Proposed Plan

Small Arms Range

Former Griffiss Air Force Base
Rome, New York
Public Comment Period
August 4, 2006 - September 5, 2006

August 2006

Air Force Recommends No Further Action For the Small Arms Range

Public Comments Solicited



Former Griffiss Air Force Base is located in Rome, New York.

This **proposed plan** is issued by the United States Air Force (Air Force) following consultation with the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). The Air Force recommends no further action for soil and groundwater at the Small Arms Range (SAR) (site designation OT-61).

This document has been prepared in accordance with public participation requirements of the ***Comprehensive Environmental Response, Compensation, and Liability Act*** of 1980, as amended, the ***National Contingency Plan***, and the former Griffiss Air Force Base (AFB) ***Federal Facility Agreement***. The SAR was not part of the original FFA, but was added by the NYSDEC and the EPA per their request in letters dated September 8, 1997 and September 29, 1997, respectively. Based on the Disposal and Reuse ***Record of Decision*** for Griffiss AFB, the Air Force will transfer the SAR to the Department of the Interior. The property will be placed in trust for the Oneida Indian Nation of New York which plans to utilize the range for their police force training. In this document, the Air Force, EPA, and NYSDEC will be referred to as the "agencies."

This proposed plan summarizes the information obtained and the work performed during the final environmental site assessment (ESA) and the interim remedial actions (IRA's) performed at the SAR at the former Griffiss AFB. This plan is intended to elicit public comments on the proposal to take no further action at this site. The final decision, or ROD, will be made only after the public comment period has ended and responses and information submitted during this time period have been reviewed and considered. Please refer to the Community Participation section at the end of this document for information on submitting public comments.

This Proposed Plan describes:

- The environmental investigations that have been conducted at the Small Arms Range.
- The proposed plan for no further action at the Small Arms Range.
- How you can participate in the final decision process for the Small Arms Range.

Proposed Plan
A document requesting public review and comment on a proposed remedial action at a particular site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
Commonly known as Superfund; a federal law that establishes a program to identify, evaluate, and remediate sites where hazardous substances may have been released, leaked, poured, spilled, or dumped into the environment.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP)
The federal regulation that provides the organizational structure and procedures for responding to releases of hazardous substances, pollutants, and contaminants.

Federal Facility Agreement (FFA)
An agreement between the EPA, the State of New York, and the Air Force to evaluate waste disposal sites at the former Griffiss AFB and perform remediation if necessary.

Record of Decision (ROD)
A public document that identifies the selected action at a site, outlines the process used to reach a decision on the remedy, and confirms that the decision complies with CERCLA.

Site Description

Regional

The former Griffiss AFB covered approximately 3,552 contiguous acres in the lowlands of the Mohawk River Valley in Rome, Oneida County, New York. Topography within the valley is relatively flat, with elevations on the former Griffiss AFB ranging from 435 to 595 feet above mean sea level. Three Mile Creek, Six Mile Creek (both of which drain into the New York State Barge Canal, located to the south of the base), and several state-designated wetlands are located on the former Griffiss AFB, which is bordered by the Mohawk River on the west. Due to its high average precipitation and predominantly silty sands, the former Griffiss AFB is considered a ***groundwater recharge zone.***

Griffiss AFB Operational History

The mission of the former Griffiss AFB varied over the years. The base was activated on February 1, 1942, as Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the U.S. Army Air Corps. Upon creation of the U.S. Air Force in 1947, the depot was renamed Griffiss Air Force Base. The base became an electronics center in 1950, with the transfer of the Watson Laboratory Complex (later Rome Air Development Center [1951], Rome Laboratory, and then the Information Directorate at Rome Research Site, established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems). The 49th Fighter Interceptor Squadron was also added. The Headquarters of the Grounds Electronics Engineering Installations Agency was established in June 1958 to engineer and install ground communications equipment throughout the world.

On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. Griffiss AFB was designated for realignment under the ***Base Realignment and Closure Act*** in 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995.

The Information Directorate at Rome Research Site and the Northeast Air Defense Sector (NEADS) will continue to operate at their current locations; the New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October 1998, when they were relocated to Fort Drum; and the Defense Finance and Accounting Services (DFAS) has established an operating location at the former Griffiss AFB.

Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous and toxic substances were used, and hazardous wastes were generated, stored, or disposed of at various sites on the installation. The defense missions involved, among others, the procurement, storage, maintenance, and shipping of war material; research and development; and aircraft operations and maintenance.

Numerous studies and investigations under the U.S. Department of Defense Installation Restoration Program have been carried out to locate, assess, and quantify the past toxic and hazardous waste storage, disposal, and spill sites. These investigations included a records search in 1981, interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment to determine the nature and extent of site contamination; Problem Confirmation and Quantification studies (similar to what is now designated a Site Investigation) in 1982 and 1985; soil and groundwater analyses in 1986; a base-wide health assessment in 1988 conducted by the U.S. Public Health Service, ***Agency for Toxic Substances and Disease Registry***;

Groundwater Recharge Zone
An area where the underlying aquifer (water-bearing zone) receives water (recharge) through downward flow from both precipitation which infiltrates into the ground and other surface water bodies such as streams, lakes, etc.

Base Realignment and Closure Act (BRAC)
A federal law that established a commission to determine which military bases would be closed and which would remain active.

Agency for Toxic Substances and Disease Registry (ATSDR)
The federal agency responsible for performing health assessments for facilities on the National Priorities List.

base-specific hydrology investigations in 1989 and 1990; a groundwater investigation in 1991; and site-specific studies and investigations between 1989 and 1995. The ATSDR issued a Public Health Assessment for Griffiss AFB dated October 23, 1995, and an addendum, dated September 9, 1996.

Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the ***National Priorities List*** on July 15, 1987. On August 21, 1990, the agencies entered into a Federal Facility Agreement under Section 120 of CERCLA. The SAR was added to the FFA by the EPA and NYSDEC per their request in September 1997. Under the terms of the agreement, the Air Force was required to prepare and submit numerous reports to the EPA and NYSDEC for review and comment. Documents associated with the Environmental Site Assessment (ESA) included a work plan, consisting of a sampling and analysis plan and a quality assurance project plan; a baseline risk assessment; and the ESA report. Documents associated with the IRAs included work plans, each made up of a Project Management Plan, a Health and Safety Plan, and an Environmental Sampling and Analysis Plan, and IRA closure reports. These documents were reviewed and approved by the NYSDEC and the EPA.

This proposed plan for the SAR is based on an evaluation of potential threat to human health and the environment due to contamination in the soil and groundwater and takes into consideration the removal of the source of contamination. During the ESA, a site-specific ***baseline risk assessment*** (using appropriate exposure assumptions to evaluate cancer risks and non-cancer health hazards) was conducted to evaluate the risks posed by detected site contaminants to the reasonably maximally exposed individual under current and future land use assumptions if no remedial action were conducted. In the ESA report, the results of the risk assessment were compared to available standards and guidance values using federal and state environmental and public health laws that were identified as potentially ***applicable or relevant and appropriate requirements*** at the site.

Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies that result in a numerical value when applied to site-specific conditions. Currently, there are no chemical-specific ARARs for soil (other than for PCBs). Therefore, other non-promulgated federal and state advisories and guidance values, referred to as ***To-Be-Considereds***, and ***background levels*** of the contaminants in the absence of TBCs, were considered.

National Priorities List (NPL)
A formal listing established by CERCLA of the nation's hazardous waste sites that have been identified for possible remediation. Sites are ranked by the EPA based on their potential for affecting human health and the environment.

Baseline Risk Assessment
An assessment required by CERCLA to evaluate potential risks to human health and the environment. This assessment estimates risks/hazards associated with existing and/or potential human and environmental exposures to contaminants at an area.

Applicable or Relevant and Appropriate Requirements (ARARs)
"Applicable" requirements mean those standards, criteria, or limitations promulgated under federal or state law that are required specific to a substance, pollutant, contaminant, action, location, or other circumstance at a CERCLA site, e.g., the New York State groundwater standards. "Relevant and appropriate" requirements mean those standards, requirements, or limitations that address problems or situations sufficiently similar to those encountered at the CERCLA sites so that their use is well suited.

To-Be-Considereds (TBCs)
Advisories, criteria, or guidance that do not meet the definition of ARAR, but may be useful in developing remedial action alternatives. For example, the New York State soil guidance values.

