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Spills - SP
ERP - E
VCP - V
BCP - C

No Further Response Action Planned Decision Document - IRP Site 1 Building 600 JP-4 Pipeline Leak Niagara Falls International Airport- Air Reserve Station

June 1999

Prepared for:

UNITED STATES DEPARTMENT OF THE AIR FORCE
Air Force Reserve Command, 914th Airlift Wing

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IRP
Installation Restoration Program

IAP-ARS
International Airport-Air Reserve Station

NFRAP
No Further Response Action Planned

RCRA
Resource Conservation and Recovery Act

NYCRR
New York Codes, Rules, and Regulations

USAF
United States Air Force

AFRC
Air Force Reserve Command

NYSDEC
New York State Department of Environmental Conservation

RI
remedial investigation

Site Name and Location

Installation Restoration Program (IRP) Site 1, Building 600 JP-4 Pipeline Leak, is located at the Niagara Falls International Airport-Air Reserve Station (IAP-ARS) in the Town of Wheatfield, Niagara County, New York.

Statement of Basis and Purpose

This No Further Response Action Planned (NFRAP) decision document presents the no further action alternative as the selected remedial action for Site 1. This alternative has been chosen in accordance with the Resource Conservation and Recovery Act (RCRA) and, more specifically, is consistent with the Corrective Action Requirements Module III of the installation's Part 373 Hazardous Waste Storage Permit. This permit was issued by New York State in accordance with Title 6, Part 373 of the New York Codes, Rules, and Regulations (6 NYCRR 373) and regulates the management and releases of hazardous wastes at Niagara Falls IAP-ARS. This NFRAP is being issued by the United States Department of the Air Force (USAF), 914th Airlift Wing of the United States Air Force Reserve Command (AFRC) at the Niagara Falls IAP-ARS, following consultation with, and the concurrence of, the New York State Department of Environmental Conservation (NYSDEC). This decision is based on the administrative record file for this site.

Description of the Selected Remedy

The selected remedy for soils and groundwater at Site 1 is no further action.

Declaration Statement

AFRC has determined, with the concurrence of NYSDEC, that no further action is warranted for soils and groundwater at Site 1, Building 600 JP-4 Pipeline Leak, because the baseline risk assessment performed during the remedial investigation (RI) and the subsequent preliminary risk evaluations performed as part of the Installation-Wide Groundwater Monitoring Project concluded that the site poses no current or potential threat to human health or the environment.

Air Force Signature

See Exhibit 1-1 for Air Force signature and acceptance of the declaration statement.

EXHIBIT 1-1
DECLARATION STATEMENT

On the basis of the remedial investigation and installation-wide groundwater monitoring performed at Installation Restoration Program (IRP) Site 1, there is no evidence to conclude that the previous operations conducted at this site have resulted in environmental contamination that poses a current or potential threat to human health or the environment. This decision removes Site 1 from further consideration in the IRP pursuant to Corrective Action Module III under the installation's Part 373 Hazardous Waste Storage Permit.

GERALD C. VONBERGE, COL, USAFRC
Commander

Date

1 Decision Summary

USAF
United States Air Force

AW
Airlift Wing

AFRC
Air Force Reserve Command

NYSDEC
New York State Department of Environmental Conservation

IAP-ARS
International Airport-Air Reserve Station

MSL
mean sea level

1.1 Introduction

This decision document is issued by the United States Department of the Air Force (USAF), 914th Airlift Wing (AW) of the Air Force Reserve Command (AFRC), following consultation with the New York State Department of Environmental Conservation (NYSDEC).

1.2 Site Name, Location, and Description

Regional Site Description

The Niagara Falls International Airport-Air Reserve Station (IAP-ARS) is located in Niagara County, New York, approximately 15 miles north of the City of Buffalo and 6 miles east of the City of Niagara Falls. The installation, located in an area of varied land use, covers approximately 547 acres in the Towns of Wheatfield and Niagara (see Figure 1-1). Areas of industrial use are primarily located 2 miles to the west and southwest, as well as adjacent to the southeast corner of the installation. Residential areas are adjacent to all sides of the installation. Areas zoned for agricultural/rural use are located to the southeast and adjacent to the northern and eastern boundaries. Commercial areas are located primarily to the west and south, along Military Road and Niagara Falls Boulevard.

Topography in the area of the installation is relatively flat. The majority of land is classified as grassland-type vegetative cover with scattered shrubs and trees. Most of the land is actively mowed and landscaped. Natural habitat is limited. Ground surface elevation at the installation ranges from approximately 600 feet above mean sea level (MSL) along the northern boundary to 585 feet above MSL along the southern boundary. Surface water drainage from the installation flows into Cayuga Creek, and then into the Little River, which in turn flows into the upper Niagara River and eventually Lake Ontario. Regional groundwater flow in the vicinity of Niagara Falls IAP-ARS is to the south-southwest toward the Niagara River.

The installation is located within the Huron Plain of the Central Lowland physiographic province. Bedrock strata in this area are comprised of Lockport dolostone from the Middle Silurian age and are approximately 140 feet thick in the vicinity of the installation. Bedrock groundwater flows through horizontal bedding planes, vertical fractures, and joints within the Lockport dolostone. Naturally occurring soils in the area are classified as Wisconsin-age glacial till, lacustrine silt and clay, and Holocene fluvial deposits.

