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EPA Superfund
Record of Decision:

GRIFFISS AIR FORCE BASE (11 AREAS)
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ROME, NY
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Final Record of Decision for the Landfill 5 Area of Concern at the Former Griffiss Air Force Base Rome, New York

March 2000

Table of Contents

Section **Page**

List of Tables

Table **Page**

List of Illustrations

Figure **Page**

List of Acronyms

AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BGS	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DFAS	Defense Finance and Accounting Services
DoD	Department of Defense
EPA	United State Environmental Protection Agency
FFA	Federal Facility Agreement
GPR	ground-penetrating radar
HI	Hazard Index
HQ	Hazard Quotient
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEADS	Northeast Air Defense Sector
NPL	National Priorities List
NYANG	New York Air National Guard
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
PCB	polychlorinated biphenyl
RAB	Restoration Advisory Board
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SAC	Strategic Air Command
SVOC	semivolatile organic compound
TOC	total organic carbon
VOC	volatile organic compound

1 Declaration

1.1 Site Name and Location

The Landfill 5 Area of Concern (AOC) 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 the presumptive remedy alternative as the selected remedial action for the Landfill 5 AOC 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, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Air Force Base Conversion Agency (AFBCA), the United States Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC) have adopted this ROD through joint agreement. Information supporting this decision is contained in the administrative record file for this site.

1.3 Assessment of the Site

Actual or threatened release of hazardous substances from the AOC, if not addressed by implementing the response action selected in this ROD, may present a potential threat to public health, welfare, or the environment.

1.4 Description of Selected Remedy

The selected remedy for the Landfill 5 AOC is the Presumptive Remedy, which was developed in accordance with EPA Presumptive Remedy Guidance for Military Landfills, dated April 29, 1996, for the expeditious cleanup of sites that are similar in character to a large number of CERCLA sites that have already been remediated. Presumptive remedies are preferred technologies for common categories of sites based on historical patterns of remedy selection and EPA's scientific and engineering evaluations of performance data on technology implementation. The remedy addresses the threats to human health and the environment that are posed by exposure to soil, sediment, surface water, and groundwater at the site. The major components of the selected remedy include:

- Installation of a low-permeability soil cover in accordance with 6 NYCRR Part 360 landfill closure regulations, dated April 1, 1987; this action would include placing a minimum of 18 inches of low-permeability soil and 6 inches of topsoil over the entire landfill surface to reduce the amount of water infiltrating through the landfill;

- Maintenance of the cover and long-term monitoring of the groundwater and stream environment; the groundwater will be monitored in accordance with the Air Force's On-base Groundwater Monitoring Plan and the stream environment will be monitored in accordance with a future plan to be prepared for the Three Mile Creek AOC; both plans will be subject to the review and approval of the EPA and NYSDEC;

- Monitoring of the groundwater and stream environment downgradient of the site to evaluate the effectiveness of the presumptive remedy;

- Implementation of institutional controls in the form of deed restrictions of the main landfill boundary to prohibit use of the area and groundwater, and to ensure the soil cover is not damaged and the area is maintained as a landfill; and

- Evaluation of site conditions at least once every five years to ensure that the remedy is protective of human health and the environment.

Executive Order 11990 Finding of No Practicable Alternative – Wetlands

There are no practicable alternatives to prevent disturbance of the wetlands during construction of the landfill cover. Some disturbance and discharge of fill material may

occur either in or immediately adjacent to the wetlands. The Air Force will take all practicable measures to minimize harm to the wetlands, which will include appropriate mitigation (e.g., wetlands restoration in consultation with the Army Corps of Engineers, EPA, and NYSDEC). The Air Force will obtain the necessary funding, to the extent Congress appropriates such funds, to complete the wetlands restoration.

1.5 Declaration Statement

The AFBCA, EPA, and NYSDEC have determined that the selected remedy will be protective of human health, and the environment and meets the requirements for remedial action set forth in CERCLA, Section 121. The Presumptive Remedy is cost effective and includes a review of the remedial action, which will be conducted five years after commencement of the remedial action, to ensure that the remedial action continues to provide adequate protection to the human health and the environment. Future potential risks associated with the site will be abated through the implementation of the selected remedy of landfill capping, groundwater restrictions, and monitoring. Installation of a soil cover, in accordance with 6 NYCRR Part 360 landfill closure regulations, will eliminate the possibility of human exposure to the landfill mass and reduce the amount of water infiltration through the landfill, which will reduce the production of leachate and reduce further groundwater degradation. In addition, institutional controls in the form of land use restrictions will prohibit use of the area, with groundwater consumption being specifically restricted.

In every case, the goal of each institutional control will be to prevent exposure to residual contamination, while at the same time allowing for redevelopment of the property in a manner that will not endanger human health and the environment. Each identified institutional control will specify the restriction imposed on the property, how such restriction will be implemented, monitored, and later enforced in the event a violation occurs.

The selected remedy represents the most appropriate approach to containment and reliable long-term protection of human health and the environment at the Landfill 5 AOC.

1.6 Signature of Adoption of the Remedy

On the basis of the remedial investigations (RIs) performed at the Landfill 5 AOC and the baseline risk assessment, the presumptive remedy is the selected remedy for the Landfill 5 AOC. The selected remedy meets the requirements for remedial action set forth in CERCLA, Section 121. NYSDEC has concurred with the selected remedial action presented in this ROD.

_____ _____

Albert F. Lowas, Jr. Date
Director
Air Force Base Conversion Agency

_____ _____

Jeanne M. Fox Date
Regional Administrator
United States Environmental Protection Agency, Region 2

2 Decision Summary

2.1 Site Name, Location, and Description

Regional Site Description

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.

Landfill 5 Area of Concern

Landfill 5 is an approximately 4-acre area located in the south-central portion of the former Griffiss AFB (see Figures 1 and 2) less than 1,000 feet south of the base industrial complex. The landfill is unlined, uncapped, and covered by a shallow layer of local soil. The soil cover is extremely shallow in the southern area of the landfill, with wastes protruding from the ground surface. The northern portion of the landfill is flat and covered with grass and was constructed using an area-type method to a total depth of approximately 6 feet. The southern portion of the landfill is covered by dense, brush undergrowth, and is heavily wooded. It was constructed directly on the floodplain of Three Mile Creek to a height of approximately 12 feet and is adjacent to regulated

forested wetland areas. A hardfill area (Hardfill 49D) is located to the northwest of Landfill 5. Debris such as empty drums has been observed in a pond to the east of Landfill 5.

The topography at the site slopes toward the south and west, with approximately 10 feet of topographical relief occurring across the site. Surface water runoff drains to one of three locations; a wetland southwest of the landfill, Three Mile Creek south of the landfill, and a drainage ditch on the west side of the landfill. The remediation activities associated with the drainage ditch will be discussed in the Three Mile Creek AOC. Groundwater flows toward the southwest (toward Three Mile Creek). Groundwater was encountered at depths of 4 to 10 feet below ground surface (BGS).

Shallow site soils consist of sandy peat, silty fine sand, and sandy silt to a depth of 2 feet BGS. Deeper soils consist of fine brown sand with varying amounts of silt and gravel from 2 BGS to 20 BGS.

