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EXPLOSIVE ORDNANCE DEMOLITION RANGE (SS-026)
SITE INVESTIGATION REPORT

PLATTSBURGH AIR FORCE BASE
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DRAFT FINAL

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EXECUTIVE SUMMARY

This SI was conducted to evaluate potentially contaminated soils and groundwater at the Explosive Ordnance Disposal Range (SS-026) IRP site at Plattsburgh AFB. The site is comprised of 8 acres in the southwest portion of Plattsburgh AFB, adjacent to another IRP site (LF-024) and approximately 350 feet north of the Salmon River. The site was used for demolition and disposal of explosive ordnance. The specific objectives of the SI were:

- To describe the physical conditions of the site
- To evaluate the nature and extent of chemical contamination in the site groundwater and soil
- To evaluate the risks posed by site contaminants to human health and the environment
- To determine if remedial or removal actions are warranted

The site surface is relatively flat, sandy, and devoid of any significant topsoil or vegetation. Precipitation, therefore, primarily infiltrates to groundwater or is lost via evapotranspiration. Shallow groundwater at the site flows to the south-southeast in an unconfined sand aquifer which discharges to the Salmon River. The confined bedrock aquifer is hydraulically isolated from the site by a clay confining unit and, therefore, was not investigated during the SI. The most significant pathways for contaminant migration at the site are leaching of soil to groundwater, transport within the shallow aquifer, and wind entrainment of contaminated surface soils.

The 1994 SI field activities included the advancement of 7 soil borings, installation of four groundwater monitoring wells, collection and chemical analysis of 10 soil samples, collection and chemical analysis of 5 groundwater samples, and observations of the site's physical condition. A Draft SI Report was issued in August 1995.

Finalization of the SI was delayed pending efforts by the Air Force to "safe" the range (to thoroughly investigate and remove any potentially dangerous ordnance). During range safing operations conducted in 1997 and 1998, several discoveries were made that were considered evidence of potential impact to human health or the environment. These included buried drums, chemical warfare training materials, and areas of debris/fill.

Twenty-seven buried 55 gallons drums containing what appeared to be waste oil products were found in the west-central portion of the site. The drums appeared to be intact upon discovery, however, two were punctured when first found. They were overpacked, sampled, and staged in the fall of 1997. Sample results were consistent with the physical observation that the material was waste petroleum product. The drums were disposed of offsite in the spring of 1998. A single empty 55-gallon drum (later disposed of as scrap) also was found in the sand berm in the northeastern portion of the site. Soils surrounding the drums were sampled and analyzed to evaluate whether product had leaked from the drums, contaminating surrounding soils. The soil samples were found to contain organic compounds and metals, but at concentrations below regulatory guidelines.

In the summer and fall of 1999, a supplemental SI sampling event was undertaken to address regulatory comments to the Draft SI Report, to evaluate the presence of chemicals associated with chemical warfare agents in the area where training materials were discovered, and to evaluate the limits and chemical character of fill materials identified during safing operations. In this event, one additional monitoring well was installed, 17 soil samples were collected and chemically analyzed, groundwater from 6 monitoring wells was collected and chemically analyzed, 14 test trenches were excavated, and 2 groundwater seep samples were collected and chemically analyzed.

Given the samples taken in both the 1994 and 1999 sampling events, minor pesticide (4,4'-DDT), explosive (RDX), and metals (antimony, cadmium, chromium, and silver) detections in near surface soils in the central bermed portion of the site appear to be the only contaminants in soil attributable to past ordnance disposal practices at the EOD Range. Only RDX appears to be migrating from soils to groundwater. RDX is present in two wells downgradient of the main range disposal area at concentrations above the USEPA's Drinking Water Health Advisory value. RDX was not detected in downgradient groundwater seeps south of the EOD Range. No evidence of chemical warfare agents (TDG, CN, CS, arsenic, or chloroform) was present in site soils. Dioxins and furans, potential residual products of herbicide use, were not detected at levels threatening to human health.

Based on the extensive test trenching performed during the 1999 investigatory event, only small quantities of generally surficial household type waste were found in the fill areas identified during the safing, other than in the "satellite fill area" located along a steep embankment to the south of the ordnance disposal area. The "satellite fill area" was found to consist primarily of surficial metallic military wastes (ammo cans, empty crushed drums, filing cabinets) and construction/demolition (C&D) debris. One small portion of the "satellite fill area" contained a tar-like substance in which PAH compounds were present at high concentrations.

Human health risks associated with exposure to site soils and/or groundwater were assessed using two exposure scenarios. These are: 1) current land use conditions, under which adult and teenage trespassers are exposed to surface soil and groundwater at leachate seeps; and 2) hypothetical future land use conditions, under which adult and child residents and construction workers are exposed to site soils and groundwater.

The calculated noncancer hazard indices for all potential receptor populations fell below the acceptable USEPA-specified upper limit of 1. The calculated cancer risks for the trespasser and construction exposure scenarios fell within the range of risk (10^{-4} to 10^{-6}) established by current USEPA guidelines that can be considered acceptable on a site specific basis. The calculated cancer risks for the residential scenario were 2×10^{-4}, a risk near the upper limit of USEPA's potentially acceptable range. The excess cancer risk posed to potential future residents is a result of exposure to high levels of PAHs in soil, particularly in the tar-like material present in the "satellite fill area", and arsenic in groundwater.

Because of the excess potential human health risk associated with exposure to the tar-like material, it is recommended that the removal of this material from the site be further investigated. It would also be prudent to remove the surficial metallic debris in the "satellite fill area", thereby removing the physical hazard associated with that material.

No quantitative assessment of potential risk posed to ecological communities was performed in this SI. However, based on a qualitative assessment, there appears to be little potential for site contaminants to adversely impact the Salmon River aquatic community.

Based on the site safing work performed, the range safing contractor (Human Factors Applications, Inc.) contracted by the United States Army Corps of Engineers recommended that the EOD Range is suitable for unrestricted reuse. Following mitigation of risk associated with the tar-like material from the "satellite fill area," there would appear to be no need to restrict the site to non-residential reuse on the basis of the environmental samples taken as part of the SI.

1.0 INTRODUCTION

This Draft Final Site Investigation (SI) Report presents, summarizes, and provides interpretations and conclusions gathered during SI field activities at the Explosive Ordnance Disposal Range site (SS-026) at Plattsburgh Air Force Base (PAFB). Remedial investigations and site remediation are being conducted at PAFB as part of the Department of Defense's Installation Restoration Program (IRP). The IRP was developed as a component of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. On November 21, 1989, PAFB was placed on the National Priorities List (NPL) by the United States Environmental Protection Agency (USEPA). On September 21, 1991, USAF entered into an interagency Federal Facilities Agreement (FFA) (Docket No.: II - CERCLA - FFA - 10201) with USEPA and the New York State Department of Environmental Conservation (NYSDEC) in order to implement the IRP. The IRP at PAFB currently is being administered by the Air Force Base Conversion Agency.

PAFB is located in northeastern New York State. It is bordered by the City of Plattsburgh to the north, Lake Champlain to the east, lake shore communities to the southeast, the Salmon River and agricultural land to the south, and Interstate 87 to the west (Figure 1-1). The base, formerly the home of the 380th Air Refueling Wing, was closed in September 1995 by the United States Air Force (USAF). The Plattsburgh Air Base Redevelopment Corporation (PARC) is coordinating the redevelopment of base property. The *Comprehensive Reuse Plan for PAFB* indicates potential light industrial (aviation alternative) or fairgrounds (nonaviation alternative) reuses for the SS-026 site (LDR 1995). The *Final Environment Impact Statement* for PAFB also indicates potential industrial or public/recreational (possibly fairgrounds) reuses for the SS-026 site (USAF 1995).

1.1 Purpose of Report

The specific objectives of the SI were to: 1) describe the physical conditions at the site; 2) evaluate the nature and extent of chemical contamination in the site groundwater and soils; 3) evaluate the risks posed by site contaminants to human health and the environment; and, 4) determine if remedial or removal actions are warranted.

Activities performed to satisfy these objectives included literature reviews, sampling of surface and subsurface soil, monitoring well installations, groundwater sampling, groundwater seep sampling, chemical and geotechnical analysis of samples, and a human health risk assessment.

1.2 Site Background

1.2.1 Site Description

The Explosive Ordnance Disposal (EOD) Range is an approximately 8-acre area located in the southwest portion of PAFB (Figures 1-1). It is situated approximately 350 feet north of the Salmon River and essentially adjoins another IRP site, LF-024 (Figure 1-2). The Weapons Storage Area complex is located a short distance east of SS-026. The EOD Range is partially enclosed by a four-strand barbed wire fence and is somewhat remote from the industrial and residential areas of the base. Primary access to this portion of the base is via an asphalt and gravel roadway from the west.

Site features as they appeared in the summer of 1994, when the base was still active, are shown in Photos 1 through 6. SS-026 was relatively flat and barren and a ridge, up to 8 feet high, was present around most of the perimeter of the site (Photos 1 and 2). Three "U"-shaped earthen mounds used to contain ordnance explosions were present in the central portion of the site (Photos 2 through 5). The ground surface, which had frequently been regraded, was generally sand-covered with some metallic debris and was sparsely vegetated with grass. The berms and substantial portions of the site were excavated, sifted, and regraded during range safing operations in 1997 and 1998 (HFA 1999) (Photos 7 through 9). The site is currently relatively flat with a few mounds of ungraded sand on the perimeters of the site (Photo 10). The area surrounding the site is wooded.

1.2.2 Site History

Site history information is summarized from the *Draft Final Report, Preliminary Assessment,* (Malcolm Pirnie, Inc.1992a). The site was used primarily for explosive ordnance demolition and disposal. Magnesium flares, Mace, tear gas, RR 119, and ALA 40 were also disposed of and burned at the site. RR 119 and ALA 40 are Air Force designations for magnesium-based flare/illumination munitions.

Ordnance was placed in "burn kettles" (i.e., a reinforced dumpster or jet engine cover) within the earthen berms. Wood and approximately five gallons of diesel fuel were then placed in the kettle and detonated with powder using a timed fuse. After each "burn," EOD personnel would clear the area within 200 feet of the "kettle" of visually apparent material and ordnance debris. The earthen berms were bulldozed periodically to maintain their shape. Bulldozing also cleared the area of combustible material (i.e., grass, trees). An unknown defoliant was also reportedly used for this purpose for three years.

The EOD Range was reportedly also used as a burial site for animals and small amounts of household waste. EOD personnel commonly found bones, dishes, and silverware during range clearance.

Chemicals of potential concern include byproducts of military ordnance disposal (metal and explosives), defoliants, chemical warfare agents and diesel fuel. Potential contaminant migration pathways include soil and groundwater.

1.2.3 Previous Investigations

A Preliminary Assessment (PA) for SS-026 was completed in 1992 (Malcolm Pirnie, Inc. 1992a). The PA included a review of historical records, interviews with base personnel regarding site use, and a site walkover. Because of the ordnance disposal and the historical use of defoliants and diesel fuel at SS-026, the site was recommended for further investigation.

In July 1994, USAF EOD personnel performed sporadic trenching while clearing the site of unexploded ordnance in preparation for this SI. During the trenching, an approximately 6-inch thick layer of household waste was discovered within 2 feet of the surface immediately east of the bermed area (Photo 6). In addition, magnesium flares were discovered at a depth of approximately 2 feet near a boring location within the bermed area. Several unexploded hand grenades were found near the berm in the northeast corner of the site and were disposed by EOD personnel. No environmental sampling was conducted at the site prior to this SI.

1994 SI field activities included the advancement of 7 soil borings, installation of 4 groundwater monitoring wells, collection and chemical analysis of 10 soil samples, collection and chemical analysis of 5 groundwater samples, and observations of the site's physical condition. These data were compiled and utilized to quantitatively assess potential risks posed by site contaminants to human receptors.

The soils at SS-026 were found to contain organic chemicals including RDX (an explosive). None of the organic compounds were detected at levels that exceeded regulatory criteria. Metals were detected in site soils at concentrations elevated relative to background soil concentrations at Plattsburgh Air Force Base; however, no unacceptable carcinogenic or noncarcinogenic human health risk was associated with exposure to the site's soils.

Only two chemicals, iron and zinc, were detected in contravention of regulatory criteria in groundwater sampled at SS-026. However, these compounds were at levels similar to regional background concentrations. Based on the negligible impact to human health and the environment posed by SS-026, the Draft Site Investigation Report (URS 1995a) concluded that remedial actions were not deemed necessary to remediate chemicals present on site due to past site activities.

During range safing operations conducted in 1997 and 1998 (HFA 1999), several discoveries were made that were considered evidence of potential impact to human health or the environment. These included buried drums, chemical warfare training materials, and debris/fill as shown on Figure 1-3.

Twenty-seven buried 55 gallons drums containing what appeared to be waste oil products were found in the west-central portion of the site. The drums appeared to be intact upon discovery, however, two were punctured when first found. They were overpacked, sampled, and staged in the fall of 1997. Sample results were consistent with the physical observation that the material was waste petroleum product. The drums were disposed of off site in the spring of 1998. A single empty 55 gallon drum (later disposed of as scrap) also was found in the sand berm in the northeastern portion of the site. Soils surrounding the drums were sampled and analyzed to evaluate whether product had leaked from the drums, contaminating surrounding soils. The soil samples were found to contain organic compounds and metals, but at concentrations below regulatory guidelines.

The buried chemical warfare agent training materials were discovered in October 1997 in the north-central portion of the site. These materials included an empty war gas identification set storage container ("PIG"), eight empty glass jars used to hold tear gas capsules, and 48 empty glass vials (used to hold diluted chemical warfare agents) from the war gas identification set. The materials were removed in 1998. The general area where the materials were found was termed the Chemical Agent Site (CAS).

Several areas of scattered debris were identified to the north, east, and south of the EOD Range. The most significant and areally extensive of these areas is situated to the south of the open EOD Range along a steep slope to the north of the Salmon River. This area was termed the Satellite Fill Area.

The range safing contractor coordinated the removal and disposal of surface and subsurface ordnance, explosives, and chemical warfare material training items discovered during the 1997-1998 unexploded ordnance clearance (HFA 1999). All property within the earthen berms that surround the EOD Range was cleared to a depth of 4 feet below grade (approximately 6.5 acres). Some areas within the earthen berms were excavated to depths of up to 16 feet below grade. A surface and subsurface clearance to a depth

of 1 foot was also performed on the buffer zone that extends a minimum of 200 feet outward from the center of the perimeter berm surrounding the range (approximately 32 acres). The range safing contractor recommended a "Certificate of Clearance for Un-Restricted Use" be issued for the property that was cleared.

The CAS area and the scattered debris areas were investigated further during the summer and fall of 1999 as part of the ongoing SI. Also, additional sampling was undertaken at 3 SI boring locations and at site monitoring wells in response to United States Environmental Protection Agency (USEPA) comments on the Draft SS-026 Site Investigation Report. These activities are described in subsequent sections of this report.

1.3 Report Organization

This report has been organized in a format consistent with Chapter 3 of USEPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA,* (USEPA 1988a). Site background information, including a discussion of previous investigations, is provided in Section 1.0. In Section 2.0, the scope of work is outlined and the methods and procedures used during the field investigation are summarized. The physical characteristics of SS-026 are described in Section 3.0. In Section 4.0, Applicable or Relevant and Appropriate Requirements (ARARs) are discussed. Section 5.0 provides a detailed discussion of analytical testing results from this study. In Section 6.0, the expected fate of contaminants and contaminant transport mechanisms are discussed. A discussion of human Risk Assessment (RA) results is presented in Section 7.0. A summary and conclusions are presented in Section 8.0, and recommendations are made in Section 9.0.

2.0 SITE INVESTIGATION FIELD ACTIVITIES

Initial SI field activities were conducted in November and December 1994 and consisted of:

- Drilling 7 soil borings
- Installing 4 monitoring wells
- Collecting representative samples from the screened interval of each monitoring well and select surface locations for geotechnical analysis
- Collecting representative environmental samples (10 soil and 5 groundwater) for chemical analysis
- Slug testing the 4 monitoring wells
- Surveying the soil boring and monitoring well locations

Additional field activities were conducted from August through October 1999 in response to regulatory agency comments to the Draft version of this report and to investigate several areas of potential impact to human health or the environment discovered during 1997/1998 range safing operations. These activities consisted of:

- Drilling 8 soil borings
- Installing 1 monitoring well
- Performing numerous shovel tests to investigate areas of reported scattered debris
- Excavating 14 test trenches
- Collecting representative environmental samples (soil, groundwater, and groundwater seep) for chemical analysis
- Surveying the soil boring, monitoring well, test trench, and sampling locations

The field and analytical programs were carried out in a manner generally consistent with the *Final Work Plan* (hereafter referred to as the Work Plan) (Malcolm Pirnie 1992b), *Final Chemical Data Acquisition Plan* (Malcolm Pirnie 1992c), *Final Site Safety and Health Plan*, (Malcolm Pirnie 1992d), and the *Final Monitoring Well Installation Plan* (Malcolm Pirnie 1992e). However, following consultation with AFBCA, NYSDEC, and USEPA, some modifications were made to the sampling and analytical program. These modifications included:

- Duplicates were taken at a minimum frequency of 1 per 20 samples for each medium.

- Trip blanks were taken at a frequency of one per cooler for coolers in which a volatile groundwater aliquot was shipped.

- Matrix spike/matrix spike duplicate (MS/MSD) samples were taken at a frequency of 1 per 20 samples.

- Rinse blanks were taken from soil sampling apparatuses at a frequency of 1 per day per apparatus.

- Precleaned, factory sealed, disposable teflon bailers were utilized for sampling of monitoring wells. Rinse blanks were taken at a frequency of 1 per batch lot from this apparatus.

- Wells were developed using a hydro-lift pump equipped with dedicated and disposable polyethylene tubing. Submersible pumps were not used.

- Hexane was eliminated as a rinse agent during decontamination of sampling equipment. Only a methanol rinse was used.

- One-inch diameter slugs were used to perform rising head hydraulic conductivity tests.

- The 3 soil borings where monitoring wells were not installed were backfilled with their drill cuttings to avoid leaving long, cylindrical solid objects buried within the EOD Range.

Most of these deviations from the project plans were documented in the *Draft Final Scope of Sampling and Analysis Activities for SS-026* submitted by URS in October 1994 and the *Final Work Plan for Supplemental Sampling and Analysis at IRP Site SS-026 (EOD Range) Plattsburgh AFB, New York* revised by URS in August 1999.

2.1 1994 SI Field Activities

The following subsections detail the SI field activities performed in November and December 1994.

2.1.1 Drilling Program

Seven soil borings were advanced at SS-026 in 1994 to evaluate subsurface conditions. Four of the soil borings were completed as shallow groundwater monitoring wells. The drilling and well installations were conducted by Buffalo Drilling Co. of Akron, New York using a CME 55 drilling rig mounted on a two-wheel drive truck chassis. A URS geologist was present during all drilling activities to evaluate physical and subsurface conditions at each borehole location.

2.1.1.1 Soil Borings

Three soil borings were advanced in the central bermed area using 4-1/4-inch ID hollow-stem

augers (HSA) to the top of the shallow water table aquifer (Figure 2-1). Soil samples were collected continuously using a 2-foot long, 3-inch ID stainless-steel split barrel sampler to a depth of 4 feet and a 2-inch ID stainless-steel split barrel sampler for the remainder of the soil boring. Soil samples were examined, classified, inspected for signs of contamination, and screened by the supervising field geologist with a photoionization detector (PID). All observations were recorded in the field notebook and summarized on the soil boring logs (Appendix D).

The soil samples were apportioned for chemical and geotechnical analysis as described in Sections 2.1.1.3 and 2.1.1.4. Upon completion, the boreholes were backfilled with auger cuttings supplemented by surrounding native sands since the loose sands encountered in the borings would "heave" into or fill the borehole as the HSA were removed. Visual observations and PID screening indicated the auger cuttings to be free of gross or volatile organic contamination.

2.1.1.2 Monitoring Well Installation

Monitoring well borings were advanced initially with 4-1/4-inch ID HSA, for greater sampling control in "heaving" sands, and sampled with 3-inch (to a depth of 4 feet) or 2-inch (below 4 feet) ID split barrel samplers. One location, MW-26-001, was sampled continuously to accurately delineate the site stratigraphy and the other locations were sampled at 5-foot (maximum) intervals. Samples were examined, classified, screened with a PID, apportioned for analysis, and logged as noted in the previous section on soil borings.

Upon reaching the borehole completion depth, the 4-1/4-inch ID HSA were removed and the borehole was redrilled with 6-1/4-inch ID HSA with decontaminated wooden knock-out plugs to allow proper monitoring well installation. Monitoring wells were constructed using 10-foot long, 2-inch ID, schedule 40 PVC well screens (0.010-inch slot) threaded into 2-inch ID, schedule 40 PVC well risers. The wells were completed with locking steel protective casings. Each well was installed according to the specifications in the *Final Monitoring Well Installation Plan* (Malcolm Pirnie 1992e). Monitoring well construction details are provided in Appendix E.

All of the monitoring wells were developed following the procedures specified in the Work Plan, except as previously noted. The well development logs are included in Appendix F.

2.1.1.3 Environmental Samples

Soil samples for chemical analysis were collected at each of the three soil boring locations in the central bermed area of the site and at monitoring well locations MW-26-001 and MW-26-003 (Figure 2-1). Two samples were obtained at each boring location. Samples collection was to be biased towards samples with elevated PID readings or visual signs of contamination. Since no visual signs of contamination or elevated PID readings were noted, samples at each boring location were collected from 0 to 2 foot depth and 2 to 4 foot depth intervals. Because of the regrading which occurred to maintain the berms at the site, surface soils were not readily distinguishable from subsurface soils at SS-026.

Each soil sample was analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, and explosives. The sample descriptions and analyses performed are summarized in Table B-1 of Appendix B.

2.1.1.4 Geotechnical Samples

Geotechnical samples were collected in 1994 from the screened interval of each of the monitoring well borings and from the ground surface at four locations. The samples were analyzed by Huntingdon Analytical Services of Middleport, New York. The sample locations and analytical results are detailed in Section 3.7.2 and the laboratory report is included as Appendix G.

2.1.2 Groundwater Sampling

Each well was purged before sampling following procedures specified in the Work Plan. Well purging logs are provided in Appendix F. After purging, samples were collected using dedicated 1-5/8-inch disposable Teflon bailers.

The four monitoring wells (MW-26-001 through MW-26-004) and an upgradient well at the adjacent LF-024 site (MW-24-001) were sampled (Figure 2-1). MW-26-001 and MW-24-001 were designated upgradient monitoring wells. Sampling of the wells took place on December 6 and 7, 1994. Samples were analyzed for TCL organic compounds, TAL metals (total and dissolved), and explosives.

2.1.3 Ecological Investigation

An ecological description of site SS-026 and its vicinity was undertaken using data gathered during the SI and the basewide habitat and wetlands investigations (URS Consultants, Inc. 1994d and 1994e). Descriptions of the habitats and wetlands within approximately 1,000 feet of SS-026 are presented in Section 3.5. The general method used in obtaining habitat and wetlands data is discussed below.

2.1.3.1 Habitat Assessment

This assessment was conducted in accordance with methods and procedures outlined in the NYSDEC document entitled *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites* (NYSDEC 1991a). This guidance document is consistent with the USEPA document entitled, *Risk Assessment Guidance for Superfund, Volume II - Environmental Evaluation Manual* (USEPA 1989c).

A Step I Habitat Assessment provides a description/characterization of the site relative to terrestrial and aquatic resources potentially at risk. Both aquatic and terrestrial covertypes were mapped. The descriptions of PAFB covertypes were derived from Reschke (1990). Delineation of covertypes was made on the basis of onsite field studies and review of base aerial photography (600-foot scale stereo pair photos, dated 1990).

Comprehensive lists of fish and wildlife species likely to be present in the identified habitats were obtained from literature and from interviews with local, state, and federal experts. Information on flora was primarily field-collected. Assumptions were validated and preliminary covertype mapping was refined during field visits.

2.1.3.2 Wetland Delineation

Wetlands in the vicinity of SS-026 were delineated by the U.S. Army Corps of Engineers (USACE) and by NYSDEC. URS also delineated wetlands during its basewide evaluation, although not in the vicinity of SS-026.

2.1.4 Laboratory Methods and Validation Procedures

Samples collected for chemical analysis were preserved, packaged, and shipped according to procedures specified in the Work Plan and *Chemical Data Acquisition Plan*. Samples were analyzed by Ecology and Environment, Inc. of Lancaster, New York. Validated results of analyses performed on respective samples are summarized in Appendix A. Methods of sample analysis used are listed in Table 2-1. Results are discussed in Section 5.0.

All analyses were validated independently for usability and completeness under the supervision of URS' Quality Assurance/Quality Control (QA/QC) Manager. This data validation was performed according to USEPA Region 2 data validation procedures. Appendix C contains data flagged with validation qualifiers and cross-references to method, trip, and field blank samples.

2.1.5 Hydrogeologic Testing

In situ slug tests were performed in monitoring wells MW-26-001 through MW-26-004 to determine the hydraulic conductivity of the water-bearing formation. Slug tests were conducted by lowering the water level within the monitoring well using a stainless-steel slug and monitoring the return of the water to its previous level. Slug testing results, calculations, and supporting data are found in Appendix H. Section 3.7.4 presents a discussion of the results.

2.1.6 Surveying

Following sampling and drilling activities, the soil borings and monitoring wells were surveyed for horizontal location and elevation. Horizontal coordinates are based on the New York State Plane Coordinate System, Transverse Mercator Projection, East Zone, North American Datum of 1927. Elevations are based on the National Geodetic Vertical Datum of 1929 (Mean Sea Level - MSL). Surveyed locations and elevations are provided in Appendix I. Survey tie points for each boring also are provided in Appendix I. All surveying was conducted under the supervision of a New York State-licensed Land Surveyor.

2.2 1999 Supplemental SI Field Activities

The 1999 supplemental SI field activities were conducted in response to regulatory agency comments to the Draft SI report and to investigate several areas of potential impact to human health or the

environment discovered during 1997/1998 range safing operations. The scope of the supplemental sampling program was developed in consultation with the AFBCA, USEPA, and NYSDEC. All sampling and analysis was performed in accordance with the *Final Work Plan for Supplemental Sampling and Analysis at IRP Site SS-026 (EOD Range) Plattsburgh AFB, New York* (URS 1999) and the aforementioned project plans (Section 2.0). The three areas of investigative interest, purpose of the work, and a summary of the sampling program is presented in Table 2-2. The 1999 supplemental investigation environmental sample locations are shown on Figure 2-2.

Prior to the initiation of field activities, areas and points of concern identified during range safing operations, including areas of alleged fill and debris and locations where chemical warfare training materials were found, were located and staked by a survey crew using an onsite grid and monument system established by the range safing contractor (Figure 1-3) (HFA 1999). Brush cleaning was necessary in the areas of alleged scattered debris/fill, especially the Satellite Fill Area, to visually inspect the areas for shovel test/test trench location selection and to allow for track excavator access.

The following subsections detail the SI field activities performed in August through December 1999.

2.2.1 Drilling Program

Eight soil borings were advanced at SS-026 in 1999 to evaluate subsurface conditions and collect environmental samples. One boring was completed as a shallow groundwater monitoring well (MW-26-005). The drilling and well installation were conducted by Aquifer Drilling and Testing (ADT) of Albany, New York. A truck-mounted Mobile Drilling B-61 rig was used to advance the monitoring well boring (MW-26-005). A trailer mounted CME 45 drilling rig was used to advance the other seven borings. A URS geologist was present during all drilling activities to evaluate physical and subsurface conditions at each borehole.

2.2.1.1. Soil Borings

All soil borings were advanced in the central portion of the range where the "U"-shaped berms were formerly located (Figure 2-2). The borings were advanced with 4-1/4-inch ID HSA or simply by collecting back-to-back split barrel samples. Soil samples were collected continuously (except MW-26-005, see Appendix D) using 2-foot long, 2-inch ID stainless steel split barrel samplers. Soil samples were examined, classified, inspected for signs of contamination, and screened by the URS supervising geologist with a PID. All observations were recorded in the field notebook and summarized in the soil boring logs (Appendix D).

The soil samples were apportioned for chemical analysis as described in Section 2.2.1.3. Upon completion, the boreholes were backfilled with auger cuttings supplemented by surrounding sands. Visual observations and PID screening indicated the samples and auger cuttings to be free of gross of volatile organic contamination.

2.2.1.2 Monitoring Well Installation

Monitoring well MW-26-005 was installed and developed following the procedures described in

Section 2.1.1.2, except only 6-1/4-inch ID HSA were used to advance the borehole. The monitoring well construction details are provided in Appendix E and the well development log is included in Appendix F.

2.2.1.3 Environmental Samples

Soil samples for chemical analysis were collected from seven soil borings (SS-026-CAS-1 through SS-026-CAS-4 and SB-26-04 through SB-26-06). Sample depths, locations, descriptions, and analytical parameters are summarized in Table 2-3. Sample locations are shown on Figure 2-2.

Samples collected from borings SS-026-CAS-1 through SS-026-CAS-4 were collected from the first soil interval that appeared to be undisturbed by range safing operations (see boring logs in Appendix D), as requested by the regulatory agencies. The samples from borings SB-26-04 through SB-26-06 were collected at specified depth intervals (0 to 2 feet and 2 to 4 feet) at the approximate locations of three 1994 SI borings (see Table 2-3).

2.2.2 Test Trench/Shovel Test Program

Areas of scattered debris were identified by the range safing contractor in 1997 and were designated Debris Locations 1 through 4 and the Satellite Fill Area (Figure 1-3). These areas were investigated through visual inspection, shovel tests, and test trenches with an excavator.

The four Debris Locations were visually inspected and shovel tests were performed to identify the quantity, areal extent, and character of any debris/fill. Locations 2 and 4 were found to contain scattered surficial debris comprised mostly of household wastes including: rusted metal cans, glass bottles and jars, flatware, bones, and clam shells (Figure 2-3 and Photo 11). The debris encountered was consistent with material described in the PAFB Archeological Survey as probably dating from the 1940s and 1950s, likely predating PAFB (USACERL/TAC 1994). Location 1, which was originally included as a portion of the Satellite Fill Area, revealed no signs of debris during shovel tests. Location 3 was found to contain mostly surficial debris composed of household waste consisting of broken glass, flatware, rusted cans, and bone fragments (Photos 6 and 10). However, some buried debris also appeared to be present at this location.

Test tenches were later excavated at Location 3 and the Satellite Fill Area to determine the areal and vertical extent of the debris/fill. A total of fourteen test trenches (Figure 2-3) were excavated at the site with a Kobelco 115 SRDR track excavator operated by Garrow Brothers, Inc. of Plattsburgh, New York to characterize and determine the extent of the debris/fill present. Test trenches EOD-TP-01 and EOD-TP-02 were excavated in the western portion of Location 3. Only EOD-TP-01 encountered any debris/fill, which consisted of a small pocket of primarily household waste and limited quantities of construction/demolition debris (glass, brick, broken flatware, asphalt, and a length of rubber hose). The remaining test trenches (EOD-TP-03 through EOD-TP-14) were excavated in the Satellite Fill Area. No signs of surficial or buried debris/fill were encountered in EOD-TP-09 and EOD-TP-10. Three test trenches (EOD-TP-03, -06, and -07) were found to have scattered surficial debris consisting of glass, flatware, wood, asphalt, rusted and empty 55-gallon drums, concrete, and rusted ammunition containers (Photo 12). The remaining test trenches were found to contain surficial debris and fill which ranged in thickness from one to three feet. The limits of buried fill (0.5 to 3 feet in depth below ground surface) are shown in Figure 2-4. A description of the materials found in the test trenches is provided in Table 4. Test trench logs are provided in Appendix Q.

Only one soil sample, SS-026-SF-1, was collected directly from a test trench. SS-026-SF-1 was collected from soil containing a tar-like substance located at the surface of EOD-TP-11 (Table 2-5). The sample was collected using a decontaminated stainless steel bowl and spoon and was analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, and TAL metals.

2.2.3 Other Environmental Samples

This section describes the collection of soil, groundwater, and groundwater seep samples not associated with the drilling and trenching programs.

2.2.3.1 Soil Samples

Two soil samples, SS-026-CAS-5 and SS-026-CAS-6, were collected from surface soils in the general CAS Area for risk assessment purposes (Figure 2-2). Sample descriptive information and analytical parameters are detailed in Table 2-3.

Two soil samples were collected at the base of the slope in the Satellite Fill Area, one (SS-026-SF-2) beneath an empty and intact 55-gallon drum located approximately 10 feet west of EOD-TP-12 and one (SS-26-SF-6) beneath where two empty tear gas canisters were found (Figure 2-2). Sample descriptive information and analytical parameters are detailed in Table 2-5.

Two soil samples (SS-026-SF-4 and SS-026-SF-5) were collected at groundwater seep locations at the base of the slope in the Satellite Fill Area (Figure 2-2). Sample descriptive information and analytical parameters are detailed in Table 2-5. Companion groundwater seep samples were collected at the same time (see below).

All soil samples described in this section were collected using decontaminated stainless steel shovels, bowls, and spoons.

2.2.3.2 Groundwater Seep Samples

Groundwater seeps were identified at the base of the steep slope in the Satellite Fill Area. Groundwater seep samples (LS-026-SF-1 and LS-026-SF-2) were collected by digging approximately 1-foot deep pits at the seep locations, allowing the pits to fill with water, and directly immersing the samples bottles in the water. Sample descriptive information and analytical parameters are detailed in Table 2-5.

2.2.3.3 Monitoring Well Groundwater Samples

Groundwater samples were collected from six monitoring wells (Figure 2-2). Each well was purged before sampling following procedures specified in the Work Plan. Well purging logs are provided in Appendix F. After purging, samples were collected using 1 5/8-inch disposable Teflon bailers with teflon-coated stainless steel leaders. The sample from newly installed well MW-26-005 was analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, and RDX. The existing site wells (MW-26-001 through MW-26-004) and MW-24-001 were analyzed for TCL VOCs and RDX.

2.2.4 Laboratory Methods and Validation Procedures

Samples collected for chemical analyses were preserved, packaged, and shipped according to procedures specified in the Work Plan. The samples were analyzed and reviewed by three laboratories. GPL Laboratories, LLLP of Gaithersburg, Maryland was responsible for the CN, CS, TDG, and RDX analyses. Pace Analytical Services, Inc. of Minneapolis, Minnesota performed the dioxin/furan analyses. Buck Environmental Laboratories, Inc. of Cortland, New York was responsible for the remaining analytical parameters (i.e., TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, chloroform, and arsenic).

All analyses were validated by URS for usability and completeness. This data validation was performed according to USEPA Region 2 data validation procedures. The results of the audit are documented in the Data Assessment Summary. Appendix C contains data flagged with validation qualifiers.

2.2.5 Surveying

Following the completion of investigative activities at the site, all sample points, borings, test trenches, the new well, and any other necessary locations were surveyed according to the procedures detailed previously in Section 2.1.6.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 Surface Features

SS-026 is located in the southwestern portion of Plattsburgh AFB, west of the Weapons Storage Area complex, and northeast of LF-024 (Figure 1-3). In 1994, the site was sparsely vegetated with grasses and the soils had been regularly regraded (particularly in the central portion of the range) to maintain the berms. Some metallic debris was present on the ground surface and a concrete wall and pad (probably serving as an explosion backstop) were present in one of the "U"-shaped bermed areas. The site was relatively flat at an elevation of approximately 180 feet above mean sea level (amsl). The berms rose 6 to 8 feet above the surrounding ground surface and a ridge (up to approximately 8 feet high) was present along most of the perimeter of the range.

During range safing operations in 1997 and 1998, the majority of the former EOD Range was excavated to depths of up to 16 feet, the excavated soils were sifted to remove any unexploded ordnance, and the sifted soils were regraded (Photos 7 through 9). The regraded site is flatter (still at an elevation of approximately 180 feet amsl) with no berms present in the central portion of the range. A few large mounds (up to 10 feet high) of sifted but ungraded sand remain on the north and south perimeters of the former range. Due to the regrading operations, the site is only sparsely vegetated with grasses (Photo 10). Wooded lands surround the open area of the site. A topographic break is located approximately 100 feet south of the open area of the site. A steep slope drops approximately 30 feet to the floodplain of the Salmon River (Figure 1-2). Groundwater seeps were observed at the base of the slope. However, surface water runoff pathways to the Salmon River were not evident at the site.

3.2 Climate

The following meteorological information was obtained from the Monthly Climatological Summary records of the PAFB weather station which was closed in 1995.

PAFB receives an average 41.4 inches of precipitation annually (equivalent rainfall), including 63 inches of snow. The maximum recorded 24-hour rainfall was 1.8 inches and the maximum recorded 24-hour snowfall was 15 inches. Relative humidity averages 66 percent annually. The average daily maximum temperature is 53°F and the average daily minimum is 34°F. The extreme temperatures on record are 92°F and -28°F, both of which were reached in 1993.

In 1993, the average daily maximum and minimum temperatures were 52°F and 33°F respectively. The maximum wind speed was 44 knots and the average wind speed was 5 knots. The predominant wind directions are north and southeast. Total precipitation was 31.83 inches (equivalent rainfall), including 108.9 inches of snow. Average daily maximum and minimum temperatures during 1994 were 52°F and 34°F, respectively. Total precipitation in 1994 was 28.78 inches including 68.9 inches of snow.

3.3 Demography and Land Use

According to the 1990 U.S. Census, Greater Plattsburgh had a population of 38,173. Between 1970 and 1990, the population of Clinton County grew from 72,934 to 85,969, an average growth rate of approximately 0.9 percent per year. Assuming this growth rate remained constant, the projected

population of Greater Plattsburgh would be approximately 41,751 by the year 2000; however, closure of the base in 1995 may have reduced the local population by up to 6,000.

Land uses near Plattsburgh AFB include residential, commercial, industrial, and recreational. A zoning map for Plattsburgh AFB and vicinity is presented on Figure 3-1. Zoning could be restructured based upon reuse and redevelopment recommendations from PARC. Future industrial or public/recreation reuse of the SS-026 site area was proposed in base reuse documents.

The base obtains its potable water from the City of Plattsburgh municipal water system. Municipal water supply sources are the Paterson and Mead reservoirs, and West Brook, located approximately 5 miles northwest of the City of Plattsburgh. Some residences adjacent to the base rely on private wells for drinking water. These residences include the homes along Kemp Lane (near the base's north gate), a residential development on old NY Route 22 (near the NY Route 22 and I-87 interchange), and residences along Route 9 located adjacent to the southeast corner of the base, east, and north of the Salmon River. These residential areas are shown on Figure 3-2. The Kemp Lane and Route 22 residences using groundwater are located upgradient from SS-026 and should not be affected by groundwater flow from the site. The residences located along Route 9 have wells reportedly installed in bedrock. They are located approximately 2 miles east of SS-026, along Route 9. Groundwater from SS-026 appears to discharge to the Salmon River directly south of the site. Therefore, groundwater flow from SS-026 should not affect the residential wells along Route 9.

3.4 Soils

Soils at SS-026 have been mapped as the Udipsamments and Psammaquents complex. Soils peripheral to the range are identified as Plainfield loamy sand. These soil unit designations are described in Table 3-1. Site geology is discussed in Section 3.7.

3.5 Ecology

A Step I Habitat Assessment (URS Consultants, Inc. 1994d) and wetland delineations (USACE 1992) were used to evaluate and characterize SS-026.

3.5.1 Covertypes

Vegetative covertypes, both aquatic and terrestrial, were mapped over the entire base at a scale of 1" = 200' during the Step I Habitat Assessment (URS Consultants, Inc. 1994c). Fourteen covertypes were identified within 1,000 feet of SS-026 (Figure 3-3) and are described below.

- **Riverine System**

(MS) Midreach Stream - A midreach stream is moderate to large sized with a mainstream dominated by riffle/run/pool associations. Stream bottom substrates are generally bedrock, boulders, cobble, gravel, or sand. There may be small backwaters, seeps, wetlands, or waterfalls associated with the mainstream habitats. There also may be temporary slackwater regions associated with snags, debris, or beaver dams. It is similar to the midreach stream of Reschke (1990). The Salmon River is an example

of a midreach stream located directly south of SS-026 and some of the expected fish species in a midreach stream include:

Rainbow Trout *(Oncorhynchus mykiss)*
Brown Trout *(Salmo trutta)*
White Sucker *(Catostomus commersoni)*
Silver Redhorse *(Moxostoma anisurum)*
Common Shiner *(Notropis cornutus)*

(DS) - Ditch/Intermittent Stream - This type occurs along small drainageways, either channelized or natural. These drainageways are often lined with plant species from the wet meadow or shrub swamp communities and are similar to the ditch/artificial intermittent stream of Reschke (1990). There are various intermittent streams/ditches in the grass area to the west of the PAFB runway. Examples of this covertype are found north of SS-026 and north of the Weapons Storage Area to the east of SS-026 (Figure 3-3). Fish species in ditches may include:

Bluntnose Minnow (*Pimephales notatus*)
Creek Chub (*Semotilus atromaculatus*)
Johnny Darter (*Etheostoma nigrum*)

- **Terrestrial System - Forested Covertypes**

(PH) - Pine-Hardwoods - This covertype is the most xeric of the forested types. It occurs on well-drained sandy soils. It is similar to the Appalachian oak-pine forest and pine-northern hardwoods forest of Reschke (1990). Pines make up more than 50 percent of the stand. Some stands are plantations. This covertype occurs throughout the base. Examples may be seen to the east of the runway and in the areas bordering SS-026 on the north, east, and south (Figure 3-3). Dominant plant species include:

Trees/Saplings
Pines (*Pinus strobus, P. rigida, P. resinosa*)
Oaks (*Quercus rubra, Q. alba, Q. velutina*)
Aspens (*Populus grandidentata, P. tremuloides*)
Paper Birch (*Betula papyrifera*)
Black Cherry (*Prunus serotina*)

Shrubs
Blueberries (*Vaccinium angustifolium, V. pallidum*)
Black Huckleberry (*Gaylussacia baccata*)
Sheep Laurel (*Kalmia angustifolia*)

Herbs
Bracken Fern (*Pteridium aquilinum*)
Sarsaparilla (*Aralia nudicaulis*)
Indian Cucumber-root (*Medeola virginiana*)

(HH) - Hemlock-Hardwoods - This covertype is more mesic than the pine-hardwoods described above. It often occurs on cool north- to east-facing slopes, but also occurs on moist flats. It is similar to the hemlock-northern hardwood forest of Reschke (1990). Hemlocks make up more than 50 percent of the stand. This covertype is rare on the base since hemlock-hardwoods tend to be small areas surrounded by mixed hardwood or pine hardwood forests. An example of this covertype can be found in a stand along the Salmon River to the southeast of SS-026 and just southwest of a large mowed area that is part of the Weapons Storage Area (Figure 3-3). Dominant plant species include:

Trees/Saplings

- Hemlock (*Tsuga canadensis*)
- Beech (*Fagus grandifolia*)
- Yellow Birch (*Betula alleghaniensis*)
- White Pine (*Pinus strobus*)
- Sugar Maple (*Acer saccharum*)
- Black Cherry (*Prunus serotina*)
- Northern White Cedar (*Thuja occidentalis*)

Shrubs

- Hobblebush (*Viburnum alnifolium*)
- Striped Maple (*Acer pennsylvanicum*)

Herbs

- Canada Mayflower (*Maianthemum canadense*)
- Bluebead-lily (*Clintonia borealis*)
- Indian Cucumber-root (*Medeola virginiana*)

(MH) - Mixed Hardwoods - This covertype occurs on mesic sites. It is most similar to successional northern hardwoods, but with elements of the beech-maple mesic forest of Reschke (1990). Some conifers may be present, such as white pine, hemlock, and northern white cedar, but these together make up less than 50 percent of the stand. This covertype is found throughout the base. Large and small stands are found around the perimeter of SS-026 (Figure 3-3). Dominant plant species include:

Trees/Saplings

- Red Maple (*Acer rubrum*)
- Aspens (*Populus grandidentata, P. tremuloides*)
- Paper Birch (*Betula papyrifera*)
- Beech (*Fagus grandifolia*)
- Sugar Maple (*Acer saccharum*)
- White Ash (*Fraxinus americana*)
- Oaks (*Quercus rubra, Q. alba, Q. macrocarpa*)

Shrubs

- Hop Hornbeam (*Ostrya virginiana*)
- Ironwood (*Carpinus caroliniana*)
- Spicebush (*Lindera benzoin*)

Herbs

Cinnamon Fern (*Osmunda cinnamomea*)
Sensitive Fern (*Onoclea sensibilis*)
Spinulose Wood Fern (*Dryopteris spinulosa*)

- **Terrestrial System-Non-Forested Covertypes (Disturbed)**

(DM) - Dry Meadow - This covertype is maintained by periodic mowing or brush-hogging (generally at least annually) and is dominated by various non-hydrophytic forbs and grasses. Young shrubs and seedlings/saplings may be present, but are only minor components of the community and periodically are cut back. This covertype contains various elements of the successional old field, cropland/field crops, and pastureland covertypes of Reschke (1990). This covertype is found primarily along the western periphery of the base, interspersed with mixed hardwood forest. Patches of dry meadow are found along the western edge of SS-026 as well as to the south along the Salmon River (Figure 3-3). Dominant plant species include:

Herbs

Goldenrods (*Solidago nemoralis, S. altissima, S. canadensis*)
Bluegrasses (*Poa pratensis, P. compressa*)
Kentucky Fescue (*Festuca arundinacea*)
Quackgrass (*Agropyron repens*)
Timothy (*Phleum pratense*)
Orchard Grass (*Dactylis glomerata*)
New England Aster (*Aster novae-angliae*)
Common Evening Primrose (*Oenothera biennis*)
Wild Carrot (*Daucus carota*)
Ragweed (*Ambrosia artemisiifolia*)

Young Shrubs

Northern Arrowwood (*Viburnum recognitum*)
Common Blackberry (*Rubus allegheniensis*)
Multiflora Rose (*Rosa multiflora*)

Saplings/Seedlings

White Ash (*Fraxinus americana*)
Aspens (*Populus tremuloides, P. grandidentata*)
Red Maple (*Acer rubrum*)

(SU) - Successional Shrubland - This covertype is similar to the successional old field, but is usually somewhat farther along successionally (i.e., farther removed in time from maintenance). Shrubs and young trees/saplings make up more than 50 percent of the areal cover. Forbs and grasses are present, but make up less than 50 percent of the areal cover. It is similar to the successional shrubland of Reschke (1990). This covertype is found throughout the base. Some examples include an area to the south of SS-026 along the Salmon River and to the west, along the periphery of the investigated area (Figure 3-3). Dominant plant species include:

Shrubs

Black chokeberry (*Aronia prunifolia*)
Dogwoods (*Cornus amomum, C. racemosa*)
Northern Arrowwood (*Viburnum recognitum*)
Common Blackberry (*Rubus allegheniensis*)
Roses (*Rosa carolina, R. multiflora*)
Glossy Buckthorn (*Rhamnus frangula*)
Sumacs (*Rhus typhina, R. glabra*)

Small Trees/Saplings

White Ash (*Fraxinus americana*)
Aspens (*Populus tremuloides, P. grandidentata*)
Soft Maples (*Acer rubrum, A. negundo*)
Paper Birch (*Betula papyrifera*)

Herbs

Goldenrods (*Solidago nemoralis, S. altissima, S. canadensis*)
Kentucky Bluegrass (*Poa pratensis*)
Kentucky Fescue (*Festuca arundinacea*)
Quackgrass (*Agropyron repens*)
Timothy (*Phleum pratense*)
Orchard Grass (*Dactylis glomerata*)
New England Aster (*Aster novae-angliae*)
Common Evening Primrose (*Oenothera biennis*)
Wild Carrot (*Daucus carota*)
Ragweed (*Ambrosia artemisiifolia*)

- **Terrestrial System - Non-Forested Covertypes (Highly Disturbed)**

(ML) - Mowed Lawn - This covertype is mapped in areas of lawn grasses maintained by regular mowing. Trees and shrubs may be present, but make up less than 30 percent of the areal cover. This covertype can be found throughout the base. It includes a good portion of the Weapons Storage Area bunkers which are located to the east of SS-026 (Figure 3-3).

(IS) - Unvegetated Impervious Surfaces - This covertype includes paved surfaces (e.g., roads, parking lots, runway, etc.) and building exteriors. These surfaces are impervious to precipitation and possess artificial drainage systems (e.g., gutters, storm sewers, etc.). Vascular plants are only minor, incidental components of this covertype which is found throughout the base.

(PS) - Unvegetated Permeable Surfaces - This covertype includes a multitude of areas where vegetation has been removed, but the surface has not been paved or sealed. Examples include abandoned sand pits and landfills. Vascular plants are only minor, incidental components of this covertype which is similar to the sand mine and construction/road maintenance spoils covertypes of Reschke (1990). The SS-026 site is an example of this covertype (Photos 1, 2, and 5).

(UP) - Unpaved Road/Roadside/Pathway - This covertype includes a multitude of situations in which vegetation is maintained (mowed, brush-hogged, or defoliated) in linear corridors, such as utility right-of-ways and along unpaved roads and paths. Vegetation may consist of a number of elements from the dry meadow and mowed lawn covertypes described previously. A combination of unpaved road/path, mowed roadside/pathway, and herbicided roadway/pathway of Reschke (1990) are included. This covertype is present immediately east and west of SS-026.

- **Palustrine System (Wetlands) - Forested Covertypes**

(HS) - Mixed Hardwoods (Red Maple) Swamp - This covertype occurs on seasonally to regularly wet sites, yet various hardwoods make up more than 50 percent of the stand and the site is a wetland. It is similar to the red maple-hardwood swamp of Reschke (1990). Some conifers may be present, such as white pine, hemlock, and northern white cedar, but these together make up less than 50 percent of the stand. There are several hardwood swamp areas scattered throughout the base. Some examples include stands near the southeastern end of the runway, north and west of the Weapons Storage Area, as well as small stands to the south which follow the Salmon River (Figure 3-3). Dominant plant species include:

Trees/Saplings
- Red Maple (*Acer rubrum*)
- American Elm (*Ulmus americana*)
- Gray Birch (*Betula populifolia*)
- Ashes (*Fraxinus pennsylvanica, F. nigra*)
- Black Willow (*Salix nigra*)
- Cottonwood (*Populus deltoides*)

Shrubs
- Alders (*Alnus rugosa, A. serrulata*)
- Winterberry (*Ilex verticillata*)
- Black chokeberry (*Aronia melanocarpa*)
- Silky Dogwood (*Cornus amomum*)
- Northern Arrowwood (*Viburnum recognitum*)
- Highbush Blueberry (*Vaccinium corymbosum*)
- Glossy Buckthorn (*Rhamnus frangula*)
- Pussy Willow (*Salix discolor*)
- Meadowsweet (*Spiraea alba*)

Herbs/Ground Cover
- Sedges (*Carex crinita, C. lupulina*)
- Jewelweed (*Impatiens capensis*)
- False Nettle (*Boehmeria cylindrica*)
- Poison Ivy (*Rhus radicans*)
- Moneywort (*Lysimachia nummularia*)
- Cinnamon Fern (*Osmunda cinnamomea*)

Royal Fern (*Osmunda regalis*)
Sensitive Fern (*Onoclea sensibilis*)

- **Palustrine System (Wetlands) - Non-Forested Covertypes**

(SH) - Shrub Swamp - This type is indicated where various shrubs make up more than 50 percent of the areal cover and the area is wetland. It is similar to the shrub swamp of Reschke (1990). There are two small areas with this covertype just west of the runway at the edge of the ditches leading toward the Weapons Storage Area. Dominant plant species include:

Shrubs
Alders (*Alnus rugosa, A. serrulata*)
Winterberry (*Ilex verticillata*)
Black chokeberry (*Aronia prunifolia*)
Dogwoods (*Cornus amomum, C. racemosa*)
Northern Arrowwood (*Viburnum recognitum*)
Highbush Blueberry (*Vaccinium corymbosum*)
Glossy Buckthorn (*Rhamnus frangula*)
Shrub Willows (*Salix discolor, S. sericea*)
Meadowsweet (*Spiraea alba*)
Steeplebush (*Spiraea tomentosa*)

Small Trees/Saplings
Soft Maples (*Acer rubrum, A. negundo*)
American Elm (*Ulmus americana*)
Gray Birch (*Betula populifolia*)
Black Ash (*Fraxinus nigra*)
Black Willow (*Salix nigra*)
Cottonwood (*Populus deltoides*)

Herbs
Sedges (*Carex crinita, C. lupulina*)
Jewelweed (*Impatiens capensis*)

(WM) - Wet Meadow - This type is indicated where various open-habitat grasses, sedges, rushes, bulrushes, and forbs make up more than 50 percent of the areal cover and the area is wetland. Young shrubs and seedlings/saplings may be present, but make up less than 50 percent of the areal cover. This covertype contains various elements of the ditch/artificial intermittent stream, shallow emergent marsh, sedge meadow, and reedgrass/purple loosestrife marsh of Reschke (1990). There are areas of wet meadow located southwest of SS-026 (Figure 3-3). Dominant plant species include:

Herbs
Cattails (*Typha angustifolia, T. latifolia*)
Bulrushes (*Scirpus atrovirens, S. cyperinus, S. validus*)
Sedges (*Carex crinita, C. vulpinoidea, C. lupulina*)
Rushes (*Juncus effusus, J. bufonius*)

Reed Canary Grass (*Phalaris arundinacea*)
Rice Cut Grass (*Leersia oryzoides*)
Water Millet (*Echinochloa muricata*)
Jewelweed (*Impatiens capensis*)
Blue Vervain (*Verbena hastata*)
Dwarf St. John's-wort (*Hypericum mutilum*)
Giant Goldenrod (*Solidago gigantea*)
Calico Aster (*Aster lateriflorus*)
Boneset (*Eupatorium perfoliatum*)
Beggar-ticks (*Bidens cernua*)
Water-horehound (*Lycopus americanus*)
Purple Willow-herb (*Epilobium coloratum*)
Sensitive Fern (*Onoclea sensibilis*)

3.5.2 Protected Wetlands

Federal and NYSDEC regulated wetlands in the vicinity of the SS-026 site are shown on Figure 3-4. Other wetlands on the base are described in the Final Wetland Delineation Report (URS Consultants, Inc. 1994e).

Numerous federally regulated wetlands are located within 1,000 feet south of SS-026. These wetlands are relatively small in area and include a cattails emergent marsh south of LF-024 and mixed hardwood swamps peripheral to the Salmon River. A larger wetland, which includes both federally and state (designation PB-14) regulated areas, is located approximately 500 feet north of SS-026. This wetland is comprised of primarily mixed hardwood swampland and shrub (cattail) swampland.

3.5.3 Wildlife Species Present

Appendix J has a listing of fish, birds, mammals, reptiles, and amphibians that could be encountered at the base.

3.5.4 Special Resources

The New York Natural Heritage Program has completed an inventory of threatened and endangered species in the area and discovered five threatened, endangered, or special concern species on the base. These include two wetland plant species, the Houghton umbrella-sedge (*Cyperus houghtonii*) and a generic sedge species (*Carex houghtonii*); one avian predator, the Northern harrier (*Circus cyaneus*); and two songbirds, the Grasshopper sparrow (*Ammodramus savannarum*) and the Vesper sparrow (*Pooecetes gramineus*). The Northern harrier, also known as the marsh hawk, prefers marshes and open grasslands. The Grasshopper sparrow prefers open grassy and weedy meadows, pastures, and plains. The Vesper sparrow prefers fields, pastures, and roadsides in farming country. The plants are listed as rare, the hawk is threatened, and the songbirds are listed as special concern species. Although these species were discovered on the base, none were observed within 1,000 feet of the EOD Range. However, the birds may potentially be present due to their high mobility.

3.5.5 Resource Characterization

The EOD Range itself is not considered a valuable natural resource. Both federal and state designated wetlands, however, are located within 1,000 feet of the site.

3.6 Surface Water Hydrology

SS-026 lies approximately 350 feet north of the Salmon River which discharges to Lake Champlain. Although no surface runoff pathways were evident linking the EOD Range with the Salmon River, shallow groundwater was observed to flow toward the river.

3.6.1 Site Drainage

As previously noted, no runoff pathways are evident exiting SS-026. The lack of runoff pathways is likely the result of highly permeable, sandy, sparsely vegetated soils and the low topographic relief across the site. Because of these features, nearly all of the precipitation which falls on the site infiltrates to the shallow water table aquifer system. The Weapons Storage Area and adjacent IRP Site SS-013, east of SS-026, are topographically lower than SS-026. The fill area at LF-024 is at nearly equivalent or lower elevations than SS-026. The surface topography at LF-024 slopes southward toward the Salmon River. There should be no runoff from these sites onto SS-026.

3.6.2 Salmon River Hydrology

The Salmon River in the vicinity of SS-026 is classified by the NYSDEC as a Class C(T) stream. The symbol (T) indicates that the designated waters are trout waters and that a dissolved oxygen content specification is available. The river originates approximately 20 miles west of the base, in the Adirondack Mountains. No discharge measurements are available for this river. Although PAFB was not classified on Federal Emergency Management Agency floodplain maps, the EOD Ranges lies approximately 40 feet higher than the nearest Salmon River meander bend.

3.6.3 Lake Champlain Hydrology

Present-day Lake Champlain represents the remnant of glacial Lake Vermont, which occupied the Champlain Valley during the most recent glacial retreat during the Pleistocene Epoch about 10,000 years ago. The Lake Champlain drainage basin occupies an area of approximately 8,277 square miles. Lake Champlain drains northward into the Richelieu River, which continues northward for approximately 75 miles to discharge into the St. Lawrence River.

Lake Champlain, with a surface elevation of about 95 feet amsl, is approximately 125 miles long and covers about 490 square miles. Maximum and minimum lake water levels at the Burlington, Vermont gauging station have ranged from approximately 102 feet to 93 feet amsl, respectively (USGS 1992). Lake Champlain's maximum depth is approximately 399 feet (Fisher 1968).

The Lake receives water from precipitation and from the numerous streams that drain the Adirondack Mountains in New York and the Green Mountains in Vermont. The Lake also receives groundwater flow in the Plattsburgh area from a confined bedrock aquifer (Giese and Hobba 1970). Lake

Champlain is classified by NYSDEC as a Class A water body, designated for drinking water supplies, culinary or food processing uses, and any other uses.

3.7 Hydrogeology and Geology

The hydrogeology and geology in the vicinity of SS-026 were previously characterized during the base-wide hydrogeology investigation (Malcolm Pirnie, Inc. 1996). Subsurface information was obtained during this SI from soil borings, monitoring wells, and test trenches. Groundwater elevation data from the adjacent LF-024 site also were utilized in the hydrogeologic interpretation. The following subsections present the hydrogeology and geology of the SS-026 area.

3.7.1. Regional Hydrogeology

PAFB is located in the St. Lawrence-Champlain Lowlands physiographic province of New York State (Van Diver 1985). The base lies within the Lake Champlain Valley, which trends north-south between the Adirondack Mountains to the west and the Green Mountains to the east.

During the most recent Pleistocene glacial retreat approximately 10,000 years ago, the Laurentide ice mass retreated northward through the Champlain Valley. It left behind huge glacial deposits and large quantities of glacial meltwater, the latter of which formed glacial lakes. Lake Champlain, once a proglacial lake, underwent a series of stages or temporary water levels during the glacial retreat. These stages are recognizable from the different beach levels found in the area. The lake stages were influenced primarily by the amount of meltwater generated by the waning glacial mass, and by isostatic uplift in the area which regionally is estimated to have been approximately 500 feet (Fisher 1968). Isostatic uplift and drainage eventually outpaced the melting ice, and Lake Champlain gradually stabilized at its present-day surface elevation of approximately 95 to 100 feet amsl.

The unconsolidated surficial deposits in the vicinity of PAFB have been mapped as alluvial sediments, kame deposits, glaciomarine and glaciolacustrine sand, silt and clay, and glacial till (Cadwell, et al. 1991). Figure 3-5 depicts the surficial geology in the vicinity of the base. These deposits are described below:

- Alluvial sediments - recent deposits occurring primarily in valleys (e.g., Salmon and Saranac Rivers). Composed of sand and gravel, with varying amounts of silt on floodplains.

- Kame deposits - generally coarse to fine gravel and/or sand with lateral variability in texture and permeability. These deposits occur near the northwest portion of PAFB.

- Glaciomarine and glaciolacustrine sand - stratified, fine to medium permeable sand of variable thickness. This unit represents the most laterally extensive surficial deposit at PAFB.

- Glaciomarine and glaciolacustrine silt and clay - generally laminated to massive silt and clay of low permeability, deposited in deep water. These deposits occur surficially at the south end of the flightline apron, in the Golf Course Drainage Area, and in the bed of the Salmon River.

- Glacial till - variably textured (boulders to silt and clay) deposit that typically is well-graded and generally deposited beneath glacial ice. Permeability varies with degree of compaction.

Ordovician-age bedrock, which consists of a series of thinly to thickly bedded limestones and dolostones with medium to micritic textures, underlies the unconsolidated overburden deposits (Malcolm Pirnie, Inc. 1996). These carbonate rocks dip to the east and form an artesian aquifer in the Champlain Valley (Giese and Hobba 1970).

Groundwater in the Plattsburgh area occurs in both the overburden deposits and the bedrock. Groundwater movement in these media is controlled by aquifer characteristics, infiltration, and runoff. The Adirondack Mountains to the west of Plattsburgh represent the major recharge area for the region and Lake Champlain represents the regional discharge area (Giese and Hobba 1970). Other locally significant discharge areas include the Saranac and Salmon Rivers, located north and south of PAFB, respectively.

Water yields from wells screened in unconsolidated deposits vary from several hundred gallons per minute (gpm) to only a few gpm. In general, alluvial sediments and kame deposits provide the highest water yields. The silt and clay deposits have low hydraulic conductivities and are poor aquifers. The glacial till produces only low (1 to 20 gpm) water yields.

Groundwater movement in the bedrock is controlled by physical characteristics of the rock. These include primary porosity, secondary fractures, faults, bedding planes, joints, and solution cavities. Average well yields from rock wells in the vicinity of the base range from 2 to 200 gpm (Giese and Hobba 1970).

3.7.2 Site Geology

The stratigraphy in the vicinity of SS-026 was explored only to shallow depths (i.e., 30 feet or less). Information regarding deeper stratigraphic units has been extrapolated from studies at the Flightline IRP site, SS-004, (URS Consultants, Inc. 1994f) and the base-wide hydrogeology investigation (Malcolm Pirnie, Inc. 1996). Figure 3-6 shows the location of cross-section A-A' and Figure 3-7 shows the anticipated vertical profile of sediments underlying SS-026.

Surficial deposits at the EOD Range are glaciomarine and glaciolacustrine sands. The sands become finer with depth and grade into glaciomarine and glaciolacustrine silt and clay. The silt and clay is expected to be underlain by glacial till and bedrock. The stratigraphic units are described below. Geotechnical results from the sand unit collected at the site are summarized in Table 3-2. The complete geotechnical testing report may be found in Appendix G.

3.7.2.1 Sand

This unit is characterized as generally fine to medium grained sand with occasional interstratified layers of coarser sand, silt, and gravel. Typically, the sand is brown above the water table, but gray beneath it. This is due to oxidizing conditions above the water table and reducing conditions below the water table. The sand unit typically becomes finer-grained with depth, grading texturally into the underlying silt and clay unit. Only SI boring MW-26-005 penetrated through the sand layer at a depth of 29 feet below grade, or an elevation of approximately 151 feet amsl.

3.7.2.2 Silt and Clay

The silt and clay unit was only encountered in boring MW-26-005 at a depth of 29 feet. However, the unit was investigated at several locations across the base during other studies which suggest that the silt and clay unit may be approximately 20 feet thick beneath SS-026 (URS 2000). This unit is generally characterized as gray, soft to hard silt and clay. The plasticity index of the unit generally increases with depth, as does clay content (URS Consultants, Inc. 1995b).

3.7.2.3 Glacial Till

SI borings were not advanced to the glacial till layer; however, the glacial till was encountered in all of the bedrock well and piezometer borings installed as part of the base-wide hydrogeology investigation (Malcolm Pirnie, Inc. 1996). Piezometer cluster PZ-4, located approximately 2,000 feet northwest of SS-026, is the closest exploration to the site that encountered glacial till. The thickness of the glacial till at piezometer cluster PZ-4 is 7 feet. The glacial till thickness increased to the southeast to 18 feet at piezometer cluster PZ-6, located approximately 3,600 feet southeast of SS-026.

The glacial till is characterized as a poorly-sorted silty sand and clay matrix with frequent gravel and cobbles, and occasional boulders (Malcolm Pirnie, Inc. 1996). The glacial till typically is gray and medium to very dense. Split-spoon refusal was common while sampling this unit, and intact glacial till cores were recovered at several locations where the till was initially mistaken for bedrock.

3.7.2.4 Bedrock

Bedrock depth was determined from deep wells and seismic surveys conducted by Malcolm Pirnie during the base-wide hydrogeology investigation. Based on limited available information, a top-of-bedrock contour map across most of PAFB was developed (Malcolm Pirnie, Inc. 1996). The bedrock surface was inferred to rise steeply between control points east and west of SS-026 (Figure 3-8). The estimated bedrock surface elevation at SS-026 could range from approximately 80 to 120 feet amsl.

Bedrock beneath the base has not otherwise been formally mapped. It is characterized as a series of carbonates, described as thinly to thickly bedded limestones and dolostones. Bedding is horizontal to sub-horizontal and ranges from massive to thin (Malcolm Pirnie, Inc. 1996).

3.7.3 Site Hydrogeology

Three distinct hydrogeologic units are identified in the SS-026 study area: (1) an unconfined water table aquifer present in the sand unit; (2) a confining layer (aquitard) consisting of silts and clays (silt and clay unit); and (3) a confined aquifer within the glacial till and bedrock (Giese and Hobba 1970). Information provided in this section incorporates data from the unconfined aquifer gathered during the SS-026 SI and from basewide hydrogeologic studies (Malcolm Pirnie, Inc. 1996 and URS 2000).

3.7.3.1 Water Table Aquifer

Groundwater elevations were recorded in the newly installed SS-026 SI monitoring wells and the

existing LF-024 monitoring wells during this study. These data, which were used to infer groundwater flow patterns across the site, are summarized in Table 3-3.

Figures 3-9 and 3-10 depict the potentiometric surface of the unconfined water table aquifer in the vicinity of SS-026 developed from water level data collected on December 10, 1994 and October 6, 1999, respectively. The groundwater contours indicate generally southeastward flow at a horizontal gradient which ranges from approximately 0.015 ft/ft in the northeastern portion of the site to 0.07 ft/ft in the southwestern portion of the site. The flow direction becomes more southerly, following topography south of the site, and the gradient increases to approximately 0.1 ft/ft. Vertical hydraulic gradients could not be calculated as part of this SI since no monitoring well clusters are located on site. As shown in Figure 3-9, groundwater flow from LF-024 is to the southeast toward the Salmon River and should not impact water quality at SS-026.

The thickness of the unsaturated (vadose) zone beneath of SS-026 generally ranges from approximately 6 feet in the southwestern portion of the site to greater than 13 feet at MW-26-004 in the southeastern portion of the site as shown on Figure 3-11. The unsaturated thickness contours were generated by subtracting the groundwater potentiometric surface contours from the ground surface topographic contours. Based on the estimated elevations of the top of the silt and clay unit (which marks the bottom of the shallow aquifer) and bedrock, the saturated zone of the water table aquifer is estimated to be approximately 20 feet thick beneath SS-026 and the total overburden thickness is estimated to range from 50 to 100 feet in the site area.

3.7.3.2 Confining Layer

The silt and clay unit forms a confining layer (aquitard) that separates the unconfined sand and confined glacial till/bedrock aquifers. On the basis of available boring and geophysical data, the confining units appear to be continuous beneath the site (Malcolm Pirnie, Inc. 1996).

The vertical hydraulic conductivity of the silt and clay unit has been determined to be on the order of 10^{-8} cm/sec and (URS Consultants, Inc. 1995b). Where present, this unit would effectively confine the glacial till/bedrock aquifer and restrict groundwater movement between the water table and glacial till/bedrock aquifers.

3.7.3.3 Confined Glacial Till/Bedrock Aquifer

Eight bedrock wells/piezometers were installed as part of the base-wide hydrogeology investigation conducted by Malcolm Pirnie, Inc. (1996). These wells were advanced to the first significant water-bearing interval within the bedrock and, therefore, measure the potentiometric surface of the shallow bedrock zone. Groundwater flow in the shallow bedrock aquifer is to the east and southeast, toward Lake Champlain and the Salmon River, at a horizontal gradient of approximately 0.007 ft/ft. The hydraulic gradient decreases near the intersection of two normal faults mapped near the runway in the southeastern portion of the base. A groundwater divide appears to coincide with the location of the intersection of these faults with groundwater flow diverted to the east toward Lake Champlain, and to the south toward the Salmon River. Figure 3-12 shows a portion of the base-wide potentiometric surface of the bedrock aquifer mapped by Malcolm Pirnie, Inc. (1996) in the vicinity of SS-026.

Previous investigations defined the glacial till unit as a confining or semi-confining layer, but information gathered during the *Fire Training Area (FT-002)/Industrial Area Groundwater Operable Unit Remedial Investigation/Feasibility Study* (FT-002/IA GW OU RI/FS) indicates that the till is a conductive, water-bearing zone (URS 2000). The till unit is confined by the overlying silt and clay unit and is isolated from the unconfined water table aquifer. However, the till is in immediate contact with the underlying bedrock aquifer. Only six wells have been installed in the till unit and all of these wells are distant (over 1 mile) from SS-026. Therefore, information regarding the till unit beneath SS-026 is unavailable.

Malcolm Pirnie determined that base-wide vertical hydraulic gradients between the water table aquifer and the confined bedrock aquifer were typically downward; however, the nearest well cluster to SS-026 (PZ-4 located approximately 2,000 feet to the northwest) indicated an upward vertical gradient between the bedrock and water table aquifers. Although no site-specific information is available to determine the vertical gradients present between the two aquifers, a projection of the bedrock potentiometric surface contours (Figure 3-12) suggests a downward flow gradient from the water table aquifer to the bedrock aquifer at SS-026.

3.7.4 Hydraulic Conductivity

In situ hydraulic conductivity tests were performed in each of the four monitoring wells installed as part of the SS-026 SI. Each well was screened across the water table in the sand aquifer and rising head (slug-out) tests were performed on the wells and analyzed using the Bouwer and Rice method (Bouwer and Rice 1976; Bouwer 1989). Hydraulic conductivity values are presented in Table 3-4. The values from the slug-out tests range from 4.8×10^{-3} cm/sec to 1.4×10^{-2} cm/sec. The slug test analyses are included as Appendix H.

Malcolm Pirnie, Inc. also performed slug tests on monitoring wells screened in the sand aquifer and determined that base-wide hydraulic conductivity values for the sand aquifer ranged from 4.6×10^{-5} to 1.0×10^{-2} cm/sec (Malcolm Pirnie 1996). The large range of hydraulic conductivity values was attributed to differences in depositional environments and grain size, both vertically and laterally across the base.

Malcolm Pirnie, Inc. performed laboratory analyses on 9 Shelby tubes samples of the silt and clay unit from base-wide clusters and Attachment I sites. The permeability test results ranged from 5.60×10^{-8} to 7.04×10^{-7} cm/sec (Malcolm Pirnie 1996). URS Consultants, Inc. determined the vertical hydraulic conductivity of the silt and clay unit to be on the order of 10^{-8} cm/sec, which is similar to the Malcolm Pirnie, Inc. permeability test results for this unit (URS Consultants, Inc. 1995b).

Slug tests performed as part of the FT-002/IA GW OU RI/FS on three well screened in the till unit yielded mean horizontal hydraulic conductivities of 2.06×10^{-4} cm/sec, 1.80×10^{-4} cm/sec, and 5.64×10^{-3} cm/sec (URS 2000). However, these wells were distant from SS-026 and the properties of the till unit (if present) beneath SS-026 are unknown.

Slug tests performed by Malcolm Pirnie, Inc. as part of the base-wide hydrogeology investigation on 5 bedrock wells that indicated hydraulic conductivities ranging from 1.91×10^{-6} to 1.41×10^{-2} cm/sec. Malcolm Pirnie, Inc. concluded that because of the inherent anisotropy of the formation, the hydraulic

conductivity values from these fractured bedrock wells may be more indicative of the individual fracture zones than of the formation as a whole (Malcolm Pirnie, Inc. 1996).

3.7.5 Water Balance

A water balance for the SS-026 site was performed using the USEPA HELP model to estimate the relative contributions of all hydrologic components in the unsaturated zone to the SS-026 water budget. Climatologic data for the years 1977 through 1981 from the Burlington, Vermont weather station were used in the model and enhanced with synthetically generated climatic data for Burlington. With the additional input of onsite soils characteristics, the model provided a water budget consisting of precipitation, runoff, evapotranspiration, percolation to groundwater, and storage.

The site was modeled as consisting of one layer comprised of 10 feet of sand. Both well graded and poorly graded sands were considered in the model. Based on site observations and the site topography (Figure 3-7), runoff was assumed to collect in lower basinal areas of the site and eventually infiltrate to groundwater.

Using the enhanced climatic data for the period of 1977 through 1981, the modeled average values of the water budget components were:

Precipitation	34.7	in/yr
Runoff	4.6	in/yr
Evapotranspiration	20.9	in/yr
Percolation	9.4	in/yr
Δ Storage	-0.2	in/yr

Detailed calculations, sketches, and the model are presented in Appendix K.

4.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The National Oil and Hazardous Substance Pollution Contingency Plan (40 CFR 300) requires that the selection of remedial actions at CERCLA sites meet applicable or relevant and appropriate requirements (ARARs) of federal and state environmental laws and regulations (USEPA 1990b). The process of identifying ARARs begins during the scoping of the Remedial Investigation/Feasibility Study and continues through the remedial design phase. ARARs identification is always site-specific.

4.1 Definition of ARARs and TBCs

A requirement of federal or state law may be either "applicable" or "relevant and appropriate."

Applicable requirements are those cleanup standards, standards of control, and other environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance or contaminant, a remedial action, a location, or other circumstances at a CERCLA site.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not "applicable" to a hazardous substance or contaminant, a remedial action, a location, or other circumstances at a CERCLA site, nevertheless address problems or situations sufficiently similar to those encountered at a CERCLA site that their use is well-suited to the particular site.

In addition to promulgated standards and controls, other requirements are "to be considered" (TBC). TBCs are federal and state policies, advisories, and other non-promulgated health and environmental criteria, including numerical guidance values, that are not legally binding. TBCs are used for the protection of public health and the environment if no specific ARARs for a chemical or other site conditions exist, or if ARARs are not deemed sufficiently protective.

ARARs are divided into the following three classifications, although many categories overlap.

Location-specific requirements pertain to existing natural or cultural features at the site that are specifically protected. These may affect contaminant levels or remedial actions allowed at the site. These will be addressed in Section 4.2 of this report.

Chemical-specific requirements are numerical values, or methodologies which result in the establishment of numerical values, for the acceptable amount of a chemical in the environment. Chemical-specific requirements are addressed in detail in Section 4.3 of this report.

Action-specific requirements pertain to the proposed site remedies and govern implementability of the selected site remedy.

4.2 Location-specific ARARs

The following location-specific ARARs were evaluated in relation to the SS-026 site.

4.2.1 Natural Features

National Environmental Policy Act of 1969 (NEPA)

The Department of the Air Force recently revised its regulations to update the Air Force process for compliance with NEPA. The final rule for the Environmental Impact Analysis Process (32 CFR Part 989) was published in the January 24, 1995 Federal Register. This revision provides policy and guidance for consideration of environmental matters in the Air Force decision-making process. It implements the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508) and 32 CFR Part 188 (Department of Defense Directive 6050.1, Environmental Effects in the United States of DOD Actions).

The Air Force position on CERCLA-consistent response actions with respect to the requirements of NEPA is that the CERCLA response process can satisfy the requirements of NEPA by addressing potential impacts of remedial actions on human health and the environment (USAF 1992). Installations have the option to prepare separate NEPA and CERCLA-consistent restoration documentation, but an attempt is made to:

- Integrate NEPA and CERCLA documentation whenever possible
- Use the community involvement element of the CERCLA process to address impacts of remedial actions
- Evaluate potential environmental impacts the response action may have on natural resources
- Reflect any potential impacts from anticipated CERCLA response actions in the disposal/reuse Environmental Impact Statement (EIS)

32 CFR Part 989 also sets forth policy for compliance with Executive Orders #11988 and #11990 on Floodplain Management and Wetlands Protection. These require that a remedial alternative located in a floodplain or in a wetland not be selected unless a determination is made that no practicable alternative exists. If no practicable alternative exists, potential harm must be minimized and action taken to restore and preserve the natural and beneficial values of floodplains (e.g., reduction and control of flood hazard, replenishment of groundwater, soil conservation, and conservation and long-term productivity of existing flora and fauna).

Section 404 of the Clean Water Act and related regulations (40 CFR 230) protect waters of the United States, including wetlands, and prohibit the deposition of dredged or excavated materials. Protection of aquatic and wetland habitats is a primary goal of this program. Remedial activities that affect habitats may include capping, stream channelization, and dewatering of the site (see 33 CFR 320-330 for USACE permit regulations).

New York State Use and Protection of Waters (6 NYCRR 608) established a permit program to protect certain classes of New York State waterways. Stream disturbances must be avoided, or adverse

impacts must be mitigated through terms and conditions of the joint permitting process between NYSDEC and USACE regulating waters of the United States. Protected streams included Class A, B and C (T).

New York State Fish and Wildlife Regulations (6 NYCRR 182) and the federal Endangered Species Act (16 USC 1531) list and protect endangered or threatened species from actions that may threaten their existence or modify their habitats. Rare and endangered plant species also are protected in New York State by regulations in 6 NYCRR 193. The species data bases with location-specific information are kept by the U.S. Fish and Wildlife Service and the New York State Heritage Program, housed in NYSDEC.

Fish and Wildlife Coordination Act (16 USC 661) requires action to protect fish and wildlife from actions which would affect or modify wildlife habitat.

New York State Water Quality Classifications (6 NYCRR 701-703) classifies groundwater, streams, and other water bodies. Classes A, B, C, and D fresh surface waters are pre-identified and their best uses, ranging from fishing to drinking, are protected with ambient water quality criteria. These are addressed in this section under chemical-specific ARARs.

New York State Floodplain Management Act and Regulations (ECL Article 36, and 6 NYCRR 500) regulates activities taking place in floodplains. Although PAFB was not classified on Federal Emergency Management Agency (FEMA) maps, nearby off-base mapping indicates SS-026 to be above the 100-year floodplain boundary.

4.2.2 Cultural Features

National Historic Preservation Act (16 USC 470) NHPA is a federal law that establishes the responsibilities of federal agencies with respect to "historic properties." Historic properties include objects from both history and prehistory and cover the range from standing structures to discrete artifacts recovered from archaeological excavations. This federal law also protects properties listed on, or eligible for inclusion on, the National Register of Historic Places (NRHP). Archaeological finds that are considered eligible for inclusion on the NRHP also are protected by this act. The New York State Historic Preservation Office lists all federal and state protected properties. This office has determined that investigation and general remedial activities at PAFB will not adversely affect existing historic properties.

An Archeological Survey of Plattsburgh Air Force Base, Clinton County, New York, dated 15 November 1994, is a cultural resources study prepared for PAFB (USACERL/TAC 1994). The two primary goals of the study were to provide PAFB with prehistoric and historic contexts for the base; and, to provide it with an inventory of sites, ages, locations, conditions, and potential significance, in terms of NRHP criteria, for both prehistoric and historic archaeological resources discovered in the survey units. No prehistoric sites were identified during the course of the survey; however, five historic sites were located on the Main Base, and four were discovered on the Old Base.

According to the study, SS-026 is located near three sites where isolated finds of cultural materials were encountered in shovel tests (D-1, D-2, E-1) and is situated in proximity to areas which have a high and a moderate probability of containing prehistoric cultural remains. It is unlikely that these remains can be located without employing heavy equipment to remove the thick alluvial deposits. Identified historic cultural remains were limited, isolated, or classified as historically insignificant.

Archaeological and Historic Preservation Act (16 USC Section 469). This act provides for the protection of archaeological data that might be lost as a result of a federal construction project. In contrast to the National Historic Preservation Act, the law allows for only the preservation of the data and not the site itself.

4.3 Chemical-specific ARARs

Numerical standards have been developed for each environmental medium at SS-026 through the evaluation of the following ARARs and TBCs which address specific chemicals. Tables 4-1 and Tables in Appendix A present these numerical standards, which are compared with analytical data in Section 5.0.

4.3.1 Groundwater

New York State regulates groundwater quality through numerical standards and guidance values established by NYSDEC (6 NYCRR Chapters 701 and 703) and the New York State Department of Health (10 NYCRR Chapter 5, Subpart 5-1). These values have been consolidated into a single NYSDEC guidance document, the Division of Water's Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* (NYSDEC 1998). In New York State, there is little practical difference between standards and guidance values since the procedure for determining these values is the same and the state has the authority to enforce guidance values where there are no promulgated standards (6 NYCRR 701.15(d)).

The Safe Drinking Water Act (SDWA) authorizes the National Primary and Secondary Drinking Water Regulations (40 CFR 141 and 143). The potable groundwater standards established by these regulations are called Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs). MCLs are legally enforceable federal drinking water standards, while MCLGs are non-enforceable health goals established by USEPA. MCLs are commonly identified as ARARs for existing or potential future drinking water sources. MCLGs are used in cases in which multiple contaminants or pathways or exposures present extraordinary risks to human health. In such cases, USEPA makes a site-specific determination of the more stringent standards (USEPA 1993).

Groundwater currently is not used as a potable water source on base, therefore MCLGs are not considered ARARs for SS-026, but will be retained as a TBC. MCLs, however, are relevant and appropriate because groundwater may be considered a future water supply source. Secondary Maximum Contaminant Levels (SMCLs) are federally non-enforceable regulations that control contaminants in drinking water that affect the aesthetic qualities relating to the public acceptance of drinking water and are TBCs. The Office of Drinking Water publishes non-enforceable contaminant limits for 1-day, 10-day, longer-term (usually 7 years), and lifetime exposures to chemicals. These health advisories normally indicate endpoints of toxicity or suggested no adverse effect response levels for individual compounds. Although these criteria documents carry no regulatory force, they are TBCs for SS-026. Additional TBCs for explosive compounds in drinking water were provided by USEPA Region 2.

ARAR values for groundwater at SS-026, which are derived primarily from TOGS 1.1.1, are presented in Table 4-1.

4.3.2 Soils

Federal and state laws and regulations have not promulgated standards for soil contaminants other than for hazardous waste characterization. However, NYSDEC has established soil cleanup objectives in its document entitled *Determination of Soil Cleanup Objectives and Cleanup Levels* (NYSDEC 1994). The NYSDEC cleanup objectives for organic compounds are based on the soil to water partition theory model. They represent the maximum concentration of a particular organic compound that may be in soil and not produce groundwater contamination greater than groundwater standards. NYSDEC cleanup objectives for metals are based upon published average concentrations detected in eastern U.S. soils. NYSDEC permits the use of "site background" data for metals, if this data is available. A basewide background surface soil and groundwater survey was performed in late 1994, primarily to establish background inorganic constituent concentrations in PAFB soils (URS Consultants, Inc. 1996). The 95% Upper Tolerance Limit (UTL) calculated for each inorganic constituent detected in the background soil samples will be considered as "site background" metals concentrations and appropriate for use as soil TBCs. RCRA hazardous waste toxicity characteristic limits established by 40 CFR 261 are considered soil ARARs. The chemical-specific TBCs and ARARs developed for soil at SS-026 are presented in Table 4-1.

5.0 NATURE AND EXTENT OF CONTAMINATION

This section characterizes the nature and extent of contaminants detected in soil and groundwater at SS-026. The potential sources of contamination at SS-026 include byproducts of ordnance disposal, diesel fuel which was used to ignite ordnance, and defoliants. Any of these substances would have immediately impacted soils at the site and, over a longer period, could have leached into the groundwater system.

5.1 Soil

When the EOD Range was active site soils were subjected to significant reworking, as the former "U"-shaped berms were maintained by bulldozing. Soil excavation, sifting, and regrading during range safing activities further disturbed site soils. Because no significant top soil layer has formed and surface/subsurface soil were subjected to repositioning, no distinction is made between surface soil and subsurface soil at SS-026. The concentrations of analytes detected in soil samples are compared to soil TBC values presented in Table 4-1.

5.1.1 Previous Investigations

No previous chemical investigations of soil were conducted at SS-026 before the SI.

5.1.2 1994 Site Investigation Activities

Ten soil samples were collected at five boring locations (MW-26-001, MW-26-003, SB-26-01, SB-26-02, and SB-26-03) during the SI. Two samples were collected at each location from 0 to 2 foot and 2 to 4 foot depths. One sample location (MW-26-001) was outside of the main ordnance disposal area and was used to characterize local background conditions. The other four locations were in the vicinity of the central bermed area. All of the samples were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs; explosives; and TAL metals.

A summary of the analytes detected in the SS-026 soil samples is presented in Table 5-1 and illustrated on Figure 5-1.

Only three VOCs were detected in the soil samples--methylene chloride, acetone, and toluene--at concentrations ranging from 1 to 34 micrograms per kilogram (μg/kg). Acetone also was detected in the background soil samples from location MW-26-001. Methylene chloride, acetone, and toluene are considered by USEPA to be common laboratory contaminants. In any case, all detected VOC concentrations were well below their respective TBC values.

The only SVOC detection was diethylphthalate at a concentration of 780 μg/kg in a sample from upgradient location MW-26-001. Phthalates are also considered to be common sampling equipment and laboratory related contaminants. The lone diethylphthalate detection was an order of magnitude below its TBC value.

No PCBs were detected in the soil samples. The only pesticide detection was 4,4'-DDT at a concentration of 1.4 μg/kg at location SB-26-03. Again, this detection was well below the TBC value (2100 μg/kg).

One explosive, RDX, was detected in one soil sample from location SB-26-01 at a concentration of 1.5 milligrams per kilogram (mg/kg).

Nineteen of the 23 TAL metals were detected in site soils. Mercury, selenium, and thallium were not detected in site soils and zinc analytical results were rejected due to quality control criteria deficiencies. Four metals--antimony, cadmium, chromium, and silver--were present at concentrations that exceeded TBC values (although by less than an order of magnitude in all cases). The TBC exceedances all occurred in soil samples collected from borings within the bermed areas (SB-26-01, SB-26-02, and SB-26-03) where ordnance was disposed.

5.1.3 1997 Range Safing Activities

During range safing operations in late 1997, 27 buried 55-gallon drums containing what appeared to be waste oil products were found in the west-central portion of the site (Figure 1-3). The drums were overpacked, sampled, and later disposed of offsite. Two soil samples (EOD PIT 1 and EOD PIT 2) were collected from the bottom of the excavation where the drums had been removed.

A single empty 55-gallon drum (later disposed of as scrap) was also found in the perimeter sand berm in the northeastern portion of the site (Figure 1-3). One soil sample (EOD BERM 1) was collected beneath this drum.

The three soil samples were analyzed for TCL VOCs, TCL SVOCs, TCL Pesticides/PCBs, and TAL metals to evaluate whether product had leaked from the drums, contaminating surrounding soils. Detected analytical results are summarized in Table 5-2.

Only two VOCs, methylene chloride and acetone, were detected in the soil samples at concentrations well below their respective TVC values. No SVOCs or PCBs were detected in the samples. 4,4'-DDT and its metabolite 4,4'-DDE were detected at concentrations well below their TBC values. Seventeen of the 23 TAL metals were detected in the soil samples, but concentrations were all below their respective TBC values. Cyanide was not detected in the samples.

No evidence of soil contamination was noted in either drum removal excavation during the visual inspection and PID survey prior to sample collection. Compounds detected in the soil samples were present at low or background concentrations and did not exceed regulatory criteria. Therefore, the soils in these two drum removal areas did not appear to warrant further investigation.

5.1.4 1999 Site Investigation Activities

The 1999 supplemental investigation soil sample locations and analytical parameters were chosen to address concerns in three areas: the CAS Area; the main EOD Range disposal area; and the Satellite Fill Area (Table 2-2). Therefore, the soil sample data will be discussed in this context.

5.1.4.1 CAS Area

Six soil samples (SS-026-CAS-1 through SS-026-CAS-6) were collected in the CAS Area and analyzed for arsenic, chloroform, and thiodigycol (TDG) as indicator parameters for the presence of chemical warfare agent compounds (which cannot be readily analyzed). Sample SS-026-CAS-3 was also analyzed for CN and CS because empty tear gas glass jars were found at this location. A summary of the detected analytes in the soil samples is provided in Table 5-3.

Arsenic was detected in only one sample (SS-026-CAS-1) at a concentration of 1.4 mg/kg which is below the 7.5 mg/kg TBC value. Chloroform and TDG were not detected in the samples. CN and CS were not detected in SS-026-CAS-3.

Arsenic was present in one sample at a concentration less than the 95% Upper Tolerance Limit concentration calculated for basewide background soil samples (URS 1996). Therefore, the data do not appear to indicate the presence of chemical warfare agent compounds or their residuals in the CAS area.

5.1.4.2 EOD Range

Six soil samples (SB-26-04-01/02 through SB-26-06-01/02) were collected at the locations of three former SI soil borings (see Table 2-3 and Figures 2-1 and 2-2) to evaluate the presence of tear gas or dioxins in the main range disposal area. The samples were analyzed for CN, CS, and dioxins/furans. A summary of the detected analytes in the soil samples is provided in Table 5-4.

CN and CS were not detected in any of the samples. Dioxins/furans were detected in every sample, but at concentrations below action levels.

5.1.4.3 Satellite Fill Area

Five soil samples (SS-026-SF-1, SS-026-SF-2, SS-026-SF-4, SS-026-SF-5, and SS-026-SF-6) were collected at various locations in the Satellite Fill Area (see Table 2-5 and Figure 2-2) and analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, and TAL metals. Sample SS-026-SF-6 was also analyzed for CN and CS. A summary of the detected analytes in the soil samples is provided in Table 5-5.

Two VOCs, methylene chloride and toluene, were detected only in SS-026-SF-4 but at concentrations well below their respective TBC values. These VOCs were also detected in the associated field blank (Appendix C3).

A total of twenty SVOCs were detected among the samples collected. Of these twenty SVOCs, eighteen of the compounds were found in SS-026-SF-1 and twelve of those detections were found to be above their respective TBC values. The compounds detected above TBC values in SS-026-SF-1 are polycyclic aromatic hydrocarbons (PAHs) that are probably associated with the tar-like substance found in surface soils in EOD-TP-11. The only other SVOC detection that exceeded TBC values was benzo(a)pyrene in SS-026-SF-4, possibly due to the high content of decaying organic matter (vegetation) in the sample. CN and CS were not detected in sample SS-026-SF-6.

No PCBs were detected in any of the samples.

Three metals (copper, selenium, and zinc) were detected at concentrations above their respective TBC values. Copper and zinc both exceeded their respective TBC values only in sample SS-026-SF-2, which was collected beneath an empty, intact, rusted, bluish green 55-gallon drum. The copper and zinc detections may have been related to paint chips weathering off of the drum. Selenium was detected in all samples at concentrations in exceedance of the 2.0 mg/kg TBC value. Detected selenium concentrations ranged from 3.7 to 7.6 mg/kg.

5.2 Groundwater

The concentrations of analytes detected in groundwater samples are compared to ARAR values presented in Table 4-1.

5.2.1 Previous Investigations

No previous investigations of groundwater were conducted at SS-026 before the SI.

5.2.2 1994 Site Investigation Activities

Groundwater samples were collected from the four existing SS-026 monitoring wells and one well from nearby IRP site LF-024. Two wells were located upgradient of the main ordnance disposal area of SS-026 (MW-24-001 and MW-26-001) and the remaining three wells were considered to be downgradient of this area (MW-26-002, MW-26-003, and MW-26-004). All samples were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs; explosives; and TAL metals (total and dissolved). A summary of the analytes detected in the groundwater samples is presented in Table 5-6 and illustrated on Figure 5-2.

The only VOC detection was acetone in the groundwater sample from MW-26-002 at a concentration of 15 μg/L. Bis(2-ethylhexyl) phthalate was the only SVOC detected; it was found in all three downgradient wells at a maximum concentration of 4 μg/L. Both acetone and bis(2-ethylhexyl) phthalate are common laboratory contaminants. All VOC and SVOC detections were at concentrations below ARAR values.

No pesticides or PCBs were detected in the groundwater samples.

One explosive, RDX, was detected at one location (MW-26-003) at a concentration of 5.6 μg/L. USEPA has a Drinking Water Health Advisory value of 2 μg/L for RDX. MW-26-003 is directly downgradient of the former bermed area where ordnance was disposed and is also the well closest to the former bermed area.

Twenty of the 23 TAL metals were detected in the groundwater samples. Mercury, selenium, and silver were not detected in site groundwater. Four metals -- aluminum, antimony, iron, and zinc -- were detected at concentrations exceeding ARAR values. The sole antimony detection and ARAR exceedance was in upgradient well (MW-24-001). Aluminum and iron detections (total) in all wells, both upgradient and downgradient, exceeded ARAR values and are probably indicative of natural local enrichment of these elements in groundwater. Zinc was also detected in all wells with only the concentration (total) in well MW-26-004 (315 μg/L) exceeding the 300 μg/L ARAR value.

5.2.3 1999 Site Investigation Activities

Groundwater samples were collected from the SS-026 monitoring wells and one well from LF-024 and also from two groundwater seeps at the base of the slope in the Satellite Fill Area.

5.2.3.1 Monitoring Well Groundwater Samples

Groundwater samples were collected from the five SS-026 monitoring wells and MW-24-001. Samples were analyzed for TCL VOCs and RDX. The sample from MW-26-005 was additionally analyzed for TCL SVOCs, TCL PCBs, and TAL metals. A summary of the detected analytes in these groundwater samples is provided in Table 5-7.

No VOCs, SVOCs, or PCBs were detected in any of the samples collected.

RDX was detected in wells MW-26-003 (6.1 μg/L) and MW-26-004 (5.5 μg/L) at concentrations that exceed the 2 μg/L USEPA Drinking Water Health Advisory value.

Fifteen metals were detected in MW-26-005. Only two metals (iron and selenium) were detected at concentrations that exceeded their respective ARAR values. Selenium was detected at concentrations (12.3 μg/L and 11.8 μg/L in the sample and field replicate, respectively) that only slightly exceeded the groundwater standard of 10 μg/L.

5.2.3.2 Groundwater Seep Samples

Two groundwater seep samples (LS-026-SF-1 and LS-026-SF-2) were collected from groundwater seeps along the base of the steep slope in the Satellite Fill Area. The samples were analyzed for TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, and RDX. A summary of the detected analytes in the groundwater seep samples is provided in Table 5-8.

No VOCs, SVOCs, PCBs, or RDX were detected in the seep samples.

Four metals (iron, manganese, selenium, and thallium) were detected at concentrations above their respective groundwater ARARs. Iron and manganese concentrations in both samples and the field replicate exceeded their respective ARAR values. Thallium was detected at a concentration above its groundwater ARAR value in LS-026-SF-1, but was not detected in the field replicate for this sample. Selenium was detected in LS-026-SF-1 and it field replicate (11.9 μg/L and 13.8 μg/L, respectively) at concentrations just slightly above the 10 μg/L ARAR value.

5.3 Tentatively Identified Compounds

Tentatively Identified Compounds (TICs) were not commonly observed in the 1994 SS-026 samples. The 1994 TIC analytical results are summarized in Table 5-9. No VOC TICs were detected for either soil or groundwater. Most of the SVOCs that were detected could not be identified. Based on these results, the 1994 TICs did not appear to warrant further consideration.

All but one of the 1999 sample VOC TICs were rejected during the data assessment summary. One unknown VOC at an estimated concentration of 19 μg/kg was present in SS-026-CAS-5. SVOC TICs were detected in nine samples, including an equipment blank.

The majority of SVOC TICs occurred in samples collected in the highly organic (decayed vegetative debris) soils at the base of the slope in the Satellite Fill Area. All soil samples (SS-026-SF-1, SS-026-SF-2, SS-026-SF-4, SS-026-SF-5, and SS-026-SF-6) and groundwater seep samples (LS-026-SF-1 and LS-026-SF-2) collected in this area had SVOC TICs. The only other sample to have an SVOC TIC was the groundwater sample from newly installed monitoring well MW-26-005.

The SVOC TICs in sample SS-026-SF-1 were primarily polyaromatic hydrocarbon compounds, probably due to the tar-like substance in this sample. The greatest number (20) and highest concentration (47,700 μg/kg) of TIC detections also occurred in this sample. TIC detections in the other 8 samples were quite variable (including Vitamin E) and consisted primarily of unknown compounds. The 1999 VOC and SVOC TIC laboratory Form 1s are provided in Appendix R.

5.4 Site Contaminant Summary

The SI sampling results at SS-026 indicate minor impacts to soil and groundwater related to past activities at the EOD Range. VOC detections in soil and groundwater were infrequent and at low concentrations that did not exceed TBC or ARAR values. Also, all VOCs detected are common laboratory contaminants.

SVOCs detected in the 1994 SI samples were primarily common laboratory contaminants at concentrations that did not exceed TBC or ARAR values. 1999 soil sample SS-026-SF-1 contained 12 PAHs at concentrations exceeding their respective TBC values, probably due to a tar-like substance present in surface soils at the location of test trench EOD-TP-11. The PAHs detected are relatively insoluble in water and were not detected in the groundwater seep samples collected downslope from EOD-TP-11.

No PCBs were detected in soil or groundwater. The only site pesticide detections were 4,4'-DDT and its metabolite 4,4'-DDE in three soil samples at concentrations well below their respective TBC values. Dioxins and furans were also detected in site soil samples, but at concentrations below action levels.

RDX was the only explosive compound detected, both in soil and groundwater. The presence of RDX is due to past ordnance disposal at the EOD Range. RDX was detected in a soil sample from the former bermed ordnance disposal area and in two groundwater monitoring wells downgradient from this area (MW-26-003 and MW-26-004) at concentrations exceeding the USEPA's Drinking Water Health Advisory value.

Four metals -- antimony, cadmium, chromium, and silver -- were detected at concentrations exceeding TBC values in the 1994 SI soil samples collected in the bermed area. These TBC exceedances were by less than an order of magnitude. Antimony, cadmium, and silver were not detected in any 1994 downgradient groundwater samples and chromium detections were comparable in upgradient and downgradient groundwater samples. The only analytes detected at concentrations exceeding ARARs in the 1994 downgradient groundwater samples were aluminum and iron; these compounds were also detected

at concentrations exceeding ARARs in the upgradient groundwater samples. Therefore, the site did not appear to be contributing metals contamination to groundwater.

Three metals -- copper, selenium, and zinc -- were detected at concentrations exceeding TBC values in the 1999 SI soil samples collected in the bermed area. These soil samples were collected downgradient of all SS-026 monitoring wells. Two groundwater seep samples collected downslope from these soil samples had iron, manganese, selenium, and thallium detections at concentration exceeding their respective groundwater ARARs. The concentrations of iron and selenium in the groundwater sample from MW-26-005 also exceeded their respective groundwater ARARs. The 1999 analytical results indicate that the site may be contributing selenium to groundwater, however, selenium was not detected in any of the 1994 soil or groundwater samples.

5.5 Conclusions

Minor pesticide (4,4'-DDT), explosive (RDX), and metals (antimony, cadmium, chromium, and silver) detections in near surface soils in the central bermed portion of the site appear to be the only contaminants in soil attributable to past ordnance disposal practices at the EOD Range. Only RDX appears to be migrating from soils to groundwater. RDX is present in two wells downgradient of the main range disposal area at concentrations above the USEPA's Drinking Water Health Advisory value. RDX was not detected in downgradient groundwater seeps south of the EOD Range.

Past disposal of debris in the woods south of the EOD Range has resulted in a tar-like substance contaminating surface soils in a limited area.

6.0 CONTAMINANT FATE AND TRANSPORT

This section describes the probable fate and transport of contaminants identified at SS-026. Contaminant fate and transport are determined primarily by the properties of the individual contaminant, the migration pathways available at a particular site, and the character of the media in which transport occurs.

6.1 Migration Pathways

Migration pathways are determined by the physical characteristics of the site and the distribution and types of contaminants identified at the site. These pathways also vary by medium. For example, groundwater contaminants migrate through advection and dispersion in groundwater and volatilization into the unsaturated zone. Soil contaminants travel via wind and water erosion, by infiltrating precipitation, and by volatilization to the air or soil pores. Some compounds sorb onto soils and may be biotransformed by various organisms.

6.1.1 Soil Migration Pathways

A major migration pathway for VOCs in the vadose zone at this site is volatilization from the soil and subsequent migration through air. The degree of volatilization is directly related to a contaminant's vapor pressure. At room temperature, contaminants with relatively high vapor pressures (>10 mm Hg) are more likely to volatilize than contaminants with low vapor pressures (<1 mm Hg) (Howard 1989). Most VOCs at SS-026 exhibit relatively high vapor pressures (Table 6-1).

Infiltrating precipitation, which leaches soluble compounds from the soil, serves as a secondary pathway for VOCs. In this process, compounds with moderate water solubilities that are trapped in the soil are dissolved by precipitation and transported through the soil to the groundwater.

Leaching is an unlikely migration pathway for PAHs, pesticides, and metals in soil. These chemicals have low solubilities and high organic carbon-water partition coefficient (K_{oc}) values (Table 6-1). As a result, they have a tendency to sorb to soils and will be transported primarily by wind and water erosion. Because of the site topography and hydrology, wind erosion is probably the more significant of these pathways.

6.1.2 Groundwater Migration Pathways

Advection (the process by which solutes are transported by the bulk motion of flowing groundwater) and hydrodynamic dispersion (the tendency for the solute to spread out from the path that it would be expected to follow according to the hydraulics of the flow system) are the primary controlling transport mechanisms for dissolved groundwater contaminants. Hydrodynamic dispersion consists of two components, molecular diffusion and mechanical dispersion. Molecular diffusion is defined as the process by which a solute in water will move from an area of greater concentration toward an area where it is less concentrated. Diffusion will occur as long as a concentration gradient exists, even if the fluid is not moving. However, this is generally an insignificant transport process. Mechanical dispersion is defined as the process by which mixing of solutes and water occurs during transport along interstitial flow paths within the formation and is a significant process by which contaminants are transported. Other factors that

affect groundwater transport mechanisms include the site soil conditions, physical characteristics of the aquifer, hydrogeology, and physical and chemical characteristics of the contaminants.

The sand aquifer beneath SS-026 contains both silt and clay, and serves as a medium for sorbing some portion of the groundwater contaminants. Volatile contaminants also may be released from groundwater through volatilization at the water table surface (into soil pore spaces) or at groundwater discharge points (to the atmosphere).

6.2 Fate and Transport of Contaminants in Soil

Several contaminants were detected in soils at SS-026. For ease of discussion, these chemicals have been grouped according to properties and behaviors. The chemicals are characterized as VOCs, PAHs, phthalates, pesticides, explosives, and metals.

6.2.1 Volatile Organic Compounds (VOCs)

Acetone, methylene chloride, and toluene were detected in the soil at the site. Acetone is miscible in water and has a high vapor pressure, making it very mobile in groundwater and also likely to volatilize. Acetone's low K_{oc} value indicates that it will probably not remain in the soil. Methylene chloride has a high vapor pressure, high solubility, and low K_{oc} and also would be expected to volatilize or be transported with groundwater. Toluene is less volatile and less soluble and would be expected to slowly biodegrade under the aerobic conditions present at the site.

6.2.2 PAHs

PAHs were the largest group of organic contaminants detected in site soils, primarily in sample SS-026-SF-1. All of these compounds exhibit low solubilities, high K_{oc} and K_{ow} values, and low vapor pressures (Table 6-1). Accordingly, the ultimate fate of these PAHs is sorption to soils, followed by gradual degradation. In some cases, surface runoff and wind erosion may facilitate transport of PAHs sorbed to soils.

PAHs are hydrocarbons containing two or more fused benzene rings. Generally, a PAH compound with several rings biodegrades less readily than a PAH with fewer rings. The number of rings for each PAH is indicated on Table 6-1. The carcinogenic PAHs have four or more rings and are relatively resistant to biodegradation. Some animals can metabolize PAHs. The resulting metabolites may, however, be toxic (Arthur D. Little, Inc. 1985).

Dibenzofuran and carbazole were also found in soil samples. The fate of these compounds is similar to that described for PAHs.

6.2.3 Phthalates

Diethylphthalate, bis(2-ethylhexyl)phthalate, and di-n-butylphthalate were detected in soil samples. Phthalates have relatively high K_{oc} and octanol-water partition coefficient (K_{ow}) values and low water solubilities, which indicate a limited potential for migration in groundwater. Phthalates biodegrade only under certain ideal conditions and generally persist in the environment. Their resistance to biodegradation,

hydrolysis, and volatilization increases their exposure to percolating precipitation and the likelihood that they may be transported with groundwater (Arthur D. Little, Inc. 1985).

6.2.4 Pesticides

4,4'-DDT and its metabolite 4,4'-DDE were the only pesticides detected at the site. They persist in the environment due to their low solubilities and resistance to biodegradation. Their high K_{oc} and K_{ow} values indicate that they will adsorb readily onto soil particles. Once adsorbed, these pesticides can migrate with dust particles in the air and with soil or sediment particles in surface water runoff (Callahan 1979). Biotransformation and bioaccumulation serve as additional fate pathways for many pesticides.

6.2.5 Explosives

The explosive RDX was found in 1 soil sample. This compound is not a common environmental concern and little data pertaining to its fate in the environment is available. Table 6-1 shows a relatively low solubility and octanol-water partition coefficient (K_{ow}) for RDX. These data suggest limited mobility for RDX in soils.

6.2.6 Metals

Several metals were identified in the soils at SS-026, but antimony, cadmium, chromium, copper, selenium, silver, and zinc were detected at concentrations exceeding TBC values. In general, the fate of these metals depends on their methylation or formation of different organocompounds, and the pH of the soil. Antimony forms anionic compounds which are relatively mobile in water but it may sorb or co-precipitate with hydrous oxides. In acidic soils (pH levels from 4.5 to 5.5), cadmium is relatively mobile but easily sorbed onto clays, organic material, and hydrous oxides; yet at pH levels above 7.5, sorbed cadmium remains immobile. Chromium in soil is present mainly as an insoluble oxide, therefore, it is not very mobile in soil. Mobility of chromium in soluble form decreases due to adsorption to clay and complexation with organic material and iron oxide (Fe_2O_3). Leaching of soluble and unadsorbed chromium complexes from soil to groundwater may occur with increasing pH or may be facilitated by the lower pH of acid rain. Silver is relatively immobile in soil with pH levels greater than 4. Compared to other heavy metals, zinc is readily soluble and mobile in soils. It most commonly occurs as Zn^{2+} in acid environments. Despite its mobility, it also can be sorbed onto mineral and organic components. The pH of soils at the site typically ranges from 4.5 to 6.5 and therefore, is slightly acidic. The pH of the soils would affect the mobility of the individual metals as indicated in the above discussion. Metals sorbed onto soils consequently are subject to mechanical transport by wind and soil erosion.

6.3 Fate and Transport of Contaminants in Groundwater

Many physical, chemical, and biological processes may affect the fate and persistence of contaminants in groundwater. Possible fate pathways include dissolution of a compound into water, volatilization, flocculation and precipitation, adsorption, hydrolysis, photolysis, and biodegradation. VOCs in groundwater may partition into the unsaturated zone and diffuse into the pores. However, because VOCs in groundwater usually are present at concentrations below their solubilities, volatilization is not expected to be a primary migration pathway for the groundwater contaminants at the site. Flocculation and precipitation are not expected to be important fate pathways because the contaminants detected in

groundwater are at concentrations below their solubilities and thus are expected to be in soluble form. Hydrolysis is a slow reaction for most organic compounds detected in the groundwater at this site (Howard 1990).

The fate processes considered most important for groundwater contaminants are dissolution, adsorption, and biodegradation. Dissolution occurs when precipitation infiltrates through unsaturated soil or in the saturated zone. Table 6-1 presents the solubility, the K_{oc} value, the Henry's Law constant, the log K_{ow} value, and vapor pressure of each organic chemical detected in the groundwater.

Highly soluble compounds (e.g., acetone), are more easily dissolved and will be transported more quickly into the groundwater. Once they reach the groundwater, they are more mobile, tend not to partition to soil and sediments, are less likely to volatilize (depending on their vapor pressure), and are generally biodegradable. Compounds with low water solubility (e.g., phthalates) tend to adsorb onto soil particles and to biodegrade poorly.

The chemicals identified at the site have been grouped according to similar properties and behaviors for the discussion, and include: VOCs, phthalates, explosives, and metals.

6.3.1 VOCs

Acetone was the only VOC detected in groundwater. Because of its miscibility in water and its low K_{oc} acetone is highly mobile in groundwater. It also has a high vapor pressure and could volatilize to soil pores.

6.3.2 Phthalates

Bis(2-ethylhexyl)phthalate (BEHP) was detected at low concentrations in groundwater samples. BEHP has a relatively high K_{oc} value and low water solubility, limiting its migration to groundwater. Generally, BEHP persists in the environment because it is resistant to biodegradation, hydrolysis, and volatilization.

6.3.3 Explosives

As previously discussed, little data is available regarding the fate of RDX in the environment. Based on the available data, RDX is expected to have a limited capacity for migration in groundwater.

6.3.4 Metals

Most metals are ubiquitous in groundwater. Aluminum, iron, selenium, and zinc were the only inorganics exceeding ARAR values in downgradient wells at SS-026. Iron, manganese, selenium, and thallium concentrations exceeded groundwater ARAR values in groundwater seep samples. Most inorganics are moderately mobile in groundwater and tend to sorb or co-precipitate onto hydrous oxides. The pH of the groundwater often affects the solubilities of inorganics.

More detailed descriptions of the aqueous inorganic complexes formed by some of the metals exceeding ARARs follow:

Aluminum (Al) is often present in the environment as aluminum hydroxides, $Al(OH)^{2+}$ and $Al(OH)_6^{3-}$, which serve as the basis of clay minerals. Under neutral pHs, aluminum hydroxides exhibit low solubilities. At pHs below 5.5, aluminum becomes quite mobile and can compete with other cations for exchange site (Kabata-Pendias and Pendias 1984).

Iron (Fe) exists in the +2 and +3 valence states. Naturally occurring iron is present as Fe (II) and Fe (III). Fe (II) prevails in reducing environments and at low pH (i.e., conditions found in groundwater or below the thermocline in lake bottom waters). Fe (III) prevails in oxidizing environments at pH levels greater than 7. Under typical groundwater conditions, iron exists in the more soluble Fe (II) state (USEPA 1979). In this state, iron would be expected to move in the groundwater. However, if Fe (II) became exposed to more oxidizing conditions, Fe (II) would oxidize to Fe (III) and precipitate as Fe (III) oxidizes, becoming relatively immobile. Adsorption can be an important retention mechanism of iron at low pH or at low aqueous concentrations.

Manganese (Mn) exhibits +2, +3, +4, and +7 oxidations states. Mn (II) is the predominant ionic species in aquatic systems, representing about 90 percent of the total amount of manganese in the system. The other oxidation states (+3 to +7) generally do not apply to water chemistry. Under acidic conditions (at pH levels less than 7), manganese oxides and hydroxides liberate the highly mobile Mn (II). Manganese does not adsorb in soils as readily as other metals increasing its relative transportability in water. Silicates, hydroxides, and carbonates provide a substrate for manganese adsorption and are materials that reduce Mn solubility (Kabata-Pendias and Pendias 1984). Manganese also complexes with organic matter, and sorbs to clay minerals and hydrous iron oxides. In comparison with aqueous species of iron, Mn^{2+} is stable over a wider range of pH and redox conditions. Thus, detectable concentrations of manganese may persist after much of the iron oxidizes and precipitates out of solution.

Selenium (Se) exists in natural aqueous environments in -2, +4, and +6 valence states. Most of the selenium species in the environmental pH range (4 to 10) exist as anions. Although some studies indicate that precipitation may occur, no definitive information on solubility-controlling solids is available. Maximum adsorption of selenate and selenite occurs primarily through specific adsorption in the acidic pH range on geologic materials enriched in hydrous oxides of aluminum and iron or amorphous aluminosilicates (USEPA 1979).

Zinc (Zn) is relatively mobile in oxidizing conditions, but is precipitated as the sulfide in reducing environments. Zinc is sorbed onto hydrous oxides of manganese and iron, organic material, and clay minerals. At high concentrations, precipitation of zinc hydroxides, carbonates, or sulfates may limit aqueous zinc concentrations (USEPA 1979).

7.0 BASELINE HEALTH RISK ASSESSMENT

7.1 Objectives and Scope

The health risk assessment presented in this chapter is an analysis of the potential adverse health effects caused by the release of contaminants from the EOD Range in the absence of remedial measures. As such, it may be classified as a no-action, or "baseline" health risk assessment (HRA). This baseline HRA quantitatively addresses human health risk posed given current and future site conditions.

This baseline HRA is considered an integral part of the SI for the SS-026 site. It uses data and information collected during the SI to assess human health risk in the immediate and surrounding area. Since this chapter assesses risks posed to human populations as well as ecological receptors, it has two major components. The baseline HRA serves as one of the principal criteria for determining whether, and to what degree, remedial action may be required at the site.

7.2 Human Health Risk Assessment

The human HRA for SS-026 follows the general format and procedures set forth in *Risk Assessment Guidance for Superfund (RAGS)* (USEPA 1989a). The HRA includes the following five components:

- Data Evaluation
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization
- Uncertainty Analysis

These components are presented sequentially in subsections 7.2.2 through 7.2.6. The conclusions to the human HRA are presented in subsection 7.2.7.

7.2.1 Site Background

SS-026, approximately eight acres in size, is located in the southwestern portion of Plattsburgh AFB. The Weapons Storage Area is east of SS-026 and a former landfill (LF-024) lies a short distance south of SS-026.

The EOD Range reportedly was used for disposal of ordnance including WWII munitions, small caliber ordnance, magnesium flares, Mace, and tear gas. Ordnance was deposited in "burn kettles" within earthen berms and detonated. Potential site contaminants include byproducts of military ordnance disposal, metallic debris, defoliants, and diesel fuel. A description of the site and past activities at the site is presented in greater detail in Sections 1.0 and 3.0.

7.2.2 Data Evaluation

The HRA for SS-026 is based upon the analytical results of the environmental media sampled as discussed in Section 5.0. The data evaluation process followed the guidelines in *RAGS* (USEPA 1989a) and *Guidance for Data Usability in Risk Assessment* (USEPA 1990a). Steps in determining the usability

of data in the HRA include comparing site data with method blanks and evaluating the data qualifiers and reported detection limits. The usability of the data is discussed in detail for each sampling event in Appendix C.

Data validation was performed by environmental chemists at URS Consultants, Inc., under the supervision of the Project Quality Assurance/Quality Control (QA/QC) Task Leader. All deliverables were in accordance with the approved project plans. The validation reports, summary tables, and all definitions of data qualifiers are presented in Appendix C.

Analytical Methods and Quantitation Limits

The analytical methods employed and their corresponding quantitation limits were evaluated for appropriateness for use in the risk assessment. The media collected on site included soil, groundwater seep, and groundwater samples and were analyzed for TCL volatiles, TCL semivolatiles, TCL pesticides/PCBs, polychlorinated dibenzodioxins and dibenzofurans, TAL metals, cyanide, explosives and lacrimators. Not all samples were analyzed for all parameters. The analytical methods utilized are listed in the Appendix C reports. The analytical methods which were used incorporate quality control measures to ensure confidence in target compound identification and quantitation.

Before eliminating chemicals based upon non-detection, the sample quantitation limits (SQLs) were reviewed against corresponding standards, criteria, or ARARs. Quantitation limits were assessed for proper adjustment based on the sample percent moisture or due to dilutions in order to quantify target compounds. All reported analytical results had SQLs which were properly adjusted; therefore, no further data qualifications were necessary.

Evaluation of Qualified Data

Qualified data were evaluated to determine whether data were appropriate for use in the risk assessment. The reports in Appendix C present the results of the data validation and any qualified data. Analytical results qualified with a "U" indicate that a chemical was analyzed for but not detected. Chemicals with U-qualified data were included in the risk assessment only when there was a detection of that chemical in at least one sample of a particular medium. If there was at least one chemical detection in a sample, then the undetected U-qualified data were used at a value of one-half the sample quantitation limit in the calculation of representative exposure point concentrations.

Duplicate samples were included as follows for use in the risk assessment. If a chemical was detected in both samples, the two detected concentrations were averaged and this value was used in the risk assessment. If a chemical had U-qualified concentrations in both samples, the average of these two U-qualified concentrations was used in the risk assessment. When a chemical was detected in one of the two samples, the detected concentration was used in the risk assessment.

Organics detected at concentrations below the sample quantitation limits are flagged by the laboratory with a "J," indicating that the reported concentration is an estimate, although the identity of the analyte is certain. Data may be qualified as estimated during the data validation process for reasons discussed in evaluation of data quality. J-qualified data are considered acceptable for use in the risk assessment (USEPA 1989a).

Analytical results qualified with an "R" (i.e., rejected) during the data validation process were excluded from the risk assessment. Data are rejected on the basis of deviation from method protocols, validation guideline requirements, and holding time exceedances.

7.2.3 Exposure Assessment

The purpose of the exposure assessment is to estimate the type and magnitude of potential human exposure to chemicals present at the EOD Range. Ultimately, this purpose is achieved by estimating an exposure dose for each exposure pathway and onsite chemical. There are several steps to the exposure assessment: (1) characterization of exposure setting; (2) identification of potential exposure pathways; and (3) quantification of exposure for each identified pathway.

7.2.3.1 Characterization of Exposure Setting

In this first step of the exposure assessment, physical characteristics (e.g., climate, vegetation, and hydrology) and potentially exposed populations are identified and discussed with respect to general characteristics of SS-026 that may influence exposure (e.g., the population's location relative to the site, activity patterns). Section 3.0 of this report provides detailed descriptions of the physical characteristics (e.g., geological setting, groundwater and surface water hydrology, etc.) of the site. Characterization of exposure setting, discussed below, is used to support the other steps in the exposure assessment.

Physical Setting

The climate at Plattsburgh AFB includes average daily minimum and maximum temperatures of 33°F and 52°F with an average annual precipitation of 41.4 inches (water equivalent) including 63 inches of snow. The site is an open area of land which is sparsely vegetated. Figure 1-2 shows that SS-026 is largely bordered by wooded land which somewhat restricts site access. "No trespassing" postings are located in the woodlands surrounding the site. The sandy soil of the site was regraded to create earthen berms (approximately 7 to 8 feet in height) in the center of the site where past explosive/demolition activities occurred.

Groundwater flows to the south-southeast towards the Salmon River which lies within approximately 350 feet of the site. The water table is approximately 8 to 10 feet below ground surface within the unconfined sand aquifer. No evidence of surface water or runoff was observed on or immediately adjacent to SS-026 during field activities.

The Weapons Storage Area is located approximately 650 feet east of SS-026 and a former landfill (LF-024) lies within 100 feet southeast of SS-026 (Figure 1-2). No physical barriers, such as gates or barbed-wire fences, exist between SS-026 and LF-024. A dirt/gravel roadway, which has entrance gates on either side, allows access to SS-026 from the east and from the west. The gates prevent vehicles from accessing the site but can be crossed by pedestrians. Interstate 87 runs north to south approximately 800 feet west of SS-026 and acts as a barrier to off-site visitors accessing Plattsburgh AFB from the west. The closest residential community is located approximately ¾ of a mile to the west of SS-026 on the west side of I-87.

Identification of Potentially Exposed Populations

Potentially exposed populations were assessed for current and future land use conditions at SS-026. Plattsburgh AFB was closed in 1995. Physical barriers, (i.e., I-87, the Salmon River, and the surrounding woods) impede access to SS-026, making it a remote area for access by trespassers. Although trespassers potentially could access the site through the single-barred gates on either side of the adjacent roadway, no evidence of trespassing activities (i.e., tire tracks, footprints) was encountered during the remedial investigation. Because of the physical barriers posed to trespassers, older trespassers (i.e., teenagers) would be more likely to access the site than younger children. Therefore, teenage and adult trespassers have been identified as potentially exposed populations under current land use conditions.

Land reuse plans were identified in March 1995 by the Plattsburgh Air Base Redevelopment Corporation (PARC). According to the PARC's proposed action plan, the preferred reuse for the site is industrial. Two alternative reuse plans were also issued by the PARC. Both alternative plans (non-aviation and airport with mixed use) designate this area for public/recreational use, including possible use as fairgrounds. However, this HRA evaluates the risk to a potential site resident to determine whether site reuse restriction will be necessary. Since a site resident will be exposed to the site for longer periods of time than a recreational site user, potential health risks to the resident is the only scenario evaluated because it is the most conservative.

The future land use can be considered in two phases. The first phase is a transitional period (short-term exposure) in which new construction and intrusive activities may occur. During this phase, construction workers are identified as the potentially exposed population. The second phase is long-term use of the area during which site residents are the exposed population.

7.2.3.2 Identification of Potential Exposure Pathways

The identification of potential exposure pathways is the second step in the exposure assessment and encompasses the identification of media of concern and the identification of chemicals of potential concern from each identified media. Next, using both the characterization of the exposure setting (subsection 7.2.3.1) and the identifications of media and chemicals of concern, the identification of complete exposure pathways can be summarized. A complete exposure pathway can be identified if there is: (1) a source or chemical release from a source; (2) an exposure point where contact can occur; and (3) an exposure route (e.g., ingestion) by which contact can occur. If the exposure point differs from the source, a transport/exposure medium also is necessary. It may not be necessary to quantitatively evaluate a complete exposure pathway in the HRA if there is sound justification to eliminate that pathway. The following paragraphs discuss this process.

Identification of Media of Concern

Receptors may be exposed to surface soil, subsurface soil, and groundwater given the reasonably expected current and potential future uses of the site. These media were sampled at SS-026 and are quantitatively assessed as media of concern.

Surface soil samples were collected at a depth range of 0 to 2.0 feet at sixteen locations as shown in Figures 2-1 and 2-2. Eight subsurface soil samples were collected at a depth range of 2.0 to 4.0 feet

at some of these locations and three additional subsurface samples were collected at a depth range of 2.0 to 9.0 feet (SS-026-CAS-2, SS-026-CAS-3, and SS-026-CAS-4). Six groundwater wells also were sampled during the SI. One of the 6 groundwater samples (MW-24-001) is considered background (sidegradient) and is not included in the exposure assessment of this HRA. All of the monitoring wells were screened in the shallow water table aquifer, thereby justifying the comparison and combination of all data points for evaluation in the HRA. Groundwater seep samples from two locations were also collected and these data are used in the HRA evaluation.

Surface water and sediment are not considered media of concern for this HRA. The nearest surface water body, the Salmon River, is not impacted by runoff directly from SS-026, as none was observed at the site during the SI (all precipitation was observed to infiltrate - see Section 3.7.5). In addition, site groundwater contaminants are not believed to be impacting the river based on the minor contamination observed in the groundwater samples.

Identification of Chemicals of Potential Concern

Data presented in the SI report were statistically analyzed to identify chemicals of potential concern (CPCs) for inclusion in the baseline HRA. All detected organic chemicals were considered CPCs. However, as a result of a statistical screening procedure, several inorganic chemicals were eliminated from consideration since they were detected at background concentrations.

The statistical methods utilized for CPC screening are established and well-documented in many statistical texts. Two documents, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Interim Final Guidance* (USEPA 1989b) and the *Addendum to Interim Final Guidance* (USEPA 1992b), were utilized as the primary references in the development of the CPC screening procedure which is discussed below.

Figure 7-1 presents the two-step methodology utilized for CPC screening of inorganic chemicals in soil. In the first screening step, the concentration of each individual soil sample chemical is compared to the corresponding upper tolerance limit for that chemical derived from basewide background soil data. Based on USEPA guidance (USEPA 1989b), a one-sided upper tolerance limit with a coverage of 95 percent and a confidence coefficient of 95 percent was used for the first screening step. The 95th percentile upper tolerance limit (95% UTL) is the statistically derived background concentration. If none of the onsite detections of a chemical exceed the 95% UTL, it can be safely concluded that the chemical is present at background levels and the chemical is not considered a CPC. Background data and derivation of 95% UTLs are presented in the basewide background study (URS Consultants, Inc. 1996).

The nature of tolerance intervals is such that, even in the absence of contamination, a certain percentage of measurements can be expected to exceed the upper tolerance limits by random chance. For example, approximately 5 percent (or 1 in every 20) of onsite chemical concentrations would be expected to exceed the 95% UTL if onsite chemical concentrations are at background levels. Because these occasional exceedances do not necessarily indicate the presence of contamination at a site, a second screening step is used for inorganic chemicals in soil which exceed the 95% UTL in one or more onsite samples (Figure 7-1). In the second screening step, the onsite mean concentration is compared to the mean of the background samples using the non-parametric Wilcoxon Rank-Sum Test procedure. If the onsite mean concentration does not exceed the mean of the background samples, then the chemical is within the

expected background range and is not considered a CPC; otherwise, the chemical is considered a CPC and is included in the HRA.

For groundwater, including groundwater seeps, the first screening step was utilized to identify inorganic CPCs as shown in Figure 7-1. The groundwater background database (i.e., 7 samples collected by Malcolm Pirnie, Inc. from upgradient piezometer clusters as part of the 1994 basewide hydrogeology investigation) was considered to be insufficient to be further compared with onsite data in the second screening step. Therefore, only the first screening step (shown in Figure 7-1) was utilized to identify inorganic CPCs in groundwater.

Chemicals detected in onsite samples but not in background samples cannot be statistically analyzed and thus, all are considered CPCs. Additionally, the inorganic metals calcium, magnesium, iron, sodium, and potassium were statistically analyzed but are not included in the HRA regardless of the outcome of statistical analyses. In accordance with *RAGS*, "Chemicals that are (1) essential human nutrients, (2) present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and (3) toxic only at very high doses (i.e., much higher than those that could be associated with contact at the site) need not be considered further in the quantitative risk assessment" (USEPA 1989a).

In Appendix L, the screening processes completed for surface soil, surface and subsurface soil combined, and groundwater are summarized on Tables L-1, L-2, and L-3, respectively. Information provided on these tables include all chemicals detected in onsite samples, their maximum concentration on site, their frequency of detection, the outcome of the first screening process, and for soils, the outcome of the second screening process. Detailed calculations for the second screening step developed for inorganic CPCs detected in surface soil and surface/subsurface soil not eliminated in the first screening step are presented in Appendix L on Tables L-4 and L-5, respectively.

Tentatively Identified Compounds (TICs) were reviewed for input to the baseline HRA. Until a standard is analyzed, however, positive identification of a TIC remains uncertain. Analytical standards for TICs were not analyzed, which leads to uncertainties in chemical identification and quantitation of a TIC. Due to the low frequency of detection, few identified TICs, and the above-mentioned uncertainties, TICs were not included in the HRA as recommended in *RAGS*.

CPCs identified for the surface soil medium, surface and subsurface soil media combined, and groundwater are summarized on Tables 7-1, 7-2, and 7-3, respectively. Tabular data summaries for each evaluated medium are presented in Section 5.0 of this report. These tables include the frequency of detection, the range of detected concentrations, as well as the location of the maximum detected concentrations. The range of sample quantitation limits can be determined by referring to the validation summary tables presented in Appendix C of this SI report. Generally, few organics were detected in soils, except for sample SS-026-SF-1 where PAHs, 4-methylphenol, dibenzofuran, diethylphthalate, carbazole, and di-n-butylphthalate were detected. Organics detected in the remaining sample locations include: methylene chloride, acetone, toluene, 4,4'-DDE, 4,4'-DDT, RDX, and dioxins. Likewise, for the groundwater medium, methylene chloride, acetone, bis(2-ethylhexyl)phthalate, and RDX were included in the risk assessment. Organic chemicals were not detected in the groundwater seep samples.

Summary of Exposure Pathways

Exposure pathways for SS-026 have been developed for current and potential future land use scenarios. Pathway analysis for current land use conditions is presented in Table 7-4 and illustrated in Figure 7-2.

Given current conditions, exposure could occur to teenage and adult trespassers on site through incidental ingestion of or dermal contact with surface soil (0 to 2 foot depth) or through dermal contact with water from the groundwater seeps. Since the area is sparsely vegetated, wind erosion of the soil surface and consequent fugitive dust generation is expected to occur. Therefore, inhalation of fugitive dust by receptors in the current scenario is also possible.

Pathway analysis for assumed future land use conditions is presented in Table 7-5 and illustrated in Figure 7-3. Potential exposure pathways for receptors in the future use scenario include incidental ingestion of and dermal contact with excavated or regraded soil (currently 0 to 9 foot depth) by construction workers in a transition phase and by future residents upon completion of site redevelopment. Construction workers also would be exposed via inhalation of fugitive dust during intrusive activities. Inhalation of fugitive dust by residents is not considered a complete exposure route since the site area would be almost entirely paved or landscaped, and soil erosion would be negligible.

Given the future residential scenario, it is assumed that receptors will use onsite groundwater as their potable water supply. This is a conservative assumption, since a municipal water supply system already exists at the nearby Weapons Storage Area and Munitions Maintenance Squadron. Under these assumed conditions, exposure to groundwater contaminants may occur through ingestion or inhalation of organic chemicals in vapors while showering. Exposure via dermal contact with groundwater was evaluated in the HRA. This pathway is not expected to be significant in comparison with the other routes of exposure.

Volatilization of VOCs from soils at the EOD Range also was examined as a potential exposure pathway. Based on the infrequent detection and low concentration of VOCs in soils sampled during the SI, it was determined that risk associated with inhalation of VOCs at SS-026 would be insignificant; hence, this exposure pathway is not considered for the exposure scenario from soils in the HRA. Volatilization of chemicals from groundwater during showering of a future site resident has been included in the SI.

7.2.3.3 Quantification of Exposure

The quantification of exposure is the final step in the exposure assessment. This step includes the development of exposure point concentrations and the estimation of chemical intake or absorbed dose as well as exposure parameters utilized in the estimation. The following paragraphs discuss the exposure quantification completed for SS-026.

Development of Exposure Point Concentrations

In order to quantify health effects, it is necessary to establish the concentration of each CPC at the point where it comes into contact with a human receptor (i.e., along a complete exposure pathway). For all exposure pathways, except inhalation routes, there is direct contact with CPCs in surface and subsurface

soil and groundwater. Because of the uncertainty associated with the estimation of exposure concentrations, statistical methods were employed to calculate them. Figure 7-4 is a flow diagram which presents the process completed for development of exposure point concentrations for CPCs at SS-026.

As recommended in *RAGS* (USEPA 1989a), the exposure concentration used to evaluate health risk has been calculated as the 95th percentile upper confidence limit (UL_{95}) on the arithmetic mean. For each of the CPCs identified for each medium evaluated, a UL_{95} value has been calculated using the procedures described in *Supplemental Guidance to RAGS: Calculating the Concentration Term* (USEPA 1992c) and methodology described by R. O. Gilbert (Gilbert 1987). This procedure involves initially determining the distribution of data for each CPC in each medium and then calculating the UL_{95} using one of two equations, depending upon whether the data are normally or log-normally distributed.

For small sample sizes, the large variability in the measured concentration often yields a UL_{95} value greater than the maximum detected concentration. In these cases, the maximum detected concentration was used to represent the exposure point concentration. For samples where the CPC was not detected, the exposure point concentration was calculated assuming one-half the sample quantitation limit for organic compounds or one-half the contract required detection limit for metals.

Since risk from dioxins and furans is assessed for the mixture of congeners and not for each individual compound, the following approach was followed to develop the exposure concentration. First the toxic equivalent concentration (TEC) was developed in accordance with USEPA guidelines (USEPA 1989e). Calculating the TEC of a mixture involves multiplying the concentration of individual congeners by their respective toxicity equivalency factors (TEF). A TEF has been assigned to each individual congener. If a congener was not detected in a sample, then half its detection limit was used in the calculation of TEC and the toxicity equivalence. The sum of congener TECs is the toxicity equivalence for the mixture, which is used to calculate potential risk to receptors. Only four congeners were detected in one or more samples at the PAFB EOD range and those were used in developing the toxicity equivalence of each sample.

Tables 7-1 (surface soil), 7-2 (surface and subsurface soil) and 7-3 (groundwater and groundwater seeps) present the exposure concentrations used to calculate risk from direct exposure to SS-026 CPCs. These tables also summarize for each CPC the distribution of the data, the corresponding UL_{95} value, and the maximum concentration detected on site. UL_{95} values were not calculated for the contaminants in the groundwater seeps since only two samples were collected. Instead, the maximum detected concentration was used in the HRA. A more detailed presentation of the exposure concentration calculations for media of concern at SS-026 are shown in Appendix M.

As mentioned earlier, the exposure concentrations presented in Tables 7-1 through 7-3 can be utilized for direct routes of exposure (i.e., ingestion and dermal contact). However, exposure concentrations for the inhalation of fugitive dust under the current and future use scenarios are based on surface soil (current use) or surface/subsurface soil (future use) concentrations presented in Tables 7-1 and 7-2, respectively. These are then adjusted using a factor determined from each respective fugitive dust model (NYSDEC 1991b; USEPA 1985; USEPA 1994) and are presented in Table 7-6. A more detailed description of the fugitive dust models and the determination of respirable concentrations for surface soil and surface/subsurface soils are presented in Appendix N.

Likewise, exposure concentrations used for organic chemicals volatilizing during showering were modeled based upon groundwater concentrations. The transfer efficiency of chemicals from groundwater to air (i.e., based on diffusion coefficients in air and water and on Henry's Law constants), and values for volume of water used during showering, and the volume of the shower were determined from the literature. This information is presented in Table 7-7. A more detailed description of the shower model is presented in Appendix N.

Estimation of Chemical Intake/Absorbed Dose and Exposure Parameters

The exposure dose, which is expressed as chemical intake for ingestion and inhalation routes, is defined as the mass of a substance in contact with an organism's exchange boundary (e.g., lungs) per unit body weight per unit time. The exposure route is expressed as absorbed dose for the dermal contact route and is equivalent to intake multiplied by an absorption factor. Units for exposure intake typically are milligrams per kilogram-day (mg/kg-day).

The exposure dose is calculated on the basis of the chemical's concentration in the environmental medium of concern, and a number of intake variables (or exposure parameters) expressing the frequency, duration, and magnitude of exposure. These exposure parameters, discussed below, are selected so that, in combination, they produce an estimate of the reasonable maximum exposure for each particular exposure pathway.

The exposure dose equations and subsequent calculations for each exposure pathway, as taken from *RAGS* (USEPA 1989a), are presented in Appendix O in Tables O-1 through O-22. By calculating an average daily exposure dose, chronic (lifetime) exposure is determined for each adult receptor (trespasser under current use and site resident under future use), and subchronic (short-term) exposure is assessed for teenage trespassers under the current scenario and for construction workers and children residents under the future use scenario.

In general, the exposure parameters used in this HRA were taken from *RAGS* (USEPA 1989a), *Standard Default Exposure Factors* (USEPA 1991), *Exposure Factors Handbook* (USEPA 1989d), and *Dermal Exposure Assessment: Principles and Applications* (USEPA 1992a). The exposure parameters used in the HRA for the current and the future use scenarios are summarized in Tables 7-8 and 7-9, respectively. Exposure parameters that differ from the default values presented in these documents are discussed below.

All Routes of Exposure

In the absence of USEPA recommended exposure frequencies for teenage and adult trespassers, an exposure frequency of 3 days/week or 78 days/year was estimated, assuming the site is frozen or covered with snow approximately six months of the year and is accessible during the warmer months of the year (i.e., May through October). The exposure frequency of 78 days/year is a conservative estimate of this parameter, since most adults are at work for most of their adult lives and teenagers are at school for most of the day during part of the warmer months (May through October). In a similar manner, the exposure frequency for construction workers of 5 days/week for 3 months, or 60 days/year, was estimated assuming construction will take 3 months for completion. The exposure frequency values for residents are the default values presented in *RAGS* (USEPA 1989a).

The exposure durations (ED) used for the adult and children residents are the USEPA default values. The ED value used for adult trespassers was thirty years. The ED used for teenage trespassers is 6 years, since this reflects the age range (13 to 18 years old) under this scenario. The ED used for construction workers is 3 months or 0.25 years, since construction is expected to be completed within this time period.

The expected age of the teenage trespassers (13 to 18 years old) was considered in estimating their body weight. A body weight of 56 kg was developed for these receptors by averaging the 50th percentile body weights for males and females age 13 to 18 years old (USEPA 1989d).

Ingestion of Surface Soil

The value of 1.0 (unitless) for the fraction ingested is used to account for the fraction of contaminated soil that is presumed to be ingested. The default value of soil ingestion rate for a resident as presented in *RAGS* (USEPA 1989a) was used for calculating the ingestion of surface soils by trespassers.

Dermal Contact with Soil

The values used for skin surface area available for contact for the current receptors (i.e., trespassers) and future construction workers and site residents were developed from surface area data reported in *Exposure Factors Handbook*, *RAGS,* and *Dermal Exposure Assessment: Principles and Applications* (USEPA 1989d; 1989a; 1992a). For teenage and adult trespassers under the current land use scenario, and adult residents under the future land use scenario, the surface area value is the sum of the surface areas of the arms, hands, and legs (USEPA 1989d). The calculated value is 7,948 cm^2 (USEPA 1989d). For future construction workers, the surface area is the sum of the total exposed surface area of the arms and hands of an adult male (i.e., 3,120 cm^2). For future children residents, the sum of the surface areas of the arms, hands, and legs of children three to six years of age was used in calculating the value of the surface area. The calculated value is 3,520 cm^2.

The dermal absorption values were received from M. Maddaloni of USEPA Region 2 (Maddaloni 1999a and 1999b).

Inhalation of Fugitive Dust

The values used for the inhalation rates were developed from inhalation rate data reported in *Exposure Factors Handbook* (USEPA 1989a). For the trespassing scenario, it was assumed that adults and teenagers participating in trespassing activities (i.e., biking, running, and walking) would spend 50 percent of the time at a light activity level and 50 percent of the time at a moderate activity level. The values calculated for the adult and teenage trespassers are 1.3 m^3/hour and 1.5 m^3/hour, respectively. For a reasonable construction scenario it was assumed that an individual would spend 50 percent of the time working at a heavy activity level and 50 percent of the time working at a moderate activity level. The value calculated for construction workers is 3.0 m^3/hr.

The exposure time used for trespassers under this exposure route is based on professional judgement. It was determined that they would be inhaling fugitive dust for 4 hours/day.

Dermal Contact with Groundwater

To evaluate the risk to future receptors (i.e. residents) from dermal contact with groundwater and to current receptors (i.e. adult and teenage trespassers) from dermal contact with groundwater seeps, different values of skin surface area available were used. For residents, the average skin surface area of the 50th percentile of adult males and females was used. According to *RAGS* (USEPA 1989a) this value is 18,150 cm^2. For trespassers, the skin surface area available was calculated to be 7,948 cm^2, which is the same exposure as discussed in the Dermal Contact with Soil subsection above. To calculate the risk from dermal contact, the permeability coefficient was used. Chemical-specific values of the permeability coefficient are presented in *Dermal Exposure Assessment: Principles and Applications* (USEPA 1992a). Appendix O presents the permeability coefficients for all CPCs in groundwater and groundwater seeps.

7.2.4 Toxicity Assessment

The CPCs identified from media collected at SS-026 may be categorized by their relative health risks. Risks are divided into carcinogenic (chronic only) and noncarcinogenic (chronic and subchronic) effects. USEPA has defined toxicity values for both types of effects that are to be used in evaluating these risks.

Toxicity data used in this HRA are from the database SmartTOX (SmartTOX 1999), which uses the *Integrated Risk Information System* (IRIS) (USEPA 1999) and the *Health Effects Assessment Summary Tables* (HEAST) (USEPA 1997).

For evaluation of carcinogenic risk from exposure to contaminants, USEPA has established slope factors (SFs). An SF is a measure of toxicity that defines quantitatively the correlation between dose and response. It is used in the risk assessment to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a known or potential carcinogen. SFs have been developed for oral intake and for inhalation routes of exposure.

For evaluating noncarcinogenic effects from exposure to contaminants, the measures of toxicity used are the reference dose (RfD) when the exposure route is via ingestion or dermal contact, and reference concentration (RfC) when the pathway is inhalation. Specific values have been developed for chronic (long-term) and subchronic (short-term) RfDs and RfCs.

Chronic RfDs are derived from the No-Observed-Adverse-Effect-Level (NOAEL) for the critical toxic effect. They are modified by the application of uncertainty factors, discussed below, which reflect the type of study on which the values are based. Chronic RfCs are derived in a similar fashion but are based upon studies of inhalation exposure. For this reason, calculation of RfCs is more complex; therefore, RfCs are available for fewer chemicals.

Subchronic values for RfDs and RfCs are derived in the same manner as the chronic values when suitable less-than-lifetime studies are available. Subchronic RfDs and RfCs are used to evaluate noncarcinogenic effects over an exposure period of two weeks to seven years.

Since toxicity information is limited for many chemicals in the HRA, uncertainty factors also are published for RfDs. These uncertainty factors generally range from 3 to 3,000. A high uncertainty factor

indicates low strength of evidence for the toxicity value and further indicates that the toxicity value might change if additional data become available. A low uncertainty factor indicates that there is a high degree of confidence in the value and that a change is less likely should more data become available.

It should be noted that, in general, slope factors and reference doses are derived for oral and inhalation routes of exposure and are expressed as administered doses. For the dermal exposure route, these toxicity values should be adjusted to account for the absorption efficiency of any given chemical and to express the toxicity values as absorbed doses rather than administered doses. In accordance with Appendix A of *RAGS* (USEPA 1989a), the toxicity values were adjusted where applicable and are discussed below.

7.2.4.1 Carcinogenic Effects

Table 7-10 summarizes toxicity information for known or potential carcinogens that were detected in the environmental media at SS-026. For each of these compounds, the following information is provided:

a. Slope Factor, representing a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. Slope factors are expressed as inverse units of dose, that is $(mg/kg\text{-}day)^{-1}$. This slope factor allows calculation of incremental lifetime cancer risk associated with exposure to the chemical at a known or estimated dosage. Table 7-10 provides separate slope factors, where applicable and available, for oral and inhalation routes of exposure.

For the inhalation route of exposure, the toxicity values for carcinogenic effects can be expressed in terms of risk per unit concentration, that is $[\mu g/m^3]^{-1}$. The following equation, as recommended in *RAGS* (USEPA 1989a), was utilized to convert the risk per unit concentration values to slope factors $([mg/kg\text{-}day]^{-1})$:

Equation:

$$Slope\ Factor = \frac{Unit\ Risk\ [mg/m^3]^{-1} \times 70\ kg}{20\ m^3/day \times 0.001\ mg/mg}$$

Where:

70 kg = body weight default value
20 m^3/day = inhalation rate default value
0.001 mg/μg = conversion factor

b. Weight-of-Evidence for carcinogenicity, expressing the degree of confidence relating to the likelihood that exposure to a given chemical class causes cancer in humans. This weight-of-evidence is based upon the following USEPA classification system:

Group A -- Human Carcinogen - Indicates that there is sufficient evidence from epidemiological studies to support a causal association between an agent and cancer in humans.

Group B -- Probable Human Carcinogen - Indicates that there is at least limited evidence from epidemiological studies of carcinogenicity to humans (Group B1) or that, in the absence of positive data on humans, there is sufficient evidence of carcinogenicity in animals (Group B2).

Group C -- Possible Human Carcinogen - Indicates that there is limited evidence of carcinogenicity in animals and inadequate or lack of human data.

Group D -- Not Classified - Indicates that there were no data to evaluate or that the evidence for carcinogenicity in humans and animals is inadequate.

