes and a free product measurement summary table has also been prepared.

Terracon and SWS have been measuring free product on a weekly basis in twenty seven groundwater monitoring wells followed by removal of the free product and limited amounts of impacted groundwater. Groundwater monitoring wells AW-5, AW-6, AW-8 thru AW-15, AW-18, AW-19, AW-22, AW-45, AW-49, AW-51 thru AW-57, AW-62, AW-63, AW-65, AW-74, RW-38, and RW-58 have been monitored with free product removal during the following six events:

- June 26, 2015
- July 01, 2015
- July 09, 2015
- July 15, 2015
- July 23, 2015
- July 30, 2015

Please see the attached Figure 1, Appendix A for well locations and tables in Appendix B for measurement and free product removal details.

Terracon appreciates the opportunity to provide environmental services to Axeon and we look forward to continuing to work with you on this project. If you have any questions or comments please contact us at your earliest convenience.

Sincerely,
**Terracon Consultants, Inc.**

William S. Anderson III, P.E.
Senior Environmental Engineer

Attached: Figure and Tables

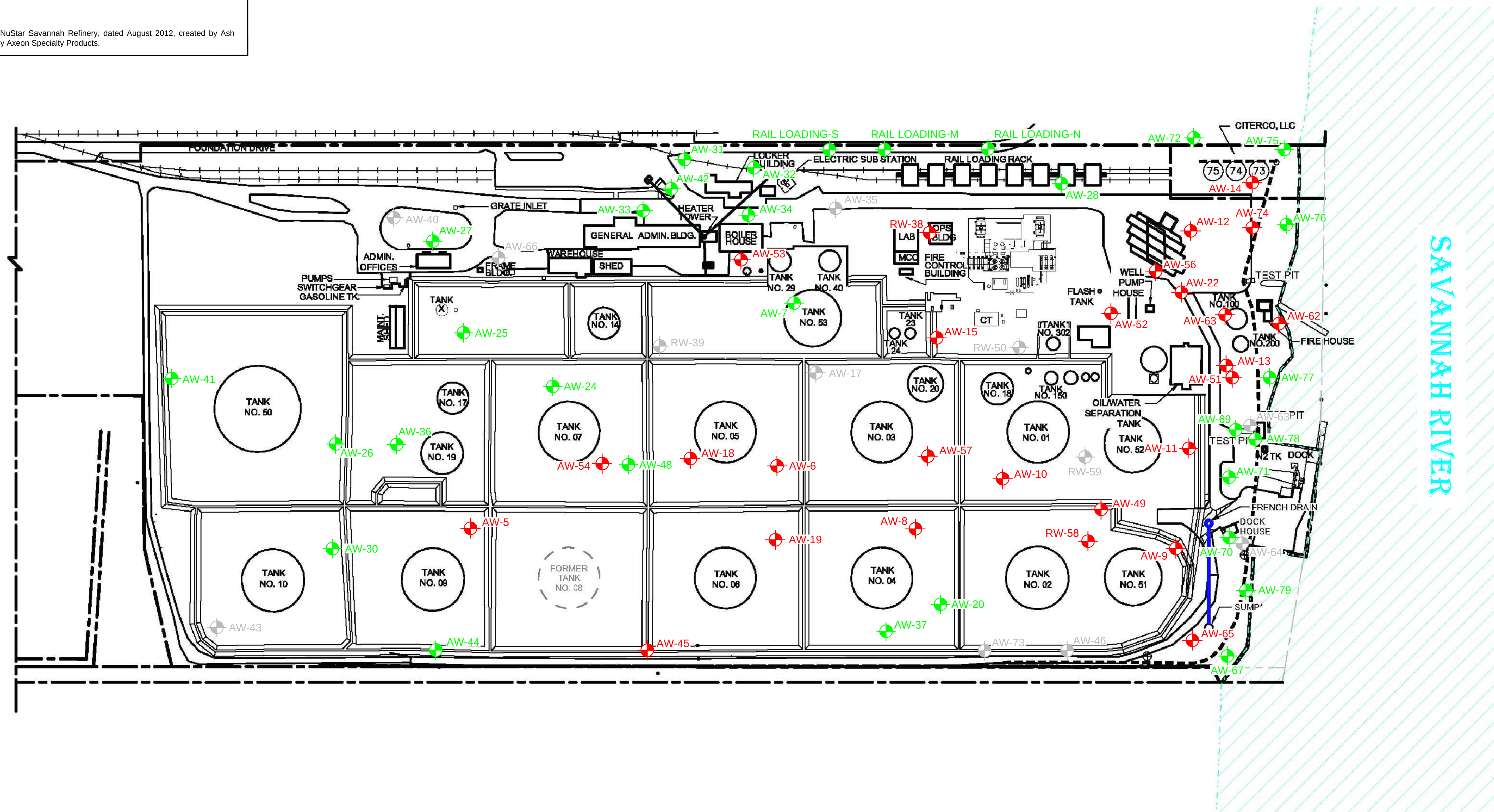
# APPENDIX A
Figure

## EXPLANATION

- LOCATION OF WELL WITH NO DETECTABLE LNAPL
- LOCATION OF WELL CONTAINING DETECTABLE AMOUNTS OF LNAPL
- WELL WHICH COULD NOT BE LOCATED
- POLY-WALL

Note:
Base map was taken from the site plan for NuStar Savannah Refinery, dated August 2012, created by Ash Creek Associates, and provided to Terracon by Axeon Specialty Products.

N




0 100' 200'
1" = 200'
APPROXIMATE SCALE IN FEET

| | | | |
|---|---|---|---|
| Project Mngr: WSA | Project No. ES157043 | Terracon Consulting Engineers & Scientists | MONITORING WELL LOCATION DIAGRAM |
| Drawn By: JCM | Scale: 1" = 200' | 2201 Rowland Avenue, Savannah, Georgia 31404 | Axeon Specialty Products |
| Checked By: SPL | File Name: ES157043.dwg | Phone (912) 629 4000 Fax. (912) 629 4001 | Savannah Plant, 7 Foundation Drive, Savannah, Chatham County, Georgia |