2.2 Site History and Investigation Activities

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 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 Watson Laboratory Complex (later Rome Laboratory). The 49th Fighter Interceptor Squadron was also added in that year. In June 1951, the Rome Air Development Center was established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems. The Headquarters of the Ground Electronics Engineering Installations Agency was added 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 resulting in deactivation of the 416th Bombardment Wing in September 1995. Rome Laboratory

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 at various sites on the installation. The defense missions involved, among others, procurement, storage, maintenance, and shipping of war materiel; research and development; and aircraft operations and maintenance.

Landfill 5 operated for approximately one year following the abandonment of Landfill 6 in 1959. An estimated 18,000 cubic yards of municipal wastes were burned and covered at the landfill. Underground fires that were difficult to extinguish were reported to have occurred at the landfill.

Numerous studies and investigations under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP) 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 by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR); base-specific hydrology investigations in 1989 and 1990; 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, 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, USAF, EPA, and NYSDEC entered into a Federal Facility Agreement (FFA) under Section 120 of CERCLA.

Under the terms of the agreement, the Air Force was required to prepare and submit numerous reports to NYSDEC and EPA for review and comment. These reports address remedial activities that the Air Force is required to undertake under CERCLA and include identification of Areas of Concern on base; a scope of work for an RI; a work plan for the RI, including a sampling and analysis plan and a quality assurance project plan; a baseline risk assessment; a community relations plan; an RI report; a work plan and the report for a supplemental investigation; and a Landfill Cover Investigation Report. The Air Force delivered the draft-final RI report covering 31 AOCs to EPA and NYSDEC on December 20, 1996, and the final SI report was delivered on July 24, 1998. The Final Landfill Cover Investigation Report was delivered on December 8, 1997.

This ROD for remedial action is based on an evaluation of potential threats to human health and the environment due to contamination in the soil, sediment, and groundwater media at the Landfill 5 AOC and adjacent areas. During the RI, a site-specific baseline risk assessment (using appropriate toxicological and exposure assumptions to evaluate cancer risks and non-cancer health hazards) was conducted in order to evaluate the risks posed by detected site contaminants to the reasonably maximally exposed individual under current and future land use assumptions. The risk assessment for this site evaluated an unrestricted use scenario. In the RI 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 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), sediments, or air. 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. This comparison was used in the selection of the preferred remedial action.

Initial Site Investigations

Initial site investigations were performed in 1981. As part of this preliminary investigation, a groundwater monitoring well was installed downgradient of Landfill 5. In

1982, the monitoring well was sampled, and dissolved chromium, copper, and zinc were detected. This well was also included in the 1992/1993 quarterly sampling program performed at the former base. Quarterly sampling results indicated the presence of acetone, methylene chloride, di-n-butylphthalate, and total glycols.

Remedial Investigation

In 1994, an RI was performed. The main objective of the RI was to investigate the nature and extent of environmental contamination from historical releases at the AOC in order to determine whether any remedial action was necessary to prevent potential threats to human health and the environment. The RI included a geophysical survey consisting of a magnetometry survey and ground-penetrating radar (GPR) survey; a passive soil gas survey; the installation of three groundwater monitoring wells; the collection and analysis of groundwater samples from four wells; and the sampling and analysis of sediment and surface soil samples. Surface water could not be sampled because none was present at this AOC.

Geophysical Surveys. The purpose of the geophysical survey was to determine the locations and extent of subsurface disposal areas at Landfill 5 and define the landfill boundaries. With the exception to the southwestern area of Landfill 5, the results of the geophysical survey indicated the presence of numerous anomalies throughout the survey area, and a reinforced concrete slab was identified at one location.

Passive Soil Gas Survey. The passive soil gas survey, which was performed at 26 points across the site, identified volatile organic compounds (VOCs) at 22 of the 26 locations sampled.

Groundwater Investigation. Analysis of the groundwater samples indicated the presence of three VOCs, 14 SVOCs, eight pesticides/PCBs, 20 metals, glycols, and petroleum hydrocarbons. The concentrations of one VOC, four SVOCs, four pesticides/PCBs, eight metals, and petroleum hydrocarbons exceeded the most stringent criterion for groundwater (see Table 1).

Sediment Investigation. Analysis of the wetland sediment samples indicated the presence of five VOCs, 10 SVOCs, 19 pesticides/PCBs, and 22 metals, one dioxin, and petroleum hydrocarbons. The concentrations of eight SVOCs, 11 pesticides/PCBs, seven metals, and one dioxin were detected at concentrations exceeding the most stringent criterion for sediments (see Table 2).

Surface Soil Investigation. Analysis of the surface soil samples indicated the presence of one VOC, 17 SVOCs, eight pesticides/PCBs, five dioxins/furans, 19 metals, and petroleum hydrocarbons. The concentration of one VOC, four SVOCs, three pesticides/PCBs, and nine metals exceeded the most stringent criterion for surface soil (see Table 3).

Supplemental Investigations

An RI supplemental investigation was performed in 1997 for the Landfill 5 AOC. As part of this investigation, three test pit excavations were performed at the locations of the three strongest subsurface geophysical anomalies detected during the RI geophysical investigations. However, no buried drums were located and therefore, no samples were collected from these test pits. Three near-surface soil samples and one leachate sample were collected, and one new monitoring well was installed and sampled. Samples from the existing monitoring wells were also collected and analyzed.

The groundwater sampling during the supplemental investigation confirmed the presence of carbon tetrachloride, but no other results exceeded the most stringent criterion. The near surface soil samples contained 18 SVOCs, seven pesticides/PCBs, and 22 metals. Eight SVOCs, two pesticides, and seven metals were detected at concentrations exceeding the most stringent criterion (see Table 4). The leachate sample contained one VOC, three SVOCs, and 11 metals. Only two metals, zinc and manganese, were detected at concentrations exceeding the most stringent criterion.

A Landfill Cover Investigation performed in 1997 included the following tasks: historical records search, field survey, aerial photographic survey, auger investigation, permeability sample collection, and a landfill performance model analysis. The investigation further defined the areal extent of the landfill and the landfill boundary and revealed that the thickness of the existing landfill soil cover ranges from 0.8 to 2.4 feet.

In 1998, three drums were found near Landfill 5 during the surface debris consolidation project. The drums were inspected and monitored with portable field equipment for VOCs and radiation. It was determined that the drums were empty, and they were crushed and transported to Landfill 2/3 for disposal. Soil beneath these drums exhibited minor staining and was removed to a depth of 1 foot. Confirmatory soil samples were collected and analyzed for VOCs, SVOCs, polycyclic aromatic hydrocarbons (PAHs), pesticides/PCBs, and metals. The results indicated there was no residual contamination from the drums.

2.3 Highlights of Community Participation

The final proposed plan and a fact sheet for the Landfill 5 AOC indicating Presumptive Remedy as the selected remedial action were released to the public on February 7, 2000. The document was made available to the public in both the administrative record file located at Building 301 in the Griffiss Business and Technology Park and in the Information Repository maintained at the Jervis Public Library. The notice announcing the availability of this document was published in the *Rome Sentinel* on February 5, 2000. A public comment period lasting from February 7, 2000, to March 8, 2000, was set up to encourage public participation in the remedial action selection process. In addition, a public meeting was held on February 23, 2000. At this meeting, representatives from AFBCA, EPA, and NYSDEC answered questions about issues at the AOC and the Presumptive Remedy proposal under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD (see Section 3).

