



February 8, 2012

**Subject: FFOR Excavation and Step-Out Conflicts
Addendum to Interim Measures Work Plan, Bulk Fuels Facility Spill, March 2011
Solid Waste Management Units ST-106 and SS-111
Kirtland Air Force Base, New Mexico**

This letter is being submitted as an addendum to the Interim Measures Work Plan, prepared by Shaw Environmental and Infrastructure, Inc. (Shaw) for the U.S. Army Corps of Engineers (USACE) under contract W912DY-10-D-0014, Delivery Order 0002. This letter describes Shaw's proposal to advance direct push boreholes in an area of recent excavation in the Bulk Fuels Facility (BFF). Additionally, this letter discusses the actions Shaw will take to resolve conflicts between planned Former Fuel Offloading Rack (FFOR) step-out samples and existing underground utilities.

The March 2011 Interim Measures Work Plan states that Shaw will perform an investigation of the shallow soil along the former fuel line from the FFOR to the pump house (Building 1033), and from Building 1033 to the site of the former aboveground fuel storage tanks 2420 and 2422. This investigation is to be carried out in coordination with the removal of FFOR structures. Following the initial soil investigation, step-out samples are to be collected in order to fully delineate any exceedance zones. Any contaminated areas that are identified up to 20 ft bgs will be excavated.

Excavation Area: Problem and Proposed Actions

The initial soil investigation field work was carried out from June to mid-August 2011. Direct Push technology (DPT) borings were drilled along the centerline and on each side of former pipelines that connected the FFOR to Building 1033. DPT borings were advanced along a line oriented directly over what was once the centerline of the now-excavated pipelines, with 10-ft spacing between boring samples. In addition, DPT borings were collected along two lines oriented parallel to the former pipe centerline with the two lines situated 5 ft from and on opposite sides of the former pipe centerline. Samples were collected from depths of 0, 5, 10, 15, and 20 ft bgs and submitted for TPH, VOCs, SVOCs, and lead analysis.

All sampling from the FFOR to Building 1033 and from Building 1033 to the former tanks was completed during this time except for one area directly adjacent to Building 1033 along its west side (Figure 1). Construction was ongoing in this area during the time of the soil investigation. Do to the on-going construction and excavation by Chugach Management Services this area was inaccessible.

Until January 20, 2012 there was an existing excavation in this location (Figure 2); however this excavation has now been for the most part backfilled. Though the excavation has been backfilled, the soil has not been compacted, and it does not entirely fill the excavation, seeing as some infrastructure has been removed. Collecting DPT samples at the originally proposed locations in the excavation would pose a severe health and safety risk. Furthermore, within the area of the excavation, 0-13 ft bgs (the approximate depth of the excavation) does not represent original material that would have been affected by leaks from the former fuel

lines. Another complication in this area is that the original fuel pipelines, although abandoned, are still in place and extend 30 ft west from the foundation of the pump house to terminate in a concrete slurry. These 16" lines are directly underneath several planned sample locations, making advancement to 20ft bgs impossible.