Group E-- No Evidence of Carcinogenicity to Humans - Indicates that there is no evidence of carcinogenicity in at least two adequate animal tests in different species or both epidemiological and animal studies.

c. Basis for Carcinogenicity Classification, i.e., type of data and tumors upon which the slope factor and weight of evidence are based.

7.2.4.2 Noncarcinogenic Effects

Unlike carcinogenic effects, noncarcinogenic effects are thought to have estimated daily exposure levels that are likely to be without an appreciable risk of adverse effects over a lifetime (chronic) or short-term (subchronic) period of exposure. This section provides information concerning these toxicity values which are calculated based on these estimated daily exposure levels.

Table 7-10 summarizes the noncarcinogenic toxicity information for the CPCs (carcinogens and noncarcinogens) that were identified at SS-026. For each CPC, the following information is provided:

a. Toxicity Values, expressed in mg/kg-day, generally identifying the threshold dosage level below which adverse health effects are not expected. The most common and preferred criterion for expressing potency is the RfD which is an estimate of the average daily exposure level below which significant, adverse noncarcinogenic health effects are not expected.

The published chronic and subchronic inhalation toxicity values are reported as RfC and in the units of mg/m^3. The published RfCs were converted to RfDs, expressed in units of mg/kg-day, using the following equation as given in *RAGS* (USEPA 1989a):

Equation:

$$\text{Reference Dose}(RfD) = \frac{RfC\ (mg/m^3)\ \times\ 20\ m^3/day}{70\ kg}$$

Where:

70 kg = body weight default value
20 m^3/day = inhalation rate default value

In accordance with *RAGS* (USEPA 1989a), if subchronic data are missing and a chronic RfD derived from chronic data exists, the chronic RfD is adopted as the subchronic RfD. Table 7-10 identifies when chronic RfDs were used for subchronic RfDs.

b. Critical Effects, expressing the end point of adverse response (e.g., liver damage) associated with the exposure to noncarcinogenic chemicals.

7.2.4.3 Adjustments for Absorption Efficiency

Absorption adjustments are necessary to ensure that the site exposure estimate and the toxicity values for comparison are both expressed as absorbed doses or as intakes. In accordance with Appendix A in *RAGS* (USEPA 1989a), the following adjustments were made:

First, when assessing the dermal contact pathway, adjustment of toxicity values from administered to absorbed doses are necessary. Based on USEPA Region 2 guidance (Maddaloni 1995), the oral reference dose for silver was multiplied by a 4 percent oral absorption efficiency factor. This was done to account for silver's property of being poorly absorbed by the gastrointestinal tract. Conversely, an adjustment for absorption efficiency would be necessary to convert the exposure estimate from an intake into an absorbed dose when a toxicity value is expressed as an absorbed dose rather than an administered dose. For the toxicity values reported for CPCs at SS-026, this adjustment was not necessary since all values were expressed in administered doses.

Lastly, if the medium of concern in the HRA differs from the medium of exposure assumed by the toxicity value an absorption adjustment may be appropriate. In the absence of reliable information on relative absorption efficiencies for the CPCs identified at SS-026, it was assumed that the relative absorption efficiency between food or soil and water is 1.0. In the case of cadmium where RfDs are available for drinking water and food, the RfD for water was utilized since cadmium was a CPC for groundwater.

7.2.4.4 Chemicals Which Lack Pathway-Specific Toxicity Values

The CPCs identified in media of concern at SS-026, for which some toxicity information is available, were included in pathway-specific risk calculations only when relevant toxicity information was available for that pathway. For example, of the 36 CPCs, all of which have noncarcinogenic effects, 20 have been assigned chronic oral RfD values, but only 5 have been assigned inhalation RfDs. Therefore, many more chemicals have been included in risk calculations for pathways involving oral or dermal exposure than exposure via inhalation.

In general, more information is available for carcinogens due to the fact that the level of data required to classify a compound as a human carcinogen usually is sufficient to calculate an SF. Of the 19 carcinogens, 14 have oral SFs and 6 have inhalation SFs. Toxicity profiles have been prepared that

summarize physical, chemical, and toxicological information for each contaminant and are presented in Appendix P.

7.2.5 Risk Characterization

7.2.5.1 Method of Analysis

Health risk is a function of both human exposure and chemical toxicity. The risk characterization is the process by which the exposure assessment (Section 7.2.3) is integrated with the toxicity assessment (Section 7.2.4) to estimate present and potential threats to human health posed by contamination at the site. There is a method for calculating the carcinogenic and noncarcinogenic (chronic and subchronic) risks posed by SS-026 in the absence of remedial measures.

Carcinogenic risk is expressed as the incremental lifetime cancer risk to an individual or population exposed to contaminants at a site. This incremental lifetime cancer risk corresponds to the 95th percentile upper confidence limit (UL_{95}) of the probability (when based on animal data), or to the maximum likely estimate (when based on human data), of developing cancer over a 70-year lifetime from exposure to hazardous substances present at a hazardous waste site. It is computed by the following equation:

$$\text{Cancer Risk} = \text{Exposure Level (mg/kg-day)} \times \text{Slope Factor (mg/kg-day)}^{-1}$$

As indicated by the above equation, incremental lifetime cancer risk is dimensionless. A risk of 1.0×10^{-6} for example, indicates that an individual would incur an additional risk of 0.000001 (or 1 in one-million) due to exposure to contaminants at a given site. Alternately, out of a population of one million persons so exposed, this level of risk would indicate that one person, on average, would contract cancer due to such exposure.

The evaluation of noncarcinogenic risk is based on a threshold response theory. The threshold response theory states that each chemical has an estimated daily exposure level above which adverse health effects can be observed. The evaluation process involves a comparison of an exposure level (or dose) to the estimated threshold response level. The term used to make this comparison is the "hazard quotient," which is defined as:

$$\text{Hazard Quotient} = \frac{\text{Exposure Level (Intake or Absorbed Dose) (mg/kg-day)}}{\text{Reference Dose (mg/kg-day)}}$$

In the above equation, reference doses are the toxicity values used for expressing noncarcinogenic effects. The sum of the hazard quotients is the hazard index.

As previously discussed, noncarcinogenic effects of the CPCs identified at SS-026 may produce different forms of human response, or end points. Therefore, the result of summing the hazard quotients of all noncarcinogenic effects within a pathway, the initial step in assessing noncarcinogenic risk, should be interpreted with caution.

Noncarcinogenic effects have been evaluated separately for chronic (lifetime) and subchronic (short-term) exposure. Chronic risk evaluation assumes 24 to 30 years of exposure to SS-026

contaminants; whereas subchronic evaluation assumes a shorter exposure (3 months to 6 years), such as might be experienced by teenage trespassers (6 years) under current land use and by construction workers (3 months) and children residents (6 years) in the future land use scenario.

As shown in Figure 7-2, four basic exposure pathways were considered under the current land use scenario. Risks associated with exposure pathways for each receptor were combined. Total risks (carcinogenic and chronic noncarcinogenic for adult trespassers, and carcinogenic and subchronic noncarcinogenic for teenage trespassers) were determined by summing the cancer risks and hazard indices from the applicable exposure pathways (i.e., dermal contact, ingestion, and inhalation of fugitive dust from surface soil and dermal contact with water from the groundwater seeps).

Seven basic exposure pathways were considered under the future land use scenario, as shown in Figure 7-3. Risks associated with all exposure pathways for each receptor were combined. One total exposure cancer risk and hazard index was presented for future site residents by combining adult and children cancer risks and hazard indices respectively. Calculations of combined total cancer risks and hazard indices are summarized in Table 7-11.

7.2.5.2 Noncarcinogenic Health Effects - Results and Discussion

The hazard index for each scenario and population is presented in Table 7-11. The total hazard index is a measure of whether subchronic (short-term)/chronic (long-term) exposure to chemicals on site poses a concern for noncarcinogenic health effects. According to USEPA, such a potential exists when the hazard index exceeds unity (1.0).

In the current land use scenario, the total chronic hazard index for adult trespassers is 4×10^{-3}, and the total subchronic hazard index for teenage trespassers (based on a subchronic exposure duration) is also 4×10^{-3}. These hazard indices are below the acceptable value of 1.

In the future land use scenarios, the hazard index for residents (adult and children) is 8×10^{-1}. For construction workers (based on a subchronic exposure duration), the hazard index is 2×10^{-3}. Both of these values are below the acceptable threshold of 1.

7.2.5.3 Carcinogenic Risk - Results and Discussion

The total cancer risks for each scenario and population are presented in Table 7-11. USEPA, through the NCP, has established acceptable exposure levels for known or suspected carcinogens that are to be used to establish remedial action objectives. An excess upper-bound lifetime cancer risk of 1×10^{-6} to 1×10^{-4} represents the range of risk established by USEPA guidelines that can be considered acceptable on a site-specific basis.

In the current land use scenario, the total cancer risks for the adult trespasser and the teenage trespasser are 4×10^{-5} and 9×10^{-6}, respectively. Both cancer risks are within the risk range considered acceptable to USEPA on a site-specific basis.

In the future land use scenarios, the total cancer risk for the construction worker is 2×10^{-5} and the total cancer risk for the resident is 2×10^{-4}. The cancer risk for the construction worker is within

the USEPA range while the cancer risk for the resident is slightly above the USEPA's risk range. The primary causes for this carcinogenic risk are PAHs in soil and arsenic in groundwater. The PAHs were detected mainly in sample SS-026-SF-1.

7.2.6 Uncertainty Analysis

The estimates of carcinogenic risk and noncarcinogenic health effects (chronic/subchronic) in this baseline HRA are based upon numerous assumptions and, therefore, involve a considerable degree of uncertainty. Some of this uncertainty is inherent in the risk assessment process itself, and in the current limits of scientific knowledge regarding human health risk factors. For example, the necessary extrapolation of animal study data to humans introduces a large uncertainty factor into the process, as does extrapolation from the high doses used in these studies to the low doses associated with most hazardous waste sites, such as the SS-026 site. Likewise, estimating human exposure and human intake is largely judgmental and involves extrapolation of human behavioral patterns (often unknown even at present) into the relatively distant future. The exposure assessment for this study is based upon reasonable maximum exposures, defined as the highest exposure that may be reasonably expected at a site. The intent is to estimate a conservative exposure scenario that is still within the range of possible exposure.

Due to these types of uncertainties, as presented in Table 7-12, the results of the baseline HRA for the SS-026 site should not be taken as a characterization of absolute risk or as a fully probable estimate of this risk. Rather, they are intended to identify the types and relative levels of risk associated with various potential exposure routes at SS-026 so that remedial efforts can be focused upon those aspects of the site that are of greatest concern from a human health standpoint. Table 7-12 presents the uncertainties according to whether they produce an underestimation or overestimation of risk, or whether their effect is unknown. The presentation of uncertainties is broken down categorically by uncertainties concerning the identification of CPCs, exposure assessment, toxicity assessment, as well as risk characterization.

7.2.7 Conclusions

This baseline HRA, performed in compliance with USEPA guidance documents, has been prepared to evaluate potential adverse human health effects resulting from exposure to contaminants from the SS-026 site in the absence of remedial measures. A noncarcinogenic hazard index higher than unity or a carcinogenic risk higher than the risk range considered acceptable by USEPA on a site specific basis generally indicates that remediation is required. A value lower than unity or lower than this range generally indicates that a risk-based remedial action is not required.

The risk evaluation summarized in Table 7-11 demonstrates that both the noncarcinogenic and carcinogenic chemicals detected at site SS-026 pose no significant threat to **potential current populations**. The total site-wide hazard indices are less than 1 and the site-wide carcinogenic risks lie within or below the range of risk considered acceptable by USEPA on a site specific basis for all current exposure pathways assessed.

For the **future residential use** scenario, cancer risk is slightly above the USEPA risk range. Carcinogenic risk above the USEPA risk range is due primarily to the ingestion of arsenic in groundwater and dermal contact and incidental ingestion of PAHs in soil by future residents. It should be noted that arsenic was detected at concentrations well below New York State drinking water standards at SS-026.

Hazard indices for all **future populations** are below the acceptable threshold of 1. Carcinogenic risk to **future construction workers** falls within the risk range considered acceptable to USEPA on a site specific basis.

8.0 SUMMARY AND CONCLUSIONS

This SI was conducted to evaluate potentially contaminated soils and groundwater at the Explosive Ordnance Disposal Range (SS-026) IRP site at Plattsburgh AFB. The site is comprised of 8 acres in the southwest portion of Plattsburgh AFB, adjacent to another IRP site (LF-024) and approximately 350 feet north of the Salmon River. The site was used for demolition and disposal of explosive ordnance. The specific objectives of the SI were:

- To describe the physical conditions of the site
- To evaluate the nature and extent of chemical contamination in the site groundwater and soil
- To evaluate the risks posed by site contaminants to human health and the environment
- To determine if remedial or removal actions are warranted

The site surface is relatively flat, sandy, and devoid of any significant topsoil or vegetation. Precipitation, therefore, primarily infiltrates to groundwater or is lost via evapotranspiration. Shallow groundwater at the site flows to the south-southeast in an unconfined sand aquifer which discharges to the Salmon River. The confined bedrock aquifer is hydraulically isolated from the site by a clay confining unit and, therefore, was not investigated during the SI. The most significant pathways for contaminant migration at the site are leaching of soil to groundwater, transport within the shallow aquifer, and wind entrainment of contaminated surface soils.

The 1994 SI field activities included the advancement of 7 soil borings, installation of four groundwater monitoring wells, collection and chemical analysis of 10 soil samples, collection and chemical analysis of 5 groundwater samples, and observations of the site's physical condition. A Draft SI Report was issued in August 1995.

Finalization of the SI was delayed pending efforts by the Air Force to "safe" the range (to thoroughly investigate and remove any potentially dangerous ordnance). During range safing operations conducted in 1997 and 1998, several discoveries were made that were considered evidence of potential impact to human health or the environment. These included buried drums, chemical warfare training materials, and areas of debris/fill.

Twenty-seven buried 55 gallons drums containing what appeared to be waste oil products were found in the west-central portion of the site. The drums appeared to be intact upon discovery, however, two were punctured when first found. They were overpacked, sampled, and staged in the fall of 1997. Sample results were consistent with the physical observation that the material was waste petroleum product. The drums were disposed of offsite in the spring of 1998. A single empty 55-gallon drum (later disposed of as scrap) also was found in the sand berm in the northeastern portion of the site. Soils surrounding the drums were sampled and analyzed to evaluate whether product had leaked from the drums, contaminating surrounding soils. The soil samples were found to contain organic compounds and metals, but at concentrations below regulatory guidelines.

In the summer and fall of 1999, a supplemental SI sampling event was undertaken to address

regulatory comments to the Draft SI Report, to evaluate the presence of chemicals associated with chemical warfare agents in the area where training materials were discovered, and to evaluate the limits and chemical character of fill materials identified during safing operations. In this event, one additional monitoring well was installed, 17 soil samples were collected and chemically analyzed, groundwater from 6 monitoring wells was collected and chemically analyzed, 14 test trenches were excavated, and 2 groundwater seep samples were collected and chemically analyzed.

Given the samples taken in both the 1994 and 1999 sampling events, minor pesticide (4,4'-DDT), explosive (RDX), and metals (antimony, cadmium, chromium, and silver) detections in near surface soils in the central bermed portion of the site appear to be the only contaminants in soil attributable to past ordnance disposal practices at the EOD Range. Copper, selenium, and zinc also were detected above TBCs in the "satellite fill area." Only RDX appears to be migrating from soils to groundwater. RDX is present in two wells downgradient of the main range disposal area at concentrations above the USEPA's Drinking Water Health Advisory value. RDX was not detected in downgradient groundwater seeps south of the EOD Range.

Based on the extensive test trenching performed during the 1999 investigatory event, only small quantities of generally surficial household type waste were found in the fill areas identified during the safing, other than in the "satellite fill area" located along a steep embankment to the south of the ordnance disposal area (see Figure 2-3). The "satellite fill area" was found to consist primarily of surficial metallic military wastes (ammo cans, empty crushed drums, filing cabinets) and construction/demolition (C&D) debris. One small portion of the "satellite fill area" contained a tar-like substance in which PAH compounds were present at high concentrations.

Human health risks associated with exposure to site soils and/or groundwater were assessed using two exposure scenarios. These are: 1) current land use conditions, under which adult and teenage trespassers are exposed to surface soil and groundwater at leachate seeps; and 2) hypothetical future land use conditions, under which adult and child residents and construction workers are exposed to site soils and groundwater. A summary of calculated cancer risks values and non-cancer hazard indices is given in Table 8-1.

The calculated noncancer hazard indices for all potential receptor populations fell below the acceptable USEPA-specified upper limit of 1. The calculated cancer risks for the trespasser and construction exposure scenarios fell within the range of risk (10^{-4} to 10^{-6}) established by current USEPA guidelines that can be considered acceptable on a site specific basis. The calculated cancer risks for the residential scenario were 2×10^{-4}, a risk near the upper limit of USEPA's potentially acceptable range. The excess cancer risk posed to potential future residents is a result of exposure to high levels of PAHs in soil and arsenic in groundwater.

No quantitative assessment of potential risk posed to ecological communities was performed in this SI. However, there appears to be little potential for site contaminants to adversely impact the Salmon River aquatic community. If the groundwater seeps located downgradient from SS-026 and 250 feet upgradient from the Salmon River are conservatively assumed to be representative of potential site groundwater contaminant loading to the river, then comparison of the seep sample results to surface water criteria would be an appropriate preliminary measure of potential impact. This comparison is presented below considering the maximum concentrations of the three contaminants of concern (arsenic, selenium, and thallium) identified in Section 7.2.3.3, the NYSDEC TOGS (1.1.1) Ambient Water Quality Standards for Class C (T) Surface Waters, and the USEPA's Title 40 Part 131, Section 304 Acute and Chronic Freshwater Criteria.

Chemical	Maximum Concentration μg/L	NYS Class C (T) (μg/L)	EPA Acute (μg/L)	EPA Chronic (μg/L)
Arsenic	7.5	150	360	190
Selenium	13.8	4.6	20	5
Thallium	6.6	8	Not Listed	Not Listed

Given these comparisons, the maximum selenium criteria concentration exceeds the New York State Class C (T) and the USEPA Freshwater Chronic criteria by a factor of 3. No other exceedances of the criteria occur. Although the selenium concentration exceeds these criteria, the actual impact on the river would be considerably less because of the dilution capacity of the river and dilution and adsorption along the 250 foot distance from the seeps (which immediately reinfiltrate into the ground near where the groundwater is expressed) to the river. Thus, there appears to be little potential for significant contaminant loading from site SS-026 to the Salmon River.

9.0 RECOMMENDATIONS

9.1 Basis

9.1.1 Soil

Organic compounds were not detected in soils at site SS-026 at concentrations above New York State guidelines except for benzo(a)pyrene in one sample (SS-026-SF-4) at a concentration of 213 μg/kg. Polycyclic aromatic hydrocarbons (PAHs) were, however, detected at relatively high concentrations in a sample of tar-like material in the "satellite fill area" including 12 PAHs above New York State guidelines. Antimony, copper, cadmium, chromium, selenium, silver, and zinc were detected on site at concentrations above New York State guidelines. No evidence of chemical warfare agents (TDG, CN, CS, arsenic, or chloroform) was present in site soils. Dioxins and furans, potential residual products of herbicide use, were not detected at levels threatening to human health.

9.1.2 Groundwater

In the most recent (1999) sampling event, only RDX (a residual explosive), iron, and selenium were detected in contravention of groundwater chemical specific ARARs or TBCs.

9.1.3 Physical Hazards

Outside of the "satellite fill area", only small pockets of surficial household debris including flatware, bones, and trash are present; these areas do not pose a physical hazard. In the "satellite fill area", metallic debris is present on the surface, some of which may pose a potential physical hazard to trespassers.

9.1.4 Human Health Risk

There appears to be no unacceptable excess noncancer risk associated with current or future exposure to site contaminants at SS-026. Cancer risks generally fell within the risk range (10^{-4} to 10^{-6}) considered to be acceptable to USEPA on a case by case basis. The highest cancer risk (2×10^{-4}) is associated with exposure given a hypothetical future residential use scenario; risk is primarily resultant from arsenic in groundwater and PAHs in soil.

Arsenic was detected in groundwater at a concentration below its New York State Class GA water quality criterion, but contributes the most to the 8×10^{-5} calculated potential cancer risk given hypothetical future use of groundwater as a primary potable supply source. RDX was calculated to contribute only 6×10^{-6} of this risk; however RDX was detected at a concentration slightly above USEPA's drinking water health advisory value.

The vast majority of PAHs detected in soil occurred in a sample of tar-like material in the "satellite fill area". Direct contact with soil (the sum of adult and child risks for dermal contact and ingestion) contributes 1×10^{-4} to the total additive cancer risk for the residential reuse scenario.

Were the tar-like material to be removed, the calculated cancer risk for residential exposure to site soils could be decreased at minimum from 1×10^{-4} to 1×10^{-5} (comparing the exposure concentration of

benzo(a)pyrene [1,610 μg/kg] to the maximum from all other samples [213 μg/kg]). This would reduce the overall additive cancer risk for the residential scenario to about 9 x 10^{-5}, which falls within the risk range considered to be acceptable to USEPA on a case by case basis. This reduction in risk is illustrated further below.

Additive Cancer Risk for Residential Scenario - Current Conditions

Direct Contact with Soil	1 x 10^{-4}
Direct Contact with Groundwater	8 x 10^{-5}
Total Cancer Risk	2 x 10^{-4}

Additive Cancer Risk for Residential Scenario - Tar-like Material Removed

Direct Contact with Soil	1 x 10^{-5}
Direct Contact with Groundwater	8 x 10^{-5}
Total Cancer Risk	9 x 10^{-5}

In addition, there appears to be little potential for site contaminants to adversely impact site ecological communities.

9.1.5 Explosive Ordnance

Based on the site safing work performed, the range safing contractor (Human Factors Applications, Inc.) contracted by the United States Army Corps of Engineers recommended that the site is suitable for unrestricted reuse.

9.2 Recommendations

Because of the excess potential human health risk associated with exposure to the tar-like material, it is recommended that removal of this material be investigated. A Work Plan should be developed to outline an investigation to evaluate the extent and volume of tar-like material and heavily PAH contaminated soil present in the "satellite fill area". Based on the results of the investigation, a further course of action should be recommended. Potential actions could include conducting a Removal Action, preparing a Feasibility Study, or, if the volume of material is found to be small and is removed during the investigation, preparing the appropriate decision documents.

Given removal of the tar-like material, there would be no need to institute actions to restrict the site to non-residential reuse since the human health risk for residential use would fall to within acceptable levels.

It would also be prudent to remove the surficial metallic debris in the "satellite fill area", thereby removing the potential physical hazard associated with that material.

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LIST OF ACRONYMS

AMC	Air Mobility Command
AMSL	Above Mean Seal Level
ARAR	Applicable or Relevant and Appropriate Requirements
BAF	Bioaccumulation Factor
BEHP	Bis(2-ethylhexyl)phthalate
BGS	Below Ground Surface
BW	Backwater
C&D	Construction & Demolition
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CN	chloroacetophenone (tear gas)
CPC	Chemical of Potential Concern
CS	chlorobenzylidenemalononitrile (tear gas)
DBP	Di-n-octylphthalate
DEP	Diethylphthalate
ECAO	USEPA Environmental Criteria & Assessment Office
ECL	Environmental Conservation Law
ED	Exposure Duration
EM	Electromagnetic
FEMA	Federal Emergency Management Agency
FFA	Federal Facilities Agreement
FS	Feasibility Study
HARM	Hazard Assessment Ranking Methodology
HEAST	Health Effects Summary Tables
HI	Hazard Index

LIST OF ACRONYMS

HQ	Hazard Quotient
HRA	Health Risk Assessment
HS	Mixed Hardwood Swamp
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
LOEL	Lowest-Observed-Effects-Level
MCL	Maximum Contaminant Levels
MCLG	Maximum Contaminant Levels Goals
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MSL	Mean Sea Level Datum
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NEPA	National Environmental Policy Act
NOAEL	No-Observed-Effects-Level
NRHP	National Register of Historic Places
NY	New York
NYCRR	New York Codes Rules and Regulations
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
PA	Preliminary Assessment
PAFB	Plattsburgh Air Force Base
PAH	Polycyclic Aromatic Hydrocarbon
PARC	Plattsburgh Air Base Redevelopment Corporation
PCB	Polychlorinated Biphenyl
PDE	Potential Dietary Exposure
PHC	Petroleum Hydrocarbon
PID	Photoionization Detector
PVC	Polyvinyl Chloride

LIST OF ACRONYMS

QA/QC	Quality Assurance/Quality Control
RA	Risk Assessment
RAGS	Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
RTV	Relative Toxicity Value
SAC	Strategic Air Command
SACM	Superfund Accelerated Cleanup Model
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SI	Site Investigation
SMCL	Secondary Maximum Contaminant Levels
SQL	Sample Quantitation Limit
SVOC	Semivolatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum, NYSDEC
TAL	Target Analyte List
TBC	To Be Considered
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TDG	Thiodiglycol
TEC	Toxic Equivalent Concentration
TEF	Toxicity Equivalence Factor
TIC	Tentatively Identified Compound
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TOGS	Technical and Operational Guidance Series, NYSDEC

LIST OF ACRONYMS

URS	URS Consultants, Inc.
USACE	United States Army Corps of Engineers
USACERL/TAC	United States Army Construction Engineering Research Laboratories/Technical Assistance Center
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UL_{95}	95th Percent Upper Confidence Limit
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound
WM	Wet Meadow

TABLE 2-1

EOD RANGE (SS-026)
SAMPLE ANALYSIS METHODS

ANALYSIS	METHOD	REFERENCE
TCL Volatiles	USEPA SOW - Organics (CLP OLM 01.8)	1
TCL Semivolatiles	USEPA SOW - Organics (CLP OLM 01.8)	1
TCL Pesticides/PCB	USEPA SOW - Organics (CLP OLM 01.8)	1
TAL Metals	USEPA SOW - Inorganics (CLP ILM 03.0)	2
Explosives	Method 8330	3

REFERENCES:

1. USEPA Contract Laboratory Program Statement of Work for Organic Analysis; Multi-Media, Multi-Concentration, Document Number OLM01.8.
2. USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis; Multi-Media, Multi-Concentration, Document Number ILM03.0.
3. Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods, SW-846, Third Edition.

TABLE 2-2

1999 SUPPLEMENTAL SAMPLING PROGRAM AT THE EOD RANGE (SS-026)

Areas of Interest	Sampling Program	Sample Depth	Purpose
CHEMICAL AGENT SITE (CAS) - location where chemical warfare training materials were found	Collected 6 soil samples in the CAS area for arsenic, chloroform, and thiodiglycol (TDG) analyses. Four of the samples were taken at locations where chemical warfare training materials were found during range clearing. The remaining two samples were generally located in the area where the materials were found and taken at the surface to characterize the area for risk purposes. One sample, where empty tear gas jars were found, was also analyzed for CN and CS.	various	To investigate the potential presence of mustard gas, phosgene, chloropicrin, and lewisite in soil in the area where chemical warfare training materials were found. Since chemical warfare agent compounds cannot be readily analyzed, USACE recommended sampling for the indicator parameters arsenic, chloroform, and TDG.
SATELLITE FILL AREA - area between the EOD range and Salmon River where debris was found during range safing.	Collected 5 soil samples for TCL VOCs, TCL SVOCs, TCL PCBs, and TAL metals analyses. Three samples were located based upon visual observations and PID screening during test trenching and two samples were co-located with seep samples. Collected samples from two leachate seeps emanating from the steep embankment in the area. Analyzed the samples for TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, and RDX.	various	To chemically characterize the satellite fill area.

TABLE 2-2 (Continued)

Areas of Interest	Sampling Program	Sample Depth	Purpose
EOD RANGE AREA – response to USEPA comments on SS-026 Draft SI Report.	Collected 6 soil samples from 3 SI soil boring locations. Analyzed samples for dioxin, 2-chloroacetophenone (CN), and chlorobenzylidenemalononitrile (CS). Sampled 5 existing groundwater monitoring wells for TCL VOCs and RDX and 1 new well for TCL VOCs, TCL SVOCs, TCL PCBs, TAL metals, and RDX.	0-2 feet and 2-4 feet at each of 3 locations.	USEPA suggested that dioxins, CN, and CS should be analyzed in soil at the EOD Range to determine the effects of herbicide use and the potential presence of MACE or tear gas. Groundwater samples for VOCS and RDX and the new well were included per USEPA's suggestion.

TABLE 2-3
PLATTSBURGH AFB - SS-026
CAS AREA AND EOD RANGE AREA SOIL SAMPLING SUMMARY

Sample ID	Sample Depth	Sample Location	Description of Material Sampled	Analytical Parameters
SS-026-CAS-1	0-2'	Area where 48 vials from a war gas identification set were found	Brown fine sand, trace medium to coarse sand	Arsenic, chloroform, and thiodiglycol (TDG)
SS-026-CAS-2	2-4'	Area where 48 vials from a war gas identification set were found	Brown fine sand, trace medium sand, organish bands and mottles	Arsenic, chloroform, and TDG
SS-026-CAS-3	5-7'	Location where 8 empty tear gas glass jars were found	Brown fine sand, trace orangish mottles and black bands	Arsenic, chloroform, TDG, 2-chloroacetophenone (CN), and chlorobenzylidenemalononitrile (CS)
SS-026-CAS-4	8-9'	Location where war gas ID set "PIG" was found	Brown fine sand, trace medium sand, orangish bands and mottles	Arsenic, chloroform, and TDG
SS-026-CAS-5	0-1'	General CAS area for risk assessment purposes	Brown fine sand, trace medium to coarse sand, many fine roots	Arsenic, chloroform, and TDG
SS-026-CAS-6	0-1'	General CAS area for risk assessment purposes	Top 6" – Brown fine sand, some medium to coarse sand, fine gravel; 6-12" – Tan fine sand, trace medium sand, orangish mottles	Arsenic, chloroform, and TDG
SB-26-04-01	0-2'	Location of SI soil boring SB-26-01	Brown fine sand, trace medium sand	Dioxin, CN, and CS
SB-26-04-02	2-4'	Location of SI soil boring SB-26-01	Brown fine sand, trace medium sand	Dioxin, CN, and CS
SB-26-05-01	0-2'	Location of SI soil boring SB-26-03	Brown fine sand, trace medium to coarse sand	Dioxin, CN, and CS
SS-26-05-02	2-4'	Location of SI soil boring SB-26-03	Brown fine sand, trace medium to coarse sand	Dioxin, CN, and CS
SB-26-06-01	0-2'	Location of SI soil boring SB-26-02	Brown fine sand, trace medium to coarse sand	Dioxin, CN, and CS
SB-26-06-02	2-4'	Location of SI soil boring SB-26-02	Brown fine sand, trace medium to coarse sand	Dioxin, CN, and CS

TABLE 2-4
PLATTSBURGH AFB – SS-026
TEST TRENCH MATERIAL DESCRIPTIONS

Test Trench	Test Trench Dimensions	Description of Material Encountered	Maximum Fill Thickness	Maximum PID Reading	Depth to Water Table
EOD-TP-01	43' long x 4' deep x 5' wide	Regraded soil (brown fine sand with some glass, brick, broken flatware, rubber hose, bones, and asphalt) overlying brown fine sand	1.5 feet	No readings above background	Not encountered
EOD-TP-02	30' long x 4' deep x 5' wide	Probable regraded soil (homogeneous brown fine sand, few burned pieces of wood) overlying brown fine sand with orange mottles	None encountered	No readings above background	Not encountered
EOD-TP-03	42' long x 6' deep x 5' wide	Surficial debris (glass, brick, broken flatware, asphalt, bones) overlying brown fine sand	Surficial debris	No readings above background	Not encountered
EOD-TP-04	50' long x 5' deep x 5' wide	Surficial and buried debris (rusted metal, concrete, bed springs, wood, and asphalt in a matrix of brown fine sand) overlying brown fine sand	1 foot	No readings above background	Not encountered
EOD-TP-05	62' long x 5' deep x 5' wide	Surficial and buried debris (rusted metal, asphalt, concrete, paint can, broken glass, and flatware in a matrix of brown fine sand) overlying orangish brown fine sand	1 foot	No readings above background	Not encountered
EOD-TP-06	76' long x 8' deep x 5' wide	Surficial debris (rusted metal, few rusted and empty 55 gallon drums, filing cabinet, and copper sheeting) overlying orangish brown fine sand	Surficial debris	No readings above background	Not encountered
EOD-TP-07	88' long x 8' deep x 5' wide	Surficial debris (sparse concrete, bricks, broken glass, and flatware) overlying dark brown fine sand	Surficial debris	No readings above background	Not encountered
EOD-TP-08	59' long x 6' deep x 5' wide	Surficial and buried debris (concrete, brick, asphalt, roof shingles, rusty metal ammunition cans, rusted 55 gallon drum fragments, clay pipe, and plywood in a matrix of dark brown fine sand) overlying orangish brown fine sand	2 feet	No readings above background	Not encountered
EOD-TP-09	17' long x 5' deep x 5' wide	No fill material encountered. Dark brown fine sand overlying orangish brown fine sand	None encountered	No readings above background	Not encountered
EOD-TP-10	12' long x 6' deep x 5' wide	No fill material encountered. Dark brown fine sand overlying orangish brown fine sand	None encountered	No readings above background	Not encountered

TABLE 2-4 (Continued)

Test Trench	Test Trench Dimensions	Description of Material Encountered	Maximum Fill Thickness	Maximum PID Reading	Depth to Water Table
EOD-TP-11	28' long x 5' deep x 5' wide	Surficial and buried debris (rusted ammunition cans, rusted and crushed 55 gallon drum, chain-link fence, concrete, asphalt, bag fragment labeled "Asbestos", hard tar, glass bottles, clay pipe, and fiberglass insulation in a matrix of dark brown, fine sand) overlying orangish brown fine sand	1 foot	No readings above background	Not encountered
EOD-TP-12	26' long x 4' deep x 5' wide	Surficial and buried debris (concrete, asphalt, brick, rusted metal ammunition cans, rusty pieces of 55-gallon drums, rubber tires, gypsum wallboard, hard tar, wire, and steel cable in a matrix of dark brown fine sand) overlying orangish brown fine sand	1 to 3 feet	No readings above background	Not encountered
EOD-TP-13	29' long x 6' deep x 5' wide	Surficial and buried debris (sections of telephone pole [up to 8' in length], metal pieces, rubber hose, and three empty rusted metal cases labeled "Bombtail T-743 Delay Arming Vane" in a matrix of dark brown fine sand) overlying orangish brown fine sand	1 foot	No readings above background	Not encountered
EOD-TP-14	30' long x 7' deep x 5' wide	Regraded soil (dark brown fine sand with some cobbles and boulders and a 20' long piece of steel cable) overlying orangish brown fine sand	1 foot	No readings above background	Not encountered

TABLE 2-5
PLATTSBURGH AFB - SS-026
SATTELITE FILL AREA SAMPLING SUMMARY

Sample ID	Sample Depth	Sample Location	Description of Material Sampled	Analytical Parameters
SS-026-SF-1	0-6"	Surface soils in central portion of EOD-TP-11	Dark brown fine sand with some organics, roots, and black tar	TCL VOC, TCL SVOC, TCL PCBs, and TAL Metals
SS-026-SF-2	0-4"	Surface soil, 10' west of south end of EOD-TP-12 beneath an empty, intact 55 gallon drum.	Dark brown, fine sand	TCL VOC, TCL SVOCs, TCL PCBs, TAL Metals
SF-026-SF-4	0-6"	Surface soil at groundwater seep at south end of EOD range, base of slope (eastern sample, paired with LS-026-SF-1)	0-3" Dark brown to black moist silt and fine sand, trace clay and gravel, some decaying organic matter; 3-6" Orangish brown to gray fine sand, trace silt	TCL VOC, TCL SVOC, TCL PCBs, and TAL Metals
SS-026-SF-5	0-6"	Surface soil at groundwater seep at south end of EOD range, base of slope (western sample, paired with LS-026-SF-2)	Dark brown to black, moist, silt and fine sand trace clay and gravel some organics	TCL VOC, TCL SVOC, TCL PCBs, and TAL Metals
SS-026-SF-6	0-6"	Base of slope, south end of EOD range beneath where two tear gas canisters were found	Dark brown to black, moist silt and fine sand, trace clay and gravel, some organics	TCL VOCs, TCL SVOC, TCL PCBs, TAL Metals, CN, and CS
LS-026-SF-1	Surface water	Groundwater seep at south end of EOD range, base of slope (eastern sample)	Gray to brownish gray turbid water, no noticeable odor.	TCL VOC, TCL SVOC, TCL PCBs, TAL Metals, and RDX
LS-026-SF-2	Surface water	Groundwater seep at south end of EOD range, base of slope (western sample)	Slightly turbid gray water, slight decaying organics odor.	TCL VOC, TCL SVOC, TCL PCB, TAL Metals, and RDX

TABLE 3-1

EOD RANGE (SS-026)
SOIL SERIES DESIGNATIONS

SOIL UNIT NO.	SOIL GROUP OR SERIES	DESCRIPTION
114	Udipsamments and Psammaquents Complex	Very deep, excessively drained to somewhat poorly drained (sandy fill or disturbed material).
171A	Plainfield Loamy Sand	Very deep, nearly level to gently sloping, excessively drained. Found on sandy plains, deltas, and stream terraces.

Source: Soil Survey of Plattsburgh Air Force Base, N.Y.(USDA-SCS, undated).

TABLE 3-2

EOD RANGE (SS-026) SITE INVESTIGATION
GEOTECHNICAL ANALYSIS SUMMARY

	GRAIN SIZE DISTRIBUTION					
Sample Location/Depth	**% Gravel**	**% Sand**	**% Silt**	**% Clay**	**USCS Class**	**Water Content (%)**
MW-26-001/8′ - 10′	0.0	57.7	35.7	6.6	SM	22.6
MW-26-002/9′-11′	0.0	95.8	4.2*		SP	24.7
MW-26-003/9′-11′	0.0	97.3	2.7*		SP	23.7
MW-26-004/9′-11′	0.2	77.7	22.1*		SM	21.3
SB-26-03/0′ - 2′	0.1	89.5	10.4*		SP/SM	6.3
MW-26-001/0 - 4"	0.0	81.6	15.9	2.5	SM	8.3
MW-26-002/0 - 4"	0.3	92.3	5.6	1.8	SP/SM	5.0
MW-26-003/0 - 3"	0.5	95.5	4.0*		SP	3.2

* Combined silt and clay percentage

TABLE 3-3

EOD RANGE (SS-026)
GROUNDWATER ELEVATIONS

MONITORING WELL I.D.	SITE	MEASURING POINT (TOP OF RISER) ELEVATION*	MEASUREMENT DATE		
			12/10/94	12/11/94	10/06/99
			GW Elevation *	GW Elevation *	GW Elevation *
MW-26-001	SS-026	188.81	180.20	180.23	179.42
MW-26-002	SS-026	185.63	173.51	173.57	173.58
MW-26-003	SS-026	183.44	172.80	172.84	173.12
MW-26-004	SS-026	185.95	172.20	172.21	172.43
MW-26-005	SS-026	182.70	NA	NA	173.20
MW-24-001	LF-024	185.75	180.06	180.17	NA
MW-24-002	LF-024	157.45	153.73	153.75	NA
MW-24-003	LF-024	158.42	155.43	155.42	NA
MW-24-004	LF-024	164.61	161.34	161.39	NA

* Above Mean Sea Level

TABLE 3-4

EOD RANGE (SS-026) SITE INVESTIGATION
HYDRAULIC CONDUCTIVITY OF WATER TABLE AQUIFER
DETERMINED FROM IN-SITU SLUG TESTS

MONITORING WELL I.D.	SCREENED INTERVAL		UNIT SCREENED	HYDRAULIC CONDUCTIVITY	
				SLUG OUT TEST	
	DEPTH(ft.)	ELEVATION(ft.)		(cm/sec.)	(ft./day)
MW-26-001	5-15	180.72-170.72	Silty Fine Sand	4.80×10^{-3}	13.7
MW-26-002	6-16	175.76-165.76	Fine Sand	1.19×10^{-2}	33.7
MW-26-003	6-16	174.76-164.26	Fine Sand	1.38×10^{-2}	39.1
MW-26-004	7-17	176.16-166.16	Fine Sand	7.77×10^{-3}	22.0
AVERAGE*				8.85×10^{-3}	25.1

*Geometric Mean

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater		Soil	
		ARAR Value (µg/l)	Source	TBC Value (µg/kg)	Source
Chloromethane	VOC	5	A		
Bromomethane	VOC	5	A		
Vinyl Chloride	VOC	2	A	200	D
Chloroethane	VOC	5	A	1,900	D
Methylene Chloride	VOC	5	A	100	D
Acetone	VOC	50	A	200	D
Carbon Disulfide	VOC	50	B	2,700	D
1,1-Dichloroethene	VOC	5	A	400	D
1,1-Dichloroethane	VOC	5	A	200	D
1,2-Dichloroethene (total)	VOC	5	A(1)	300	D(1)
Chloroform	VOC	7	A	300	D
1,2-Dichloroethane	VOC	0.6	A	100	D
2-Butanone (or MEK)	VOC	50	A	300	D
1,1,1-Trichloroethane	VOC	5	A	800	D
Carbon Tetrachloride	VOC	5	A	600	D
Bromodichloromethane	VOC	50	A		
1,2-Dichloropropane	VOC	1	A		
cis-1,3-dichloropropene	VOC	0.4	A(2)		
Trichloroethene	VOC	5	A	700	D
Dibromochloromethane	VOC	50	A		
1,1,2-Trichloroethane	VOC	1	A		
Benzene	VOC	1	A	60	D
trans-1,3-dichloropropene	VOC	0.4	A(2)		
Bromoform	VOC	50	A		
4-Methyl-2-pentanone	VOC	50	B	1,000	D
2-Hexanone	VOC	50	A		
Tetrachloroethene	VOC	5	A	1,400	D
1,1,2,2-Tetrachloroethane	VOC	5	A	600	D
Toluene	VOC	5	A	1,500	D
Chlorobenzene	VOC	5	A	1,700	D
Ethylbenzene	VOC	5	A	5,500	D
Styrene	VOC	5	A		
Total Xylenes	VOC	5	A(1)	1,200	D

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater		Soil	
		ARAR Value (µg/l)	Source	TBC Value (µg/kg)	Source
Phenol	SVOC	1	A(P)	30	D
bis(2-Chloroethyl)ether	SVOC	1	A		
2-Chlorophenol	SVOC	1	A(P)	800	D
1,3-Dichlorobenzene	SVOC	3	A(3)	1,600	D
1,4-Dichlorobenzene	SVOC	3	A(3)	8,500	D
1,2-Dichlorobenzene	SVOC	3	A(3)	7,900	D
2-Methylphenol	SVOC	1	A(P)	100	D
Bis(2-chloroisopropyl)ether	SVOC	50	B		
4-Methylphenol	SVOC	1	A(P)	900	D
N-Nitroso-di-n-propylamine	SVOC	50	B		
Hexachloroethane	SVOC	5	A		
Nitrobenzene	SVOC	0.4	A	200	D
Isophorone	SVOC	50	A	4,400	D
2-Nitrophenol	SVOC	1	A(P)	330	D
2,4-Dimethylphenol	SVOC	1	A(P)		
Bis(2-chloroethoxy)methane	SVOC	5	A		
2,4-Dichlorophenol	SVOC	1	A(P)	400	D
1,2,4-Trichlorobenzene	SVOC	5	A	3,400	D
Naphthalene	SVOC	10	A	13,000	D
4-Chloroaniline	SVOC	5	A	220	D
Hexachlorobutadiene	SVOC	0.5	A		
4-Chloro-3-methylphenol	SVOC	1	A(P)	240	D
2-Methylnaphthalene	SVOC	50	B	36,400	D
Hexachlorocyclopentadiene	SVOC	5	A		
2,4,6-Trichlorophenol	SVOC	1	A(P)		
2,4,5-Trichlorophenol	SVOC	1	A(P)	100	D
2-Chloronaphthalene	SVOC	10	A		
2-Nitroaniline	SVOC	5	A	430	D
Dimethylphthalate	SVOC	50	A	2,000	D
Acenaphthylene	SVOC	50	B	41,000	D
2,6-Dinitrotoluene	SVOC	5	A	1,000	D

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater		Soil	
		ARAR Value (µg/l)	Source	TBC Value (µg/kg)	Source
3-Nitroaniline	SVOC	5	A	500	D
Acenaphthene	SVOC	20	A	50,000	D
2,4-Dinitrophenol	SVOC	1	A(P)	200	D
4-Nitrophenol	SVOC	1	A(P)	100	D
Dibenzofuran	SVOC	50	B	6,200	D
2,4-Dinitrotoluene	SVOC	5	A		
Diethylphthalate	SVOC	50	A	7,100	D
4-Chlorophenyl-phenylether	SVOC	50	B		
Fluorene	SVOC	50	A	50,000	D
4-Nitroaniline	SVOC	5	A		
4,6-Dinitro-2-methylphenol	SVOC	1	A(P)		
N-nitrosodiphenylamine	SVOC	50	A		
4-Bromophenylphenylether	SVOC	50	B		
Hexachlorobenzene	SVOC	0.04	A	410	D
Pentachlorophenol	SVOC	1	A(P)	1,000	D
Phenanthrene	SVOC	50	A	50,000	D
Anthracene	SVOC	50	A	50,000	D
Carbazole	SVOC	50	B		
Di-n-butylphthalate	SVOC	50	A	8,100	D
Fluoranthene	SVOC	50	A	50,000	D
Pyrene	SVOC	50	A	50,000	D
Butylbenzylphthalate	SVOC	50	A	50,000	D
3,3'-Dichlorobenzidine	SVOC	5	A		
Benzo(a)anthracene	SVOC	0.002	A	224	D
Chrysene	SVOC	0.002	A	400	D
bis(2-Ethylhexyl)phthalate	SVOC	6	C	50,000	D
Di-n-octylphthalate	SVOC	50	A	50,000	D
Benzo(b)fluoranthene	SVOC	0.002	A	1,100	D
Benzo(k)fluoranthene	SVOC	0.002	A	1,100	D
Benzo(a)pyrene	SVOC	ND	A	61	D
Indeno(1,2,3-cd)pyrene	SVOC	0.002	A	3,200	D
Dibenz(a,h)anthracene	SVOC	50	B	14	D
Benzo(g,h,i)perylene	SVOC	50	B	50,000	D

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater		Soil	
		ARAR Value (µg/l)	Source	TBC Value (µg/kg)	Source
alpha-BHC	PEST	0.01	A	110	D
beta-BHC	PEST	0.04	A	200	D
delta-BHC	PEST	0.04	A	300	D
gamma-BHC (Lindane)	PEST	0.05	A	60	D
Heptachlor	PEST	0.04	A	100	D
Aldrin	PEST	ND	A	41	D
Heptachlor epoxide	PEST	0.03	A	20	D
Endosulfan I	PEST	50	B	900	D
Dieldrin	PEST	0.004	A	44	D
4,4'-DDE	PEST	0.2	A	2,100	D
Endrin	PEST	ND	A	100	D
Endosulfan II	PEST	50	B	900	D
4,4'-DDD	PEST	0.3	A	2,900	D
Endosulfan sulfate	PEST	50	B	1,000	D
4,4'-DDT	PEST	0.2	A	2,100	D
Methoxychlor	PEST	35	A	10,000	D
Endrin ketone	PEST	5	A		
Endrin aldehyde	PEST	5	A		
alpha-Chlordane	PEST	0.05	A	540	D(4)
gamma-Chlordane	PEST	0.05	A	540	D(4)
Toxaphene	PEST	0.06	A		
Aroclor-1016	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1221	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1232	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1242	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1248	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1254	PCB	0.09	A(8)	1,000	D(5)
Aroclor-1260	PCB	0.09	A(8)	1,000	D(5)

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater/TBC		Soil	
		TBC Value (µg/l)	Source	TBC Value (mg/kg)	Source
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	EXP	17.5	E		
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	EXP	2	E		
1,3,5-Trinitrobenzene	EXP	2	E		
1,3-Dinitrobenzene	EXP	1	E		
Methyl-2,4,6-trinitrophenylnitramine (TETRYL)	EXP	50	B		
Nitrobenzene	EXP	0.4	A	0.2	D
2,4,6-Trinitrotoluene	EXP	2	E		
4-Amino-2,6-Dinitrotoluene	EXP	50	B		
2-Amino-4,6-Dinitrotoluene	EXP	50	B		
2,4-Dinitrotoluene	EXP	0.5	E		
2,6-Dinitrotoluene	EXP	5	A	1	D
2-Nitrotoluene	EXP	5	A		
3-Nitrotoluene	EXP	5	A		
4-Nitrotoluene	EXP	5	A		

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

PARAMETER	Class	Groundwater		Soil	
		ARAR Value (µg/l)	Source	TBC Value (mg/kg)	Source
Aluminum	MET	50 to 200	C	8510	SB
Antimony	MET	3	A	12.6	SB
Arsenic	MET	25	A	7.5	D
Barium	MET	1,000	A	300	D
Beryllium	MET	3	A	0.74	SB
Cadmium	MET	5	C	1.3	SB
Calcium	MET			30200	SB
Chromium	MET	50	A	19.5	SB
Cobalt	MET			30	D
Copper	MET	200	A	44.1	SB
Iron	MET	300	A(7)	36700	SB
Lead	MET	15	C	79.4	SB(6)
Magnesium	MET	35,000	A	3340	SB
Manganese	MET	300	A(7)	474	SB
Mercury	MET	2	A	0.1	D
Nickel	MET	100	A	13	D
Potassium	MET			929	SB
Selenium	MET	10	A	2	D
Silver	MET	50	A	ND	SB
Sodium	MET	20,000	A	520	SB
Thallium	MET	2	C	ND	SB
Vanadium	MET			150	D
Zinc	MET	2000	A	63.4	SB

TABLE 4-1

EOD RANGE (SS-026)
CHEMICAL-SPECIFIC ARARs/TBCs

NOTES:

(1) Applies to each isomer individually.
(2) Applies to the sum of cis- and trans-1,3-dichloropropene.
(3) Applies to the sum of 1,2-; 1,3-; and 1,4-dichlorobenzene.
(4) Applies to technical chlordane.
(5) 1,000 µg/kg applies to surface soils,
10,000 µg/kg applies to subsurface soils.
(6) Background levels for lead vary widely. Average levels in undeveloped rural areas may range from 4-61 ppm (mg/kg). Average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm (mg/kg).
(7) Standard for the sum of iron and manganese is 500 µg/l.
(8) Applies to total PCBs.
(P) Phenolic compound. Standard is for total phenols.

SOURCES:

A - NYSDEC Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, TOGS 1.1.1, June 1998.
B - 10NYCRR Chapter 5, Subpart 5-1, Public Water Systems, New York State Department of Health.
C - USEPA Drinking Water Standards 40 CFR 141-143.
D - NYSDEC Soil Cleanup Objectives and Cleanup Levels, TAGM HWR-94-4046, January 1994.
E - USEPA Region 2 TBC Guidance for Explosive Compounds in Drinking Water.

ABBREVIATIONS:

VOC - Volatile Organic Compound.
SVOC - Semivolatile Organic Compound.
PEST - Pesticides.
PCB - Polychlorinated biphenyls.
EXP - Explosives.
MET - Metals.
ND - Not detected.
SB - Site background.
ARAR- Applicable or Relevant and Appropriate Requirements.
TBCs - To Be Considered (criteria that are not legally binding).

TABLE 5-1

EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN 1994 SOIL SAMPLES

Analyte	Class	TBC VALUE	Background Samples			Disposal Area Samples				Location of Onsite Maximum Detection
			Detection Frequency	Min. Detected Concentration	Max. Detected Concentration	Detection Frequency	Frequency of TBC Exceedance	Min. Detected Concentration	Max. Detected Concentration	
Methylene Chloride	VOC	100	0 / 2	—	—	2 / 8	0 / 8	1	1	SB26-02-0/SB26-03-0
Acetone	VOC	200	2 / 2	12	13	5 / 8	0 / 8	3	34	WB-MW-26-003-0
Toluene	VOC	1,500	0 / 2	—	—	1 / 8	0 / 8	3	3	SB26-02-0
Diethylphthalate	SVOC	7,100	1 / 2	—	780	0 / 8	0 / 8	—	—	—
4,4'-DDT	PEST	2,100	0 / 2	—	—	1 / 8	0 / 8	1.4	1.4	SB26-03-0
RDX	EXP	—	0 / 2	—	—	1 / 8	0 / 8	1.5	1.5	SB26-01-0
Aluminum (mg/kg)	METAL	8510 (SB)	2 / 2	3050	4780	8 / 8	0 / 8	1150	2770	SB26-03-2
Antimony (mg/kg)	METAL	12.6 (SB)	0 / 2	—	—	3 / 8	2 / 8	7.6	42.9	SB26-02-2
Arsenic (mg/kg)	METAL	7.5 **	2 / 2	1	1.2	5 / 8	0 / 8	0.41	0.95	SB26-02-2
Barium (mg/kg)	METAL	300 **	2 / 2	13.6	17	8 / 8	0 / 8	4.8	21.4	SB26-02-2
Beryllium (mg/kg)	METAL	0.74 (SB)	2 / 2	0.16	0.21	6 / 8	0 / 8	0.06	0.14	WB-MW-26-003-0
Cadmium (mg/kg)	METAL	1.3 (SB)**	2 / 2	1.1	1.3	7 / 8	4 / 8	0.67	5.3	SB26-02-2
Calcium (mg/kg)	METAL	30200 (SB)	2 / 2	815	841	8 / 8	0 / 8	310	885	SB26-02-2
Chromium (mg/kg)	METAL	19.5 (SB)	2 / 2	4.2	5.3	7 / 8	1 / 8	1.9	31.1	SB26-02-0
Cobalt (mg/kg)	METAL	30 **	2 / 2	3.1	3.4	7 / 8	0 / 8	1.6	15.1	SB26-02-0
Copper (mg/kg)	METAL	44.1 (SB)	2 / 2	2	4.4	8 / 8	0 / 8	1.4	5.9	SB26-01-2
Iron (mg/kg)	METAL	36700 (SB)	2 / 2	5270	5560	8 / 8	0 / 8	2550	5990	SB26-02-2
Lead (mg/kg)	METAL	79.4 (SB)	2 / 2	1.2	1.3	8 / 8	0 / 8	0.5	11	SB26-03-0
Magnesium (mg/kg)	METAL	3340 (SB)	2 / 2	809	830	8 / 8	0 / 8	184	812	SB26-02-2
Manganese (mg/kg)	METAL	474 (SB)	2 / 2	24.7	41	8 / 8	0 / 8	28.8	103	SB26-02-2
Nickel (mg/kg)	METAL	13 **	2 / 2	4.7	5.1	5 / 8	0 / 8	2.8	10.6	SB26-01-2
Potassium (mg/kg)	METAL	929 (SB)	2 / 2	370	395	8 / 8	0 / 8	206	480	SB26-02-2
Silver (mg/kg)	METAL	ND (SB)	0 / 2	—	—	1 / 8	1 / 8	1.3	1.3	SB26-01-2
Sodium (mg/kg)	METAL	520 (SB)	1 / 2	—	141	7 / 8	0 / 8	89.5	412	SB26-02-2
Vanadium (mg/kg)	METAL	150 **	2 / 2	9.5	11.4	8 / 8	0 / 8	3.3	8.4	SB26-03-0/SB26-03-2

Notes:

1) Concentrations in µg/kg unless otherwise noted.

2) TBC values defined in Tables 4-1. A TBC value is not available for RDX.

3) SB - Site Background. (95% Upper Tolerance Limit Value from Background Surface Soil & Groundwater Survey: URS 1995)

4) **- NYSDEC recommended soil cleanup objective (NYSDEC HWR-94-4046; Appendix A, Table 4)

TABLE 5-2
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1997 SOIL SAMPLES

Location ID			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample ID			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Depth Interval (ft.)			-	-	-
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	**Units**	**Criteria***			
Volatile Organic Compounds					
Methylene chloride	UG/KG	100	4	6	5
Acetone	UG/KG	200	42	45	46
Pesticide Organic Compounds					
4,4'-DDE	UG/KG	2100	1.0		
4,4'-DDT	UG/KG	2100	3.0		0.44
Metallic Species					
Aluminum	MG/KG	8510 (SB)	3830	1800	3340
Arsenic	MG/KG	7.5	0.77		1.3
Barium	MG/KG	300	13.7	19.7	21.7
Calcium	MG/KG	30200 (SB)	311	1220	1020
Chromium	MG/KG	19.5 (SB)	2.4	3.8	5.7
Cobalt	MG/KG	30	1.1	1.6	2.4
Copper	MG/KG	44.1 (SB)	1.9	0.78	2.3
Iron	MG/KG	36700 (SB)	3560	4800	12300
Lead	MG/KG	79.4 (SB)	9.8	3	3.6
Magnesium	MG/KG	3340 (SB)	335	439	906
Manganese	MG/KG	474 (SB)	56.5	79.6	74.9
Nickel	MG/KG	13	2.7	2.9	5.5
Potassium	MG/KG	929 (SB)	118	136	322
Selenium	MG/KG	2	0.85		1.3
Sodium	MG/KG	520 (SB)	59.5	45.4	66.7
Vanadium	MG/KG	150	4.5	5.3	11.3

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

Concentration Exceeds Criteria.

MDL - Method Detection Limit
SB - Site Background

Only Detected Results Reported.

Advanced Selection: Tab5-2
J:\0100013\DB\access\PROGRAM.mde
Printed: 3/29/00 4:11:40 PM
WHERE (((tblRES.LOCID) Like "eod*"));

TABLE 5-2
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1997 SOIL SAMPLES

Location ID			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample ID			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Depth Interval (ft.)			-	-	-
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	Criteria*			
Metallic Species					
Zinc	MG/KG	63.4 (SB)	29	14.8	25.5

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

Concentration Exceeds Criteria.

MDL - Method Detection Limit
SB - Site Background

Only Detected Results Reported.

Advanced Selection: Tab5-2
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WHERE (((tblRES.LOCID) Like "eod*"));

TABLE 5-3
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1999 SOIL SAMPLES

Location ID			SS-026-CAS-1	SS-026-CAS-2	SS-026-CAS-3	SS-026-CAS-4	SS-026-CAS-5
Sample ID			SS-026-CAS-1	SS-026-CAS-2	SS-026-CAS-3	SS-026-CAS-4	SS-026-CAS-5
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)			0.0-2.0	2.0-4.0	5.0-7.0	8.0-9.0	0.0-1.0
Date Sampled			09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Parameter	Units	Criteria*					
Metallic Species							
Arsenic	MG/KG	7.5	1.4				

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

Concentration Exceeds Criteria.

Only Detected Results Reported.

TABLE 5-4
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1999 SOIL BORING SAMPLES

Location ID		SB-26-01	SB-26-01	SB-26-02	SB-26-02	SB-26-03
Sample ID		SB-26-04-01	SB-26-04-02	SB-26-06-01	SB-26-06-02	SB-26-05-01DUP
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0	0.0-2.0	2.0-4.0	0.0-2.0
Date Sampled		09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Parameter	Units					Field Replicate (1)
Dioxins & Furans						
1,2,3,4,6,7,8-HpCDF	NG/KG					0.95
1,2,3,4,6,7,8-HpCDD	NG/KG	1.8	1.9	2.70	7.10	4.20
OCDF	NG/KG				6.50	1.80
OCDD	NG/KG	13.00	12.00	17.00	72.00	32.00
Total HxCDF	NG/KG	0.60			2.60	
Total HxCDD	NG/KG				2.50	
Total HpCDF	NG/KG	0.97				2.00
Total HpCDD	NG/KG	3.30	3.50	5.70	16.00	8.10
Dioxin Toxicity Equivalence	NG/KG	0.0310	0.0310	0.0439	0.1495	0.086

Only detected results reported.

Advanced Selection: TABLE 9
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Printed: 3/29/00 11:40:23 AM
WHERE (((tblRES.PARVQ)<>"R") AND ((tblRES.LOCID) Like "SB-26-*") AND ((tblRES.LOGDATE)>#8/30/99#));

TABLE 5-4
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1999 SOIL BORING SAMPLES

Location ID		SB-26-03	SB-26-03
Sample ID		SB-26-05-01	SB-26-05-02
Matrix		Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0
Date Sampled		09/01/99	09/01/99
Parameter	Units		
Dioxins & Furans			
1,2,3,4,6,7,8-HpCDD	NG/KG	3.8	
OCDF	NG/KG		1.10
OCDD	NG/KG	37.00	3.90
Total HxCDF	NG/KG	1.40	
Total HpCDF	NG/KG	0.98	0.70
Total HpCDD	NG/KG	8.2	0.48
Dioxin Toxicity Equivalence	NG/KG	0.075	0.005

Only detected results reported.

TABLE 5-5
EOD RANGE (SS-026)
SATELLITE FILL AREA
SUMMARY OF ANALYTES DETECTED IN
1999 SURFACE SOIL SAMPLES

Location ID			SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID			SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled			09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	**Units**	**Criteria***			Field Replicate (1)		
Volatile Organic Compounds							
Methylene chloride	UG/KG	100				54	
Toluene	UG/KG	1500				17	
Semivolatile Organic Compounds							
4-Methylphenol (p-cresol)	UG/KG	900	814				
Naphthalene	UG/KG	13000	18100				
2-Methylnaphthalene	UG/KG	36400	12900				
Acenaphthene	UG/KG	50000	20600				
Dibenzofuran	UG/KG	6200	13800				
Fluorene	UG/KG	50000	21600				
Phenanthrene	UG/KG	50000	72000				
Carbazole	UG/KG	-	19200				
Di-n-butylphthalate	UG/KG	8100		352			
Fluoranthene	UG/KG	50000	57500	78			
Pyrene	UG/KG	50000	58600	82			
Benzo(a)anthracene	UG/KG	224 or MDL	57700				
Chrysene	UG/KG	400	26100				
bis(2-Ethylhexyl)phthalate	UG/KG	50000		679			
Benzo(b)fluoranthene	UG/KG	1100	14700				
Benzo(k)fluoranthene	UG/KG	1100	12400				
Benzo(a)pyrene	UG/KG	61 or MDL	17900			213	
Indeno(1,2,3-cd)pyrene	UG/KG	3200	14700				
Dibenz(a,h)anthracene	UG/KG	14 or MDL	8840				

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

(oval) Concentration Exceeds Criteria.

SB - Site Background
MDL - Method Detection Limit

Only Detected Results Reported.

TABLE 5-5
EOD RANGE (SS-026)
SATELLITE FILL AREA
SUMMARY OF ANALYTES DETECTED IN
1999 SURFACE SOIL SAMPLES

Location ID			SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID			SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix			Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)			0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled			09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	**Units**	**Criteria***			Field Replicate (1)		
Semivolatile Organic Compounds							
Benzo(g,h,i)perylene	UG/KG	50000	15600				
Metallic Species							
Aluminum	MG/KG	8510 (SB)	3390	3140	3350	3090	2990
Antimony	MG/KG	12.6 (SB)	2.7	1.4	2.9	3.2	7.2
Barium	MG/KG	300	15.5	15.4	26.2	25.3	22.9
Beryllium	MG/KG	0.74 (SB)	0.21	0.13	0.17	0.17	0.23
Cadmium	MG/KG	1.3 (SB)					0.03
Calcium	MG/KG	30200 (SB)	3150	2070	2290	2430	5080
Chromium	MG/KG	19.5 (SB)	6.3	10	5	4.4	5.3
Cobalt	MG/KG	30	1.3	1.2	1.1	0.96	1.3
Copper	MG/KG	44.1 (SB)	5.8	52.8	2	2.3	3.8
Iron	MG/KG	36700 (SB)	11200	7970	4650	4410	5260
Lead	MG/KG	79.4 (SB)	16.6	65.3	NA	NA	NA
Magnesium	MG/KG	3340 (SB)	789	424	720	731	1540
Nickel	MG/KG	13	3.2	2.5	2.9	2.6	2.6
Potassium	MG/KG	929 (SB)	234	152	261	218	333
Selenium	MG/KG	2	7.6	5.7	4.5	3.7	4.5
Vanadium	MG/KG	150	21	11	7.2	6.7	9.1
Zinc	MG/KG	63.4 (SB)	27.3	153	NA	NA	NA

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

Concentration Exceeds Criteria.

SB - Site Background
MDL - Method Detection Limit

Only Detected Results Reported.

Advanced Selection: TABLE 7
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Printed: 3/29/00 11:54:49 AM
WHERE (((tblRES.PARVQ)<>"R") AND ((tblRES.LOCID) Like "SS-026-SF*"));

TABLE 5-5
EOD RANGE (SS-026)
SATELLITE FILL AREA
SUMMARY OF ANALYTES DETECTED IN
1999 SURFACE SOIL SAMPLES

Location ID			SS-026-SF-6
Sample ID			SS-026-SF-6
Matrix			Soil
Depth Interval (ft.)			0.0-0.5
Date Sampled			09/15/99
Parameter	**Units**	**Criteria***	
Metallic Species			
Aluminum	MG/KG	8510 (SB)	2180
Antimony	MG/KG	12.6 (SB)	5.1
Barium	MG/KG	300	18.4
Calcium	MG/KG	30200 (SB)	5760
Chromium	MG/KG	19.5 (SB)	5.2
Cobalt	MG/KG	30	0.9
Copper	MG/KG	44.1 (SB)	16.8
Iron	MG/KG	36700 (SB)	4820
Lead	MG/KG	79.4 (SB)	12.8
Magnesium	MG/KG	3340 (SB)	596
Nickel	MG/KG	13	7
Potassium	MG/KG	929 (SB)	216
Selenium	MG/KG	2	4.7
Vanadium	MG/KG	150	8.3
Zinc	MG/KG	63.4 (SB)	56.1

NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels; HWR-94-4046 January 24, 1994 (Revised).

Concentration Exceeds Criteria.

SB - Site Background
MDL - Method Detection Limit

Only Detected Results Reported.

Advanced Selection: TABLE 7
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WHERE (((tblRES.PARVQ)<>"R") AND ((tblRES.LOCID) Like "SS-026-SF*"));

TABLE 5-6
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN 1994 GROUNDWATER SAMPLES

Analyte	Class	ARAR VALUE	Upgradient Samples				Onsite Samples				Location of Onsite Maximum Detection
			Detection Frequency	Frequency of ARAR Exceedance	Min. Detected Concentration	Max. Detected Concentration	Detection Frequency	Frequency of ARAR Exceedance	Min. Detected Concentration	Max. Detected Concentration	
Acetone	VOC	50	0 / 2	0 / 2	—	—	1 / 3	0 / 3	15	15	MW-26-002
bis(2-Ethylhexyl)phthalate	SVOC	6	0 / 2	0 / 2	—	—	3 / 3	0 / 3	2	4	MW-26-002
RDX	EXP	50	0 / 2	0 / 2	—	—	1 / 3	0 / 3	5.6	5.6	MW-26-003
Aluminum (Total)	METAL	50 to 200	2 / 2	2 / 2	234	3940	3 / 3	3 / 3	703	6050	MW-26-003
Antimony (Total)	METAL	3	1 / 2	1 / 2	29.3	29.3	0 / 3	0 / 3	—	—	—
Arsenic (Total)	METAL	25	1 / 2	0 / 2	3	3	3 / 3	0 / 3	2.2	4.9	MW-26-003
Barium (Total)	METAL	1,000	2 / 2	0 / 2	7.9	29.2	3 / 3	0 / 3	7.7	46.2	MW-26-003
Beryllium (Total)	METAL	3	1 / 2	0 / 2	0.46	0.46	3 / 3	0 / 3	0.29	0.74	MW-26-003
Calcium (Total)	METAL	—	2 / 2	0 / 2	8190	9310	3 / 3	0 / 3	5230	16300	MW-26-002
Chromium (Total)	METAL	50	1 / 2	0 / 2	5.7	5.7	1 / 3	0 / 3	11.5	11.5	MW-26-003
Cobalt (Total)	METAL	—	2 / 2	0 / 2	5.6	6.2	1 / 3	0 / 3	9.3	9.3	MW-26-003
Copper (Total)	METAL	200	1 / 2	0 / 2	5.4	5.4	2 / 3	0 / 3	4.3	13.3	MW-26-003
Iron (Total)	METAL	300	2 / 2	2 / 2	314	6140	3 / 3	3 / 3	1860	12600	MW-26-003
Lead (Total)	METAL	15	2 / 2	0 / 2	1.2	4.3	3 / 3	0 / 3	2.2	5.6	MW-26-003
Magnesium (Total)	METAL	35,000	2 / 2	0 / 2	1850	3040	3 / 3	0 / 3	783	3700	MW-26-002
Manganese (Total)	METAL	300	2 / 2	0 / 2	10.7	62.9	3 / 3	0 / 3	30.3	104	MW-26-003
Nickel (Total)	METAL	100	1 / 2	0 / 2	12	12	1 / 3	0 / 3	21	21	MW-26-003
Potassium (Total)	METAL	—	2 / 2	0 / 2	1840	2310	3 / 3	0 / 3	1620	3020	MW-26-003
Sodium (Total)	METAL	20,000	2 / 2	0 / 2	1410	4870	3 / 3	0 / 3	1410	1920	MW-26-003
Vanadium (Total)	METAL	—	1 / 2	0 / 2	8.6	8.6	2 / 3	0 / 3	3.8	27.7	MW-26-003
Zinc (Total)	METAL	300	2 / 2	0 / 2	52	182	3 / 3	1 / 3	221	315	MW-26-004
Aluminum (Dissolved)	METAL	50 to 200	2 / 2	1 / 2	38	105	2 / 3	1 / 3	35.8	280	MW-26-002
Arsenic (Dissolved)	METAL	25	0 / 2	0 / 2	—	—	1 / 3	0 / 3	3.3	3.3	MW-26-002
Barium (Dissolved)	METAL	1,000	2 / 2	0 / 2	34.6	105	3 / 3	0 / 3	29.1	49.2	MW-26-004
Cadmium (Dissolved)	METAL	5	0 / 2	0 / 2	—	—	1 / 3	0 / 3	4.1	4.1	MW-26-004
Calcium (Dissolved)	METAL	—	2 / 2	0 / 2	7730	9410	3 / 3	0 / 3	5040	19100	MW-26-004
Cobalt (Dissolved)	METAL	—	1 / 2	0 / 2	5.1	5.1	0 / 3	0 / 3	—	—	—
Iron (Dissolved)	METAL	300	2 / 2	0 / 2	25.9	73.6	3 / 3	0 / 3	13.7	61.2	MW-26-002
Lead (Dissolved)	METAL	15	1 / 2	0 / 2	1.3	1.3	3 / 3	0 / 3	1.1	1.4	MW-26-004
Magnesium (Dissolved)	METAL	35,000	2 / 2	0 / 2	1690	1900	3 / 3	0 / 3	421	3620	MW-26-002
Manganese (Dissolved)	METAL	300	2 / 2	0 / 2	8.3	9.8	3 / 3	0 / 3	8.9	107	MW-26-002
Potassium (Dissolved)	METAL	—	2 / 2	0 / 2	1300	2290	3 / 3	0 / 3	1490	2070	MW-26-004
Sodium (Dissolved)	METAL	20,000	2 / 2	0 / 2	1830	5320	3 / 3	0 / 3	1170	1580	MW-26-003
Thallium (Dissolved)	METAL	2	1 / 2	0 / 2	1.3	1.3	0 / 3	0 / 3	—	—	—
Zinc (Dissolved)	METAL	300	2 / 2	0 / 2	29.1	78.7	3 / 3	0 / 3	24.1	37.9	MW-26-004

Notes:

1) ARAR values defined in Tables 4-1.

TABLE 5-7
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1999 GROUNDWATER SAMPLE RESULTS

Location ID			MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID			MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix			Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)			-	-	-	-	-
Date Sampled			10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units	Criteria*					
Explosives (Nitroaromatics & Nitroamines)							
RDX	UG/L	2				6.1	5.5

* United States Environmental Protection Agency's Drinking Water Health Advisory value.

Concentration Exceeds Criteria.

Only Detected Results Reported.

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Printed: 3/30/00 8:08:03 AM
WHERE (((tblRES.[LOCID] = 'MW-24-001') OR (tblRES.[LOCID] = 'MW-26-001') OR (tblRES.[LOCID] = 'MW-26-002') OR (tblRES.[LOCID] = 'MW-26-003') OR((tblRES.[LOCID] = 'MW-26-004')) AND (((CDate([tblRES]![LOGDATE])) Between #10/1/99# And #10/06/99#))

TABLE 5-7
EOD RANGE (SS-026)
SUMMARY OF ANALYTES DETECTED IN
1999 GROUNDWATER SAMPLE RESULTS

Location ID			MW-26-005	MW-26-005
Sample ID			MW-26-005DUP	MW-26-005
Matrix			Ground Water	Ground Water
Depth Interval (ft.)			-	-
Date Sampled			10/06/99	10/06/99
Parameter	Units	Criteria*	Field Replicate (1)	
Metallic Species				
Aluminum	UG/L	-	3350	3700
Barium	UG/L	1000	41.8	40.7
Calcium	UG/L	-	25700	23200
Chromium	UG/L	50	6.6	7.3
Copper	UG/L	200	9.2	8.8
Iron	UG/L	300	6500	7200
Magnesium	UG/L	35000	5060	5090
Manganese	UG/L	300	196	180
Mercury	UG/L	0.7	0.22	0.37
Nickel	UG/L	100	4.9	5.2
Potassium	UG/L	-	1570	1570
Selenium	UG/L	10	11.8	12.3
Sodium	UG/L	20000	1600	1590
Vanadium	UG/L	-	10.8	11.9
Zinc	UG/L	2000	51	46.9

* NYSDEC Conservation. 1998. TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June, Class GA.

Concentration Exceeds Criteria.

Only Detected Results Reported.

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Printed: 3/30/00 8:08:59 AM
WHERE (((tblRES.[LOCID] = "MW-26-005")) AND (((CDate([tblRES]![LOGDATE])) Between #10/1/99# And #10/06/99#))

TABLE 5-8
EOD RANGE (SS-026)
SATELLITE FILL AREA
SUMMARY OF ANALYTES DETECTED IN
1999 GROUNDWATER SEEP SAMPLES

Location ID			LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID			LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix			GW Seep	GW Seep	GW Seep
Depth Interval (ft.)			0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled			09/15/99	09/15/99	09/15/99
Parameter	**Units**	**Criteria***	Field Replicate (1)		
Metallic Species					
Aluminum	UG/L	-	7950	8540	2280
Arsenic	UG/L	25	7.3	7.5	
Barium	UG/L	1000	151	164	34.7
Calcium	UG/L	-	48500	51600	28800
Chromium	UG/L	50	12.0	12.8	4.2
Copper	UG/L	200	12.7	13.8	8.5
Iron	UG/L	300	13600	14900	4470
Lead	UG/L	25	23.2	24.8	8.2
Magnesium	UG/L	35000	11200	11800	7540
Manganese	UG/L	300	2420	2640	401
Nickel	UG/L	100	8.3	8.5	2.9
Potassium	UG/L	-	2690	2880	938
Selenium	UG/L	10	13.8	11.9	7.1
Sodium	UG/L	20000	6070	6370	5450
Thallium	UG/L	0.5		6.6	
Vanadium	UG/L	-	17.5	19.0	6.2
Zinc	UG/L	2000	54.2	70.3	34.2

NYSDEC Conservation. 1998. TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June, Class GA.

Concentration Exceeds Criteria.

Only Detected Results Reported.

TABLE 5-9

EOD RANGE (SS-026)
TENTATIVELY IDENTIFIED COMPOUNDS IN 1994 SI SAMPLES

SAMPLE MEDIUM	ANALYTE	TYPE*	FREQUENCY OF DETECTION	MAXIMUM DETECTED CONCENTRATION (ppb)
Surface and Subsurface soil	Aldol Condensation Product	SVOC	10/11	52000
	Unknown	SVOC	11/11	5000
Groundwater	Aldol Condensation Product	SVOC	6/6	20
	Molecular Sulfur	SVOC	2/6	3
	Prometon	SVOC	3/6	38
	Unknown	SVOC	6/6	73

* No VOC TICs detected for soil or groundwater.

NOTE: Aldol condensation product is a laboratory artifact.

TABLE 6-1

EOD RANGE (SS-026)
Physical Properties of Chemical Compounds in Soils and Groundwater

	Water Solubility (mg/L at 25°C) unless indicated otherwise	Koc	Henry's Law Constant (atm-m³/mole)	Vapor Pressure (mm Hg at 20°C) unless indicated otherwise	log Kow
VOLATILE ORGANIC COMPOUNDS					
Halogenated Hydrocarbons					
Methylene Chloride	16,700	25	3.19E-03	3.62E+02	1.3
Non-Halogenated Hydrocarbons					
Toluene	535	242	5.93E-03	2.87E+01 (25°C)	2.7
Ketones					
Acetone	Miscible [1]	1	3.67E-05[1]	2.31E+02 (25°C)[1]	-0.24[1]
SEMIVOLATILE ORGANIC COMPOUNDS					
PAHs (# of phenol rings)					
Acenaphthene (2)	3.42	2,580	2.34E-04	1E-3 to 1E-2	4.3
Benzo(a)anthracene (4)	0.014	125,719	6.6E-07[3]	5.00E-09	5.6
Benzo(a)pyrene (5)	0.0038	282,185	1.26E-02	5.00E-09 (25°C)	6.0
Benzo(b)fluoranthene (4)	0.0012[3]	1,148,497	1.20e-05[3]	1E-11 to 1E-6	6.6
Benzo(k)fluoranthene (4)	0.0	2,020,971	1.04E-03	9.59E-11	6.8
Benzo(g,h,i)perylene (5)	0.00026	7,762,471[3]	1.40E-07[3]	1.00E-10	7.2
Chrysene (4)	0.002	420,108	7.26E-20[3]	1E-11 to 1E-6	5.6
Dibenzo(a,h)anthracene (5)	0.0005	1,659,587[3]	7.33E-09[3]	1.00E-10 (25°C)	6.0
Fluoranthene (3)	0.3	19,800	1.69E-02[3]	1E-6 to 1E-4	5.3
Fluorene (2)	2.0	5,835	1.17E-04	1E-3 to 1E-2	4.2
Indeno(1,2,3-cd)pyrene (5)	0.6	30,902,954[3]	2.96E-20[3]	1.00E-11	7.7
2-Methylnaphthalene (2)	24.6 [3]	8,500	5.05E-04[2]	1.11E-04 (25°C)[2]	3.86[2]
Naphthalene (2)	34.4	1,300	3.60E-04	4.92E-02	3.4
Phenanthrene (3)	1.3	2,300	1.08E-04	6.80E-04	4.5
Pyrene (4)	0.1	63,400	1.09E-05[3]	6.85E-07	5.3
Carbazole	2 (?°C)[28]	NA	4.40E+01[28]	4.00E+02 (323°C)[18]	3.29[18]
Phenols					
4-Methylphenol	22,600 (40°C)	17	9.60E-07[1]	1.30E-01[1]	1.94[1]
Phthalates					
bis(2-Ethylhexyl)phthalate	0.4	12,200	1.10E-05[3]	2.00E-07	8.7
Diethylphthalate	1,000 (32°C)	123	8.46E-07	5.00E-02 (70°C)	3.7
Di-n-butylphthalate	13	217	6.30E-05[3]	1.00E-01 (115°C)	5.2
Miscellaneous					
Dibenzofuran	10 [3]	2,140	NA	2.96E-06 (25°C)[2]	4.31[2]
PESTICIDES AND PCBS					
4,4'-DDE	0.12	155,000	2.34E-05	6.50E-06	5.7
4,4'-DDT	0.006	238,000	3.8E-05[3]	1.90E-07	4.0
EXPLOSIVES					
RDX	60* (23°C)	NA	NA	NA	0.87*

NA - Not Available.

Notes:

Koc - the organic carbon-water partition coefficient. It indicates the tendency of an organic chemical to partition between particles containing organic carbon and water. The partition coefficient is defined as the concentration of chemical adsorbed onto organic carbon in soil or sediment divided by the amount of chemical in the water. Chemicals with high Koc values tend to be adsorbed onto organic rich soil/sediments and characteristically have low water solubilities. Chemicals with low Koc values have low tendencies to adsorb to soil/sediments and usually have high solubilities in water.

Henry's Law Constant - also called the air-water partition coefficient. Chemicals with Henry's Law constants <1E-7 atm-m^3/mole are less volatile than water and would be expected to remain in water. Chemicals with values in the range from 1E-7 to 1E-5 atm-m^3/mole volatilize slowly. Volatilization is an important transfer mechanism for chemicals with values from 1E-5 to 1E-3 atm-m^3/mole. Chemicals with values >1E-3 atm-m^3/mole volatilize rapidly.

Vapor Pressure - chemicals with high vapor pressures (>10mm Hg at 20°C) are more likely to volatilize than chemicals with low vapor pressures (<1 ppm at 20°C).

Kow - the octanol-water partition coefficient. It is a measure of the degree to which an organic chemical will preferentially dissolve in water or an organic solvent. The partition coefficient is defined as the equilibrium concentration of the chemical in octanol divided by the equilibrium concentration in water. The greater the octanol-water coefficient, the less mobile the chemical tends to be in the environment.

References:

All Koc values are from the following reference except where indicated otherwise:

Fetter,C.W.,1989. Applied Hydrogeology, Second Edition, Merrill Publishing Company, Columbus, Ohio.

All values for water solubility, Henry's constant, vapor pressure, and Kow are from the following reference except where indicated otherwise:

USEPA, 1983. Treatability Manual, Volume I. Treatability Data, Document Number EPA-600/2-82-001a, Washington, D.C.

[1]Howard, P.H., 1989, 1990, 1991, 1993. Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Lewis Publishers, Volumes I, II, III, IV, Chelsea, Michigan.

[2]Mackey, Donald, Wan Ying Shiu, and Kuo Ching Ma, 1992. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Vol. II, Lewis Publishers, Ann Arbor, Michigan.

[3]Montgomery, J.H., and L.M. Welkom, 1990. Groundwater Chemicals Desk Reference, Lewis Publishers, Volumes I, II, Chelsea, Michigan.

[18]Verschveren, K., 1983. Handbook of Environmental Data on Organic Chemicals, 2nd Edition, Van Nostrand Reinhold Company, Inc., New York, New York.

[28]USEPA, 1987. Hazardous Waste Treatment, Storage and Disposal Facilities (TSDF) - Air Emissions Models, Doc. No. EPA-450/3-87-026, Washington, D.C.

*USEPA, 1987. Risk Reduction Engineering Laboratory, "RREL Treatability Database", Version 5.0, EPA-600/c-93/003b.

TABLE 7-1

EOD RANGE (SS-026)

EXPOSURE CONCENTRATIONS OF SURFACE SOIL CHEMICALS

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Exposure Concentration
Methylene Chloride	UG/KG	54	16.05	Log	16
Acetone	UG/KG	46	30.67	Normal	31
Toluene	UG/KG	17	8.32	Log	8.32
4-Methylphenol (p-cresol)	UG/KG	814	322.33	Log	322
Naphthalene	UG/KG	18100	1637.28	Log	1637
2-Methylnaphthalene	UG/KG	12900	1261.78	Log	1262
Acenaphthene	UG/KG	20600	1818.01	Log	1818
Dibenzofuran	UG/KG	13800	1325.42	Log	1325
Fluorene	UG/KG	21600	1896.47	Log	1896
Phenanthrene	UG/KG	72000	6534.41	Log	6534
Carbazole	UG/KG	19200	1718.58	Log	1719
Di-n-butylphthalate	UG/KG	352	460.55	Log	352
Fluoranthene	UG/KG	57500	5608.99	Log	5609
Pyrene	UG/KG	58600	5664.42	Log	5664
Benzo(a)anthracene	UG/KG	57700	5060.55	Log	5061
Chrysene	UG/KG	26100	2242.97	Log	2243
bis(2-Ethylhexyl)phthalate	UG/KG	679	517.46	Log	517
Benzo(b)fluoranthene	UG/KG	14700	1390.15	Log	1390
Benzo(k)fluoranthene	UG/KG	12400	1222.19	Log	1222
Benzo(a)pyrene	UG/KG	17900	1607.9	Log	1608
Indeno(1,2,3-cd)pyrene	UG/KG	14700	1390.15	Log	1390
Dibenz(a,h)anthracene	UG/KG	8840	970.31	Log	970
Benzo(g,h,i)perylene	UG/KG	15600	1455.65	Log	1456
4,4'-DDE	UG/KG	1	2.03	Log	1.00
4,4'-DDT	UG/KG	3	2.2	Normal	2.20
RDX	UG/KG	1500	1.88E+26	Log	1500
Dioxins & Furans (Toxicity Equivalence)	NG/KG	0.08	0.1	Log	0.08
Selenium	MG/KG	7.6	3.61	Normal	3.61
Zinc	MG/KG	153	120.22	Log	120.22

TABLE 7-2

EOD RANGE (SS-026)

EXPOSURE CONCENTRATIONS OF SOIL CHEMICALS

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Exposure Concentration
Methylene Chloride	UG/KG	54	11.23	Log	11
Acetone	UG/KG	46	25.33	Normal	25
Toluene	UG/KG	17	7.32	Log	7
4-Methylphenol (p-cresol)	UG/KG	814	275.37	Log	275
Naphthalene	UG/KG	18100	805.79	Log	806
2-Methylnaphthalene	UG/KG	12900	685.8	Log	686
Acenaphthene	UG/KG	20600	859.38	Log	859
Dibenzofuran	UG/KG	13800	706.45	Log	706
Diethylphthalate	UG/KG	780	397.69	Log	398
Fluorene	UG/KG	21600	880.19	Log	880
Phenanthrene	UG/KG	72000	1823.95	Log	1824
Carbazole	UG/KG	19200	828.54	Log	829
Di-n-butylphthalate	UG/KG	352	356.1	Log	352
Fluoranthene	UG/KG	57500	1613.04	Log	1613
Pyrene	UG/KG	58600	1625.29	Log	1625
Benzo(a)anthracene	UG/KG	57700	1570.54	Log	1571
Chrysene	UG/KG	26100	976.08	Log	976
bis(2-Ethylhexyl)phthalate	UG/KG	679	388.32	Log	388
Benzo(b)fluoranthene	UG/KG	14700	728.71	Log	729
Benzo(k)fluoranthene	UG/KG	12400	673.41	Log	673
Benzo(a)pyrene	UG/KG	17900	793.13	Log	793
Indeno(1,2,3-cd)pyrene	UG/KG	14700	728.71	Log	729
Dibenz(a,h)anthracene	UG/KG	8840	580.74	Log	581
Benzo(g,h,i)perylene	UG/KG	15600	748.86	Log	749
4,4'-DDE	UG/KG	1	1.92	Log	1.00
4,4'-DDT	UG/KG	3	2.03	Normal	2.03
RDX	UG/KG	1500	32667.31	Log	1500
Dioxins & Furans (Toxicity Equivalence)	UG/KG	0.15	0.58	Log	0.15
Selenium	NG/KG	7.6	4.61	Log	4.61
Silver	MG/KG	1.3	0.49	Log	0.49
Zinc	MG/KG	153	132.38	Log	132.38

NOTE:
Exposure to soil includes surface and subsurface soil data.

TABLE 7-3

EOD RANGE (SS-026)

EXPOSURE CONCENTRATIONS OF GROUNDWATER CHEMICALS

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Exposure Concentration
Acetone	UG/L	15	7.66	Log	7.66
bis(2-Ethylhexyl)phthalate	UG/L	4	5.04	Normal	4
RDX	UG/L	6.1	4.43	Log	4.43
Arsenic	UG/L	4.9	4.33	Log	4.33
Beryllium	UG/L	0.74	0.63	Normal	0.63
Cadmium	UG/L	4.1	4.22	Log	4.1
Mercury	UG/L	0.29	0.23	Log	0.23
Selenium	UG/L	12.05	19.86	Log	12.05
Thallium	UG/L	1.3	3.66	Log	1.3
EXPOSURE CONCENTRATIONS OF GROUNDWATER SEEP SAMPLES					
Arsenic	UG/L	7.4	SEE NOTE		7.4
Selenium	UG/L	12.85	"		12.85
Thallium	UG/L	6.6	"		6.6

NOTE:
Since only two samples of groundwater seep samples were collected, the exposure concentration was set equal to the maximum detection (UCL95 was not caslculated).

TABLE 7-4

EOD RANGE (SS-026)
POTENTIAL PATHWAYS OF EXPOSURE - CURRENT USE CONDITIONS

POTENTIALLY CONTAMINATED MEDIUM	POTENTIAL ROUTES OF EXPOSURE	POTENTIAL RECEPTORS	PATHWAY COMPLETE?
Surface Soil (onsite)	Dermal absorption, incidental ingestion	Trespassers (Adults and Teenagers)	Yes. While participating in onsite activities such as biking and walking, contact with soil is likely.
Subsurface Soil (onsite)	Dermal absorption, incidental ingestion	Trespassers (Adults and Teenagers)	No. Trespassers do not make contact with subsurface soil.
Air (onsite)	Inhalation of volatile contaminants from soil, surface water and/or fugitive dust	Trespassers (Adults and Teenagers)	Yes. This pathway is complete for fugitive dust since the site is barren. Volatilzation from soil is unlikely since few volatiles were detected onsite at few sample locations and at relatively low concentrations. Surface water was not observed onsite.
Groundwater (onsite)	Dermal absorption, ingestion, inhalation	Trespassers (Adults and Teenagers)	No. Groundwater onsite is not currently used for any purpose.
Groundwater (offsite)	Dermal absorption, ingestion, inhalation	Residents (Adults and Children)	No. Residents use a municipal potable water supply.
Groundwater Seeps (onsite)	Dermal absorption	Trespassers (Adults and Teenagers)	Yes. While participating in onsite activities such as biking and walking, incidental contact with groundwater seeps is likely.
Surface Water	Dermal absorption, incidental ingestion	Trespassers (Adults and Teenagers)	No. This medium was not observed onsite. No fishing or swimming activities can take place onsite.

TABLE 7-5

EOD RANGE (SS-026)
POTENTIAL PATHWAYS OF EXPOSURE - FUTURE USE CONDITIONS

POTENTIALLY CONTAMINATED MEDIUM	POTENTIAL ROUTES OF EXPOSURE	POTENTIAL RECEPTORS	PATHWAY COMPLETE?
Soil* (onsite)	Dermal absorption, incidental ingestion	Residents and construction workers	Yes. While participating in intrusive activities construction workers could make contact with this medium. Residents may contact regraded soil while being outside.
Air (onsite)	Inhalation of volatile contaminants from soil, surface water and/or fugitive dust	Construction workers only	Yes. This pathway is complete for fugitive dust during construction since the site will be excavated. Construction workers will be exposed to fugitive dust. Residents will not be exposed since the site is expected to be paved or landscaped after it is developed.ince the site is barren. Volatiilzationfrom soil is unlikely since few volatiles were detected onsite at few samples and at relatively low concentrations. Surface water wasnot observed onsite.
Groundwater (onsite)	Dermal absorption, ingestion, inhalation	Residents only	Yes. There is a remote possibility that groundwater onsite may be used as a potable water supply.
Groundwater (offsite)	Dermal absorption, ingestion, inhalation	Residents (Adults and Children)	No. Residents use a municipal potable water supply.
Surface Water	Dermal absorption, incidental ingestion	Residents and constrruction workers	No. This medium was not observed onsite. No fishing or swimming activities can take place onsite.

NOTE - *Soil consists of surface and subsurface soil combined.

TABLE 7-6

EOD RANGE (SS-026)
CURRENT AND FUTURE LAND USE
MODELED RESPIRABLE FUGITIVE DUST CONCENTRATIONS FOR SOIL

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	EXPOSURE CONCENTRATION (CSD) (Dimensionless)	MODELING EXPOSURE FACTOR (MEF) (mg/m^3)	RESPIRABLE CONCENTRATION (CA) (mg/m^3)
CURRENT USE:	SURFACE SOIL:			
Methylene Chloride	1.61E-02	1.61E-08	8.54E-02	1.37E-09
Acetone	3.07E-02	3.07E-08	8.54E-02	2.62E-09
Toluene	8.32E-03	8.32E-09	8.54E-02	7.11E-10
4-Methylphenol (p-cresol)	3.22E-01	3.22E-07	8.54E-02	2.75E-08
Naphthalene	1.64E+00	1.64E-06	8.54E-02	1.40E-07
2-Methylnaphthalene	1.26E+00	1.26E-06	8.54E-02	1.08E-07
Acenaphthene	1.82E+00	1.82E-06	8.54E-02	1.55E-07
Dibenzofuran	1.33E+00	1.33E-06	8.54E-02	1.13E-07
Fluorene	1.90E+00	1.90E-06	8.54E-02	1.62E-07
Phenanthrene	6.53E+00	6.53E-06	8.54E-02	5.58E-07
Carbazole	1.72E+00	1.72E-06	8.54E-02	1.47E-07
Di-n-butylphthalate	3.52E-01	3.52E-07	8.54E-02	3.01E-08
Fluoranthene	5.61E+00	5.61E-06	8.54E-02	4.79E-07
Pyrene	5.66E+00	5.66E-06	8.54E-02	4.84E-07
Benzo(a)anthracene	5.06E+00	5.06E-06	8.54E-02	4.32E-07
Chrysene	2.24E+00	2.24E-06	8.54E-02	1.92E-07
bis(2-Ethylhexyl)phthalate	5.17E-01	5.17E-07	8.54E-02	4.42E-08
Benzo(b)fluoranthene	1.39E+00	1.39E-06	8.54E-02	1.19E-07
Benzo(k)fluoranthene	1.22E+00	1.22E-06	8.54E-02	1.04E-07
Benzo(a)pyrene	1.61E+00	1.61E-06	8.54E-02	1.37E-07
Indeno(1,2,3-cd)pyrene	1.39E+00	1.39E-06	8.54E-02	1.19E-07
Dibenz(a,h)anthracene	9.70E-01	9.70E-07	8.54E-02	8.29E-08
Benzo(g,h,i)perylene	1.46E+00	1.46E-06	8.54E-02	1.24E-07
4,4'-DDE	1.00E-03	1.00E-09	8.54E-02	8.54E-11
4,4'-DDT	2.20E-03	2.20E-09	8.54E-02	1.88E-10
RDX	1.50E+00	1.50E-06	8.54E-02	1.28E-07
Dioxins & Furans (Toxicity Equivalence)	8.00E-08	8.00E-14	8.54E-02	6.83E-15
Selenium	3.61E+00	3.61E-06	8.54E-02	3.08E-07
Zinc	1.20E+02	1.20E-04	8.54E-02	1.03E-05
FUTURE USE:	SURFACE/SUBSURFACE SOIL:			
Methylene Chloride	1.12E-02	1.12E-08	3.31E-01	3.72E-09
Acetone	2.53E-02	2.53E-08	3.31E-01	8.38E-09
Toluene	7.32E-03	7.32E-09	3.31E-01	2.42E-09
4-Methylphenol (p-cresol)	2.75E-01	2.75E-07	3.31E-01	9.11E-08
Naphthalene	8.06E-01	8.06E-07	3.31E-01	2.67E-07
2-Methylnaphthalene	6.86E-01	6.86E-07	3.31E-01	2.27E-07
Acenaphthene	8.59E-01	8.59E-07	3.31E-01	2.84E-07
Dibenzofuran	7.06E-01	7.06E-07	3.31E-01	2.34E-07
Diethylphthalate	3.98E-01	3.98E-07	3.31E-01	1.32E-07
Fluorene	8.80E-01	8.80E-07	3.31E-01	2.91E-07
Phenanthrene	1.82E+00	1.82E-06	3.31E-01	6.04E-07
Carbazole	8.29E-01	8.29E-07	3.31E-01	2.74E-07
Di-n-butylphthalate	3.52E-01	3.52E-07	3.31E-01	1.17E-07
Fluoranthene	1.61E+00	1.61E-06	3.31E-01	5.34E-07
Pyrene	1.63E+00	1.63E-06	3.31E-01	5.38E-07
Benzo(a)anthracene	1.57E+00	1.57E-06	3.31E-01	5.20E-07
Chrysene	9.76E-01	9.76E-07	3.31E-01	3.23E-07
bis(2-Ethylhexyl)phthalate	3.88E-01	3.88E-07	3.31E-01	1.29E-07
Benzo(b)fluoranthene	7.29E-01	7.29E-07	3.31E-01	2.41E-07
Benzo(k)fluoranthene	6.73E-01	6.73E-07	3.31E-01	2.23E-07
Benzo(a)pyrene	7.93E-01	7.93E-07	3.31E-01	2.63E-07
Indeno(1,2,3-cd)pyrene	7.29E-01	7.29E-07	3.31E-01	2.41E-07
Dibenz(a,h)anthracene	5.81E-01	5.81E-07	3.31E-01	1.92E-07
Benzo(g,h,i)perylene	7.49E-01	7.49E-07	3.31E-01	2.48E-07
4,4'-DDE	1.00E-03	1.00E-09	3.31E-01	3.31E-10
4,4'-DDT	2.03E-03	2.03E-09	3.31E-01	6.72E-10
RDX	1.50E+00	1.50E-06	3.31E-01	4.97E-07
Dioxins & Furans (Toxicity Equivalence)	1.50E-07	1.50E-13	3.31E-01	4.97E-14
Selenium	4.61E+00	4.61E-06	3.31E-01	1.53E-06
Silver	4.90E-01	4.90E-07	3.31E-01	1.62E-07
Zinc	1.32E+02	1.32E-04	3.31E-01	4.38E-05

EQUATIONS:

CSD = CS × 0.000001

CA = CSD × MEF

TABLE 7-7

EOD RANGE (SS-026)
TRANSFER EFFICIENCIES AND EXPOSURE CONCENTRATIONS FOR CHEMICALS VOLATILIZING FROM GROUNDWATER DURING SHOWERING

CHEMICAL	DIFFUSION COEFFICIENT IN AIR (Da) (m^2/s)	DIFFUSION COEFFICIENT IN WATER (Dw) (m^2/s)	HENRY'S LAW CONSTANT[1] (H) (torr · m^3/mol)	TRANSFER EFFICIENCY (Ø) (unitless)	EXPOSURE CONCENTRATION IN GROUNDWATER (Cw) (mg/l)	EXPOSURE CONCENTRATION IN AIR (Ca) (mg/m^3)
Acetone[1]	1.24E-05	1.14E-09	1.90E-02	3.40E-01	7.66E-03	3.90E-01
bis(2-Ethylhexyl)phthalate	3.51E-06	3.66E-10	2.28E-04	3.91E-03	4.00E-03	2.34E-03
RDX	7.54E-06	7.40E-10	NA	NA	4.43E-03	NA

PARAMETER	SYMBOL	UNITS	VALUE
Diffusivity of Radon in Air	Dar	m^2/s	2.00E-05
Diffusivity of Radon in Water	Dwr	m^2/s	1.40E-09
Henry's Law Constant for Radon	Hr	torr · m^3/mol	70
Transfer Efficiency for Radon	Ør	unitless	0.7
Ideal Gas Constant	R	m^3 · torr/mol · K	0.062396
Temperature	T	K	298
Volume of Water Used During Shower	Vw	liters	300
Volume of Shower	Vs	m^3	2

$$Ø = Ør \cdot \{ [2.5/(Dwr^{2/3})] + [R \cdot T/(Dar^{2/3} \cdot Hr)] \}/\{ [2.5/(Dw^{2/3})] + [R \cdot T/(Da^{2/3} \cdot H)] \}$$

$$Ca = Vw \cdot Ø \cdot Cw / Vs$$

NA - Not available

[1] Henry's Law constants and annotated diffusion coefficients were obtained from the following reference:
USEPA, December 1987. Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) - Air Emission Models. (EPA-450/3-87-26)
The remaining diffusion coefficients were calculated using the Hayduk and Laudie method for air and the FSG method for water (Handbook of Chemical Property Estimation Methods).

TABLE 7-8

EOD RANGE (SS-026)
SUMMARY OF EXPOSURE PARAMETERS
CURRENT USE SCENARIO

PARAMETER	ADULT TRESPASSER				TEENAGE TRESPASSER			
	SURFACE SOIL			GROUNDWATER SEEPS	SURFACE SOIL			GROUNDWATER SEEPS
	INGESTION	DERMAL CONTACT	INHALATION OF FUGITIVE DUST	DERMAL CONTACT	INGESTION	DERMAL CONTACT	INHALATION OF FUGITIVE DUST	DERMAL CONTACT
CS	mg/kg	mg/kg	—	—	mg/kg	mg/kg	—	—
CA	—	—	mg/m³	—	—	—	mg/m³	—
CW	—	—	—	mg/l				mg/l
IR	100 mg/day (5)	—	1.3 m³/hr (3)	—	100 mg/day (2)	—	1.5 m³/hr (3)	—
CF	0.000001 kg/mg (1)	0.000001 kg/mg (1)	—	0.001 l/cm³	0.000001 kg/mg (1)	0.000001 kg/mg (1)	—	0.001 l/cm³
FI	1.0 (unitless) (1)	—	—	—	1.0 (unitless) (1)	—	—	—
ET	—	—	4 hours/day (5)	4 hours/event (5)	—	—	4 hours/day (5)	4 hours/even (5)
EF	78 days/year (5)	78 events/year (5)	78 days/year (5)	78 events/year (5)	78 days/year (5)	78 events/year (5)	78 days/year (5)	78 events/yea (5)
ED	30 years (5)	30 years (5)	30 years (5)	30 years (5)	6 years (5)	6 years (5)	6 years (5)	6 years (5)
SA	—	7,948 cm²/event (3)	—	7,948 cm²/event (3)	—	7,948 cm²/event (3)	—	7,948 cm²/event (3)
AF	—	1.0 mg/cm² (4)	—	1.0 mg/cm² (4)	—	1.0 mg/cm² (4)	—	1.0 mg/cm² (4)
ABS	—	(6)	—	—	—	(6)	—	—
PC	—	—	—	cm/hr (4)	—	—	—	cm/hr (4)
BW	70 kg (1)	70 kg (1)	70 kg (1)	70 kg (1)	56 kg (3)	56 kg (3)	56 kg (3)	70 kg (1)
AT (carcinogens)	25,550 days (1)	25,550 days (1)	25,550 days (1)	25550 days (1)	25,550 days (1)	25,550 days (1)	25,550 days (1)	25550 days (1)
AT (noncarcinogens)	10,950 days (1)	10,950 days (1)	10,950 days (1)	10950 days (1)	2,190 days (1)	2,190 days (1)	2,190 days (1)	2,190 days (1)

NOTES:

CS - Chemical concentration in surface soil
CA - Chemical concentration in air
IR - Ingestion rate or inhalation rate
CF - Conversion factor
FI - Fraction ingested
ET - Exposure time
EF - Exposure frequency
ED - Exposure duration
ET - Exposure time
SA - Skin surface area available for contact
AF - Soil to skin adherence factor
ABS - Absorption factors
PC - Permeability constant
BW - Body weight
AT - Averaging time

EQUATIONS:

Soil Ingestion: Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)

Dermal Contact with Soil: Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)

Inhalation of Fugitive Dust: Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Dermal Contact with Groundwater Seeps: Absorbed Dose = (CW × CF × SA × PC × ET × EF × ED) / (BW × AT)

SOURCES:

(1) USEPA, 1989a. Risk Assessment Guidance for Superfund.
(2) USEPA, 1991a. Standard Default Exposure Factors (Supplemental Guidance Memorandum).
(3) USEPA, 1990a. Exposure Factors Handbook.
(4) USEPA, 1992a. Dermal Exposure Assessment: Principles and Applications.
(5) Professional judgement - See text.
(6) Maddaloni 1999 - see text.

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TABLE 7-9

EOD RANGE (SS-026)
SUMMARY OF EXPOSURE PARAMETERS
FUTURE USE SCENARIO

PARAMETER	RESIDENT																				CONSTRUCTION WORKER								
	SOIL*								GROUNDWATER												SOIL*								
	INGESTION				DERMAL CONTACT				INGESTION			DERMAL CONTACT			INHALATION OF VAPORS WHILE SHOWERING					DERMAL CONTACT			INGESTION			INHALATION OF FUGITIVE DUST		
	ADULT	CHILD			ADULT	CHILD			ADULT			ADULT																	
CS			mg/kg				mg/kg		—			—			—							mg/kg			mg/kg			—		
CA	—	—			—	—			—			—				mg/m³					—			—				mg/m³	
CW	—	—			—	—				mg/l			mg/l		—						—			—			—		
IR	100	200	mg/day	(2)	—	—			2	liter/day	(1)	—			0.6	m³/hr	(1)				—			480	mg/day	(2)	3.0	m³/hr	(3)
CF	0.000001	0.000001	kg/mg	(1)	0.000001	0.000001	kg/mg	(1)	—			0.001	l/cm²		—						0.000001	kg/mg	(1)	0.000001	kg/mg	(1)	—		
FI	1.0	1.0	(unitless)	(5)	—	—			—			—			—						—			1.0	(unitless)	(5)	—		
ET	—	—			—	—			—			0.21	hours/day**	(1)	0.21	hours/day**	(1)				—			—			8	hours/day	(2)
EF	350	350	days/year	(5)	350	350	events/year	(5)	350	days/year	(1)	350	days/year	(1)	350	days/year	(1)				60	events/year	(5)	60	days/year	(5)	60	days/year	(5)
ED	24	6	years	(2)	24	6	years	(2)	30	years	(2)	30	years	(2)	30	years	(2)				0.25	years	(5)	0.25	years	(5)	0.25	years	(5)
SA	—	—			7,948	3,520	cm²/event	(5)	—			18150	cm²/hour	(1)	—						3,120	cm²/event	(5)	—			—		
AF	—	—			1.0	1.0	mg/cm²	(4)	—			—			—						1.0	mg/cm²	(4)	—			—		
ABS	—	—						(6)	—			—			—								(6)	—			—		
PC	—	—			—	—			—			cm/hr		(4)	—						—			—			—		
BW	70	15	kg	(1)	70	15	kg	(1)	70	kg	(1)	70	kg	(1)	70	kg	(1)				70	kg	(1)	70	kg	(1)	70	kg	(1)
AT (car.)	25,550	25,550	days	(1)	25,550	25,550	days	(1)	25,550	days	(1)	25,550	days	(1)	25,550	days	(1)				25,550	days	(1)	25,550	days	(1)	25,550	days	(1)
AT (noncar.)	10,950	2,190	days	(1)	10,950	2,190	days	(1)	10,950	days	(1)	10,950	days	(1)	10,950	days	(1)				91	days	(1)	91	days	(1)	91	days	(1)

NOTES:

CS - Chemical concentration in surface soil
CA - Chemical concentration in air
CW - Chemical concentration in groundwater
IR - Ingestion rate or inhalation rate
CF - Conversion factor
FI - Fraction ingested
EF - Exposure frequency
ED - Exposure duration
ET - Exposure time
SA - Skin surface area available for contact
AF - Soil to skin adherence factor
ABS - Absorption factors
PC - Permeability constant
BW - Body weight
AT - Averaging time
** - Assumes a 12 minute shower per day.

EQUATIONS:

Inhalation: Intake = (CA × IR × ET × EF × ED) / (BW × AT)
Soil Ingestion: Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)
Groundwater Ingestion: Intake = (CW × IR × EF × ED) / (BW × AT)
Dermal Contact with Soil: Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)
Dermal Contact with Groundwater Seeps: Absorbed Dose = (CW × CF × SA × PC × ET × EF × ED) / (BW × AT)

SOURCES:

(1) USEPA, 1989a. Risk Assessment Guidance for Superfund.
(2) USEPA, 1991a. Standard Default Exposure Factors (Supplemental Guidance Memorandum).
(3) USEPA, 1990a. Exposure Factors Handbook.
(4) USEPA, 1992a. Dermal Exposure Assessment: Principles and Applications.
(5) Professional judgement - See text.
(6) Maddaloni 1999 - see text.

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: CARCINOGENIC EFFECTS

Compound	USEPA Weight-of-Evidence Classification	Slope Factor (mg/kg-day)^-1		Basis for Carcinogenicity Classification
		Inhalation	Oral	
Methylene chloride	B2 (1)	0.0016 (1)	0.0075 (1)	Inadequate human data and sufficient evidence of carcinogenicity in animals: increased incidence of hepatocellular neoplasms and alveolar/bronchiolar neoplasms in male and female mice, and increased incidence of benign mammary tumors in both sexes .
4-Methylphenol (p-cresol)	C (1)	NV (1)	NV (1)	Increased incidence of skin papillomas in mice in an initiation-promotion study. The three cresol isomers produced positive results in genetic toxicity studies both alone and in combination.
Naphthalene	C (1)	NV (1)	NV (1)	Inadequate data of carcinogenicity in humans exposed to naphthalene via the oral and inhalation routes, and the limited evidence of carcinogenicity in animals via the inhalation route.
Carbazole	B2 (1)	NV (1)	0.02 (1)	—
Benzo(a)anthracene	B2 (1)	NV (1)	0.73 (2)	No human data from animal bioassays. B(a)A produced tumors in mice exposed by gavage, i.p., subcutaneous, or intramuscular injection & topical application. B(a)A produced mutations in bacteria and mammalian cells, & transformed mammalian cells . .
Chrysene	B2 (1)	NV (1)	NV (1)	No human data and sufficient data from animal bioassays. Produced carcinomas and malignant lymphoma in mice after intraperitoneal injection and skin carcinomas in mice following dermal exposure. Produced chromosomal abnormalities in hamster . . . .
bis(2-Ethylhexyl)phthalate	B2 (1)	NV (1)	0.014 (1)	Orally administered DEHP produced significant dose-related increases in liver tumor repsponses in rats and mice of both sexes.
Benzo(b)fluoranthene	B2 (1)	NV (1)	0.73 (2)	No human and sufficient data from animal bioassays. B(b)F produced tumors in mice after lung implantation, i.p. or subcutaneous injection and skin painting.
Benzo(k)fluoranthene	B2 (1)	NV (1)	0.073 (2)	No human data & sufficient data from animal bioassays. B(k)F produced tumors after lung implantation in mice and when administered with a promoting agent in skin-painting studies. Equivocal results have been found in a lung adenoma assay in mice .

Source List:
1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Value Available

USEPA Weight-of-Evidence Classification
A - Human Carcinogen
B1 or B2 - Probable Human Carcinogen
C - Possible Human Carcinogen

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: CARCINOGENIC EFFECTS

Compound	USEPA Weight-of-Evidence Classification	Slope Factor (mg/kg-day)^-1		Basis for Carcinogenicity Classification
		Inhalation	Oral	
Benzo(a)pyrene	B2 (1)	NV (1)	7.3 (2)	Human data specifically linking BAP to a carcinogenic effect are lacking. There are, however, multiple animal studies in many species demonstrating BAP to be carcinogenic following administration by numerous routes. BAP has produced positive . . .
Indeno(1,2,3-cd)pyrene	B2 (1)	NV (1)	0.73 (2)	No human data and sufficient data from animal bioassays. Produced tumors in mice following lung implants, subcutaneous injection and dermal exposure. Tested positive in bacterial gene mutation assays.
Dibenz(a,h)anthracene	B2 (1)	NV (1)	7.3 (2)	No human data & sufficient data from animal bioassays. Produced carcinomas in mice following oral or dermal exposure & injection site tumors in several species folowing subcutaneous or intramuscular administration. Has induced DNA damage . . .
4,4'-DDE	B2 (1)	NV (1)	0.34 (1)	Increased incidence of liver tumors including carcinomas in two strains of mice and in hamsters and of thyroid tumors in female rats by diet.
4,4'-DDT	B2 (1)	0.3395 (1)	0.34 (1)	Observation of tumors (generally of the liver) in seven studies in various mouse strains and three in rats. DDT is structurally similar to other probable carcinogens, such as DDD and DDE.
RDX	C (1)	NV (1)	0.11 (1)	Hepatocellular adenomas and carcinomas in female B6C3F1 mice.
Dioxin Toxicity Equivalence	B2 (1)	150,000.0 (1)	150,000.0 (1)	—
Arsenic	A (1)	15.05 (1)	1.5 (1)	Based on sufficient evidence from human data. An increased lung cancer mortality was observed in multiple human populations exposed primarily through inhalation. Also, increased mortality from multiple internal organ cancers (liver, kidney, ...
Beryllium	B1 (1)	8.4 (1)	NV (1)	Limited evidence of carcinogenicity in humans exposed to airborne beryllium (lung cancer) and sufficient evidence of carcinogenicity in animals.

Source List:
1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Value Available

USEPA Weight-of-Evidence Classification
A - Human Carcinogen
B1 or B2 - Probable Human Carcinogen
C - Possible Human Carcinogen

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: CARCINOGENIC EFFECTS

Compound	USEPA Weight-of-Evidence Classification	Slope Factor (mg/kg-day)^-1		Basis for Carcinogenicity Classification
		Inhalation	Oral	
Cadmium	B1 (1)	6.3 (1)	NV (1)	Limited evidence from occupational epidemiologic studies of cadmium is consistent across investigators and study populations. There is sufficient evidence of carcinogenicity in rats and mice by inhalation and intramuscular and subcutaneous . . . . .

Source List:

1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Value Available

USEPA Weight-of-Evidence Classification
A - Human Carcinogen
B1 or B2 - Probable Human Carcinogen
C - Possible Human Carcinogen

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS

Compound	Reference Dose (mg/kg-day)				Critical Effects			
	Inhalation		Oral		Inhalation		Oral	
	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic
Methylene chloride	0.8571 (1)	0.8571 (1)	0.06 (1)	0.06 (1)	Liver - Toxicity	Liver - Toxicity	Liver toxicity	Liver - Toxicity
Acetone	NV (1)	NV (1)	0.1 (1)	1.0 (1)	—	—	Increased liver and kidney weights and nephrotoxicity	Liver - Increased weight; Kidney - Increased weight; Kidney - Nephrotoxicity
Toluene	0.1143 (1)	NV (1)	0.2 (1)	2.0 (1)	Neurological effects	—	Changes in liver and kidney weights	Liver - Altered weight; Kidney - Altered weight
4-Methylphenol (p-cresol)	NV (1)	NV (1)	0.005 (1)	0.005 (1)	—	—	Central nervous system - Hypoactivity; Respiratory system - Distress; Whole body - Maternal death	Central nervous system - Hypoactivity; Respiratory system - Distress; Whole body - Maternal death
Naphthalene	0.0009 (1)	NV (1)	0.02 (1)	0.02 (3)	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively	—	Decreased mean terminal body weight in males	—
2-Methylnaphthalene					—	—	—	—
Acenaphthene	NV (1)	NV (1)	0.06 (1)	0.6 (1)	—	—	Hepatotoxicity	Liver - Hepatotoxicity
Dibenzofuran	NV (1)	NV (1)	NV (1)	NV (1)	—	—	—	—
Diethylphthalate	NV (1)	NV (1)	0.8 (1)	8.0 (1)	—	—	Decreased growth rate, food consumption and altered organ weights.	Whole body - Decreased growth; Organs - Decreased weight
Fluorene	NV (1)	NV (1)	0.04 (1)	0.4 (1)	—	—	Decreased RBC, packed cell volume and hemoglobin	Erythrocytes - Decreased counts
Phenanthrene	NV (1)	NV (1)	NV (1)	NV (1)	—	—	—	—

Source List:

1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Values Available
NOEL - No Observed Effects Level

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS

Compound	Reference Dose (mg/kg-day)				Critical Effects			
	Inhalation		Oral		Inhalation		Oral	
	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic
Carbazole	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Di-n-butylphthalate	NV (1)	NV (1)	0.1 (1)	1.0 (1)	–	–	Increased mortality	Whole body - Increased mortality
Fluoranthene	NV (1)	NV (1)	0.04 (1)	0.4 (1)	–	–	Nephropathy, increased liver weights, hematological alterations, and clinical effects	Kidney - Nephropathy; Liver - Weight change; Blood - Hematological changes
Pyrene	NV (1)	NV (1)	0.03 (1)	0.3 (1)	–	–	Kidney effects (renal tubular pathology, decreased kidney weights)	Kidney - Effects
Benzo(a)anthracene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Chrysene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
bis(2-Ethylhexyl)phthalate	NV (1)	NV (1)	0.02 (1)	0.02 (3)	–	–	Increased relative liver weight	–
Benzo(b)fluoranthene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Benzo(k)fluoranthene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Benzo(a)pyrene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Indeno(1,2,3-cd)pyrene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–

Source List:

1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Values Available
NOEL - No Observed Effects Level

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS

Compound	Reference Dose (mg/kg-day)				Critical Effects			
	Inhalation		Oral		Inhalation		Oral	
	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic
Dibenz(a,h)anthracene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Benzo(g,h,i)perylene	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
4,4'-DDE	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
4,4'-DDT	NV (1)	NV (1)	0.0005 (1)	0.0005 (1)	–	–	Liver lesions	Liver - Lesions
RDX	NV (1)	NV (1)	0.003 (1)	0.003 (1)	–	–	Inflammation of the prostate	Prostate - Inflammation; Prostate - Hemosiderosis
Dioxin Toxicity Equivalence	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Zinc	NV (1)	NV (1)	0.3 (1)	0.3 (3)	–	–	47% decrease in erythrocyte superoxide dismutase (ESOD) concentration in adult females after 10 weeks of zinc exposure	Blood - Decreased blood enzyme
Arsenic	NV (1)	NV (1)	0.0003 (1)	0.0003 (1)	–	–	Hyperpigmentation, keratosis and possible vascular complications.	Skin - Keratosis; Skin - Hyperpigmen
Beryllium	0.0057 (1)	NV (1)	0.002 (1)	0.005 (1)	Beryllium sensitization and pregression to CBD	–	Small intestinal lesions	None observed
Mercury	0.0001 (1)	0.0001 (1)	NV (1)	NV (1)	Hand tremor; increases in memory disturbances; slight subjective and objective evidence of autonomic dysfunction	Nervous system - Neurotoxicity	–	–
Silver	NV (1)	NV (1)	0.005 (1)	0.005 (1)	–	–	Argyria	Skin - Argyria

Source List:

1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Values Available
NOEL - No Observed Effects Level

TABLE 7-10
EOD RANGE (SS-026)
TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS

Compound	Reference Dose (mg/kg-day)				Critical Effects			
	Inhalation		Oral		Inhalation		Oral	
	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic	Chronic	Subchronic
Thallium	NV (1)	NV (1)	NV (1)	NV (1)	–	–	–	–
Cadmium	NV (1)	NV (1)	0.0005 (1)	0.0005 (3)	–	–	Significant proteinuria	–
Selenium	NV (1)	NV (1)	0.005 (1)	0.005 (1)	–	–	Clinical selenosis	Whole body - Clinical selenosis

Source List:

1 SmartTOX Database
2 Based on estimated order of potency with respect to Benzo(a)pyrene presented in USEPA.
3 Chronic RFD is used for subchronic RFD when no subchronic value is available.

NV - No Values Available
NOEL - No Observed Effects Level

TABLE 7-11

EOD RANGE (SS-026)

CANCER RISKS AND HAZARD INDICES FOR MULTIPLE HUMAN PATHWAYS

EXPOSURE PATHWAY	CURRENT USE				FUTURE USE					
	CANCER RISK		HAZARD INDEX		CANCER RISK			HAZARD INDEX		
			CHRONIC	SUBCHRONIC				CHRONIC	SUBCHRONIC	
	ADULT TRESPASSERS	TEENAGE TRESPASSERS	ADULT TRESPASSERS	TEENAGE TRESPASSERS	ADULT RESIDENT	CHILD RESIDENT	CONSTRUCTION WORKERS	ADULT RESIDENT	CHILD RESIDENT	CONSTRUCTION WORKERS
Dermal Contact with Soil*	3.E-05	8.E-06	2.E-03	8.E-04	6.E-05	3.E-05	2.E-05	3.E-03	3.E-03	1.E-04
Ingestion of Soil*	3.E-06	8.E-07	7.E-04	7.E-04	6.E-06	1.E-05	5.E-08	3.E-03	3.E-02	2.E-03
Inhalation of Fugitive Dust	7.E-12	2.E-12	3.E-06	4.E-06	-	-	2.E-12	-	-	2.E-05
Ingestion of Groundwater	-	-	-	-	8.E-05		-	7.E-01		-
Dermal Contact with Groundwater	-	-	-	-	1.E-07		-	1.E-03		-
Inhalation of Chemicals in Vapors While Showering	-	-	-	-	NV		-	NV		-
Dermal Contact with Groundwater Seeps	5.E-07	1.E-07	2.E-03	2.E-03	-		-	-		-
TOTAL EXPOSURE CANCER RISK	**4.E-05**	**9.E-06**	-	-	**2.E-04**		**2.E-05**	-		-
TOTAL EXPOSURE HAZARD INDEX	-	-	**4.E-03**	**4.E-03**	-		-	**8.E-01**		**2.E-03**

NOTES-

* - For the future use, soil consists of surface and subsurface soil combined.

- Pathway not evaluated in the HRA

TABLE 7-12
EOD RANGE (SS-026)
POTENTIAL SOURCES OF UNCERTAINTY

Potential Source	Direction of Effect	Reasons for Uncertainty
Identification of Chemicals of Potential Concern: Analytical Data	Unknown	Surficial soil and groundwater data were collected from various locations (surface soil) and an unconfined water-bearing zone (groundwater) at SS-026. Samples may not be representative of the entire site.
Background Data	Unknown	The comparisons of onsite data to background are limited by the background samples collected.
Groundwater Metals Data	Overestimate risk	Groundwater total metal results were used as opposed to filtered metals data. Groundwater used for drinking water would likely be better represented by filtered data.
Exposure Assessment:		
Likelihood of exposure pathways	Unknown/Overestimate	Pathways may not actually occur. The site's most preferred reuse is for industrial development. Site risks have been overestimated since future receptors were assumed to be site residents, not industrial workers.
Lack of consideration of transformation of chemicals	Overestimate risk	Risk estimates are based on recent chemical observations, which may decrease over time.
Exposure assumptions (frequency, duration and intensity)	Overestimate risk	Parameters are conservative estimates of exposure.

TABLE 7-12 (Con't)
EOD RANGE (SS-026)
POTENTIAL SOURCES OF UNCERTAINTY

Potential Source	Direction of Effect	Reasons for Uncertainty
Absorption of soil contaminants through skin	Overestimate risk	Dermal absorption is a function of the length of actual skin contact, which may be limited at the site.
Fugitive Dust Model and Alternative Area Source Model for Estimating Ambient Air Concentrations	Unknown	The model was designed for rapid assessment and makes several conservative assumptions that tend to overestimate risk.
Dermal absorption not calculated for all chemicals	Underestimate risk	Dermal absorption factors are available for certain chemicals only. Risk from remaining chemicals could not be quantified.
Toxicity Assessment:		
Extrapolation of animal toxicity data to humans	Unknown, probably overestimate risk	Animal studies typically involve high-dose exposures whereas humans are exposed to lower doses.
Analytes with no toxicity values	Underestimate risk	Risks associated with chemicals that lack toxicity values cannot be quantified.
Use of linearized, multi-stage model to derive cancer slope factors	Overestimate risk	Model assumes a non-threshold, linear at low dose relationship for carcinogens. Model results in a 95% upper confidence limit of the cancer risk. The true risk is unlikely to be higher and may be as low as zero.

TABLE 7-12 (Con't)
EOD RANGE (SS-026)
POTENTIAL SOURCES OF UNCERTAINTY

Potential Source	Direction of Effect	Reasons for Uncertainty
Use of uncertainty factors in derivation of reference doses	Unknown	Ten-fold uncertainty factors are incorporated to account for various sources of uncertainty (e.g., animal to human extrapolation, protection of sensitive human populations, extrapolation from subchronic to chronic data).
Risk Characterization:		
Summation of cancer and noncancer risks	Unknown	Adding risks ignores potential synergistic or antagonistic effects. Assumes similarity in mechanism of action, which is not the case for many substances.
Combination of pathways	Overestimate risk	In order to determine total site-wide risks, the risks were summed over all exposure pathways. However, the net probability of an individual being exposed to all non-exclusive pathways is very low.

TABLE 8-1

EOD RANGE (SS-026)
CANCER RISKS AND HAZARD INDICES FOR MULTIPLE HUMAN PATHWAYS

HUMAN HEALTH RISK ASSESSMENT

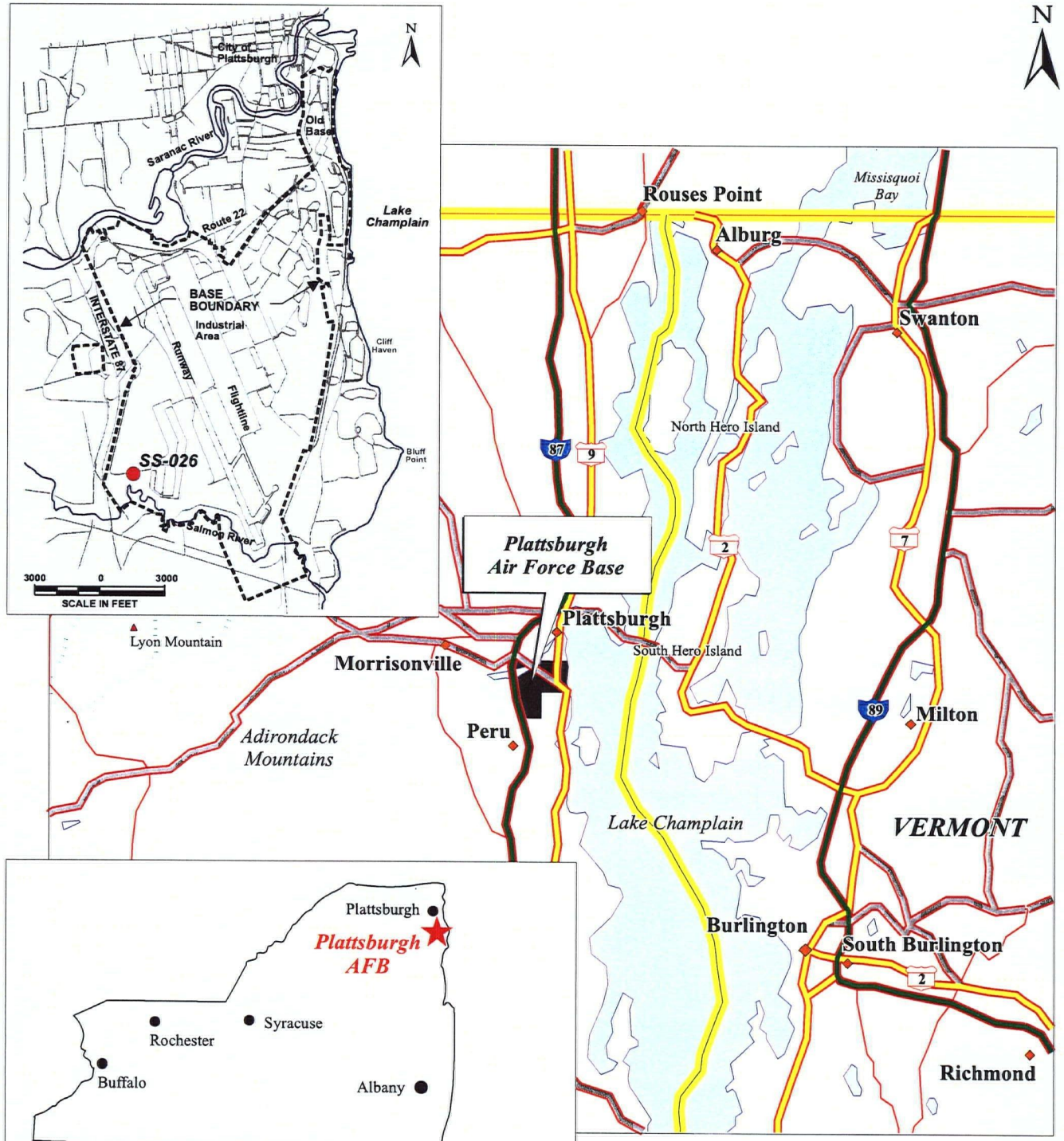
EXPOSURE PATHWAY	CURRENT USE				FUTURE USE					
	CANCER RISK		HAZARD INDEX		CANCER RISK			HAZARD INDEX		
			CHRONIC	SUBCHRONIC				CHRONIC	SUBCHRONIC	
	ADULT TRESPASSERS	TEENAGE TRESPASSERS	ADULT TRESPASSERS	TEENAGE TRESPASSERS	ADULT RESIDENTS	CHILD RESIDENT	CONSTRUCTION WORKERS	ADULT RESIDENTS	CHILD RESIDENT	CONSTRUCTION WORKERS
Dermal Contact with Soil*	3.E-05	8.E-06	2.E-03	8.E-04	6.E-05	3.E-05	2.E-05	3.E-03	3.E-03	1.E-04
Ingestion of Soil*	3.E-06	8.E-07	7.E-04	7.E-04	6.E-06	1.E-05	5.E-08	3.E-03	3.E-02	2.E-03
Inhalation of Fugitive Dust	7.E-12	2.E-12	3.E-06	4.E-06	-	-	2.E-12	-	-	2.E-05
Ingestion of Groundwater	-	-	-	-	8.E-05		-	7.E-01		-
Dermal Contact with Groundwater	-	-	-	-	1.E-07		-	1.E-03		-
Inhalation of Chemicals in Vapors While Showering	-	-	-	-	NV		-	NV		-
Dermal Contact with Groundwater Seeps	5.E-07	1.E-07	2.E-03	2.E-03	-		-	-		-
TOTAL EXPOSURE CANCER RISK	**4.E-05**	**9.E-06**	**-**	**-**	**2.E-04**		**2.E-05**	**-**		**-**
TOTAL EXPOSURE HAZARD INDEX	**-**	**-**	**4.E-03**	**4.E-03**	**-**		**-**	**8.E-01**		**2.E-03**

NOTES-

* - For the future use, soil consists of surface and subsurface soil combined.

- Pathway not evaluated in the HRA

Figures



© 1993 DeLorme Mapping

AG15015-01F0049.00-022500-NPV

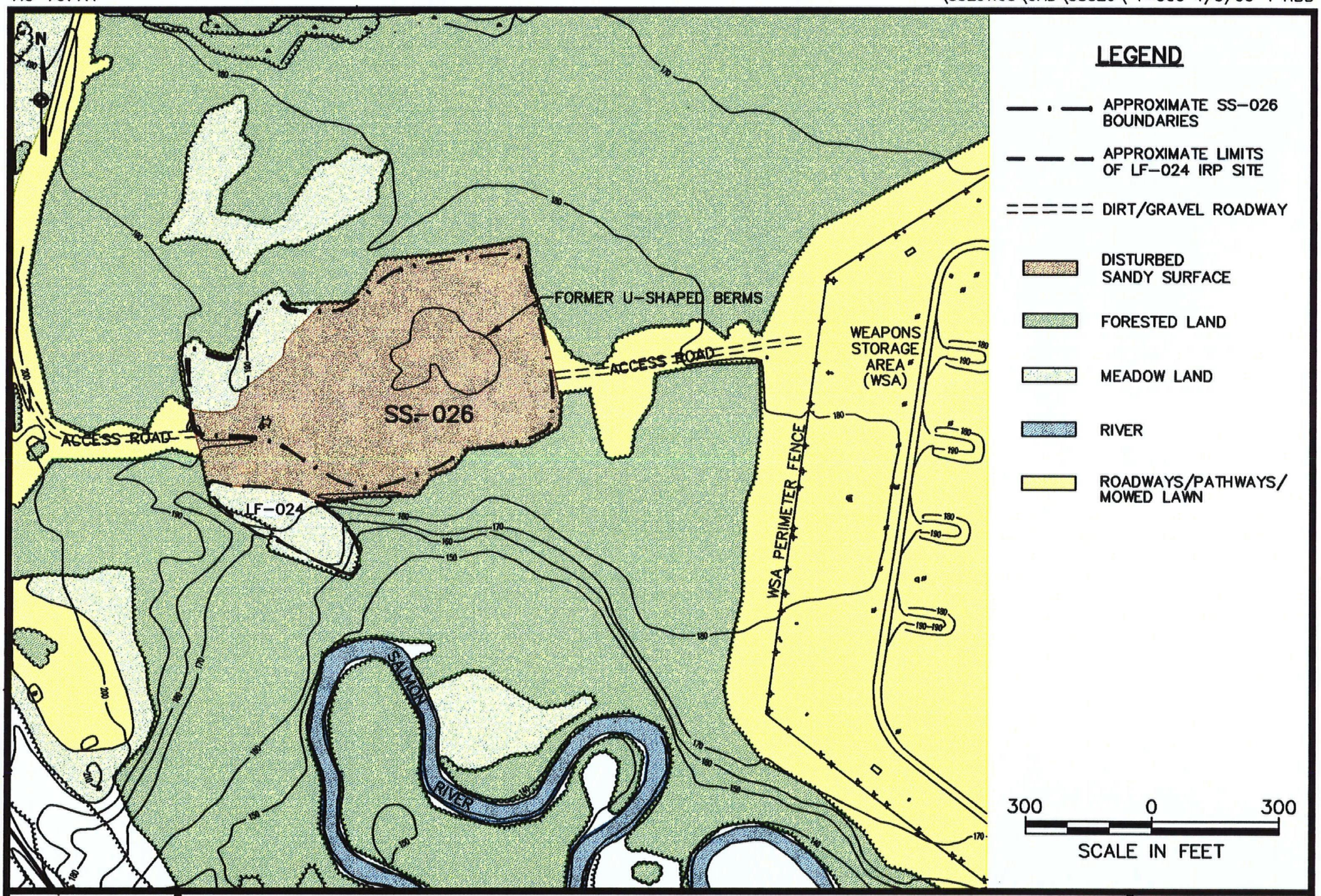
URS CONSULTANTS, INC.

PLATTSBURGH AIR FORCE BASE
LOCATION MAP

FIGURE 1-1

AC-7077A

\35291.00\CAD\SS026\ 1=300 4/3/00-1 HBB

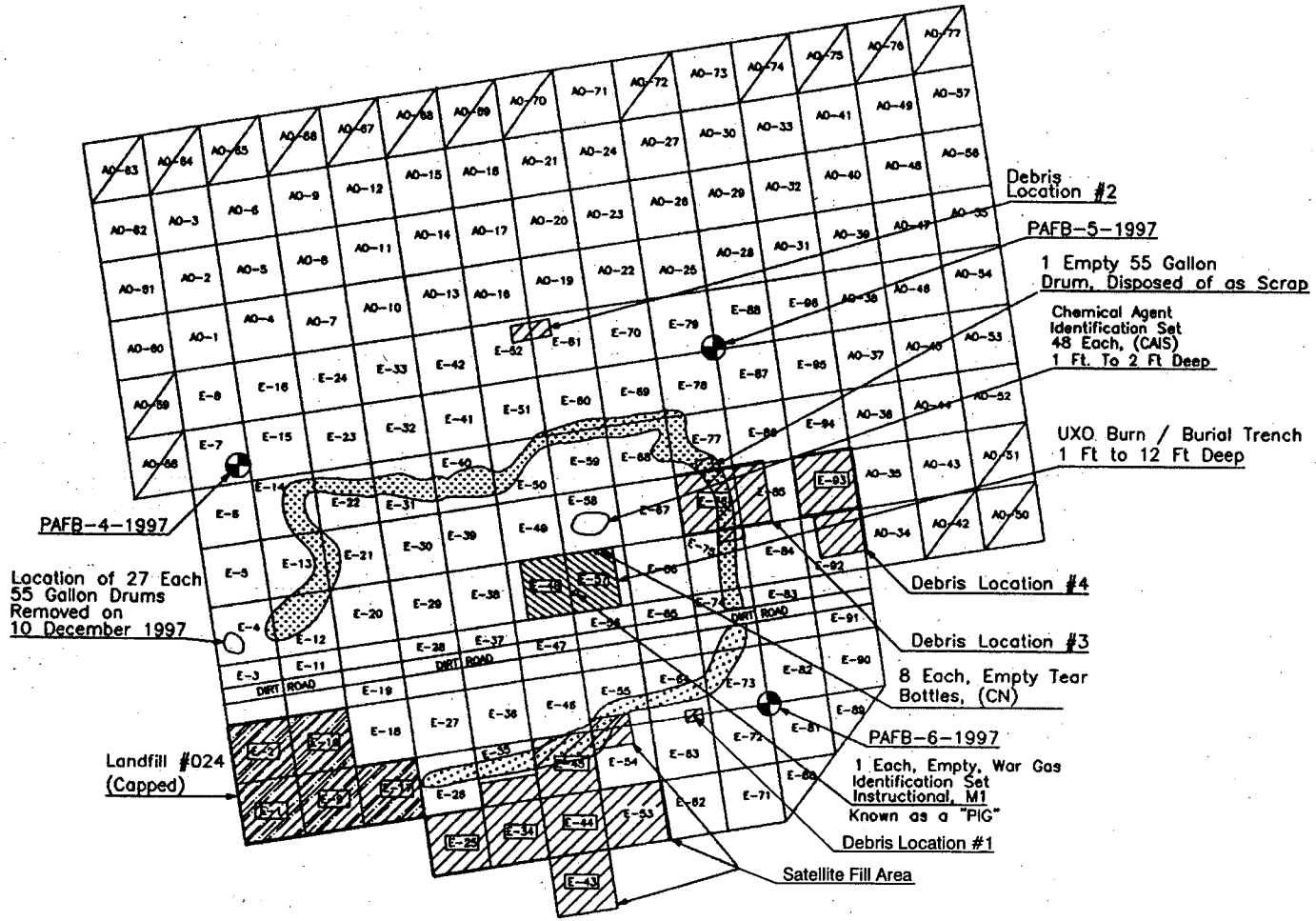


URS CONSULTANTS, INC.

SS-026 - EOD RANGE
SITE FEATURES

FIGURE 1-2

AG15116-35291.17-032400-GCM



NOTE: PATTERN INDICATES THE BERM THAT BORDERS THE EOD RANGE
THE AREA OUTSIDE THE BERM IS THE BUFFER ZONE
TOTAL AREA CLEARED, 39.05 ACRES

NOTE: PATTERN INDICATES THE UXO BURN / BURIAL TRENCH

NOTE: PATTERN INDICATES LANDFILL GRIDS

NOTE: GRIDS NOT CLEARED BECAUSE ADJACENT GRIDS CONTAINED NO UXO

NOTE: CONCRETE MONUMENT WITH DISC SET BY CDS MARKED WITH

SCALE IN FEET

SOURCE:
Final Ordnance and Explosives Removal Action Report, Human Factors Applications Inc. (HFA), May 1999

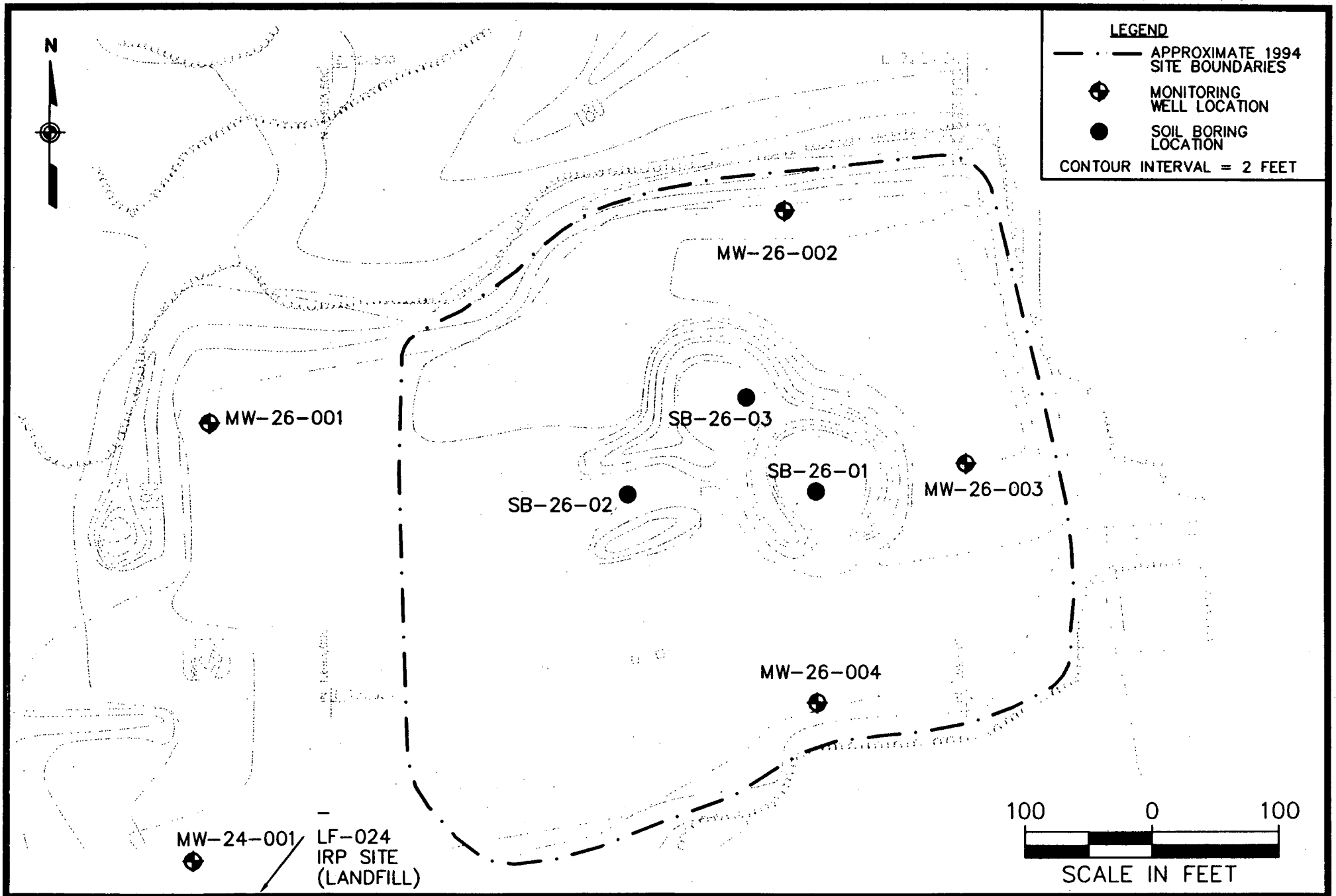
URS
CONSULTANTS, INC.