2.4 Scope and Role of Site Response Action

The scope of the Presumptive Remedy Alternative for the Landfill 5 AOC addresses the concerns for human health and the environment. The Presumptive Remedy will bring the landfill cap into compliance with NYSDEC's standards of April 1987.

2.5 Summary of Site Risks

Site risks were analyzed based on the extent of contamination at the Landfill 5 AOC. As part of the RI, 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 soils, sediments, and groundwater at the site. The results of this assessment were considered in the cleanup goal selection process.

Human Health Risk Assessment

A baseline human health risk assessment was conducted during the RI to determine whether chemicals detected at the Landfill 5 AOC could pose health risks to individuals under current and proposed future land uses in an unrestricted-use scenario. 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 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., ingestion of contaminated soils) 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 value) assessment of site-related risks and a discussion of uncertainties associated with the evaluation of the risks and hazards for the site.

Chemicals of potential concern were selected for use in the risk assessment based on the analytical results and data quality evaluation. All contaminants detected in the soil, soil gas, sediments, and groundwater at the site were considered chemicals of potential concern with the exception of inorganics detected at concentrations less than twice the mean background concentrations; iron, magnesium, calcium, potassium, and sodium, which are essential human nutrients; and compounds detected in less than 5% of the total samples (unless they were known human carcinogens). Petroleum hydrocarbons as a class were not selected as chemicals of concern in the risk assessment, but the individual

toxic constituents (e.g., benzene, toluene, and ethylbenzene) were evaluated. The presence of petroleum hydrocarbons as a class of contaminants was considered in the selection of the preferred remedial action.

The current and future land use designations for the Landfill 5 AOC are open space and wetlands/surface water. The human health risk assessment evaluated exposure to potential residential, recreational, and occupational (landscape worker and future industrial worker) populations that may be exposed to chemicals detected in the site media. The various exposure scenarios for each population are described in Table 5. Intake assumptions, which are based on EPA guidance, are more fully described in the RI.

Quantitative estimates of carcinogenic and noncarcinogenic risks were calculated for the Landfill 5 AOC 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 the potential carcinogen. The risks of the individual chemicals are summed for each pathway to develop a total risk estimate. The range of acceptable risk is generally considered to be 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, 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 soils) and across pathways to determine the HI. When the HI exceeds 1, there may be 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 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.

The carcinogenic risks to the adult residential, agricultural, and recreational receptor were presented in the RI report. Specific exposure assumptions are described in the RI report.

The total carcinogenic risk to a future adult resident from all pathways was calculated as 7 in 100,000 (7×10^{-5}), which is within EPA's target lifetime excess cancer risk range of 1 in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}) for Superfund sites.

The total carcinogenic risk from all exposure pathways for future adult recreational users, current and future adult landscape workers, and future adult industrial workers (25-year exposure assumption for both) was calculated, respectively, as 3 in 100,000 (3×10^{-5}), 2 in 100,000 (2×10^{-5}), and 8 in 1,000,000 (8×10^{-6}). The results are all within EPA's target risk range; therefore, potential adverse carcinogenic health effects are not expected to occur from exposure to chemicals at this site.

For noncarcinogenic risks, the child is the receptor generally assumed to have the greatest estimated risk; therefore, HIs were calculated for the adult, adolescent, youth, and child. The total HIs for the future residential adult, adolescent, youth, and child were calculated as 10, 10, 20, and 30, respectively, all exceeding the acceptable level of 1. The exposure pathway controlling the risk was ingestion of groundwater, with manganese contributing the majority of the calculated risk. The HIs for all other exposure pathways for receptors of all ages were below the acceptable level of 1.

The total HIs calculated for current and future recreational adult, adolescent, youth, and child receptors were 0.5, 0.7, 0.9, and 2, respectively. Exposure to surface soils contributed the majority of the noncarcinogenic hazard for all receptors. For the child, incidental ingestion of surface soil and dermal contact with surface soil contributed the greatest risk. The total HI of 2 was driven by the PCB Aroclor 1254 in the soil.

The total HI for the current and future adult landscape workers was 0.4, which is below the acceptable level of 1. Therefore, potential adverse noncarcinogenic health affects are not expected to occur for landscape workers.

The results of the human health baseline risk assessment indicate that chemicals detected in air, surface soil, groundwater, and sediments likely do not present a risk to future off site residents, current and future adult recreational users, or current and future occupational workers, as long as groundwater is not used as a drinking water source. Exposure to chemicals detected in the surface soil may pose a risk for a recreational child receptor. The quantitative evaluation of risk is subject to several conservative assumptions and should not be considered an absolute measure of risk.

Uncertainties exist in many areas of the human health risk assessment process. However, use of conservative variables in intake calculations and conservative 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 Landfill 5 AOC include: (1) The HIs associated with dermal contact with soil and sediment were not quantified for the majority of COPCs, which may lead to underestimation of the overall risk due to dermal contact.; (2) The models used in the RI are likely to overestimate exposure point concentrations in air, which would cause an overestimation of risk for the inhalation pathway; (3) The model used in the RI to estimate exposure point concentrations in crops irrigated with groundwater may under- or overestimate risk through the crop ingestion pathway; (4) The hypothetical future scenario of residential use of groundwater as a potable water supply could be an overestimate of risk. Currently groundwater is not used as a potable water supply, and there are no residential dwellings near this AOC; and (5) Toxicological criteria were not available for all chemicals found at the site, which may result in an underestimation of risk.

Ecological Risk Assessment

A baseline risk assessment for ecological receptors at the Landfill 5 AOC was conducted during the RI. The environmental evaluation modeled risks to raccoons, short-tailed shrews, and American woodcocks from exposures to surface soil and sediment.

The baseline risk assessment included exposure to contaminated sediments in Three Mile Creek beyond the current Landfill 5 AOC. Risks associated with Three Mile Creek contaminants will be discussed in the Three Mile Creek feasibility study. The HQs indicative of risks to the raccoon were calculated to be below 1; therefore, the potential for adverse impacts is considered to be insignificant. The HQs for three out of approxi-

mately 80 chemicals exceeded 1 for the short-tailed shrew (27 for 2,3,7,8 TCDD; 1.89 for aluminum; and 1.69 for selenium). The HQ for one chemical exceeded 1 for the American woodcock (2.8 for 2,3,7,8 TCDD). These results indicate a potential for adverse effects to these ecological receptors. However, these exceedances were partially driven by the Three Mile Creek sediments.

Modeling of bioaccumulation to higher order species was not performed, nor was the cumulative effect of multiple contaminants considered; this tends to underestimate the risk to ecological receptors.

Although certain state-listed endangered plants and animals have been observed on or in the vicinity of the base, no threatened and/or endangered species have been identified at this site. There are no federally listed (U.S. Department of the Interior) threatened or endangered plant or animal species at the former base. Overall this AOC poses only a moderate threat to the environment in its unremediated state.

2.6 Remedial Action Objectives

The following are the remedial action objectives developed for this site based upon the use of the presumptive remedy guidance and the site data:

Containment of Contamination

- Consolidation of various debris and waste areas into the main landfill boundary in order to reduce the area to be capped and the potential for nearby wildlife and human populations to be exposed to the landfill mass; and

- Reduce infiltration of rain water and snow-melt water through the landfill mass in order to minimize the potential for leachate generation and groundwater contamination.