Background Levels
The level of a chemical or contaminant naturally occurring in the vicinity of the site. to that particular site.

Site Description

The Small Arms Range is located in the northern portion of the former Griffiss AFB (Figure 1). It is bordered on the north by Landfill 1, on the east by Hardfill 49a, and on the west by a gravel road. The SAR can be divided into two distinct areas, the southern main range and northern supplemental range. The main range consists of a metal-sided structure (Building 6025) and backstop berms. Building 6025 is open on the eastern side to accommodate 21 firing positions. The main range is enclosed on the northern, eastern, and southern sides by sandy berms, which rise as much as 29 feet above the center of the range floor. Former berm material was located east of the main berm within Hardfill 49a. Figure 2 shows a detailed map of the SAR property.

The northern supplemental range consists of two 6-foot diameter concrete pipes on a covered concrete pad (Structure 6028), and a backstop berm. The backstop berm is an extension of the main range backstop berm. The main range and the supplemental range are separated by the northern berm of the main range. The northern side of the supplemental range is open.

The berms and infield areas are fully vegetated with native grasses. The infields are mowed. Two office/maintenance buildings (Structures 853 and 854) are associated with the SAR.

Under the Proposed Action for reuse of the former Griffiss AFB, the SAR/Hardfill 49A area has been designated as vacant land (development reserve).

Since 1996, the Oneida Indian Nation Police have been using the SAR for limited firearms training on an approximate once every six months schedule, firing less than 6,000 rounds per year of environmentally safe bullets. Since the existing SAR backstop berm borders the site in the direction or line of fire, future use of the SAR/Hardfill 49A area will likely be vacant property, tied to usage of the SAR as a limited use small arms firing range.

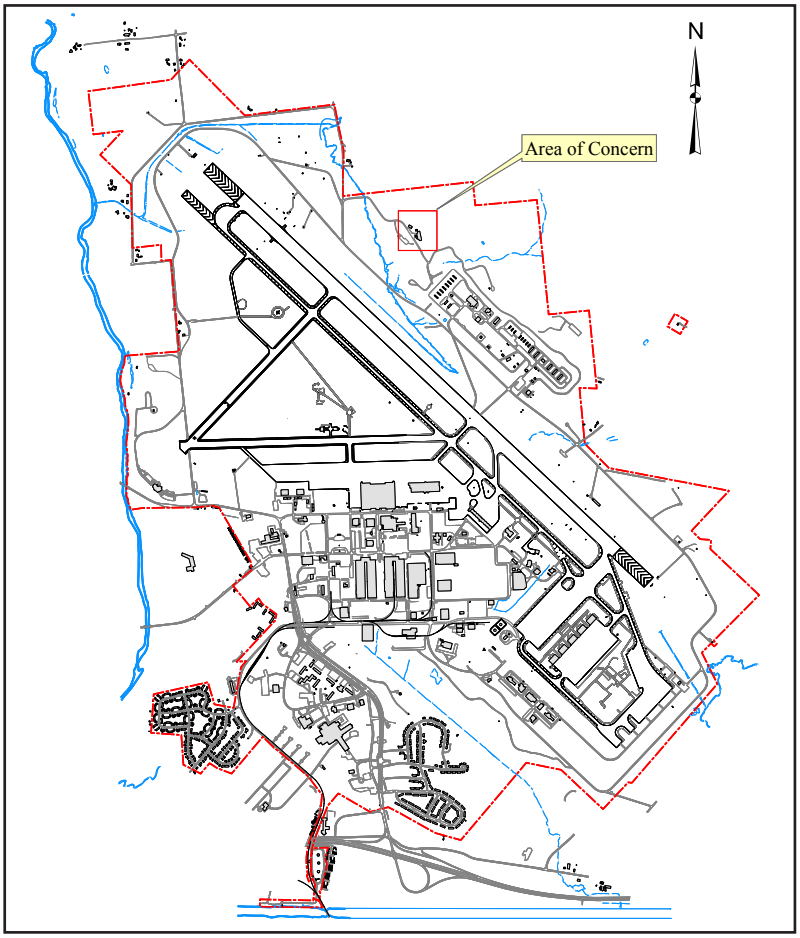


Figure 1: Location of the Small Arms Range at the Former Griffiss AFB.

Site History

The main range was built in 1961 for small arms training. The supplemental range was built in 1987 for machine gun training. The ranges were used until the base realignment in September 1995. The Oneida Indian Nation Police force began using the SAR for training in July 1996.

Landfill 1, adjacent to the SAR, was opened in 1960. Site-related constituents at the SAR are assumed to be limited to selected metals associated with fire arms training.

The SAR originally included a berm with a 100-yard backstop (former SAR berm shown in Figure 2). In the early 1980s, this berm was demolished and a new berm that reduced the shooting range distance from 100 yards to 50 yards was created. The footprint of the former berm (100-yard range), after being spread, was later used for disposal of hardfill in conjunction with the Hardfill 49A operation.

Cartridges used at the firing range consisted of brass shell casings with lead or copper-jacketed lead bullets. Small quantities of tin and antimony are present as alloys in most lead bullets. Many bullets retrieved from the backstop berms were copper-jacketed. Most casings are made of brass (copper and zinc alloys).