Site 1, Building 600 JP-4 Pipeline Leak

Site 1, Building 600 JP-4 Pipeline Leak, is located along McGuire Street between Kinross Street and Otis Drive (see Figure 1-2). The site is bordered on the east by Building 600 and on the west by a flat, grass-covered, open field. The field, which extends to Thompson Street, is the location of former Buildings 518 and 524. In 1969, a leak in a JP-4 hydrant system saturated soil between McGuire Street and Building 600 (see Figure 1-2). As an interim remedial measure, the leaking pipeline section was immediately drained of any residual JP-4, capped at both ends, and abandoned in place. In 1986, the saturated soil area was capped with asphalt and is currently used as a roadway and parking area. Records do not indicate whether any saturated soil was excavated from the area at the time of the interim remedial measure.

Site 1 is generally flat with a gentle slope to the south and a maximum relief of 5 feet. The average elevation of the site is approximately 592 feet above MSL. Surface runoff drains via overland flow toward the south and eventually drains to Cayuga Creek via storm sewers. No drainage ditches or swales are located near the site. The site is not located within the 100-year or 500-year floodplain of Cayuga Creek. Depth to groundwater is approximately 5 feet below ground surface (BGS), and flow is generally to the southwest.

BGS
below ground surface

AFRF
Air Force Reserve Facility

NYANG
New York Air National Guard

1.3 Operations History and Environmental Background

Niagara Falls Operations History

Niagara Falls IAP-ARS was established as Niagara Falls Air Force Reserve Facility (AFRF) in November 1942. The federal government leased 468 acres of municipal airport land for use by the Army Air Corps. In 1946, 132.2 acres of the leased land were returned to the City of Niagara Falls. The 136th Fighter Squadron of the New York Air National Guard (NYANG) was established on 8 December 1948 and occupied Old Camp Bell near the Bell Aircraft plant on the installation. The 76th Air Base Squadron was activated on 1 February 1952 as the installation host unit.

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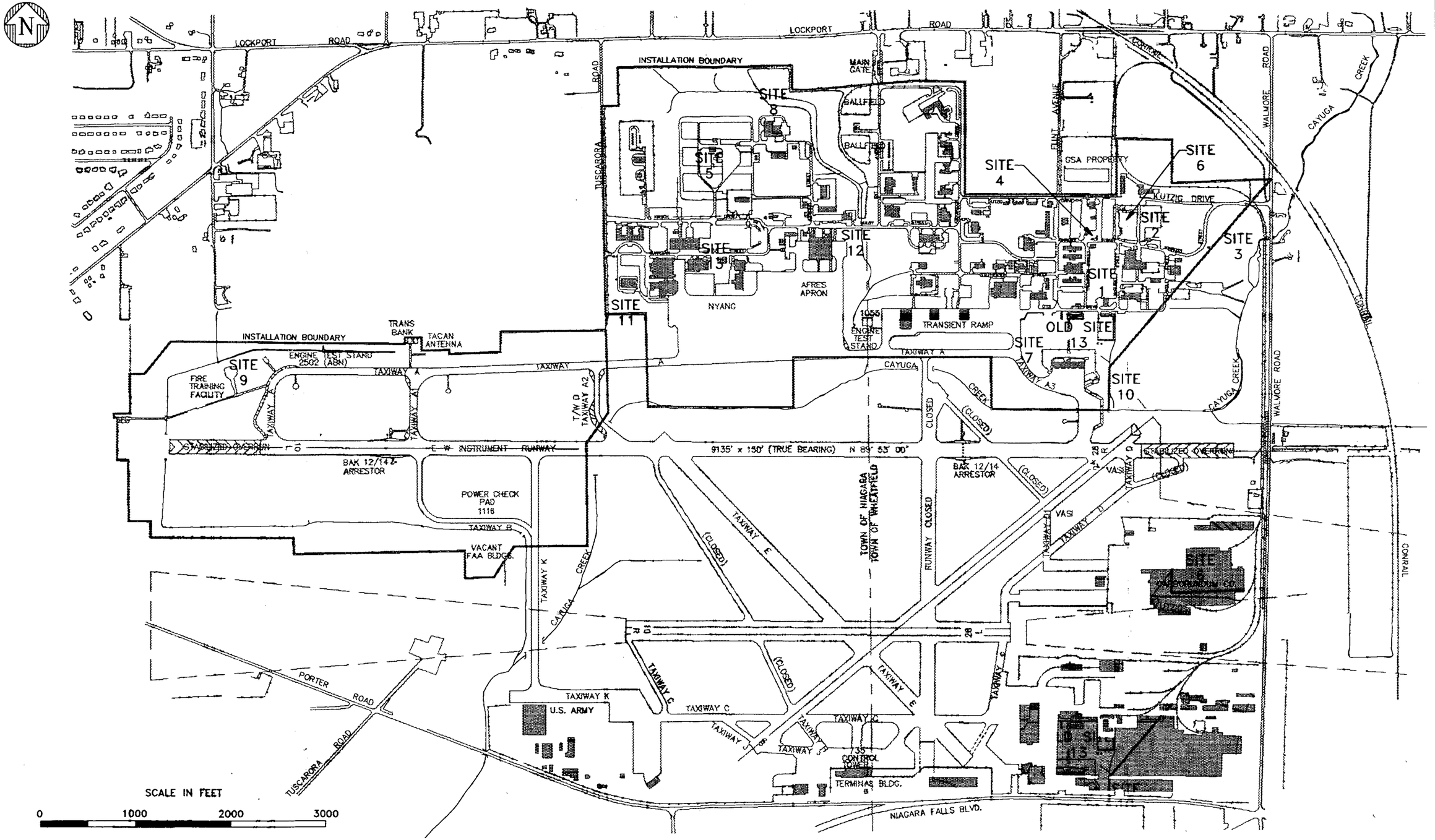


