Final

Record of Decision

The Small Arms Range
(OT-61)
at the
Former Griffiss Air Force Base
Rome, New York

September 2007

AIR FORCE REAL PROPERTY AGENCY

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List of Abbreviations and Acronyms

AFB	Air Force Base
AFRPA	Air Force Real Property Agency
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
BGS	Below ground surface
BRAC	Base Realignment and Closure Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	Chemicals of Potential Concern
CY	Cubic Yards
DOD	Department of Defense
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
FFA	Federal Facility Agreement
FWIA	Fish and Wildlife Impact Analysis
GLDC	Griffiss Local Development Corporation
IRP	Installation Restoration Program
µg/L	micrograms per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEADS	Northeast Air Defense Sector
NPL	National Priorities List
NYANG	New York Air National Guard
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
PRG	Preliminary Remediation Goal
RAB	Restoration Advisory Board
ROD	Record of Decision
SAC	Strategic Air Command
SAR	Small Arms Range
SVOC	Semi-volatile organic compound
STARS	Spill Technology and Remediation Series
TAL	Target Analyte List
TBC	To Be Considered
TCLP	Toxicity characteristic leaching procedure
TOGS	Technical and Operational Guidance Series
VOC	Volatile organic compound
XRF	X-Ray Fluorescence

1 Declaration

1.1 Site Name and Location

The Small Arms Range (SAR) (site identification designation OT-61) is located at the former Griffiss Air Force Base (AFB) in Rome, Oneida County, New York.

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) presents no further actions for soil and groundwater as the selected remedy for the SAR at the former Griffiss AFB. This alternative has been chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

The remedy has been selected by the United States Air Force (Air Force) in conjunction with the United States Environmental Protection Agency (EPA) and with concurrence of the New York State Department of Environmental Conservation (NYSDEC) pursuant to the Federal Facility Agreement (FFA) among the parties under section 120 of CERCLA. This decision is based on the administrative record file for the SAR.

1.3 Assessment of the Site

Based upon the previous removal actions performed and the achievement of cleanup levels for unrestricted use, no further action is selected as the final action for the SAR.

1.4 Description of Selected Remedy

The selected remedy for the SAR is no further action for soil and groundwater. Following the implementation of the two removal actions taken by the Air Force, the residual level of metals (antimony, copper, and lead) contamination in the soil does not exceed standards or guidance values. Since residual levels of contaminants in the soil are limited in their extent and do not pose a risk for continued groundwater contamination, the soil is not considered to be a current or potential threat to the public or the environment.

No volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) were detected in samples obtained at the SAR which exceed the New York State (NYS) Class GA groundwater standards or NYS groundwater guidance values during the closure evaluation/investigation. Confirmatory soil sampling also verified that the remaining soil on-site is below the preliminary remediation goals (PRGs) established as screening levels.

1.5 Statutory Determinations

It has been determined that no remedial action is necessary at the SAR. The Air Force Real Property Agency (AFRPA) and EPA, with concurrence from NYSDEC, have determined that no further action for soil and groundwater is warranted for this site.

As a result, five-year reviews will not be required for this site..

1.6 Authorizing Signatures

On the basis of the two previous removal actions and subsequent investigations performed at the SAR, there is no evidence that residual contamination at this site poses a current or future potential threat to human health or the environment. The NYSDEC has concurred with the selected remedy presented in this Record of Decision.

Jeffrey Domm
Deputy Director
Air Force Real Property Agency

25 Sept 2007
Date

George Pavlou
Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region 2

9/27/07
Date

2 Decision Summary

2.1 Site Name, Location, and Brief Description

The SAR (site identification designation OT-61) is located at the former Griffiss AFB in Rome, Oneida County, New York. Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the National Priorities List (NPL) on July 15, 1987. On August 21, 1990, the EPA, NYSDEC, and the Air Force entered into an FFA under Section 120 of CERCLA.

The SAR is located northeast of Perimeter Road (see Figure 1). It is bordered on the northeast by a wooded area, on the north by Landfill 1, on the east by Hardfill 49A (consisting of building debris and refuse), and on the southwest by a gravel road as shown by Figure 2. The SAR originally included a berm along with a 100-yard backstop. Directly to the east, the SAR is bordered by an off-base vacant woodlot. In the early 1980s, the former SAR berm was demolished and a new berm was constructed that reduced the shooting range distance to 50 yards (see Figure 3). The footprint of the former berm (a 100-yard range), after being spread, was later used for disposal of hardfill in conjunction with the Hardfill 49A operation.

2.2 Site History and Enforcement Activities

2.2.1 The Former 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 Air Force in 1947, the depot was renamed Griffiss AFB. The base became an electronics center in 1950, with the transfer of 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 Ground Electronics Engineering Instal-

lations 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 (BRAC) 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 established their present operating location at the former Griffiss AFB.