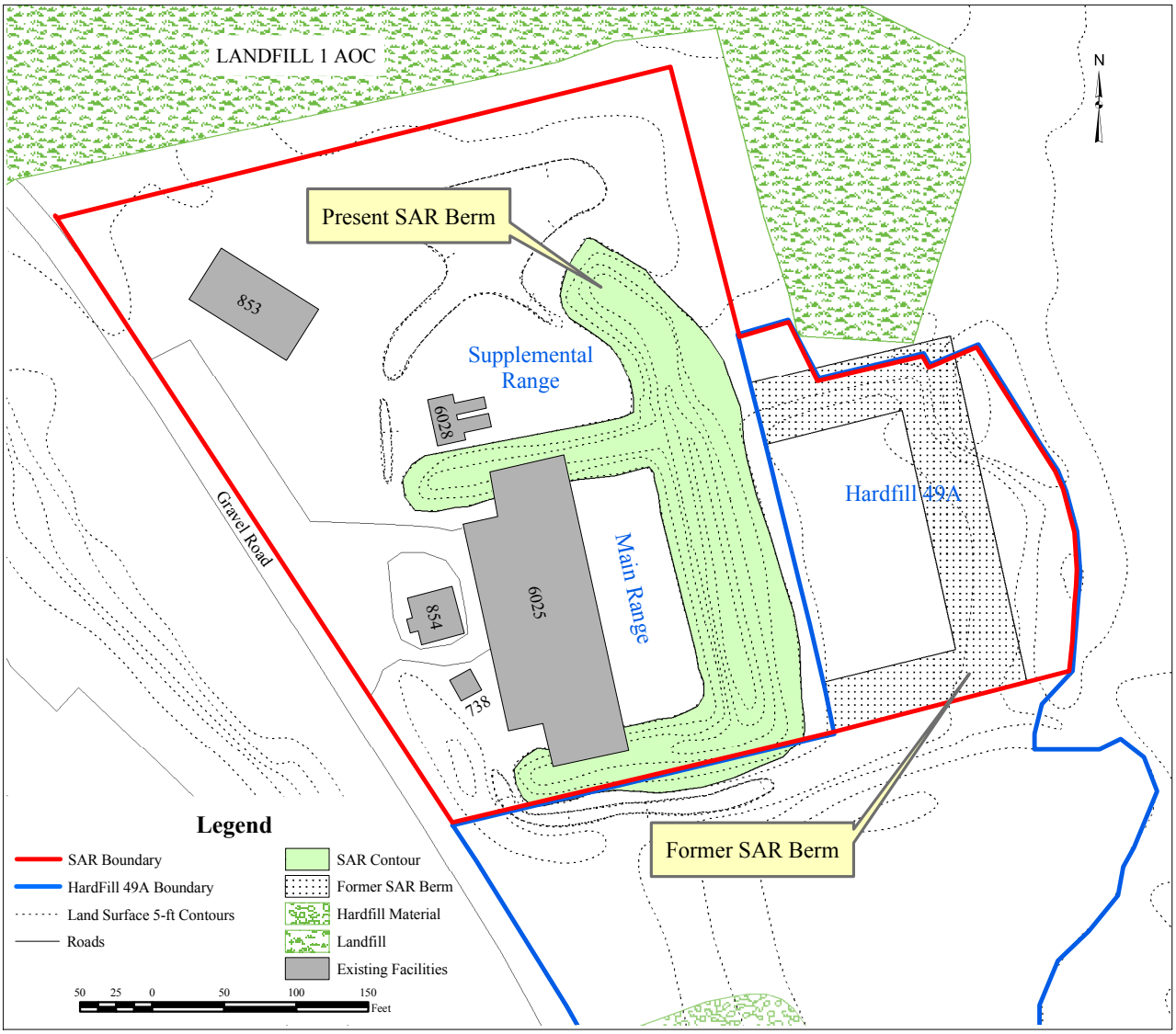


Figure 2: Small Arms Range - Present and Former Berm

Geology and Hydrogeology

The geology in the SAR consists of organic silty soils overlying sand and gravel, fine to medium sand, and glacial till. The maximum thickness of unconsolidated native deposits above the till is approximately 20 feet. Groundwater flow in the area of the SAR is to the west-southwest toward the Six Mile Creek tributary. The groundwater gradient is 0.014 ft/ft from the northeast to the southwest across the site.

The Six Mile Creek tributary is located approximately 600 feet south and southwest of the SAR and Six Mile Creek is located 1000 feet southwest of the SAR. The average depth to the water table is approximately 13 feet below ground surface (bgs) as measured in the three groundwater monitoring wells installed at the SAR.

Class GA Groundwater Standards

As defined in the New York State Codes Rules and Regulations, Title 6, Part 703 for groundwater water quality standards, guidance values, or groundwater effluent. The Class GA Standard for lead is 25 micrograms per liter.

Summary of Site Activities

Environmental Site Assessment

An ESA was conducted in 1996, whose main objective was to investigate the nature and extent of environmental contamination from historical releases at the SAR. Hand auger borings were conducted at 35 locations to characterize the lateral and vertical extent of lead and other metals in the surface soils and shallow subsurface soils (down to 2 ft bgs).

Five soil borings and three monitoring well borings were drilled to characterize soils vertically and to facilitate shallow and deeper subsurface soil sample collection. Groundwater monitoring wells were installed around the perimeter of the SAR to determine whether the shallow groundwater was impacted.

The soil and groundwater data quality were evaluated based on a number of criteria. On-site and downgradient soil data were compared to background screening levels (two times the previously established Base-wide background concentrations reported during the Remedial Investigation in 1996 [Law, Dec. 1996]); concentrations exceeding these background screening levels by more than a factor of two indicated releases attributable to the site. Two times the arithmetic mean is considered to approximate the 95th percentile of the upper confidence limit of the arithmetic mean data set and was previously agreed to as a background screening level. This is supported by the EPA in the "Supplemental Guidance to RAGS: Region 4 Bulletins. Data Collection and Evaluation, Human Health Risk Assessment Bulletin No. 1" (EPA, Nov. 1995).

Groundwater analytical results were compared to both the upgradient concentration and the NYS ***Class GA Groundwater Standards*** and/or Guidance Values; sample results exceeding the upgradient concentrations by more than a factor of two and the Class GA Standards and/or Guidance Values indicated releases attributable to the site. In cases where levels were "non-detect" in the upgradient well, background screening levels were considered. Downgradient sample results (around the perimeter) were used to assess whether migration was occurring.

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Soil Results

Analytical results from surface soils, shallow surface soils, and deeper soil boring samples indicated the following:

- In soil samples collected from all depths, 15 metals were detected above background screening levels in at least one sample. Of those, antimony, copper, and lead were considered directly attributable to activities at the SAR (Table 1).

- In general, the highest concentrations of antimony, copper, and lead were found in surface soils and shallow subsurface soils in the impact zone of the backstop berms at the supplemental and main ranges and at localized "hot spots" on the back sides of the east berms at both ranges and the south berm of the main range.

- Concentrations of metals attributable to the SAR (antimony, copper, and lead) were found to decrease with depth. Concentrations in soil boring samples collected below 2 feet were below background screening levels, indicating vertical migration of site-related metals was not occurring.

- Arsenic was present at the SAR, but mostly at concentrations within one order of magnitude of the Basewide background for arsenic of 2.45 mg/kg. Only two samples contained arsenic at a concentration exceeding 'one order of magnitude greater that the base background level'; one detection was 50.76 mg/kg and one was 260.57 mg/kg. The majority of the samples contained arsenic at concentrations less than 10 mg/kg. Therefore, these two higher arsenic detections were considered anomalies and were not indicative of SAR activities. Moreover, the arsenic exceedance locations were later removed as they were located within the limits of the excavation associated with the first interim remedial action. The interim remedial action was conducted from Summer 1998 through Fall 1999 as a result of lead contamination.

- Beryllium was also present at the SAR, but at concentrations within one order of magnitude of the background screening level of 0.36 mg/kg.

- Other metals detected above background screening levels were either naturally occurring metals such as calcium and potassium, or were very limited in distribution.

Table 1

COMPOUNDS EXCEEDING TWO TIMES THE MEAN BASEWIDE BACKGROUND LEVELS FROM SOIL SAMPLES COLLECTED DURING THE ENVIRONMENTAL SITE ASSESSMENT

Compound	Two Times Mean Basewide Background Levels	Range of Detected Concentrations	Frequency of Detection Above Two Times Basewide Background Levels	Most Stringent Criterion [a]
Metals (mg/kg)				
Arsenic	4.9	0.72 M - 260.57 M	44/111	7.5
Antimony	6.8	144.95 M - 534.87 M	4/111	3.4 (SB)
Beryllium	0.72	0.38 - 3.21	32/111	0.36 (SB)
Copper	43.8	8.89 - 560.31	13/111	25
Lead	36	1.39 JM - 246730.3 JM	35/111	18.1 (SB)

Notes:

[a] - NYS Recommended soil cleanup objective, TAGM 4046 unless otherwise noted.

JM - The analyte was positively indentified, the quantitation is an estimation. A matrix effect was present.

M - A matrix effect was present.

SB - Soil Background Level.

Summary of Site Activities (Cont.)

Groundwater Results

Four groundwater samples were collected during the ESA from monitoring wells installed around the SAR and submitted for analysis of ***volatile organic compounds***, ***semivolatile organic compounds***, metals, and diesel-range petroleum hydrocarbons. Results indicated the following:

- No VOCs or SVOCs were detected in the groundwater samples collected from the SAR. Although diesel-range petroleum hydrocarbons were detected in all four groundwater samples, the upgradient concentration was higher than the downgradient concentrations, indicating that these compounds are not associated with a release from the SAR.

- Lead was the only metal attributable to the SAR which was detected above Class GA Groundwater Standards and background screening levels in a downgradient groundwater sample, indicating a release of lead (Table 2).

Volatile Organic Compounds (VOCs)
A group of organic compounds that have a tendency to vaporize readily.

Semi-volatile Organic Compounds (SVOCs)
A group of organic compounds that are easily extracted from soil, water, etc., using an organic solvent.

Table 2

SMALL ARMS RANGE
GROUNDWATER RESULTS COLLECTED
DURING THE ENVIRONMENTAL SITE ASSESSMENT

Compound	Range of Detected Concentrations	NYSDEC Class GA Groundwater Standards	Frequency of Detection Above NYSDEC Groundwater Standards
VOCs			
	No Detections		
SVOCs			
	No Detections		
Metals (µg/L)			
Arsenic	1.7 FM - 7.5 M	25	0/4
Antimony	ND	3	0/4
Beryllium	ND	3	0/4
Copper	13.87 F - 24.06 M	200	0/4
Lead	21.6 M - 80.8 M	25	1/4
Petroleum Hydrocarbons (µg/L)			
PHC as Diesel Fuel	75 F - 227 F	NS	0/4

Notes:

F - The analyte was positively indentified but the associated numerical value is below the PQL.

M - A matrix effect was present.

ND - Not Detected.

NS - No NYSDEC GW Standard.

Summary of Site Risks

Human Health Risk Assessment

A baseline human health risk assessment (HHRA) was conducted during the ESA to determine whether chemicals detected at the SAR could pose health risks to individuals under current and proposed future land uses.