ecology and environment

Figure 1-1 NIAGARA FALLS IAP-ARS LOCATION MAP

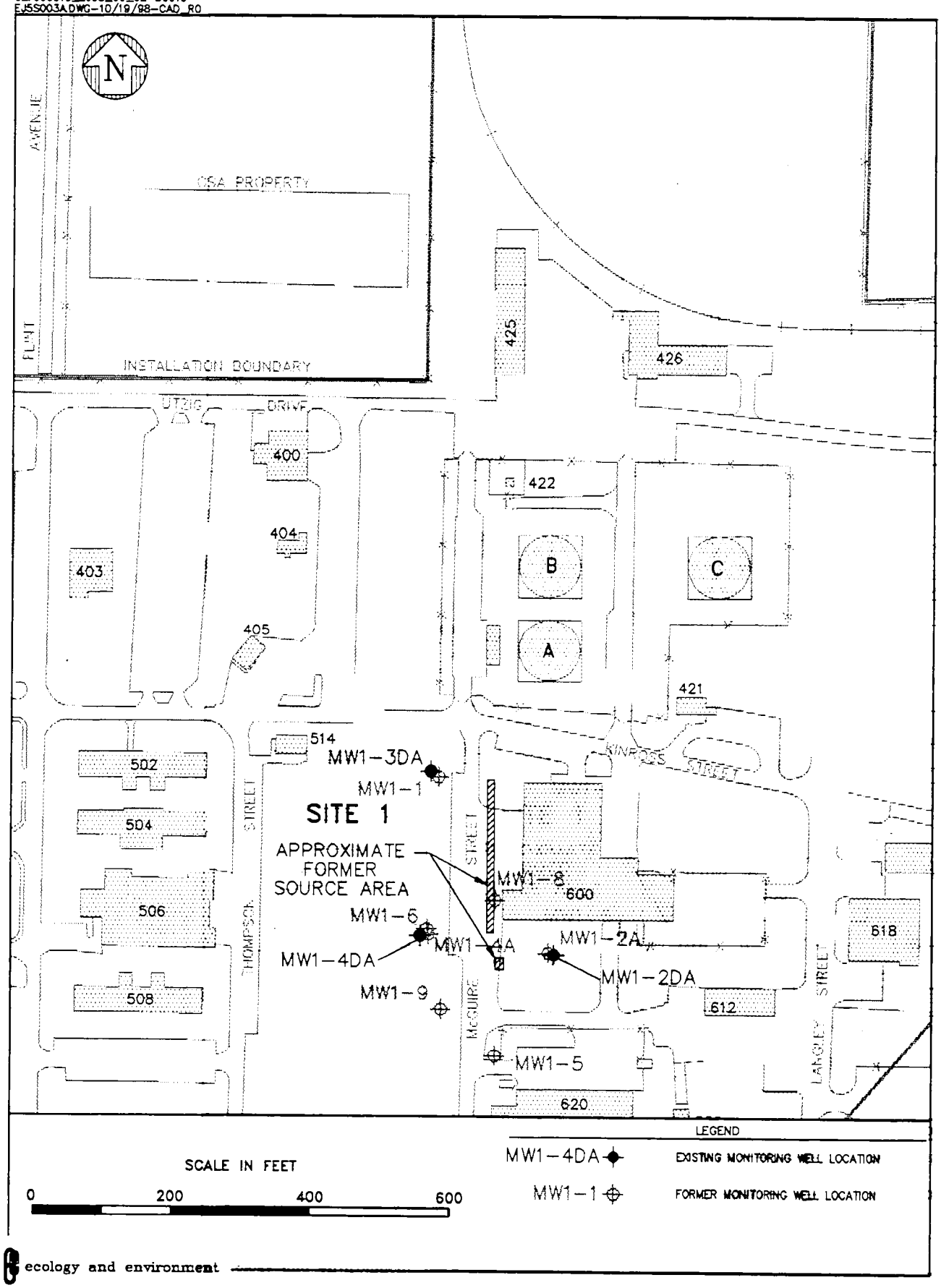


Figure 1-2
IRP SITE 1, BUILDING 600 JP-4 PIPELINE LEAK (ST-11)
SITE LAYOUT
NIAGARA FALLS ARS

On 16 February 1953, the 518th Air Defense Group replaced the 76th Air Base Squadron as the host unit, and the NYANG 47th Fighter Interceptor Squadron replaced the 136th Fighter Interceptor Squadron. In August 1955, the USAF reactivated the 15th Fighter Group to replace the 518th Air Defense Group. In July 1960, the 15th Fighter Group was deactivated, and the 4621st Support Group began operations as the installation host unit. The 4621st Support Group was redesignated as the 4621st Air Base Group in July 1964.

BOMARC
Boeing Michigan Aeronautical Research Center

The North American Defense Command Defense System CIM-10B Boeing Michigan Aeronautical Research Center (BOMARC) missile was deployed in the western portion of the installation in 1959. The 35th Air Defense Missile Squadron was activated to maintain the BOMARC missiles at the installation. The 35th Air Defense Missile Squadron and the missiles were deactivated in the late 1960s, and the NYANG 107th Tactical Fighter Group became the tenant organization occupying the western portion of the installation.

The 49th Fighter Interceptor Squadron, 1st Detachment, assumed responsibility for the installation from the 4621st Air Base Group in March 1970. On 1 January 1971, the installation was transferred from the Aerospace Defense Command to AFRC, and the 914th Tactical Airlift Group became the host unit. The main tenant organization, NYANG 107th Tactical Fighter Group, was redesignated as the 107th Fighter Interceptor Group. In early 1992, the Niagara Falls AFRF was renamed the Niagara Falls IAP-ARS, the 914th Tactical Airlift Group became the 914th Airlift Group, and the 107th Fighter Interceptor Group became the 107th Fighter Group. In 1994, the NYANG 107th Fighter Group was redesignated as the 107th Air Refueling Group, and the 914th Airlift Group was redesignated as the 914th AW. In 1995, the NYANG 107th Air Refueling Group was redesignated at the 107th Air Refueling Wing. When activated, the units are commanded by Air Mobility Command.