2.2.2 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 upon the installation. The defense missions for the base involved, among others, 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 (DOD) 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 (Engineering Science 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 (Weston 1982) and 1985 (Weston 1985); soil and groundwater analyses in 1986; a basewide health assessment in 1988 by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR) (ATSDR 1988); base-specific hydrology investigations in 1989 and 1990 (Geotech 1991); a groundwater investigation in 1991; and site-specific investigations between 1989 and 1993. ATSDR issued a Public Health Assessment for Griffiss AFB, dated October 23, 1995 (ATSDR 1995), and an addendum, dated September 9, 1996.

Pursuant to Section 105 of CERCLA, Griffiss AFB was included on the National Priorities List (NPL) on July 15, 1987. On August 21, 1990 the Air Force, EPA and NYSDEC entered into a Federal Facility Agreement (FFA) under section 120 of CERCLA. The SAR was added to the FFA by the EPA and the NYSDEC per their request in September 1997. Under the terms of the FFA, 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 removal actions included work plans, each made up of a Project Management Plan, a Health and Safety Plan, and an Environmental Sampling and Analysis Plan, and closure reports. These documents were approved by the EPA and the NYSDEC.

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 assumption 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 (ARARs) at the SAR.

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 (TBCs), and background levels of the contaminants in the absence of TBCs, were considered. For groundwater, the standards used were values that have been promulgated and placed into regulation according to scientific procedures that are in regulation (6 NYCRR Part 702). Guidance values were used where a standard for a particular substance has not been established for a particular water class and type of value (section 702.15). The standards and guidance values are presented in the Division of Water Technical and Operational Guidance Series (TOGS). The NYS Class GA Groundwater Quality Standards were identified as chemical-specific ARARs.

2.3 Community Participation

A proposed plan for the SAR, indicating no further action for soil and groundwater, was released to the public on August 4, 2006. The document was made available to the public in the administrative record file located at 153 Brooks Road in the Griffiss Business and Technology Park. The notice announcing the availability of this document was published in the *Rome Sentinel* on August 4, 2006. A public comment period lasting from August 4, 2006 to September 5, 2006, was established to solicit public comments on the proposal to take no further action at the SAR. The Air Force was available to answer questions about issues at the SAR and the proposal under consideration. The status of the SAR was briefed in the May 25, 2006 and November 8, 2006 Restoration Advisory Board (RAB) meetings.

2.4 Scope and Role of Site Response Action

The decision for no further action includes the evaluation of both the soil and groundwater at the SAR. The SAR does not pose an unacceptable risk to human health or to the environment.

2.5 Site Characteristics

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 NYS 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.

Located northeast of Perimeter Road the SAR is bordered on the north by Landfill 1, on the east by Hardfill 49A, and on the west by a gravel road (see Figure 2). 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 SAR. The Six

Mile Creek tributary, which receives groundwater discharge, is located approximately 600 feet south and southwest of the SAR. Six Mile Creek is located 1000 feet southwest of the SAR. In the area of the SAR, the average depth to the water table is approximately 13 feet below ground surface (bgs).

The SAR consists mainly of two distinct areas; the southern main range (approximately 2 acres) and the northern supplemental range (approximately 1 acre). The main range was built in 1961 for small arms training while the supplemental range was built in 1987 for machine gun training. 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 (see Figure 3).

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 ranges are separated by the northern berm of the main range, while the supplemental range is open on the northern side. Both the berms and infield areas of the ranges are fully vegetated; only the infield areas are mowed. Two office/maintenance buildings (Structures 854 and former Structure 853) are associated with the SAR. It is reported that the SAR originally included a 100-yard backstop, which was replaced in the early 1980s with a berm that shortened the range to 50-yards (see Figures 2 and 3). The footprint of the former berm (100-yard range) was then later used for disposal of hardfill in conjunction with the Hardfill 49A operation.

The Hardfill 49A was formerly adjacent to the SAR with a portion of the hardfill overlapping with the former SAR berm area. Hardfill 49A is approximately a 3-acre area that was an extension of the original SAR and later informally used for the placement of hardfill material and construction and demolition materials after the SAR was reconfigured to its present orientation. Hardfill material included concrete, metallic debris and wood. A geotextile liner was installed and the area was graded with a minimum of ten inches of soil.

2.5.1 Environmental Site Assessment

In 1996, an ESA was performed to investigate the nature and extent of environmental contamination from historical releases at the SAR. To characterize the lateral and vertical extent

of lead and other metals in the surface soils and shallow subsurface soils (2 ft bgs), hand auger borings were obtained at 35 locations. Five soil borings and three monitoring well borings were also drilled to characterize soils vertically and to facilitate shallow and deeper subsurface soil sample collections. Groundwater monitoring wells were installed around the perimeter of the SAR to determine whether the shallow groundwater was impacted.