As part of the baseline risk assessment, the following four-step process was used for assessing site-related human health risks for a reasonable maximum exposure scenario (Table 3): Hazard Identification - identifies the contaminants of potential concern (COPCs) at the site based on several factors such as toxicity, frequency of occurrence, and concentration; Exposure Assessment - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g., ingesting contaminated soil) by which humans are potentially exposed; Toxicity Assessment - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); Risk Characterization - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk and non-cancer Hazard Index value) assessment of site-related risks, and a discussion of uncertainties associated with the evaluation of the risks and hazards for the site.

The baseline risk assessment began with selecting contaminants of concern which were representative of site conditions. Contaminants of concern were identified for SAR soils and groundwater underlying the SAR.

The only chemicals analyzed were metals since these are the only significant contaminants associated with small arms ranges. All detected chemicals were screened to eliminate those which were not of concern.

The site assessment evaluated the health effects which could result from exposure to contamination at the SAR if no remedial action were taken under current and future land-use scenarios. Three potential receptor groups were evaluated: adults who use the ranges during small arms training, children brought onto the site by authorized users or who trespass during inactive periods, and workers who are exposed to soil and groundwater used for industrial purposes (Table 3). The potential exposure pathways of concern for current range users included ingestion of surface soil (0 - 2 feet) and dermal contact with surface soil. The potential exposure pathways for hypothetical children were ingestion and dermal contact with surface soil. However, it is considered unlikely that children will be on the site in the future except on a sporadic basis. The potential exposure pathways of concern for the hypothetical future workers were ingestion and dermal contact of surface soil, and dermal contact with groundwater. Ingestion of groundwater was not considered, since a reliable municipal water supply is in place at the Base and it is highly unlikely that groundwater will be used in the future for drinking.

Table 3

SMALL ARMS RANGE
RISK ASSESSMENT EXPOSURE SCENARIOS

RANGE USERS AND CHILDREN OF RANGE USERS	INDUSTRIAL WORKERS
• Incidental ingestion of surface soil • Dermal contact with soil	• Incidental ingestion of surface soil • Dermal contact with soil • Dermal contact with groundwater

Summary of Site Risks (Cont.)

Human Health Risk Assessment (Cont.)

Quantitative estimates of carcinogenic and noncarcinogenic risks were calculated for the SAR as part of a risk characterization. The risk characterization evaluates potential health risks based on estimated exposure intakes and toxicity values. For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen.

The risks of individual chemicals are summed for each pathway to develop a total risk estimate. The range of acceptable risk is 1 in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}) of an individual developing cancer over a 70-year lifetime from exposure to the contaminant(s) under specific exposure assumptions. Therefore, sites with carcinogenic risk below the risk range for a reasonable maximum exposure do not generally require cleanup based upon carcinogenic risk under the NCP.

To assess the overall noncarcinogenic effects posed by more than one contaminant, the EPA has developed the Hazard Quotient (HQ) and Hazard Index (HI). The HQ is the ratio of the chronic daily intake of a chemical to the reference dose for the chemical. The reference dose is an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive sub-populations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime. The HQs are summed for all contaminants within an exposure pathway (e.g., ingestion of soil) and across pathways to determine the HI. When the HI exceeds 1, there may be a concern for potential noncarcinogenic health effects if the contaminants in question are believed to cause similar toxic effects.

EPA bases its decision to conduct site remediation on the risk to human health and the environment. Cleanup actions may be taken when EPA determines that the risk at a site exceeds the cancer risk level of 1 in 10,000 (1×10^{-4}) or if the noncarcinogenic HI exceeds a level of 1. Once either of these thresholds has been exceeded, the 1 in 1,000,000 (1×10^{-6}) risk level and an HI of 1 or less may be used as the point of departure for determining remediation goals for alternatives.

Results of Site-Specific Health Risk Assessment

Potential risks from exposure to COPCs at the SAR were evaluated for range users, their children, and industrial workers after the ESA, prior to the first IRA. The potential carcinogenic and noncarcinogenic risks from exposure to soil or groundwater are summarized below.

Carcinogenic Risk Results

No carcinogenic risks were calculated in the baseline human health risk assessment, as none of the contaminants of concern except lead have been identified as carcinogens. Although lead is a Group B2 carcinogen, no slope factor is available with which to evaluate it, and the greatest danger from lead is associated with its neurological effects, particularly in children. Although exposure to children is unlikely at the SAR, the Air Force chose the conservative EPA value of 400 mg/kg as a ***preliminary remediation goal***, which is protective of children in a residential setting. The limits of excavation performed during the IRAs performed at the SAR were guided by this PRG.

Noncarcinogenic Risk Results

The total HIs for the current and future range user, the future child, and the future industrial worker exposed to either surface soil or groundwater, as applicable, were calculated as 0.7, 1, and 7, respectively. Since the HIs for the range user and child are less than or equal to 1, no adverse effects are anticipated due to any chemicals detected, with the possible exception of lead (discussed below). The chemical causing the HI to exceed 1 for the future worker was antimony in the surface soil on the berms, based on exposure to a "hot spot" at the northeast corner of the main range on the east berm (which was removed during the first IRA).

Preliminary Remediation Goal (PRG)
The PRGs are a listing of contaminants together with initially anticipated cleanup concentrations or risk-based levels for each medium. PRGs serve to focus the development of alternatives on remedial technologies that can achieve the remediation goals.

Because there are no toxicity values available for lead, lead was evaluated separately. Prior to the IRA, high lead levels in surface soil attributing to potential risk effects were found only in the "hot spots" associated with the main range on the east berm and one spot on the south berm.

The risk assessment concluded that outside of the identified hot spots, lead and/or antimony in surface soil and in groundwater did not appear to pose a threat to human health.

Uncertainties Analysis

Uncertainties exist in many areas of the human health risk assessment process. However, the use of conservative variables in intake calculations and health-protective assumptions throughout the entire risk assessment process results in an assessment that is protective of human health and the environment. Examples of uncertainties associated with the risk assessment for the SAR include: (1) due to a lack of toxicity values, the HIs and carcinogenic risks associated with dermal contact with soil and groundwater and ingestion of soil were not quantified for lead, which may result in an underestimation of risk. However, conservative screening values were used to conduct the evaluation of lead (residential exposure of children was used for soil); (2) the assumed frequency of the range user and child to visit the range was 25 times per year, when in reality this is likely to be about two times per year; (3) industrial workers were assumed to work in direct contact with the soil and groundwater, even though workers wear protective clothing which would likely decrease their predicted exposure to the site. This assumption would result in an overestimation of the risk; (4) there may be additional chemical-specific risks at the site associated with background levels of carcinogens such as arsenic and beryllium in surface soil which were not quantified, and may result in an underestimation of risk.

However, after a comparison between the exposure point concentrations and the industrial and residential risk-based concentrations for these constituents (as provided by EPA Region 3 in its 1996 Risk-Based Concentration Table), the magnitude of these risks is estimated to range from about 3×10^{-6} to 2×10^{-5} for industrial and residential uses, respectively; these levels are within the EPA's acceptable range of risk. Furthermore, the IRAs have addressed the presence of any such compounds in the surface soil within the areas of soil removal.

Ecological Risk Assessment Results

A risk assessment for ecological receptors at the SAR was conducted to determine potential adverse effects to the local environment and ecology.

A Fish and Wildlife Impact Analysis (FWIA) was conducted following the requirements outlined as Step I and Step IIA of the October 1994 NYSDEC Division of Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (NYSDEC, 1994). A pathway analysis was conducted to establish resources which may be exposed to chemicals at the site or migrating from the site. The FWIA concluded that remedial measures specifically designed for the protection of wildlife from contaminants in soil and groundwater were not warranted, even before the excavation activities performed during the IRAs.

Migration of metals from the site surface soils via run-off or erosion into Six Mile Creek was considered unlikely due to the presence of perimeter berms separating the range from the creek and its tributaries and a vegetative cover which holds the soils in place, minimizing erosion.

