



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 377TH AIR BASE WING (AFMC)



MEMORANDUM FOR MS. MARCY LEAVITT, CHIEF
GROUNDWATER QUALITY BUREAU
NEW MEXICO ENVIRONMENT DEPARTMENT
PO BOX 26110
SANTA FE NM 87502

AR Doc #1359

FROM: 377 ABW/EM
2050 Wyoming Blvd SE,
Building 20685, Suite 125
Kirtland AFB NM 87117-5270

SUBJECT: Addendum to Stage I Abatement Plan for ST-106, Bulk Fuels
Facility, Kirtland AFB

1. We are submitting an addendum to complete the subject abatement plan. The addendum is required in accordance with Condition 4 of the 11 Jul 00 conditional approval of the abatement plan (AP-28).
2. An investigation to determine if groundwater contamination exists is necessary due to the vertical extent of the subsurface soil contamination determined to this point in the investigation. The addendum outlines our proposal for installation of monitor wells to determine if the groundwater has been impacted. Additionally, the addendum outlines our proposal for installation of additional soil borings to determine the horizontal extent of the soil contamination, which has not been determined.
3. A draft report of the findings of the investigation will be submitted 90 days after your approval of the addendum. The final report will be submitted 14 days after receipt of your comments.
4. Please contact me at 505-846-9002 or Mr. Mark Holmes at 505-846-9005 or if you have any questions on this matter.


HARRY M. DAVIDSON
Acting Chief, Restoration Branch
Environmental Management Division

Attachment:
Addendum to Abatement Plan

1359 001

11/17/07

cc:

NMED-HRMB (Mr. Kieling) w/ atch
NMED-HRMB KAFB (Mr. Moats) w/o atch
NMED-GWQB (Ms. Parker) w/o atch
NMED-GWQB (Mr. Mullany) w/o atch
EPA Region 6 (Ms. Tellez) w/ atch
HQ AFMC/CEVC (Mr. Fort) w/ atch
DESC/DESC-FQ (Mr. Kennedy) w/ atch
AFCEE (Mr. Arnold) w/o atch
CH2MHILL (Ms. Minchak) w/o atch
377 ABW/EMC (Mr. Montano) w/o atch

ADDENDUM 2 TO STAGE 1 ABATEMENT PLAN ST-106,

KIRTLAND AFB BULK FUELS FACILITY

AUGUST 31, 2000

The following additional information is being provided to supplement the final Stage 1 Abatement Plan submitted for ST-106, Kirtland AFB Bulk Fuels Facility, on 19 April 2000. The 14-inch diameter belowground pipelines that transfer fuel from the offloading rack to the pump house at the Kirtland Air Force Base Bulk Fuels Facility (ST-106) failed during pressure testing three times in November 1999. The specific details of the releases were detailed in the 7-day and 15-day notifications, submitted 19 November and 16 December 2000, respectively, and in the first Addendum to the Stage 1 Abatement Plan. This second Addendum presents a revised plan for a groundwater investigation and further defines the investigation to be performed to define the horizontal extent of the detected contamination.

Previous Investigations

A soil gas survey, a shallow soil investigation using a direct-push method, and a limited deep soil investigation have been completed at the site. The soil-gas survey showed relatively low total petroleum hydrocarbon (TPH) concentrations in the soil gas across the whole ST-106 site. In the soil investigations, subsurface petroleum fuel contamination was identified in two deep soil borings. These two borings were located on the eastern and western ends of the off-loading rack. The maximum concentrations detected were 81,000 parts per million (ppm) TPH in the 105 ft below ground surface (bgs) sample from boring SB-25 and 114,000 ppm TPH in the 270 ft bgs sample from boring SB-26. The deepest that the contamination was detected in the two borings was 0.25 mg/kg

TPH from the 200 ft bgs sample from boring SB-25 and 0.54 mg/kg TPH from the 310 ft bgs sample from boring SB-26. Contamination was also detected in several shallow soil borings (SB-01 through SB-24 are $\leq 40'$ bgs each) at the ST-106 site (Figure 1). Contamination was found along the JP-8 off-loading rack that supplies the 300 foot long belowground pipeline. The horizontal extent of the shallow ($<40'$ bgs) contamination has been delineated during the direct push investigation. The contamination appeared to be limited to within 50 feet of the below ground pipelines, and to the area previously affected by the surface spill. The horizontal extent below 40' bgs is unknown and is expected to be greater than the shallow extent. The vertical extent of contamination has been established in the area of the fuel off-loading rack.