During the ESA four groundwater samples were collected from monitoring wells that were installed around the SAR and submitted for analysis of VOCs, SVOCs, metals, and diesel-range petroleum hydrocarbons. No VOCs or SVOCs were detected in the samples collected from the wells. Although diesel-range petroleum hydrocarbons were detected in the samples, the upgradient concentration was higher than the downgradient concentrations, indicating that these compounds were 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 levels in a downgradient groundwater sample, indicating a release of lead.

SAR soil data were compared to background screening levels (two times the previously established background concentrations), where concentrations exceeding these levels by more than a factor of two would indicate releases from the SAR. Groundwater results were compared to both the upgradient concentration and the NYS Class GA Groundwater Standards and/or Guidance Values. To determine whether migration was occurring, downgradient samples were assessed.

In all soil samples collected (111 in total) from all depths, 15 metals were detected above the background screening levels in at least one soil sample. Of those, antimony, copper, and lead were considered to be directly attributed to the activities at the SAR. Lead contamination found at the SAR was discovered to decrease with depth, and samples collected below two feet were below background screening levels. This indicates that vertical migration of site-related contamination was not occurring. Of the soil samples collected, 35 samples were reported to have lead contamination above two times the basewide background levels (detected concentrations of lead ranged from 1.39 mg/Kg to 246,730.3 mg/Kg). Arsenic was also present at the SAR, but at concentrations within one order of magnitude of the background screening level of 4.9 mg/kg. The concentrations of arsenic in surface soils are uniformly distributed throughout the Base and therefore not directly attributed to the activities of the SAR. One sample location from the supplemental range was reported with an anomalous arsenic concentration of 260 mg/kg; however, this area

was later removed, as it was included within the limits of the excavation area associated with the first removal action.

2.6 Current and Potential Future Site and Resource Uses

Under the Proposed Action for the reuse of Griffiss AFB developed by the Griffiss Local Development Corporation (GLDC), the SAR area has been designated as vacant land (development reserve). Since 1996, Oneida Indian Nation Police have been using the SAR for limited firearms training approximately once every six months, firing less than 6,000 rounds of environmentally safe bullets per year. Since the existing SAR backstop berm borders the SAR in the direction or line of fire, future use of the SAR area will likely be vacant property, tied to usage of the SAR as a limited use small arms firing range. There is no anticipated groundwater use because of local municipal water service, however NYS default groundwater classification is Class GA. Class GA represents groundwater effluent limitations that are in regulation (6 NYCRR 703.6).

2.7 Summary of Site Risks

Site risks were analyzed based on the extent of contamination at the SAR. As part of the ESA, a baseline risk assessment was conducted to evaluate current and future potential risks to human health and the environment associated with contaminants found in the soil and groundwater at the SAR.

2.7.1 Human Health Risk Assessment

A baseline human health risk assessment was conducted during the ESA, prior to the removal actions, to determine whether chemicals detected at the SAR could pose health risks to individuals under the current and proposed future land uses. As part of the baseline risk assessment, the following four-step process was used to assess site-related human health risks for a reasonable maximum exposure scenario:

- Hazard Identification – identifies the contaminants of concern at the SAR 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., ingestions of 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); and
- 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 [HI] 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 COPCs which were representative of conditions at the SAR. COPCs 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 SAR by authorized users or who trespass during inactive periods, and workers who are exposed to soil and groundwater used for industrial purposes. 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 SAR 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.

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.

The decision whether to conduct site remediation is based on the risk to human health and the environment. Cleanup actions may be taken when the risk at a site exceeds the cancer risk level of 1 in 10,000 (1×10^{-4}) or 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.

Carcinogenic Risk

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 was 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 PRG, which is based on the federal 400 mg/kg level specified as protective for children's play areas. The limits of excavation performed during the removal actions performed at the SAR were guided by this PRG.

Noncarcinogenic Risk

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 removal action).

Because there are no toxicity values available for lead, lead was evaluated separately. Prior to the removal action, 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.

Summary

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. Quantitative evaluation of risk is subject to several conservative assumptions and should not be considered an absolute measure of risk.

2.7.2 Uncertainties

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) the HIs and carcinogenic risks associated with dermal contact with soil and groundwater and ingestion of soil were not quantified for lead because of a lack of toxicity values, 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 EPA's acceptable range of risk. Furthermore, the removal actions have addressed the presence of any such compounds in the surface soil within the areas of soil removal.

2.7.3 Ecological Risk Assessment

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

A NYS 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. A pathway analysis was conducted to establish resources which may be exposed to chemicals at the SAR or migrating from the SAR. 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 removal actions.

Migration of metals from the site surface soils via run-off or erosion into Six Mile Creek was considered unlikely because of 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.

