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NSA PANAMA CITY
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TECHNICAL MEMORANDUM REGARDING PATH FORWARD FOR SITE 278
GROUNDWATER DATA AT NSA PANAMA CITY FL
5/20/2010
TETRA TECH INC



For: Partnering Team
From: Larry Smith
Subject: Site 278
Date: May 20, 2010

Overview:

- Contamination due to leakage from four (2 asphalt coated steel installed 1964 and 2 fiberglass installed 1977 respectively) 7,500-gallon underground storage tanks (USTs) and /or piping used for diesel storage.
- Soil and groundwater impacted no visible product.
- Contaminant is diesel. Max in soil/groundwater.

Goal: With available data determine if an SRCO for NFA is applicable.

Path forward: Review currently available data to determine if two quarters of groundwater data are less than FDEP GCTLs. If so request SRCO.

History: Site 278 is located at the east dock alongside Alligator Bayou. The site is the former location of four 7,500-gallon underground storage tanks (USTs) used for diesel fuel storage. In 1989 all the tanks were removed and replaced with two 15,000-gallon double walled steel tanks. During excavation high levels of petroleum vapors were detected exceeding the explosive gas meter in use at the time. Visual inspection indicated stained soil under the tank pads. An unknown amount of stained soil was removed and disposed of while the remaining visibly contaminated soil was aerated over Visqueen. No groundwater samples were collected at that time. Several soil samples were collected from soils selected for disposal to meet acceptable levels for transport. A Tank Closure Report was not submitted by the contractor and no manifest copies were provided for soil transportation. It appears the source for contamination at the site is the four former 7,500-gallon diesel USTs.

Synopsis of available Site 278 historical documents:

- A CA of Site 278 was conducted and a CAR was submitted to FDEP in July 1993 (ABB-ES, 1993). During the CA, free product was found in one well (MW-5). Soil OVA readings indicated excessively contaminated soil per Chapter 62-770.200, F.A.C. and groundwater samples detected contaminants in the kerosene analytical group (KAG). The CA stated that natural attenuation was likely occurring. The CAR stated that soil and groundwater at the site exceed Chapter 62-770, F.A.C. target levels for KAG. The FDEP reviewed the assessment and requested additional information and clarification of site data.
- ABB-ES performed additional work at the site and provided data clarification in a CARA submitted to the FDEP in November 1993. FDEP requested additional clarification and sampling.

- FDEP requested additional assessment and information in a letter dated March 1994. ABB-ES performed a supplemental investigation to complete the CA and submitted it in May 1995 (ABB-ES 1995).
- In September 1995, FDEP completed the review of the CA, CAR, CARA, and supplemental information and recommended submission of a RAP.
- The RAP was submitted in April 1996 recommending a vacuum enhanced extraction (VEE) recovery system to clean up the free product in groundwater and soil. It was estimated that the system run no more than three years. It also recommended continued groundwater monitoring. The system startup and tuning were completed in between January and March 1998 (EnSafe 2001). The system operated on a bimonthly schedule through December 2001. In 2002, EnSafe reported that no free product had been recorded since June 2001 (EnSafe 2002).
- In May 2002, CCI conducted groundwater monitoring in order to assess current conditions at the site since VEE system operation. No measurable free product was detected and volatile organic compound (VOC) analysis revealed low concentrations at the site with no exceedances. Polynuclear aromatic hydrocarbon (PAH) exceedances were limited to well CSS-278-MW-06. Total recoverable petroleum hydrocarbon (TRPH) concentrations were detected at levels exceeding the GCTL in five of the nine monitoring wells. Soil boring samples collected at this time also detected concentrations of TRPH exceeding their SCTL regulatory limit.
- In August 2002, CH2M Hill submitted a Work Plan Addendum for Remediation System Optimization based on the recommendations of CCI. It was recommended that an AAS system with passive soil vapor extraction (SVE) be installed to address both the groundwater and soil contamination at the site. Groundwater monitoring was recommended on a semiannual basis. It was proposed at the conclusion of the system installation that a Construction Completion Report (CCR) would be submitted along with the first monitoring report.
- In April 2002, groundwater samples were collected from nine monitoring wells. No measureable free product was detected in any of the wells at Site 278, although a fuel odor was noted while sampling wells 278-MW04, MW05, MW06, and MW07. VOC analysis revealed low concentrations of ethylbenzene and cis-1,2-dichloroethylene in well 278-MW06. Cis-1,2-dichloroethylene was also detected at low concentrations in wells 278-MW03 and MW-05. PAH exceedances were limited to well 278-MW06; 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were all detected above their respective GCTLs. TRPH concentrations were detected in levels exceeding the GCTL in five of the nine monitoring locations.

The following conclusions were formulated regarding the remedial activities at Site 278: Groundwater concentrations in two of the on-site wells (278-MW05 and MW06) continued to exhibit levels of petroleum constituents above their respective GCTLs. As of May 2004, the SVE system had removed approximately 20 lbs of volatile hydrocarbons, the AAS/SVE system is effectively removing petroleum hydrocarbons from the water table and vadose zone, however, the rate of removal is lower than anticipated due to water in the SVE lines. In April 2002, groundwater samples were collected from nine monitoring wells. No measureable free product was detected in any of the wells at Site 278, although a fuel odor was noted while sampling wells 278-MW04, MW05, MW06, and MW07. VOC analysis revealed low concentrations of ethylbenzene and cis-1,2-dichloroethylene in well 278-MW06. Cis-1,2-dichloroethylene was also detected at low concentrations in wells 278-MW03 and MW-05. PAH exceedances were

limited to well 278-MW06; 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were all detected above their respective GCTLs. TRPH concentrations were detected in levels exceeding the GCTL in five of the nine monitoring locations.

