

The COPECs that were initially identified for surface soil, surface water, sediment, and groundwater at the IMR ranges are presented in Table 2-8.

In order to focus future ecological risk assessment efforts on the constituents that are the most prevalent at the IMR ranges and have the greatest potential to pose ecological risk, additional lines of evidence were assessed to refine the initial list of COPECs. These additional lines of evidence were scrutinized to aid in the decision process of whether or not to include a constituent as a COPEC in future ecological assessments at the IMR ranges. These additional lines of evidence are discussed in the following sections.

2.1 COPECs in Surface Soil

Antimony, copper, lead, and zinc were frequently detected in surface soil at all of the IMR ranges at concentrations that exceeded their respective ESVs. The highest concentrations of these four constituents were found in locations that are associated with small arms use (i.e., soil berms that are the impact areas). Thus, it could be concluded that these constituents are site-related and could be considered COPECs in surface soil at all of the IMR ranges. The surface soil sample locations at the IMR ranges and the COPEC concentrations at each of the sampling locations are presented in Figures 2-1 through 2-4.

2.1.1 Surface Soil at the Skeet Range

In addition to the four constituents discussed above, beryllium, cobalt, manganese, benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene were also detected in surface soil samples at the Skeet Range at concentrations that exceeded their respective ESVs (Table 2-1). Beryllium was detected in two samples at concentrations that exceeded the ESV. However, the HQ_{screen} equals 1.3. Cobalt was detected in one sample that exceeded its ESV and the HQ_{screen} equals 1.3. Manganese was detected in one sample at a concentration that exceeded the background threshold value. Therefore, based on the fact that these inorganic compounds were infrequently detected, their maximum detected concentrations only slightly exceeded their ESVs, and they were not detected in a pattern that would associate their elevated concentrations with Skeet Range activities, these constituents were not considered COPECs in surface soil at the Skeet Range.

The four polycyclic aromatic hydrocarbon (PAH) compounds that were detected at elevated concentrations in surface soil at the Skeet Range [benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene] were restricted to the clay pigeon area. Benzo(a)pyrene and pyrene were detected in two samples at concentrations that exceeded their ESVs while fluoranthene and phenanthrene