| Approved By: WSA | Date: May 27, 2015 | | Figure 1 |

# APPENDIX B

Weekly Measurement Tables

**FREE PRODUCT GAUGING: 6/25/15 - 6/26/15**
**Axeon Specialty Products - Savannah Plant**

| Well Number | Date Measured | Time Measured | Depth to F.P. (ft) | Depth to Water (ft) | Product Thickness (ft) | Notes |
|---|---|---|---|---|---|---|
| AW-5 | 6/26/2015 | 8:25 AM | 5.81 | 6.35 | 0.54 | |
| AW-6 | 6/26/2015 | 10:55 AM | 7.78 | 9.46 | 1.68 | |
| AW-8 | 6/26/2015 | 11:30 AM | 11.88 | 12.76 | 0.88 | 80' of hose needed to reach well from berm |
| AW-9 | 6/25/2015 | 1:30 PM | 10.89 | 14.78 | 3.89 | |
| AW-10 | 6/25/2015 | 3:00 PM | 10.32 | 13.00 | 2.68 | |
| AW-11 | 6/26/2015 | 12:10 PM | 10.99 | 13.63 | 2.64 | |
| AW-12 | 6/25/2015 | 11:55 AM | 9.24 | 15.26 | 6.02 | |
| AW-13 | 6/25/2015 | 1:00 PM | 10.71 | NA | Product to thick to gauge | Free product too thick in consistancy. All product removed. |
| AW-14 | 6/26/2015 | 11:05 AM | 9.31 | 10.07 | 0.00 | |
| AW-15 | 6/26/2015 | 11:20 AM | 9.90 | 10.18 | 0.28 | |
| AW-18 | 6/26/2015 | 10:40 AM | 6.18 | 6.35 | 0.17 | |
| AW-19 | 6/25/2015 | 2:30 PM | 11.92 | 12.32 | 0.40 | |
| AW-22 | 6/25/2015 | 2:45 PM | NA | NA | NA | Access blocked by pump attachment on well head |
| AW-45 | 6/26/2015 | 8:10 AM | 11.61 | 11.80 | 0.19 | |
| AW-49 | 6/26/2015 | 12:25 PM | 12.92 | 16.16 | 3.24 | |
| AW-51 | 6/25/2015 | 1:10 PM | 10.07 | 13.88 | 3.81 | |
| AW-52 | 6/26/2015 | 10:15 AM | 12.41 | 16.04 | 3.63 | |
| AW-53 | 6/26/2015 | 9:50 AM | 5.48 | 5.71 | 0.23 | |
| AW-54 | 6/26/2015 | 9:10 AM | 4.25 | 17.50 | 13.25 | |
| AW-56 | 6/25/2015 | 12:25 PM | 9.92 | 15.58 | 5.66 | |
| AW-57 | 6/25/2015 | 3:15 PM | 8.30 | 11.41 | 3.11 | |
| AW-62 | 6/26/2015 | 7:15 AM | 6.68 | 6.97 | 0.29 | |
| AW-65 | 6/26/2015 | 7:45 AM | 10.85 | 12.95 | 2.10 | |
| AW-63 | 6/25/2015 | 12:45 PM | 11.87 | 13.83 | 1.96 | |
| AW-74 | 6/25/2015 | 11:30 AM | 9.49 | 12.52 | 3.03 | |
| RW-38 | 6/25/2015 | 10:50 AM | 4.04 | 4.85 | 0.81 | |
| RW-58 | 6/25/2015 | 2:05 PM | 8.35 | 8.79 | 0.44 | |