PLATTSBURGH AFB - SS-026 - EOD RANGE LOCATIONS OF NON-UXO ITEMS DISCOVERED BY RANGE SAFING CONTRACTOR IN 1997/1998

FIGURE 1-3

AC-7583A

J:\3529117\CAD\SS026\ 1=100 4/3/00-1 HBB

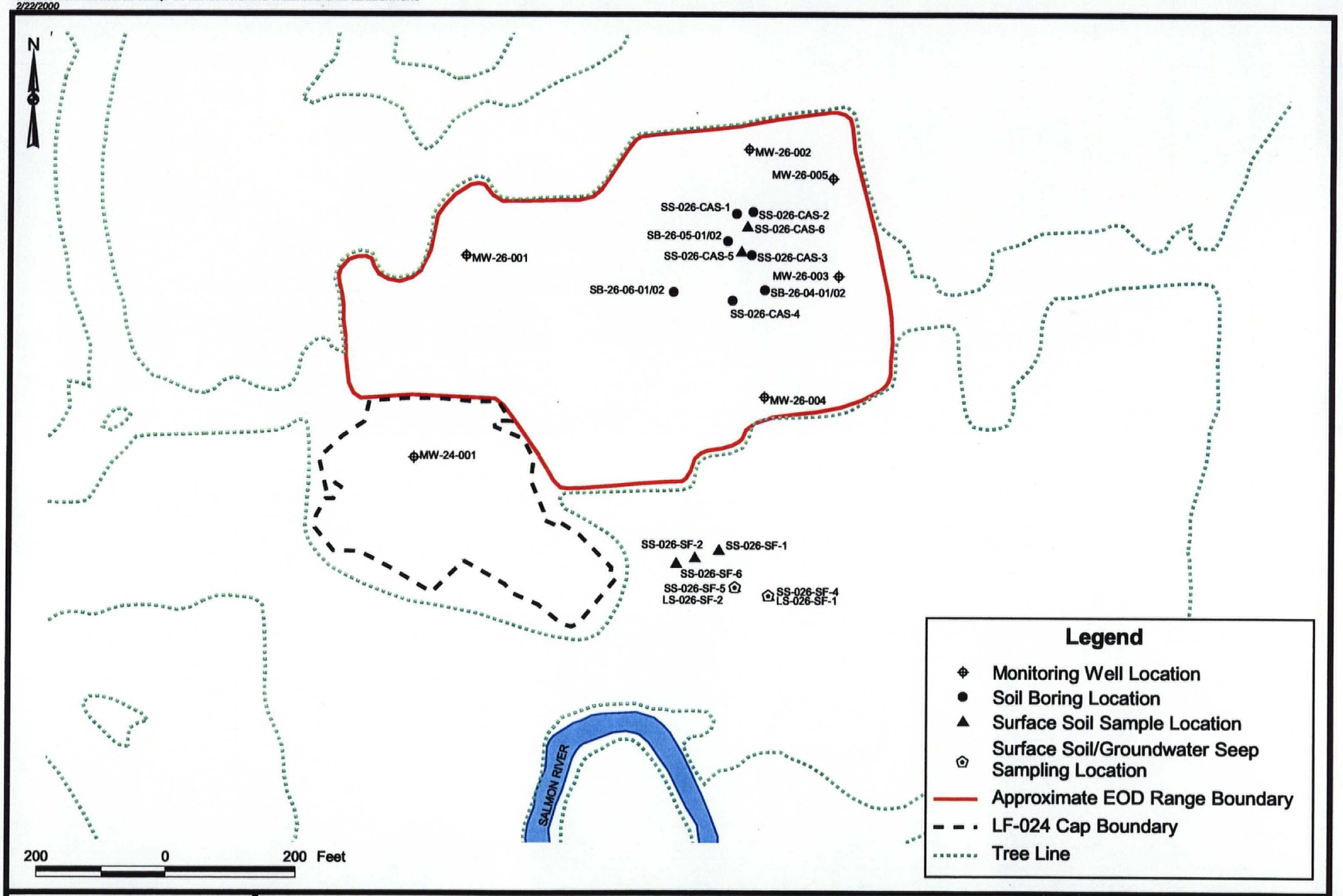


URS CONSULTANTS, INC.

SS-026 – EOD RANGE
1994 SAMPLE LOCATIONS

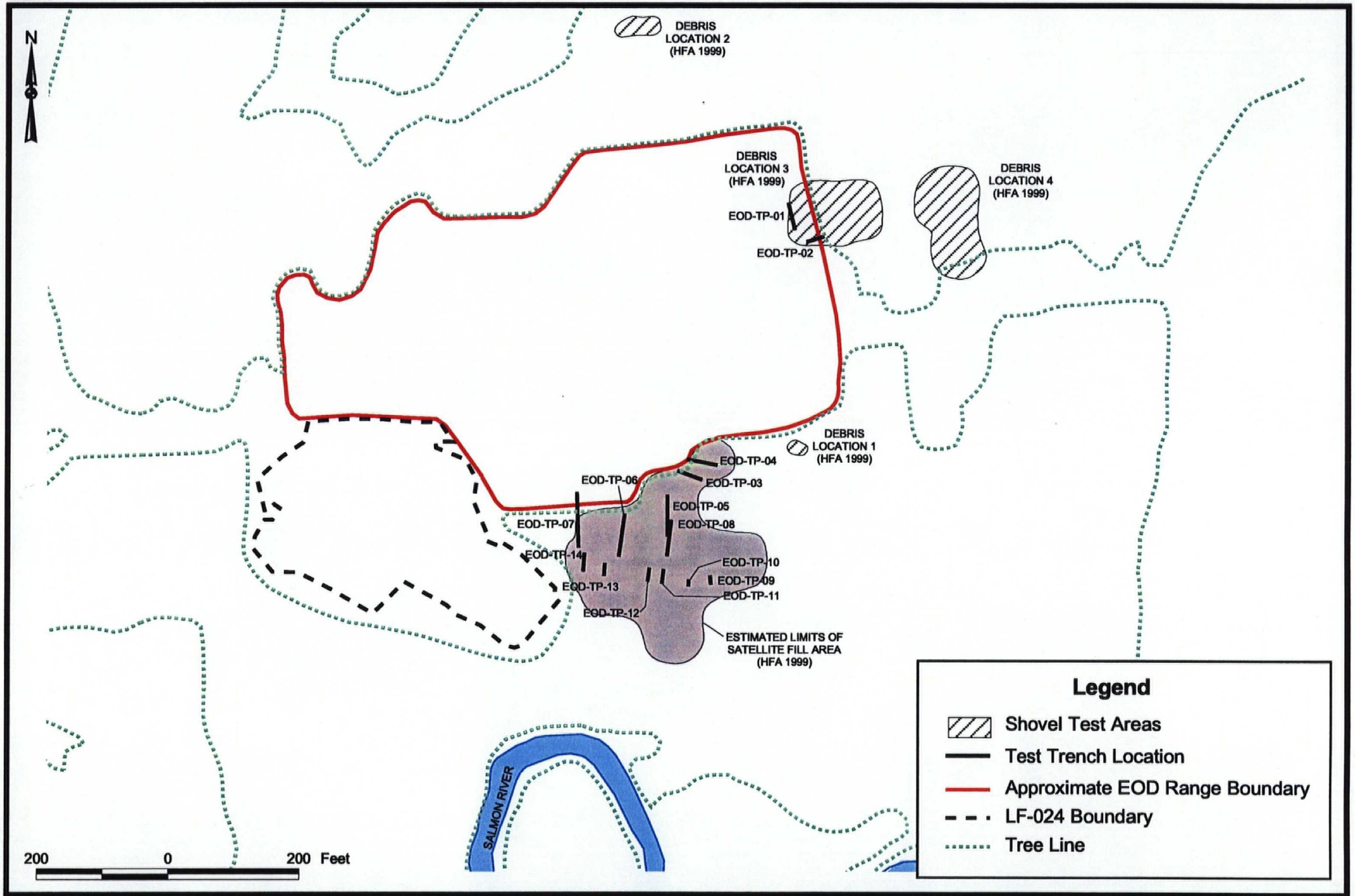
FIGURE 2-1

J:\0100013\DB\GIS\1999\ss-026.apr SS-026 MONTIORING WELL/SOIL SAMPLE LOCATIONS
2/22/2000



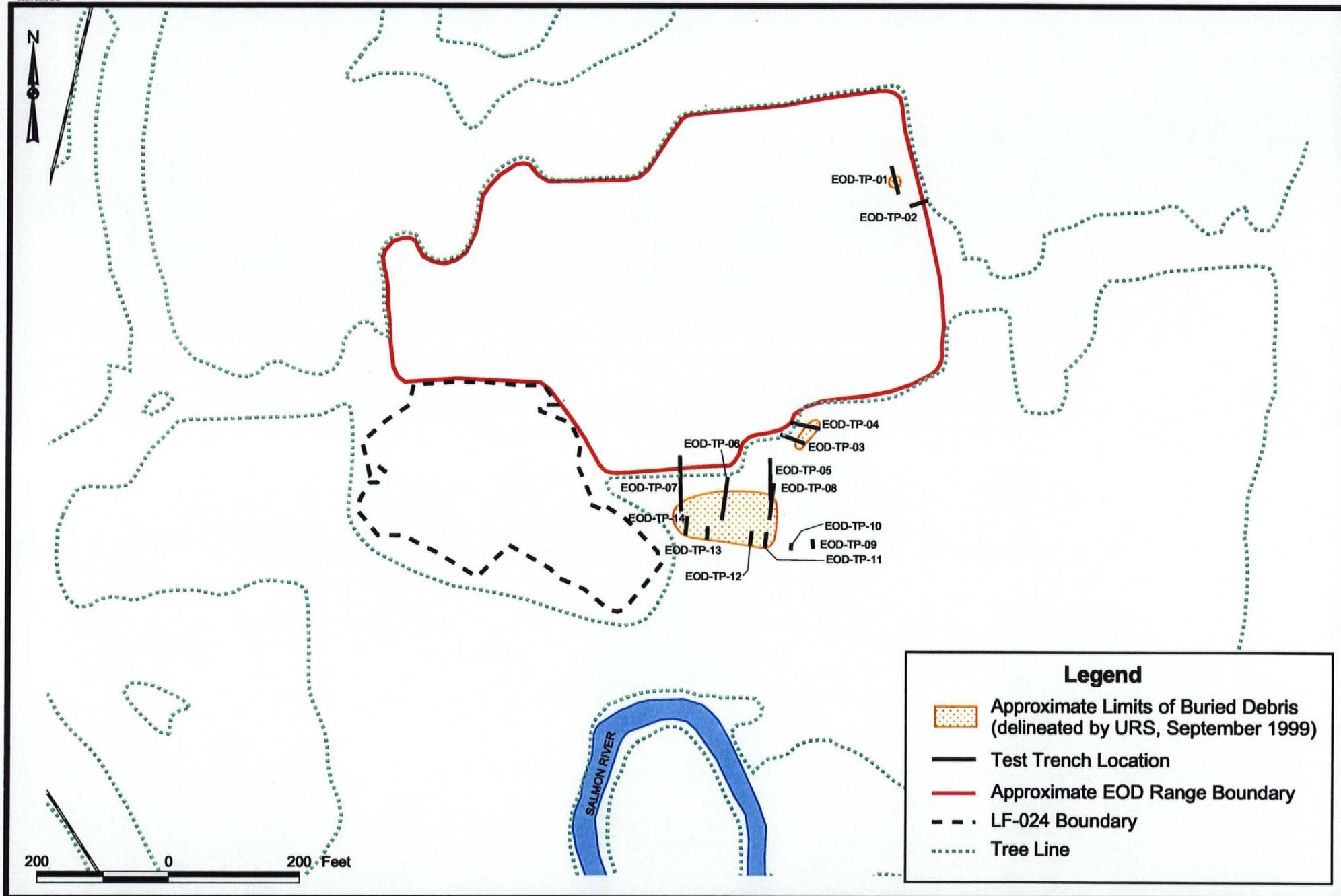
URS Consultants, Inc.	PLATTSBURGH AFB - SS-026 - EOD RANGE 1999 SUPPLEMENTAL INVESTIGATION ENVIRONMENTAL SAMPLE LOCATIONS	FIGURE 2-2

J:\0100013\DB\GIS\1999\ss-026.apr SS-026 TEST PIT LOCATIONS
2/22/2000

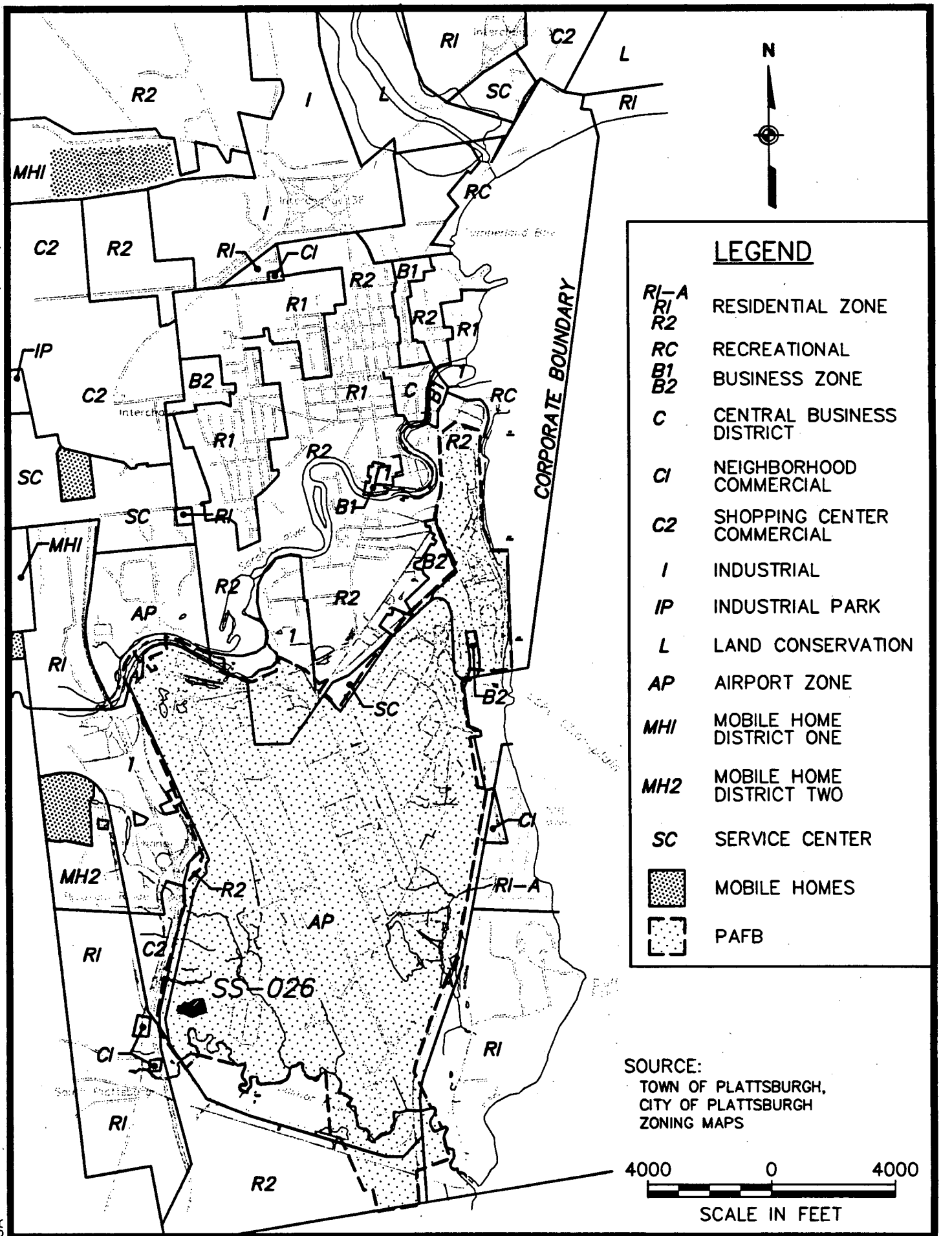


URS Consultants, Inc.	PLATTSBURGH AFB - SS-026 - EOD RANGE DEBRIS AREAS INVESTIGATED USING SHOVEL TESTS AND TEST TRENCHES	FIGURE 2-3

J:\0100013\DB\GIS\1999\ss-026.apr SS-026 LIMITS OF BURIED DEBRIS
3/27/2000



URS Consultants, Inc.	PLATTSBURGH AFB - SS-026 - EOD RANGE APPROXIMATE LIMITS OF BURIED DEBRIS (6 INCHES TO 3 FEET DEPTH)	FIGURE 2-4



35291.00\CAD\SS026 1=4000 4/3/00-1 HBB

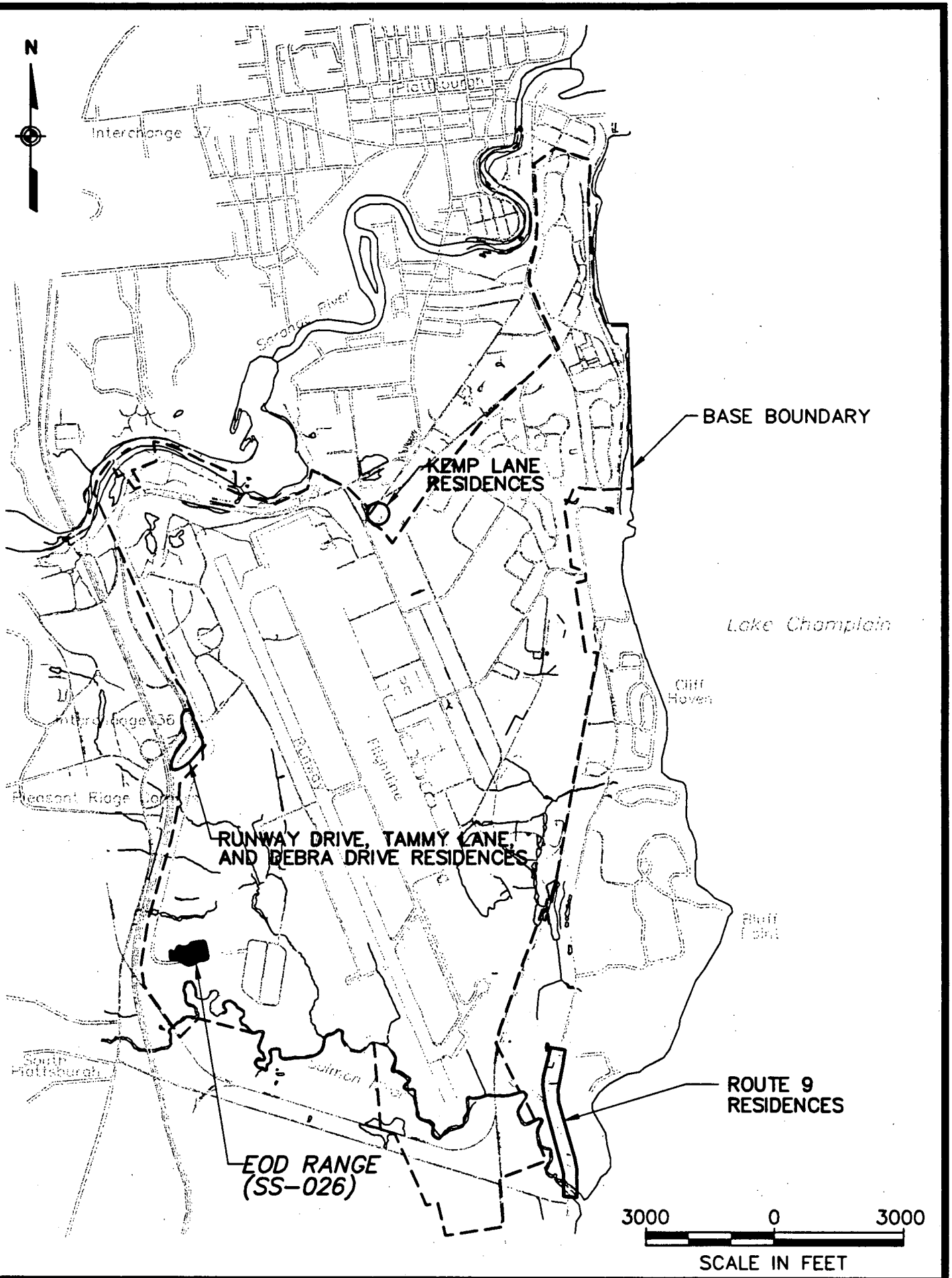
AC-6965A

URS CONSULTANTS, INC.

PLATTSBURGH A.F.B.
ZONING MAP

FIGURE 3-1

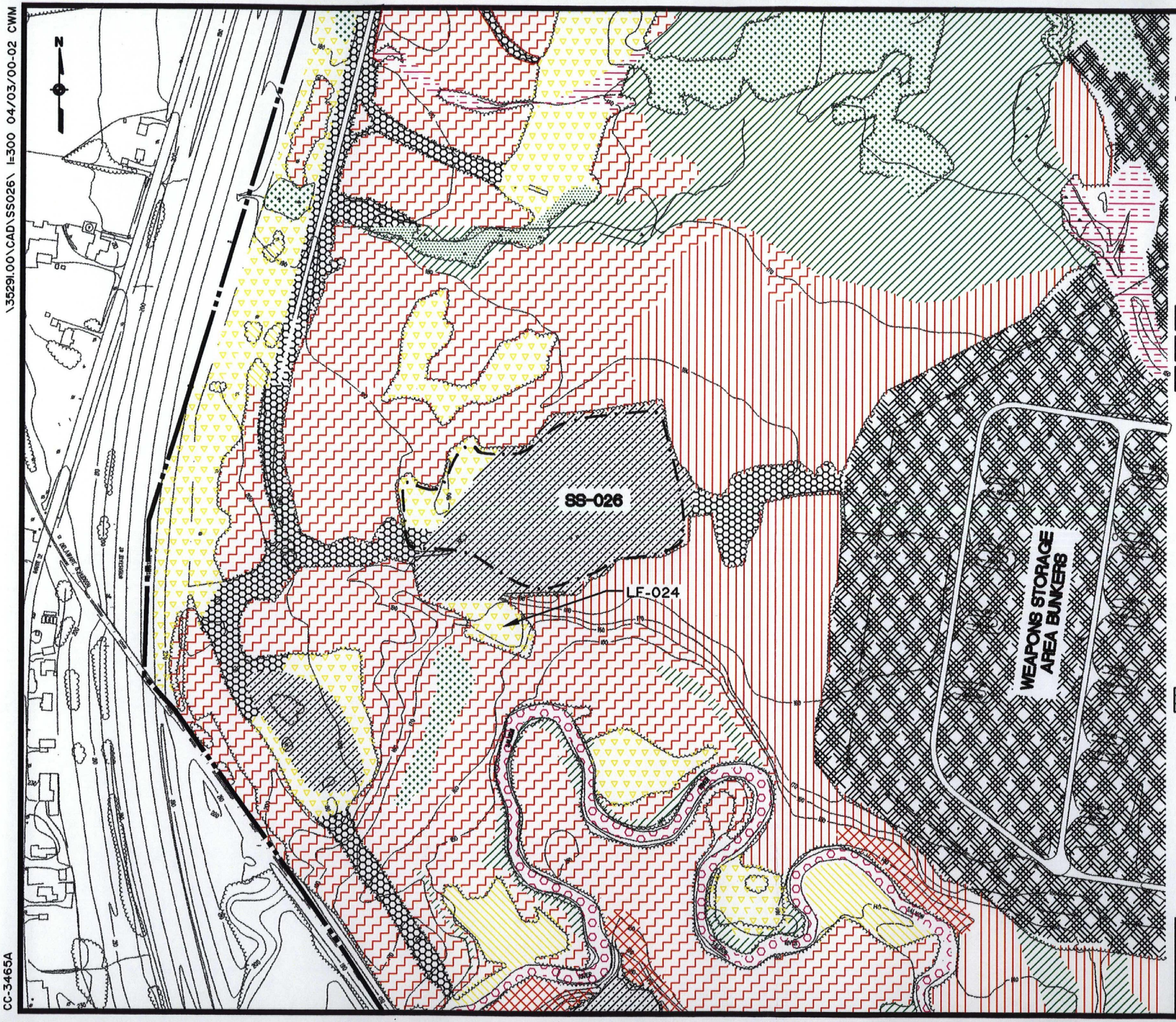
J:\35291\CAD\SS026\ 1=3000 4/3/00-1 HBB



AC-8558A

URS CONSULTANTS, INC.	PLATTSBURGH AFB LOCATIONS OF OFF-BASE RESIDENCES UTILIZING GROUNDWATER FOR POTABLE USE	FIGURE 3-2

\3529I.00\CAD\SS026\ I=300 04/03/00-02 CWM



LEGEND

APPROXIMATE SS-026 BOUNDARIES

LIMIT OF COVERTYPE INVESTIGATION

RIVERINE SYSTEM

(MS) MIDREACH STREAM

(DS) DITCH/INTERMITTENT STREAM

TERRESTRIAL SYSTEM

FORESTED COVERTYPES

(PH) PINE-HARDWOODS

(HH) HEMLOCK-HARDWOODS

(MH) MIXED HARDWOODS

NON-FORESTED COVERTYPES MODERATELY DISTURBED

(DM) DRY MEADOW

(SU) SUCCESSIONAL SHRUBLAND

NON-FORESTED COVERTYPES HIGHLY DISTURBED

(ML) MOWED LAWN

(IS) UNVEGETATED IMPERVIOUS SURFACES

(PS) UNVEGETATED PERMEABLE SURFACES

(UP) UNPAVED ROAD/ROADSIDE/ PATHWAY

PALUSTRINE SYSTEM (WETLAND)

FORESTED COVERTYPES

(HS) MIXED HARDWOODS (RED MAPLE) SWAMP

NON-FORESTED COVERTYPES

(SH) SHRUB SWAMP

(WM) WET MEADOW

NOTE:

(IS) UNVEGETATED IMPERVIOUS SURFACES ARE INDICATED WITHOUT ANY DESCRIPTIVE PATTERN. THESE ARE TYPICALLY SHOWN AS BUILDINGS, PARKING AREAS, ROADS, RUNWAYS, ETC.

300 0 300

SCALE IN FEET

SS-026 - EOD RANGE HABITAT COVERTYPES

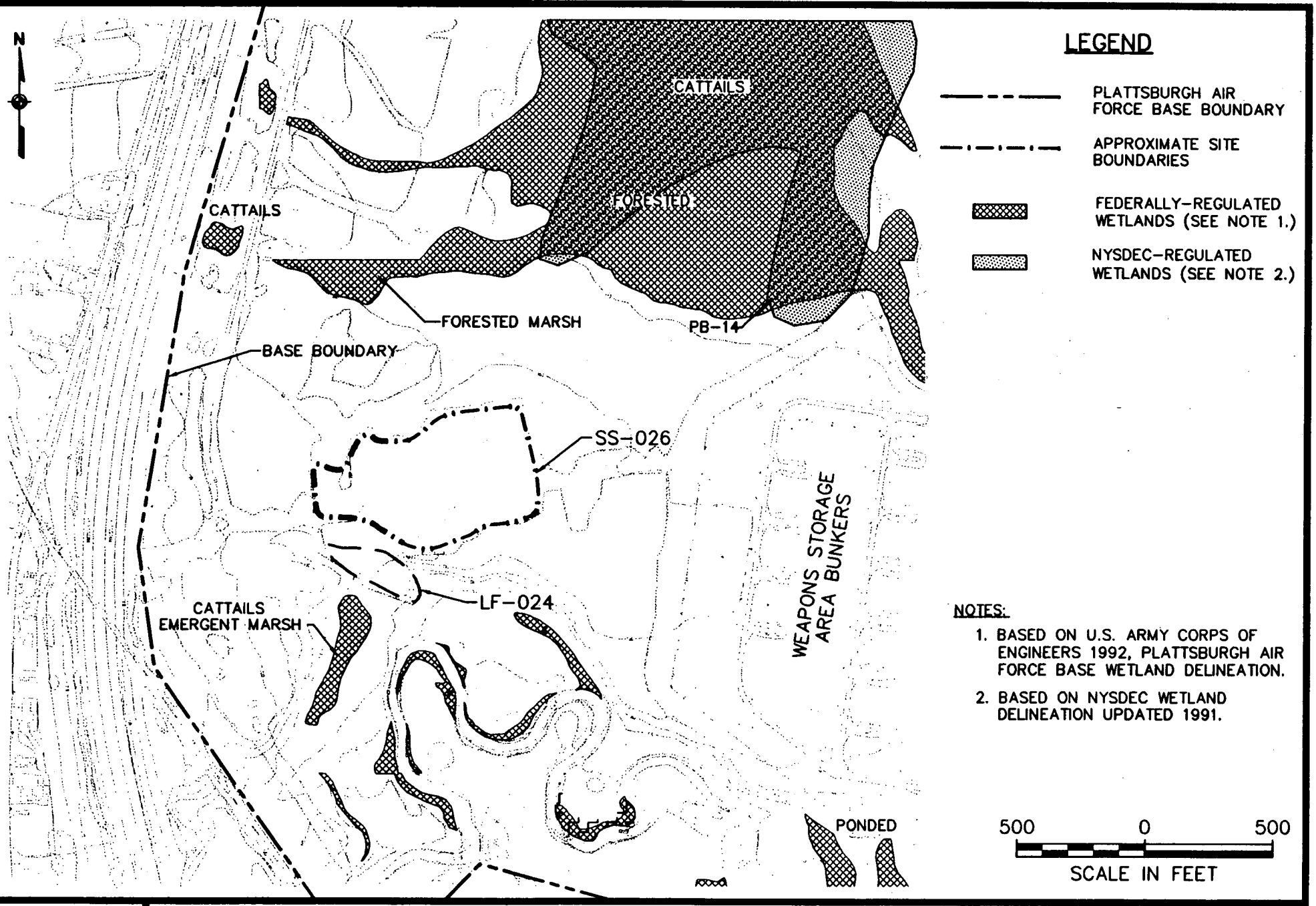
URS CONSULTANTS, INC.

FIGURE 3-3

CC-3465A

AC-6991A

\35291.00\CAD\SS026\ 1=500 4/3/00-1 HBB

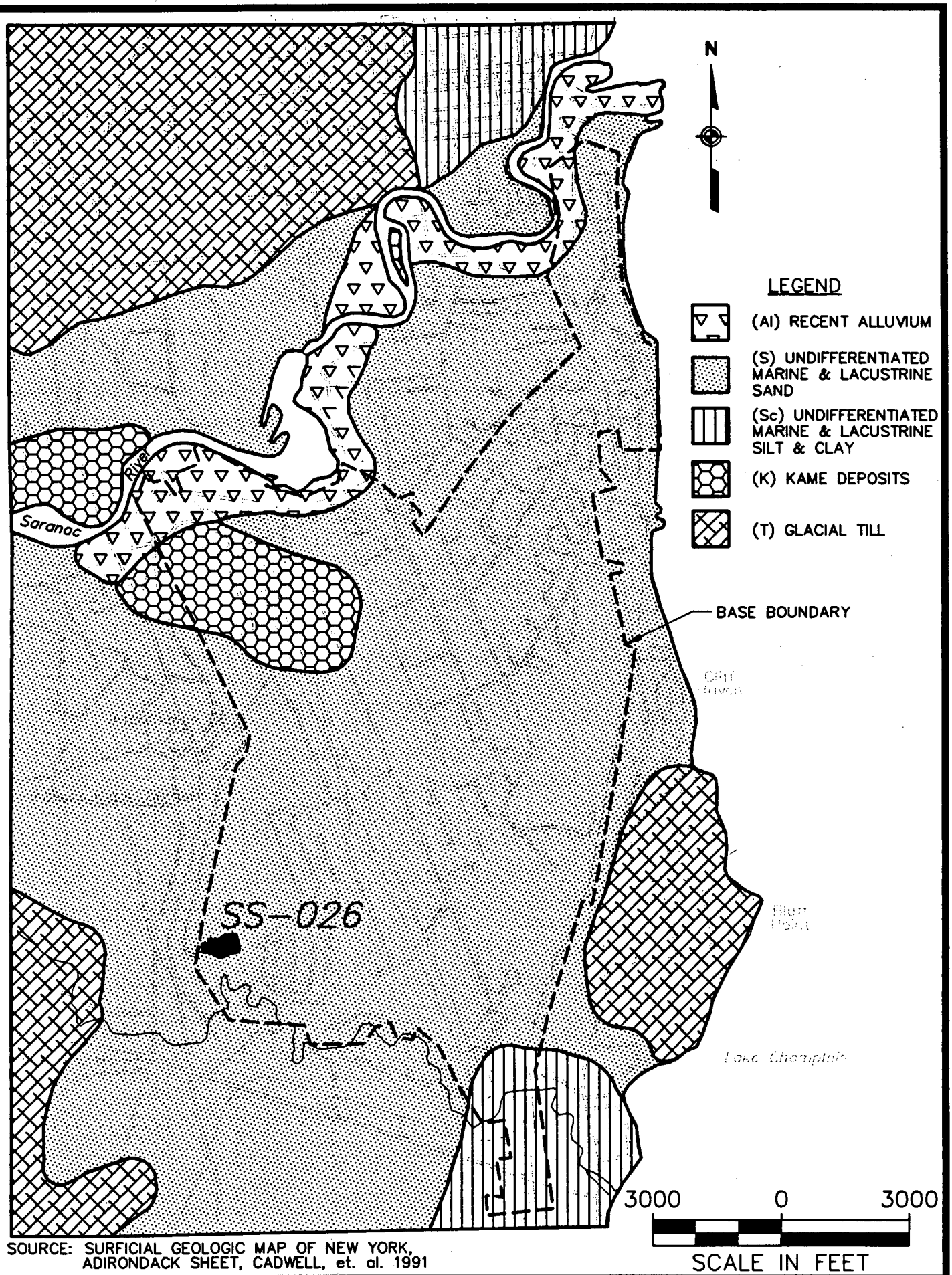


URS CONSULTANTS, INC.

SS-026 – EOD RANGE
REGULATED WETLANDS

FIGURE 3-4

35291.00\CAD\SS026 1=3000 4/3/00-1 HBB

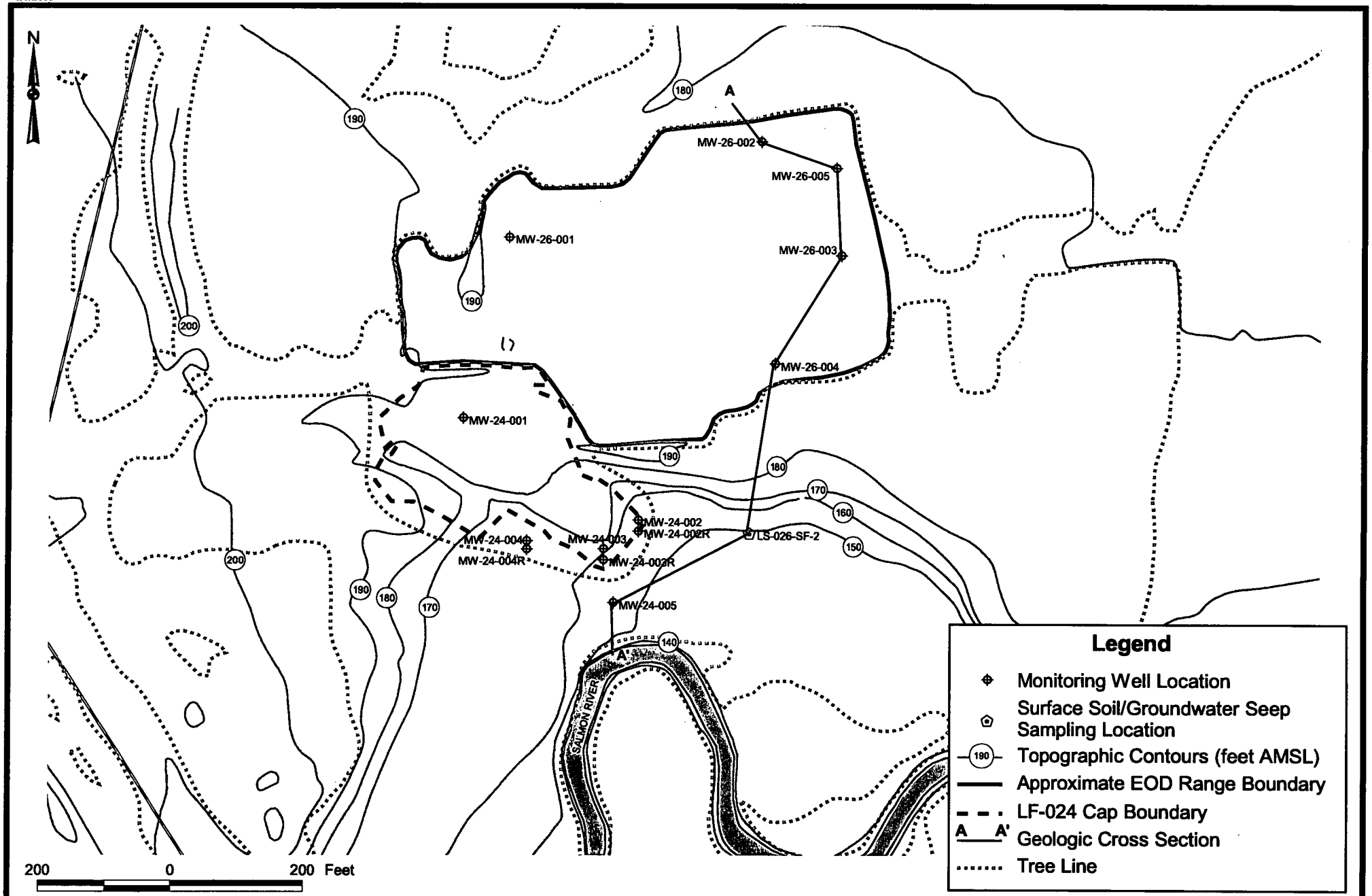


SOURCE: SURFICIAL GEOLOGIC MAP OF NEW YORK, ADIRONDACK SHEET, CADWELL, et. al. 1991

AC-7076A

URS CONSULTANTS, INC.	PLATTSBURGH A.F.B. AND VICINITY SURFICIAL GEOLOGY	FIGURE 3-5

J:\0100013\DB\GIS\1999\ss-026.apr GEOLOGIC CROSS SECTION
3/3/2000



URS Consultants, Inc.	PLATTSBURGH AFB - SS-026 - EOD RANGE GEOLOGIC CROSS SECTION A-A' LOCATION	FIGURE 3-6

\0100049\CAD\ 1=100 4/3/00-03 CWM

CHANGE IN LINE OF SECTION

APPROXIMATE NORTHERN EOD RANGE BOUNDARY

CHANGE IN LINE OF SECTION

APPROXIMATE SOUTHERN EOD. RANGE BOUNDARY

A

A'

MW-26-002 (173.58)

MW-26-005 (173.20)

MW-26-003 (173.12)

MW-26-004 (172.43)

LS-026-SF-2 (GROUNDWATER SEEP)

MW-24-005 (149.60)

SALMON RIVER

190

180

170

160

150

140

SCALE IN FEET

100 0 100

HORIZ. SCALE IN FEET
VERT. EXAGGERATION = 10X

NOTES:

1. GEOLOGICAL CONDITIONS SHOWN ARE REPRESENTATIVE OF THE CONDITIONS ENCOUNTERED AT EACH BORING LOCATION TO THE DEPTH DRILLED. EXTRAPOLATIONS BETWEEN BORINGS HAVE BEEN INTERPRETED USING STANDARDLY ACCEPTED GEOLOGIC PRACTICES AND PRINCIPLES. ACTUAL CONDITIONS MAY VARY BETWEEN BORINGS FROM THOSE SHOWN.
2. ELEVATIONS BASED ON TRANSVERSE MERCATOR PROJECTION, EAST ZONE, NORTH AMERICAN DATUM 1983.
3. GROUND SURFACE BASED ON 1990 USGS TOPOGRAPHIC MAP.
4. STRATIGRAPHIC UNIT CONTACTS ARE DASHED WHERE INFERRED.

LEGEND

MW-26-002
(173.58) GROUNDWATER ELEVATION (10/6/99 FOR ALL EXCEPT MW-24-005, WHICH IS INFERRED FROM HISTORICAL DATA)

MONITORING WELL SCREEN

BOREHOLE TERMINATION BEYOND SCREENED INTERVAL

BROWN FINE SAND TRACE TO SOME SILT

GRAY SILTY FINE SAND AND FINE SAND

SILT AND CLAY CONFINING LAYER

INFERRED WATER TABLE FROM WATER LEVEL DATA OBTAINED ON 10/6/99

SS-026 – EOD RANGE
GEOLOGIC CROSS-SECTION A-A'

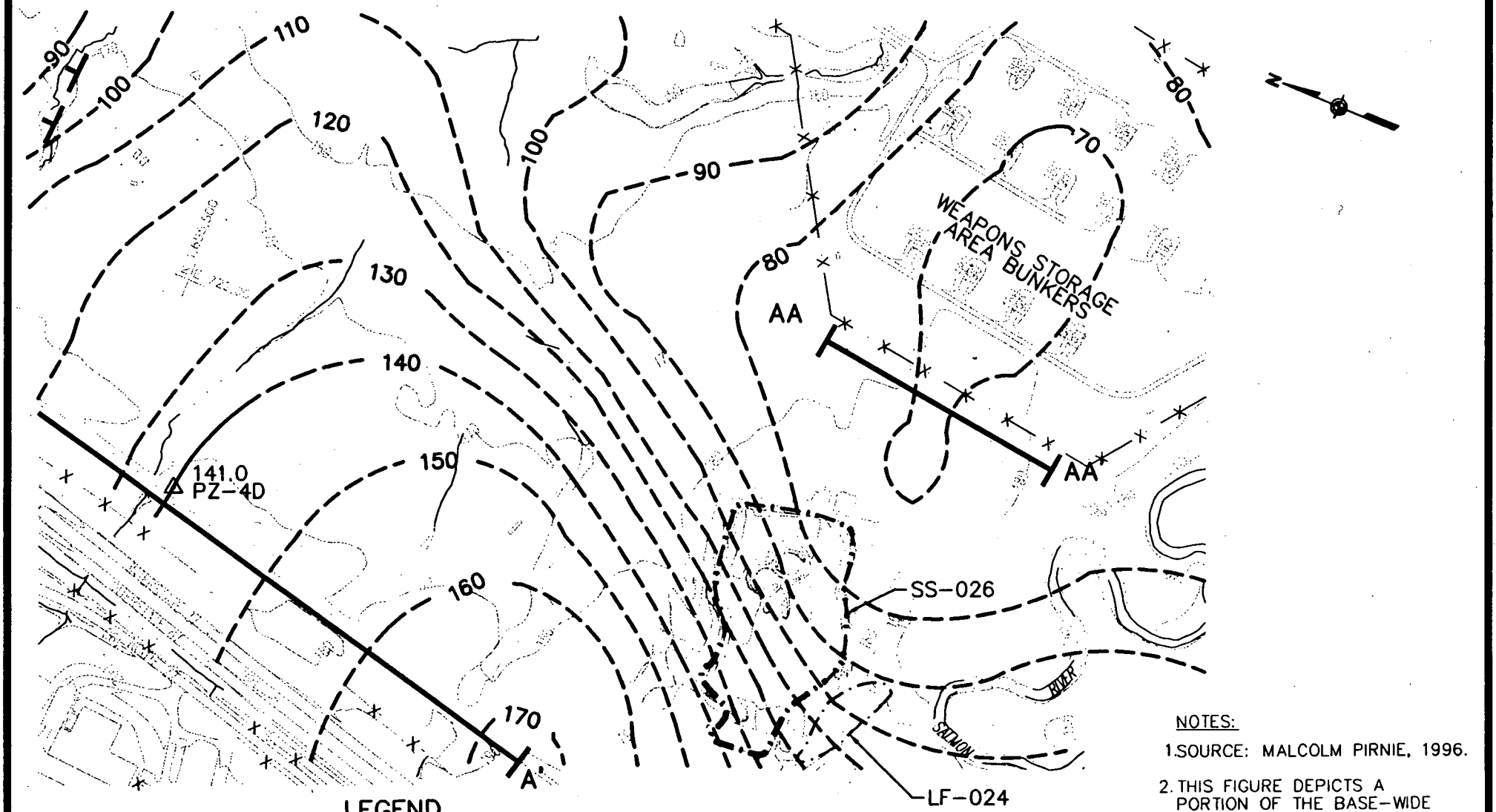
URS CONSULTANTS, INC.

FIGURE 3-7

CC-6333

AC-7593A

\0535291.00\CAD\SS026\ 1=500 4/3/00-1 HBB



LEGEND

- APPROXIMATE SS-026 BOUNDARIES
- NORMAL FAULT INFERRED BY FISHER, 1968. (HACHURES ON DOWN-DROPPED SIDE)
- 141.0 TOP OF BEDROCK ELEVATION (FT. AMSL)
- △PZ-4D BASE WIDE PIEZOMETER LOCATION (MALCOLM PIRNIE, 1996)
- TOP OF BEDROCK CONTOUR (INFERRED)
- A — A' BASE-WIDE SEISMIC REFRACTION LINES (MALCOLM PIRNIE, 1996)

NOTES:

1. SOURCE: MALCOLM PIRNIE, 1996.
2. THIS FIGURE DEPICTS A PORTION OF THE BASE-WIDE TOP OF BEDROCK SURFACE (SEE NOTE 1).

500 0 500

SCALE IN FEET

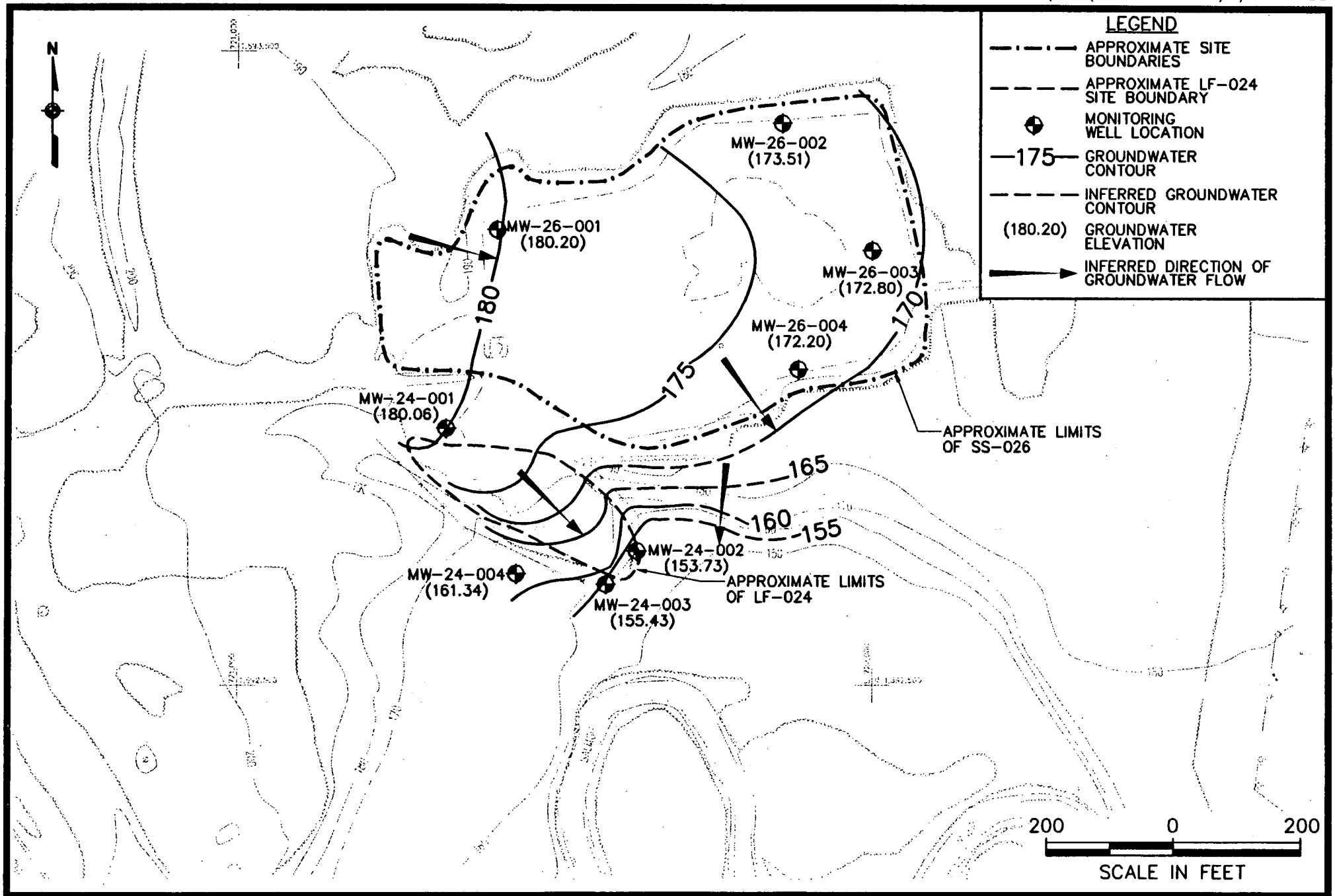
URS CONSULTANTS, INC.

SS-026 – EOD RANGE
TOP OF BEDROCK SURFACE

FIGURE 3-8

AC-6728A

35291.00\CAD\SS026 1=200 4/3/00-1 HBB

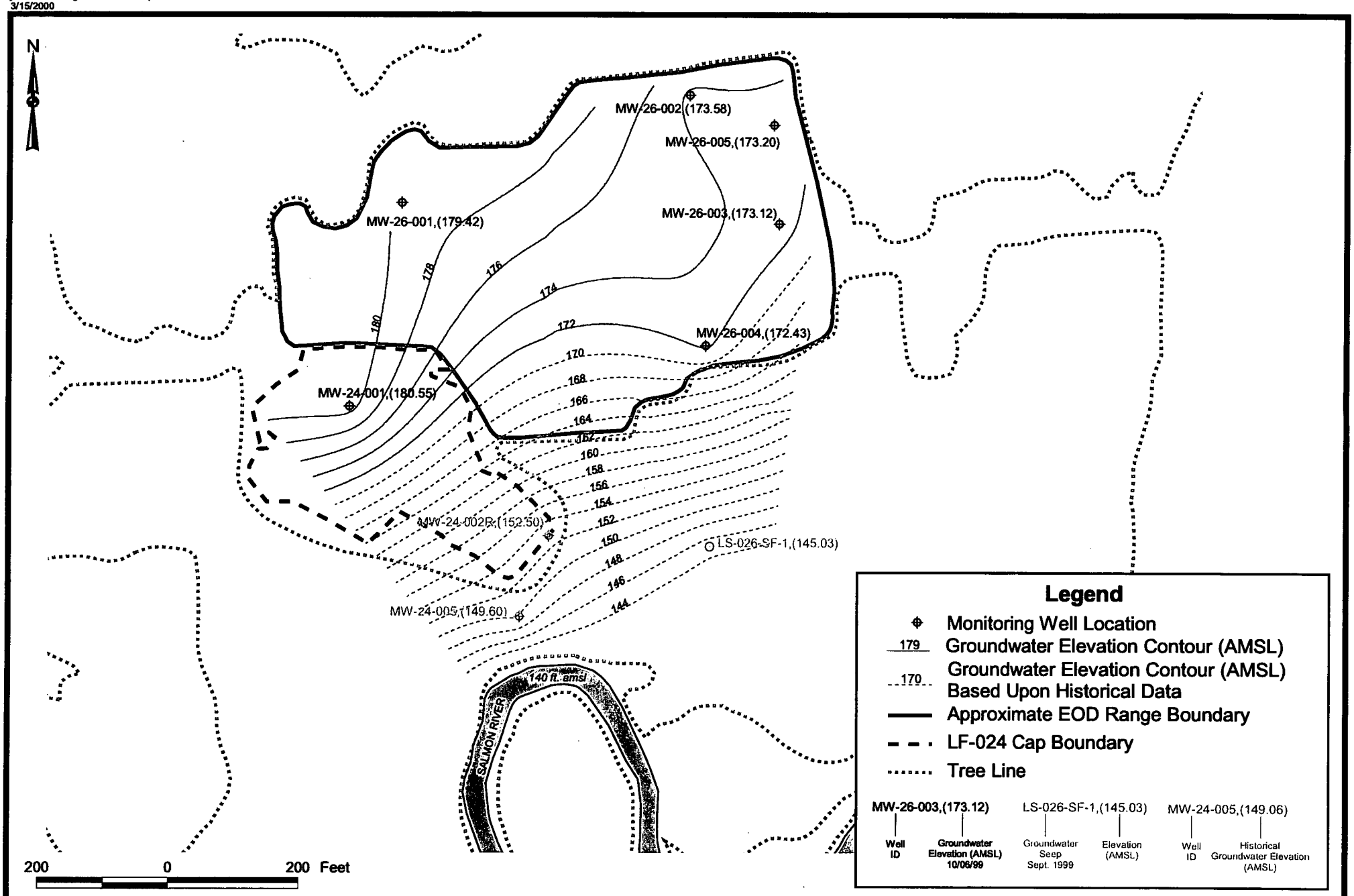


URS CONSULTANTS, INC.

SS-026 - EOD RANGE
POTENTIOMETRIC SURFACE OF UNCONFINED AQUIFER 12/10/94

FIGURE 3-9

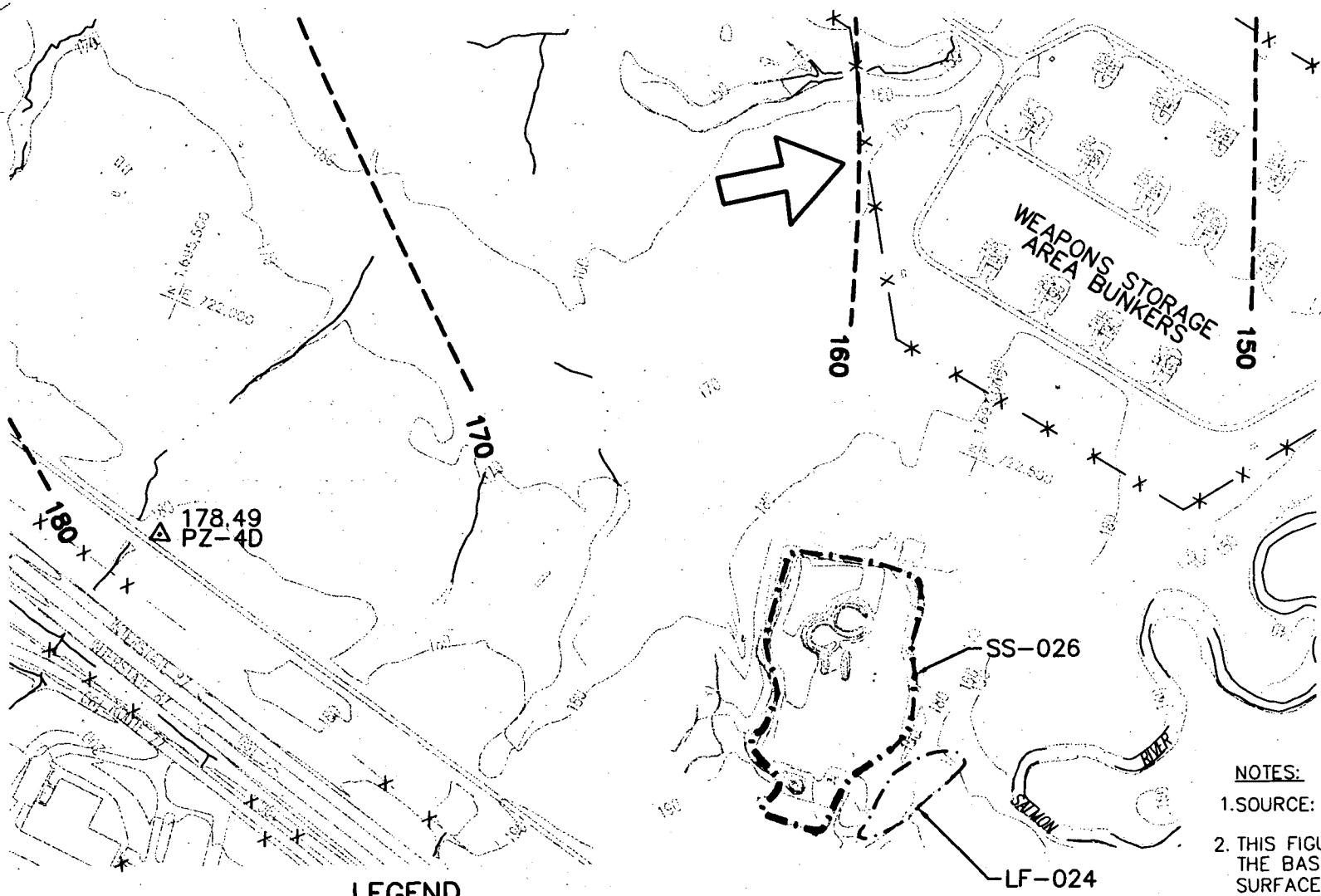
j:\0100013\db\gis\1999\ss-026.apr 10/06/99 CONTOUR
3/15/2000



URS Consultants, Inc.	PLATTSBURGH AFB - SS-026 - EOD RANGE POTENTIOMETRIC SURFACE OF UNCONFINED AQUIFER 10/06/99	FIGURE 3-10

AC-7592A

\0535291.00\CAD\SS026\ 1=500 4/3/00-1 HBB



NOTES:

1. SOURCE: MALCOLM PIRNIE, 1996.
2. THIS FIGURE DEPICTS A PORTION OF THE BASE-WIDE POTENTIOMETRIC SURFACE OF THE BEDROCK AQUIFER (SEE NOTE 1).

LEGEND

- APPROXIMATE SITE BOUNDARIES
- INFERRED BEDROCK GROUNDWATER FLOW DIRECTION
- BEDROCK POTENTIOMETRIC SURFACE CONTOUR (INFERRED)
- PZ-4D△ PIEZOMETER LOCATION
- 178.49 BEDROCK GROUNDWATER ELEVATION (FT. AMSL)

500 0 500

SCALE IN FEET

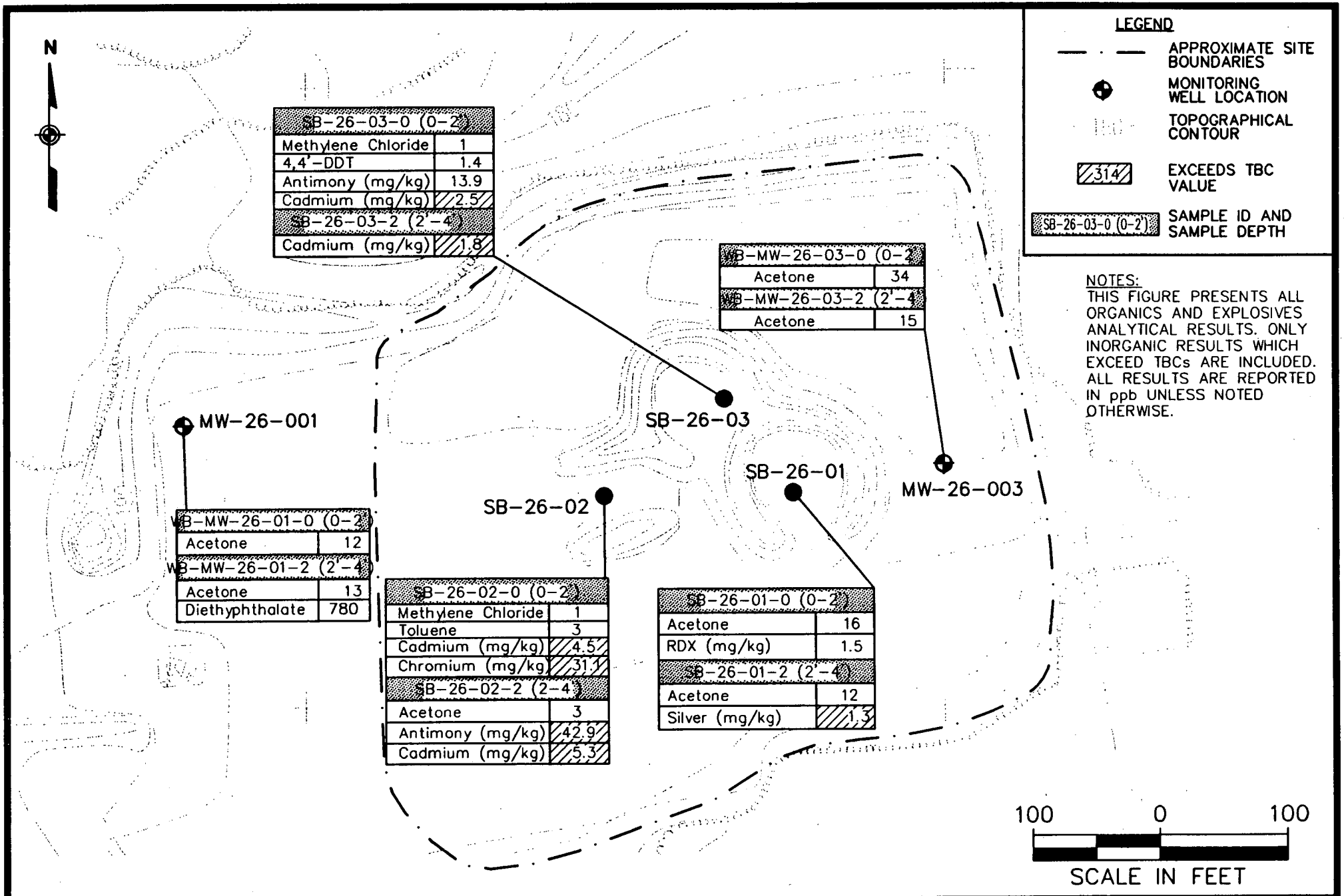
URS CONSULTANTS, INC.

SS-026 - EOD RANGE
POTENTIOMETRIC SURFACE OF BEDROCK AQUIFER (APRIL 1993)

FIGURE 3-12

AC-7590A

J:\35291.00\CAD\SS026\ 1=100 4/3/00-1 HBB



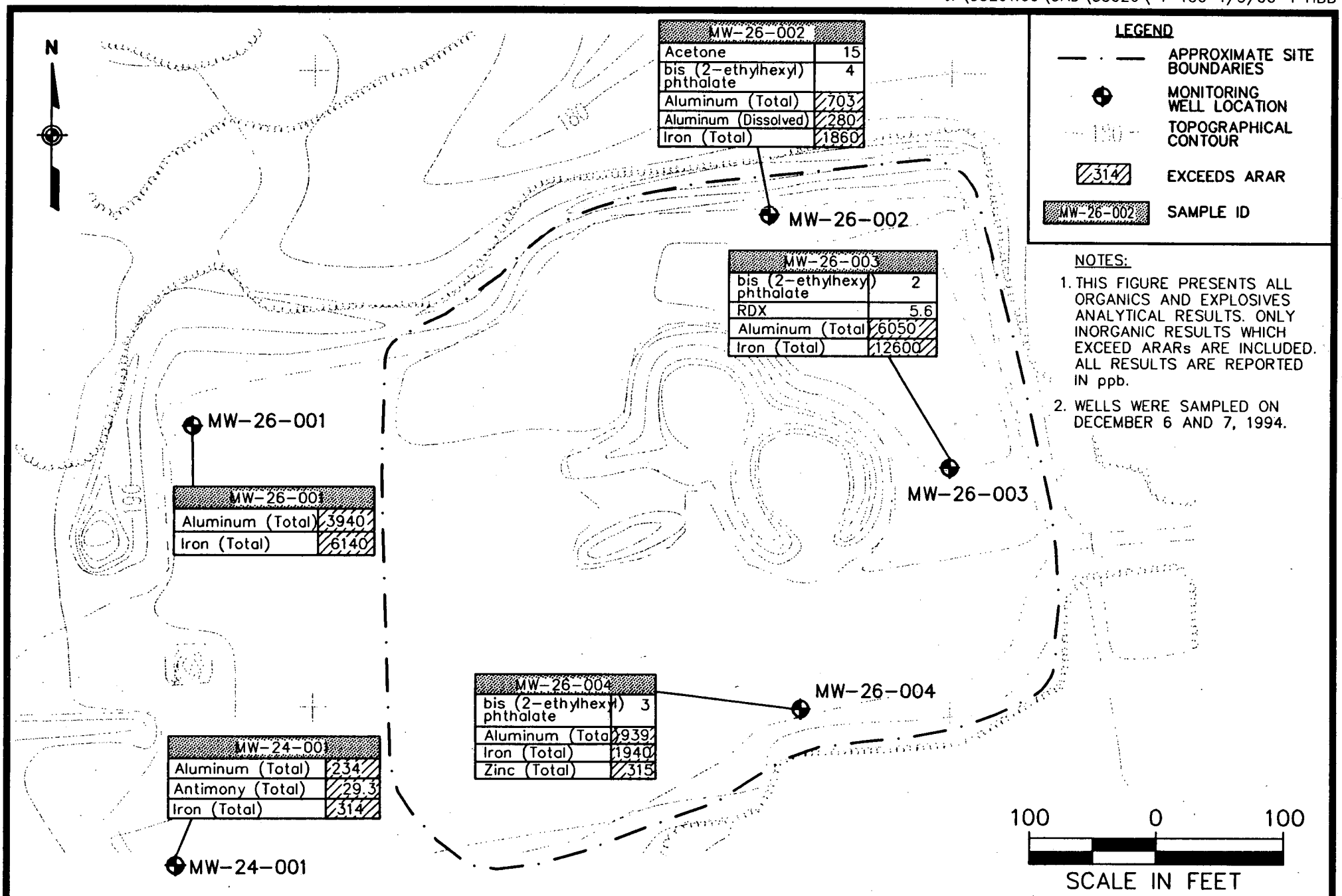
URS CONSULTANTS, INC.

SS-026 – EOD RANGE
1994 SITE INVESTIGATION SOIL RESULTS

FIGURE 5-1

AC-7591A

J:\35291.00\CAD\SS026\ 1=100 4/3/00-1 HBB

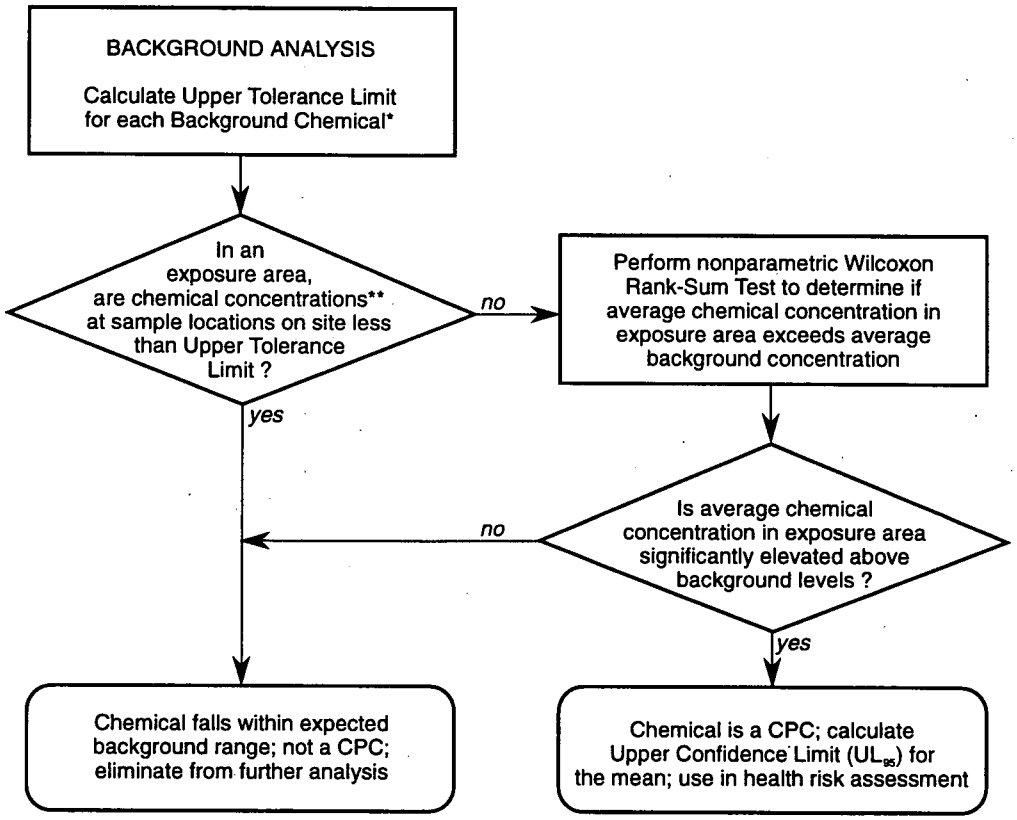


URS CONSULTANTS, INC.

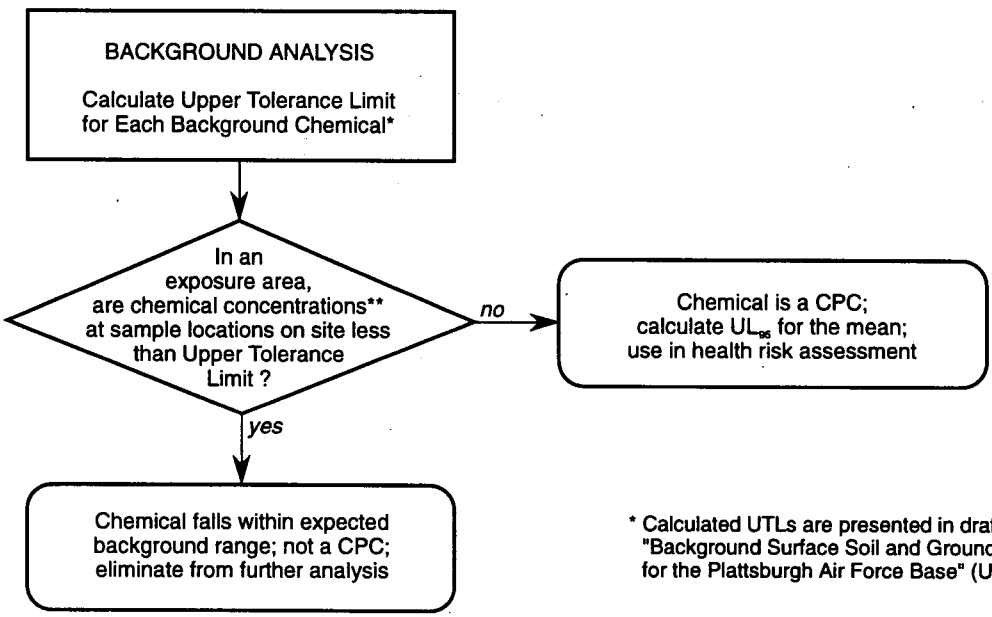
SS-026 – EOD RANGE
1994 SITE INVESTIGATION GROUNDWATER RESULTS

FIGURE 5-2

SOIL SCREENING



GROUNDWATER SCREENING



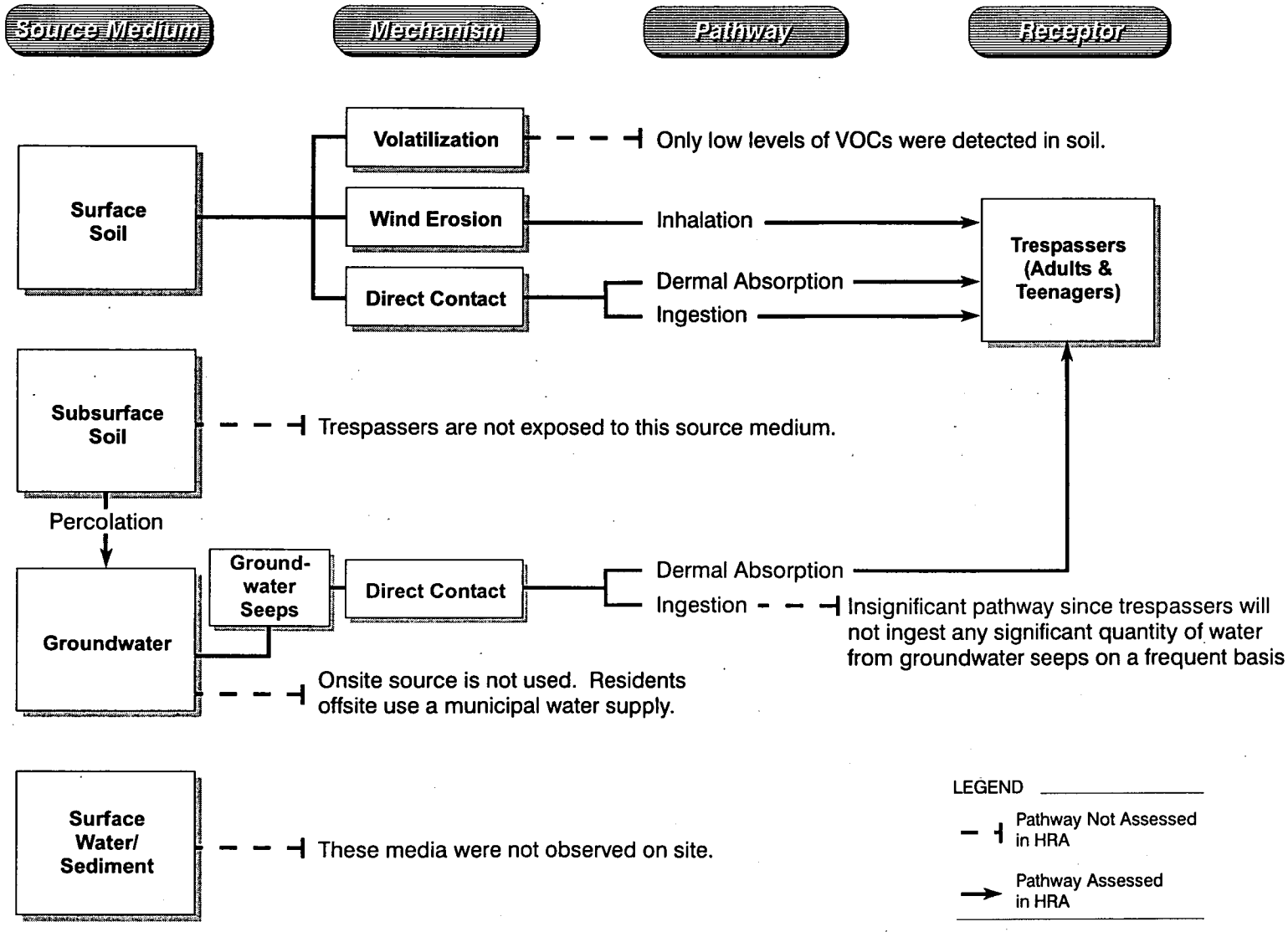
* Calculated UTLs are presented in draft report "Background Surface Soil and Groundwater Survey for the Plattsburgh Air Force Base" (URS 1995)

** Original or natural log-transformed, depending upon background distribution

URS CONSULTANTS, INC.	METHODS FOR SCREENING INORGANIC CPCs IN SOIL AND GROUNDWATER EOD RANGE (SS-026)	FIGURE 7-1

AG7445-35291.17-041095-GM

AG15193-35291.17-041300-GM

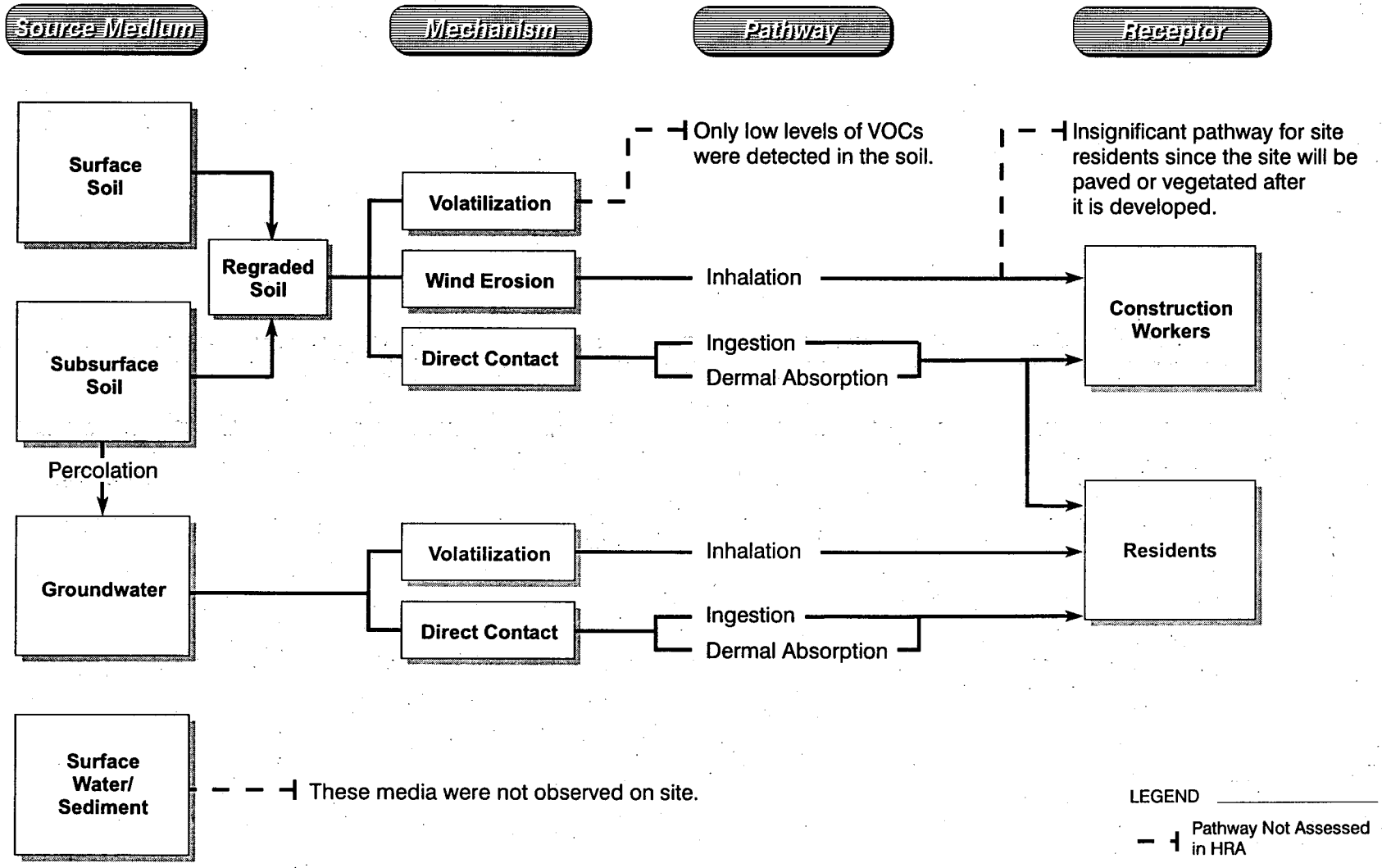


URS CONSULTANTS, INC.

EXPOSURE PATHWAYS - CURRENT USE
EOD RANGE (SS-026)

FIGURE 7-2

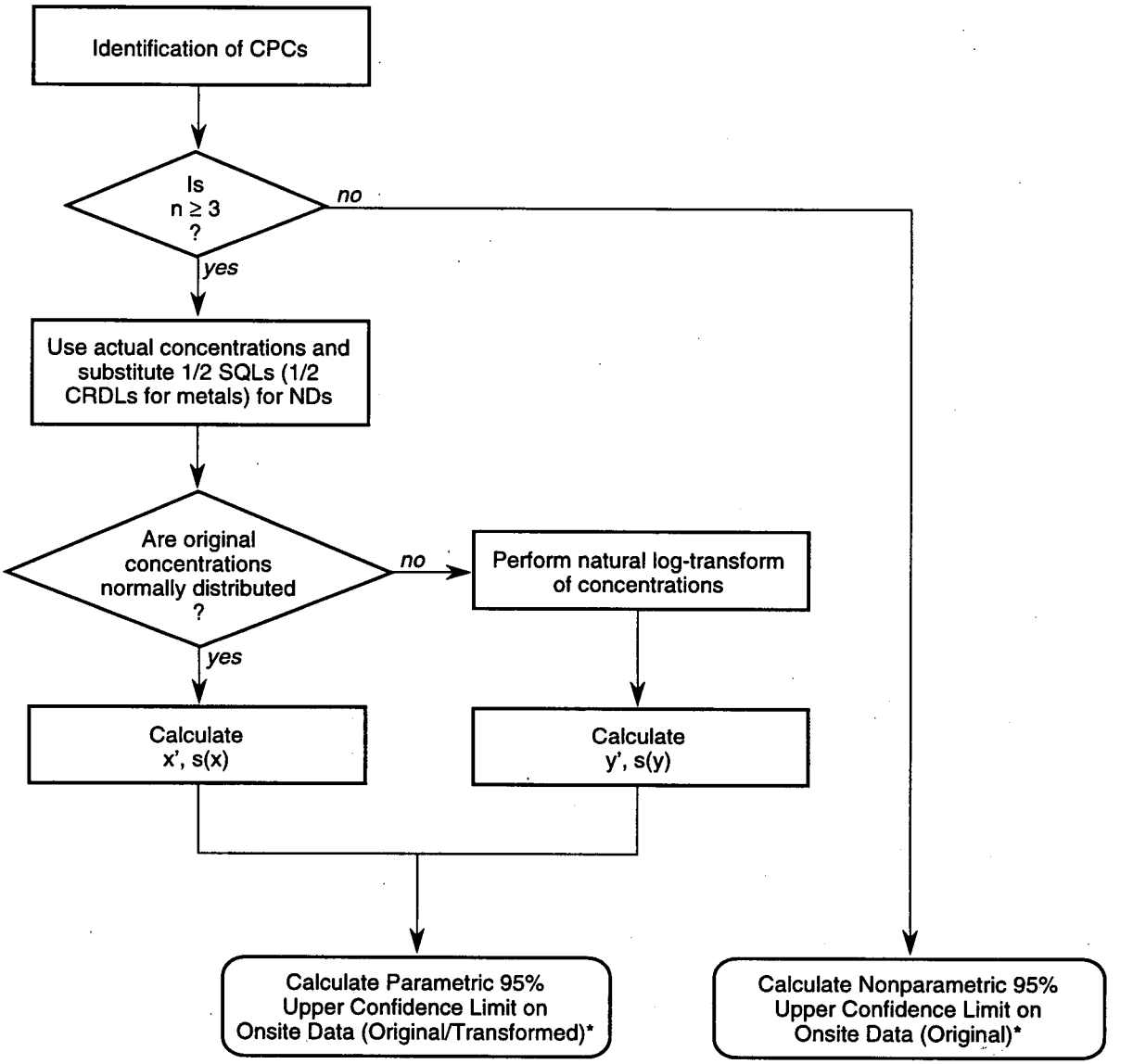
AG15194-35291.17-041300-GM



URS CONSULTANTS, INC.

EXPOSURE PATHWAYS - FUTURE USE
EOD RANGE (SS-026)

FIGURE 7-3



* If the calculated 95% Upper Confidence Limit exceeds the maximum concentration detected in the background samples, then the maximum detection will become the estimated exposure concentration.

NOTES:

n = number of samples analyzed
x' = mean of original (untransformed) data
s(x) = standard deviation of original (untransformed) data
y' = mean of natural log-transformed data
s(y) = standard deviation of natural log-transformed data
SQL = Sample Quantitation Limit
CRDL = Contract Required Detection Limit
ND = Non-Detect

URS CONSULTANTS, INC.

DEVELOPMENT OF EXPOSURE POINT CONCENTRATIONS EOD RANGE (SS-026)

FIGURE 7-4

AG7444-35291.17-041095-GM

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 1: An eastward view of the EOD range taken from the ridge near MW-26-001 (1994).

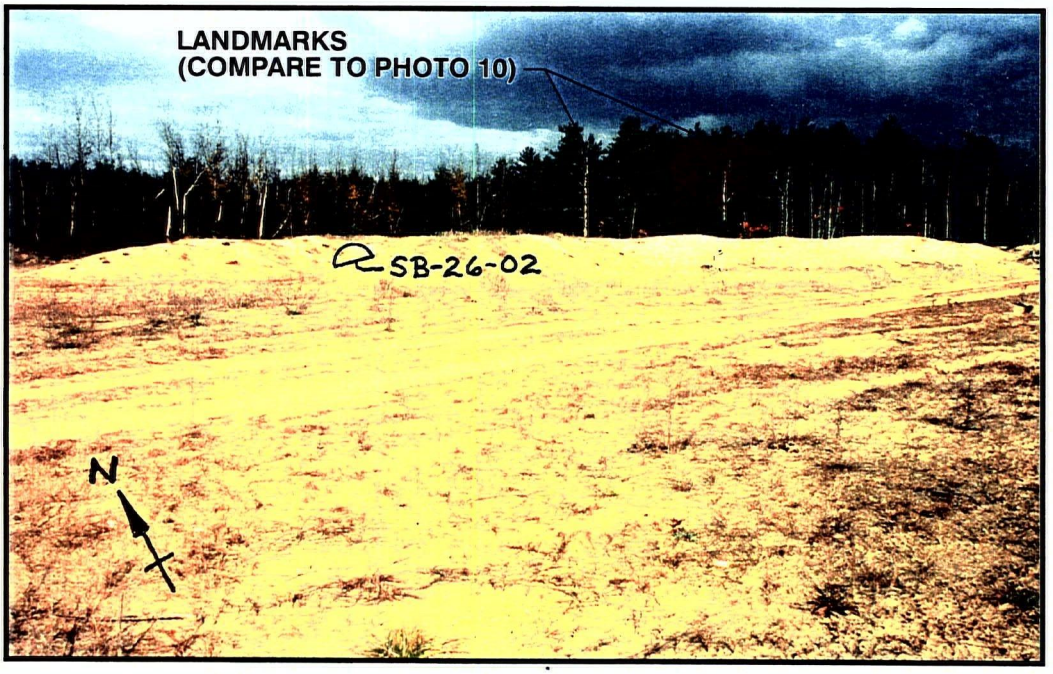


Photo 2: A northeastward view of the "U"-shaped earthen berms in the central portion of the site that were used to contain ordnance burns (1994).

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 3: A northeastward view of boring location SB-26-02. The trench behind the stake was excavated by USAF EOD personnel during the 1994 site unexploded ordnance clearance.

Photo 4: A northward view of boring location SB-26-03 and the adjacent concrete block backstop structure (1994).

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 5: A northeastward view of the "U"-shaped bermed area where boring SB-26-01 was performed (1994).

Photo 6: A trench excavated by USAF EOD personnel on the eastern side of SS-026 during the 1994 site unexploded ordnance clearance. Note the dark brown household waste layer. This material was also identified by the 1997-1998 range safing contractor (Debris Area 3). The area was further investigated with shovel tests and test trenches (EOD-TP-01 & -02) during the 1999 Supplemental SI field work.

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 7: Excavation of SS-026 soils during 1998 range safing operations.

Photo 8: Sifting of soils excavated during 1998 range safing operations.

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 9: Regrading of excavated and sifted soils during 1998 range safing operations.

PLATTSBURGH AIR FORCE BASE

EOD Range (SS-026) Site Photos

Photo 10: September 1999 panoramic of northeastern-eastern end of EOD Range (compare to Photo 2).

PLATTSBURGH AIR FORCE BASE
EOD Range (SS-026) Site Photos

Photo 11: Typical scattered surficial debris found at Debris Locations 2, 3, and 4 during 1999 SI shovel testing.

Photo 12: Typical 1999 SI test trench (EOD-TP-11 is shown).

APPENDIX A

1994 DETECTED ANALYTICAL RESULTS

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Chloromethane	—				
Bromomethane	—				
Vinyl Chloride	200				
Chloroethane	1,900				
Methylene Chloride	100				
Acetone	200	12	5	13	34
Carbon Disulfide	2,700				
1,1-Dichloroethene	400				
1,1-Dichloroethane	200				
1,2-Dichloroethene (total)	300				
Chloroform	300				
1,2-Dichloroethane	100				
2-Butanone	300				
1,1,1-Trichloroethane	800				
Carbon Tetrachloride	600				
Bromodichloromethane	—				
1,2-Dichloropropane	—				
cis-1,3-Dichloropropene	—				
Trichloroethene	700				
Dibromochloromethane	—				
1,1,2-Trichloroethane	—				
Benzene	60				
trans-1,3-Dichloropropene	—				
Bromoform	—				
4-Methyl-2-Pentanone	1,000				
2-Hexanone	—				
Tetrachloroethene	1,400				
1,1,2,2-Tetrachloroethane	600				
Toluene	1,500				
Chlorobenzene	1,700				
Ethylbenzene	5,500				
Styrene	—				
Xylene (total)	1,200				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Chloromethane	—				
Bromomethane	—				
Vinyl Chloride	200				
Chloroethane	1,900				
Methylene Chloride	100				1
Acetone	200	15	16	12	
Carbon Disulfide	2,700				
1,1-Dichloroethene	400				
1,1-Dichloroethane	200				
1,2-Dichloroethene (total)	300				
Chloroform	300				
1,2-Dichloroethane	100				
2-Butanone	300				
1,1,1-Trichloroethane	800				
Carbon Tetrachloride	600				
Bromodichloromethane	—				
1,2-Dichloropropane	—				
cis-1,3-Dichloropropene	—				
Trichloroethene	700				
Dibromochloromethane	—				
1,1,2-Trichloroethane	—				
Benzene	60				
trans-1,3-Dichloropropene	—				
Bromoform	—				
4-Methyl-2-Pentanone	1,000				
2-Hexanone	—				
Tetrachloroethene	1,400				
1,1,2,2-Tetrachloroethane	600				
Toluene	1,500				3
Chlorobenzene	1,700				
Ethylbenzene	5,500				
Styrene	—				
Xylene (total)	1,200				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Units		UG/KG	UG/KG	UG/KG
Parameter	TBC			
Chloromethane	—			
Bromomethane	—			
Vinyl Chloride	200			
Chloroethane	1,900			
Methylene Chloride	100		1	
Acetone	200	3		
Carbon Disulfide	2,700			
1,1-Dichloroethene	400			
1,1-Dichloroethane	200			
1,2-Dichloroethene (total)	300			
Chloroform	300			
1,2-Dichloroethane	100			
2-Butanone	300			
1,1,1-Trichloroethane	800			
Carbon Tetrachloride	600			
Bromodichloromethane	—			
1,2-Dichloropropane	—			
cis-1,3-Dichloropropene	—			
Trichloroethene	700			
Dibromochloromethane	—			
1,1,2-Trichloroethane	—			
Benzene	60			
trans-1,3-Dichloropropene	—			
Bromoform	—			
4-Methyl-2-Pentanone	1,000			
2-Hexanone	—			
Tetrachloroethene	1,400			
1,1,2,2-Tetrachloroethane	600			
Toluene	1,500			
Chlorobenzene	1,700			
Ethylbenzene	5,500			
Styrene	—			
Xylene (total)	1,200			

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Phenol	30				
bis(2-Chloroethyl)ether	—				
2-Chlorophenol	800				
1,3-Dichlorobenzene	1,600				
1,4-Dichlorobenzene	8,500				
1,2-Dichlorobenzene	7,900				
2-Methylphenol	100				
2,2'-oxybis(1-Chloropropane)	—				
4-Methylphenol	900				
N-Nitroso-di-n-propylamine	—				
Hexachloroethane	—				
Nitrobenzene	200				
Isophorone	4,400				
2-Nitrophenol	330				
2,4-Dimethylphenol	—				
bis(2-Chloroethoxy)methane	—				
2,4-Dichlorophenol	400				
1,2,4-Trichlorobenzene	3,400				
Naphthalene	13,000				
4-Chloroaniline	220				
Hexachlorobutadiene	—				
4-Chloro-3-methylphenol	240				
2-Methylnaphthalene	36,400				
Hexachlorocyclopentadiene	—				
2,4,6-Trichlorophenol	—				
2,4,5-Trichlorophenol	100				
2-Chloronaphthalene	—				
2-Nitroaniline	430				
Dimethylphthalate	2,000				
Acenaphthylene	41,000				
2,6-Dinitrotoluene	1,000				
3-Nitroaniline	500				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Acenaphthene	50,000				
2,4-Dinitrophenol	200				
4-Nitrophenol	100				
Dibenzofuran	6,200				
2,4-Dinitrotoluene	—				
Diethylphthalate	7,100			780	
4-Chlorophenyl-phenylether	—				
Fluorene	50,000				
4-Nitroaniline	—				
4,6-Dinitro-2-methylphenol	—				
N-Nitrosodiphenylamine	—				
4-Bromophenyl-phenylether	—				
Hexachlorobenzene	410				
Pentachlorophenol	1,000				
Phenanthrene	50,000				
Anthracene	50,000				
Carbazole	—				
Di-n-butylphthalate	8,100				
Fluoranthene	50,000				
Pyrene	50,000				
Butylbenzylphthalate	50,000				
3,3'-Dichlorobenzidine	—				
Benzo(a)anthracene	224				
Chrysene	400				
bis(2-Ethylhexyl)phthalate	50,000				
Di-n-octylphthalate	50,000				
Benzo(b)fluoranthene	1,100				
Benzo(k)fluoranthene	1,100				
Benzo(a)pyrene	61				
Indeno(1,2,3-cd)pyrene	3,200				
Dibenz(a,h)anthracene	14				
Benzo(g,h,i)perylene	50,000				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Phenol	30				
bis(2-Chloroethyl)ether	—				
2-Chlorophenol	800				
1,3-Dichlorobenzene	1,600				
1,4-Dichlorobenzene	8,500				
1,2-Dichlorobenzene	7,900				
2-Methylphenol	100				
2,2'-oxybis(1-Chloropropane)	—				
4-Methylphenol	900				
N-Nitroso-di-n-propylamine	—				
Hexachloroethane	—				
Nitrobenzene	200				
Isophorone	4,400				
2-Nitrophenol	330				
2,4-Dimethylphenol	—				
bis(2-Chloroethoxy)methane	—				
2,4-Dichlorophenol	400				
1,2,4-Trichlorobenzene	3,400				
Naphthalene	13,000				
4-Chloroaniline	220				
Hexachlorobutadiene	—				
4-Chloro-3-methylphenol	240				
2-Methylnaphthalene	36,400				
Hexachlorocyclopentadiene	—				
2,4,6-Trichlorophenol	—				
2,4,5-Trichlorophenol	100				
2-Chloronaphthalene	—				
2-Nitroaniline	430				
Dimethylphthalate	2,000				
Acenaphthylene	41,000				
2,6-Dinitrotoluene	1,000				
3-Nitroaniline	500				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
Acenaphthene	50,000				
2,4-Dinitrophenol	200				
4-Nitrophenol	100				
Dibenzofuran	6,200				
2,4-Dinitrotoluene	—				
Diethylphthalate	7,100				
4-Chlorophenyl-phenylether	—				
Fluorene	50,000				
4-Nitroaniline	—				
4,6-Dinitro-2-methylphenol	—				
N-Nitrosodiphenylamine	—				
4-Bromophenyl-phenylether	—				
Hexachlorobenzene	410				
Pentachlorophenol	1,000				
Phenanthrene	50,000				
Anthracene	50,000				
Carbazole	—				
Di-n-butylphthalate	8,100				
Fluoranthene	50,000				
Pyrene	50,000				
Butylbenzylphthalate	50,000				
3,3'-Dichlorobenzidine	—				
Benzo(a)anthracene	224				
Chrysene	400				
bis(2-Ethylhexyl)phthalate	50,000				
Di-n-octylphthalate	50,000				
Benzo(b)fluoranthene	1,100				
Benzo(k)fluoranthene	1,100				
Benzo(a)pyrene	61				
Indeno(1,2,3-cd)pyrene	3,200				
Dibenz(a,h)anthracene	14				
Benzo(g,h,i)perylene	50,000				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG
Parameter	TBC			
Phenol	30			
bis(2-Chloroethyl)ether	—			
2-Chlorophenol	800			
1,3-Dichlorobenzene	1,600			
1,4-Dichlorobenzene	8,500			
1,2-Dichlorobenzene	7,900			
2-Methylphenol	100			
2,2'-oxybis(1-Chloropropane)	—			
4-Methylphenol	900			
N-Nitroso-di-n-propylamine	—			
Hexachloroethane	—			
Nitrobenzene	200			
Isophorone	4,400			
2-Nitrophenol	330			
2,4-Dimethylphenol	—			
bis(2-Chloroethoxy)methane	—			
2,4-Dichlorophenol	400			
1,2,4-Trichlorobenzene	3,400			
Naphthalene	13,000			
4-Chloroaniline	220			
Hexachlorobutadiene	—			
4-Chloro-3-methylphenol	240			
2-Methylnaphthalene	36,400			
Hexachlorocyclopentadiene	—			
2,4,6-Trichlorophenol	—			
2,4,5-Trichlorophenol	100			
2-Chloronaphthalene	—			
2-Nitroaniline	430			
Dimethylphthalate	2,000			
Acenaphthylene	41,000			
2,6-Dinitrotoluene	1,000			
3-Nitroaniline	500			

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG
Parameter	TBC			
Acenaphthene	50,000			
2,4-Dinitrophenol	200			
4-Nitrophenol	100			
Dibenzofuran	6,200			
2,4-Dinitrotoluene	—			
Diethylphthalate	7,100			
4-Chlorophenyl-phenylether	—			
Fluorene	50,000			
4-Nitroaniline	—			
4,6-Dinitro-2-methylphenol	—			
N-Nitrosodiphenylamine	—			
4-Bromophenyl-phenylether	—			
Hexachlorobenzene	410			
Pentachlorophenol	1,000			
Phenanthrene	50,000			
Anthracene	50,000			
Carbazole	—			
Di-n-butylphthalate	8,100			
Fluoranthene	50,000			
Pyrene	50,000			
Butylbenzylphthalate	50,000			
3,3'-Dichlorobenzidine	—			
Benzo(a)anthracene	224			
Chrysene	400			
bis(2-Ethylhexyl)phthalate	50,000			
Di-n-octylphthalate	50,000			
Benzo(b)fluoranthene	1,100			
Benzo(k)fluoranthene	1,100			
Benzo(a)pyrene	61			
Indeno(1,2,3-cd)pyrene	3,200			
Dibenz(a,h)anthracene	14			
Benzo(g,h,i)perylene	50,000			

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
alpha-BHC	110				
beta-BHC	200				
delta-BHC	300				
gamma-BHC (Lindane)	60				
Heptachlor	100				
Aldrin	41				
Heptachlor epoxide	20				
Endosulfan I	900				
Dieldrin	44				
4,4'-DDE	2,100				
Endrin	100				
Endosulfan II	900				
4,4'-DDD	2,900				
Endosulfan sulfate	1,000				
4,4'-DDT	2,100				
Methoxychlor	10,000				
Endrin ketone	—				
Endrin aldehyde	—				
alpha-Chlordane	540				
gamma-Chlordane	540				
Toxaphene	—				
Aroclor-1016	1,000/10,000 (1)				
Aroclor-1221	1,000/10,000 (1)				
Aroclor-1232	1,000/10,000 (1)				
Aroclor-1242	1,000/10,000 (1)				
Aroclor-1248	1,000/10,000 (1)				
Aroclor-1254	1,000/10,000 (1)				
Aroclor-1260	1,000/10,000 (1)				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.
(1) - Surface soil - 1,000; Subsurface soil - 10,000.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Parameter	TBC				
alpha-BHC	110				
beta-BHC	200				
delta-BHC	300				
gamma-BHC (Lindane)	60				
Heptachlor	100				
Aldrin	41				
Heptachlor epoxide	20				
Endosulfan I	900				
Dieldrin	44				
4,4'-DDE	2,100				
Endrin	100				
Endosulfan II	900				
4,4'-DDD	2,900				
Endosulfan sulfate	1,000				
4,4'-DDT	2,100				
Methoxychlor	10,000				
Endrin ketone	—				
Endrin aldehyde	—				
alpha-Chlordane	540				
gamma-Chlordane	540				
Toxaphene	—				
Aroclor-1016	1,000/10,000 (1)				
Aroclor-1221	1,000/10,000 (1)				
Aroclor-1232	1,000/10,000 (1)				
Aroclor-1242	1,000/10,000 (1)				
Aroclor-1248	1,000/10,000 (1)				
Aroclor-1254	1,000/10,000 (1)				
Aroclor-1260	1,000/10,000 (1)				

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.
(1) - Surface soil - 1,000; Subsurface soil - 10,000.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		UG/KG	UG/KG	UG/KG
Parameter	TBC			
alpha-BHC	110			
beta-BHC	200			
delta-BHC	300			
gamma-BHC (Lindane)	60			
Heptachlor	100			
Aldrin	41			
Heptachlor epoxide	20			
Endosulfan I	900			
Dieldrin	44			
4,4'-DDE	2,100			
Endrin	100			
Endosulfan II	900			
4,4'-DDD	2,900			
Endosulfan sulfate	1,000			
4,4'-DDT	2,100		1.4	
Methoxychlor	10,000			
Endrin ketone	—			
Endrin aldehyde	—			
alpha-Chlordane	540			
gamma-Chlordane	540			
Toxaphene	—			
Aroclor-1016	1,000/10,000 (1)			
Aroclor-1221	1,000/10,000 (1)			
Aroclor-1232	1,000/10,000 (1)			
Aroclor-1242	1,000/10,000 (1)			
Aroclor-1248	1,000/10,000 (1)			
Aroclor-1254	1,000/10,000 (1)			
Aroclor-1260	1,000/10,000 (1)			

Only detected results reported.
TBC - "To Be Considered" criteria
that are not legally binding.
— - No TBC available.
(1) - Surface soil - 1,000; Subsurface soil - 10,000.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth		0	0	2	0
Ending Depth		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Parameter	TBC				
Aluminum	8510 (SB)	4780	4370	3050	1610
Antimony	12.6 (SB)				
Arsenic	7.5 **	0.9	1.2	1	
Barium	300 **	13.6	12.3	17	7.9
Beryllium	0.74 (SB)	0.21	0.21	0.16	0.14
Cadmium	1.3 (SB)	1.3	0.94	1.1	1.1
Calcium	30200 (SB)	717	815	841	410
Chromium	19.5 (SB)	5.3	4.9	4.2	2
Cobalt	30 **	3.4	2.8	3.1	1.9
Copper	44.1 (SB)	4.4	2.3	2	1.5
Iron	36700 (SB)	5560	5190	5270	3390
Lead	79.4 (SB)	1.3	1.2	1.2	0.57
Magnesium	3340 (SB)	790	830	809	518
Manganese	474 (SB)	24.7	24.1	41	38
Mercury	0.1 **				
Nickel	13 **	5.1	5.1	4.7	3.6
Potassium	929 (SB)	355	370	395	261
Selenium	2 **				
Silver	ND (SB)				
Sodium	520 (SB)			141	
Thallium	ND (SB)				
Vanadium	150 **	11	11.4	9.5	4.4
Zinc	63.4 (SB)	R	R	R	R

Only detected results reported.

TBC - "To Be Considered" criteria that are not legally binding. Determined as per NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, HRW-94-4046, January, 1994.

SB - Site Background. (95% Upper Tolerance Limit Value from Background Surface Soil & Groundwater Survey: URS 1995)

**- NYSDEC recommended soil cleanup objective (NYSDEC HWR-94-4046;) Appendix A, Table 4)

R - The sample results are rejected due to serious deficiencies in the ability to meet holding time criteria and quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth		2	0	2	0
Ending Depth		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Parameter	TBC				
Aluminum	8510 (SB)	1260	1970	1360	1150
Antimony	12.6 (SB)				
Arsenic	7.5 **			0.41	0.7
Barium	300 **	5.4	9.5	4.8	16
Beryllium	0.74 (SB)	0.11	0.13	0.13	
Cadmium	1.3 (SB)	0.67	0.76		4.5 [a]
Calcium	30200 (SB)	556	453	539	310
Chromium	19.5 (SB)	1.9	1.9		31.1 [a]
Cobalt	30 **	1.6	1.8	6.8	15.1
Copper	44.1 (SB)	1.4	2.8	5.9	4.2
Iron	36700 (SB)	2550	3480	3860	2970
Lead	79.4 (SB)	0.5	2.1	0.83	4.6
Magnesium	3340 (SB)	535	631	532	184
Manganese	474 (SB)	34.8	42.1	83.7	29.9
Mercury	0.1 **				
Nickel	13 **	2.8	3.7	10.6	
Potassium	929 (SB)	223	301	293	206
Selenium	2 **				
Silver	ND (SB)			1.3 [a]	
Sodium	520 (SB)	89.5	95.3	209	362
Thallium	ND (SB)				
Vanadium	150 **	3.3	4.7	5.8	5.1
Zinc	63.4 (SB)	R	R	R	R

Only detected results reported.

TBC - "To Be Considered" criteria that are not legally binding. Determined as per NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, HRW-94-4046, January, 1994.

[a] - Exceeds TBC.

SB - Site Background. (95% Upper Tolerance Limit Value from Background Surface Soil & Groundwater Survey: URS 1995)

**- NYSDEC recommended soil cleanup objective (NYSDEC HWR-94-4046;) Appendix A, Table 4)

R - The sample results are rejected due to serious deficiencies in the ability to meet holding time criteria and quality control criteria. The presence or absence of the analyte cannot be verified.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth		2	0	2
Ending Depth		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG
Parameter	TBC			
Aluminum	8510 (SB)	1830	2740	2770
Antimony	12.6 (SB)	42.9 [a]	13.9 [a]	7.6
Arsenic	7.5 **	0.95	0.86	0.5
Barium	300 **	21.4	15.1	16.8
Beryllium	0.74 (SB)		0.09	0.06
Cadmium	1.3 (SB)	5.3 [a]	2.5 [a]	1.8 [a]
Calcium	30200 (SB)	885	623	463
Chromium	19.5 (SB)	19.3	7.8	7.8
Cobalt	30 **		4	1.9
Copper	44.1 (SB)	3	4.4	1.8
Iron	36700 (SB)	5990	5440	5410
Lead	79.4 (SB)	2.5	11	2.6
Magnesium	3340 (SB)	812	518	627
Manganese	474 (SB)	103	62.5	28.8
Mercury	0.1 **			
Nickel	13 **		3.5	
Potassium	929 (SB)	480	335	351
Selenium	2 **			
Silver	ND (SB)			
Sodium	520 (SB)	412	274	230
Thallium	ND (SB)			
Vanadium	150 **	7.7	8.4	8.4
Zinc	63.4 (SB)	R	R	R

Only detected results reported.

TBC - "To Be Considered" criteria that are not legally binding. Determined as per NYSDEC TAGM: Determination of Soil Cleanup Objectives and Cleanup Levels, HRW-94-4046, January, 1994.

[a] - Exceeds TBC.

SB - Site Background. (95% Upper Tolerance Limit Value from Background Surface Soil & Groundwater Survey: URS 1995)

**- NYSDEC recommended soil cleanup objective (NYSDEC HWR-94-4046;) Appendix A, Table 4)

R - The sample results are rejected due to serious deficiencies in the ability to meet holding time criteria and quality control criteria. The presence or absence of the analyte cannot be verified.

EXPLOSIVE COMPOUND ABBREVIATIONS
METHOD NUMBER 8330

Compound	Abbreviation
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX
1,3,5-Trinitrobenzene	1,3,5-TNB
1,3-Dinitrobenzene	1,3-DNB
Methyl-2,4,6-trinitrophenylnitramine	Tetryl
Nitrobenzene	NB
2,4,6-Trinitrotoluene	2,4,6-TNT
4-Amino-2,6-dinitrotoluene	4-Am-DNT
2-Amino-4,6-dinitrotoluene	2-Am-DNT
2,4-Dinitrotoluene	2,4-DNT
2,6-Dinitrotoluene	2,6-DNT
2-Nitrotoluene	2-NT
3-Nitrotoluene	3-NT
4-Nitrotoluene	4-NT

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
EXPLOSIVES

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth		0	0	2	0
Ending Depth		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Dilution		1	1	1	1
% Moisture		10	9	15	5
Parameter	TBC				
HMX	—				
RDX	—				
1,3,5-TNB	—				
1,3-DNB	—				
Tetryl	—				
NB	0.2				
2,4,6-TNT	—				
4-Am-DNT	—				
2-Am-DNT	—				
2,6-DNT	1.0				
2,4-DNT	—				
2-NT	—				
4-NT	—				
3-NT	—				

TBC - "To Be Considered" criteria
that are not legally binding.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
EXPLOSIVES

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth		2	0	2	0
Ending Depth		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Dilution		1	1	1	1
% Moisture		5	4	3	5
Parameter	TBC				
HMX	—				
RDX	—		1.5		
1,3,5-TNB	—				
1,3-DNB	—				
Tetryl	—				
NB	0.2				
2,4,6-TNT	—				
4-Am-DNT	—				
2-Am-DNT	—				
2,6-DNT	1.0				
2,4-DNT	—				
2-NT	—				
4-NT	—				
3-NT	—				

TBC - "To Be Considered" criteria
that are not legally binding.

TABLE A-1

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
EXPLOSIVES

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth		2	0	2
Ending Depth		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG
Dilution		1	1	1
% Moisture		5	5	8
Parameter	TBC			
HMX	—			
RDX	—			
1,3,5-TNB	—			
1,3-DNB	—			
Tetryl	—			
NB	0.2			
2,4,6-TNT	—			
4-Am-DNT	—			
2-Am-DNT	—			
2,6-DNT	1.0			
2,4-DNT	—			
2-NT	—			
4-NT	—			
3-NT	—			

TBC - "To Be Considered" criteria
that are not legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (VOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Chloromethane	5			
Bromomethane	5			
Vinyl Chloride	2			
Chloroethane	5			
Methylene Chloride	5			
Acetone	50		15	
Carbon Disulfide	50			
1,1-Dichloroethene	5			
1,1-Dichloroethane	5			
1,2-Dichloroethene (total)	5			
Chloroform	7			
1,2-Dichloroethane	5			
2-Butanone	50			
1,1,1-Trichloroethane	5			
Carbon Tetrachloride	5			
Bromodichloromethane	50			
1,2-Dichloropropane	5			
cis-1,3-Dichloropropene	5			
Trichloroethene	5			
Dibromochloromethane	50			
1,1,2-Trichloroethane	5			
Benzene	0.7			
trans-1,3-Dichloropropene	5			
Bromoform	50			
4-Methyl-2-Pentanone	50			
2-Hexanone	50			
Tetrachloroethene	5			
1,1,2,2-Tetrachloroethane	5			
Toluene	5			
Chlorobenzene	5			
Ethylbenzene	5			
Styrene	5			
Xylene (total)	5			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (VOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Chloromethane	5			
Bromomethane	5			
Vinyl Chloride	2			
Chloroethane	5			
Methylene Chloride	5			
Acetone	50			
Carbon Disulfide	50			
1,1-Dichloroethene	5			
1,1-Dichloroethane	5			
1,2-Dichloroethene (total)	5			
Chloroform	7			
1,2-Dichloroethane	5			
2-Butanone	50			
1,1,1-Trichloroethane	5			
Carbon Tetrachloride	5			
Bromodichloromethane	50			
1,2-Dichloropropane	5			
cis-1,3-Dichloropropene	5			
Trichloroethene	5			
Dibromochloromethane	50			
1,1,2-Trichloroethane	5			
Benzene	0.7			
trans-1,3-Dichloropropene	5			
Bromoform	50			
4-Methyl-2-Pentanone	50			
2-Hexanone	50			
Tetrachloroethene	5			
1,1,2,2-Tetrachloroethane	5			
Toluene	5			
Chlorobenzene	5			
Ethylbenzene	5			
Styrene	5			
Xylene (total)	5			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Phenol	1			
bis(2-Chloroethyl)ether	1			
2-Chlorophenol	1			
1,3-Dichlorobenzene	5			
1,4-Dichlorobenzene	4.7			
1,2-Dichlorobenzene	4.7			
2-Methylphenol	1			
2,2'-oxybis(1-Chloropropane)	50			
4-Methylphenol	1			
N-Nitroso-di-n-propylamine	50			
Hexachloroethane	5			
Nitrobenzene	5			
Isophorone	50			
2-Nitrophenol	1			
2,4-Dimethylphenol	1			
bis(2-Chloroethoxy)methane	5			
2,4-Dichlorophenol	1			
1,2,4-Trichlorobenzene	5			
Naphthalene	10			
4-Chloroaniline	5			
Hexachlorobutadiene	5			
4-Chloro-3-methylphenol	1			
2-Methylnaphthalene	50			
Hexachlorocyclopentadiene	5			
2,4,6-Trichlorophenol	1			
2,4,5-Trichlorophenol	1			
2-Chloronaphthalene	10			
2-Nitroaniline	5			
Dimethylphthalate	50			
Acenaphthylene	50			
2,6-Dinitrotoluene	5			
3-Nitroaniline	5			

Only detected results reported.
ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Acenaphthene	20			
2,4-Dinitrophenol	1			
4-Nitrophenol	1			
Dibenzofuran	50			
2,4-Dinitrotoluene	5			
Diethylphthalate	50			
4-Chlorophenyl-phenylether	50			
Fluorene	50			
4-Nitroaniline	5			
4,6-Dinitro-2-methylphenol	1			
N-Nitrosodiphenylamine	50			
4-Bromophenyl-phenylether	50			
Hexachlorobenzene	0.35			
Pentachlorophenol	1			
Phenanthrene	50			
Anthracene	50			
Carbazole	50			
Di-n-butylphthalate	50			
Fluoranthene	50			
Pyrene	50			
Butylbenzylphthalate	50			
3,3'-Dichlorobenzidine	5			
Benzo(a)anthracene	0.002			
Chrysene	0.002			
bis(2-Ethylhexyl)phthalate	6		4	2
Di-n-octylphthalate	50			
Benzo(b)fluoranthene	0.002			
Benzo(k)fluoranthene	0.002			
Benzo(a)pyrene	ND			
Indeno(1,2,3-cd)pyrene	0.002			
Dibenz(a,h)anthracene	50			
Benzo(g,h,i)perylene	50			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Phenol	1			
bis(2-Chloroethyl)ether	1			
2-Chlorophenol	1			
1,3-Dichlorobenzene	5			
1,4-Dichlorobenzene	4.7			
1,2-Dichlorobenzene	4.7			
2-Methylphenol	1			
2,2'-oxybis(1-Chloropropane)	50			
4-Methylphenol	1			
N-Nitroso-di-n-propylamine	50			
Hexachloroethane	5			
Nitrobenzene	5			
Isophorone	50			
2-Nitrophenol	1			
2,4-Dimethylphenol	1			
bis(2-Chloroethoxy)methane	5			
2,4-Dichlorophenol	1			
1,2,4-Trichlorobenzene	5			
Naphthalene	10			
4-Chloroaniline	5			
Hexachlorobutadiene	5			
4-Chloro-3-methylphenol	1			
2-Methylnaphthalene	50			
Hexachlorocyclopentadiene	5			
2,4,6-Trichlorophenol	1			
2,4,5-Trichlorophenol	1			
2-Chloronaphthalene	10			
2-Nitroaniline	5			
Dimethylphthalate	50			
Acenaphthylene	50			
2,6-Dinitrotoluene	5			
3-Nitroaniline	5			

Only detected results reported.
ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
Acenaphthene	20			
2,4-Dinitrophenol	1			
4-Nitrophenol	1			
Dibenzofuran	50			
2,4-Dinitrotoluene	5			
Diethylphthalate	50			
4-Chlorophenyl-phenylether	50			
Fluorene	50			
4-Nitroaniline	5			
4,6-Dinitro-2-methylphenol	1			
N-Nitrosodiphenylamine	50			
4-Bromophenyl-phenylether	50			
Hexachlorobenzene	0.35			
Pentachlorophenol	1			
Phenanthrene	50			
Anthracene	50			
Carbazole	50			
Di-n-butylphthalate	50			
Fluoranthene	50			
Pyrene	50			
Butylbenzylphthalate	50			
3,3'-Dichlorobenzidine	5			
Benzo(a)anthracene	0.002			
Chrysene	0.002			
bis(2-Ethylhexyl)phthalate	6	3		
Di-n-octylphthalate	50			
Benzo(b)fluoranthene	0.002			
Benzo(k)fluoranthene	0.002			
Benzo(a)pyrene	ND			
Indeno(1,2,3-cd)pyrene	0.002			
Dibenz(a,h)anthracene	50			
Benzo(g,h,i)perylene	50			

Only detected results reported.
ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (PESTICIDES/PCB's)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
alpha-BHC	ND			
beta-BHC	ND			
delta-BHC	ND			
gamma-BHC (Lindane)	ND			
Heptachlor	ND			
Aldrin	ND			
Heptachlor epoxide	ND			
Endosulfan I	50			
Dieldrin	ND			
4,4'-DDE	ND			
Endrin	ND			
Endosulfan II	50			
4,4'-DDD	ND			
Endosulfan sulfate	50			
4,4'-DDT	ND			
Methoxychlor	35			
Endrin ketone	5			
Endrin aldehyde	5			
alpha-Chlordane	0.1			
gamma-Chlordane	0.1			
Toxaphene	ND			
Aroclor-1016	0.1			
Aroclor-1221	0.1			
Aroclor-1232	0.1			
Aroclor-1242	0.1			
Aroclor-1248	0.1			
Aroclor-1254	0.1			
Aroclor-1260	0.1			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

ND - Not detected.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (PESTICIDES/PCB's)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
alpha-BHC	ND			
beta-BHC	ND			
delta-BHC	ND			
gamma-BHC (Lindane)	ND			
Heptachlor	ND			
Aldrin	ND			
Heptachlor epoxide	ND			
Endosulfan I	50			
Dieldrin	ND			
4,4'-DDE	ND			
Endrin	ND			
Endosulfan II	50			
4,4'-DDD	ND			
Endosulfan sulfate	50			
4,4'-DDT	ND			
Methoxychlor	35			
Endrin ketone	5			
Endrin aldehyde	5			
alpha-Chlordane	0.1			
gamma-Chlordane	0.1			
Toxaphene	ND			
Aroclor-1016	0.1			
Aroclor-1221	0.1			
Aroclor-1232	0.1			
Aroclor-1242	0.1			
Aroclor-1248	0.1			
Aroclor-1254	0.1			
Aroclor-1260	0.1			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

ND - Not detected.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-26-001	MW-26-001	MW-26-002	MW-26-002
Well I.D.		MW-26-001	MW-26-001	MW-26-002	MW-26-002
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	ARAR	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	50 to200	3940 [a]	105	703 [a]	280 [a]
Antimony	3				
Arsenic	25	3		3	3.3
Barium	1,000	29.2	105	9.7	29.1
Beryllium	3	0.46		0.29	
Cadmium	5				
Calcium	—	8190	7730	16300	19100
Chromium	50	5.7			
Cobalt	—	5.6			
Copper	200	5.4			
Iron	300	6140 [a]	73.6	1860 [a]	61.2
Lead	15	4.3	1.3	2.4	1.2
Magnesium	35,000	3040	1690	3700	3620
Manganese	300	62.9	9.8	99.7	107
Mercury	2				
Nickel	100	12			
Potassium	—	1840	1300	1620	1490
Selenium	10				
Silver	50				
Sodium	20,000	1410	1830	1630	1410
Thallium	2		1.3		
Vanadium	—	8.6			
Zinc	300	52	78.7	221	24.1

Only detected results reported.
ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.
— - No ARAR available.
[a] - Exceeds ARAR.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-26-003	MW-26-003	MW-26-004	MW-26-004
Well I.D.		MW-26-003	MW-26-003	MW-26-004	MW-26-004
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	ARAR	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	50 to200	6050 [a]		939 [a]	35.8
Antimony	3				
Arsenic	25	4.9		2.2	
Barium	1,000	46.2	30.4	7.7	49.2
Beryllium	3	0.74		0.29	
Cadmium	5				4.1
Calcium	—	8610	7000	5230	5040
Chromium	50	11.5			
Cobalt	—	9.3			
Copper	200	13.3		4.3	
Iron	300	12600 [a]	13.7	1940 [a]	30.4
Lead	15	5.6	1.1	2.2	1.4
Magnesium	35,000	3170	934	783	421
Manganese	300	104	13	30.3	8.9
Mercury	2				
Nickel	100	21			
Potassium	—	3020	1910	2280	2070
Selenium	10				
Silver	50				
Sodium	20,000	1920	1580	1410	1170
Thallium	2				
Vanadium	—	27.7		3.8	
Zinc	300	297	27.3	315 [a]	37.9

Only detected results reported.
ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.
— - No ARAR available.
[a] - Exceeds ARAR.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-24-001	MW-24-001	MW-24-001 DUP	MW-24-001 DUP
Well I.D.		MW-24-001	MW-24-001	MW-24-001	MW-24-001
Date Sampled		07-Dec-94	07-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	ARAR	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	50 to200	234 [a]	38	225 [a]	
Antimony	3	29.3 [a]			
Arsenic	25				
Barium	1,000	7.9	34.6	6.9	24.9
Beryllium	3				
Cadmium	5				
Calcium	—	8900	9410	9310	8450
Chromium	50				
Cobalt	—	6.2		6	5.1
Copper	200				
Iron	300	314 [a]	13.4	288	25.9
Lead	15	1		1.2	
Magnesium	35,000	1810	1900	1850	1710
Manganese	300	9.8	7.7	10.7	8.3
Mercury	2				
Nickel	100				
Potassium	—	2160	2130	2310	2290
Selenium	10				
Silver	50				
Sodium	20,000	4820	5120	4870	5320
Thallium	2				
Vanadium	—				
Zinc	300	182	29.1	146	25

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

— - No ARAR available.

[a] - Exceeds ARAR.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FOCE BASE SS-026
GROUNDWATER (EXPLOSIVES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
HMX	50			
RDX	50			5.6
1,3,5-TNB	5			
1,3-DNB	5			
Tetryl	50			
NB	5			
2,4,6-TNT	5			
4-Am-2,6-DNT	50			
2-Am-4,6-DNT	50			
2,6-DNT	5			
2,4-DNT	5			
2-NT	5			
4-NT	5			
3-NT	5			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

TABLE A-2

ANALYTICAL RESULTS
PLATTSBURGH AIR FOCE BASE SS-026
GROUNDWATER (EXPLOSIVES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	ARAR			
HMX	50			
RDX	50			
1,3,5-TNB	5			
1,3-DNB	5			
Tetryl	50			
NB	5			
2,4,6-TNT	5			
4-Am-2,6-DNT	50			
2-Am-4,6-DNT	50			
2,6-DNT	5			
2,4-DNT	5			
2-NT	5			
4-NT	5			
3-NT	5			

Only detected results reported.

ARAR - "Applicable or Relevant and Appropriate Requirements" that are legally binding.

APPENDIX B

1994 SAMPLE DATA SUMMARY

TABLE B-1

PLATTSBURGH AIR FORCE BASE (SITE SS-026)
SAMPLE DATA SUMMARY

Sample ID	Depth	Sample Matrix	Date Sampled							Organic Screening	Description
			VOA	SVOA	Pest/PCBs	TAL Metals	TAL Metals		Explosives		
							Filtered Metals	Unfiltered Metals		HNU (ppm)*	
WB-MW-26-001-0	0.0 — 2.0	Surface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Orange/brown fine sand.
WB-MW-26-001-0 Dup	0.0 — 2.0	Surface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Orange/brown fine sand.
WB-MW-26-003-0	0.0 — 2.0	Surface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Light tan fine sand.
SB-26-01-0	0.0 — 2.0	Surface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.2	Orange/brown fine sand.
SB-26-02-0	0.0 — 2.0	Surface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.2	Brown fine sand.
SB-26-03-0	0.0 — 2.0	Surface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.2	Light brown fine sand.
WB-MW-26-001-2	2.0 — 4.0	Subsurface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Orange/brown fine sand.
WB-MW-26-001-2 MS	2.0 — 4.0	Subsurface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Orange/brown fine sand.
WB-MW-26-001-2 MSD	2.0 — 4.0	Subsurface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.2	Orange/brown fine sand.
WB-MW-26-003-2	2.0 — 4.0	Subsurface Soil	08-NOV-94	08-NOV-94	08-NOV-94	08-NOV-94	--	--	08-NOV-94	0.3	Light tan fine sand.
SB-26-01-2	2.0 — 4.0	Subsurface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.2	Tan fine sand.
SB-26-02-2	2.0 — 4.0	Subsurface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.3	Brown coarse sand.
SB-26-03-2	2.0 — 4.0	Subsurface Soil	09-NOV-94	09-NOV-94	09-NOV-94	09-NOV-94	--	--	09-NOV-94	0.2	Light brown fine sand.
MW-26-001	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-26-002	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-26-003	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-26-003 MS	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-26-003 MSD	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-26-004	0.0 — 0.0	Groundwater	06-DEC-94	06-DEC-94	06-DEC-94	--	06-DEC-94	06-DEC-94	06-DEC-94	--	Clear.
MW-24-001	0.0 — 0.0	Groundwater	07-DEC-94	07-DEC-94	07-DEC-94	--	07-DEC-94	07-DEC-94	07-DEC-94	--	Clear.
MW-24-001 Dup	0.0 — 0.0	Groundwater	07-DEC-94	07-DEC-94	07-DEC-94	--	07-DEC-94	07-DEC-94	07-DEC-94	--	Clear.

* The HNu PID background reading was typically 0.2 ppm.

APPENDIX C

DATA VALIDATION/ASSESSMENT SUMMARY TABLES

APPENDIX C1

1994 DATA

QUALITY CONTROL SUMMARY REPORT
SS-026 EOD RANGE

Plattsburgh Air Force Base Installation Restoration Program

prepared for:

United States Department of The Air Force
Plattsburgh Air Force Base
Plattsburgh, New York

March 1995

G2003

SS-026 - EOD RANGE
QUALITY CONTROL SUMMARY REPORT

PLATTSBURGH AIR FORCE BASE
INSTALLATION RESTORATION PROGRAM

MARCH 1995

Prepared by:

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1.0 PROJECT SCOPE

A Remedial Investigation (RI) currently is being undertaken at the Explosive Ordnance Demolition (EOD) Range (SS-026) at Plattsburgh Air Force Base (AFB) in Clinton County, New York. In November and December 1994, surface and subsurface soil samples, as well as groundwater samples were collected from the site and analyzed by Ecology and Environment, Inc. (E&E) of Lancaster, New York. Subsequent to chemical analysis, the chemical data was validated, organized, and interpreted. Results will be included in the RI Report for SS-026.

2.0 SCOPE OF THE QUALITY CONTROL SUMMARY REPORT

Three deliverables are used to track the validation and interpretation of chemical data generated during the SS-026 RI -- the Interim Raw Data Package, the Quality Control Report, and the Remedial Investigation Report.

The Interim Raw Data Package (IRDP) submitted on February 14, 1995, was a comprehensive compilation of raw data obtained from the field sampling activities. It included documentation of sample and blank analytical results for all fractions, matrix spike/matrix spike duplicate data for organic fractions, method blank summaries, and chain-of-custody.

This Quality Control Summary Report (QCSR) report presents the validated analytical data in the form of appropriately flagged data tables (Appendix A) and provides detail regarding the validation results. Quality control (QC) samples (method blanks, trip blanks, and rinse blanks) are tabulated in Appendix A and are cross-referenced to associated samples. An explanation of validation qualifiers is included in Appendix A, as well as a list of compound abbreviations used for explosives data. The reliability of the data is discussed in Section 7.0. This QCSR contains organic surrogate spike results - Form II's (Appendix B); organic and inorganic matrix spike results-Forms III and V (Appendix C); inorganic duplicate sample results - Form VIs (Appendix D); and inorganic laboratory control sample results - Form VIIs (Appendix E).

The Remedial Investigation (RI) Report, to be submitted in the Spring of 1995, summarizes, reduces, and draws conclusions from the data collected during the field activities and previous investigations. Analytical data will be presented in the following form:

- Appendix A will contain tabulated, analytical data; however, only usable and unflagged data will be presented.

- Appendix C - Appendix C will contain tabulated and flagged analytical data in accordance with the data validation guidelines. This Appendix will be identical to that of the QCSR.

- The body of report will summarize (number of hits, maximums, minimums, averages), statistically reduce, and interpret the data.

The analytical data packages will be maintained in their entirety for a period of two years at the office of URS Consultants, Inc. in Buffalo, New York.

3.0 SAMPLING PROCEDURES (PLANNED VS. IMPLEMENTED)

Samples were collected in a manner consistent with the project plans and no deviations were encountered.

4.0 ANALYTICAL PROCEDURES

All analyses were performed in accordance with USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Analysis, Multi-media, Multi-concentration, Document Number OLM01.8 and USEPA CLP SOW for Inorganic Analysis, Multi-media, Multi-concentration, Document Number ILM03.0.

The data was validated following the guidelines established by USEPA CLP Organic Data Review SOP No. HW-6, Revision #8, and USEPA Evaluation of Metals Data for the CLP based on SOW 3/90, Revision XI.

5.0 ANALYTICAL DEVIATIONS

Some analytical problems were encountered during the analysis of some samples and are summarized in Table 1. The table identifies the sample ID, fraction, and analytical problem encountered and, how the data was qualified as a result of the data validation. A complete summary of the validation tables are presented in Appendix A.

As identified in Table 1, and in accordance with the referenced validation guidelines, zinc was rejected in eleven soil samples because there was zero percent recovery for the associated spike sample. Based upon this poor spike recovery, the zinc results are not reliable. Due to various QC outliers (identified in Appendix A) some individual metals are qualified as estimated (these are not included in Table 1 to avoid having numerous qualifications).

6.0 DATA PRESENTATION

Analytical results will be reported in Appendix A of the RI Report. Validation summary tables (flagged with USEPA validation qualifiers) are included as Appendix A of this report. Included in Appendix B is a list which provides a cross-reference between URS chain-of-custody IDs and E&E sample IDs.

7.0 QA/QC ACTIVITIES/DATA RELIABILITY

QA/QC activities for the field and laboratory were performed in accordance with the approved project plans. No QA/QC deviations were noted and all QA/QC activities were performed at the frequency dictated in these documents.

The reliability of data is determined during the data validation process. USEPA has established guidelines for the measurement of data reliability (or validity). Data not meeting

USEPA standards, were considered to be unreliable; hence, the analytical results were rejected (e.g., zinc results). Validation procedures utilized are identified in Section 4.0.

8.0 PERCENT COMPLETENESS

The analytical and QC data presented in Appendix A were validated using standard USEPA CLP methods and validation guidelines. The project goal for completeness, as defined in the project plans, was 95 percent. Completeness is defined as a measure of the amount of data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions.

The following table presents the percent completeness measured for this project. The percent completeness was calculated for each medium analyzed.

Medium	% Completeness
Soil	95.6%
Groundwater	100%

TABLE 1
ANALYTICAL DEVIATIONS AND DATA QUALIFICATIONS

Sample ID	Medium	Fraction	Deviation	Qualification
WB-MW-26-003-0	Soil	VOA	Calibration Exceedance	Chloromethane estimated
WB-MW-26-003-2	Soil	VOA	Calibration Exceedance	Chloromethane estimated
SB-26-01-0	Soil	VOA	Calibration Exceedance	Chloromethane estimated
SB-26-01-2	Soil	VOA	Calibration Exceedance	Chloromethane estimated
SB-26-02-0	Soil	VOA	Calibration Exceedance	Chloromethane and acetone estimated
SB-26-02-2	Soil	VOA	Calibration Exceedance	Chloromethane estimated
SB-26-03-0	Soil	VOA	Calibration Exceedance	Chloromethane and vinyl chloride estimated
SB-26-03-2	Soil	VOA	Calibration Exceedance	Chloromethane and vinyl chloride estimated
WB-MW-26-001-0	Soil	SVOA	Calibration Exceedance	2,2'-oxybis (1-Chloropropane) and Di-n-octylphthalate estimated
WB-MW-26-001-0DUP	Soil	SVOA	Calibration Exceedance	2,2'-oxybis (1-Chloropropane) and Di-n-octylphthalate estimated
WB-MW-26-001-2	Soil	SVOA	Calibration Exceedance	2,2'-oxybis (1-Chloropropane) and Di-n-octylphthalate estimated
WB-MW-26-003-0	Soil	SVOA	Calibration Exceedance	2,2'-oxybis (1-Chloropropane) and Di-n-octylphthalate estimated
WB-MW-26-003-2	Soil	SVOA	Calibration Exceedance	2,2'-oxybis (1-chloropropane), Di-n-octylphthalate, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene estimated
MW-26-001	GW	VOA	Calibration Exceedance	2-Hexanone estimated
MW-26-002	GW	VOA	Calibration Exceedance	2-Hexanone estimated
MW-26-003	GW	VOA	Calibration Exceedance	2-Hexanone estimated
MW-26-004	GW	VOA	Calibration Exceedance	2-Hexanone estimated
MW-24-001DUP	GW	SVOA	Calibration Exceedance	2-Hexanone estimated

TABLE 1 (Cont'd)
ANALYTICAL DEVIATIONS AND DATA QUALIFICATIONS

Sample ID	Medium	Fraction	Deviation	Qualification
MW-26-001	GW	SVOA	Calibration Exceedance	4-Chloraniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, Carbazole, Butylbenzylphthalate, 3,3'-Dichlorobenzidine and bis(2-Ethylhexyl)phthalate estimated
MW-26-002	GW	SVOA	Calibration Exceedance	4-Chloraniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, Carbazole, Butylbenzylphthalate, 3,3'-Dichlorobenzidine and bis(2-Ethylhexyl)phthalate estimated
MW-26-003	GW	SVOA	Calibration Exceedance	4-Chloraniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, Carbazole, Butylbenzylphthalate, 3,3'-Dichlorobenzidine and bis(2-Ethylhexyl)phthalate estimated
MW-26-004	GW	SVOA	Calibration Exceedance	4-Chloraniline, 2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, Carbazole, Butylbenzylphthalate, 3,3'-Dichlorobenzidine and bis(2-Ethylhexyl)phthalate estimated
MW-24-001	GW	SVOA	Calibration Exceedance	2,4-Dinitrophenol, 4-Nitrophenol, 4-Nitroaniline, and Carbazole estimated
MW-24-001DUP	GW	SVOA	Calibration Exceedance	3,3'-Dichlorobenzidine and bis(2-ethyhexyl)phthlate estimated

TABLE 1 (Cont'd)
ANALYTICAL DEVIATIONS AND DATA QUALIFICATIONS

Sample ID	Medium	Fraction	Deviation	Qualification
WB-MW-26-001-0, WB-MW-26-001-0DUP, WB-MW-26-003-2, WB-MW-26-003-0, and WB-MW-003-2	Soil	Ag	Spike Exceedance	Data estimated
WB-MW-26-003-0 WB-MW-26-003-2	Soil	Pb	Calibration Exceedance	Data estimated
SB26-01-0 SB26-01-2 SB26-02-0	Soil	Ag	Spike Exceedance	Data estimated
SB26-02-2 SB26-03-0 SB26-03-2	Soil	As and Ag	Spike Exceedance	Data estimated
SB26-03-0 SB26-03-2	GW	Cd	Calibration Exceedance	Data estimated
MW-26-001 MW-26-002 MW-26-003	GW	Al, Ag and Zn (total and dissolved)	Spike Exceedance	Data estimated
MW-26-004	GW	Pb, Ag and Zn (total only)	Spike Exceedance	Data estimated
MW-26-004	GW	A1, Pb, Ag and Zn (dissolved only)	Spike Exceedance	Data estimated
MW-24-001 and MW-24-001 DUP	GW	Al, Ag and Zn (total and dissolved)	Spike Exceedance	Data estimated
FB26-941207	GW	Al, Se and Zn (total and dissolved	Spike Exceedance	Data estimated

Abbreviations:

GW	-	Groundwater
VOA	-	Volatiles
SVOA	-	Semivolatiles
MW	-	Monitoring Well
DUP	-	Duplicate
WB	-	Well Boring
Ag	-	Silver
As	-	Arsenic
Al	-	Aluminum
Zn	-	Zinc
Se	-	Selenium
Cd	-	Cadmium
SB	-	Soil Boring
Pb	-	Lead

EXPLANATION OF VALIDATION QUALIFIERS

The following are definitions of the validation qualifiers assigned to results during the data review process.

U - Analysis was conducted for the analyte but was not detected.

J - Indicates an estimated concentration because results were either below the sample quantitation limit or quality control criteria were not met.

R - The sample results were rejected due to serious deficiencies in the ability to meet holding time criteria and/or quality control criteria established by the USEPA. The presence or absence of the analyte could not be verified.

***** - The compound was detected but was determined unusable due to contamination in the associated QC blank.

[] - The sample result was less than the contract required detection limit but greater than or equal to the instrument detection limit.