2.8 Interim Removal Actions

2.8.1 First SAR Removal Action

Based on the recommendations of the ESA, the first removal action was performed in two phases by PEER at the SAR in 1998-1999. A total of approximately 11,800 tons of lead-contaminated soil were removed, transported off the base, stabilized, and landfilled. The initial

phase consisted of a total of 2,627.41 tons of contaminated soil being removed from the faces of the berms and up to one foot from the range floor. The berms were later rebuilt to facilitate future use as a small arms range. During the removal action, a much greater area of lead contaminated soil was identified than anticipated during the original scope of the work. The second phase was performed during 1999 and a total of 9,168.13 tons of soil were removed during this phase of the remediation (see Figure 4). Both removal activities were performed by screening the soil using hand held X-ray fluorescence (XRF) spectroscopy unit. These were also used to identify when the PRG of 400 mg/kg lead was achieved. Over-excavation was performed in locations where confirmation sampling exceeded this level.

2.8.2 Second SAR/Hardfill 49A Removal Action 2002

Parsons performed a second removal action from March through September 2002 at the SAR/Hardfill 49A site (see Figure 4). In total 10,325 cubic yards (cy) of material were excavated and screened. All the material from the entire excavation area was screened at 2" and the larger section (>2 inch) of the material was manually sorted into wood, metal, stones, brick, and concrete. Wood and metal were disposed of offsite and the stones, brick and concrete were rescreened and staged for reuse.

All material smaller than 2 inch, was rescreened at 0.25 inch. The larger portions of this rescreening (0.25 - 2 inch) were visually inspected and noted to contain lead bullets, bullet casings and other metal evidence. This material was staged pending sampling and analysis and off-site disposal. The results from the sampling indicated that the material was considered to be non-hazardous. The smaller section (0.25 inch) was observed to be free of contamination and was staged in 500 cy stockpiles. Composite samples of each pile were submitted to an off-site laboratory and analyzed for Target Analyte List (TAL) Total Metals (including total lead) and Toxicity Characteristics Leaching Procedure (TCLP) Lead to test for 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. The results from this procedure indicated that the material was below the PRG of 400 mg/kg for lead and reusable as backfill.

Groundwater Analysis

The NYS Class GA Groundwater Standards were used to assess groundwater quality. Class GA waters are defined as fresh groundwater found in the saturated zone of unconsolidated deposits, consolidated rock, and bedrock. The best use of Class GA waters is as a source of potable water.

Samples collected during the 2000, 2001, and 2003 sampling events indicated no detections of either total or dissolved lead at concentrations above the NYS Class GA Groundwater Standard (25 µg/L). Several exceedances of the NYS Groundwater Standards during each sampling event were noted for iron and manganese which are widespread throughout the Base and therefore are neither limited nor specific to the SAR. The magnitude of the levels were in general, however, significantly lower than those reported in samples collected in June 1999, perhaps as a result of the lower suspended solids concentrations (based on the results of field sampling), and/or the source removal along with the removal of contaminated soils associated with the removal action.

Soil Analysis

Post-excavation confirmatory sampling was performed at the excavated area within the footprint of Hardfill 49A (Figure 4) using a 50' x 50' grid system (divided into 27 sub-grids). One composite sample was submitted from five grab samples collected within each sub-grid within the excavated area at a depth from 0 to 6 inches. The composite samples were analyzed for TAL Total Metals and TCLP Lead. The confirmation samples indicated that all results were below the PRG of 400 mg/kg for lead.

The results of the TCLP analysis showed that all samples contained less than 5 mg/L lead and therefore were considered non-hazardous. One sample (HF49A-CS-14A0) 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.

During the closure evaluation/investigation, no contamination exceeding ARARs were identified in soil or groundwater samples and the SAR was recommended for closure.

2.9 Remedial Action Objectives

No remedial action objectives are defined in this section because of the no further action alternative for soil and groundwater at the SAR.

2.10 Comparative Analysis of Alternatives

The no further action alternative for soil and groundwater was assessed on the basis of both a detailed and a comparative analysis pursuant to the NCP. The analysis of the SAR consisted of an assessment of the alternative against nine evaluation criteria. In general, the following "threshold" criteria must be satisfied by the proposed alternative for it to be eligible for selection:

1. Overall protection of human health and the environment addresses whether a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with ARARs addresses whether a remedy would (a) meet all of the ARARs or (b) provide grounds for invoking a waiver.

In addition, the following "primary balancing" criteria are used to make comparisons and identify major trade-offs:

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of toxicity, mobility, or volume via treatment refers to a remedial technology's expected ability to reduce the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants at the site.

5. Short-term effectiveness addresses (a) the period of time needed to achieve protection and (b) any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.

6. Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. Cost includes estimated capital, operation and maintenance, and present-worth costs.

Finally, the following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. State acceptance indicates whether, based on its review of the RI and the Proposed Plan, the State supports or opposes the preferred alternative and/or has identified any reservations with respect to the preferred alternative.

9. Community acceptance refers to the public's general response to the alternatives described in the Proposed Plan and the RI reports. Factors of community acceptance include support, reservation, or opposition by the community.

The no further action alternative for soil and groundwater complies with the nine criteria presented above.

2.11 Principal Threat Wastes

There are no principal threat wastes at the SAR.

2.12 Selected Remedy

The Selected Remedy for the SAR is no further action for soil and groundwater. Following the implementation of the previous removal actions, no residual chemicals detected at the SAR exceed standards or guidance values. Therefore, the soil and groundwater are not considered to be a current or potential future threat to the public or the environment.

2.13 Statutory Determinations

It has been determined that no remedial action is necessary at the SAR. The Air Force and EPA, with concurrence from NYSDEC, have determined that no further action for soil and groundwater is warranted for the SAR.

As a result, five-year reviews will not be required for the SAR.

2.14 Documentation of Significant Changes

No significant changes have been made to the selected remedy from the time the proposed plan was released to the public for comment.

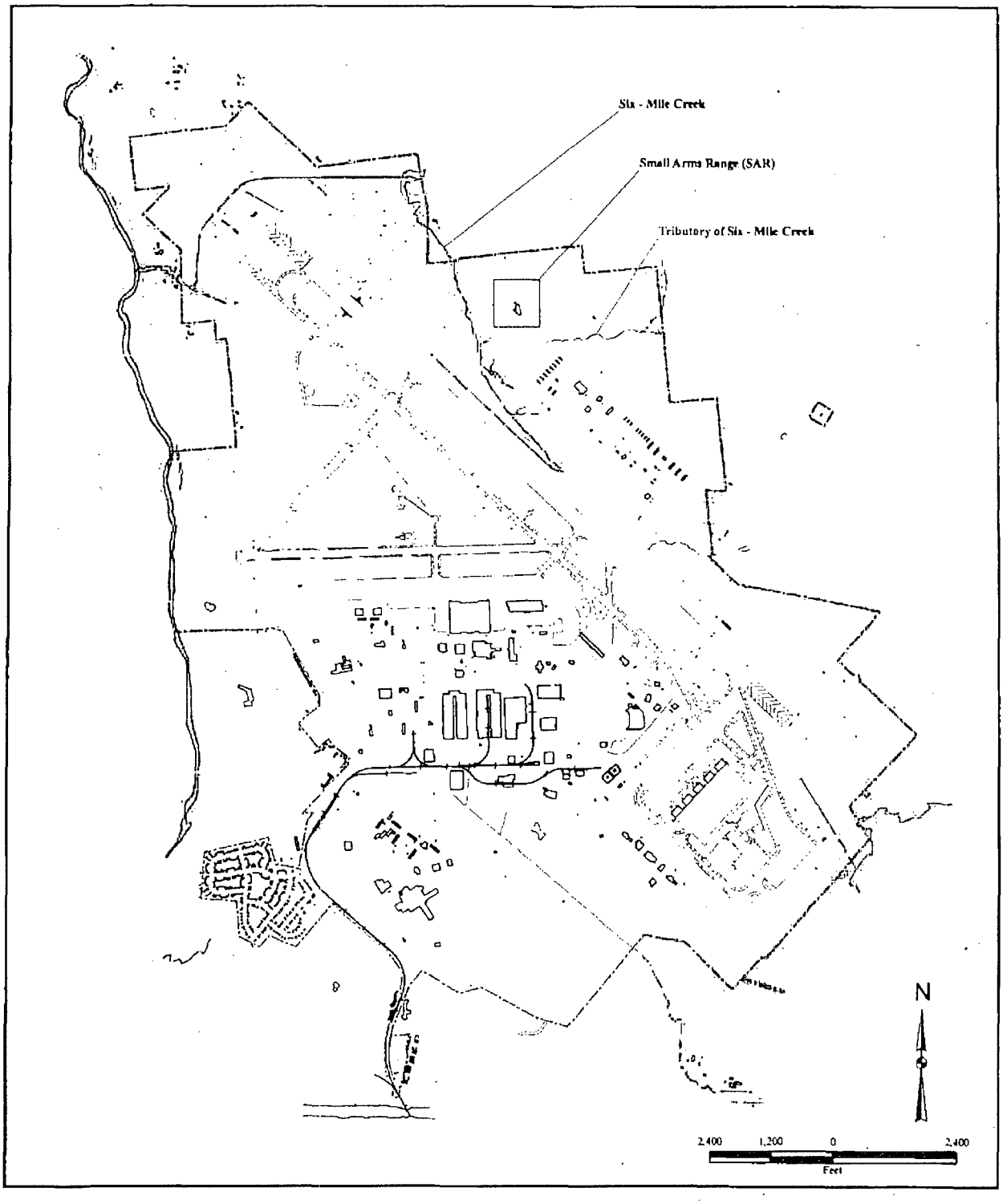


Figure 1: Location of the Small Arms Range at the former Griffiss AFB.