Directly to the south of ST-106 is the Condensate Tank and Evaporation Pond (CAU ST-341). Previous investigations at ST-341 include Appendix III Phase 1 and Appendix III Phase 2 RCRA Facility Investigations (RFIs) (USAF, 1995a and 1997), and a Bioventing Feasibility Site Characterization study (1997). During the RFIs, the horizontal and vertical extent of TPH contamination was well defined. The TPH contamination had not spread far beyond the limits of the pond boundary. A soil-gas survey at ST-341 showed that TPH concentrations were high under the evaporation pond but generally increased with depth and to the north and west, which is not consistent with the distribution of TPH in soil samples. The data suggest that there may be another source of TPH vapors below and to the north of the contamination associated with the evaporation pond.

Proposed Groundwater Investigation

The depth of the soil contamination has led to some concern that groundwater may be affected by the TPH contamination at ST-106. Very low levels of benzene, toluene, ethylbenzene, and xylene (BTEX) (0.2 mg/L benzene and 0.7 mg/L toluene, estimated concentrations, 4/26/2000)

LEGEND

- Stage 1 Abatement Plan Soil Sampling Location
- ST-341 Appendix III RFI Soil Sampling Locations
- △ Groundwater Monitoring Well
- ▲ Groundwater Supply Well
- ⊕ Proposed Groundwater Monitoring Well Location