The 914th AW has the primary installation mission and trains approximately 1,860 reserve officers and airmen to combat-ready status for any national emergency. Current activities include airlifting troops and supplies, providing front line troops with personnel and logistical support, and conducting medical evacuations. In 1994, the NYANG converted from18 F-16 A/B fighters to 10 KC-135R tankers, and the 914th AW converted to the C-130H cargo airplane.

Environmental Background

Since 1942, various national defense missions have been carried out at the installation, including storage, maintenance, and shipping of war material; research and development; and aircraft operations and maintenance. As a result, hazardous substances and wastes were used, stored, or disposed of at various sites.

DoD
Department of Defense

IRP
Installation Restoration Program

RI/FS
remedial investigation/feasibility study

Several studies and investigations have been conducted under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP) to detect, locate, and quantify contamination resulting from hazardous substances and wastes. To date, 14 sites have been identified at the Niagara Falls IAP-ARS as potential sources of environmental contamination. Installation-wide studies and investigations conducted include the following:

- A 1983 Phase I record search involving interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment of the potential for site contamination (Engineering-Science 1983);
- A Phase II/Stage 1 confirmation/quantification investigation conducted between 1984 and 1986 to identify areas of contamination (SAIC 1986);
- A comprehensive remedial investigation/feasibility study (RI/FS) conducted between 1987 and 1991 designed to identify and quantify the extent of environmental contamination, screen remedial alternatives, and assess potential risks to human health and the environment (SAIC 1991);
- Installation-wide groundwater monitoring projects conducted annually since 1995 designed to further quantify the extent of contamination, perform long-term monitoring, evaluate potential corrective actions, and evaluate potential risks to human health and the environment;
- The preparation of site-specific decision documents identifying four sites that were closed with recommendations for no further action (Sites 6, 11, 12, and old Site 13); and
- The preparation of site-specific decision documents outlining future actions at eight IRP sites (Sites 1, 2, 3, 4, 5, 8, 9, and new Site 13).

Since 1991, additional investigations have been performed including focused and limited RI/FS studies, corrective measures studies,

remedial design, and long-term groundwater monitoring. A 1994 decision document recommended continued groundwater monitoring at Site 1 (Law 1994).

Pursuant to the corrective action requirements under the installation's NYSDEC Part 373 Hazardous Waste Storage Permit, AFRC has continued long-term groundwater monitoring at 10 IRP sites (including Site 1); prepared a RCRA facility investigation/ corrective measures study (RFI/CMS) for three of the 10 sites (Sites 3, 10, and 13); and developed remedial designs involving groundwater extraction and discharge systems at the same three sites. These efforts were initiated in 1994. The extraction systems are currently in operation.

RFI/CMS
RCRA facility investigation/corrective measures study

ARAR
applicable or relevant and appropriate requirement

RAB
Restoration Advisory Board

TBC
to be considered

CERCLA
Comprehensive Environmental Response and Liability Act

Based on the following investigation criteria, AFRC has proposed no further action at Site 1. The standards and guidance values were determined by using the federal and state environmental and public laws that were identified as potentially applicable or relevant and appropriate requirements (ARARs) at the site. Currently, there are no chemical-specific ARARs for soil. Therefore, other nonpromulgated federal and state advisories and guidance values, referred to as to be considered (TBC), and background levels of the contaminants in the absence of TBCs, were considered. Second, a site-specific baseline risk assessment, using appropriate toxicological and exposure assumptions, was conducted to evaluate the risks posed by detected site contaminants. In addition, as part of the Installation-Wide Groundwater Monitoring Project, a preliminary risk evaluation was conducted to further assess the potential risks posed to human and environmental receptors.

1.4 Highlights of Community Participation

Public interest in the creation of a Restoration Advisory Board (RAB) was solicited in November 1996 and again in January 1998. A RAB allows the public to become involved in the investigations and remedial actions performed on base. However, due to a lack of community interest, a RAB was not formed.

This document is available to the public in an information repository maintained at the Niagara Falls Public Library at 1425 Main Street, Niagara Falls, New York, 14305. This decision document presents the selected remedial action for IRP Site 1 at Niagara Falls IAP-ARS, chosen in accordance with RCRA and, more specifically, Module III of the base's 6 NYCRR Part 373 Hazardous Waste Storage Permit. The decision for this site is based on the administrative record. No public meeting was required.

1.5 Scope of Response Action

No streams or swales are located at Site 1; all surface water drainage is via overland flow. Because the site does not contain surface water or sediment, the NFRAP for IRP Site 1 addresses soil and groundwater only. Based on the concentration of chemicals in the soil and groundwater, the baseline and supplemental risk assessments, and the preliminary risk evaluations, there is no evidence that previous operations conducted at this site have resulted in environmental contamination posing a current or potential threat to human health or the environment.

2 Summary of Site Activities

The following section provides a detailed summary of the groundwater and subsurface soil sampling that has been conducted at Niagara Falls IAP-ARS. The letter designations (suffixes) assigned to the monitoring wells are defined as follows:

- No designation–overburden well, set at the top of bedrock (approximately 5 to 12 feet BGS);
- A–replacement well, similar construction as original well; and
- D–shallow bedrock well, typically set 10 feet into bedrock.

