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June 10, 2008

Mr. Scott Miller
Remedial Project Manager
U.S. Environmental Protection Agency
Region IV, Superfund North Florida Section
61 Forsyth Street, SW
Atlanta, GA 30303-3104

**Subject:** Transmittal of the "Upper Floridan Aquifer Sentinel Monitoring Well Installation Work Plan, Revision 1, Koppers Inc. Site, Gainesville, Florida"

Dear Mr. Miller:

On behalf of Beazer East, Inc., attached is a copy of the report entitled "*Upper Floridan Aquifer Sentinel Monitoring Well Installation Work Plan, Koppers Inc. Site, Revision 1, Gainesville, Florida.*" Figures 4, 5 and 6 have been updated or revised. Beazer East, Inc. will implement the scope of work upon approval from the EPA. Pending driller availability, mobilization to the site will occur within approximately 1 month of EPA approval.

Should you require additional information, please feel free to contact me at (303) 665-4390.

Sincerely,

James R. Erickson

James R. Erickson, P.G.
Principal Hydrogeologist

Enclosure

cc: B. O'Steen, U.S. EPA
K. Helton, FDEP
J. Mousa, ACEPD
D. Richardson, GRU
M. Brourman, BEI
M. Slenska, BEI
J. Fankulewski, KI

# UPPER FLORIDAN AQUIFER
# SENTINEL MONITORING WELL INSTALLATION
# WORK PLAN, REVISION 1

# KOPPERS INC. SITE
# GAINESVILLE, FLORIDA

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**Prepared For:**

Beazer East, Inc.

**Prepared by:**

GeoTrans, Inc.
363 Centennial Parkway, Suite 210
Louisville, Colorado 80027

June 10, 2008

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# 1.0 INTRODUCTION

This work plan describes the drilling, well construction, and related services that will be performed during installation of the four Upper Floridan (UF) Aquifer sentinel monitoring wells downgradient of the Cabot Carbon/Koppers Superfund Site (the Site) located in Gainesville, Florida. The work will be performed under the supervision of a Tetra Tech/GeoTrans (GeoTrans) geologist/engineer who is familiar with the site and objectives of the work plan. Details on the scope of the work, including the investigation objectives, available geologic and hydrogeologic information, and the proposed number, locations, sizes, depths and other specifications for the drilling and installation of monitoring wells are provided herein.

## 1.1 SITE DESCRIPTION

The Site is located in the City of Gainesville, in Alachua County, Florida (Figure 1). The Site encompasses approximately 90 acres and has been used as an active wood-treating facility for approximately 90 years. Adjacent properties include the former Cabot Carbon portion of the Superfund site to the east, private residences to the west and northwest, and commercial facilities and private residences to the north and south.

## 1.2 SITE HYDROGEOLOGY

The Site is located in the Northern Highlands of Alachua County. Four principal hydrostratigraphic units are present in this area: 1) Surficial Aquifer, 2) Hawthorn Group (HG) deposits, 3) UF Aquifer, and 4) Lower Floridan Aquifer. A conceptual geologic section showing these hydrostratigraphic units is provided in Figure 2.

The Surficial Aquifer consists of approximately 20- to 30-feet of marine terrace deposits comprised of unconsolidated, fine- to medium-grained sand, with thin layers of interbedded silt and clay deposits.

The HG deposits underlie the Surficial Aquifer and consist of a complex sequence of interbedded clays, silts, sands and carbonates, with three low-permeability clay deposits located at the top, middle and bottom of this unit. The HG deposits are approximately 120 to 125 feet thick beneath the Site and separate the overlying Surficial Aquifer from the underlying UF Aquifer.

The UF Aquifer underlies the HG deposits. The two primary formations that comprise the UF Aquifer are the Ocala Limestone and the Avon Park. There are two major water producing zones within the UF Aquifer: 1) Upper Transmissive Zone (UTZ), and 2) Lower Transmissive Zone (LTZ). The UTZ and LTZ are separated by a lower-permeability carbonate deposits referred to as the Semi-Confining Unit (SCU). The regional groundwater flow direction in the UF Aquifer is to the northeast towards the Murphree wellfield (GeoTrans, 2004).

The Lower Floridan Aquifer is separated from the UF Aquifer by approximately 200 feet of low-permeability carbonate deposits, in addition to numerous intra-aquifer low-permeability zones. No water-supply wells are known to be completed in the Lower Floridan Aquifer within Alachua County.

### 1.3 EXISTING UPPER FLORIDAN WELLS

Currently, there are 29 UF Aquifer monitoring wells completed at or near the Site (Figure 3). Ten of these monitoring wells (FW-1 through FW-9, and GRU well MWTP-MW1) are standard completion monitoring wells. Nineteen of these wells (FW-10B through FW-24C, and FW-4C) are completed with Westbay multi-port sampling systems.

## 2.0 PROJECT OBJECTIVES AND APPROACH

### 2.1 OBJECTIVE

The objective of the proposed sentinel monitoring well installation work plan is to augment the existing monitoring network by installing wells at a downgradient, off-Site location aligned with the principal groundwater flow direction from the Site. The sentinel wells will be incorporated into the long-term monitoring of UF Aquifer groundwater at the Site.