Evaluate Effectiveness of the Remedy by

- Monitoring the groundwater and stream environment (which may include, but is not necessarily limited to, sediment, surface water, and biota) downgradient of the site.

Restrict Exposure to Contamination

- Implementation of institutional controls in the form of deed restrictions of the main landfill boundary to prohibit use of the area and groundwater.

2.7 Description and Evaluation of Remedial Action Alternatives

Superfund remedial and removal programs have found that certain categories of sites have similar characteristics, such as types of contaminants, types of disposal practices, or how environmental media are affected. Based on information acquired from evaluating the past cleanup at these sites, the Superfund program has developed presumptive remedies to accelerate future cleanups of these sites. Containment has been established as the presumptive remedy for CERCLA municipal landfills. Containment technologies are generally deemed appropriate for municipal landfills because the volume and heterogeneity of the waste can generally be presumed to make excavation and/or treatment impractical as well as more costly than containment.

CERCLA regulations mandate that a remedial action must be protective of human health and the environment, cost effective, and utilize permanent solutions and treatment technologies to the maximum extent practicable. These regulations also establish a preference for remedial actions that employ, as a principal element, treatment to permanently reduce the volume, toxicity, or mobility of contaminants at a site. As part of the presumptive remedy approach, the proposed plan evaluated a no action scenario as dictated by CERCLA and compared it to the presumptive remedy alternative. A summary of the two alternatives is presented below.

No Action Alternative

CERCLA requires that the no action alternative be compared with other alternatives. Under the No Action Alternative, no remedy would be implemented at the Landfill 5 AOC. The site would remain as it is now and there would be no monitoring of contaminants in the groundwater or stream environment. No institutional controls restricting habitation or use would be established. Costs and construction time are not associated with this alternative.

Presumptive Remedy Alternative

The Presumptive Remedy Alternative includes (1) installation of a low-permeability soil cover in accordance with 6 NYCRR Part 360 landfill closure regulations, dated April 1, 1987; this action would include placing a minimum of 18 inches of low-permeability soil and 6 inches of topsoil over the entire landfill surface to reduce the amount of water infiltration through the landfill; (2) maintenance of the cover and long-term monitoring of the groundwater and stream environment (which may include, but is not necessarily limited to, sediment, surface water, and biota); the groundwater will be monitored in accordance with the Air Force's Long-Term Groundwater Monitoring Program and the stream environment will be monitored in accordance with a future plan to be prepared for the Three Mile Creek AOC; both plans will be subject to the review and approval of the EPA and NYSDEC; (3) monitoring the groundwater and stream environment downgradient of the site to evaluate the effectiveness of the presumptive remedy; and (4) implementation of institutional controls in the form of deed restrictions of the main landfill boundary to prohibit use of the area and groundwater, and to ensure the cap is not damaged and the area is maintained as a landfill.

It is proposed that the Landfill 5 AOC wetland sediments be monitored as part of the Presumptive Remedy described above, but remain in their existing state with no remedial action. This alternative is believed to provide the best balance among the first eight evaluation criteria. Upon consultation with the state and federal Fish and Wildlife offices, the Air Force has determined that the sediments do not pose an unacceptable risk to humans, and removal of the sediments would require the actual destruction of the aquatic and benthic life and forested wetlands. The minimal risks posed to aquatic and benthic life do not warrant their destruction and the destruction of a forested wetland. The wetland will benefit from the additional soil cover to be placed on Landfill 5 and the long-term monitoring program included in the Presumptive Remedy. Any wetlands disturbed during the remedial action will be restored. In addition, if leachate discharges are observed during routine walkovers of the landfill, leachate management will be considered at that time.

2.8 Summary of Comparative Analysis

Remedial alternatives are assessed on the basis of both a detailed and a comparative analysis pursuant to the NCP. The detailed analysis of Landfill 5 consisted of (1) an assessment of the individual alternatives against nine evaluation criteria and (2) a comparative analysis focusing upon the relative performance of each alternative against the criteria. In general, the following "threshold" criteria must be satisfied by an 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, and/or institutional controls.

2. Compliance with ARARs addresses whether a remedy would (1) meet all of the ARARs or (2) provide grounds for invoking a waiver.

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

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 (1) the period of time needed to achieve protection and (2) 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.

A comparative analysis of the two alternatives, No Action and the Presumptive Remedy, based on the nine evaluation criteria follows:

1. Overall Protection of Human Health and the Environment

   The No Action alternative would potentially not provide adequate protection of human health and the environment. Based on the levels of contaminants and the risk assessment results, there would be a potentially unacceptable risk from incidental ingestion of soils and groundwater by recreational and residential receptors (assuming groundwater were used for domestic purposes in the future).

   The Presumptive Remedy will provide adequate protection from exposure to groundwater by limiting the future use of the landfill through the implementation of institutional controls. In addition, the additional landfill cover materials will eliminate the possibility of human exposure to the contaminated soils and landfill mass. The Presumptive Remedy will also be effective in limiting infiltration of rain water, which will potentially reduce leachate generation and the potential transportation of contaminants from the landfill to the creek via groundwater migration.

2. Compliance with ARARs

   Contaminant concentrations in the groundwater will not immediately comply with the groundwater ARARs under the No Action alternative or the Presumptive Remedy alternative. However, the institutional controls proposed by the Presumptive Remedy alternative will restrict the ingestion of groundwater, which is the primary pathway that poses a potential risk to human health at this AOC. Further, groundwater monitoring will be conducted to assure that there is no further contaminant migration and that groundwater standards will be achieved over time.
3. Long-term Effectiveness and Permanence

Due to the potential for future groundwater and soil ingestion, the No Action alternative would not allow for reliable protection of human health and the environment in the long term.

For the Presumptive Remedy alternative, the installation and maintenance of a low-permeability soil cover will reduce water infiltration and eliminate contact with the contaminated soil and landfill mass. This action coupled with the long-term monitoring program of the groundwater, surface water, sediment and biota is the most aggressive approach to containment and reliable long-term protection of human health and the environment.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

   The No Action alternative provides no treatment or containment of contaminant migration, therefore, it does not result in any reduction in toxicity, mobility, or volume.

   The construction of a low-permeability soil cover will decrease the opportunity for contaminated soil migration and infiltration of rain and surface water through the landfill. In addition, the cover is expected to reduce leachate generation, which in turn will reduce the potential for transporting contaminants from the landfill to the creek via groundwater. Although treatment will not be employed, this alternative will reduce mobility and volume.

5. Short-term Effectiveness

   The No Action alternative would not be an effective alternative because potential risks from exposure to soils and ingestion of groundwater would continue to exist.

   For the Presumptive Remedy alternative, construction of the landfill cover would be completed in approximately three to five months. During this time, no exposure to hazardous substances would occur in the community. Potential risks to construction workers would primarily be associated with equipment movement. Any wetlands disturbed during the remedial action will be minimal and will be restored.

6. Implementability

   There would be no limitations to implementing the No Action alternative.