Several metals, particularly lead and zinc, have been detected consistently in the groundwater at the installation, occasionally at concentrations above standards. Many of these metals are known to be naturally occurring in the local soil and bedrock, and, in some cases, are inconsistent with known installation activities. An April 30, 1996, letter from NYSDEC concurred that some metals present may be attributed to native soil and bedrock, but also stated that a traditional list of metals should still be analyzed for on an annual basis. Therefore, the following analytical results discussion for metals detected in both groundwater and subsurface soil samples has been limited to highlight only the following metals identified by NYSDEC as those of greatest concern: arsenic, cadmium, chromium, copper, lead, nickel, and zinc.

Phase I Records Search

During the 1983 Phase I records search (Engineering-Science 1983), information was collected from file materials, site visits, and interviews. Sites identified by this search were ranked by the U.S. Air Force Hazard Assessment Rating Methodology (HARM). The Building 600 JP-4 Pipeline Leak site ranked highest at the installation and was therefore identified as Site 1. The report determined that the potential existed for environmental contamination and contaminant migration and recommended the installation of monitoring wells to characterize groundwater quality and identify contaminant migration.

HARM
Hazard Assessment
Rating Methodology

TOC
total organic carbon

POC
purgeable organic carbon

TRPH
total recoverable petroleum hydrocarbons

Phase II/Stage 1 Confirmation/Quantification Investigation

During the Phase II investigation in 1984, five overburden groundwater monitoring wells (MW1-1, MW1-2, MW1-3, MW1-4, and MW1-5); two bedrock monitoring wells (MW1-1D and MW-1-2D); and two soil borings were drilled and installed (SAIC 1986). Analysis of groundwater samples indicated the presence of oil and grease at a maximum concentration of 0.13 mg/L, total organic carbon (TOC) at a maximum concentration of 14 mg/L, and purgeable organic carbon (POC) at a maximum concentration of 46 mg/L. Subsurface soil samples from the borings also contained oil and grease and TOC (see Table 2-1). The Phase II report concluded that further investigation was needed to delineate the extent of contamination and identify specific contaminants.

IRP RI/FS

Based on the results of the Phase II investigation, additional work was conducted during the comprehensive IRP RI/FS between 1987 and 1990 (SAIC 1991). This included the installation of two overburden monitoring wells (MW1-6 and MW1-7) and two bedrock monitoring wells (MW1-3D and MW1-4D) and the collection of soil-gas, groundwater, and subsurface soil samples. Groundwater sample analysis indicated that several metals, including arsenic, chromium, copper, lead, nickel, and zinc were present. Arsenic, with a maximum concentration of 720 µg/L, lead with a maximum of 321 µg/L, and nickel with a maximum of 46 µg/L exceeded current NYSDEC standards in at least one sample each. Benzene (0.92 µg/L), toluene (1 µg/L), and TRPH (1.6 mg/L) were also detected, but only in the background overburden well (MW1-7).

Elevated concentrations of total recoverable petroleum hydrocarbons (TRPH) were detected in two subsurface soil samples collected near the source area (see Table 2-1). The RI/FS report recommended additional investigation to confirm and define the possible extent of groundwater contamination near the source area. It was also concluded that metals detected in the groundwater samples were the result of natural processes and were not site related.

Table 2-1 IRP Site 1, Historical Subsurface Soil Analytical Results Summary Niagara Falls IAP-ARS

Investigation	Samples Collected	Analytical Results		
		Description	Sample Depth (ft BGS)	Positive Hits (mg/kg)
Phase II Investigation (SAIC 1986)	Four subsurface soil samples were collected from four soil borings located along the southwest corner of Building 600, immediately adjacent to the source area. They were analyzed for oil and grease, and TOC.	Oil and grease was detected in one sample. TOC ranged from non detect to 2%.	2.4 - 4.0	Oil and grease: 17.6
RI/FS (SAIC 1991)	Two subsurface soil samples from a soil boring installed along the southwest side of Building 600, in the approximate location of the source area, were analyzed for VOCs and TRPH.	Both samples contained high levels of TRPH; however, no VOCs were detected.	3.1 - 4.6	TRPH: 18,000
			4.6 - 5.7	TRPH: 1,100
Additional RI/FS (E & E 1992)	No subsurface soil samples were collected at Site 1 under this investigation.			

Table 2-1 (Cont.)

Investigation	Samples Collected	Analytical Results		
		Description	Sample Depth (ft BGS)	Positive Hits (mg/kg)
Limited RI/FS (E & E 1994)	Two subsurface soil samples, one from monitoring well boring MW1-8 and one from **a soil boring located immediately south of the source area on McGuire Street, were collected. Both samples were submitted for VOCs, base** neutral semivolatile organics, metals, and TRPH analysis.	TRPH was detected in both samples. One sample contained small amounts of two **VOCs and two semivolatile compounds, all below the NYSDEC soil cleanup objectives. The same five metals of concern were detected** in both samples with chromium, nickel, and zinc exceeding their cleanup objectives.	1.0 - 3.0 (MW1-8)	TRPH: 150 Chromium: 18 Copper: 20 **Lead: 37** **Nickel: 22** **Zinc: 300**
			1.5 - 3.5	**TRPH: 440** **Ethylbenzene: 0.2** Xylenes, total 0.3 Naphthalene: 0.1 2-Methylnaphthalene: 0.3 Chromium: 22 Copper: 19 Lead: 49 Nickel: 25 Zinc: 560
Installation-Wide Groundwater Monitoring Project (E & E 1995-1998)	No additional subsurface soil samples were collected.			

Key:

BETX = Benzene, ethylbenzene, toluene, xylenes.
BGS = Below ground surface.
Mg/kg = Milligrams per kilogram.
TOC = Total organic carbon.
TRPH = Total recoverable petroleum hydrocarbons.
VOCs = Volatile organic compounds.