EXPLOSIVE COMPOUND ABBREVIATIONS
METHOD NUMBER 8030

Compound	Abbreviation
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX
1,3,5-Trinitrobenzene	1,3,5-TNB
1,3-Dinitrobenzene	1,3-DNB
Methyl-2,4,6-trinitrophenylnitramine	Tetryl
Nitrobenzene	NB
2,4,6-Trinitrotoluene	2,4,6-TNT
4-Amino-2,6-dinitrotoluene	4-Am-DNT
2-Amino-4,6-dinitrotoluene	2-Am-DNT
2,4-Dinitrotoluene	2,4-DNT
2,6-Dinitrotoluene	2,6-DNT
2-Nitrotoluene	2-NT
3-Nitrotoluene	3-NT
4-Nitrotoluene	4-NT

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Date Analyzed		12-Nov-94	12-Nov-94	12-Nov-94	12-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		10	9	15	5
Parameter	Class				
Chloromethane	VOC	11 UJ	11 UJ	12 UJ	10 UJ
Bromomethane	VOC	11 U	11 U	12 U	10 U
Vinyl Chloride	VOC	11 U	11 U	12 U	10 U
Chloroethane	VOC	11 U	11 U	12 U	10 U
Methylene Chloride	VOC	11 U	11 U	12 U	10 U
Acetone	VOC	12 J	5 J	13 J	34 J
Carbon Disulfide	VOC	11 U	11 U	12 U	10 U
1,1-Dichloroethene	VOC	11 U	11 U	12 U	10 U
1,1-Dichloroethane	VOC	11 U	11 U	12 U	10 U
1,2-Dichloroethene (total)	VOC	11 U	11 U	12 U	10 U
Chloroform	VOC	11 U	11 U	12 U	10 U
1,2-Dichloroethane	VOC	11 U	11 U	12 U	10 U
2-Butanone	VOC	11 U	11 U	12 U	10 U
1,1,1-Trichloroethane	VOC	11 U	11 U	12 U	10 U
Carbon Tetrachloride	VOC	11 U	11 U	12 U	10 U
Bromodichloromethane	VOC	11 U	11 U	12 U	10 U
1,2-Dichloropropane	VOC	11 U	11 U	12 U	10 U
cis-1,3-Dichloropropene	VOC	11 U	11 U	12 U	10 U
Trichloroethene	VOC	11 U	11 U	12 U	10 U
Dibromochloromethane	VOC	11 U	11 U	12 U	10 U
1,1,2-Trichloroethane	VOC	11 U	11 U	12 U	10 U
Benzene	VOC	11 U	11 U	12 U	10 U
trans-1,3-Dichloropropene	VOC	11 U	11 U	12 U	10 U
Bromoform	VOC	11 U	11 U	12 U	10 U
4-Methyl-2-Pentanone	VOC	11 U	11 U	12 U	10 U
2-Hexanone	VOC	11 U	11 U	12 U	10 U
Tetrachloroethene	VOC	11 U	11 U	12 U	10 U
1,1,2,2-Tetrachloroethane	VOC	11 U	11 U	12 U	10 U
Toluene	VOC	11 U	11 U	12 U	10 U
Chlorobenzene	VOC	11 U	11 U	12 U	10 U
Ethylbenzene	VOC	11 U	11 U	12 U	10 U
Styrene	VOC	11 U	11 U	12 U	10 U
Xylene (total)	VOC	11 U	11 U	12 U	10 U
Associated Method Blank		VBLKS1	VBLKS1	VBLKS1	VBLKS1
Associated Trip Blank		NA	NA	NA	NA
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

MADE BY JSM DATE 07/14/95
CHKD BY SW DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Date Analyzed		12-Nov-94	12-Nov-94	12-Nov-94	12-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		5	4	3	5
Parameter	Class				
Chloromethane	VOC	10 UJ	10 UJ	11 UJ	10 UJ
Bromomethane	VOC	10 U	10 U	11 U	10 U
Vinyl Chloride	VOC	10 U	10 U	11 U	10 U
Chloroethane	VOC	10 U	10 U	11 U	10 U
Methylene Chloride	VOC	10 U	10 U	11 U	1 J
Acetone	VOC	15 J	16 J	12 J	10 UJ
Carbon Disulfide	VOC	10 U	10 U	11 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U	11 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U	11 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U	11 U	10 U
Chloroform	VOC	10 U	10 U	11 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U	11 U	10 U
2-Butanone	VOC	10 U	10 U	11 U	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U	11 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U	11 U	10 U
Bromodichloromethane	VOC	10 U	10 U	11 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U	11 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U	11 U	10 U
Trichloroethene	VOC	10 U	10 U	11 U	10 U
Dibromochloromethane	VOC	10 U	10 U	11 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U	11 U	10 U
Benzene	VOC	10 U	10 U	11 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U	11 U	10 U
Bromoform	VOC	10 U	10 U	11 U	10 U
4-Methyl-2-Pentanone	VOC	10 U	10 U	11 U	10 U
2-Hexanone	VOC	10 U	10 U	11 U	10 U
Tetrachloroethene	VOC	10 U	10 U	11 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U	11 U	10 U
Toluene	VOC	10 U	10 U	11 U	3 J
Chlorobenzene	VOC	10 U	10 U	11 U	10 U
Ethylbenzene	VOC	10 U	10 U	11 U	10 U
Styrene	VOC	10 U	10 U	11 U	10 U
Xylene (total)	VOC	10 U	10 U	11 U	10 U
Associated Method Blank		VBLKS1	VBLKS1	VBLKS1	VBLKS1
Associated Trip Blank		NA	NA	NA	NA
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
SOIL (VOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Date Analyzed		12-Nov-94	14-Nov-94	14-Nov-94
Units		UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1
% Moisture		5	5	6
Parameter	Class			
Chloromethane	VOC	11 UJ	11 UJ	11 UJ
Bromomethane	VOC	11 U	11 U	11 U
Vinyl Chloride	VOC	11 U	11 UJ	11 UJ
Chloroethane	VOC	11 U	11 U	11 U
Methylene Chloride	VOC	11 U	1 J	11 U
Acetone	VOC	3 J	16 U*	11 U*
Carbon Disulfide	VOC	11 U	11 U	11 U
1,1-Dichloroethene	VOC	11 U	11 U	11 U
1,1-Dichloroethane	VOC	11 U	11 U	11 U
1,2-Dichloroethene (total)	VOC	11 U	11 U	11 U
Chloroform	VOC	11 U	11 U	11 U
1,2-Dichloroethane	VOC	11 U	11 U	11 U
2-Butanone	VOC	11 U	11 U	11 U
1,1,1-Trichloroethane	VOC	11 U	11 U	11 U
Carbon Tetrachloride	VOC	11 U	11 U	11 U
Bromodichloromethane	VOC	11 U	11 U	11 U
1,2-Dichloropropane	VOC	11 U	11 U	11 U
cis-1,3-Dichloropropene	VOC	11 U	11 U	11 U
Trichloroethene	VOC	11 U	11 U	11 U
Dibromochloromethane	VOC	11 U	11 U	11 U
1,1,2-Trichloroethane	VOC	11 U	11 U	11 U
Benzene	VOC	11 U	11 U	11 U
trans-1,3-Dichloropropene	VOC	11 U	11 U	11 U
Bromoform	VOC	11 U	11 U	11 U
4-Methyl-2-Pentanone	VOC	11 U	11 U	11 U
2-Hexanone	VOC	11 U	11 U	11 U
Tetrachloroethene	VOC	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	VOC	11 U	11 U	11 U
Toluene	VOC	11 U	11 U	11 U
Chlorobenzene	VOC	11 U	11 U	11 U
Ethylbenzene	VOC	11 U	11 U	11 U
Styrene	VOC	11 U	11 U	11 U
Xylene (total)	VOC	11 U	11 U	11 U
Associated Method Blank		VBLKS1	VBLKS2	VBLKS2
Associated Trip Blank		NA	NA	NA
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Date Extracted		11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94
Date Analyzed		24-Nov-94	24-Nov-94	24-Nov-94	24-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		10	9	15	5
Parameter	Class				
Phenol	SVOC	370 U	360 U	390 U	350 U
bis(2-Chloroethyl)ether	SVOC	370 U	360 U	390 U	350 U
2-Chlorophenol	SVOC	370 U	360 U	390 U	350 U
1,3-Dichlorobenzene	SVOC	370 U	360 U	390 U	350 U
1,4-Dichlorobenzene	SVOC	370 U	360 U	390 U	350 U
1,2-Dichlorobenzene	SVOC	370 U	360 U	390 U	350 U
2-Methylphenol	SVOC	370 U	360 U	390 U	350 U
2,2'-oxybis(1-Chloropropane)	SVOC	370 UJ	360 UJ	390 UJ	350 UJ
4-Methylphenol	SVOC	370 U	360 U	390 U	350 U
N-Nitroso-di-n-propylamine	SVOC	370 U	360 U	390 U	350 U
Hexachloroethane	SVOC	370 U	360 U	390 U	350 U
Nitrobenzene	SVOC	370 U	360 U	390 U	350 U
Isophorone	SVOC	370 U	360 U	390 U	350 U
2-Nitrophenol	SVOC	370 U	360 U	390 U	350 U
2,4-Dimethylphenol	SVOC	370 U	360 U	390 U	350 U
bis(2-Chloroethoxy)methane	SVOC	370 U	360 U	390 U	350 U
2,4-Dichlorophenol	SVOC	370 U	360 U	390 U	350 U
1,2,4-Trichlorobenzene	SVOC	370 U	360 U	390 U	350 U
Naphthalene	SVOC	370 U	360 U	390 U	350 U
4-Chloroaniline	SVOC	370 U	360 U	390 U	350 U
Hexachlorobutadiene	SVOC	370 U	360 U	390 U	350 U
4-Chloro-3-methylphenol	SVOC	370 U	360 U	390 U	350 U
2-Methylnaphthalene	SVOC	370 U	360 U	390 U	350 U
Hexachlorocyclopentadiene	SVOC	370 U	360 U	390 U	350 U
2,4,6-Trichlorophenol	SVOC	370 U	360 U	390 U	350 U
2,4,5-Trichlorophenol	SVOC	890 U	880 U	940 U	840 U
2-Chloronaphthalene	SVOC	370 U	360 U	390 U	350 U
2-Nitroaniline	SVOC	890 U	880 U	940 U	840 U
Dimethylphthalate	SVOC	370 U	360 U	390 U	350 U
Acenaphthylene	SVOC	370 U	360 U	390 U	350 U
2,6-Dinitrotoluene	SVOC	370 U	360 U	390 U	350 U
3-Nitroaniline	SVOC	890 U	880 U	940 U	840 U
Associated Method Blank		SBLKS1	SBLKS1	SBLKS1	SBLKS1
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Date Extracted		11-Nov-94	11-Nov-94	11-Nov-94	11-Nov-94
Date Analyzed		24-Nov-94	24-Nov-94	24-Nov-94	24-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		10	9	15	5
Parameter	Class				
Acenaphthene	SVOC	370 U	360 U	390 U	350 U
2,4-Dinitrophenol	SVOC	890 U	880 U	940 U	840 U
4-Nitrophenol	SVOC	890 U	880 U	940 U	840 U
Dibenzofuran	SVOC	370 U	360 U	390 U	350 U
2,4-Dinitrotoluene	SVOC	370 U	360 U	390 U	350 U
Diethylphthalate	SVOC	370 U	360 U	780	350 U
4-Chlorophenyl-phenylether	SVOC	370 U	360 U	390 U	350 U
Fluorene	SVOC	370 U	360 U	390 U	350 U
4-Nitroaniline	SVOC	890 U	880 U	940 U	840 U
4,6-Dinitro-2-methylphenol	SVOC	890 U	880 U	940 U	840 U
N-Nitrosodiphenylamine	SVOC	370 U	360 U	390 U	350 U
4-Bromophenyl-phenylether	SVOC	370 U	360 U	390 U	350 U
Hexachlorobenzene	SVOC	370 U	360 U	390 U	350 U
Pentachlorophenol	SVOC	890 U	880 U	940 U	840 U
Phenanthrene	SVOC	370 U	360 U	390 U	350 U
Anthracene	SVOC	370 U	360 U	390 U	350 U
Carbazole	SVOC	370 U	360 U	390 U	350 U
Di-n-butylphthalate	SVOC	370 U	360 U	390 U	350 U
Fluoranthene	SVOC	370 U	360 U	390 U	350 U
Pyrene	SVOC	370 U	360 U	390 U	350 U
Butylbenzylphthalate	SVOC	370 U	360 U	390 U	350 U
3,3'-Dichlorobenzidine	SVOC	370 U	360 U	390 U	350 U
Benzo(a)anthracene	SVOC	370 U	360 U	390 U	350 U
Chrysene	SVOC	370 U	360 U	390 U	350 U
bis(2-Ethylhexyl)phthalate	SVOC	370 U	360 U	390 U	350 U
Di-n-octylphthalate	SVOC	370 UJ	360 UJ	390 UJ	350 UJ
Benzo(b)fluoranthene	SVOC	370 U	360 U	390 U	350 U
Benzo(k)fluoranthene	SVOC	370 U	360 U	390 U	350 U
Benzo(a)pyrene	SVOC	370 U	360 U	390 U	350 U
Indeno(1,2,3-cd)pyrene	SVOC	370 UJ	360 UJ	390 UJ	350 UJ
Dibenz(a,h)anthracene	SVOC	370 UJ	360 UJ	390 UJ	350 UJ
Benzo(g,h,i)perylene	SVOC	370 UJ	360 UJ	390 UJ	350 UJ
Associated Method Blank		SBLKS1	SBLKS1	SBLKS1	SBLKS1
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		11-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94
Date Analyzed		24-Nov-94	23-Nov-94	23-Nov-94	23-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		5	4	3	5
Parameter	Class				
Phenol	SVOC	350 U	340 U	340 U	350 U
bis(2-Chloroethyl)ether	SVOC	350 U	340 U	340 U	350 U
2-Chlorophenol	SVOC	350 U	340 U	340 U	350 U
1,3-Dichlorobenzene	SVOC	350 U	340 U	340 U	350 U
1,4-Dichlorobenzene	SVOC	350 U	340 U	340 U	350 U
1,2-Dichlorobenzene	SVOC	350 U	340 U	340 U	350 U
2-Methylphenol	SVOC	350 U	340 U	340 U	350 U
2,2'-oxybis(1-Chloropropane)	SVOC	350 UJ	340 U	340 U	350 U
4-Methylphenol	SVOC	350 U	340 U	340 U	350 U
N-Nitroso-di-n-propylamine	SVOC	350 U	340 U	340 U	350 U
Hexachloroethane	SVOC	350 U	340 U	340 U	350 U
Nitrobenzene	SVOC	350 U	340 U	340 U	350 U
Isophorone	SVOC	350 U	340 U	340 U	350 U
2-Nitrophenol	SVOC	350 U	340 U	340 U	350 U
2,4-Dimethylphenol	SVOC	350 U	340 U	340 U	350 U
bis(2-Chloroethoxy)methane	SVOC	350 U	340 U	340 U	350 U
2,4-Dichlorophenol	SVOC	350 U	340 U	340 U	350 U
1,2,4-Trichlorobenzene	SVOC	350 U	340 U	340 U	350 U
Naphthalene	SVOC	350 U	340 U	340 U	350 U
4-Chloroaniline	SVOC	350 U	340 U	340 U	350 U
Hexachlorobutadiene	SVOC	350 U	340 U	340 U	350 U
4-Chloro-3-methylphenol	SVOC	350 U	340 U	340 U	350 U
2-Methylnaphthalene	SVOC	350 U	340 U	340 U	350 U
Hexachlorocyclopentadiene	SVOC	350 U	340 U	340 U	350 U
2,4,6-Trichlorophenol	SVOC	350 U	340 U	340 U	350 U
2,4,5-Trichlorophenol	SVOC	840 U	830 U	820 U	840 U
2-Chloronaphthalene	SVOC	350 U	340 U	340 U	350 U
2-Nitroaniline	SVOC	840 U	830 U	820 U	840 U
Dimethylphthalate	SVOC	350 U	340 U	340 U	350 U
Acenaphthylene	SVOC	350 U	340 U	340 U	350 U
2,6-Dinitrotoluene	SVOC	350 U	340 U	340 U	350 U
3-Nitroaniline	SVOC	840 U	830 U	820 U	840 U
Associated Method Blank		SBLKS1	SBLKS2	SBLKS2	SBLKS2
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

MADE BY JSM DATE 07/14/95
CHKD BY SW DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		11-Nov-94	15-Nov-94	15-Nov-94	15-Nov-94
Date Analyzed		24-Nov-94	23-Nov-94	23-Nov-94	23-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1	1
% Moisture		5	4	3	5
Parameter	Class				
Acenaphthene	SVOC	350 U	340 U	340 U	350 U
2,4-Dinitrophenol	SVOC	840 U	830 U	820 U	840 U
4-Nitrophenol	SVOC	840 U	830 U	820 U	840 U
Dibenzofuran	SVOC	350 U	340 U	340 U	350 U
2,4-Dinitrotoluene	SVOC	350 U	340 U	340 U	350 U
Diethylphthalate	SVOC	350 U	340 U	340 U	350 U
4-Chlorophenyl-phenylether	SVOC	350 U	340 U	340 U	350 U
Fluorene	SVOC	350 U	340 U	340 U	350 U
4-Nitroaniline	SVOC	840 U	830 U	820 U	840 U
4,6-Dinitro-2-methylphenol	SVOC	840 U	830 U	820 U	840 U
N-Nitrosodiphenylamine	SVOC	350 U	340 U	340 U	350 U
4-Bromophenyl-phenylether	SVOC	350 U	340 U	340 U	350 U
Hexachlorobenzene	SVOC	350 U	340 U	340 U	350 U
Pentachlorophenol	SVOC	840 U	830 U	820 U	840 U
Phenanthrene	SVOC	350 U	340 U	340 U	350 U
Anthracene	SVOC	350 U	340 U	340 U	350 U
Carbazole	SVOC	350 U	340 U	340 U	350 U
Di-n-butylphthalate	SVOC	350 U	340 U	340 U	350 U
Fluoranthene	SVOC	350 U	340 U	340 U	350 U
Pyrene	SVOC	350 U	340 U	340 U	350 U
Butylbenzylphthalate	SVOC	350 U	340 U	340 U	350 U
3,3'-Dichlorobenzidine	SVOC	350 U	340 U	340 U	350 U
Benzo(a)anthracene	SVOC	350 U	340 U	340 U	350 U
Chrysene	SVOC	350 U	340 U	340 U	350 U
bis(2-Ethylhexyl)phthalate	SVOC	350 U	340 U	340 U	350 U
Di-n-octylphthalate	SVOC	350 UJ	340 U	340 U	350 U
Benzo(b)fluoranthene	SVOC	350 U	340 U	340 U	350 U
Benzo(k)fluoranthene	SVOC	350 U	340 U	340 U	350 U
Benzo(a)pyrene	SVOC	350 U	340 U	340 U	350 U
Indeno(1,2,3-cd)pyrene	SVOC	350 UJ	340 U	340 U	350 U
Dibenz(a,h)anthracene	SVOC	350 UJ	340 U	340 U	350 U
Benzo(g,h,i)perylene	SVOC	350 UJ	340 U	340 U	350 U
Associated Method Blank		SBLKS1	SBLKS2	SBLKS2	SBLKS2
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		15-Nov-94	15-Nov-94	15-Nov-94
Date Analyzed		24-Nov-94	24-Nov-94	24-Nov-94
Units		UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1
% Moisture		5	5	6
Parameter	Class			
Phenol	SVOC	350 U	350 U	350 U
bis(2-Chloroethyl)ether	SVOC	350 U	350 U	350 U
2-Chlorophenol	SVOC	350 U	350 U	350 U
1,3-Dichlorobenzene	SVOC	350 U	350 U	350 U
1,4-Dichlorobenzene	SVOC	350 U	350 U	350 U
1,2-Dichlorobenzene	SVOC	350 U	350 U	350 U
2-Methylphenol	SVOC	350 U	350 U	350 U
2,2'-oxybis(1-Chloropropane)	SVOC	350 U	350 U	350 U
4-Methylphenol	SVOC	350 U	350 U	350 U
N-Nitroso-di-n-propylamine	SVOC	350 U	350 U	350 U
Hexachloroethane	SVOC	350 U	350 U	350 U
Nitrobenzene	SVOC	350 U	350 U	350 U
Isophorone	SVOC	350 U	350 U	350 U
2-Nitrophenol	SVOC	350 U	350 U	350 U
2,4-Dimethylphenol	SVOC	350 U	350 U	350 U
bis(2-Chloroethoxy)methane	SVOC	350 U	350 U	350 U
2,4-Dichlorophenol	SVOC	350 U	350 U	350 U
1,2,4-Trichlorobenzene	SVOC	350 U	350 U	350 U
Naphthalene	SVOC	350 U	350 U	350 U
4-Chloroaniline	SVOC	350 U	350 U	350 U
Hexachlorobutadiene	SVOC	350 U	350 U	350 U
4-Chloro-3-methylphenol	SVOC	350 U	350 U	350 U
2-Methylnaphthalene	SVOC	350 U	350 U	350 U
Hexachlorocyclopentadiene	SVOC	350 U	350 U	350 U
2,4,6-Trichlorophenol	SVOC	350 U	350 U	350 U
2,4,5-Trichlorophenol	SVOC	840 U	840 U	850 U
2-Chloronaphthalene	SVOC	350 U	350 U	350 U
2-Nitroaniline	SVOC	840 U	840 U	850 U
Dimethylphthalate	SVOC	350 U	350 U	350 U
Acenaphthylene	SVOC	350 U	350 U	350 U
2,6-Dinitrotoluene	SVOC	350 U	350 U	350 U
3-Nitroaniline	SVOC	840 U	840 U	850 U
Associated Method Blank		SBLKS2	SBLKS2	SBLKS2
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

MADE BY JSM DATE 07/14/95
CHKD BY [illegible] DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (SEMIVOLATILES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		15-Nov-94	15-Nov-94	15-Nov-94
Date Analyzed		24-Nov-94	24-Nov-94	24-Nov-94
Units		UG/KG	UG/KG	UG/KG
Dilution Factor		1	1	1
% Moisture		5	5	6
Parameter	Class			
Acenaphthene	SVOC	350 U	350 U	350 U
2,4-Dinitrophenol	SVOC	840 U	840 U	850 U
4-Nitrophenol	SVOC	840 U	840 U	850 U
Dibenzofuran	SVOC	350 U	350 U	350 U
2,4-Dinitrotoluene	SVOC	350 U	350 U	350 U
Diethylphthalate	SVOC	350 U	350 U	350 U
4-Chlorophenyl-phenylether	SVOC	350 U	350 U	350 U
Fluorene	SVOC	350 U	350 U	350 U
4-Nitroaniline	SVOC	840 U	840 U	850 U
4,6-Dinitro-2-methylphenol	SVOC	840 U	840 U	850 U
N-Nitrosodiphenylamine	SVOC	350 U	350 U	350 U
4-Bromophenyl-phenylether	SVOC	350 U	350 U	350 U
Hexachlorobenzene	SVOC	350 U	350 U	350 U
Pentachlorophenol	SVOC	840 U	840 U	850 U
Phenanthrene	SVOC	350 U	350 U	350 U
Anthracene	SVOC	350 U	350 U	350 U
Carbazole	SVOC	350 U	350 U	350 U
Di-n-butylphthalate	SVOC	350 U	350 U	350 U
Fluoranthene	SVOC	350 U	350 U	350 U
Pyrene	SVOC	350 U	350 U	350 U
Butylbenzylphthalate	SVOC	350 U	350 U	350 U
3,3'-Dichlorobenzidine	SVOC	350 U	350 U	350 U
Benzo(a)anthracene	SVOC	350 U	350 U	350 U
Chrysene	SVOC	350 U	350 U	350 U
bis(2-Ethylhexyl)phthalate	SVOC	350 U	350 U	350 U
Di-n-octylphthalate	SVOC	350 U	350 U	350 U
Benzo(b)fluoranthene	SVOC	350 U	350 U	350 U
Benzo(k)fluoranthene	SVOC	350 U	350 U	350 U
Benzo(a)pyrene	SVOC	350 U	350 U	350 U
Indeno(1,2,3-cd)pyrene	SVOC	350 U	350 U	350 U
Dibenz(a,h)anthracene	SVOC	350 U	350 U	350 U
Benzo(g,h,i)perylene	SVOC	350 U	350 U	350 U
Associated Method Blank		SBLKS2	SBLKS2	SBLKS2
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

MADE BY JSM DATE 07/14/95
CHKD BY SW DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth (ft.)		0	0	2	0
Ending Depth (ft.)		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Date Extracted		10-Nov-94	10-Nov-94	10-Nov-94	10-Nov-94
Date Analyzed		22-Nov-94	22-Nov-94	22-Nov-94	22-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1.0	1.0	1.0	1.0
% Moisture		10	9	15	5
Parameter	Class				
alpha-BHC	PEST	1.9 U	1.9 U	2.0 U	1.8 U
alpha-BHC	PEST	1.9 U	1.9 U	2.0 U	1.8 U
beta-BHC	PEST	1.9 U	1.9 U	2.0 U	1.8 U
delta-BHC	PEST	1.9 U	1.9 U	2.0 U	1.8 U
gamma-BHC (Lindane)	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Heptachlor	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Aldrin	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Heptachlor epoxide	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Endosulfan I	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Dieldrin	PEST	3.7 U	3.6 U	3.9 U	3.5 U
4,4'-DDE	PEST	3.7 U	3.6 U	3.9 U	3.5 U
Endrin	PEST	3.7 U	3.6 U	3.9 U	3.5 U
Endosulfan II	PEST	3.7 U	3.6 U	3.9 U	3.5 U
4,4'-DDD	PEST	3.7 U	3.6 U	3.9 U	3.5 U
Endosulfan sulfate	PEST	3.7 U	3.6 U	3.9 U	3.5 U
4,4'-DDT	PEST	3.7 U	3.6 U	3.9 U	3.5 U
Methoxychlor	PEST	19 U	19 U	20 U	18 U
Endrin ketone	PEST	3.7 U	3.6 U	3.9 U	3.5 U
Endrin aldehyde	PEST	3.7 U	3.6 U	3.9 U	3.5 U
alpha-Chlordane	PEST	1.9 U	1.9 U	2.0 U	1.8 U
gamma-Chlordane	PEST	1.9 U	1.9 U	2.0 U	1.8 U
Toxaphene	PEST	190 U	190 U	200 U	180 U
Aroclor-1016	PCB	37 U	36 U	39 U	35 U
Aroclor-1221	PCB	74 U	74 U	79 U	71 U
Aroclor-1232	PCB	37 U	36 U	39 U	35 U
Aroclor-1242	PCB	37 U	36 U	39 U	35 U
Aroclor-1248	PCB	37 U	36 U	39 U	35 U
Aroclor-1254	PCB	37 U	36 U	39 U	35 U
Aroclor-1260	PCB	37 U	36 U	39 U	35 U
Associated Method Blank		PBLKS1	PBLKS1	PBLKS1	PBLKS1
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

MADE BY JSM DATE 07/14/95
CHKD BY SN DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth (ft.)		2	0	2	0
Ending Depth (ft.)		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		10-Nov-94	14-Nov-94	14-Nov-94	14-Nov-94
Date Analyzed		22-Nov-94	29-Nov-94	29-Nov-94	29-Nov-94
Units		UG/KG	UG/KG	UG/KG	UG/KG
Dilution Factor		1.0	1.0	1.0	1.0
% Moisture		5	4	3	5
Parameter	Class				
alpha-BHC	PEST	1.8 U	1.8 U	1.8 U	1.8 U
alpha-BHC	PEST	1.8 U	1.8 U	1.8 U	1.8 U
beta-BHC	PEST	1.8 U	1.8 U	1.8 U	1.8 U
delta-BHC	PEST	1.8 U	1.8 U	1.8 U	1.8 U
gamma-BHC (Lindane)	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Heptachlor	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Aldrin	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Heptachlor epoxide	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Endosulfan I	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Dieldrin	PEST	3.5 U	3.4 U	3.4 U	3.5 U
4,4'-DDE	PEST	3.5 U	3.4 U	3.4 U	3.5 U
Endrin	PEST	3.5 U	3.4 U	3.4 U	3.5 U
Endosulfan II	PEST	3.5 U	3.4 U	3.4 U	3.5 U
4,4'-DDD	PEST	3.5 U	3.4 U	3.4 U	3.5 U
Endosulfan sulfate	PEST	3.5 U	3.4 U	3.4 U	3.5 U
4,4'-DDT	PEST	3.5 U	3.4 U	3.4 U	3.5 U
Methoxychlor	PEST	18 U	18 U	18 U	18 U
Endrin ketone	PEST	3.5 U	3.4 U	3.4 U	3.5 U
Endrin aldehyde	PEST	3.5 U	3.4 U	3.4 U	3.5 U
alpha-Chlordane	PEST	1.8 U	1.8 U	1.8 U	1.8 U
gamma-Chlordane	PEST	1.8 U	1.8 U	1.8 U	1.8 U
Toxaphene	PEST	180 U	180 U	180 U	180 U
Aroclor-1016	PCB	35 U	34 U	34 U	35 U
Aroclor-1221	PCB	71 U	70 U	69 U	71 U
Aroclor-1232	PCB	35 U	34 U	34 U	35 U
Aroclor-1242	PCB	35 U	34 U	34 U	35 U
Aroclor-1248	PCB	35 U	34 U	34 U	35 U
Aroclor-1254	PCB	35 U	34 U	34 U	35 U
Aroclor-1260	PCB	35 U	34 U	34 U	35 U
Associated Method Blank		PBLKS1	PBLKS2	PBLKS2	PBLKS2
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (PESTICIDES/PCB's)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth (ft.)		2	0	2
Ending Depth (ft.)		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Date Extracted		14-Nov-94	14-Nov-94	14-Nov-94
Date Analyzed		29-Nov-94	29-Nov-94	29-Nov-94
Units		UG/KG	UG/KG	UG/KG
Dilution Factor		1.0	1.0	1.0
% Moisture		5	5	8
Parameter	Class			
alpha-BHC	PEST	1.8 U	1.8 U	1.8 U
alpha-BHC	PEST	1.8 U	1.8 U	1.8 U
beta-BHC	PEST	1.8 U	1.8 U	1.8 U
delta-BHC	PEST	1.8 U	1.8 U	1.8 U
gamma-BHC (Lindane)	PEST	1.8 U	1.8 U	1.8 U
Heptachlor	PEST	1.8 U	1.8 U	1.8 U
Aldrin	PEST	1.8 U	1.8 U	1.8 U
Heptachlor epoxide	PEST	1.8 U	1.8 U	1.8 U
Endosulfan I	PEST	1.8 U	1.8 U	1.8 U
Dieldrin	PEST	3.5 U	3.5 U	3.5 U
4,4'-DDE	PEST	3.5 U	3.5 U	3.5 U
Endrin	PEST	3.5 U	3.5 U	3.5 U
Endosulfan II	PEST	3.5 U	3.5 U	3.5 U
4,4'-DDD	PEST	3.5 U	3.5 U	3.5 U
Endosulfan sulfate	PEST	3.5 U	3.5 U	3.5 U
4,4'-DDT	PEST	3.5 U	1.4 J	3.5 U
Methoxychlor	PEST	18 U	18 U	18 U
Endrin ketone	PEST	3.5 U	3.5 U	3.5 U
Endrin aldehyde	PEST	3.5 U	3.5 U	3.5 U
alpha-Chlordane	PEST	1.8 U	1.8 U	1.8 U
gamma-Chlordane	PEST	1.8 U	1.8 U	1.8 U
Toxaphene	PEST	180 U	180 U	180 U
Aroclor-1016	PCB	35 U	35 U	35 U
Aroclor-1221	PCB	71 U	71 U	71 U
Aroclor-1232	PCB	35 U	35 U	35 U
Aroclor-1242	PCB	35 U	35 U	35 U
Aroclor-1248	PCB	35 U	35 U	35 U
Aroclor-1254	PCB	35 U	35 U	35 U
Aroclor-1260	PCB	35 U	35 U	35 U
Associated Method Blank		PBLKS2	PBLKS2	PBLKS2
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Location Identifier		MW-26-001	MW-26-001	MW-26-001	MW-26-003
Beginning Depth		0	0	2	0
Ending Depth		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
% Moisture		10	9	15	5
Parameter	Class				
Aluminum	METAL	4780	4370	3050	1610
Antimony	METAL	5.6 U	5.6 U	6.0 U	5.3 U
Arsenic	METAL	0.90 J	1.2 J	1.0 J	0.42 U
Barium	METAL	13.6 J	12.3 J	17 J	7.9 J
Beryllium	METAL	0.21 J	0.21 J	0.16 J	0.14 J
Cadmium	METAL	1.3	0.94 J	1.1 J	1.1
Calcium	METAL	717 J	815 J	841 J	410 J
Chromium	METAL	5.3	4.9	4.2	2.0 J
Cobalt	METAL	3.4 J	2.8 J	3.1 J	1.9 J
Copper	METAL	4.4 J	2.3 J	2.0 J	1.5 J
Iron	METAL	5560	5190	5270	3390
Lead	METAL	1.3	1.2	1.2	0.57 J
Magnesium	METAL	790 J	830 J	809 J	518 J
Manganese	METAL	24.7	24.1	41	38
Mercury	METAL	0.11 U	0.11 U	0.12 U	0.10 U
Nickel	METAL	5.1 J	5.1 J	4.7 J	3.6 J
Potassium	METAL	355 J	370 J	395 J	261 J
Selenium	METAL	0.44 U	0.44 U	0.47 U	0.42 U
Silver	METAL	0.66 UJ	0.66 UJ	0.71 UJ	0.63 UJ
Sodium	METAL	87.7 U	87.3 U	141 J	83.1 U
Thallium	METAL	0.44 U	0.44 U	0.47 U	0.42 U
Vanadium	METAL	11 J	11.4	9.5 J	4.4 J
Zinc	METAL	34.4 R	28.7 R	142 R	18.2 R
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

MADE BY JSM DATE 07/14/95
CHKD BY SW DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Location Identifier		MW-26-003	SB26-01	SB26-01	SB26-02
Beginning Depth		2	0	2	0
Ending Depth		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
% Moisture		5	4	3	6
Parameter	Class				
Aluminum	METAL	1260	1970	1360	1150
Antimony	METAL	5.3 U	5.3 U	5.2 U	5.4 U
Arsenic	METAL	0.42 U	0.42 U	0.41 []	0.70 []
Barium	METAL	5.4 []	9.5 []	4.8 []	16 []
Beryllium	METAL	0.11 []	0.13 []	0.13 []	0.04 U
Cadmium	METAL	0.67 []	0.76 []	0.52 U	4.5
Calcium	METAL	556 []	453 []	539 []	310 []
Chromium	METAL	1.9 []	1.9 []	0.99 U	31.1
Cobalt	METAL	1.6 []	1.8 []	6.8 []	15.1
Copper	METAL	1.4 []	2.8 []	5.9	4.2 []
Iron	METAL	2550	3480	3860	2970
Lead	METAL	0.5 []J	2.1	0.83	4.6
Magnesium	METAL	535 []	631 []	532 []	184 []
Manganese	METAL	34.8	42.1	83.7	29.9
Mercury	METAL	0.11 U	0.10 U	0.10 U	0.11 U
Nickel	METAL	2.8 []	3.7 []	10.6	1.8 U
Potassium	METAL	223 []	301 []	293 []	206 []
Selenium	METAL	0.42 U	0.42 U	0.41 U	0.42 U
Silver	METAL	0.63 UJ	0.62 UJ	1.3 []J	0.63 UJ
Sodium	METAL	89.5 []	95.3 []	209 []	362 []
Thallium	METAL	0.42 U	0.42 U	0.41 U	0.42 U
Vanadium	METAL	3.3 []	4.7 []	5.8 []	5.1 []
Zinc	METAL	36.9 R	10.7 R	0.81 R	13 R
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

MADE BY JSM DATE 07/14/95
CHKD BY SM DATE 7/14/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (METALS)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Location Identifier		SB26-02	SB26-03	SB26-03
Beginning Depth		2	0	2
Ending Depth		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG
% Moisture		5	5	7
Parameter	Class			
Aluminum	METAL	1830	2740	2770
Antimony	METAL	42.9	13.9	7.6 []
Arsenic	METAL	0.95 []J	0.86 []J	0.5 []J
Barium	METAL	21.4 []	15.1 []	16.8 []
Beryllium	METAL	0.04 U	0.09 []	0.06 []
Cadmium	METAL	5.3	2.5 J	1.8 J
Calcium	METAL	885 []	623 []	463 []
Chromium	METAL	19.3	7.8	7.8
Cobalt	METAL	0.86 U	4.0 []	1.9 []
Copper	METAL	3.0 []	4.4 []	1.8 []
Iron	METAL	5990	5440	5410
Lead	METAL	2.5	11	2.6
Magnesium	METAL	812 []	518 []	627 []
Manganese	METAL	103	62.5	28.8
Mercury	METAL	0.11 U	0.11 U	0.11 U
Nickel	METAL	1.8 U	3.5 []	1.8 U
Potassium	METAL	480 []	335 []	351 []
Selenium	METAL	0.42 U	0.42 U	0.43 U
Silver	METAL	0.63 UJ	0.63 UJ	0.64 UJ
Sodium	METAL	412 []	274 []	230 []
Thallium	METAL	0.42 U	0.42 U	0.43 U
Vanadium	METAL	7.7 []	8.4 []	8.4 []
Zinc	METAL	14.1 R	18.4 R	10.9 R
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

MADE BY JSM DATE 07/14/95
CHKD BY SM DATE 7/17/95

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TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (EXPLOSIVES)

Sample I.D.		WB-MW-26-001-0	WB-MW-26-001-0 DUP	WB-MW-26-001-2	WB-MW-26-003-0
Beginning Depth		0	0	2	0
Ending Depth		2	2	4	2
Date Sampled		08-Nov-94	08-Nov-94	08-Nov-94	08-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Dilution		1	1	1	1
% Moisture		10	9	15	5
Parameter	Class				
HMX	MISC	1.0 U	1.0 U	1.0 U	1.0 U
HMX	MISC	1.0 U	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
4-Am-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2-Am-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1115	MB1115	MB1115	MB1115
Associated Rinse Blank		FB26-110894-S	FB26-110894-S	FB26-110894-S	FB26-110894-S

MADE BY JSM DATE 07/14/95
CHKD BY SM DATE 7/17/95

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (EXPLOSIVES)

Sample I.D.		WB-MW-26-003-2	SB26-01-0	SB26-01-2	SB26-02-0
Beginning Depth		2	0	2	0
Ending Depth		4	2	4	2
Date Sampled		08-Nov-94	09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG	MG/KG
Dilution		1	1	1	1
% Moisture		5	4	3	5
Parameter	Class				
HMX	MISC	1.0 U	1.0 U	1.0 U	1.0 U
HMX	MISC	1.0 U	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.5	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
4-Am-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2-Am-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1115	MB1115	MB1115	MB1115
Associated Rinse Blank		FB26-110894-S	FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-1

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
SOIL (EXPLOSIVES)

Sample I.D.		SB26-02-2	SB26-03-0	SB26-03-2
Beginning Depth		2	0	2
Ending Depth		4	2	4
Date Sampled		09-Nov-94	09-Nov-94	09-Nov-94
Units		MG/KG	MG/KG	MG/KG
Dilution		1	1	1
% Moisture		5	5	8
Parameter	Class			
HMX	MISC	1.0 U	1.0 U	1.0 U
HMX	MISC	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U
4-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1115	MB1115	MB1115
Associated Rinse Blank		FB26-110994-S	FB26-110994-S	FB26-110994-S

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (VOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Date Analyzed		09-Dec-94	09-Dec-94	09-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Chloromethane	VOC	10 U	10 U	10 U
Bromomethane	VOC	10 U	10 U	10 U
Vinyl Chloride	VOC	10 U	10 U	10 U
Chloroethane	VOC	10 U	10 U	10 U
Methylene Chloride	VOC	10 U	10 U	10 U
Acetone	VOC	10 U	15	10 U
Carbon Disulfide	VOC	10 U	10 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U	10 U
Chloroform	VOC	10 U	10 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U	10 U
2-Butanone	VOC	10 U	10 U	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U	10 U
Bromodichloromethane	VOC	10 U	10 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Trichloroethene	VOC	10 U	10 U	10 U
Dibromochloromethane	VOC	10 U	10 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U	10 U
Benzene	VOC	10 U	10 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Bromoform	VOC	10 U	10 U	10 U
4-Methyl-2-Pentanone	VOC	10 U	10 U	10 U
2-Hexanone	VOC	10 UJ	10 UJ	10 U
Tetrachloroethene	VOC	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U	10 U
Toluene	VOC	10 U	10 U	10 U
Chlorobenzene	VOC	10 U	10 U	10 U
Ethylbenzene	VOC	10 U	10 U	10 U
Styrene	VOC	10 U	10 U	10 U
Xylene (total)	VOC	10 U	10 U	10 U
Associated Method Blank		VBLKW1	VBLKW1	VBLKW1
Associated Trip Blank		TB-26-941206	TB-26-941206	TB-26-941206
Associated Rinse Blank		FB-26-941207-W	FB-26-941207-W	FB-26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (VOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Date Analyzed		09-Dec-94	09-Dec-94	09-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Chloromethane	VOC	10 U	10 U	10 U
Bromomethane	VOC	10 U	10 U	10 U
Vinyl Chloride	VOC	10 U	10 U	10 U
Chloroethane	VOC	10 U	10 U	10 U
Methylene Chloride	VOC	10 U	10 U	10 U
Acetone	VOC	10 U	10 U	10 U
Carbon Disulfide	VOC	10 U	10 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U	10 U
Chloroform	VOC	10 U	10 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U	10 U
2-Butanone	VOC	10 U	10 U	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U	10 U
Bromodichloromethane	VOC	10 U	10 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Trichloroethene	VOC	10 U	10 U	10 U
Dibromochloromethane	VOC	10 U	10 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U	10 U
Benzene	VOC	10 U	10 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Bromoform	VOC	10 U	10 U	10 U
4-Methyl-2-Pentanone	VOC	10 U	10 U	10 U
2-Hexanone	VOC	10 U	10 UJ	10 UJ
Tetrachloroethene	VOC	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U	10 U
Toluene	VOC	10 U	10 U	10 U
Chlorobenzene	VOC	10 U	10 U	10 U
Ethylbenzene	VOC	10 U	10 U	10 U
Styrene	VOC	10 U	10 U	10 U
Xylene (total)	VOC	10 U	10 U	10 U
Associated Method Blank		VBLKW1	VBLKW1	VBLKW1
Associated Trip Blank		TB-26-941206	TB-26-941207-W	TB-26-941207-W
Associated Rinse Blank		FB-26-941207-W	FB-26-941207-W	FB-26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Date Extracted		08-Dec-94	08-Dec-94	08-Dec-94
Date Analyzed		09-Dec-94	09-Dec-94	09-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Phenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethyl)ether	SVOC	10 U	10 U	10 U
2-Chlorophenol	SVOC	10 U	10 U	10 U
1,3-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,4-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,2-Dichlorobenzene	SVOC	10 U	10 U	10 U
2-Methylphenol	SVOC	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	SVOC	10 U	10 U	10 U
4-Methylphenol	SVOC	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	SVOC	10 U	10 U	10 U
Hexachloroethane	SVOC	10 U	10 U	10 U
Nitrobenzene	SVOC	10 U	10 U	10 U
Isophorone	SVOC	10 U	10 U	10 U
2-Nitrophenol	SVOC	10 U	10 U	10 U
2,4-Dimethylphenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	SVOC	10 U	10 U	10 U
2,4-Dichlorophenol	SVOC	10 U	10 U	10 U
1,2,4-Trichlorobenzene	SVOC	10 U	10 U	10 U
Naphthalene	SVOC	10 U	10 U	10 U
4-Chloroaniline	SVOC	10 UJ	10 UJ	10 UJ
Hexachlorobutadiene	SVOC	10 U	10 U	10 U
4-Chloro-3-methylphenol	SVOC	10 U	10 U	10 U
2-Methylnaphthalene	SVOC	10 U	10 U	10 U
Hexachlorocyclopentadiene	SVOC	10 U	10 U	10 U
2,4,6-Trichlorophenol	SVOC	10 U	10 U	10 U
2,4,5-Trichlorophenol	SVOC	25 U	25 U	25 U
2-Chloronaphthalene	SVOC	10 U	10 U	10 U
2-Nitroaniline	SVOC	25 U	25 U	25 U
Dimethylphthalate	SVOC	10 U	10 U	10 U
Acenaphthylene	SVOC	10 U	10 U	10 U
2,6-Dinitrotoluene	SVOC	10 U	10 U	10 U
3-Nitroaniline	SVOC	25 UJ	25 UJ	25 UJ
Associated Method Blank		SBLKW1	SBLKW1	SBLKW1
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Date Extracted		08-Dec-94	08-Dec-94	08-Dec-94
Date Analyzed		09-Dec-94	09-Dec-94	09-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Acenaphthene	SVOC	10 U	10 U	10 U
2,4-Dinitrophenol	SVOC	25 UJ	25 UJ	25 UJ
4-Nitrophenol	SVOC	25 UJ	25 UJ	25 UJ
Dibenzofuran	SVOC	10 U	10 U	10 U
2,4-Dinitrotoluene	SVOC	10 U	10 U	10 U
Diethylphthalate	SVOC	10 U	10 U	10 U
4-Chlorophenyl-phenylether	SVOC	10 U	10 U	10 U
Fluorene	SVOC	10 U	10 U	10 U
4-Nitroaniline	SVOC	25 UJ	25 UJ	25 UJ
4,6-Dinitro-2-methylphenol	SVOC	25 U	25 U	25 U
N-Nitrosodiphenylamine	SVOC	10 U	10 U	10 U
4-Bromophenyl-phenylether	SVOC	10 U	10 U	10 U
Hexachlorobenzene	SVOC	10 U	10 U	10 U
Pentachlorophenol	SVOC	25 U	25 U	25 U
Phenanthrene	SVOC	10 U	10 U	10 U
Anthracene	SVOC	10 U	10 U	10 U
Carbazole	SVOC	10 UJ	10 UJ	10 UJ
Di-n-butylphthalate	SVOC	10 U	10 U	10 U
Fluoranthene	SVOC	10 U	10 U	10 U
Pyrene	SVOC	10 U	10 U	10 U
Butylbenzylphthalate	SVOC	10 UJ	10 UJ	10 UJ
3,3'-Dichlorobenzidine	SVOC	10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	SVOC	10 U	10 U	10 U
Chrysene	SVOC	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	SVOC	10 UJ	4 J	2 J
Di-n-octylphthalate	SVOC	10 U	10 U	10 U
Benzo(b)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(k)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(a)pyrene	SVOC	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	SVOC	10 U	10 U	10 U
Dibenz(a,h)anthracene	SVOC	10 U	10 U	10 U
Benzo(g,h,i)perylene	SVOC	10 U	10 U	10 U
Associated Method Blank		SBLKW1	SBLKW1	SBLKW1
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Date Extracted		08-Dec-94	12-Dec-94	12-Dec-94
Date Analyzed		09-Dec-94	13-Dec-94	13-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Phenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethyl)ether	SVOC	10 U	10 U	10 U
2-Chlorophenol	SVOC	10 U	10 U	10 U
1,3-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,4-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,2-Dichlorobenzene	SVOC	10 U	10 U	10 U
2-Methylphenol	SVOC	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	SVOC	10 U	10 U	10 U
4-Methylphenol	SVOC	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	SVOC	10 U	10 U	10 U
Hexachloroethane	SVOC	10 U	10 U	10 U
Nitrobenzene	SVOC	10 U	10 U	10 U
Isophorone	SVOC	10 U	10 U	10 U
2-Nitrophenol	SVOC	10 U	10 U	10 U
2,4-Dimethylphenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	SVOC	10 U	10 U	10 U
2,4-Dichlorophenol	SVOC	10 U	10 U	10 U
1,2,4-Trichlorobenzene	SVOC	10 U	10 U	10 U
Naphthalene	SVOC	10 U	10 U	10 U
4-Chloroaniline	SVOC	10 UJ	10 U	10 U
Hexachlorobutadiene	SVOC	10 U	10 U	10 U
4-Chloro-3-methylphenol	SVOC	10 U	10 U	10 U
2-Methylnaphthalene	SVOC	10 U	10 U	10 U
Hexachlorocyclopentadiene	SVOC	10 U	10 U	10 U
2,4,6-Trichlorophenol	SVOC	10 U	10 U	10 U
2,4,5-Trichlorophenol	SVOC	25 U	25 U	25 U
2-Chloronaphthalene	SVOC	10 U	10 U	10 U
2-Nitroaniline	SVOC	25 U	25 U	25 U
Dimethylphthalate	SVOC	10 U	10 U	10 U
Acenaphthylene	SVOC	10 U	10 U	10 U
2,6-Dinitrotoluene	SVOC	10 U	10 U	10 U
3-Nitroaniline	SVOC	25 UJ	25 UJ	25 UJ
Associated Method Blank		SBLKW1	SBLKW2A	SBLKW2A
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (SEMIVOLATILES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Date Extracted		08-Dec-94	12-Dec-94	12-Dec-94
Date Analyzed		09-Dec-94	13-Dec-94	13-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Acenaphthene	SVOC	10 U	10 U	10 U
2,4-Dinitrophenol	SVOC	25 UJ	25 UJ	25 UJ
4-Nitrophenol	SVOC	25 UJ	25 UJ	25 UJ
Dibenzofuran	SVOC	10 U	10 U	10 U
2,4-Dinitrotoluene	SVOC	10 U	10 U	10 U
Diethylphthalate	SVOC	10 U	10 U	10 U
4-Chlorophenyl-phenylether	SVOC	10 U	10 U	10 U
Fluorene	SVOC	10 U	10 U	10 U
4-Nitroaniline	SVOC	25 UJ	25 UJ	25 UJ
4,6-Dinitro-2-methylphenol	SVOC	25 U	25 U	25 U
N-Nitrosodiphenylamine	SVOC	10 U	10 U	10 U
4-Bromophenyl-phenylether	SVOC	10 U	10 U	10 U
Hexachlorobenzene	SVOC	10 U	10 U	10 U
Pentachlorophenol	SVOC	25 U	25 U	25 U
Phenanthrene	SVOC	10 U	10 U	10 U
Anthracene	SVOC	10 U	10 U	10 U
Carbazole	SVOC	10 UJ	10 UJ	10 UJ
Di-n-butylphthalate	SVOC	10 U	10 U	10 U
Fluoranthene	SVOC	10 U	10 U	10 U
Pyrene	SVOC	10 U	10 U	10 U
Butylbenzylphthalate	SVOC	10 UJ	10 U	10 U
3,3'-Dichlorobenzidine	SVOC	10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	SVOC	10 U	10 U	10 U
Chrysene	SVOC	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	SVOC	3 J	10 UJ	10 UJ
Di-n-octylphthalate	SVOC	10 U	10 U	10 U
Benzo(b)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(k)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(a)pyrene	SVOC	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	SVOC	10 U	10 U	10 U
Dibenz(a,h)anthracene	SVOC	10 U	10 U	10 U
Benzo(g,h,i)perylene	SVOC	10 U	10 U	10 U
Associated Method Blank		SBLKW1	SBLKW2A	SBLKW2A
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (PESTICIDES/PCB's)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Date Extracted		08-Dec-94	08-Dec-94	08-Dec-94
Date Analyzed		15-Dec-94	15-Dec-94	15-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
alpha-BHC	PEST	0.05 U	0.05 U	0.05 U
beta-BHC	PEST	0.05 U	0.05 U	0.05 U
delta-BHC	PEST	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	PEST	0.05 U	0.05 U	0.05 U
Heptachlor	PEST	0.05 U	0.05 U	0.05 U
Aldrin	PEST	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	PEST	0.05 U	0.05 U	0.05 U
Endosulfan I	PEST	0.05 U	0.05 U	0.05 U
Dieldrin	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDE	PEST	0.10 U	0.10 U	0.10 U
Endrin	PEST	0.10 U	0.10 U	0.10 U
Endosulfan II	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDD	PEST	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDT	PEST	0.10 U	0.10 U	0.10 U
Methoxychlor	PEST	0.50 U	0.50 U	0.50 U
Endrin ketone	PEST	0.10 U	0.10 U	0.10 U
Endrin aldehyde	PEST	0.10 U	0.10 U	0.10 U
alpha-Chlordane	PEST	0.05 U	0.05 U	0.05 U
gamma-Chlordane	PEST	0.05 U	0.05 U	0.05 U
Toxaphene	PEST	5.0 U	5.0 U	5.0 U
Aroclor-1016	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1221	PCB	2.0 U	2.0 U	2.0 U
Aroclor-1232	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1242	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1248	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1254	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1260	PCB	1.0 U	1.0 U	1.0 U
Associated Method Blank		PBLKW1A	PBLKW1A	PBLKW1A
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (PESTICIDES/PCB's)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Date Extracted		08-Dec-94	09-Dec-94	09-Dec-94
Date Analyzed		15-Dec-94	16-Dec-94	16-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
alpha-BHC	PEST	0.05 U	0.05 U	0.05 U
beta-BHC	PEST	0.05 U	0.05 U	0.05 U
delta-BHC	PEST	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	PEST	0.05 U	0.05 U	0.05 U
Heptachlor	PEST	0.05 U	0.05 U	0.05 U
Aldrin	PEST	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	PEST	0.05 U	0.05 U	0.05 U
Endosulfan I	PEST	0.05 U	0.05 U	0.05 U
Dieldrin	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDE	PEST	0.10 U	0.10 U	0.10 U
Endrin	PEST	0.10 U	0.10 U	0.10 U
Endosulfan II	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDD	PEST	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDT	PEST	0.10 U	0.10 U	0.10 U
Methoxychlor	PEST	0.50 U	0.50 U	0.50 U
Endrin ketone	PEST	0.10 U	0.10 U	0.10 U
Endrin aldehyde	PEST	0.10 U	0.10 U	0.10 U
alpha-Chlordane	PEST	0.05 U	0.05 U	0.05 U
gamma-Chlordane	PEST	0.05 U	0.05 U	0.05 U
Toxaphene	PEST	5.0 U	5.0 U	5.0 U
Aroclor-1016	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1221	PCB	2.0 U	2.0 U	2.0 U
Aroclor-1232	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1242	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1248	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1254	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1260	PCB	1.0 U	1.0 U	1.0 U
Associated Method Blank		PBLKW1A	PBLKW2A	PBLKW2A
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

MADE BY JSM DATE 07/14/95
CHKD BY SW DATE 7/17/95

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TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-26-001	MW-26-001	MW-26-002	MW-26-002
Well I.D.		MW-26-001	MW-26-001	MW-26-002	MW-26-002
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	Class	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	METAL	3940 J	105 [J	703 J	280 J
Antimony	METAL	25.3 U	25.3 U	25.3 U	25.3 U
Arsenic	METAL	3.0 [	2.0 U	3.0 [	3.3 [
Barium	METAL	29.2 [	105 [	9.7 [	29.1 [
Beryllium	METAL	0.46 [	0.20 U	0.29 [	0.20 U
Cadmium	METAL	2.5 U	2.5 U	2.5 U	2.5 U
Calcium	METAL	8190	7730	16300	19100
Chromium	METAL	5.7 [	4.8 U	4.8 U	4.8 U
Cobalt	METAL	5.6 [	4.1 U	4.1 U	4.1 U
Copper	METAL	5.4 [	4.2 U	4.2 U	4.2 U
Iron	METAL	6140	73.6 [	1860	61.2 [
Lead	METAL	4.3	1.3 [J	2.4 [	1.2 [
Magnesium	METAL	3040 [	1690 [	3700 [	3620 [
Manganese	METAL	62.9	9.8 [	99.7	107
Mercury	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	METAL	12 [	8.4 U	8.4 U	8.4 U
Potassium	METAL	1840 [	1300 [	1620 [	1490 [
Selenium	METAL	2.0 U	2.0 U	2.0 U	2.0 U
Silver	METAL	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Sodium	METAL	1410 [	1830 [	1630 [	1410 [
Thallium	METAL	1.0 U	1.3 [	5.0 UJ	1.0 U
Vanadium	METAL	8.6 [	3.6 U	3.6 U	3.6 U
Zinc	METAL	52 J	78.7 J	221 J	24.1 J
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W	FB26-941207-W

MADE BY JSM DATE 07/14/95
CHKD BY SN DATE 7/17/95

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TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-26-003	MW-26-003	MW-26-004	MW-26-004
Well I.D.		MW-26-003	MW-26-003	MW-26-004	MW-26-004
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94	06-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	Class	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	METAL	6050 J	35.2 UJ	939 J	35.8 [illegible]J
Antimony	METAL	25.3 U	25.3 U	25.3 U	25.3 U
Arsenic	METAL	4.9 [illegible]	2.0 U	2.2 [illegible]	2.0 U
Barium	METAL	46.2 [illegible]	30.4 [illegible]	7.7 [illegible]	49.2 [illegible]
Beryllium	METAL	0.74 [illegible]	0.20 U	0.29 [illegible]	0.20 U
Cadmium	METAL	2.5 U	2.5 U	2.5 U	4.1 [illegible]
Calcium	METAL	8610	7000	5230	5040
Chromium	METAL	11.5	4.8 U	4.8 U	4.8 U
Cobalt	METAL	9.3 [illegible]	4.1 U	4.1 U	4.1 U
Copper	METAL	13.3 [illegible]	4.2 U	4.3 [illegible]	4.2 U
Iron	METAL	12600	13.7 [illegible]	1940	30.4 [illegible]
Lead	METAL	5.6	1.1 [illegible]	2.2 [illegible]J	1.4 [illegible]J
Magnesium	METAL	3170 [illegible]	934 [illegible]	783 [illegible]	421 [illegible]
Manganese	METAL	104	13 [illegible]	30.3	8.9 [illegible]
Mercury	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	METAL	21 [illegible]	8.4 U	8.4 U	8.4 U
Potassium	METAL	3020 [illegible]	1910 [illegible]	2280 [illegible]	2070 [illegible]
Selenium	METAL	2.0 U	2.0 U	2.0 U	2.0 U
Silver	METAL	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Sodium	METAL	1920 [illegible]	1580 [illegible]	1410 [illegible]	1170 [illegible]
Thallium	METAL	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	METAL	27.7 [illegible]	3.6 U	3.8 [illegible]	3.6 U
Zinc	METAL	297 J	27.3 J	315 J	37.9 J
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
GROUNDWATER (METALS)

Sample I.D.		MW-24-001	MW-24-001	MW-24-001 DUP	MW-24-001 DUP
Well I.D.		MW-24-001	MW-24-001	MW-24-001	MW-24-001
Date Sampled		07-Dec-94	07-Dec-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	Class	TOTAL	DISSOLVED	TOTAL	DISSOLVED
Aluminum	METAL	234 J	38 UJ	225 J	35.2 UJ
Antimony	METAL	29.3	25.3 U	25.3 U	25.3 U
Arsenic	METAL	2.0 U	2.0 U	2.0 U	2.0 U
Barium	METAL	7.9	34.6	6.9	24.9
Beryllium	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	METAL	2.5 U	2.5 U	2.5 U	2.5 U
Calcium	METAL	8900	9410	9310	8450
Chromium	METAL	4.8 U	4.8 U	4.8 U	4.8 U
Cobalt	METAL	6.2	4.1 U	6.0	5.1
Copper	METAL	4.2 U	4.2 U	4.2 U	4.2 U
Iron	METAL	314	13.4	288	25.9
Lead	METAL	1.0	1.0 U	1.2	1.0 U
Magnesium	METAL	1810	1900	1850	1710
Manganese	METAL	9.8	7.7	10.7	8.3
Mercury	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	METAL	8.4 U	8.4 U	8.4 U	8.4 U
Potassium	METAL	2160	2130	2310	2290
Selenium	METAL	2.0 U	2.0 U	2.0 U	2.0 U
Silver	METAL	3.0 UJ	3.0 UJ	3.0 UJ	3.0 UJ
Sodium	METAL	4820	5120	4870	5320
Thallium	METAL	1.0 U	5.0 U	1.0 U	1.0 U
Vanadium	METAL	3.6 U	3.6 U	3.6 U	3.6 U
Zinc	METAL	182 J	29.1 J	146 J	25 J
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W	FB26-941207-W

MADE BY JSM DATE 07/14/95
CHKD BY SAN DATE 7/17/95

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TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (EXPLOSIVES)

Sample I.D.		MW-26-001	MW-26-002	MW-26-003
Well I.D.		MW-26-001	MW-26-002	MW-26-003
Date Sampled		06-Dec-94	06-Dec-94	06-Dec-94
Date Extracted		09-Dec-94	09-Dec-94	09-Dec-94
Date Analyzed		19-Dec-94	19-Dec-94	19-Dec-94
Units		UG/L	UG/L	UG/L
Dilution		1	1	1
Parameter	Class			
HMX	MISC	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	5.6
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U
4-Am-2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2-Am-4,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1209	MB1209	MB1209
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-2

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
GROUNDWATER (EXPLOSIVES)

Sample I.D.		MW-26-004	MW-24-001	MW-24-001 DUP
Well I.D.		MW-26-004	MW-24-001	MW-24-001
Date Sampled		06-Dec-94	07-Dec-94	07-Dec-94
Date Extracted		09-Dec-94	09-Dec-94	09-Dec-94
Date Analyzed		20-Dec-94	20-Dec-94	20-Dec-94
Units		UG/L	UG/L	UG/L
Dilution		1	1	1
Parameter	Class			
HMX	MISC	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U
4-Am-2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2-Am-4,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1209	MB1209	MB1209
Associated Rinse Blank		FB26-941207-W	FB26-941207-W	FB26-941207-W

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
TRIP BLANK (VOLATILES)

Sample I.D.		TB-26-941206	TB-26-941207-W
Date Sampled		06-Dec-94	07-Dec-94
Date Analyzed		09-Dec-94	09-Dec-94
Units		UG/L	UG/L
Dilution Factor		1	1
Parameter	Class		
Chloromethane	VOC	10 U	10 U
Bromomethane	VOC	10 U	10 U
Vinyl Chloride	VOC	10 U	10 U
Chloroethane	VOC	10 U	10 U
Methylene Chloride	VOC	10 U	10 U
Acetone	VOC	10 U	10 UJ
Carbon Disulfide	VOC	10 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U
Chloroform	VOC	10 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U
2-Butanone	VOC	10 U	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U
Bromodichloromethane	VOC	10 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U
Trichloroethene	VOC	10 U	10 U
Dibromochloromethane	VOC	10 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U
Benzene	VOC	10 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U
Bromoform	VOC	10 U	10 U
4-Methyl-2-Pentanone	VOC	10 U	10 U
2-Hexanone	VOC	10 UJ	10 U
Tetrachloroethene	VOC	10 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U
Toluene	VOC	10 U	10 U
Chlorobenzene	VOC	10 U	10 U
Ethylbenzene	VOC	10 U	10 U
Styrene	VOC	10 U	10 U
Xylene (total)	VOC	10 U	10 U
Associated Method Blank		VBLKW1	VBLKW2
Associated Trip Blank		NA	NA
Associated Rinse Blank		NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
RINSE BLANK (VOLATILES)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB-26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94
Date Analyzed		12-Nov-94	12-Nov-94	09-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Chloromethane	VOC	10 UJ	10 UJ	10 U
Bromomethane	VOC	10 U	10 U	10 U
Vinyl Chloride	VOC	10 U	10 U	10 U
Chloroethane	VOC	10 U	10 U	10 U
Methylene Chloride	VOC	10 U	10 U	10 U
Acetone	VOC	10 UJ	10 UJ	4 J
Carbon Disulfide	VOC	10 U	10 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U	10 U
Chloroform	VOC	10 U	10 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U	10 U
2-Butanone	VOC	10 UJ	10 UJ	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U	10 U
Bromodichloromethane	VOC	10 U	10 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Trichloroethene	VOC	10 U	10 U	10 U
Dibromochloromethane	VOC	10 U	10 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U	10 U
Benzene	VOC	10 U	10 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U	10 U
Bromoform	VOC	10 U	10 U	10 U
4-Methyl-2-Pentanone	VOC	10 U	10 U	10 U
2-Hexanone	VOC	10 U	10 U	10 U
Tetrachloroethene	VOC	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U	10 U
Toluene	VOC	10 U	10 U	10 U
Chlorobenzene	VOC	10 U	10 U	10 U
Ethylbenzene	VOC	10 U	10 U	10 U
Styrene	VOC	10 U	10 U	10 U
Xylene (total)	VOC	10 U	10 U	10 U
Associated Method Blank		VBLKW1	VBLKW1	VBLKW2
Associated Trip Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
RINSE BLANK (SEMIVOLATILES)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94
Date Extracted		10-Nov-94	10-Nov-94	12-Dec-94
Date Analyzed		17-Nov-94	17-Nov-94	13-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Phenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethyl)ether	SVOC	10 U	10 U	10 U
2-Chlorophenol	SVOC	10 U	10 U	10 U
1,3-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,4-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,2-Dichlorobenzene	SVOC	10 U	10 U	10 U
2-Methylphenol	SVOC	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	SVOC	10 U	10 UJ	10 U
4-Methylphenol	SVOC	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	SVOC	10 U	10 U	10 U
Hexachloroethane	SVOC	10 U	10 U	10 U
Nitrobenzene	SVOC	10 U	10 U	10 U
Isophorone	SVOC	10 U	10 U	10 U
2-Nitrophenol	SVOC	10 U	10 U	10 U
2,4-Dimethylphenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	SVOC	10 U	10 U	10 U
2,4-Dichlorophenol	SVOC	10 U	10 U	10 U
1,2,4-Trichlorobenzene	SVOC	10 U	10 U	10 U
Naphthalene	SVOC	10 U	10 U	10 U
4-Chloroaniline	SVOC	10 U	10 U	10 U
Hexachlorobutadiene	SVOC	10 U	10 U	10 U
4-Chloro-3-methylphenol	SVOC	10 U	10 U	10 U
2-Methylnaphthalene	SVOC	10 U	10 U	10 U
Hexachlorocyclopentadiene	SVOC	10 U	10 U	10 U
2,4,6-Trichlorophenol	SVOC	10 U	10 U	10 U
2,4,5-Trichlorophenol	SVOC	25 U	25 UJ	25 U
2-Chloronaphthalene	SVOC	10 U	10 U	10 U
2-Nitroaniline	SVOC	25 U	25 U	25 U
Dimethylphthalate	SVOC	10 U	10 U	10 U
Acenaphthylene	SVOC	10 U	10 U	10 U
2,6-Dinitrotoluene	SVOC	10 U	10 UJ	10 U
3-Nitroaniline	SVOC	25 U	25 U	25 UJ
Associated Method Blank		SBLKW1A	SBLKW2	SBLKW2A
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
RINSE BLANK (SEMIVOLATILES)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94
Date Extracted		10-Nov-94	10-Nov-94	12-Dec-94
Date Analyzed		17-Nov-94	17-Nov-94	13-Dec-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Acenaphthene	SVOC	10 U	10 U	10 U
2,4-Dinitrophenol	SVOC	25 UJ	25 UJ	25 UJ
4-Nitrophenol	SVOC	25 U	25 U	25 UJ
Dibenzofuran	SVOC	10 U	10 U	10 U
2,4-Dinitrotoluene	SVOC	10 U	10 U	10 U
Diethylphthalate	SVOC	10 U	10 U	10 U
4-Chlorophenyl-phenylether	SVOC	10 U	10 U	10 U
Fluorene	SVOC	10 U	10 U	10 U
4-Nitroaniline	SVOC	25 U	25 U	25 UJ
4,6-Dinitro-2-methylphenol	SVOC	25 UJ	25 U	25 U
N-Nitrosodiphenylamine	SVOC	10 U	10 U	10 U
4-Bromophenyl-phenylether	SVOC	10 U	10 U	10 U
Hexachlorobenzene	SVOC	10 U	10 U	10 U
Pentachlorophenol	SVOC	25 U	25 U	25 U
Phenanthrene	SVOC	10 U	10 U	10 U
Anthracene	SVOC	10 U	10 U	10 U
Carbazole	SVOC	10 U	10 U	10 UJ
Di-n-butylphthalate	SVOC	10 U	10 U	10 U
Fluoranthene	SVOC	10 U	10 U	10 U
Pyrene	SVOC	10 U	10 U	10 U
Butylbenzylphthalate	SVOC	10 U	10 U	10 U
3,3'-Dichlorobenzidine	SVOC	10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	SVOC	10 U	10 U	10 U
Chrysene	SVOC	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	SVOC	10 U	10 U	10 U*
Di-n-octylphthalate	SVOC	10 U	10 U	10 U
Benzo(b)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(k)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(a)pyrene	SVOC	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	SVOC	10 U	10 U	10 U
Dibenz(a,h)anthracene	SVOC	10 U	10 U	10 U
Benzo(g,h,i)perylene	SVOC	10 U	10 U	10 U
Associated Method Blank		SBLKW1A	SBLKW2	SBLKW2A
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
RINSE BLANKS (PESTICIDES/PCB's)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94
Date Extracted		11-Nov-94	14-Nov-94	09-Dec-94
Date Analyzed		22-Nov-94	29-Nov-94	16-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	Class			
alpha-BHC	PEST	0.05 U	0.05 U	0.05 U
beta-BHC	PEST	0.05 U	0.05 U	0.05 U
delta-BHC	PEST	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	PEST	0.05 U	0.05 U	0.05 U
Heptachlor	PEST	0.05 U	0.05 U	0.05 U
Aldrin	PEST	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	PEST	0.05 U	0.05 U	0.05 U
Endosulfan I	PEST	0.05 U	0.05 U	0.05 U
Dieldrin	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDE	PEST	0.10 U	0.10 U	0.10 U
Endrin	PEST	0.10 U	0.10 U	0.10 U
Endosulfan II	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDD	PEST	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDT	PEST	0.10 U	0.10 U	0.10 U
Methoxychlor	PEST	0.50 U	0.50 U	0.50 U
Endrin ketone	PEST	0.10 U	0.10 U	0.10 U
Endrin aldehyde	PEST	0.10 U	0.10 U	0.10 U
alpha-Chlordane	PEST	0.05 U	0.05 U	0.05 U
gamma-Chlordane	PEST	0.05 U	0.05 U	0.05 U
Toxaphene	PEST	5.0 U	5.0 U	5.0 U
Aroclor-1016	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1221	PCB	2.0 U	2.0 U	2.0 U
Aroclor-1232	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1242	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1248	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1254	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1260	PCB	1.0 U	1.0 U	1.0 U
Associated Method Blank		PBLKW1	PBLKW2	PBLKW2A
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
RINSE BLANK (METALS)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB26-941207-W	FB26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94	07-Dec-94
Units		UG/L	UG/L	UG/L	UG/L
Parameter	Class			TOTAL	DISSOLVED
Aluminum	METAL	35.2 U	35.2 U	35.2 UJ	56.4 J
Antimony	METAL	25.3 U	25.3 U	25.3 U	25.3 U
Arsenic	METAL	2.0 U	2.0 U	2.1 J	2.0 U
Barium	METAL	5.1 U	5.1 U	5.1 U	5.1 U
Beryllium	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Cadmium	METAL	2.5 U	2.5 U	2.5 U	2.5 U
Calcium	METAL	201 J	97.5 U	397 J	133 J
Chromium	METAL	4.8 U	8.9 J	4.8 U	4.8 U
Cobalt	METAL	4.1 U	4.1 U	4.1 U	4.1 U
Copper	METAL	4.5 J	4.2 U	4.2 U	4.2 U
Iron	METAL	22 J	62.9 J	7.1 J	9.4 J
Lead	METAL	1.0 U	1.0 U	1.0 U	1.0 U
Magnesium	METAL	116 U	116 U	116 U	116 U
Manganese	METAL	0.80 U	1.9 J	5.3 J	6.1 J
Mercury	METAL	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	METAL	8.4 U	8.6 J	8.4 U	8.4 U
Potassium	METAL	246 U	246 U	338 J	334 J
Selenium	METAL	2.0 U	2.0 U	2.0 U	2.0 U
Silver	METAL	3.0 U	3.0 U	3.0 UJ	3.0 UJ
Sodium	METAL	396 U	396 U	3700 J	4050 J
Thallium	METAL	2.0 U	2.0 U	1.0 U	1.0 U
Vanadium	METAL	3.6 U	3.6 U	3.6 U	3.6 U
Zinc	METAL	6.8 J	7.1 J	8.8 J	13.8 J

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TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
RINSE BLANK (EXPLOSIVES)

Sample I.D.		FB26-110894-S	FB26-110994-S	FB26-941207-W
Date Sampled		08-Nov-94	09-Nov-94	07-Dec-94
Units		UG/L	UG/L	UG/L
Dilution		1	1	1
Parameter	Class			
HMX	MISC	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U
4-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U
Associated Method Blank		MB1114	MB1114	MB3834

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SITE SS-026
METHOD BLANK (VOLATILES)

Sample I.D.		VBLKW1	VBLKS1	VBLKS2	VBLKW1	VBLKW2
Date Analyzed		11-Nov-94	12-Nov-94	14-Nov-94	09-Dec-94	09-Dec-94
Units		UG/L	UG/KG	UG/KG	UG/L	UG/L
Parameter	Class					
Chloromethane	VOC	10 UJ	10 UJ	10 UJ	10 U	10 U
Bromomethane	VOC	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	VOC	10 U	10 U	10 UJ	10 U	10 U
Chloroethane	VOC	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	VOC	10 U	10 U	10 U	10 U	10 U
Acetone	VOC	10 UJ	10 UJ	10 J	10 U	10 UJ
Carbon Disulfide	VOC	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	VOC	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	VOC	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	VOC	10 U	10 U	10 U	10 U	10 U
Chloroform	VOC	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	VOC	10 U	10 U	10 U	10 U	10 U
2-Butanone	VOC	10 UJ	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	VOC	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	VOC	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	VOC	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	VOC	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	VOC	10 U	10 U	10 U	10 U	10 U
Trichloroethene	VOC	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	VOC	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	VOC	10 U	10 U	10 U	10 U	10 U
Benzene	VOC	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	VOC	10 U	10 U	10 U	10 U	10 U
Bromoform	VOC	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	VOC	10 U	10 U	10 U	10 U	10 U
2-Hexanone	VOC	10 U	10 U	10 U	10 UJ	10 U
Tetrachloroethene	VOC	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	VOC	10 U	10 U	10 U	10 U	10 U
Toluene	VOC	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	VOC	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	VOC	10 U	10 U	10 U	10 U	10 U
Styrene	VOC	10 U	10 U	10 U	10 U	10 U
Xylene (total)	VOC	10 U	10 U	10 U	10 U	10 U
Associated Method Blank		NA	NA	NA	NA	NA
Associated Trip Blank		NA	NA	NA	NA	NA
Associated Rinse Blank		NA	NA	NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (SEMIVOLATILES)

Sample I.D.		SBLKS1	SBLKS2	SBLKW1A
Date Extracted		11-Nov-94	15-Nov-94	10-Nov-94
Date Analyzed		23-Nov-94	23-Nov-94	17-Nov-94
Units		UG/KG	UG/KG	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Phenol	SVOC	330 U	330 U	10 U
bis(2-Chloroethyl)ether	SVOC	330 U	330 U	10 U
2-Chlorophenol	SVOC	330 U	330 U	10 U
1,3-Dichlorobenzene	SVOC	330 U	330 U	10 U
1,4-Dichlorobenzene	SVOC	330 U	330 U	10 U
1,2-Dichlorobenzene	SVOC	330 U	330 U	10 U
2-Methylphenol	SVOC	330 U	330 U	10 U
2,2'-oxybis(1-Chloropropane)	SVOC	330 UJ	330 U	10 U
4-Methylphenol	SVOC	330 U	330 U	10 U
N-Nitroso-di-n-propylamine	SVOC	330 U	330 U	10 U
Hexachloroethane	SVOC	330 U	330 U	10 U
Nitrobenzene	SVOC	330 U	330 U	10 U
Isophorone	SVOC	330 U	330 U	10 U
2-Nitrophenol	SVOC	330 U	330 U	10 U
2,4-Dimethylphenol	SVOC	330 U	330 U	10 U
bis(2-Chloroethoxy)methane	SVOC	330 U	330 U	10 U
2,4-Dichlorophenol	SVOC	330 U	330 U	10 U
1,2,4-Trichlorobenzene	SVOC	330 U	330 U	10 U
Naphthalene	SVOC	330 U	330 U	10 U
4-Chloroaniline	SVOC	330 U	330 U	10 U
Hexachlorobutadiene	SVOC	330 U	330 U	10 U
4-Chloro-3-methylphenol	SVOC	330 U	330 U	10 U
2-Methylnaphthalene	SVOC	330 U	330 U	10 U
Hexachlorocyclopentadiene	SVOC	330 U	330 U	10 U
2,4,6-Trichlorophenol	SVOC	330 U	330 U	10 U
2,4,5-Trichlorophenol	SVOC	800 U	800 U	25 U
2-Chloronaphthalene	SVOC	330 U	330 U	10 U
2-Nitroaniline	SVOC	800 U	800 U	25 U
Dimethylphthalate	SVOC	330 U	330 U	10 U
Acenaphthylene	SVOC	330 U	330 U	10 U
2,6-Dinitrotoluene	SVOC	330 U	330 U	10 U
3-Nitroaniline	SVOC	800 U	800 U	25 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (SEMIVOLATILES)

Sample I.D.		SBLKS1	SBLKS2	SBLKW1A
Date Extracted		11-Nov-94	15-Nov-94	10-Nov-94
Date Analyzed		23-Nov-94	23-Nov-94	17-Nov-94
Units		UG/KG	UG/KG	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Acenaphthene	SVOC	330 U	330 U	10 U
2,4-Dinitrophenol	SVOC	800 U	800 U	25 UJ
4-Nitrophenol	SVOC	800 U	800 U	25 U
Dibenzofuran	SVOC	330 U	330 U	10 U
2,4-Dinitrotoluene	SVOC	330 U	330 U	10 U
Diethylphthalate	SVOC	330 U	330 U	10 U
4-Chlorophenyl-phenylether	SVOC	330 U	330 U	10 U
Fluorene	SVOC	330 U	330 U	10 U
4-Nitroaniline	SVOC	800 U	800 U	25 U
4,6-Dinitro-2-methylphenol	SVOC	800 U	800 U	25 UJ
N-Nitrosodiphenylamine	SVOC	330 U	330 U	10 U
4-Bromophenyl-phenylether	SVOC	330 U	330 U	10 U
Hexachlorobenzene	SVOC	330 U	330 U	10 U
Pentachlorophenol	SVOC	800 U	800 U	25 U
Phenanthrene	SVOC	330 U	330 U	10 U
Anthracene	SVOC	330 U	330 U	10 U
Carbazole	SVOC	330 U	330 U	10 U
Di-n-butylphthalate	SVOC	330 U	330 U	10 U
Fluoranthene	SVOC	330 U	330 U	10 U
Pyrene	SVOC	330 U	330 U	10 U
Butylbenzylphthalate	SVOC	330 U	330 U	10 U
3,3'-Dichlorobenzidine	SVOC	330 U	330 U	10 UJ
Benzo(a)anthracene	SVOC	330 U	330 U	10 U
Chrysene	SVOC	330 U	330 U	10 U
bis(2-Ethylhexyl)phthalate	SVOC	330 U	330 U	10 U
Di-n-octylphthalate	SVOC	330 UJ	330 U	10 U
Benzo(b)fluoranthene	SVOC	330 U	330 U	10 U
Benzo(k)fluoranthene	SVOC	330 U	330 U	10 U
Benzo(a)pyrene	SVOC	330 U	330 U	10 U
Indeno(1,2,3-cd)pyrene	SVOC	330 UJ	330 U	10 U
Dibenz(a,h)anthracene	SVOC	330 UJ	330 U	10 U
Benzo(g,h,i)perylene	SVOC	330 UJ	330 U	10 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (SEMIVOLATILES)

Sample I.D.		SBLKW1A	SBLKW2A	SBLKW2
Date Extracted		08-Dec-94	12-Dec-94	10-Nov-94
Date Analyzed		09-Dec-94	13-Dec-94	17-Nov-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Phenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethyl)ether	SVOC	10 U	10 U	10 U
2-Chlorophenol	SVOC	10 U	10 U	10 U
1,3-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,4-Dichlorobenzene	SVOC	10 U	10 U	10 U
1,2-Dichlorobenzene	SVOC	10 U	10 U	10 U
2-Methylphenol	SVOC	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	SVOC	10 U	10 U	10 U
4-Methylphenol	SVOC	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	SVOC	10 U	10 U	10 U
Hexachloroethane	SVOC	10 U	10 U	10 U
Nitrobenzene	SVOC	10 U	10 U	10 U
Isophorone	SVOC	10 U	10 U	10 U
2-Nitrophenol	SVOC	10 U	10 U	10 U
2,4-Dimethylphenol	SVOC	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	SVOC	10 U	10 U	10 U
2,4-Dichlorophenol	SVOC	10 U	10 U	10 U
1,2,4-Trichlorobenzene	SVOC	10 U	10 U	10 U
Naphthalene	SVOC	10 U	10 U	10 U
4-Chloroaniline	SVOC	10 UJ	10 U	10 U
Hexachlorobutadiene	SVOC	10 U	10 U	10 U
4-Chloro-3-methylphenol	SVOC	10 U	10 U	10 U
2-Methylnaphthalene	SVOC	10 U	10 U	10 U
Hexachlorocyclopentadiene	SVOC	10 U	10 U	10 U
2,4,6-Trichlorophenol	SVOC	10 U	10 U	10 U
2,4,5-Trichlorophenol	SVOC	25 U	25 U	25 UJ
2-Chloronaphthalene	SVOC	10 U	10 U	10 U
2-Nitroaniline	SVOC	25 U	25 U	25 U
Dimethylphthalate	SVOC	10 U	10 U	10 U
Acenaphthylene	SVOC	10 U	10 U	10 U
2,6-Dinitrotoluene	SVOC	10 U	10 U	10 UJ
3-Nitroaniline	SVOC	25 UJ	25 UJ	25 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (SEMIVOLATILES)

Sample I.D.		SBLKW1A	SBLKW2A	SBLKW2
Date Extracted		08-Dec-94	12-Dec-94	10-Nov-94
Date Analyzed		09-Dec-94	13-Dec-94	17-Nov-94
Units		UG/L	UG/L	UG/L
Dilution Factor		1	1	1
Parameter	Class			
Acenaphthene	SVOC	10 U	10 U	10 U
2,4-Dinitrophenol	SVOC	25 UJ	25 UJ	25 UJ
4-Nitrophenol	SVOC	25 UJ	25 UJ	25 U
Dibenzofuran	SVOC	10 U	10 U	10 U
2,4-Dinitrotoluene	SVOC	10 U	10 U	10 U
Diethylphthalate	SVOC	10 U	10 U	10 U
4-Chlorophenyl-phenylether	SVOC	10 U	10 U	10 U
Fluorene	SVOC	10 U	10 U	10 U
4-Nitroaniline	SVOC	25 UJ	25 UJ	25 U
4,6-Dinitro-2-methylphenol	SVOC	25 U	25 U	25 U
N-Nitrosodiphenylamine	SVOC	10 U	10 U	10 U
4-Bromophenyl-phenylether	SVOC	10 U	10 U	10 U
Hexachlorobenzene	SVOC	10 U	10 U	10 U
Pentachlorophenol	SVOC	25 U	25 U	25 U
Phenanthrene	SVOC	10 U	10 U	10 U
Anthracene	SVOC	10 U	10 U	10 U
Carbazole	SVOC	10 UJ	10 UJ	10 U
Di-n-butylphthalate	SVOC	10 U	10 U	10 U
Fluoranthene	SVOC	10 U	10 U	10 U
Pyrene	SVOC	10 U	10 U	10 U
Butylbenzylphthalate	SVOC	10 UJ	10 U	10 U
3,3'-Dichlorobenzidine	SVOC	10 UJ	10 UJ	10 UJ
Benzo(a)anthracene	SVOC	10 U	10 U	10 U
Chrysene	SVOC	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	SVOC	10 UJ	2 J	10 U
Di-n-octylphthalate	SVOC	10 U	10 U	10 U
Benzo(b)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(k)fluoranthene	SVOC	10 U	10 U	10 U
Benzo(a)pyrene	SVOC	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	SVOC	10 U	10 U	10 U
Dibenz(a,h)anthracene	SVOC	10 U	10 U	10 U
Benzo(g,h,i)perylene	SVOC	10 U	10 U	10 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (PESTICIDES/PCB's)

Sample I.D.		PBLKS1	PBLKS2	PBLKW1
Date Extracted		10-Nov-94	14-Nov-94	11-Nov-94
Date Analyzed		22-Nov-94	29-Nov-94	22-Nov-94
Units		UG/KG	UG/KG	UG/L
Parameter	Class			
alpha-BHC	PEST	1.7 U	1.7 U	0.05 U
beta-BHC	PEST	1.7 U	1.7 U	0.05 U
delta-BHC	PEST	1.7 U	1.7 U	0.05 U
gamma-BHC (Lindane)	PEST	1.7 U	1.7 U	0.05 U
Heptachlor	PEST	1.7 U	1.7 U	0.05 U
Aldrin	PEST	1.7 U	1.7 U	0.05 U
Heptachlor epoxide	PEST	1.7 U	1.7 U	0.05 U
Endosulfan I	PEST	1.7 U	1.7 U	0.05 U
Dieldrin	PEST	3.3 U	3.3 U	0.10 U
4,4'-DDE	PEST	3.3 U	3.3 U	0.10 U
Endrin	PEST	3.3 U	3.3 U	0.10 U
Endosulfan II	PEST	3.3 U	3.3 U	0.10 U
4,4'-DDD	PEST	3.3 U	3.3 U	0.10 U
Endosulfan sulfate	PEST	3.3 U	3.3 U	0.10 U
4,4'-DDT	PEST	3.3 U	3.3 U	0.10 U
Methoxychlor	PEST	17 U	17 U	0.50 U
Endrin ketone	PEST	3.3 U	3.3 U	0.10 U
Endrin aldehyde	PEST	3.3 U	3.3 U	0.10 U
alpha-Chlordane	PEST	1.7 U	1.7 U	0.05 U
gamma-Chlordane	PEST	1.7 U	1.7 U	0.05 U
Toxaphene	PEST	170 U	170 U	5.0 U
Aroclor-1016	PCB	33 U	33 U	1.0 U
Aroclor-1221	PCB	67 U	67 U	2.0 U
Aroclor-1232	PCB	33 U	33 U	1.0 U
Aroclor-1242	PCB	33 U	33 U	1.0 U
Aroclor-1248	PCB	33 U	33 U	1.0 U
Aroclor-1254	PCB	33 U	33 U	1.0 U
Aroclor-1260	PCB	33 U	33 U	1.0 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH AIR FORCE BASE SS-026
METHOD BLANK (PESTICIDES/PCB's)

Sample I.D.		PBLKW2	PBLKW1A	PBLKW2A
Date Extracted		14-Nov-94	08-Dec-94	09-Dec-94
Date Analyzed		29-Nov-94	16-Dec-94	15-Dec-94
Units		UG/L	UG/L	UG/L
Parameter	Class			
alpha-BHC	PEST	0.05 U	0.05 U	0.05 U
beta-BHC	PEST	0.05 U	0.05 U	0.05 U
delta-BHC	PEST	0.05 U	0.05 U	0.05 U
gamma-BHC (Lindane)	PEST	0.05 U	0.05 U	0.05 U
Heptachlor	PEST	0.05 U	0.05 U	0.05 U
Aldrin	PEST	0.05 U	0.05 U	0.05 U
Heptachlor epoxide	PEST	0.05 U	0.05 U	0.05 U
Endosulfan I	PEST	0.05 U	0.05 U	0.05 U
Dieldrin	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDE	PEST	0.10 U	0.10 U	0.10 U
Endrin	PEST	0.10 U	0.10 U	0.10 U
Endosulfan II	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDD	PEST	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	PEST	0.10 U	0.10 U	0.10 U
4,4'-DDT	PEST	0.10 U	0.10 U	0.10 U
Methoxychlor	PEST	0.50 U	0.50 U	0.50 U
Endrin ketone	PEST	0.10 U	0.10 U	0.10 U
Endrin aldehyde	PEST	0.10 U	0.10 U	0.10 U
alpha-Chlordane	PEST	0.05 U	0.05 U	0.05 U
gamma-Chlordane	PEST	0.05 U	0.05 U	0.05 U
Toxaphene	PEST	5.0 U	5.0 U	5.0 U
Aroclor-1016	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1221	PCB	2.0 U	2.0 U	2.0 U
Aroclor-1232	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1242	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1248	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1254	PCB	1.0 U	1.0 U	1.0 U
Aroclor-1260	PCB	1.0 U	1.0 U	1.0 U
Associated Method Blank		NA	NA	NA
Associated Rinse Blank		NA	NA	NA

TABLE C-3

VALIDATION SUMMARY TABLE
PLATTSBURGH SS-026
METHOD BLANK (EXPLOSIVES)

Sample ID		MB1114	MB1115	MB1209
Date Analyzed		14-Nov-94	15-Nov-94	19-Dec-94
Units		UG/L	MG/KG	UG/L
Dilution		1	1	1
Parameter	Class			
HMX	MISC	1.0 U	1.0 U	1.0 U
RDX	MISC	1.0 U	1.0 U	1.0 U
1,3,5-TNB	MISC	1.0 U	1.0 U	1.0 U
1,3-DNB	MISC	1.0 U	1.0 U	1.0 U
Tetryl	MISC	1.0 U	1.0 U	1.0 U
NB	MISC	1.0 U	1.0 U	1.0 U
2,4,6-TNT	MISC	1.0 U	1.0 U	1.0 U
4-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2-Am-DNT	MISC	1.0 U	1.0 U	1.0 U
2,6-DNT	MISC	1.0 U	1.0 U	1.0 U
2,4-DNT	MISC	1.0 U	1.0 U	1.0 U
2-NT	MISC	1.0 U	1.0 U	1.0 U
4-NT	MISC	1.0 U	1.0 U	1.0 U
3-NT	MISC	1.0 U	1.0 U	1.0 U

APPENDIX C2

1997 DATA

DATA ASSESSMENT SUMMARY

PLATTSBURGH AIR FORCE BASE

EOD RANGE PIT/BERM SOIL SAMPLING, D.O.# 26

Three soil samples, one matrix spike/matrix spike duplicate, and one field blank were collected at the EOD Range at Plattsburgh Air Force Base (PAFB), Plattsburgh, New York on December 11, 1997, and sent to American Environmental Network, located in Monroe, CT, for analysis. All samples were received intact and under the proper chain-of-custody by the laboratory, and were analyzed in accordance with SW-846 methodologies (January 1995, Update IIB) for Target Compound List (TCL) volatiles, semivolatiles, pesticides, and PCBs, and for Target Analyte List (TAL) metals (including cyanide).

The data package was reviewed for compliance with the methods referenced above, USEPA Region II CLP Organic Data Review, SOP No. HW-6, Revision #10, October 1995, and USEPA Region II Evaluation of Metals Data for the Contract Laboratory Program, SOP #HW-2, Rev.11, Jan. 1992. The following report is a summary of the data audit. Data qualifiers applied to the analytical results include "U" (not detected) and "J" (estimated value based on QC outliers or value is below laboratory quantitation limit). The validated analytical results can be found in the Table 1.

TCL Volatiles (Method 8260A):

The percent relative standard deviation of acetone in the initial calibration associated with all soil samples, and the percent difference of bromomethane and chloroethane in the continuing calibration associated with all soil samples, were above EPA Region II control limits. The results for these compounds were qualified as estimated in all soil samples, following EPA Region II validation guidelines. The percent difference of chloroethane in the continuing calibration associated with the field blank was above EPA Region II control limits. The result for chloroethane was qualified as estimated in the field blank, following EPA Region II validation guidelines. No other data qualifications were made, and all other data are usable as reported.

TCL Semivolatiles (Method 8270B):

The percent differences of indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene, benzoic acid, 2,4-dinitrophenol, and bis(2-ethylhexyl)phthalate were above EPA Region II control limits in one or more of the continuing calibration standards. The results for these compounds were qualified as estimated in the samples associated with these calibration standards, per EPA Region II validation guidelines. No other data qualifications were made, and all other data are usable as reported.

TCL Pesticides/PCBs:

The percent relative standard deviation of methoxychlor in the initial calibration was above the EPA Region II control limit. The results for methoxychlor were qualified as estimated in all samples, following EPA Region II validation guidelines. No other data qualifications were made, and all other data are usable as reported.

TAL Metals:

The CRDL standard percent recoveries of cadmium, lead, selenium, and thallium were outside of EPA Region II control limits. When effected by these CRDL standards, the results for these compounds were qualified as estimated, following EPA Region II validation guidelines. The percent recovery of aluminum in the matrix spike analysis of soil sample EOD PIT1 was 302%. EPA Region II validation guidelines require the rejection of sample results when the recovery is above 200% and the sample concentration is less than four times the amount of spike added. However, the concentration of aluminum in sample EOD PIT1 was only slightly less than four times the amount of spike added to the sample, and the recovery of aluminum in the LCS was within acceptable QC limits. Based on professional judgement, the results for aluminum were qualified as estimated in all soil samples. The result for zinc in the ICP serial dilution analysis of soil sample EOD PIT1 was not within EPA Region II criteria. The results for zinc were qualified as estimated in all soil samples, following EPA Region II validation guidelines. No other data qualifications were made, and all other data are usable as reported.

Cyanide:

The percent recovery of cyanide in the matrix spike analysis of soil sample EOD PIT1 was below EPA Region II control limits. The results for cyanide were qualified as estimated in all soil samples, following EPA Region II validation guidelines.

cc: D.Hunt
M.Bitka
B.Przybyl
S.Moeller
File: 01.00026.00

TABLE 1

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	TBC			
Volatiles					
Chloromethane	UG/KG		10 U	12 U	12 U
Bromomethane	UG/KG		10 UJ	12 UJ	12 UJ
Vinyl Chloride	UG/KG	200	10 U	12 U	12 U
Chloroethane	UG/KG	1900	10 UJ	12 UJ	12 UJ
Methylene Chloride	UG/KG	100	4 J	6	5 J
Acetone	UG/KG	200	42 J	45 J	46 J
Carbon Disulfide	UG/KG	2700	5 U	6 U	6 U
Vinyl Acetate	UG/KG		10 U	12 U	12 U
1,1-Dichloroethene	UG/KG	400	5 U	6 U	6 U
1,1-Dichloroethane	UG/KG	200	5 U	6 U	6 U
1,2-Dichloroethene (total)	UG/KG	300	5 U	6 U	6 U
Chloroform	UG/KG	300	5 U	6 U	6 U
1,2-Dichloroethane	UG/KG	100	5 U	6 U	6 U
Methyl Ethyl Ketone (2-Butanone)	UG/KG	300	10 U	12 U	12 U
1,1,1-Trichloroethane	UG/KG	800	5 U	6 U	6 U
Carbon Tetrachloride	UG/KG	600	5 U	6 U	6 U
Bromodichloromethane	UG/KG		5 U	6 U	6 U
1,2-Dichloropropane	UG/KG		5 U	6 U	6 U
cis-1,3-Dichloropropene	UG/KG		5 U	6 U	6 U
Trichloroethene	UG/KG	700	5 U	6 U	6 U
Dibromochloromethane	UG/KG		5 U	6 U	6 U
1,1,2-Trichloroethane	UG/KG		5 U	6 U	6 U
Benzene	UG/KG	60	5 U	6 U	6 U
trans-1,3-Dichloropropene	UG/KG		5 U	6 U	6 U
Bromoform	UG/KG		5 U	6 U	6 U
4-Methyl-2-Pentanone	UG/KG	1000	10 U	12 U	12 U
2-Hexanone	UG/KG		10 U	12 U	12 U
Tetrachloroethene	UG/KG	1400	5 U	6 U	6 U
Toluene	UG/KG	1500	5 U	6 U	6 U
1,1,2,2-Tetrachloroethane	UG/KG	600	5 U	6 U	6 U
Chlorobenzene	UG/KG	1700	5 U	6 U	6 U
Ethylbenzene	UG/KG	5500	5 U	6 U	6 U
Styrene	UG/KG		5 U	6 U	6 U
Xylene (total)	UG/KG	1200	5 U	6 U	6 U

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY _____ DATE 1-22-98
CHKD BY _____ DATE 1-22-98

TABLE 1

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	**Units**	**TBC**			
Semivolatiles					
Phenol	UG/KG	30 MDL	340 U	410 U	400 U
bis(2-Chloroethyl)ether	UG/KG		340 U	410 U	400 U
2-Chlorophenol	UG/KG	800	340 U	410 U	400 U
1,3-Dichlorobenzene	UG/KG	1600	340 U	410 U	400 U
1,4-Dichlorobenzene	UG/KG	8500	340 U	410 U	400 U
Benzyl Alcohol	UG/KG		340 U	410 U	400 U
1,2-Dichlorobenzene	UG/KG	7900	340 U	410 U	400 U
2-Methylphenol (o-cresol)	UG/KG	100	340 U	410 U	400 U
2,2'-oxybis(1-Chloropropane)	UG/KG		340 U	410 U	400 U
4-Methylphenol (p-cresol)	UG/KG	900	340 U	410 U	400 U
N-Nitroso-di-n-propylamine	UG/KG		340 U	410 U	400 U
Hexachloroethane	UG/KG		340 U	410 U	400 U
Nitrobenzene	UG/KG	200 MDL	340 U	410 U	400 U
Isophorone	UG/KG	4400	340 U	410 U	400 U
2-Nitrophenol	UG/KG	330 MDL	340 U	410 U	400 U
2,4-Dimethylphenol	UG/KG		340 U	410 U	400 U
Benzoic Acid	UG/KG		1700 U	2000 U	1900 U
bis(2-Chloroethoxy)methane	UG/KG		340 U	410 U	400 U
2,4-Dichlorophenol	UG/KG	400	340 U	410 U	400 U
1,2,4-Trichlorobenzene	UG/KG	3400	340 U	410 U	400 U
Naphthalene	UG/KG	13000	340 U	410 U	400 U
4-Chloroaniline	UG/KG	220 MDL	340 U	410 U	400 U
Hexachlorobutadiene	UG/KG		340 U	410 U	400 U
4-Chloro-3-methylphenol	UG/KG	240 MDL	340 U	410 U	400 U
2-Methylnaphthalene	UG/KG	36400	340 U	410 U	400 U
Hexachlorocyclopentadiene	UG/KG		340 U	410 U	400 U
2,4,6-Trichlorophenol	UG/KG		340 U	410 U	400 U
2,4,5-Trichlorophenol	UG/KG	100	1700 U	2000 U	1900 U
2-Chloronaphthalene	UG/KG		340 U	410 U	400 U
2-Nitroaniline	UG/KG	430 MDL	1700 U	2000 U	1900 U
Dimethylphthalate	UG/KG	2000	340 U	410 U	400 U
Acenaphthylene	UG/KG	41000	340 U	410 U	400 U
2,6-Dinitrotoluene	UG/KG	1000	340 U	410 U	400 U
3-Nitroaniline	UG/KG	500 MDL	1700 U	2000 U	1900 U

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY JL DATE 1-22-98
CHKD BY JMH DATE 1-22-98

TABLE 1

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	TBC			
Semivolatiles					
Acenaphthene	UG/KG	50000	340 U	410 U	400 U
2,4-Dinitrophenol	UG/KG	200 MDL	1700 UJ	2000 U	1900 UJ
4-Nitrophenol	UG/KG	100 MDL	1700 U	2000 U	1900 U
Dibenzofuran	UG/KG	6200	340 U	410 U	400 U
2,4-Dinitrotoluene	UG/KG		340 U	410 U	400 U
Diethylphthalate	UG/KG	7100	340 U	410 U	400 U
4-Chlorophenyl-phenylether	UG/KG		340 U	410 U	400 U
Fluorene	UG/KG	50000	340 U	410 U	400 U
4-Nitroaniline	UG/KG		1700 U	2000 U	1900 U
4,6-Dinitro-2-methylphenol	UG/KG		1700 U	2000 U	1900 U
N-Nitrosodiphenylamine	UG/KG		340 U	410 U	400 U
4-Bromophenyl-phenylether	UG/KG		340 U	410 U	400 U
Hexachlorobenzene	UG/KG	410	340 U	410 U	400 U
Pentachlorophenol	UG/KG	1000 MDL	1700 U	2000 U	1900 U
Phenanthrene	UG/KG	50000	340 U	410 U	400 U
Anthracene	UG/KG	50000	340 U	410 U	400 U
Carbazole	UG/KG		340 U	410 U	400 U
Di-n-butylphthalate	UG/KG	8100	340 U	410 U	400 U
Fluoranthene	UG/KG	50000	340 U	410 U	400 U
Pyrene	UG/KG	50000	340 U	410 U	400 U
Butylbenzylphthalate	UG/KG	50000	340 U	410 U	400 U
3,3'-Dichlorobenzidine	UG/KG		690 U	810 U	800 U
Benzo(a)anthracene	UG/KG	224 MDL	340 U	410 U	400 U
Chrysene	UG/KG	400	340 U	410 U	400 U
bis(2-Ethylhexyl)phthalate	UG/KG	50000	340 UJ	410 U	400 UJ
Di-n-octylphthalate	UG/KG	50000	340 U	410 U	400 U
Benzo(b)fluoranthene	UG/KG	1100	340 U	410 U	400 U
Benzo(k)fluoranthene	UG/KG	1100	340 U	410 U	400 U
Benzo(a)pyrene	UG/KG	61 MDL	340 U	410 U	400 U
Indeno(1,2,3-cd)pyrene	UG/KG	3200	340 U	410 UJ	400 U
Dibenz(a,h)anthracene	UG/KG	14 MDL	340 U	410 UJ	400 U
Benzo(g,h,i)perylene	UG/KG	50000	340 U	410 UJ	400 U

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY ... DATE 1-27-98
CHKD BY ... DATE 1-27-98

TABLE 1

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	TBC			
PEST					
alpha-BHC	UG/KG	110	1.8 U	2.1 U	2.0 U
beta-BHC	UG/KG	200	1.8 U	2.1 U	2.0 U
delta-BHC	UG/KG	300	1.8 U	2.1 U	2.0 U
gamma-BHC (Lindane)	UG/KG	60	1.8 U	2.1 U	2.0 U
Heptachlor	UG/KG	100	1.8 U	2.1 U	2.0 U
Aldrin	UG/KG	41	1.8 U	2.1 U	2.0 U
Heptachlor epoxide	UG/KG	20	1.8 U	2.1 U	2.0 U
Endosulfan I	UG/KG	900	1.8 U	2.1 U	2.0 U
Dieldrin	UG/KG	44	3.4 U	4.1 U	4.0 U
4,4'-DDE	UG/KG	2100	1.0 J	4.1 U	4.0 U
Endrin	UG/KG	100	3.4 U	4.1 U	4.0 U
Endosulfan II	UG/KG	900	3.4 U	4.1 U	4.0 U
4,4'-DDD	UG/KG	2900	3.4 U	4.1 U	4.0 U
Endosulfan sulfate	UG/KG	1000	3.4 U	4.1 U	4.0 U
4,4'-DDT	UG/KG	2100	3.0 J	4.1 U	0.44 J
Methoxychlor	UG/KG	10000	18 UJ	21 UJ	20 UJ
Endrin ketone	UG/KG		3.4 U	4.1 U	4.0 U
Endrin aldehyde	UG/KG		3.4 U	4.1 U	4.0 U
alpha-Chlordane	UG/KG	540	1.8 U	2.1 U	2.0 U
gamma-Chlordane	UG/KG	540	1.8 U	2.1 U	2.0 U
Toxaphene	UG/KG		34 U	41 U	40 U
Aroclor 1016	UG/KG	10000	34 U	41 U	40 U
Aroclor 1221	UG/KG	10000	70 U	83 U	81 U
Aroclor 1232	UG/KG	10000	34 U	41 U	40 U
Aroclor 1242	UG/KG	10000	34 U	41 U	40 U
Aroclor 1248	UG/KG	10000	34 U	41 U	40 U
Aroclor 1254	UG/KG	10000	34 U	41 U	40 U
Aroclor 1260	UG/KG	10000	34 U	41 U	40 U

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY JL DATE 1-29-98
CHKD BY [illegible] DATE 1-29-98

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	TBC			
Metals					
Aluminum	MG/KG	8510 (SB)	3830 J	1800 J	3340 J
Antimony	MG/KG	12.6 (SB)	1.7 U	1.9 U	2.0 U
Arsenic	MG/KG	7.5 *	0.77	0.72 U	1.3
Barium	MG/KG	300 *	13.7	19.7	21.7
Beryllium	MG/KG	0.74 (SB)	0.21 U	0.24 U	0.24 U
Cadmium	MG/KG	1.3 (SB)	0.21 U	0.24 U	0.24 U
Calcium	MG/KG	30200 (SB)	311	1220	1020
Chromium	MG/KG	19.5 (SB)	2.4	3.8	5.7
Cobalt	MG/KG	30 *	1.1	1.6	2.4
Copper	MG/KG	44.1 (SB)	1.9	0.78	2.3
Iron	MG/KG	36700 (SB)	3560	4800	12300
Lead	MG/KG	79.4 (SB)	9.8 J	3.0 J	3.6 J
Magnesium	MG/KG	3340 (SB)	335	439	906
Manganese	MG/KG	474 (SB)	56.5	79.6	74.9
Mercury	MG/KG	0.1 *	0.10 U	0.12 U	0.12 U
Nickel	MG/KG	13 *	2.7	2.9	5.5
Potassium	MG/KG	929 (SB)	118	136	322
Selenium	MG/KG	2 *	0.85 J	0.97 U	1.3 J
Silver	MG/KG	0 (SB)	0.21 U	0.24 U	0.24 U
Sodium	MG/KG	520 (SB)	59.5	45.4	66.7
Thallium	MG/KG	0 (SB)	1.0 UJ	1.2 UJ	1.2 UJ
Vanadium	MG/KG	150 *	4.5	5.3	11.3
Zinc	MG/KG	63.4 (SB)	29.0 J	14.8 J	25.5 J

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY _____ DATE 1-23-98
CHKD BY _____ DATE 1-23-98

PLATTSBURGH AFB

EOD RANGE
SOIL SAMPLE RESULTS

Location I.D.			EOD BERM 1	EOD PIT 1	EOD PIT 2
Sample I.D.			EODBERM1	EODPIT1	EODPIT2
Matrix			Soil	Soil	Soil
Date Sampled			12/11/97	12/11/97	12/11/97
Parameter	Units	TBC			
MISC					
Cyanide	MG/KG		0.520 UJ	0.600 UJ	0.610 UJ

TBC - NYSDEC Technical Administrative Guidance Memorandum #4046-Determination of Soil Cleanup Objectives and Cleanup Levels (1992).

MDL - Method Detection Limit.

(SB) - Site Background concentration from "Background Surface Soil & Groundwater Survey for the Plattsburgh Air Force Base", URS Consultants, Inc. (1996).

MADE BY: JL DATE: 1-27-98
CHKD. BY: JMW DATE: 1-27-98

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
Volatiles		
Chloromethane	UG/L	10 U
Bromomethane	UG/L	10 U
Vinyl Chloride	UG/L	10 U
Chloroethane	UG/L	10 UJ
Methylene Chloride	UG/L	5 U
Acetone	UG/L	10 U
Carbon Disulfide	UG/L	5 U
Vinyl Acetate	UG/L	10 U
1,1-Dichloroethene	UG/L	5 U
1,1-Dichloroethane	UG/L	5 U
1,2-Dichloroethene (total)	UG/L	5 U
Chloroform	UG/L	5 U
1,2-Dichloroethane	UG/L	5 U
Methyl Ethyl Ketone (2-Butanone)	UG/L	10 U
1,1,1-Trichloroethane	UG/L	5 U
Carbon Tetrachloride	UG/L	5 U
Bromodichloromethane	UG/L	5 U
1,2-Dichloropropane	UG/L	5 U
cis-1,3-Dichloropropene	UG/L	5 U
Trichloroethene	UG/L	5 U
Dibromochloromethane	UG/L	5 U
1,1,2-Trichloroethane	UG/L	5 U
Benzene	UG/L	5 U
trans-1,3-Dichloropropene	UG/L	5 U
Bromoform	UG/L	5 U
4-Methyl-2-Pentanone	UG/L	10 U
2-Hexanone	UG/L	10 U
Tetrachloroethene	UG/L	5 U
Toluene	UG/L	5 U
1,1,2,2-Tetrachloroethane	UG/L	5 U
Chlorobenzene	UG/L	5 U
Ethylbenzene	UG/L	5 U
Styrene	UG/L	5 U
Xylene (total)	UG/L	5 U

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
Semivolatiles		
Phenol	UG/L	10 U
bis(2-Chloroethyl)ether	UG/L	10 U
2-Chlorophenol	UG/L	10 U
1,3-Dichlorobenzene	UG/L	10 U
1,4-Dichlorobenzene	UG/L	10 U
Benzyl Alcohol	UG/L	10 U
1,2-Dichlorobenzene	UG/L	10 U
2-Methylphenol (o-cresol)	UG/L	10 U
2,2'-oxybis(1-Chloropropane)	UG/L	10 U
4-Methylphenol (p-cresol)	UG/L	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U
Hexachloroethane	UG/L	10 U
Nitrobenzene	UG/L	10 U
Isophorone	UG/L	10 U
2-Nitrophenol	UG/L	10 U
2,4-Dimethylphenol	UG/L	10 U
Benzoic Acid	UG/L	50 U
bis(2-Chloroethoxy)methane	UG/L	10 U
2,4-Dichlorophenol	UG/L	10 U
1,2,4-Trichlorobenzene	UG/L	10 U
Naphthalene	UG/L	10 U
4-Chloroaniline	UG/L	10 U
Hexachlorobutadiene	UG/L	10 U
4-Chloro-3-methylphenol	UG/L	10 U
2-Methylnaphthalene	UG/L	10 U
Hexachlorocyclopentadiene	UG/L	10 U
2,4,6-Trichlorophenol	UG/L	10 U
2,4,5-Trichlorophenol	UG/L	50 U
2-Chloronaphthalene	UG/L	10 U
2-Nitroaniline	UG/L	50 U
Dimethylphthalate	UG/L	10 U
Acenaphthylene	UG/L	10 U
2,6-Dinitrotoluene	UG/L	10 U
3-Nitroaniline	UG/L	50 U
Acenaphthene	UG/L	10 U
2,4-Dinitrophenol	UG/L	50 U
4-Nitrophenol	UG/L	50 U

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
Semivolatiles		
Dibenzofuran	UG/L	10 U
2,4-Dinitrotoluene	UG/L	10 U
Diethylphthalate	UG/L	10 U
4-Chlorophenyl-phenylether	UG/L	10 U
Fluorene	UG/L	10 U
4-Nitroaniline	UG/L	20 U
4,6-Dinitro-2-methylphenol	UG/L	50 U
N-Nitrosodiphenylamine	UG/L	10 U
4-Bromophenyl-phenylether	UG/L	10 U
Hexachlorobenzene	UG/L	10 U
Pentachlorophenol	UG/L	50 U
Phenanthrene	UG/L	10 U
Anthracene	UG/L	10 U
Carbazole	UG/L	10 U
Di-n-butylphthalate	UG/L	10 U
Fluoranthene	UG/L	10 U
Pyrene	UG/L	10 U
Butylbenzylphthalate	UG/L	10 U
3,3'-Dichlorobenzidine	UG/L	20 U
Benzo(a)anthracene	UG/L	10 U
Chrysene	UG/L	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U
Di-n-octylphthalate	UG/L	10 U
Benzo(b)fluoranthene	UG/L	10 U
Benzo(k)fluoranthene	UG/L	10 U
Benzo(a)pyrene	UG/L	10 U
Indeno(1,2,3-cd)pyrene	UG/L	10 U
Dibenz(a,h)anthracene	UG/L	10 U
Benzo(g,h,i)perylene	UG/L	10 U

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
PEST		
alpha-BHC	UG/L	0.050 U
beta-BHC	UG/L	0.050 U
delta-BHC	UG/L	0.050 U
gamma-BHC (Lindane)	UG/L	0.050 U
Heptachlor	UG/L	0.050 U
Aldrin	UG/L	0.050 U
Heptachlor epoxide	UG/L	0.050 U
Endosulfan I	UG/L	0.050 U
Dieldrin	UG/L	0.10 U
4,4'-DDE	UG/L	0.10 U
Endrin	UG/L	0.10 U
Endosulfan II	UG/L	0.10 U
4,4'-DDD	UG/L	0.10 U
Endosulfan sulfate	UG/L	0.10 U
4,4'-DDT	UG/L	0.10 U
Methoxychlor	UG/L	0.50 UJ
Endrin ketone	UG/L	0.10 U
Endrin aldehyde	UG/L	0.10 U
alpha-Chlordane	UG/L	0.050 U
gamma-Chlordane	UG/L	0.050 U
Toxaphene	UG/L	1.0 U
Aroclor 1016	UG/L	1.0 U
Aroclor 1221	UG/L	2.0 U
Aroclor 1232	UG/L	1.0 U
Aroclor 1242	UG/L	1.0 U
Aroclor 1248	UG/L	1.0 U
Aroclor 1254	UG/L	1.0 U
Aroclor 1260	UG/L	1.0 U

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
Metals		
Aluminum	UG/L	13.0 U
Antimony	UG/L	8.0 U
Arsenic	UG/L	3.0 U
Barium	UG/L	1.0 U
Beryllium	UG/L	1.0 U
Cadmium	UG/L	1.0 U
Calcium	UG/L	32.6
Chromium	UG/L	1.0 U
Cobalt	UG/L	2.0 U
Copper	UG/L	1.0 U
Iron	UG/L	25.0
Lead	UG/L	2.0 U
Magnesium	UG/L	8.0 U
Manganese	UG/L	4.0 U
Mercury	UG/L	0.20 U
Nickel	UG/L	2.0 U
Potassium	UG/L	43.8
Selenium	UG/L	4.0 U
Silver	UG/L	1.0 U
Sodium	UG/L	148
Thallium	UG/L	5.0 UJ
Vanadium	UG/L	1.0 U
Zinc	UG/L	1.0 U

TABLE 1
PLATTSBURGH AFB
EOD RANGE
FIELD QC SAMPLE RESULTS

Location I.D.		FIELDQC
Sample I.D.		EBEOD01
Matrix		Water
Date Sampled		12/11/97
Parameter	Units	Equipment Rinse Blank
MISC		
Cyanide	MG/L	0.010 U

APPENDIX C3

1999 DATA

DATA ASSESSMENT SUMMARY
PAFB SS-026 (EOD RANGE)

Twelve soil samples, two field duplicates and one rinse blank were collected at the Plattsburgh Air Force Base (PAFB) Explosive Ordnance Demolition (EOD) Range on September 1, 1999. Three soils and one field duplicate, two groundwater seep and one field duplicate, one equipment blank and one trip blank were collected at the EOD Range on September 15, 1999. Two soils were collected at the EOD Range on September 20, 1999. Six groundwater samples, one field duplicate and one trip blank were collected at the EOD Range on October 6, 1999. The samples were analyzed in accordance with New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP), October 1995, for the following parameters:

- Target Compound List (TCL) Volatile Organic Compounds (VOC) or Chloroform only by ASP 95-1;
- TCL Semivolatile Organic Compounds (SVOC) by ASP 95-2;
- TCL Polychlorinated Biphenyls (PCBs) by ASP 95-3;
- Target Analyte List (TAL) Metals (23) or Arsenic only by ASP CLP-M;
- Polychlorinated Dibenzo-p-dioxins/Polychlorinated Dibenzofurans (PCDDs/PCDFs) by SW8290;
- Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) by SW8330; and
- Chloroacetophenone (CN) and Chlorobenzylidinemalonitrile (CS) by SW8270C.

Samples were also analyzed in accordance with United States Toxic and Hazardous Materials Agency (USATHAMA) for the following parameter:

- Thiodyglycol (TD) by LW18

Not all samples were analyzed for all parameters. A listing of the samples collected and analytical parameters requested is provided in Table 1. The validated analytical results on a per matrix basis can be found in Table 2.

Analyses were performed by Buck Environmental Laboratories, Inc. (Cortland, NY), except for PCDDs/PCDFs which were analyzed by Pace Analytical Services, Inc. (Minneapolis, MN), and RDX, CN, CS and TD which were analyzed by GPL Laboratories, LLLP (Gaithersburg, MD).

The data were reviewed/validated for compliance with the methods referenced above and the following United States Environmental Protection Agency (USEPA) Region II data validation guidelines:

- Contract Laboratory Program (CLP) Organic Data Review, SOP No. HW-6, Rev. 11, June 1996;

- Evaluation of Metals Data for the CLP, SOP No. HW-2, Rev. XI, January 1992;

- Data Validation SOP for SW-846 Method 8330, Nitroaromatics and Nitroamines by High Performance Liquid Chromatography (HPLC), SOP No. HW-16, Rev. 1, April 1994; and

- Data Validation SOP for SW-846 Method 8290, PCDDs and PCDFs by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), SOP No. HW-19, Rev. 1, October 1994.

Qualifications applied to the sample results include "R" (rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria), "U" (undetected), "J"/"UJ" [estimated value due to quality control (QC) outliers or concentration below the quantitation limit (organic)] and "B" [concentration below the quantitation limit (metals)]. Summarized below are the analytical deviations encountered during the data validation and explanations for the qualification of data.

General

Two of the four coolers containing groundwater seep and surface soil samples received at the laboratory on 09/16/99 were above the 4° C ± 2° C criteria, at 6.5° C and 6.8° C. The data was not qualified because the temperatures were below 10°C, in accordance with Region II validation guidelines.

All analytical results for sample SS-026-SF-6 was qualified "J" (estimated) or "UJ" (estimated quantitation limit) because the moisture content of the sample was greater than 50%.

TCL VOC/Chloroform Data

Samples MW-24-001, MW-26-001, MW-26-002, MW-26-003, MW-26-004, MW-26-005, MW-26-005 DUP and TB100699 for TCL volatiles were analyzed 2 days outside the NYSDEC ASP contractual holding time of 10 days from the validated time of sample receipt (VTSR). No qualification was required because the samples were properly preserved with hydrochloric acid (HCl) to a pH<2 and analyzed within USEPA Region II validation guidelines technical holding time of 14 days from sample collection.

Acetone was qualified "J" (estimated) or "UJ" (estimated quantitation limit) in all surface soil and groundwater samples and trip blank TB100699 because the initial calibration (ICAL) criteria of 30 percent relative standard deviation (%RSD) or the continuing calibration (CCAL) criteria of 25 percent difference (%D) was exceeded. It should be noted the ICAL(s) and CCAL(s) were in compliance with method requirements.

Methylene chloride, acetone, chloroform, 4-methyl-2-pentanone, and toluene were detected in method blanks. Methylene chloride, 1,2-dichloroethene and toluene were detected in the equipment blank. The following compounds detected in the associated samples were qualified: acetone was qualified "U" (not detected) at the quantified concentration for samples SS-026-SF-1, SS-026-SF-2, SS-026-SF-4, SS-026-SF-4 DUP, SS-026-SF-5 and SS-026-SF-6; methylene chloride was qualified "U" at the quantitation limit in SS-026-SF-4 and SS-026-SF-6; and toluene was qualified "U" at the quantitation limit in SS-026-SF-6. The concentrations detected in the

samples were less than five times (ten times for the common laboratory contaminant acetone and methylene chloride) the adjusted value in the associated blank.

SVOC Data

I. TCL SVOA

The laboratory did not perform gel permeation chromatography (GPC) clean-up on the soil samples and associated QC samples as required by the method. The purpose of GPC is to remove high molecular weight compound interference. The laboratory's response was that the extracts were visually clean, all surrogate recoveries and chromatography were acceptable. The lack of performing the GPC clean-up procedure on the soil samples does not impact the data, therefore the data was not qualified.

Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were qualified "J" in SS-026-SF-2 because the %RSD exceeded the ICAL criteria of 30 %RSD. 2,2'-Oxybis(1-chloropropane), 4-chloroaniline, hexachlorobutadiene, hexachlorocyclopentadiene, 3-nitroaniline, 2,4-dinitrophenol, 4-nitrophenol, 4-nitroaniline, 4,6-dinitro-2-methylphenol, n-nitrosodiphenylamine, di-n-butylphthalate, butylbenzylphthalate, bis(2-ethylhexyl) phthalate and/or di-n-octylphthalate were qualified "UJ" in several samples because the %D exceeded the CCAL criteria of 25%. It should be noted the ICAL(s) and CCAL(s) were in compliance with method requirements.

II. CN and CS

All soil samples except SS-026-SF-6 were qualified as estimated (UJ), in accordance with Region II validation guidelines for semivolatiles, because the technical holding times for extraction were exceeded by 2 days. It should be noted all holding times were in compliance with method and contractual requirements. Equipment blank EB1-090199 was extracted 2 days outside the contractual holding time. No qualification was necessary because it was extracted within the technical holding time.

The matrix spike (MS), matrix spike duplicate (MSD) and laboratory control samples (LCS) did not include the target compounds CN and CS. The laboratory used the compounds listed for Method 8270C, which is based on the USEPA CLP TCL. All percent recoveries (%R) and relative percent differences (RPDs) were within laboratory control limits, except for a low %R of n-nitroso-di-n-propylamine in the MSD and pyrene in the LCS. No action is taken based on MS/MSD data alone. Region II validation guidelines does not evaluate LCS data for semivolatile data. In response to the data audit letter, the laboratory extracted and submitted LCS results for water and soil matrices spiked with CN and CS. The percent recoveries of CN and CS in the LCSs were within the method QC guidance limits of 70%-130 %R.

PCB Data

The laboratory did not perform a GPC clean-up on the soil sample extracts and associated QC samples or a florisil clean-up on all sample extracts and associated QC samples.

GPC clean-up is required by the method for soil matrices. Florisil clean-up is required by the method for all matrices. The data was not qualified because no PCBs were detected, the chromatography did not exhibit interference (i.e., stable baseline with few peaks) which could inhibit PCB detection or identification and all associated QC met acceptance criteria.

The laboratory added an improper spiking solution to the initial extraction of LS-26-SF-2 (water) and SS-026-SF-5 (soil) MS/MSD and the MSBs. The MSs and MSDs were re-extracted 13 days past the sample's holding time. In accordance with Region II validation guidelines, the MS/MSD sample results were qualified "J". No associated samples were qualified because the extractions were performed within technical and contractual holding times and the MS/MSD/MSB recoveries were within method QC limits except for endrin, which exhibited a high recovery in the water MSB (130 %R vs 121 %R upper control limit). MS/MSD/MSB data is used to evaluate method accuracy. Pesticides are not requested parameters but the method requires pesticide compounds in the spiking solution.

Thiodiglycol (TD) Data

The soil samples for TD were extracted outside the contractual holding time of 5 days from the VTSR. No qualification was required because the samples were extracted within the method holding time of 7 days from sample collection and technical holding time of 14 days from sample collection. It should be noted Region II does not have validation criteria for Method LW18 analysis. The TD data was reviewed for method compliance following the intent of Region II validation guidelines for HPLC analysis by Method SW8330.

Metals Data

Mercury was qualified "R" (rejected) in all groundwater seep, soil and equipment blank samples because of serious deficiencies in the data due to calibration non-conformances and systematic contamination.

Mercury was qualified "J" (estimated) in accordance with Region II validation guidelines for samples MW-26-005 and MW-26-005 DUP because the laboratory used 3 points instead of 5 in the initial calibration as required by the method, and the associated check standards were not within ±10% of the true value (acceptance criteria is ±20% of the true value when a 5 point calibration is performed). Also, the concentration of mercury in MW-26-005 was less than the concentration in the calibration blank which followed the samples.

Zinc was qualified "J" (estimated) in sample MW-26-005 and MW-26-005 DUP because the percent difference (%D) between the sample and serial dilution concentration is greater than 50 %D, suggesting matrix interference.

Antimony was qualified "J"/"UJ" in all soil samples because the MS recovery was less than 75% but greater than 10%. Manganese and silver were rejected in all soil samples because the MS recovery was less than 10%.

Arsenic was qualified "UJ" in samples SS-026-SF-4, SS-026-SF-4DUP, SS-026-SF-5 and SS-026-SF-6, selenium was qualified "J" in sample LS-26-SF-2 and thallium was qualified "J" in

samples LS-26-SF-1 and EB1-091599 because the associated contact required detection limit (CRDL) standard recovery was outside the 80% to 120% control limits.

Thallium was qualified "J"/"UJ" in all groundwater seep samples and equipment blank EB1-091599 because the RPD between the sample and matrix duplicate was greater than 50% and the difference between the sample and MD was greater than the CRDL.

In accordance with Region II validation guidelines, zinc was rejected in samples SS-026-SF-4, SS-026-SF-4DUP and SS-026-SF-5 and lead was rejected in samples SS-026-SF-4, SS-026-SF-4 DUP and SS-026-SF-5 because the adjusted concentration in the samples was less than five times the associated equipment blank concentration. All other metals in the equipment blank(s) were detected at concentrations less than the CRDL ("B" qualifier) or the adjusted concentration in the sample was greater than five times the equipment blank concentration.

PCDD/PCDF Data

The samples arrived at Pace Analytical Services, Inc. at 13° C, which is above the method requirement i.e., 4° C $\pm$ 2° C. Region II validation guidelines do not specifically address elevated cooler temperature issues for PCDDs/PCDFs. Since PCDDs/PCDFs are relatively stable in the environment, as evident from the extended contractual/technical extraction holding time (i.e., 30 days from sample collection), no data qualifiers were applied to the data.

The method blank associated with sample SB-26-05-01 exhibited contamination for 1,2,3,4,6,7,8-HpCDD, total HpCDD, OCDF and OCDD. The 1,2,3,4,6,7,8-HpCDD, total HpCDD and OCDD results for sample SB-26-05-01 were qualified "B" by the laboratory, but the sample levels were greater than 5 times the method blank concentration and should be considered real values. However, the OCDF result was qualified "U", per Region II validation guidelines, since its value was less than 5 times the method blank concentration.

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TABLE 1
SAMPLE ANALYTICAL SUMMARY
PAFB SS-026 (EOD RANGE)

Sample ID	Sample Date	Sample Type	Analytical Parameter	Notes
EB1-090199	09/01/99	Rinse Blank	CN, CS, TD, Dioxins/Furans	
SB-026-04-01	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SB-026-04-02	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SB-026-05-01	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SB-026-05-01 DUP	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SB-026-05-02	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SB-026-06-01	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	Plus MS/MSD
SB-026-06-02	09/01/99	Soil Boring	CN,CS, Dioxins/Furans	-
SS-026-CAS-1	09/01/99	Soil Boring	Chloroform, Arsenic, TD	-
SS-026-CAS-2	09/01/99	Soil Boring	Chloroform, Arsenic, TD	-
SS-026-CAS-3	09/01/99	Soil Boring	Chloroform, Arsenic, TD, CN, CS	-
SS-026-CAS-4	09/01/99	Soil Boring	Chloroform, Arsenic, TD	-
SS-026-CAS-5	09/01/99	Surface Soil	Chloroform, Arsenic, TD	-
SS-026-CAS-5 DUP	09/01/99	Surface Soil	Chloroform, Arsenic, TD	Field Replicate
SS-026-CAS-6	09/01/99	Surface Soil	Chloroform, Arsenic, TD	Plus MS/MSD
EB1-091599	09/15/99	Rinse Blank	VOA, SVOA, PCBs, Metals	-
LS-026-SF-1	09/15/99	Groundwater Seep	VOA, SVOA, PCBs, Metals, RDX	-
LS-026-SF-1 DUP	09/15/99	Groundwater Seep	VOA, SVOA, PCBs, Metals, RDX	Field Replicate
LS-026-SF-2	09/15/99	Groundwater Seep	VOA, SVOA, PCBs, Metals, RDX	Plus MS/MSD
SS-026-SF-4	09/15/99	Surface Soil	VOA, SVOA, PCBs, Metals	-
SS-026-SF-4 DUP	09/15/99	Surface Soil	VOA, SVOA, PCBs, Metals	Field Replicate
SS-026-SF-5	09/15/99	Surface Soil	VOA, SVOA, PCBs, Metals	Plus MS/MSD
SS-026-SF-6	09/15/99	Surface Soil	VOA, SVOA, PCBs, Metals, CN, CS	-
TB1-091599	09/15/99	Trip Blank	VOA	-
SS-026-SF-1	09/20/99	Surface Soil	VOA, SVOA, PCBs, Metals	-
SS-026-SF-2	09/20/99	Surface Soil	VOA, SVOA, PCBs, Metals	-
MW-024-001	10/06/99	Groundwater	VOA, RDX	-
MW-026-001	10/06/99	Groundwater	VOA, RDX	-
MW-026-002	10/06/99	Groundwater	VOA, RDX	-
MW-026-003	10/06/99	Groundwater	VOA, RDX	-
MW-026-004	10/06/99	Groundwater	VOA, RDX	-
MW-026-005	10/06/99	Groundwater	VOA, SVOA, PCBs, Metals, RDX	Plus MS/MSD
MW-026-005 DUP	10/06/99	Groundwater	VOA, SVOA, PCBs, Metals, RDX	Field Replicate
TB100699	10/06/99	Trip Blank	VOA	-

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Volatile Organic Compounds						
Chloromethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Bromomethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Vinyl Chloride	UG/KG	12 U	12 U	16 U	17 U	16 U
Chloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Methylene Chloride	UG/KG	12 U	12 U	16 U	54	16 U
Acetone	UG/KG	18 UJ	17 UJ	54 UJ	34 UJ	58 UJ
Carbon Disulfide	UG/KG	12 U	12 U	16 U	17 U	16 U
1,1-Dichloroethene	UG/KG	12 U	12 U	16 U	17 U	16 U
1,1-Dichloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
1,2-Dichloroethene (total)	UG/KG	12 U	12 U	16 U	17 U	16 U
Chloroform	UG/KG	12 U	12 U	16 U	17 U	16 U
1,2-Dichloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Methyl Ethyl Ketone (2-Butanone)	UG/KG	12 U	12 U	16 U	17 U	16 U
1,1,1-Trichloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Carbon Tetrachloride	UG/KG	12 U	12 U	16 U	17 U	16 U
Bromodichloromethane	UG/KG	12 U	12 U	16 U	17 U	16 U
1,2-Dichloropropane	UG/KG	12 U	12 U	16 U	17 U	16 U
cis-1,3-Dichloropropene	UG/KG	12 U	12 U	16 U	17 U	16 U
Trichloroethene	UG/KG	12 U	12 U	16 U	17 U	16 U
Dibromochloromethane	UG/KG	12 U	12 U	16 U	17 U	16 U
1,1,2-Trichloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Benzene	UG/KG	12 U	12 U	16 U	17 U	16 U
trans-1,3-Dichloropropene	UG/KG	12 U	12 U	16 U	17 U	16 U
Bromoform	UG/KG	12 U	12 U	16 U	17 U	16 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Volatile Organic Compounds						
4-Methyl-2-pentanone	UG/KG	12 U	12 U	16 U	17 U	16 U
2-Hexanone	UG/KG	12 U	12 U	16 U	17 U	16 U
Tetrachloroethene	UG/KG	12 U	12 U	16 U	17 U	16 U
Toluene	UG/KG	12 U	12 U	16 U	17	16 U
1,1,2,2-Tetrachloroethane	UG/KG	12 U	12 U	16 U	17 U	16 U
Chlorobenzene	UG/KG	12 U	12 U	16 U	17 U	16 U
Ethylbenzene	UG/KG	12 U	12 U	16 U	17 U	16 U
Styrene	UG/KG	12 U	12 U	16 U	17 U	16 U
Xylene (total)	UG/KG	12 U	12 U	16 U	17 U	16 U
Semivolatile Organic Compounds						
Phenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
bis(2-Chloroethyl)ether	UG/KG	3840 U	390 U	532 U	532 U	584 U
2-Chlorophenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
1,3-Dichlorobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
1,4-Dichlorobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
1,2-Dichlorobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
2-Methylphenol (o-cresol)	UG/KG	3840 U	390 U	532 U	532 U	584 U
2,2'-Oxybis(1-chloro)propane	UG/KG	3840 U	390 U	532 UJ	532 UJ	584 UJ
4-Methylphenol (p-cresol)	UG/KG	814 J	390 U	532 U	532 U	584 U
N-Nitroso-di-n-propylamine	UG/KG	3840 U	390 U	532 U	532 U	584 U
Hexachloroethane	UG/KG	3840 U	390 U	532 U	532 U	584 U
Nitrobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
Isophorone	UG/KG	3840 U	390 U	532 U	532 U	584 U
2-Nitrophenol	UG/KG	3840 U	390 U	532 U	532 U	584 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Semivolatile Organic Compounds						
2,4-Dimethylphenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
bis(2-Chloroethoxy)methane	UG/KG	3840 U	390 U	532 U	532 U	584 U
2,4-Dichlorophenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
1,2,4-Trichlorobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
Naphthalene	UG/KG	18100	390 U	532 U	532 U	584 U
4-Chloroaniline	UG/KG	3840 U	390 U	532 UJ	532 UJ	584 UJ
Hexachlorobutadiene	UG/KG	3840 U	390 U	532 U	532 U	584 U
4-Chloro-3-methylphenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
2-Methylnaphthalene	UG/KG	12900	390 U	532 U	532 U	584 U
Hexachlorocyclopentadiene	UG/KG	3840 U	390 UJ	532 UJ	532 UJ	584 UJ
2,4,6-Trichlorophenol	UG/KG	3840 U	390 U	532 U	532 U	584 U
2,4,5-Trichlorophenol	UG/KG	9610 U	976 U	1330 U	1330 U	1460 U
2-Chloronaphthalene	UG/KG	3840 U	390 U	532 U	532 U	584 U
2-Nitroaniline	UG/KG	9610 U	976 U	1330 U	1330 U	1460 U
Dimethylphthalate	UG/KG	3840 U	390 U	532 U	532 U	584 U
Acenaphthylene	UG/KG	3840 U	390 U	532 U	532 U	584 U
2,6-Dinitrotoluene	UG/KG	3840 U	390 U	532 U	532 U	584 U
3-Nitroaniline	UG/KG	9610 U	976 U	1330 UJ	1330 UJ	1460 UJ
Acenaphthene	UG/KG	20600	390 U	532 U	532 U	584 U
2,4-Dinitrophenol	UG/KG	9610 U	976 UJ	1330 U	1330 U	1460 U
4-Nitrophenol	UG/KG	9610 U	976 U	1330 UJ	1330 UJ	1460 UJ
Dibenzofuran	UG/KG	13800	390 U	532 U	532 U	584 U
2,4-Dinitrotoluene	UG/KG	3840 U	390 U	532 U	532 U	584 U
Diethylphthalate	UG/KG	3840 U	390 U	532 U	532 U	584 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Semivolatile Organic Compounds						
4-Chlorophenyl-phenylether	UG/KG	3840 U	390 U	532 U	532 U	584 U
Fluorene	UG/KG	21600	390 U	532 U	532 U	584 U
4-Nitroaniline	UG/KG	9610 U	976 U	1330 UJ	1330 UJ	1460 UJ
4,6-Dinitro-2-methylphenol	UG/KG	9610 U	976 UJ	1330 UJ	1330 UJ	1460 UJ
N-Nitrosodiphenylamine	UG/KG	3840 U	390 U	532 UJ	532 UJ	584 UJ
4-Bromophenyl-phenylether	UG/KG	3840 U	390 U	532 U	532 U	584 U
Hexachlorobenzene	UG/KG	3840 U	390 U	532 U	532 U	584 U
Pentachlorophenol	UG/KG	9610 U	976 U	1330 U	1330 U	1460 U
Phenanthrene	UG/KG	72000 D	390 U	532 U	532 U	584 U
Anthracene	UG/KG	3840 U	390 U	532 U	532 U	584 U
Carbazole	UG/KG	19200	390 U	532 U	532 U	584 U
Di-n-butylphthalate	UG/KG	3840 U	352 J	532 U	532 U	584 U
Fluoranthene	UG/KG	57500 D	78 J	532 U	532 U	584 U
Pyrene	UG/KG	58600 D	82 J	532 U	532 U	584 U
Butylbenzylphthalate	UG/KG	3840 U	390 U	532 U	532 U	584 U
3,3'-Dichlorobenzidine	UG/KG	3840 U	390 U	532 U	532 U	584 U
Benzo(a)anthracene	UG/KG	57700 D	390 U	532 U	532 U	584 U
Chrysene	UG/KG	26100	390 U	532 U	532 U	584 U
bis(2-Ethylhexyl)phthalate	UG/KG	3840 U	679 J	532 U	532 U	584 U
Di-n-octylphthalate	UG/KG	3840 U	390 UJ	532 UJ	532 UJ	584 UJ
Benzo(b)fluoranthene	UG/KG	14700	390 U	532 U	532 U	584 U
Benzo(k)fluoranthene	UG/KG	12400	390 U	532 U	532 U	584 U
Benzo(a)pyrene	UG/KG	17900	390 U	532 U	213 J	584 U
Indeno(1,2,3-cd)pyrene	UG/KG	14700	390 U	532 U	532 U	584 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Semivolatile Organic Compounds						
Dibenz(a,h)anthracene	UG/KG	8840	390 U	532 U	532 U	584 U
Benzo(g,h,i)perylene	UG/KG	15600	390 U	532 U	532 U	584 U
Metallic Species						
Aluminum	MG/KG	3390	3140	3350	3090	2990
Antimony	MG/KG	2.7 BJ	1.4 BJ	2.9 BJ	3.2 BJ	7.2 BJ
Arsenic	MG/KG	0.58 U	0.57 U	0.72 UJ	0.66 UJ	0.78 UJ
Barium	MG/KG	15.5 B	15.4 B	26.2 B	25.3 B	22.9 B
Beryllium	MG/KG	0.21 B	0.13 B	0.17 B	0.17 B	0.23 B
Cadmium	MG/KG	0.12 U	0.11 U	0.14 U	0.13 U	0.03 B
Calcium	MG/KG	3150	2070	2290	2430	5080
Chromium	MG/KG	6.3	10	5	4.4	5.3
Cobalt	MG/KG	1.3 B	1.2 B	1.1 B	0.96 B	1.3 B
Copper	MG/KG	5.8	52.8	2 B	2.3 B	3.8 B
Iron	MG/KG	11200	7970	4650	4410	5260
Lead	MG/KG	16.6	65.3	3.1 R	3.4 R	5.3 R
Magnesium	MG/KG	789	424	720	731	1540
Manganese	MG/KG	102 R	86.2 R	83.1 R	72 R	181 R
Mercury	MG/KG	0.11 R	0.03 R	0.1 R	0.07 R	0.16 R
Nickel	MG/KG	3.2 B	2.5 B	2.9 B	2.6 B	2.6 B
Potassium	MG/KG	234 B	152 B	261 B	218 B	333 B
Selenium	MG/KG	7.6	5.7	4.5	3.7	4.5
Silver	MG/KG	0.35 UR	0.34 UR	0.44 UR	0.40 UR	0.47 UR
Sodium	MG/KG	15.5 U	15.3 U	19.4 U	17.8 U	20.9 U
Thallium	MG/KG	0.70 U	0.68 U	0.87 U	0.80 U	0.09 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4	SS-026-SF-4	SS-026-SF-5
Sample ID		SS-026-SF-1	SS-026-SF-2	SS-026-SF-4DUP	SS-026-SF-4	SS-026-SF-5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled		09/20/99	09/20/99	09/15/99	09/15/99	09/15/99
Parameter	Units			Field Replicate (1)		
Metallic Species						
Vanadium	MG/KG	21	11	7.2 B	6.7	9.1
Zinc	MG/KG	27.3	153	8.7 R	10.7 R	15.3 R
Polychlorinated Biphenyls						
Aroclor 1016	UG/KG	38 U	38 U	54 U	47 U	61 U
Aroclor 1221	UG/KG	78 U	77 U	110 U	96 U	120 U
Aroclor 1232	UG/KG	38 U	38 U	54 U	47 U	61 U
Aroclor 1242	UG/KG	38 U	38 U	54 U	47 U	61 U
Aroclor 1248	UG/KG	38 U	38 U	54 U	47 U	61 U
Aroclor 1254	UG/KG	38 U	38 U	54 U	47 U	61 U
Aroclor 1260	UG/KG	38 U	38 U	54 U	47 U	61 U
Miscellaneous Assays						
2-Chloroacetophenone	UG/KG	NA	NA	NA	NA	NA
2-Chlorobenzylidenemalononitrile	UG/KG	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Volatile Organic Compounds		
Chloromethane	UG/KG	23 UJ
Bromomethane	UG/KG	23 UJ
Vinyl Chloride	UG/KG	23 UJ
Chloroethane	UG/KG	23 UJ
Methylene Chloride	UG/KG	23 UJ
Acetone	UG/KG	59 UJ
Carbon Disulfide	UG/KG	23 UJ
1,1-Dichloroethene	UG/KG	23 UJ
1,1-Dichloroethane	UG/KG	23 UJ
1,2-Dichloroethene (total)	UG/KG	23 UJ
Chloroform	UG/KG	23 UJ
1,2-Dichloroethane	UG/KG	23 UJ
Methyl Ethyl Ketone (2-Butanone)	UG/KG	23 UJ
1,1,1-Trichloroethane	UG/KG	23 UJ
Carbon Tetrachloride	UG/KG	23 UJ
Bromodichloromethane	UG/KG	23 UJ
1,2-Dichloropropane	UG/KG	23 UJ
cis-1,3-Dichloropropene	UG/KG	23 UJ
Trichloroethene	UG/KG	23 UJ
Dibromochloromethane	UG/KG	23 UJ
1,1,2-Trichloroethane	UG/KG	23 UJ
Benzene	UG/KG	23 UJ
trans-1,3-Dichloropropene	UG/KG	23 UJ
Bromoform	UG/KG	23 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Volatile Organic Compounds		
4-Methyl-2-pentanone	UG/KG	23 UJ
2-Hexanone	UG/KG	23 UJ
Tetrachloroethene	UG/KG	23 UJ
Toluene	UG/KG	23 UJ
1,1,2,2-Tetrachloroethane	UG/KG	23 UJ
Chlorobenzene	UG/KG	23 UJ
Ethylbenzene	UG/KG	23 UJ
Styrene	UG/KG	23 UJ
Xylene (total)	UG/KG	23 UJ
Semivolatile Organic Compounds		
Phenol	UG/KG	758 UJ
bis(2-Chloroethyl)ether	UG/KG	758 UJ
2-Chlorophenol	UG/KG	758 UJ
1,3-Dichlorobenzene	UG/KG	758 UJ
1,4-Dichlorobenzene	UG/KG	758 UJ
1,2-Dichlorobenzene	UG/KG	758 UJ
2-Methylphenol (o-cresol)	UG/KG	758 UJ
2,2'-Oxybis(1-chloro)propane	UG/KG	758 UJ
4-Methylphenol (p-cresol)	UG/KG	758 UJ
N-Nitroso-di-n-propylamine	UG/KG	758 UJ
Hexachloroethane	UG/KG	758 UJ
Nitrobenzene	UG/KG	758 UJ
Isophorone	UG/KG	758 UJ
2-Nitrophenol	UG/KG	758 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Semivolatile Organic Compounds		
2,4-Dimethylphenol	UG/KG	758 UJ
bis(2-Chloroethoxy)methane	UG/KG	758 UJ
2,4-Dichlorophenol	UG/KG	758 UJ
1,2,4-Trichlorobenzene	UG/KG	758 UJ
Naphthalene	UG/KG	758 UJ
4-Chloroaniline	UG/KG	758 UJ
Hexachlorobutadiene	UG/KG	758 UJ
4-Chloro-3-methylphenol	UG/KG	758 UJ
2-Methylnaphthalene	UG/KG	758 UJ
Hexachlorocyclopentadiene	UG/KG	758 UJ
2,4,6-Trichlorophenol	UG/KG	758 UJ
2,4,5-Trichlorophenol	UG/KG	1890 UJ
2-Chloronaphthalene	UG/KG	758 UJ
2-Nitroaniline	UG/KG	1890 UJ
Dimethylphthalate	UG/KG	758 UJ
Acenaphthylene	UG/KG	758 UJ
2,6-Dinitrotoluene	UG/KG	758 UJ
3-Nitroaniline	UG/KG	1890 UJ
Acenaphthene	UG/KG	758 UJ
2,4-Dinitrophenol	UG/KG	1890 UJ
4-Nitrophenol	UG/KG	1890 UJ
Dibenzofuran	UG/KG	758 UJ
2,4-Dinitrotoluene	UG/KG	758 UJ
Diethylphthalate	UG/KG	758 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Semivolatile Organic Compounds		
4-Chlorophenyl-phenylether	UG/KG	758 UJ
Fluorene	UG/KG	758 UJ
4-Nitroaniline	UG/KG	1890 UJ
4,6-Dinitro-2-methylphenol	UG/KG	1890 UJ
N-Nitrosodiphenylamine	UG/KG	758 UJ
4-Bromophenyl-phenylether	UG/KG	758 UJ
Hexachlorobenzene	UG/KG	758 UJ
Pentachlorophenol	UG/KG	1890 UJ
Phenanthrene	UG/KG	758 UJ
Anthracene	UG/KG	758 UJ
Carbazole	UG/KG	758 UJ
Di-n-butylphthalate	UG/KG	758 UJ
Fluoranthene	UG/KG	758 UJ
Pyrene	UG/KG	758 UJ
Butylbenzylphthalate	UG/KG	758 UJ
3,3'-Dichlorobenzidine	UG/KG	758 UJ
Benzo(a)anthracene	UG/KG	758 UJ
Chrysene	UG/KG	758 UJ
bis(2-Ethylhexyl)phthalate	UG/KG	758 UJ
Di-n-octylphthalate	UG/KG	758 UJ
Benzo(b)fluoranthene	UG/KG	758 UJ
Benzo(k)fluoranthene	UG/KG	758 UJ
Benzo(a)pyrene	UG/KG	758 UJ
Indeno(1,2,3-cd)pyrene	UG/KG	758 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Semivolatile Organic Compounds		
Dibenz(a,h)anthracene	UG/KG	758 UJ
Benzo(g,h,i)perylene	UG/KG	758 UJ
Metallic Species		
Aluminum	MG/KG	2180 J
Antimony	MG/KG	5.1 BJ
Arsenic	MG/KG	1.0 UJ
Barium	MG/KG	18.4 BJ
Beryllium	MG/KG	0.20 UJ
Cadmium	MG/KG	0.20 UJ
Calcium	MG/KG	5760 J
Chromium	MG/KG	5.2 J
Cobalt	MG/KG	0.9 BJ
Copper	MG/KG	16.8 J
Iron	MG/KG	4820 J
Lead	MG/KG	12.8 J
Magnesium	MG/KG	596 J
Manganese	MG/KG	93.7 R
Mercury	MG/KG	0.14 R
Nickel	MG/KG	7 BJ
Potassium	MG/KG	216 BJ
Selenium	MG/KG	4.7 J
Silver	MG/KG	0.61 UR
Sodium	MG/KG	27.1 UJ
Thallium	MG/KG	1.2 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-SF-6
Sample ID		SS-026-SF-6
Matrix		Soil
Depth Interval (ft.)		0.0-0.5
Date Sampled		09/15/99
Parameter	**Units**	
Metallic Species		
Vanadium	MG/KG	8.3 BJ
Zinc	MG/KG	56.1 J
Polychlorinated Biphenyls		
Aroclor 1016	UG/KG	75 UJ
Aroclor 1221	UG/KG	150 UJ
Aroclor 1232	UG/KG	75 UJ
Aroclor 1242	UG/KG	75 UJ
Aroclor 1248	UG/KG	75 UJ
Aroclor 1254	UG/KG	75 UJ
Aroclor 1260	UG/KG	75 UJ
Miscellaneous Assays		
2-Chloroacetophenone	UG/KG	1400 UJ
2-Chlorobenzylidenemalononitrile	UG/KG	1400 UJ

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-CAS-1	SS-026-CAS-2	SS-026-CAS-3	SS-026-CAS-4	SS-026-CAS-5
Sample ID		SS-026-CAS-1	SS-026-CAS-2	SS-026-CAS-3	SS-026-CAS-4	SS-026-CAS-5DUP
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0	5.0-7.0	8.0-9.0	0.0-1.0
Date Sampled		09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Parameter	Units					Field Replicate (1)
Volatile Organic Compounds						
Chloroform	UG/KG	12 U	13 U	11 U	11 U	NA
Metallic Species						
Arsenic	MG/KG	1.4 B	0.49 U	0.48 U	0.49 U	NA
Miscellaneous Assays						
2-Chloroacetophenone	UG/KG	NA	NA	690 UJ	NA	NA
2-Chlorobenzylidenemalononitrile	UG/KG	NA	NA	690 UJ	NA	NA
Thiodiglycol	UG/KG	502 U	511 U	516 U	611 U	510 U

Flags assigned during chemistry validation are shown.

TABLE 2
SURFACE SOIL SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SS-026-CAS-5	SS-026-CAS-6
Sample ID		SS-026-CAS-5	SS-026-CAS-6
Matrix		Soil	Soil
Depth Interval (ft.)		0.0-1.0	0.0-1.0
Date Sampled		09/01/99	09/01/99
Parameter	**Units**		
Volatile Organic Compounds			
Chloroform	UG/KG	10 U	12 U
Metallic Species			
Arsenic	MG/KG	0.50 U	0.48 U
Miscellaneous Assays			
2-Chloroacetophenone	UG/KG	NA	NA
2-Chlorobenzylidenemalononitrile	UG/KG	NA	NA
Thiodiglycol	UG/KG	501 U	508 U

Flags assigned during chemistry validation are shown.

TABLE 2
SOIL BORING SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SB-26-01	SB-26-01	SB-26-02	SB-26-02	SB-26-03
Sample ID		SB-26-04-01	SB-26-04-02	SB-26-06-01	SB-26-06-02	SB-26-05-01DUP
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0	0.0-2.0	2.0-4.0	0.0-2.0
Date Sampled		09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Parameter	Units					Field Replicate (1)
Miscellaneous Assays						
2-Chloroacetophenone	UG/KG	690 UJ	710 UJ	690 UJ	720 UJ	840 UJ
2-Chlorobenzylidenemalononitrile	UG/KG	690 UJ	710 UJ	690 UJ	720 UJ	840 UJ
Dioxins & Furans						
2,3,7,8-TCDD	NG/KG	0.81 U	0.99 U	1.60 U	1.20 U	0.62 U
2,3,7,8-TCDF	NG/KG	0.69 U	0.82 U	1.50 U	1.20 U	0.48 U
1,2,3,7,8-PeCDD	NG/KG	0.62 U	1.10 U	1.70 U	1.90 U	1.40 U
1,2,3,7,8-PeCDF	NG/KG	0.48 U	1.10 U	2.00 U	1.30 U	0.79 U
2,3,4,7,8-PeCDF	NG/KG	0.53 U	0.92 U	1.20 U	1.40 U	0.75 U
1,2,3,4,7,8-HxCDD	NG/KG	1.10 U	1.30 U	1.90 U	1.90 U	0.87 U
1,2,3,6,7,8-HxCDD	NG/KG	0.78 U	1.20 U	1.30 U	1.10 U	0.72 U
1,2,3,7,8,9-HxCDD	NG/KG	1.00 U	0.87 U	1.50 U	1.00 U	0.69 U
1,2,3,4,7,8-HxCDF	NG/KG	0.58 U	0.78 U	1.50 U	1.10 U	0.70 U
1,2,3,6,7,8-HxCDF	NG/KG	0.73 U	0.86 U	1.10 U	1.00 U	0.39 U
1,2,3,7,8,9-HxCDF	NG/KG	0.69 U	0.77 U	3.10 U	1.40 U	0.73 U
2,3,4,6,7,8-HxCDF	NG/KG	0.59 U	0.71 U	2.80 U	1.50 U	0.57 U
1,2,3,4,6,7,8-HpCDD	NG/KG	1.8 J	1.9 J	2.70 J	7.10	4.20 J
1,2,3,4,6,7,8-HpCDF	NG/KG	0.42 U	0.80 U	2.40 U	1.20 U	0.95 J
1,2,3,4,7,8,9-HpCDF	NG/KG	0.69 U	0.89 U	1.90 U	1.10 U	0.68 U
OCDD	NG/KG	13.00	12.00	17.00	72.00	32.00
OCDF	NG/KG	1.50 U	1.00 U	2.10 U	6.50 J	1.80 J
Total TCDD	NG/KG	0.81 U	0.99 U	1.60 U	1.20 U	0.62 U
Total TCDF	NG/KG	0.69 U	0.82 U	1.50 U	1.20 U	0.48 U
Total PeCDD	NG/KG	0.62 U	1.10 U	1.70 U	1.90 U	1.40 U
Total PeCDF	NG/KG	0.50 U	1.00 U	1.60 U	1.40 U	0.77 U

Flags assigned during chemistry validation are shown.