**FREE PRODUCT GAUGING: 7/1/15 - 7/2/15**
**Axeon Specialty Products - Savannah Plant**

Terracon

| Well Number | Date Measured | Time Measured | Depth to F.P. (ft) | Depth to Water (ft) | Product Thickness (ft) | Notes |
|---|---|---|---|---|---|---|
| AW-5 | 7/2/2015 | 8:40 AM | 6.23 | 6.75 | 0.52 | |
| AW-6 | 7/1/2015 | 11:48 AM | 8.89 | 9.43 | 0.54 | |
| AW-8 | 7/1/2015 | 11:06 AM | 12.31 | 12.59 | 0.28 | |
| AW-9 | 7/1/2015 | 9:52 AM | 10.62 | 13.72 | 3.10 | |
| AW-10 | 7/1/2015 | 12:40 PM | 10.16 | 14.18 | 4.02 | |
| AW-11 | 7/1/2015 | 1:00 PM | 10.91 | 13.15 | 2.24 | |
| AW-12 | 7/1/2015 | 8:05 AM | 9.32 | 14.38 | 5.06 | |
| AW-13 | 7/1/2015 | 8:59 AM | NA | 10.37 | NA | |
| AW-14 | 7/1/2015 | 7:42 AM | NA | 7.28 | NA | |
| AW-15 | 7/1/2015 | 12:10 PM | 10.36 | 10.84 | 0.48 | |
| AW-18 | 7/1/2015 | 11:28 AM | 6.63 | 6.82 | 0.19 | |
| AW-19 | 7/1/2015 | 10:42 AM | 12.00 | 12.28 | 0.28 | |
| AW-22 | 7/1/2015 | 8:42 AM | NA | NA | NA | Access blocked by pump attachment on well head |
| AW-45 | 7/2/2015 | 8:15 AM | 11.62 | 12.11 | 0.49 | |
| AW-49 | 7/1/2015 | 9:32 AM | 12.52 | 14.85 | 2.33 | |
| AW-51 | 7/1/2015 | 9:10 AM | 9.88 | 13.43 | 3.55 | |
| AW-52 | 7/2/2015 | 9:30 AM | 12.56 | 16.22 | 3.66 | |
| AW-53 | 7/2/2015 | 9:54 AM | 6.34 | 6.88 | 0.54 | |
| AW-54 | 7/2/2015 | 9:03 AM | 5.65 | 7.60 | 1.95 | |
| AW-56 | 7/1/2015 | 8:26 AM | 10.20 | 13.15 | 2.95 | |
| AW-57 | 7/1/2015 | 12:25 PM | 8.43 | 11.13 | 2.70 | |
| AW-62 | 7/2/2015 | 7:28 AM | 7.33 | 7.52 | 0.19 | |
| AW-65 | 7/2/2015 | 7:55 AM | 11.56 | 11.77 | 0.21 | |
| AW-63 | 7/1/2015 | 8:45 AM | 11.19 | 12.44 | 1.25 | |
| AW-74 | 7/1/2015 | 7:48 AM | 7.74 | 8.29 | 0.55 | |
| RW-38 | 7/1/2015 | 7:30 AM | 4.15 | 4.18 | 0.03 | |
| RW-58 | 7/1/2015 | 10:20 AM | 8.18 | 8.54 | 0.36 | |