   Construction of the landfill cover for the Presumptive Remedy is relatively straightforward. Materials and equipment necessary for the cover construction are readily available. Likewise, performance of a long-term monitoring program and implementation of institutional controls in the form of deed restrictions of the main landfill boundary should pose no significant impediments to the implementation of the Presumptive Remedy alternative.

7. Cost

   There would be no costs associated with the No Action alternative.

   Capital costs for capping of the landfill will be approximately 1.0 to 1.5 million dollars. Operation and Maintenance (O & M) costs will be approximately $10,000 per year. The project construction duration will be approximately three to five months.

2.9 Description of the Selected Remedy

The selected remedial action alternative for the Landfill 5 AOC is the Presumptive Remedy. This alternative was chosen because it has been demonstrated to be effective for similar military landfills and is known to be both cost-effective and easy to implement. The threshold criteria are satisfied by the Presumptive Remedy. The Presumptive Remedy includes the following actions:

1. Preparation of the landfill surface prior to providing cover materials. The landfill cover will be cleared and grubbed, and low areas would be backfilled. The landfill surface also will be regraded to prevent future erosion or ponding. Any wetlands disturbed during the remedial action would be restored.

2. Decommissioning of monitoring wells located within the construction limits.

3. Installation of a low-permeability soil cover in accordance with 6 NYCRR Part 360 landfill closure regulations, dated April 1, 1987; this action would include placing a minimum of 18 inches of low-permeability soil and 6 inches of topsoil over the entire landfill surface to reduce the amount of water infiltration through the landfill.

4. Maintenance of the cover and long-term monitoring of the groundwater and stream environment; the groundwater will be monitored in accordance with the Air Force's Long-Term Groundwater Monitoring Program and the stream environment will be monitored in accordance with a future plan to be prepared for the Three Mile Creek AOC; both plans will be subject to the review and approval of the EPA and NYSDEC.

5. Monitoring the groundwater and stream environment downgradient of the site to evaluate the effectiveness of the presumptive remedy.

6. Implementation of institutional controls in the form of deed restrictions of the main landfill boundary and groundwater to prohibit use of the groundwater, and to ensure the cap is not damaged and the area is maintained as a landfill.

7. Evaluation of site conditions at least once every five years.

In addition, it is proposed that the Landfill 5 AOC wetland sediments be monitored as part of the Presumptive Remedy described above, but remain in their existing state with no remedial action. This alternative is believed to provide the best balance among the first eight evaluation criteria. Upon consultation with the state and federal Fish and Wildlife offices, the Air Force has determined that the sediments do not pose an unacceptable risk to humans, and removal of the sediments would require the actual destruction of the aquatic and benthic life and forested wetlands. The minimal risks posed to aquatic and benthic life do not warrant their destruction and the destruction of a forested wetland. The wetland will benefit from the additional soil cover to be placed on Landfill 5 and the long-term monitoring program included in the Presumptive Remedy.

2.10 Statutory Determinations

In general, the selected remedy must meet the statutory requirements of CERCLA, Section 121, which are itemized in Section 1.5 of this ROD and described below.

Protection of Human Health and the Environment

The Presumptive Remedy will provide adequate protection from exposure to groundwater by limiting the future use of the landfill through the implementation of institutional controls. Also, the additional landfill cover materials will eliminate the possibility of human exposure to the contaminated soils and landfill mass. The Presumptive Remedy will also be effective in limiting infiltration of rain water, which will potentially reduce leachate generation and the transportation of contaminants from the landfill to the creek via groundwater migration.

Compliance with ARARs

Contaminant concentrations in the groundwater will not immediately comply with the groundwater ARARs under the No Action alternative or the Presumptive Remedy alternative. However, the institutional controls proposed by the Presumptive Remedy alternative will restrict the ingestion of groundwater, which is the primary pathway that poses a potential risk to human health at this AOC. Further, groundwater monitoring will

be conducted to assure that there is no further contaminant migration and that groundwater standards will be achieved over time.

Cost-Effectiveness

The cost of the remedy is typical for the scope of the remedial action.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Installation and maintenance of a low-permeability cover does not represent a completely permanent solution to contamination at the site. However, the combination of capping and long-term monitoring of the groundwater and the stream environment present the most aggressive approach to this contamination with the exception of landfill excavation. Thorough investigations during the RI and SI demonstrated that no distinct sources of contamination are present in the landfill. Thus, the approach adopted by the selected remedy represents the greatest long-term effectiveness appropriate for this AOC.

Preference for Treatment as a Principal Element

The presumptive remedy does not employ treatment of the groundwater because no distinct sources of contamination were identified in the landfill. However, exposure to groundwater will be limited by the implementation of institutional controls at the landfill. The installation and maintenance of the landfill cover will potentially benefit groundwater quality by reducing the amount of leachate generated, thus limiting potential transportation of contaminants to the creek through groundwater migration.

2.11 Documentation of Significant Changes

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

Table 1
COMPOUNDS EXCEEDING GUIDANCE VALUES
LANDFILL 5 AOC
GROUNDWATER SAMPLES

Compound	Range of Detected Concentrations	Frequency of Detection	Most Stringent Criterion
VOCs (µg/L)			
Carbon tetrachloride	6.6	1/4	5 [a]
SVOCs (µg/L)			
Benzo(a)anthracene	0.05 J	1/4	0.002 [b]
Benzo(b)fluoranthene	0.03 J	1/4	0.002 [b]
Bis(2-ethylhexyl)phthalate	5 J - 7J	1/4	6 [c]
Chrysene	0.04 J	1/4	0.002 [b]
Pesticides/PCBs (µg/L)			
gamma BHC (lindane)	0.5	1/4	ND [a]
2,2,3,3,4,4,6-Heptachlorobiphenyl	0.2 J	1/4	0.1 [a]
2,2,3,4,6-Pentachlorobiphenyl	0.2 J	1/4	0.1 [a]
2,2,4,4,5,6,-Hexachlorobiphenyl	0.3 J	1/4	0.1 [a]
Metals (mg/L)			
Aluminum	0.2 - 1.54	2/4	0.05 [d]
Arsenic	0.003 - 0.033	1/6	0.025 [a]
Iron	0.05 J - 3.19	3/4	0.3 [a]
Lead	0.00133 J - 0.0164	1/4	0.015 [c]
Manganese	0.0068 J - 9.86	3/4	0.05 [d]
Mercury	0.00003 - 0.0125 J	1/4	0.002 [a]
Sodium	3.92 - 52.8	2/4	20 [a]
Zinc	0.315	1/4	0.3 [a]
Wet Chemistry (mg/L)			
Petroleum hydrocarbons	0.09 J - 0.17 J	1/4	0.1 [a]

[a] NYSDEC Class GA groundwater standard.
[b] NYSDEC Class GA groundwater guidance value.
[c] Federal maximum contaminant level.
[d] Federal secondary maximum contaminant level.

Key:
J = Estimated concentration.