### 2.2 WELL LOCATIONS

The proposed off-Site sentinel monitoring well locations are approximately 600 to 800 feet downgradient of the Site's northern property boundary. The approximate locations of the proposed sentinel monitoring wells are shown in Figure 4; however, the final locations for these new wells will be dependent on accessibility and access agreements with landowners.

### 2.3 GENERAL DRILLING INFORMATION

Continuous 3-inch to 4-inch diameter soil/rock core will be collected from all rotosonic borings and logged by the oversight geologist/engineer to characterize lithology. The core will be collected, photographed, and stored. Samples from select cores may be taken for chemical analyses. To ensure that the majority of the drilling fluids are recovered during well development, all water used during drilling of the well completion interval will be tagged with a sodium bromide tracer. The tracer will be added to the drilling makeup water reservoir at an approximate concentration of 100 parts per million (ppm).

All annular space outside of all telescoping casings will be filled from the bottom up via a tremmie pipe or other method that ensures complete annular filling with no void space. Casing centralizers will be installed at appropriate distances on the outside of all casings to help minimize channeling of grout and to help ensure a complete and uniform

grout seal. The grout will be allowed to cure a minimum of 12 hours prior to additional work being performed inside of the casing.

All investigation derived waste will be containerized. Solids will be placed in driller-supplied 55-gal drums and transported to a centralized staging area for transportation and disposal. Groundwater samples from monitoring wells along the northern Site property boundary indicate that UF Aquifer is not impacted downgradient of the Site. However, all groundwater removed from these wells during development will be transferred to the Site groundwater treatment system bulk-storage tank for treatment.

## 2.4 WELL COMPLETION DETAILS

The sentinel monitoring wells are proposed to be installed in clean off-Site areas that are projected to be outside of Site-related groundwater impacts. Because there is little to no potential for "dragdown" of impacted Site-related impacts at these locations, Beazer proposes to install one isolation casing into the Hawthorn Group deposits lower clay unit. The single isolation casing will provide additional insurance that potential non-Site related impacts are not inadvertently introduced into the UF Aquifer at these locations. It will also minimize the potential for groundwater in overlying deposits entering the UF Aquifer during well construction.

The two proposed UTZ sentinel monitoring wells (FW-25B and FW-26B) will be completed to an approximate depth of 245 feet. Prior to drilling into the UF Aquifer, a single 10-inch ID isolation casing will be installed into the HG deposit lower clay unit at an approximate depth of 125 feet to isolate the UF Aquifer from the overlying deposits. The sentinel monitoring wells will be constructed with a 4-inch diameter well casing and four separate screen intervals, similar to the completion of existing monitoring well FW-24B (Figure 5). The well casing will be constructed with a combination of stainless steel and mild steel risers. A 4-inch diameter mild-steel casing will be used from ground surface to the base of the 10-inch isolation casing and stainless steel casing will be used from the base of the 10-inch casing to the top of the screen. Four stainless-steel 10-foot long well screens will be installed across the approximately 40 to 100-foot thick UTZ. Each of the four well screens will be separated by 10 feet of blank stainless steel casing. The wellbore annulus opposite the well screen intervals will be backfilled with filter sand installed via a tremmie pipe. The wellbore annulus opposite the blank casing will be backfilled with bentonite to isolate the individual screen intervals. An approximately 5-foot thick bentonite plug will be installed above the uppermost screen and the remainder of the borehole annulus will be backfilled to land surface with a cement grout, as per ASTM and SJRWMD guidance.

Prior to the installation of the multi-screened wells, select geophysical logs will be run across the UTZ zone. The geophysical logs will consist of: 1) Temperature, 2) Conductivity, and 3) Caliper. Logging will be performed in the open borehole by pulling the override casing back to the base of the HG deposits.

The proposed LTZ sentinel monitoring wells (FW-25C and FW-26C) will be co-located with UTZ sentinel monitoring wells. The total depth of the LTZ wells will be approximate 380 feet. Because of borehole instability issues in the UF Aquifer, the LTZ monitoring wells will be completed with a 4-inch diameter well casing and three separate 10-foot screen intervals. The wells will be constructed similar to the UTZ wells, with a single 10-inch diameter isolation casing completed into the HG deposit lower clay unit. An 8-inch diameter borehole will be advanced to the base of the LTZ, where a 4-inch diameter multi-screened well will be installed. Each of the three well screens will be separated by 20 feet of blank stainless steel casing (Figure 6). The wellbore annulus opposite the well screen intervals will be backfilled with filter sand installed via a tremmie pipe. The wellbore annulus opposite the blank casing will be backfilled with bentonite to isolate the individual screen intervals. An approximately 5-foot thick bentonite plug will be installed above the uppermost screen and the remainder of the borehole annulus will be backfilled to land surface with a cement grout, as per ASTM and SJRWMD guidance.

Prior to the installation of the multi-screened wells, select geophysical logs will be run across the LTZ zone. The geophysical logs will consist of: 1) Temperature, 2) Conductivity, and 3) Caliper. Logging will be performed in the open borehole by pulling the override casing back to the base of the SCU.