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WHERE ((([tblRES].[LOCID] = "SB-26-01") OR ([tblRES].[LOCID] = "SB-26-02") OR ([tblRES].[LOCID] = "SB-26-03")) AND ((([tblRES].[LOGDATE]) Between #8/1/1999 And #10/30/1999#)))

TABLE 2
SOIL BORING SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SB-26-01	SB-26-01	SB-26-02	SB-26-02	SB-26-03
Sample ID		SB-26-04-01	SB-26-04-02	SB-26-06-01	SB-26-06-02	SB-26-05-01DUP
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0	0.0-2.0	2.0-4.0	0.0-2.0
Date Sampled		09/01/99	09/01/99	09/01/99	09/01/99	09/01/99
Parameter	Units					Field Replicate (1)
Dioxins & Furans						
Total HxCDD	NG/KG	0.96 U	1.10 U	1.60 U	2.50 J	0.76 U
Total HxCDF	NG/KG	0.60 J	0.78 U	2.10 U	2.60 J	0.60 U
Total HpCDD	NG/KG	3.30 J	3.50 J	5.70	16.00	8.10
Total HpCDF	NG/KG	0.97 J	0.84 U	2.20 U	1.00 U	2.00 J
Toxicity Equivalence	NG/KG	0.0310	0.0310	0.0439	0.1495	0.086

Flags assigned during chemistry validation are shown.

TABLE 2
SOIL BORING SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SB-26-03	SB-26-03
Sample ID		SB-26-05-01	SB-26-05-02
Matrix		Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0
Date Sampled		09/01/99	09/01/99
Parameter	Units		
Miscellaneous Assays			
2-Chloroacetophenone	UG/KG	840 UJ	830 UJ
2-Chlorobenzylidenemalononitrile	UG/KG	840 UJ	830 UJ
Dioxins & Furans			
2,3,7,8-TCDD	NG/KG	0.50 U	0.98 U
2,3,7,8-TCDF	NG/KG	0.52 U	0.49 U
1,2,3,7,8-PeCDD	NG/KG	0.80 U	1.20 U
1,2,3,7,8-PeCDF	NG/KG	1.90 U	0.65 U
2,3,4,7,8-PeCDF	NG/KG	2.00 U	0.68 U
1,2,3,4,7,8-HxCDD	NG/KG	1.40 U	0.83 U
1,2,3,6,7,8-HxCDD	NG/KG	0.97 U	0.82 U
1,2,3,7,8,9-HxCDD	NG/KG	0.89 U	0.73 U
1,2,3,4,7,8-HxCDF	NG/KG	0.97 U	0.47 U
1,2,3,6,7,8-HxCDF	NG/KG	0.66 U	0.55 U
1,2,3,7,8,9-HxCDF	NG/KG	0.61 U	0.43 U
2,3,4,6,7,8-HxCDF	NG/KG	1.20 U	0.63 U
1,2,3,4,6,7,8-HpCDD	NG/KG	3.8 B	0.81 U
1,2,3,4,6,7,8-HpCDF	NG/KG	0.81 U	0.61 U
1,2,3,4,7,8,9-HpCDF	NG/KG	0.34 U	0.78 U
OCDD	NG/KG	37.00 B	3.90 J
OCDF	NG/KG	5.0 U	1.10 J
Total TCDD	NG/KG	0.50 U	0.98 U
Total TCDF	NG/KG	0.52 U	0.49 U
Total PeCDD	NG/KG	0.80 U	1.20 U
Total PeCDF	NG/KG	1.90 U	0.66 U

Flags assigned during chemistry validation are shown.

TABLE 2
SOIL BORING SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		SB-26-03	SB-26-03
Sample ID		SB-26-05-01	SB-26-05-02
Matrix		Soil	Soil
Depth Interval (ft.)		0.0-2.0	2.0-4.0
Date Sampled		09/01/99	09/01/99
Parameter	Units		
Dioxins & Furans			
Total HxCDD	NG/KG	1.10 U	0.79 U
Total HxCDF	NG/KG	1.40	0.52 U
Total HpCDD	NG/KG	8.2 B	0.48 J
Total HpCDF	NG/KG	0.98	0.70 J
Toxicity Equivalence	NG/KG	0.075	0.005

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Volatile Organic Compounds				
Chloromethane	UG/L	10 U	10 U	10 U
Bromomethane	UG/L	10 U	10 U	10 U
Vinyl chloride	UG/L	10 U	10 U	10 U
Chloroethane	UG/L	10 U	10 U	10 U
Methylene chloride	UG/L	10 U	10 U	10 U
Acetone	UG/L	10 U	10 U	10 U
Carbon disulfide	UG/L	10 U	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U	10 U
1,2-Dichloroethene (total)	UG/L	10 U	10 U	10 U
Chloroform	UG/L	10 U	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U	10 U
Methyl ethyl ketone (2-Butanone)	UG/L	10 U	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U	10 U
Carbon tetrachloride	UG/L	10 U	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U	10 U
1,3-Dichloropropene (cis)	UG/L	10 U	10 U	10 U
Trichloroethene	UG/L	10 U	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U	10 U
Benzene	UG/L	10 U	10 U	10 U
1,3-Dichloropropene (trans)	UG/L	10 U	10 U	10 U
Bromoform	UG/L	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Volatile Organic Compounds				
4-Methyl-2-pentanone	UG/L	10 U	10 U	10 U
2-Hexanone	UG/L	10 U	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U	10 U
Toluene	UG/L	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U	10 U
Styrene	UG/L	10 U	10 U	10 U
Xylene (total)	UG/L	10 U	10 U	10 U
Semivolatile Organic Compounds				
Phenol	UG/L	10 U	10 U	10 U
bis(2-Chloroethyl)ether	UG/L	10 U	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U	10 U
2-Methylphenol (o-cresol)	UG/L	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	UG/L	10 UJ	10 UJ	10 U
4-Methylphenol (p-cresol)	UG/L	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U	10 U
Isophorone	UG/L	10 U	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Semivolatile Organic Compounds				
2,4-Dimethylphenol	UG/L	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	UG/L	10 U	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U	10 U
Naphthalene	UG/L	10 U	10 U	10 U
4-Chloroaniline	UG/L	10 UJ	10 UJ	10 U
Hexachlorobutadiene	UG/L	10 U	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 UJ	10 UJ	10 UJ
2,4,6-Trichlorophenol	UG/L	10 U	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U	25 U
Dimethylphthalate	UG/L	10 U	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U	10 U
3-Nitroaniline	UG/L	25 UJ	25 UJ	25 U
Acenaphthene	UG/L	10 U	10 U	10 U
2,4-Dinitrophenol	UG/L	25 U	25 U	25 UJ
4-Nitrophenol	UG/L	25 UJ	25 UJ	25 U
Dibenzofuran	UG/L	10 U	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Semivolatile Organic Compounds				
4-Chlorophenyl-phenylether	UG/L	10 U	10 U	10 U
Fluorene	UG/L	10 U	10 U	10 U
4-Nitroaniline	UG/L	25 UJ	25 UJ	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 UJ	25 UJ	25 UJ
N-Nitrosodiphenylamine	UG/L	10 UJ	10 UJ	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U	25 U
Phenanthrene	UG/L	10 U	10 U	10 U
Anthracene	UG/L	10 U	10 U	10 U
Carbazole	UG/L	10 U	10 U	10 U
Di-n-butylphthalate	UG/L	10 U	10 U	10 UJ
Fluoranthene	UG/L	10 U	10 U	10 U
Pyrene	UG/L	10 U	10 U	10 U
Butylbenzylphthalate	UG/L	10 U	10 U	10 U
3,3'-Dichlorobenzidine	UG/L	10 U	10 U	10 U
Benzo(a)anthracene	UG/L	10 U	10 U	10 U
Chrysene	UG/L	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U	10 U
Di-n-octylphthalate	UG/L	10 UJ	10 UJ	10 UJ
Benzo(b)fluoranthene	UG/L	10 U	10 U	10 U
Benzo(k)fluoranthene	UG/L	10 U	10 U	10 U
Benzo(a)pyrene	UG/L	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	UG/L	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Semivolatile Organic Compounds				
Dibenz(a,h)anthracene	UG/L	10 U	10 U	10 U
Benzo(g,h,i)perylene	UG/L	10 U	10 U	10 U
Polychlorinated Biphenyls				
Aroclor 1016	UG/L	1 U	1 U	1 U
Aroclor 1221	UG/L	2 U	2 U	2 U
Aroclor 1232	UG/L	1 U	1 U	1 U
Aroclor 1242	UG/L	1 U	1 U	1 U
Aroclor 1248	UG/L	1 U	1 U	1 U
Aroclor 1254	UG/L	1 U	1 U	1 U
Aroclor 1260	UG/L	1 U	1 U	1 U
Explosives (Nitroaromatics & Nitroamines)				
RDX	UG/L	2.6 U	2.6 U	2.6 U
Metallic Species				
Aluminum	UG/L	7950	8540	2280
Antimony	UG/L	10.00 U	10.00 U	10.00 U
Arsenic	UG/L	7.3 B	7.5 B	5.0 U
Barium	UG/L	151 B	164 B	34.7 B
Beryllium	UG/L	1.0 U	1.0 U	1.0 U
Cadmium	UG/L	1.0 U	1.0 U	1.0 U
Calcium	UG/L	48500	51600	28800
Chromium	UG/L	12.0	12.8	4.2 B
Cobalt	UG/L	3.0 U	3.0 U	3.0 U
Copper	UG/L	12.7 B	13.8 B	8.5 B
Iron	UG/L	13600	14900	4470

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SEEP SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		LS-026-SF-1	LS-026-SF-1	LS-026-SF-2
Sample ID		LS-026-SF-1DUP	LS-026-SF-1	LS-026-SF-2
Matrix		GW Seep	GW Seep	GW Seep
Depth Interval (ft.)		0.0-1.0	0.0-1.0	0.0-1.5
Date Sampled		09/15/99	09/15/99	09/15/99
Parameter	Units	Field Replicate (1)		
Metallic Species				
Lead	UG/L	23.2	24.8	8.2
Magnesium	UG/L	11200	11800	7540
Manganese	UG/L	2420	2640	401
Nickel	UG/L	8.3 B	8.5 B	2.9 B
Potassium	UG/L	2690 B	2880 B	938 B
Selenium	UG/L	13.8	11.9	7.1 J
Silver	UG/L	3.0 U	3.0 U	3.0 U
Sodium	UG/L	6070	6370	5450
Thallium	UG/L	6.0 UJ	6.6 BJ	6.0 UJ
Vanadium	UG/L	17.5 B	19.0 B	6.2 B
Zinc	UG/L	54.2	70.3	34.2

Flags assigned during chemistry validation are shown.

Advanced Selection: TABLE 8
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WHERE (((tblRES.PARVO)<>"R") AND ((tblRES.LOCID) Like "LS-026-SF*"));

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Volatile Organic Compounds						
Chloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
Bromomethane	UG/L	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	UG/L	10 U	10 U	10 U	10 U	10 U
Chloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	UG/L	10 U	10 U	10 U	10 U	10 U
Acetone	UG/L	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Carbon Disulfide	UG/L	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	UG/L	10 U	10 U	10 U	10 U	10 U
Chloroform	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Methyl Ethyl Ketone (2-Butanone)	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	UG/L	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U
Trichloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Benzene	UG/L	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U	10 U	10 U	10 U
Bromoform	UG/L	10 U	10 U	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Volatile Organic Compounds						
4-Methyl-2-pentanone	UG/L	10 U	10 U	10 U	10 U	10 U
2-Hexanone	UG/L	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U	10 U	10 U	10 U
Toluene	UG/L	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U	10 U	10 U	10 U
Styrene	UG/L	10 U	10 U	10 U	10 U	10 U
Xylene (total)	UG/L	10 U	10 U	10 U	10 U	10 U
Semivolatile Organic Compounds						
Phenol	UG/L	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	UG/L	NA	NA	NA	NA	NA
2-Chlorophenol	UG/L	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	UG/L	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	UG/L	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	UG/L	NA	NA	NA	NA	NA
2-Methylphenol (o-cresol)	UG/L	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloro)propane	UG/L	NA	NA	NA	NA	NA
4-Methylphenol (p-cresol)	UG/L	NA	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	UG/L	NA	NA	NA	NA	NA
Hexachloroethane	UG/L	NA	NA	NA	NA	NA
Nitrobenzene	UG/L	NA	NA	NA	NA	NA
Isophorone	UG/L	NA	NA	NA	NA	NA
2-Nitrophenol	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Semivolatile Organic Compounds						
2,4-Dimethylphenol	UG/L	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	UG/L	NA	NA	NA	NA	NA
2,4-Dichlorophenol	UG/L	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	UG/L	NA	NA	NA	NA	NA
Naphthalene	UG/L	NA	NA	NA	NA	NA
4-Chloroaniline	UG/L	NA	NA	NA	NA	NA
Hexachlorobutadiene	UG/L	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	UG/L	NA	NA	NA	NA	NA
2-Methylnaphthalene	UG/L	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	UG/L	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	UG/L	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	UG/L	NA	NA	NA	NA	NA
2-Chloronaphthalene	UG/L	NA	NA	NA	NA	NA
2-Nitroaniline	UG/L	NA	NA	NA	NA	NA
Dimethylphthalate	UG/L	NA	NA	NA	NA	NA
Acenaphthylene	UG/L	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	UG/L	NA	NA	NA	NA	NA
3-Nitroaniline	UG/L	NA	NA	NA	NA	NA
Acenaphthene	UG/L	NA	NA	NA	NA	NA
2,4-Dinitrophenol	UG/L	NA	NA	NA	NA	NA
4-Nitrophenol	UG/L	NA	NA	NA	NA	NA
Dibenzofuran	UG/L	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	UG/L	NA	NA	NA	NA	NA
Diethylphthalate	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Semivolatile Organic Compounds						
4-Chlorophenyl-phenylether	UG/L	NA	NA	NA	NA	NA
Fluorene	UG/L	NA	NA	NA	NA	NA
4-Nitroaniline	UG/L	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	UG/L	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	UG/L	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	UG/L	NA	NA	NA	NA	NA
Hexachlorobenzene	UG/L	NA	NA	NA	NA	NA
Pentachlorophenol	UG/L	NA	NA	NA	NA	NA
Phenanthrene	UG/L	NA	NA	NA	NA	NA
Anthracene	UG/L	NA	NA	NA	NA	NA
Carbazole	UG/L	NA	NA	NA	NA	NA
Di-n-butylphthalate	UG/L	NA	NA	NA	NA	NA
Fluoranthene	UG/L	NA	NA	NA	NA	NA
Pyrene	UG/L	NA	NA	NA	NA	NA
Butylbenzylphthalate	UG/L	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	UG/L	NA	NA	NA	NA	NA
Benzo(a)anthracene	UG/L	NA	NA	NA	NA	NA
Chrysene	UG/L	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	NA	NA	NA	NA	NA
Di-n-octylphthalate	UG/L	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	UG/L	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	UG/L	NA	NA	NA	NA	NA
Benzo(a)pyrene	UG/L	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown..

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Semivolatile Organic Compounds						
Dibenz(a,h)anthracene	UG/L	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	UG/L	NA	NA	NA	NA	NA
Metallic Species						
Aluminum	UG/L	NA	NA	NA	NA	NA
Antimony	UG/L	NA	NA	NA	NA	NA
Arsenic	UG/L	NA	NA	NA	NA	NA
Barium	UG/L	NA	NA	NA	NA	NA
Beryllium	UG/L	NA	NA	NA	NA	NA
Cadmium	UG/L	NA	NA	NA	NA	NA
Calcium	UG/L	NA	NA	NA	NA	NA
Chromium	UG/L	NA	NA	NA	NA	NA
Cobalt	UG/L	NA	NA	NA	NA	NA
Copper	UG/L	NA	NA	NA	NA	NA
Iron	UG/L	NA	NA	NA	NA	NA
Lead	UG/L	NA	NA	NA	NA	NA
Magnesium	UG/L	NA	NA	NA	NA	NA
Manganese	UG/L	NA	NA	NA	NA	NA
Mercury	UG/L	NA	NA	NA	NA	NA
Nickel	UG/L	NA	NA	NA	NA	NA
Potassium	UG/L	NA	NA	NA	NA	NA
Selenium	UG/L	NA	NA	NA	NA	NA
Silver	UG/L	NA	NA	NA	NA	NA
Sodium	UG/L	NA	NA	NA	NA	NA
Thallium	UG/L	NA	NA	NA	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Sample ID		MW-24-001	MW-26-001	MW-26-002	MW-26-003	MW-26-004
Matrix		Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft.)		-	-	-	-	-
Date Sampled		10/06/99	10/06/99	10/06/99	10/06/99	10/06/99
Parameter	Units					
Metallic Species						
Vanadium	UG/L	NA	NA	NA	NA	NA
Zinc	UG/L	NA	NA	NA	NA	NA
Polychlorinated Biphenyls						
Aroclor 1016	UG/L	NA	NA	NA	NA	NA
Aroclor 1221	UG/L	NA	NA	NA	NA	NA
Aroclor 1232	UG/L	NA	NA	NA	NA	NA
Aroclor 1242	UG/L	NA	NA	NA	NA	NA
Aroclor 1248	UG/L	NA	NA	NA	NA	NA
Aroclor 1254	UG/L	NA	NA	NA	NA	NA
Aroclor 1260	UG/L	NA	NA	NA	NA	NA
Miscellaneous Assays						
RDX	UG/L	2.6 U	2.6 U	2.6 U	6.1	5.5

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Volatile Organic Compounds			
Chloromethane	UG/L	10 U	10 U
Bromomethane	UG/L	10 U	10 U
Vinyl Chloride	UG/L	10 U	10 U
Chloroethane	UG/L	10 U	10 U
Methylene Chloride	UG/L	10 U	10 U
Acetone	UG/L	10 UJ	10 UJ
Carbon Disulfide	UG/L	10 U	10 U
1,1-Dichloroethene	UG/L	10 U	10 U
1,1-Dichloroethane	UG/L	10 U	10 U
1,2-Dichloroethene (total)	UG/L	10 U	10 U
Chloroform	UG/L	10 U	10 U
1,2-Dichloroethane	UG/L	10 U	10 U
Methyl Ethyl Ketone (2-Butanone)	UG/L	10 U	10 U
1,1,1-Trichloroethane	UG/L	10 U	10 U
Carbon Tetrachloride	UG/L	10 U	10 U
Bromodichloromethane	UG/L	10 U	10 U
1,2-Dichloropropane	UG/L	10 U	10 U
cis-1,3-Dichloropropene	UG/L	10 U	10 U
Trichloroethene	UG/L	10 U	10 U
Dibromochloromethane	UG/L	10 U	10 U
1,1,2-Trichloroethane	UG/L	10 U	10 U
Benzene	UG/L	10 U	10 U
trans-1,3-Dichloropropene	UG/L	10 U	10 U
Bromoform	UG/L	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Volatile Organic Compounds			
4-Methyl-2-pentanone	UG/L	10 U	10 U
2-Hexanone	UG/L	10 U	10 U
Tetrachloroethene	UG/L	10 U	10 U
Toluene	UG/L	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	10 U	10 U
Chlorobenzene	UG/L	10 U	10 U
Ethylbenzene	UG/L	10 U	10 U
Styrene	UG/L	10 U	10 U
Xylene (total)	UG/L	10 U	10 U
Semivolatile Organic Compounds			
Phenol	UG/L	10 U	10 U
bis(2-Chloroethyl)ether	UG/L	10 U	10 U
2-Chlorophenol	UG/L	10 U	10 U
1,3-Dichlorobenzene	UG/L	10 U	10 U
1,4-Dichlorobenzene	UG/L	10 U	10 U
1,2-Dichlorobenzene	UG/L	10 U	10 U
2-Methylphenol (o-cresol)	UG/L	10 U	10 U
2,2'-Oxybis(1-chloro)propane	UG/L	10 UJ	10 UJ
4-Methylphenol (p-cresol)	UG/L	10 U	10 U
N-Nitroso-di-n-propylamine	UG/L	10 U	10 U
Hexachloroethane	UG/L	10 U	10 U
Nitrobenzene	UG/L	10 U	10 U
Isophorone	UG/L	10 U	10 U
2-Nitrophenol	UG/L	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Semivolatile Organic Compounds			
2,4-Dimethylphenol	UG/L	10 U	10 U
bis(2-Chloroethoxy)methane	UG/L	10 U	10 U
2,4-Dichlorophenol	UG/L	10 U	10 U
1,2,4-Trichlorobenzene	UG/L	10 U	10 U
Naphthalene	UG/L	10 U	10 U
4-Chloroaniline	UG/L	10 UJ	10 UJ
Hexachlorobutadiene	UG/L	10 U	10 U
4-Chloro-3-methylphenol	UG/L	10 U	10 U
2-Methylnaphthalene	UG/L	10 U	10 U
Hexachlorocyclopentadiene	UG/L	10 U	10 U
2,4,6-Trichlorophenol	UG/L	10 U	10 U
2,4,5-Trichlorophenol	UG/L	25 U	25 U
2-Chloronaphthalene	UG/L	10 U	10 U
2-Nitroaniline	UG/L	25 U	25 U
Dimethylphthalate	UG/L	10 U	10 U
Acenaphthylene	UG/L	10 U	10 U
2,6-Dinitrotoluene	UG/L	10 U	10 U
3-Nitroaniline	UG/L	25 U	25 U
Acenaphthene	UG/L	10 U	10 U
2,4-Dinitrophenol	UG/L	25 UJ	25 UJ
4-Nitrophenol	UG/L	25 U	25 U
Dibenzofuran	UG/L	10 U	10 U
2,4-Dinitrotoluene	UG/L	10 U	10 U
Diethylphthalate	UG/L	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Semivolatile Organic Compounds			
4-Chlorophenyl-phenylether	UG/L	10 U	10 U
Fluorene	UG/L	10 U	10 U
4-Nitroaniline	UG/L	25 U	25 U
4,6-Dinitro-2-methylphenol	UG/L	25 U	25 U
N-Nitrosodiphenylamine	UG/L	10 U	10 U
4-Bromophenyl-phenylether	UG/L	10 U	10 U
Hexachlorobenzene	UG/L	10 U	10 U
Pentachlorophenol	UG/L	25 U	25 U
Phenanthrene	UG/L	10 U	10 U
Anthracene	UG/L	10 U	10 U
Carbazole	UG/L	10 U	10 U
Di-n-butylphthalate	UG/L	10 UJ	10 UJ
Fluoranthene	UG/L	10 U	10 U
Pyrene	UG/L	10 U	10 U
Butylbenzylphthalate	UG/L	10 UJ	10 UJ
3,3'-Dichlorobenzidine	UG/L	10 U	10 U
Benzo(a)anthracene	UG/L	10 U	10 U
Chrysene	UG/L	10 U	10 U
bis(2-Ethylhexyl)phthalate	UG/L	10 U	10 U
Di-n-octylphthalate	UG/L	10 UJ	10 UJ
Benzo(b)fluoranthene	UG/L	10 U	10 U
Benzo(k)fluoranthene	UG/L	10 U	10 U
Benzo(a)pyrene	UG/L	10 U	10 U
Indeno(1,2,3-cd)pyrene	UG/L	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Semivolatile Organic Compounds			
Dibenz(a,h)anthracene	UG/L	10 U	10 U
Benzo(g,h,i)perylene	UG/L	10 U	10 U
Metallic Species			
Aluminum	UG/L	3350	3700
Antimony	UG/L	10.0 U	10.0 U
Arsenic	UG/L	5.0 U	5.0 U
Barium	UG/L	41.8 B	40.7 B
Beryllium	UG/L	1.0 U	1.0 U
Cadmium	UG/L	1.0 U	1.0 U
Calcium	UG/L	25700	23200
Chromium	UG/L	6.6 B	7.3 B
Cobalt	UG/L	3.0 U	3.0 U
Copper	UG/L	9.2 B	8.8 B
Iron	UG/L	6500	7200
Lead	UG/L	1.0 U	1.0 U
Magnesium	UG/L	5060	5090
Manganese	UG/L	196	180
Mercury	UG/L	0.22 J	0.37 J
Nickel	UG/L	4.9 B	5.2 B
Potassium	UG/L	1570 B	1570 B
Selenium	UG/L	11.8	12.3
Silver	UG/L	3.0 U	3.0 U
Sodium	UG/L	1600 B	1590 B
Thallium	UG/L	6.0 U	6.0 U

Flags assigned during chemistry validation are shown.

TABLE 2
GROUNDWATER SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		MW-26-005	MW-26-005
Sample ID		MW-26-005DUP	MW-26-005
Matrix		Ground Water	Ground Water
Depth Interval (ft.)		-	-
Date Sampled		10/06/99	10/06/99
Parameter	Units	Field Replicate (1)	
Metallic Species			
Vanadium	UG/L	10.8 B	11.9 B
Zinc	UG/L	51 J	46.9 J
Polychlorinated Biphenyls			
Aroclor 1016	UG/L	1 U	1 U
Aroclor 1221	UG/L	2 U	2 U
Aroclor 1232	UG/L	1 U	1 U
Aroclor 1242	UG/L	1 U	1 U
Aroclor 1248	UG/L	1 U	1 U
Aroclor 1254	UG/L	1 U	1 U
Aroclor 1260	UG/L	1 U	1 U
Miscellaneous Assays			
RDX	UG/L	2.6 U	2.6 U

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Volatile Organic Compounds					
Chloromethane	UG/L	NA	10 U	10 U	10 U
Bromomethane	UG/L	NA	10 U	10 U	10 U
Vinyl Chloride	UG/L	NA	10 U	10 U	10 U
Chloroethane	UG/L	NA	10 U	10 U	10 U
Methylene Chloride	UG/L	NA	2 J	10 U	10 U
Acetone	UG/L	NA	10 U	10 U	10 UJ
Carbon Disulfide	UG/L	NA	10 U	10 U	10 U
1,1-Dichloroethene	UG/L	NA	10 U	10 U	10 U
1,1-Dichloroethane	UG/L	NA	10 U	10 U	10 U
1,2-Dichloroethene (total)	UG/L	NA	3 J	10 U	10 U
Chloroform	UG/L	NA	10 U	10 U	10 U
1,2-Dichloroethane	UG/L	NA	10 U	10 U	10 U
Methyl Ethyl Ketone (2-Butanone)	UG/L	NA	10 U	10 U	10 U
1,1,1-Trichloroethane	UG/L	NA	10 U	10 U	10 U
Carbon Tetrachloride	UG/L	NA	10 U	10 U	10 U
Bromodichloromethane	UG/L	NA	10 U	10 U	10 U
1,2-Dichloropropane	UG/L	NA	10 U	10 U	10 U
cis-1,3-Dichloropropene	UG/L	NA	10 U	10 U	10 U
Trichloroethene	UG/L	NA	10 U	10 U	10 U
Dibromochloromethane	UG/L	NA	10 U	10 U	10 U
1,1,2-Trichloroethane	UG/L	NA	10 U	10 U	10 U
Benzene	UG/L	NA	10 U	10 U	10 U
trans-1,3-Dichloropropene	UG/L	NA	10 U	10 U	10 U
Bromoform	UG/L	NA	10 U	10 U	10 U

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Volatile Organic Compounds					
4-Methyl-2-pentanone	UG/L	NA	10 U	10 U	10 U
2-Hexanone	UG/L	NA	10 U	10 U	10 U
Tetrachloroethene	UG/L	NA	10 U	10 U	10 U
Toluene	UG/L	NA	0.9 J	10 U	10 U
1,1,2,2-Tetrachloroethane	UG/L	NA	10 U	10 U	10 U
Chlorobenzene	UG/L	NA	10 U	10 U	10 U
Ethylbenzene	UG/L	NA	10 U	10 U	10 U
Styrene	UG/L	NA	10 U	10 U	10 U
Xylene (total)	UG/L	NA	10 U	10 U	10 U
Semivolatile Organic Compounds					
Phenol	UG/L	NA	10 U	NA	NA
bis(2-Chloroethyl)ether	UG/L	NA	10 U	NA	NA
2-Chlorophenol	UG/L	NA	10 U	NA	NA
1,3-Dichlorobenzene	UG/L	NA	10 U	NA	NA
1,4-Dichlorobenzene	UG/L	NA	10 U	NA	NA
1,2-Dichlorobenzene	UG/L	NA	10 U	NA	NA
2-Methylphenol (o-cresol)	UG/L	NA	10 U	NA	NA
2,2'-Oxybis(1-chloro)propane	UG/L	NA	10 UJ	NA	NA
4-Methylphenol (p-cresol)	UG/L	NA	10 U	NA	NA
N-Nitroso-di-n-propylamine	UG/L	NA	10 U	NA	NA
Hexachloroethane	UG/L	NA	10 U	NA	NA
Nitrobenzene	UG/L	NA	10 U	NA	NA
Isophorone	UG/L	NA	10 U	NA	NA
2-Nitrophenol	UG/L	NA	10 U	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Semivolatile Organic Compounds					
2,4-Dimethylphenol	UG/L	NA	10 U	NA	NA
bis(2-Chloroethoxy)methane	UG/L	NA	10 U	NA	NA
2,4-Dichlorophenol	UG/L	NA	10 U	NA	NA
1,2,4-Trichlorobenzene	UG/L	NA	10 U	NA	NA
Naphthalene	UG/L	NA	10 U	NA	NA
4-Chloroaniline	UG/L	NA	10 UJ	NA	NA
Hexachlorobutadiene	UG/L	NA	10 U	NA	NA
4-Chloro-3-methylphenol	UG/L	NA	10 U	NA	NA
2-Methylnaphthalene	UG/L	NA	10 U	NA	NA
Hexachlorocyclopentadiene	UG/L	NA	10 UJ	NA	NA
2,4,6-Trichlorophenol	UG/L	NA	10 U	NA	NA
2,4,5-Trichlorophenol	UG/L	NA	25 U	NA	NA
2-Chloronaphthalene	UG/L	NA	10 U	NA	NA
2-Nitroaniline	UG/L	NA	25 U	NA	NA
Dimethylphthalate	UG/L	NA	10 U	NA	NA
Acenaphthylene	UG/L	NA	10 U	NA	NA
2,6-Dinitrotoluene	UG/L	NA	10 U	NA	NA
3-Nitroaniline	UG/L	NA	25 UJ	NA	NA
Acenaphthene	UG/L	NA	10 U	NA	NA
2,4-Dinitrophenol	UG/L	NA	25 U	NA	NA
4-Nitrophenol	UG/L	NA	25 UJ	NA	NA
Dibenzofuran	UG/L	NA	10 U	NA	NA
2,4-Dinitrotoluene	UG/L	NA	10 U	NA	NA
Diethylphthalate	UG/L	NA	10 U	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Semivolatile Organic Compounds					
4-Chlorophenyl-phenylether	UG/L	NA	10 U	NA	NA
Fluorene	UG/L	NA	10 U	NA	NA
4-Nitroaniline	UG/L	NA	25 UJ	NA	NA
4,6-Dinitro-2-methylphenol	UG/L	NA	25 UJ	NA	NA
N-Nitrosodiphenylamine	UG/L	NA	10 UJ	NA	NA
4-Bromophenyl-phenylether	UG/L	NA	10 U	NA	NA
Hexachlorobenzene	UG/L	NA	10 U	NA	NA
Pentachlorophenol	UG/L	NA	25 U	NA	NA
Phenanthrene	UG/L	NA	10 U	NA	NA
Anthracene	UG/L	NA	10 U	NA	NA
Carbazole	UG/L	NA	10 U	NA	NA
Di-n-butylphthalate	UG/L	NA	10 U	NA	NA
Fluoranthene	UG/L	NA	10 U	NA	NA
Pyrene	UG/L	NA	10 U	NA	NA
Butylbenzylphthalate	UG/L	NA	10 U	NA	NA
3,3'-Dichlorobenzidine	UG/L	NA	10 U	NA	NA
Benzo(a)anthracene	UG/L	NA	10 U	NA	NA
Chrysene	UG/L	NA	10 U	NA	NA
bis(2-Ethylhexyl)phthalate	UG/L	NA	10 U	NA	NA
Di-n-octylphthalate	UG/L	NA	10 UJ	NA	NA
Benzo(b)fluoranthene	UG/L	NA	10 U	NA	NA
Benzo(k)fluoranthene	UG/L	NA	10 U	NA	NA
Benzo(a)pyrene	UG/L	NA	10 U	NA	NA
Indeno(1,2,3-cd)pyrene	UG/L	NA	10 U	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Semivolatile Organic Compounds					
Dibenz(a,h)anthracene	UG/L	NA	10 U	NA	NA
Benzo(g,h,i)perylene	UG/L	NA	10 U	NA	NA
Metallic Species					
Aluminum	UG/L	NA	103 B	NA	NA
Antimony	UG/L	NA	10.0 U	NA	NA
Arsenic	UG/L	NA	5.0 U	NA	NA
Barium	UG/L	NA	9.0 U	NA	NA
Beryllium	UG/L	NA	1.0 U	NA	NA
Cadmium	UG/L	NA	1.0 U	NA	NA
Calcium	UG/L	NA	779 B	NA	NA
Chromium	UG/L	NA	1.0 U	NA	NA
Cobalt	UG/L	NA	3.0 U	NA	NA
Copper	UG/L	NA	6.8 B	NA	NA
Iron	UG/L	NA	147	NA	NA
Lead	UG/L	NA	10.9	NA	NA
Magnesium	UG/L	NA	149 B	NA	NA
Manganese	UG/L	NA	3.7 B	NA	NA
Mercury	UG/L	NA	0.18 UR	NA	NA
Nickel	UG/L	NA	2.0 U	NA	NA
Potassium	UG/L	NA	52.0 U	NA	NA
Selenium	UG/L	NA	4.0 U	NA	NA
Silver	UG/L	NA	3.0 U	NA	NA
Sodium	UG/L	NA	444 B	NA	NA
Thallium	UG/L	NA	8.9 BJ	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Metallic Species					
Vanadium	UG/L	NA	3.0 U	NA	NA
Zinc	UG/L	NA	28.3	NA	NA
Polychlorinated Biphenyls					
Aroclor 1016	UG/L	NA	1 U	NA	NA
Aroclor 1221	UG/L	NA	2 U	NA	NA
Aroclor 1232	UG/L	NA	1 U	NA	NA
Aroclor 1242	UG/L	NA	1 U	NA	NA
Aroclor 1248	UG/L	NA	1 U	NA	NA
Aroclor 1254	UG/L	NA	1 U	NA	NA
Aroclor 1260	UG/L	NA	1 U	NA	NA
Miscellaneous Assays					
2-Chloroacetophenone	UG/L	21 U	NA	NA	NA
2-Chlorobenzylidenemalononitrile	UG/L	21 U	NA	NA	NA
Thiodiglycol	UG/L	2.0 U	NA	NA	NA
Dioxins & Furans					
2,3,7,8-TCDD	NG/L	0.0190 U	NA	NA	NA
2,3,7,8-TCDF	NG/L	0.0098 U	NA	NA	NA
1,2,3,7,8-PeCDD	NG/L	0.0140 U	NA	NA	NA
1,2,3,7,8-PeCDF	NG/L	0.0092 U	NA	NA	NA
2,3,4,7,8-PeCDF	NG/L	0.0073 U	NA	NA	NA
1,2,3,4,7,8-HxCDD	NG/L	0.0190 U	NA	NA	NA
1,2,3,6,7,8-HxCDD	NG/L	0.0150 U	NA	NA	NA
1,2,3,7,8,9-HxCDD	NG/L	0.0140 U	NA	NA	NA
1,2,3,4,7,8-HxCDF	NG/L	0.0070 U	NA	NA	NA

Flags assigned during chemistry validation are shown.

TABLE 2
FIELD QC SAMPLE RESULTS
PLATTSBURGH AIR FORCE BASE - EOD RANGE

Location ID		FIELDQC	FIELDQC	FIELDQC	FIELDQC
Sample ID		EB1-090199	EB1-091599	TB1-091599	TB100699
Matrix		Water Quality	Water Quality	Water Quality	Water Quality
Depth Interval (ft.)		-	-	-	-
Date Sampled		09/01/99	09/15/99	09/15/99	10/06/99
Parameter	Units	Equipment Blank (1)	Equipment Blank (1)	Trip Blank (1)	Trip Blank (1)
Dioxins & Furans					
1,2,3,6,7,8-HxCDF	NG/L	0.0071 U	NA	NA	NA
1,2,3,7,8,9-HxCDF	NG/L	0.0110 U	NA	NA	NA
2,3,4,6,7,8-HxCDF	NG/L	0.0079 U	NA	NA	NA
1,2,3,4,6,7,8-HpCDD	NG/L	0.0130 U	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	NG/L	0.0077 U	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	NG/L	0.0094 U	NA	NA	NA
OCDD	NG/L	0.0180 U	NA	NA	NA
OCDF	NG/L	0.0200 U	NA	NA	NA
Total TCDD	NG/L	0.0190 U	NA	NA	NA
Total TCDF	NG/L	0.0098 U	NA	NA	NA
Total PeCDD	NG/L	0.0140 U	NA	NA	NA
Total PeCDF	NG/L	0.0083 U	NA	NA	NA
Total HxCDD	NG/L	0.0160 U	NA	NA	NA
Total HxCDF	NG/L	0.0082 U	NA	NA	NA
Total HpCDD	NG/L	0.0130 U	NA	NA	NA
Total HpCDF	NG/L	0.0084 U	NA	NA	NA
Toxicity Equivalence	NG/L	0.0000	NA	NA	NA

Flags assigned during chemistry validation are shown.

Appendix D

APPENDIX D

SOIL BORING LOGS

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. SB-26-01

PROJECT:	SS-026 EOD RANGE
CLIENT:	PLATTSBURGH AIR FORCE BASE
BORING CONTRACTOR:	BUFFALO DRILLING
SHEET NO.	1 OF 1
JOB NO.:	053529.17
BORING LOCATION:	N-1693165.837 E-721890.826
GROUND ELEVATION:	180.16'
DATE STARTED:	11-9-94 (1136)
DATE FINISHED:	11-9-94 (1154)
DRILLER:	ROGER KEPHART
GEOLOGIST:	STEVEN MOELLER
REVIEWED BY:	DUANE LENHART

GROUND WATER:

DATE	TIME	LEV	TYPE
11/9	1200	7.0'	BGS in 4¼" HSA advanced to 8' depth

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4¼"	2"ø3"		
WT.		140#		
FALL		30"		

• POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	CLASS USCS	PID Sample/Headspace (ppm)	REMARKS
		*1	3" SS	1 1	55	Orange Brown	VERY LOOSE	FINE SAND, trace to some medium sand (many distinct orange mottles)	SW	0.7 / 0.7	SLIGHTLY MOIST
4		*2	3" SS	3 5 / 4 5 / 6 6	90	TAN	LOOSE			0.7 / 0.7	
5		3	2" SS	1 3 / 4 6	75			FINE SAND (many faint to distinct orange mottles)	SP	0.7 / 0.7	MOIST
8		4	2" SS	3 5 / 6 8	60	BROWN	MEDIUM DENSE			0.7 / 0.7	WET
10								BORING COMPLETED AT 8' DEPTH (AUGERS ADVANCED TO 8' DEPTH, SAMPLED TO 8' DEPTH)			
15								* ENVIRONMENTAL SAMPLES COLLECTED FROM 0-2' SS AND 2-4' SS.			
20											
25											
30											
35											

A-3205

COMMENTS BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS USING 4¼" HSA. BOREHOLE BACKFILLED WITH CUTTINGS AND SURROUNDING SAND.

PROJECT NO. 053529.17
BORING NO. SB-26-01

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. SB-26-02

PROJECT: SS-026 EOD RANGE
CLIENT: PITTSBURGH AIR FORCE BASE
BORING CONTRACTOR: BUFFALO DRILLING
GROUND WATER:

DATE	TIME	LEV	TYPE
			NONE
			TAKEN

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4 1/4"	3" & 2"		
WT.		140#		
FALL		30"		

* POCKET PENETROMETER READING

SHEET NO. 1 OF 1
JOB NO.: 0535291.17
BORING LOCATION: N-1693163.495 E-721731.793
GROUND ELEVATION: 183.28'
DATE STARTED: 11-9-94 (1512)
DATE FINISHED: 11-9-94 (1535)
DRILLER: ROGER KISPHART
GEOLOGIST: STEVEN MOELLER
REVIEWED BY: DUANE LENHARDT

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID/FID SAMP/HEADSPACE (PPM)	REMARKS
2		*1	3" SS	2 4 / 5 5	80	BROWN	LOOSE	FINE SAND, trace medium sand	SP	0.2 / a1	SLIGHTLY MOIST
3		*2	3" SS	7 5 / 5 5	70			FINE to COARSE SAND	SW	0.3 / 0.0	
5		3	2" SS	2 2 / 3 5	60	LIGHT BROWN TO BROWN		FINE SAND with a few faint orange mottles	SP	0.2 / 0.0	MOIST
8		4	2" SS	2 3 / 5 3	80	BROWN and ORANGE				0.2 / 0.1	WET @ 7'
10								BORING COMPLETED AT 8' DEPTH. (AUGERS ADVANCED TO 6' DEPTH, SAMPLED TO 8' DEPTH)			
15								* ENVIRONMENTAL SAMPLES COLLECTED FROM 0-2' SS AND 2-4' SS.			
20											
25											
30											
35											

A-3205

COMMENTS: BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS. BOREHOLE BACKFILLED WITH CUTTINGS AND SURROUNDING SAND.

PROJECT NO. 0535291.17
BORING NO. SB-26-02

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. SB-26-03

PROJECT:	SS-026 EOD RANGE
CLIENT:	PLATTSBURGH AIR FORCE BASE
BORING CONTRACTOR:	BUFFALO DRILLING
SHEET NO.	1 OF 1
JOB NO.:	0535291.17
BORING LOCATION:	N-1673240.034 E-721836.115
GROUND ELEVATION:	182.81'
DATE STARTED:	11-9-94 (1410)
DATE FINISHED:	11-9-94 (1445)
DRILLER:	ROGER KEPHART
GEOLOGIST:	STEVEN MOELLER
REVIEWED BY:	DUANE LENHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11/9	1440	6.0'	BGS in 4¼" HSA advanced to 8' depth

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4¼"	3"ø2"		
WT.		140#		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID @ BREATHING ZONE (ppm)	REMARKS
0		*+1	3" SS	1 2 / 3 4	90	LIGHT BROWN	VERY LOOSE	FINE SAND, trace medium sand and silt	SP/SM	0.2 / 0.2	SLIGHTLY MOIST
		*2	3" SS	3 4 / 4 4	85					0.2 / 0.2	
5		3	2" SS	1 2 / 2 2	35					0.2 / 0.2	
		4	2" SS	2 2 / 4 6	80		LOOSE			0.2 / NT	MOIST
8											
10		5	2" SS	4 5 / 7 5	55	BROWN/ ORANGE	MEDIUM DENSE	FINE SAND with a few faint orange mottles	SP	0.2 / 0.2	WET
15							BORING depth 8' depth	COMPLETED AT 10' (augers advanced to 8' depth, sampled to 10')			NT = NOT TAKEN
20								* ENVIRONMENTAL SAMPLES COLLECTED FROM 0-2' SS AND 2-4' SS.			
25								+ GEOTECHNICAL SAMPLES COLLECTED FROM 0-2' SS.			
30											
35											

A-3205

COMMENTS BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS USING 4¼" HSA. BOREHOLE BACKFILLED WITH CUTTINGS AND SURROUNDING SAND.

PROJECT NO. 0535291.17
BORING NO. SB-26-03

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. WB-MW-26-001

PROJECT: SS-026 EOD RANGE
CLIENT: Plattsburgh Air Force Base
BORING CONTRACTOR: Buffalo Drilling
GROUND WATER:

DATE	TIME	LEV	TYPE
11/8	1155	9'	BGS in 4¼" HSA advanced to 14' depth

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4¼"	2"ϕ	3"	
WT.		140*		
FALL		30"		

* POCKET PENETROMETER READING

SHEET NO. 1 OF 1
JOB NO. : 0535291.17
BORING LOCATION: N-1643219.873 E-721405.146
GROUND ELEVATION: 185.72'
DATE STARTED: 11-8-94 (1050)
DATE FINISHED: 11-8-94 (1136)
DRILLER: Roger Kephart
GEOLOGIST: Steven Moeller
REVIEWED BY: DUANE LENHARDT

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID SAMPLE HEADSPACE (ppm)	REMARKS
	SS	*1	3" SS	1 3 / 5 8	65	ORANGISH BROWN TO TAN	VERY LOOSE	FINE SAND, trace to some silt; trace medium sand, clay, gravel (faint to distinct orange mottles up to 2cm.)	SP/SM	0.2 / 0.2	Slightly moist
	SS	*2	3" SS	9 10 / 13 12	75	TAN	LOOSE TO MEDIUM DENSE			0.2 / 0.2	Moist
5	SS	3	2" SS	2 5 / 5 6	65					0.3 / NT	Wet @ ~5'
	SS	4	2" SS	5 7 / 9 4	50					0.3 / 0.1	
9	S	+5	2" SS	3 3 / 3 4	50	GRAY				0.2 / NT	
10	SS	6	2" SS	3 5 / 7 8	55	DARK GRAY		SILTY FINE SAND, trace clay (few black to bluish-black mottles or blebs)	SM	0.2 / 0.2	
	SS	7	2" SS	3 7 / 5 6	70					0.2 / NT	
15	SS	8	2" SS	4 3 / 4 7	60					0.3 / 0.2	
16								BORING COMPLETED AT 16' depth (augers advanced to 14' depth, sampled to 16')			NT = Not taken
20								* ENVIRONMENTAL SAMPLES collected from 0-2' and 2'-4' SS.			
25								+ GEOTECHNICAL SAMPLE collected from 8'-10' SS.			
30											
35											

A-3205

COMMENTS BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS USING 4¼" HSA. 4¼" HSA WERE PULLED AND 6¼" HSA WERE USED TO INSTALL WELL MW-26-001 IN THE SAME HOLE (6¼" HSA WERE ADVANCED TO 15' DEPTH).

PROJECT NO. 0535291.17
BORING NO. WB-MW-26-001

URS CONSULTANTS, Inc.

TEST BORING LOG

BORING NO. WB-MW-26-002

PROJECT:	SS-026 EOD RANGE
CLIENT:	PLATTSBURGH AIR FORCE BASE
BORING CONTRACTOR:	BUFFALO DRILLING
SHEET NO. / OF	
JOB NO. :	053591.17
BORING LOCATION:	N-1693387.578 E-721855.577
GROUND ELEVATION:	181.76'
DATE STARTED:	11-10-94 (820)
DATE FINISHED:	11-10-94 (844)
DRILLER:	ROGER KEPHART
GEOLOGIST:	STEVEN MOELLER
REVIEWED BY:	DUANE LENHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11/10	0900	11.5'	BGS in 4¼" HSA advanced to 16' depth

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4¼"	2"		
WT.		140#		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID SAMPLE HEADSPACE (ppm) & REMARKS
5		1	SS	WH/2, 1/3	25	LIGHT BROWN	VERY LOOSE	FINE SAND, TRACE MED SAND, FAINT TO DISTINCT ORANGE MOTTLES	SP	0.2/NT SLIGHTLY MOIST
9		2	SS	1/3, 2/5	65					0.1/0.1
10		+3	SS	1/3, 2/4	55	BROWN	LOOSE			0.1/0.1 WET
14										
15	S	4	SS	4/6, 5/6	45	GRAY to DARK GRAY	MEDIUM DENSE	VERY FINE TO FINE SAND, trace silt		0.1/0.0
20								BORING COMPLETED AT 16' DEPTH (advanced augers to 16' depth, sampled to 16' depth)		NT = NOT TAKEN
25								+ GEOTECHNICAL SAMPLE COLLECTED FROM 9-11' SS.		
30								NO ENVIRONMENTAL SAMPLES COLLECTED.		
35										

A-3205

COMMENTS BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS USING 4¼" HSA. SUBSEQUENTLY, WELL MW-26-002 WAS INSTALLED. 4½" HSA WERE PULLED AND 6¼" HSA WERE USED FOR WELL INSTALLATION. D-5

PROJECT NO. 053591.17

BORING NO. WB-MW-26-002

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. WB-MW-26-003

PROJECT:	SS-026 EOD RANGE
CLIENT:	PLATTSBURGH AIR FORCE BASE
BORING CONTRACTOR:	BUFFALO DRILLING
SHEET NO.	OF
JOB NO. :	053529 1.17
BORING LOCATION:	N-1693187.938 E-721999.376
GROUND ELEVATION:	180.26'
DATE STARTED:	11-8-94 (1540)
DATE FINISHED:	11-9-94 (829)
DRILLER:	ROGER KEPHART
GEOLOGIST:	STEVEN MOELLER
REVIEWED BY:	DUANE LENHART

GROUND WATER:					CAS.	SAMP	CORE	TUBE
DATE	TIME	LEV	TYPE	TYPE	HSA	SS		
11/9	0900	9.6'	BGS in 4¼"	DIA.	4 1/4"	3" & 2"		
			HSA advanced	WT.		140#		
			to 14' depth	FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY / RQD %	DESCRIPTION: COLOR	CONSISTENCY / HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID & FIELD SCREENING (ppm)	REMARKS
		*1	3" SS	1 1 / 2 4	75	ORANGE BROWN LIGHT BROWN	VERY LOOSE	FINE SAND, TRACE TO SOME MED SAND, FEW ORANGE MOTTLES	SP	0.2 / 0.2	SLIGHTLY MOIST
		*2	3" SS	3 9 / 16 10	80		MED DENSE			0.3 / NT	
5		3	2" SS	2 2 / 2 4	60		VERY LOOSE TO LOOSE			0.2 / NT	
											WET
10		+4	2" SS	2 2 / 3 4	60					0.2 / 0.2	
14.5				4 5			MED DENSE				
15		5	2" SS	6 5	55	GRAY		VERY FINE TO FINE SAND, TRACE SILT		0.1 / 0.2	
16								BORING COMPLETED AT 16' DEPTH. (AUGERS ADVANCED TO 14' DEPTH, SAMPLED TO 16' DEPTH).			NT = NOT TAKEN
20											
25								* ENVIRONMENTAL SAMPLES COLLECTED FROM 0-2' SS AND 2-4' SS.			
30								+ GEOTECHNICAL SAMPLE COLLECTED FROM 9-11' SS.			
35											

A-3205

COMMENTS BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS USING 6 1/4" HSA. SUBSEQUENTLY, WELL MW-26-003 WAS INSTALLED. 4 1/4" HSA WORE PULLED AND 6 1/4" HSA WERE USED FOR WELL INSTALLATION. D-6

PROJECT NO. 053529 1.17
BORING NO. WB-MW-26-003

URS CONSULTANTS, Inc.

TEST BORING LOG

PROJECT:	SS-026 EOD RANGE
CLIENT:	PLATTSBURGH AIR FORCE BASE
BORING CONTRACTOR:	BUFFALO DRILLING
BORING NO.	WB-MW-26-004
SHEET NO.	1 OF 1
JOB NO. :	0535291.17
BORING LOCATION:	N - 1693999.754 E - 721881.660
GROUND ELEVATION:	183.16'
DATE STARTED:	11-10-94 (1305)
DATE FINISHED:	11-10-94 (1325)
DRILLER:	ROGER KEPHART
GEOLOGIST:	STEVEN MOELLER
REVIEWED BY:	DUANE LEHARDT

GROUND WATER:

DATE	TIME	LEV	TYPE
11/10	1400	12.0'	BGS in 4¼" HSA advanced to 14' depth

	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS		
DIA.	4¼"	2"		
WT.		140#		
FALL		30"		

* POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	DESCRIPTION MATERIAL DESCRIPTION	CLASS USCS	PID Sample headspace (ppm)	REMARKS
		1	2" SS	1 1 / 2 2	25	LIGHT BROWN TO BROWN (ORANGE)	VERY LOOSE	FINE SAND, trace medium sand and silt (few faint orange mottles and laminae)	SP	0.2 / 0.1	SLIGHTLY MOIST
5		2	2" SS	2 3 / 3 3	50		LOOSE			0.2 / 0.1	
9											
10		+3	2" SS	1 3 / 4 3	80			Some silt	SM	0.2 / 0.1	WET
15											
16		4	2" SS	3 4 / 4 6	70					0.2 / NT	
20								BORING COMPLETED AT 16' DEPTH (AUGERS ADVANCED TO 14' DEPTH, SAMPLED TO 16' DEPTH.) NO ENVIRONMENTAL SAMPLES TAKEN + GEOTECHNICAL SAMPLE COLLECTED FROM 9-11'SS.			NT = Not taken
25											
30											
35											

A-3205

COMMENTS: BOREHOLE ADVANCED WITH A CME 55 RIG ON A 2WD TRUCK CHASSIS. USING 6¼ HSA. SUBSEQUENTLY, WELL MW-26-004 WAS INSTALLED 4¼" HSA WERE PULLED AND 6¼" HSA WERE ADVANCED TO 17.5' DEPTH TO INSTALL MW-26-004.

PROJECT NO. 0535291.17
BORING NO. WB-MW-26-004

URS CONSULTANTS, Inc.

TEST BORING LOG
BORING NO. MW-26-005
SHEET NO. 1 OF 1
JOB NO.: 01F0000049.10.16005
BORING LOCATION: N-169334.135 E-721990.134
GROUND ELEVATION: 180.06' amsl
DATE STARTED: 8-31-99
DATE FINISHED: 8-31-99
DRILLER: Les Darrow
GEOLOGIST: Scott Fischer
REVIEWED BY: DIANE LEWARK

PROJECT: PAFB- SS-026 EOD Range
CLIENT: AFCEE
BORING CONTRACTOR: Aquifer Drilling & Testing, Albany, N.Y.
GROUND WATER: water table

DATE	TIME	LEV	TYPE
8/31	1100	7.7'	bgs in HSA advanced to 28' depth

	TYPE	CAS.	SAMP	CORE	TUBE
TYPE	HSA	SS	(split spoon)		
DIA.	6¼"	2"			
WT.		140#			
FALL		30"			

• POCKET PENETROMETER READING

DEPTH FT	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY / ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	PID Sample Headspace (ppm)	REMARKS
5		1	SS	6 8 / 9 10	80	LIGHT BROWN	MEDIUM DENSE	FINE SAND	SP	0.2 / 0.2	some distinct orange mottles
10		2	SS	3 4 / 6 7	75		LOOSE TO MEDIUM DENSE			1.0 / 0.2	WET
15		3	SS	4 6 / 8 10	80	GRAY		trace silt		1.0 / 0.2	
		4	SS	7 7 / 9 15	90					0.8 / 0.3	
		5	SS	5 8 / 4 5	80					0.2 / 0.2	
20		6	SS	1/2'	60		VERY LOOSE	SILTY FINE SAND, trace clay	SM/ML	0.2 / 0.2	
	S	7	SS	1 2 / 4 2	60		LOOSE			0.2 / 0.2	
25	S	8	SS	3 2 / 3 6	95					0.2 / 0.2	
	S	9	SS	4 2 / 4 4	75					0.2 / 0.2	
29	S	10	SS	2 3 / 3 5	60		MEDIUM STIFF	SILTY CLAY	CL/CH	0.2 / 0.2	STICKY AND VERY PLASTIC
30							BORING COMPLETED @ 30' (HSA advanced to 28', sampled to 30')				
35							* NO ENVIRONMENTAL OR GEOTECHNICAL SAMPLES COLLECTED.				

A-3208

COMMENTS Boring advance with a truck-mounted Mobile B-61 drilling rig using 6¼" I.D. hollow stem augers (HSA). Monitoring well MW-26-005 installed in borehole.

PROJECT NO. 01F0000049.10.16005
BORING NO. MW-26-005

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SB-26-04

PROJECT: EOD Range (SS-026)

SHEET: 1 OF 1

CLIENT: PAFB-AFCEE

JOB NO.: 01F0000049.00.16005

BORING CONTRACTOR: Aquifer Drilling & Testing, Albany, N.Y.

BORING LOCATION: N-1693166.479 E-721881.241

GROUNDWATER: not encountered

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE	—	Split Spoon		
DIA.	—	2"		
WT.		140#		
FALL		30"		

*POCKET PENETROMETER READING

GROUND ELEVATION: 183.09'

DATE STARTED: 9-1-99

DATE FINISHED: 9-1-99

DRILLER: Les Darrow

GEOLOGIST: Scott Fischer

REVIEWED BY: Steven Moeller

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	DESCRIPTION: COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		1*	SS	1 3 / 3 2	75	BROWN	VERY LOOSE TO LOOSE	FINE SAND, trace medium sand	SP	Homogeneous (possibly regraded)
4		2*	SS	3 2 / 2 1	50					
5								Boring completed at 4' depth (back-to-back split spoons)		No PID readings above background
10							* Environmental samples SB-26-04-01 and SB-26-04-02 collected for dioxin, CN, and CS laboratory analyses.			
15							NOTE	This boring was performed at approximately the same location as previous boring SB-26-01.		
20										
25										
30										
35										

COMMENTS: Boring advanced with a skid-mounted CME-45 drill rig.

PROJECT NO.: 01F0000049.00

BORING NO.: SB-26-04

URSF-031H/1 OF 2/TBL/GCM

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SB-26-05

PROJECT: EOD Range (SS-026)

SHEET: 1 OF 1

CLIENT: PAFB - AFCEE

JOB NO.: 01F0000049.00.16005

BORING CONTRACTOR: Aquifer Drilling & Testing, Albany, N.Y.

BORING LOCATION: N-1693243.519 E-721821.493

GROUNDWATER: not encountered

GROUND ELEVATION: 183.38'

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	—	Split Spoon		
				DIA.	—	2"		
				WT.		140#		
				FALL		30"		
				*POCKET PENETROMETER READING				

DATE STARTED: 9-1-99

DATE FINISHED: 9-1-99

DRILLER: Les Darrow

GEOLOGIST: Scott Fischer

REVIEWED BY: Steven Moeller

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION: COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		1*	SS	1 2 / 4 7	85	BROWN	VERY LOOSE	FINE SAND, trace medium and coarse sand	SP	Orange banding last 6" of SS#1 and all of SS#2
							LOOSE TO MEDIUM DENSE			
4		2*	SS	4 4 / 4 7	80					
5								Boring completed at 4' depth (back-to-back split spoons)		No PID readings above background
10								*Environmental samples SB-26-05-01 and SB-26-05-02 collected for dioxin, CN, and CS laboratory analyses.		
15								NOTE This boring was performed at approximately the same location as previous boring SB-26-03.		
20										
25										
30										
35										

COMMENTS: Boring advanced with a skid-mounted CME-45 drill rig.

PROJECT NO.: 01F0000049.00

BORING NO.: SB-26-05

URSF-031H/1 OF 2/TBL/GCM

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SB-26-06
SHEET: 1 OF 1
PROJECT: EOD Range (SS-026)
CLIENT: PAFB-AFCEE
JOB NO.: 01F0000049.00.16005
BORING CONTRACTOR: Aquifer Drilling & Testing, Albany, N.Y.
BORING LOCATION: N-1693163.165 E-721734.322
GROUNDWATER: not encountered
GROUND ELEVATION: 183.38'
DATE STARTED: 9-1-99
DATE FINISHED: 9-1-99
DRILLER: Les Darrow
GEOLOGIST: Scott Fischer
REVIEWED BY: Steven Moeller

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	—	Split Spoon		
				DIA.	—	2"		
				WT.		140#		
				FALL		30"		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		1*	SS	1 2 / 2 2	90	BROWN	VERY LOOSE	FINE SAND, trace medium and coarse sand	SP	Homogeneous (possibly regraded)
4		2*	SS	1 1 / 1 1	80					
5								Boring completed at 4' depth (back-to-back split spoons)		No PID readings above background
10								* Environmental samples SB-26-06-01 and SB-26-06-02 collected for dioxin, CN, and CS laboratory analyses.		
15								NOTE This boring was performed at approximately the same location as previous boring. SB-26-02.		
20										
25										
30										
35										

COMMENTS: Boring advanced with a skid-mounted CME-45 drill rig.

PROJECT NO.: 01F0000049.00
BORING NO.: SB-26-06

URSF-031/W1 OF 2/TBL/GCM

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SS-026-CAS-1

PROJECT: FOD RANGE (SS-026)
SHEET: 1 OF 1
CLIENT: PAFB-AFCEE
JOB NO.: 01F00000 49.00.16005
BORING CONTRACTOR: ADT (ALBANY, N.Y.)
BORING LOCATION: N-1693286.948 E-721835.074
GROUNDWATER: ENCOUNTERED AT 8.6'
GROUND ELEVATION: 181.60'
DATE STARTED: 9-1-99
DATE FINISHED: 9-1-99
DRILLER: Les Darrow
GEOLOGIST: Scott Fischer
REVIEWED BY: S. Moeller

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Split Spoon		
				DIA.	4¼"	2 inch		
				WT.		140 lb		
				FALL		30 inches		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY / RQD %	DESCRIPTION: COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
0		1*	SS	2 2 / 3 3	75%	Brown	Loose	Fine sand, trace medium sand, few orange and gray bands	SP	Appears undisturbed
		2	SS	3 3 / 5 6	50%					
5		3	SS	3 3 / 4 4	80%					Moist
		4	SS	4 5 / 4 5	95%					
		5	SS	2 4 / 4 8	60%					Wet @ 8.6'
10								Boring completed at 10.0' (hollow-stem augers [HSA] advanced to 8' depth, sampled to 10')		No PID readings above background
15										
20										
25										
30										
35										

COMMENTS: Boring Advanced with skid-mounted CME-45.
* Sample submitted (SS-026-CAS-1, 0-2') for TD6, Arsenic, & Chloroform laboratory analyses.

PROJECT NO.: 01F00 000 49.00.16005
BORING NO.: SS-026-CAS-1

URSF-031H/1 OF 2/TBL/GCM

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SS-026-CAS-2

PROJECT: FOD RANGE (SS-026)

CLIENT: PAFB-AFCEE

BORING CONTRACTOR: ADT (Albany, N.Y.)

GROUNDWATER: NOT ENCOUNTERED.

DATE	TIME	LEVEL	TYPE

	CAS.	SAMPLER	CORE	TUBE
TYPE	HSA	SPLIT SPOON		
DIA.	4¼"	2 inch		
WT.		140 lb		
FALL		30 inches		

* POCKET PENETROMETER READING

SHEET: 1 OF 1

JOB NO.: 01F00000 49.00.1600S

BORING LOCATION: N-1693288.962 E-721861.933

GROUND ELEVATION: 180.61'

DATE STARTED: 9/1/99

DATE FINISHED: 9/1/99

DRILLER: Les Darrow

GEOLOGIST: Scott Fischer

REVIEWED BY: S. Moeller

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY RQD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
1.0		1	SS	2 2 / 4 4	80%	Brown	Loose	Regraded soil: fine sand	SP	HOMOGENEOUS
		2*	SS	4 4 / 6 8	50%	Brown	Loose	fine sand, trace medium sand, few orangish bands and mottles.	SP	APPEARS UNDISTURBED
5 6.0		3	SS	2 3 / 3 4	70%					MOIST
								Boring completed at 6.0' (hollow-stem augers [HSA] advanced to 4' depth, sampled to 6')		NO PID Readings Above Background

10 15 20 25 30 35

COMMENTS: Boring advanced with skid-mounted CME-45.
* sample submitted (SS-026-CAS-2 3'-4') for Arsenic, Chloroform, and TDG laboratory analyses.

PROJECT NO.: 01F00000 49.00.1600S

BORING NO.: SS-026-CAS-2

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SS-026-CAS-3

PROJECT: FOD RANGE (SS-026)
SHEET: 1 OF 1
CLIENT: PAFB.
JOB NO.: 01F00000 49.00.16005
BORING CONTRACTOR: ADT (ALBANY, N.Y.)
BORING LOCATION: N-1693221.334 E-721860.005
GROUNDWATER: NOT ENCOUNTERED
GROUND ELEVATION: 182.23'
DATE STARTED: 9-1-99
DATE FINISHED: 9-1-99
DRILLER: Les Darrow
GEOLOGIST: Scott Fischer
REVIEWED BY: S. Moeller

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	SPLIT SPOON		
				DIA.	4 1/4"	2 inch		
				WT.		140 lb		
				FALL		30 inches		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	DESCRIPTION COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
		1	SS	1 2 / 2 2	75	Brown	LOOSE	REGRADED SOIL & FILL: FINE SAND, TRACE MEDIUM TO COARSE SAND, CONCRETE		
		2	SS	3 3 / 1 1	50					
4.6'										
5		3*	SS	1 1 / 4 7	60	Light Brown	LOOSE	FINE SAND, TRACE MEDIUM SAND.	SP	MOIST APPEARS UNDISTURBED
8.0		4	SS	4 5 / 6 8	75					
10								Boring Completed at 8.0' (hollow-stem augers [HSA] advanced to 6' depth, sampled to 8')		NO PID READINGS ABOVE BACKGROUND
15										
20										
25										
30										
35										

COMMENTS: Boring Advanced with skid-mounted CME-45.
* SAMPLE SUBMITTED (SS-026-CAS-3, 5'-7') for Arsenic, TDG, and chloroform, and GN/CS laboratory analyses.

PROJECT NO.: 01F00000 49.00.16005
BORING NO.: SS-026-CAS-3

URSF-031H/1 OF 2/TBL/GCM

URS Greiner, Inc.

TEST BORING LOG

BORING NO.: SS-026-CAS-4

PROJECT: FOD RANGE (SS-026)
SHEET: 1 OF 1
CLIENT: PAFB.
JOB NO.: 01F00000 49.00.16005
BORING CONTRACTOR: ADT (ALBANY, N.Y.)
BORING LOCATION: N = 1693149.996 E = 721829.107
GROUNDWATER: ENCOUNTERED AT 11.0'
GROUND ELEVATION: 184.18'
DATE STARTED: 9-1-99
DATE FINISHED: 9-1-99
DRILLER: Les Darrow
GEOLOGIST: Scott Fischer
REVIEWED BY: S. Moeller

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE	HSA	Split Spoon		
				DIA.	4¼"	2 inch		
				WT.		140 lb		
				FALL		30 inches		
				* POCKET PENETROMETER READING				

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE TYPE	BLOWS PER 6"	RECOVERY ROD %	COLOR	CONSISTENCY HARDNESS	MATERIAL DESCRIPTION	CLASS USCS	REMARKS
0		1	SS	2 3 / 3 3	95%	Brown	LOOSE	REGRADED SOIL: FINE SAND, TRACE MEDIUM AND COARSE SAND	SP	HOMOGENEOUS
		2	SS	2 1 / 2 1	60%		VERY LOOSE			MOIST
5		3	SS	1 1/12" / 1 1	90%					
8.0		4	SS	1 1/12" / 1 1	75%					
		5*	SS	2 2 / 2 3	90%	ORANGE AND GRAY	VERY LOOSE TO LOOSE	FINE SAND, TRACE MEDIUM AND COARSE SAND.	SP	ALTERNATING ORANGE AND GRAY BANDS
10		6	SS	2 3 / 3 5	90%					WET @ 11'
12.0'								Boring Completed 12.0' (hollow-stem augers [HSA] advanced to 10' depth, sampled to 12')		NO PID READINGS ABOVE BACKGROUND
15										
20										
25										
30										
35										

COMMENTS: Boring Advanced with skid-mounted CME-45. Sample Submitted *(SS-026-CAS-4, 8'-9') for Arsenic, Chloroform, & TDG laboratory analyses.

PROJECT NO.: 01F00 000 49.00.16005
BORING NO.: SS-026-CAS-4

URSF-031H/1 OF 2/TBL/GCM

Appendix E

APPENDIX E
MONITORING WELL CONSTRUCTION DIAGRAMS

DRILLING SUMMARY

Geologist: Steve Moeller

Drilling Contractor: Buffalo Drilling Company

Driller: Roger Kephart

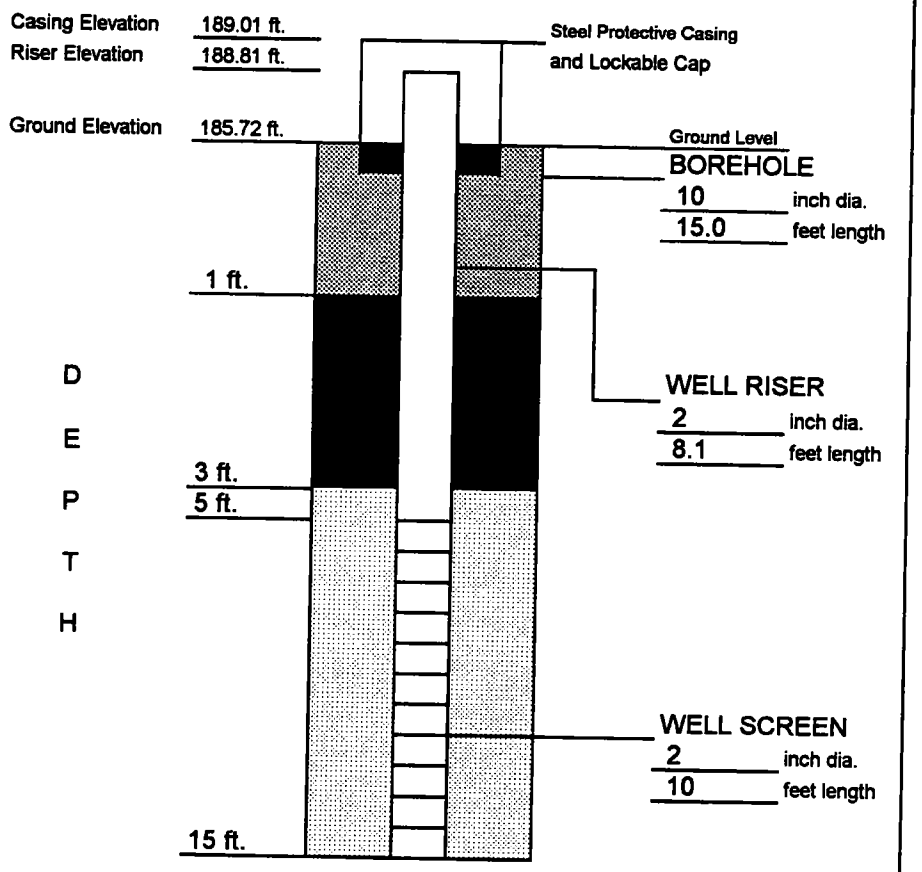
Drill Rig: CME 55

Date: 11/8/94

GEOLOGIC LOG

depth(ft.)	lithology
0 - 9'	Fine sand, trace to some silt, trace medium sand, clay and gravel
9' - 16'	Silty fine sand, trace clay

WELL DESIGN



NOT TO SCALE

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal Type #1: Cement-bentonite grout Setting: 0 - 1'
Monitor: Schedule 40 PVC	Slot Size: 0.010-inch	Seal Type #2: Bentonite pellets Setting: 1.0' - 3.0'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: Valve #00N Sand	Cored Interval: None	Cement/Bentonite Grout
Setting: 3.0' - 15.0'	Core Diameter: None	Bentonite Seal
	Reamed Diameter: None	Silica Sandpack

Client: **PAFB**	Project: **PAFB SS-026**	Project No.: **0535291.17**
URS Consultants, Inc.	**Monitoring Well Construction Details**	**Well Number:** MW-26-001

DRILLING SUMMARY

Geologist: Steve Moeller

Drilling Contractor: Buffalo Drilling Company

Driller: Roger Kephart

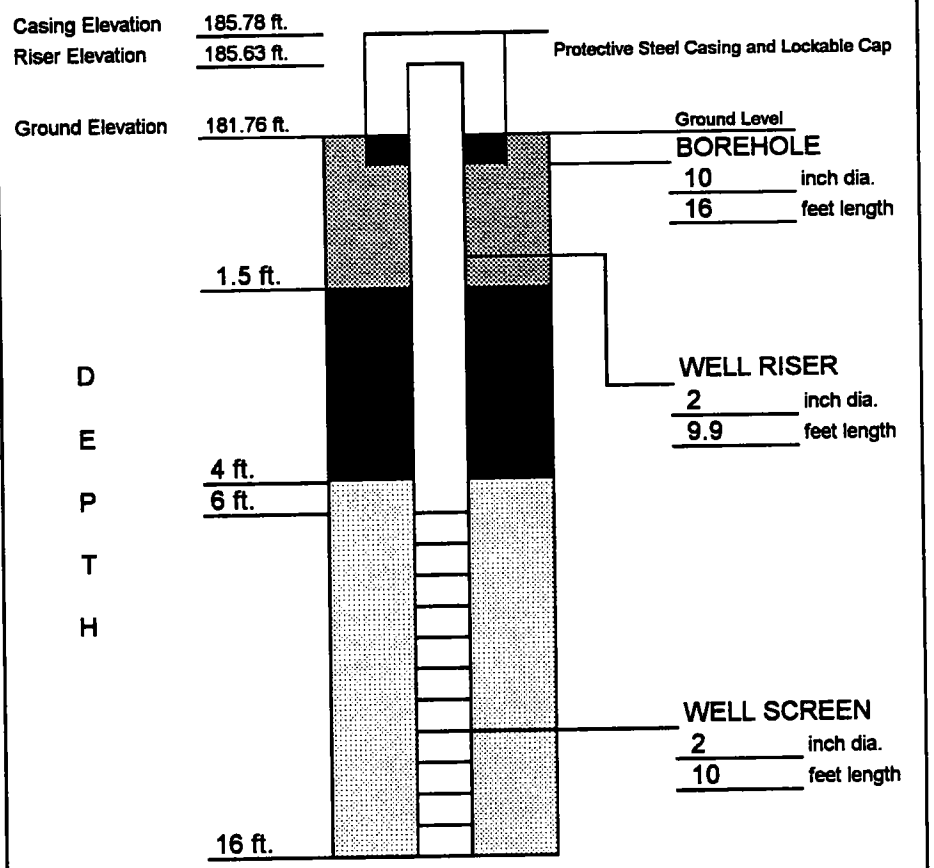
Drill Rig: CME 55

Date: 11/10/94

GEOLOGIC LOG

depth(ft.)	lithology
0 - 14'	Fine sand, trace medium sand
14' - 16'	Very fine to fine sand, trace silt

WELL DESIGN



NOT TO SCALE

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal Type #1: Cement-bentonite grout Setting: 0 - 1.5'
Monitor: Schedule 40 PVC	Slot Size: 0.010-inch	Seal Type #2: Bentonite pellets Setting: 1.5' - 4.0'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: Valve #00N Sand	Cored Interval: None	Cement/Bentonite Grout
Setting: 4.0' - 16.0'	Core Diameter: None	Bentonite Seal
	Reamed Diameter: None	Silica Sandpack

Client: PAFB	Project: PAFB SS-026	Project No.: 0535291.17
URS Consultants, Inc.	Monitoring Well Construction Details	Well Number: MW-26-002

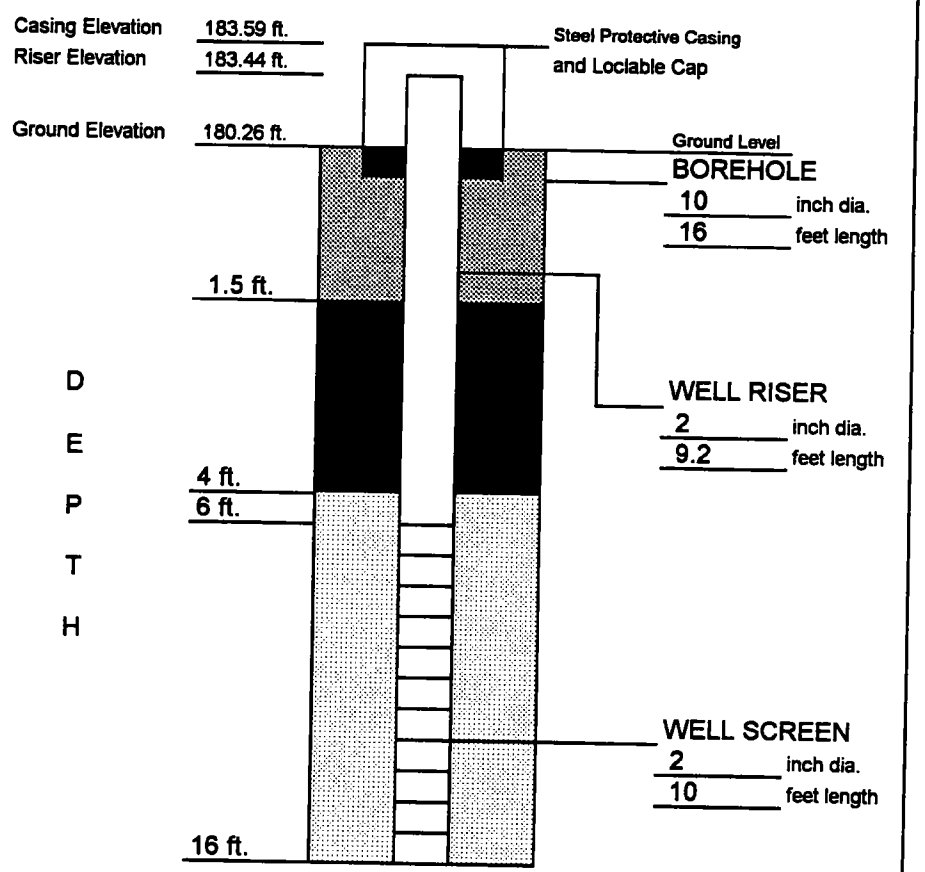
DRILLING SUMMARY

Geologist:	Steve Moeller
Drilling Contractor:	Buffalo Drilling Company
Driller:	Roger Kephart
Drill Rig:	CME 55
Date:	11/9/94

GEOLOGIC LOG

depth(ft.)	lithology
0 - 14.5'	Fine sand, trace to some medium sand
14.5' - 16.0'	Very fine to fine sand, trace silt

WELL DESIGN



NOT TO SCALE

CASING MATERIAL	*SCREEN MATERIAL*	*SEAL MATERIAL*
Surface: Steel	Type: Schedule 40 PVC	Seal Type #1: Cement-bentonite grout Setting: 0 - 1.5'
Monitor: Schedule 40 PVC	Slot Size: 0.010-inch	Seal Type #2: Bentonite pellets Setting: 1.5' - 4.0'

FILTER MATERIAL	*ROCK CORING*	*LEGEND*
Type: Valve #00N Sand	Cored Interval: None	Cement/Bentonite Grout
Setting: 4.0' - 16.0'	Core Diameter: None	Bentonite Seal
	Reamed Diameter: None	Silica Sandpack

Client: PAFB	Project: PAFB SS-026	Project No.: 0535291.17
URS Consultants, Inc.	Monitoring Well Construction Details	Well Number: MW-26-003

DRILLING SUMMARY

Geologist:
Steve Moeller

Drilling Contractor:
Buffalo Drilling Company

Driller:
Roger Kephart

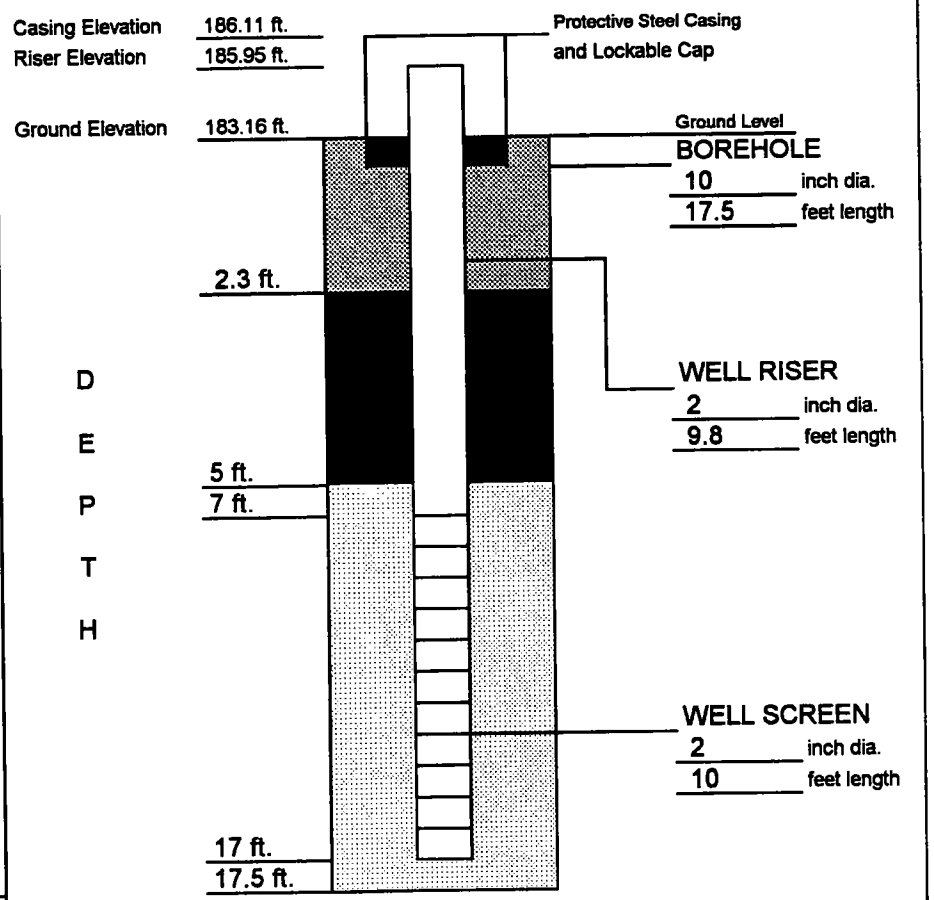
Drill Rig:
CME 55

Date:
11/10/94

GEOLOGIC LOG

depth(ft.)	lithology
0 - 9.0'	Fine sand, trace medium sand and silt
9.0' - 17.5'	Fine sand, some silt, trace medium sand

WELL DESIGN



CASING MATERIAL

Surface: Steel

Monitor: Schedule 40 PVC

SCREEN MATERIAL

Type: Schedule 40 PVC

Slot Size: 0.010-inch

SEAL MATERIAL

Seal Type #1: Cement-bentonite grout
Setting: 0 - 2.3'

Seal Type #2: Bentonite pellets
Setting: 2.3' - 5.0'

FILTER MATERIAL

Type: Valve #00N Sand

Setting: 5.0' - 17.5'

ROCK CORING

Cored Interval: None

Core Diameter: None

Reamed Diameter: None

LEGEND

Cement/Bentonite Grout

Bentonite Seal

Silica Sandpack

Client: PAFB	Project: PAFB SS-026	Project No.: 0535291.17
U R S Consultants, Inc.	Monitoring Well Construction Details	Well Number: MW-26-004

DRILLING SUMMARY

Geologist:
Scott Fischer

Drilling Company:
ADT

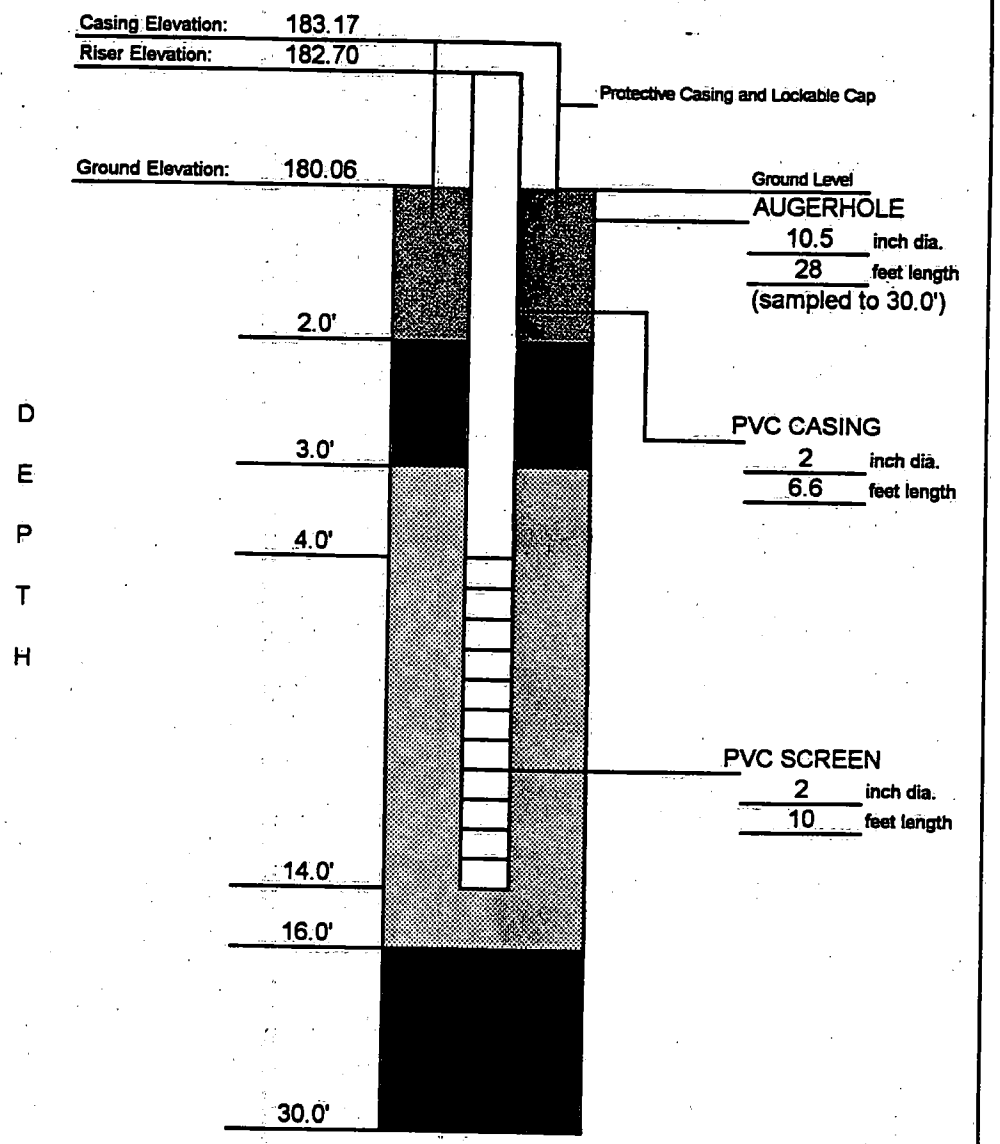
Driller:
Les Darrow

Rig Make/Model:
Mobil B-61

Date:
08/31/99

GEOLOGIC LOG

Depth(ft.)	Description
0-20.0	Fine sand
20.0-29.0	Silty fine sand
29.0-30.0	Silty clay



Not to Scale

WELL DESIGN

CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface: Steel Stick-up	Type: 2" Sch. 40 PVC	Type: Filpro #1 Silica sand — Setting: 3.0' - 16.0'
Monitor: 2" Sch. 40 PVC	Slot Size: 0.010 inch Setting: 4.0' - 14.0'	**SEAL MATERIAL** Type: Cement/ Bentonite Grout. — Setting: 0' - 2.0' Type: Bentonite Pellets. — Setting: 2.0' - 3.0', 16.0'-30.0'

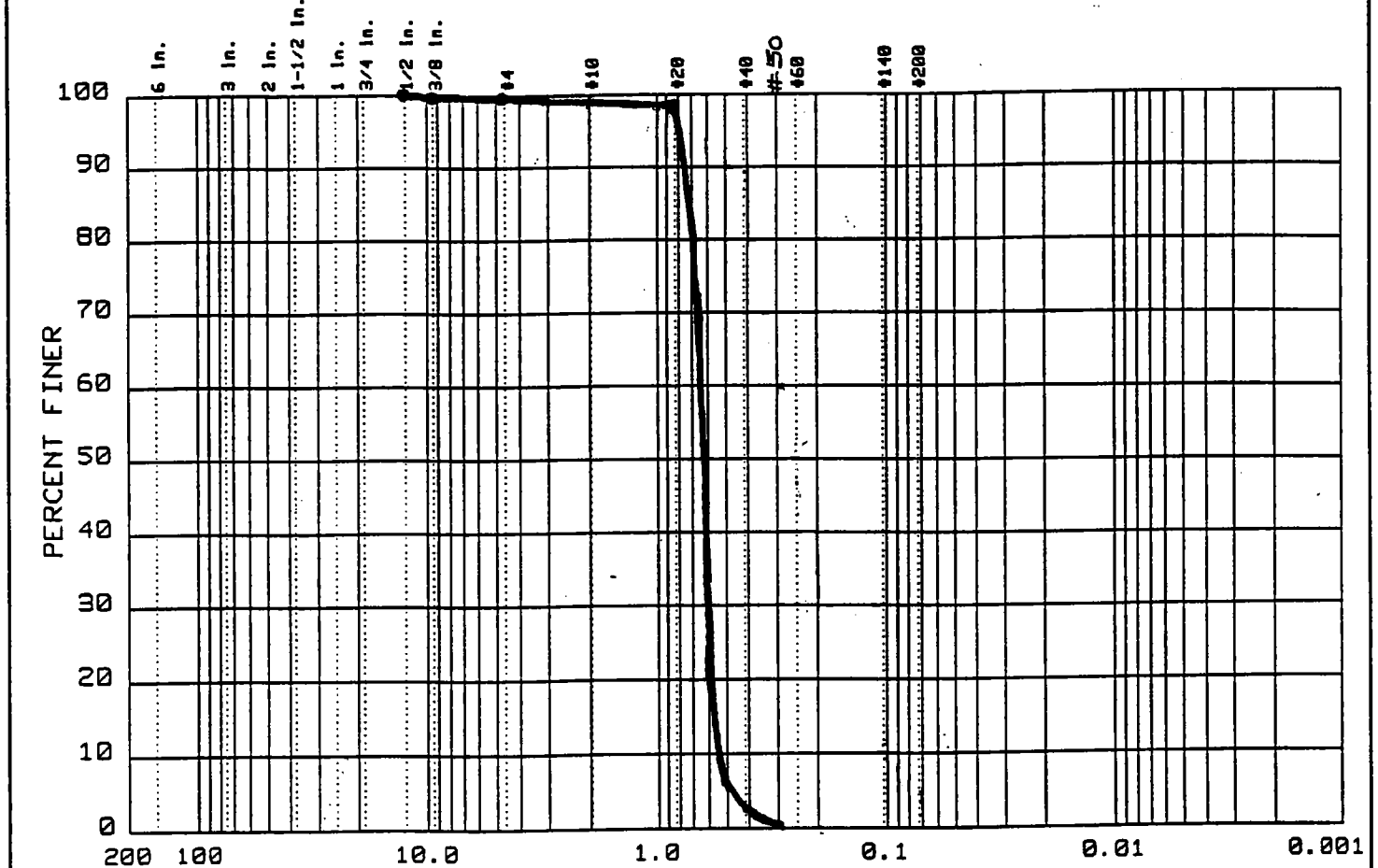
COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: AFCEE	Location: EOD Range	Project No.: 01F0000049.00
URS Consultants, Inc.	MONITORING WELL CONSTRUCTION DETAILS	Well Number: MW-26-005

GRAIN SIZE DISTRIBUTION TEST REPORT



	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	0.0	0.	99.7+	<0.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●										

MATERIAL DESCRIPTION	USCS	AASHTO
VALVE #OON SILICA SAND (used for 1994 SS-026 SI well sandpacks)	SP	

Project: PLATTSBURGH A.F.B. PLATTSBURGH, N.Y.

URS CONSULTANTS

GRAIN SIZE DISTRIBUTION CURVE

E-5

NORTHERN TECHNICAL SERVICES

8 East Main Street, Malone NY 12953

MONITOR WELL INSTALLATION DETAIL

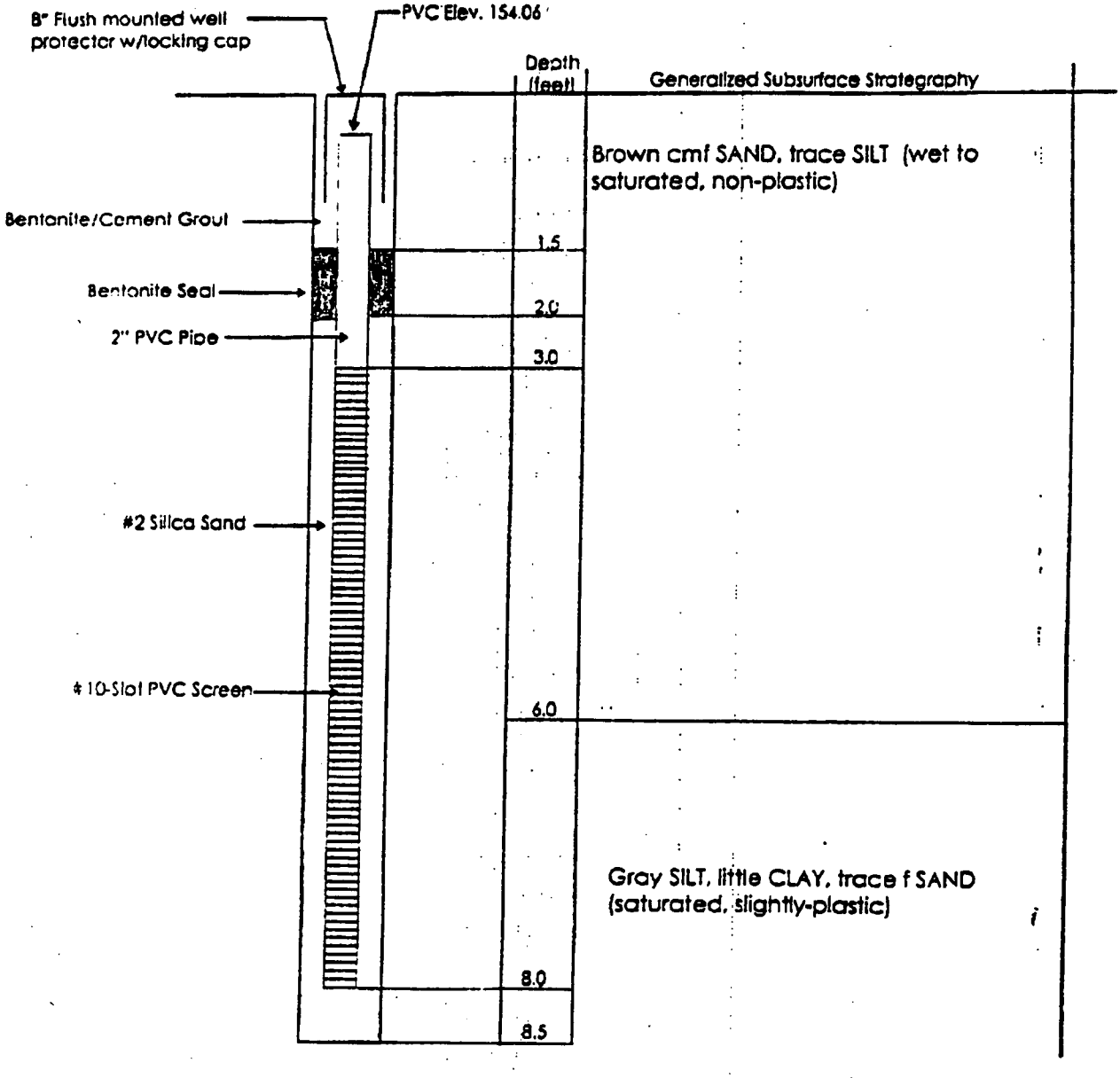
CLIENT: Air Force Base Conversion Agency
Plattsburgh, New York

Well No.: MW24-002R
NTS Report No. JN191-3-8-98

PROJECT: Plattsburgh Air Force Base
Landfill LF 024
Plattsburgh, New York

Date: 8/13/98

Driller: Chris Wheeler



MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. MW24-003

PROJECT PAFB | START DATE 11/23/92 | END DATE 11/23/92

PROJECT NO. 3285501 | FIELD GEOLOGIST Brad Gyory

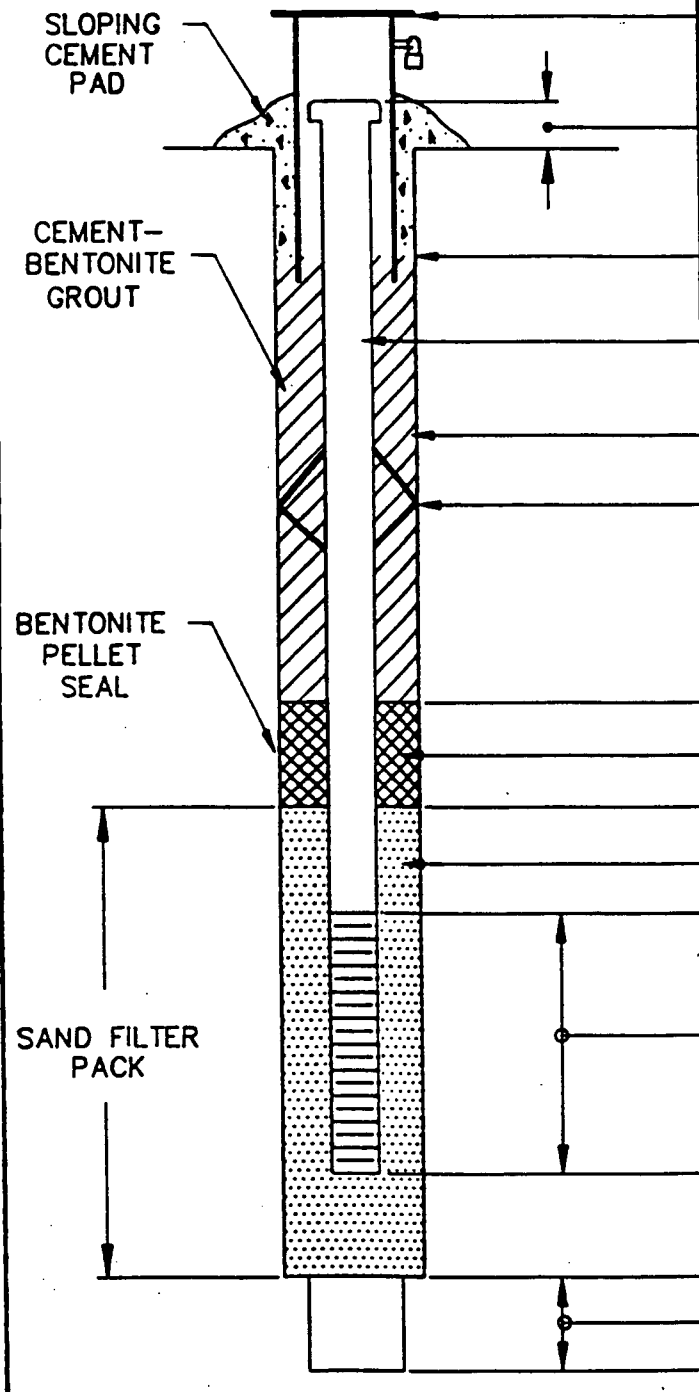
LOCATION LF-024 adjacent to MW24-003

DRILLING CO. Parratt Wolff, Inc.

DRILLER(S) Arnold Chapel

DRILLING METHOD(S) Slam Bar / Hammer

DEVELOPMENT METHOD(S) Possitive displacement pump



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING 2" steel

LOCKED? ✓ YES ___ NO

STICK-UP ~ 2.0'

DEPTH TO TOP OF GROUT/ BOTTOM OF CEMENT N/A

RISER DIAMETER AND MATERIAL 1.25" steel

BOREHOLE DIAMETER NA

DEPTH TO CENTRALIZERS NA

DEPTH N/A

PELLET SIZE N/A

DEPTH N/A

SAND SIZE N/A

DEPTH 0.5

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 1.25" 0.007 slot stainless steel

DEPTH 3.5

DEPTH N/A

BACKFILL MATERIAL N/A

BOTTOM OF BOREHOLE N/A

NOTE: DEPTHS ARE FEET BELOW GRADE

Depth to water = 2.72' on 12/2/92

OMWSHEET.DWG 9-20-90

NORTHERN TECHNICAL SERVICES

8 East Main Street, Malone NY 12953

MONITOR WELL INSTALLATION DETAIL

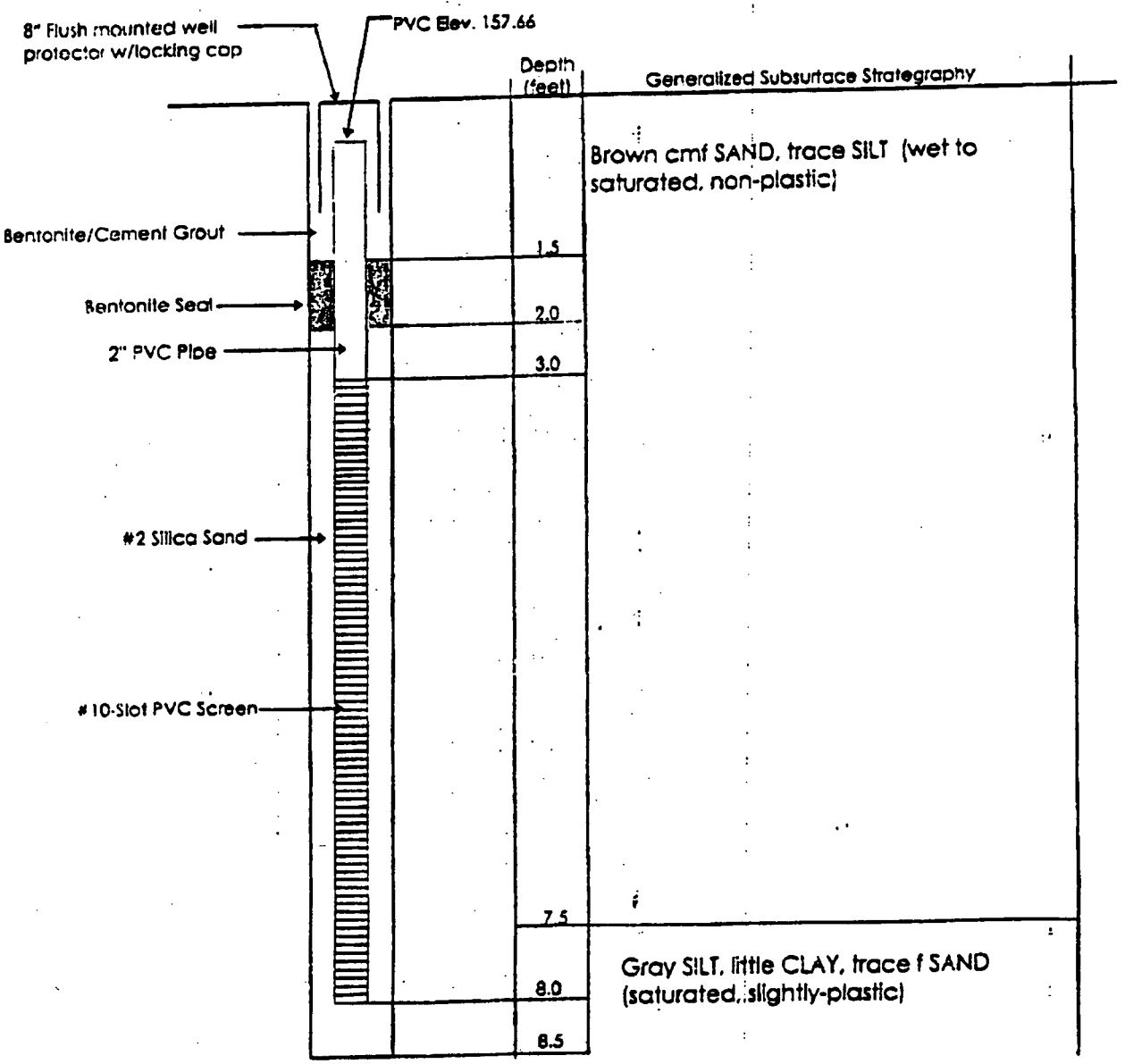
CLIENT: Air Force Base Conversion Agency
Plattsburgh, New York

Well No.: MW24-003R
NTS Report No. JN191-3-8-98

PROJECT: Plattsburgh Air Force Base
Landfill LF 024
Plattsburgh, New York

Date: 8/13/98

Driller: Chris Wheeler



MALCOLM PIRNIE

OVERBURDEN MONITORING WELL SHEET

WELL NO. MW24-004

PROJECT PAFB | START DATE 11/23/92 | END DATE 11/23/92

PROJECT NO. 3285 501 | FIELD GEOLOGIST Brad Gyory

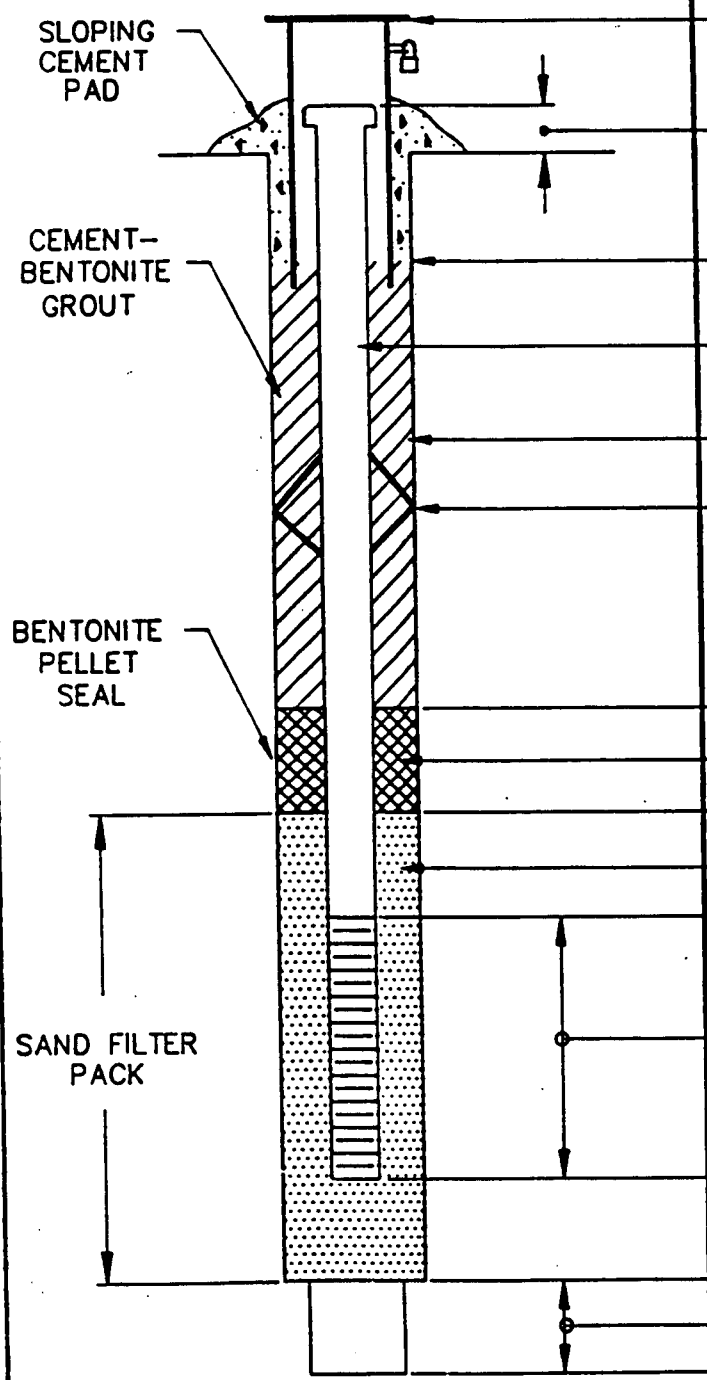
LOCATION LF-024 adjacent to MW24-004

DRILLING CO. Parratt Wolff, Inc.

DRILLER(S) Arnold Chapel

DRILLING METHOD(S) Slam Bar / Hammer

DEVELOPMENT METHOD(S) Possitive displacement pump



SIZE AND LENGTH OF LOCKABLE PROTECTIVE STEEL CASING 2" steel

LOCKED? ✓ YES ___ NO

STICK-UP ~ 2.0'

DEPTH TO TOP OF GROUT/BOTTOM OF CEMENT N/A

RISER DIAMETER AND MATERIAL 1.25" steel

BOREHOLE DIAMETER NA

DEPTH TO CENTRALIZERS NA

DEPTH N/A

PELLET SIZE N/A

DEPTH N/A

SAND SIZE N/A

DEPTH 0.7'

SCREEN DIAMETER, SLOT SIZE, AND MATERIAL 1.25" 0.007 slot stainless steel

DEPTH 3.7'

DEPTH N/A

BACKFILL MATERIAL N/A

BOTTOM OF BOREHOLE N/A

NOTE: DEPTHS ARE FEET BELOW GRADE

Depth to water = 3.5' on 11/25/92

OMWSHEET.DWG 9-20-90

NORTHERN TECHNICAL SERVICES

8 East Main Street, Malone NY 12953

MONITOR WELL INSTALLATION DETAIL

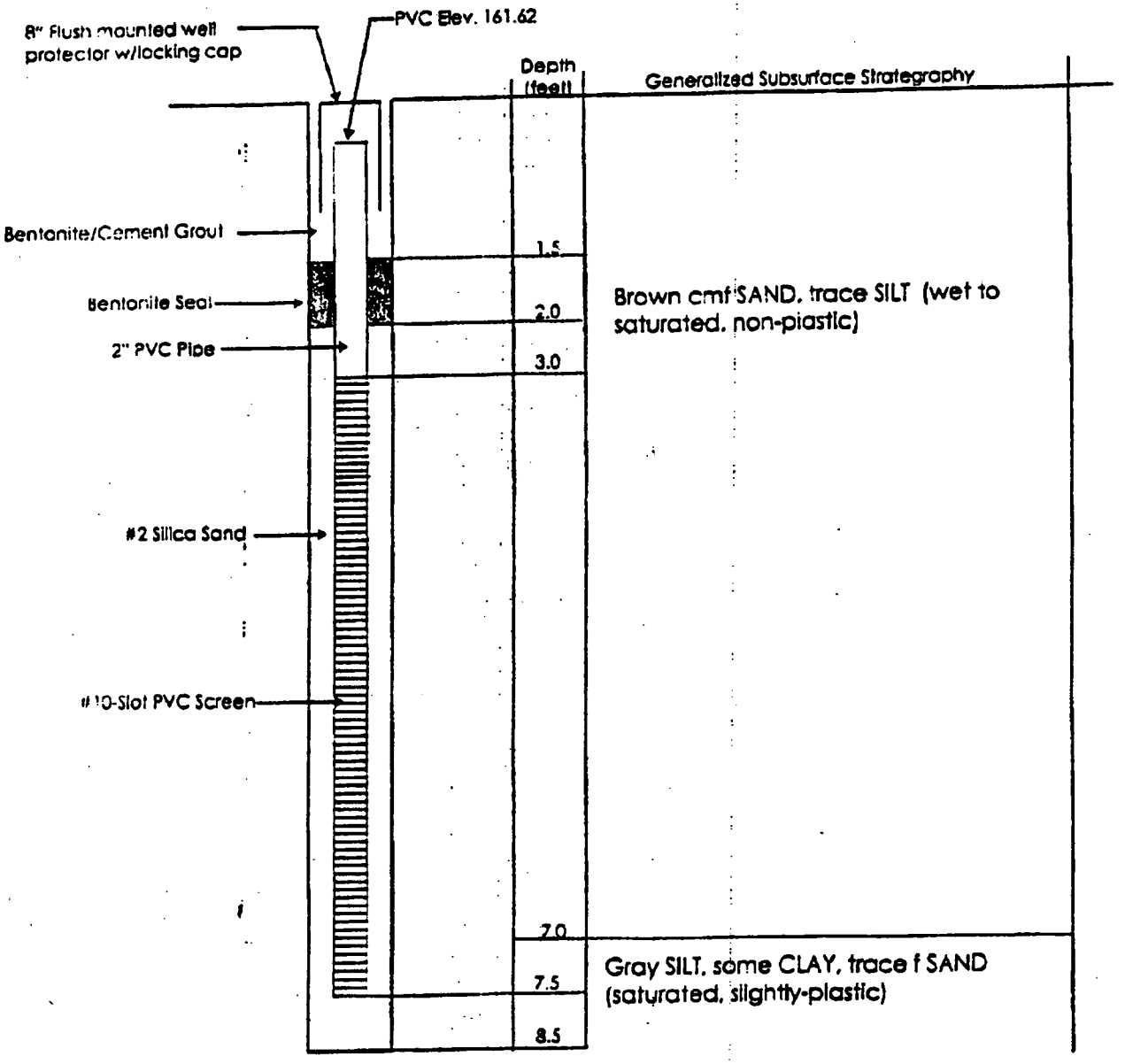
CLIENT: Air Force Base Conversion Agency
Plattsburgh, New York

Well No.: MW24-004R
NTS Report No. JN191-3-8-98

PROJECT: Plattsburgh Air Force Base
Landfill LF 024
Plattsburgh, New York

Date: 8/13/98

Driller: Chris Wheeler



NORTHERN TECHNICAL SERVICES

8 East Main Street, Malone NY 12953

MONITOR WELL INSTALLATION DETAIL

CLIENT: Air Force Base Conversion Agency
Plattsburgh, New York

Well No.: MW24-005
NTS Report No. JN191-3-8-98

PROJECT: Plattsburgh Air Force Base
Landfill LF 024
Plattsburgh, New York

Date: 8/14/98

Driller: Chris Wheeler

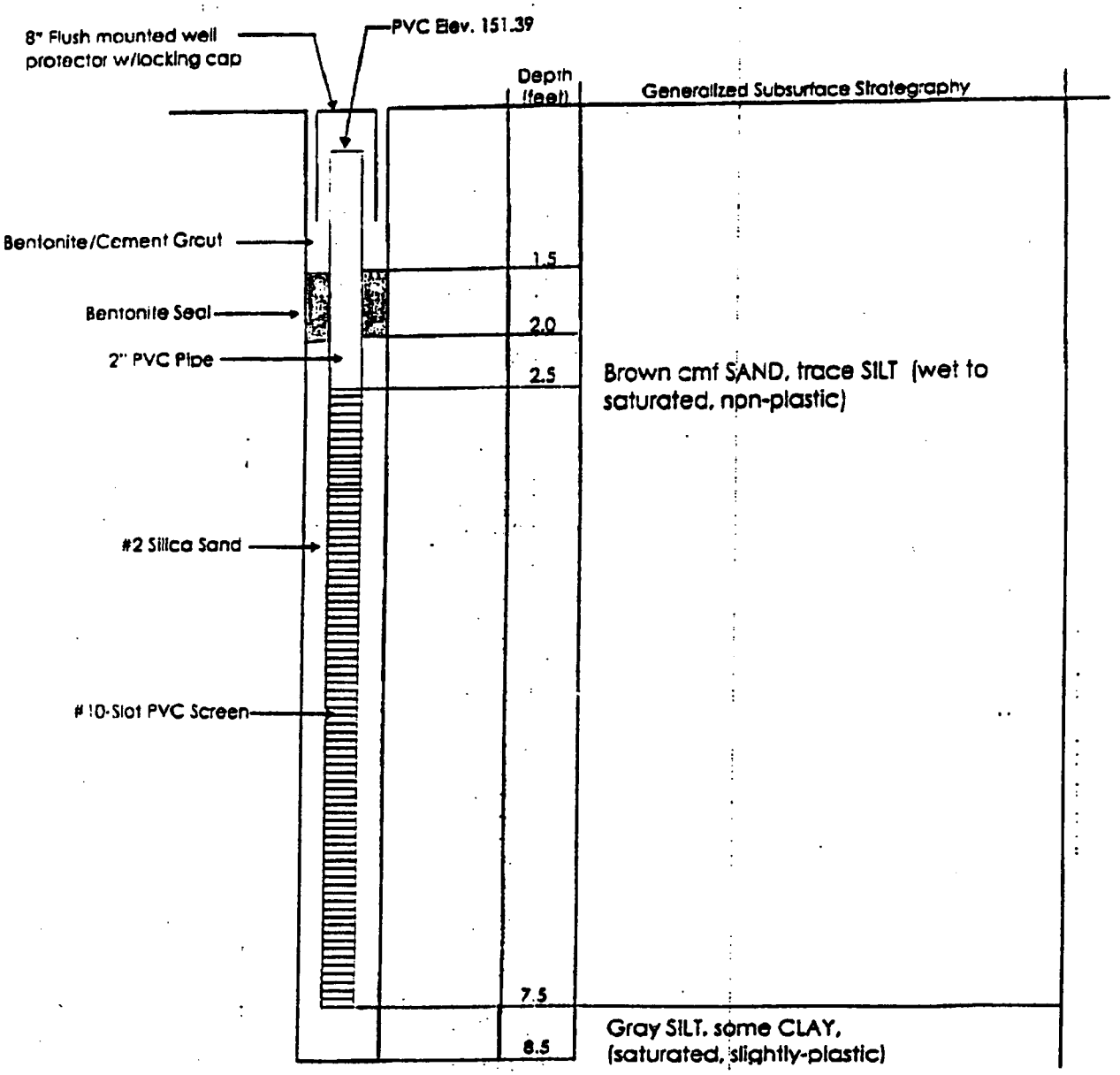


TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
25PLTW2		08/09/1995	NA	NA	NA	47.00	50	NA	NA	NA	NA	NA	NA	50.00	NA	NA	NA
26PLTW3	B	08/09/1995	232.73	232.73	232.54	42.00	45	NA	NA	NA	NA	NA	NA	45.00	NA	NA	NA
27PLTW4	A	08/09/1995	234.06	234.06	233.85	37.00	40	NA	NA	NA	NA	NA	NA	40.00	NA	NA	NA
28PLTW4	A	08/09/1995	234.07	234.07	233.85	22.00	25	NA	NA	NA	NA	NA	NA	25.00	NA	NA	NA
29PLTW5	B	08/09/1995	214.14	214.14	213.92	42.00	45	NA	NA	NA	NA	NA	NA	45.00	NA	NA	NA
30PLTW6	B	08/09/1995	191.69	191.69	191.58	32.00	35	NA	NA	NA	NA	NA	NA	35.00	NA	NA	NA
31PLTW11	B	08/09/1995	229.38	229.38	229.20	52.00	55	NA	NA	NA	NA	NA	NA	55.00	NA	NA	NA
32PLTW12	A	08/09/1995	204.72	204.72	204.62	15.00	18	NA	NA	NA	NA	NA	NA	18.00	NA	NA	NA
33PLTW12	B	08/09/1995	204.71	204.71	204.47	27.00	30	NA	NA	NA	NA	NA	NA	30.00	NA	NA	NA
34PLTW12	B	08/09/1995	204.71	204.71	204.50	37.00	40	NA	NA	NA	NA	NA	NA	40.00	NA	NA	NA
35PLTW13	B	08/09/1995	194.76	194.76	194.57	22.00	25	NA	NA	NA	NA	NA	NA	25.00	NA	NA	NA
36PLTW14	A	08/09/1995	187.92	187.92	187.72	17.00	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
37PLTW15	A	08/09/1995	184.21	184.21	183.99	7.00	10	NA	NA	NA	NA	NA	NA	10.00	NA	NA	NA
38PLTW15	B	08/09/1995	184.19	184.19	183.99	27.00	30	NA	NA	NA	NA	NA	NA	30.00	NA	NA	NA
39PLTW16	A	08/09/1995	183.30	183.30	183.12	17.00	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
40PLTW7	A	08/09/1995	195.76	195.76	195.56	27.00	30	NA	NA	NA	NA	NA	NA	30.00	NA	NA	NA
41PLTW10	A	08/09/1995	203.35	203.35	203.15	27.00	30	NA	NA	NA	NA	NA	NA	30.00	NA	NA	NA
42PLTW9	A	08/09/1995	212.62	212.62	212.41	12.00	15	NA	NA	NA	NA	NA	NA	15.00	NA	NA	NA
43PLTW9	A	08/09/1995	212.62	212.62	212.52	5.00	8	NA	NA	NA	NA	NA	NA	8.00	NA	NA	NA
44PLTW1	A	08/09/1995	223.06	223.06	222.87	22.00	25	NA	NA	NA	NA	NA	NA	25.00	NA	NA	NA
45PLTW1	B	08/09/1995	222.89	222.89	222.69	37.00	40	NA	NA	NA	NA	NA	NA	40.00	NA	NA	NA
46PLTW8	B	08/09/1995	219.94	219.94	219.75	22.00	25	NA	NA	NA	NA	NA	NA	25.00	NA	NA	NA
47PLTW22	B	08/09/1995	182.18	182.18	181.93	32.00	35	NA	NA	NA	NA	NA	NA	35.00	NA	NA	NA
48PLTW22	B	08/09/1995	182.06	182.06	181.86	36.00	39	NA	NA	NA	NA	NA	NA	39.20	NA	NA	NA
49PLTW22	B	08/09/1995	182.02	182.02	181.89	19.00	22	NA	NA	NA	NA	NA	NA	22.00	NA	NA	NA
50PLTW5		08/09/1995	NA	NA	NA	42.90	45.90	NA	NA	NA	NA	NA	NA	45.90	NA	NA	NA
51PLTW6		08/09/1995	NA	NA	NA	36.50	39.50	NA	NA	NA	NA	NA	NA	39.50	NA	NA	NA
52PLTW7		08/09/1995	NA	NA	NA	17.00	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
53PLTW8		08/09/1995	NA	NA	NA	43.00	46	NA	NA	NA	NA	NA	NA	46.00	NA	NA	NA
54PLTW6		08/09/1995	NA	NA	NA	43.10	46.1	NA	NA	NA	NA	NA	NA	46.10	NA	NA	NA
55PLTW17	B	08/09/1995	215.58	215.58	215.15	62	65	NA	NA	NA	NA	NA	NA	65.00	NA	NA	NA
56PLTW17	B	08/09/1995	215.56	215.56	215.23	32	35	NA	NA	NA	NA	NA	NA	35.00	NA	NA	NA
57PLTW17	A	08/09/1995	215.48	215.48	215.28	22	25	NA	NA	NA	NA	NA	NA	25.00	NA	NA	NA
58PLTW18	B	08/09/1995	208.32	208.32	208.05	52	55	NA	NA	NA	NA	NA	NA	55.00	NA	NA	NA

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BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
59PLTW19	B	08/09/1995	200.34	200.34	200.13	62	65	NA	NA	NA	NA	NA	NA	62.80	NA	NA	NA
60PLTW19	B	08/09/1995	200.25	200.25	199.89	32	35	NA	NA	NA	NA	NA	NA	35.00	NA	NA	NA
61PLTW19	A	08/09/1995	200.24	200.24	199.84	17	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
62PLTW20	B	08/09/1995	194.18	194.18	193.93	32.80	35.8	NA	NA	NA	NA	NA	NA	35.80	NA	NA	NA
63PLTW20	A	08/09/1995	194.19	194.19	193.64	17.00	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
64PLTW9		08/09/1995	NA	NA	NA	53.20	56.2	NA	NA	NA	NA	NA	NA	56.20	NA	NA	NA
65PLTW9		08/09/1995	NA	NA	NA	46.60	49.6	NA	NA	NA	NA	NA	NA	49.60	NA	NA	NA
66PLTW9		08/09/1995	NA	NA	NA	40.00	43	NA	NA	NA	NA	NA	NA	43.00	NA	NA	NA
67PLTW9		08/09/1995	NA	NA	NA	49.40	52.4	NA	NA	NA	NA	NA	NA	52.40	NA	NA	NA
68PLTW21	B	08/09/1995	195.74	195.74	195.51	32.00	35	NA	NA	NA	NA	NA	NA	35.00	NA	NA	NA
69PLTW21	A	08/09/1995	195.74	195.74	195.63	17.00	20	NA	NA	NA	NA	NA	NA	20.00	NA	NA	NA
B-02-501		12/19/1995	142.32	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	19	1	14	NE
B-02-502		05/31/1996	226.01	NA	NA	NA	NA	NA	NA	NA	NA	50	67.5	68	67.5	NE	NE
B-02-503		05/23/1996	158.65	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	27	26	NE	NE
B-02-504		06/11/1996	262.56	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	7	NE	5	NE
BSW-1	A	11/01/1996	NA	NA	NA	11,18,26	12,19,27					NA	NA	30	NA	NA	NA
BSW-2	A	11/01/1996	NA	NA	NA	11,18,26	12,19,27					NA	NA	27.25	NA	NA	NA
BV-1	A	11/01/1996	NA	NA	NA	3.0	3.25					NA	NA	3.5	NA	NA	NA
BV-2	A	11/01/1996	NA	NA	NA	3.0	3.25					NA	NA	3.5	NA	NA	NA
EPA-B-1		/ /	139.34	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	4.15	3.65	NE	NE
EPA-B-2		/ /	141.92	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	4.85	4.60	NE	NE
EPA-B-3		/ /	140.43	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	4.25	3.75	NE	NE
EW-1	A	10/16/1996	NA	NA	NA	3	28	2	28.5	0.7	2	NE	NE	30	NE	NE	NE
MP-1	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MP-1A	A	06/11/1996	259.96	NA	NA	9,22,35	11,24,37					NE	NE	37	NE	NE	NE
MP-2	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MP-2A	A	06/12/1996	253.47	NA	NA	9,18,27	11,20,29					NE	NE	29	NE	NE	NE
MP-3	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MP-3A	A	06/12/1996	245.96	NA	NA	9,15,21	11,17,23					NE	NE	23	NE	NE	NE
MP-4	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MP-4A	A	06/13/1996	243.60	NA	NA	9,14,20	11,16,22					NE	NE	22	NE	NE	NE
MP-5	A	11/01/1996	NA	NA	NA	3.0,9.0	3.5,9.5					NA	NA	10	NA	NA	NA
MP-6	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MP-7	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA

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MP-8	A	11/01/1996	NA	NA	NA	3.0	3.5					NA	NA	4	NA	NA	NA
MW-02-001	A	11/08/1987	252.30	252.3	252.18	33	43	30	46	27	30	NE	NE	46	NE	NE	NE
MW-02-002	A	11/10/1987	250.80	250.79	250.63	30	40	28	42	25	28	NE	NE	42	NE	NE	NE
MW-02-003	A	11/16/1987	251.00	251.04	250.91	30	40	27	42	25	27	NE	NE	42	NE	NE	NE
MW-02-004	A	11/03/1987	254.20	257.16	256.93	34.8	44.8	32.8	47.7	30.8	32.8	NE	NE	48	NE	NE	NE
MW-02-005	A	11/04/1987	249.10	251.08	250.92	32.5	42.5	30	44	28	30	NE	NE	44	NE	NE	NE
MW-02-006	A	11/03/1987	245.80	248.78	248.62	27	37	25	39	23	25	NE	NE	44	NE	NE	NE
MW-02-007	B	11/19/1987	245.80	248.83	248.69	64	74	64	79	55	60	74	81	124	81	87.5	124
MW-02-008	A	11/05/1987	257.40	260.44	260.25	35.5	45.5	32	48	30	32	NE	NE	48	NE	NE	NE
MW-02-009	A	11/19/1987	254.20	257.22	256.98	34	44	32	45	30	32	40	NA	45	NE	NE	NE
MW-02-010	A	11/20/1987	260.90	263.93	263.74	41	51	38	52	36	38	NE	NE	52	NE	NE	NE
MW-02-011	A	11/22/1988	258.32	260.55	260.48	39	54	36.7	55	34.7	36.7	NE	NE	55	NE	NE	NE
MW-02-012	A	11/30/1988	252.88	252.59	252.10	34	49	30.5	51	28.5	30.5	NE	NE	51	NE	NE	NE
MW-02-013	A	11/30/1988	256.61	256.16	255.54	33.5	48.5	30.5	51	29.5	30.5	NE	NE	51	NE	NE	NE
MW-02-014	A	12/01/1988	251.29	254.01	253.78	29	45	27	46	25	27	NE	NE	51	NE	NE	NE
MW-02-015	A	12/02/1988	253.77	256.87	256.25	31	47	29	46	27	29	NE	NE	51	NE	NE	NE
MW-02-016	A	12/02/1988	265.19	267.35	267.33	41	56	38.5	57	36.5	38.5	NE	NE	57	NE	NE	NE
MW-02-017	A	11/29/1988	248.02	250.52	250.44	27	42	24.5	43	22.5	24.5	NE	NE	43	NE	NE	NE
MW-02-018	A	12/01/1988	243.05	245.79	245.75	24	39	22	39.5	20	22	NE	NE	42	NE	NE	NE
MW-02-019	A	12/02/1988	228.20	228.2	227.93	9	24	7	26	5	7	NE	NE	26	NE	NE	NE
MW-02-020	B	12/02/1988	227.58	230.26	230.16	30	40	27	40.5	20	27	50	62	64	62	NE	NE
MW-02-021	A	11/18/1988	189.49	193.93	193.85	7	17	5	17.5	3	5	33	NA	35	NE	NE	NE
MW-02-022	B	11/19/1988	189.49	191.83	191.75	20	30	17	32	11	17	NE	NE	32	NE	NE	NE
MW-02-023	B	11/22/1988	206.97	206.97	206.62	43	53	39	53	33	39	54	55	56	55	NE	NE
MW-02-024	B	12/04/1988	254.09	257.38	257.22	76	86	72	89	66	72	NE	NE	91	89	NE	NE
MW-02-025	A	11/29/1988	254.67	259.39	259.45	33	49	31	50	29	31	NE	NE	50	NE	NE	NE
MW-02-026	A	11/30/1988	271.60	274.10	274.06	47	62	45	63	42.9	46	NE	NE	63	NE	NE	NE
MW-02-027	B	11/29/1988	271.77	274.30	274.22	82.5	92.5	79	92.5	73	79	NE	NE	96	93	NE	NE
MW-02-028	A	12/03/1988	257.08	260.09	259.84	35	50.3	33	50.5	31	33	NE	NE	51	NE	NE	NE
MW-02-029	B	12/02/1988	257.63	260.35	260.23	77	87	74	91	86	74	NE	NE	91	88	NE	NE
MW-02-030	B	12/02/1988	226.99	229.77	229.55	45.5	55.5	40.3	56	33	40.3	50	62	56	NE	NE	NE
MW-02-031	A	12/04/1988	251.06	251.06	250.81	29	44	26.5	46	24.5	26.5	NE	NE	46	NE	NE	NE
MW-02-032	A	01/01/1989	257.53	259.53	NA	35	60	32	63	29	32	NE	NE	63	NE	NE	NE
MW-02-033	B	01/04/1991	258.12	260.12	259.95	81	91	78	92.3	0	78	84	90.5	96	90.5	NE	NE

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MW-02-034	B	12/21/1990	249.09	251.77	251.7	71.5	81.5	68.5	86	0	68.5	80	81	88.5	81	NE	NE
MW-02-035	B	01/07/1991	250.06	250.06	249.36	74	84	70.5	85.5	0	70.5	80	82	85.5	82	NE	NE
MW-02-036	A	01/06/1991	250.11	250.11	249.41	27.7	42.6	25.2	43	0	25.5	NE	NE	46	NE	NE	NE
MW-02-037	A	08/09/1991	228.4	228.41	228.01	25	35	22	37	6	22	NA	NA	37	NA	NA	NA
MW-02-038	B	08/08/1991	228.4	228.41	227.97	45	55	42	57	6	42	NA	NA	57	NA	NA	NA
MW-02-039	B	08/09/1991	226.76	227	226.25	40	50	37	57.5	5	37	NA	NA	57.5	NA	NA	NA
MW-02-040	A	08/09/1991	209.42	209.58	209.02	20	30	16.4	31	5	16.4	NA	NA	31	NA	NA	NA
MW-02-041	B	08/10/1991	210.11	210.24	209.05	35	45	31.5	46	5	31.5	NA	NA	46	NA	NA	NA
MW-02-042	B	08/10/1991	209.31	209.33	208.76	52	62	49	63	4	49	NA	NA	63	NA	NA	NA
MW-02-043	A	08/12/1991	185.90	185.98	185.47	15	25	11.5	26	4	11.5	30	34	40	34	NE	NE
MW-02-044	A	08/10/1991	190.79	191.13	190.24	19	29	15.5	33	5	15.5	NA	NA	37.5	33	NE	NE
MW-02-045	A	08/12/1991	182.11	182.13	181.65	13.4	23.4	10	24	4	10	NA	NA	24	NA	NA	NA
MW-02-046	B	08/13/1991	211.83	211.79	211.38	35.5	45.5	32	46.5	5	32	NA	NA	46.5	NE	NE	NE
MW-02-047	B	08/13/1991	200.07	200.13	199.59	25.5	35.5	22.5	36.6	4	22.5	NA	NA	36.6	NA	NA	NA
MW-02-048	A	08/13/1991	185.51	185.72	185.09	5.5	20.5	4	21.5	2.5	4	20	24	26.5	24	NE	NE
MW-02-049	A	08/12/1991	190.03	190.01	189.52	25.5	35.5	22.2	36.5	4	22.2	NA	NA	36.5	NA	NA	NA
MW-02-050	A	12/15/1995	137.56	139.78	139.78	2	4.5	1.5	5.5	0.75	1.5	1	4.5	21	4.5	19	NE
MW-02-051	C	12/15/1995	137.65	139.64	139.64	19	29	17	31	14	17	1	4.5	57	4.5	19	22
MW-02-052	C	09/19/1996	172.75	172.77	172.58	44	54	39	55	35	39	NE	NE	60	25	37	NE
MW-02-053	D	08/19/1996	142.47	142.47	142.31	131.5	141.5	125.9	142	121.9	125.9	0	1.5	142	1.5	14	117
MW-02-054	D	07/26/1996	143.78	145.47	144.30	58	68	55.5	70	49.5	55.5	NE	NE	70	5	21	47
MW-02-055	A	05/23/1996	171.76	171.76	171.25	3	13	2	14	1	2	7	14	17	14	NE	NE
MW-02-056	D	07/12/1996	167.47	167.47	167.21	26.5	36.5	25	38.5	23.5	25	5	12	46.5	12	17	23
MW-02-057	A	06/05/1996	185.73	185.73	185.28	2	12	1	13	0.5	1	16	18	21	18.0	NE	NE
MW-02-058	D	07/24/1996	149.06	152.29	150.03	47	57	46	58	43	46	NE	NE	68	8	22	39
MW-02-059	A	05/16/1996	172.16	172.16	172.63	2	12	1.6	14	1	1.6	NE	NE	22	20.5	NE	NE
MW-02-060	A	05/16/1996	197.48	200.29	200.06	3.5	13.5	2.6	15	1	2.6	33	37	39	37.0	NE	NE
MW-02-061	A	05/21/1996	223.15	223.15	222.89	12	22	9.5	25	5.5	9.5	NE	NE	52	50.0	NE	NE
MW-02-062	A	05/22/1996	264.35	266.00	265.79	10	20	8	21	4	8	NE	NE	22	21.0	NE	NE
MW-02-063	A	06/12/1996	298.79	298.79	298.08	3	13	2	14	1	2	NE	NE	22	17.0	NE	NE
MW-02-064	C	08/02/1996	270.28	270.28	269.95	68	73	65	75	61	65	NE	NE	106	40.5	57	69
MW-02-065	A	05/21/1996	270.03	270.03	269.61	26	36	23	37	18.9	23	NE	NE	42	40.5	NE	NE
MW-02-066	C	09/19/1996	167.28	167.36	166.94	18.5	23.5	17.5	23.8	15.5	17.5	5	11	25	12	17	23
MW-02-067	A	05/29/1996	140.47	142.75	142.58	2.5	5.5	2	6	1	2	NE	NE	6	5.5	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

NA - Not Available / Applicable
NE - Not Encountered
NC - No Casing

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-02-068	D	07/18/1996	140.43	143.00	142.83	73	88	69.5	90	63	69.5	NE	NE	90	5	30	60
MW-02-070	A	/ /	258.82	258.17	258.48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-02-071	A	/ /	258.65	257.93	258.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-02-072	A	/ /	257.82	257.06	257.42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-02-073	A	05/29/1996	186.24	186.24	185.90	4	14	3	15	1	3	27	30.5	32	30.5	NE	NE
MW-02-073A	A	/ /	257.53	257.35	257.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-02-074	A	05/28/1996	187.08	187.08	186.56	4	14	3	15	1	3	30	33	34	33	NE	NE
MW-02-074A	A	/ /	257.58	257.58	257.32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-02-075	C	09/18/1996	155.24	155.37	155.09	59	69	56	70	53	56	8	9.5	72	9.5	25	NE
MW-02-075A	A	06/17/1996	246.63	249.57	249.42	19	39	17	39	14	17	NE	NE	39	NE	NE	NE
MW-02-076	A	06/11/1996	150.33	152.70	152.53	2.5	5.5	2	6	1	2	NE	NE	8	7.0	NE	NE
MW-02-076A	A	06/17/1996	250.84	250.80	250.47	23	43	21	43	17	21	NE	NE	43	NE	NE	NE
MW-02-077	D	08/20/1996	149.46	152.08	151.02	154	164	150	164.5	144	150	NE	NE	164.5	7	28	142
MW-02-077A	A	06/18/1996	252.78	252.82	252.53	25	45	21	45	17	21	NE	NE	45	NE	NE	NE
MW-02-078	D	08/19/1996	150.83	150.98	150.64	185	195	183	195.5	181	183	2	4	195.5	4	30	170
MW-02-078A	A	06/19/1996	249.21	249.10	248.75	21	41	19	41	16	19	NE	NE	41	NE	NE	NE
MW-02-079	A	05/22/1996	144.44	144.44	144.30	2.5	6	2	7	1	2	NE	NE	9	5	NE	NE
MW-02-079A	A	06/19/1996	252.35	252.29	251.95	24	44	22	44	19	22	NE	NE	44	NE	NE	NE
MW-02-080	D	08/19/1996	144.73	144.80	144.57	221.5	231.5	217	232	214	217	NE	NE	233	5	28	210
MW-02-080A	A	06/18/1996	257.21	257.25	256.99	30	50	28	50	25	28	NE	NE	50	NE	NE	NE
MW-02-081	B	05/19/1997	201.79	201.79	201.40	27	42	25	43	21.5	25	40	44	45	44	NE	NE
MW-02-082	A	05/21/1997	201.97	201.97	201.72	10	25	7.5	25.5	4.0	7.5	NE	NE	25.5	NE	NE	NE
MW-02-083	B	05/28/1997	208.35	208.35	208.11	38	53	36	54	34	36	NE	NE	57	55	NE	NE
MW-02-084	A	05/29/1997	208.55	208.55	208.3	11	26	9.0	26.5	3.0	9.0	NE	NE	26.5	NE	NE	NE
MW-02-085	B	05/23/1997	215.96	215.96	215.66	48.5	63.5	45.5	64	42.5	45.5	50	64	65	64	NE	NE
MW-02-086	A	05/27/1997	216.14	216.14	215.90	13	28	10.0	28.5	2	10	NE	NE	28.5	NE	NE	NE
MW-02-087	B	05/29/1997	186.99	186.99	186.78	17	32	14	32.5	10	14	30	34	34	33	NE	NE
MW-02-088	A	05/30/1997	185.98	185.98	185.23	3	18	2.5	21	1.5	2.5	NE	NE	32	31	NE	NE
MW-02-089	A	06/02/1997	170.49	170.49	170.25	3	18	2.5	20	1.5	2.5	20	24.5	27	24.5	NE	NE
MW-02-090	A	06/03/1997	172.01	172.01	171.65	8	23	5	24	2	5	16	25	27	25	NE	NE
MW-02-091	A	06/03/1997	177.15	177.15	176.75	3	18	2.5	20	1.5	2.5	20	25	27	25	NE	NE
MW-02-092	B	06/06/1997	185.81	185.81	185.58	15.4	30.4	12.5	31	10.5	12.5	NE	NE	31	31	NE	NE
MW-04-001	A	11/16/1987	180.79	181.34	181.01	6	11	6	11.5	1.5	3.5	NE	NE	12	11.5	NE	NE
MW-04-001R	A	09/18/1996	180.53	180.61	180.32	3	12	2.5	12.5	1	2.5	NE	NE	12.5	12	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

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NE - Not Encountered
NC - No Casing

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-04-002	A	11/16/1987	165.47	165.78	165.58	3.5	8.5	2	10	1	2	NE	NE	10	7	NE	NE
MW-04-003	A	11/10/1987	167.30	167.59	167.44	5	10	3	11.4	0	3	5	11	12	11	NE	NE
MW-04-004	A	11/22/1987	177.28	177.29	177.19	5	15	3.7	16	2	3.7	NE	NE	17	16	NE	NE
MW-04-005	A	11/10/1987	190.96	191.03	190.97	7	17	5	22	2	5	20	NE	22	NE	NE	NE
MW-04-006	A	11/11/1987	207.47	207.51	207.27	16	26	6	27	4	6	21	NE	27	NE	NE	NE
MW-05-001	A	11/24/1992	187.00	NA	190.00	4	11	3	12	1	3	NA	NA	32.5	NA	NA	NA
MW-05-002	A	11/24/1992	190.67	190.67	190.13	4	11	2	12	1	2	NE	NE	36	35	NE	NE
MW-05-003	A	11/30/1992	187.43	187.43	186.98	4	14	3	15	1	3	NA	NA	32.5	NA	NA	NA
MW-06-001	A	11/22/1992	201.19	201.19	200.23	6.5	13.5	4.5	14	2.3	4.5	36	39	42	39	NE	NE
MW-06-002	B	11/22/1992	193.19	193.19	192.79	17.5	27.5	15.5	28.5	11.4	15.5	26.5	32	37	32	NE	NE
MW-06-003	A	11/23/1992	194.91	194.91	194.72	3.2	10.1	2.6	10.5	1.3	2.6	27.5	NE	33	NE	NE	NE
MW-07-001	A	11/05/1992	155.30	155.35	154.80	2.8	7.6	2	7.8	0.6	2.0	0.5	9	18	9	NE	NE
MW-07-002	A	11/05/1992	154.60	154.68	154.50	3.9	7.5	2.1	7.7	0.7	2.1	2	14.5	17	14.5	NE	NE
MW-07-003	A	12/02/1992	151.10	151.16	151.09	0.5	3.5	NA	NA	NA	NA	0	10	17	10	NE	NE
MW-07-004	A	11/05/1992	156.30	156.33	155.98	2.7	7.3	2	7.5	0.8	2	0	10	12	10	NE	NE
MW-07-005	A	11/16/1994	150.58	150.62	150.28	2.5	5	2	5.5	1	2	0	4	6	4	NE	NE
MW-10-001	A	11/02/1993	187.64	189.78	189.58	5	15	4.2	15.5	3	4.2	24	32	36	32	NE	NE
MW-10-002	A	11/02/1993	187.49	187.49	187.21	5	15	4.2	15	3	4.2	29	34	36	34	NE	NE
MW-10-003	A	11/02/1993	186.53	186.53	186.19	5	15	4	15	3	4	14	35	37	35	NE	NE
MW-10-004	A	08/23/1999	184.06	184.15	183.38	3.4	13.4	2	15	1	2	NE	NE	17	NE	NE	NE
MW-10-005	A	08/24/1999	182.89	183.09	182.41	4	14	2	16	1	2	NE	NE	16	NE	NE	NE
MW-10-006	B	08/24/1999	182.23	182.41	181.97	18	28	16	28.5	2	16	NE	NE	30	28	NE	NE
MW-10-007	A	08/24/1999	180.59	180.76	180.22	5	15	3	17	1	3	NE	NE	17	NE	NE	NE
MW-10-008	B	08/30/1999	187.54	190.44	190.23	24	34	22	34.5	2	22	26	34	35	34	NE	NE
MW-11-001	A	11/09/1987	159.82	163.02	162.82	7.5	17.5	5.5	19	3.5	5.5	8.5	18	19	18	NE	NE
MW-11-002	A	11/09/1987	152.58	NA	155.58	7	17	5	18	3	5	10	15	22	15	NE	NE
MW-11-002R	A	02/02/1999	154.37	158.29	158.05	2.5	12.5	1.5	13	1	1.5	10	NE	13	NE	NE	NE
MW-11-003	A	11/09/1987	153.53	NA	156.53	9	14	7	15	5	7	8.5	13.5	19	13.5	NE	NE
MW-11-003R	A	02/02/1999	154.25	157.62	157.30	3	13	2.5	13.5	1.5	2.5	11	13.5	13.5	13.5	NE	NE
MW-11-004	A	12/03/1988	152.54	155.10	154.83	5	15	3.9	15.6	2.2	3.9	5	9	15.6	9	NE	NE
MW-11-005	A	11/19/1988	163.46	167.04	166.11	7.8	17.8	5.5	21	3.5	5.5	NE	NE	21	18	NE	NE
MW-11-006	A	11/19/1988	170.13	173.45	173.13	4.9	14.9	2.6	24	2	2.6	NE	NE	26	23	NE	NE
MW-11-007	A	11/20/1988	172.47	175.47	175.22	4	14	3	16	2	3	NE	NE	16	NE	NE	NE
MW-11-008	A	11/20/1988	171.06	174.13	173.96	4	14	3	16	2	3	NE	NE	16	NE	NE	NE