## FREE PRODUCT GAUGING: 7/9/15 - 7/10/15
### Axeon Specialty Products - Savannah Plant

| Well Number | Date Measured | Time Measured | Depth to F.P. (ft) | Depth to Water (ft) | Product Thickness (ft) | Notes |
|---|---|---|---|---|---|---|
| AW-5 | 7/9/2015 | 2:10 PM | 5.82 | 6.11 | 0.29 | 2 in, 5 minute Vac with seal |
| AW-6 | 7/9/2015 | 12:15 PM | 7.81 | 8.92 | 1.11 | 2 in, 10 min Vac with seal |
| AW-8 | 7/9/2015 | 12:10 PM | 13.31 | 13.52 | 0.21 | 2 in, 5 minute Vac with seal |
| AW-9 | | | | | | |
| AW-10 | | | | | | |
| AW-11 | 7/9/2015 | 12:35 PM | 11.09 | 13.12 | 2.03 | 2 in, 20 min Vac with seal |
| AW-12 | | | | | | |
| AW-13 | 7/9/2015 | 10:20 AM | 11.10 | 11.41 | 0.31 | 2 in, 10 min Vac with seal |
| AW-14 | 7/9/2015 | 10:00 AM | 9.20 | 9.91 | 0.71 | 2 in, 5 minute Vac with seal |
| AW-15 | 7/9/2015 | 12:45 PM | 10.51 | 10.80 | 0.29 | 2 in, 10 min Vac with seal |
| AW-18 | 7/9/2015 | 11:58 AM | 6.86 | 7.00 | 0.14 | 2 in, 5 minute Vac with seal |
| AW-19 | 7/9/2015 | 11:32 AM | 11.89 | 12.05 | 0.16 | 2 in, 5 minute Vac with seal |
| AW-22 | 7/9/2015 | NA | NA | NA | NA | 2 in, Access blocked by attachment on well head |
| AW-45 | 7/9/2015 | 3:07 PM | NA | 11.41 | NA | 4 in, 'No detectable product in well |
| AW-49 | 7/9/2015 | 10:45 AM | 13.16 | 16.16 | 3.00 | 4 in, 15 min Vac with seal |
| AW-51 | | | | | | |
| AW-52 | 7/9/2015 | 9:03 AM | 12.44 | 16.40 | 3.96 | 4 in, 15 min Vac with seal |
| AW-53 | 7/9/2015 | 2:30 PM | 6.22 | 6.55 | 0.33 | 4 in, 10 min Vac with seal |
| AW-54 | | | | | | |
| AW-56 | | | | | | |
| AW-57 | | | | | | |
| AW-62 | | | | | | |
| AW-65 | | | | | | |
| AW-68 | 7/9/2015 | 9:40 AM | 12.52 | 13.08 | 0.56 | 4 in, 5 min Vac with seal |
| AW-74 | | | | | | |
| RW-38 | 7/9/2015 | 8:45 AM | NA | 3.89 | NA | 4 in, 5 min Vac with seal |
| RW-58 | 7/9/2015 | 11:08 AM | 8.56 | 9.13 | 0.57 | 4 in, 5 min Vac with seal |

# FREE PRODUCT GAUGING: 7/15/15 - 7/16/15
## Axeon Specialty Products - Savannah Plant

Terracon

| Well Number | Date Measured | Time Measured | Depth to F.P. (ft) | Depth to Water (ft) | Product Thickness (ft) | Notes |
|---|---|---|---|---|---|---|
| AW-5 | | | | | | |
| AW-6 | | | | | | |
| AW-8 | | | | | | |
| AW-9 | 7/15/2015 | 7:08 AM | 10.74 | 14.08 | 3.34 | |
| AW-10 | 7/15/2015 | 7:48 AM | 10.58 | 14.71 | 4.13 | |
| AW-11 | 7/15/2015 | 7:17 AM | 8.45 | 10.24 | 1.79 | |
| AW-12 | 7/15/2015 | 7:32 AM | 9.10 | 13.91 | 4.81 | |
| AW-13 | | | | | | |
| AW-14 | | | | | | |
| AW-15 | | | | | | |
| AW-18 | | | | | | |
| AW-19 | | | | | | |
| AW-22 | | | | | | Access blocked by pump attachment on well head |
| AW-45 | | | | | | |
| AW-49 | 7/15/2015 | 7:13 AM | 12.78 | 14.98 | 2.20 | |
| AW-51 | 7/15/2015 | 7:20 AM | 10.23 | 11.06 | 0.83 | |
| AW-52 | 7/15/2015 | 7:44 AM | 12.43 | 16.43 | 4.00 | |
| AW-53 | | | | | | |
| AW-54 | 7/15/2015 | 8:00 AM | 5.59 | 9.47 | 3.88 | |
| AW-56 | 7/15/2015 | 7:38 AM | 9.69 | 15.11 | 5.42 | |
| AW-57 | 7/15/2015 | 7:53 AM | 8.45 | 10.24 | 1.79 | |
| AW-62 | 7/15/2015 | 6:50 AM | 6.65 | 6.92 | 0.27 | |
| AW-65 | 7/15/2015 | 6:55 AM | 11.47 | 11.64 | 0.17 | |
| AW-63 | 7/15/2015 | 7:23 AM | 11.49 | 11.66 | 0.17 | |
| AW-74 | 7/15/2015 | 7:28 AM | 7.81 | 8.51 | 0.70 | |
| RW-38 | | | | | | |
| RW-58 | | | | | | |