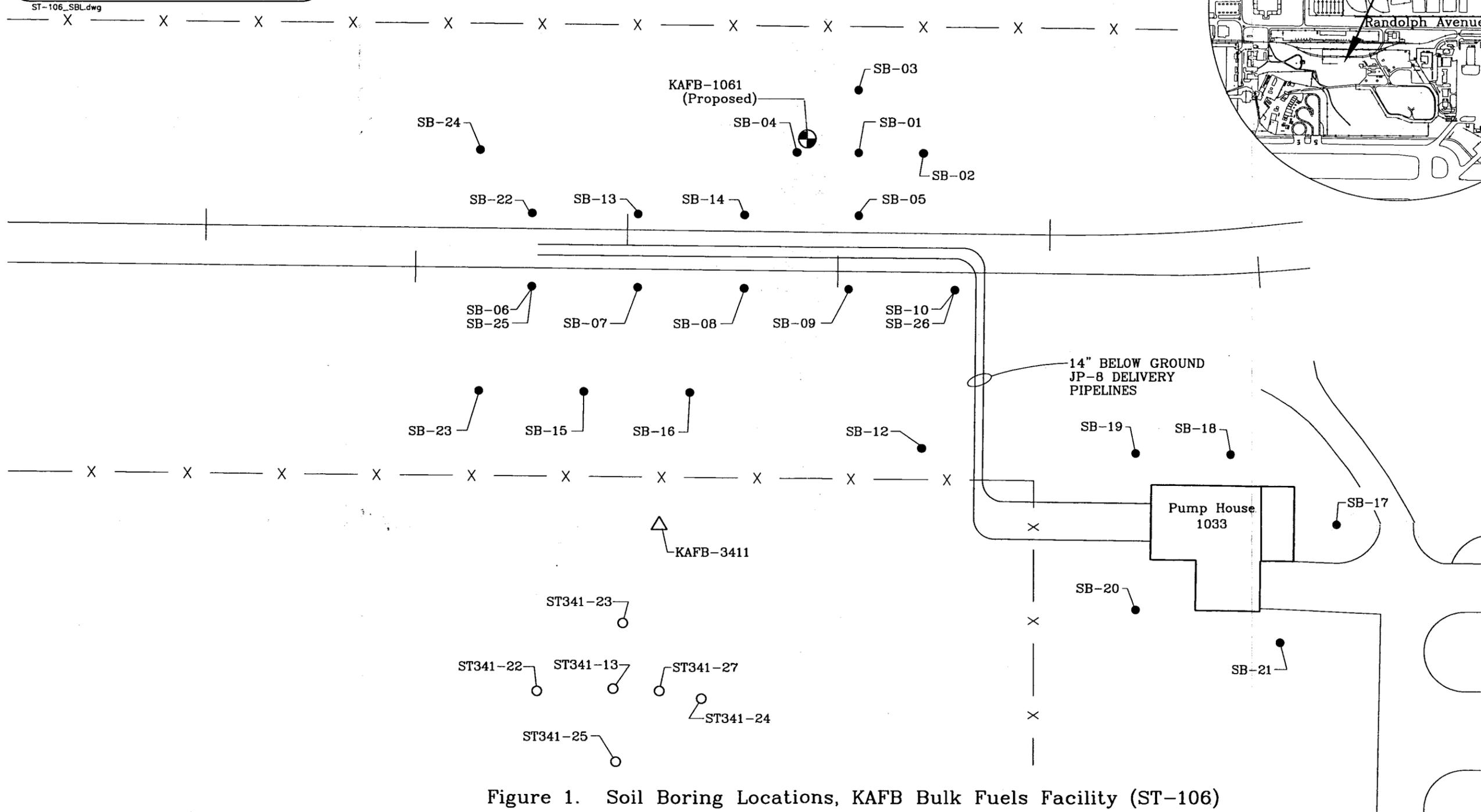
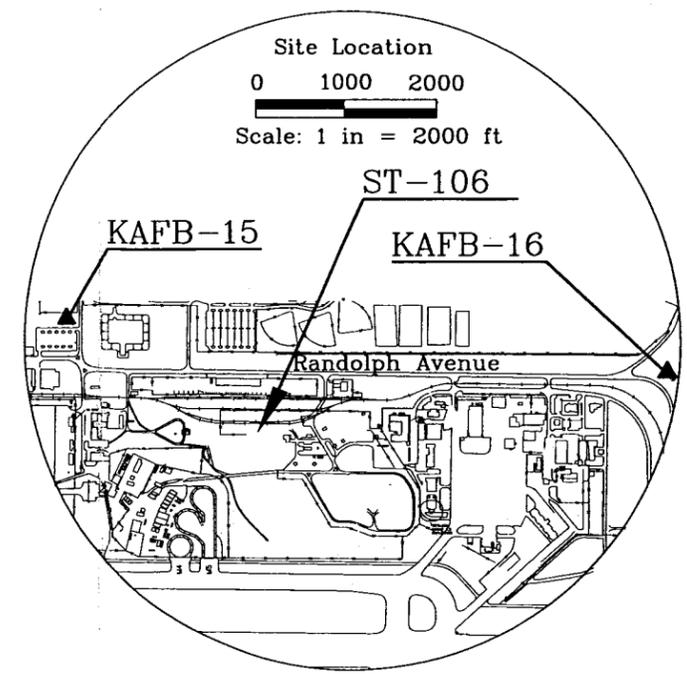
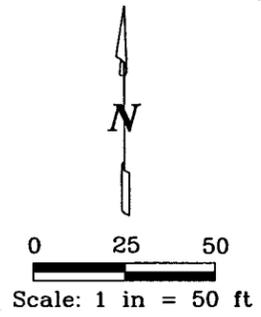


Figure 1. Soil Boring Locations, KAFB Bulk Fuels Facility (ST-106)

contamination has been identified in groundwater monitoring well KAFB-3411, which is only about 100 feet south of the ST-106 site (Figure 1). Potential receptors for groundwater contamination are Kirtland AFB water supply wells KAFB-15 and KAFB-16 (Figure 1), which are north of the site.

The installation of one groundwater monitoring well (KAFB-1061) is proposed to determine if the regional aquifer has been affected by the soil contamination (Figure 1). One round of ground water samples will be collected and analyzed for TPH, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) (Table 1). Groundwater well installation and sampling will follow those procedures specified in the Base-Wide Plan SOP A1.6.

