

HAFB



MEMORANDUM
REVISION TO EXISTING APPROVED VOLUNTARY CORRECTIVE
MEASURES WORK PLAN FOR
SOIL REMEDIATION AT SITE SS-61 (August 2006)
HOLLOMAN AFB, NEW MEXICO

DATE: April 24, 2009

FROM: Frank Gardner and Chuck Schick, Bhate Associates, Inc.

TO: David Strasser, NMED Hazardous Waste Bureau

COPY: David C. Scruggs, 49 CES/CEA

SUBJECT: REVISION TO EXISTING APPROVED VOLUNTARY
CORRECTIVE MEASURES WORK PLAN FOR
SOIL REMEDIATION AT SITE SS-61
HOLLOMAN AFB, NEW MEXICO
(HWB-HAFB-05-007 and HAFB 05-008)

The purpose of this memorandum is to provide justification and request limited modification to the existing Voluntary Corrective Measures work plan. Section 1.0 contains a brief explanation of the approved work plan and the conditions encountered during initial implementation. Section 2.0 identifies the specific modifications requested. Section 3.0 summarizes the justifications for the requested modifications.

1.0 BACKGROUND

In August 2006, Holloman AFB submitted a VCM work plan to address remediation of soil (by excavation and land farm treatment) at Environmental Restoration Program (ERP) site SS-61. The work plan was approved by NMED in April 2007. Worked commenced under the plan in June 2007 and was suspended in August 2007. The release consists of aviation gasoline used to supply a temporary unit of post WWII propeller driven bombers that were temporarily stationed at Holloman. The original conceptual model for the work plan involved the excavation of soil from releases along the 8 inch steel pipeline and/or perhaps the debris areas where overfilling may have occurred. However, the excavation of the T-junction in the 8-inch steel pipeline north of Building 1072 revealed conditions not anticipated in the conceptual model. The excavation activities of 2007 revealed the following conditions at the site:

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1. A major source of contamination to the subsurface resulted from the failure of a simple mechanical T-joint located north of Building 1072. Another major source area is at the terminus of the pipeline near Building 1071.
2. Very little contamination is present above the current water table. However significant contamination is present in soil beneath the present water table.
3. The present water table is artificially higher due to the presence of leaking water lines leading to and from the large water tower west of the site which have raised static levels by about 10 ft. Depth to water in this part of the base is typically 30 ft below ground surface (bgs) but averages 20 ft bgs at SS-61. This submerged contamination was not anticipated in the conceptual model for the ACM or for that matter, by any of the previous investigations conducted at the site

The gasoline AST and piping system operated approximately between 1946 and perhaps the mid 1950s. This predates the installation of the high pressure water lines and water tower located west of the site. Leaks from this water supply system have resulted in a raised water table which submerged the hydrocarbon source area. Since previous investigations were based upon a more traditional conceptual model -a hydrocarbon release from the surface/near subsurface to a static water table and product dispersed on top of the water table- the extent of contamination was never properly characterized. Also, this appears to explain why the distribution of contamination across the site seemed so random and without a distinct source during previous investigations. All previous investigations, like most hydrocarbon studies, focused on area above the present water table and any contamination detected was the result of hydrocarbons released from the submerged stratum.

Work was suspended in September 2007 and Air Combat Command ordered and funded Holloman to conduct an assessment of extent of PCS located below the water table (VCM Addendum Letter Report, North Wind Inc., 2009). In September and October 2008, soil borings were installed and sampled across the site in a manner consistent with previous investigative techniques. During this investigation, soil borings were advanced below the current water table and to the submerged PCS located between approximately 25 and 40 feet bgs.

Attachments 1, 2, 3, 4 & 5 (Figures 6-2, 6-3, 6-4, 6-6 and 6-7 from the VCM Addendum Letter Report, (North Wind, 2009) illustrate the lateral extent and vertical extent of PCS in soil above the New Mexico SSLs. Based upon this characterization effort, it appears that approximately 8 acres of PCS with a thickness ranging between approximately 10 and 20 feet thick exists north of Dezonía Road. Another area of PCS exceeding the SSL was delineated south of Building 1071. Some of the PCS will be remediated through excavation and land farming while other areas are not accessible due to structures and large scale utilities. Areas not treatable through excavation and land farm treatment

will be addressed with a separate VCM work plan and will presumably undergo some type of passive technology. PCS is clearly discernable by both visual and olfactory senses. It is darkly stained and has a strong hydrocarbon odor. Conversely, un-impacted soils, are clean and do not produce hydrocarbon odors.

Holloman plans on excavating a large portion of this PCS in accordance with the existing approved VCM work plan with some modifications due to the scale of the excavation. These modifications are discussed in Section 2.0 and are consistent with other comparable large scale remediation activities at the Base (such as sites SS02/05 and T38).