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## 2.5 WELL SURFACE COMPLETION AND DEVELOPMENT

The final 4-inch diameter permanent well casing will extend to grade. A 6-inch protective flush mounted casing with locking cover will be installed around the well casing. A 4-foot by 4-foot by 6-inch thick concrete pad will be constructed around the stickup. The pad will be completed 3 inches above existing grade with the apron tapered 2 inches lower such that precipitation runoff will flow away from the well.

The wells will be developed by pumping no sooner than 24 hours after installation to remove formation material and residual well construction fines from the sampling interval of the well. Well development shall consist of over-pumping of the well until the discharge water has turbidity less than 10 NTUs and sodium bromide concentrations are below 25 ppm or have reached asymptotic levels.

# 3.0 REPORTING AND SCHEDULE

## 3.1 REPORTING

A report documenting the results of activities described in this Work Plan will be submitted for Agency review after the completion of the well-drilling program and the results of the groundwater samples are obtained. The letter report will include a description of well-completion activities, borehole logs, and as-built well completion diagrams.

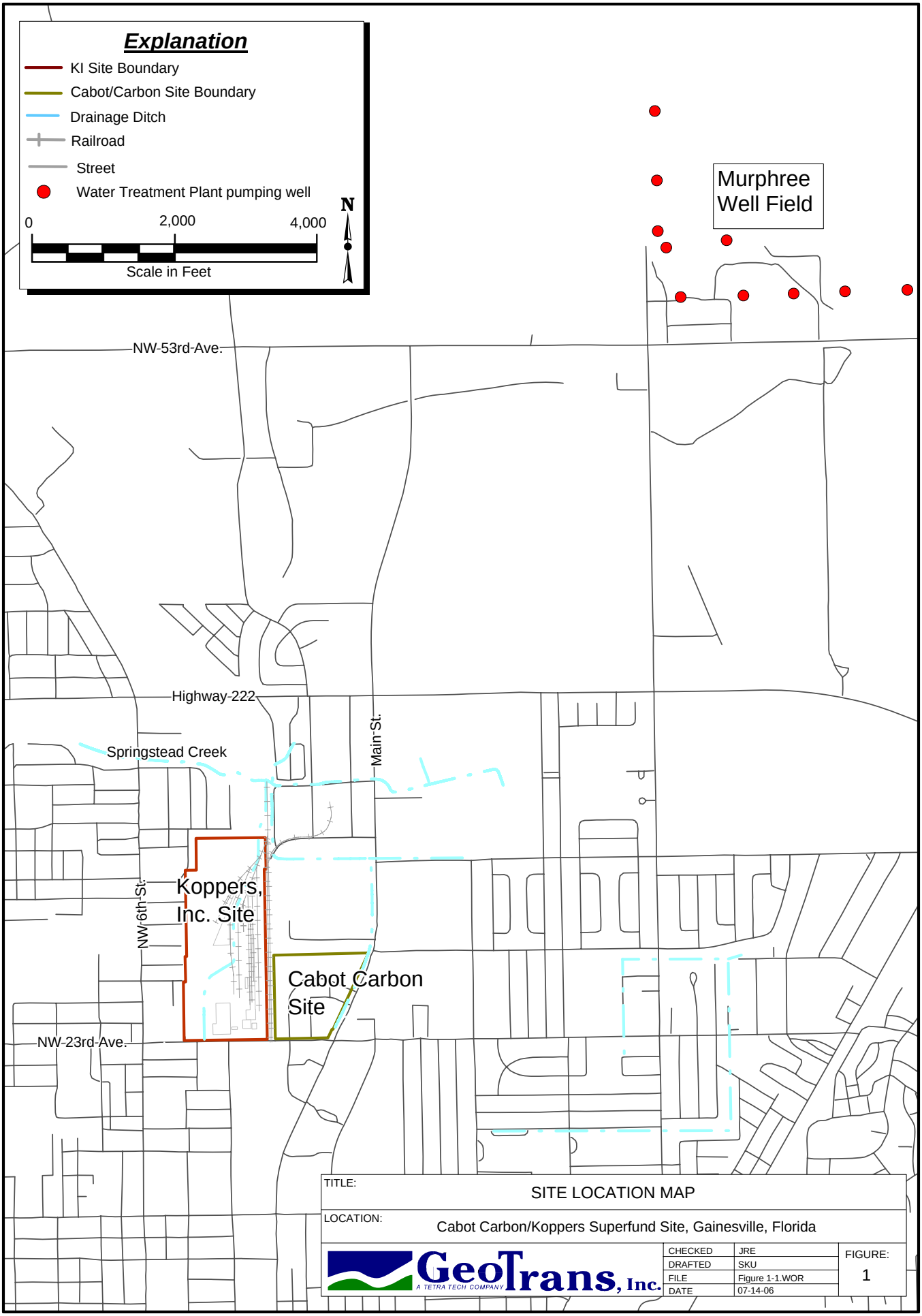
## 3.2 SCHEDULE

The schedule for implementation of this work plan will be dependent on Agency approval of the workplan. In addition, the schedule for the well installation will be dependent on obtaining access agreements from landowners and on driller availability. It is anticipated that once stakeholder approval of the work plan is received, it will require approximately 1 month for a driller to mobilize to the Site.