An additional groundwater well may be installed depending on observations made during the installation of the regional groundwater monitoring well and the analytical results. If contamination is found in the regional groundwater samples, a down-gradient regional groundwater monitoring well may be installed. If shallow, perched groundwater is encountered during the installation of the regional groundwater well, and the regional aquifer is not determined to be contaminated, a monitoring well may be installed to assess water quality in the shallow groundwater. If it is installed, this well will be sampled

The initial groundwater well will be located north of the source (the 14" belowground pipeline) so that it is between the source and the water supply wells. The well will be located approximately 50 ft north of the pipeline, and approximately 75 ft west of the east end of the loading rack. The well installation and construction will conform to procedures specified in the Base-Wide Plan SOP A1.6. The well will be installed using air-rotary casing-hammer methods, have a 4 or 5-inch schedule 80 PVC casing, and 25 feet of 0.020 slot well-screen installed across the water table. During installation of the well, subsurface geology will be logged from drill cuttings and from soil samples. Soil samples will be collected every 10 feet from the surface to 100 ft bgs, every 20 feet from 100 feet bgs

until field screening with a photoionization detector (PID) indicates that the samples are not contaminated. All of the samples will be analyzed for TPH, 50% of the samples will be analyzed for BTEX, and 20% will be analyzed for VOCs and SVOCs. The samples that will be analyzed for BTEX and VOCs/SVOCs will be selected from the samples with the highest PID readings. BTEX and VOCs/SVOCs results will be used to compare the soil concentrations to US EPA Region 6 Human Health-Based Soil Screening Criteria.

Proposed Soils Investigation

The results of the soil samples from the well installation (KAFB-1061), the two previous deep borings (SB-25 and SB-26) and the data from the installation of well KAFB-3411 will be used to locate four additional soil borings to delineate the horizontal extent of the deep subsurface contamination (Figure 1). Soil sample collection will follow those procedures specified in the Base-Wide Plan SOP A1.6. Sample information is summarized below:

- Four boreholes will be advanced in the JP8 off-loading rack area. Borings will be located northwest and southwest of SB-25, and northeast and southeast of the SB-26. The borings will be advanced to the depth of approximately 300 ft bgs. The goal of these initial four borings is to identify the horizontal extent of the TPH contamination. Therefore all attempts will be made using the available data to locate the borings far enough from the loading rack so that none of the soil results exceed the NMED TPH guideline of 100 ppm or any of the US EPA Region 6 risk-based human health soil screening criteria for VOCs and SVOCs while not being too far away from the loading rack to adequately constrain the horizontal extent of contamination.
- At each soil boring location soil samples will be collected at 5-ft intervals and a field headspace analysis will be done using a PID. Borings will be advanced until three consecutive soil samples display no headspace reading (~0 ppm) within the soil strata of concern. At each boring location,

20% of soil samples (approximately every 25 feet bgs) will be selected for laboratory analysis.

The soil samples selected for laboratory analysis will include the sample collected from the maximum depth interval of a given boring and a sample from the interval that displayed the highest headspace reading (Table 2).

- All soil samples selected for laboratory analysis will be analyzed for TPH by EPA Method 8015 Modified and 50% of the samples will be selected for laboratory analysis for BTEX by EPA Method 8020. In addition, 20% of samples selected for laboratory analysis will be analyzed for VOCs (including BTEX) by EPA Method 8260 and SVOCs by EPA Method 8270. The samples selected for BTEX and VOC/SVOC analyses will be those with the highest PID readings. The appropriate QA/QC samples as specified in the Base-Wide Plan will be collected and analyzed by the analytical laboratory selected for the project. The substitution of SW846 Update III equivalent analysis methods will be acceptable if requested by the laboratory.
- Following completion of drilling, boreholes will be properly abandoned by filling the remaining borehole space with bentonite powder or they may be fully or partially screened with a PVC screen so that the borings can be used as part of a remediation system. The horizontal location of all soil borings will be surveyed.
- Drill cuttings will be managed as outlined in the IDWMP section of this Abatement Plan.