2.0 WORK PLAN MODIFICATIONS

Attachment 6 is a map of the area to be remediated through excavation and land farm treatment. The estimated volume of clean overburden is 90,680 cubic yards. The estimated volume of PCS to be removed and treated is 120,906 cubic yards. Using attachment 4, the calculated lineal feet of side wall for the excavation is approximately 2550 lineal feet.

The planned excavation is of a much larger scale than originally anticipated in the approved work plan which focused on small areas along the pipeline and associated structures. These changes in scale require changes to the frequency of screening sampling and laboratory analysis in order to make excavation and treatment possible.

1. The currently approved plan requires the screening un-impacted overburden every 25 yards using an organic vapor analyzer (OVA) or photoionization detector (PID). The modification requests increasing this interval to every 500 yards. Based upon the estimated volume, up to 182 samples could be analyzed for hydrocarbons using a PID or OVA.
2. The currently approved plan requires confirmation field screening (using ultraviolet fluorescence) is required every 50 yards. The modification requests increasing this interval to every 2000 yards. Based upon the estimated volume, up to 46 samples could be analyzed for hydrocarbons using the SiteLab® technique and equipment.
3. Once stockpiled, the un-impacted overburden will be sampled every 3500 cubic yards instead of the current interval of 200 yards. Based upon the estimated volume, up to 26 samples could be submitted for laboratory analysis.
4. Excavation confirmation sidewall sampling will be done every 50 lineal feet of sidewall instead of every 18 feet. Based upon the size of the anticipated excavation up to 51 soil samples will be collected for confirmation laboratory analysis.

A direct comparison of these changes are illustrated in the modified version of **Table 4-1** (Excavation Sampling Quantities and Analysis) from the Approved work plan. The changes are illustrated with a strikethrough of the current quantities and the new quantities are underlined.

(From the approved work plan)

Table 4-1
Excavation Sampling Quantities and Analysis

SS-61 Soil Remediation
Voluntary Corrective Measures Work Plan
Holloman AFB, New Mexico
Bhate Project No. 9050361.01.02

Sample Type	Contamination Profile	Purpose	Frequency	Estimated Quantity	Method/Analyses	Requested Analyses Time
Overburden	Un-impacted Soils	Initial Field Screening	Every 500 cu yds	20 <u>182</u>	OVA / VOCs	Real Time
		Field Confirmatory	Every 2000 cu yds	40 <u>46</u>	UVF / TPH	
Stock Pile (Overburden)	Un-impacted Soils	Backfill Characterization (Lab validation)	Every 3500 cu yds	3 <u>26</u>	Laboratory/TPH, VOCs, and SVOCs	24 hours
Excavation Confirmation	Clean wall denoting extent of excavation	Closure	2 every 50 In ft, at mid-depth within contamination zone, minimum of 1 per side wall if < 18 In ft	44 <u>51</u>	Laboratory/TPH, VOCs, and SVOCs	7 days

Notes:

cu yds = Cubic yards

In ft = Linear feet

TPH = Total Petroleum Hydrocarbons

VOCs = Volatile organic compounds

SVOCs = Semi-volatile organic compounds

UVF = Ultraviolet fluorometer

OVA = Organic Vapor Analyzer

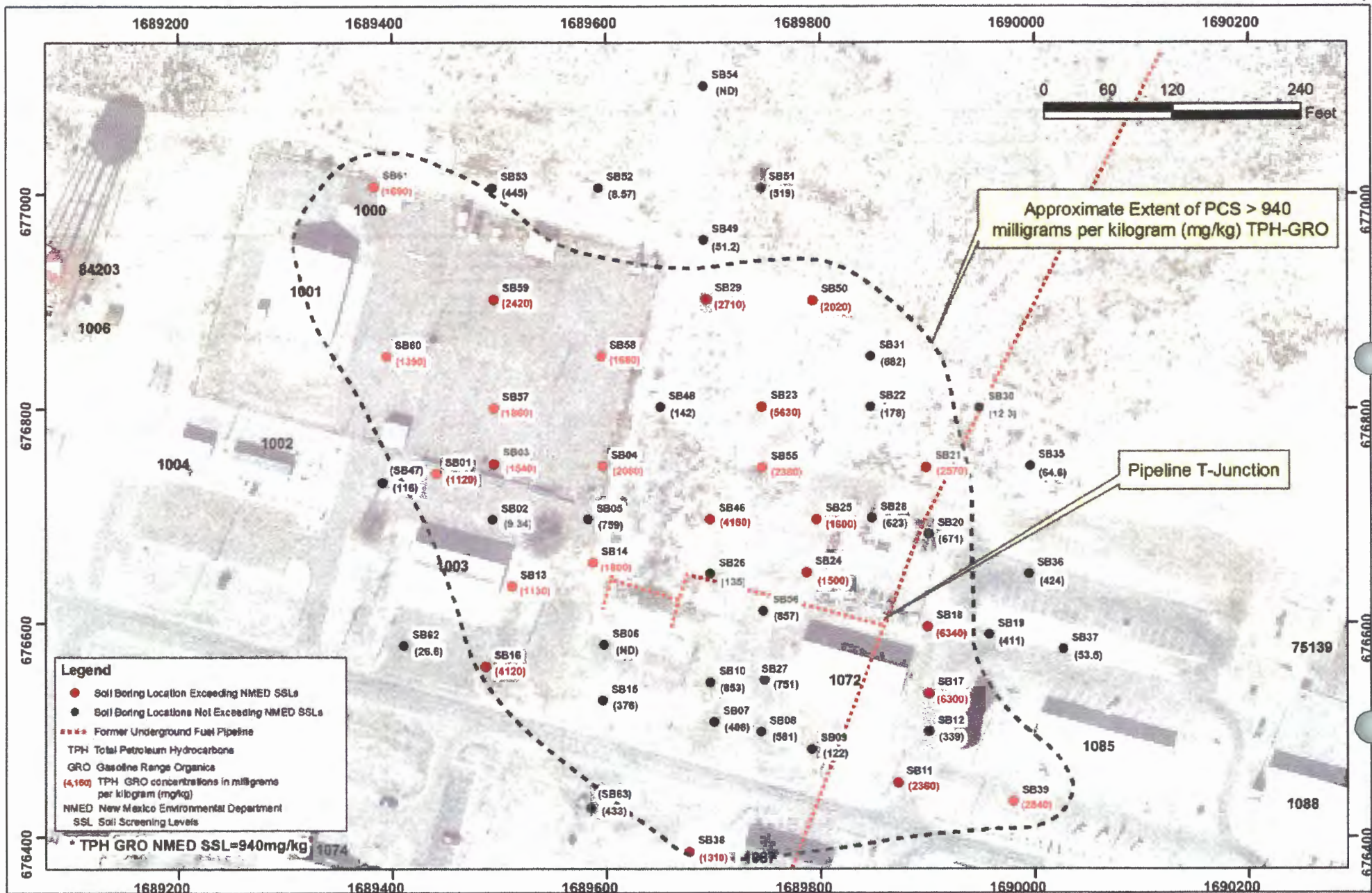
3.0 JUSTIFICATIONS FOR CHANGES IN THE INTERVAL

The excavation at the pipeline T-junction (which was a mechanical fitting) and the 2008 soil boring investigation to determine the depth of PCS below the present water table revealed a substantially greater volume and distribution of PCS. When the existing work plan for the site was approved the goal was to excavate PCS from isolated areas in the immediate proximity of the pipeline. The excavations anticipated in the approved work plan were thought to be small, isolated and limited to the proximity of the pipeline. This model of excavation was based upon numerous rounds of investigation in which soil borings and monitoring wells terminated in the upper portion of the present water table. However, the excavation at the T-junction in the pipeline north of Building 1072 and the 2008 deep soil boring investigation (**VCM Addendum Letter Report, North Wind, 2009**) performed to assess the extent of PCS provide a more accurate delineation of PCS.

The changes to the frequency and distribution of confirmation samples, screening samples and overburden samples are similar to those currently applied at sites like the T-38 Test Cell Spill site (SS-59) and the Jet Fuel spill site at the POL Yard (SS-02/05). At these locations, large scale excavations, land farm treatment and exposed sidewalls provide absolute and sure remediation of PCS with both direct visual observation and laboratory analysis.

LIST OF ATTACHMENTS

- Attachment 1** Figure 6-2, Areal extent of PCS at the T-junction Source Area (from the VCM Addendum Letter Report, (North Wind, 2009)
- Attachment 2** Figure 6-3, Pipeline T-junction PCS Source Area Cross Section A-A' (from the VCM Addendum Letter Report, (North Wind, 2009)
- Attachment 3** Figure 6-4, Pipeline T-junction PCS Source Area Cross Section B-B' (from the VCM Addendum Letter Report, (North Wind, 2009)
- Attachment 4** Figure 6-6, Areal extent of PCS at the Pipeline Vault Source Area (from the VCM Addendum Letter Report, (North Wind, 2009)
- Attachment 5** Figure 6-7, Pipeline Vault PCS Source Area Cross Section C-C' (from the VCM Addendum Letter Report, (North Wind, 2009)
- Attachment 6** **Modified** Figure 6-2 (from the VCM Addendum Letter Report, (North Wind, 2009), indicating the planned PCS excavation Area and estimated volumes of PCS and overburden.