Hydrogeologic Zones:
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NA - Not Available / Applicable
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NC - No Casing

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-11-009	B	12/05/1988	160.76	164.06	163.86	24	29	21	30	15	21	NE	NE	54.5	29.5	37	54
MW-11-010	A	12/06/1988	168.41	171.80	171.58	17	22	14.5	22.5	11.5	14.5	NE	NE	54.5	22.5	42.5	54.5
MW-12-001	A	11/20/1987	150.30	NA	153.30	6	11	4.7	12	2.7	4.7	NE	NE	12	8.5	NE	NE
MW-12-001R	A	02/02/1999	149.36	152.88	152.65	3.5	13.5	2.5	14.5	1.5	2.5	8	12	14.5	12	NE	NE
MW-13-001	A	11/22/1987	175.47	178.66	178.47	5	15	3	17	1	3	NE	NE	17.0	NE	NE	NE
MW-13-002	B	11/22/1987	174.93	178.11	177.93	15	25	12.5	27	8	12.5	18	27	62.5	27	57.5	NE
MW-13-003	A	11/23/1987	180.30	183.52	183.27	9.3	19.3	7	22.5	4.7	7	NE	NE	22.5	NE	NE	NE
MW-13-004	A	11/23/1987	151.30	154.58	154.32	5	11	4	12.5	2	4	NE	NE	17.0	12.5	NE	NE
MW-13-005	A	11/24/1987	152.70	156.80	155.71	4.3	9.3	3.4	10	2	3.4	7.5	12	12.0	NE	NE	NE
MW-13-006	A	12/01/1993	174.75	176.68	176.26	8	18	7	24	4.8	7	31.5	45	47	45	NE	NE
MW-13-007	A	12/01/1993	160.23	163.00	162.81	5	15	4.5	15.6	3.5	4.5	5	14	26	14	NE	NE
MW-13-008	A	12/01/1993	160.63	160.63	160.34	6	16	5.5	16.6	4	5.5	8.5	20	22	20	NE	NE
MW-13-009	A	09/07/1995	161.15	163.37	163.37	4	14	3.5	15	2	3.5	5	NE	17	NE	NE	NE
MW-13-010	A	09/06/1995	166.30	168.69	168.71	5	20	4	20	2	4	0	20	22	20	NE	NE
MW-13-011	A	09/07/1995	167.17	169.63	169.63	4	14	3.5	15	2	3.5	10	NE	15	NE	NE	NE
MW-13-012	A	09/07/1995	154.51	157.46	157.38	4	14	3.5	15	2	3.5	0	15	17	15	NE	NE
MW-16-001	A	11/08/1987	212.90	213.11	212.91	10	20	8	21	6	8	NE	NE	22	NE	NE	NE
MW-16-002	A	11/08/1987	209.90	213.05	212.85	7	17	5	18.2	3	5	NE	NE	18.2	NE	NE	NE
MW-16-003	B	11/08/1987	210.60	213.77	213.57	32.5	42.5	26.5	45	12	26.5	45.5	NE	51	NE	NE	NE
MW-16-004	A	11/29/1993	211.88	213.62	213.37	8	18	7	18.6	5	7	43	59	61	59	NE	NE
MW-16-005	A	10/21/1993	213.88	213.88	213.63	11.5	26.5	9	27	5.5	9	42	59	63	59	NE	NE
MW-16-006	A	11/29/1993	210.61	212.87	212.51	19.5	29.5	17.8	29.5	14.5	17.8	43	58	62	58	NE	NE
MW-16-007	B	11/30/1993	208.96	210.51	210.25	28	38	26.2	39	24	26.2	35	55	57	55	NE	NE
MW-16-008	A	09/06/1995	208.71	211.62	211.61	5	15	4	15.5	2	4	NE	NE	15.5	NE	NE	NE
MW-16-009	B	09/07/1995	208.77	211.77	211.77	49	59	47	60	42	47	NE	NE	61	60	NE	NE
MW-16-010	A	08/23/1996	203.77	203.79	203.53	4	19	2.5	19.5	1.5	2.5	NE	NE	20	NE	NE	NE
MW-16-011	B	08/23/1996	203.83	203.83	203.40	29	44	27	44.5	25	27	40	45	47	45	NE	NE
MW-16-012	B	08/26/1996	199.34	199.41	198.99	19	39	17	40	14	17	30	41	42	41	NE	NE
MW-16-013	A	07/22/1997	192.92	195.93	195.23	3	18	2.2	19	1	2.2	NE	NE	19	NE	NE	NE
MW-16-014	B	07/22/1997	192.50	196.13	195.76	19	34	17	35	15	17	30	35	37	35	NE	NE
MW-16-015	A	07/23/1997	208.93	211.41	210.97	7	22	6	23	4	6	NE	NE	23	NE	NE	NE
MW-16-016	B	07/23/1997	208.97	211.90	211.70	35	50	33	51	31	33	35	NE	51	NE	NE	NE
MW-17-001	A	11/07/1987	180.24	180.24	179.94	7	17	5	19.5	3	5	NE	NE	19.5	NE	NE	NE
MW-17-002	A	11/07/1987	179.21	180.91	180.84	7	17	5	19.4	3	5	NE	NE	19.4	NE	NE	NE

Hydrogeologic Zones:
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NA - Not Available / Applicable
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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-17-003	B	11/23/1987	178.86	181.11	180.86	17.5	27.5	14.5	29	12.5	14.5	26	28.5	29	28.5	NE	NE
MW-17-004	A	01/08/1993	177.03	180.60	179.82	4	9	3	10	1.8	3	NE	NE	10	NE	NE	NE
MW-17-005	A	01/08/1993	173.06	173.06	172.83	4	14	3	15	1	3	16.5	24.75	28	24.75	NE	NE
MW-18-001	A	01/09/1993	156.00	156	155.61	18	28	16	29	14	16	25	34	36	34	NE	NE
MW-18-002	A	01/09/1993	155.00	155.5	155.23	18	28	16	29	14	16	30	34	36	34	NE	NE
MW-18-003	A	01/09/1993	154.00	154	153.99	18	28	17.1	29	15.1	17.1	30	32	34	32	NE	NE
MW-19-001	A	11/20/1992	156.73	156.73	156.73	11.2	21.2	9.2	22	7.2	9.2	NA	NA	28	26	NE	NE
MW-2009-1	A	01/01/1989	NA	NA	NA	NA	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2009-2	A	01/01/1989	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2009-3	A	01/01/1989	NA	NA	NA	NA	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-21-001	A	11/23/1987	NA	NA	219	12	22	9	24	7	9	NE	NE	24	NE	20	NE
MW-21-002	A	11/23/1987	198.61	201.94	201.79	5	15	3	19	2	3	NE	NE	19	NE	19	NE
MW-21-003	A	11/23/1987	196.92	200.33	200.23	4	14	3	16	2	3	NE	NE	16	NE	6	NE
MW-21-004	A	10/11/1993	199.62	201.98	201.57	7	17	6	19	4	6	NE	NE	41.5	NE	10	40
MW-21-005	A	09/26/1993	202.86	204.83	204.65	6.8	11.8	6.2	11.9	4.2	6.2	NE	NE	12	NE	9	NE
MW-21-006	A	09/25/1993	197.83	200.55	200.25	5.5	15.5	5	15.5	3.5	5.5	NE	NE	15.5	NE	13	NE
MW-21-007	A	10/09/1993	234.67	236.93	236.47	7.5	17.5	6.5	18.6	4	6.5	NE	NE	36	NE	14	NE
MW-21-008	A	09/27/1993	219.97	221.13	220.59	19	29	17	29.5	14	17	NE	NE	30	NE	25	NE
MW-21-009	A	07/20/1998	203.33	205.79	205.45	4.5	9.5	3.5	10	2.5	3.5	NE	NE	10	NE	NE	NE
MW-22-001	A	11/17/1987	229.10	232.29	232.10	8	18	6	20	4	6	NE	NE	20	NE	NE	NE
MW-22-002	A	11/17/1987	252.09	255.36	255.09	32	42	29	44	26.8	29	NE	NE	44	NE	NE	NE
MW-22-003	A	11/20/1988	277.16	280.30	280.03	40	55	38	56	36	38	NE	NE	56	NE	NE	NE
MW-22-004	A	11/19/1988	276.87	279.62	279.34	52.5	62.5	50	63.5	47.7	50	62.5	64.8	70	64.8	69	NE
MW-22-005	A	11/20/1988	229.51	232.87	232.66	5	20	4	21	2	4	NE	NE	21	NE	NE	NE
MW-22-006	B	11/20/1988	229.43	231.97	231.77	23	33.5	20.3	34.5	13	20.3	NE	NE	38.5	35	NE	NE
MW-22-007	A	12/03/1988	263.54	266.41	266.37	39	54	37	54	35	37	NE	NE	54	NE	NE	NE
MW-22-008	B	12/01/1988	263.67	266.98	266.7	82.5	92.5	79	96	73	79	NE	NE	96	93	NE	NE
MW-22-009	B	11/18/1988	228.62	231.87	231.58	35	45	32.5	46.8	6	32.5	44	50	51.6	50	NE	NE
MW-22-010	B	11/21/1988	252.17	255.32	255.07	60	70	55.5	71	49.5	55.5	69	78	81	78	NE	NE
MW-23-001	A	11/07/1987	232.85	235.91	235.85	15.5	25.5	13	27	11	13	NE	NE	27	NE	NE	NE
MW-23-002	A	11/06/1987	251.90	255.02	254.90	34	44	32	45.5	30	32	NE	NE	47	NE	NE	NE
MW-23-003	A	11/06/1987	231.16	234.34	234.16	17	27	15.1	30	13	15.1	NE	NE	30	NE	NE	NE
MW-23-004	B	07/09/1988	271.40	274.10	273.90	80	90	77	91	67	77	90	102	103	102	NE	NE
MW-23-005	B	07/11/1988	251.20	254.08	253.92	67	77	63	80	53	63	76	86	87	86	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

NA - Not Available / Applicable
NE - Not Encountered
NC - No Casing

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-23-006	A	07/21/1988	245.60	247.36	247.22	28	43	26	45	24	26	NE	NE	45	NE	NE	NE
MW-23-007	B	07/13/1988	245.80	248.28	247.94	62	72	55	73	45	55	71	NE	80	NE	NE	NE
MW-23-008	A	07/20/1988	233.60	235.53	235.30	18	33	15	35	12	15	NE	NE	35	NE	NE	NE
MW-23-009	A	07/19/1988	233.60	236.22	235.92	32	42	28	44	18	28	NE	NE	44	NE	NE	NE
MW-23-010	B	07/15/1988	233.70	235.22	235.10	48	58	44	60	34	44	65	NE	72	NE	NE	NE
MW-23-011	A	07/22/1988	231.53	234.09	233.80	16	31	14.2	32.5	12	14.2	NE	NE	32.5	NE	NE	NE
MW-23-012	B	07/22/1988	231.26	233.88	233.66	54.5	64.5	50.3	65	43	50.3	NE	NE	74	66	NE	NE
MW-23-013	B	07/21/1988	233.64	236.04	235.77	55.5	65.5	52.1	66.4	45	52.1	NE	NE	74	60	NE	NE
MW-23-101	A	03/27/1996	216.15	219.18	218.92	5	20	4	22	2	4	NA	NA	22	NA	NA	NA
MW-23-102	B	03/28/1996	216.17	219.18	218.57	39	49	34	67	32	34	51	64.5	67	64.5	NA	NA
MW-23-103	A	03/25/1996	204.91	208.28	207.98	5	15	4	20	2	4	NA	NA	20	NA	NA	NA
MW-23-104	A	03/26/1996	195.68	198.87	198.28	5	15	4	17	2	4	NA	NA	17	NA	NA	NA
MW-24-001	A	01/07/1993	NA	NA	185.75	5.5	14.5	4	15.4	2	5.5	14	NE	21	NE	NE	NE
MW-24-002	A	01/10/1993	157.45	159.45	157.45	0.2	3.2	NA	NA	NA	NA	NA	NA	3.2	NA	NA	NA
MW-24-002R	A	08/13/1998	154.62	154.80	154.44	3.0	8.0	2	8.5	1.5	2	6	NE	8.5	NE	NE	NE
MW-24-003	A	01/10/1993	158.42	160.42	158.42	0.5	3.5	NA	NA	NA	NA	NA	NA	3.5	NA	NA	NA
MW-24-003R	A	08/13/1998	158.32	158.34	158.07	3.0	8.0	2	8.5	1.5	2	7.5	NE	8.5	NE	NE	NE
MW-24-004	A	01/10/1993	164.61	166.61	164.61	0.7	3.7	NA	NA	NA	NA	NA	NA	3.7	NA	NA	NA
MW-24-004R	A	08/13/1998	162.50	162.47	161.95	3.0	7.5	2	8.5	1.5	2	7	NE	8.5	NE	NE	NE
MW-24-005	A	08/14/1998	152.21	152.31	151.85	2.5	7.5	2	8.5	1.5	2	7.5	NE	8.5	NE	NE	NE
MW-26-001	A	11/08/1994	185.72	189.01	188.81	5	15	3	15	1	3	9	NE	16	NE	NE	NE
MW-26-002	A	11/10/1994	181.76	185.78	185.63	6	16	4	16	1.5	4	NE	NE	16	NE	NE	NE
MW-26-003	A	11/09/1994	180.26	183.59	183.44	6	16	4	16	1.5	4	NE	NE	16	NE	NE	NE
MW-26-004	A	11/10/1994	183.16	186.11	185.95	7	17	5	17.5	2.3	5	9	NE	17.5	NE	NE	NE
MW-26-005	A	08/31/1999	180.06	183.17	182.70	4	14	3	16	2	3	20	29	30	29	NE	NE
MW-2612-01	A	07/02/1998	165.57	165.57	165.08	3.0	13.0	2.5	14	1.5	2.5	NE	NE	21.0	19	NE	NE
MW-2612-02	A	07/06/1998	164.58	164.58	163.95	3.0	13.0	2.5	14	1.5	2.5	NE	NE	14.0	NE	NE	NE
MW-2612-03	A	07/02/1998	164.20	164.20	163.35	3.5	13.5	3.0	15	2	3	NE	NE	21.0	20	NE	NE
MW-2612-04	A	06/07/1999	155.14	155.27	155.08	4	14	3	14.5	2	3	8	14.5	16	14.5	NE	NE
MW-2612-05	A	07/08/1999	170.66	170.67	170.20	3	13	2.5	13.5	1.5	2.5	NE	NE	13.5	NE	NE	NE
MW-2612-06	A	07/08/1999	175.03	175.04	174.32	4	14	2.5	14.5	1.5	2.5	NE	NE	14.5	NE	NE	NE
MW-2612-07	A	07/07/1999	180.78	180.78	180.16	6.5	16.5	4	18	2.5	4	NE	NE	18	NE	NE	NE
MW-2612-08	A	07/09/1999	172.45	172.45	171.93	2.5	12.5	2	13	1.5	2	NE	NE	13	NE	NE	NE
MW-2612-09	A	07/07/1999	165.18	165.35	164.87	1.5	11.5	1.3	12	0.3	1.3	NE	NE	12	NE	NE	NE

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-2612-10	A	06/08/1999	150.58	154.33	154.08	2	10.5	1.5	11	1	1.5	6	11.5	12	11.5	NE	NE
MW-2612-11	B	06/07/1999	164.19	164.22	163.86	15	20	13	20.5	2	13	NE	NE	20.5	20.5	NE	NE
MW-2612-12	A	06/08/1999	165.10	165.09	164.68	12	17	11	17.5	2	11	14	17.5	18	17.5	NE	NE
MW-2612-13	B	07/07/1999	170.08	170.08	169.81	17	22	14	22.5	3	14	15	22.5	24	22.5	NE	NE
MW-2612-14	B	07/08/1999	174.78	174.78	174.06	23	28	21	28.5	3	21	26	29	30	29	NE	NE
MW-2612-15	B	07/06/1999	180.70	180.70	180.22	24.5	29.5	22	30	3	22	28	31	32	31	NE	NE
MW-2657-1	A	07/06/1998	194.84	194.84	194.29	3.0	13.0	2.5	14	1.5	2.5	NE	NE	16.0	NE	NE	NE
MW-2657-2	A	07/07/1998	191.39	193.69	193.42	2.0	12.0	1.5	13	1	1.5	NE	NE	13.0	NE	NE	NE
MW-27-001	A	10/13/1994	212.17	214.59	214.59	5	15	4	15	2	4	8	NE	15	NE	NE	NE
MW-28-001	A	10/17/1994	159.12	159.12	158.84	9.5	19.5	6.5	20	3.5	6.5	12.2	NE	20	NE	NE	NE
MW-28-002	A	10/17/1994	155.28	155.29	155.01	17	27	15	28	12	15	20	NE	28	NE	NE	NE
MW-28-003	B	08/29/1996	153.24	153.26	153.07	30	40	28	40	26	28	30	41	42	41	NE	NE
MW-28-004	A	08/29/1996	153.64	153.68	153.47	11	26	9	26	6.5	9	NE	NE	26	NE	NE	NE
MW-28-005	A	07/15/1997	153.91	153.91	153.60	16	26	14	30	12	14	NE	NE	32	30	NE	NE
MW-28-006	A	07/16/1997	156.26	156.26	156.00	16	26	14	32	11	14	25	31	32	31	NE	NE
MW-28-007	A	07/17/1997	156.74	156.74	156.48	11	21	9	22	7	9	20	25	27	25	NE	NE
MW-2895-1	A	12/10/1996	213.76	213.80	213.46	7	17	6	17.5	4	6	NE	NE	62	61	NE	NE
MW-2895-2	A	12/11/1996	199.84	202.90	202.63	2	17	1.5	18	1	1.5	NE	NE	18	NE	NE	NE
MW-2895-3I	B	12/11/1996	202.43	206.00	205.62	27	42	25	43	22	25	NE	NE	47	45	NE	NE
MW-2895-3S	A	12/10/1996	202.70	205.90	205.54	2	17	1.5	18	1	1.5	NE	NE	18	NE	NE	NE
MW-29-001	A	10/14/1994	199.54	199.54	199.43	5.5	15.5	3.6	15.5	1.5	3.6	NE	NE	16	NE	NE	NE
MW-30-001	A	11/19/1994	173.15	176.41	176.22	5	15	3.5	17	1.75	3.5	NE	NE	17	NE	NE	NE
MW-30-002	A	11/19/1994	166.10	169.65	168.36	2.9	12.9	1.5	14.9	1	1.5	NE	NE	14.9	NE	NE	NE
MW-30-003	A	11/20/1994	163.04	163.25	162.70	2	12	1.3	14	0.5	1.3	NE	NE	14	NE	NE	NE
MW-30-004	A	11/19/1994	160.25	164.08	163.32	4	14	1	14.1	0.25	1	NE	NE	14.1	NE	NE	NE
MW-30-005	A	09/12/1995	166.14	169.40	169.12	2.25	12.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-30-006	A	09/12/1995	163.63	167.58	167.50	0	9.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-30-007	A	09/18/1996	167.05	167.23	166.82	3.5	13.5	2.5	14	1	2.5	NE	NE	14	NE	NE	NE
MW-30-008	A	06/01/1997	160.22	160.22	159.96	3	18	2.5	18.5	1.5	2.5	NA	NA	18	NA	NA	NA
MW-31-001	A	11/17/1994	196.17	199.01	198.81	2.5	12.5	1.3	14.5	0.5	1.3	NE	NE	14.5	NE	NE	NE
MW-31-002	A	11/17/1994	191.50	194.51	194.27	2.5	12.5	1.5	14.5	0.75	1.5	NE	NE	14.5	NE	NE	NE
MW-31-003	A	11/18/1994	192.72	195.55	195.17	2.9	12.9	1.5	14.9	0.86	1.5	NE	NE	14.9	NE	NE	NE
MW-31-004	A	11/18/1994	191.00	191.00	190.49	2.75	12.75	1.75	14.75	1	2.75	NE	NE	14.75	NE	NE	NE
MW-31-005	A	09/12/1995	196.27	198.86	198.76	2.65	12.65	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Hydrogeologic Zones:
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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
MW-31-006	A	09/12/1995	197.16	200.58	200.42	1.80	11.80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-31-007	A	07/20/1995	199.33	199.33	199.01	3	13	2.5	14	1.5	2.5	NE	NE	14	NE	NE	NE
MW-33-001	A	10/15/1994	229.20	232.35	232.35	7	17	5	17	2	5	NE	NE	18	NE	NE	NE
MW-33-002	A	10/15/1994	226.92	230.07	230.07	6	16	4	16	2	4	NE	NE	16	NE	NE	NE
MW-34-001	A	11/14/1994	147.23	NA	NA	6	16	4	16	3	4	0	2	18	2	NE	NE
PMW-1	A	10/15/1996	NA	NA	NA	4	29	3	30	1	3	NE	NE	30	NE	NE	NE
PMW-2	A	10/15/1996	NA	NA	NA	4	29	3	30	1	3	NE	NE	30	NE	NE	NE
PMW-3	A	10/15/1996	NA	NA	NA	4	29	3	30	1	3	NE	NE	30	NE	NE	NE
POL-1	A	10/25/1990	149.66	153.41	153.52	3	13	2	14	1	2	3	11	14	11	NE	NE
POL-2	A	10/25/1990	149.57	153.17	153.34	3	13	2	14	0.5	2	6	12	16	12	NE	NE
POL-3	A	10/25/1990	147.69	152.53	152.27	2	12	1	14	0	1	3	7	16	7	NE	NE
POL-4	A	/ /	158.27	158.40	158.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE
POL-5	A	02/02/1999	145.92	149.40	149.06	3	8	2.5	8.5	1.5	2.5	NA	NA	8.5	6	NE	NE
POL-6	A	02/02/1999	145.14	148.53	148.16	2.5	7.5	2	8	1	2	NA	NA	8	7	NE	NE
POL-7	A	02/02/1999	147.29	150.93	150.63	3	7	2	7.5	1	2	NA	NA	7.5	5	NE	NE
PT-02-01	A	08/02/1996	201.92	201.92	201.42	6	41	4	42	1.5	4	40	41	42	41.0	NE	NE
PVW-1	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-2	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-3	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-4	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-5	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-6	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-7	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-8	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PVW-9	A	11/01/1996	NA	NC	NA	0.5	3.0	NA	NA	NA	NA	NA	NA	3.25	NE	NE	NE
PZ-02-01	A	06/05/1996	201.91	201.91	201.71	6	41	4	41.5	2	4	40	41.5	42	41.5	NE	NE
PZ-02-02	A	06/05/1996	201.38	201.38	201.14	6	41	4	41.5	2	4	40	41	42	41.0	NE	NE
PZ-02-03	C	08/20/1996	133.97	134.07	133.83	24	34	22	35	17	22	NE	NE	68.5	4.5	16	34
PZ-10S	A	01/07/1993	143.74	143.84	143.76	3	5	2	6	1	2	NE	NE	6	5	NE	NE
PZ-11D	D	12/18/1992	173.10	173.14	172.97	59	119	OPEN	OPEN	57	59	NE	NE	119	23	30	54
PZ-11I	B	10/17/1992	173.34	173.38	173.21	19	24	17	26	15	17	NE	NE	28	24	NE	NE
PZ-11S	A	10/17/1992	173.80	173.83	173.66	3.5	10.5	2.5	12.5	1	2.5	NE	NE	12.5	NE	NE	NE
PZ-12I	B	10/30/1992	174.40	173.40	172.90	26	28	24	30	22	24	NE	NE	32	29	NE	NE
PZ-12S	A	10/30/1992	173.63	173.63	173.15	4	9	3	9.5	1.5	3	NE	NE	9.5	NE	NE	NE

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
PZ-13-01	A	09/12/1995	173.13	NC	175.94	2.3	5.3	NA	NA	NA	NA	NA	NA	5.3	NE	NE	NE
PZ-13-02	A	09/12/1995	162.53	NC	165.18	2.7	5.7	NA	NA	NA	NA	NA	NA	5.7	NE	NE	NE
PZ-13-03	A	08/23/1995	158.77	NC	162.19	1.8	4.8	NA	NA	NA	NA	NA	NA	4.8	NE	NE	NE
PZ-13-04	A	09/12/1995	161.34	NC	164.75	3.9	6.9	NA	NA	NA	NA	NA	NA	6.9	NE	NE	NE
PZ-13-05	A	08/23/1995	157.06	NC	160.20	0.3	3.3	NA	NA	NA	NA	NA	NA	3.3	NE	NE	NE
PZ-13-06	A	09/12/1995	158.77	NC	161.95	0.1	3.1	NA	NA	NA	NA	NA	NA	3.1	NE	NE	NE
PZ-13-07	A	09/12/1995	186.41	NC	188.82	18	21	NA	NA	NA	NA	NA	NA	21	NE	NE	NE
PZ-13-08	A	09/12/1995	176.72	NC	179.67	11.4	14.4	NA	NA	NA	NA	NA	NA	14.4	NE	NE	NE
PZ-13S	A	11/03/1992	161.00	160.99	160.91	3	8	2.5	9	1.2	2.5	NE	NE	14	11	NE	NE
PZ-1D	D	12/20/1992	146.30	146.33	146.12	22.5	27.5	OPEN	OPEN	20.5	22.5	9	10	27.5	10	14	18
PZ-1S	A	10/21/1992	146.58	146.58	146.19	3	10	2	11	1	2	9	10	16	10	14	NE
PZ-2895-1	A	12/09/1996	207.21	NC	210.44	6.2	8.7	NA	NA	NA	NA	NA	NA	9.5	NE	NE	NE
PZ-2895-2	A	12/10/1996	197.44	NC	202.38	0.4	2.9	NA	NA	NA	NA	NA	NA	3.7	NE	NE	NE
PZ-2895-3	A	12/09/1996	203.88	NC	206.38	2.8	5.3	NA	NA	NA	NA	NA	NA	6.1	NE	NE	NE
PZ-2D	D	12/16/1992	203.69	203.69	203.56	78.5	83.5	OPEN	OPEN	76.5	78.5	33	44	83.5	44	59	73.5
PZ-2I	B	10/29/1992	203.13	203.13	202.65	28	33	26	44	24	26	33	44	46	44	NE	NE
PZ-2S	A	10/29/1992	202.81	202.81	202.56	4	9	3	10	1.2	3	NE	NE	10	NE	NE	NE
PZ-3D	D	11/09/1992	267.90	267.90	267.72	124.5	134	OPEN	OPEN	122.5	124.5	NE	NE	134	48	51.5	115
PZ-3I	A	10/19/1992	268.53	268.53	268.24	43	48	41	49	39	41	NE	NE	50	NE	NE	NE
PZ-3S	A	10/20/1992	268.05	268.05	267.83	32	39	30	40	28	30	NE	NE	40	NE	NE	NE
PZ-4D	D	12/16/1992	181.14	180.22	180.19	45	65	OPEN	OPEN	44	45	10.5	16	65	16	33	40
PZ-4S	A	10/28/1992	181.30	181.38	181.27	3	8	2.9	8.5	1	2.9	10.5	16	18	16	NE	NE
PZ-5S	A	11/02/1992	153.91	153.91	153.76	9	14	7	16	1.5	7	NE	NE	24	21.5	NE	NE
PZ-6D	D	11/10/1992	173.32	175.24	174.85	78.5	83.5	OPEN	OPEN	76.5	78.5	14	28.5	83.5	28.5	50	73
PZ-6I	B	10/17/1992	172.86	175.66	175.40	25	27	23	30	21	23	14	28.5	34	28.5	NE	NE
PZ-6S	A	10/17/1992	173.00	175.30	175.03	7.5	14.5	5.5	16.5	3.5	5.5	NA	NA	16.5	NE	NE	NE
PZ-7S	A	11/07/1992	183.38	183.38	183.11	10	15	8	16	6	8	NE	NE	20	16.5	NE	NE
PZ-8D	D	01/18/1993	154.86	154.86	154.63	141.7	146.7	OPEN	OPEN	139.7	141.7	6	8.75	146.7	8.75	25	136
PZ-8S	A	10/18/1992	155.42	155.47	155.16	3	9	2	11	1	2	6	8.75	12	8.75	NE	NE
RW-01	A	/ /	258.91	258.16	257.59	30	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RW-02	A	/ /	254.25	255.50	249.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RW-03	A	/ /	253.43	253.60	252.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RW-04	A	/ /	256.24	256.24	255.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RW-04A	A	06/27/1996	256.60	256.79	255.90	28	59	25	59	21	25	NE	NE	59	NE	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

NA - Not Available / Applicable
NE - Not Encountered
NC - No Casing

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TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
RW-05	A	11/21/1995	258.45	258.74	257.65	23	63	18	63	12.6	18	NE	NE	63	NE	NE	NE
RW-06	A	06/26/1996	256.99	257.33	256.33	29	59.8	26	59.8	20.5	26	NE	NE	59.8	NE	NE	NE
RW-07	A	06/25/1996	254.67	254.80	253.65	29	59	25	59	21	25	NE	NE	59	NE	NE	NE
RW-08	A	06/14/1996	250.71	250.90	249.70	23	53	15	53	7	15	NE	NE	53	NE	NE	NE
RW-09	A	06/18/1996	247.36	247.57	246.95	20	50	17	50	14	17	NE	NE	50	NE	NE	NE
RW-10	A	06/17/1996	247.24	247.44	246.56	20	50	17	50	13.5	17	NE	NE	50	NE	NE	NE
RW-11	A	06/19/1996	254.19	254.45	253.55	27	57	24	57	20	24	NE	NE	57	NE	NE	NE
SB-34-002	A	11/16/1994	145.55	NA	NA	NA	NA	NA	NA	NA	NA	0	1	4	1	NE	NE
VE/BV-1	A	11/01/1996	NA	NA	NA	3	3.25	NA	NA	NA	NA	NA	NA	3.5	NE	NE	NE
VE/BV-2	A	11/01/1996	NA	NA	NA	3	3.25	NA	NA	NA	NA	NA	NA	3.5	NE	NE	NE
VE/BV-3	A	11/01/1996	NA	NA	NA	3	3.25	NA	NA	NA	NA	NA	NA	3.5	NE	NE	NE
VE/BV-4	A	11/01/1996	NA	NA	NA	3	3.25	NA	NA	NA	NA	NA	NA	3.5	NE	NE	NE
VE/BV-5	A	11/01/1996	NA	NA	NA	3	3.25	NA	NA	NA	NA	NA	NA	3.5	NE	NE	NE
VE/VW-01	A	06/05/1996	262.13	262.32	262.03	8.40	48.4	6.5	48.4	4	6.5	NE	NE	50	NE	NE	NE
VE/VW-02	A	06/06/1996	260.98	261.21	260.83	8.6	48.60	6.5	48.6	4	6.5	NE	NE	49	NE	NE	NE
VE/VW-03	A	06/05/1996	259.25	259.49	259.11	9.3	49.3	7	49.3	4	7	NE	NE	49.3	NE	NE	NE
VE/VW-04	A	06/05/1996	259.55	259.63	259.25	9.1	49.1	7	49.1	5	7	NE	NE	49.1	NE	NE	NE
VE/VW-05	A	06/06/1996	258.49	258.59	258.29	10.00	50.00	8	50	5.5	8	NE	NE	50	NE	NE	NE
VE/VW-06	A	/ /	258.30	258.38	257.98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VE/VW-07	A	06/14/1996	256.58	256.79	256.57	33.00	43.00	7	43	5	7	NE	NE	43	NE	NE	NE
VE/VW-08	A	06/06/1996	257.48	257.63	257.23	10.00	50.00	8	50	5.5	8	NE	NE	50	NE	NE	NE
VE/VW-09	A	06/28/1996	253.82	253.86	253.07	27.00	57.00	23	57	18.5	23	NE	NE	57	NE	NE	NE
VE/VW-10	A	06/11/1996	254.94	255.07	254.74	28.00	48.00	7	48	5	7	NE	NE	48	NE	NE	NE
VE/VW-11	A	06/10/1996	253.31	253.46	253.17	30.00	40.00	7	40	5	7	NE	NE	40	NE	NE	NE
VE/VW-12	A	06/12/1996	251.34	251.51	250.66	23.00	53.00	17	53	6	17	NE	NE	53	NE	NE	NE
VE/VW-13	A	06/10/1996	251.87	252.08	251.71	30.00	40.00	7	40	5	7	NE	NE	40	NE	NE	NE
VE/VW-14	A	06/14/1996	258.32	258.47	258.14	35.00	45.00	7	45	5	7	NE	NE	45	NE	NE	NE
VW-01	A	06/11/1996	250.92	251.02	250.70	30.00	40.00	7	40	5	7	NE	NE	40	NE	NE	NE
VW-02	A	/ /	248.46	248.73	248.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VW-03	A	06/13/1996	246.48	247.12	246.89	25.00	35.00	7	35	5	7	NE	NE	35	NE	NE	NE
VW-04	A	/ /	247.18	247.38	247.03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VW-05	A	06/10/1996	247.47	247.62	247.31	25.00	35.00	7	35	5	7	NE	NE	35	NE	NE	NE
VW-06	A	06/10/1996	246.06	246.19	245.84	25.00	35.00	7	35	5	7	NE	NE	35	NE	NE	NE
VW-07	A	06/10/1996	244.71	244.86	244.52	23.00	33.00	7	33	5	7	NE	NE	33	NE	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

NA - Not Available / Applicable
NE - Not Encountered
NC - No Casing

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03/17/2000

TABLE E-1

BASEWIDE WELL COMPLETION AND STRATIGRAPHIC INFORMATION

Location I.D.	Hydrogeologic Zone Monitored	Installation Date	Ground Elev. (ft.)	Top Casing Elev. (ft.)	Top Riser Elev. (ft.)	Depth to Top of Screen (ft.)	Depth to Bottom of Screen (ft.)	Depth to Top of Sandpack (ft.)	Depth to Bottom of Sandpack (ft.)	Depth to Top of Seal (ft.)	Depth to Bottom of Seal (ft.)	Depth to Top of Silty Sand (ft.)	Depth to Bottom of Silty Sand (ft.)	Total Boring Depth (ft.)	Depth to Top of Clay (ft.)	Depth to Top of Till (ft.)	Depth to Top of Bedrock (ft.)
VW-08	A	06/07/1996	244.69	244.86	244.50	24.1	34.10	7	34.1	5	7	NE	NE	34.1	NE	NE	NE
VW-09	A	06/07/1996	243.72	243.95	243.59	22.70	32.70	7	32.7	4	7	NE	NE	33	NE	NE	NE
VW-10	A	06/06/1996	243.90	244.09	243.80	23.9	33.90	7	33.9	5	7	NE	NE	35	NE	NE	NE
VW-11	A	06/06/1996	242.29	242.50	242.12	22.50	32.50	7	32.5	4	7	NE	NE	35	NE	NE	NE

Hydrogeologic Zones:
A - Shallow Unconfined Aquifer
B - Deep Unconfined Aquifer
C - Till Water-bearing Zone
D - Bedrock Aquifer

NA - Not Available / Applicable
NE - Not Encountered
NC - No Casing

APPENDIX F

WELL DEVELOPMENT/PURGING LOGS

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY, T. HARPER

DATE: 11/13/94, 11/17/94

WELL NO.: MW-26-001

1. TOTAL CASING AND SCREEN LENGTH (FT.): 17.96 (11/13/94)
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 9.11 (11/13/94)
4. VOLUME OF WATER IN CASING (GAL.): 1.50

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.51 GAL. (3 CASINGS)

PARAMETERS	11-13-94 → 11-17-94 ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5	10	15	20	INITIAL	25	35	40	50	60
pH	6.77	6.82	7.12	7.00	7.67	7.25	7.25	7.67	7.63	7.78	8.41
SPEC. COND. (µmho)	73.5	70.5	113.2	138	159	132.9	103.7	140.8	169.9	170.4	178
TURBIDITY (NTU)	>1000	>1000	>1000	>1000	>1000	>1000	637	>1000	>1000	405	340
TEMPERATURE (°C)	11.3	11.2	11.1	11.3	11.3	8.4	9.6	8.6	10.5	12.1	11.6
DISSOLVED OXYGEN (mg/L)	6.5	5.9	7.4	6.9	6.4	10.8	10.2	10.5	10.0	10.4	8.9

COMMENTS: WELL MW-26-001 was developed using dedicated 5/8" HDPE tubing and a check valve with a Waterra Hydrolift pump - URS #120

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY, T. HARPER

DATE: 11/17/94, 11/18/94

WELL NO.: MW-26-001

1. TOTAL CASING AND SCREEN LENGTH (FT.): 17.96 (11/13/94)
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 9.11 (11/13/94)
4. VOLUME OF WATER IN CASING (GAL.): 1.50

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.51 GAL. (3 CASINGS)

PARAMETERS	11-17-94 → ACCUMULATED VOLUME PURGED (GALLONS) → 11-18-94										
	70	80	INITIAL	90	100	110	120	130	140	150	
pH	8.58	8.63	7.71	7.42	7.30	7.75	7.93	7.92	7.99	8.00	
SPEC. COND. (µmho)	213	235	276	426	412	368	318	443	471	478	
TURBIDITY (NTU)	409	105	70.7	100	122	71.6	685	21.6	45.0	21.8	
TEMPERATURE (°C)	10.9	10.3	7.2	8.4	10.3	10.2	10.5	11.1	11.3	11.2	
DISSOLVED OXYGEN (mg/L)	9.8	10.0	8.4	8.6	7.9	7.7	8.3	8.0	8.1	8.4	

COMMENTS: WELL MW-26-001 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra hydrolift pump - URS #120

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: KKEARNEY, T. HARPER

DATE: 11/13/94

WELL NO.: MW-26-002

1. TOTAL CASING AND SCREEN LENGTH (FT.):	19.05
2. CASING INTERNAL DIAMETER (IN.):	2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.):	12.06
4. VOLUME OF WATER IN CASING (GAL.):	1.19

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

3.56 GAL. (3 CASINGS)

PARAMETERS	INITIAL	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	5	10	15	20	30	40	50	60	70	80
pH	7.14	7.92	7.78	7.70	7.55	7.51	7.38	7.43	7.29	7.29	7.24
SPEC. COND. (µmho)	262	169	136	123	109	94.2	82.5	72.6	63.5	54.5	48.5
TURBIDITY (NTU)	>1000	>1000	788	547	448	318	242	214	177	149	143
TEMPERATURE (°C)	11.8	11.9	11.8	11.8	11.8	11.7	11.6	11.7	11.6	11.5	11.5
DISSOLVED OXYGEN (mg/L)	3.3	5.1	5.1	5.1	5.2	5.2	5.2	5.0	5.1	5.2	5.2

COMMENTS: WELL MW-26-002 was developed using dedicated 5/8" HDPE tubing and check valve with a Wattera Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY, T. HARPER

DATE: 11/13/94, 11/14/94

WELL NO.: MW-26-002

1. TOTAL CASING AND SCREEN LENGTH (FT.):	19.17 (11/14/94)
2. CASING INTERNAL DIAMETER (IN.):	2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.):	12.09 (11/14/94)
4. VOLUME OF WATER IN CASING (GAL.):	1.20

WELL ID.	VOL. (GAL/FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

3.61 GAL. (3 CASINGS)

PARAMETERS	11/13/94 → 11/14/94 ACCUMULATED VOLUME PURGED (GALLONS)										
	90	100	110	120	130	INITIAL	135	140	145	150	160
pH	7.28	7.27	7.27	7.25	7.25	7.52	7.53	7.57	7.61	7.68	7.69
SPEC. COND. (µmho)	48.1	45.4	42.9	41.4	40.9	75.9	67.6	50.9	45.6	43.5	40.2
TURBIDITY (NTU)	129	118	103	94.3	84.7	112	136	132	94.0	79.6	62.4
TEMPERATURE (°C)	11.5	11.6	11.2	11.2	11.2	12.4	11.9	11.7	11.7	11.8	11.7
DISSOLVED OXYGEN (mg/L)	4.8	4.6	4.7	4.8	4.8	6.0	6.1	6.0	6.3	5.6	5.9

COMMENTS: WELL MW-26-002 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY T. HARPER

DATE: 11/14/94

WELL NO.: MW-26-002

1. TOTAL CASING AND SCREEN LENGTH (FT.): 19.17
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 12.09
4. VOLUME OF WATER IN CASING (GAL.): 1.20

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

3.61 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	170	180	190								
pH	7.68	7.51	7.45								
SPEC. COND. (µmho)	38.2	38.1	36.7								
TURBIDITY (NTU)	45.8	45.0	36.5								
TEMPERATURE (°C)	11.7	11.8	11.8								
DISSOLVED OXYGEN (mg/L)	5.7	6.0	5.8								

COMMENTS: WELL MW-26-002 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: T. HARPER, K. KEARNEY

DATE: 11/14/94

WELL NO.: MW-26-003

1. TOTAL CASING AND SCREEN LENGTH (FT.): 19.20
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 10.51
4. VOLUME OF WATER IN CASING (GAL.): 1.48

4.43 GAL. (3 CASINGS)

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETERS	INITIAL	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	5	10	15	20	30	40	50	60	70	80
pH	7.29	7.14	6.94	7.02	6.97	6.91	6.94	6.84	6.78	6.74	6.68
SPEC. COND. (µmho)	73.0	76.9	70.5	68.5	63.9	62.7	62.2	60.3	61.3	57.6	59.3
TURBIDITY (NTU)	>1000	>1000	>1000	>1000	>1000	823	576	472	329	233	193
TEMPERATURE (°C)	11.4	11.2	11.2	11.2	11.1	11.2	11.2	11.2	11.1	11.0	11.0
DISSOLVED OXYGEN (mg/L)	6.5	5.9	6.2	6.0	6.0	6.0	5.9	6.0	6.0	5.6	5.4

COMMENTS: WELL MW-26-003 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY, T. HARPER

DATE: 11/14/94, 11/17/94

WELL NO.: MW-26-003

1. TOTAL CASING AND SCREEN LENGTH (FT.): 19.20 (11/17/94)
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 10.53 (11/17/94)
4. VOLUME OF WATER IN CASING (GAL.): 1.47

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.42 GAL. (3 CASINGS)

PARAMETERS	11/14/94 → ACCUMULATED VOLUME PURGED (GALLONS) → 11/17/94										
	90	100	110	120	130	140	INITIAL	150	160	170	180
pH	6.66	6.61	6.71	6.69	6.62	6.68	7.71	7.74	7.77	7.83	7.77
SPEC. COND. (µmho)	61.3	58.9	59.2	58.6	60.8	59.6	92.4	80.2	81.9	79.4	76.8
TURBIDITY (NTU)	164	152	134	126	88.0	80.4	318	302	142	102	60.7
TEMPERATURE (°C)	11.0	11.1	11.0	11.0	11.1	11.0	7.5	9.2	10.0	10.0	9.6
DISSOLVED OXYGEN (mg/L)	5.7	5.8	6.1	6.1	5.9	5.4	8.8	8.8	9.8	10.7	10.0

COMMENTS: WELL MW-26-003 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: K. KEARNEY, T. HARPER

DATE: 11/17/94

WELL NO.: MW-26-003

1. TOTAL CASING AND SCREEN LENGTH (FT.): 19.20
2. CASING INTERNAL DIAMETER (IN.): 2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.): 10.53
4. VOLUME OF WATER IN CASING (GAL.): 1.47

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.42 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	190	200	210	220	230	240					
pH	7.76	7.48	7.59	7.55	7.77	7.72					
SPEC. COND. (µmho)	83.4	82.6	94.0	85.1	83.6	81.6					
TURBIDITY (NTU)	61.1	52.7	39.8	40.8	43.4	45.2					
TEMPERATURE (°C)	9.8	8.7	10.0	9.7	10.0	10.3					
DISSOLVED OXYGEN (mg/L)	10.0	11.2	9.1	9.6	10.3	10.9					

COMMENTS: WELL MW-26-003 was developed using dedicated 5/8" HDPE tubing and check valve with a Waterra Hydrolift pump. URS # 120

Generator URS # 125

URSF-021/1 OF 1/WDPL

WELL DEVELOPMENT LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: T. HARPER, K. KEARNEY

DATE: 11/17/94

WELL NO.: MW-26-004

1. TOTAL CASING AND SCREEN LENGTH (FT.):	20.08
2. CASING INTERNAL DIAMETER (IN.):	2" PVC
3. WATER LEVEL BELOW TOP OF CASING (FT.):	13.56
4. VOLUME OF WATER IN CASING (GAL.):	1.11

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

3.32 GAL. (3 CASINGS)

PARAMETERS	INITIAL	ACCUMULATED VOLUME PURGED (GALLONS)									
	0	5	10	15	20	30	40	50			
pH	7.93	7.23	7.12	7.24	7.58	7.68	7.98	7.96			
SPEC. COND. (µmho)	50.4	76.6	58.9	63.3	63.3	61.9	60.1	62.0			
TURBIDITY (NTU)	>1000	>1000	>1000	133	43	17.0	26.8	3.47			
TEMPERATURE (°C)	8.8	10.1	9.8	9.8	9.8	9.1	9.2	8.8			
DISSOLVED OXYGEN (mg/L)	10.5	10.0	8.9	9.7	9.5	10.7	10.0	9.5			

COMMENTS: WELL MW-26-004 WAS DEVELOPED USING DEDICATED 5/8" HDPE TUBING AND CHECK VALVE WITH A Waterra HYDROLIFT PUMP

URSF-021/1 OF 1/WDPL

WELL PURGING LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291 - 17 EOD RANGE

STAFF: Kevin Kearney, Tom Harper

DATE: 12-6-94

WELL NO.: MW-26-001

1. TOTAL CASING AND SCREEN LENGTH (FT.): 18.04'
2. CASING INTERNAL DIAMETER (IN.): 2"
3. WATER LEVEL BELOW TOP OF CASING (FT.): 8.66'
4. VOLUME OF WATER IN CASING (GAL.): 1.59

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.78 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5		SAMPLE							
pH	7.38	7.76		7.46							
SPEC. COND. (µmho)	172	56.2		45.0							
TURBIDITY (NTU)	7.15	95.7		35.9							
TEMPERATURE (°C)	10.1	11.1		10.2							
DISSOLVED OXYGEN (mg/L)	5.0	6.1		7.8							

COMMENTS: start purge 0945
End purge 0955
Sample time 1400

URSF-021/1 OF 2/WDPL

WELL PURGING LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291.17 EOD RANGE

STAFF: Kevin Kearney, Tom Harper

DATE: 12-6-94

WELL NO.: MW-26-002

1. TOTAL CASING AND SCREEN LENGTH (FT.):	19.32'
2. CASING INTERNAL DIAMETER (IN.):	2"
3. WATER LEVEL BELOW TOP OF CASING (FT.):	12.34'
4. VOLUME OF WATER IN CASING (GAL.):	1.19
	3.56 GAL. (3 CASINGS)

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	4		SAMPLE							
pH	7.79	7.66		7.53							
SPEC. COND. (µmho)	49.0	49.2		66.4							
TURBIDITY (NTU)	25.8	59.5		28.6							
TEMPERATURE (°C)	11.8	12.3		11.0							
DISSOLVED OXYGEN (mg/L)	4.5	4.1		4.9							

COMMENTS:

Start purge 1015
End purge 1020
Sample time 1500

URSF-021/1 OF 2/WDPL

WELL PURGING LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291-17 EOD RANGE

STAFF: Kevin Kearney, Tom Harper

DATE: 12-6-94

WELL NO.: MW-26-003

		WELL ID.	VOL. (GAL./FT.)
1. TOTAL CASING AND SCREEN LENGTH (FT.):	19.01'	1"	0.04
		2"	0.17
2. CASING INTERNAL DIAMETER (IN.):	2"	3"	0.38
		4"	0.66
3. WATER LEVEL BELOW TOP OF CASING (FT.):	11.74'	5"	1.04
		6"	1.50
4. VOLUME OF WATER IN CASING (GAL.):	1.24	8"	2.60

3.72 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	4		SAMPLE							
pH	7.60	6.72		7.29							
SPEC. COND. (µmho)	55.3	44.2		49.3							
TURBIDITY (NTU)	129	40.5		33.3							
TEMPERATURE (°C)	11.1	11.2		11.1							
DISSOLVED OXYGEN (mg/L)	4.9	5.1		7.9							

COMMENTS: start purge 1036
End purge 1040
Sample time 1530

URSF-021/1 OF 2/WDPL

WELL PURGING LOG

URS CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB

PROJECT NO.: 35291 - 17 EOD RANGE

STAFF: KEVIN KEARNEY, TOM HARPER

DATE: 12/6/94

WELL NO.: MW-26-004

1. TOTAL CASING AND SCREEN LENGTH (FT.):	20.09'
2. CASING INTERNAL DIAMETER (IN.):	2"
3. WATER LEVEL BELOW TOP OF CASING (FT.):	13.72'
4. VOLUME OF WATER IN CASING (GAL.):	1.08

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

3.25 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	4		SAMPLE							
pH	6.61	6.60		7.43							
SPEC. COND. (µmho)	24.3	25.6		36.2							
TURBIDITY (NTU)	26.3	14.7		30.7							
TEMPERATURE (°C)	10.7	11.6		11.2							
DISSOLVED OXYGEN (mg/L)	4.7	8.5		7.2							

COMMENTS:

start purge 1055
End purge 1100
Sample time 1615

URSF-021/1 OF 2/WDPL

WELL PURGING LOG

URS
CONSULTANTS, INC.

PROJECT TITLE: PLATTSBURGH AFB
PROJECT NO.: 35291 - 17 EOD RANGE
STAFF: Kevin Kearney
DATE: 12-7-94

WELL NO.: MW - 24 - 001

1. TOTAL CASING AND SCREEN LENGTH (FT.): 14.43'
2. CASING INTERNAL DIAMETER (IN.): 2"
3. WATER LEVEL BELOW TOP OF CASING (FT.): 6.26'
4. VOLUME OF WATER IN CASING (GAL.): 1.39

WELL ID.	VOL. (GAL./FT.)
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

4.17 GAL. (3 CASINGS)

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5		SAMPLE							
pH	7.62	7.09		7.14							
SPEC. COND. (µmho)	104	65.2		45.2							
TURBIDITY (NTU)	16.5	6.54		26.6							
TEMPERATURE (°C)	7.1	7.3		7.7							
DISSOLVED OXYGEN (mg/L)	6.6	6.3		3.5							

COMMENTS: Start purge 0945
End purge 0952
Sample time 1010

URSF-021/1 OF 2/WDPL

WELL DEVELOPMENT LOG

URS Greiner

PROJECT TITLE: PAFB Site SS-026 WELL NO.: MW-26-005

PROJECT NO.: 01F0000049.00.16005

STAFF: Rob Giordano START: 13:02

DATE(S): 9/29/99 STOP: 15:50

HEADSPACE (ppm): 0.5

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	15.80	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	9.51	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.29	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.07	5"	1.04
6. VOLUME OF WATER REMOVED (GAL.)	=	70	6"	1.50
			8"	2.60

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	0	5	10	15	20	25	30	40	50	60	70
pH	7.11	6.86	6.68	6.68	6.50	6.64	6.82	6.69	6.75	6.97	6.78
SPEC. COND. (umhos)	178	176.5	180.5	156.6	148.2	146.8	151.7	138.1	119.6	120.7	126.4
TEMPERATURE (°C)	23.1	18.4	18.0	17.5	17.8	17.9	18.3	20.5	18.0	18.5	18.2
TURBIDITY (NTU)	>100	>100	>100	>100	95	92	94	84	82	52	39
DISSOLVED OXYGEN (mg/l)	2.65	1.59	1.70	1.60	1.57	1.62	2.44	2.92	3.19	2.81	2.51

COMMENTS: Well developed with Waterra Hydrolift Pump using dedicated 5/8 " OD, HDPE tubing and foot valve.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-24-001

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 11:31

DATE(S): 10-06-99 STOP PURGE: 11:50

SAMPLE TIME: 16:20

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.10	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	5.20	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.90	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.51	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	4.54	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	5.0	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	5	Sample								
pH	5.85	6.05	6.23								
SPEC. COND. (umhos)	1111	987	813								
TEMPERATURE ^{0}C	12.3	11.5	11.8								
TURBIDITY (NTU)	4.0	20.0	6.0								
DISSOLVED OXYGEN (mg/L)	18.9	8.5	3.0								
ORP (mV)	248	276	213								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC and RDX analyses.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-26-001

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 11:53

DATE(S): 10-06-99 STOP PURGE: 12:03

SAMPLE TIME: 16:30

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	17.81	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	9.39	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.42	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.43	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	4.29	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.5	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	4.5	Sample								
pH	6.77	6.62	6.75								
SPEC. COND. (umhos)	879	922	717								
TEMPERATURE ^{0}C	12.0	13.9	12.0								
TURBIDITY (NTU)	30.0	>100	12.0								
DISSOLVED OXYGEN (mg/L)	8.9	7.0	2.7								
ORP (mV)	230	260.7	225.7								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC and RDX analyses.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-26-002

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 12:50

DATE(S): 10-06-99 STOP PURGE: 13:05

SAMPLE TIME: 15:54

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	19.10	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	12.05	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	7.05	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.20	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	3.60	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.0	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	4	Sample								
pH	7.70	6.52	6.97								
SPEC. COND. (umhos)	1198	668	570								
TEMPERATURE ^{0}C	13.5	13.7	10.9								
TURBIDITY (NTU)	92.0	>100	15.0								
DISSOLVED OXYGEN (mg/L)	4.9	4.8	2.2								
ORP (mV)	210.9	223.8	179.2								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC and RDX analyses.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-26-003

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 12:19

DATE(S): 10-06-99 STOP PURGE: 12:22

SAMPLE TIME: 16:00

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	18.80	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	10.32	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.48	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.44	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	4.32	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.5	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	4.5	Sample								
pH	6.83	6.63	7.00								
SPEC. COND. (umhos)	367	365	342								
TEMPERATURE ^{0}C	12.9	13.4	10.7								
TURBIDITY (NTU)	15.0	95.0	6.0								
DISSOLVED OXYGEN (mg/L)	6.3	5.6	3.1								
ORP (mV)	20	224	176.5								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC and RDX analyses.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-26-004

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 13:06

DATE(S): 10-06-99 STOP PURGE: 13:15

SAMPLE TIME: 13:54

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	19.95	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.52	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.43	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.09	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	3.28	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	4.0	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	4	Sample								
pH	6.33	6.26	6.72								
SPEC. COND. (umhos)	563	560	568								
TEMPERATURE °C	12.8	12.6	11.0								
TURBIDITY (NTU)	9.0	39.0	10.0								
DISSOLVED OXYGEN (mg/L)	4.4	4.5	3.3								
ORP (mV)	272.6	275.7	268.6								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC and RDX analyses.

WELL PURGING LOG

URS Greiner

PROJECT TITLE: EOD Range (SS-026) WELL NO.: MW-26-005

PROJECT NO.: 01F0000049.00.16005

STAFF: Scott Fischer and Paul Pavone START PURGE: 11:53

DATE(S): 10-06-99 STOP PURGE: 12:03

SAMPLE TIME: 16:30

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	14.71	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	9.50	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	5.21	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.89	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.66	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.0	8"	2.60

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	3	Sample								
pH	6.69	6.84	7.84								
SPEC. COND. (umhos)	1656	1993	845								
TEMPERATURE °C	11.9	13.2	13.2								
TURBIDITY (NTU)	20.0	68.0	42.0								
DISSOLVED OXYGEN (mg/L)	5.5	5.0	9.2								
ORP (mV)	228.8	220.9	212								

COMMENTS: Purged well by hand using dedicated HDPE tubing and foot valve.
Sample obtained using a disposable Teflon bailer with a Teflon-coated stainless-steel leader.
Sample submitted for TCL VOC,TCL SVOC, TCL PCBs, TAL metals and RDX analyses.
QA/QC samples taken: Matrix Spike, Matrix Spike Duplicate, and Field Duplicate.

APPENDIX G

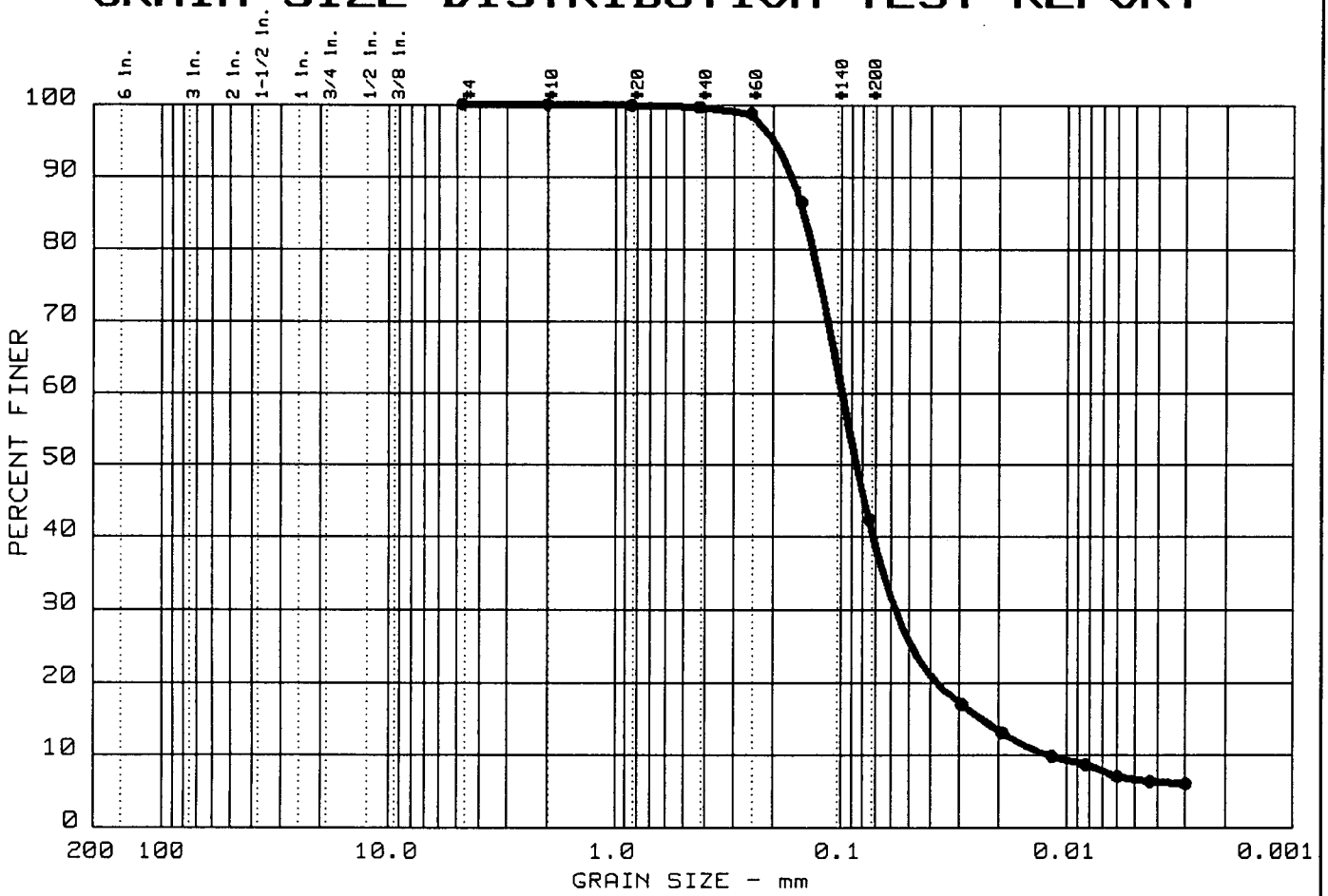
GEOTECHNICAL TESTING RESULTS

EOD RANGE (SS-026)
GEOTECHNICAL ANALYSIS SUMMARY

	GRAIN SIZE DISTRIBUTION				USCS Class	Water Content (%)
Sample Location/Depth	% Gravel	% Sand	% Silt	%Clay		
MW-26-001/8' - 10'	0.0	57.7	35.7	6.6	SM	22.6
MW-26-002/9´-11´	0.0	95.8	4.2*		SP	24.7
MW-26-003/9´-11´	0.0	97.3	2.7*		SP	23.7
MW-26-004/9´-11´	0.2	77.7	22.1*		SM	21.3
SB-26-03/0' - 2'	0.1	89.5	10.4*		SP/SM	6.3
MW-26-001/0 - 4"	0.0	81.6	15.9	2.5	SM	8.3
MW-26-002/0 - 4"	0.3	92.3	5.6	1.8	SP/SM	5.0
MW-26-003/0 - 3"	0.5	95.5	4.0*		SP	3.2

* Combined silt and clay percentage

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	57.7	35.7	6.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.15	0.10	0.08	0.057	0.0238	0.0122	2.71	8.1

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Some Silt, tr clay	SM	

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-001 / 8'- 10'

Date: DECEMBER 5, 1994

Remarks:
CLIENT: URS CONSULTANTS
WATER CONTENT: 22.6%

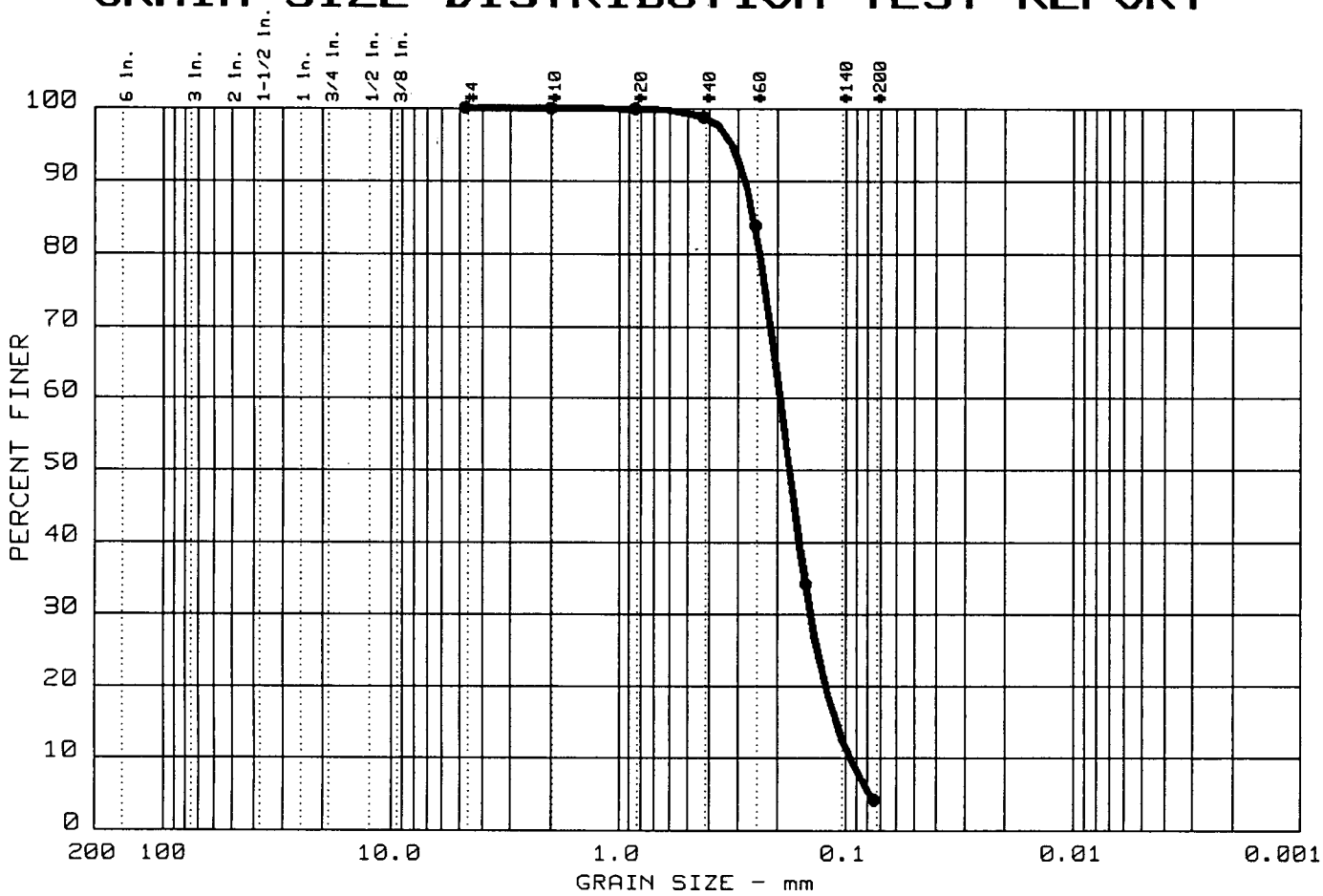
LAB NO. 2168.001

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	0.0	95.8	4.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25	0.19	0.18	0.142	0.1093	0.0951	1.10	2.0

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, trace fines	SP	

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-002 / 9'- 11'

Date: DECEMBER 5, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

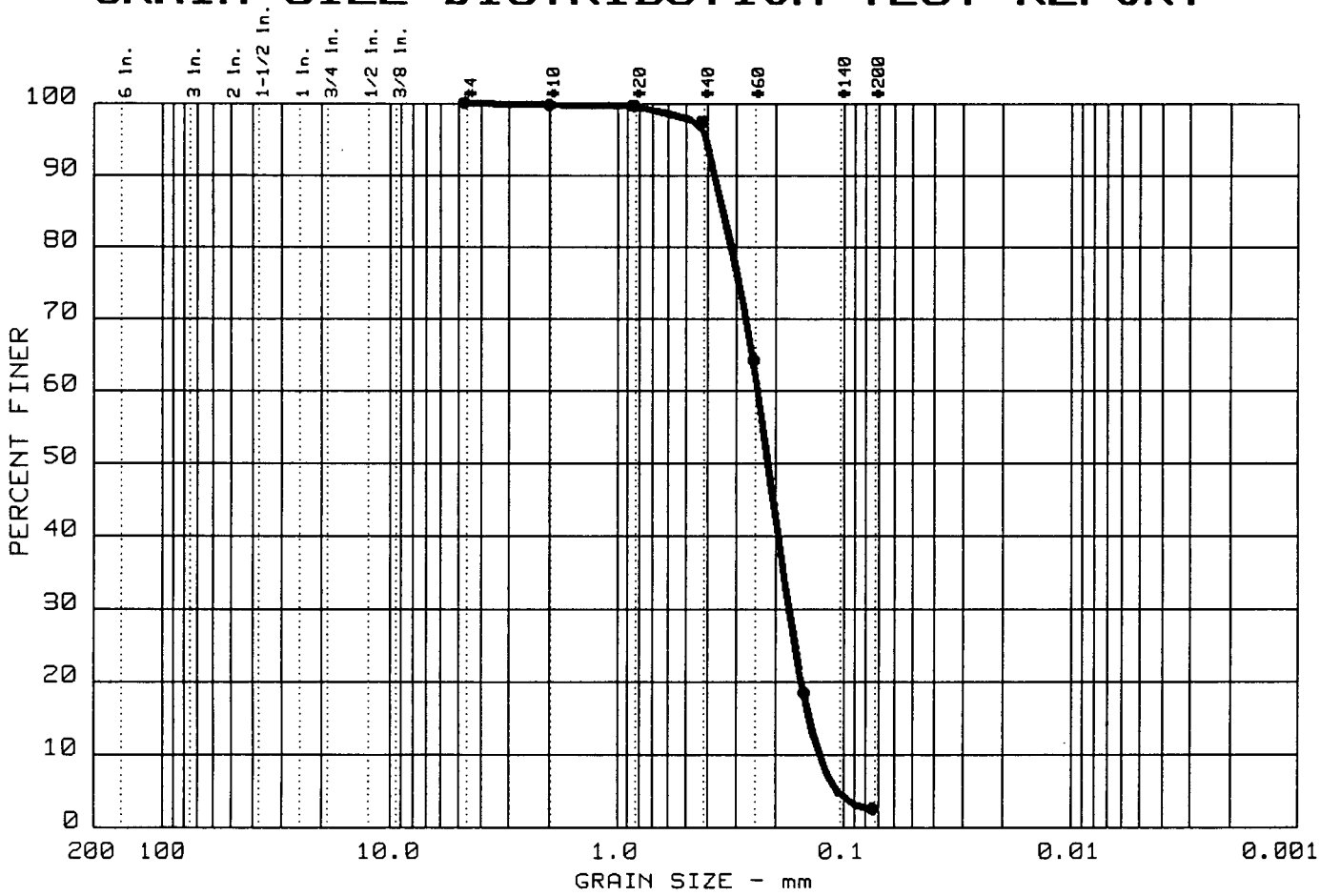
CLIENT: URS CONSULTANTS

WATER CONTENT: 24.7%

LAB NO. 2168.002

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	97.3	2.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.34	0.24	0.22	0.174	0.1414	0.1271	1.00	1.9

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, trace fines	SP	

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-003 / 9'- 11'

Date: DECEMBER 5, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

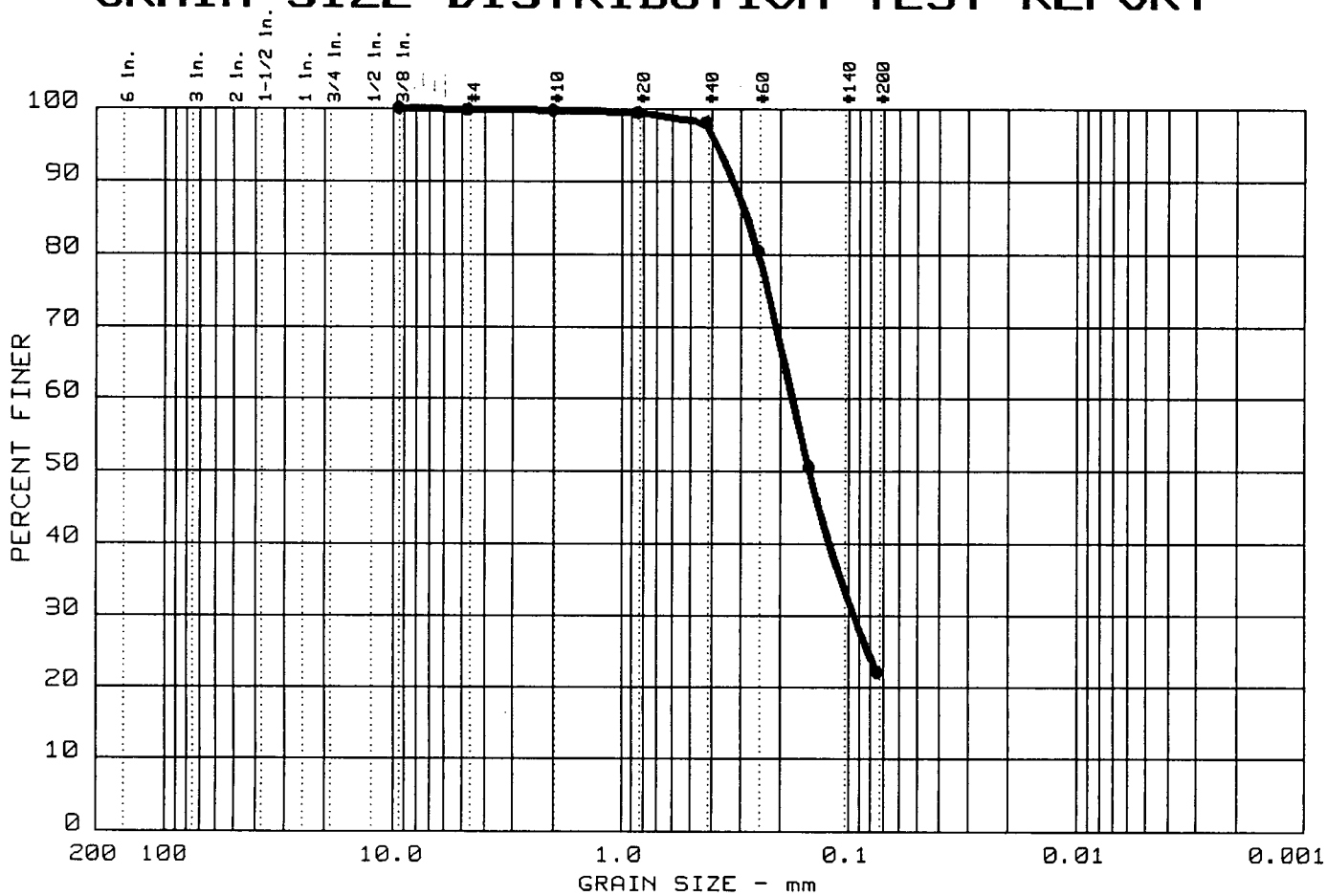
HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:
CLIENT: URS CONSULTANTS
WATER CONTENT: 23.7%

LAB NO. 2168.003

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	0.2	77.7	22.1	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.28	0.18	0.15	0.094				

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, Some Fines, trace gravel	SM	

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-004 / 9'- 11'

Date: DECEMBER 5, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

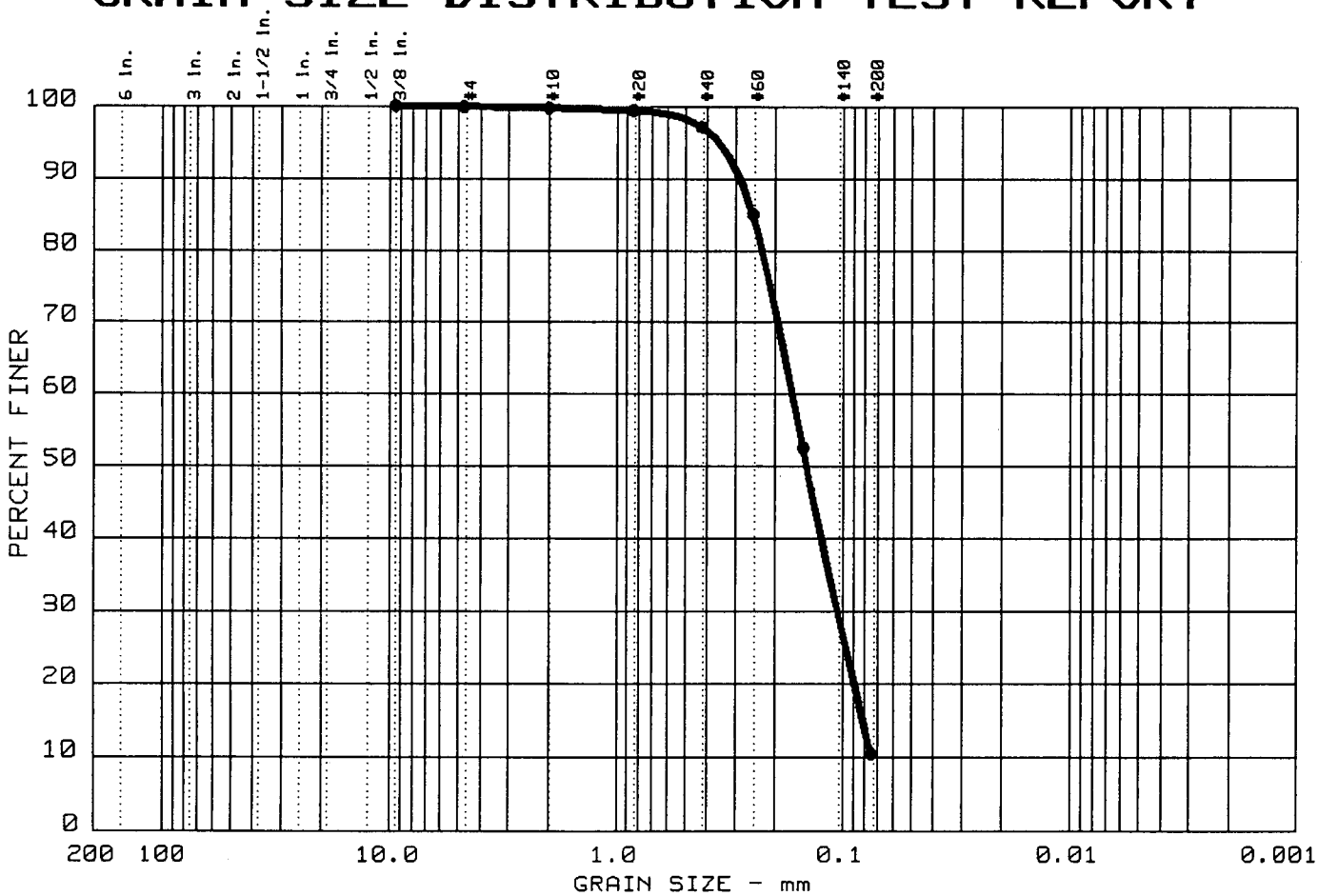
CLIENT: URS CONSULTANTS

WATER CONTENT: 21.3%

LAB NO. 2168.004

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	5	0.0	0.1	89.5	10.4	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25	0.17	0.14	0.105	0.0812			

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, Little Fines, trace gravel	SP-SM	

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: SB-26-03 / 0'- 2'

Date: DECEMBER 5, 1994

Remarks:
CLIENT: URS CONSULTANTS
WATER CONTENT: 6.3%

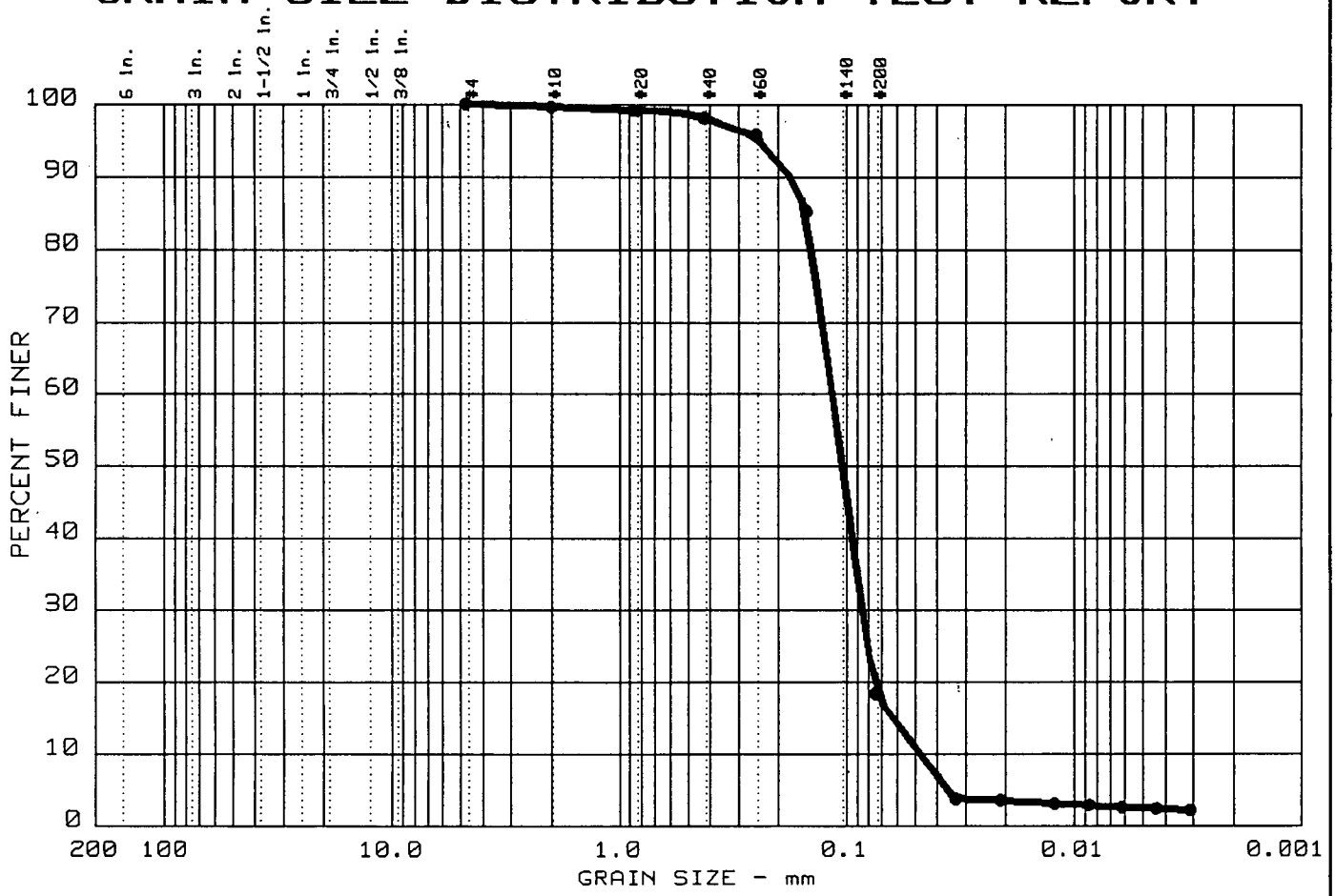
LAB NO. 2168.005

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	0.0	81.6	15.9	2.5

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.15	0.12	0.10	0.085	0.0619	0.0470	1.32	2.5

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, Little Silt, trace clay, ORGANICS	SM	

Project No.: G008.018
Project: PLATTSBURGH A.F.B. PLATTSBURGH, N.Y.
● Location: MW-26-001 / 0"- 4"

Date: JANUARY 3, 1995

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

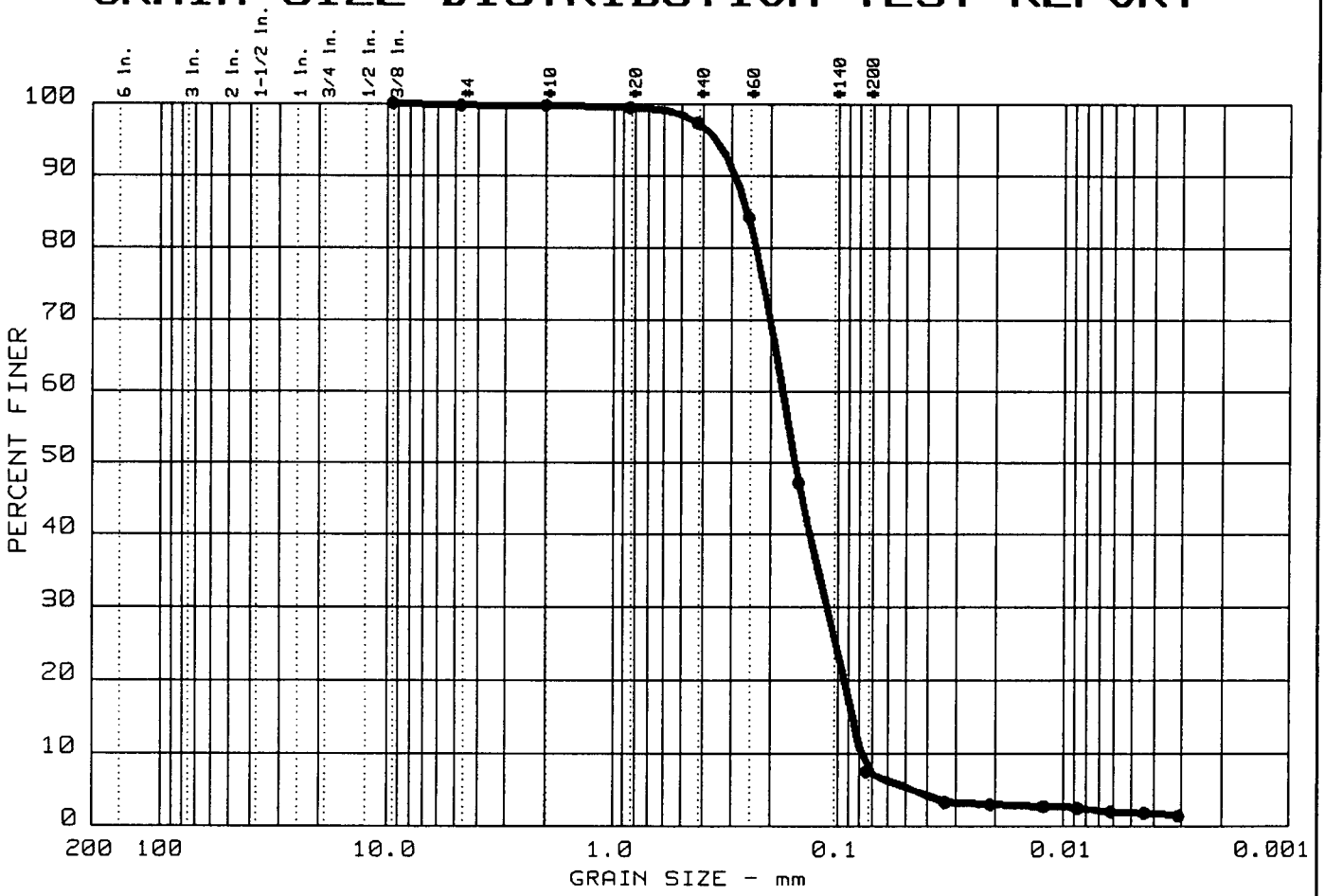
CLIENT: URS CONSULTANTS

WATER CONTENT: 8.3%

LAB NO. 2183.001

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	7	0.0	0.3	92.3	5.6	1.8

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.25	0.18	0.16	0.111	0.0853	0.0783	0.90	2.2

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, tr silt & clay & gravel, ORGANICS	SP-SM	

Project No.: G008.018
Project: PLATTSBURGH A.F.B. PLATTSBURGH, N.Y.
● Location: MW-26-002 / 0"- 4"

Date: JANUARY 3, 1995

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

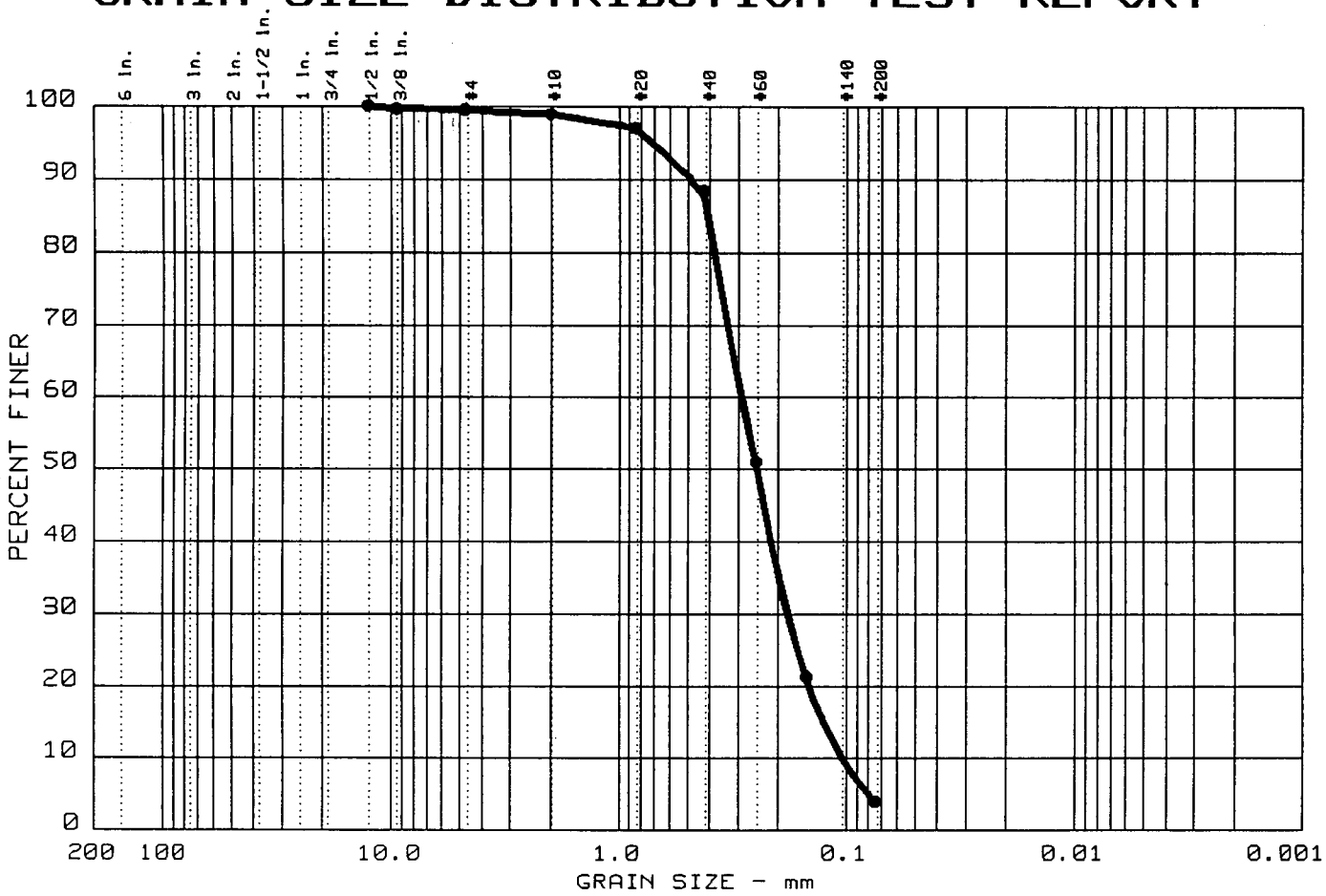
CLIENT: URS CONSULTANTS

WATER CONTENT: 5.0%

LAB NO. 2183.002

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.5	95.5	4.0	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.41	0.29	0.25	0.180	0.1256	0.1033	1.10	2.8

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, trace fines & gravel, ORGANICS	SP	

Project No.: G008.018
Project: PLATTSBURGH A.F.B. PLATTSBURGH, N.Y.
● Location: MW-26-003 / 0"- 3"

Date: JANUARY 3, 1995

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

CLIENT: URS CONSULTANTS

WATER CONTENT: 3.2%

LAB NO. 2183.003

Figure No. 1

APPENDIX H

SLUG TESTING RESULTS

BOUWER AND RICE METHOD FOR INTERPRETATION OF SLUG TESTS: FOR UNCONFINED AND LEAKY CONFINED AQUIFERS.
TO UTILIZE THIS WORKSHEET, ENTER YOUR DATA AT LOCATIONS MARKED BY AN "*".
PROGRAM CAN INCLUDE EFFECTS OF SANDPACK DEWATERING (ASSUMING WATER IS RISING WITHIN THE SANDPACK).

#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	6.50	0.100	0.0	-2.3026
2	0.01	6.51	0.110	0.6	-2.2073
3	0.02	7.14	0.740	1.2	-0.3011
4	0.03	6.68	0.280	1.8	-1.2730
5	0.05	7.44	1.040	3.0	0.0392
6	0.06	7.39	0.990	3.6	-0.0101
7	0.08	7.01	0.610	4.8	-0.4943
8	0.10	7.02	0.620	6.0	-0.4780
9	0.11	6.78	0.380	6.6	-0.9676
10	0.13	6.89	0.490	7.8	-0.7133
11	0.15	6.91	0.510	9.0	-0.6733
12	0.16	6.89	0.490	9.6	-0.7133
13	0.18	6.87	0.470	10.8	-0.7550
14	0.20	6.85	0.450	12.0	-0.7985
15	0.25	6.82	0.420	15.0	-0.8675
16	0.33	6.79	0.390	19.8	-0.9416
17	0.50	6.77	0.370	30.0	-0.9943
18	0.75	6.76	0.360	45.0	-1.0217
19	1.25	6.75	0.350	75.0	-1.0498
20	1.75	6.73	0.330	105.0	-1.1087
21	2.50	6.71	0.310	150.0	-1.1712
22	4.00	6.68	0.280	240.0	-1.2730
23	6.00	6.65	0.250	360.0	-1.3863
24	9.00	6.61	0.210	540.0	-1.5606
25	14.00	6.57	0.170	840.0	-1.7720
26	20.00	6.53	0.130	1200.0	-2.0402
27	30.00	6.48	0.080	1800.0	-2.5257

* PROJECT NAME : Plattsburgh AFB: EOD Range
* PROJECT NO : 35291.17
* WELL NO : **MW-26-001 (SLUG IN)**
* ANALYST : KEARNEY/BYRNE
* DATE COLLECTED : 12/11/94
* RISER PIPE (ID): (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) = 10.0 in. = 0.4167 (radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) = 9.48 Ft.
* MAX DRAWDOWN (IN SUBSET): (H-Ho)= 1.00 Ft.
* STATIC WATER LEVEL PRESSURE = 6.40 Ft.
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM: 9.48 Ft.
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 30.00 Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 1
* SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
RATIO OF L/(r sub w) = 22.75
---LOG OF L/(r sub w) = 1.3570
FOR PARTIALLY PENETRATING WELLS--
A = 2.19
B = 0.31
FOR FULLY PENETRATING WELLS--
C = 1.60

---EVALUATION OF LN(Re/(r sub w)):
CONST.1 = 0.3520
CONST.2 = 3.8969 =(MAX. OF 6.0)= 3.8969
LN(Re/(r sub w)) = 2.00

EFFECTIVE r sub c (for sandpack dewatering) = 0.1787
(1/T)(LN(Yo/Yt)) (SLOPE) = -1.55E-02 sec^(-1)

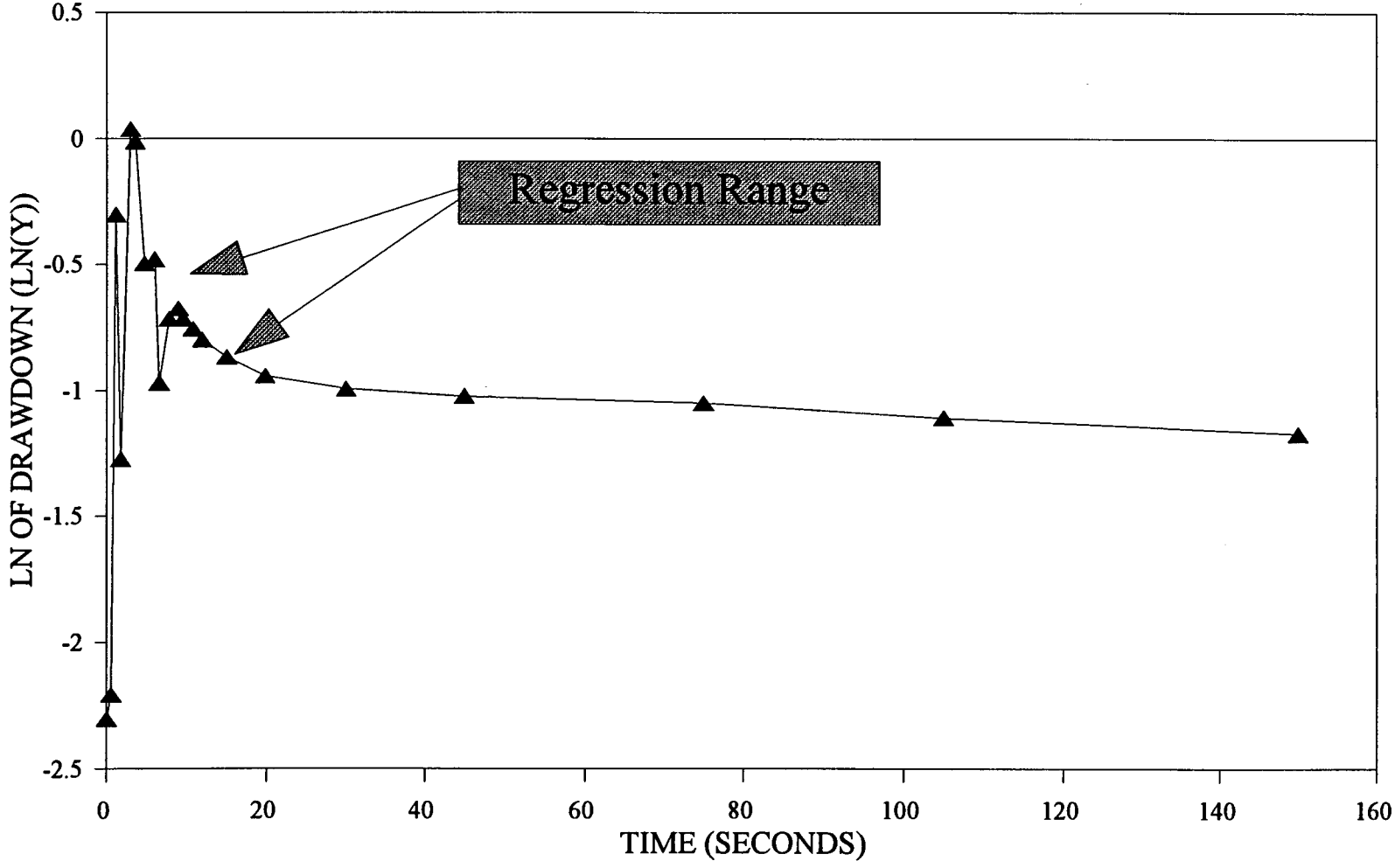
HYDRAULIC CONDUCTIVITY (K) = 5.23E-05 ft/sec <==========
1.59E-03 cm/sec <==========

Regression Output:

Constant		-0.59
Std Err of Y Est		1.56E-01
R Squared		0.0535
No. of Observations		7.0000
Degrees of Freedom		5
X Coefficient(s)	-1.55E-02	
Std Err of Coef.	2.92E-02	
Regression Range	t=6.0 - 12.0	

RATE OF RECOVERY TEST

MW-26-001 (SLUG IN)



#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	6.40	0.100	0.0	-2.3026
2	0.01	6.07	0.430	0.6	-0.8440
3	0.02	5.61	0.890	1.2	-0.1165
4	0.03	5.48	1.020	1.8	0.0198
5	0.05	5.55	0.950	3.0	-0.0513
6	0.06	5.72	0.780	3.6	-0.2485
7	0.08	5.77	0.730	4.8	-0.3147
8	0.10	5.83	0.670	6.0	-0.4005
9	0.11	5.89	0.610	6.6	-0.4943
10	0.13	5.93	0.570	7.8	-0.5621
11	0.15	5.97	0.530	9.0	-0.6349
12	0.16	6.01	0.490	9.6	-0.7133
13	0.18	6.04	0.460	10.8	-0.7765
14	0.20	6.07	0.430	12.0	-0.8440
15	0.25	6.12	0.380	15.0	-0.9676
16	0.33	6.18	0.320	19.8	-1.1394
17	0.50	6.22	0.280	30.0	-1.2730
18	0.75	6.24	0.260	45.0	-1.3471
19	1.25	6.26	0.240	75.0	-1.4271
20	1.75	6.27	0.230	105.0	-1.4697
21	2.50	6.28	0.220	150.0	-1.5141
22	4.00	6.29	0.210	240.0	-1.5606
23	6.00	6.30	0.200	360.0	-1.6094
24	9.00	6.31	0.190	540.0	-1.6607
25	14.00	6.32	0.180	840.0	-1.7148
26	20.00	6.33	0.170	1200.0	-1.7720
27	30.00	6.35	0.150	1800.0	-1.8971

* PROJECT NAME : Plattsburgh AFB: EOD Range
* PROJECT NO : 35291.17
* WELL NO : MW-26-001 (SLUG OUT)
* ANALYST : KEARNEY/BYRNE
* DATE COLLECTED 12/11/94
* RISER PIPE (ID): (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) = 10.0 in. = 0.4167 (radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) = 9.48 Ft.
* MAX DRAWDOWN (IN SUBSET): (H-Ho)= 1.00 Ft.
* STATIC WATER LEVEL PRESSURE = 6.50 Ft.
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM: 9.48 Ft.
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 30.00 Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 1
* SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
RATIO OF L/(r sub w) = 22.75
---LOG OF L/(r sub w) = 1.3570
FOR PARTIALLY PENETRATING WELLS--
A = 2.19
B = 0.31
FOR FULLY PENETRATING WELLS--
C = 1.60

---EVALUATION OF LN(Re/(r sub w)):
CONST.1 = 0.3520
CONST.2 = 3.8969 =(MAX. OF 6.0)= 3.8969
LN(Re/(r sub w) = 2.00

EFFECTIVE r sub c (for sandpack dewatering) = 0.1787
(1/T)(LN(Yo/Yt)) (SLOPE) = -4.68E-02 sec^(-1)

HYDRAULIC CONDUCTIVITY (K) = 1.58E-04 ft/sec <==========
4.80E-03 cm/sec <==========

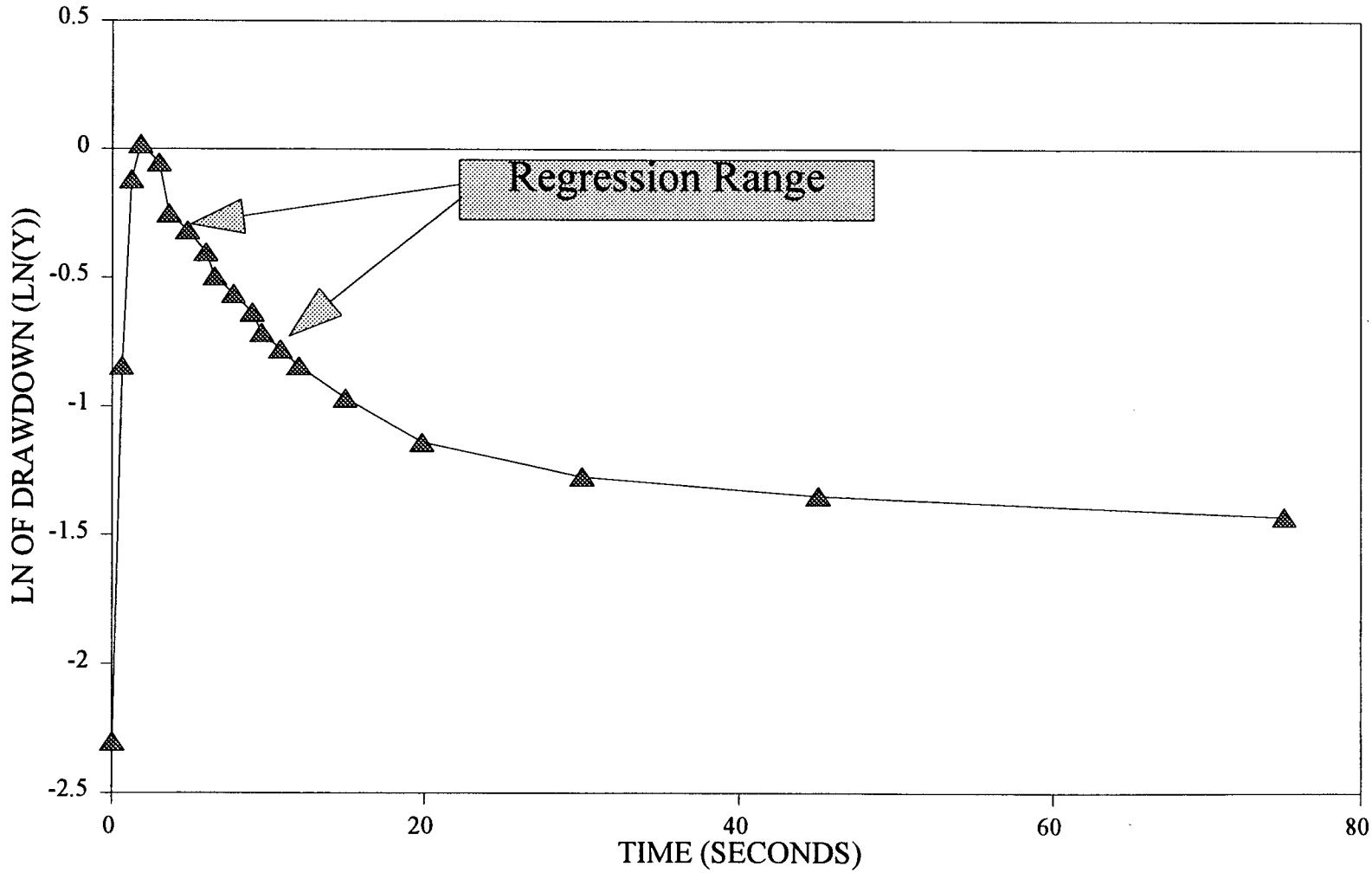
Regression Output:

Constant		-0.27
Std Err of Y Est		1.02E-02
R Squared		0.9942
No. of Observations		4.0000
Degrees of Freedom		2
X Coefficient(s)	-4.68E-02	
Std Err of Coef.	2.53E-03	
Regression Range	t=4.8 - 10.8	

H - 7

RATE OF RECOVERY TEST

MW-26-001 (SLUG OUT)



BOUWER AND RICE METHOD FOR INTERPRETATION OF SLUG TESTS: FOR UNCONFINED AND LEAKY CONFINED AQUIFERS.
TO UTILIZE THIS WORKSHEET, ENTER YOUR DATA AT LOCATIONS MARKED BY AN "*".
PROGRAM CAN INCLUDE EFFECTS OF SANDPACK DEWATERING (ASSUMING WATER IS RISING WITHIN THE SANDPACK).

#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	4.00	0.100	0.0	-2.3026
2	0.01	4.00	0.100	0.6	-2.3026
3	0.02	4.00	0.100	1.2	-2.3026
4	0.03	4.00	0.100	1.8	-2.3026
5	0.05	3.99	0.090	3.0	-2.4079
6	0.06	4.82	0.920	3.6	-0.0834
7	0.08	4.59	0.690	4.8	-0.3711
8	0.10	4.20	0.300	6.0	-1.2040
9	0.11	3.97	0.070	6.6	-2.6593
10	0.13	4.48	0.580	7.8	-0.5447
11	0.15	4.17	0.270	9.0	-1.3093
12	0.16	4.15	0.250	9.6	-1.3863
13	0.18	4.17	0.270	10.8	-1.3093
14	0.20	4.16	0.260	12.0	-1.3471
15	0.25	4.15	0.250	15.0	-1.3863
16	0.33	4.12	0.220	19.8	-1.5141
17	0.50	4.10	0.200	30.0	-1.6094
18	0.75	4.07	0.170	45.0	-1.7720
19	1.25	4.04	0.140	75.0	-1.9661
20	1.75	4.03	0.130	105.0	-2.0402
21	2.50	4.02	0.120	150.0	-2.1203
22	4.00	4.02	0.120	240.0	-2.1203
23	6.00	4.01	0.110	360.0	-2.2073
24	9.00	4.01	0.110	540.0	-2.2073
25	12.00	4.01	0.110	720.0	-2.2073
26	16.00	4.01	0.110	960.0	-2.2073

* PROJECT NAME :	Plattsburgh AFB: EOD Range		
* PROJECT NO :	35291.17		
* WELL NO :	**MW-26-002(SLUG IN)**		
* ANALYST :	KEARNEY/BYRNE		
* DATE COLLECTED :	12/11/94		
* RISER PIPE (ID): (2 r sub c) =	2.0 in. =	0.0833	(radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) =	10.0 in. =	0.4167	(radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) =	7.75 Ft.		
* MAX DRAWDOWN (IN SUBSET): (H-Ho)=	1.00 Ft.		
* STATIC WATER LEVEL PRESSURE =	3.90 Ft.		
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM:	7.75 Ft.		
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) =		25.00	Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)?		1	
* SANDPACK'S SPECIFIC YIELD (Sy) =	0.15		

BOUWER AND RICE CURVE COEFFICIENTS:			
RATIO OF L/(r sub w) =	18.60		
---LOG OF L/(r sub w) =	1.2695		
FOR PARTIALLY PENETRATING WELLS--			
A =	2.05		
B =	0.30		
FOR FULLY PENETRATING WELLS--			
C =	1.48		
---EVALUATION OF LN(Re/(r sub w)):			
CONST.1 =	0.3763		
CONST.2 =	3.7233	=(MAX. OF 6.0)=	3.7233
LN(Re/(r sub w) =	1.83		

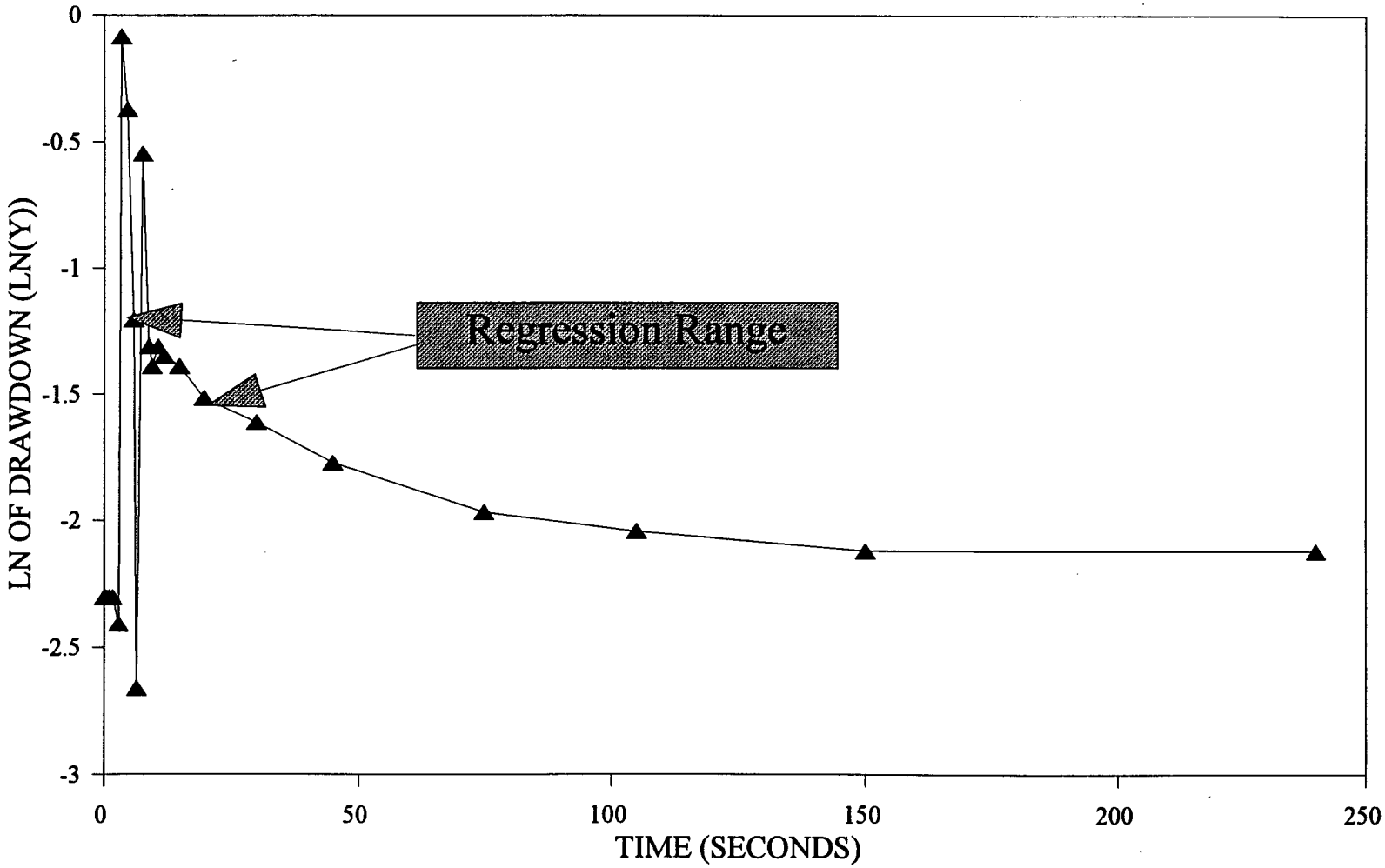
EFFECTIVE r sub c (for sandpack dewatering) =	0.1787	
(1/T)(LN(Yo/Yt)) (SLOPE) =	-1.64E-02	sec^(-1)
HYDRAULIC CONDUCTIVITY (K) =	6.21E-05	ft/sec <==========
	1.89E-03	**cm/sec** <==========

Regression Output:

Constant	-1.17
Std Err of Y Est	4.05E-02
R Squared	0.7740
No. of Observations	6.0000
Degrees of Freedom	4
X Coefficient(s)	-1.64E-02
Std Err of Coef.	4.44E-03
Regression Range	t=9.0 - 19.8

RATE OF RECOVERY TEST

MW-26-002 (SLUG IN)



BOUWER AND RICE METHOD FOR INTERPRETATION OF SLUG TESTS: FOR UNCONFINED AND LEAKY CONFINED AQUIFERS.
TO UTILIZE THIS WORKSHEET, ENTER YOUR DATA AT LOCATIONS MARKED BY AN "*".
PROGRAM CAN INCLUDE EFFECTS OF SANDPACK DEWATERING (ASSUMING WATER IS RISING WITHIN THE SANDPACK).

#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	4.01	0.090	0.0	-2.4079
2	0.01	3.32	0.780	0.6	-0.2485
3	0.02	2.83	1.270	1.2	0.2390
4	0.03	2.96	1.140	1.8	0.1310
5	0.05	3.02	1.080	3.0	0.0770
6	0.06	3.05	1.050	3.6	0.0488
7	0.08	3.20	0.900	4.8	-0.1054
8	0.10	3.33	0.770	6.0	-0.2614
9	0.11	3.44	0.660	6.6	-0.4155
10	0.13	3.46	0.640	7.8	-0.4463
11	0.15	3.58	0.520	9.0	-0.6539
12	0.16	3.65	0.450	9.6	-0.7985
13	0.18	3.69	0.410	10.8	-0.8916
14	0.20	3.73	0.370	12.0	-0.9943
15	0.25	3.79	0.310	15.0	-1.1712
16	0.33	3.85	0.250	19.8	-1.3863
17	0.50	3.86	0.240	30.0	-1.4271
18	0.75	3.90	0.200	45.0	-1.6094
19	1.25	3.93	0.170	75.0	-1.7720
20	1.75	3.94	0.160	105.0	-1.8326
21	2.50	3.95	0.150	150.0	-1.8971
22	4.00	3.96	0.140	240.0	-1.9661
23	6.00	3.97	0.130	360.0	-2.0402
24	9.00	3.97	0.130	540.0	-2.0402
25	12.00	3.97	0.130	720.0	-2.0402
26	16.00	3.97	0.130	960.0	-2.0402

* PROJECT NAME : Plattsburgh AFB: EOD Range
* PROJECT NO : 35291.17
* WELL NO : **MW-26-002(SLUG OUT)**
* ANALYST : KEARNEY/BYRNE
* DATE COLLECTED : 12/11/94
* RISER PIPE (ID): (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) = 10.0 in. = 0.4167 (radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) = 7.75 Ft.
* MAX DRAWDOWN (IN SUBSET): (H-Ho)= 1.00 Ft.
* STATIC WATER LEVEL PRESSURE = 4.10 Ft.
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM: 7.75 Ft.
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 25.00 Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 1
* SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
RATIO OF L/(r sub w) = 18.60
---LOG OF L/(r sub w) = 1.2695
FOR PARTIALLY PENETRATING WELLS--
A = 2.05
B = 0.30
FOR FULLY PENETRATING WELLS--
C = 1.48

---EVALUATION OF LN(Re/(r sub w)):
CONST.1 = 0.3763
CONST.2 = 3.7233 =(MAX. OF 6.0)= 3.7233
LN(Re/(r sub w) = 1.83

EFFECTIVE r sub c (for sandpack dewatering) = 0.1787
(1/T)(LN(Yo/Yt)) (SLOPE) = -1.03E-01 sec^(-1)

HYDRAULIC CONDUCTIVITY (K) = 3.90E-04 ft/sec <==========
1.19E-02 cm/sec <==========

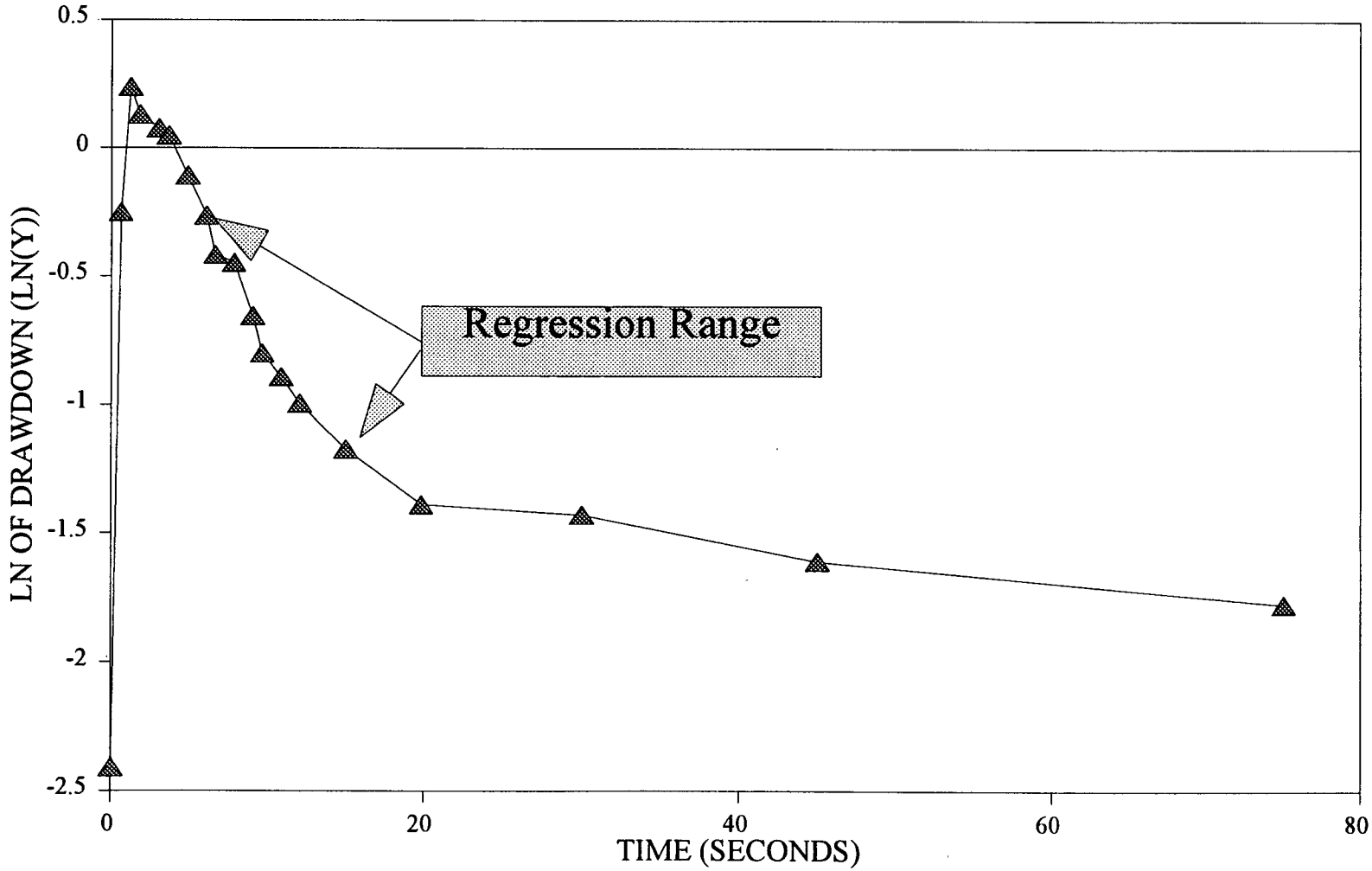
Regression Output:

Constant	0.29
Std Err of Y Est	7.50E-02
R Squared	0.9514
No. of Observations	8.0000
Degrees of Freedom	6
X Coefficient(s)	-1.03E-01
Std Err of Coef.	9.53E-03
Regression Range	t=6.0 - 15.0

H - 7

RATE OF RECOVERY TEST

MW-26-002 (SLUG OUT)



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#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	5.00	0.200	0.0	-1.6094
2	0.01	5.00	0.200	0.6	-1.6094
3	0.02	5.00	0.200	1.2	-1.6094
4	0.03	5.52	0.720	1.8	-0.3285
5	0.05	5.61	0.810	3.0	-0.2107
6	0.06	5.38	0.580	3.6	-0.5447
7	0.08	5.29	0.490	4.8	-0.7133
8	0.10	5.24	0.440	6.0	-0.8210
9	0.11	5.20	0.400	6.6	-0.9163
10	0.13	5.18	0.380	7.8	-0.9676
11	0.15	5.15	0.350	9.0	-1.0498
12	0.16	5.14	0.340	9.6	-1.0788
13	0.18	5.13	0.330	10.8	-1.1087
14	0.20	5.12	0.320	12.0	-1.1394
15	0.25	5.09	0.290	15.0	-1.2379
16	0.33	5.07	0.270	19.8	-1.3093
17	0.50	5.04	0.240	30.0	-1.4271
18	0.75	5.03	0.230	45.0	-1.4697
19	1.25	5.01	0.210	75.0	-1.5606
20	1.75	5.01	0.210	105.0	-1.5606
21	2.50	5.01	0.210	150.0	-1.5606
22	4.00	5.01	0.210	240.0	-1.5606
23	6.00	5.00	0.200	360.0	-1.6094
24	9.00	4.99	0.190	540.0	-1.6607
25	12.00	4.99	0.190	720.0	-1.6607
26	16.00	4.99	0.190	960.0	-1.6607

* PROJECT NAME :	Plattsburgh AFB: EOD Range		
* PROJECT NO :	35291.17		
* WELL NO :	**MW-26-003(SLUG IN)**		
* ANALYST :	KEARNEY/BYRNE		
* DATE COLLECTED :	12/11/94		
* RISER PIPE (ID): (2 r sub c) =	2.0 in. =	0.0833	(radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) =	10.0 in. =	0.4167	(radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) =	8.54 Ft.		
* MAX DRAWDOWN (IN SUBSET): (H-Ho)=	1.00 Ft.		
* STATIC WATER LEVEL PRESSURE =	4.80 Ft.		
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM:	8.54 Ft.		
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) =		23.00	Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)?		1	
* SANDPACK'S SPECIFIC YIELD (Sy) =	0.15		

BOUWER AND RICE CURVE COEFFICIENTS:			
RATIO OF L/(r sub w) =	20.50		
---LOG OF L/(r sub w) =	1.3117		
FOR PARTIALLY PENETRATING WELLS--			
A =	2.11		
B =	0.30		
FOR FULLY PENETRATING WELLS--			
C =	1.53		
---EVALUATION OF LN(Re/(r sub w)):			
CONST.1 =	0.3642		
CONST.2 =	3.5469	=(MAX. OF 6.0)=	3.5469
LN(Re/(r sub w) =	1.93		

EFFECTIVE r sub c (for sandpack dewatering) =	0.1787		
(1/T)(LN(Yo/Yt)) (SLOPE) =	-5.85E-02	sec^(-1)	
HYDRAULIC CONDUCTIVITY (K) =	2.11E-04	ft/sec	<==========
	6.42E-03	**cm/sec**	<==========

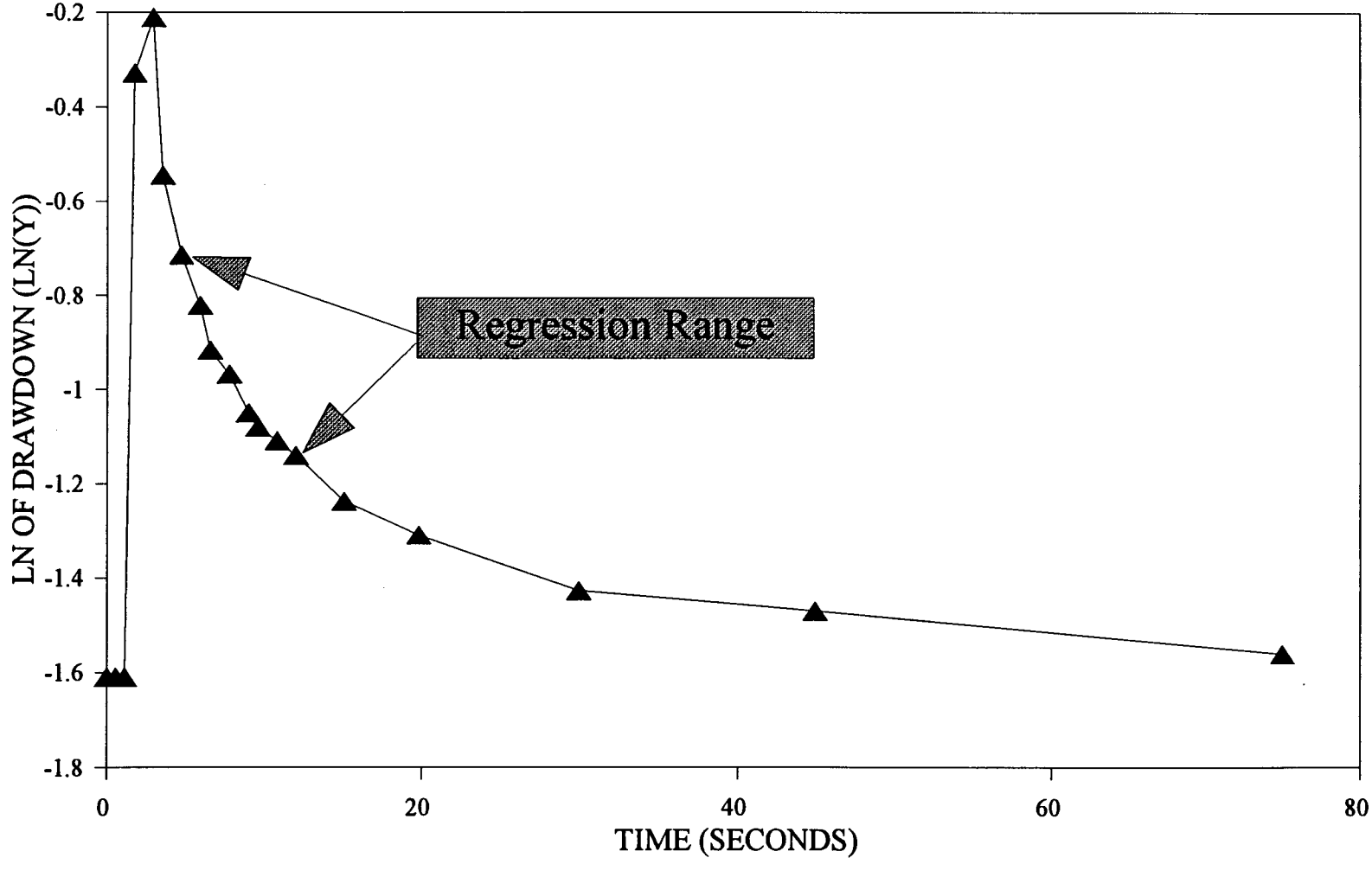
Regression Output:

Constant	-0.49
Std Err of Y Est	4.18E-02
R Squared	0.9331
No. of Observations	8.0000
Degrees of Freedom	6
X Coefficient(s)	-5.85E-02
Std Err of Coef.	6.39E-03
Regression Range	t=4.8 - 12.0

H - 9

RATE OF RECOVERY TEST

MW-26-003 (SLUG IN)



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#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	4.99	0.110	0.0	-2.2073
2	0.01	4.99	0.110	0.6	-2.2073
3	0.02	4.86	0.240	1.2	-1.4271
4	0.03	4.74	0.360	1.8	-1.0217
5	0.05	4.23	0.870	3.0	-0.1393
6	0.06	4.16	0.940	3.6	-0.0619
7	0.08	4.32	0.780	4.8	-0.2485
8	0.10	4.47	0.630	6.0	-0.4620
9	0.11	4.56	0.540	6.6	-0.6162
10	0.13	4.65	0.450	7.8	-0.7985
11	0.15	4.71	0.390	9.0	-0.9416
12	0.16	4.76	0.340	9.6	-1.0788
13	0.18	4.80	0.300	10.8	-1.2040
14	0.20	4.82	0.280	12.0	-1.2730
15	0.25	4.88	0.220	15.0	-1.5141
16	0.33	4.92	0.180	19.8	-1.7148
17	0.50	4.95	0.150	30.0	-1.8971
18	0.75	4.97	0.130	45.0	-2.0402
19	1.25	4.98	0.120	75.0	-2.1203
20	1.75	4.99	0.110	105.0	-2.2073
21	2.50	4.99	0.110	150.0	-2.2073
22	4.00	4.99	0.110	240.0	-2.2073
23	6.00	4.98	0.120	360.0	-2.1203
24	9.00	4.98	0.120	540.0	-2.1203
25	12.00	4.98	0.120	720.0	-2.1203
26	16.00	4.98	0.120	960.0	-2.1203

* PROJECT NAME : Plattsburgh AFB: EOD Range
* PROJECT NO : 35291.17
* WELL NO : **MW-26-003(SLUG OUT)**
* ANALYST : KEARNEY/BYRNE
* DATE COLLECTED : 12/11/94
* RISER PIPE (ID): (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) = 10.0 in. = 0.4167 (radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) = 8.54 Ft.
* MAX DRAWDOWN (IN SUBSET): (H-Ho)= 1.00 Ft.
* STATIC WATER LEVEL PRESSURE = 5.10 Ft.
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM: 8.54 Ft.
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 23.00 Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 1
* SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
RATIO OF L/(r sub w) = 20.50
---LOG OF L/(r sub w) = 1.3117
FOR PARTIALLY PENETRATING WELLS--
A = 2.11
B = 0.30
FOR FULLY PENETRATING WELLS--
C = 1.53

---EVALUATION OF LN(Re/(r sub w)):
CONST.1 = 0.3642
CONST.2 = 3.5469 =(MAX. OF 6.0)= 3.5469
LN(Re/(r sub w) = 1.93

EFFECTIVE r sub c (for sandpack dewatering) = 0.1787
(1/T)(LN(Yo/Yt)) (SLOPE) = -1.26E-01 sec^(-1)

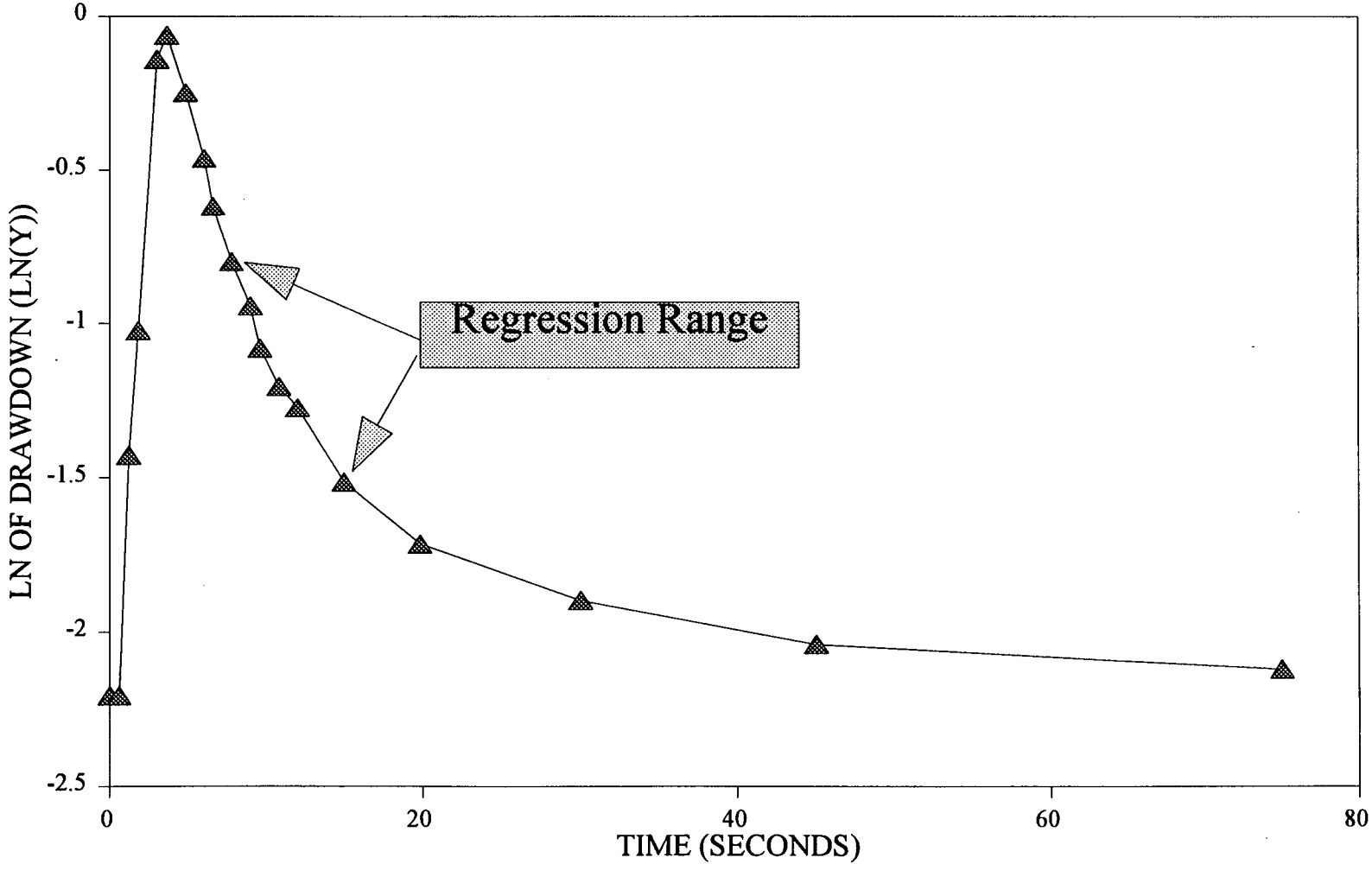
HYDRAULIC CONDUCTIVITY (K) = 4.53E-04 ft/sec <==========
1.38E-02 cm/sec <==========

Regression Output:

Constant		0.18
Std Err of Y Est		4.36E-02
R Squared		0.9756
No. of Observations		6.0000
Degrees of Freedom		4
X Coefficient(s)	-1.26E-01	
Std Err of Coef.	9.94E-03	
Regression Range	t=6.6 -12.0	

RATE OF RECOVERY TEST

MW-26-003 (SLUG OUT)



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#	*TIME mi (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	3.72	0.120	0.0	-2.1203
2	0.01	3.72	0.120	0.6	-2.1203
3	0.02	3.72	0.120	1.2	-2.1203
4	0.03	3.72	0.120	1.8	-2.1203
5	0.05	4.34	0.740	3.0	-0.3011
6	0.06	4.18	0.580	3.6	-0.5447
7	0.08	4.18	0.580	4.8	-0.5447
8	0.10	4.22	0.620	6.0	-0.4780
9	0.11	4.16	0.560	6.6	-0.5798
10	0.13	3.98	0.380	7.8	-0.9676
11	0.15	4.19	0.590	9.0	-0.5276
12	0.16	4.01	0.410	9.6	-0.8916
13	0.18	4.00	0.400	10.8	-0.9163
14	0.20	3.98	0.380	12.0	-0.9676
15	0.25	3.95	0.350	15.0	-1.0498
16	0.33	3.92	0.320	19.8	-1.1394
17	0.50	3.89	0.290	30.0	-1.2379
18	0.75	3.86	0.260	45.0	-1.3471
19	1.25	3.81	0.210	75.0	-1.5606
20	1.75	3.79	0.190	105.0	-1.6607
21	2.50	3.77	0.170	150.0	-1.7720
22	4.00	3.75	0.150	240.0	-1.8971
23	6.00	3.74	0.140	360.0	-1.9661
24	9.00	3.72	0.120	540.0	-2.1203
25	12.00	3.72	0.120	720.0	-2.1203
26	16.00	3.72	0.120	960.0	-2.1203

* PROJECT NAME :	Plattsburgh AFB: EOD Range		
* PROJECT NO :	35291.17		
* WELL NO :	**MW-26-004 (SLUG IN)**		
* ANALYST :	KEARNEY/BYRNE		
* DATE COLLECTED :	12/11/94		
* RISER PIPE (ID): (2 r sub c) =	2.0 in. =	0.0833	(radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) =	10.0 in. =	0.4167	(radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) =	7.54 Ft.		
* MAX DRAWDOWN (IN SUBSET): (H-Ho)=	1.00 Ft.		
* STATIC WATER LEVEL PRESSURE =	3.60 Ft.		
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM:	7.54 Ft.		
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) =		23.00	Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)?		1	
* SANDPACK'S SPECIFIC YIELD (Sy) =	0.15		

BOUWER AND RICE CURVE COEFFICIENTS:			
RATIO OF L/(r sub w) =	18.10		
---LOG OF L/(r sub w) =	1.2576		
FOR PARTIALLY PENETRATING WELLS--			
A =	2.03		
B =	0.30		
FOR FULLY PENETRATING WELLS--			
C =	1.46		
---EVALUATION OF LN(Re/(r sub w)):			
CONST.1 =	0.3799		
CONST.2 =	3.6137	=(MAX. OF 6.0)=	3.6137
LN(Re/(r sub w) =	1.81		

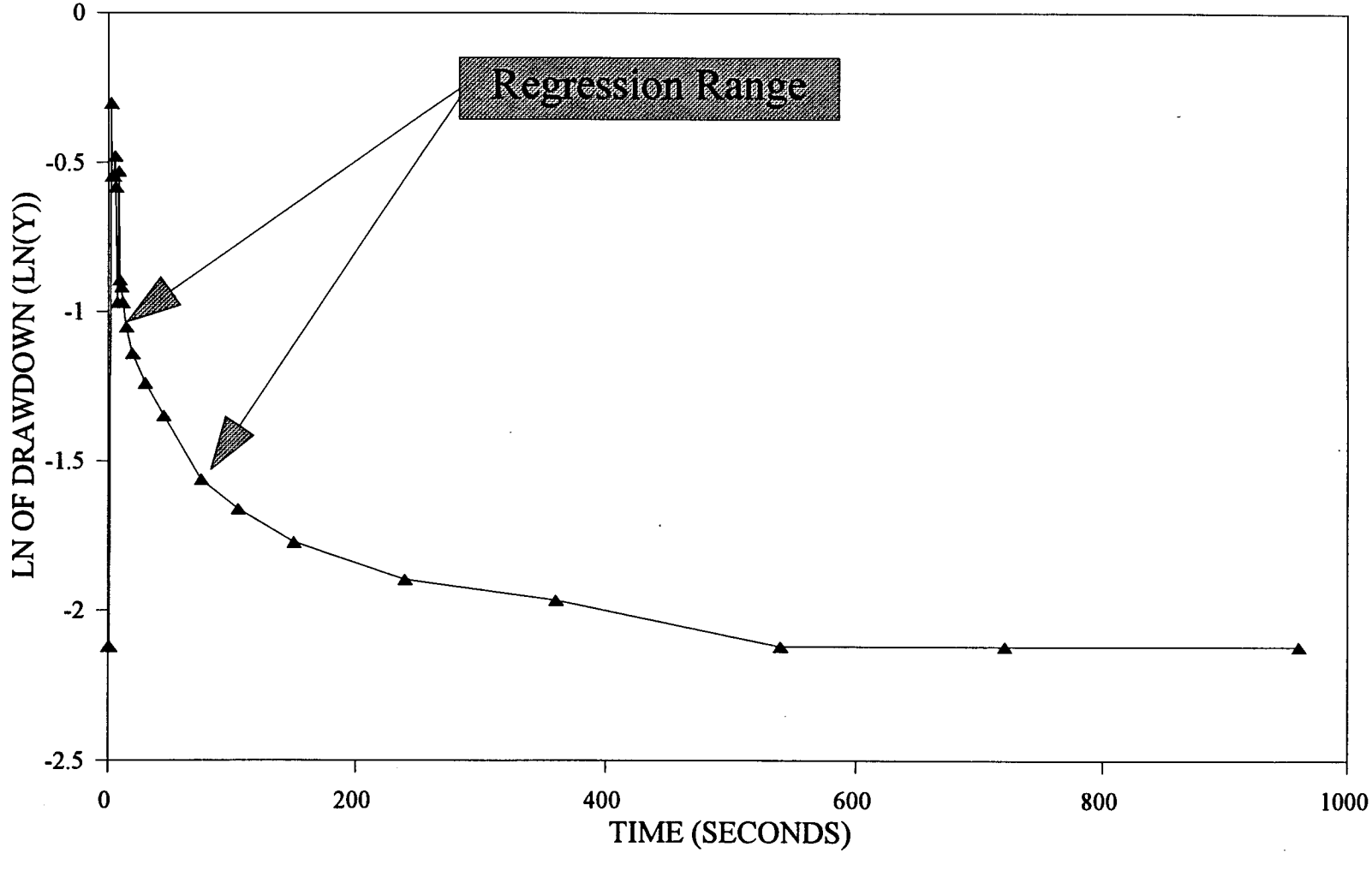
EFFECTIVE r sub c (for sandpack dewatering) =	0.1787		
(1/T)(LN(Yo/Yt)) (SLOPE) =	-2.47E-02	sec^(-1)	
HYDRAULIC CONDUCTIVITY (K) =	9.50E-05	ft/sec	<==========
	2.90E-03	**cm/sec**	<==========

Regression Output:

Constant	-0.66
Std Err of Y Est	1.56E-02
R Squared	0.9825
No. of Observations	5.0000
Degrees of Freedom	3
X Coefficient(s)	-2.47E-02
Std Err of Coef.	1.91E-03
Regression Range	t= 9.6 - 19.8

RATE OF RECOVERY TEST

MW-26-004 (SLUG IN)



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TO UTILIZE THIS WORKSHEET, ENTER YOUR DATA AT LOCATIONS MARKED BY AN "*".
PROGRAM CAN INCLUDE EFFECTS OF SANDPACK DEWATERING (ASSUMING WATER IS RISING WITHIN THE SANDPACK).