Table 2
COMPOUNDS EXCEEDING GUIDANCE VALUES
LANDFILL 5 AOC
WETLANDS SEDIMENT SAMPLES

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
SVOCs (µg/kg)			
Benzo(a)anthracene	160 J - 340 J	6/7	1.3 * [c]
Benzo(a)pyrene	180 J - 290 J	4/7	1.3 * [c]
Benzo(b)fluoranthene	120 J - 690 J	5/7	1.3 * [c]
Benzo(k)fluoranthene	150 J - 260 J	2/7	1.3 * [c]
Bis(2-ethylhexyl)phthalate	2,800	1/7	199.5 * [a]
Chrysene	140 J - 390 J	6/7	1.3 * [c]
Fluoranthene	150 J - 760 J	3/7	600 * [b]
Phenanthrene	180 J - 380	6/7	120 * [a]
Pesticides/PCBs (µg/kg)			
Aldrin	0.32 J	1/8	0.1* [c]
alpha BHC	6.5 J	1/8	0.06 * [c]
alpha Chlordane	0.86 J - 4.9 J	4/8	0.001 * [c]
Dieldrin	1.17 J - 31 J	4/8	0.1 * [c]
Endrin	11 J - 75	3/8	0.8 * [c]
gamma Chlordane	0.71 J - 1.66 J	3/8	0.001 * [c]
Heptachlor	22 J - 44	2/8	0.001 * [c]
Heptachlor epoxide	15 J	1/8	0.001 * [c]
p, p'-DDD	3.75 J - 62	7/8	0.01 * [c]
p, p'-DDE	4.64 J - 26	7/8	0.01 * [c]
p, p'-DDT	1.95 J - 36	5/8	0.01 * [c]
Metals (mg/L)			
Arsenic	1.9 - 12.0	2/7	6 [d]
Cadmium	1.29 J	1/7	0.6 [d]
Copper	10.6 - 71	7/7	16 [d]
Lead	25.4 - 106	7/7	31 [d]
Mercury	0.44 - 0.446	2/7	0.15 [d]
Nickel	17.4 J	1/7	16 [c]
Zinc	86.6 - 163	3/7	120 [d]
Dioxins and Furans (ng/kg)			
2,3,7,8-TCDD	8.2 - 30	4/6	0.2 * [e]

* Criterion expressed as µg/g of organic carbon (ng/g for dioxins and furans); sample results normalized based on site-specific total organic carbon prior to comparison.

[a] NYSDEC criterion for protection of benthic aquatic life – chronic level.

[b] Federal guidance value, National Oceanic and Atmospheric Administration.

[c] NYSDEC criterion for protection of human health – bioaccumulation.

[d] State criterion for metals in sediment.

[e] NYSDEC criterion for protection of wildlife – bioaccumulation.

Key:

J = Estimated concentration.

Table 3
COMPOUNDS EXCEEDING GUIDANCE VALUES
LANDFILL 5 AOC
SURFACE SOIL SAMPLES

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
VOCs (µg/kg)			
Acetone	330 J	1/3	200 [a]
SVOCs (µg/kg)			
Benzo(a)pyrene	250 J	1/3	61 [a]
Benzo(b)fluoranthene	330 J - 1,500 J	1/3	1,100 [a]
Benzo(k)fluoranthene	140 J - 1,400 J	1/3	1,100 [a]
Chrysene	1,600	1/3	400 [a]
Pesticides/PCBs (µg/kg)			
Dieldrin	67 J	1/3	40 [a]
Heptachlor epoxide	31 J	1/3	20 [a]
Aroclor 1254	4,000 J	1/3	1,000 [a]
Metals (mg/kg)			
Arsenic	3.4 - 6.4	2/3	4.9 [b]
Barium	78.1 - 156 J	3/3	71 [b]
Calcium	12,700 - 32,700	1/3	23,820 [b]
Chromium, hexavalent	2.9 - 3.9	3/3	0.45 [b]
Lead	13.6 - 87.5 J	1/3	36.2 [b]
Molybdenum	19 - 24.4	3/3	ND [b]
Sodium	229 - 588	2/3	259 [b]
Strontium	26.2 - 60.7	1/3	55 [b]
Zinc	69.4 - 173	1/3	120 [b]

[a] NYS-recommended soil cleanup objective.

[b] Background screening concentration.

Key:

J = Estimated concentration.

ND = Nondetect.

Table 4
COMPOUNDS EXCEEDING GUIDANCE VALUES
LANDFILL 5 AOC
SI NEAR-SURFACE SOIL SAMPLES

Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
SVOCs (µg/kg)			
Benzo(a)anthracene	480 J - 53,000	4/4	224 [a]
Benzo(a)pyrene	590 J - 50,000 J	4/4	61 [a]
Benzo(b)fluoranthene	1,100 J - 75,000 J	3/4	1,100 [a]
Benzo(k)fluoranthene	39,000 J	1/4	1,100 [a]
Chrysene	530 J - 52,000	4/4	400 [a]
Dibenzo(a,h)anthracene	200 J - 4,500 J	4/4	14 [a]
Fluoranthene	710 J - 90,000	1/4	50,000 [a]
Pyrene	1,100 J - 110,000	1/4	50,000 [a]
Pesticides/PCBs (µg/kg)			
Dieldrin	61 - 350	3 /4	40 [a]
Heptachlor epoxide	11 - 93	1/4	20 [a]
Metals (mg/kg)			
Arsenic	4.7 - 17	3/4	4.9 [b]
Beryllium	0.99 - 1.1	2/4	0.64 [b]
Cadmium	2.4	1/4	1.0 [a]
Calcium	7,200 J - 37,000 J	1/4	23,820 [b]
Lead	48 J - 110 J	4/4	36.2 [b]
Mercury (solid)	0.14 - 0.28	4/4	0.1 [a]
Zinc	72 J - 210 J	2/4	120 [b]

[a] NYS-recommended soil cleanup objective.

[b] Background screening concentration.

Key:

J= Estimated concentration.

Table 5
LANDFILLS AOC
RISK ASSESSMENT EXPOSURE SCENARIOS

RESIDENTIAL RECEPTOR	RECREATIONAL RECEPTOR	LANDSCAPE WORKER	INDUSTRIAL WORKER
Adult, Child, Youth, Adolescent	**Adult, Child, Youth, Adolescent**	**Adult**	**Adult**
• Inhalation of airborne chemicals • Inhalation of fugitive dust from surface soils • Ingestion of groundwater • Dermal contact with groundwater (during showering) • Inhalation of VOCs from groundwater (during showering) • Ingestion of crops irrigated with groundwater	• Inhalation of airborne chemicals • Inhalation of fugitive dust from surface soil • Incidental ingestion of surface soil • Dermal contact with surface soil • Incidental ingestion of sediments • Dermal contact with sediments	• Incidental ingestion of surface soil • Inhalation of fugitive dust from surface soil • Dermal contact with surface soil • Inhalation of airborne chemicals	• Ingestion of groundwater • Dermal contact with groundwater (during showering) • Inhalation of VOCs from groundwater(during showering)