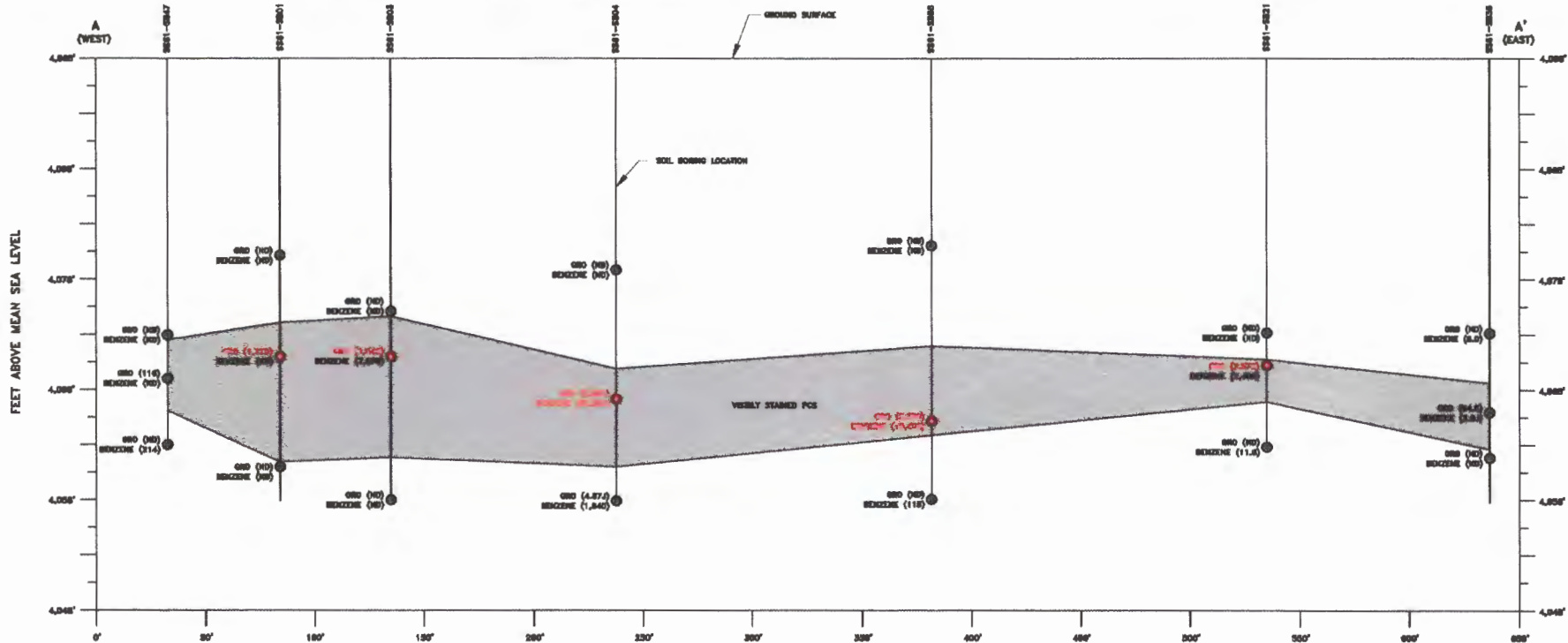
Areal Extent of the PCS Horizon
Pipeline T-Junction Source Area

Voluntary Corrective Measures
Addendum Letter Report
Site SS-61
Holloman AFB, New Mexico

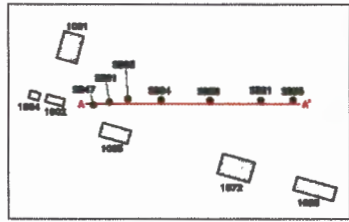


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9080130	1"=120'	12/22/08	cm
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			Figure 6-2

Figure 6-2



CROSS SECTION A-A'



CROSS SECTION A-A' DETAIL
NOT TO SCALE

LEGEND:

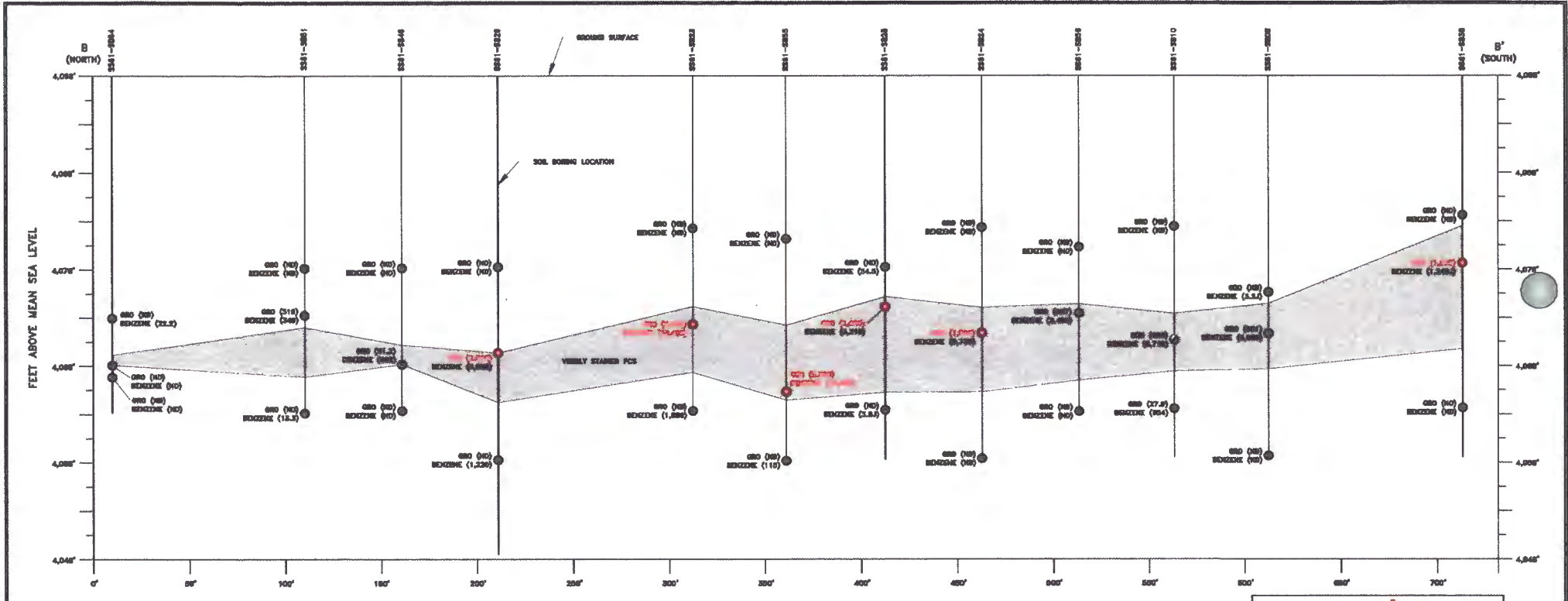
- SOIL SAMPLE LOCATION (RESULTS BELOW HMED SSL AND/OR TPH SCREENING GUIDELINES)
- SOIL SAMPLE LOCATION (RESULTS EXCEED HMED SSL AND/OR TPH SCREENING GUIDELINES)
- ORO GASOLINE RANGE ORGANICS CONCENTRATION IN SOIL REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg)
- MEKZENE BENZENE CONCENTRATION IN SOIL REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)
- PCS PETROLEUM CONTAMINATED SOIL
- SSL SOIL SCREENING LEVEL
- V VERTICAL
- H HORIZONTAL
- (L&E) ESTIMATED VALUE
- (ND) NOT DETECTED
- HMED NEW MEXICO ENVIRONMENT DEPARTMENT HMED TPH SCREENING GUIDELINE = 940 mg/kg HMED SSL FOR BENZENE = 10,300 µg/kg



PIPELINE T-JUNCTION PCS SOURCE AREA
CROSS SECTION A-A'

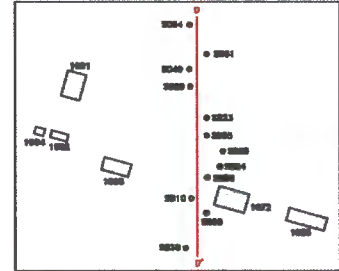
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Voluntary Corrective Measures
Addendum Letter Report
Site SS-61
Holloman AFB, New Mexico
Figure 6-3



CROSS SECTION B-B'

- LEGEND:**
- SOIL SAMPLE LOCATION (RESULTS BELOW MMD SSL AND/OR TPH SCREENING GUIDELINES)
 - SOIL SAMPLE LOCATION (RESULTS EXCEED MMD SSL AND/OR TPH SCREENING GUIDELINES)
 - GD CASOLINE RANGE ORGANICS CONCENTRATION IN SOIL REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)
 - BZDZ BENZENE CONCENTRATION IN SOIL REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)
 - PCS PETROLEUM CONTAMINATED SOIL
 - SSL SOIL SCREENING LEVEL
 - Y VERTICAL
 - H HORIZONTAL
 - (22.5) ESTIMATED VALUE
 - (ND) NOT DETECTED
 - MMD NEW MEXICO ENVIRONMENT DEPARTMENT
 - MMD TPH SCREENING GUIDELINE = 940 mg/kg
 - MMD SSL FOR BENZENE = 10,300 µg/kg