- On July 28 and November 12, 2004, Aerostar collected groundwater samples from seven monitoring wells. LNAPL was not detected in any monitoring wells during these events. Analytical results showed a slight exceedence in MW-6 (referred to as 278-MW06 in previous reports, but will be labeled as MW-6 here after) of naphthalene, detected at 0.021 mg/L, and 1-methylnaphthalene, detected at 0.033 mg/L for the sampling event on July 28. The GCTLs for both of these contaminants are 0.020 mg/L. All other wells did not exceed GCTLs for BTEX, PAH, and TRPH.
- On March 15 and June 21, 2005, Aerostar collected groundwater samples from six monitoring wells. LNAPL was detected in MW-5 during these sampling events; therefore, MW-5 was not sampled. Total BTEX and PAH concentration were below GCTLs in both sampling events. TRPH was detected in monitoring wells MW-6 (10 mg/L) above the GCTL of 5 mg/L on March 15, and MW-7 and MW-8 had exceedences with concentrations of 7 mg/L and 5.2 mg/L, respectively.
- On September 7 and November 9, 2005, Aerostar collected groundwater samples from six monitoring wells. LNAPL was detected in MW-5 during both sampling events; therefore, MW-5 was not sampled. No monitoring wells sampled exceeded GCTLs for BTEX, PAH, and TRPH.
- On February 23, 2006, Aerostar collected groundwater samples from six monitoring wells. LNAPL was detected in MW-5 during this sampling event and was not sampled. All other wells sampled were below the GCTLs for BTEX, PAHs, and TRPH.

On June 6, 2006, Aerostar collected groundwater samples from seven monitoring wells. LNAPL was not present in MW-5, so that well could be sampled. MW-5 was the only well that had exceedences, with concentrations of benzo(a)pyrene (0.0029 mg/L), benzo(b)fluoranthene (0.0004 mg/L), and Indeno(1,2,3-cd)pyrene (0.0025 mg/L) above their respective GCTLs. TRPH in MW-5 also exceeded the GCTL with a concentration of 9.5 mg/L.

- On August 22 and November 20, 2006, Aerostar collected groundwater samples from seven monitoring wells. LNAPL was not detected during these two events. Analytical results for the 3rd and 4th quarters showed BTEX and PAH concentrations below GCTLs in all monitoring wells sampled. During the 3rd quarter, TRPH exceeded the GCTL of 5 mg/L in MW-5 with a concentration of 30 mg/L. During the 4th quarter, TRPH concentrations were detected in MW-5 at 1.4 mg/L.
- On March 26, 2007, Aerostar collected groundwater samples from seven monitoring wells. On May 11, 2007, Aerostar collected groundwater samples from thirteen monitoring wells. LNAPL was not detected during the 1st or 2nd quarters, year 2007 sampling events. The sampling event confirmed that PAH, total BTEX, and TRPH are below MDLs or their respective GCTLs in all monitoring wells.
- On September 26 and November 20, 2007, Aerostar collected groundwater samples from seven monitoring wells. Analytical results for the 3rd and 4th quarters, year 2007 sampling events showed BTEX and PAH concentrations below GCTLs in all monitoring wells samples. During the 3rd quarter, TRPH concentrations were below GCTLs in all monitoring wells sampled; however, during the 4th quarter, year 2007, TRPH exceeded the GCTL of 5.00 mg/L in MW-6 (5.10 mg/L).

Ten soil borings were advanced on November 20, 2007. Analytical results showed BTEX and PAH concentrations below SCTLs for residential and commercial standards. TRPH was detected in soil samples SB-6 (5-7'), SB-7 (5-7'), SB-8 (5-7'), SB-9 (5-7'), SB-

10 (5-7') at concentrations of 1700 mg/kg, 890 mg/kg, 9000 mg/kg, 3400 mg/kg, 1000 mg/kg, which exceeded the SCTL for residential soil of 460 mg/kg. Soil samples SB-8 (5-7') and SB-9 (5-7') exceeded the SCTL for industrial/commercial soil of 2700 mg/kg.

- On December 8 and 9, 2008, Aerostar collected groundwater samples from 6 monitoring wells. LNAPL was not detected during this sampling event. Analytical results for this quarter showed BTEX and TRPH concentrations below GCTLs in all monitoring wells sampled. With the exception of 1-methylnaphthalene and naphthalene, all PAH concentrations were below GCTLs in all wells sampled. 1-Methylnaphthalene slightly exceeded the GCTL of 0.028 mg/L in the groundwater sample collected from MW-6 (0.033 mg/L). Naphthalene slightly exceeded the GCTL of 0.014 mg/l in the groundwater sample collected from MW-6 (0.0143 mg/L).

On December 8 and 9, 2008, Aerostar advanced seven soil borings at the site. The TRPH SCTL of 340 mg/kg was exceeded in soil samples SB-8R (4-5') and SB 9-R (4-5') with concentrations of 18,800 mg/kg and 608 mg/kg, respectively. Soil sample SB-8R (4-5') exceeded the SCTL for industrial/commercial direct contact soil of 2700 mg/kg. These soil samples were further analyzed by the Florida Criteria Working Group (CWG) method and all detections were below their respective SCTLs for TRPH Fraction.

- On March 19, 2009, Aerostar collected groundwater samples from six monitoring wells. LNAPL was not detected during this sampling event. Analytical results showed BTEX, PAH, and TRPH concentrations below GCTLs in all monitoring wells sampled.
- On August 21, 2009, Aerostar collected groundwater samples from six monitoring wells. LNAPL was not detected during this sampling event. Analytical results showed BTEX, PAH, and TRPH concentrations below GCTLs in all monitoring wells sampled. There were no FDEP GCTL exceedences in any of the monitoring wells sampled over the last two monitoring events.