Additional RI/FS

As part of an investigation performed at Sites 2, 4, 5, and 9 in October 1992, two background wells at Site 1 were sampled and analyzed for VOCs, metals, and general analytical parameters (E & E 1992). Neither well contained any VOCs. Commonly occurring metals such as iron, magnesium, manganese, and sodium were present above standards or guidance values in one or both of the unfiltered samples. Lead, at a maximum concentration of 12 µg/L, and zinc, at a maximum concentration of 360 µg/L, were present below standards.

Limited RI/FS

Additional limited RI/FS work, including installation of two overburden wells (MW1-8 and MW1-9) and one soil boring, and the collection of groundwater and subsurface soil samples, was conducted in November 1993 (E & E 1994). Chloroform (8.2 µg/L) was detected above current NYSDEC groundwater standards in MW1-9. Other volatiles detected below standards include benzene (0.6 µg/L), cis-1,2-dichloroethene (cis-1,2-DCE) (3.7 µg/L), methyl tert-butyl ether (MTBE) (3.8 µg/L), trichloroethene (TCE) (2.9 µg/L), and toluene (1.2 µg/L). Metals detected above groundwater standards or guidance values included chromium, copper, lead, nickel, and zinc at maximum concentrations of 100 µg/L, 260 µg/L, 150 µg/L, 130 µg/L, and 3,800 µg/L, respectively. TRPH was detected in two wells at a maximum concentration of 2,700 µg/L. TRPH, total xylenes, ethylbenzene, naphthalene, and 2-methylnaphthalene were detected in subsurface soil samples (see Table 2-1). TRPH was detected at concentrations lower than common cleanup standards and two orders of magnitude lower than the concentrations detected during the IRP RI/FS. Five of the metals of concern were also detected; three were above cleanup objectives (see Table 2-1).

TCE
trichloroethene

cis-1,2-DCE
cis-1,2-dichloroethene

MTBE
methyl tert-butyl ether

Installation-Wide Groundwater Monitoring

Under the Installation-Wide Groundwater Monitoring Project that began in September 1994 (E & E 1996a; 1997; 1998a; 1998b), the four bedrock wells and two of the overburden wells (MW1-2 and MW1-7) were replaced. Between 1995 and 1998, all wells at Site 1 were abandoned with the concurrence of NYSDEC, with the exception of the background wells (MW1-7A and MW1-1DA) and the three bedrock wells near the former source area (MW1-2DA, MW1-3DA, and MW1-4DA). Groundwater sampling was conducted in various wells twice in 1995, 1996, and 1997 and once in 1998. The only VOCs detected above NYSDEC groundwater standards were TCE and cis-1,2-dichloroethene in well MW1-3DA. These compounds were present each time this well was sampled, as illustrated in Figure 2-1. The only VOC detected in a Site 1 well other than MW1-3DA, with the exception of minor amounts of laboratory contaminants, was TCE (1.3 µg/L) in MW1-

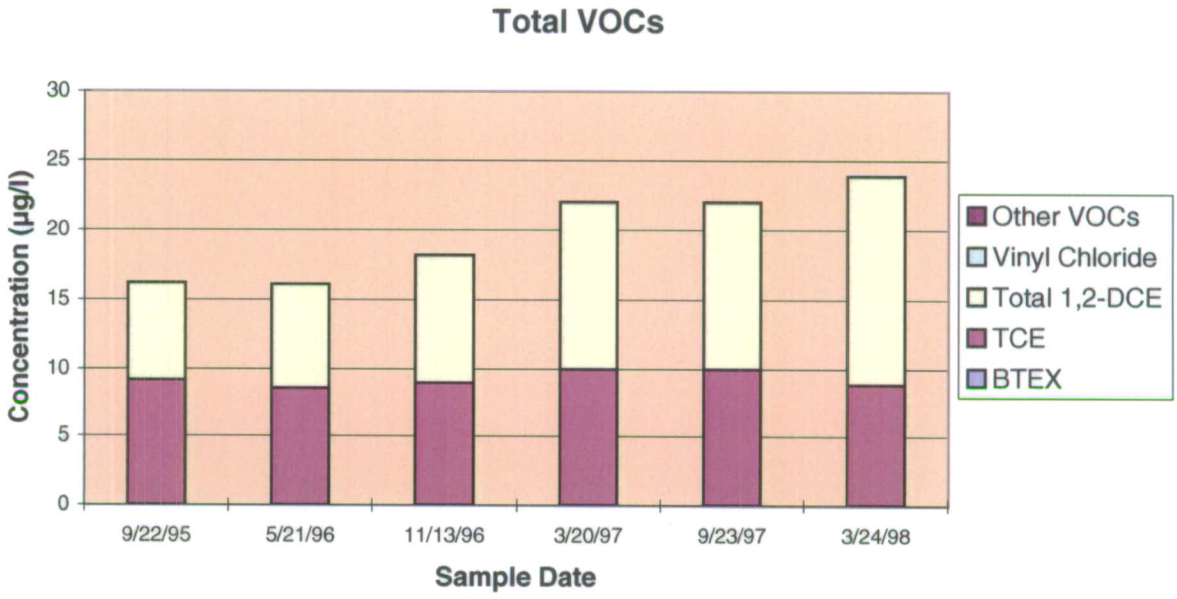
1DA in September 1995. Metals that exceeded standards on one or more occasions include lead, copper, and cadmium. It was determined during this and previous investigations that the presence of metals in the groundwater is naturally occurring. No existing wells have been found to contain analytes related to the JP-4 pipeline leak. The presence of low concentrations of chlorinated solvents in one well is consistent with historical base-wide activities but is not associated with the known source at Site 1.