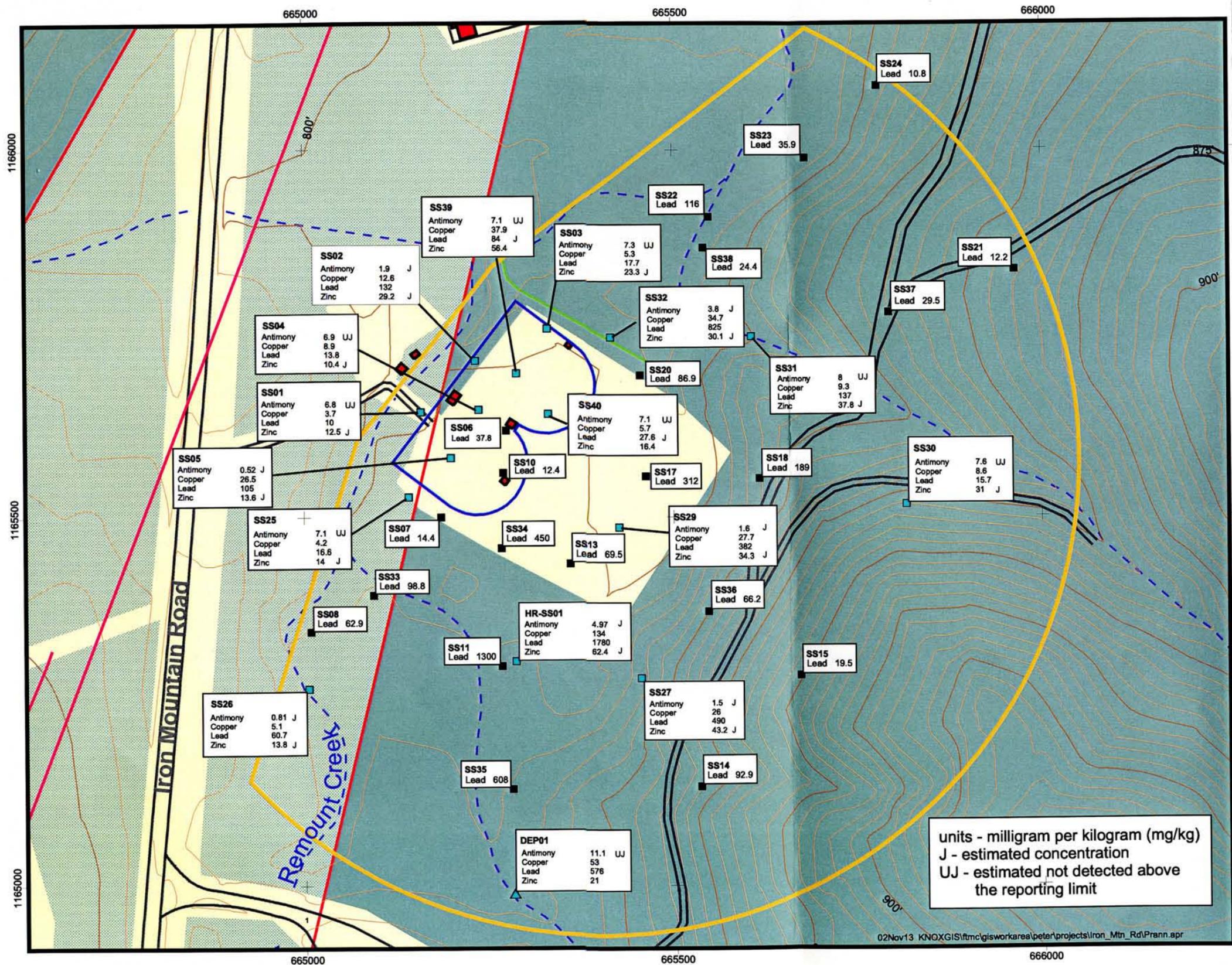


Figure 2-1
Skेत Range, Parcel 69Q
Surface Soil
Sample Locations
with COPEC Results

Legend

- Depositional Soil
- Soil Sample - additional tests
- Soil Sample - Lead only
- Roads
- 25' Index Contours
- 5' Elevation Contours
- Streams - Intermittent
- Clay Pigeon Area Limits based on Visual Observations
- Buildings
- Study Area
- ByPass Corridor
- Wooded
- Not Wooded

N

August 2002

0 100 200

State Plane feet, NAD83

U.S Army Corps of Engineers
 Mobile District
 Fort McClellan
 Calhoun County
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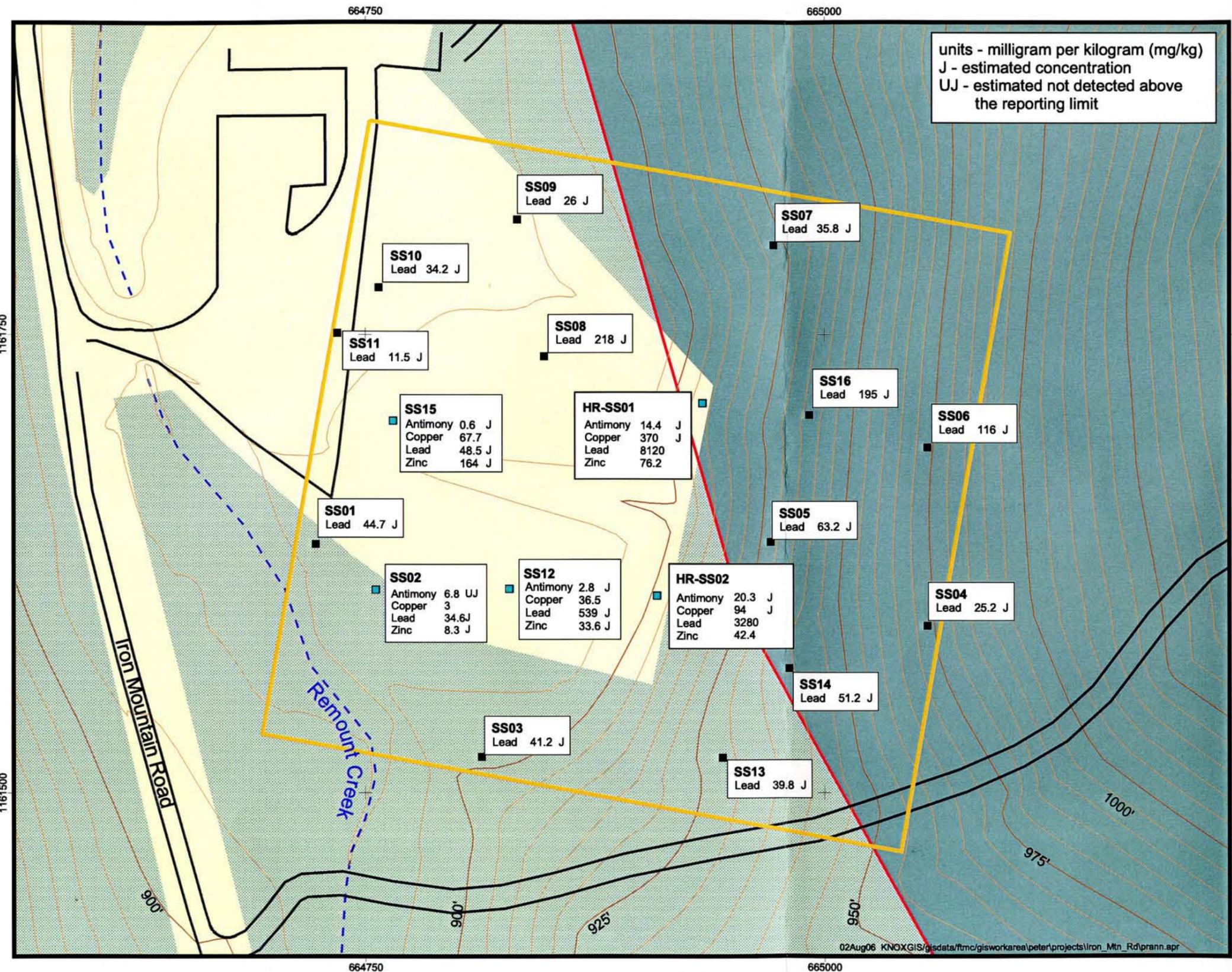