#	*TIME min (X)	*WATER LEVEL Ft.	DRAWDO (Y)	TIME sec (X')	LN (Y)
1	0.000	3.72	0.080	0.0	-2.5257
2	0.01	3.28	0.520	0.6	-0.6539
3	0.02	3.24	0.560	1.2	-0.5798
4	0.03	2.99	0.810	1.8	-0.2107
5	0.05	2.65	1.150	3.0	0.1398
6	0.06	2.76	1.040	3.6	0.0392
7	0.08	2.85	0.950	4.8	-0.0513
8	0.10	2.92	0.880	6.0	-0.1278
9	0.11	3.01	0.790	6.6	-0.2357
10	0.13	3.07	0.730	7.8	-0.3147
11	0.15	3.13	0.670	9.0	-0.4005
12	0.16	3.19	0.610	9.6	-0.4943
13	0.18	3.24	0.560	10.8	-0.5798
14	0.20	3.28	0.520	12.0	-0.6539
15	0.25	3.38	0.420	15.0	-0.8675
16	0.33	3.48	0.320	19.8	-1.1394
17	0.50	3.56	0.240	30.0	-1.4271
18	0.75	3.60	0.200	45.0	-1.6094
19	1.25	3.64	0.160	75.0	-1.8326
20	1.75	3.65	0.150	105.0	-1.8971
21	2.50	3.67	0.130	150.0	-2.0402
22	4.00	3.69	0.110	240.0	-2.2073
23	6.00	3.70	0.100	360.0	-2.3026
24	9.00	3.70	0.100	540.0	-2.3026
25	12.00	3.72	0.080	720.0	-2.5257
26	16.00	3.71	0.090	960.0	-2.4079

* PROJECT NAME : Plattsburgh AFB: EOD Range
* PROJECT NO : 35291.17
* WELL NO : **MW-26-004(SLUG OUT)**
* ANALYST : KEARNEY/BYRNE
* DATE COLLECTED : 12/11/94
* RISER PIPE (ID): (2 r sub c) = 2.0 in. = 0.0833 (radius in ft.)
* EFFECTIVE SCREEN DIAMETER: (D) = 10.0 in. = 0.4167 (radius in ft.)
* EFFECTIVE SCREEN LENGTH: (L) = 7.54 Ft.
* MAX DRAWDOWN (IN SUBSET): (H-Ho)= 1.00 Ft.
* STATIC WATER LEVEL PRESSURE = 3.80 Ft.
* DEPTH FROM SWL TO EFF. SCREEN BOTTOM: 7.54 Ft.
* EST. AQUIFER DEPTH (SWL TO AQUIFER BOTTOM): (D) = 23.00 Ft.
* INCLUDE SANDPACK DEWATERING (ENTER 1 IF YES, 0 IF NO)? 1
* SANDPACK'S SPECIFIC YIELD (Sy) = 0.15

BOUWER AND RICE CURVE COEFFICIENTS:
RATIO OF L/(r sub w) = 18.10
---LOG OF L/(r sub w) = 1.2576
FOR PARTIALLY PENETRATING WELLS--
A = 2.03
B = 0.30
FOR FULLY PENETRATING WELLS--
C = 1.46

---EVALUATION OF LN(Re/(r sub w)):
CONST.1 = 0.3799
CONST.2 = 3.6137 =(MAX. OF 6.0)= 3.6137
LN(Re/(r sub w) = 1.81

EFFECTIVE r sub c (for sandpack dewatering) = 0.1787
(1/T)(LN(Yo/Yt)) (SLOPE) = -6.63E-02 sec^(-1)

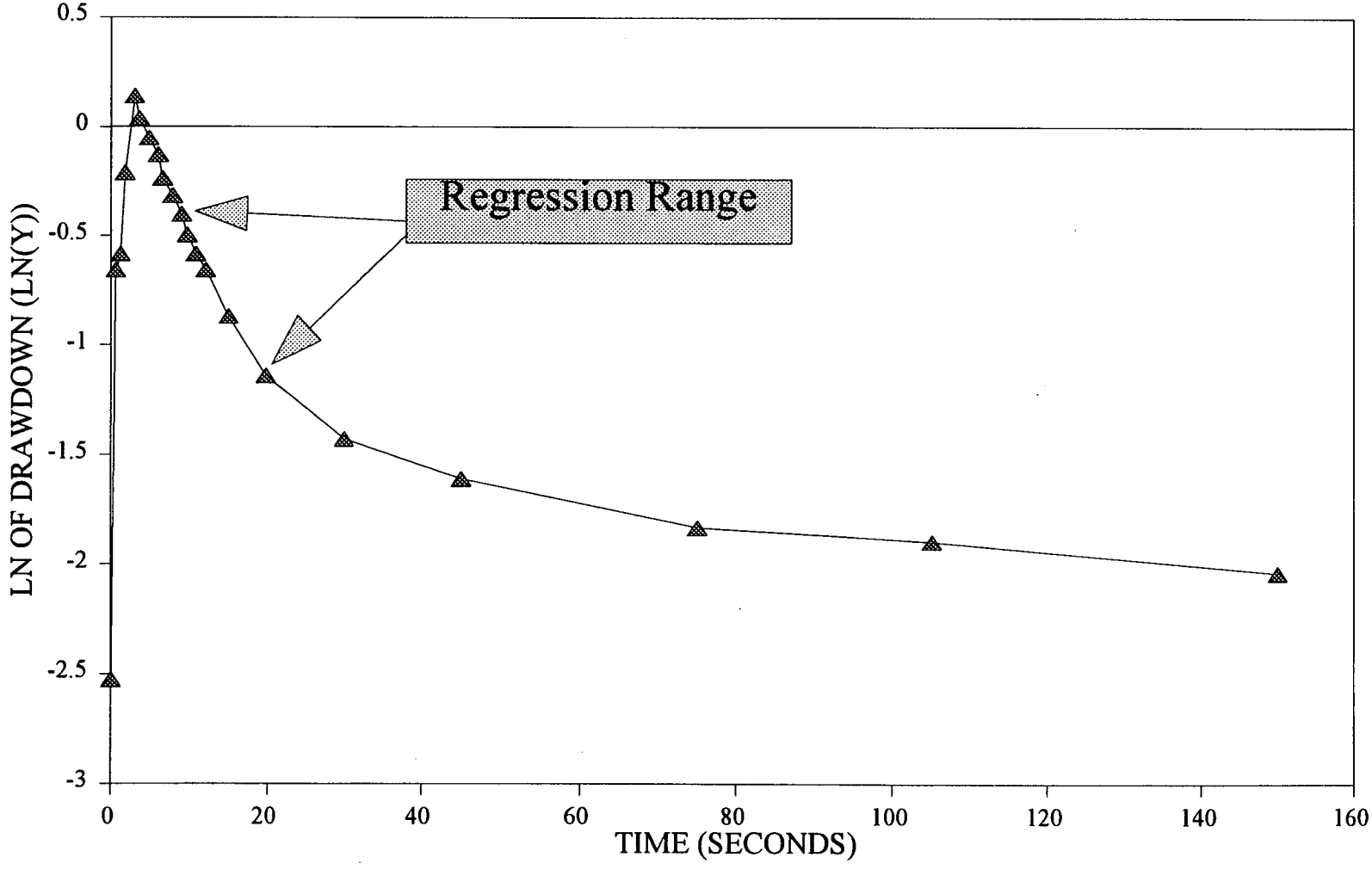
HYDRAULIC CONDUCTIVITY (K) = 2.55E-04 ft/sec <==========
7.77E-03 cm/sec <==========

Regression Output:

Constant		0.15
Std Err of Y Est		2.95E-02
R Squared		0.9906
No. of Observations		6.0000
Degrees of Freedom		4
X Coefficient(s)	-6.63E-02	
Std Err of Coef.	3.24E-03	
Regression Range	t= 9.0 -19.8	

RATE OF RECOVERY TEST

MW-26-004 (SLUG OUT)



APPENDIX I

SURVEY TIE SHEETS

PLATTSBURGH A.F.B

SITE SS-026, E.O.D. RANGE

COODINATE AND ELEVATION LIST

Sampling Locations	Northing	Easting	Elevation
MW-26-001	1693219.873	721405.146	Ground - 185.72 Pad - 185.87 Riser - 188.81 Casing - 189.01
MW-26-002	1693387.578	721855.577	Ground - 181.76 Pad - 181.96 Riser - 185.63 Casing - 185.78
MW-26-003	1693187.928	721999.376	Ground - 180.26 Pad - 180.36 Riser - 183.44 Casing - 183.59
MW-26-004	1692999.254	721881.660	Ground - 183.16 Pad - 183.36 Riser - 185.95 Casing - 186.11
MW-24-001	1692905.621	721325.293	Top of Riser - 185.75
SB-26-01	1693165.827	721880.826	Ground - 180.16
SB-26-02	1693163.495	721731.792	Ground - 183.28
SB-26-03	1693240.034	721826.115	Ground - 182.81

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PLATTSBURGH AFB
EOD RANGE
COORDINATE AND ELEVATION LIST

Location ID	Type	Northing	Easting	Ground Elevation (ft)
LS-026-SF-1	Seep	1692690.416	721889.6862	145.03
LS-026-SF-2	Seep	1692703.690	721835.3967	148.54
MW-24-001	Well	1692905.38	721324.51	NA
MW-26-001	Well	1693219.87	721405.15	185.72
MW-26-002	Well	1693387.58	721855.58	181.76
MW-26-003	Well	1693187.93	721999.38	180.26
MW-26-004	Well	1692999.25	721881.66	183.16
MW-26-005	Well	1693341.135	721990.1344	180.06
SB-26-01	Borehole	1693165.83	721880.83	180.16
SB-26-02	Borehole	1693163.50	721731.79	183.28
SB-26-03	Borehole	1693240.03	721826.12	182.81
SS-026-CAS-1	Surface Survey	1693286.948	721835.0742	181.60
SS-026-CAS-2	Surface Survey	1693288.962	721861.9329	180.61
SS-026-CAS-3	Surface Survey	1693221.334	721860.0049	182.23
SS-026-CAS-4	Surface Survey	1693149.996	721829.1072	184.18
SS-026-CAS-5	Surface Survey	1693227.474	721843.2944	183.38
SS-026-CAS-6	Surface Survey	1693266.925	721852.7211	181.98
SS-026-SF-1	Surface Survey	1692762.065	721809.0826	165.46
SS-026-SF-2	Surface Survey	1692750.648	721770.4156	156.63
SS-026-SF-4	Surface Survey	1692690.416	721889.6862	145.03
SS-026-SF-5	Surface Survey	1692703.690	721835.3967	148.54
SS-026-SF-6	Surface Survey	1692741.462	721740.3991	151.66

Coordinate System:
Horizontal - State Plane, NAD27, New York East, U.S. Survey Feet;
Vertical - NGVD29, U.S. Survey Feet.

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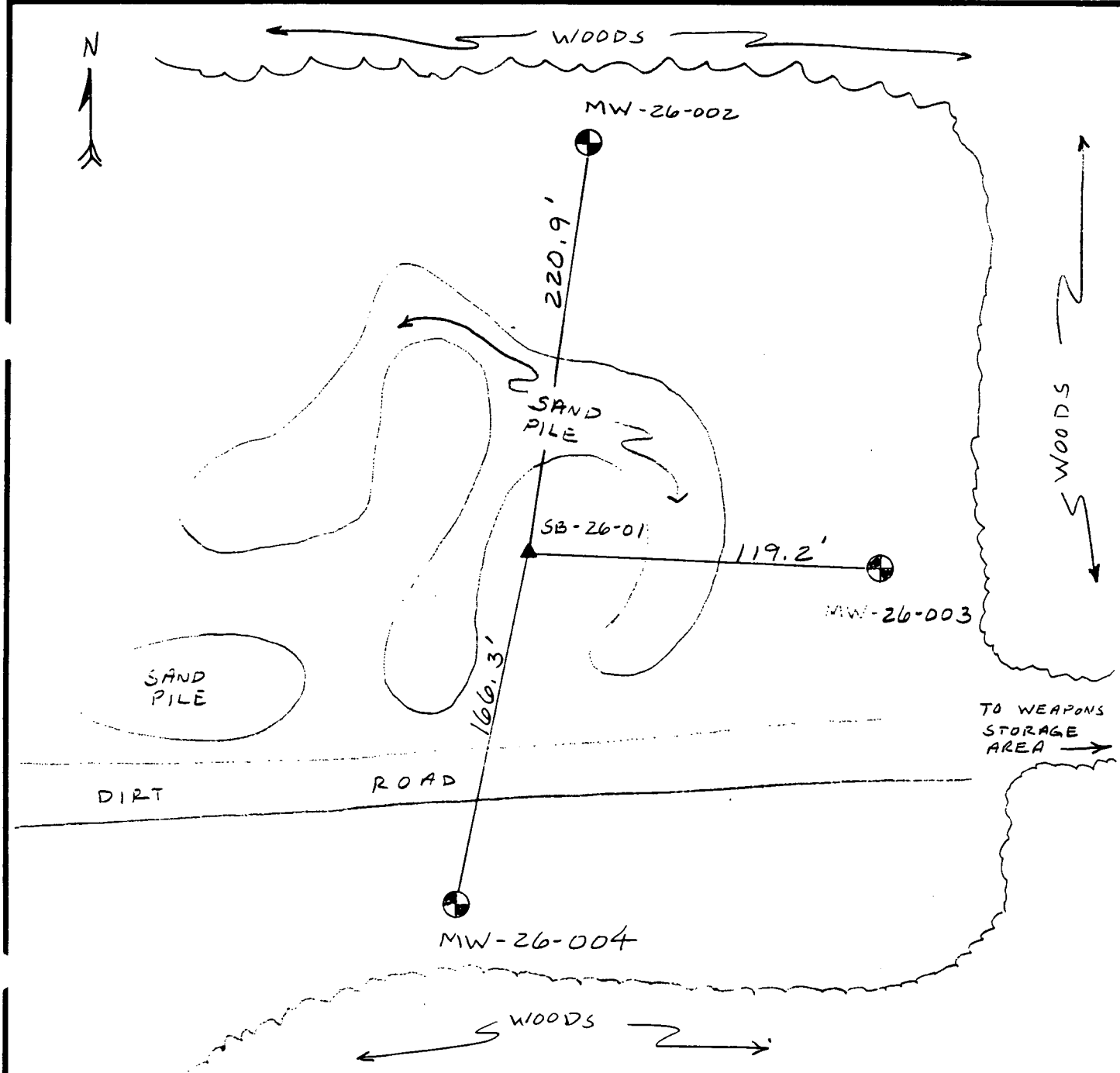
SUBSURFACE BORING LOCATION SHEET

NORTHING : 1693165.827
EASTING : 721880.826
GROUND ELEVATION : 180.16
HORIZONTAL DATUM : NAD 83
VERTICAL DATUM : NGVD 29

BORING I.D. SB-26-01
SITE I.D. SS-026.



POSITION RELATIVE TO EXISTING FEATURES

A-5429

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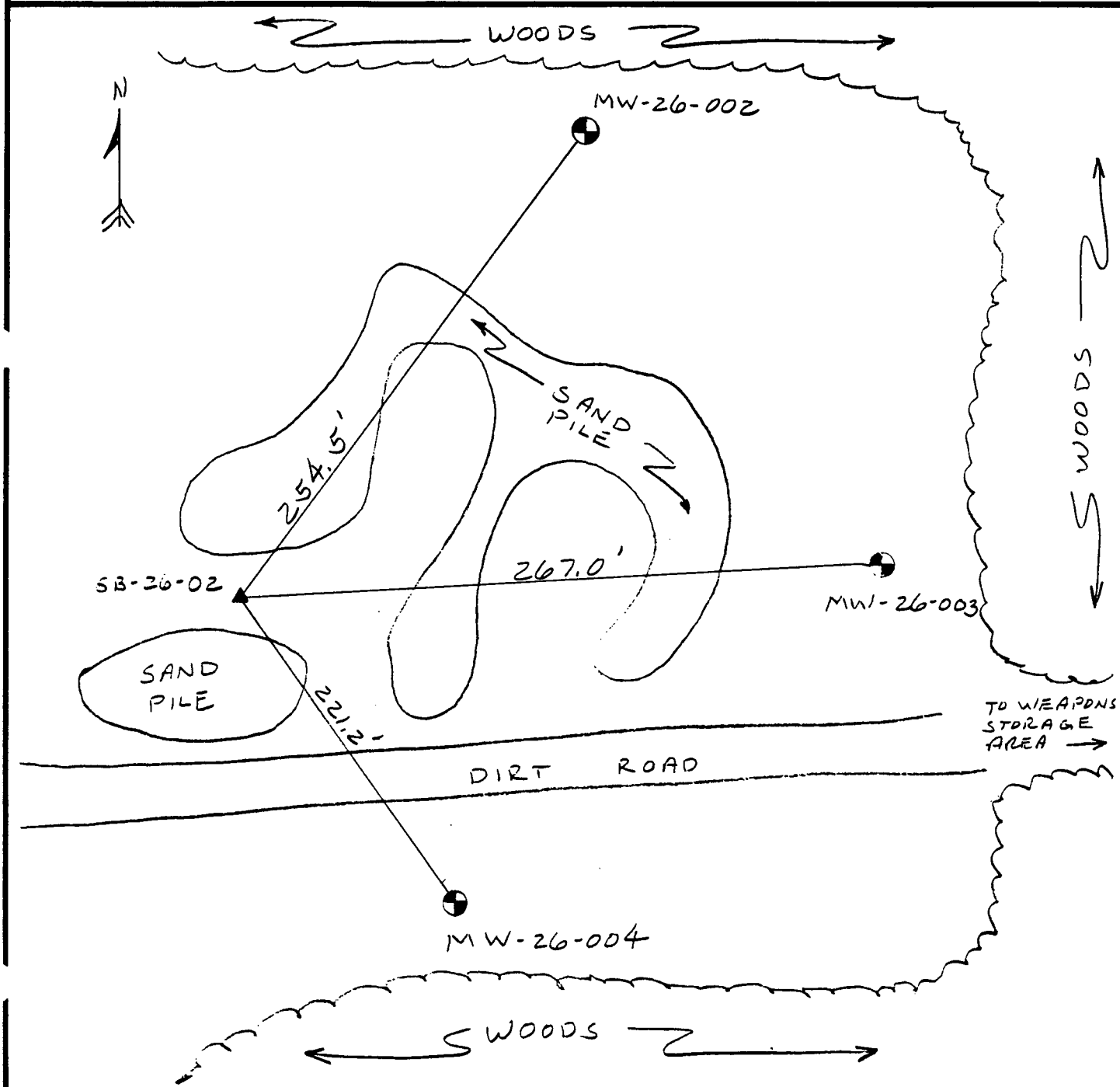
SUBSURFACE BORING LOCATION SHEET

NORTHING : 1693163.495
EASTING : 721731.792
GROUND ELEVATION : 183.28
HORIZONTAL DATUM : NAD 83
VERTICAL DATUM : NGVD 29

BORING I.D. SB-26-02
SITE I.D. SS-026.



POSITION RELATIVE TO EXISTING FEATURES

A-5429

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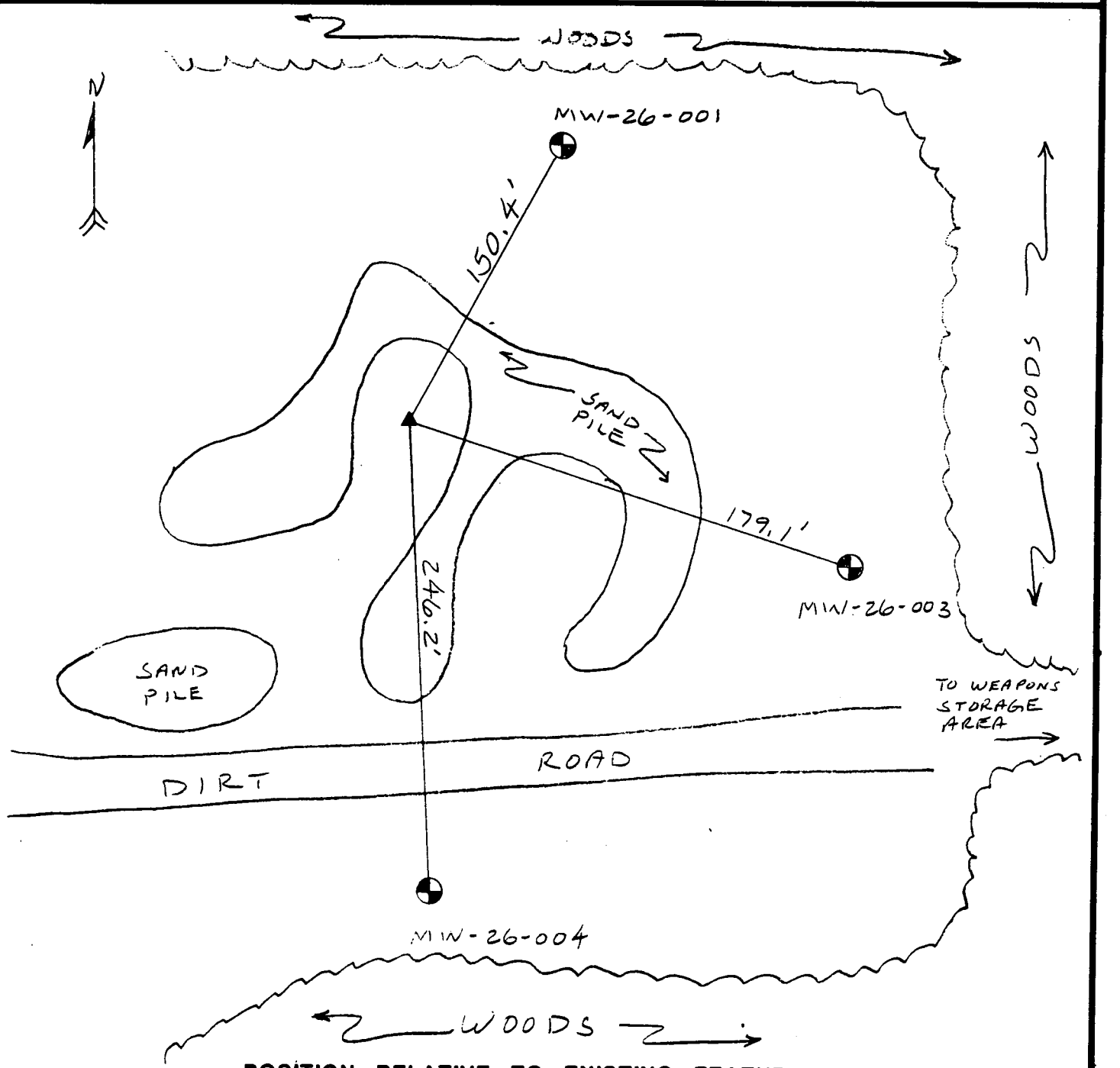
SUBSURFACE BORING LOCATION SHEET

NORTHING : 1693240.034
EASTING : 721826.115
GROUND ELEVATION : 182.81
HORIZONTAL DATUM : NAD 83
VERTICAL DATUM : NGVD 29

BORING I.D. SB-26-03
SITE I.D. SS-026.



POSITION RELATIVE TO EXISTING FEATURES

A-5429

APPENDIX J

SPECIES LIST

TABLE 1. FISHES IN THE VICINITY OF PLATTSBURGH AIR FORCE BASE

(Includes Lake Champlain, Saranac River and Salmon River)

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS	OBSERVED IN SALMON RIVER(a)	OBSERVED IN SARANAC RIVER(a)
Northern brook lamprey	*Ichthyomyzon fossor*	NHP inventory(b)			
Silver lamprey	*Ichthyomyzon unicuspis*	NHP inventory			
Sea lamprey	*Petromyzon marinus*			X	X
Lake Sturgeon	*Acipenser fulvescens*	Threatened		X	X
Longnose gar	*Lepisosteus osseus*	NHP inventory			
Bowfin	*Amia calva*				
American eel	*Anguilla rostrata*			X	X
Mooneye	*Hiodon tergisus*	Threatened			X
Cisco	*Coregonus artedii*	NHP inventory			
Lake whitefish	*Coregonus clupeaformis*				
Round whitefish	*Prosopium cylindraceu*	Endangered			
Rainbow trout	*Oncorhynchus mykiss*			X	X
Atlantic salmon	*Salmo salar*	Protected			
Brown trout	*Salmo trutta*			X	
Brook trout	*Salvelinus fontinalis*				X(c)
Lake trout	*Salvelinus namaycush*				
Rainbow smelt	*Osmerus mordax*			X	
Central mudminnow	*Umbra limi*				
Grass pickerel	*Esox americanus*				
Northern pike	*Esox lucius*			X	X
Muskellunge	*Esox masquinongy*				
Chain pickerel	*Esox niger*				X
Goldfish	*Carassius auratus*				
Lake chub	*Couesius plumbeus*	NHP inventory			
Carp	*Cyprinus carpio*				
Cutlips minnow	*Exoglossum maxillingua*			X	
Brassy minnow	*Hybognathus hankinsoni*				
Eastern silvery minnow	*Hybognathus regius*				
Golden shiner	*Notemigonus crysoleucas*			X	X
Emerald shiner	*Notropis atherinoides*				
Bridle shiner	*Notropis bifrenatus*				

TABLE 1 (continued). FISHES IN THE VICINITY OF PLATTSBURGH AIR FORCE BASE

(Includes Lake Champlain, Saranac River and Salmon River)

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS	OBSERVED IN SALMON RIVER(a)	OBSERVED IN SARANAC RIVER(a)
Striped shiner	*Notropis chrysocephalu*	NHP inventory			
Common shiner	*Notropis cornutus*			X	
Blackchin shiner	*Notropis heterodon*	Special Concern			
Blacknose shiner	*Notropis heterolepis*	NHP inventory			
Spottail shiner	*Notropis hudsonius*				
Rosyface shiner	*Notropis rubellus*				
Sand shiner	*Notropis stramineus*	NHP inventory			
Mimic shiner	*Notropis volucellus*	NHP inventory			
Northern redbelly dace	*Phoxinus eos*				
Finescale dace	*Phoxinus neogaeus*	NHP inventory		X	
Bluntnose minnow	*Pimephales notatus*			X	
Fathead minnow	*Pimephales promelas*				
Blacknose dace	*Rhinicthys atratulus*			X	
Longnose dace	*Rhinicthys cataractae*			X	
Creek chub	*Semotilus atromaculatus*			X	X
Fallfish	*Semotilus corporalis*			X	X
Pearl dace	*Semotilus margarita*				
Quillback carpsucker	*Carpiodes cyprinus*	NHP inventory			
Longnose sucker	*Catostomus catostomus*	NHP inventory			
White sucker	*Catostomus commersoni*			X	X
Silver redhorse	*Moxostoma anisurum*				
Shorthead redhorse	*Moxostoma macrolepidotum*				
Greater redhorse	*Moxostoma valencienne*	NHP inventory			
Brown bullhead	*Ictalurus nebulosus*			X	X
Channel catfish	*Ictalurus punctatus*				
Stonecat	*Noturus flavus*	NHP inventory		X	X(c)
Trout-perch	*Percopsis omiscomaycu*	NHP inventory			
Burbot	*Lota lota*	NHP inventory			
Banded killifish	*Fundulus diaphanus*				X(c)
Brook stickleback	*Culaea inconstans*	NHP inventory			
Rock bass	*Ambloplites rupestris*			X	X

TABLE 1 (continued). FISHES IN THE VICINITY OF PLATTSBURGH AIR FORCE BASE

(Includes Lake Champlain, Saranac River and Salmon River)

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS	OBSERVED IN SALMON RIVER(a)	OBSERVED IN SARANAC RIVER(a)
Pumpkinseed	*Lepomis gibbosus*			X	X
Bluegill	*Lepomis machrochirus*				
Smallmouth bass	*Micropterus dolomieui*			X	X
Largemouth bass	*Micropterus salmoides*				
Black crappie	*Pomoxis nigromaculatus*				
Eastern sand darter	*Ammocrypta pellucida*	Endangered	Endangered		
Fantail darter	*Etheostoma flabellare*				
Johnny darter	*Etheostoma nigrum*			X	
Tesselated darter	*Etheostoma olmstedi*			X(c)	
Yellow perch	*Perca flavescens*			X	X
Logperch	*Percina caprodes*	NHP inventory		X	X(c)
Channel darter	*Percina copelandi*	NHP inventory			
Sauger	*Stizostedion canadense*	NHP inventory			
Walleye	*Stizostedion vitreum*				X
Freshwater drum	*Aplodinotus grunniens*	NHP inventory			
Mottled sculpin	*Cottus bairdi*				
Slimy sculpin	*Cottus cognatus*				

(a) Limited fish surveys executed by the NYSDEC from 1929-1971; species may be found upriver or only at the mouth of a rive
(b) Unprotected, but may be rare and is therefore currently being inventoried by the New York Natural Heritage Program
(c) Fish noted in NYSDEC lamprey studies in 1991 and 1992 (draft only)

References:

Lee, David S., et al, 1981. Atlas of North American Freshwater Fishes. North Carolina State Museum of Natural History

New York Department of Environmental Conservation, 1929-1971. Various data sheets recording river surveys and collected fishes along the Salmon and Saranac Rivers, NY. Includes only those reaches adjacent to or downstream from Plattsburgh AFB.

U.S. Fish and Wildlife Service, 1986. Fish and Wildlife Management Plan for Plattsburgh Air Force Base, New York.

Werner, Robert G., 1980. Freshwater Fishes of New York State. Syracuse, NY

TABLE 2. EXPECTED BIRDS AT OR NEAR PLATTSBURGH AIR FORCE BASE

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	VERMONT LEGAL STATUS	FEDERAL LEGAL STATUS(d)	BREEDS IN VICINITY(a)	OBSERVED ONSITE(b)
Common Loon	*Gamia immer*	Protected, Special Concern	Endangered			
Pied-billed Grebe	*Podilymbus podiceps*					
American Bittern	*Botaurus lentiginosus*	Protected				
Great Blue Heron	*Ardea herodias*	Protected			x	x
Green-backed Heron	*Butorides striatus*				x	
Canada Goose	*Branta canadensis*					x
Wood Duck	*Aix sponsa*				x	
American Black Duck	*Anas rubripes*				x	x
Mallard	*Anas platyrhynchos*				x	x
Blue-winged Teal	*Anas discors*					
Common Goldeneye	*Bucephala clangula*	Game, Protected				
Common Merganser	*Mergus merganser*				x	
Osprey	*Pandion haliaetus*	Threatened	Endangered			
Northern Harrier	*Circus cyaneus*	Threatened				x
Sharp-shinned Hawk	*Accipiter striatus*				x	
Northern Goshawk	*Accipiter gentilis*					
Cooper's Hawk	*Accipiter cooperii*	Protected, Special Concern				
Red-shouldered Hawk	*Buteo lineatus*	Threatened				
Broad-winged Hawk	*Buteo platypterus*					
Red-tailed Hawk	*Buteo jamaicensis*					x
Rough-legged Hawk	*Buteo lagopus*					(c)
American Kestrel	*Falco sparverius*				x	
Ruffed Grouse	*Bonasa umbellus*				x	x
Common Moorhen	*Gallinula chloropus*					
Killdeer	*Charadrius vociferus*				x	
Spotted Sandpiper	*Actitis macularia*				x	
Upland Sandpiper	*Bartramia longicauda*	Protected, Special Concern	Threatened			
Common Snipe	*Capella gallinago*				x	
American Woodcock	*Philohela minor*				x	
Herring Gull	*Larus argentatus*				x	
Ring-billed Gull	*Larus delawarensis*					

TABLE 2(continued). EXPECTED BIRDS AT OR NEAR PLATTSBURGH AIR FORCE BASE

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	VERMONT LEGAL STATUS	FEDERAL LEGAL STATUS(d)	BREEDS IN VICINITY(a)	OBSERVED ONSITE(b)
Rock Dove	*Columba livia*				x	x
Mourning Dove	*Zenaida macroura*				x	
Black-billed Cuckoo	*Coccyzus erythropthalmus*					
Yellow-billed Cuckoo	*Coccyzus americanus*					
Eastern Screech Owl	*Otus asio*					
Great Horned Owl	*Bubo virginianus*					
Barred Owl	*Strix varia*					
Long-eared Owl	*Asio otus*	Protected				
Common Nighthawk	*Chordeiles minor*	Protected, Special Concern			x	
Whip-poor-will	*Caprimulgus vociferus*					
Chimney Swift	*Chaetura pelagica*				x	
Ruby-throated Hummingbird	*Archilochus colubris*				x	
Belted Kingfisher	*Megaceryle alcyon*				x	
Yellow-bellied Sapsucker	*Sphyrapicus varius*					
Downy Woodpecker	*Picoides pubescens*				x	
Hairy Woodpecker	*Picoides villosus*				x	
Northern Flicker	*Colaptes auratus*				x	
Pileated Woodpecker	*Dryocopus pileatus*				x	
Eastern Wood-peewee	*Contopus virens*				x	
Alder Flycatcher	*Empidonax alnorum*				x	
Willow Flycatcher	*Empidonax traillii*					
Least Flycatcher	*Empidonax minimus*				x	
Eastern Phoebe	*Sayornis phoebe*				x	
Great Crested Flycatcher	*Myiarchus crinitus*				x	
Eastern Kingbird	*Tyrannus tyrannus*				x	
Horned Lark	*Eremophila alpestris*					
Purple Martin	*Progne subis*				x	
Tree Swallow	*Iridoprocne bicolor*				x	
Northern Rough-winged Swallo	*Stelgidopteryx serripennis*				x	
Bank Swallow	*Riparia riparia*				x	
Cliff Swallow	*Petrochelidon pyrrhonota*				x	

TABLE 2(continued). EXPECTED BIRDS AT OR NEAR PLATTSBURGH AIR FORCE BASE

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	VERMONT LEGAL STATUS	FEDERAL LEGAL STATUS(d)	BREEDS IN VICINITY(a)	OBSERVED ONSITE(b)
Barn Swallow	*Hirundo rustica*				x	
Blue Jay	*Cyanocitta cristata*				x	x
American Crow	*Corvus brachyrhynchos*				x	x
Tufted Titmouse	*Parus bicolor*					
Black-capped Chickadee	*Parus atricapillus*				x	x
Red-breasted Nuthatch	*Sitta canadensis*				x	
White-breasted Nuthatch	*Sitta carolinensis*				x	
Brown Creeper	*Certhia familiaris*				x	
House Wren	*Troglodytes aedon*				x	
Winter Wren	*Troglodytes troglodytes*					
Eastern Bluebird	*Sialia sialis*				x	
Veery	*Catharus fuscescens*				x	
Hermit Thrush	*Catharus guttata*					
Wood Thrush	*Hylocichla mustelina*				x	
American Robin	*Turdus migratorius*				x	
Gray Catbird	*Dumetella carolinensis*				x	
Northern Mockingbird	*Mimus polyglottos*				x	
Brown Thrasher	*Toxostoma rufum*				x	
Cedar Waxwing	*Bombycilla cedrorum*				x	
European Starling	*Sturnus vulgaris*				x	
Solitary Vireo	*Vireo solitarius*					
Yellow-throated Vireo	*Vireo flavifrons*					
Warbling Vireo	*Vireo gilvus*				x	
Red-eyed Vireo	*Vireo olivaceus*				x	
Nashville Warbler	*Vermivora ruficapilla*					
Yellow Warbler	*Dendroica petechia*				x	
Chestnut-sided Warbler	*Dendroica pensylvanica*				x	
Black-throated Blue Warbler	*Dendroica caerulescens*					
Yellow-rumped Warbler	*Dendroica coronata*				x	
Black-throated Green Warbler	*Dendroica virens*					
Pine Warbler	*Dendroica pinus*				x	

TABLE 2(continued). EXPECTED BIRDS AT OR NEAR PLATTSBURGH AIR FORCE BASE

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	VERMONT LEGAL STATUS	FEDERAL LEGAL STATUS(d)	BREEDS IN VICINITY(a)	OBSERVED ONSITE(b)
Black-and-white Warbler	*Mniotilta varia*				x	
American Redstart	*Setophaga ruticilla*				x	
Ovenbird	*Seiurus aurocapillus*				x	
Northern Waterthrush	*Seiurus noveboracensis*					
Mourning Warbler	*Oporornis philadelphia*					
Common Yellowthroat	*Geothlypis trichas*				x	
Canada Warbler	*Wilsonia canadensis*					
Scarlet Tanager	*Piranga olivacea*				x	
Northern Cardinal	*Cardinalis cardinalis*				x	
Indigo Bunting	*Passerina cyanea*				x	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*				x	
Rufous-sided Towhee	*Pipilo erythropthalmus*					
Chipping Sparrow	*Spizella passerina*				x	x
Field Sparrow	*Spizella pusilla*				x	
Grasshopper Sparrow	*Ammodramus savannarrum*	Special Concern				x
Vesper Sparrow	*Pooecetes gramineus*	Special Concern			x	x
Savannah Sparrow	*Passerculus sandwichensis*				x	
Song Sparrow	*Melospiza melodia*				x	
Swamp Sparrow	*Melospiza georgiana*				x	
Tree Sparrow	*Spizella arborea*					(c)
White-throated Sparrow	*Zonotrichia albicollis*				x	
Dark-eyed Junco	*Junco hyemalis*					
Bobolink	*Dolichonyx oryzivorus*				x	
Red-winged Blackbird	*Agelaius phoeniceus*				x	
Eastern Meadowlark	*Sturnella magna*				x	
Common Grackle	*Quiscalus quiscula*				x	
Brown-headed Cowbird	*Molothrus ater*				x	
Northern Oriole	*Icterus galbula*				x	
Purple Finch	*Carpodacus purpureus*				x	
House Finch	*Carpodacus mexicanus*				x	
Red Crossbill	*Loxia curvirostra*					
Pine Siskin	*Carduelis pinus*				x	

TABLE 2(continued). EXPECTED BIRDS AT OR NEAR PLATTSBURGH AIR FORCE BASE

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	VERMONT LEGAL STATUS	FEDERAL LEGAL STATUS(d)	BREEDS IN VICINITY(a)	OBSERVED ONSITE(b)
American Goldfinch	*Carduelis tristis*				x	
Evening Grosbeak	*Hesperiphona vespertina*					
House Sparrow	*Passer domesticus*				x	
Snow Bunting	*Plectrophenax nivalis*					(c)

(a) "Possible," "probable," or "confirmed" breeding within the Plattsburgh AFB and a 0.5-mile radius, according to "The Atlas of Breeding Birds of New York State"
(b) Observed at Plattsburgh AFB during investigations by URS (1994a) and by Corey (1994).
(c) Found in this vicinity in the winter only
(d) No birds on this list currently have federal endangered or threatened species status

References:

Andrle, Robert F. and Janet R. Carroll, 1988. The Atlas of Breeding Birds In New York State. Ithaca, New York

New York Department of Environmental Conservation (NHP), 1993. Bird List (Active Inventory and Watchlist), New York

Peterson, Roger T., 1980. A Field Guide to the Birds East of the Rockies. Boston, Massachusetts

U.S. Fish and Wildlife Service, 1986. Fish and Wildlife Management Plan for Plattsburgh Air Force Base, New York

Vermont Department of Fish and Wildlife (Nongame and NHP), 1992. Endangered and Threatened Animals of Vermont (list). Vermont

TABLE 3. PLATTSBURGH AFB: List of Potential Mammal Inhabitants

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS	OBSERVED ONSITE(c)
Masked shrew	*Sorex cinereus*			
Water shrew	*Sorex palustris*			
Long-tailed shrew	*Sorex dispar*			
Short-tailed shrew	*Blarina brevicauda*			
Pygmy shrew	*Microsorex hoyi*			
Hairy-tailed mole	*Parascalops breweri*			x(a)
Star-nosed mole	*Condylura cristata*			x(a)
Little brown bat	*Myotis lucifigus*			
Keen's myotis	*Myotis keenii*			
Indiana bat	*Myotis sodalis*	Endangered	Endangered	
Small-footed bat	*Myotis leibii*			
Eastern pipistrelle	*Pipistrellus subflavus*			
Big brown bat	*Eptesicus fuscus*			
Red bat	*Lasiurus borealis*			
Hoary bat	*Lasiurus cinereus*			
Silver-haired bat	*Lasionycteris noctivagans*			
Eastern cottontail	*Sylvilagus floridanus*			
Snowshoe hare	*Lepus americanus*			
Eastern chipmunk	*Tamias striatus*			
Woodchuck	*Marmota monax*			
Gray squirrel	*Sciurus carolinensis*			x
Red squirrel	*Tamiasciurus hudsonicus*			x
Southern flying squirrel	*Glaucomys volans*			
Northern flying squirrel	*Glaucomys sabrinus*			
Beaver	*Castor canadensis*			
Deer mouse	*Peromyscus maniculatus*			
White-footed mouse	*Peromyscus leucopus*			x(b)
Southern red-backed vole	*Clethrionomys gapperi*			x(b)
Meadow vole	*Microtus pennsylvanicus*			x(b)
Muskrat	*Ondatra zibethicus*			x
Southern bog lemming	*Synaptomys cooperi*			
Meadow jumping mouse	*Zapus hudsonius*			
Woodland jumping mouse	*Napaeozapus insignis*			
Porcupine	*Erithizon dorsatum*			
Coyote	*Canis latrans*			

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TABLE 3(continued). PLATTSBURGH AFB: List of Potential Mammal Inhabitants

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS	OBSERVED ONSITE(c)
Red fox	*Vulpes vulpes*			
Gray fox	*Urocyon cinereoargenteus*			
Raccoon	*Procyon lotor*			x
Marten	*Martes americana*			
Fisher	*Martes pennanti*			
Ermine	*Mustela erminea*			
Long-tailed weasel	*Mustela frenata*			
Mink	*Mustela vison*			
Striped skunk	*Mephitis mephitis*			
River otter	*Lutra canadensis*			
Bobcat	*Lynx rufus*			
White-tailed deer	*Odocoileus virginianus*			x
Opossum	*Didelphis marsupialis*			

(a) Fresh mole hills along flightline
(b) mouse/mole channeling (tunnels) in tall grass
(c) Observed onsite by URS (1994a)

References:

Burt, William H., 1980. A Field Guide to the Mammals (third edition); Boston, Massachusetts

Murie, Olaus J., 1958. A Field Guide to Animal Tracks. Boston, Massachusetts

Saunders, D. Andrew. 1980. Adirondack Mammals. State University of New York, College of Environmental Science and Forestry

U.S. Fish and Wildlife Service, 1986. Fish and Wildlife Management Plan for Plattsburgh Air Force Base, New York. Initial Plan for October 1986 to October 1991.

Table 4. Expected Amphibians and Reptiles At or Near Plattsburgh Air Force Base

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS(b)	OBSERVED ONSITE(a)
AMPHIBIANS				
Mudpuppy	*Cryptobranchus alleganiensis*			
Jefferson salamander complex	*Ambystoma jeffersonianum x laterale*			
Spotted salamander	*Ambystoma maculatum*			
Red-spotted newt	*Notophthalmus viridenscens*			
Northern dusky salamander	*Desmognathus fuscus*			
Redback salamander	*Plethodon cinereus*			
Northern spring salamander	*Gyrinophilus porphyriticus*			
Northern two-lined salamander	*Eurycea bislineata*			
American Toad	*Bufo americanus*			
Gray treefrog	*Hyla versicolor-chrysoscelis*			
Northern spring peeper	*Pseudacris crucifer*			
Western chorus frog	*Pseudacris triseriata*			
Bullfrog	*Rana catesbeiana*			
Green frog	*Rana clamitans*			x
Mink frog	*Rana septentrionalis*			
Wood frog	*Rana sylvatica*			
Northern leopard frog	*Rana pipiens*			x
Pickerel frog	*Rana palustris*			x
REPTILES				
Common snapping turtle	*Chelydra serpentina*			
Wood turtle	*Clemmys insculpta*	Special Concern		
Common map turtle	*Graptemys geographica*			
Midland painted turtle	*Chrysemys p. marginata*			
Northern water snake	*Nerodia sipedon*			
Northern brown snake	*Storeria dekayi*			
Northern redbelly snake	*Storeria occiptomaculata*			
Eastern garter snake	*Thamnophis sirtalis*			

Table 4(continued). Expected Amphibians and Reptiles At or Near Plattsburgh Air Force Base

COMMON NAME	SCIENTIFIC NAME	NEW YORK LEGAL STATUS	FEDERAL LEGAL STATUS(b)	OBSERVED ONSITE(a)
REPTILES				
Northern ringneck snake	*Diadophis punctatus*			
Smooth green snake	*Opheodrys vernalis*			
Eastern milk snake	*Lampropeltis triangulum*			
Timber rattlesnake	*Crotalus horridus*	Threatened		

(a) Observed onsite by URS (1994a)
(b) No amphibians or reptiles on this list currently have federal endangered or threatened species status

References:

Conant, Roger and Joseph T. Collins, 1991. Reptiles and Amphibians, Eastern and Central North America. Boston, Massachusetts

New York Audubon, 1993. Checklist of New York Reptiles and Amphibians (unpublished)

New York Department of Environmental Conservation, Natural Heritage Program, 1993. Animal List: (Active Inventory and Watchlist). Albany, New York

U.S. Fish and Wildlife Service, 1986. Fish and Wildlife Management Plan for Plattsburgh Air Force Base, New York

APPENDIX K

WATER BALANCE CALCULATIONS

1. PURPOSE

The purpose of this analysis was to estimate the components of the water balance for the SS-026 site.

2. METHODOLOGY

The USEPA model Hydrologic Evaluation of Landfill Performance (HELP) was used.

3. PARAMETERS

The following values of the parameters were used:

* **Runoff potential**
  The topography of the site (see Fig 2-1) slopes towards a low lying area in the northeastern part of the site. It appears that this area has no outlet and all runoff potentially generated on site would eventually infiltrate here. However, in order to determine the amount of runoff that would collect in this swale, the modeled area did not include this swale.
* **Topographic features**
  Based on Fig 2-1, the longest drainage length is about 500 ft, and the average slope of the surface is 1%.
* **Vegetation**
  From Section 3.1, the site is covered with sparse grass. A HELP option of "poor grass" was used in the simulations.
* **Stratification of the unsaturated zone**
  The unsaturated zone is comprised of brown sands, with an average depth to water table of approximately 10 ft. No topsoil was observed to be present. It was assumed that this can be represented by a 120 inch thick layer of HELP soils #1 or #2, treated as a Vertical Percolation Layer. These have hydraulic conductivities on the order of 1E-2 and 5E-3, respectively, which is also consistent with the results of slug tests at SS-026 (see App. H).
* **Climatic data**
  The site is located in Plattsburgh, NY. The closest weather station for which the HELP data set is available is Burlington, Vt, located across Lake Champlain from Plattsburgh. A combination of historic and synthetically generated climatic data for Burlington was utilized in the simulations.

A sketch containing a summary of the input data is shown on page 3 of this package.

4. CALCULATIONS

Two simulations were performed. The only difference between them was the type of soil assumed to represent the brown sands found at the site:

RUN #1 : HELP soil type #1
RUN #2 : HELP soil type #2

The output files are presented on pages 4-10 (RUN #1) and 11-17 (RUN #2) of this package. The summary of the results obtained for the modeled period of 1977-1981 is shown below. Values are given in INCHES PER YEAR.

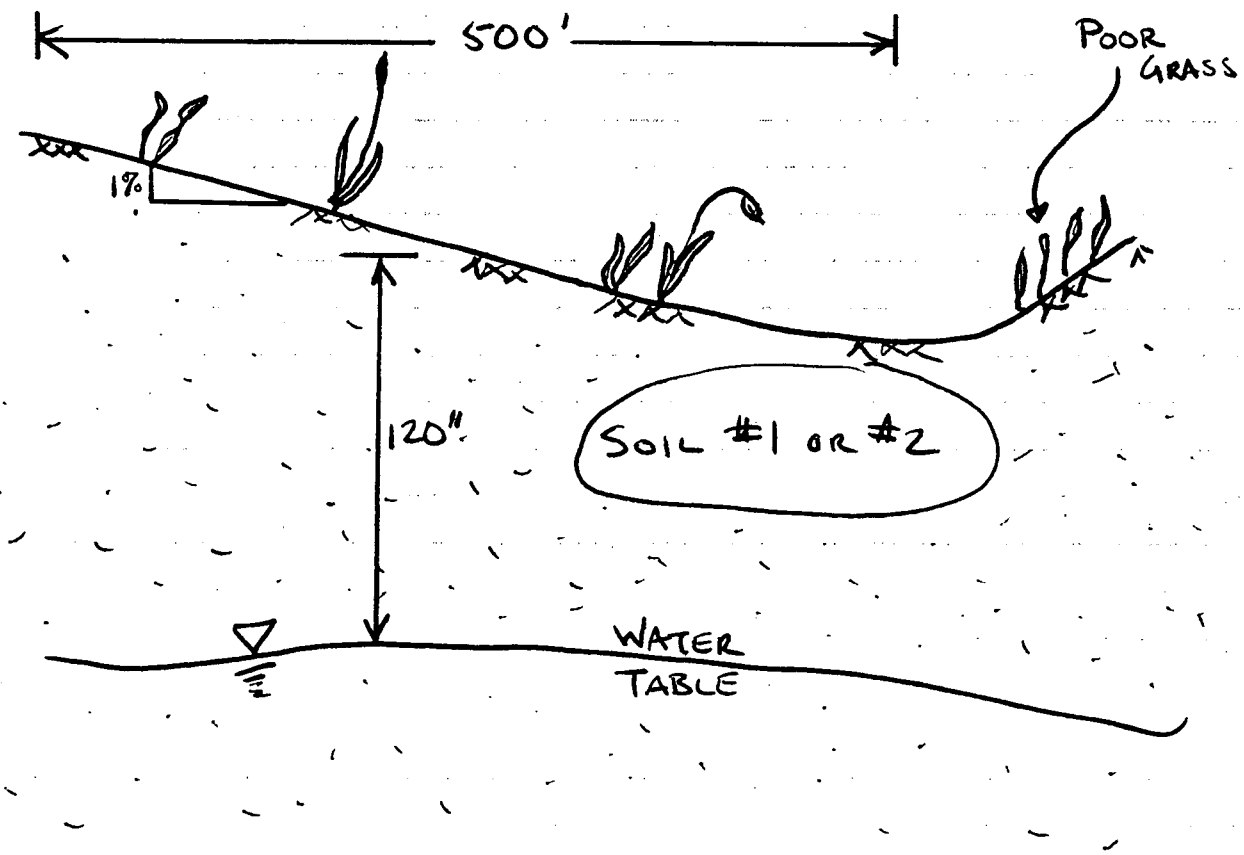
COMPONENT OF WATER BUDGET	RUN #1 RANGE	RUN #1 AVERAGE	RUN #2 RANGE	RUN #2 AVERAGE
PRECIPITATION	30.4-42.1	34.7	30.4-42.1	34.7
RUNOFF	1.8-5.7	4.5	1.9-5.8	4.6
EVAPOTRANSPIRATION	18.2-23.5	20.7	18.6-23.7	21.1
PERCOLATION TO GW	6.4-14.4	9.7	5.4-13.6	9.1

The results indicate that the majority of precipitation is evapotranspirated, but that percolation to groundwater is also significant. Approximately one-seventh of the precipitation runs into the swale where it remains until it percolates to ground. The results are not sensitive to the type of soil assumed to represent the onsite sands. Using the average values from the table above, the volumetric rates of the water budget are as follows:

* **Precipitation**
  Q_P = 34.7 in/yr * (1/12) ft/in * 43,560 ft^2/acre
  Q_P = 126,000 ft^3/yr/acre = 942,000 gal/yr/acre
* **Runoff**
  Q_R = 4.55 in/yr * (1/12) ft/in * 43,560 ft^2/acre
  Q_R = 16,500 ft^3/yr/acre = 123,000 gal/yr/acre
* **Evapotranspiration**
  Q_E = 20.9 in/yr * (1/12) ft/in * 43,560 ft^2/acre
  Q_E = 75,900 ft^3/yr/acre = 568,000 gal/yr/acre
* **Percolation to groundwater**
  Q_{PG} = 9.4 in/yr * (1/12) ft/in * 43,560 ft^2/acre
  Q_{PG} = 34,100 ft^3/yr/acre = 255,000 gal/yr/acre

m:\models\ss26help\sum
7/21/95 14:53

CLIMATIC DATA FOR BURLINGTON, VT.



SUMMARY OF INPUT DATA

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**                                                                  **
**                                                                  **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE        **
**               HELP MODEL VERSION 3.03  (31 DECEMBER 1994)        **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY           **
**                    USAE WATERWAYS EXPERIMENT STATION             **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                  **
**                                                                  **
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**********************************************************************


PRECIPITATION DATA FILE:     C:\HELP3\data4.D4
TEMPERATURE DATA FILE:       C:\HELP3\data7.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\data13.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\data11.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\data26.D10
OUTPUT DATA FILE:            C:\HELP3\run1ss26.OUT


TIME:  12:18     DATE:   7/12/1995


**********************************************************************

     TITLE:  Plattsburgh AFB Site SS-026, by KHT, Run #1

**********************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                      MATERIAL TEXTURE NUMBER   1
          THICKNESS                     =    120.00   INCHES
          POROSITY                      =      0.4170 VOL/VOL
          FIELD CAPACITY                =      0.0450 VOL/VOL
          WILTING POINT                 =      0.0180 VOL/VOL
          INITIAL SOIL WATER CONTENT  =??????????? VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.999999978000E-02 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  1.80
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 1 WITH A POOR STAND OF GRASS, A SURFACE SLOPE OF 1.% AND A SLOPE LENGTH OF 500. FEET.

SCS RUNOFF CURVE NUMBER	=	61.40	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	14.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	2.669	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	5.838	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.252	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=??????????		INCHES
TOTAL INITIAL WATER	=??????????		INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BURLINGTON VERMONT

MAXIMUM LEAF AREA INDEX	= 1.00	
START OF GROWING SEASON (JULIAN DATE)	= 130	
END OF GROWING SEASON (JULIAN DATE)	= 275	
AVERAGE ANNUAL WIND SPEED	= 8.80	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	= 67.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	= 67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	= 73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	= 73.00	%

NOTE: PRECIPITATION DATA FOR BURLINGTON VERMONT WAS ENTERED FROM THE DEFAULT DATA FILE.

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BURLINGTON VERMONT

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
16.60	18.10	29.20	42.70	55.20	64.90
69.60	67.10	58.80	47.90	36.60	22.60

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING

COEFFICIENTS FOR BURLINGTON VERMONT

STATION LATITUDE = 44.50 DEGREES

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ANNUAL TOTALS FOR YEAR 1977

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.27	138920.125	100.00
RUNOFF	4.480	16263.754	11.71
EVAPOTRANSPIRATION	19.408	70449.570	50.71
PERC./LEAKAGE THROUGH LAYER 1	14.387623	52227.070	37.60
CHANGE IN WATER STORAGE	-0.006	-20.286	-0.01
SOIL WATER AT START OF YEAR	15.039	54592.164	
SOIL WATER AT END OF YEAR	15.034	54571.879	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.021	0.00

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ANNUAL TOTALS FOR YEAR 1978

	INCHES	CU. FEET	PERCENT
PRECIPITATION	31.02	112602.648	100.00
RUNOFF	5.667	20572.598	18.27
EVAPOTRANSPIRATION	21.368	77566.312	68.88
PERC./LEAKAGE THROUGH LAYER 1	6.351507	23055.971	20.48
CHANGE IN WATER STORAGE	-2.367	-8592.263	-7.63
SOIL WATER AT START OF YEAR	15.034	54571.879	
SOIL WATER AT END OF YEAR	11.276	40931.965	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	1.391	5047.649	4.48
ANNUAL WATER BUDGET BALANCE	0.0000	0.033	0.00

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ANNUAL TOTALS FOR YEAR 1979

	INCHES	CU. FEET	PERCENT
PRECIPITATION	31.52	114417.617	100.00
RUNOFF	5.519	20033.904	17.51
EVAPOTRANSPIRATION	18.173	65966.227	57.65
PERC./LEAKAGE THROUGH LAYER 1	6.398781	23227.574	20.30
CHANGE IN WATER STORAGE	1.430	5189.888	4.54
SOIL WATER AT START OF YEAR	11.276	40931.965	
SOIL WATER AT END OF YEAR	12.982	47124.996	
SNOW WATER AT START OF YEAR	1.391	5047.649	4.41
SNOW WATER AT END OF YEAR	1.114	4044.506	3.53
ANNUAL WATER BUDGET BALANCE	0.0000	0.024	0.00

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ANNUAL TOTALS FOR YEAR 1980

	INCHES	CU. FEET	PERCENT
PRECIPITATION	30.42	110424.641	100.00
RUNOFF	1.767	6415.292	5.81
EVAPOTRANSPIRATION	20.976	76141.984	68.95
PERC./LEAKAGE THROUGH LAYER 1	7.898703	28672.293	25.97
CHANGE IN WATER STORAGE	-0.222	-804.991	-0.73
SOIL WATER AT START OF YEAR	12.982	47124.996	
SOIL WATER AT END OF YEAR	13.875	50364.512	

SNOW WATER AT START OF YEAR	1.114	4044.506	3.66
SNOW WATER AT END OF YEAR	0.009	31.501	0.03
ANNUAL WATER BUDGET BALANCE	0.0000	0.062	0.00

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ANNUAL TOTALS FOR YEAR 1981

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.12	152895.547	100.00
RUNOFF	4.960	18005.963	11.78
EVAPOTRANSPIRATION	23.496	85288.750	55.78
PERC./LEAKAGE THROUGH LAYER 1	13.247578	48088.707	31.45
CHANGE IN WATER STORAGE	0.408	1480.667	0.97
SOIL WATER AT START OF YEAR	13.875	50364.512	
SOIL WATER AT END OF YEAR	13.596	49353.527	
SNOW WATER AT START OF YEAR	0.009	31.501	0.02
SNOW WATER AT END OF YEAR	0.695	2523.153	1.65
ANNUAL WATER BUDGET BALANCE	0.0087	31.468	0.02

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1977 THROUGH 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.38	1.58	2.35	2.93	2.14	2.55
	3.40	4.11	4.48	3.76	2.90	2.09
STD. DEVIATIONS	2.06	2.15	0.67	0.51	1.38	1.18
	1.75	1.67	1.67	1.38	1.26	0.74
RUNOFF						

TOTALS	0.164	0.248	2.721	1.136	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.210
STD. DEVIATIONS	0.224	0.388	1.648	0.457	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.360

EVAPOTRANSPIRATION

TOTALS	0.573	0.622	1.212	2.177	1.584	2.656
	2.657	3.014	2.561	1.857	1.209	0.560
STD. DEVIATIONS	0.117	0.154	0.405	0.286	1.020	1.464
	0.919	0.614	0.421	0.217	0.115	0.075

PERCOLATION/LEAKAGE THROUGH LAYER 1

TOTALS	0.9704	0.5129	0.3985	0.3537	0.5517	0.6897
	0.5047	0.4688	0.7206	1.9168	1.2764	1.2926
STD. DEVIATIONS	0.3704	0.1368	0.0815	0.1425	0.4911	0.2490
	0.1650	0.2427	0.3990	1.5683	1.0935	0.7713

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1977 THROUGH 1981

	INCHES		CU. FEET	PERCENT
PRECIPITATION	34.67	(5.239)	125852.1	100.00
RUNOFF	4.479	(1.5874)	16258.30	12.919
EVAPOTRANSPIRATION	20.684	(2.0245)	75082.57	59.659
PERCOLATION/LEAKAGE THROUGH LAYER 1	9.65684	(3.86991)	35054.324	27.85358
CHANGE IN WATER STORAGE	-0.151	(1.3918)	-549.40	-0.437

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PEAK DAILY VALUES FOR YEARS 1977 THROUGH 1981

	(INCHES)	(CU. FT.)
PRECIPITATION	2.36	8566.800
RUNOFF	3.042	11041.0322
PERCOLATION/LEAKAGE THROUGH LAYER 1	0.238894	867.18689
SNOW WATER	6.39	23194.2285

MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.2600
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0054

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FINAL WATER STORAGE AT END OF YEAR 1981

LAYER	(INCHES)	(VOL/VOL)
1	13.5965	0.1133
SNOW WATER	0.000	

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**                                                                  **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE        **
**               HELP MODEL VERSION 3.03  (31 DECEMBER 1994)        **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY           **
**                    USAE WATERWAYS EXPERIMENT STATION             **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                  **
**                                                                  **
**********************************************************************
**********************************************************************

PRECIPITATION DATA FILE:     C:\HELP3\data4.D4
TEMPERATURE DATA FILE:       C:\HELP3\data7.D7
SOLAR RADIATION DATA FILE:   C:\HELP3\data13.D13
EVAPOTRANSPIRATION DATA:     C:\HELP3\data11.D11
SOIL AND DESIGN DATA FILE:   C:\HELP3\data262.D10
OUTPUT DATA FILE:            C:\HELP3\run2ss26.OUT

TIME:  12:22     DATE:   7/12/1995

**********************************************************************

     TITLE:  Plattsburgh AFB Site SS-026, by KHT, Run #2

**********************************************************************

     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

                                LAYER  1
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                      MATERIAL TEXTURE NUMBER   2
          THICKNESS                     =    120.00   INCHES
          POROSITY                      =      0.4370 VOL/VOL
          FIELD CAPACITY                =      0.0620 VOL/VOL
          WILTING POINT                 =      0.0240 VOL/VOL
          INITIAL SOIL WATER CONTENT  =??????????? VOL/VOL
          EFFECTIVE SAT. HYD. COND.   =  0.579999993000E-02 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  1.80
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
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GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 2 WITH A POOR STAND OF GRASS, A SURFACE SLOPE OF 1.% AND A SLOPE LENGTH OF 500. FEET.

SCS RUNOFF CURVE NUMBER	=	70.90	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.000	ACRES
EVAPORATIVE ZONE DEPTH	=	14.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	3.115	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	6.118	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	0.336	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=??????????		INCHES
TOTAL INITIAL WATER	=??????????		INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM BURLINGTON VERMONT

MAXIMUM LEAF AREA INDEX	= 1.00	
START OF GROWING SEASON (JULIAN DATE)	= 130	
END OF GROWING SEASON (JULIAN DATE)	= 275	
AVERAGE ANNUAL WIND SPEED	= 8.80	MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	= 67.00	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	= 67.00	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	= 73.00	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	= 73.00	%

NOTE: PRECIPITATION DATA FOR BURLINGTON VERMONT WAS ENTERED FROM THE DEFAULT DATA FILE.

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING COEFFICIENTS FOR BURLINGTON VERMONT

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
16.60	18.10	29.20	42.70	55.20	64.90
69.60	67.10	58.80	47.90	36.60	22.60

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING

COEFFICIENTS FOR BURLINGTON VERMONT

STATION LATITUDE = 44.50 DEGREES

****

ANNUAL TOTALS FOR YEAR 1977

	INCHES	CU. FEET	PERCENT
PRECIPITATION	38.27	138920.125	100.00
RUNOFF	4.689	17019.709	12.25
EVAPOTRANSPIRATION	20.000	72598.555	52.26
PERC./LEAKAGE THROUGH LAYER 1	13.575549	49279.242	35.47
CHANGE IN WATER STORAGE	0.006	22.620	0.02
SOIL WATER AT START OF YEAR	19.062	69196.187	
SOIL WATER AT END OF YEAR	19.069	69218.812	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.003	0.00

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ANNUAL TOTALS FOR YEAR 1978

	INCHES	CU. FEET	PERCENT
PRECIPITATION	31.02	112602.648	100.00
RUNOFF	5.767	20935.475	18.59
EVAPOTRANSPIRATION	21.839	79274.687	70.40
PERC./LEAKAGE THROUGH LAYER 1	6.435420	23360.572	20.75
CHANGE IN WATER STORAGE	-3.022	-10968.187	-9.74
SOIL WATER AT START OF YEAR	19.069	69218.812	
SOIL WATER AT END OF YEAR	14.656	53202.973	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00

SNOW WATER AT END OF YEAR	1.391	5047.649	4.48
ANNUAL WATER BUDGET BALANCE	0.0000	0.104	0.00

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ANNUAL TOTALS FOR YEAR 1979

	INCHES	CU. FEET	PERCENT
PRECIPITATION	31.52	114417.617	100.00
RUNOFF	5.577	20243.977	17.69
EVAPOTRANSPIRATION	18.587	67471.445	58.97
PERC./LEAKAGE THROUGH LAYER 1	5.363579	19469.793	17.02
CHANGE IN WATER STORAGE	1.992	7232.414	6.32
SOIL WATER AT START OF YEAR	14.656	53202.973	
SOIL WATER AT END OF YEAR	16.925	61438.531	
SNOW WATER AT START OF YEAR	1.391	5047.649	4.41
SNOW WATER AT END OF YEAR	1.114	4044.506	3.53
ANNUAL WATER BUDGET BALANCE	0.0000	-0.016	0.00

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ANNUAL TOTALS FOR YEAR 1980

	INCHES	CU. FEET	PERCENT
PRECIPITATION	30.42	110424.641	100.00
RUNOFF	1.861	6756.701	6.12
EVAPOTRANSPIRATION	21.354	77515.961	70.20
PERC./LEAKAGE THROUGH LAYER 1	7.464611	27096.537	24.54
CHANGE IN WATER STORAGE	-0.260	-944.597	-0.86
SOIL WATER AT START OF YEAR	16.925	61438.531	
SOIL WATER AT END OF YEAR	17.779	64538.437	

SNOW WATER AT START OF YEAR	1.114	4044.506	3.66
SNOW WATER AT END OF YEAR	0.009	31.501	0.03
ANNUAL WATER BUDGET BALANCE	0.0000	0.040	0.00

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ANNUAL TOTALS FOR YEAR 1981

	INCHES	CU. FEET	PERCENT
PRECIPITATION	42.12	152895.547	100.00
RUNOFF	5.051	18336.736	11.99
EVAPOTRANSPIRATION	23.668	85915.555	56.19
PERC./LEAKAGE THROUGH LAYER 1	12.875788	46739.109	30.57
CHANGE IN WATER STORAGE	0.516	1872.689	1.22
SOIL WATER AT START OF YEAR	17.779	64538.437	
SOIL WATER AT END OF YEAR	17.609	63919.477	
SNOW WATER AT START OF YEAR	0.009	31.501	0.02
SNOW WATER AT END OF YEAR	0.695	2523.153	1.65
ANNUAL WATER BUDGET BALANCE	0.0087	31.461	0.02

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1977 THROUGH 1981

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	2.38	1.58	2.35	2.93	2.14	2.55
	3.40	4.11	4.48	3.76	2.90	2.09
STD. DEVIATIONS	2.06	2.15	0.67	0.51	1.38	1.18
	1.75	1.67	1.67	1.38	1.26	0.74
RUNOFF						

TOTALS	0.171	0.257	2.764	1.163	0.000	0.000
	0.001	0.007	0.004	0.000	0.000	0.222
STD. DEVIATIONS	0.233	0.398	1.663	0.460	0.000	0.000
	0.002	0.016	0.008	0.000	0.000	0.380
EVAPOTRANSPIRATION						

TOTALS	0.573	0.622	1.217	2.232	1.658	2.693
	2.850	2.993	2.618	1.869	1.203	0.560
STD. DEVIATIONS	0.118	0.154	0.411	0.129	0.936	1.455
	0.975	0.676	0.452	0.196	0.117	0.075
PERCOLATION/LEAKAGE THROUGH LAYER 1						

TOTALS	1.0478	0.5847	0.4640	0.3433	0.3902	0.5761
	0.5512	0.4803	0.4548	1.6860	1.3501	1.2145
STD. DEVIATIONS	0.4798	0.1772	0.1061	0.0589	0.3021	0.2954
	0.2073	0.0775	0.1551	1.4391	1.0628	0.8361

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1977 THROUGH 1981

	INCHES		CU. FEET	PERCENT
PRECIPITATION	34.67	(5.239)	125852.1	100.00
RUNOFF	4.589	(1.5834)	16658.52	13.237
EVAPOTRANSPIRATION	21.090	(1.9190)	76555.23	60.830
PERCOLATION/LEAKAGE THROUGH LAYER 1	9.14299	(3.80832)	33189.047	26.37146
CHANGE IN WATER STORAGE	-0.153	(1.8245)	-557.01	-0.443

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PEAK DAILY VALUES FOR YEARS 1977 THROUGH 1981

	(INCHES)	(CU. FT.)
PRECIPITATION	2.36	8566.800
RUNOFF	3.066	11130.6182
PERCOLATION/LEAKAGE THROUGH LAYER 1	0.208518	756.92102
SNOW WATER	6.39	23194.2285

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.2830

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.0170

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FINAL WATER STORAGE AT END OF YEAR 1981

LAYER	(INCHES)	(VOL/VOL)
1	17.6091	0.1467
SNOW WATER	0.000	

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APPENDIX L

SCREENING RESULTS FOR CPC IDENTIFICATION

TABLE L-1
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)
				Min	Max	Avg			
Methylene Chloride	UG/KG	13	6	1	54	11.83			
Acetone	UG/KG	13	6	8.5	46	31.92			
Toluene	UG/KG	13	2	3	17	10			
4-Methylphenol (p-cresol)	UG/KG	13	1	814	814	814			
Naphthalene	UG/KG	13	1	18100	18100	18100			
2-Methylnaphthalene	UG/KG	13	1	12900	12900	12900			
Acenaphthene	UG/KG	13	1	20600	20600	20600			
Dibenzofuran	UG/KG	13	1	13800	13800	13800			
Fluorene	UG/KG	13	1	21600	21600	21600			
Phenanthrene	UG/KG	13	1	72000	72000	72000			
Carbazole	UG/KG	13	1	19200	19200	19200			
Di-n-butylphthalate	UG/KG	13	1	352	352	352			
Fluoranthene	UG/KG	13	2	78	57500	28789			
Pyrene	UG/KG	13	2	82	58600	29341			
Benzo(a)anthracene	UG/KG	13	1	57700	57700	57700			
Chrysene	UG/KG	13	1	26100	26100	26100			
bis(2-Ethylhexyl)phthalate	UG/KG	13	1	679	679	679			
Benzo(b)fluoranthene	UG/KG	13	1	14700	14700	14700			
Benzo(k)fluoranthene	UG/KG	13	1	12400	12400	12400			
Benzo(a)pyrene	UG/KG	13	2	213	17900	9056.5			
Indeno(1,2,3-cd)pyrene	UG/KG	13	1	14700	14700	14700			
Dibenz(a,h)anthracene	UG/KG	13	1	8840	8840	8840			
Benzo(g,h,i)perylene	UG/KG	13	1	15600	15600	15600			
4,4'-DDE	UG/KG	8	1	1	1	1			
4,4'-DDT	UG/KG	8	3	0.44	3	1.61			
RDX	UG/KG	5	1	1500	1500	1500			
Dioxins & Furans (Toxicity Equivalence)	NG/KG	3	3	0.03	0.08	0.05			
Aluminum	MG/KG	13	13	1150	4575	2764.23	8510	no	
Antimony	MG/KG	13	6	1.4	13.9	5.56	12.6	yes	no
Arsenic	MG/KG	16	6	0.7	1.4	1.01	3.44	no	
Barium	MG/KG	13	13	7.9	25.75	16.5	101	no	
Beryllium	MG/KG	13	8	0.09	0.23	0.16	0.74	no	

TABLE L-1
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)
				Min	Max	Avg			
Cadmium	MG/KG	13	6	0.03	4.5	1.67	1.3	yes	no
Calcium	MG/KG	13	13	310	5760	1810.23	30200	no	
Chromium	MG/KG	13	13	1.9	31.1	7.02	19.5	yes	no
Cobalt	MG/KG	13	13	0.9	15.1	2.83	9.2	yes	no
Copper	MG/KG	13	13	0.78	52.8	7.89	44.11	yes	no
Iron	MG/KG	13	13	2970	12300	5776.54	36700	no	
Lead	MG/KG	11	11	0.57	65.3	11.87	79.4	no	
Magnesium	MG/KG	13	13	184	1540	647.35	3340	no	
Manganese	MG/KG	8	8	24.4	79.6	50.99	474	no	
Nickel	MG/KG	13	12	2.5	7	3.75	12.6	no	
Potassium	MG/KG	13	13	118	362.5	247.38	929	no	
Selenium	MG/KG	13	7	0.85	7.6	4.11	1.65	yes	yes
Sodium	MG/KG	13	6	45.4	362	150.48	520	no	
Vanadium	MG/KG	13	13	4.4	21	8.56	90.2	no	
Zinc	MG/KG	6	6	14.8	153	50.95	63.4	yes	yes

TABLE L-2
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN SOIL
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)
				Min	Max	Avg			
Methylene Chloride	UG/KG	18	6	1	54	11.83			
Acetone	UG/KG	18	10	3	46	23.45			
Toluene	UG/KG	18	2	3	17	10			
4-Methylphenol (p-cresol)	UG/KG	18	1	814	814	814			
Naphthalene	UG/KG	18	1	18100	18100	18100			
2-Methylnaphthalene	UG/KG	18	1	12900	12900	12900			
Acenaphthene	UG/KG	18	1	20600	20600	20600			
Dibenzofuran	UG/KG	18	1	13800	13800	13800			
Diethylphthalate	UG/KG	18	1	780	780	780			
Fluorene	UG/KG	18	1	21600	21600	21600			
Phenanthrene	UG/KG	18	1	72000	72000	72000			
Carbazole	UG/KG	18	1	19200	19200	19200			
Di-n-butylphthalate	UG/KG	18	1	352	352	352			
Fluoranthene	UG/KG	18	2	78	57500	28789			
Pyrene	UG/KG	18	2	82	58600	29341			
Benzo(a)anthracene	UG/KG	18	1	57700	57700	57700			
Chrysene	UG/KG	18	1	26100	26100	26100			
bis(2-Ethylhexyl)phthalate	UG/KG	18	1	679	679	679			
Benzo(b)fluoranthene	UG/KG	18	1	14700	14700	14700			
Benzo(k)fluoranthene	UG/KG	18	1	12400	12400	12400			
Benzo(a)pyrene	UG/KG	18	2	213	17900	9056.5			
Indeno(1,2,3-cd)pyrene	UG/KG	18	1	14700	14700	14700			
Dibenz(a,h)anthracene	UG/KG	18	1	8840	8840	8840			
Benzo(g,h,i)perylene	UG/KG	18	1	15600	15600	15600			
4,4'-DDE	UG/KG	13	1	1	1	1			
4,4'-DDT	UG/KG	13	3	0.44	3	1.61			
RDX	UG/KG	10	1	1500	1500	1500			
Dioxins & Furans (Toxicity Equivalence)	NG/KG	6	6	0.01	0.15	0.06			
Aluminum	MG/KG	18	18	1150	4575	2566.94	8510	no	
Antimony	MG/KG	18	8	1.4	42.9	10.48	12.6	yes	no
Arsenic	MG/KG	24	10	0.41	1.4	0.89	3.44	no	
Barium	MG/KG	18	18	4.8	25.75	15.55	101	no	
Beryllium	MG/KG	18	12	0.06	0.23	0.15	0.74	no	
Cadmium	MG/KG	18	10	0.03	5.3	1.89	1.3	yes	no

TABLE L-2
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN SOIL
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)
				Min	Max	Avg			
Calcium	MG/KG	18	18	310	5760	1489.83	30200	no	
Chromium	MG/KG	18	17	1.9	31.1	7.32	19.5	yes	no
Cobalt	MG/KG	18	17	0.9	15.1	2.95	9.2	yes	no
Copper	MG/KG	18	18	0.78	52.8	6.48	44.11	yes	no
Iron	MG/KG	18	18	2550	12300	5454.17	36700	no	
Lead	MG/KG	16	16	0.5	65.3	8.64	79.4	no	
Magnesium	MG/KG	18	18	184	1540	651.69	3340	no	
Manganese	MG/KG	13	13	24.4	103	53.78	474	no	
Nickel	MG/KG	18	15	2.5	10.6	4.21	12.6	no	
Potassium	MG/KG	18	18	118	480	275.44	929	no	
Selenium	MG/KG	18	7	0.85	7.6	4.11	1.65	yes	yes
Silver	MG/KG	13	1	1.3	1.3	1.3	ND	yes	
Sodium	MG/KG	18	11	45.4	412	180.4	520	no	
Vanadium	MG/KG	18	18	3.3	21	8.11	90.2	no	
Zinc	MG/KG	8	8	14.1	153	57.73	63.4	yes	yes

NOTE
Soil samples include both surface and subsurface soil samples.

ND - Not Detected

TABLE L-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Chemical of Potential Concern (Y/N)
				Min	Max	Avg		
Acetone	UG/L	9	1	15	15	15		
bis(2-Ethylhexyl)phthalate	UG/L	5	3	2	4	3		
RDX	UG/L	9	2	5.5	6.1	5.8		
Aluminum	UG/L	5	5	105	6050	2131.78	29600	no
Arsenic	UG/L	5	4	2.2	4.9	3.31	3.6	yes
Barium	UG/L	5	5	19.4	67.1	38.9	200	no
Beryllium	UG/L	5	4	0.29	0.74	0.45	ND	yes
Cadmium	UG/L	5	1	4.1	4.1	4.1	2.1	yes
Calcium	UG/L	5	5	5135	24450	12610	175000	no
Chromium	UG/L	5	3	5.7	11.5	8.05	42.9	no
Cobalt	UG/L	5	2	5.6	9.3	7.45	19.8	no
Copper	UG/L	5	4	4.3	13.3	8	170	no
Iron	UG/L	5	5	960.6	6850	3641.89	51600	no
Lead	UG/L	5	4	1.8	3.35	2.44	26.4	no
Magnesium	UG/L	5	5	602	5075	2750.8	80600	no
Manganese	UG/L	5	5	19.6	188	81.16	5470	no
Mercury	UG/L	5	1	0.29	0.29	0.29	ND	yes
Nickel	UG/L	5	3	5.05	21	12.68	34.8	no
Potassium	UG/L	5	5	1555	2465	1867	40000	no
Selenium	UG/L	5	1	12.05	12.05	12.05	ND	yes
Sodium	UG/L	5	5	1290	1750	1555	77700	no

TABLE L-3
IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
EOD RANGE (SS-026)

Parameter	Units	Numer of Samples	Number of Detections	Range of Detections			Background 95% UTL (metals)	Chemical of Potential Concern (Y/N)
				Min	Max	Avg		
Thallium	UG/L	5	1	1.3	1.3	1.3	ND	yes
Vanadium	UG/L	5	4	3.8	27.7	12.86	52	no
Zinc	UG/L	5	5	48.95	176.45	115.09	349	no
EXPOSURE CONCENTRATIONS OF GROUNDWATER SEEP SAMPLES								
Aluminum	UG/L	2	2	2280	8245	5262.5	29600	no
Arsenic	UG/L	2	1	7.4	7.4	7.4	3.6	yes
Barium	UG/L	2	2	34.7	157.5	96.1	200	no
Calcium	UG/L	2	2	28800	50050	39425	175000	no
Chromium	UG/L	2	2	4.2	12.4	8.3	42.9	no
Copper	UG/L	2	2	8.5	13.25	10.875	170	no
Iron	UG/L	2	2	4470	14250	9360	51600	no
Lead	UG/L	2	2	8.2	24	16.1	26.4	no
Magnesium	UG/L	2	2	7540	11500	9520	80600	no
Manganese	UG/L	2	2	401	2530	1465.5	5470	no
Nickel	UG/L	2	2	2.9	8.4	5.65	34.8	no
Potassium	UG/L	2	2	938	2785	1861.5	40000	no
Selenium	UG/L	2	2	7.1	12.85	9.975	ND	yes
Sodium	UG/L	2	2	5450	6220	5835	77700	no
Thallium	UG/L	2	1	6.6	6.6	6.6	ND	yes
Vanadium	UG/L	2	2	6.2	18.25	12.225	52	no
Zinc	UG/L	2	2	34.2	62.25	48.225	349	no

NOTE:
Since only two samples of groundwater seep samples were collected, the exposure concentration was set equal to the maximum detection (UCL95 was not caslculated).

J:\00049\eod_ucl95fixnormal.xls\GW-APP_L\DP
04/13/2000\3:07 PM

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Antimony

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	1.70	2	2
EOD PIT 1	12/11/97	-	Onsite	1.90	3	3
EOD PIT 2	12/11/97	-	Onsite	2.00	4	4
MW-26-001	11/8/94	0.0-2.0	Onsite	5.60	29	30
MW-26-003	11/8/94	0.0-2.0	Onsite	5.30	13	16
SB-26-01	11/9/94	0.0-2.0	Onsite	5.30	14	16
SB-26-02	11/9/94	0.0-2.0	Onsite	5.40	20	22.5
SB-26-03	11/9/94	0.0-2.0	Onsite	**13.90**	38	38
SS-026-SF-1	9/20/99	0-0.5	Onsite	**2.70**	5	5
SS-026-SF-2	9/20/99	0-0.5	Onsite	**1.40**	1	1
SS-026-SF-4	9/15/99	0-0.5	Onsite	**3.05**	6	6
SS-026-SF-5	9/15/99	0-0.5	Onsite	**7.20**	36	36
SS-026-SF-6	9/15/99	0-0.5	Onsite	**5.10**	9	9
SS-10-08	10/26/94	-	Background	**12.60**	37	37
SS-10-09	10/26/94	-	Background	4.20	7	7.5
SS-13-19	10/26/94	-	Background	4.20	8	7.5
SS-BKD-001	10/26/94	-	Background	5.60	30	30
SS-BKD-002	10/26/94	-	Background	5.70	32	32
SS-BKD-003	10/26/94	-	Background	5.30	15	16
SS-BKD-004	10/26/94	-	Background	5.40	21	22.5
SS-BKD-005	10/26/94	-	Background	5.40	22	22.5
SS-BKD-006	10/26/94	-	Background	5.50	26	27
SS-BKD-007	10/26/94	-	Background	5.50	27	27
SS-BKD-008	10/26/94	-	Background	5.20	10	11
SS-BKD-009	10/26/94	-	Background	5.30	16	16
SS-BKD-010	10/26/94	-	Background	6.00	34	34
SS-BKD-011	10/26/94	-	Background	5.60	31	30
SS-BKD-012	10/26/94	-	Background	5.40	23	22.5
SS-BKD-013	10/26/94	-	Background	5.40	24	22.5
SS-BKD-014	10/26/94	-	Background	5.30	17	16
SS-BKD-015	10/26/94	-	Background	5.20	11	11
SS-BKD-016	10/26/94	-	Background	6.20	35	35
SS-BKD-017	10/26/94	-	Background	5.20	12	11
SS-BKD-018	10/26/94	-	Background	5.30	18	16
SS-BKD-019	10/26/94	-	Background	5.30	19	16
SS-BKD-020	10/26/94	-	Background	5.90	33	33
SS-BKD-021	10/26/94	-	Background	5.50	28	27
SS-BKD-022	10/26/94	-	Background	5.40	25	22.5

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	25
Mean Onsite Data	4.6577
Mean Background Data	5.6640
Standard Deviation Onsite Data	3.3515
Standard Deviation Backgound Data	1.5083
Sum of Sample Ranks Onsite Date	188.5000
Sum of Sample Ranks Background Data	552.5000
Wilcoxon Statistic W	97.5000
Expected Value E(W)	162.5
Standard Deviation SD(W)	32.5000
Standard Deviation (Ties) SD^(W)	32.3145
Approximate Z-score Z	-2.0270
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Cadmium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	0.21	6	6
EOD PIT 1	12/11/97	-	Onsite	0.24	7	7.5
EOD PIT 2	12/11/97	-	Onsite	0.24	8	7.5
MW-26-001	11/8/94	0.0-2.0	Onsite	**1.12**	36	36
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.10**	35	35
SB-26-01	11/9/94	0.0-2.0	Onsite	**0.76**	34	34
SB-26-02	11/9/94	0.0-2.0	Onsite	**4.50**	39	39
SB-26-03	11/9/94	0.0-2.0	Onsite	**2.50**	38	38
SS-026-SF-1	9/20/99	0-0.5	Onsite	0.12	3	3
SS-026-SF-2	9/20/99	0-0.5	Onsite	0.11	2	2
SS-026-SF-4	9/15/99	0-0.5	Onsite	0.14	4	4
SS-026-SF-5	9/15/99	0-0.5	Onsite	**0.03**	1	1
SS-026-SF-6	9/15/99	0-0.5	Onsite	0.20	5	5
SS-04-029	10/26/94	-	Background	0.57	29	29.5
SS-10-08	10/26/94	-	Background	**1.30**	37	37
SS-10-09	10/26/94	-	Background	0.40	9	9.5
SS-13-19	10/26/94	-	Background	0.40	10	9.5
SS-BKD-001	10/26/94	-	Background	0.56	28	28
SS-BKD-002	10/26/94	-	Background	0.57	30	29.5
SS-BKD-003	10/26/94	-	Background	0.53	16	18.5
SS-BKD-004	10/26/94	-	Background	0.53	17	18.5
SS-BKD-005	10/26/94	-	Background	0.54	22	24
SS-BKD-006	10/26/94	-	Background	0.54	23	24
SS-BKD-007	10/26/94	-	Background	0.54	24	24
SS-BKD-008	10/26/94	-	Background	0.52	11	13
SS-BKD-009	10/26/94	-	Background	0.53	18	18.5
SS-BKD-010	10/26/94	-	Background	0.59	32	32
SS-BKD-011	10/26/94	-	Background	0.55	27	27
SS-BKD-012	10/26/94	-	Background	0.53	19	18.5
SS-BKD-013	10/26/94	-	Background	0.54	25	24
SS-BKD-014	10/26/94	-	Background	0.53	20	18.5
SS-BKD-015	10/26/94	-	Background	0.52	12	13
SS-BKD-016	10/26/94	-	Background	0.61	33	33
SS-BKD-017	10/26/94	-	Background	0.52	13	13
SS-BKD-018	10/26/94	-	Background	0.52	14	13
SS-BKD-019	10/26/94	-	Background	0.52	15	13
SS-BKD-020	10/26/94	-	Background	0.58	31	31
SS-BKD-021	10/26/94	-	Background	0.54	26	24
SS-BKD-022	10/26/94	-	Background	0.53	21	18.5

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	26
Mean Onsite Data	0.8665
Mean Background Data	0.5619
Standard Deviation Onsite Data	1.2918
Standard Deviation Backgound Data	0.1573
Sum of Sample Ranks Onsite Date	218.0000
Sum of Sample Ranks Background Data	562.0000
Wilcoxon Statistic W	127.0000
Expected Value E(W)	169
Standard Deviation SD(W)	33.5659
Standard Deviation (Ties) SD^(W)	33.4331
Approximate Z-score Z	-1.2712
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Chromium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**2.40**	5	5
EOD PIT 1	12/11/97	-	Onsite	**3.80**	8	8
EOD PIT 2	12/11/97	-	Onsite	**5.70**	18	18
MW-26-001	11/8/94	0.0-2.0	Onsite	**5.10**	12	12
MW-26-003	11/8/94	0.0-2.0	Onsite	**2.00**	2	2.5
SB-26-01	11/9/94	0.0-2.0	Onsite	**1.90**	1	1
SB-26-02	11/9/94	0.0-2.0	Onsite	**31.10**	39	39
SB-26-03	11/9/94	0.0-2.0	Onsite	**7.80**	29	29
SS-026-SF-1	9/20/99	0-0.5	Onsite	**6.30**	21	21.5
SS-026-SF-2	9/20/99	0-0.5	Onsite	**10.00**	32	32
SS-026-SF-4	9/15/99	0-0.5	Onsite	**4.70**	9	9.5
SS-026-SF-5	9/15/99	0-0.5	Onsite	**5.30**	16	16
SS-026-SF-6	9/15/99	0-0.5	Onsite	**5.20**	14	14.5
SS-04-029	10/26/94	-	Background	**4.70**	10	9.5
SS-10-08	10/26/94	-	Background	**19.45**	38	38
SS-10-09	10/26/94	-	Background	**2.00**	3	2.5
SS-13-19	10/26/94	-	Background	**7.70**	28	28
SS-BKD-001	10/26/94	-	Background	**8.40**	30	30.5
SS-BKD-002	10/26/94	-	Background	**15.30**	37	37
SS-BKD-003	10/26/94	-	Background	**7.50**	27	27
SS-BKD-004	10/26/94	-	Background	**5.60**	17	17
SS-BKD-005	10/26/94	-	Background	**11.40**	34	34
SS-BKD-006	10/26/94	-	Background	**6.30**	22	21.5
SS-BKD-007	10/26/94	-	Background	**10.30**	33	33
SS-BKD-008	10/26/94	-	Background	**5.20**	15	14.5
SS-BKD-009	10/26/94	-	Background	**8.40**	31	30.5
SS-BKD-010	10/26/94	-	Background	**11.50**	35	35
SS-BKD-011	10/26/94	-	Background	**12.70**	36	36
SS-BKD-012	10/26/94	-	Background	**4.90**	11	11
SS-BKD-013	10/26/94	-	Background	**7.30**	26	26
SS-BKD-014	10/26/94	-	Background	**6.40**	23	23
SS-BKD-015	10/26/94	-	Background	**6.60**	24	24
SS-BKD-016	10/26/94	-	Background	**5.15**	13	13
SS-BKD-017	10/26/94	-	Background	**6.80**	25	25
SS-BKD-018	10/26/94	-	Background	**5.90**	19	19
SS-BKD-019	10/26/94	-	Background	**3.40**	7	7
SS-BKD-020	10/26/94	-	Background	**6.10**	20	20
SS-BKD-021	10/26/94	-	Background	**2.30**	4	4
SS-BKD-022	10/26/94	-	Background	**2.50**	6	6

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	26
Mean Onsite Data	7.0231
Mean Background Data	7.4538
Standard Deviation Onsite Data	7.5832
Standard Deviation Backgound Data	4.0397
Sum of Sample Ranks Onsite Date	208.0000
Sum of Sample Ranks Background Data	572.0000
Wilcoxon Statistic W	117.0000
Expected Value E(W)	169
Standard Deviation SD(W)	33.5659
Standard Deviation (Ties) SD^(W)	33.5574
Approximate Z-score Z	-1.5645
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Cobalt

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**1.10**	6	6
EOD PIT 1	12/11/97	-	Onsite	**1.60**	12	12.5
EOD PIT 2	12/11/97	-	Onsite	**2.40**	17	18.5
MW-26-001	11/8/94	0.0-2.0	Onsite	**3.10**	26	26
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.90**	15	15
SB-26-01	11/9/94	0.0-2.0	Onsite	**1.80**	14	14
SB-26-02	11/9/94	0.0-2.0	Onsite	**15.10**	38	38
SB-26-03	11/9/94	0.0-2.0	Onsite	**4.00**	33	33
SS-026-SF-1	9/20/99	0-0.5	Onsite	**1.30**	8	9
SS-026-SF-2	9/20/99	0-0.5	Onsite	**1.20**	7	7
SS-026-SF-4	9/15/99	0-0.5	Onsite	**1.03**	5	5
SS-026-SF-5	9/15/99	0-0.5	Onsite	**1.30**	9	9
SS-026-SF-6	9/15/99	0-0.5	Onsite	**0.90**	3	3
SS-10-08	10/26/94	-	Background	**2.50**	22	22
SS-10-09	10/26/94	-	Background	0.60	1	1
SS-13-19	10/26/94	-	Background	**1.50**	11	11
SS-BKD-001	10/26/94	-	Background	**6.25**	35	35
SS-BKD-002	10/26/94	-	Background	**7.30**	36	36
SS-BKD-003	10/26/94	-	Background	**3.70**	29	29.5
SS-BKD-004	10/26/94	-	Background	**2.70**	24	24.5
SS-BKD-005	10/26/94	-	Background	**9.20**	37	37
SS-BKD-006	10/26/94	-	Background	**2.30**	16	16
SS-BKD-007	10/26/94	-	Background	**3.70**	30	29.5
SS-BKD-008	10/26/94	-	Background	**2.40**	18	18.5
SS-BKD-009	10/26/94	-	Background	**3.90**	32	32
SS-BKD-010	10/26/94	-	Background	**2.60**	23	23
SS-BKD-011	10/26/94	-	Background	**2.70**	25	24.5
SS-BKD-012	10/26/94	-	Background	**1.60**	13	12.5
SS-BKD-013	10/26/94	-	Background	**5.30**	34	34
SS-BKD-014	10/26/94	-	Background	**3.30**	28	28
SS-BKD-015	10/26/94	-	Background	**2.40**	19	18.5
SS-BKD-016	10/26/94	-	Background	**2.45**	21	21
SS-BKD-017	10/26/94	-	Background	**2.40**	20	18.5
SS-BKD-018	10/26/94	-	Background	**3.10**	27	27
SS-BKD-019	10/26/94	-	Background	**1.30**	10	9
SS-BKD-020	10/26/94	-	Background	**3.80**	31	31
SS-BKD-021	10/26/94	-	Background	0.89	2	2
SS-BKD-022	10/26/94	-	Background	**0.91**	4	4

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND (((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	25
Mean Onsite Data	2.8254
Mean Background Data	3.1520
Standard Deviation Onsite Data	3.7960
Standard Deviation Backgound Data	2.0298
Sum of Sample Ranks Onsite Date	196.0000
Sum of Sample Ranks Background Data	545.0000
Wilcoxon Statistic W	105.0000
Expected Value E(W)	162.5
Standard Deviation SD(W)	32.5000
Standard Deviation (Ties) SD^(W)	32.4698
Approximate Z-score Z	-1.7863
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Copper

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**1.90**	7	7
EOD PIT 1	12/11/97	-	Onsite	**0.78**	1	1
EOD PIT 2	12/11/97	-	Onsite	**2.30**	11	11
MW-26-001	11/8/94	0.0-2.0	Onsite	**3.35**	16	16
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.50**	5	5
SB-26-01	11/9/94	0.0-2.0	Onsite	**2.80**	14	14.5
SB-26-02	11/9/94	0.0-2.0	Onsite	**4.20**	19	19.5
SB-26-03	11/9/94	0.0-2.0	Onsite	**4.40**	21	21
SS-026-SF-1	9/20/99	0-0.5	Onsite	**5.80**	24	24
SS-026-SF-2	9/20/99	0-0.5	Onsite	**52.80**	38	38
SS-026-SF-4	9/15/99	0-0.5	Onsite	**2.15**	8	8
SS-026-SF-5	9/15/99	0-0.5	Onsite	**3.80**	18	18
SS-026-SF-6	9/15/99	0-0.5	Onsite	**16.80**	35	35
SS-10-08	10/26/94	-	Background	**41.30**	36	36
SS-10-09	10/26/94	-	Background	**7.80**	29	29
SS-13-19	10/26/94	-	Background	**2.20**	9	9.5
SS-BKD-001	10/26/94	-	Background	**6.95**	27	27
SS-BKD-002	10/26/94	-	Background	**15.00**	33	33
SS-BKD-003	10/26/94	-	Background	**7.40**	28	28
SS-BKD-004	10/26/94	-	Background	**6.00**	25	25
SS-BKD-005	10/26/94	-	Background	**9.80**	32	32
SS-BKD-006	10/26/94	-	Background	**15.20**	34	34
SS-BKD-007	10/26/94	-	Background	**9.20**	31	31
SS-BKD-008	10/26/94	-	Background	**47.30**	37	37
SS-BKD-009	10/26/94	-	Background	**4.80**	23	23
SS-BKD-010	10/26/94	-	Background	**4.20**	20	19.5
SS-BKD-011	10/26/94	-	Background	**6.40**	26	26
SS-BKD-012	10/26/94	-	Background	**1.60**	6	6
SS-BKD-013	10/26/94	-	Background	**4.70**	22	22
SS-BKD-014	10/26/94	-	Background	**2.20**	10	9.5
SS-BKD-015	10/26/94	-	Background	**2.50**	12	12
SS-BKD-016	10/26/94	-	Background	**2.75**	13	13
SS-BKD-017	10/26/94	-	Background	**3.70**	17	17
SS-BKD-018	10/26/94	-	Background	**8.10**	30	30
SS-BKD-019	10/26/94	-	Background	**1.30**	4	4
SS-BKD-020	10/26/94	-	Background	**2.80**	15	14.5
SS-BKD-021	10/26/94	-	Background	0.91	3	3
SS-BKD-022	10/26/94	-	Background	0.90	2	2

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Background Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	25
Mean Onsite Data	7.8908
Mean Background Data	8.6004
Standard Deviation Onsite Data	14.0865
Standard Deviation Backgound Data	11.4577
Sum of Sample Ranks Onsite Date	218.0000
Sum of Sample Ranks Background Data	523.0000
Wilcoxon Statistic W	127.0000
Expected Value E(W)	162.5
Standard Deviation SD(W)	32.5000
Standard Deviation (Ties) SD^(W)	32.4947
Approximate Z-score Z	-1.1079
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL
Selenium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**0.85**	31	31
EOD PIT 1	12/11/97	-	Onsite	0.97	32	32
EOD PIT 2	12/11/97	-	Onsite	**1.30**	33	33
MW-26-001	11/8/94	0.0-2.0	Onsite	0.44	29	29.5
MW-26-003	11/8/94	0.0-2.0	Onsite	0.42	23	25
SB-26-01	11/9/94	0.0-2.0	Onsite	0.42	24	25
SB-26-02	11/9/94	0.0-2.0	Onsite	0.42	25	25
SB-26-03	11/9/94	0.0-2.0	Onsite	0.42	26	25
SS-026-SF-1	9/20/99	0-0.5	Onsite	**7.60**	39	39
SS-026-SF-2	9/20/99	0-0.5	Onsite	**5.70**	38	38
SS-026-SF-4	9/15/99	0-0.5	Onsite	**4.10**	35	35
SS-026-SF-5	9/15/99	0-0.5	Onsite	**4.50**	36	36
SS-026-SF-6	9/15/99	0-0.5	Onsite	**4.70**	37	37
SS-04-029	10/26/94	-	Background	0.21	1	1
SS-10-08	10/26/94	-	Background	**1.65**	34	34
SS-10-09	10/26/94	-	Background	0.32	2	2.5
SS-13-19	10/26/94	-	Background	0.32	3	2.5
SS-BKD-001	10/26/94	-	Background	0.40	20	20.5
SS-BKD-002	10/26/94	-	Background	0.41	22	22
SS-BKD-003	10/26/94	-	Background	0.38	8	10.5
SS-BKD-004	10/26/94	-	Background	0.38	9	10.5
SS-BKD-005	10/26/94	-	Background	0.39	14	16.5
SS-BKD-006	10/26/94	-	Background	0.39	15	16.5
SS-BKD-007	10/26/94	-	Background	0.39	16	16.5
SS-BKD-008	10/26/94	-	Background	0.37	4	5.5
SS-BKD-009	10/26/94	-	Background	0.38	10	10.5
SS-BKD-010	10/26/94	-	Background	0.43	28	28
SS-BKD-011	10/26/94	-	Background	0.40	21	20.5
SS-BKD-012	10/26/94	-	Background	0.39	17	16.5
SS-BKD-013	10/26/94	-	Background	0.39	18	16.5
SS-BKD-014	10/26/94	-	Background	0.38	11	10.5
SS-BKD-015	10/26/94	-	Background	0.37	5	5.5
SS-BKD-016	10/26/94	-	Background	0.44	30	29.5
SS-BKD-017	10/26/94	-	Background	0.37	6	5.5
SS-BKD-018	10/26/94	-	Background	0.37	7	5.5
SS-BKD-019	10/26/94	-	Background	0.38	12	10.5
SS-BKD-020	10/26/94	-	Background	0.42	27	25
SS-BKD-021	10/26/94	-	Background	0.39	19	16.5
SS-BKD-022	10/26/94	-	Background	0.38	13	10.5

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-4
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SURFACE SOIL

Compliance Data (n)	13
Background Data (n)	26
Mean Onsite Data	2.4492
Mean Background Data	0.4269
Standard Deviation Onsite Data	2.5111
Standard Deviation Backgound Data	0.2532
Sum of Sample Ranks Onsite Date	410.5000
Sum of Sample Ranks Background Data	369.5000
Wilcoxon Statistic W	319.5000
Expected Value E(W)	169
Standard Deviation SD(W)	33.5659
Standard Deviation (Ties) SD^(W)	33.3904
Approximate Z-score Z	4.4923
Significance Level A	0.05
ZA	1.6449
Potential Concern	**YES**

Detected Concentrations are Shown in Bold.

Onsite Selection: SurfaceSoil — WHERE (((tblRES.MATRIX)="SO") AND ((CDbl([tblRES]![SBD]))>=0 And (CDbl([tblRES]![SBD]))<=2) AND ((CDbl([tblRES]![SED]))>=0 And (CDbl([tblRES]![SED]))<=2) AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Antimony

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	1.70	2	2
EOD PIT 1	12/11/97	-	Onsite	1.90	3	3
EOD PIT 2	12/11/97	-	Onsite	2.00	4	4
MW-26-001	11/8/94	0.0-2.0	Onsite	5.60	31	32
MW-26-001	11/8/94	2.0-4.0	Onsite	6.00	36	36.5
MW-26-003	11/8/94	0.0-2.0	Onsite	5.30	14	17.5
MW-26-003	11/8/94	2.0-4.0	Onsite	5.30	15	17.5
SB-26-01	11/9/94	0.0-2.0	Onsite	5.30	16	17.5
SB-26-01	11/9/94	2.0-4.0	Onsite	5.20	10	11.5
SB-26-02	11/9/94	0.0-2.0	Onsite	5.40	22	24.5
SB-26-02	11/9/94	2.0-4.0	Onsite	**42.90**	43	43
SB-26-03	11/9/94	0.0-2.0	Onsite	**13.90**	42	42
SB-26-03	11/9/94	2.0-4.0	Onsite	**7.60**	40	40
SS-026-SF-1	9/20/99	0-0.5	Onsite	**2.70**	5	5
SS-026-SF-2	9/20/99	0-0.5	Onsite	**1.40**	1	1
SS-026-SF-4	9/15/99	0-0.5	Onsite	**3.05**	6	6
SS-026-SF-5	9/15/99	0-0.5	Onsite	**7.20**	39	39
SS-026-SF-6	9/15/99	0-0.5	Onsite	**5.10**	9	9
SS-10-08	10/26/94	-	Background	**12.60**	41	41
SS-10-09	10/26/94	-	Background	4.20	7	7.5
SS-13-19	10/26/94	-	Background	4.20	8	7.5
SS-BKD-001	10/26/94	-	Background	5.60	32	32
SS-BKD-002	10/26/94	-	Background	5.70	34	34
SS-BKD-003	10/26/94	-	Background	5.30	17	17.5
SS-BKD-004	10/26/94	-	Background	5.40	23	24.5
SS-BKD-005	10/26/94	-	Background	5.40	24	24.5
SS-BKD-006	10/26/94	-	Background	5.50	28	29
SS-BKD-007	10/26/94	-	Background	5.50	29	29
SS-BKD-008	10/26/94	-	Background	5.20	11	11.5
SS-BKD-009	10/26/94	-	Background	5.30	18	17.5
SS-BKD-010	10/26/94	-	Background	6.00	37	36.5
SS-BKD-011	10/26/94	-	Background	5.60	33	32
SS-BKD-012	10/26/94	-	Background	5.40	25	24.5
SS-BKD-013	10/26/94	-	Background	5.40	26	24.5
SS-BKD-014	10/26/94	-	Background	5.30	19	17.5
SS-BKD-015	10/26/94	-	Background	5.20	12	11.5
SS-BKD-016	10/26/94	-	Background	6.20	38	38
SS-BKD-017	10/26/94	-	Background	5.20	13	11.5
SS-BKD-018	10/26/94	-	Background	5.30	20	17.5
SS-BKD-019	10/26/94	-	Background	5.30	21	17.5
SS-BKD-020	10/26/94	-	Background	5.90	35	35

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil — WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-021	10/26/94	-	Background	5.50	30	29
SS-BKD-022	10/26/94	-	Background	5.40	27	24.5

Compliance Data (n)	18
Background Data (n)	25
Mean Onsite Data	7.0861
Mean Background Data	5.6640
Standard Deviation Onsite Data	9.4005
Standard Deviation Backgound Data	1.5083
Sum of Sample Ranks Onsite Date	351.0000
Sum of Sample Ranks Background Data	595.0000
Wilcoxon Statistic W	180.0000
Expected Value E(W)	225
Standard Deviation SD(W)	40.6202
Standard Deviation (Ties) SD^(W)	40.4065
Approximate Z-score Z	-1.1261
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)<>"27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Cadmium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	0.21	6	6
EOD PIT 1	12/11/97	-	Onsite	0.24	7	7.5
EOD PIT 2	12/11/97	-	Onsite	0.24	8	7.5
MW-26-001	11/8/94	0.0-2.0	Onsite	**1.12**	39	39
MW-26-001	11/8/94	2.0-4.0	Onsite	**1.10**	37	37.5
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.10**	38	37.5
MW-26-003	11/8/94	2.0-4.0	Onsite	**0.67**	35	35
SB-26-01	11/9/94	0.0-2.0	Onsite	**0.76**	36	36
SB-26-01	11/9/94	2.0-4.0	Onsite	0.52	11	13.5
SB-26-02	11/9/94	0.0-2.0	Onsite	**4.50**	43	43
SB-26-02	11/9/94	2.0-4.0	Onsite	**5.30**	44	44
SB-26-03	11/9/94	0.0-2.0	Onsite	**2.50**	42	42
SB-26-03	11/9/94	2.0-4.0	Onsite	**1.80**	41	41
SS-026-SF-1	9/20/99	0-0.5	Onsite	0.12	3	3
SS-026-SF-2	9/20/99	0-0.5	Onsite	0.11	2	2
SS-026-SF-4	9/15/99	0-0.5	Onsite	0.14	4	4
SS-026-SF-5	9/15/99	0-0.5	Onsite	**0.03**	1	1
SS-026-SF-6	9/15/99	0-0.5	Onsite	0.20	5	5
SS-04-029	10/26/94	-	Background	0.57	30	30.5
SS-10-08	10/26/94	-	Background	**1.30**	40	40
SS-10-09	10/26/94	-	Background	0.40	9	9.5
SS-13-19	10/26/94	-	Background	0.40	10	9.5
SS-BKD-001	10/26/94	-	Background	0.56	29	29
SS-BKD-002	10/26/94	-	Background	0.57	31	30.5
SS-BKD-003	10/26/94	-	Background	0.53	17	19.5
SS-BKD-004	10/26/94	-	Background	0.53	18	19.5
SS-BKD-005	10/26/94	-	Background	0.54	23	25
SS-BKD-006	10/26/94	-	Background	0.54	24	25
SS-BKD-007	10/26/94	-	Background	0.54	25	25
SS-BKD-008	10/26/94	-	Background	0.52	12	13.5
SS-BKD-009	10/26/94	-	Background	0.53	19	19.5
SS-BKD-010	10/26/94	-	Background	0.59	33	33
SS-BKD-011	10/26/94	-	Background	0.55	28	28
SS-BKD-012	10/26/94	-	Background	0.53	20	19.5
SS-BKD-013	10/26/94	-	Background	0.54	26	25
SS-BKD-014	10/26/94	-	Background	0.53	21	19.5
SS-BKD-015	10/26/94	-	Background	0.52	13	13.5
SS-BKD-016	10/26/94	-	Background	0.61	34	34
SS-BKD-017	10/26/94	-	Background	0.52	14	13.5
SS-BKD-018	10/26/94	-	Background	0.52	15	13.5
SS-BKD-019	10/26/94	-	Background	0.52	16	13.5

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-020	10/26/94	-	Background	0.58	32	32
SS-BKD-021	10/26/94	-	Background	0.54	27	25
SS-BKD-022	10/26/94	-	Background	0.53	22	19.5

Compliance Data (n)	18
Background Data (n)	26
Mean Onsite Data	1.1475
Mean Background Data	0.5619
Standard Deviation Onsite Data	1.5213
Standard Deviation Backgound Data	0.1573
Sum of Sample Ranks Onsite Date	404.5000
Sum of Sample Ranks Background Data	585.5000
Wilcoxon Statistic W	233.5000
Expected Value E(W)	234
Standard Deviation SD(W)	41.8927
Standard Deviation (Ties) SD^(W)	41.7537
Approximate Z-score Z	-0.0239
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Chromium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**2.40**	7	7
EOD PIT 1	12/11/97	-	Onsite	**3.80**	10	10
EOD PIT 2	12/11/97	-	Onsite	**5.70**	21	21
MW-26-001	11/8/94	0.0-2.0	Onsite	**5.10**	15	15
MW-26-001	11/8/94	2.0-4.0	Onsite	**4.20**	11	11
MW-26-003	11/8/94	0.0-2.0	Onsite	**2.00**	4	4.5
MW-26-003	11/8/94	2.0-4.0	Onsite	**1.90**	2	2.5
SB-26-01	11/9/94	0.0-2.0	Onsite	**1.90**	3	2.5
SB-26-01	11/9/94	2.0-4.0	Onsite	0.99	1	1
SB-26-02	11/9/94	0.0-2.0	Onsite	**31.10**	44	44
SB-26-02	11/9/94	2.0-4.0	Onsite	**19.30**	42	42
SB-26-03	11/9/94	0.0-2.0	Onsite	**7.80**	32	32.5
SB-26-03	11/9/94	2.0-4.0	Onsite	**7.80**	33	32.5
SS-026-SF-1	9/20/99	0-0.5	Onsite	**6.30**	24	24.5
SS-026-SF-2	9/20/99	0-0.5	Onsite	**10.00**	36	36
SS-026-SF-4	9/15/99	0-0.5	Onsite	**4.70**	12	12.5
SS-026-SF-5	9/15/99	0-0.5	Onsite	**5.30**	19	19
SS-026-SF-6	9/15/99	0-0.5	Onsite	**5.20**	17	17.5
SS-04-029	10/26/94	-	Background	**4.70**	13	12.5
SS-10-08	10/26/94	-	Background	**19.45**	43	43
SS-10-09	10/26/94	-	Background	**2.00**	5	4.5
SS-13-19	10/26/94	-	Background	**7.70**	31	31
SS-BKD-001	10/26/94	-	Background	**8.40**	34	34.5
SS-BKD-002	10/26/94	-	Background	**15.30**	41	41
SS-BKD-003	10/26/94	-	Background	**7.50**	30	30
SS-BKD-004	10/26/94	-	Background	**5.60**	20	20
SS-BKD-005	10/26/94	-	Background	**11.40**	38	38
SS-BKD-006	10/26/94	-	Background	**6.30**	25	24.5
SS-BKD-007	10/26/94	-	Background	**10.30**	37	37
SS-BKD-008	10/26/94	-	Background	**5.20**	18	17.5
SS-BKD-009	10/26/94	-	Background	**8.40**	35	34.5
SS-BKD-010	10/26/94	-	Background	**11.50**	39	39
SS-BKD-011	10/26/94	-	Background	**12.70**	40	40
SS-BKD-012	10/26/94	-	Background	**4.90**	14	14
SS-BKD-013	10/26/94	-	Background	**7.30**	29	29
SS-BKD-014	10/26/94	-	Background	**6.40**	26	26
SS-BKD-015	10/26/94	-	Background	**6.60**	27	27
SS-BKD-016	10/26/94	-	Background	**5.15**	16	16
SS-BKD-017	10/26/94	-	Background	**6.80**	28	28
SS-BKD-018	10/26/94	-	Background	**5.90**	22	22
SS-BKD-019	10/26/94	-	Background	**3.40**	9	9

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-020	10/26/94	-	Background	**6.10**	23	23
SS-BKD-021	10/26/94	-	Background	**2.30**	6	6
SS-BKD-022	10/26/94	-	Background	**2.50**	8	8

Compliance Data (n)	18
Background Data (n)	26
Mean Onsite Data	6.9717
Mean Background Data	7.4538
Standard Deviation Onsite Data	7.3242
Standard Deviation Backgound Data	4.0397
Sum of Sample Ranks Onsite Date	335.0000
Sum of Sample Ranks Background Data	655.0000
Wilcoxon Statistic W	164.0000
Expected Value E(W)	234
Standard Deviation SD(W)	41.8927
Standard Deviation (Ties) SD^(W)	41.8824
Approximate Z-score Z	-1.6833
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Cobalt

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**1.10**	7	7
EOD PIT 1	12/11/97	-	Onsite	**1.60**	13	14
EOD PIT 2	12/11/97	-	Onsite	**2.40**	20	21.5
MW-26-001	11/8/94	0.0-2.0	Onsite	**3.10**	29	29
MW-26-001	11/8/94	2.0-4.0	Onsite	**3.10**	30	30.5
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.90**	17	17.5
MW-26-003	11/8/94	2.0-4.0	Onsite	**1.60**	14	14
SB-26-01	11/9/94	0.0-2.0	Onsite	**1.80**	16	16
SB-26-01	11/9/94	2.0-4.0	Onsite	**6.80**	40	40
SB-26-02	11/9/94	0.0-2.0	Onsite	**15.10**	43	43
SB-26-02	11/9/94	2.0-4.0	Onsite	0.86	2	2
SB-26-03	11/9/94	0.0-2.0	Onsite	**4.00**	37	37
SB-26-03	11/9/94	2.0-4.0	Onsite	**1.90**	18	17.5
SS-026-SF-1	9/20/99	0-0.5	Onsite	**1.30**	9	10
SS-026-SF-2	9/20/99	0-0.5	Onsite	**1.20**	8	8
SS-026-SF-4	9/15/99	0-0.5	Onsite	**1.03**	6	6
SS-026-SF-5	9/15/99	0-0.5	Onsite	**1.30**	10	10
SS-026-SF-6	9/15/99	0-0.5	Onsite	**0.90**	4	4
SS-10-08	10/26/94	-	Background	**2.50**	25	25
SS-10-09	10/26/94	-	Background	0.60	1	1
SS-13-19	10/26/94	-	Background	**1.50**	12	12
SS-BKD-001	10/26/94	-	Background	**6.25**	39	39
SS-BKD-002	10/26/94	-	Background	**7.30**	41	41
SS-BKD-003	10/26/94	-	Background	**3.70**	33	33.5
SS-BKD-004	10/26/94	-	Background	**2.70**	27	27.5
SS-BKD-005	10/26/94	-	Background	**9.20**	42	42
SS-BKD-006	10/26/94	-	Background	**2.30**	19	19
SS-BKD-007	10/26/94	-	Background	**3.70**	34	33.5
SS-BKD-008	10/26/94	-	Background	**2.40**	21	21.5
SS-BKD-009	10/26/94	-	Background	**3.90**	36	36
SS-BKD-010	10/26/94	-	Background	**2.60**	26	26
SS-BKD-011	10/26/94	-	Background	**2.70**	28	27.5
SS-BKD-012	10/26/94	-	Background	**1.60**	15	14
SS-BKD-013	10/26/94	-	Background	**5.30**	38	38
SS-BKD-014	10/26/94	-	Background	**3.30**	32	32
SS-BKD-015	10/26/94	-	Background	**2.40**	22	21.5
SS-BKD-016	10/26/94	-	Background	**2.45**	24	24
SS-BKD-017	10/26/94	-	Background	**2.40**	23	21.5
SS-BKD-018	10/26/94	-	Background	**3.10**	31	30.5
SS-BKD-019	10/26/94	-	Background	**1.30**	11	10
SS-BKD-020	10/26/94	-	Background	**3.80**	35	35

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27")).

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND")).

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-021	10/26/94	-	Background	0.89	3	3
SS-BKD-022	10/26/94	-	Background	**0.91**	5	5

Compliance Data (n)	18
Background Data (n)	25
Mean Onsite Data	2.8328
Mean Background Data	3.1520
Standard Deviation Onsite Data	3.3869
Standard Deviation Backgound Data	2.0298
Sum of Sample Ranks Onsite Date	327.0000
Sum of Sample Ranks Background Data	619.0000
Wilcoxon Statistic W	156.0000
Expected Value E(W)	225
Standard Deviation SD(W)	40.6202
Standard Deviation (Ties) SD^(W)	40.5864
Approximate Z-score Z	-1.7124
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Copper

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**1.90**	9	9
EOD PIT 1	12/11/97	-	Onsite	**0.78**	1	1
EOD PIT 2	12/11/97	-	Onsite	**2.30**	14	14
MW-26-001	11/8/94	0.0-2.0	Onsite	**3.35**	20	20
MW-26-001	11/8/94	2.0-4.0	Onsite	**2.00**	10	10
MW-26-003	11/8/94	0.0-2.0	Onsite	**1.50**	6	6
MW-26-003	11/8/94	2.0-4.0	Onsite	**1.40**	5	5
SB-26-01	11/9/94	0.0-2.0	Onsite	**2.80**	17	17.5
SB-26-01	11/9/94	2.0-4.0	Onsite	**5.90**	29	29
SB-26-02	11/9/94	0.0-2.0	Onsite	**4.20**	23	23.5
SB-26-02	11/9/94	2.0-4.0	Onsite	**3.00**	19	19
SB-26-03	11/9/94	0.0-2.0	Onsite	**4.40**	25	25
SB-26-03	11/9/94	2.0-4.0	Onsite	**1.80**	8	8
SS-026-SF-1	9/20/99	0-0.5	Onsite	**5.80**	28	28
SS-026-SF-2	9/20/99	0-0.5	Onsite	**52.80**	43	43
SS-026-SF-4	9/15/99	0-0.5	Onsite	**2.15**	11	11
SS-026-SF-5	9/15/99	0-0.5	Onsite	**3.80**	22	22
SS-026-SF-6	9/15/99	0-0.5	Onsite	**16.80**	40	40
SS-10-08	10/26/94	-	Background	**41.30**	41	41
SS-10-09	10/26/94	-	Background	**7.80**	34	34
SS-13-19	10/26/94	-	Background	**2.20**	12	12.5
SS-BKD-001	10/26/94	-	Background	**6.95**	32	32
SS-BKD-002	10/26/94	-	Background	**15.00**	38	38
SS-BKD-003	10/26/94	-	Background	**7.40**	33	33
SS-BKD-004	10/26/94	-	Background	**6.00**	30	30
SS-BKD-005	10/26/94	-	Background	**9.80**	37	37
SS-BKD-006	10/26/94	-	Background	**15.20**	39	39
SS-BKD-007	10/26/94	-	Background	**9.20**	36	36
SS-BKD-008	10/26/94	-	Background	**47.30**	42	42
SS-BKD-009	10/26/94	-	Background	**4.80**	27	27
SS-BKD-010	10/26/94	-	Background	**4.20**	24	23.5
SS-BKD-011	10/26/94	-	Background	**6.40**	31	31
SS-BKD-012	10/26/94	-	Background	**1.60**	7	7
SS-BKD-013	10/26/94	-	Background	**4.70**	26	26
SS-BKD-014	10/26/94	-	Background	**2.20**	13	12.5
SS-BKD-015	10/26/94	-	Background	**2.50**	15	15
SS-BKD-016	10/26/94	-	Background	**2.75**	16	16
SS-BKD-017	10/26/94	-	Background	**3.70**	21	21
SS-BKD-018	10/26/94	-	Background	**8.10**	35	35
SS-BKD-019	10/26/94	-	Background	**1.30**	4	4
SS-BKD-020	10/26/94	-	Background	**2.80**	18	17.5

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-021	10/26/94	-	Background	0.91	3	3
SS-BKD-022	10/26/94	-	Background	0.90	2	2

Compliance Data (n)	18
Background Data (n)	25
Mean Onsite Data	6.4822
Mean Background Data	8.6004
Standard Deviation Onsite Data	12.0959
Standard Deviation Backgound Data	11.4577
Sum of Sample Ranks Onsite Date	331.0000
Sum of Sample Ranks Background Data	615.0000
Wilcoxon Statistic W	160.0000
Expected Value E(W)	225
Standard Deviation SD(W)	40.6202
Standard Deviation (Ties) SD^(W)	40.6156
Approximate Z-score Z	-1.6127
Significance Level A	0.05
ZA	1.6449
Potential Concern	**NO**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Selenium

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**0.85**	36	36
EOD PIT 1	12/11/97	-	Onsite	0.97	37	37
EOD PIT 2	12/11/97	-	Onsite	**1.30**	38	38
MW-26-001	11/8/94	0.0-2.0	Onsite	0.44	33	33.5
MW-26-001	11/8/94	2.0-4.0	Onsite	0.47	35	35
MW-26-003	11/8/94	0.0-2.0	Onsite	0.42	24	27
MW-26-003	11/8/94	2.0-4.0	Onsite	0.42	25	27
SB-26-01	11/9/94	0.0-2.0	Onsite	0.42	26	27
SB-26-01	11/9/94	2.0-4.0	Onsite	0.41	22	22.5
SB-26-02	11/9/94	0.0-2.0	Onsite	0.42	27	27
SB-26-02	11/9/94	2.0-4.0	Onsite	0.42	28	27
SB-26-03	11/9/94	0.0-2.0	Onsite	0.42	29	27
SB-26-03	11/9/94	2.0-4.0	Onsite	0.43	31	31.5
SS-026-SF-1	9/20/99	0-0.5	Onsite	**7.60**	44	44
SS-026-SF-2	9/20/99	0-0.5	Onsite	**5.70**	43	43
SS-026-SF-4	9/15/99	0-0.5	Onsite	**4.10**	40	40
SS-026-SF-5	9/15/99	0-0.5	Onsite	**4.50**	41	41
SS-026-SF-6	9/15/99	0-0.5	Onsite	**4.70**	42	42
SS-04-029	10/26/94	-	Background	0.21	1	1
SS-10-08	10/26/94	-	Background	**1.65**	39	39
SS-10-09	10/26/94	-	Background	0.32	2	2.5
SS-13-19	10/26/94	-	Background	0.32	3	2.5
SS-BKD-001	10/26/94	-	Background	0.40	20	20.5
SS-BKD-002	10/26/94	-	Background	0.41	23	22.5
SS-BKD-003	10/26/94	-	Background	0.38	8	10.5
SS-BKD-004	10/26/94	-	Background	0.38	9	10.5
SS-BKD-005	10/26/94	-	Background	0.39	14	16.5
SS-BKD-006	10/26/94	-	Background	0.39	15	16.5
SS-BKD-007	10/26/94	-	Background	0.39	16	16.5
SS-BKD-008	10/26/94	-	Background	0.37	4	5.5
SS-BKD-009	10/26/94	-	Background	0.38	10	10.5
SS-BKD-010	10/26/94	-	Background	0.43	32	31.5
SS-BKD-011	10/26/94	-	Background	0.40	21	20.5
SS-BKD-012	10/26/94	-	Background	0.39	17	16.5
SS-BKD-013	10/26/94	-	Background	0.39	18	16.5
SS-BKD-014	10/26/94	-	Background	0.38	11	10.5
SS-BKD-015	10/26/94	-	Background	0.37	5	5.5
SS-BKD-016	10/26/94	-	Background	0.44	34	33.5
SS-BKD-017	10/26/94	-	Background	0.37	6	5.5
SS-BKD-018	10/26/94	-	Background	0.37	7	5.5
SS-BKD-019	10/26/94	-	Background	0.38	12	10.5

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

SS-BKD-020	10/26/94	-	Background	0.42	30	27
SS-BKD-021	10/26/94	-	Background	0.39	19	16.5
SS-BKD-022	10/26/94	-	Background	0.38	13	10.5

Compliance Data (n)	18
Background Data (n)	26
Mean Onsite Data	1.8883
Mean Background Data	0.4269
Standard Deviation Onsite Data	2.3059
Standard Deviation Backgound Data	0.2532
Sum of Sample Ranks Onsite Date	605.5000
Sum of Sample Ranks Background Data	384.5000
Wilcoxon Statistic W	434.5000
Expected Value E(W)	234
Standard Deviation SD(W)	41.8927
Standard Deviation (Ties) SD^(W)	41.6841
Approximate Z-score Z	4.7980
Significance Level A	0.05
ZA	1.6449
Potential Concern	**YES**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)>"27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL
Zinc

LOCID	LOG DATE	DEPTH INTERVAL (ft)	TYPE	CONCENTRATION (MG/KG)	RANK	RANK (Ties)
EOD BERM 1	12/11/97	-	Onsite	**29.00**	21	21
EOD PIT 1	12/11/97	-	Onsite	**14.80**	9	9
EOD PIT 2	12/11/97	-	Onsite	**25.50**	16	16.5
MW-26-001	11/8/94	2.0-4.0	Onsite	**142.00**	32	32
SB-26-02	11/9/94	2.0-4.0	Onsite	**14.10**	7	7
SS-026-SF-1	9/20/99	0-0.5	Onsite	**27.30**	19	19
SS-026-SF-2	9/20/99	0-0.5	Onsite	**153.00**	33	33
SS-026-SF-6	9/15/99	0-0.5	Onsite	**56.10**	29	29
SS-10-08	10/26/94	-	Background	**48.70**	27	27
SS-10-09	10/26/94	-	Background	**11.40**	3	3
SS-13-19	10/26/94	-	Background	**18.40**	13	13
SS-BKD-001	10/26/94	-	Background	**17.00**	11	11
SS-BKD-002	10/26/94	-	Background	**56.20**	30	30
SS-BKD-003	10/26/94	-	Background	**11.80**	4	4
SS-BKD-004	10/26/94	-	Background	**27.80**	20	20
SS-BKD-005	10/26/94	-	Background	**30.60**	22	22
SS-BKD-006	10/26/94	-	Background	**64.40**	31	31
SS-BKD-007	10/26/94	-	Background	**23.00**	14	14
SS-BKD-008	10/26/94	-	Background	**14.50**	8	8
SS-BKD-009	10/26/94	-	Background	**39.10**	25	25
SS-BKD-010	10/26/94	-	Background	**25.40**	15	15
SS-BKD-011	10/26/94	-	Background	**33.00**	23	23
SS-BKD-012	10/26/94	-	Background	**16.00**	10	10
SS-BKD-013	10/26/94	-	Background	**11.10**	2	2
SS-BKD-014	10/26/94	-	Background	**12.30**	5	5.5
SS-BKD-015	10/26/94	-	Background	**25.90**	18	18
SS-BKD-016	10/26/94	-	Background	**35.55**	24	24
SS-BKD-017	10/26/94	-	Background	**53.70**	28	28
SS-BKD-018	10/26/94	-	Background	**42.50**	26	26
SS-BKD-019	10/26/94	-	Background	**11.00**	1	1
SS-BKD-020	10/26/94	-	Background	**25.50**	17	16.5
SS-BKD-021	10/26/94	-	Background	**17.70**	12	12
SS-BKD-022	10/26/94	-	Background	**12.30**	6	5.5

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)="27"));

Backround Selection: back WHERE (((tblRES.SITEID)="BACKGROUND"));

TABLE L-5
EOD RANGE (SS-026)
WILCOXON RANK-SUM TEST ONSITE SOIL

Compliance Data (n)	8
Background Data (n)	25
Mean Onsite Data	57.7250
Mean Background Data	27.3940
Standard Deviation Onsite Data	56.9677
Standard Deviation Backgound Data	15.7000
Sum of Sample Ranks Onsite Date	166.5000
Sum of Sample Ranks Background Data	394.5000
Wilcoxon Statistic W	130.5000
Expected Value E(W)	100
Standard Deviation SD(W)	23.8048
Standard Deviation (Ties) SD^(W)	23.8008
Approximate Z-score Z	1.2605
Significance Level A	0.05
ZA	1.6449
Potential Concern	**YES**

Detected Concentrations are Shown in Bold.

Onsite Selection: Soil — WHERE (((tblRES.MATRIX)="SO") AND ((tblRES.SACODE)<>"EB" And (tblRES.SACODE)<>"TB" And (tblRES.SACODE)<>"SD" And (tblRES.SACODE)<>"LR" And (tblRES.SACODE)<>"MS") AND ((tblRES.SITEID)<>"27"));

Backround Selection: back — WHERE (((tblRES.SITEID)="BACKGROUND"));

APPENDIX M

CALCULATION WORK SHEETS FOR EXPOSURE CONCENTRATIONS

TABLE M-1

EXPOSURE CONCENTRATIONS OF SURFACE SOIL CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)	Exposure Concentration
Methylene Chloride	UG/KG	54	16.05	Log				16
Acetone	UG/KG	46	30.67	Normal				31
Toluene	UG/KG	17	8.32	Log				8.32
4-Methylphenol (p-cresol)	UG/KG	814	322.33	Log				322
Naphthalene	UG/KG	18100	1637.28	Log				1637
2-Methylnaphthalene	UG/KG	12900	1261.78	Log				1262
Acenaphthene	UG/KG	20600	1818.01	Log				1818
Dibenzofuran	UG/KG	13800	1325.42	Log				1325
Fluorene	UG/KG	21600	1896.47	Log				1896
Phenanthrene	UG/KG	72000	6534.41	Log				6534
Carbazole	UG/KG	19200	1718.58	Log				1719
Di-n-butylphthalate	UG/KG	352	460.55	Log				352
Fluoranthene	UG/KG	57500	5608.99	Log				5609
Pyrene	UG/KG	58600	5664.42	Log				5664
Benzo(a)anthracene	UG/KG	57700	5060.55	Log				5061
Chrysene	UG/KG	26100	2242.97	Log				2243
bis(2-Ethylhexyl)phthalate	UG/KG	679	517.46	Log				517
Benzo(b)fluoranthene	UG/KG	14700	1390.15	Log				1390
Benzo(k)fluoranthene	UG/KG	12400	1222.19	Log				1222
Benzo(a)pyrene	UG/KG	17900	1607.9	Log				1608
Indeno(1,2,3-cd)pyrene	UG/KG	14700	1390.15	Log				1390
Dibenz(a,h)anthracene	UG/KG	8840	970.31	Log				970
Benzo(g,h,i)perylene	UG/KG	15600	1455.65	Log				1456
4,4'-DDE	UG/KG	1	2.03	Log				1.00

TABLE M-1

EXPOSURE CONCENTRATIONS OF SURFACE SOIL CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)	Exposure Concentration
4,4'-DDT	UG/KG	3	2.2	Normal				2.20
RDX	UG/KG	1500	1.8767E+26	Log				1500
Dioxins & Furans (Toxicity Equivalence)	NG/KG	0.08	0.1	Log				0.08
Aluminum	MG/KG	4575	3242.52	Normal	8510	no		---
Antimony	MG/KG	13.9	5.7	Log	12.6	yes	no	---
Arsenic	MG/KG	1.4	0.78	Log	3.44	no		---
Barium	MG/KG	25.75	19.02	Normal	101	no		---
Beryllium	MG/KG	0.23	0.16	Normal	0.74	no		---
Cadmium	MG/KG	4.5	5.06	Log	1.3	yes	no	---
Calcium	MG/KG	5760	3592.05	Log	30200	no		---
Chromium	MG/KG	31.1	10.14	Log	19.5	yes	no	---
Cobalt	MG/KG	15.1	3.9	Log	9.2	yes	no	---
Copper	MG/KG	52.8	13.56	Log	44.11	yes	no	---
Iron	MG/KG	12300	7230.68	Log	36700	no		---
Lead	MG/KG	65.3	42.46	Log	79.4	no		---
Magnesium	MG/KG	1540	859.85	Log	3340	no		---
Manganese	MG/KG	79.6	64.49	Normal	474	no		---
Nickel	MG/KG	7	4.3	Normal	12.6	no		---
Potassium	MG/KG	362.5	287	Normal	929	no		---
Selenium	MG/KG	7.6	3.61	Normal	1.65	yes	yes	3.61
Sodium	MG/KG	362	226.58	Log	520	no		---
Vanadium	MG/KG	21	10.89	Log	90.2	no		---
Zinc	MG/KG	153	120.22	Log	63.4	yes	yes	120.22

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TABLE M-2

EXPOSURE CONCENTRATIONS OF SOIL CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)	Wilkoxon Rank Sum Test Exposure Concentration
Methylene Chloride	UG/KG	54	11.23	Log				11
Acetone	UG/KG	46	25.33	Normal				25
Toluene	UG/KG	17	7.32	Log				7
4-Methylphenol (p-cresol)	UG/KG	814	275.37	Log				275
Naphthalene	UG/KG	18100	805.79	Log				806
2-Methylnaphthalene	UG/KG	12900	685.8	Log				686
Acenaphthene	UG/KG	20600	859.38	Log				859
Dibenzofuran	UG/KG	13800	706.45	Log				706
Diethylphthalate	UG/KG	780	397.69	Log				398
Fluorene	UG/KG	21600	880.19	Log				880
Phenanthrene	UG/KG	72000	1823.95	Log				1824
Carbazole	UG/KG	19200	828.54	Log				829
Di-n-butylphthalate	UG/KG	352	356.1	Log				352
Fluoranthene	UG/KG	57500	1613.04	Log				1613
Pyrene	UG/KG	58600	1625.29	Log				1625
Benzo(a)anthracene	UG/KG	57700	1570.54	Log				1571
Chrysene	UG/KG	26100	976.08	Log				976
bis(2-Ethylhexyl)phthalate	UG/KG	679	388.32	Log				388
Benzo(b)fluoranthene	UG/KG	14700	728.71	Log				729
Benzo(k)fluoranthene	UG/KG	12400	673.41	Log				673
Benzo(a)pyrene	UG/KG	17900	793.13	Log				793
Indeno(1,2,3-cd)pyrene	UG/KG	14700	728.71	Log				729
Dibenz(a,h)anthracene	UG/KG	8840	580.74	Log				581
Benzo(g,h,i)perylene	UG/KG	15600	748.86	Log				749
4,4'-DDE	UG/KG	1	1.92	Log				1.00

TABLE M-2

EXPOSURE CONCENTRATIONS OF SOIL CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Site Detections Exceding Background 95% UTL	Wilkoxon Rank Sum Test Chemical of Potential concern (Y/N)	Exposure Concentration
4,4'-DDT	UG/KG	3	2.03	Normal				2.03
RDX	UG/KG	1500	32667.31	Log				1500
Dioxins & Furans (Toxicity Equivalence)	NG/KG	0.15	0.58	Log				0.15
Aluminum	MG/KG	4575	2961.79	Normal	8510	no		---
Antimony	MG/KG	42.9	8.35	Log	12.6	yes	no	---
Arsenic	MG/KG	1.4	0.68	Log	3.44	no		---
Barium	MG/KG	25.75	17.94	Normal	101	no		---
Beryllium	MG/KG	0.23	0.15	Normal	0.74	no		---
Cadmium	MG/KG	5.3	5.21	Log	1.3	yes	no	---
Calcium	MG/KG	5760	2244.1	Log	30200	no		---
Chromium	MG/KG	31.1	11.27	Log	19.5	yes	no	---
Cobalt	MG/KG	15.1	3.85	Log	9.2	yes	no	---
Copper	MG/KG	52.8	8.61	Log	44.11	yes	no	---
Iron	MG/KG	12300	6483.61	Log	36700	no		---
Lead	MG/KG	65.3	20.42	Log	79.4	no		---
Magnesium	MG/KG	1540	797.19	Log	3340	no		---
Manganese	MG/KG	103	66.05	Normal	474	no		---
Nickel	MG/KG	10.6	5.07	Log	12.6	no		---
Potassium	MG/KG	480	314.24	Normal	929	no		---
Selenium	MG/KG	7.6	4.61	Log	1.65	yes	yes	4.61
Silver	MG/KG	1.3	0.49	Log	ND	yes		0.49
Sodium	MG/KG	412	336.09	Log	520	no		---
Vanadium	MG/KG	21	9.81	Log	90.2	no		---
Zinc	MG/KG	153	132.38	Log	63.4	yes	yes	132.38

NOTE

Soil samples include both surface and subsurface soil samples.

ND - Not Detected

TABLE M-3

EXPOSURE CONCENTRATIONS OF GROUNDWATER CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Chemical of Potential Concern (Y/N)	Exposure Concentration
Sodium	UG/L	1750	1716.88	Normal	77700	no	---
Thallium	UG/L	1.3	3.66	Log	ND	yes	1.3
Vanadium	UG/L	27.7	63.09	Log	52	no	---
Zinc	UG/L	176.45	169.2	Normal	349	no	---
EXPOSURE CONCENTRATIONS OF GROUNDWATER SEEP SAMPLES							
Aluminum	UG/L	8245	SEE NOTE		29600	no	---
Arsenic	UG/L	7.4	"		3.6	yes	7.4
Barium	UG/L	157.5	"		200	no	---
Calcium	UG/L	50050	"		175000	no	---
Chromium	UG/L	12.4	"		42.9	no	---
Copper	UG/L	13.25	"		170	no	---
Iron	UG/L	14250	"		51600	no	---
Lead	UG/L	24	"		26.4	no	---
Magnesium	UG/L	11500	"		80600	no	---
Manganese	UG/L	2530	"		5470	no	---
Nickel	UG/L	8.4	"		34.8	no	---
Potassium	UG/L	2785	"		40000	no	---
Selenium	UG/L	12.85	"		ND	yes	12.85
Sodium	UG/L	6220	"		77700	no	---
Thallium	UG/L	6.6	"		ND	yes	6.6
Vanadium	UG/L	18.25	"		52	no	---
Zinc	UG/L	62.25	"		349	no	---

NOTE:
Since only two samples of groundwater seep samples were collected, the exposure concentration was set equal to the maximum detection (UCL95 was not caslculated).

TABLE M-3

EXPOSURE CONCENTRATIONS OF GROUNDWATER CHEMICALS

EOD RANGE (SS-026)

Parameter	Units	Maximum Detected Concentration	UCL95	Distribution	Background 95% UTL (metals)	Chemical of Potential Concern (Y/N)	Exposure Concentration
Acetone	UG/L	15	7.66	Log			7.66
bis(2-Ethylhexyl)phthalate	UG/L	4	5.04	Normal			4
RDX	UG/L	6.1	4.43	Log			4.43
Aluminum	UG/L	6050	719645.13	Log	29600	no	---
Arsenic	UG/L	4.9	4.33	Log	3.6	yes	4.33
Barium	UG/L	67.1	56.03	Normal	200	no	---
Beryllium	UG/L	0.74	0.63	Normal	ND	yes	0.63
Cadmium	UG/L	4.1	4.22	Log	2.1	yes	4.1
Calcium	UG/L	24450	20395.16	Normal	175000	no	---
Chromium	UG/L	11.5	9.39	Normal	42.9	no	---
Cobalt	UG/L	9.3	10.98	Log	19.8	no	---
Copper	UG/L	13.3	11.01	Normal	170	no	---
Iron	UG/L	6850	6335.63	Normal	51600	no	---
Lead	UG/L	3.35	3.09	Normal	26.4	no	---
Magnesium	UG/L	5075	4366.28	Normal	80600	no	---
Manganese	UG/L	188	283.4	Log	5470	no	---
Mercury	UG/L	0.29	0.23	Log	ND	yes	0.23
Nickel	UG/L	21	22.42	Log	34.8	no	---
Potassium	UG/L	2465	2273.26	Normal	40000	no	---
Selenium	UG/L	12.05	19.86	Log	ND	yes	12.05

APPENDIX N

FUGITIVE DUST MODEL

SITE SS-026

PLATTSBURGH AIR FORCE BASE
FUGITIVE DUST MODEL
EOD RANGE (SS-026)

SUMMARY

The USEPA documents, *Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites* (EPA/600/8-85/002, Feb. 1985) and *AP-42* Chapter 13.2, July 1994, were used to estimate the rate of fugitive dust emission from the Plattsburgh AFB site SS-026. The *New York State Air Guide-1 Draft* by the NYSDEC was used to estimate the Maximum Actual Annual Impact concentration for an onsite receptor during current and future construction activities.

The Maximum Actual Annual Concentration (C_a) for an onsite receptor during current use at the site was estimated to be:

$$C_a = 8.54 \times 10^{-2} \alpha_{surf} \text{ mg/m}^3$$

The Maximum Actual Annual Concentration (C_a) for an onsite receptor during future construction activities is:

$$C_a = (10.7 \times 10^{-2} \alpha_{surf} + 22.4 \times 10^{-2} \alpha_{sub}) \text{ mg/m}^3$$

"α_{surf}" is the dimensionless concentration of the chemical in the surface soil at the site.
"α_{sub}" is the dimensionless concentration of the chemical in the subsurface at the site.
"α_{surf}," "α_{sub}," and "C_a" are all contaminant-specific.

1. Purpose

The purpose of this calculation is to estimate the ambient air concentration of contaminants from particulate emissions on the SS-026 site during current activities, as well as future construction activities.

2. Methodology

The rate of fugitive dust emissions was estimated using the methodologies described in two USEPA documents: the *Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites* (EPA/600/8-85/002, Feb. 1985) and *AP-42* Chapter 13.2, July, 1994. These documents are hereafter referred to as the "manual." The fugitive dust concentration model in the ambient air presented in the manual is applicable to sites measuring 300 ft x 300 ft or smaller, and to receptors located less than 200 ft from the site. Because SS-026 measures 500 ft x 500 ft (Figure 1, p. 19), the annual impact concentration of contaminants on site receptors could not be calculated using USEPA methods. Instead, the *New York State Air Guide-1 Draft* was used to calculate the emission rate.

All tables and figures referred to in this model are from the USEPA sources and copies appear in this appendix.

3. Calculations

A. Determination of Soil Mode

1. Surface Soil

From the grain size analyses (pp. 18-19 of this calculation)

a. MW-26-002 (0 to 4")

i) $\frac{(0.075 + 0.15)}{2} = 0.1125$ mm

ii) $\frac{(0.15 + 0.25)}{2} = 0.2$ mm

$M_{avg} = \frac{(0.1125 + 0.2)}{2} = 0.156$ mm

b. MW-26-003 (0 to 3")

i) $\frac{(0.15 + 0.25)}{2} = 0.2$ mm

ii) $\frac{(0.25 + 0.4)}{2} = 0.325$ mm

$M_{avg} = \frac{(0.2 + 0.325)}{2} = 0.2625$ mm

c. Representative mode for the surface soil = (0.156 + 0.2625)/2 = 0.21 mm

Therefore, $M_{surface\ soil} = 0.21$ mm

2. Subsurface Soil

Since the site will be developed for industrial use, the excavation will be limited to 10'-0 from the grain size analysis (pp. 20-22 of this calculation).

a. WB - MW-26-002 (9 ft to 11 ft)

i) $\frac{(0.15 + 0.25)}{2} = 0.20$ mm

b. WB-MW-26-003 (9 ft to 11 ft)

i) $\frac{(0.15 + 0.25)}{2} = 0.2$ mm

c. WB-MW-26-004 (9 ft to 11 ft)

i) $\frac{(0.25 + 0.15)}{2} = 0.2$ mm

ii) $\frac{(0.15 + 0.07)}{2} = 0.11$ mm

$M_{avg} = \frac{(0.2 + 0.11)}{2} = 0.155$ mm

d. Representative mode for subsurface soil = (0.2 + 0.2 + 0.155)/3 = 0.185 mm

Therefore, $M_{subsurface\ soil} = 0.185$ mm

B. Current Use Scenario

1. Summary of Assumptions

a. The site was approximated as a square region

Area of the site = 250,000 ft^2

(Figure 1, pp. 19-20 of this calculation)

Approximated square size is 500 ft x 500 ft

b. Large non-erodible particles are not present so u_{*_t} did not need to be corrected

c. Present scenario will take into account grassland for roughness height

d. 100% of the present site has been assumed to be without vegetation

e. Surface and subsurface soils have different contaminant concentrations

$$\alpha_{surf} \neq \alpha_{sub}$$

f. No traffic or other sources will contribute to site contamination.

2. Calculation for Current Use Activities

a. Likelihood of Wind Erosion

Visual inspection of the site indicates that it is without vegetation. As a result, wind erosion will occur on the present site.

b. Type of Emission Model

There will not be any activity at the site before the construction begins. Therefore, present surface soil (0 to 3") is used to calculate the emission model.

i) From the grain size analysis (p. 3 of this calculation):

Mode = 0.21 mm

Thus, the representative mode for the site M = 0.21 mm

ii) From Figure 3-4 (p. 24 of this calculation), the threshold velocity for this mode is u_{*t} = 34 cm/sec. It is assumed that large non-erodible particles are not present at the site, therefore, u_{*t} does not need to be corrected.

iii) Because 75 cm/s > 34 cm/sec, the Unlimited Reservoir Model will be utilized.

c. Wind Erosion from Surfaces with Unlimited Erosion

i) To determine the annual average emission rate, the following equation from in the manual was used (Equation 4-4):

$$E_{10} = 0.036\ (1 - V) \left(\frac{[u]}{u_t} \right)^3 F(x)$$

Where:

E_{10} = annual average emission rate ($g/m^2 hr$)

V = fraction of vegetated surface

[u] = mean annual wind speed (from Table 4-1, pp. 29-30)

x = $0.886\ u_t/[u]$

F(x) = function of x (plotted in Figure 4-3, p. 28 of this calculation)

u_t = threshold value of wind speed at 7 m (m/s)

- Rearrange Equation 4-3 in the manual to find u_t

$$u(z) = \left(\frac{u_{*t}}{0.4} \right) \ln \left(\frac{z}{z_0} \right)$$

Where:

$u(z)$ = wind speed at height "z" (m/s)

u_{*_t} = friction velocity (m/s)

z = height above surface (cm)

z_o = roughness height (cm)

- u_{*_t} = 34 cm/sec = 0.34 m/sec
- z = 7 m = 700 cm
- z_o = 1.5 cm (from Figure 3-6, p. 25 of this calculation)

Thus

$$u(z = 7\ m) = \left(\frac{0.34\ m/s}{0.4}\right) \ln\left(\frac{700\ cm}{1.5\ cm}\right) = \underline{5.22\ m/s}$$

- [u] = 3.9 m/s (from Table 4-1, for pp. 26-27 for Burlington, VT)

- To find F (x) $x = 0.886\ u_t/[u]$

$$x = 0.886\ \frac{u_t}{[u]} = \frac{(0.886 \times 5.22\ m/s)}{3.9\ m/s} = 1.186$$

F(x) = 1.37 (from Figure 4-3, p. 28 of this calculation)

- At present, 100% of the site is bare; thus, V = 0.0 %

$$E_{10} = 0.036\ (1 - 0)\left(\frac{3.9\ m/s}{5.22\ m/s}\right)^3 (1.37) = \underline{0.02057\ g/m^2 hr}$$

ii) Total mass emission rate for wind erosion can be calculated from

$R_w = \alpha_{surf} E_w A$ (Equation 2-1 in the manual)

Where:

R_w = emission rate of contaminant (g/hr)

α_{surf} = mass fraction of surface soil contaminant (unitless)

E_w = emission factor ($g/m^2 hr$)

A = source area extent (m^2)

- α_{surf} = contaminant-specific
- $E_w = E_{10} = 0.02057\ g/m^2 hr$
- $A = 250{,}000\ ft^2 = 23{,}226\ m^2$

$R_w = \alpha_{surf} (0.02057\ g/m^2\ hr) \times 23{,}226\ m^2$

$\underline{R_w = 477.76\ \alpha_{surf}\ g/hr}$

iii) There will not be any vehicular traffic.

d. Maximum Actual Annual Impact (C_a) due to Wind Erosion

i) To determine the actual annual impact, the alternate area source method from *NYS Air Guide-1* was used because it addresses areas up to 3,300 feet x 3,300 feet. The present site is 500 ft x 500 ft or 250,000 ft^2. The entire area will be subjected to fugitive dust. The area source emission rate was calculated using the following equation from page B-11 of *NYS Air Guide-1* (pages 40-42 of this calculation):

$$Q_A = \frac{Q_a}{A}$$

Where :

Q_A = area source emission rate (lb/hr ft^2)

Q_a = emission rate (lb/hr)

A = area (ft^2)

- A = 250,000 ft^2
- $Q_a = R_w$
  $= 477.76\ \alpha_{surf}$ g/hr
  $= 477.76\ \alpha_{surf}$ g/hr x (0.0022 lb/g)
  $= 1.05\ \alpha_{surf}$ lb/hr

$$Q_A = \frac{1.05\ \alpha_{surf}\ lb/hr}{250{,}000\ ft^2} = \underline{\underline{4.2\ x\ 10^{-6}\ \alpha_{surf}\ lb/hr\ ft^2}}$$

ii) Maximum Actual Annual Impact (C_a)

$C_a\ (\mu g/m^3) = KQ_A\ C_m$

(Refer to p. B-11 of *New York State Air Guide-1*, p. 42 of this calculation)

Where:

K = 15 for $330 \leq S \leq 3300$
  = 30 for $S > 3300$

S = length of a side of the area source (ft)

C_m = conversion factor from lb/hr ft^2 to $\mu g/m^2 s$

Q_A = area source emission rate (lb/hr ft^2)

- $C_m = 1.355 \times 10^6$ (conversion factor from lb/hr ft^2 to $\mu g/m^2 s$)
- S = 500 ft, so K = 15
- $Q_A = (4.2 \times 10^{-6}\ \alpha_{surf})$ lb/hr ft^2

$$C_a = 15\ (4.2 \times 10^{-6}\ \alpha_{surf}) \times 1.355 \times 10^{6}\ \mu g/m^3$$
$$= 85.365 \times 10^{-3}\ \alpha_{surf}\ \mu g/m^3$$
$$= 0.0854\ \alpha_{surf}\ mg/m^3$$
$$= 8.54 \times 10^{-2}\ \alpha_{surf}\ mg/m^3$$

C. Future Use Scenario

Construction Activities:

At present, the entire site is without vegetation. During future construction activities, about 80% of the site will undergo excavation and the ground surface will be subjected to wind erosion. Vehicular traffic also will contribute to emissions.