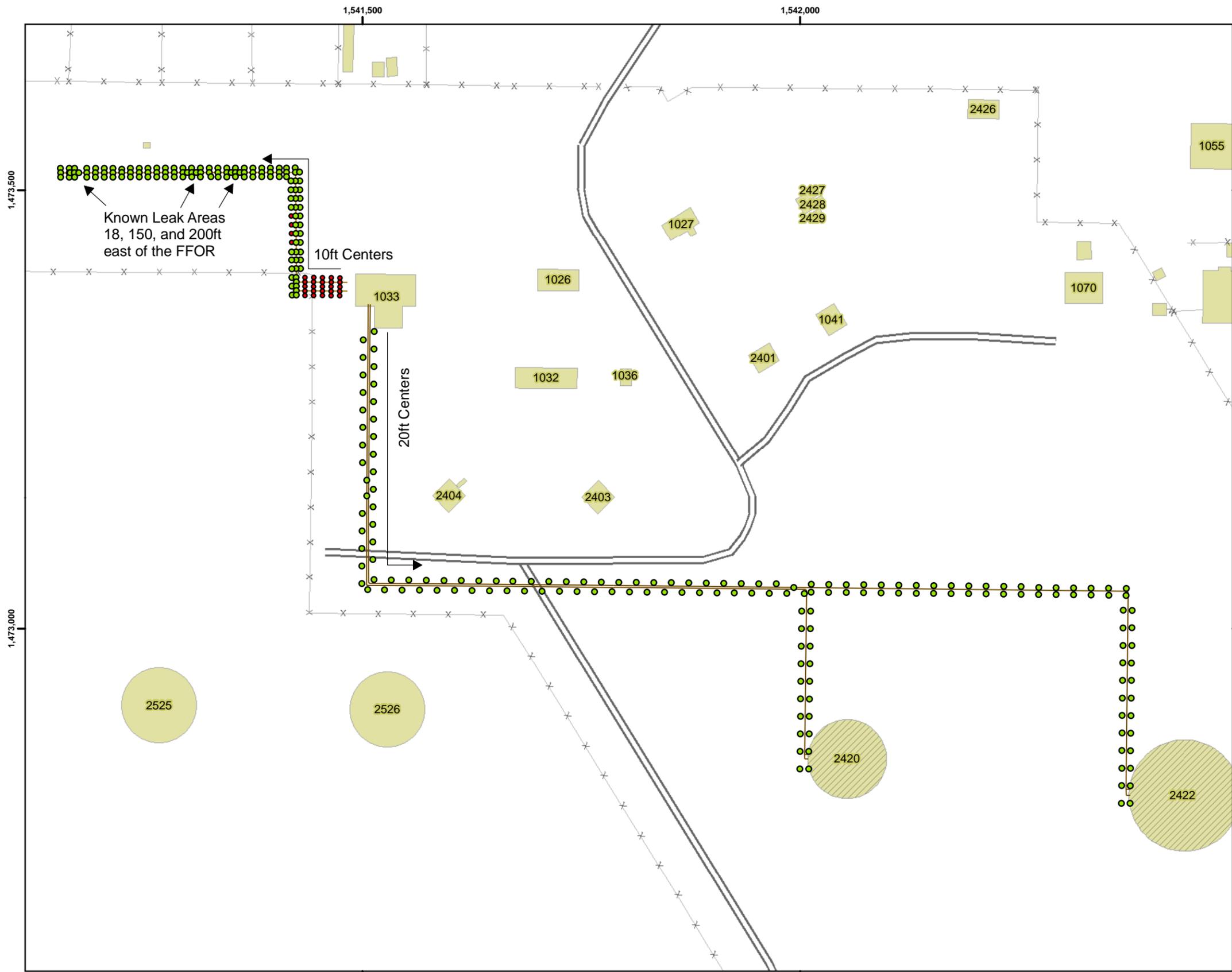
In order to maintain health and safety standards, and to remain true to the intent of the original soil investigation plan outlined in the Interim measures Work Plan, Shaw proposes to modify the soil boring locations in the area of the excavation (Figure 2) in the following ways:

1. The ten foot spacing between soil borings parallel to the former fuel lines will remain the same. Spacing between soil borings perpendicular to the fuel line will be slightly spread out so that full advancement of all borings is possible around the in-place fuel lines.
2. Any remaining soil borings that are not in the area of the excavation will be collected as stated in the Interim Measures Work Plan.
3. Following advancement of the soil borings, Shaw will re-excavate the area of the excavation to twenty feet and collect confirmation soil samples on the sidewalls and floor as stated in the Interim Measures Work Plan.
4. In order to excavate the area, it will be necessary for Shaw to remove the in-place fuel lines back to the pump house foundation.
5. Following removal of the fuel lines, excavation, and sampling, Shaw will fill the excavation with clean backfill as outlined in the Interim Measures Work Plan.