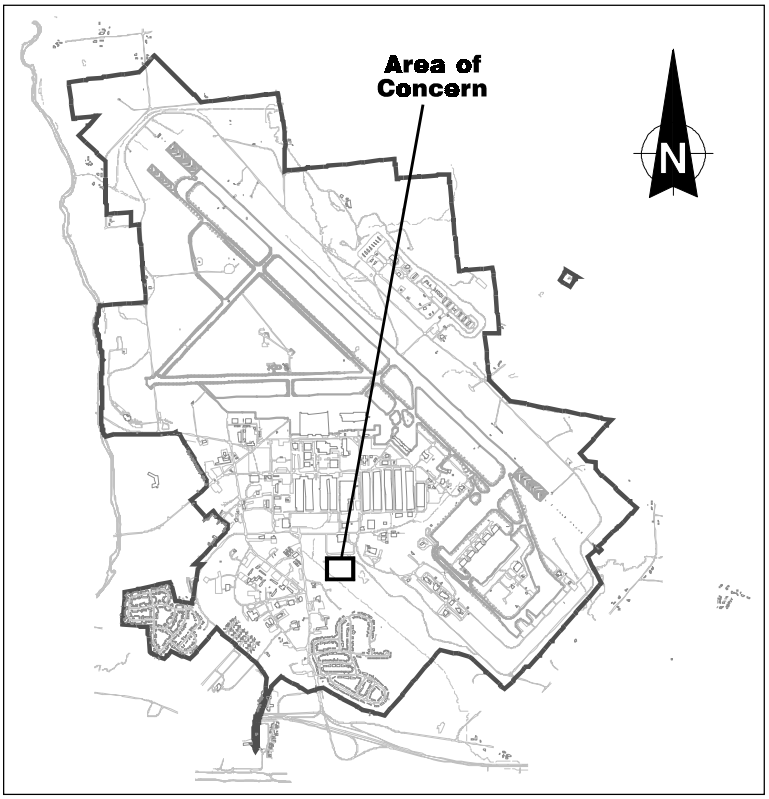

Figure 1: Landfill 5 AOC is located in the south-central portion of the former Griffiss AFB.

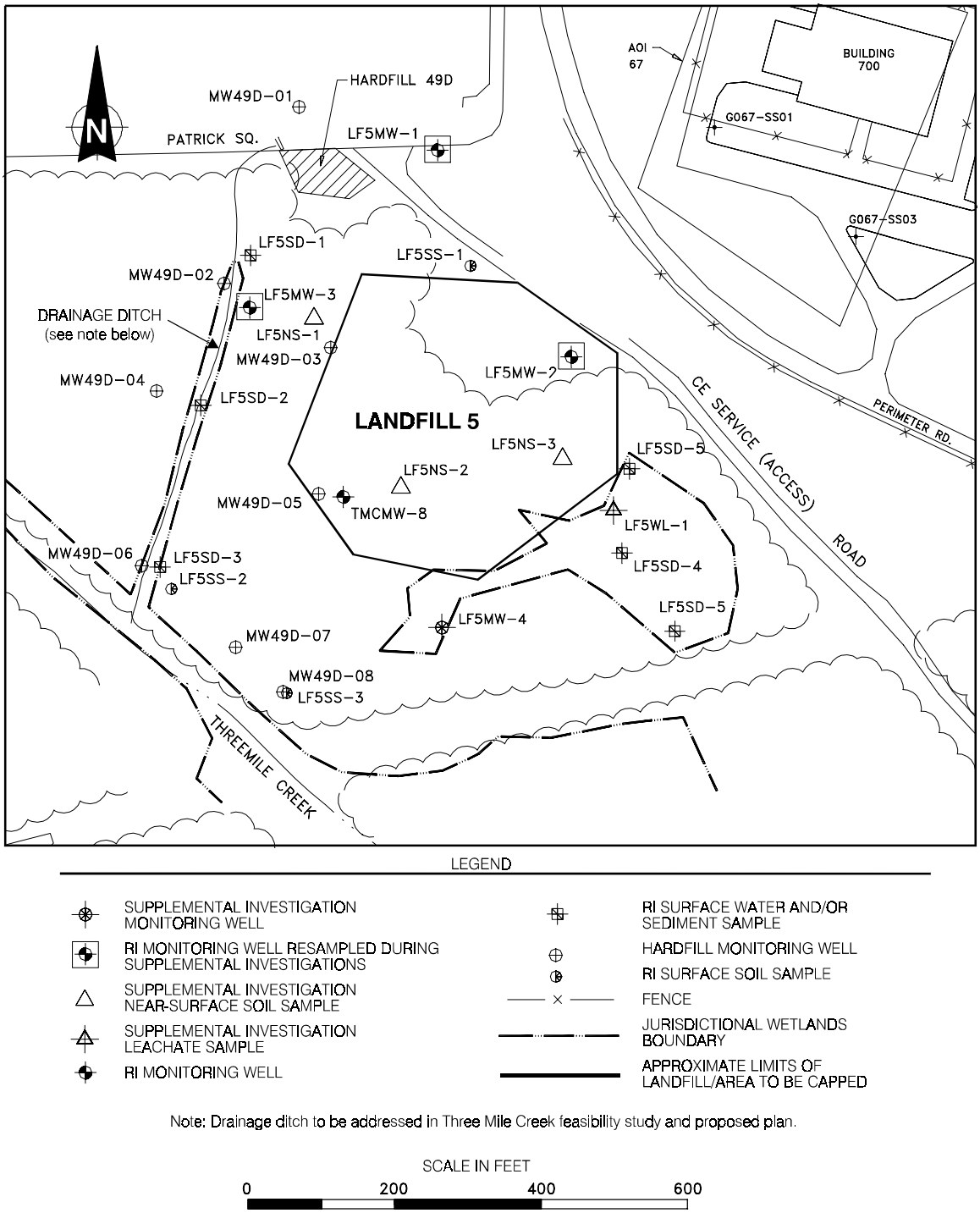

Figure 2: Landfill 5 AOC

3 Responsiveness Summary

On Monday, February 7, 2000, AFBCA, following consultation with and concurrence of the EPA and NYSDEC, released for public comment the proposed plan for remedial action at Landfill 5 AOC at the former Griffiss Air Force Base. The release of the proposed plan initiated the public comment period, which concluded on March 8, 2000.

During the public comment period, a public meeting was held on Wednesday, February 23, 2000, at 5:00 p.m. at the Floyd Town Hall located at 8299 Old Floyd Road, Rome, New York. The public meeting included a presentation and discussion of four landfill AOCs: Landfills 2/3, Landfill 4, Landfill 5, and Landfill 7. A court reporter recorded the proceedings of the public meeting. Copies of the transcript and attendance list are included in the Administrative Record. The public comment period and the public meeting were intended to elicit public comment on the proposals for remedial action at Landfills 2/3, 5, and 7, and the proposal for no further action for soils with groundwater monitoring at Landfill 4.

This section summarizes and provides responses to the verbal comments received at the public meeting and the written comments received during the public comment period.

Comment #1 (oral - John Fitzgerald)

Mr. Fitzgerald expressed the following concerns: a) Contaminant levels are exceeding standards or criteria, but the public has been told not to worry about it because, "we are going to put a cover on it and we will walk away, and you will be fine, just don't drink the water….I seem to be the only one worried about it." b) He believes that there is a mess on the base with the landfills and that the Federal government has the capability

to clean them up, but instead they're going to walk away and leave the mess to the residents. He doesn't think that an unlined landfill should be capped, but rather the material should be dug up and put in a lined landfill. c) He indicated that some people kept their old wells when the new water main was installed because the new water is metered and they use the water from the wells to wash cars, water gardens, fill pools, and kids also drink from the hose.

