

**TECHNICAL BRIEFING – FORMER SKEET RANGE REMEDIAL INVESTIGATION (RI) REPORT –
(DRAFT FINAL) DECEMBER 2011**

The document reviewed was a RI report submitted by the Army to regulators on December 16, 2011. This technical briefing will provide an overview of the site background and work accomplished and a brief summary of the findings. The RI report contains an executive summary that should provide the interested reader with more comprehensive details.

Background

The Former Skeet Range was constructed in the 1950s and was used for recreational trap and skeet shooting from the 1950s to the 1990s. The entire area is reported to be mapped as wetlands (according to NJDEP guidance). Extensive landfilling in the past was reportedly employed to create useable land in the area. Several environmental investigations have been conducted in this area and included sampling of surface soil, subsurface soil, sediment, groundwater, and surface water. As part of the RI a human health risk assessment (HHRA) and screening level ecological risk assessment (SLERA) were also conducted.

Environmental Impact

The main contaminant at the site is lead although several other metals and polyaromatic hydrocarbons (PAHs) have been detected. Some of the constituents other than lead have been attributed to land filling (arsenic is also found upgradient of the Former Skeet Range), natural geologic conditions (iron), or other human-derived sources (e.g., asphalt roads for PAHs). Available sampling results do not indicate that lead has leached into groundwater; lead is thought to be bound to soil and organic carbon. Iron and arsenic occur in groundwater at concentrations exceeding LOCs. Arsenic is believed to emanate from historic landfilling or other contaminated sites. Iron is attributed to natural geologic conditions. Lead, arsenic, and PAHs have been detected at concentrations exceeding levels of concern (LOC) in soil. Arsenic may be from landfill activities and PAHs could be from nearby asphalt roads or clay targets. Delineation of lead extent is nearly complete; additional sampling to delineate the vertical extent in the maximum shot fall zone and along one of the perimeters can be completed as part of the Feasibility Study (FS). In sediment results, one detection of PAHs exceeds the LOC; that detection may be related to clay pigeons or nearby asphalt roads. Other detected metals (arsenic and antimony) may emanate

from the Former Skeet Range or from historic landfill activities. Surface water detections of lead are definitively linked to the Former Skeet Range based on their occurrence in proximity to soil and sediment exceedances. Other metals detections in surface water (antimony, arsenic, and iron) have been attributed to high turbidity of the samples, landfilling within the area, or weathering of the shot used in the Former Skeet Range. In addition, natural geologic conditions contribute to elevated iron concentrations sitewide.

Ecological Risks

There are potential adverse impacts to all modeled wildlife especially for contact with lead in soil and sediment. The modeled wildlife include the following representative species: American woodcock, short-tailed shrew, meadow vole, northern bobwhite quail, raccoon, and marsh wren. Some of the species are expected to be affected more adversely than others depending on a wide range of factors including their size, foraging habits, areal extent of range, and other considerations. There is a potential reduction of food supply due to lead in surface soil: lead, antimony, arsenic, copper, and zinc in sediment; lead, copper, and iron in surface water. Lead, copper, and iron concentrations in surface water exceeded state and/or federal water criteria for protection of aquatic life. Finally large lead particles present an additional potential hazard to birds that use the material as grit. Additional evaluation of ecological risks is required to quantify the impacts.

Human Health Risks

Current use of the site is commercial/industrial. At present there are no current workers at the site. For purposes of the HHRA current and future routine workers, current and future construction workers, and future adult and child residents were considered. Due to the wetland nature of the area it is difficult to imagine future residential development; industrial development would also be unlikely given current regulations regarding wetlands protection. Unacceptable (cancer) risks to future residents (adult and child) and future routine workers are due to PAHs in surface soil, and arsenic in surface water, sediment, and groundwater. The (non-cancer) hazard affects the same populations plus the current routine workers due to antimony in sediment and surface water, and to arsenic in groundwater. According to the Integrated Exposure Uptake Biokinetic (IEUBK) Lead Model (to predict the probability of elevated blood levels for children) and the U.S. Environmental Protection Agency (USEPA) Adult Lead Model, the

presence of lead in concentrations detected at the site results in a “considerable exceedance of safe exposure levels” for children and adults.

Concluding Remarks

Lead is the primary constituent of concern at the site. Although other contaminants have been detected lead is the main risk driver for both humans and wildlife. Nearby waste sites (Site 34, Site 180, and Site 19) have resulted in degradation of the overall area and it is apparent that some of the contaminants detected at the Former Skeet Range are related to landfilling activity in the past. Human health impacts due to lead are severe based on two different lead models. In addition, other contaminants (PAHs, arsenic, and antimony) in soil, sediment, groundwater and or surface water contribute to human health impacts at the site. Access to the site by humans can be restricted as has been attempted at other sites; the likelihood of future development (excluding remedial efforts) is low given the wetlands composition of the area. However, access to wildlife cannot be effectively restricted and the SLERA indicates significant adverse impacts to all modeled wildlife. Additional evaluation of potential ecological risks will be definitely by required before suitable remedial alternatives can be identified. Additional soil/sediment delineation can also be accomplished as part of the FS.