Interim Remedial Actions

Preliminary Remediation Goals

The results of the baseline HHRA found lead and antimony in the surface soil, particularly at those concentrations found in the backstop berms, to be the only contaminants to pose any significant health threat to any receptors. Thus, lead and antimony were the only contaminants of concern. For lead, the Air Force used 400 mg/kg lead as the PRG in the areas at the SAR both with and without controlled access. This highly conservative EPA value, protective of children in a residential setting, supports the Air Force's goal of minimizing future liability. The PRG for antimony of 7 mg/kg was chosen based on site background levels. Dermal contact with groundwater was not found to pose a significant threat to human health based on the results of the HHRA (this conclusion was based on exposure point concentrations which were at least 1.7 times higher than the total concentrations measured during subsequent groundwater sampling events).

There are no current groundwater users that could be impacted by the site, and because the nearest groundwater users are approximately 1.5 to 2.75 miles southeast of the SAR at a cross-gradient location that is not in the flowpath of groundwater from the SAR, residential exposure to groundwater is highly unlikely. Public water is available in the vicinity of the SAR and Base-wide.

First Interim Remedial Action

Based on the recommendations of the ESA, an IRA was performed to excavate portions of the berm material and the isolated "hot spots" outside the berms containing lead and antimony in exceedance of the PRGs of 400 mg/kg and 7 mg/kg, respectively.

The excavation was directed by screening the soil using hand-held x-ray fluorescence (XRF) spectroscopy equipment. More than 200 soil samples were screened with the XRF; approximately one-third of the screening samples were submitted to the laboratory for either lead or total metals analysis. In areas where confirmatory sampling verified the continued presence of soil at levels exceeding the lead PRG of 400 mg/kg, overexcavation was performed. The areas of excavation and overexcavation are shown in Figure 3.

For the IRA, a total of approximately 11,800 tons (7,867 cy) of lead-contaminated soil was removed, transported off-Base, stabilized, and landfilled. The IRA was performed in two phases. The initial phase involved the excavation of approximately 2,600 tons (1,733 cy) of contaminated soil during 1998: 2 to 3 feet of soil were removed from the faces of the main and supplemental range berms, and up to 1 foot of soil was removed from the floor of the ranges within 50 feet of the toe of the berms. During this removal, a much greater area of lead-contaminated soil was identified than anticipated during the original scope of work. A volume of soil encompassing a length of 200 feet, a base width of 80 feet, and a height of 21 feet; essentially the remainder of the east berm of the main range was excavated during the second phase in 1999, when the additional 9,200 tons (6,133 cy) of contaminated soil were removed and transported off-base.

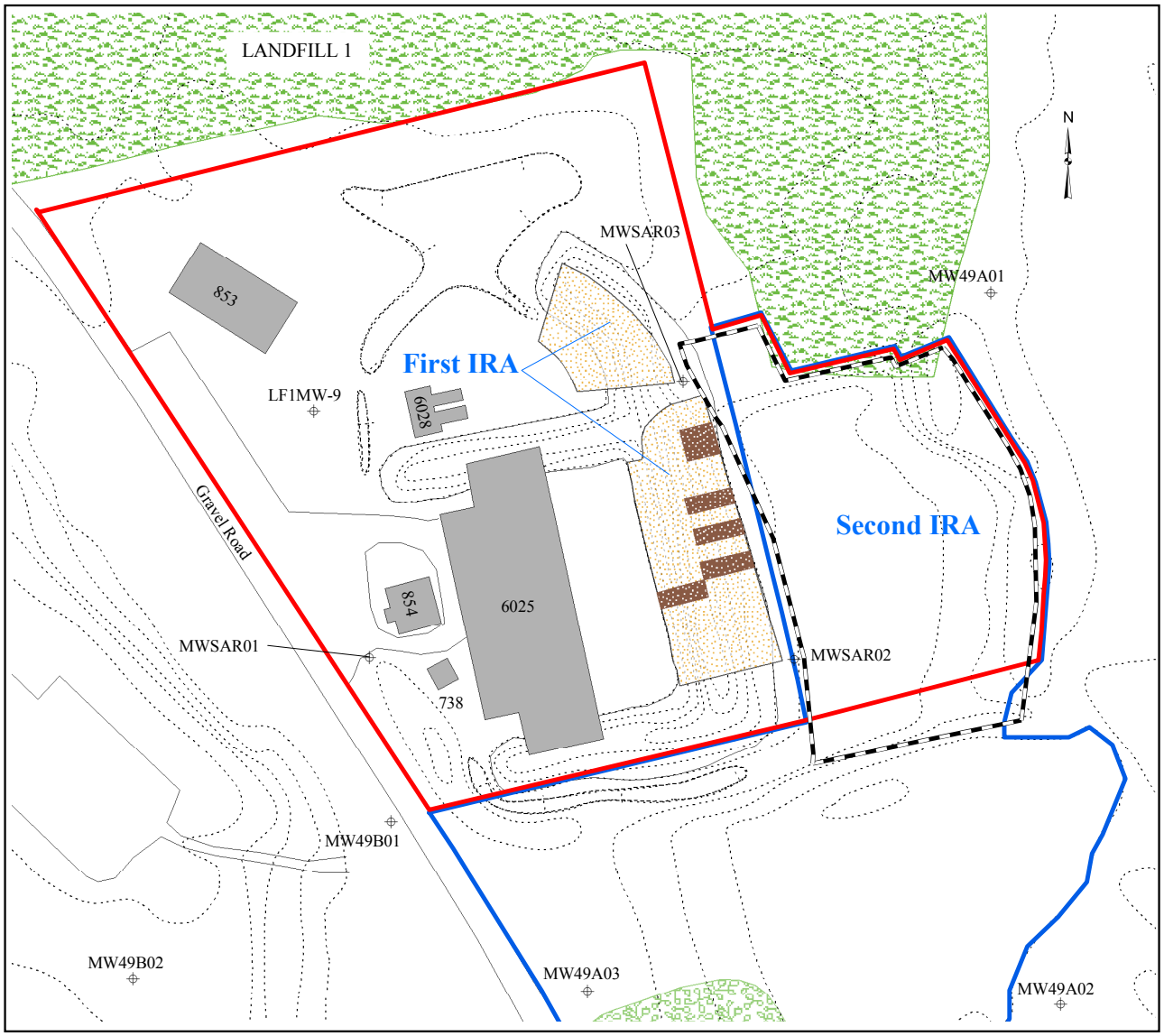


Figure 3 : Small Arms Range - IRA Removal Areas

Interim Remedial Actions (Cont.)

First Interim Remedial Action (Cont.)

After Phase II excavation confirmatory sampling ensured that the remaining site soil was below the PRG, the east berm of the main range was restored to its original condition by October 1999 (Figure 4). In addition, for all samples analyzed for antimony (21 total samples), none were reported above the PRG of 7 mg/kg.

During the IRA in the spring of 1999, 21 test pits were excavated east of the main berm (the 50-yd backstop berm) within Hardfill 49a to investigate the presence of former SAR berm material (i.e., material from the former SAR berm [100-yd range] that may have been spread when the backstop berm was moved west to its current configuration [50-yd range]).

Test pit materials were found contaminated with lead in the form of bullets, bullet fragments, lead acid battery plates, and lead paint; XRF screening indicated lead concentrations greater than 400 mg/kg at depths down to approximately 12 feet bgs over the approximate area as depicted in Figure 3. Since the handling of the excess soil volume was outside the scope of the IRA, the remaining lead-contaminated soil was left in place and was proposed to be addressed in a second interim remedial action at the SAR.

Concurrent with the IRA, a landfill consolidation project was conducted when ash and municipal waste from Landfill 1 was discovered within the limits of the SAR property. The ash and waste was removed from the SAR property, transported to a designated area within Landfill 1, and covered with 6 inches of topsoil. Confirmation samples were collected within a 25-ft grid after the ash and waste were removed to ensure that cleanup goals were met. A total of approximately 13,500 tons (9,000 cy) of waste material were removed from the SAR.