## FREE PRODUCT GAUGING: 7/23/15 - 7/24/15
### Axeon Specialty Products - Savannah Plant

| Well Number | Date Measured | Time Measured | Depth to F.P. (ft) | Depth to Water (ft) | Product Thickness (ft) | Notes |
|---|---|---|---|---|---|---|
| AW-5 | 7/24/2015 | 9:03 AM | 5.55 | 7.00 | 1.45 | 8' of hose used with 15 min. Vac |
| AW-6 | 7/24/2015 | 9:47 AM | 7.49 | 8.68 | 1.19 | 10' of hose used with 15 min. Vac |
| AW-8 | 7/24/2015 | 10:50 AM | 12.05 | 12.16 | 0.11 | Well inaccessible due to flooding |
| AW-9 | 7/23/2015 | 7:38 AM | 10.57 | 13.74 | 3.17 | 15' of hose used with 10 min. Vac |
| AW-10 | 7/23/2015 | 7:05 AM | 10.17 | 12.22 | 2.05 | 15' of hose used with 20 min. Vac |
| AW-11 | 7/23/2015 | 7:15 AM | 10.59 | 12.99 | 2.40 | 15' of hose used with 15 min. Vac |
| AW-12 | 7/23/2015 | 7:25 AM | 8.68 | 14.18 | 5.50 | 18' of hose used with15 min. Vac |
| AW-13 | 7/23/2015 | 9:00 AM | 11.49 | NA | product to thick to gauge | 15' of hose used, all product removed and 5 min.Vac |
| AW-14 | 7/24/2015 | 8:20 AM | NA | 10.43 | NA | No Free Product |
| AW-15 | 7/24/2015 | 10:35 AM | 10.41 | 10.51 | 0.10 | 11' hose used with 2 min. Vac |
| AW-18 | 7/24/2015 | 10:06 AM | 6.98 | 7.77 | 0.79 | 9' of hose used with 10 min. Vac |
| AW-19 | 7/24/2015 | 7:45 AM | 11.82 | 11.90 | 0.08 | Well was inaccessible due to flooding |
| AW-22 | 7/23/2015 | | NA | NA | NA | Access blocked by attachment on well head |
| AW-45 | 7/24/2015 | 6:50 AM | 11.25 | 11.29 | 0.04 | 12' of hose used and product removed |
| AW-49 | 7/24/2015 | 7:45 AM | 12.58 | 14.73 | 2.15 | 15' of hose used with 20 min. Vac |
| AW-51 | 7/23/2015 | 7:33 AM | 10.52 | 10.98 | 0.46 | 12' of hose used with 5 min. Vac |
| AW-52 | 7/23/2015 | 7:00 AM | 12.18 | 16.22 | 4.04 | 17' of hose used with 20 min. Vac |
| AW-53 | 7/24/2015 | 8:35 AM | 6.08 | 6.13 | 0.05 | 7' of hose used and product removed |
| AW-54 | 7/23/2015 | 7:50 AM | 5.54 | 8.00 | 2.46 | 10' of hose used with 15 min. Vac |
| AW-56 | 7/23/2015 | 7:20 AM | 9.70 | 13.83 | 4.13 | 15' of hose used with 10 min. Vac |
| AW-57 | 7/23/2015 | 7:10 AM | 8.44 | 9.00 | 0.56 | 10' of hose used with 5 min. Vac |
| AW-62 | 7/23/2015 | 8:50 AM | 9.42 | 9.65 | 0.23 | 11' of hose used with 5 min. Vac |
| AW-65 | 7/23/2015 | 9:23 AM | 11.62 | 11.81 | 0.19 | 12' of hose used with 5 min. Vac |
| AW-63 | 7/23/2015 | 8:55 AM | 11.97 | 12.45 | 0.48 | 14' of hose used with 5 min. Vac |
| AW-74 | 7/23/2015 | 7:22 AM | 9.65 | 10.41 | 0.76 | 12' of hose used with 10 min. Vac |
| RW-38 | 7/24/2015 | 6:30 AM | 3.65 | 3.67 | 0.02 | 4' of hose used and product removed |
| RW-58 | 7/23/2015 | 7:41 AM | 8.11 | 8.30 | 0.19 | 10' of hose used and 5 min. Vac |