Soil Investigation Step-Outs: Problem and Proposed Actions

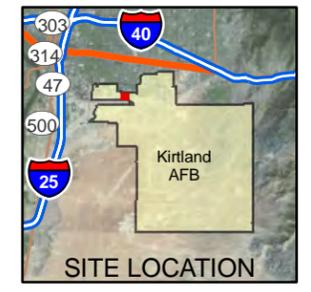
Following the initial soil investigation, Shaw identified sixteen locations where step-out samples were necessary to delineate exceedance zones. In November, 2011 these locations were surveyed and marked, and a utility located survey was carried out. It was established that there is one location where a proposed step-out sample is in conflict with existing underground utilities (Figure 3). The proposed location for this step-out places it directly above infrastructure that links soil vapor extraction wells to a soil vapor extraction system. Advancing this borehole would not only shut down, and cause damage to the SVE system at the FFOR, but could potentially release combustible hydrocarbon vapors. Shaw proposes the following steps to collect the step-out without impacting the SVE system:

1. Shaw will move the proposed step-out location 3 ft to the north.
2. During excavation, Shaw will hand excavate around the SVE conduits, and will develop an excavation plan to minimize the possibility of damaging this infrastructure.



- Legend**
- Borehole Locations Completed
 - Borehole Locations Not Completed
 - Fuel Line
 - ×× Fence
 - Interstate
 - Major Road
 - Road
 - Existing Structure
 - Previously Existing Structure

Note: Borehole locations reflect original configuration outlined in Interim Measures Work Plan.



Revision Date: 01/25/12

0 60 120 240

Feet

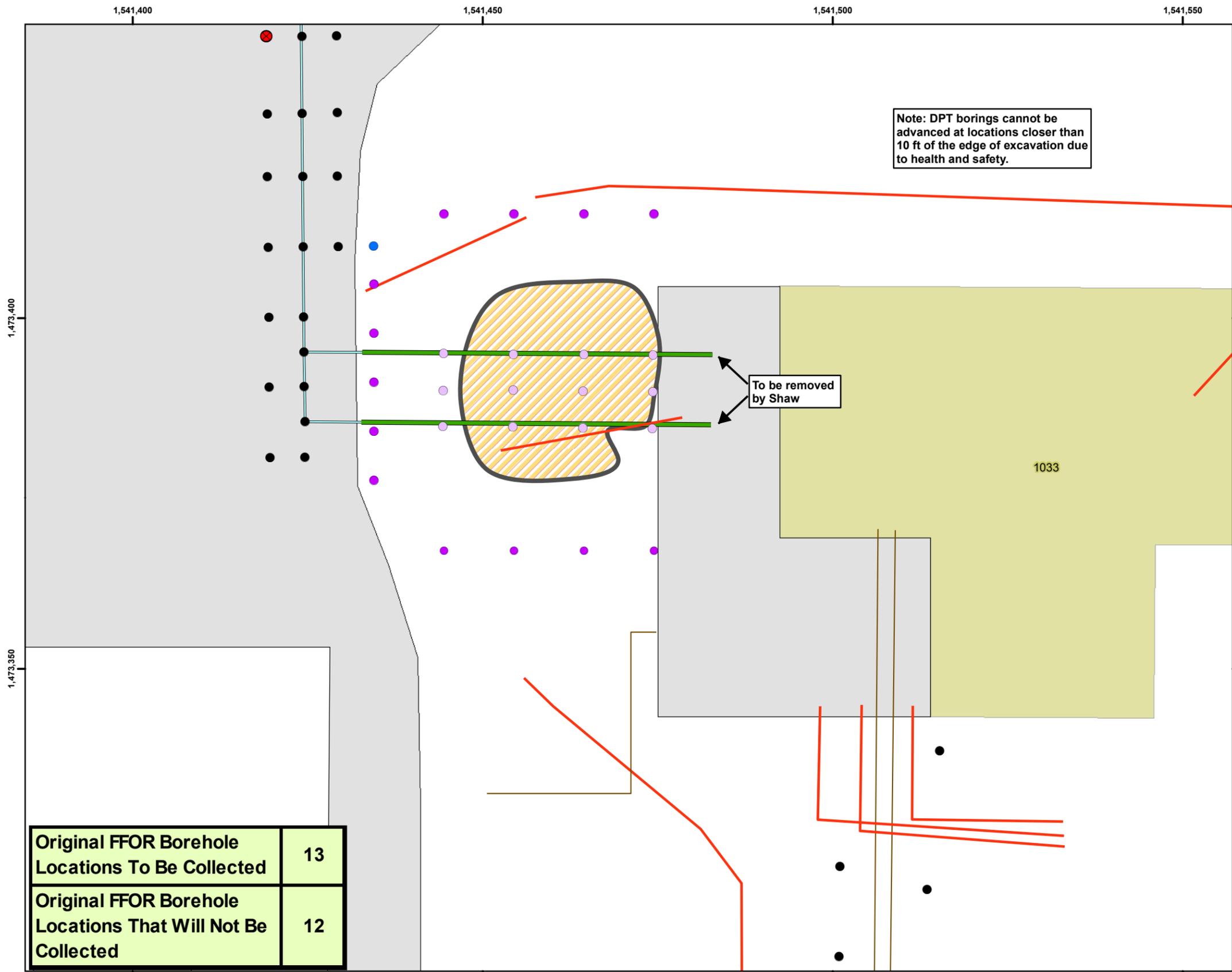
1 inch = 120 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