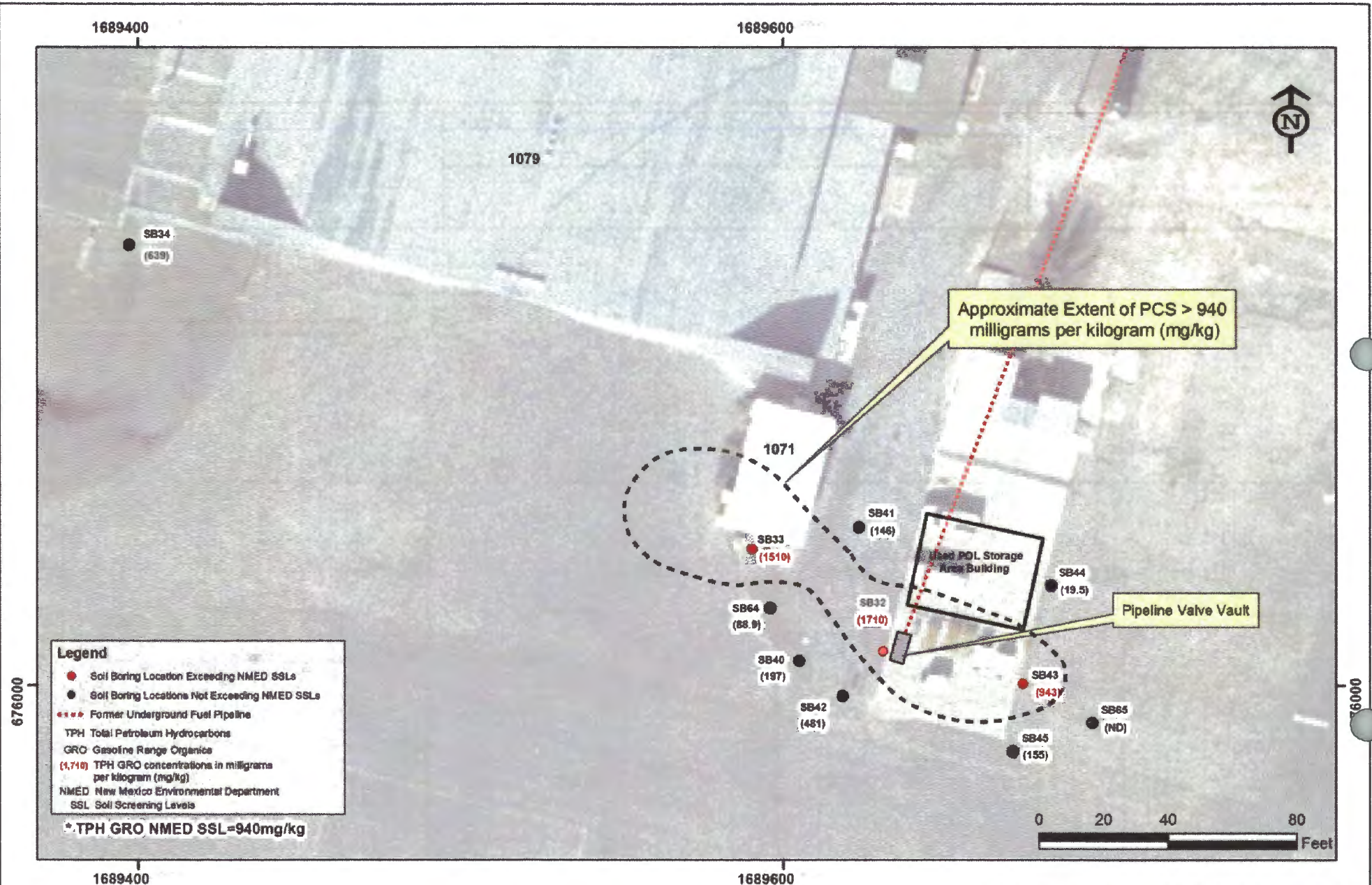


CROSS SECTION B-B' DETAIL
NOT TO SCALE



PIPELINE T-JUNCTION PCS SOURCE AREA CROSS SECTION B-B'			
PROJECT NO. 9080130	SCALE V: 1"=10' H: 1"=50'	DATE 4/20/09	DRAWN BY: MRM CHECKED BY: DM DRAWING NO: Figure 6-4

Voluntary Corrective Measures
Addendum Letter Report
Site SS-61
Holloman AFB, New Mexico
Figure 6-4