# 5.0 REFERENCES

GeoSys, 2000, Update of the Geology in the Murphree Well Field Area, prepared for Gainesville Regional Utilities, April, 2000.

GeoTrans 2004, Addendum 6: Groundwater Flow and Transport Model, Draft Report, Koppers, Inc. Site, Gainesville, Florida, October, 2004.




TITLE: SITE LOCATION MAP

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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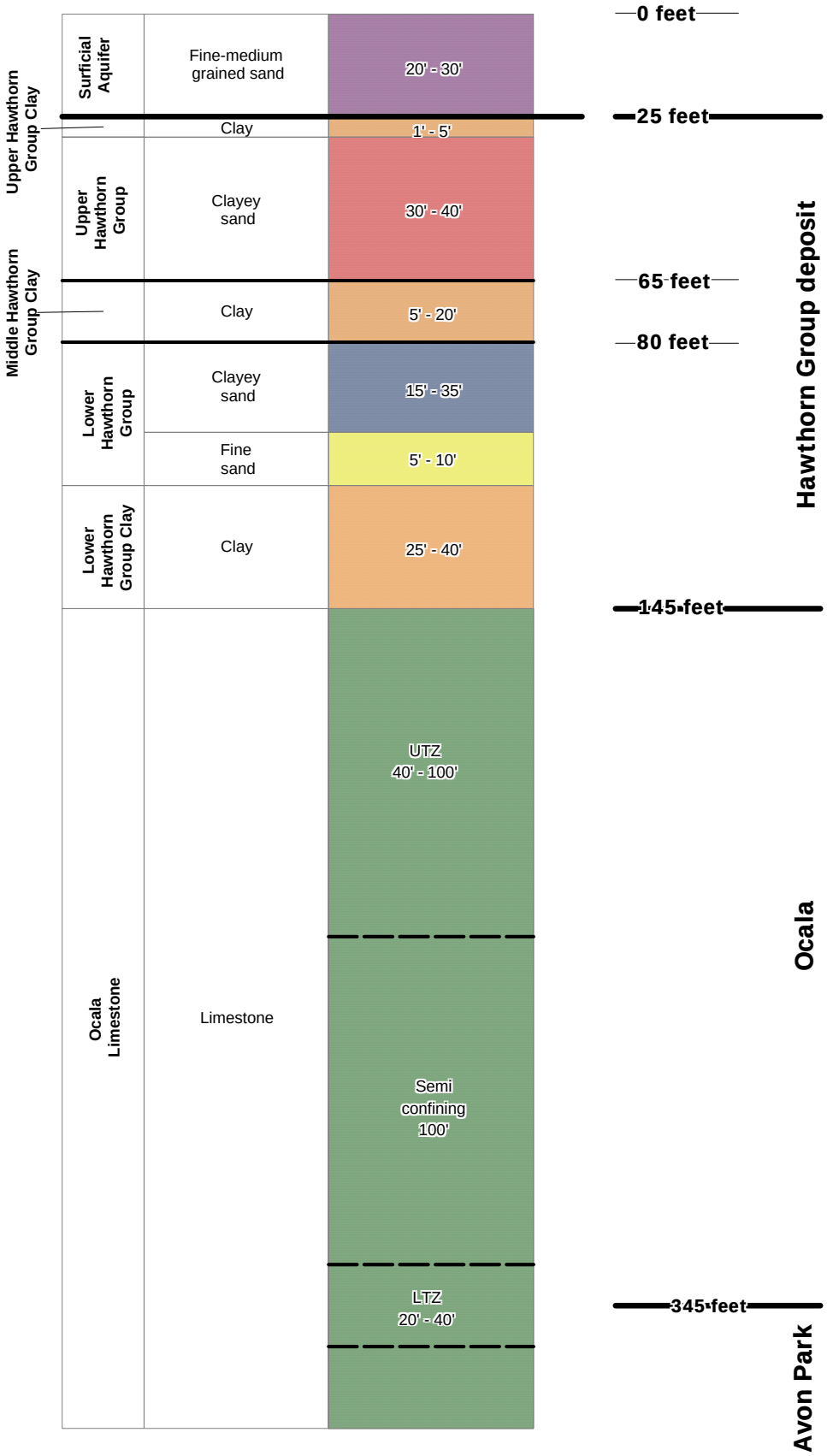
| FILE | Figure 1-1.WOR |
| DATE | 07-14-06 |