Figure 2-1: MW1-3DA Analytical Summary - VOCs and Metals

IRP Site No.:	1	**Total Depth:**	19.9 feet BGS
Well Type:	Shallow Bedrock	**Sand Pack Interval:**	11.1 - 17.9 feet BGS
Installation Date:	6/16/95	**Depth to Bedrock:**	8.0 feet BGS

This well replaced one of inappropriate construction (MW1-3D), data for which has not been included here.

VOC Results (µg/l)



Date	BTEX	TCE	Total 1,2-DCE	Vinyl Chloride	Other VOCs
9/22/95	ND	9.2	7	ND	ND
5/21/96	ND	8.6	7.5	ND	ND
11/13/96	ND	9	9.2	ND	ND
3/20/97	ND	10	12	ND	ND
9/23/97	ND	10	12	ND	ND
3/24/98	ND	8.9	15	ND	ND

Metals Results (µg/l)

Date	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
9/22/95	ND	ND	ND	ND	14	ND	61
9/16/98	ND	ND	ND	ND	35	ND	270

3

Summary of Site Risks

EPA
U.S. Environmental
Protection Agency

Several studies have been conducted to assess the extent of and the potential exposure to contaminants at IRP Site 1. As part of the RI/FS (SAIC 1991), a baseline human health risk assessment was conducted to evaluate potential current and future risks to human health associated with contaminants detected in groundwater and soil at the site. A supplemental risk assessment was conducted as part of the Limited RI/FS (E & E 1994). Concentrations of chemicals found in the soil and groundwater were compared with standard U.S. Environmental Protection Agency (EPA) risk-based screening levels and NYSDEC Class GA groundwater standards. The results of this assessment are included in the October 1994 final decision document prepared for the site (Law 1994). Additionally, as part of the Installation-Wide Groundwater Monitoring Project, preliminary risk evaluations were conducted annually from 1995 through 1997 to further assess potential risks associated with exposure to contaminants detected in groundwater at the site (E & E 1996a; 1997; 1998a). The intent of this section is not to provide a full risk assessment, but to summarize the results of the previous studies. If the risk assessment is to be used as a basis for future decision making, the detailed assessments included in the above referenced documentation should be consulted.

3.1 Human Health Risk Assessment

3.1.1 RI/FS Baseline Risk Assessment

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: 1) hazard identification, 2) exposure assessment, 3) toxicity assessment, and 4) risk assessment. Current and potential site risks from chemicals of concern were evaluated using likely exposure scenarios. All chemicals detected in the soil and groundwater at the site were considered chemicals of concern, except TRPH and those chemicals excluded during the data quality review. TRPH is a complex mixture whose component chemicals were not identified, and there are no EPA toxicity values available for this class of compounds for use in risk characterization. The individual petroleum hydrocarbon constituents detected (e.g., benzene, toluene, MTBE) were evaluated.

Routes of exposure and occupational receptors were selected for soils and groundwater at Site 1 based on its current and future land use designation of industrial. The site, which is located in the highly developed northern portion of the base, consists of paved roads, parking lots, buildings, and maintained lawns, and is regularly used by base personnel. Access to the base is controlled by a perimeter fence and armed security police. There are no plans to close the installation.

Quantitative estimates of carcinogenic and noncarcinogenic risks were calculated for the site as part of the risk characterization, which evaluated potential health risks based on estimated exposure intakes and toxicity values. For carcinogens, risks were estimated as the incremental probability of an individual developing cancer over a 70-year lifetime as a result of exposure. The cancer risks of the individual chemicals were summed for each pathway to develop a total risk estimate. Under current EPA Superfund policy, acceptable exposures to known or suspected carcinogens are generally those that represent an excess lifetime cancer risk to an individual of between 1 in 10,000 (1×10^{-4}) and 1 in 1,000,000 (1×10^{-6}) (USEPA 1992).

HQ
Hazard Quotient

HI
Hazard Index

To assess the likelihood of noncarcinogenic effects from exposure to a contaminant, EPA has developed the Hazard Quotient (HQ). The HQ is the ratio of the chronic daily intake of a chemical to the chronic reference dose for that chemical. The reference dose is an estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a lifetime. For screening purposes, the HQs are summed for all contaminants within an exposure pathway (e.g., ingestion of soils) to determine the Hazard Index (HI). If the HI exceeds 1, there may be concern for potential noncarcinogenic health effects if a single contaminant is responsible or if the contaminants responsible cause similar toxic effects. An HI less than 1 indicates that adverse health effects would not be expected.

Cleanup actions may be taken when the regulatory agencies determine that the risk at a site exceeds the cancer level of 1 in 10,000 or if the noncarcinogenic HI exceeds 1. Once either of these thresholds has been exceeded, remedial action alternatives are evaluated to reduce the risk levels to within the acceptable ranges.

Surface Water/Sediments

No streams or drainage ditches are located close to Site 1; therefore, exposure to contaminated surface water and sediments is not a concern.

Soils

A leak in a JP-4 hydrant system near Building 600, which was discovered in 1969, is the source of contamination at Site 1. The baseline risk assessment determined that routine exposure to the contaminated soils via ingestion, inhalation, or dermal contact would not occur because the spill area is currently capped with asphalt.

Groundwater

Although the installation and surrounding communities are currently provided with a municipal water supply, the baseline risk assessment assumed that base personnel hypothetically could ingest groundwater having contaminant concentrations equal to those detected at the site. The excess lifetime cancer risk was estimated to be 2×10^{-5} and was attributable to the presence of arsenic, which is found to occur naturally at high concentrations in the Niagara Falls area (E & E 1996b; Litten 1986). This estimate falls within the acceptable range for cancer risk established by EPA.

The HI for a combined exposure to all detected compounds was calculated to be approximately 0.57. Therefore, no adverse noncarcinogenic effects were anticipated for chronic exposure to groundwater.