Response #1

a) Although certain contaminant concentrations exceeded the most stringent criteria, the risk assessments performed for these AOCs (which take into account site-specific conditions and reuse planning options) determined that the risks associated with these contaminants fall within EPA's acceptable risk range, with the exception of groundwater ingestion for Landfills 2/3, 4, and 7 and groundwater ingestion and surface soil ingestion and contact for the child receptor at Landfill 5. Low-level contamination is limited to isolated areas. The Presumptive Remedy for Landfills 2/3, 5, and 7 calls for long-term monitoring of the groundwater; installation of a low-permeability soil cover in accordance with 6 NYCRR Part 360 landfill closure regulations, which will reduce exposure to the landfill mass; and implementation of institutional controls in the form of deed restrictions of the main landfill boundary to prohibit use of the area and groundwater. For Landfill 4, long-term monitoring of the groundwater will be performed and deed restrictions will be incorporated into all property transfer documents.

b) Capping the landfill as it exists now is expected to reduce the amount of rain water/snowmelt that infiltrates the landfill, comes into contact with the waste, and potentially creates leachate that may affect groundwater and surface water. The landfill cap should help to minimize the leaching of contaminants from the landfill mass into the groundwater and surface water. Capping and long-term monitoring of environmental media is often the preferred remedy for unlined landfills as opposed to excavation, removal, and reburial of the landfill mass. This is due to the chemical exposure potential (both to the workers and the nearby residents due to wind dispersion and runoff) and the potential for release of contaminants and creation of more leachate when the existing cap

is removed. The physical hazards and the considerable additional costs associated with waste excavation and reburial also were considerations.

c) As long as the old wells were disconnected from household plumbing served by the public water supply, homeowners were able to keep their old wells active as a completely separated system. There is no rule or regulation that would prevent a homeowner from making that decision. Fortunately, even for the highest levels of contamination found during the sampling programs performed in the late 1980s and early 1990s, the risks associated with watering gardens and filling swimming pools would be negligible. Very occasional ingestion, such as drinking from a garden hose several times a summer, would also pose a negligible risk, considering that most contaminants were detected at the same magnitude as drinking water standards. The actual area of possible contaminated groundwater where potential exposure would be a concern was much smaller than the extent of the new water main installation, which was a large loop for design purposes. The Landfills 2/3, 4, 5, and 7 AOCs have not been shown to contribute to off-site contamination. In addition, the on-base groundwater monitoring wells have shown isolated areas of low-level contamination and will be part of a long-term groundwater monitoring program designed to detect contamination before it migrates to off-site locations.

Comment #2 (oral – Carmen Malagisi)

Mr. Malagisi asked if the public will be allowed to comment on the long-term groundwater monitoring plan.

Response #2

Yes, a meeting will be set up to discuss the plan with the Restoration Advisory Board (RAB). The general public will be invited to attend this meeting.

Comment #3 (oral – John Fitzgerald)

Mr. Fitzgerald asked if it would be possible to recruit new members for the RAB because some of the current members have shown little interest.

Response #3

The AFBCA will forward this request to Mark Reynolds, the RAB Co-Chairman, and recommend that he seek new members.

Comment #4 (oral – Freda Melkum)

Ms. Freda Melkum relayed an incident in which she thinks that barrels filled with antifreeze were disposed in one of the landfills because the antifreeze made a group of airmen sick. She believed this incident occurred in the late 1960s or early 1970s and wanted to know which landfill the barrels were disposed in.

Response #4

The geophysical surveys performed during the RI did not detect a significant number of drums within these landfills. However, the AFBCA has researched the possibility of this incident (interviews with past base employees and base environmental engineering records), and no recollection or mention of an incident involving the use of antifreeze that made airmen sick or the disposal of such antifreeze can be found. The drums that were found in Landfills 2/3 and Landfill 5 were excavated and properly disposed, and stained soil surrounding the drums was removed. Analytical results for confirmatory soil samples collected following excavation indicated that there was no residual contamination from the drums. No drums were found in Landfill 7 or Landfill 4.

Comment #5 (oral – Roger Krol with Ocuto Blacktop in Rome)

Mr. Krol asked if the capping of the landfills would be a competitive bid.

Response #5

The present contracting strategy for Landfills 2/3 and 7 is to solicit open competitive bids. Contracts for Landfills 2/3 and 7 will be handled in a manner similar to the contracting methods used for a previous hardfill capping contract. The Air Force Center for Environmental Excellence (AFCEE) will be the contracting service center. The remedial actions are completed at Landfill 4, so there is no additional work programmed for this site. A contracting strategy has not yet been developed for Landfill 5.

Comment #6 (written – Freda Melkum)

In her letter, Ms. Melkum expresses concern that just capping the landfills with a dirt cover would not be enough. She states that during periods of snow thaw and heavy rain, the water table rises and when it recedes it takes dissolved chemicals with it. She states, " So for decades these chemicals are going to drain into 3 and 6 mile creeks." Ms. Melkum requests that a) besides monitoring and deed restrictions, an advertisement program be initiated to warn the residents not to use the well water under any circumstances; and b) signs be posted warning people to stay away from the creeks, particularly at Rickmeyer Road, Route 365, Skyline Heights, and River Road near the creeks. She states, "Considering that you are spending millions and millions of dollars on this questionable cleanup, I don't think it's too much to ask of you to spend a few hundred dollars to post some signs to warn people to the dangers. I feel we are entitled to them due to what's in these landfills." She also states that she was pleased with the cleanup of Landfill 4.

Response #6

a) As long as the old wells were disconnected from household plumbing served by the public water supply, homeowners were able to keep their old wells active as a completely separated system. There is no rule or regulation that would prevent a homeowner from making that decision. Fortunately, even for the highest levels of contamination found during the sampling programs performed in the late 1980s and early 1990s, the risks associated with watering gardens and filling swimming pools would be negligible. Very occasional ingestion, such as drinking from a garden hose several times a summer, would also pose a negligible risk, considering that most contaminants were detected at the same magnitude as drinking water standards. The actual area of possible contaminated groundwater where potential exposure would be a concern was much smaller than the extent of the new water main installation, which was a large loop for design purposes. The Landfills 2/3, 4, 5, and 7 AOCs have not been shown to contribute to off-site contamination. In addition, the on-base groundwater monitoring wells have shown isolated areas of low-level contamination and will be part of a long-term groundwater monitoring program designed to detect contamination before it migrates to off-site locations.

b) Presently, the Air Force does not plan to post signs along Three or Six Mile Creeks. When purchasing a New York State fishing license, a pamphlet is also provided that indicates the fish advisories for each individual body of water within the limits of the state. This advisory is based upon the results of independent periodic sampling performed by NYSDEC. Presently there are no specific New York State fish advisories indicated for Six Mile Creek and only the white sucker (no more than one meal a month) for Three Mile Creek. However, the general health advisory for sport fish is that you eat no more than one meal (one-half pound) per week of fish taken from the State's fresh waters. This general advisory is to protect against eating large amounts of fish that have not been tested or may contain unidentified contaminants. This advisory is based upon the results of independent periodic sampling performed by NYSDEC. In addition, human health risk assessments were performed during the remedial investigations for the creeks. The results of the assessments indicate that the risks associated with the incidental ingestion of surface water and sediments, and the dermal exposure to them resulting from swimming or wading in the water, are within the acceptable limits required by the EPA. Separate proposed plans, which will address these concerns, will be issued for Three Mile Creek and Six Mile Creek.