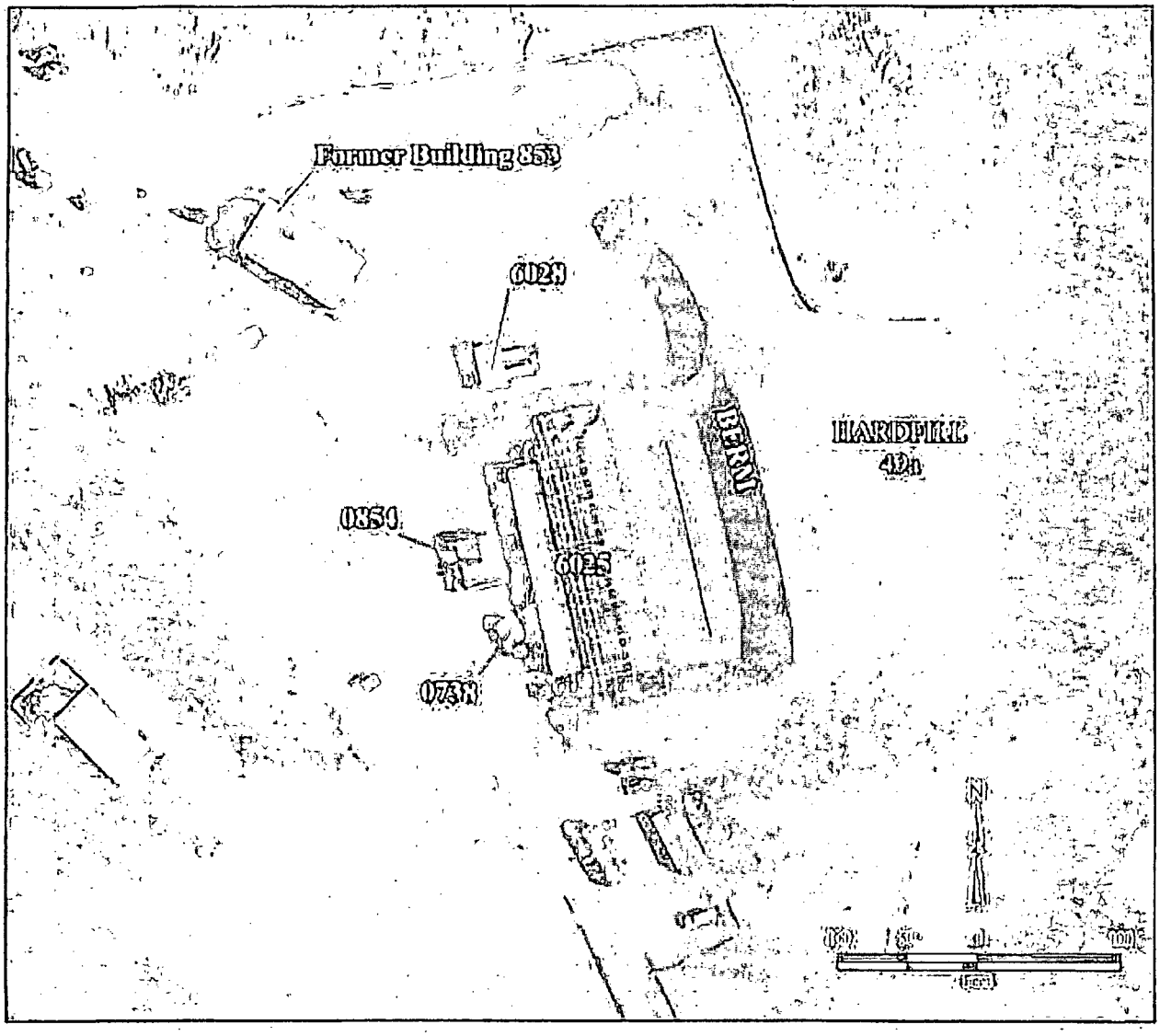