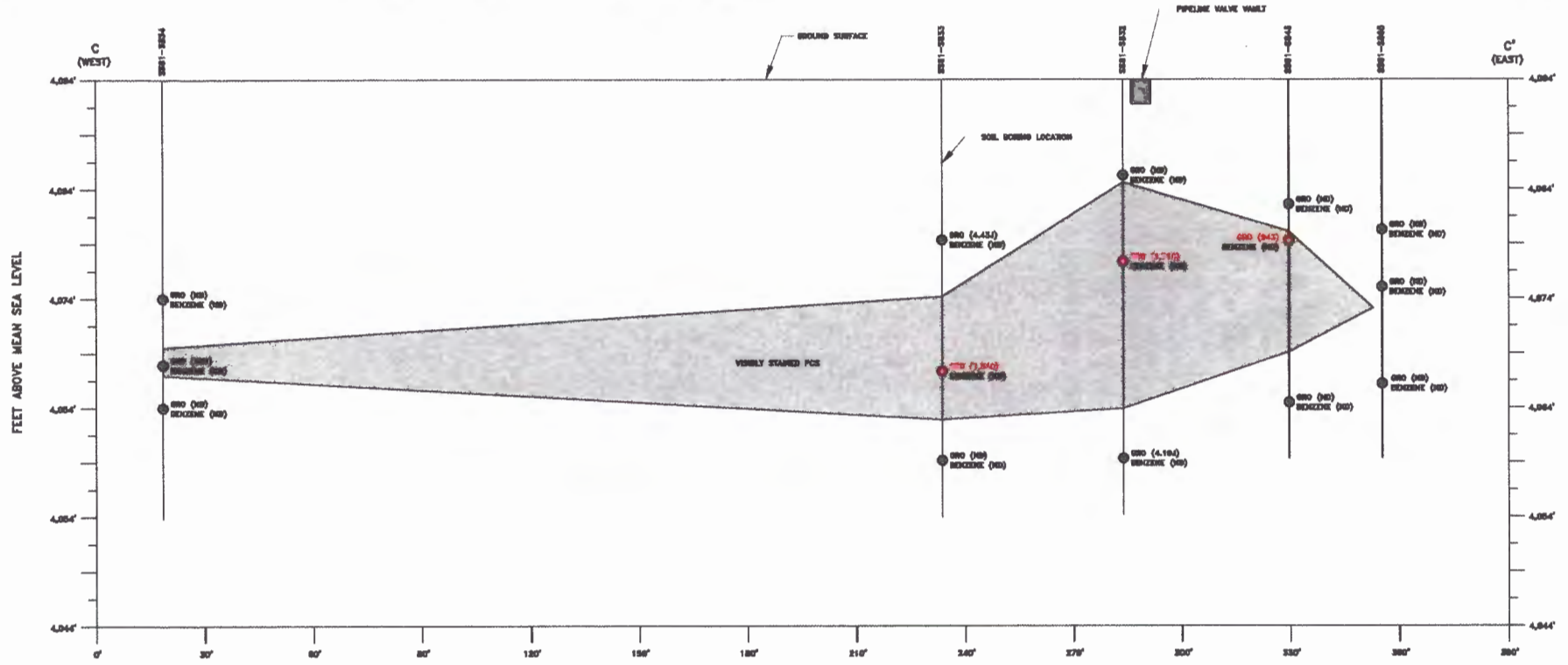


**Areal Extent of the PCS Horizon
Pipeline Valve Vault Source Area**

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Voluntary Corrective Measures
Addendum Letter Report
Site SS-61
Holloman AFB, New Mexico

Figure 6-6



CROSS SECTION C-C'

LEGEND:

- SOIL SAMPLE LOCATION (RESULTS BELOW NMED SOIL AMD/OR TPH SCREENING GUIDELINES)
- SOIL SAMPLE LOCATION (RESULTS EXCEEDED NMED SOIL AMD/OR TPH SCREENING GUIDELINES)
- 4.45J BAROLINE BAKNE ORGANICS CONCENTRATION IN SOIL REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg)
- (ND) BENZENE CONCENTRATION IN SOIL REPORTED IN MICROGRAMS PER KILOGRAM (µg/kg)
- PCS PETROLEUM CONTAMINATED SOIL
- SOIL SOIL SCREENING LEVEL
- V VERTICAL
- H HORIZONTAL
- (4.45J) ESTIMATED VALUE
- (ND) NOT DETECTED
- NMED NEW MEXICO ENVIRONMENT DEPARTMENT
- NMED TPH SCREENING GUIDELINE = 640 mg/kg
- NMED SOIL FOR BENZENE = 16,300 µg/kg

