

3.12 Site S (Former Skeet Range)

3.12.1 Site Description

According to historical aerial photographs, between 1949 and 1954, a skeet range was constructed at PPMR in an area south of McDowell Road (Figure 2; Photographs 30 and 31). The skeet range was demolished between 1970 and 1977. The orientation and aerial extent of the skeet range changed over time. The maximum extent of the skeet range appears on the 1970 photograph. The approximate location and maximum extent of the skeet range as determined from detailed examination of the historical aerial photographs is depicted on Figure 15.

3.12.2 Previous Investigations

There are two media of concern at Site S. These include: (1) surface soil, and (2) sediment. To identify appropriate surface soil sampling locations and ensure the collection of an adequate number of samples, SECOR placed a 100-foot grid over the area formerly occupied by the firing points, debris piles and shotfall area and selected 65 surface soil sampling locations. SECOR also identified 22 locations for collection of sediment samples at 100-foot intervals along the bottom of the rills and drainages that carry storm water from Site S toward the retention basin to the west. Six sediment sample locations were also selected by ADEQ in the storm water retention basin.

On October 13 and 14, 2004 SECOR personnel collected soil samples from these locations with a hand trowel from a depth of 0 to 3 inches below ground surface (Photographs 32 and 33). This work was conducted in accordance with SECOR's Work Plan for Additional Site Characterization dated September 29, 2004.

One unsieved and one dry-sieved soil sample were collected from each sampling location. The sieved soil samples were sieved through an ASTM No. 40 sieve prior to collection in 8-ounce glass containers.

All unsieved and sieved soil samples were analyzed for total lead using EPA Method 6010B. Nine surface soil samples were analyzed for pH using SW-846 Method 9045 and six unsieved samples (including some samples of surface soil and some of sediment) were analyzed for potential lead leachability using the Soil Precipitation Leaching Procedure (SPLP) which is also known as EPA Method 1312. In addition, unsieved soil samples collected from the five sampling locations formerly occupied by debris piles that were left onsite immediately after demolition of the skeet range were analyzed for lead as well as PAHs using EPA Method 8310. Sieved samples from four of these locations were also analyzed for PAHs.

Analysis of surface soil and sediment samples showed that the concentration of total lead exceeds the residential SRL of 400 mg/Kg in three areas at Site S.

The first area where the residential SRL is exceeded for lead is in proximity to surface soil sample 25 (unsieved concentration 3,900 mg/Kg) and sediment samples D-8 (sieved concentration 570 mg/Kg) and 36/D9 (sieved concentration 1,200 mg/Kg). The second area is in proximity to surface sample 28 (sieved sample 49,000 mg/Kg) and sediment sample D13 (unsieved sample 470 mg/Kg; sieved sample 740 mg/Kg). The third area is in proximity to sediment sample 50/D-20 (sieved concentration 1,200 mg/Kg). The results of surface soil sampling are presented on Figure 16. The results of surface soil sampling are presented on Figure 17.

With one exception, the concentration of leachable lead was non-detect (<0.10 mg/L). The concentration of leachable lead in the unsieved sediment sample from this location was 0.12 mg/L.

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The concentration of PAH at three locations exceeded the residential SRL. The concentration of benzo(a)pyrene in the unsieved sample collected from location 52 was 0.7 mg/Kg. The concentrations of benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, in the unsieved sample collected from location 53 were 5.0, 0.7, and 4.1 mg/Kg respectively. The concentrations of benzo(b)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene, in the unsieved/sieved samples collected from location 54 were 8.6/7.5, 9.8/8.8, 1.2/0.82, and 7.4/7.0 mg/Kg respectively. PAH analytical results are presented on Figure 18.

This information was included in a document entitled "Site Characterization Report for Site S (Former Skeet Range) Papago Park Military Reservation" that was submitted to ADEQ on November 22, 2004 (SECOR, 2004b). A second site characterization report entitled "Statistical Analysis of Lead in Surface Soil and Sediment and Background Concentrations of Lead in Undisturbed Soil, Site S (Former Skeet Range), Papago Park Military Reservation" was submitted to ADEQ on December 8, 2004 (SECOR, 2004a).

3.12.3 Site Risk

For significant residual risk to be present at Site S, COCs must be present in soil at concentrations above SRLs or in groundwater at concentrations above AWQS. The data collected during previous investigations indicates that there are currently three areas where lead concentrations in soil exceed the residential SRL, and lead shot remains evident on the ground surface in small areas, mainly in and near drainage rills in the central portion of Site S. In addition, there are three locations where the concentrations of PAHs exceed the residential SRLs.