Figure 2-2
Range 12, Parcel 70Q
Surface Soil
Sample Locations
with COPEC Results

Legend

- Soil Sample - additional tests
- Soil Sample - Lead only
- Roads
- 25' Index Contours
- 5' Elevation Contours
- - - Streams - Intermittent
- ▭ Study Area
- ▭ Bypass Corridor
- ▭ Wooded
- ▭ Not Wooded

N

August 2002

0 50 100

State Plane feet, NAD83

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664500

665000

665500

units - milligram per kilogram (mg/kg)
 J - estimated concentration
 UJ - estimated not detected above the reporting limit

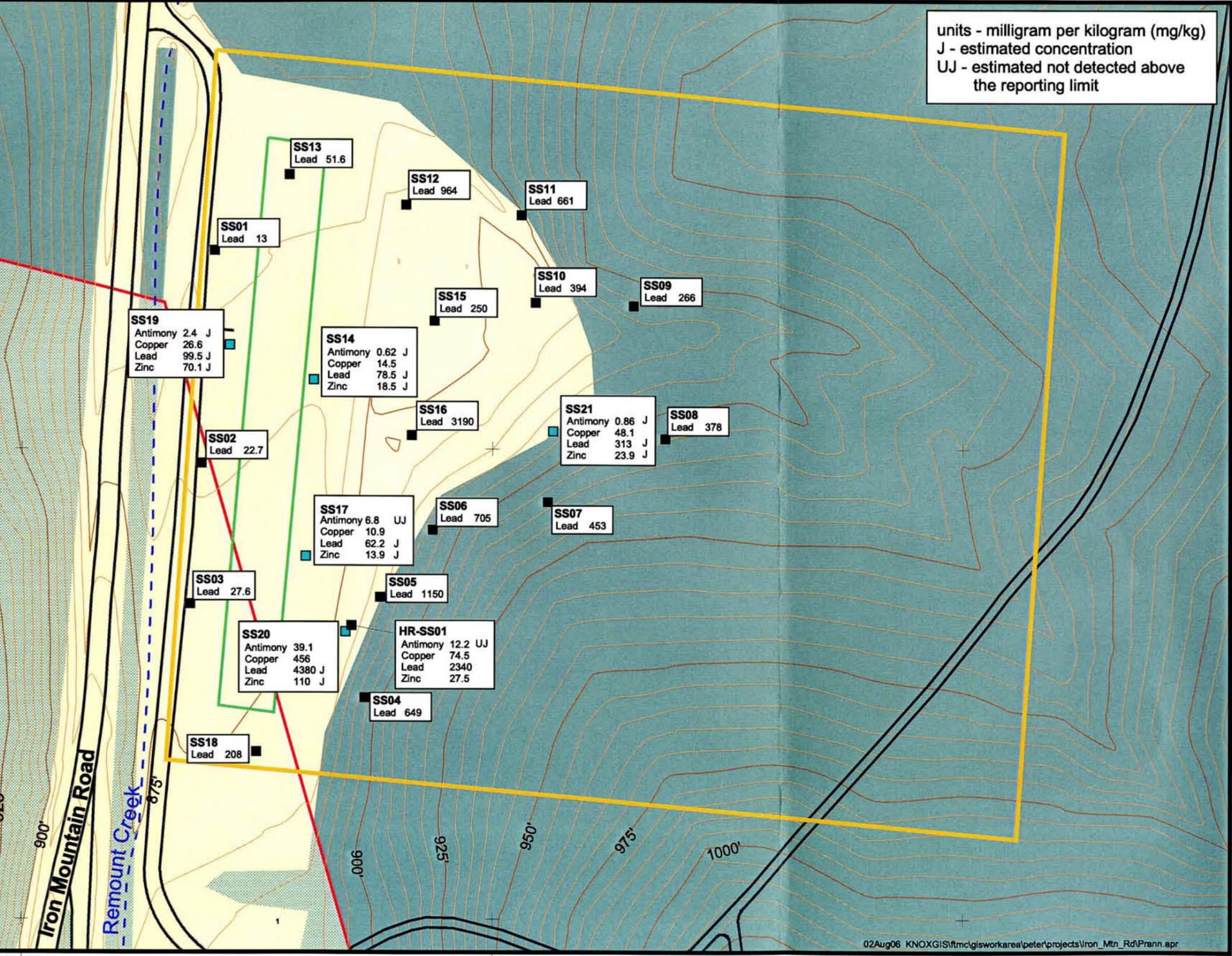


Figure 2-3
Range 13, Parcel 71Q
Surface Soil
Sample Locations
with COPEC Results

Legend

- Soil Sample - additional tests
- Soil Sample - Lead only
- Roads
- 25' Index Contours
- 5' Elevation Contours
- - - Streams - Intermittent
- ▭ Study Area
- ▭ Bypass Corridor
- ▭ Wooded
- ▭ Not Wooded

N
 August 2002

0 100 200
 State Plane feet, NAD83

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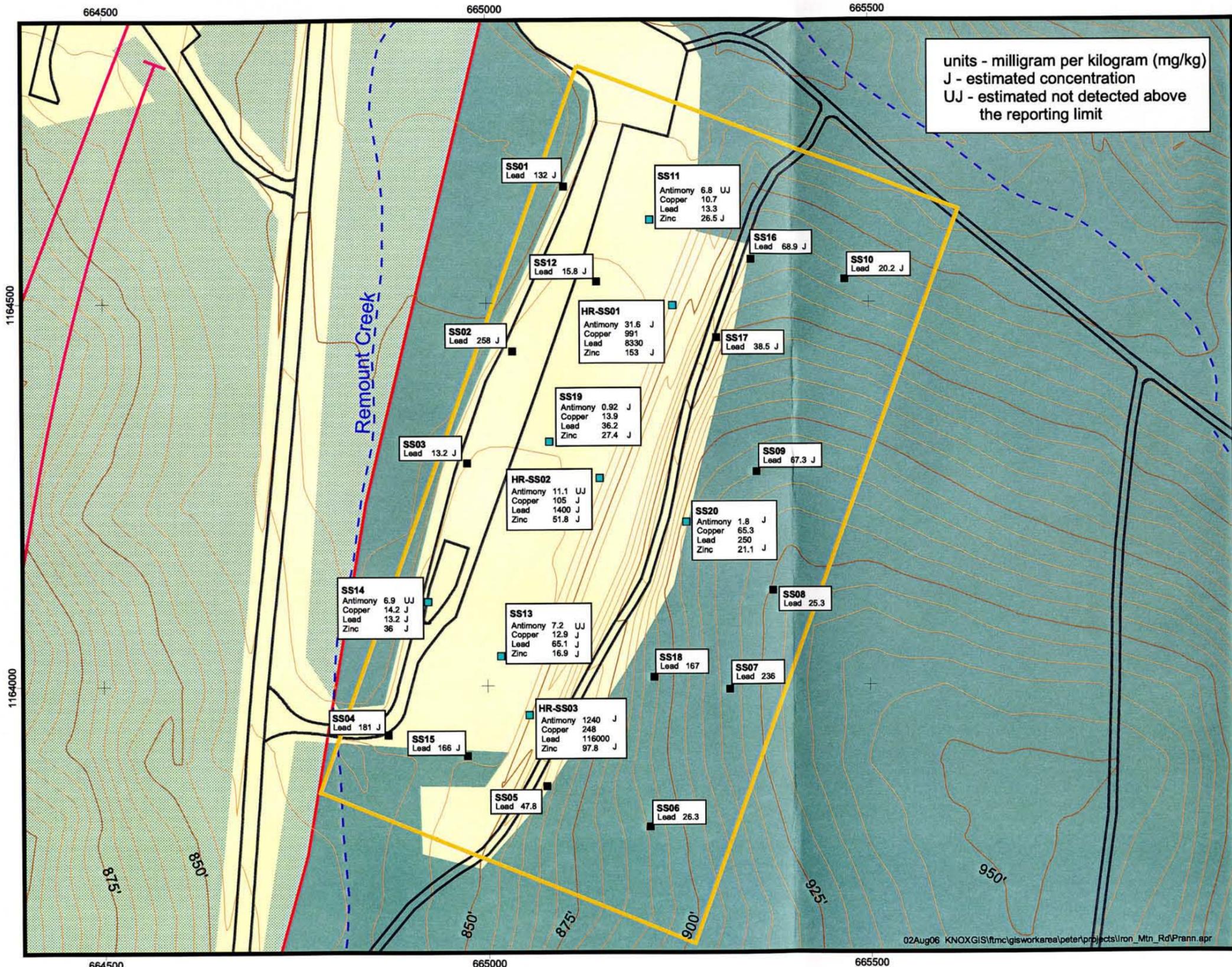