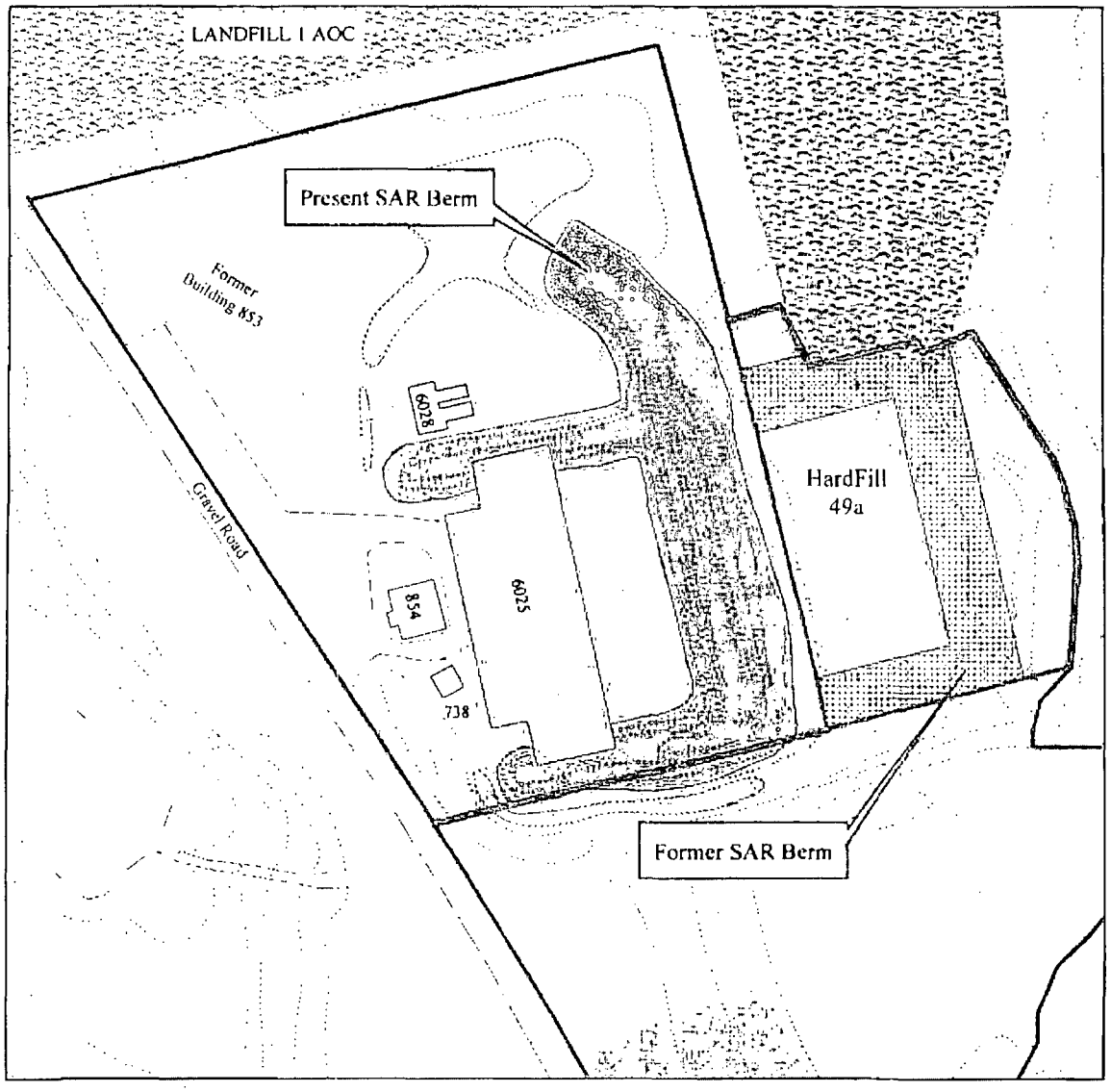