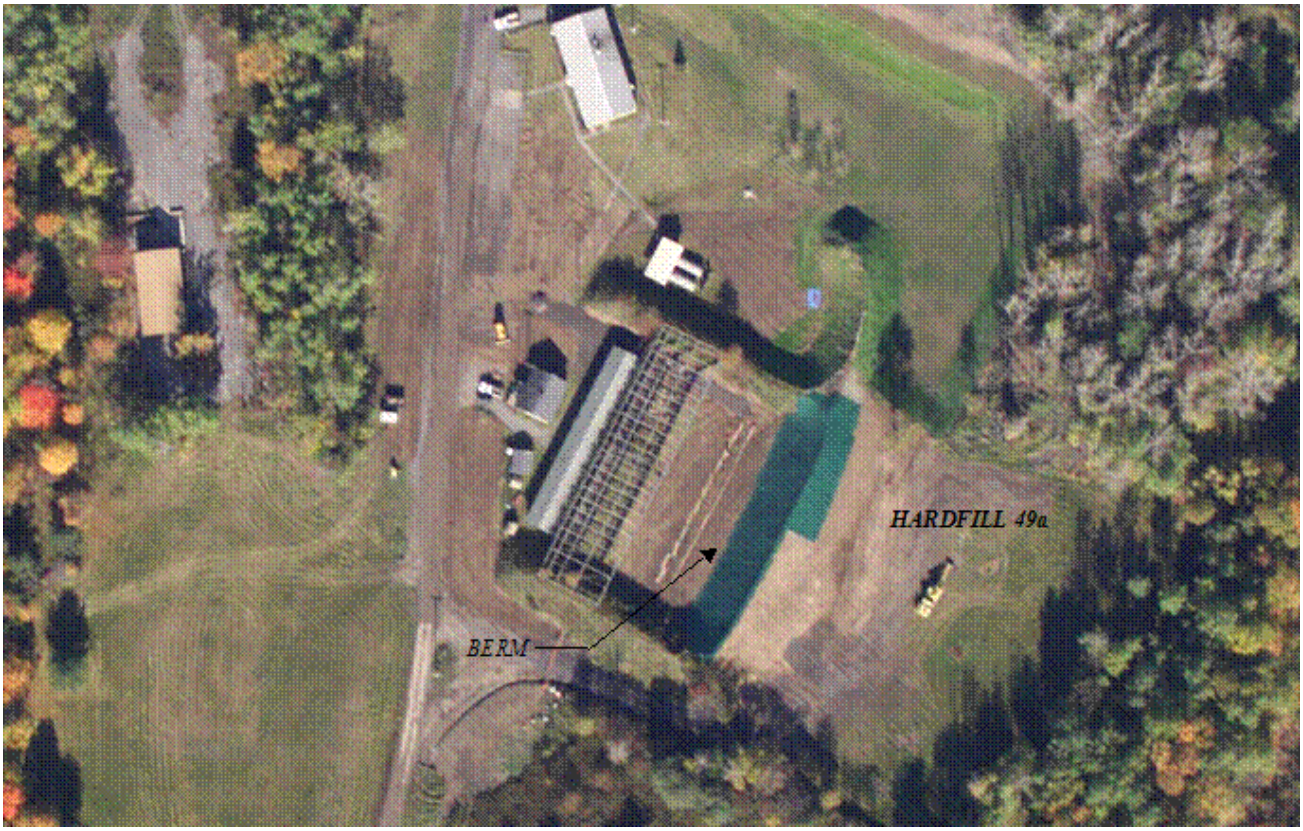


Figure 4: Aerial photo of the restored berm at the SAR, November 1999

Second Interim Remedial Action

Based upon the test pit investigation performed during the IRA in 1999, an Engineering Evaluation/Cost Analysis (EE/CA) was prepared to evaluate remedial alternatives for the SAR/Hardfill 49A location. The final EE/CA dated June 2002, recommended excavation of contaminated soil, mechanical separation of debris from contamintated soil and off-site disposal of the contaminated soil.

A second interim remedial action was performed following the review and approval of the EE/CA for the SAR/Hardfill 49A site. In total, 15,500 tons (10,325 cy) of material were excavated and screened. Before excavation, 4 inches of topsoil were removed and staged for reuse. A composite sample was collected from this topsoil pile and analysis indicated a lead concentration of 19.2 mg/kg, which is below the acceptable cleanup level.

The excavation activities started in a section of the SAR/Hardfill 49A area where telephone poles and other timber were buried. The excavated wood and timber was staged, manually cleaned and transported off-site to an approved landfill. All material from the entire excavation area was screened at 2" and the larger section (> 2") of the material was manually sorted into wood, metal and stones, and brick and concrete. Wood and metal were disposed of off-site and the stones, brick and concrete were rescreened and staged for reuse.

All material smaller than 2" was rescreened at 0.25". The larger section (0.25" - 2") was visually inspected and was found to contain minor quantities of lead bullets, bullet casings and other metal debris. This material was staged pending sampling and off-site disposal. The sampling results indicated that the material was non-hazardous. The smaller section (< 0.25") was observed to be free of contamination and was staged in 500 cubic yard (cy) stockpiles. Composite samples of each stockpile were submitted to an off-site laboratory and analyzed for Target Analyte List (TAL) Total Metals (including total lead) and Toxicity Characteristic Leaching Procedure (TCLP) lead to identify hazardous lead characteristics.

Using the TCLP, a liquid is extracted or leached from the soil and then analyzed to estimate concentrations in groundwater resulting from leaching of contaminants from affected soil.

Of the 15,500 tons (10,325 cy) of material excavated and screened from the SAR/Hardfill 49A site, 6,390 tons (4,260 cy) was reused as backfill. The other 9,097 tons (6,065 cy) was disposed of off-site, with an additional 927 tons (618 cy) of stone that had been brought in for temporary road construction. In total, 10,024 tons (6,683 cy) were removed; 8640 tons (5,760 cy) of soil and temporary stone, 984 tons (656 cy) of wood and timber, 318 tons (212 cy) of miscellaneous C&D (construction and demolition) debris, and 82.5 tons (55 cy) of scrap metal (Table 4).

Table 4

SUMMARY OF MATERIAL EXCAVATED DURING THE SECOND INTERIM REMEDIAL

Composition of Excavation Material	Backfill Quantity	Off-Site Disposal Quantity
15,500 tons from excavation	41.30% (6,390 tons)	58.70% (9,097 tons)
927 tons from temporary road construction		100% (927 tons)
Composition of Disposed Material		
Soil and Temporary Stone		86.20% (8,640 tons)
Wood and Timber		9.80% (984 tons)
Miscellaneous construction and demolition debris		3.20% (318 tons)
Scrap Metal		0.80% (82.5 tons)

Interim Remedial Actions (Cont.)

Second Interim Remedial Action (Cont.)

Post-excavation confirmatory sampling was performed within the excavated areas using a 50' x 50' grid system (Figure 5). One composite sample was submitted from five grab samples collected within each 50 ft grid of the excavated area at a depth of 0 - 6 inches. The composite samples were analyzed for TAL Total Metals and TCLP lead.

TAL Metals analysis was used to confirm that lead contamination was not present above the lead PRG of 400 ppm. Analysis of the confirmation samples indicated that all results were below the PRG of 400 ppm and reusable as backfill (Table 5).

TCLP analysis was used to characterize the excavation with respect to the lead toxicity characteristic for hazardous waste (TCLP lead > 5 mg/L). The results of the TCLP analysis indicated that all samples contained less than 5 mg/L lead and therefore were considered non-hazardous. One sample (HF49A-CS-14A) was reported with a detection of 3.8 mg/L. Since this detection was not consistent with other reported detections, the grid was overexcavated and a new sample was collected. The TCLP result for this sample (HF49A-CS-14B) was reported with a lead content of 0.662 mg/L.

After the laboratory results were validated, the site was backfilled and reconstructed. Additional backfill material was obtained from Strategic Air Command (SAC) Hill in order to bring the site to grade for proper drainage. Imported topsoil was placed over the site and the soil was revegetated.

A closure report summarizing the closure activities performed at the Small Arms Range and adjacent Hardfill 49A site was finalized following EPA approval in August 2003.