Figure 2-4
Range 19, Parcel 75Q
Surface Soil
Sample Locations
with COPEC Results

Legend

- Soil Sample - additional tests
- Soil Sample - Lead only
- Roads
- 25' Index Contours
- 5' Elevation Contours
- - - Streams - Intermittent
- ▭ Study Area
- ▭ Bypass Corridor
- ▭ Wooded
- ▭ Not Wooded

N

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0 100 200

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were detected in one sample at concentrations that exceeded their ESVs. Again, it was concluded that, based on the infrequency of detection and the highly conservative nature of the ESVs, that these PAH compounds were not considered COPECs in surface soil at the Skeet Range.

2.1.2 Surface Soil at Range 12

In addition to antimony, copper, lead, and zinc, surface soils at Range 12 also exhibited concentrations of arsenic and 4,4'-DDT that exceeded their respective ESVs (Table 2-2). Arsenic and 4,4'-DDT were both detected in one surface soil sample at concentrations greater than their ESVs, and their HQ_{screen} values were 1.9 and 1.2, respectively. All of the detected concentrations of arsenic at Range 12 were within the range of arsenic concentrations detected in background samples at FTMC (SAIC, 1998); therefore, arsenic in surface soil at Range 12 may be characteristic of naturally occurring background concentrations of arsenic. Because these two constituents were only detected sporadically at concentrations that exceeded their ESVs, their HQ_{screen} values only slightly exceeded unity, and they are not known to be associated with small arms training activities, it was concluded that arsenic and 4,4'-DDT are not COPECs in surface soil at Range 12.

2.1.3 Surface Soil at Range 13

The only constituent other than antimony, copper, lead, and zinc detected in surface soil at Range 13 at elevated concentrations was arsenic (Table 2-3). Arsenic was detected in two surface soil samples at concentrations that exceeded the ESV; however, the maximum detected concentrations were not at the locations associated with small arms training (i.e., soil berm impact areas). All of the detected concentrations of arsenic at Range 13 were within the range of arsenic concentrations detected in background samples at FTMC (SAIC, 1998); therefore, arsenic in surface soil at Range 13 may be characteristic of naturally occurring background concentrations of arsenic. Based on the fact that the detected arsenic in surface soil does not appear to be associated with small arms training activities, was infrequently detected at concentrations that exceeded the ESV, and all arsenic detections were within the range of background at FTMC, it was concluded that arsenic is not a COPEC in surface soil at Range 13.

2.1.4 Surface Soil at Range 19

In addition to antimony, copper, lead, and zinc, surface soils at Range 19 also exhibited concentrations of arsenic and silver that exceeded their respective ESVs (Table 2-4). Arsenic was detected in four samples at concentrations that exceeded the ESV; however, all of the detected concentrations of arsenic at Range 19 were within the range of arsenic detected in background samples at FTMC (SAIC, 1998). It was concluded that arsenic in surface soil at