FIGURE: 1




TITLE: HYDROSTRATIGRAPHY OF DEPOSITS BENEATH SITE

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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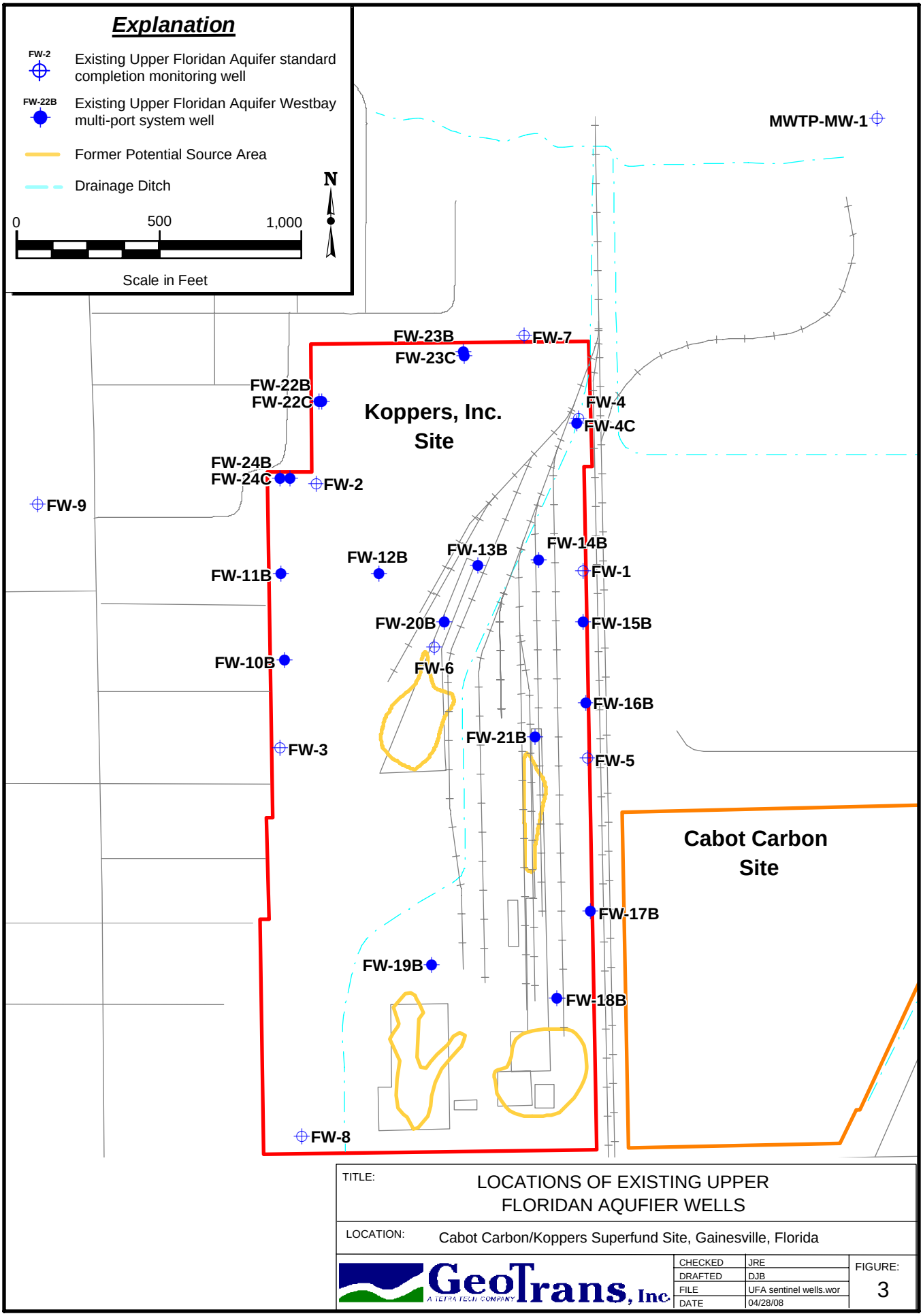
| FILE | Fig 1-3.wor |
| DATE | 07/14/06 |

FIGURE: 2




TITLE: LOCATIONS OF EXISTING UPPER FLORIDAN AQUFIER WELLS

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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FIGURE: 3