Kirtland AFB will submit a draft summary report of investigation within 90 days of regulatory approval of this Addendum.

Table 1. Proposed Soil and Groundwater Sampling

Data Needs	Investigative Technique	Borehole Locations	Number of Samples	Analyses	Selected Analytical Options ^a
Determine if documented releases have affected perched and/or regional groundwater.	<p>Install one regional groundwater well (KAFB-1061) in center of area of contaminated soil.</p> <p>Potentially install one shallow groundwater well (KAFB-1062), if perched layer is identified during drilling of regional well.</p> <p>Potentially install one down-gradient regional groundwater well if groundwater is found to be contaminated.</p>	KAFB-1061 (and possibly KAFB-1062) will be north of the fuel loading rack as close to the 14" belowground pipeline as practical and between ST106-SB-14 and ST106-SB-05	<p>One groundwater sample from the regional aquifer.</p> <p>Potentially one additional ground water sample from either a perched groundwater well or a down-gradient regional groundwater wells if any.</p>	TPH VOCs SVOCs	Level II
Determine horizontal and vertical extent of petroleum hydrocarbon contamination	<p>Collect soil samples during the installation of KAFB-1061.</p> <p>Drill four boreholes with a hollow-stem auger drill rig and collect soil samples at 5-ft intervals to a depth of 300 ft bgs.</p> <p>Two boreholes will be located north of the 14-inch belowground pipelines and two boreholes will be located south of the 14-inch belowground pipelines.</p> <p>Analytical frequency = 20%</p>	<p>KAFB-1061 (see above)</p> <p>SB-27: NW of SB-25</p> <p>SB-28: SW of SB-25</p> <p>SB-29: NE of SB-26</p> <p>SB-30: SE of SB-26</p>	<p>~72 environmental soil samples</p> <p>~7 duplicate soil sample</p> <p>~ 4 matrix spike/matrix spike duplicate soil samples</p> <p>~ 30 equipment blanks during soil sample program</p>	TPH BTEX or VOCs SVOCs	Level II

Table 2. Summary of Analytical Parameters

Sample Number ^a	TPH EPA 8015 Modified	VOCs		SVOCs EPA 8270
		BTEX only EPA 8020	VOCs EPA 8260	
Groundwater sample				
ST106-GW-01-01	1	0	1	1
Soil Samples				
ST106-GW-01-10' to -300' ^b	20	10	4	4
ST106-SB-27-5' to -300'	13	6	3	3
ST106-SB-28-5' to -300'	13	6	2	2
ST106-SB-29-5' to -300'	13	6	3	3
ST106-SB-30-5' to -300'	13	6	2	2
Soil QC Samples^c				
Equip Rinsate ^d	30	14	5	5
Field Duplicate ^e	7	4	1	1
MS/MSD Samples ^f	4	2	1	1
Trip Blank	0	0	8	0
Total soil samples	113	63	29	21

^a **Sample Number** denotes site designation–matrix–sample location–sampling event number; (i.e., sample number ST106-SB-01-002 would be a subsurface soil sample collected at ST-106 from boring location 01 from the nominal depth of 2 feet bgs).

^b The depth intervals of the samples collected for laboratory analysis from each boring location will be based on the total depth of the boring and the field headspace readings.

^c Estimated field QC samples.

^d **Equipment Rinse Blanks**—Collected for each type of non-dedicated sampling equipment used and analyzed for the same parameters as the samples they are used to collect. Equipment blanks will be collected and sent to the laboratory on a daily basis. Only equipment blanks collected every other day will be analyzed.

^e **Field Duplicates**—A field duplicate sample is a second sample collected at the same location as the original sample and is collected simultaneously or in immediate succession. Collected at a frequency of 10% of the total number of samples for chemical analyses, or daily, whichever results in more samples, and analyzed for the same parameters as equivalent samples.

^f **MS/MSD** for laboratory quality control, collected 1 in 20 samples (5 percent frequency).