FFOR BOREHOLE LOCATIONS



Note: DPT borings cannot be advanced at locations closer than 10 ft of the edge of excavation due to health and safety.

To be removed by Shaw

Legend

- FFOR Sample Location (Unsampled)
- Will Not Be Collected Due to Presence of Excavation
- Soil Sample Location Not Completed (Refusal Due to Concrete in Sub-Surface)
- FFOR Sample Location
- Proposed Step-Out Location
- Electric Utility Line
- Former Fuel Line
- Fuel Line - In Place
- Fuel Line
- Approximate Current Excavation
- Proposed Excavation to 20 ft
- Existing Structure

Note: Following removal of fuel lines, the current excavation will be fully removed to 20 ft.

SITE LOCATION

Revision Date: 01/25/12

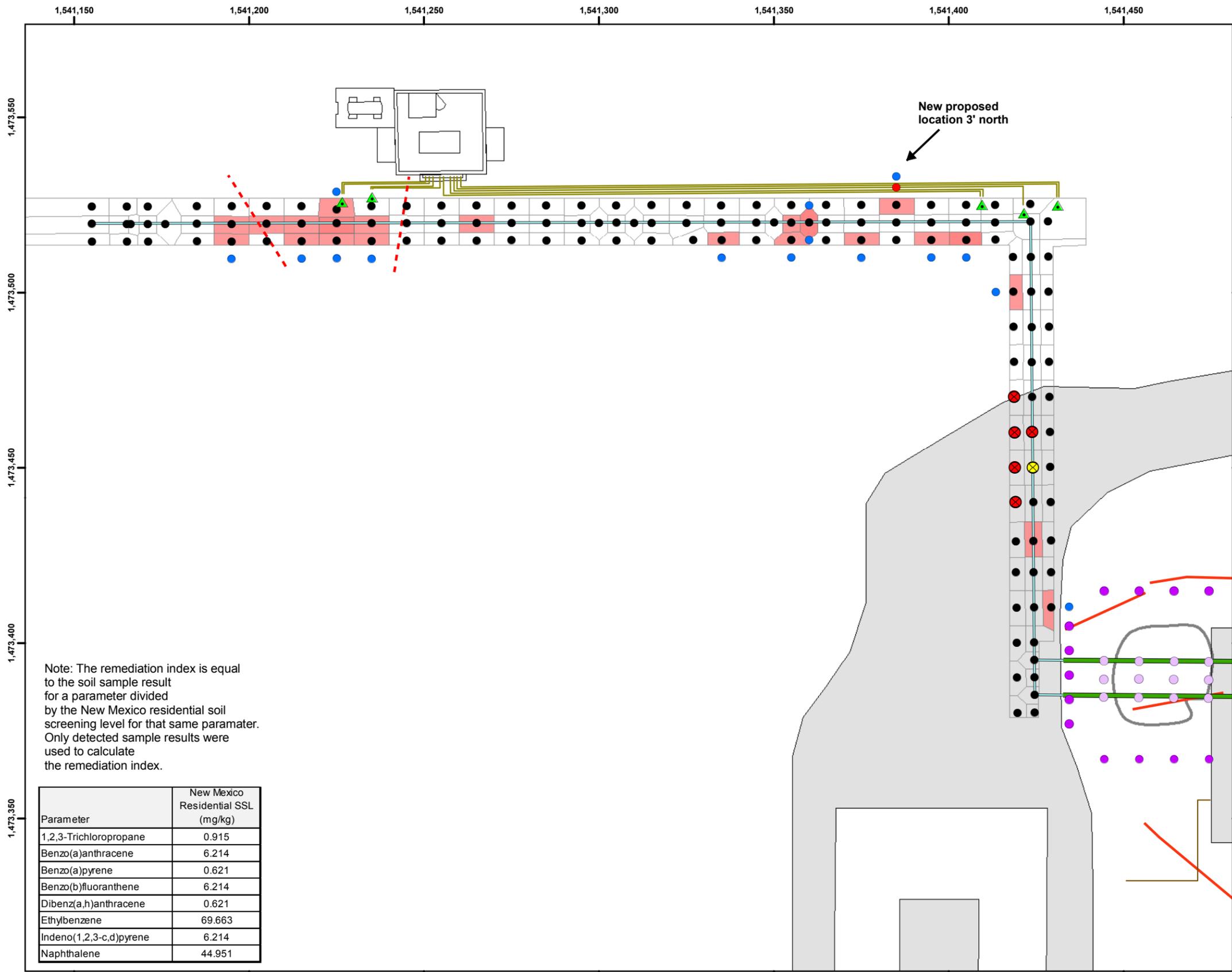
0 7.5 15 30
Feet
1 inch = 15 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

**BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO**

FIGURE 2

FFOR PROPOSED EXCAVATION



Note: The remediation index is equal to the soil sample result for a parameter divided by the New Mexico residential soil screening level for that same parameter. Only detected sample results were used to calculate the remediation index.