3.12.4 Remedial Alternatives/Selected Remedy

Any investigations or remediation to address residual risk at Site S should focus on areas where COCs have been detected in soil at concentrations above SRLs and where COCs have been detected in groundwater at concentrations above AWQS. Based on the data collected during previous investigations/remediation, it appears there are six such locations at this site.

To address these areas of concern, the following alternatives for remediation were considered:

- Alternative 1 - No further action
- Alternative 2 –Remove lead shot and soil with elevated concentrations of lead and PAHs
- Alternative 3 - Provide fencing and signage around areas of concern and Land Use Controls (LUC) to restrict access and exposure.

Alternative 2 would include removal and offsite disposal of soil with concentrations of lead and PAHs above the SRLs for residential use. Excavated soil would have to be tested using TCLP for lead and PAHs to determine classification as hazardous or non hazardous. In addition confirmation soil samples would have to be collected and analyzed for total lead and PAHs. This alternative includes preparation of a remediation workplan before the initiation of field work and a report after field work is complete. It is assumed that both documents would require ADEQ review and approval.

Alternative 3 would include the preparation of an amendment to the Real Property Master Plan (RPMP) for PPMR, maintenance of the existing perimeter fence, and preparation of an annual report that describes the status of the LUC. It also includes meetings and discussions with the Army Environmental Center and the Arizona Department of Environmental Quality (ADEQ). It does not include ambient air, surface water or ambient air monitoring since none of these have been identified as primary exposure pathways at the site.

Alternative 1 would limit but not prevent current or future exposure to lead shot and contaminated soil.

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Alternative 1 would limit but not prevent current or future exposure to lead shot and contaminated soil. Potential risks of exposure to on-site personnel and the public would remain after this alternative was implemented. Alternative 2 would prevent current and future exposure but would not be cost-effective or easy to implement. Alternative 3 would eliminate access to lead shot and contaminated soil by members of the public and reduce potential direct exposure to this material.

The cost of Alternative 1 would be \$0. The cost for Alternative 2 would be approximately \$392,300 (see Table 5). This cost assumes that excavation would only be required to 3 inches, that approximately 790 cubic yards of soil (1,030 tons) would require disposal as a hazardous waste, and that an equal amount of clean fill would need to be imported. The cost includes the collection of 8 samples for analysis of soil to be taken offsite and the collection and analysis of approximately 27 confirmation samples. It also assumes that ADEQ would charge the Army approximately \$10,000 during this time to pay for any staff time that may be necessary to conduct oversight of onsite activities.

The cost for Alternative 3 would be approximately \$230,000 (see Table 5). This cost assumes that Site S will remain, as is, in military (i.e., non-residential) use, for a period of 30 years. It assumes that the perimeter fence around Site S would have to be replaced once during this time period. It also assumes that ADEQ would charge the Army approximately \$10,000 during this time to pay for any staff time that may be necessary to conduct oversight of onsite activities.

Alternative 3 Access and Institutional Controls was selected as the remedy for this site. A description of the LUC to be implemented at Site S was included in the RPMP for PPMR. The RPMP requires the AZ ARNG to limit public access by maintaining the existing fence around the perimeter of the area at PPMR that includes Site S, and prohibits residential use of Site S. The RPMP requires that any disturbance of soil at Site S be approved by the Army Environmental Center (AEC) and ADEQ. It also requires AEC and ADEQ approval prior to removal of LUC from Site S. If ownership of Site S is transferred to a party other than the Army, it is understood that it will be necessary either to remediate the property or for the new owner to sign and obtain ADEQ approval of a Declaration of Environmental Use Restriction (DEUR) that has been prepared in accordance with R18-7-207.

In addition to the LUC included in the RPMP, Site S will be subject to five-year reviews. Section 121(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires a five-year review whenever hazardous substances remain on-site as part of a remedy. According to OSWER Directive 9355.7-03B-P Comprehensive Five-Year Review Guidance (EPA, 2001) the five-year review must address the following:

- Achievement of remedial objectives,
- Appropriateness of cleanup levels and remedial objectives, given any changes in Applicable or Relevant and Appropriate Requirements (ARARs) or site characteristics,
- Whether the remedy is effective and functioning as designed,
- The adequacy of Operation and Maintenance (O&M), and
- Early indicators of potential failure of one or more components of the remedy.

A five-year review report will be prepared no later than five years from the date of the PPMR Decision Document. A draft of the report will be sent to AEC and ADEQ for review. The report will be revised to address any comments from AEC and ADEQ. A final copy of the report will then be provided to both parties.