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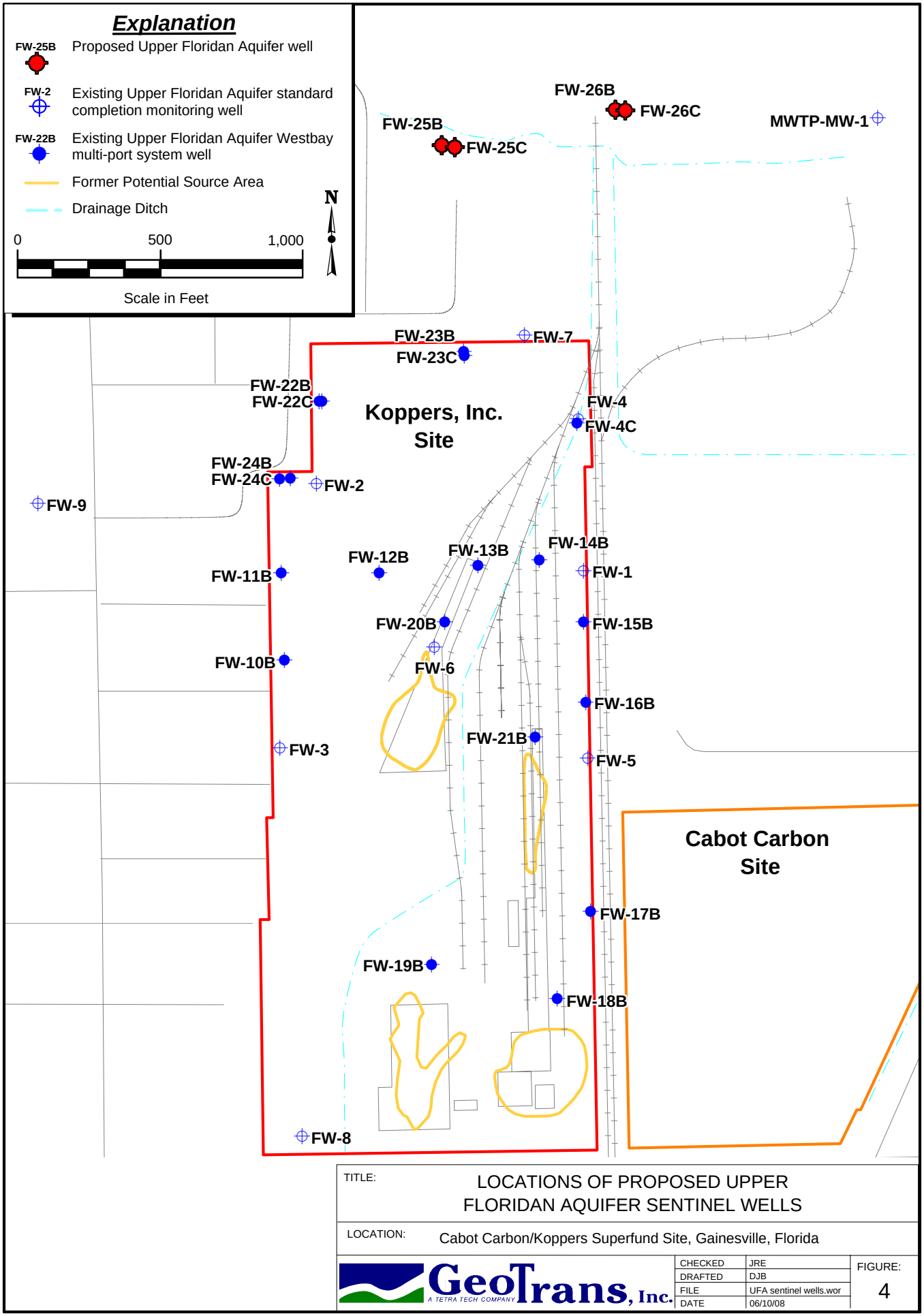


TITLE: LOCATIONS OF PROPOSED UPPER FLORIDAN AQUIFER SENTINEL WELLS

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

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| DRAFTED | DJB |
| FILE | UFA sentinel wells.wor |
| DATE | 06/10/08 |

FIGURE: 4

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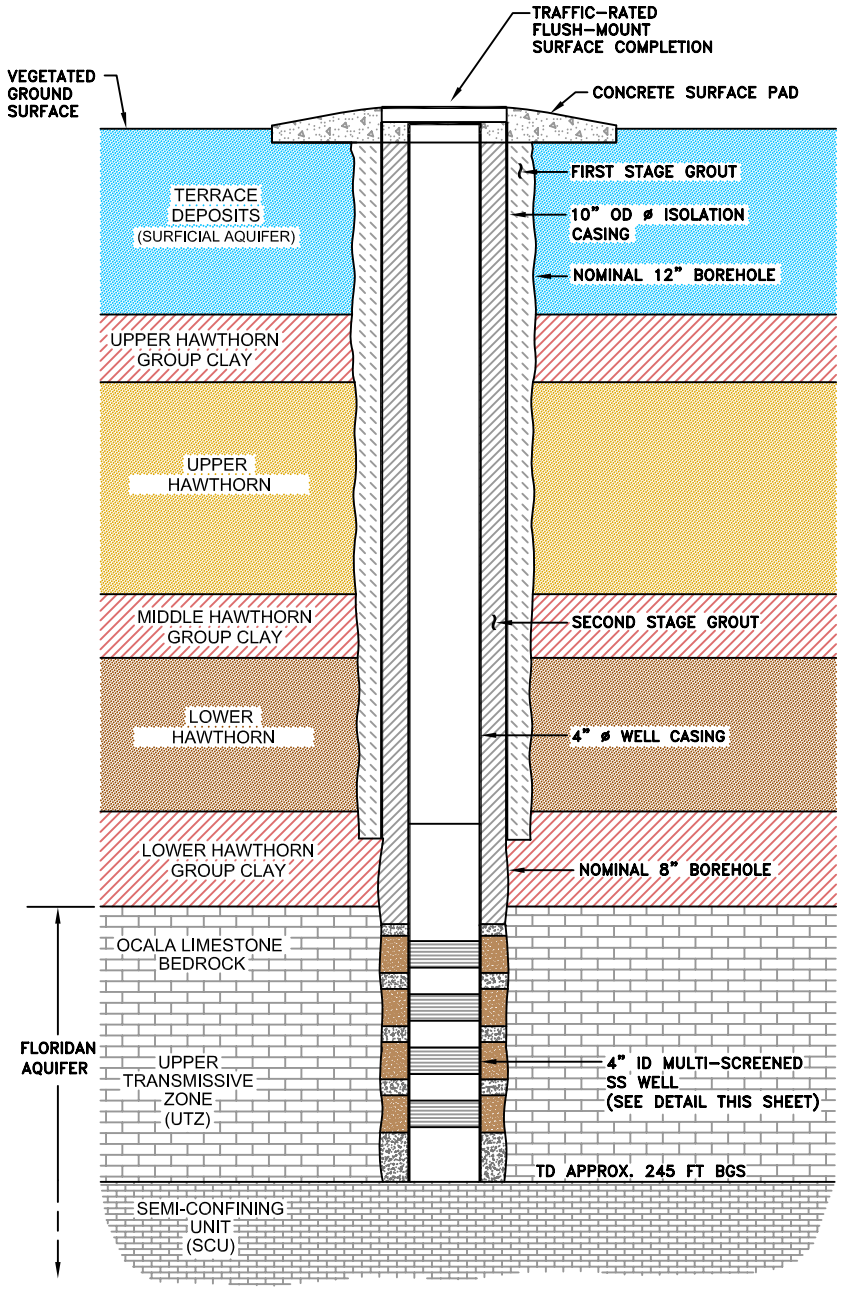