Parameter	New Mexico Residential SSL (mg/kg)
1,2,3-Trichloropropane	0.915
Benzo(a)anthracene	6.214
Benzo(a)pyrene	0.621
Benzo(b)fluoranthene	6.214
Dibenz(a,h)anthracene	0.621
Ethylbenzene	69.663
Indeno(1,2,3-c,d)pyrene	6.214
Naphthalene	44.951

Legend

- FFOR Sample Location (Unsampled)
- Will Not Be Collected Due to Presence of Excavation
- Step-Out Location
- Stepout Location Conflicting with Underground Utility
- FFOR Sample Location
- ⊗ Soil Sample Location Completed (Refusal Due to Concrete, Able to Core Through)
- ⊗ Soil Sample Location Not Completed (Refusal Due to Concrete in Sub-Surface) (See Fig. 2 for Refusal Details)
- ▲ SVE Extraction Well
- ⊕ Approximate Current Excavation
- Remediation Index <math>< 1.0</math>
- Remediation Index > 1.0
- Electric Utility Line (Dashed if Remnant Line)
- SVE Subsurface Piping
- Former Fuel Line
- Fuel Line - In Place
- Fuel Line

SITE LOCATION

Revision Date: 01/25/12

Feet
1 inch = 30 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 3

SSL EXCEEDANCES (NO TPH)
ALL DEPTHS