Table 5
Total and TCLP LEAD Found at SAR / HF49A Grid Locations

Grid #	Total Lead (ppm)	TCLP Lead (mg / L)
Guidance Value	400*	5
1	5.6	U
2	49.1	0.143
3	20.3	0.092
4	34.0	1.29
5	19.9 B	0.026
6	NS	NS
7	105	0.065
8	49.8	0.063
9	23.0 B	0.061
10	26.9	0.0525 F
11	NS	NS
12	21.0	0.061
13	24.6 B	0.489
14	66.8	0.662
15	6.9	0.0116 F
16	NS	NS
17	36.2	0.0469 F
18	35.4	0.074
19	118	0.355
20	41.5	0.0292 F
21 / 22	32.7	0.0314 F
23	88.3	0.0081 F
24	81.5	0.0134 F
25	103	0.0382 F
26	33.1	0.0215 F
27	65.3	0.0074 F

Notes:

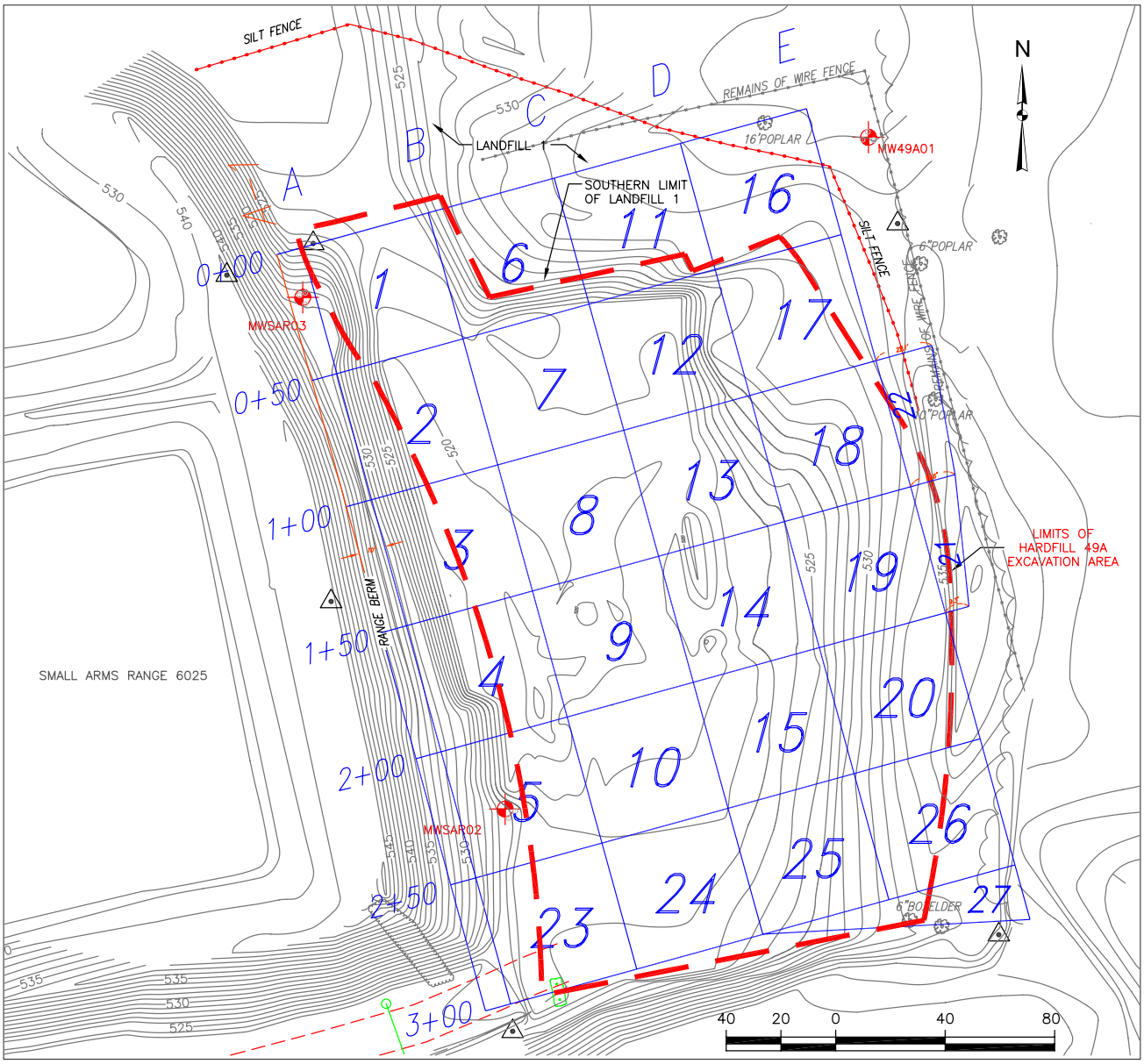
* - Approved project clean-up objective (Parsons June, 2002).

B - The analyte was found in an associated blank as well as in the primary sample.

F - The analyte was detected above the MDL, but below the RL.

NS - Not sampled.

U - The analyte was analyzed for but not detected.



GENERAL NOTES:

Grids 6, 11 & 16 are within Landfill 1.

These grids were not excavated and therefore not sampled.

Figure 5: Post-Excavation Confirmatory Sampling

Description of the Preferred Alternative

Groundwater Sampling

Supplemental to the 1996 ESA, additional groundwater sampling events were performed at the monitoring wells in the vicinity of the SAR from 1999 through 2001, and again in 2003. The wells were first re-sampled in June 1999 (prior to the completion of the IRA). Results confirmed the findings of the ESA; however, the metals concentrations were, in most cases, higher in 1999 than in 1996. This trend was attributed to the presence of high levels of suspended particulates observed in the water samples which can significantly influence measured amounts of metals in groundwater (samples were submitted for total metals analysis and were not filtered). Therefore, samples were submitted for both total and dissolved metals analysis during subsequent sampling rounds.

Samples collected during the 2000, 2001, and 2003 sampling events indicated no detections of either total or dissolved lead at concentrations above the NYSDEC Class GA Groundwater Standard (25 µg/L) (Table 6). Several exceedances of the NYS Groundwater Standards during each sampling event were noted for iron and manganese, in both total and dissolved samples. The presence of iron and manganese is widespread throughout the Base and is not limited nor specific to the SAR. The magnitude of the levels were generally, significantly lower than those reported in samples collected in June 1999 (Table 6), perhaps as a result of the lower suspended solids concentrations (based on the results of field sampling), and/or the source removal/removal of contaminated soils associated with the SAR.

No further action is proposed for soils and groundwater at the SAR. Following the implementation of the IRAs, the majority of chemicals detected at the SAR do not exceed standards or guidance values. Prior to the excavations associated with the IRAs, the baseline risk assessment indicated that the only contaminants of concern were antimony and lead in the soil, whose associated risk was deemed best reduced with source removal. After removal of 11,800 tons (7,867 cy) of contaminated soil during the first IRA, and 9,097 tons (6,065 cy) of contaminated material during the second IRA, confirmatory sampling results verified that the remaining soil on-site is below the PRG of 400 mg/kg for lead and 7 mg/kg for antimony. Although adults are the likely future users of the site, as a highly conservative measure, the PRG for lead protective of children in a residential setting was selected. Therefore, the soil is not considered to be a current or potential threat to public or the environment.

Only iron and manganese were found in downgradient monitoring wells exceeding two times the upgradient well concentrations and the NYS Class GA Groundwater Standards or Guidance Values during the groundwater sampling events. Iron and manganese are naturally occurring and are not of concern at the site, since the nearest groundwater users are approximately 1.5 to 2.75 miles southeast of the SAR at cross-gradient location that is not in the flowpath of groundwater from the SAR. However, future landowners will be notified in the property deed that groundwater at the site contained two metals (iron and manganese) that exceeded the NYS Class GA Groundwater Standards or Guidance Values.

Table 6

SMALL ARMS RANGE
1999 - 2001 AND 2003
GROUNDWATER ANALYTICAL RESULTS

Compound	NYSDEC GW Standards	Range of Detected Concentrations (1999)	a	Range of Detected Concentrations (2000)	a	Range of Detected Concentrations (2001)	a	Range of Detected Concentrations (2002)	a
VOCs (µg/L)									
1,4-dichlorobenzene	3	3.5	1/4	NA		NA		NA	
benzene	1	0.77 F	0/4	NA		NA		NA	
dichlorodifluoromethane	5	0.74 F	0/4	NA		NA		NA	
vinyl chloride	2	2.2 J	1/4	NA		NA		NA	
SVOCs (µg/L)									
1,4-dichlorobenzene	3	4	1/4	NA		NA		NA	
Metals (µg/L) (b)									
Arsenic	25	11.3 F - 49.2	2/4	ND	0/4	3.6 F	0/4	ND	0/4
Antimony	3	ND	0/4	ND	0/4	ND	0/4	ND	0/4
Beryllium	3	3.7 - 8.7	2/4	ND	0/4	ND	0/4	ND	0/4
Copper	200	55.1 - 347 J	1/4	ND	0/4	2.6 J	0/4	2.3 F - 2.8 F	0/4
Iron	300	4000 - 182000	4/4	125 J	1/4	616	1/4	69.8 F - 33500	1/4
Lead	25	11.5 - 251	1/4	ND	0/4	ND	0/4	ND	04
Manganese	300	920 - 9700	4/4	3.8 - 3240	1/4	2.3 F - 9190	1/4	5.3 F - 10300	1/4
Petroleum Hydrocarbons									
PHC as Diesel Fuel	NS	0.27 J - 2.3 J	0/4	NA		NA		NA	

Notes:

a - Frequency of Detection above NYSDEC GW Standards.

b - Results reported from dissolved metals analysis.