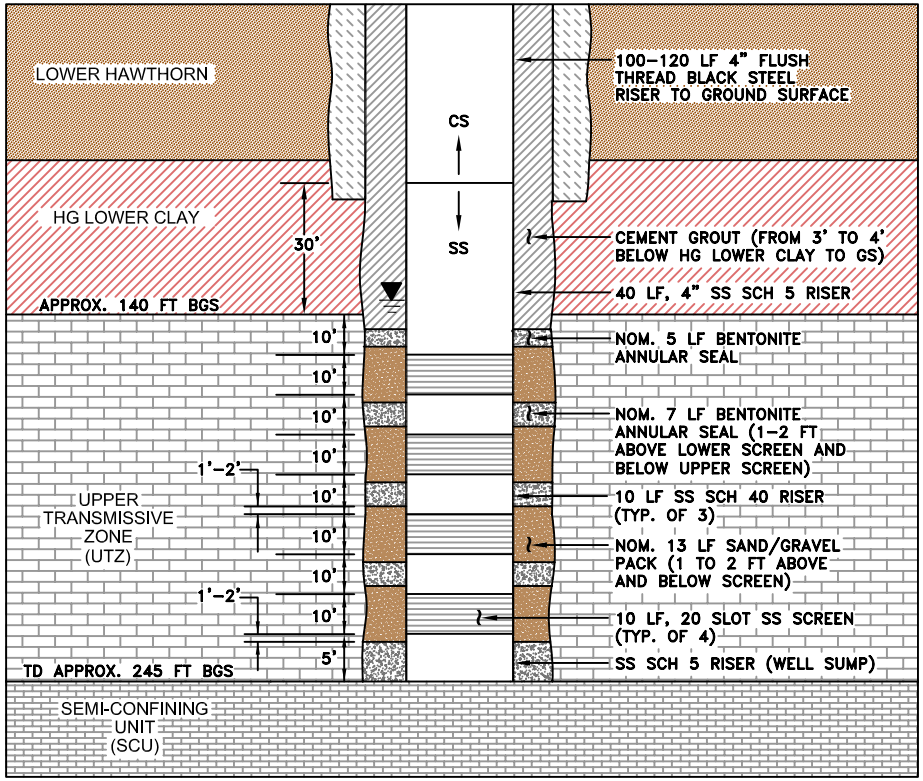


NOT TO SCALE

TITLE: TYPICAL PROPOSED FLORIDAN AQUIFER WELL FOR THE UPPER TRANSMISSIVE ZONE

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

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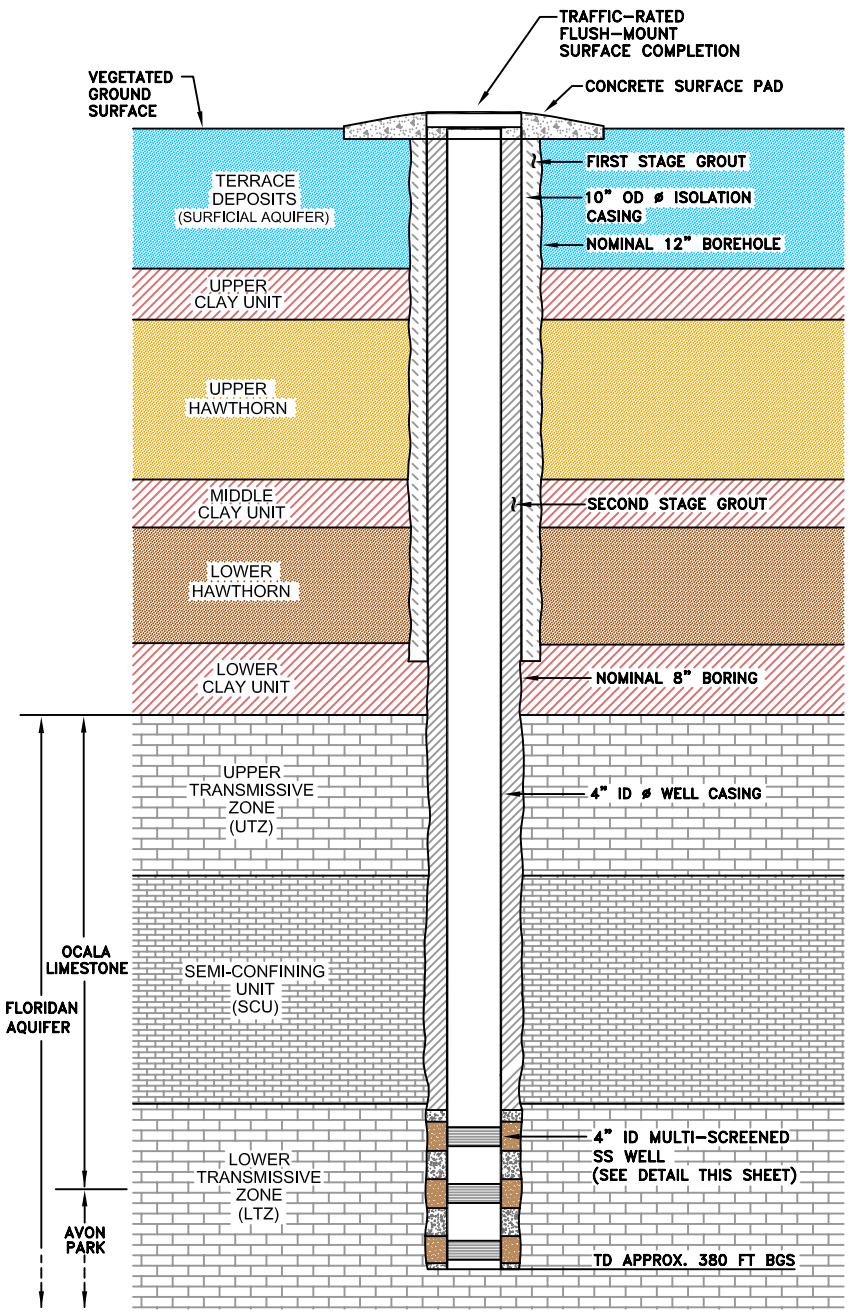
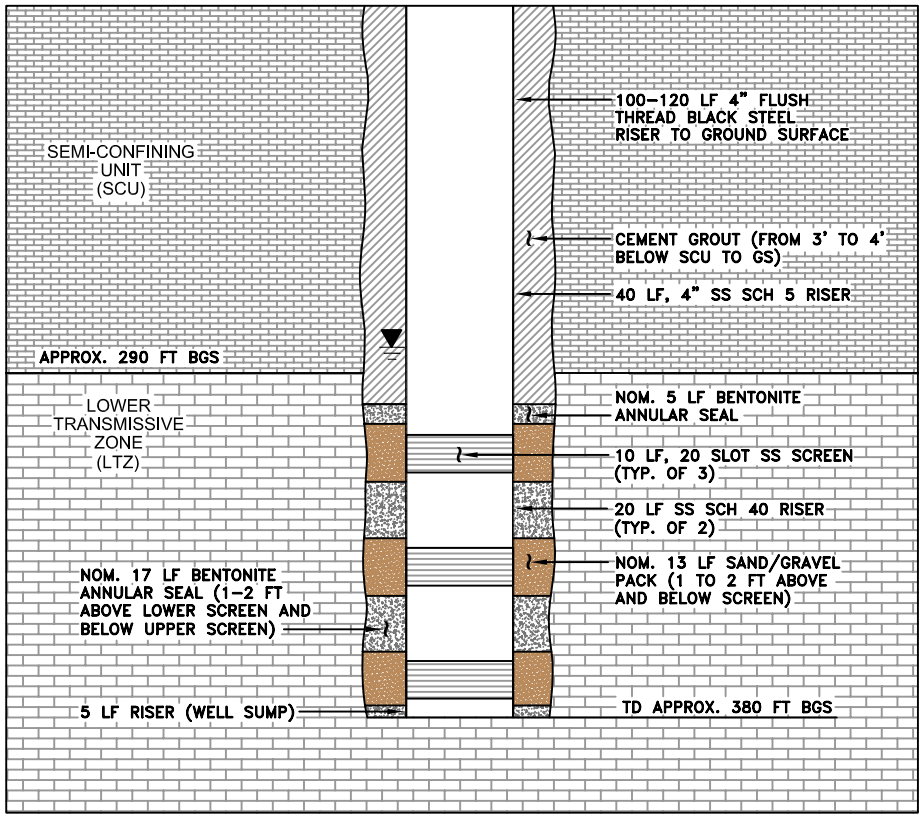
FIGURE: 5




NOT TO SCALE

TITLE: TYPICAL PROPOSED FLORIDAN AQUIFER WELL FOR THE LOWER TRANSMISSIVE ZONE

LOCATION: Cabot Carbon/Koppers Superfund Site, Gainesville, Florida

GeoTrans, Inc. A TETRA TECH COMPANY

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| FILE | FIG 6 - LTZ |
| DATE | 06/04/08 |

FIGURE: 6