Figure 2 Aerial Photo of the Small Arms Range, April 2003.



N

50 25 0 50 100 150 Feet

Figure 3 : Small Arms Range - Present and Former Berm

SAR Boundary
HardFill 49A
Land Surface 5-ft Contours
Roads
Sar Berm
Former SAR Berm
Hardfill Material
Landfill
Demolished Facilities
Existing Facilities

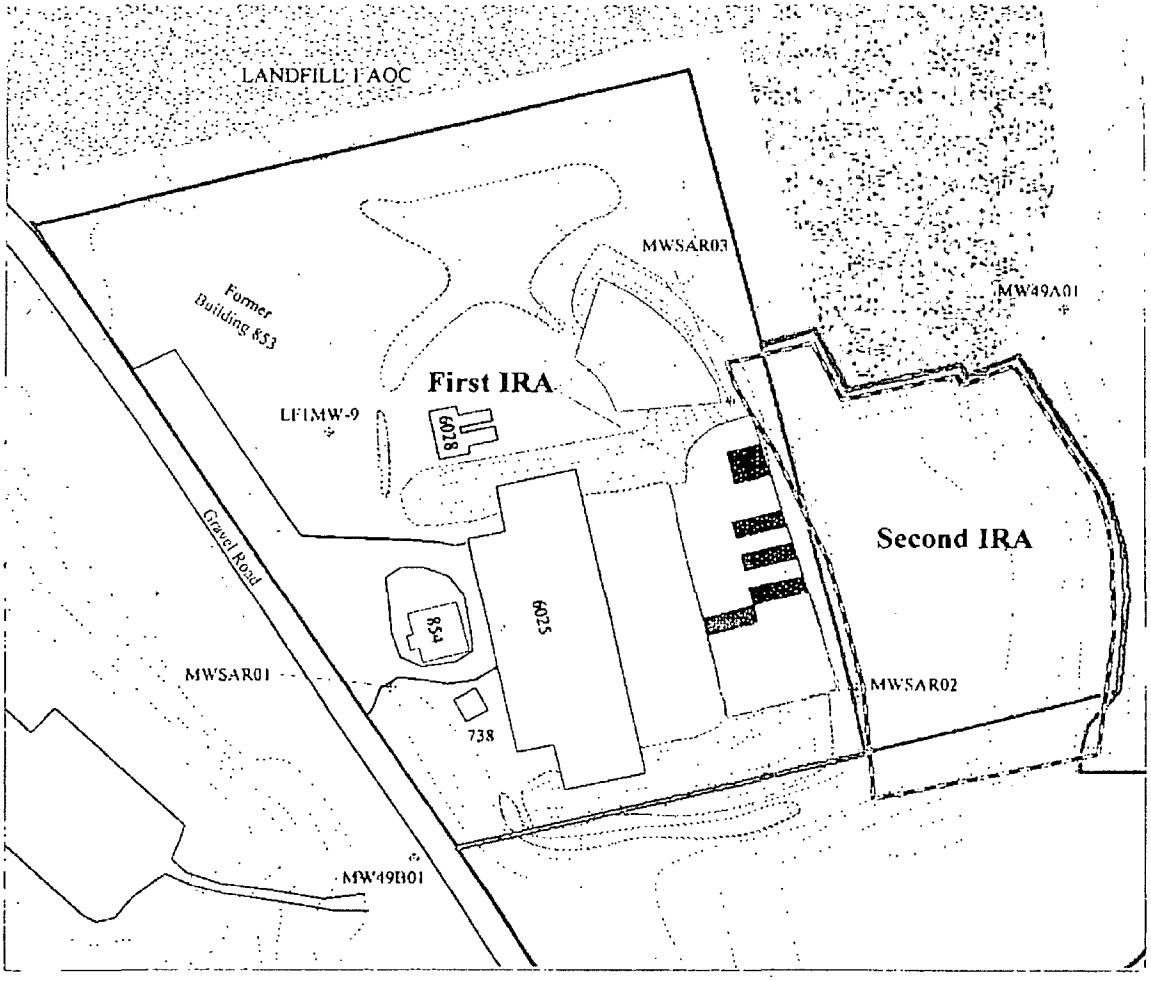
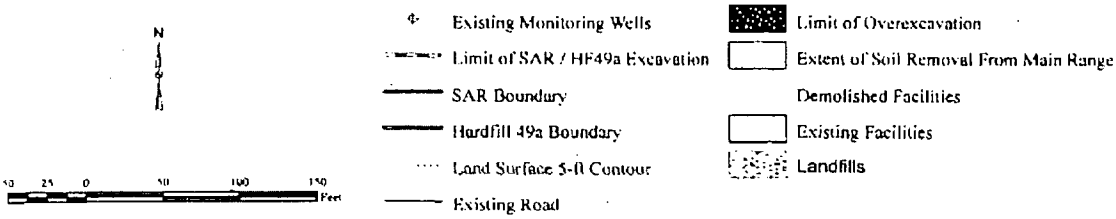


Figure 4 : Small Arms Range - IRA Removal Areas



3 Responsiveness Summary

On August 4, 2006, the AFRPA, following consultation with the concurrence of the EPA and NYSDEC, released for public comment the proposed plan for no further action for soil and groundwater at the Small Arms Range at the former Griffiss AFB. The release of the proposed plan initiated the public comment period, which concluded on September 5, 2006.

The public comment period was intended to elicit comments on the proposal for no further action at the SAR. The status of the SAR was briefed in the May 25, 2006 and November 8, 2006 RAB meetings. On May 25, 2006, the RAB meeting attendees were informed that the proposed plan will be available for public review and comment. On November 8, 2006, the RAB meeting attendees were informed that no comments were received on the Proposed Plan for the SAR and the ROD is pending.

4 References

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Weston, December 1982, *Installation Restoration Program Phase II - Problem Confirmation and Quantification Study Stage 1, Griffiss Air Force Base, Rome, New York*, prepared for United States Air Force, Brooks AFB, Texas.