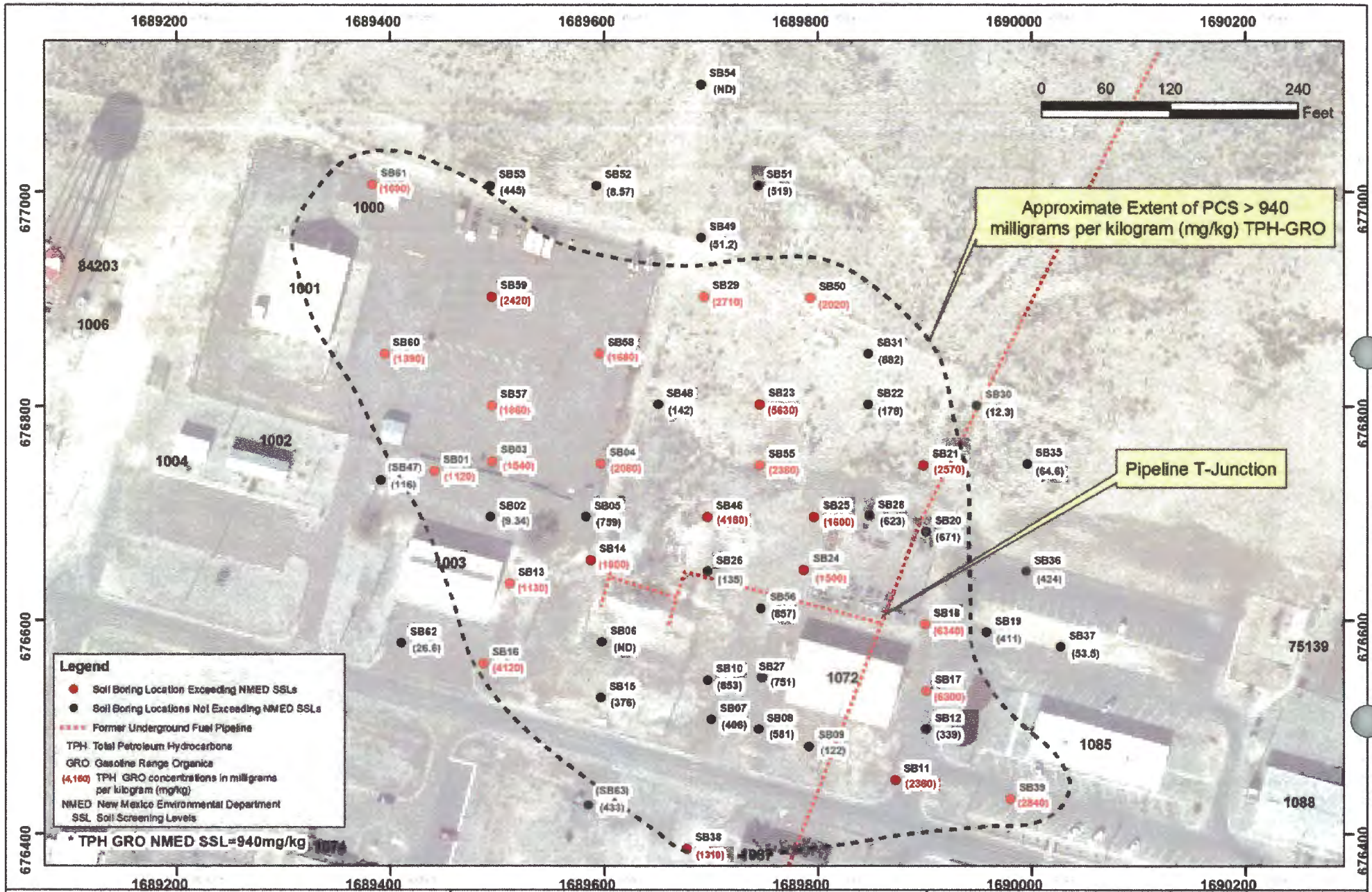


CROSS SECTION C-C' DETAIL
NOT TO SCALE



PIPELINE VALVE VAULT PCS SOURCE AREA CROSS SECTION C-C'			
PROJECT NO. 9080130	SCALE V: 1"=10' H: 1"=30'	DATE 4/20/09	DRAWN BY: MRM CHECKED BY: DM DRAWING NO: Figure 6-7

Voluntary Corrective Measures
Addendum Letter Report
Site SS-61
Holloman AFB, New Mexico
Figure 6-7



Areal Extent of the PCS Horizon
 Pipeline T-Junction Source Area

Voluntary Corrective Measures
 Addendum Letter Report
 Site SS-61
 Holloman AFB, New Mexico



PROJECT NO	SCALE	DATE	DRAWN BY:
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			Figure 6-2

Figure 6-2