F - The analyte was positively identified but the associated numerical value is below the Reporting Limit.

J - The analyte was positively identified, the quantitation is an estimation.

NA - Data is not available.

ND - The analyte was analyzed for, but not detected.

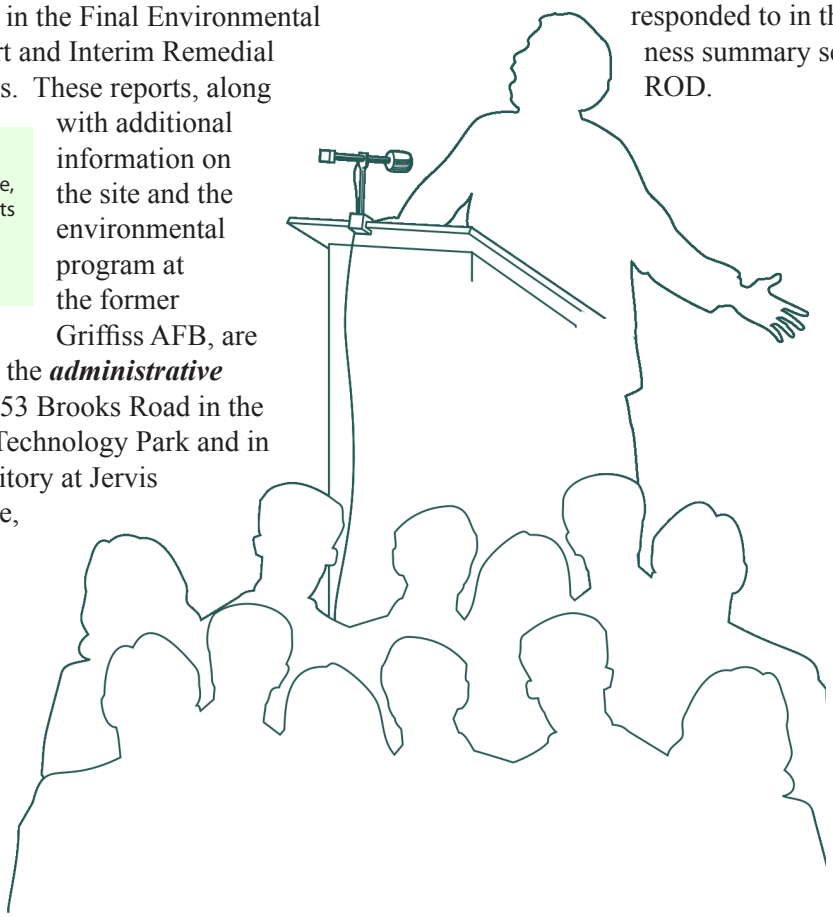
NS - No NYSDEC GW Standard applies to this analyte.

Community Participation

The agencies desire to have an open dialogue with citizens concerning the results of the site assessment investigation and subsequent interim remedial actions performed at the SAR and encourage citizens to participate by commenting on the proposal to take no further action at the site. This interaction between the agencies and the public is critical to the CERCLA process and to making sound environmental decisions. Interested parties can find details on this site in the Final Environmental Site Assessment Report and Interim Remedial Action Closure Reports. These reports, along with additional information on the site and the environmental program at the former Griffiss AFB, are available for review in the ***administrative record*** file located at 153 Brooks Road in the Griffiss Business and Technology Park and in the Information Repository at Jervis Public Library in Rome, New York.

Administrative Record
Documents including correspondence, public comments, and technical reports upon which the agencies base their remedial action selection.

The public is encouraged to review all aspects of the ESA and IRA reports for the SAR and the administrative record and comment on the agencies' proposal to take no further action at this site. The agencies will consider all public comments on this proposed plan in preparing the ROD. Depending on comments received, the plan presented in the ROD could be diffferent from the actions presented in this proposed plan. All written comments will be summarized and responded to in the responsiveness summary section of the ROD.



How You Can Participate

Whether you are reading this type of document for the first time or are familiar with the Superfund process, you are invited to participate in the process.

- Read this proposed plan and review additional documents in the administrative record file.
- Contact the Air Force, EPA, or NYSDEC project managers listed on page 22 to ask questions or request information.
- Attend a public meeting and give verbal comments (see details below).
- Submit written comments (see comment form on back cover) by September 5, 2006.

Public Comment Period

The agencies have set a public comment period from August 4, 2006, to September 5, 2006, to encourage public participation in the selection process. Written comments should be sent to:

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441

Public Meeting

A public meeting is not currently planned during this public comment period. However, following the review of written public comments, a public meeting may be convened as a result of significant public interest.

Environmental Timeline Small Arms Range

Problem Identification/ Records Search: 1981

Problem Confirmation and Quantification: 1982

Field Investigation: 1985

Griffiss AFB added to National Priorities List: 1987

Health Assessment: 1988

EPA, NYSDEC, and Air Force enter into Federal Facility Agreement: 1990

Griffiss designated for Realignment by BRAC: 1993 and 1995

ATSDR Health Assessment: 1995
Addendum: 1996

SAR Added to Federal Facility Agreement: September 1997

Environmental Site Assessment Report Final: September 1997

SAR First Interim Remedial Action Completed: October 1999

SAR Second Interim Remedial Action Completed: September 2002

Proposed Plan Final: August 2006

Public Comment Period: August 4, 2006 - September 5, 2006

More Griffiss Air Force Base Environmental Information

General information concerning the environmental program at the former Griffiss AFB can be found in the Information Repository located at the Jervis Public Library, 613 North Washington Street, Rome, New York 13440 (phone 315-336-4570). Visit the repository or call 315-330-2275 to ask about the installation activities or request background information.



Additional Information

Three agencies have been identified in the Federal Facility Agreement: the Air Force, NYSDEC, and EPA. The agreement ensures that environmental impacts on public health, welfare, and the environment associated with past and present activities at the former Griffiss AFB are thoroughly investigated and appropriate remedial actions are taken as necessary to protect the public health, welfare, and the environment. Any of the following agency representatives may be contacted to obtain additional information:

The **Air Force** is legally responsible for the environmental activities at the former Griffiss AFB. Since this site is on the National Priorities List, all investigations and cleanup plans are finalized only after consultation with the EPA and the NYSDEC.

For additional information concerning the environmental program at the former Griffiss AFB and the Air Force's role in preparing this proposed plan, contact:

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441
(315) 330-2275

The New York State Department of Environmental Conservation

For additional information concerning the state's role in preparing this proposed plan, contact:

Ms. Heather Bishop
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233
(518) 402-9764

The U.S. Environmental Protection Agency

For additional information concerning the EPA's role in preparing this proposed plan, contact:

Mr. Douglas Pocze
U.S. Environmental Protection Agency,
Region II
290 Broadway, 18th floor
New York, NY 10007-1866
(212) 637-4432

(Comments continued. Attach additional pages, if necessary.)

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Place
Stamp
Here

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
153 Brooks Road
Rome, NY 13441

Small Arms Range

This comment form is provided for your convenience in submitting written comments to the Air Force Real Property Agency concerning the Small Arms Range. If you would like to receive a copy of the Record of Decision and Responsiveness Summary, which address public comments received on this proposed plan, please ensure that the information on the mailing label below is correct.

Comments:

(continued on reverse)

BRAC Environmental Coordinator
AFRPA/DA - Griffiss
153 Brooks Road
Rome, NY 13441

This mailing
is to inform you of
the proposed
environmental plan
for the
Small Arms Range
at the former
Griffiss AFB,
and to solicit
your comments.