3.1.2 Limited RI/FS Supplemental Risk Assessment

SRA
supplemental risk assessment

COPC
contaminants of potential concern

PRG
Preliminary Remediation Goals

RBC
risk-based concentration

The Limited RI/FS supplemental risk assessment (SRA) (E & E 1994) identified site-related contaminants of potential concern (COPCs) and assessed the potential risk to human health. Using both commercial/industrial and residential scenarios, the chemical concentrations detected in subsurface soil and groundwater were compared with EPA health-based benchmark concentrations (i.e., Preliminary Remediation Goals [PRGs] and risk-based concentrations [RBCs]) as well as NYSDEC cleanup goals and groundwater standards and guidance values. The PRG values are the chemical concentrations in environmental media that correspond to an estimated cancer risk of 1×10^{-6} for carcinogens or an HI of 1 for noncarcinogens as discussed above. PRGs were calculated using formulas and default exposure assumptions contained in EPA's Risk Assessment Guidance for Superfund, Part B, as well as standard toxicity values (reference doses and slope factors) obtained from the Integrated Risk Information System (IRIS 1993) and the Health Effects Assessment Summary Tables.

Soils

Several metals were detected in subsurface soil samples collected during this investigation. However, only zinc exceeded background levels, and no metals exceeded PRGs for soil. Low concentrations of TRPH and fuel-related organic compounds were also

detected; however, none exceeded NYSDEC cleanup goals. Therefore, no COPCs were selected for soil. Although potential exposure via direct ingestion and inhalation of vapors by workers was considered, no actual significant exposure pathways were identified. It was determined that Site 1 soils do not pose a threat to human health since no risk-based screening levels were exceeded.

Groundwater

Benzene, chloroform, petroleum hydrocarbons, TCE, aluminum, lead, and manganese were identified as COPCs for groundwater at Site 1 because they exceeded background levels, NYSDEC standards, and/or PRGs. The elevated levels of aluminum and lead detected in the groundwater are believed to be related to suspended soil particles in the groundwater samples and, therefore, do not pose a risk to human health based on groundwater ingestion. Although the groundwater beneath Site 1 is classified by NYSDEC as a potential drinking water source, there are no existing exposure pathways to groundwater. The potable water on the base and in the surrounding communities is supplied by a municipal supply, which is likely to continue to be the source of drinking water in the future. Therefore, it was concluded that the potential adverse health effects from the groundwater beneath Site 1 are not significant.

3.2 Preliminary Risk Evaluation

The preliminary risk evaluation performed as part of the Installation-Wide Groundwater Monitoring Project (E & E 1996a; 1997; 1998a) assessed the potential risks posed to human and ecological receptors from exposure to contamination detected in groundwater.

3.2.1 Human Health Risk Evaluation

The preliminary risk evaluation compared organic chemical concentrations detected in the groundwater to New York State Class GA Groundwater Standards and EPA Region III RBCs for tap water. The RBCs are based on potential residential exposures through consumption of drinking water and inhalation of volatile chemicals. The criteria are consistent with the target risk levels used in the baseline risk assessment (i.e., lifetime cancer risk of 1 x 10^{-6} or a noncancer HI of 1.0). The RBCs were used to provide a conservative estimate of potential risks if site groundwater was used as a water supply source. This scenario is not realistically expected to occur since the base and surrounding areas are served by a municipal water supply system.

It was also assumed that groundwater contaminants could migrate to downgradient surface water bodies, where human exposure is possible but not likely. Therefore, the chemical concentrations in groundwater were also compared to the risk-based screening

concentrations (RBSCs) that were derived for surface water screening by assuming daily incidental ingestion by site workers. This exposure scenario is also unrealistic since the nearest surface water is more than 1,400 feet away and groundwater contaminants would degrade and disperse with time and distance from the source. The RBSCs were intended only to provide a further conservative assessment of potential risks.

The presence of metals in groundwater was not considered to be site-related; therefore, they were not included in this evaluation.

The only organic compounds detected at Site 1 during this investigation were TCE and cis-1,2-DCE. The maximum concentration of TCE exceeded the RBC for tap water by a factor of approximately 6. The resulting upper-bound cancer risk associated with residential use of such groundwater is 6×10^{-6}, which is within the range of acceptable risks under EPA policy. TCE and cis-1,2-DCE concentrations were much lower than the RBSCs for incidental ingestion indicating that even routine contact with these levels in surface water would not pose a significant health risk.

Based on the lack of a direct exposure pathway, it is considered unlikely that contamination in groundwater at or adjacent to Site 1 poses a significant risk to human health.

3.2.2 Ecological Risk Evaluation

IRP Site 1 is located in the highly developed, northern portion of the installation (see Figure 1-2). The area consists of paved roads, parking lots, buildings, and maintained lawns, and is regularly used by base personnel. It is not considered of ecological importance because it is suitable habitat for only a few individuals of common wildlife species that are habituated to humans. Consequently, the Site 1 area was not considered an ecosystem of concern and was not evaluated further.

4 Description of the NFRAP Alternative

No further action is proposed for Site 1, Building 600 JP-4 Pipeline Leak. No existing wells have been found to contain analytes related to this leak since 1995, and the concentrations of VOCs detected in 1989 and 1993 were at or below NYSDEC standards. The presence of chlorinated solvents in one bedrock well at this site is not consistent with the suspected source of contamination (JP-4) but is consistent with historical practices performed base-wide and throughout the area.

The recommendation of no further action is further supported by the baseline and supplemental risk assessments and preliminary risk evaluation, which determined that no significant exposure pathways exist and that the concentrations of compounds detected over the past three years do not exceed applicable risk-based screening criteria. Therefore, these compounds do not pose an unacceptable risk to human health or the environment.

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