1. Summary of Assumptions

a. Site was approximated as a square region

b. Large non-erodible areas are not present

c. There is no existing buildings on site, so the roughness height is assumed to be z_o = 1.5 cm

d. Construction will occur at the site. Earth-moving operations were assumed to be batch drop operations. Corresponding assumptions are:

i) Backhoe drops from a height of 10 ft

ii) The capacity of dumping device was 1.5 yd^3

iii) The backhoe operates at 30 sec/load

iv) Each load weighs 2 tons/yd^3

v) Two backhoes are used in the construction area

e. Construction vehicles were assumed to travel 21 km/hr, weigh 10 tons, and have 5 wheels on average. Approximately 10 round-trips per day were made by 4 vehicles making 1.0 km round-trips on site.

f. Surface and subsurface soils have different contaminant concentrations

$\alpha_{surf} \neq \alpha_{sub}$

g. At any time during construction activities the soil will be excavated and stockpiled on site for reuse and disposal of excess soil. It can be assumed that these activities will create a dispersion of dust. The average mode will be used for the soil. All other parameters basically remain the same.

2. Calculation for Future Use Scenario (Construction Activities)

a. Likelihood of Wind Erosion

The construction site areas will be without vegetation.

b. Type of Emission Model

From the grain size analysis (pp. 3-4 of this calculation)

Mode = 0.2, 0.2, 0.15

The representative mode for the site is:

M = 0.183 mm

From Figure 3-4 p. 27, the threshold friction velocity is:

u_{*_t} = 32 cm/sec

It is assumed that large non-erodible particles are not present on site, thus u_{*_t} does not need to be corrected. Because 75 cm/s > 32 cm/s the unlimited reservoir model will be utilized.

c. Wind Erosion from Surface with Unlimited Erosion

i) To determine the annual average emission rate, the following equation from in the manual was used (Equation 4-4):

$$E_{10} = 0.036\ (1 - V) \left(\frac{[u]}{u_t} \right)^3 F(x)$$

Where:

E_{10} = annual average emission rate ($g/m^2\,hr$)

V = fraction of vegetated surface

[u] = mean annual wind speed (from Table 4-1, pp. 26-27)

x = $0.886\ u_t/[u]$

F(x) = function of x (plotted in Figure 4-3, p. 28 of this calculation)

u_t = threshold value of wind speed at 7 m (m/s)

- Rearrange Equation 4-3 to find u_t (Equation 4-3 in the manual)

$$u(z) = \left(\frac{u_{*t}}{0.4} \right) \ln \left(\frac{z}{z_0} \right)$$

Where:

u(z) = wind speed at height "z" (m/s)

u_{*t} = friction velocity (m/s)

z = height above surface (cm)

z_o = roughness height (cm)

- u_{*t} = 32 cm/sec = 0.32 m/sec
- z = 7 m = 700 cm
- z_o = 1.5 cm (assumed between grass and plowed field, from Figure 3-6, p. 25 of this calculation)

Thus

$$u(z = 7\ m) = \left(\frac{0.32\ m/s}{0.4} \right) \ln \left(\frac{700\ cm}{1.5\ cm} \right) = \underline{4.92\ m/s}$$

- [u] = 3.9 m/s (from Table 4-1 for Burlington, VT; pp. 26-27 of

this calculation)

- To find F(x)

$$x = 0.886 \frac{u_t}{[u]} = \frac{(0.886 \; x \; 4.92 \; m/s)}{3.9 \; m/s} = 1.118$$

F (x = 1.118) = 1.44 (from p. 28 of this calculation)

- Construction activities extend over the entire site; it is assumed V=0

$$E_{10} = 0.036 \; (1 - 0) \left(\frac{3.9 \; m/s}{4.92 \; m/s} \right)^3 (1.44) = \underline{0.0258 \; g/m^2 hr}$$

ii) Total mass emission rate for wind erosion can be calculated from

$R_w = \alpha_{surf} E_w A$ (Equation 2-1 in the manual)

Where:

R_w = emission rate of contaminant (g/hr)

α_{surf} = mass fraction of surface soil contaminant (unitless)

E_w = emission factor (g/m^2 hr)

A = source area extent (m^2)

- α_{surf} = contaminant specific
- $E_w = E_{10} = 2.58 \times 10^{-2}$ g/m^2 hr
- A = 250,000 ft^2 = 23,226 m^2

$R_w = \alpha_{surf} (2.58 \times 10^{-2}$ g/m^2 hr) x (23,226 m^2)

$R_w = 599.23 \; \alpha_{surf}$ g/hr

d. Emissions Due to Construction Activities

i) The emissions produced during future construction will be accounted for in the construction assessment of emissions modeled in this section.

The earth-moving operations on site are assumed to be batch drop operations.

The quantity of particulate emissions generated by batch drop operations can be estimated using the Empirical Equation (given in *AP-42* - Chapter 13.2.2.3, July 1994) and Table 13.2.3.1 (pp. 34-36 of this calculation).

$$E = k\,(0.0032)\,\frac{\left[\frac{U}{5}\right]^{1.3}}{\left[\frac{M}{2}\right]^{1.4}}\ (lb/ton)$$

Where:

E = emission factor (lb/ton)

k = particle size multiplier (dimensionless)

U = mean wind speed (mph)

M = material moisture content (%)

- Mode of subsurface soil = 0.185 mm = 185 μm
  k = 0.74
- u = 3.9 m/s = 8.72 mph (from Table 4-1 for Burlington, VT pp. 20-22)
- M = 24.7, 23.7, 21.3 $\therefore$ M_{avg} = 23.23% (pp. 23-25 of this calculation)

NOTE: *AP-42,* Section 13.2.2 has been used to calculate the fugitive dust emission since it includes calculations for loading, unloading, equipment movement, and batch or continuous drop operation activities.

$$E = 0.74\ (0.0032)\ \frac{\left[\frac{8.72}{5}\right]^{1.3}}{\left[\frac{23.23}{2}\right]^{1.4}}\ (lb/ton) = 1.58\ x\ 10^{-4}\ lb/ton$$

- Assume a cycle of 30 sec/load. In one hour, the backhoe can process:

  (3600 sec/hr)/(30 sec/load) = 120 loads/hr

- Assume 2 ton/yd^3. The mass of soil moved in one hour is by a single backhoe:

  (120 loads/hr) (1.5 yd^3/load) (2 tons/yd^3) = 360 tons/hr

- The construction area is assumed to be = 0.8 x 250,000 ft^2 = 200,000 ft^2

- Assume 2 backhoes will be used in the construction area. The emission rate is:

  E_{emo} = (1.58 x 10^{-4} lb/ton) (2 x 360 tons/hr)/200,000 ft^2
  = 5.7 x 10^{-7} lb/ft^2 hr
  = (5.7 x 10^{-7} lb/ft^2 hr) (3.2808 ft/m)^2 x (1 g/0.0022 lb)
  = 2.79 x 10^{-3} g/m^2 hr

ii) Total mass emission rate for earth moving operations can be calculated from:

$R_{emo} = \alpha_{sub}\ E_{emo}\ A$ (Equation 2-1 in the manual)

Where:

R_w = emission rate of contaminant (g/hr)

α_{sub} = mass fraction of surface soil contaminant (unitless)

E_{emo} = emission factor (g/m^2 hr)

A = source area extent, area under construction (m^2)

- α_{sub} = contaminant specific
- $E_w = E_{10} = 2.79 \times 10^{-3}$ g/m^2 hr
- A = 200,000 ft^2

$R_{emo} = \alpha_{sub}$ (2.79 x 10^{-3} g/m^2 hr) (200,000 ft^2) (1m/3.2808 ft)^2

$\underline{R_{emo} = 51.84\ \alpha_{sub}\ g/hr}$

e. Construction Activities - Traffic

i) For traffic on the construction site, the empirical formulas for unpaved roads as given in *AP-42*, Chapter 13.2.1 will be used (see pp. 39-40).

$$E = k\ (1.7) \left[\frac{s}{12}\right] \left[\frac{S}{48}\right] \left[\frac{W}{2.7}\right]^{0.7} \left[\frac{w}{4}\right]^{0.5} \left[\frac{365-p}{365}\right] \frac{kg}{VKT}$$

Where:

E = emission factor

k = particle size multiplier (dimensionless)

s = silt content of road surface material (%)

S = mean vehicle speed (km/hr)

W = mean vehicle weight (Mg)

w = mean number of wheels

p = number of days with at least 0.254 mm of precipitation per year

- Mode surface soil = 0.21 mm
  subsurface soil = 0.185 mm

  $M_{avg} = \frac{0.21 + 0.185}{2} \approx 0.1975$ mm = 198 μm

  $\underline{k = 1.0}$

- silt content surface soil = 4.0, 5.6 Avg = 4.8
  subsurface soil = 4.2, 2.7, 22.1 Avg = 9.7%

  $s_{avg} = \frac{4.8 + 9.7}{2} = \underline{7.25\%}$

- The vehicles on the construction site will include security vehicles, workers' vehicles, and construction equipment

  Assume $\underline{S = 21 \text{ km/hr}}$

- Assume W = 10 Tons = $\underline{9.06 \text{ Mg}}$

- Mean number of wheels is $\underline{w = 5}$, based on construction vehicles.

  p = Number of days with at least 0.254 mm of precipitation/year from Figure 4-4 of the manual (p. 29 of this calculation)

  $\underline{p \text{ for PAFB} = 140 \text{ days}}$

$$E_{10} = (1.0)\ (1.7) \left[\frac{7.25}{12}\right]\left[\frac{21}{48}\right]\left[\frac{9.06}{2.7}\right]^{0.7}\left[\frac{5}{4}\right]^{0.5}\left[\frac{365-140}{365}\right] = 0.7213\ \frac{kg}{VKT}$$

$$E_{10} = 0.72\ \frac{kg}{VKT}$$

ii) Total mass emission rate for vehicular traffic:

$R_{traffic} = \alpha_{sub}\ E_{10}\ A$ (Equation 2-1 in the manual)

Where:

$R_{traffic}$ = emission rate of contaminant (g/hr)

α_{sub} = mass fraction of surface soil contaminant (unitless)

E_{10} = emission factor (kg/VKT)

A = source area extent (m^2)

- α_{sub} = contaminant-specific. In this case it is assumed that subsurface soil will have been brought to the surface by excavation and vehicular traffic on roads within the construction area).
- E_{10} = 0.72 kg/VKT
- Assume an average of 10 round-trips/day made by 4 vehicles making 1 km round-trip

  A = (365 days) (10 trips/day) (1km/trip) 4 vehicles

  = 14,600 VKT/yr

Thus

$R_{traffic}$ = α_{sub} x (0.72 kg/VKT) (14,600 VKT/yr)

= α_{sub}(10,512 kg/yr)(1000 g/kg)(1 yr/365 day)(1 day/24 hr)

= 1,200 α_{sub} g/hr

f. Maximum Actual Impact (C_a)

To determine the actual impact, the alternate area source method from the *New York State Air Guide-1* was used. The area of the site is 250,00 ft^2. Assuming a square site, the side length is equal to 500 ft.

i) The area source emission rate (Q_A) is (Refer to p. B-11 of the *New York State Air Guide-1*, p. 42 of this calculation):

$$Q_A = \frac{Q_a}{A}$$

Where:

Q_A = area source emission rate (lb/hr ft^2)

Q_a = emission rate (lb/hr)

A = area (ft^2)

- A = 165,000 ft^2
- $Q_a = R_w + R_{emo} + R_{traffic}$

  $= 599\ \alpha_{surf}$ g/hr + 51.84 α_{sub} g/hr + 1,200 α_{sub} g/hr

  $= 599\ \alpha_{surf}$ g/hr + 1,252 α_{sub} g/hr

  $= (599\ \alpha_{surf}$ g/hr + 1,252 α_{sub} g/hr) x (0.0022 lb/g)

  $= 1.32\ \alpha_{surf}$ lb/hr + 2.75 α_{sub} lb/hr

$$Q_A = \frac{(1.32\ \alpha_{surf} + 2.75\ \alpha_{subs})\ lb/hr}{250{,}000\ ft^2} = (5.28\ x\ 10^{-6}\ \alpha_{surf} + 11\ x\ 10^{-6}\ \alpha_{subs})\ lb/hr\ ft^2$$

ii) Maximum actual annual impact (C_a)

$C_a\ (\mu g/m^3) = K\ Q_A\ C_m$

(Refer to p. B-11 of *New York State Air Guide-1*, pp. 41-42 of this calculation)

Where:

K = 15 for $330 \leq S \leq 3300$

= 30 for $S > 3300$

S = length of a side of the area source (ft)

C_m = conversion factor from lb/hr ft^2 to $\mu g/m^2 s$

Q_A = area source emission rate (lb/hr ft^2)

- $C_m = 1.355 \times 10^6$ (conversion factor from lb/hr ft^2 to $\mu g/m^2 s$)
- S = 500 ft, so K = 15
- $Q_A = (5.28 \times 10^{-6} \alpha_{surf} + 11 \times 10^{-6} \alpha_{sub})$ lb/hr ft^2

$C_a = 15 (5.28 \times 10^{-6} \alpha_{surf} + 11 \times 10^{-6} \alpha_{sub}) \times 1.355 \times 10^6$

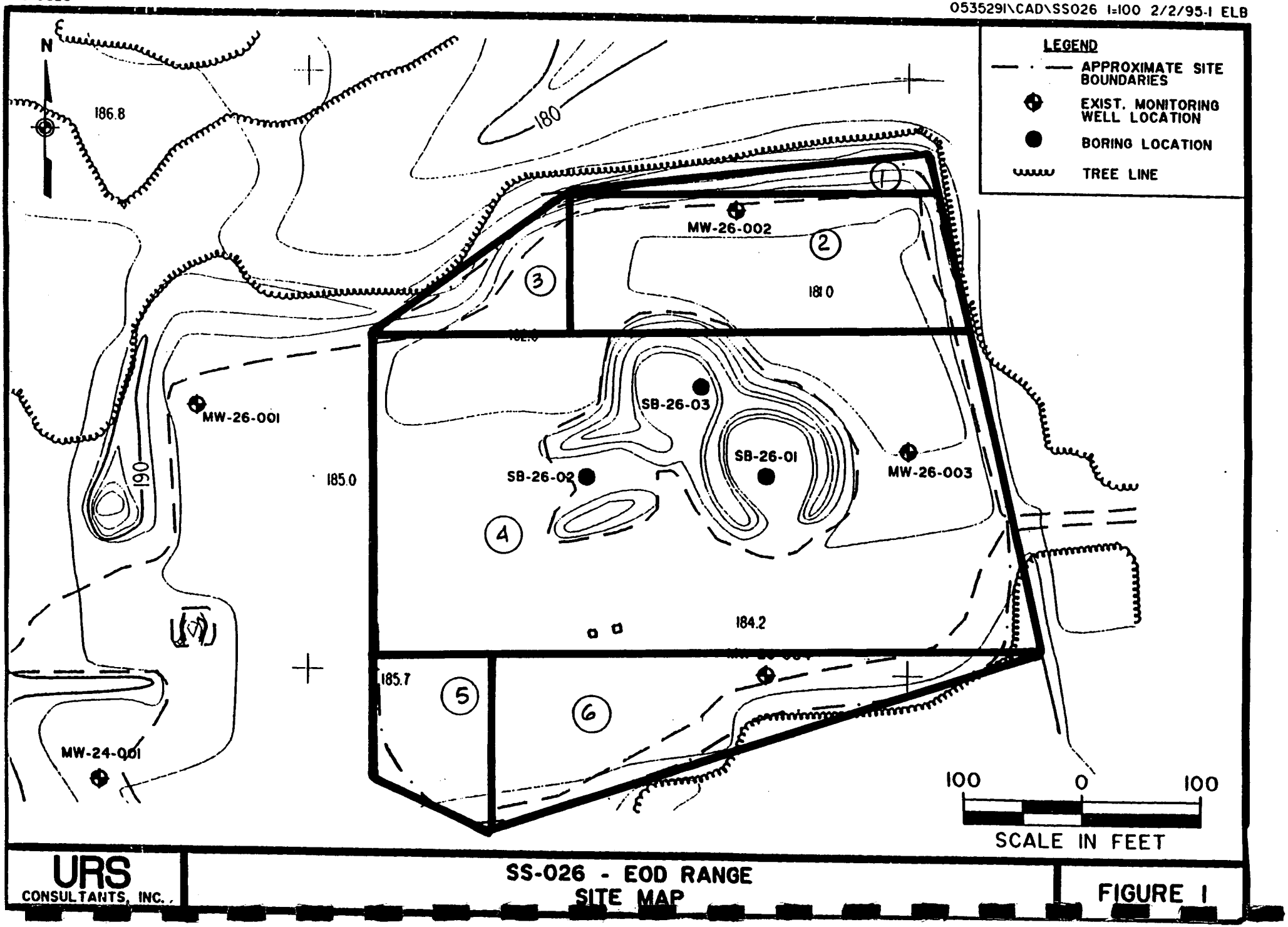
$= (107.316 \alpha_{surf} + 223.58 \alpha_{sub}) \mu g/m^3$

$= (0.107 \alpha_{surf} + 0.224 \alpha_{sub})$ mg/m^3

$= (10.7 \times 10^{-2} \alpha_{surf} + 22.4 \times 10^{-2} \alpha_{sub})$ mg/m^3

AC-6820

053529I\CAD\SS026 I=100 2/2/95-I ELB



URS CONSULTANTS, INC.

SS-026 - EOD RANGE SITE MAP

FIGURE 1

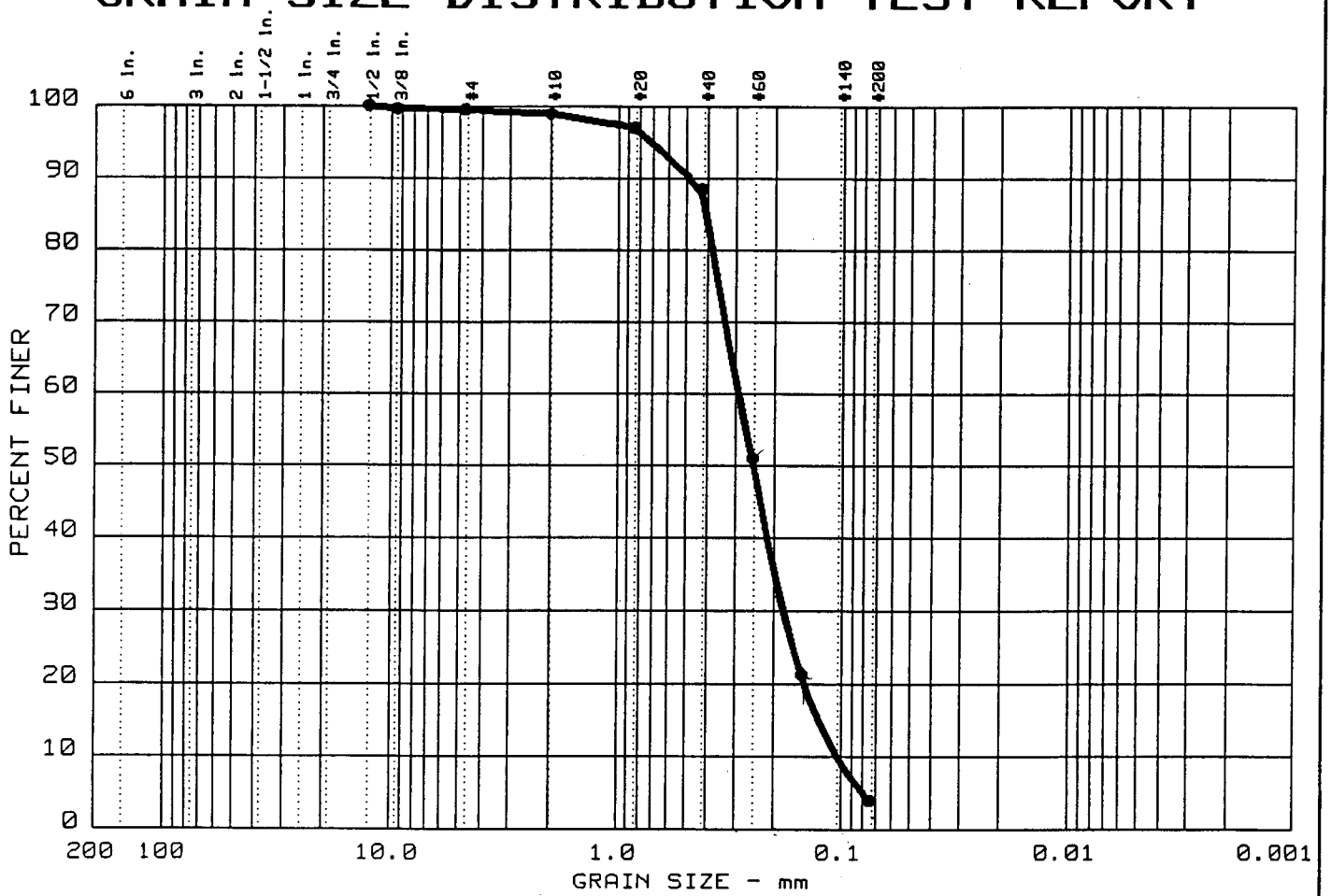
Calculation of Area of the Site

Item	1	=	½ x 310 x 30 =	4,650 sf
	2	=	½ (310 + 338) x 120 =	38,880 sf
	3	=	½ x 120 x 170 =	10,200 sf
	4	=	½ (508 + 565) x 272 =	145,928 sf
	5	=	½ (150 + 110) x 100 =	13,000 sf
	6	=	½ x 465 x 150 =	34,875 sf
			Area =	247,533 sf

Equivalent Square 497.5 ft Say 500 ft x 500 ft

Area used in calculation = 500 ft x 500 ft
= 250,000 ft^2
= 23,226 m^2

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	8	0.0	0.5	95.5	4.0	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.41	0.29	0.25	0.180	0.1256	0.1033	1.10	2.8

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN SAND, trace fines & gravel, ORGANICS.		

Project No.: G008.018
Project: PLATTSBURGH A.F.B. PLATTSBURGH, N.Y.
● Location: MW-26-003 / 0"- 3"

Date: JANUARY 3, 1995

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

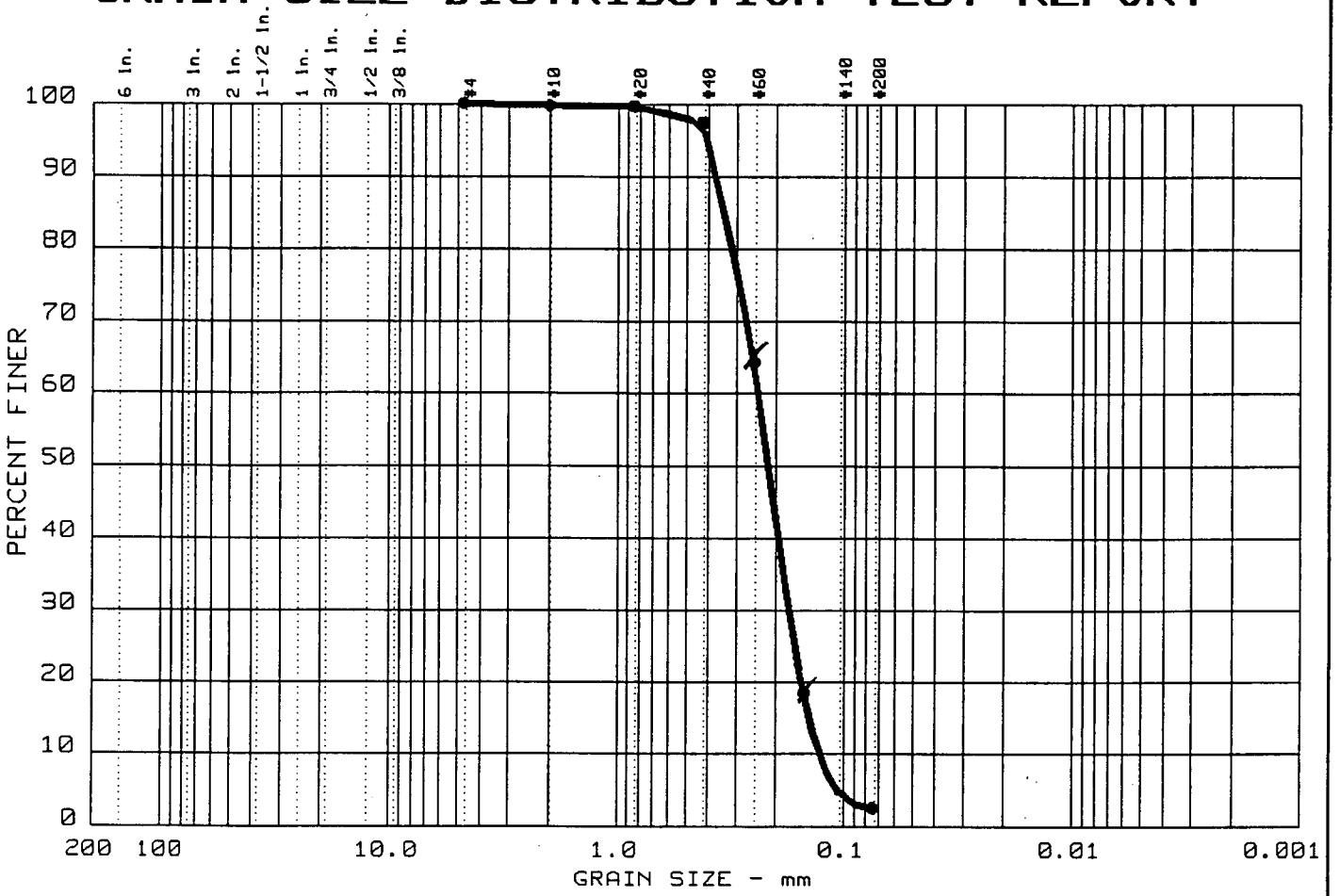
CLIENT: URS CONSULTANTS

WATER CONTENT: 3.2%

LAB NO. 2183.003

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	3	0.0	0.0	97.3	2.7	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.34	0.24	0.22	0.174	0.1414	0.1271	1.00	1.9

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, trace fines		

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-003 / 9'- 11'

Date: DECEMBER 5, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

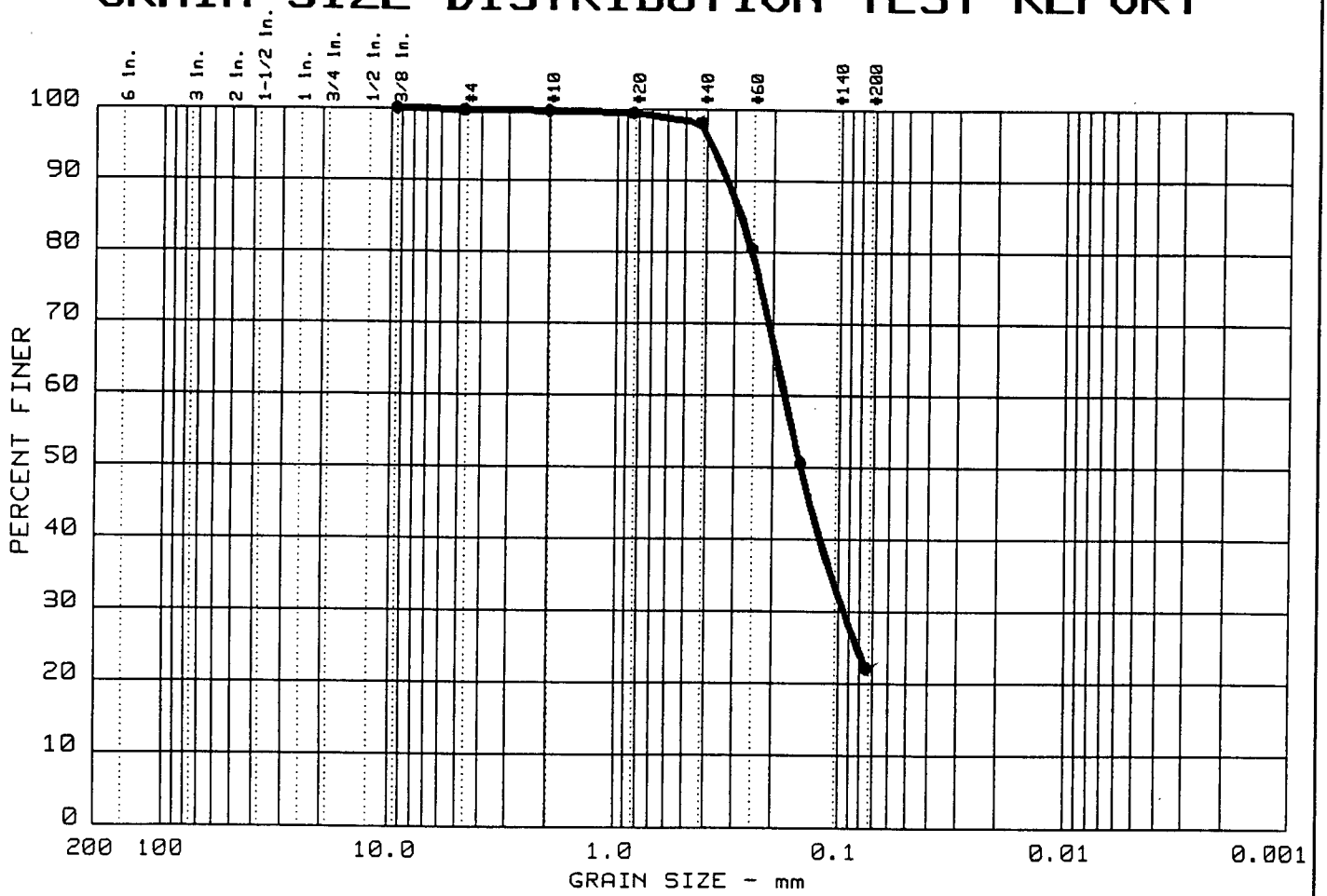
CLIENT: URS CONSULTANTS

WATER CONTENT: 23.7%

LAB NO. 2168.003

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	4	0.0	0.2	77.7	22.1	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			0.28	0.18	0.15	0.094				

MATERIAL DESCRIPTION	USCS	AASHTO
● TAN SAND, Some Fines, trace gravel		

Project No.: G008.018
Project: PLATTSBURGH AIR FORCE BASE
● Location: WB-MW-26-004 / 9'- 11'

Date: DECEMBER 5, 1994

GRAIN SIZE DISTRIBUTION TEST REPORT

HUNTINGDON ENGINEERING & ENVIRONMENTAL

Remarks:

CLIENT: URS CONSULTANTS

WATER CONTENT: 21.3%

LAB NO. 2168.004

Figure No. 1

United States
Environmental Protection
Agency

Office of Health and
Environmental Assessment
Washington DC 20460

EPA/600 8-85 002
February 1985

Research and Development

PB85-192219

EPA

Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

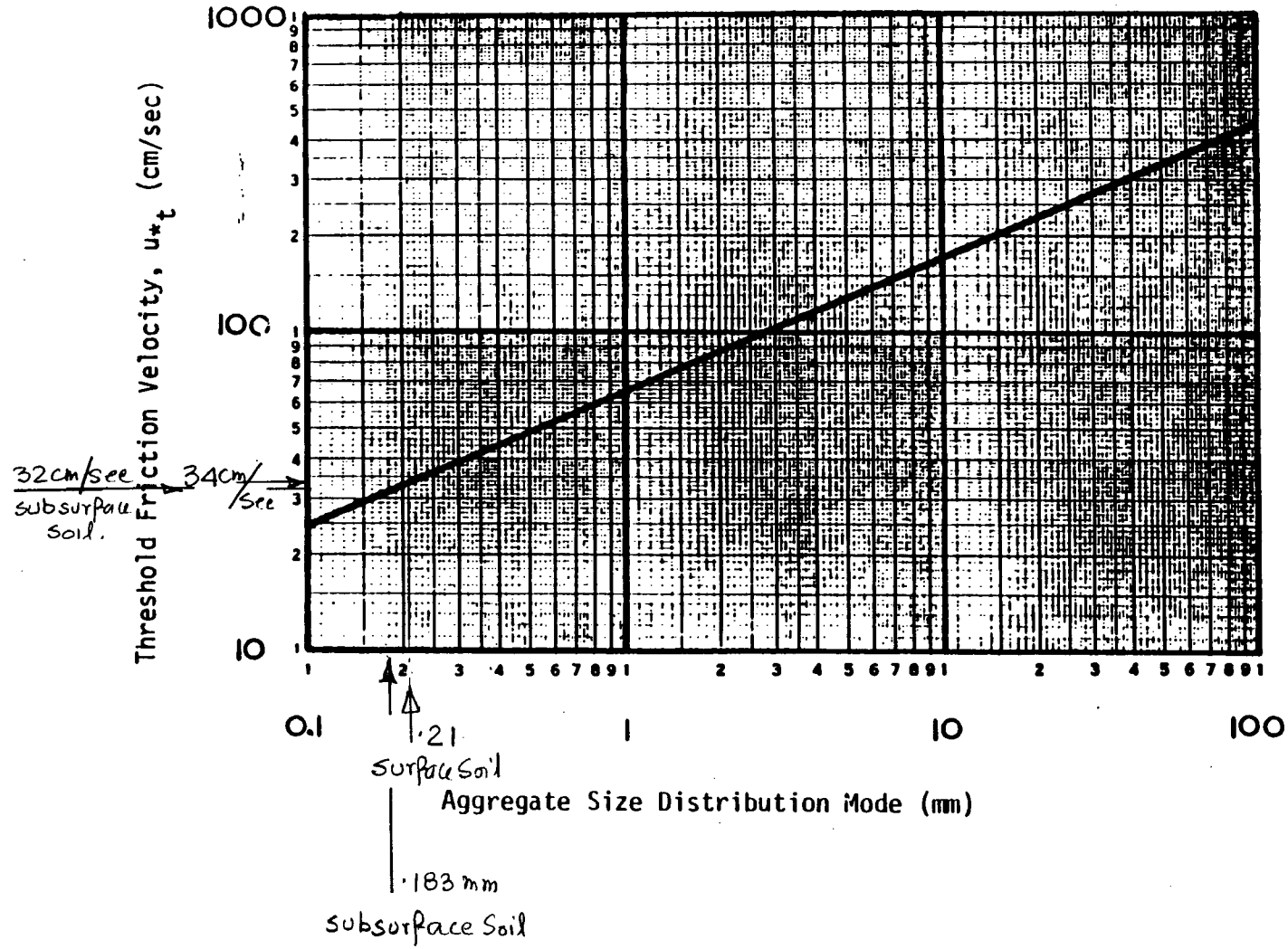


Figure 3-4. Relationship of Threshold Friction Velocity to Size Distribution Mode

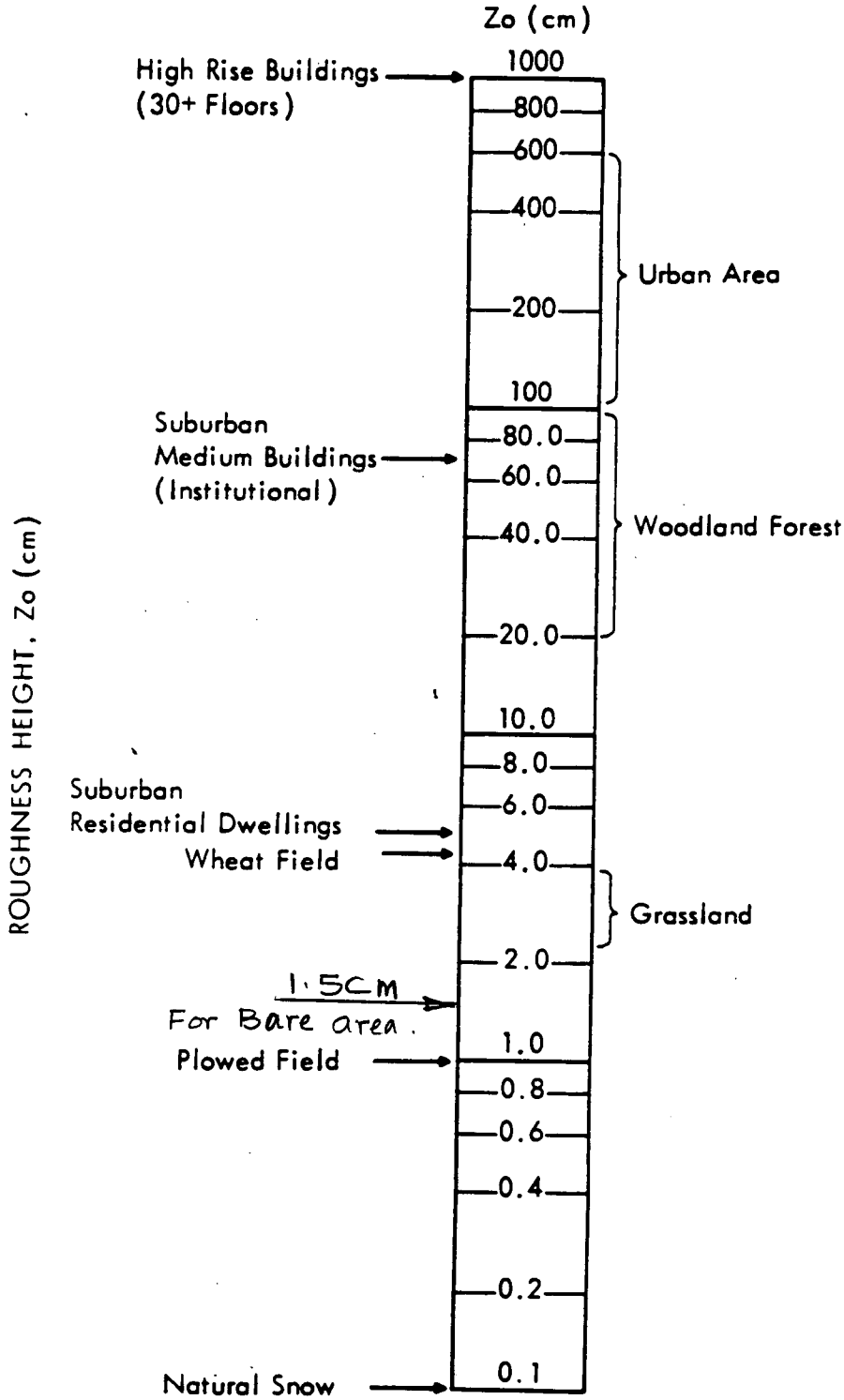


Figure 3-6. Roughness Heights for Various Surfaces (Cowherd and Guenther, 1976)

TABLE 4-1. FASTEST MILE[a] [u^+] AND MEAN WIND SPEED[b] [u] FOR SELECTED UNITED STATES STATIONS

Station	State	[u^+] (m/s)	[u] (m/s)	Station	State	[u^+] (m/s)	[u] (m/s)
Birmingham	AL	20.8	3.3	Detroit	MI	21.8	4.6
Montgomery	AL	20.2	3.0	Grand Rapids	MI	21.6	4.5
Tucson	AZ	23.0	3.7	Lansing	MI	23.7	4.6
Yuma	AZ	21.8	3.5	Sault St. Marie	MI	21.6	4.3
Fort Smith	AR	20.8	3.4	Duluth	MN	22.8	5.1
Little Rock	AR	20.9	3.6	Minneapolis	MN	22.0	4.7
Fresno	CA	15.4	2.8	Jackson	MS	20.5	3.4
Red Bluff	CA	23.3	3.9	Columbia	MO	22.4	4.4
Sacramento	CA	20.6	3.7	Kansas City	MO	22.6	4.6
San Diego	CA	15.4	3.0	St. Louis	MO	21.2	4.2
Denver	CO	22.0	4.1	Springfield	MO	22.4	5.0
Grand Junction	CO	23.6	3.6	Billings	MT	26.6	5.1
Pueblo	CO	28.1	3.9	Great Falls	MT	26.4	5.9
Hartford	CT	20.2	4.0	Havre	MT	25.9	4.5
Washington	DC	21.6	3.4	Helena	MT	24.7	3.5
Jacksonville	FL	21.7	3.8	Missoula	MT	21.6	2.7
Tampa	FL	22.2	3.9	North Platte	NE	27.7	4.6
Atlanta	GA	21.2	4.1	Omaha	NE	24.6	4.8
Macon	GA	20.1	3.5	Valentine	NE	27.1	4.8
Savannah	GA	21.3	3.6	Ely	NV	23.6	4.7
Boise	ID	21.4	4.0	Las Vegas	NV	24.4	4.0
Pocatello	ID	23.8	4.6	Reno	NV	25.2	2.9
Chicago	IL	21.0	4.6	Winnemucca	NV	22.4	3.5
Moline	IL	24.5	4.4	Concord	NH	19.2	3.0
Peoria	IL	23.2	4.6	Albuquerque	NM	25.6	4.0
Springfield	IL	24.2	5.1	Roswell	NM	26.0	4.1
Evansville	IN	20.9	3.7	Albany	NY	21.4	4.0
Fort Wayne	IN	23.7	4.6	Binghampton	NY	22.0	4.6
Indianapolis	IN	24.8	4.3	Buffalo	NY	24.1	5.5
Burlington	IA	25.0	4.6	New York	NY	22.5	5.5
Des Moines	IA	25.8	5.0	Rochester	NY	23.9	4.3
Sioux City	IA	25.9	4.9	Syracuse	NY	22.5	4.4
Concordia	KS	25.7	5.4	Cape Hatteros	NC	25.9	5.1
Dodge City	KS	27.1	6.3	Charlotte	NC	20.0	3.4
Topeka	KS	24.4	4.6	Greensboro	NC	18.9	3.4
Wichita	KS	26.0	5.6	Wilmington	NC	22.3	4.0
Louisville	KY	22.0	3.8	Bismarck	ND	26.1	4.7
Shreveport	LA	19.9	3.9	Fargo	ND	26.6	5.7
Portland	ME	21.7	3.9	Cleveland	OH	23.6	4.8
Baltimore	MD	25.0	4.2	Columbus	OH	22.1	3.9
Boston	MA	25.2	5.6	Dayton	OH	24.0	4.6

TABLE 4-1 (concluded)

Station	State	$[u^+]$ (m/s)	[u] (m/s)	Station	State	$[u^+]$ (m/s)	[u] (m/s)
Toledo	OH	22.7	4.2	Dallas	TX	21.9	4.9
Oklahoma City	OK	24.1	5.7	El Paso	TX	24.8	4.2
Tulsa	OK	21.4	4.7	Port Arthur	TX	23.7	4.5
Portland	OR	23.5	3.5	San Antonio	TX	21.0	4.2
Harrisburg	PA	20.4	3.4	Salt Lake City	UT	22.6	3.9
Philadelphia	PA	22.1	4.3	Burlington	VT	20.4	3.9
Pittsburgh	PA	21.6	4.2	Lynchburg	VA	18.3	3.5
Scranton	PA	19.9	3.8	Norfolk	VA	21.8	4.7
Huron	SD	27.4	5.3	Richmond	VA	18.9	3.4
Rapid City	SD	27.3	5.0	Quillayute	WA	16.3	3.0
Chattanooga	TN	21.4	2.8	Seattle	WA	18.7	4.1
Knoxville	TN	21.8	3.3	Spokane	WA	21.4	3.9
Memphis	TN	20.3	4.1	Green Bay	WI	25.3	4.6
Nashville	TN	20.9	3.6	Madison	WI	24.9	4.4
Abilene	TX	24.4	5.4	Milwaukee	WI	24.0	5.3
Amarillo	TX	27.3	6.1	Cheyenne	WY	27.0	5.9
Austin	TX	20.2	4.2	Lander	WY	27.4	3.1
Brownsville	TX	19.5	5.3	Sheridan	WY	27.5	3.6
Corpus Christi	TX	24.4	5.4	Elkins	WV	22.8	2.8

[a] Data taken from Extreme Wind Speeds at 129 Stations in the Contiguous United States. Simiu, E., Filliben, J. J., and M. J. Changery. NBS Building Science Series 118. U.S. Department of Commerce, National Bureau of Standards, 1979.

[b] Data taken from Local Climatological Data - Annual Summaries for 1977. U.S. Department of Commerce, National Oceanic and Atmospheric Administration/Environmental Data Service/National Climatic Data Center.

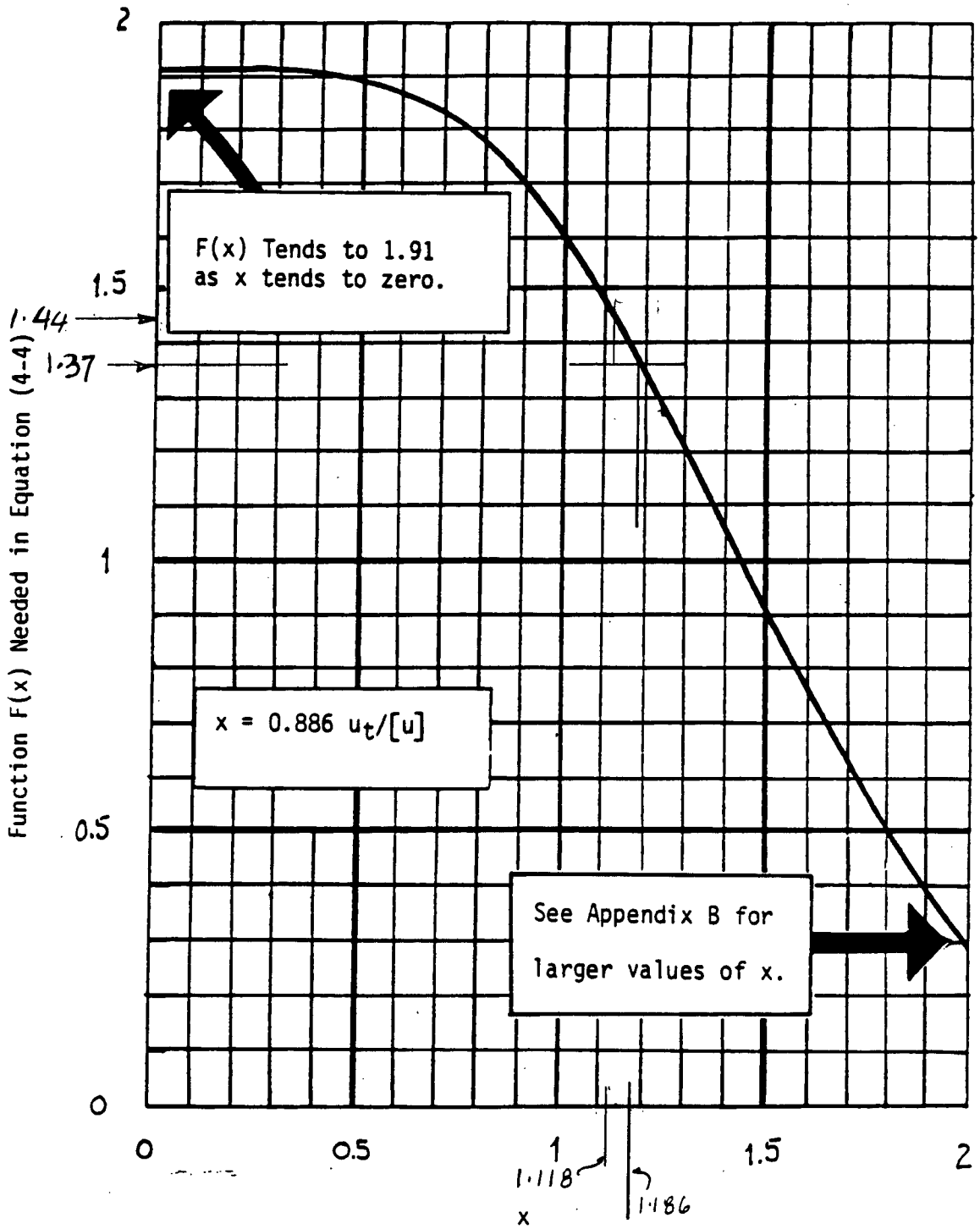


Figure 4-3. Graph of Function F(X) Needed to Estimate Unlimited Erosion

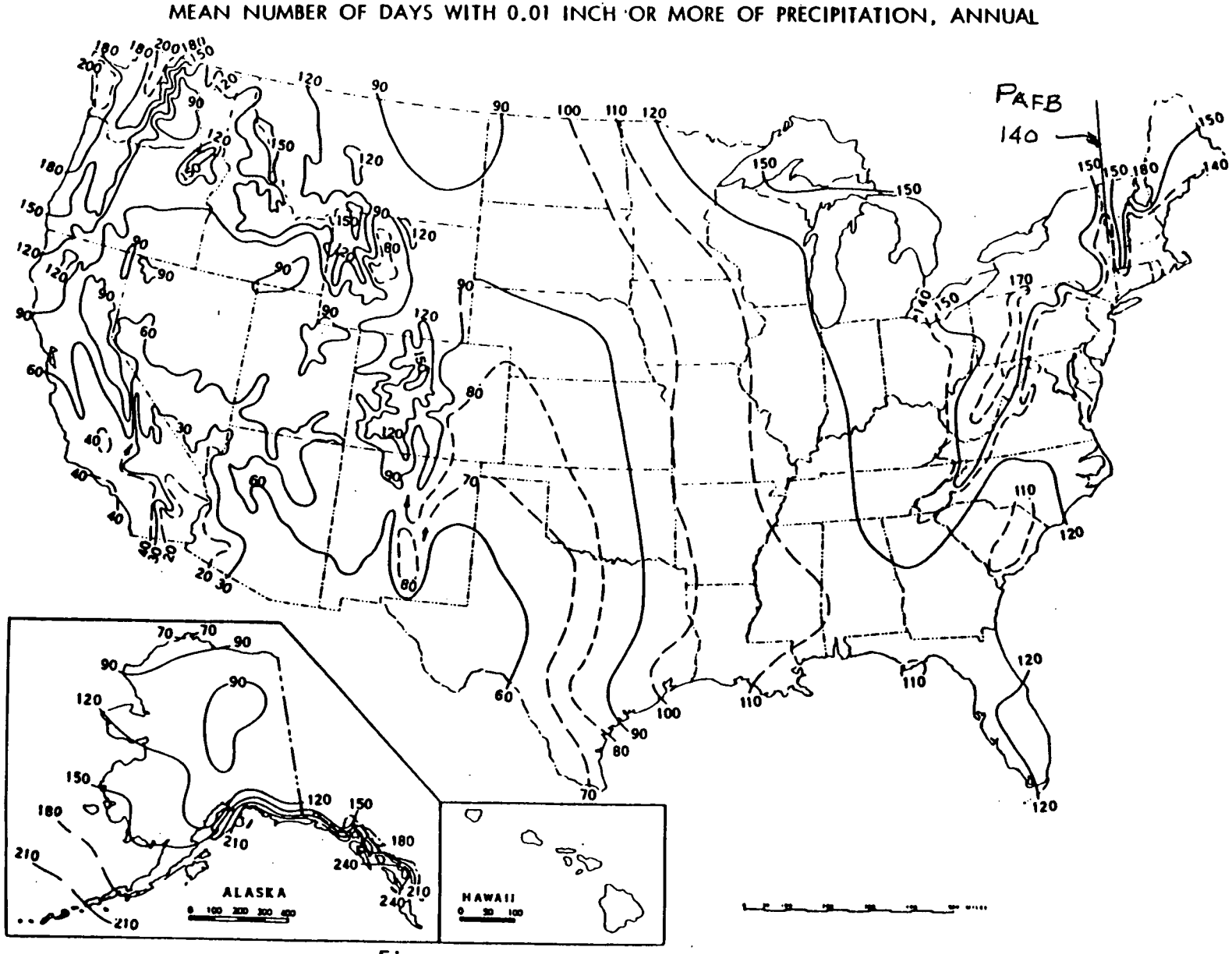


Figure 4-4. Map of Precipitation Frequency

Step 1 - Estimation of Emissions

The technical approach for estimating respirable (PM_{10}) emissions from surface contamination sites is consistent with the technique used in air pollution assessments. It is based on the following equation:

$$R_{10} = \alpha E_{10} A \qquad (2\text{-}1)$$

where R_{10} = emission rate of contaminant as PM_{10} (mass/time)

α = fraction of contaminant in PM_{10} emissions (mass/mass)

E_{10} = PM_{10} emission factor (mass/source extent)

A = source extent (source-dependent units)

The emission factor is simply the ratio of uncontrolled emissions per unit of source extent. For wind erosion, the source extent is the area of erodible surface. In the case of emissions generated by mechanical disturbance, source extent is also the area (or volume) of the material from which the emissions emanate. Normally, the "uncontrolled" emission factor incorporates the effects of natural mitigation (e.g., rainfall). If anthropogenic control measures (e.g., treating the surface with a chemical binder which forms an artificial crust) are applied to the source, the uncontrolled emission factor must be reduced to reflect the resulting fractional control.

The first step in the estimation of atmospheric particulate emissions from a surface contamination site is to decide whether potential emissions are limited to those generated by wind erosion. If traffic over the site occurs, it is likely that the traffic emissions (or emissions from other forms of mechanical disturbance) substantially exceed emissions from wind erosion. This is because, for most parts of the country, vehicle traffic is an intensive entrainment mechanism in comparison with wind erosion.

For estimation of emissions from traffic on unpaved surfaces, a predictive emission factor equation is recommended in Section 4. This equation, developed from regression analysis of field test data, explains much of the observed variance in road dust emission factor values on the basis of variances in specific road surface and traffic parameters. Thus it provides more reliable estimates of source emissions on a site specific basis than does a single-valued average emission factor. The appropriate measure of source extent for this emission factor is obtained by converting traffic counts and road segment lengths into the total vehicle-distance traveled; in effect this represents the cumulative road surface area from which the emissions are released.

For estimating emissions from wind erosion, either of two emission factor equations are recommended in Section 4 depending on the erodibility of the surface material. In both cases, the appropriate measure of source

u^+ = observed (or probable) fastest mile of wind for the period between disturbances (m/s)

$P(u^+)$ = erosion potential, i.e., quantity of erodible particles present on the surface prior to the onset of wind erosion (g/m^2)

V = fraction of contaminated surface area covered by continuous vegetative cover (equals 0 for bare soil)

PE = Thornthwaite's Precipitation Evaporation Index used as a measure of average soil moisture content

Although Equation 4-1 is based primarily on field tests of nonsoil surfaces (e.g., coal with a top size of 3 cm and a silt content exceeding 4%), subsoil and other crustal materials showed similar behavior. The erosion potential (in g/m^2) depends on the fastest mile (in m/s) as follows:

$$P(u^+) = 6.7\ (u^+ - u_t), \quad u^+ \geq u_t \qquad (4\text{-}2)$$
$$0 \quad , \quad u^+ < u_t$$

where u_t is the erosion threshold wind speed (in m/s), measured at a typical weather station sensor height of 7 m.

The threshold friction velocity determined from the site survey is converted to the equivalent wind speed at a height of 7 m using Figure 4-1. This figure assumes a logarithmic velocity profile near the earth's surface:

$$\frac{u(z)}{u_*} = \frac{1}{0.4} \ln (z/zo) \qquad (4\text{-}3)$$

where: u = wind speed at height z (m/s)
z = height above surface (cm)
u_* = friction velocity (m/sec)
z_o = roughness height (cm)

Mean annual fastest mile (u^+) values are presented in Table 4-1. The value for the weather station closest to the surface contamination site should be used.

Emissions generated by wind erosion of "limited reservoir" surfaces are also dependent on the frequency of disturbance (f) of the erodible surface, because each time that a surface is disturbed, its erosion potential is restored. A disturbance is defined as an action which results in the

exposure of fresh surface material. This would occur whenever aggregate material is either added to or removed from the old surface. A disturbance of an exposed area may also result from the turning of surface material to a depth exceeding the size of the largest pieces of material present.

Although vehicular traffic alters the surface by pulverizing surface material, several vehicle passes may be required to restore the full erosion potential, except for surfaces that crust before substantial wind erosion occurs. In that case, breaking of the crust over the area of the tire/surface contact once again exposes the erodible material beneath.

Thornthwaites' P-E (PE) Index is a useful indicator of average surface soil moisture conditions. In the present context, the P-E Index is applied as a correction parameter for wind generated emissions in the limited reservoir case. Figure 4-2 provides a basis for selecting an appropriate P-E value.

The worst-case emission rate is calculated by assuming that a disturbance occurs just prior to the annual fastest mile event, both within the 24-h period of interest. For this calculation, use Equation (4-1) with $f = 30\ mo^{-1}$.

4.1.2 Wind Erosion from Surfaces with Unlimited Erosion Potential

For estimating respirable particulate emissions from wind erosion of surfaces with an "unlimited reservoir" of erodible particles, a predictive emission factor equation developed from Gillette's (1981) field measurements of highly erodible soils is recommended. In relating the annual average rate of respirable particulate emissions (per unit area) to field and climatic factors, the equation takes the following form:

$$E_{10} = 0.036\ (1-V)\ \left(\frac{[u]}{u_t}\right)^3\ F(x) \qquad (4\text{-}4)$$

where:

E_{10} = PM_{10} emission factor, i.e., annual average PM_{10} emission rate per unit area of contaminated surface (g/m^2-hr)

V = fraction of contaminated surface vegetative cover (equals 0 for bare soil)

$[u]$ = mean annual wind speed (m/s), taken from Table 4-1

$x = 0.886\ u_t/[u]$ = dimensionless ratio

$F(x)$ = function plotted in Figure 4-3

u_t = threshold value of wind speed at 7 m (m/s)

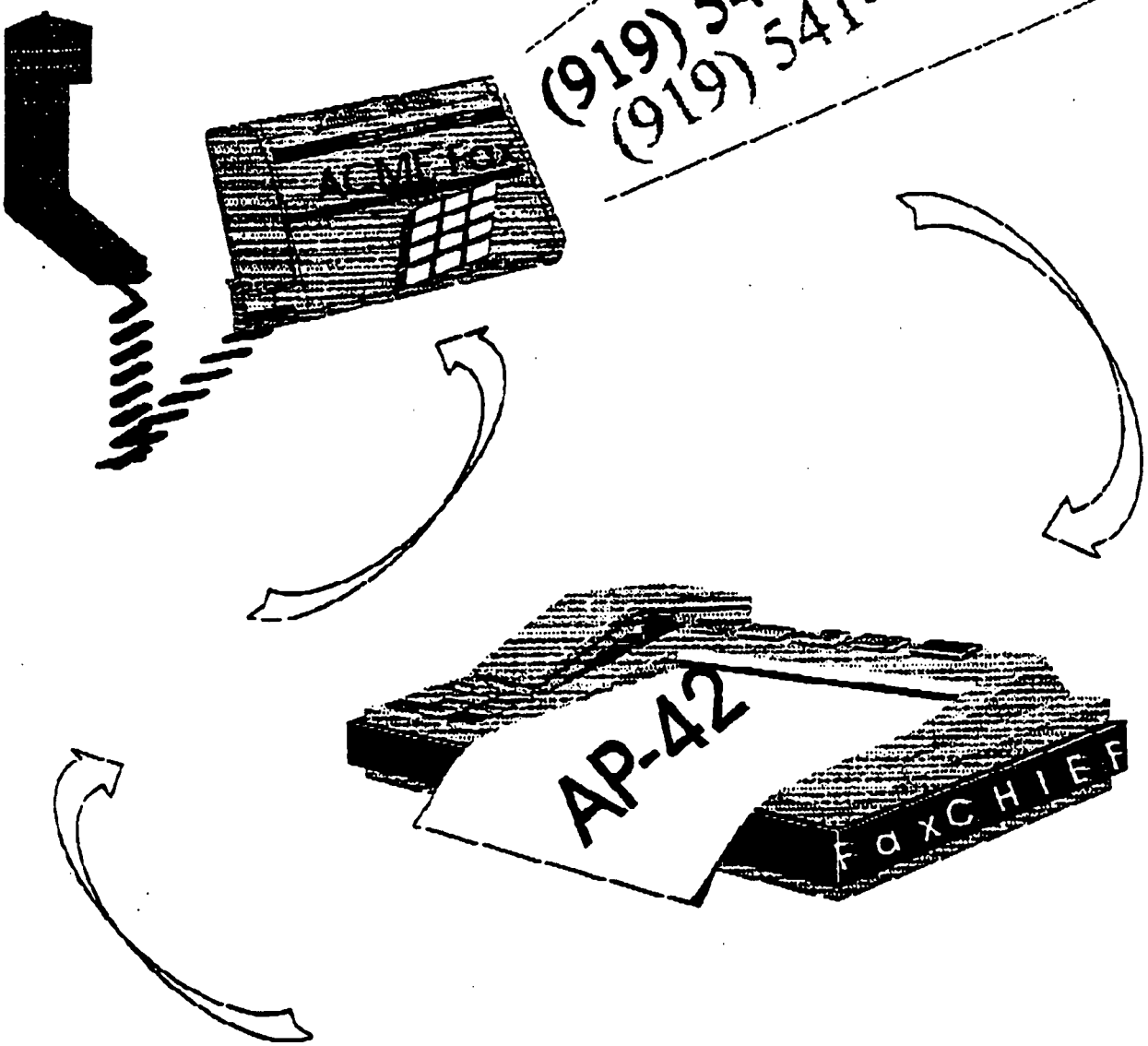
This follows from the empirical relationship that the vertical flux of particles smaller than 10 μm diameter is proportional to the cube of wind speed. Because highly erodible soils do not readily retain moisture, no moisture-related parameter is included in the equation.

Here is the information you requested.
Date: Mon Mar 20, 1995 11:58 AM

This is the information you requested from

Fax CHIEF

(919) 541-5626
(919) 541-0548



If you need assistance, phone Info CHIEF at (919) 541-5285

Index (Document #001) updated on February 22, 1995

13.2.2 AGGREGATE HANDLING AND STORAGE PILES

13.2.2.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, such as material loading onto the pile, disturbances by strong wind currents, and loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

13.2.2.2 Emissions And Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Emissions also depend on three parameters of the condition of a particular storage pile: age of the pile, moisture content, and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, the potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents, either from aggregate transfer itself or from high winds. As the aggregate pile weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and then the drying process is very slow.

Silt (particles equal to or less than 75 microns in diameter) content is determined by measuring the portion of dry aggregate material that passes through a 200-mesh screen, using ASTM-C-136 method.[1] Table 13.2.2-1 summarizes measured silt and moisture values for industrial aggregate materials.

13.2.2.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

Table 13.2.2-1. TYPICAL SILT AND MOISTURE CONTENTS OF MATERIALS AT VARIOUS INDUSTRIES[a]

Industry	No. of Facilities	Material	Silt Content (%)			Moisture Content (%)		
			No. of Samples	Range	Mean	No. of Samples	Range	Mean
Iron and steel production	9	Pellet ore	13	1.3 - 13	4.3	11	0.64 - 4.0	2.2
		Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.0	5.4
		Coal	12	2.0 - 7.7	4.6	11	2.8 - 11	4.8
		Slag	3	3.0 - 7.3	5.3	3	0.25 - 2.0	0.92
		Flue dust	3	2.7 - 23	13	1	-	17
		Coke breeze	2	4.4 - 5.4	4.9	2	6.4 - 9.2	7.8
		Blended ore	1	-	15	1	-	6.6
		Sinter	1	-	0.7	0	-	-
		Limestone	3	0.4 - 2.3	1.0	2	NA	0.2
Stone quarrying and processing	2	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
		Various limestone products	8	0.8 - 14	3.9	8	0.46 - 5.0	2.1
Taconite mining and processing	1	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.0	0.9
		Tailings	2	NA	1	1	-	0.4
Western surface coal mining	4	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
		Overburden	15	3.8 - 15	7.5	0	-	-
		Exposed ground	3	5.1 - 21	15	3	0.8 - 6.4	3.4
Coal-fired power plant	1	Coal (as received)	60	0.6 - 4.8	2.2	59	2.7 - 7.4	4.5
Municipal solid waste landfills	4	Sand	1	-	2.6	1	-	7.4
		Slag	2	3.0 - 4.7	3.8	2	2.3 - 4.9	3.6
		Cover	5	5.0 - 16	9.0	5	8.9 - 16	12
		Clay/dirt mix	1	-	9.2	1	-	14
		Clay	2	4.5 - 7.4	6.0	2	8.9 - 11	10
		Fly ash	4	78 - 81	80	4	26 - 29	27
		Misc. fill materials	1	-	12	1	-	11

[a]References 1 - 10. NA = Not Available.

The quantity of particulate emissions generated by either type of drop operation, per kg (ton) of material transferred, may be estimated, with a rating of A, using the following empirical expression:[11]

$$E = k(0.0016) \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (kg/Mg)}$$

$$E = k(0.0032) \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \text{ (lb/ton)}$$

where: E = emission factor
k = particle size multiplier (dimensionless)
U = mean wind speed, m/s (mph)
M = material moisture content (%)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) for Equation				
< 30 μm	< 15 μm	< 10 μm	< 5 μm	< 2.5 μm
0.74	0.48	0.35	0.20	0.11

The equation retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows. Note that silt content is included, even though silt content does not appear as a correction parameter in the equation. While it is reasonable to expect that silt content and emission factors are interrelated, no significant correlation between the two was found during the derivation of the equation, probably because most tests with high silt contents were conducted under lower winds, and vice versa. It is recommended that estimates from the equation be reduced one quality rating level, if the silt content used in a particular application falls outside the range given:

Ranges Of Source Conditions For Equation

		Wind Speed	
Silt Content (%)	Moisture Content (%)	(m/s)	(mph)
0.44 - 19	0.25 - 4.8	0.6 - 6.7	1.3 - 15

To retain the quality rating of the equation when it is applied to a specific facility, reliable correction parameters must be determined for specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site specific values for

correction parameters cannot be obtained, the appropriate mean from Table 13.2.2-1 may be used, but the quality rating of the equation is reduced by one letter.

For emissions from equipment traffic (trucks, front-end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 13.2.1). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

Worst-case emissions from storage pile areas occur under dry, windy conditions. Worst-case emissions from materials-handling operations may be calculated by substituting into the equation appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for Section 13.2.1, Vehicle Traffic, Unpaved Road, follows the methodology described in that section centering on parameter p. A separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity also may be justified for the worst-case averaging period.

13.2.2.4 Controls[12-13]

Watering and the use of chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical agents (such as surfactants) that permit more extensive wetting. Continuous chemical treating of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[12]

References for Section 13.2.2

1. C. Cowherd, Jr., *et al., Development Of Emission Factors For Fugitive Dust Sources*, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. Bohn, *et al., Fugitive Emissions From Integrated Iron And Steel Plants*, EPA 600/2 78 050, U. S. Environmental Protection Agency, Cincinnati, OH, March 1978.

3. C. Cowherd, Jr., *et al., Iron And Steel Plant Open Dust Source Fugitive Emission Evaluation*, EPA-600/2-79-103, U. S. Environmental Protection Agency, Cincinnati, OH, May 1979.

4. *Evaluation Of Open Dust Sources In The Vicinity Of Buffalo, New York*, EPA Contract No. 68-02-2545, Midwest Research Institute, Kansas City, MO, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., *Fugitive Emissions Evaluation*, MRI-4343-L, Midwest Research Institute, Kansas City, MO, February 1977.

6. T. Cuscino, Jr., *et al., Taconite Mining Fugitive Emissions Study*, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

Construction Phase	Dust-Generating Activities	Recommended Emission Factor	Comments	Rating Adjustment[a]
	5. Loading of excavated material into trucks	Material handling factor in Section 13.2.2		−0/−1[b]
	6. Truck dumping of fill material, road base, or other materials	Material handling factor in Section 13.2.2	May occur off-site	−0/−1[b]
	7. Compacting	Dozer equation in Table 11.24-1, -2	Emission factor downgraded because of differences in operating equipment	−1/−2[b]
	8. Motor grading	Grading equation in Table 11.24-1, -2		−1/−2[b]
III. General Construction	1. Vehicular traffic	Unpaved road emission factor in Section 13.2.1, or Paved road emission factor in Section 13.2.4		−0/−1[b] −0/−1[b]
	2. Portable plants			
	2a. Crushing	Factors for similar material/operations in Section 11 of this document		−1/−2[b]
	2b. Screening	Factors for similar material/operations in Section 11 of this document		−1/−2[b]
	2c. Material transfers	Material handling factor in Section 13.2.2		−0/−1[b]
	3. Other operations	Factors for similar material/operations in Section 11 of this document		—

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13.2.1 UNPAVED ROADS

13.2.1.1 General

Dust plumes trailing behind vehicles traveling on unpaved roads are a familiar sight in rural areas of the United States. When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

13.2.1.2 Emissions Calculation And Correction Parameters

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on correction parameters (average vehicle speed, average vehicle weight, average number of wheels per vehicle, road surface texture and road surface moisture) that characterize the condition of a particular road and the associated vehicle traffic.[1-4]

Dust emissions from unpaved roads have been found to vary in direct proportion to the fraction of silt (particles smaller than 75 micrometers in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. Table 13.2.1-1 summarizes measured silt values for industrial and rural unpaved roads.

Since the silt content of a rural dirt road will vary with location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall. The temporary reduction in emissions caused by precipitation may be accounted for by not considering emissions on "wet" days (more than 0.254 millimeters [0.01 inches] of precipitation).

The following empirical expression may be used to estimate the quantity of size specific particulate emissions from an unpaved road, per vehicle kilometer traveled (VKT) or vehicle mile traveled (VMT):

$$E = k(1.7)\left(\frac{s}{12}\right)^{s}\left(\frac{S}{48}\right)^{S}\left(\frac{W}{2.7}\right)^{0.7}\left(\frac{w}{4}\right)^{w}{}^{0.5}\left(\frac{365-p}{365}\right) \quad \text{(kg/VKT)}$$

$$E = k(5.9)\left(\frac{s}{12}\right)\left(\frac{S}{30}\right)\left(\frac{W}{3}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\left(\frac{365-p}{365}\right) \quad \text{(lb/VMT)} \qquad (1)$$

where:

E = emission factor
k = particle size multiplier (dimensionless)
s = silt content of road surface material (%)
S = mean vehicle speed, km/hr (mph)
W = mean vehicle weight, Mg (ton)
w = mean number of wheels
p = number of days with at least 0.254 mm (0.01 in.) of precipitation per year (see discussion below about the effect of precipitation.)

The particle size multiplier in the equation, k, varies with aerodynamic particle size range as follows:

Aerodynamic Particle Size Multiplier For Equation					
≤30 μm[a]	≤30 μm	≤15 μm	≤10 μm	≤5 μm	≤2.5 μm
1.0	0.80	0.50	0.36	0.20	0.095

[a]Stokes diameter.

The number of wet days per year, p, for the geographical area of interest should be determined from local climatic data. Figure 13.2.1-1 gives the geographical distribution of the mean annual number of wet days per year in the United States.[17] The equation is rated "A" for dry conditions (p = 0) and "B" for annual or seasonal conditions (p > 0). The lower rating is applied because extrapolation to seasonal or annual conditions assumes that emissions occur at the estimated rate on days without measurable precipitation and, conversely, are absent on days with measurable precipitation. Clearly, natural mitigation depends not only on how much precipitation falls, but also on other factors affecting the evaporation rate, such as ambient air temperature, wind speed, and humidity. Persons in dry, arid portions of the country may wish to base p (the number of wet days) on a greater amount of precipitation than 0.254 millimeters (0.01 inch). In addition, Reference 18 contains procedures to estimate the emission reduction achieved by the application of water to an unpaved road surface.

The equation retains the assigned quality rating, if applied within the ranges of source conditions that were tested in developing the equation, as follows:

Ranges Of Source Conditions for Equation					
Road Silt Content (wt %)	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels
	Mg	ton	km/hr	mph	
4.3 - 20	2.7 - 142	3 - 157	21 - 64	13 40	4 - 13

Moreover, to retain the quality rating of the equation when addressing a specific unpaved road, it is necessary that reliable correction parameter values be determined for the road in question. The field

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III.B.5. Calculate the maximum Short-Term Impact, C_{ST}, from the area source using the equation below:

$$C_{ST}\ (ug/m3) = C_p\ 100.$$

where C_p is the maximum Potential Annual Impact as defined above.

III.C. ALTERNATE AREA SOURCE METHOD

The following alternate area source method was developed specifically for remediation projects and urban scale emissions. It has the flexibility to permit the calculation of the maximum annual concentration within an area source. Annual impacts may be estimated both within and downwind from an area source. However, the method has not been modified to estimate short-term impacts. The method will perform better the closer the source characteristics and assumptions approximate those specified in Section IV.G. The contribution from nearby area sources can be calculated by the procedures outlined below. Only sources located within a distance of 3S (S is the length of a side of the area source) from the source being analyzed need be considered. The method can calculate impacts at receptor distances from the source boundary to a distance of 2.5S from the area source. This range encompasses practically all cases of interest in these types of applications.

The following procedures are valid for ground level area sources, effectively less than 10 feet in height, with side lengths greater than 330 feet:

III.C.1. Determine the area source emission rate (Q_A) in units of $lb/(hr\text{-}ft^2)$ by dividing the total annual emission rate, Q_a (lb/hr), by the area, A (ft^2), of the source.

$$Q_A\ \frac{(\ lb\ )}{(hr\text{-}ft^2)} = \frac{(\text{emission rate})}{(\text{area})} = \frac{Q_a}{A}$$

III.C.2. Calculate the maximum Actual Annual Impact, C_a, within the area source as defined below:

$$C_a(ug/m^3) = K \quad Q_A \quad C_m$$

Where: K_1 = 15 for 330 ft ≤ S< 3300 ft
K = 30 for S ≥ 3300 ft
C_m = 1.355×10^2, a conversion factor from $lb/(hr\text{-}ft^2)$ to $ug/m^2\text{-}sec$).

PLATTSBURGH AIR FORCE BASE
SITE SS-026 EOD RANGE
MODELING OF EXPOSURE CONCENTRATIONS FOR ORGANIC CHEMICALS DURING SHOWERING

1.0 PURPOSE

In the future land use scenario at SS-026, groundwater may be used by industrial workers at the site. Human exposure may result from ingestion of groundwater but also from inhalation of contaminants transferred from groundwater to air during showering. Consequently, a model has been developed to estimate the quantity of organic chemicals transferred from groundwater to air during showering, and the subsequent exposure concentrations in the shower.

2.0 METHODOLOGY

The method used for determining exposure concentrations is based on the method described in Human Exposure to Volatile Organic Compounds in Household Tap Water: Indoor Inhalation Pathway by Thomas McKone. Exposure concentrations in the shower were determined by the following equation:

$$C_S = \frac{W \bullet \varnothing \bullet C_w}{V_s \bullet C_F}$$

Where:

CS = chemical concentration in air during shower (mg/m3)

W = water used during shower (1)

$\varnothing$ = transfer efficiency from water to air (unitless)

CW = chemical concentration in water (mg/l)

Vs = volume of shower (liters)

CF = conversion factor for water (1 m3/1000-liters)

Values for W (300 liters) and Vs (2,000 liters) are representative values specified in McKone. Transfer efficiencies are based on the transfer efficiency of radon, which has been measured, and are dependent on specific chemical parameters. These transfer efficiencies were calculated as follows:

$$\varnothing = \frac{\varnothing_R([2.5/D_{wr}^{2/3}]+[RT/(D_{ar}^{2/3}H_r)])}{([2.5/D_{BW}^{2/3}]+[RT/(D_{BA}^{2/3}H)])}$$

Where:

ØR	=	transfer efficiency for radon (unitless)
Dwr	=	diffusion coefficient in water for radon (m2/s)
Dar	=	diffusion coefficient in air for radon (m2/s)
Hr	=	Henry's Law Constant for radon (torr-m3/mol)
DBW	=	diffusion coefficient for chemical in water (m2/s)
DBA	=	diffusion coefficient for chemical in air (m2/s)
H	=	Henry's Law Constant for chemical (torr-m3/mol)
R	=	gas constant, 0.0624 (torr-m3/mol-oK)
T	=	temperature (oK)

Values for ØR(0.70), Dwr (1.4 x 10-9 m2/s), Dar (2.0 x 10-5 m2/s), and Hr (70 torr-m3/mol) are presented in McKone. Values for chemical-specific parameters were obtained from

the Hazardous Waste Treatment, Storage, and Disposal (TSDF) - Air Emission Models by USEPA. When the diffusion coefficients could not be obtained from this source, the values were calculated by the methods outlined in the Handbook of Chemical Property Estimation Methods, by W.J. Lyman, et al.

The Hayduk and Laudie method was used to estimate the diffusion coefficient of compounds in water. It utilizes the following equation:

$$D_{BW} = \frac{13.26 \times 10^{-5}}{N_w^{1.14} V_B^{0.589}}$$

[Eqn. 17-24 from Lyman, et al., 1982]

Where:

DBW = diffusion coefficient for chemical in water (cm 2/s)

Nw = viscosity of water (at 25°C = 0.8904 cp)

V'B = molar (cm3/Mol volume estimated by the LeBas method, summing the applicable incremental values from Table 17-5 (Lyman, et al., 1982)

Similarly, the Fuller, Schettler, and Giddings Method (FSG) was used to calculate the diffusion coefficients of compounds in air. This equation is:

$$D_{BA} = \frac{10^{-3} T^{1.75} \sqrt{M_r}}{P(V_A^{1/3} + V_B^{1/3})^2}$$

[Eqn. 17-12 from Lyman, et al, 1982]

Where:

DBA = diffusion coefficient for chemical in air (cm 2/s)

T = temperature (oK)

P = pressure (atm)

Mr = (MA + MB)/(MAMB)

MA = molecular weight of air

MB = molecular weight of compound

VA = molar volume for air (cm3/Mol)

VB = molar volume of compound, (cm3/Mol calculated by summing the applicable incremental values from Table 17-4 (Lyman, et al. 1982)

3.0 RESULTS

Transfer efficiencies and respirable exposure concentrations for organic chemicals detected in groundwater are presented on Table 7-7.

REFERENCES

Lyman, W.J., et al. Handbook of Chemical Property Estimation Methods. McGraw Hill, 1982.

McKone, T.E., Human Exposure to Volatile Organic Compounds in Household Tap Water: The Indoor Inhalation Pathway. Environmental Science Technology, Vol. 21, No. 12, 1987.

USEPA, Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF) - Air Emission Models, EPA-450/3-87-26, December 1987.

APPENDIX O

HUMAN HEALTH RISK ASSESSMENT CALCULATIONS

TABLE O-1

INGESTION OF CARCINOGENIC CHEMICALS IN SURFACE SOIL - CANCER RISK
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	INTAKE (mg/kg-day) TRESPASSER ADULT	INTAKE (mg/kg-day) TRESPASSER TEENAGER	SLOPE FACTOR (mg/kg-day)^-1 ORAL	CANCER RISK (unitless) TRESPASSER ADULT	CANCER RISK (unitless) TRESPASSER TEENAGER
Methylene Chloride	1.61E-02	2.10E-09	5.25E-10	7.50E-03	1.57E-11	3.94E-12
4-Methylphenol (p-cresol)	3.22E-01	4.22E-08	1.05E-08	NV	NV	NV
Naphthalene	1.64E+00	2.14E-07	5.36E-08	NV	NV	NV
Carbazole	1.72E+00	2.25E-07	5.62E-08	2.00E-02	4.50E-09	1.12E-09
Benzo(a)anthracene	5.06E+00	6.62E-07	1.66E-07	7.30E-01	4.83E-07	1.21E-07
Chrysene	2.24E+00	2.93E-07	7.34E-08	7.30E-03	2.14E-09	5.36E-10
bis(2-Ethylhexyl)phthalate	5.17E-01	6.77E-08	1.69E-08	1.40E-02	9.48E-10	2.37E-10
Benzo(b)fluoranthene	1.39E+00	1.82E-07	4.55E-08	7.30E-01	1.33E-07	3.32E-08
Benzo(k)fluoranthene	1.22E+00	1.60E-07	4.00E-08	7.30E-02	1.17E-08	2.92E-09
Benzo(a)pyrene	1.61E+00	2.10E-07	5.26E-08	7.30E+00	1.54E-06	3.84E-07
Indeno(1,2,3-cd)pyrene	1.39E+00	1.82E-07	4.55E-08	7.30E-01	1.33E-07	3.32E-08
Dibenz(a,h)anthracene	9.70E-01	1.27E-07	3.17E-08	7.30E+00	9.27E-07	2.32E-07
4,4'-DDE	1.00E-03	1.31E-10	3.27E-11	3.40E-01	4.45E-11	1.11E-11
4,4'-DDT	2.20E-03	2.88E-10	7.20E-11	3.40E-01	9.79E-11	2.45E-11
RDX	1.50E+00	1.96E-07	4.91E-08	1.10E-01	2.16E-08	5.40E-09
Dioxins & Furans (Toxicity Equivalence)	8.00E-08	1.05E-14	2.62E-15	1.50E+05	1.57E-09	3.93E-10
			TOTAL CANCER RISK		3.E-06	8.E-07

PARAMETER	SYMBOL	UNITS	TRESPASSER ADULT	TRESPASSER TEENAGER
Ingestion rate	IR	mg/day	100	100
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06
Fraction ingested from contaminated source	FI	unitless	1	1
Exposure frequency	EF	days/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	25550	25550

NOTES:

NV - No Value

EQUATIONS:

Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-2

INGESTION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN SURFACE SOIL - HAZARD INDICES
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	INTAKE (mg/kg-day) TRESPASSER		REFERENCE DOSE ORAL RfD (mg/kg-day)		HAZARD QUOTIENT (unitless) TRESPASSER	
		ADULT	TEENAGER	CHRONIC	SUBCHRONIC	ADULT	TEENAGER
Methylene Chloride	1.61E-02	4.90E-09	6.12E-09	6.00E-02	6.00E-02	8.17E-08	1.02E-07
Acetone	3.07E-02	9.36E-09	1.17E-08	1.00E-01	1.00E+00	9.36E-08	1.17E-08
Toluene	8.32E-03	2.54E-09	3.17E-09	2.00E-01	2.00E+00	1.27E-08	1.59E-09
4-Methylphenol (p-cresol)	3.22E-01	9.84E-08	1.23E-07	5.00E-03	5.00E-03	1.97E-05	2.46E-05
Naphthalene	1.64E+00	5.00E-07	6.25E-07	2.00E-02	2.00E-02	2.50E-05	3.12E-05
2-Methylnaphthalene	1.26E+00	3.85E-07	4.82E-07	NV	NV	NV	NV
Acenaphthene	1.82E+00	5.55E-07	6.94E-07	6.00E-02	6.00E-01	9.25E-06	1.16E-06
Dibenzofuran	1.33E+00	4.05E-07	5.06E-07	NV	NV	NV	NV
Fluorene	1.90E+00	5.79E-07	7.24E-07	4.00E-02	4.00E-01	1.45E-05	1.81E-06
Phenanthrene	6.53E+00	1.99E-06	2.49E-06	NV	NV	NV	NV
Carbazole	1.72E+00	5.25E-07	6.56E-07	NV	NV	NV	NV
Di-n-butylphthalate	3.52E-01	1.07E-07	1.34E-07	1.00E-01	1.00E+00	1.07E-06	1.34E-07
Fluoranthene	5.61E+00	1.71E-06	2.14E-06	4.00E-02	4.00E-01	4.28E-05	5.35E-06
Pyrene	5.66E+00	1.73E-06	2.16E-06	3.00E-02	3.00E-01	5.76E-05	7.21E-06
Benzo(a)anthracene	5.06E+00	1.54E-06	1.93E-06	NV	NV	NV	NV
Chrysene	2.24E+00	6.85E-07	8.56E-07	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	5.17E-01	1.58E-07	1.97E-07	2.00E-02	2.00E-02	7.90E-06	9.87E-06
Benzo(b)fluoranthene	1.39E+00	4.24E-07	5.30E-07	NV	NV	NV	NV
Benzo(k)fluoranthene	1.22E+00	3.73E-07	4.66E-07	NV	NV	NV	NV
Benzo(a)pyrene	1.61E+00	4.91E-07	6.14E-07	NV	NV	NV	NV
Indeno(1,2,3-cd)pyrene	1.39E+00	4.24E-07	5.30E-07	NV	NV	NV	NV
Dibenz(a,h)anthracene	9.70E-01	2.96E-07	3.70E-07	NV	NV	NV	NV
Benzo(g,h,i)perylene	1.46E+00	4.44E-07	5.55E-07	NV	NV	NV	NV
4,4'-DDE	1.00E-03	3.05E-10	3.82E-10	NV	NV	NV	NV
4,4'-DDT	2.20E-03	6.72E-10	8.40E-10	5.00E-04	5.00E-04	1.34E-06	1.68E-06
RDX	1.50E+00	4.58E-07	5.72E-07	3.00E-03	3.00E-03	1.53E-04	1.91E-04
Dioxins & Furans (Toxicity Equivalence)	8.00E-08	2.44E-14	3.05E-14	NV	NV	NV	NV
Selenium	3.61E+00	1.10E-06	1.38E-06	5.00E-03	5.00E-03	2.20E-04	2.76E-04
Zinc	1.20E+02	3.67E-05	4.59E-05	3.00E-01	3.00E-01	1.22E-04	1.53E-04
					TOTAL HAZARD INDEX	7E-04	7E-04

PARAMETER	SYMBOL	UNITS	TRESPASSER	
			ADULT	TEENAGER
Ingestion rate	IR	mg/day	100	100
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06
Fraction ingested from contaminated source	FI	unitless	1	1
Exposure frequency	EF	days/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	10950	2190

NOTES:

NV - No Value

EQUATIONS:

Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O - 3

DERMAL CONTACT WITH CARCINOGENIC CHEMICALS IN SURFACE SOIL - CANCER RISK
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	CHEMICAL CONCENTRATION IN SOIL (CS) (mg/kg)	ABSORPTION FACTOR (unitless)	ABSORBED DOSE (mg/kg-day) TRESPASSER		SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK (unitless) TRESPASSER	
			ADULT	TEENAGER	ORAL	ADULT	TEENAGER
Methylene Chloride	1.61E-02	NV	NV	NV	7.50E-03	NV	NV
4-Methylphenol (p-cresol)	3.22E-01	0.1	3.35E-07	8.38E-08	NV	NV	NV
Naphthalene	1.64E+00	0.13	2.21E-06	5.53E-07	NV	NV	NV
Carbazole	1.72E+00	0.1	1.79E-06	4.47E-07	2.00E-02	3.57E-08	8.94E-09
Benzo(a)anthracene	5.06E+00	0.13	6.84E-06	1.71E-06	7.30E-01	4.99E-06	1.25E-06
Chrysene	2.24E+00	0.13	3.03E-06	7.58E-07	7.30E-03	2.21E-08	5.53E-09
bis(2-Ethylhexyl)phthalate	5.17E-01	0.1	5.38E-07	1.35E-07	1.40E-02	7.53E-09	1.88E-09
Benzo(b)fluoranthene	1.39E+00	0.13	1.88E-06	4.70E-07	7.30E-01	1.37E-06	3.43E-07
Benzo(k)fluoranthene	1.22E+00	0.13	1.65E-06	4.13E-07	7.30E-02	1.21E-07	3.02E-08
Benzo(a)pyrene	1.61E+00	0.13	2.17E-06	5.43E-07	7.30E+00	1.59E-05	3.97E-06
Indeno(1,2,3-cd)pyrene	1.39E+00	0.13	1.88E-06	4.70E-07	7.30E-01	1.37E-06	3.43E-07
Dibenz(a,h)anthracene	9.70E-01	0.13	1.31E-06	3.28E-07	7.30E+00	9.58E-06	2.39E-06
4,4'-DDE	1.00E-03	NV	NV	NV	3.40E-01	NV	NV
4,4'-DDT	2.20E-03	0.03	6.86E-10	1.72E-10	3.40E-01	2.33E-10	5.83E-11
RDX	1.50E+00	NV	NV	NV	1.10E-01	NV	NV
Dioxins & Furans (Toxicity Equivalence)	8.00E-08	0.03	2.50E-14	6.24E-15	1.50E+05	3.74E-09	9.36E-10
					TOTAL CANCER RISK	**3.E-05**	**9.E-06**

PARAMETER	SYMBOL	UNITS	TRESPASSER	
			ADULT	TEENAGER
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06
Skin surface area available for contact	SA	cm^2/event	7948	7948
Soil to skin adherence factor	AF	mg/cm^2	1	1
Exposure frequency	EF	events/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	25550	25550

NOTES:
NV - No Value
EQUATIONS:
Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)
Cancer Risk = (Absorbed Dose) × (Slope Factor)

TABLE O-4

DERMAL CONTACT WITH NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN SURFACE SOIL - HAZARD INDICES
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATIO IN SOIL (CS) (mg/kg)	ABSORPTION FACTOR (unitless)	ABSORBED DOSE (mg/kg-day) TRESPASSER		REFERENCE DOSE ADJUSTED ORAL RfD* (mg/kg-day)		HAZARD QUOTIENT (unitless) TRESPASSER	
			ADULT	TEENAGER	CHRONIC	UBCHRONI	ADULT	TEENAGER
Methylene Chloride	1.61E-02	NV	NV	NV	6.00E-02	6.00E-02	NV	NV
Acetone	3.07E-02	NV	NV	NV	1.00E-01	1.00E+00	NV	NV
Toluene	8.32E-03	NV	NV	NV	2.00E-01	2.00E+00	NV	NV
4-Methylphenol (p-cresol)	3.22E-01	0.1	7.82E-07	9.78E-07	5.00E-03	5.00E-03	1.56E-04	1.96E-04
Naphthalene	1.64E+00	0.13	5.16E-06	6.46E-06	2.00E-02	2.00E-02	2.58E-04	3.23E-04
2-Methylnaphthalene	1.26E+00	0.13	3.98E-06	4.98E-06	NV	NV	NV	NV
Acenaphthene	1.82E+00	0.13	5.73E-06	7.17E-06	6.00E-02	6.00E-01	9.56E-05	1.19E-05
Dibenzofuran	1.33E+00	0.1	3.22E-06	4.02E-06	NV	NV	NV	NV
Fluorene	1.90E+00	0.13	5.98E-06	7.48E-06	4.00E-02	4.00E-01	1.50E-04	1.87E-05
Phenanthrene	6.53E+00	0.13	2.06E-05	2.58E-05	NV	NV	NV	NV
Carbazole	1.72E+00	0.1	4.17E-06	5.21E-06	NV	NV	NV	NV
Di-n-butylphthalate	3.52E-01	0.1	8.54E-07	1.07E-06	1.00E-01	1.00E+00	8.54E-06	1.07E-06
Fluoranthene	5.61E+00	0.13	1.77E-05	2.21E-05	4.00E-02	4.00E-01	4.42E-04	5.53E-05
Pyrene	5.66E+00	0.13	1.79E-05	2.23E-05	3.00E-02	3.00E-01	5.96E-04	7.44E-05
Benzo(a)anthracene	5.06E+00	0.13	1.60E-05	2.00E-05	NV	NV	NV	NV
Chrysene	2.24E+00	0.13	7.08E-06	8.84E-06	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	5.17E-01	0.1	1.26E-06	1.57E-06	2.00E-02	2.00E-02	6.28E-05	7.85E-05
Benzo(b)fluoranthene	1.39E+00	0.13	4.38E-06	5.48E-06	NV	NV	NV	NV
Benzo(k)fluoranthene	1.22E+00	0.13	3.86E-06	4.82E-06	NV	NV	NV	NV
Benzo(a)pyrene	1.61E+00	0.13	5.07E-06	6.34E-06	NV	NV	NV	NV
Indeno(1,2,3-cd)pyrene	1.39E+00	0.13	4.38E-06	5.48E-06	NV	NV	NV	NV
Dibenz(a,h)anthracene	9.70E-01	0.13	3.06E-06	3.83E-06	NV	NV	NV	NV
Benzo(g,h,i)perylene	1.46E+00	0.13	4.59E-06	5.74E-06	NV	NV	NV	NV
4,4'-DDE	1.00E-03	NV	NV	NV	NV	NV	NV	NV
4,4'-DDT	2.20E-03	0.03	1.60E-09	2.00E-09	5.00E-04	5.00E-04	3.20E-06	4.00E-06
RDX	1.50E+00	NV	NV	NV	3.00E-03	3.00E-03	NV	NV
Dioxins & Furans (Toxicity Equivalenc	8.00E-08	0.03	5.82E-14	7.28E-14	NV	NV	NV	NV
Selenium	3.61E+00	NV	NV	NV	5.00E-03	5.00E-03	NV	NV
Zinc	1.20E+02	NV	NV	NV	3.00E-01	3.00E-01	NV	NV
						TOTAL HAZARD INDEX	2E-03	8E-04

PARAMETER	SYMBOL	UNITS	TRESPASSER	
			ADULT	TEENAGER
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06
Skin surface area available for contact	SA	cm^2/event	7948	7948
Soil to skin adherence factor	AF	mg/cm^2	1	1
Exposure frequency	EF	events/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	10950	2190

NOTES:

NV - No Value

EQUATIONS:

Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)

Hazard Quotient = (Absorbed Dose) / (Reference Dose)

TABLE O-5

INHALATION OF CARCINOGENIC CHEMICALS FROM FUGITIVE DUST - CANCER RISK
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	RESPIRABLE CONCENTRATION (CA) (mg/m^3)	INTAKE (mg/kg-day) TRESPASSER ADULT	INTAKE (mg/kg-day) TRESPASSER TEENAGER	SLOPE FACTOR (mg/kg-day)^-1 INHALATION	CANCER RISK (unitless) TRESPASSER ADULT	CANCER RISK (unitless) TRESPASSER TEENAGER
Methylene Chloride	1.37E-09	9.33E-12	2.69E-12	1.60E-03	1.49E-14	4.30E-15
4-Methylphenol (p-cresol)	2.75E-08	1.87E-10	5.40E-11	NV	NV	NV
Naphthalene	1.40E-07	9.51E-10	2.74E-10	NV	NV	NV
Carbazole	1.47E-07	9.99E-10	2.88E-10	NV	NV	NV
Benzo(a)anthracene	4.32E-07	2.94E-09	8.48E-10	NV	NV	NV
Chrysene	1.92E-07	1.30E-09	3.76E-10	NV	NV	NV
bis(2-Ethylhexyl)phthalate	4.42E-08	3.01E-10	8.67E-11	NV	NV	NV
Benzo(b)fluoranthene	1.19E-07	8.08E-10	2.33E-10	NV	NV	NV
Benzo(k)fluoranthene	1.04E-07	7.10E-10	2.05E-10	NV	NV	NV
Benzo(a)pyrene	1.37E-07	9.34E-10	2.69E-10	NV	NV	NV
Indeno(1,2,3-cd)pyrene	1.19E-07	8.08E-10	2.33E-10	NV	NV	NV
Dibenz(a,h)anthracene	8.29E-08	5.64E-10	1.63E-10	NV	NV	NV
4,4'-DDE	8.54E-11	5.81E-13	1.68E-13	NV	NV	NV
4,4'-DDT	1.88E-10	1.28E-12	3.69E-13	3.40E-01	4.34E-13	1.25E-13
RDX	1.28E-07	8.72E-10	2.51E-10	NV	NV	NV
Dioxins & Furans (Toxicity Equivalence)	6.83E-15	4.65E-17	1.34E-17	1.50E+05	6.97E-12	2.01E-12
		TOTAL CANCER RISK			7.E-12	2.E-12

PARAMETER	SYMBOL	UNITS	TRESPASSER ADULT	TRESPASSER TEENAGER
Inhalation rate	IR	m^3/hr	1.3	1.5
Exposure time	ET	hours/day	4	4
Exposure frequency	EF	days/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	25550	25550

NOTES:

NV - No Value

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-6

INHALATION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS FROM FUGITIVE DUST - HAZARD INDICES
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	RESPIRABLE CONCENTRATIO (CA) (mg/m³)	INTAKE (mg/kg-day) TRESPASSER		REFERENCE DOSE INHALATION RfD (mg/kg-day)		HAZARD QUOTIENT (unitless) TRESPASSER	
		ADULT	TEENAGER	CHRONIC	SUBCHRONIC	ADULT	TEENAGER
Methylene Chloride	1.37E-09	2.18E-11	3.14E-11	8.57E-01	8.57E-01	2.54E-11	3.66E-11
Acetone	2.62E-09	4.16E-11	6.00E-11	NV	NV	NV	NV
Toluene	7.11E-10	1.13E-11	1.63E-11	1.14E-01	1.14E-01	9.87E-11	1.42E-10
4-Methylphenol (p-cresol)	2.75E-08	4.37E-10	6.30E-10	NV	NV	NV	NV
Naphthalene	1.40E-07	2.22E-09	3.20E-09	8.57E-04	8.57E-04	2.59E-06	3.74E-06
2-Methylnaphthalene	1.08E-07	1.71E-09	2.47E-09	NV	NV	NV	NV
Acenaphthene	1.55E-07	2.46E-09	3.55E-09	NV	NV	NV	NV
Dibenzofuran	1.13E-07	1.80E-09	2.59E-09	NV	NV	NV	NV
Fluorene	1.62E-07	2.57E-09	3.71E-09	NV	NV	NV	NV
Phenanthrene	5.58E-07	8.86E-09	1.28E-08	NV	NV	NV	NV
Carbazole	1.47E-07	2.33E-09	3.36E-09	NV	NV	NV	NV
Di-n-butylphthalate	3.01E-08	4.77E-10	6.88E-10	NV	NV	NV	NV
Fluoranthene	4.79E-07	7.60E-09	1.10E-08	NV	NV	NV	NV
Pyrene	4.84E-07	7.68E-09	1.11E-08	NV	NV	NV	NV
Benzo(a)anthracene	4.32E-07	6.86E-09	9.90E-09	NV	NV	NV	NV
Chrysene	1.92E-07	3.04E-09	4.39E-09	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	4.42E-08	7.02E-10	1.01E-09	NV	NV	NV	NV
Benzo(b)fluoranthene	1.19E-07	1.88E-09	2.72E-09	NV	NV	NV	NV
Benzo(k)fluoranthene	1.04E-07	1.66E-09	2.39E-09	NV	NV	NV	NV
Benzo(a)pyrene	1.37E-07	2.18E-09	3.14E-09	NV	NV	NV	NV
Indeno(1,2,3-cd)pyrene	1.19E-07	1.88E-09	2.72E-09	NV	NV	NV	NV
Dibenz(a,h)anthracene	8.29E-08	1.32E-09	1.90E-09	NV	NV	NV	NV
Benzo(g,h,i)perylene	1.24E-07	1.97E-09	2.85E-09	NV	NV	NV	NV
4,4'-DDE	8.54E-11	1.36E-12	1.96E-12	NV	NV	NV	NV
4,4'-DDT	1.88E-10	2.98E-12	4.30E-12	NV	NV	NV	NV
RDX	1.28E-07	2.03E-09	2.93E-09	NV	NV	NV	NV
Dioxins & Furans (Toxicity Equivalence)	6.83E-15	1.08E-16	1.56E-16	NV	NV	NV	NV
Selenium	3.08E-07	4.89E-09	7.06E-09	NV	NV	NV	NV
Zinc	1.03E-05	1.63E-07	2.35E-07	NV	NV	NV	NV
					TOTAL HAZARD INDEX	3E-06	4E-06

PARAMETER	SYMBOL	UNITS	TRESPASSER	
			ADULT	TEENAGER
Inhalation rate	IR	m³/hr	1.3	1.5
Exposure time	ET	hours/day	4	4
Exposure frequency	EF	days/year	78	78
Exposure duration	ED	years	30	6
Body weight	BW	kg	70	56
Averaging time	AT	days	10950	2190

NOTES:

NV - No Value

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O-7

INGESTION OF CARCINOGENIC CHEMICALS IN SOIL* - CANCER RISK
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	INTAKE (mg/kg-day)			SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK (unitless)		
		RESIDENT		CONSTRUCTION		RESIDENT		CONSTRUCTION
		ADULT	CHILD	WORKER	ORAL	ADULT	CHILD	WORKER
Methylene Chloride	1.12E-02	5.27E-09	1.23E-08	4.52E-11	0.0075	3.96E-11	9.23E-11	3.39E-13
4-Methylphenol (p-cresol)	2.75E-01	1.29E-07	3.02E-07	1.11E-09	NV	NV	NV	NV
Naphthalene	8.06E-01	3.78E-07	8.83E-07	3.24E-09	NV	NV	NV	NV
Carbazole	8.29E-01	3.89E-07	9.08E-07	3.34E-09	0.02	7.78E-09	1.82E-08	6.67E-11
Benzo(a)anthracene	1.57E+00	7.38E-07	1.72E-06	6.32E-09	0.73	5.38E-07	1.26E-06	4.62E-09
Chrysene	9.76E-01	4.58E-07	1.07E-06	3.93E-09	0.0073	3.35E-09	7.81E-09	2.87E-11
bis(2-Ethylhexyl)phthalate	3.88E-01	1.82E-07	4.26E-07	1.56E-09	0.014	2.55E-09	5.96E-09	2.19E-11
Benzo(b)fluoranthene	7.29E-01	3.42E-07	7.99E-07	2.93E-09	0.73	2.50E-07	5.83E-07	2.14E-09
Benzo(k)fluoranthene	6.73E-01	3.16E-07	7.38E-07	2.71E-09	0.073	2.31E-08	5.39E-08	1.98E-10
Benzo(a)pyrene	7.93E-01	3.73E-07	8.69E-07	3.19E-09	7.3	2.72E-06	6.35E-06	2.33E-08
Indeno(1,2,3-cd)pyrene	7.29E-01	3.42E-07	7.99E-07	2.93E-09	0.73	2.50E-07	5.83E-07	2.14E-09
Dibenz(a,h)anthracene	5.81E-01	2.73E-07	6.36E-07	2.34E-09	7.3	1.99E-06	4.65E-06	1.71E-08
4,4'-DDE	1.00E-03	4.70E-10	1.10E-09	4.03E-12	0.34	1.60E-10	3.73E-10	1.37E-12
4,4'-DDT	2.03E-03	9.53E-10	2.22E-09	8.17E-12	0.34	3.24E-10	7.56E-10	2.78E-12
RDX	1.50E+00	7.05E-07	1.64E-06	6.04E-09	0.11	7.75E-08	1.81E-07	6.64E-10
Dioxins & Furans (Toxicity Equivalence)	1.50E-07	7.05E-14	1.64E-13	6.04E-16	150000	1.06E-08	2.47E-08	9.06E-11
					TOTAL CANCER RISK	6E-06	1E-05	5E-08

PARAMETER	SYMBOL	UNITS	RESIDENT		CONSTRUCTION
			ADULT	CHILD	WORKER
Ingestion rate	IR	mg/day	100	200	480
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06	1.00E-06
Fraction ingested from contaminated source	FI	unitless	1	1	1
Exposure frequency	EF	days/year	350	350	60
Exposure duration	ED	years	24	6	0.25
Body weight	BW	kg	70	15	70
Averaging time	AT	days	25550	25550	25550

NOTES:

*Exposure to soil includes surface and subsurface soil data.

NV - No Value

EQUATIONS:

Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-8

INGESTION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN SOIL* - HAZARD INDICES
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	INTAKE (mg/kg-day) RESIDENT ADULT	INTAKE (mg/kg-day) RESIDENT CHILD	INTAKE (mg/kg-day) CONSTRUCTION WORKER	REFERENCE DOSE ORAL RfD (mg/kg-day) CHRONIC	REFERENCE DOSE ORAL RfD (mg/kg-day) SUBCHRONIC	HAZARD QUOTIENT (unitless) RESIDENT ADULT	HAZARD QUOTIENT (unitless) RESIDENT CHILD	HAZARD QUOTIENT (unitless) CONSTRUCTION WORKER
Methylene Chloride	1.12E-02	1.54E-08	1.44E-07	1.27E-08	6.00E-02	6.00E-02	2.56E-07	2.39E-06	2.12E-07
Acetone	2.53E-02	3.47E-08	3.24E-07	2.86E-08	1.00E-01	1.00E+00	3.47E-07	3.24E-07	2.86E-08
Toluene	7.32E-03	1.00E-08	9.36E-08	8.27E-09	2.00E-01	2.00E+00	5.01E-08	4.68E-08	4.14E-09
4-Methylphenol (p-cresol)	2.75E-01	3.77E-07	3.52E-06	3.11E-07	5.00E-03	5.00E-03	7.54E-05	7.04E-04	6.23E-05
Naphthalene	8.06E-01	1.10E-06	1.03E-05	9.11E-07	2.00E-02	2.00E-02	5.52E-05	5.15E-04	4.55E-05
2-Methylnaphthalene	6.86E-01	9.39E-07	8.77E-06	7.75E-07	NV	NV	NV	NV	NV
Acenaphthene	8.59E-01	1.18E-06	1.10E-05	9.71E-07	6.00E-02	6.00E-01	1.96E-05	1.83E-05	1.62E-06
Dibenzofuran	7.06E-01	9.68E-07	9.03E-06	7.98E-07	NV	NV	NV	NV	NV
Diethylphthalate	3.98E-01	5.45E-07	5.08E-06	4.50E-07	0.8	8	6.81E-07	6.36E-07	5.62E-08
Fluorene	8.80E-01	1.21E-06	1.13E-05	9.95E-07	4.00E-02	4.00E-01	3.01E-05	2.81E-05	2.49E-06
Phenanthrene	1.82E+00	2.50E-06	2.33E-05	2.06E-06	NV	NV	NV	NV	NV
Carbazole	8.29E-01	1.13E-06	1.06E-05	9.36E-07	NV	NV	NV	NV	NV
Di-n-butylphthalate	3.52E-01	4.82E-07	4.50E-06	3.98E-07	1.00E-01	1.00E+00	4.82E-06	4.50E-06	3.98E-07
Fluoranthene	1.61E+00	2.21E-06	2.06E-05	1.82E-06	4.00E-02	4.00E-01	5.52E-05	5.16E-05	4.56E-06
Pyrene	1.63E+00	2.23E-06	2.08E-05	1.84E-06	3.00E-02	3.00E-01	7.42E-05	6.93E-05	6.12E-06
Benzo(a)anthracene	1.57E+00	2.15E-06	2.01E-05	1.78E-06	NV	NV	NV	NV	NV
Chrysene	9.76E-01	1.34E-06	1.25E-05	1.10E-06	NV	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	3.88E-01	5.32E-07	4.96E-06	4.39E-07	2.00E-02	2.00E-02	2.66E-05	2.48E-04	2.19E-05
Benzo(b)fluoranthene	7.29E-01	9.98E-07	9.32E-06	8.24E-07	NV	NV	NV	NV	NV
Benzo(k)fluoranthene	6.73E-01	9.22E-07	8.61E-06	7.61E-07	NV	NV	NV	NV	NV
Benzo(a)pyrene	7.93E-01	1.09E-06	1.01E-05	8.96E-07	NV	NV	NV	NV	NV
Indeno(1,2,3-cd)pyrene	7.29E-01	9.98E-07	9.32E-06	8.24E-07	NV	NV	NV	NV	NV
Dibenz(a,h)anthracene	5.81E-01	7.96E-07	7.42E-06	6.56E-07	NV	NV	NV	NV	NV
Benzo(g,h,i)perylene	7.49E-01	1.03E-06	9.57E-06	8.46E-07	NV	NV	NV	NV	NV
4,4'-DDE	1.00E-03	1.37E-09	1.28E-08	1.13E-09	NV	NV	NV	NV	NV
4,4'-DDT	2.03E-03	2.78E-09	2.60E-08	2.29E-09	5.00E-04	5.00E-04	5.56E-06	5.19E-05	4.59E-06
RDX	1.50E+00	2.05E-06	1.92E-05	1.70E-06	3.00E-03	3.00E-03	6.85E-04	6.39E-03	5.65E-04
Dioxins & Furans (Toxicity Equivalence)	1.50E-07	2.05E-13	1.92E-12	1.70E-13	NV	NV	NV	NV	NV
Selenium	4.61E+00	6.32E-06	5.89E-05	5.21E-06	5.00E-03	5.00E-03	1.26E-03	1.18E-02	1.04E-03
Silver	4.90E-01	6.71E-07	6.26E-06	5.54E-07	5.00E-03	5.00E-03	1.34E-04	1.25E-03	1.11E-04
Zinc	1.32E+02	1.81E-04	1.69E-03	1.50E-04	3.00E-01	3.00E-01	6.04E-04	5.64E-03	4.99E-04
TOTAL HAZARD INDEX							3E-03	3E-02	2E-03

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT	RESIDENT CHILD	CONSTRUCTION WORKER
Ingestion rate	IR	mg/day	100	200	480
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06	1.00E-06
Fraction ingested from contaminated source	FI	unitless	1	1	1
Exposure frequency	EF	days/year	350	350	60
Exposure duration	ED	years	24	6	0.25
Body weight	BW	kg	70	15	70
Averaging time	AT	days	8760	2190	91

NOTES:

*Exposure to soil includes surface and subsurface soil data.

NV - No Value

EQUATIONS:

Intake = (CS × IR × CF × FI × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O - 9

DERMAL CONTACT WITH CARCINOGENIC CHEMICALS IN SURFACE SOIL - CANCER RISK
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	ABSORPTION FACTOR (unitless)	ABSORBED DOSE (mg/kg-day)			SLOPE FACTOR (mg/kg-day)^-1	CANCER RISK (unitless)		
			RESIDENT		CONSTRUCTION		RESIDENT		CONSTRUCTION
			ADULT	CHILD	WORKER	ORAL	ADULT	CHILD	WORKER
Methylene Chloride	0.01123	NV	NV	NV	NV	0.0075	NV	NV	NV
4-Methylphenol (p-cresol)	0.27537	0.1	1.03E-06	5.31E-07	3.28E-07	NV	NV	NV	NV
Naphthalene	0.80579	0.13	3.91E-06	2.02E-06	1.25E-06	NV	NV	NV	NV
Carbazole	0.82854	0.1	3.09E-06	1.60E-06	9.86E-07	0.02	6.19E-08	3.20E-08	1.97E-08
Benzo(a)anthracene	1.57054	0.13	7.62E-06	3.94E-06	2.43E-06	0.73	5.56E-06	2.87E-06	1.77E-06
Chrysene	0.97608	0.13	4.74E-06	2.45E-06	1.51E-06	0.0073	3.46E-08	1.79E-08	1.10E-08
bis(2-Ethylhexyl)phthalate	0.38832	0.1	1.45E-06	7.49E-07	4.62E-07	0.014	2.03E-08	1.05E-08	6.47E-09
Benzo(b)fluoranthene	0.72871	0.13	3.54E-06	1.83E-06	1.13E-06	0.73	2.58E-06	1.33E-06	8.23E-07
Benzo(k)fluoranthene	0.67341	0.13	3.27E-06	1.69E-06	1.04E-06	0.073	2.39E-07	1.23E-07	7.61E-08
Benzo(a)pyrene	0.79313	0.13	3.85E-06	1.99E-06	1.23E-06	7.3	2.81E-05	1.45E-05	8.96E-06
Indeno(1,2,3-cd)pyrene	0.72871	0.13	3.54E-06	1.83E-06	1.13E-06	0.73	2.58E-06	1.33E-06	8.23E-07
Dibenz(a,h)anthracene	0.58074	0.13	2.82E-06	1.46E-06	8.99E-07	7.3	2.06E-05	1.06E-05	6.56E-06
4,4'-DDE	0.001	NV	NV	NV	NV	0.34	NV	NV	NV
4,4'-DDT	0.00203	0.03	2.27E-09	1.17E-09	7.25E-10	0.34	7.73E-10	3.99E-10	2.47E-10
RDX	1.5	NV	NV	NV	NV	0.11	NV	NV	NV
Dioxins & Furans (Toxicity Equivalence)	0.00000015	0.03	1.68E-13	8.68E-14	5.36E-14	150000	2.52E-08	1.30E-08	8.04E-09
						TOTAL CANCER RISK	8E-06	3E-06	2E-05

PARAMETER	SYMBOL	UNITS	RESIDENT		CONSTRUCTION
			ADULT	CHILD	WORKER
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06	1.00E-06
Skin surface area available for contact	SA	cm^2/event	7948	3520	3120
Soil to skin adherence factor	AF	mg/cm^2	1	1	1
Exposure frequency	EF	events/year	350	350	78
Exposure duration	ED	years	24	6	6
Body weight	BW	kg	70	15	56
Averaging time	AT	days	25550	25550	2190

NOTES:

NV - No Value

EQUATIONS:

Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)

Cancer Risk = (Absorbed Dose) × (Slope Factor)

TABLE O-10

DERMAL CONTACT WITH NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN SOIL* - HAZARD INDICES
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN SOIL (CS) (mg/kg)	ABSORPTION FACTOR (unitless)	ABSORBED DOSE (mg/kg-day)			REFERENCE DOSE ADJUSTED ORAL RfD** (mg/kg-day)		HAZARD QUOTIENT (unitless)		
			RESIDENT		CONSTRUCTION			RESIDENT		CONSTRUCTION
			ADULT	CHILD	WORKER	CHRONIC	SUBCHRONIC	ADULT	CHILD	WORKER
Methylene Chloride	1.12E-02	NV	NV	NV	NV	6.00E-02	6.00E-02	NV	NV	NV
Acetone	2.53E-02	NV	NV	NV	NV	1.00E-01	1.00E+00	NV	NV	NV
Toluene	7.32E-03	NV	NV	NV	NV	2.00E-01	2.00E+00	NV	NV	NV
4-Methylphenol (p-cresol)	2.75E-01	0.1	3.00E-06	6.20E-06	2.02E-07	5.00E-03	5.00E-03	6.00E-04	1.24E-03	4.05E-05
Naphthalene	8.06E-01	0.13	1.14E-05	2.36E-05	7.70E-07	2.00E-02	2.00E-02	5.70E-04	1.18E-03	3.85E-05
2-Methylnaphthalene	6.86E-01	0.13	9.71E-06	2.01E-05	6.55E-07	NV	NV	NV	NV	NV
Acenaphthene	8.59E-01	0.13	1.22E-05	2.51E-05	8.21E-07	6.00E-02	6.00E-01	2.03E-04	4.19E-05	1.37E-06
Dibenzofuran	7.06E-01	0.1	7.69E-06	1.59E-05	5.19E-07	NV	NV	NV	NV	NV
Diethylphthalate	3.98E-01	0.1	4.33E-06	8.95E-06	2.92E-07	0.8	8	5.41E-06	1.12E-06	3.65E-08
Fluorene	8.80E-01	0.13	1.25E-05	2.57E-05	8.41E-07	4.00E-02	4.00E-01	3.11E-04	6.44E-05	2.10E-06
Phenanthrene	1.82E+00	0.13	2.58E-05	5.34E-05	1.74E-06	NV	NV	NV	NV	NV
Carbazole	8.29E-01	0.1	9.02E-06	1.86E-05	6.09E-07	NV	NV	NV	NV	NV
Di-n-butylphthalate	3.52E-01	0.1	3.83E-06	7.92E-06	2.59E-07	1.00E-01	1.00E+00	3.83E-05	7.92E-06	2.59E-07
Fluoranthene	1.61E+00	0.13	2.28E-05	4.72E-05	1.54E-06	4.00E-02	4.00E-01	5.71E-04	1.18E-04	3.85E-06
Pyrene	1.63E+00	0.13	2.30E-05	4.75E-05	1.55E-06	3.00E-02	3.00E-01	7.67E-04	1.58E-04	5.17E-06
Benzo(a)anthracene	1.57E+00	0.13	2.22E-05	4.59E-05	1.50E-06	NV	NV	NV	NV	NV
Chrysene	9.76E-01	0.13	1.38E-05	2.86E-05	9.32E-07	NV	NV	NV	NV	NV
bis(2-Ethylhexyl)phthalate	3.88E-01	0.1	4.23E-06	8.74E-06	2.85E-07	2.00E-02	2.00E-02	2.11E-04	4.37E-04	1.43E-05
Benzo(b)fluoranthene	7.29E-01	0.13	1.03E-05	2.13E-05	6.96E-07	NV	NV	NV	NV	NV
Benzo(k)fluoranthene	6.73E-01	0.13	9.53E-06	1.97E-05	6.43E-07	NV	NV	NV	NV	NV
Benzo(a)pyrene	7.93E-01	0.13	1.12E-05	2.32E-05	7.58E-07	NV	NV	NV	NV	NV
Indeno(1,2,3-cd)pyrene	7.29E-01	0.13	1.03E-05	2.13E-05	6.96E-07	NV	NV	NV	NV	NV
Dibenz(a,h)anthracene	5.81E-01	0.13	8.22E-06	1.70E-05	5.55E-07	NV	NV	NV	NV	NV
Benzo(g,h,i)perylene	7.49E-01	0.13	1.06E-05	2.19E-05	7.15E-07	NV	NV	NV	NV	NV
4,4'-DDE	1.00E-03	NV	NV	NV	NV	NV	NV	NV	NV	NV
4,4'-DDT	2.03E-03	0.03	6.63E-09	1.37E-08	4.47E-10	5.00E-04	5.00E-04	1.33E-05	2.74E-05	8.95E-07
RDX	1.50E+00	NV	NV	NV	NV	3.00E-03	3.00E-03	NV	NV	NV
Dioxins & Furans (Toxicity Equivalence)	1.50E-07	0.03	4.90E-13	1.01E-12	3.31E-14	NV	NV	NV	NV	NV
Selenium	4.61E+00	NV	NV	NV	NV	5.00E-03	5.00E-03	NV	NV	NV
Silver	4.90E-01	NV	NV	NV	NV	2.00E-04	2.00E-04	NV	NV	NV
Zinc	1.32E+02	NV	NV	NV	NV	3.00E-01	3.00E-01	NV	NV	NV
							TOTAL HAZARD INDEX	2E-03	3E-03	1E-04

PARAMETER	SYMBOL	UNITS	RESIDENT		CONSTRUCTION
			ADULT	CHILD	WORKER
Conversion factor	CF	kg/mg	1.00E-06	1.00E-06	1.00E-06
Skin surface area available for contact	SA	cm^2/event	7948	3520	3120
Soil to skin adherence factor	AF	mg/cm^2	1	1	1
Exposure frequency	EF	events/year	350	350	60
Exposure duration	ED	years	24	6	0.25
Body weight	BW	kg	70	15	70
Averaging time	AT	days	8760	2190	91

NOTES:

* - Exposure to soil includes surface and subsurface soil data.

EQUATIONS:

Absorbed Dose = (CS × CF × SA × AF × ABS × EF × ED) / (BW × AT)

Hazard Quotient = (Absorbed Dose) / (Reference Dose)

TABLE O-11

INHALATION OF CARCINOGENIC CHEMICALS FROM FUGITIVE DUST* - CANCER RISK
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	RESPIRABLE CONCENTRATION (CA) (mg/m^3)	INTAKE (mg/kg-day) CONSTRUCTION WORKER	SLOPE FACTOR (mg/kg-day)^-1 INHALATION	CANCER RISK (unitless) CONSTRUCTION WORKER
Methylene Chloride	3.72E-09	7.48E-13	0.0016	1.20E-15
4-Methylphenol (p-cresol)	9.11E-08	1.83E-11	NV	NV
Naphthalene	2.67E-07	5.37E-11	NV	NV
Carbazole	2.74E-07	5.52E-11	NV	NV
Benzo(a)anthracene	5.20E-07	1.05E-10	NV	NV
Chrysene	3.23E-07	6.50E-11	NV	NV
bis(2-Ethylhexyl)phthalate	1.29E-07	2.59E-11	NV	NV
Benzo(b)fluoranthene	2.41E-07	4.86E-11	NV	NV
Benzo(k)fluoranthene	2.23E-07	4.49E-11	NV	NV
Benzo(a)pyrene	2.63E-07	5.28E-11	NV	NV
Indeno(1,2,3-cd)pyrene	2.41E-07	4.86E-11	NV	NV
Dibenz(a,h)anthracene	1.92E-07	3.87E-11	NV	NV
4,4'-DDE	3.31E-10	6.66E-14	NV	NV
4,4'-DDT	6.72E-10	1.35E-13	0.3395	4.59E-14
RDX	4.97E-07	9.99E-11	NV	NV
Dioxins & Furans (Toxicity Equivalence)	4.97E-14	9.99E-18	150000	1.50E-12
TOTAL CANCER RISK				**2E-12**

PARAMETER	SYMBOL	UNITS	CONSTRUCTION WORKER
Inhalation rate	IR	m^3/hr	3.0
Exposure time	ET	hours/day	8
Exposure frequency	EF	days/year	60
Exposure duration	ED	years	0.25
Body weight	BW	kg	70
Averaging time	AT	days	25550

NOTES:

*Exposure to soil includes surface and subsurface soil data.

NV - No Value

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-12

INHALATION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS FROM FUGITIVE DUST* - HAZARD INDEX
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	RESPIRABLE CONCENTRATION (CA) (mg/m^3)	INTAKE (mg/kg-day) CONSTRUCTION WORKER	REFERENCE DOSE INHALATION RfD (mg/kg-day) SUBCHRONIC	HAZARD QUOTIENT (unitless) CONSTRUCTION WORKER
Methylene Chloride	3.72E-09	2.10E-10	8.57E-01	2.45E-10
Acetone	8.38E-09	4.74E-10	NV	NV
Toluene	2.42E-09	1.37E-10	1.14E-01	1.20E-09
4-Methylphenol (p-cresol)	9.11E-08	5.15E-09	NV	NV
Naphthalene	2.67E-07	1.51E-08	8.57E-04	1.76E-05
2-Methylnaphthalene	2.27E-07	1.28E-08	NV	NV
Acenaphthene	2.84E-07	1.61E-08	NV	NV
Dibenzofuran	2.34E-07	1.32E-08	NV	NV
Diethylphthalate	1.32E-07	7.44E-09	NV	NV
Fluorene	2.91E-07	1.65E-08	NV	NV
Phenanthrene	6.04E-07	3.41E-08	NV	NV
Carbazole	2.74E-07	1.55E-08	NV	NV
Di-n-butylphthalate	1.17E-07	6.58E-09	NV	NV
Fluoranthene	5.34E-07	3.02E-08	NV	NV
Pyrene	5.38E-07	3.04E-08	NV	NV
Benzo(a)anthracene	5.20E-07	2.94E-08	NV	NV
Chrysene	3.23E-07	1.83E-08	NV	NV
bis(2-Ethylhexyl)phthalate	1.29E-07	7.26E-09	NV	NV
Benzo(b)fluoranthene	2.41E-07	1.36E-08	NV	NV
Benzo(k)fluoranthene	2.23E-07	1.26E-08	NV	NV
Benzo(a)pyrene	2.63E-07	1.48E-08	NV	NV
Indeno(1,2,3-cd)pyrene	2.41E-07	1.36E-08	NV	NV
Dibenz(a,h)anthracene	1.92E-07	1.09E-08	NV	NV
Benzo(g,h,i)perylene	2.48E-07	1.40E-08	NV	NV
4,4'-DDE	3.31E-10	1.87E-11	NV	NV
4,4'-DDT	6.72E-10	3.80E-11	NV	NV
RDX	4.97E-07	2.81E-08	NV	NV
Dioxins & Furans (Toxicity Equivalence)	4.97E-14	2.81E-15	NV	NV
Selenium	1.53E-06	8.62E-08	NV	NV
Silver	1.62E-07	9.17E-09	NV	NV
Zinc	4.38E-05	2.48E-06	NV	NV
			TOTAL HAZARD INDEX	2E-06

PARAMETER	SYMBOL	UNITS	CONSTRUCTION WORKER
Inhalation rate	IR	m^3/hr	3.0
Exposure time	ET	hours/day	8
Exposure frequency	EF	days/year	60
Exposure duration	ED	years	0.25
Body weight	BW	kg	70
Averaging time	AT	days	91

NOTES:

* - Exposure to soil includes surface and subsurface soil data.

NV - No Value

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O-13

INGESTION OF CARCINOGENIC CHEMICALS IN GROUNDWATER - CANCER RISK
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	INTAKE (mg/kg-day) RESIDENT ADULT	SLOPE FACTOR (mg/kg-day)^-1 ORAL	CANCER RISK (unitless) RESIDENT ADULT
bis(2-Ethylhexyl)phthalate	4.00E-03	4.70E-05	1.40E-02	6.58E-07
RDX	4.43E-03	5.20E-05	1.10E-01	5.72E-06
Arsenic	4.33E-03	5.08E-05	1.50E+00	7.63E-05
Beryllium	6.30E-04	7.40E-06	NV	NV
Cadmium	4.10E-03	4.81E-05	NV	NV
		TOTAL CANCER RISK		**8E-05**

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Ingestion Rate	IR	liters/day	2
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	25550

EQUATIONS:

Intake = (CW × IR × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-14

INGESTION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN GROUNDWATER - HAZARD INDEX
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	INTAKE (mg/kg-day) RESIDENT ADULT	REFERENCE DOSE ORAL RfD (mg/kg-day) CHRONIC	HAZARD QUOTIENT (unitless) RESIDENT ADULT
Acetone	7.66E-03	2.10E-04	1.00E-01	2.10E-03
bis(2-Ethylhexyl)phthalate	4.00E-03	1.10E-04	2.00E-02	5.48E-03
RDX	4.43E-03	1.21E-04	3.00E-03	4.05E-02
Arsenic	4.33E-03	1.19E-04	3.00E-04	3.95E-01
Beryllium	6.30E-04	1.73E-05	2.00E-03	8.63E-03
Cadmium	4.10E-03	1.12E-04	5.00E-04	2.25E-01
Mercury	2.30E-04	6.30E-06	NV	NV
Selenium	1.21E-02	3.30E-04	5.00E-03	6.60E-02
Thallium	1.30E-03	3.56E-05	NV	NV
			TOTAL HAZARD INDEX	7E-01

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Ingestion Rate	IR	liters/day	2
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	10950

EQUATIONS:

Intake = (CWM × IR × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O-15

DERMAL CONTACT WITH CARCINOGENIC CHEMICALS IN GROUNDWATER - CANCER RISK
FUTURE -USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	DERMAL PERMEABILITY CONSTANT (cm/hr)	INTAKE (mg/kg-day) RESIDENT ADULT	SLOPE FACTOR (mg/kg-day)^-1 ORAL	CANCER RISK (unitless) RESIDENT ADULT
bis(2-Ethylhexyl)phthalate	4.00E-03	2.68E-05	2.40E-09	1.40E-02	3.36E-11
RDX	4.43E-03	NV	NV	1.10E-01	NV
Arsenic	4.33E-03	1.00E-03	9.69E-08	1.50E+00	1.45E-07
Beryllium	6.30E-04	1.00E-03	1.41E-08	NV	NV
Cadmium	4.10E-03	1.00E-03	9.17E-08	NV	NV
				TOTAL CANCER RISK	1E-07

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Skin Surface Area Available for Contact	SA	cm^2/hour	18150
Volumetric Conversion Factor	CF	liter/cm^3	0.001
Exposure Time	ET	hours/day	0.21
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	25550

EQUATIONS:

Absorbed Dose = (CWM × SA × PC × ET × EF × ED × CF) / (BW × AT)

Cancer Risk = (Absorbed Dose) × (Slope Factor)

TABLE O-16

DERMAL CONTACT WITH NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN GROUNDWATER - HAZARD INDEX
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	DERMAL PERMEABILITY CONSTANT (cm/hr)	ABSORBED DOSE (mg/kg-day) RESIDENT ADULT	REFERENCE DOSE ORAL RfD (mg/kg-day) CHRONIC	HAZARD QUOTIENT (unitless) RESIDENT ADULT
Acetone	7.66E-03	5.70E-04	2.28E-07	1.00E-01	2.28E-06
bis(2-Ethylhexyl)phthalate	4.00E-03	2.68E-05	5.60E-09	2.00E-02	2.80E-07
RDX	4.43E-03	NV	NV	3.00E-03	NV
Arsenic	4.33E-03	1.00E-03	2.26E-07	3.00E-04	7.54E-04
Beryllium	6.30E-04	1.00E-03	3.29E-08	2.00E-03	1.64E-05
Cadmium	4.10E-03	1.00E-03	2.14E-07	5.00E-04	4.28E-04
Mercury	2.30E-04	1.00E-03	1.20E-08	NV	NV
Selenium	1.21E-02	1.00E-03	6.29E-07	5.00E-03	1.26E-04
Thallium	1.30E-03	1.00E-03	6.79E-08	NV	NV
				TOTAL HAZARD INDEX	1E-03

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Skin Surface Area Available for Contact	SA	cm^2/hour	18150
Volumetric Conversion Factor	CF	liter/cm^3	0.001
Exposure Time	ET	hours/day	0.21
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	10950

EQUATIONS:

Absorbed Dose = (CWM × SA × PC × ET × EF × ED × CF) / (BW × AT)

Hazard Quotient = (Absorbed Dose) / (Reference Dose)

TABLE O-17

INHALATION OF CARCINOGENIC CHEMICALS IN VAPORS WHILE SHOWERING - CANCER RISK
FUTURE-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN AIR (CA) (mg/m^3)	INTAKE (mg/kg-day) RESIDENT ADULT	SLOPE FACTOR (mg/kg-day)^-1 INHALATION	CANCER RISK (unitless) RESIDENT ADULT
bis(2-Ethylhexyl)phthalate	2.34E-03	1.73E-06	NV	NV
RDX	NA	NA	NV	NV
		TOTAL CANCER RISK		**NV**

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Inhalation Rate	IR	m^3/hour	0.6
Exposure Time	ET	hours/day	0.21
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	25550

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Cancer Risk = (Intake) × (Slope Factor)

TABLE O-18

INHALATION OF NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN VAPORS WHILE SHOWERING - HAZARD INDEX
FUTURE-USE
EXPLOSIVE ORDNANCE DEMOLITION RANGE (SS-026) - REMEDIAL INVESTIGATION

CHEMICAL	EXPOSURE CONCENTRATION IN AIR (CA) (mg/m^3)	INTAKE (mg/kg-day) RESIDENT ADULT	REFERENCE DOSE INHALATION RfD (mg/kg-day) CHRONIC	HAZARD QUOTIENT (unitless) RESIDENT ADULT
Acetone	3.90E-01	6.74E-04	NV	NV
bis(2-Ethylhexyl)phthalate	2.34E-03	4.05E-06	NV	NV
RDX	NA	NA	NV	NV
		TOTAL HAZARD INDEX		NV

PARAMETER	SYMBOL	UNITS	RESIDENT ADULT
Inhalation Rate	IR	m^3/hour	0.6
Exposure Time	ET	hours/day	0.21
Exposure Frequency	EF	days/year	350
Exposure Duration	ED	years	30
Body Weight	BW	kg	70
Averaging Time	AT	days	10950

NOTE:

NV - No Value

EQUATIONS:

Intake = (CA × IR × ET × EF × ED) / (BW × AT)

Hazard Quotient = (Intake) / (Reference Dose)

TABLE O-19

DERMAL CONTACT WITH CARCINOGENIC CHEMICALS IN GROUNDWATER SEEPS - CANCER RISK
CURRENT -USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	DERMAL PERMEABILITY CONSTANT (cm/hr)	INTAKE (mg/kg-day) TRESPASSER ADULT	INTAKE (mg/kg-day) TRESPASSER TEENAGER	SLOPE FACTOR (mg/kg-day)^-1 ORAL	CANCER RISK (unitless) TRESPASSER ADULT	CANCER RISK (unitless) TRESPASSER TEENAGER
Arsenic	7.40E-03	1.00E-03	3.08E-07	7.70E-08	1.50E+00	4.62E-07	1.15E-07
				TOTAL CANCER RISK		5E-07	1E-07

PARAMETER	SYMBOL	UNITS	TRESPASSER ADULT	TRESPASSER TEENAGER
Skin Surface Area Available for Contact	SA	cm^2/event	7948	7948
Volumetric Conversion Factor	CF	liter/cm^3	0.001	0.001
Exposure Time	ET	hours/event	4	4
Exposure Frequency	EF	events/year	78	78
Exposure Duration	ED	years	30	6
Body Weight	BW	kg	70	56
Averaging Time	AT	days	25550	25550

EQUATIONS:

Absorbed Dose = (CWM × SA × PC × ET × EF × ED × CF) / (BW × AT)

Cancer Risk = (Absorbed Dose) × (Slope Factor)

TABLE O-20

DERMAL CONTACT WITH NONCARCINOGENIC AND CARCINOGENIC CHEMICALS IN GROUNDWATER SEEPS - HAZARD INDICES
CURRENT-USE
EOD RANGE (SS-026)

CHEMICAL	EXPOSURE CONCENTRATION IN GROUNDWATER (CW) (mg/l)	DERMAL PERMEABILITY CONSTANT (cm/hr)	ABSORBED DOSE (mg/kg-day) TRESPASSER ADULT	ABSORBED DOSE (mg/kg-day) TRESPASSER TEENAGER	REFERENCE DOSE (mg/kg-day) CHRONIC	REFERENCE DOSE (mg/kg-day) SUBCHRONIC	HAZARD QUOTIENT (unitless) TRESPASSER ADULT	HAZARD QUOTIENT (unitless) TRESPASSER TEENAGER
Arsenic	4.33E-03	1.00E-03	4.20E-07	5.25E-07	3.00E-04	3.00E-04	1.40E-03	1.75E-03
Selenium	1.21E-02	1.00E-03	1.17E-06	1.46E-06	5.00E-03	5.00E-03	2.34E-04	2.92E-04
Thallium	1.30E-03	1.00E-03	1.26E-07	1.58E-07	NV	NV	NV	NV
						TOTAL HAZARD INDEX	2E-03	2E-03

PARAMETER	SYMBOL	UNITS	TRESPASSER ADULT	TRESPASSER TEENAGER
Skin Surface Area Available for Contact	SA	cm^2/event	7948	7948
Volumetric Conversion Factor	CF	liter/cm^3	0.001	0.001
Exposure Time	ET	hours/event	4	4
Exposure Frequency	EF	events/year	78	78
Exposure Duration	ED	years	30	6
Body Weight	BW	kg	70	56
Averaging Time	AT	days	10950	2190

EQUATIONS:

Absorbed Dose = (CWM × SA × PC × ET × EF × ED × CF) / (BW × AT)

Hazard Quotient = (Absorbed Dose) / (Reference Dose)

APPENDIX P

TOXICOLOGICAL PROFILES

TOXICOLOGICAL PROFILES
EXPLOSIVE ORDNANCE DEMOLITION RANGE (SS-026)
REMEDIAL INVESTIGATION

ACENAPHTHENE

Acenaphthene is a skin and mucous membrane irritant. If swallowed in large quantities, it may cause vomiting.

Acenaphthene is a polycyclic aromatic hydrocarbon (PAH) compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke or soot. Acenaphthene is found in coal tar pitch used by industry as an adhesive. It is also used as a dye intermediate, insecticide and fungicide, and in the manufacture of some plastics. People may be exposed to acenaphthene from environmental sources such as air, water, and soil, and from cigarette smoke, gasoline exhaust condensates and overcooked food. Typical exposures are not usually to acenaphthene alone, but to a mixture of chemicals.

ACETONE

Acetone is a volatile ketone commonly used as a solvent. Limited information on the transport and fate of acetone was found in the literature reviewed. However, ketones in general are probably not very persistent. Acetone has a high vapor pressure and, therefore, would be expected to volatilize readily; however, because of its high water solubility, volatilization is probably limited. Once in the atmosphere, it is apparently oxidized. Acetone has a low K_{ow} and, therefore, is probably not readily adsorbed. Biodegradation is probably important in determining the fate of acetone in the environment because of its aliphatic nature. Acetone is a colorless liquid with a sweetish odor. It is used as a solvent for waxes, oils, resins, rubber, plastic, lacquers, varnishes, and rubber cement. It is used in the production of lubricating oils, pharmaceuticals and pesticides.

Acetone is considered to have rather low toxicity. Acute and chronic inhalation of acetone concentrations exceeding 500 ppm can cause eye and upper respiratory tract irritation and headaches. Nausea and other GI effects have not been reported. No serious chronic health hazards have been associated with long-term, low-level acetone exposure. Short-term inhalation of acetone vapors causes no detectable effects at acetone concentrations below 500 ppm. Inhalation of small quantities of acetone over long periods of time can cause irritation of the respiratory tract, coughing, and headache.

ARSENIC

Arsenic exists to a small extent in the elemental form but is usually present in various chemical states. Inorganic arsenic usually refers to trivalent or pentavalent arsenic combined with oxygen,

sulfur, or chlorine. Organic arsenic refers to arsenic combined with carbon and hydrogen groups; an example is methylated arsenic as found in herbicides.

Of an estimated total release of approximately 10,000 short tons annually in the United States, smelter activity accounts for about 50%, biocide (pesticide, herbicide, fungicide) use contributes 32%, and glass production contributes about 7%, with the remaining amount being released from various other sources.

Arsenic toxicity varies with its valency and the chemical form of the compound. Inorganic trivalent compounds are more acutely toxic than pentavalent compounds, both of which are more toxic than organic arsenic compounds. No reports have been found showing that metallic arsenic causes acute toxicity in organisms.

Qualitative data on toxic levels of arsenic from inhalation exposure indicate that high levels may be associated with severe irritation of the nasal mucosa, larynx, and bronchi. Inorganic arsenic exposure has been related to reversible effects on the nervous and hematopoietic systems.

Acute arsenic poisoning in adults is associated with relatively large doses (>70 to 180 mg). Symptoms of arsenic toxicity include fever, anorexia, melanosis, and cardiac arrhythmia, which may be followed by cardiovascular failure. Other symptoms include severe gastrointestinal damage, shock, and coma. Direct toxic effects on the liver, hematopoietic, nervous, and cardiovascular systems may also occur. Some effects are reversible while others are not.

In humans, chronic oral exposure to arsenic may induce a sequence of changes in the skin, proceeding from hyperpigmentation to hyperkeratosis and leading in some cases to skin cancers, which are characterized as either squamous carcinomas in the keratotic areas or basal cell carcinomas.

BENZO(a)ANTHRACENE

Benzo(a)anthracene produced tumors in mice exposed by gavage, intraperitoneal, subcutaneous or intramuscular injection and topical application. Benzo(a)anthracene produced mutations in bacteria and in mammalian cells, and transformed mammalian cells in culture. Although there are no human data that specifically link exposure to benzo(a)anthracene to human cancers, benzo(a)anthracene is a component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions and cigarette smoke.

Benzo(a)anthracene is a PAH compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke or soot. This chemical combines with dust particles in the air and is carried into water and soil and onto crops. Benzo(a)anthracene is found in coal tar pitch used by industry as an adhesive.

BENZO(a)PYRENE

Short term and intermediate oral exposure to very high levels of benzo(a)pyrene resulted in death in experimental animals. The induction of cancer is the key endpoint of toxicity following chronic exposures to lower doses of benzo(a)pyrene in the diet. Lethal effects from high doses of benzo(a)pyrene were caused by bone marrow depression. There is no information available for the potential human carcingenicity following oral benzo(a)pyrene exposure. Studies with experimental animals have produced leukemia and tumors of the forestomach and lung following intermediate exposure in mice.

No short term or intermediate inhalation exposure effects are available for benzo(a)pyrene. The induction of cancer is the key long term effect. Benzo(a)pyrene is moderately potent experimental carcinogen in many species by many routes of exposure. There are no reports directly correlating human benzo(a)pyrene exposure and tumor development, although humans are likely to be exposed by all routes.

Benzo(a)pyrene is a PAH compound. It is formed when any organic material burns and is usually found in smoke and soot as a combustion byproduct. Benzo(a)pyrene is found in coal tar pitch used by the industry, and is found in cresote. People may be exposed to benzo(a)pyrene from environmental sources such as air, water, and soil, and from tobacco smoke and overcooked food. Typical exposures are not usually to benzo(a)pyrene alone, but to a mixture of similar chemicals.

BENZO(b)FLUORANTHENE

There are no data available to assess significant exposure levels of benzo(b)fluoranthene alone for humans. Reports of adverse health effects such as carcinogenicity by the inhalation and dermal routes of exposure do exist for mixtures that include benzo(b)fluoranthene thus providing some information to qualitatively assess its role as a human carcinogen. It is a carcinogen via various routes; a poison to rats via subcutaneous route; a contaminant in food, water, and smoke; and an experimental teratogen, neoplastic agent, and mutagen.

Benzo(b)fluoranthene, in its pure form, is a colorless crystalline solid. It is a PAH that is formed during combustion of fossil fuels and organic material.

BENZO(k)FLUORANTHENE

Benzo(k)fluoranthene produced tumors after lung implantation in mice and when administered with a promoting agent in skin-painting studies. Equivocal results have been found in a lung adenoma assay in mice. Benzo(k)fluoranthene is mutagenic in bacteria. Although there are no human data that specifically link exposure to benzo(k)fluoranthene to human cancers, benzo(k)fluoranthene is a component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions, and cigarette smoke.

Benzo(k)fluoranthene is a PAH compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Benzo(k)fluoranthene is found in coal tar pitched used by the industry as an adhesive.

BENZO(g,h,i)PERYLENE

Benzo(g,h,i)perylene appeared to increase lung epidermoid tumors when administered with trioctanonin in a lung implant study. In a lifetime implant study, 3-month-old female Osborne-Mendel rats received in a lung implant of benzo(g,h,i)perylene. Epidermoid carcinomas in the lung and thorax were observed. The apparent increased incidence of tumors was not statistically significant and no distant tumors were seen.

Benzo(g,h,i)perylene is a PAH compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Benzo(g,h,i)perylene is found in coal tar pitch used by the industry as an adhesive. People may be exposed to benzo(g,h,i)perylene from environmental sources such as air, water, and soil, and from cigarette smoke and overcooked food. Typical exposures are not usually to benzo(g,h,i)perylene alone, but to a mixture of similar chemicals.

BERYLLIUM

Beryllium is a gray metal that combines the properties of light weight and high tensile strength. Beryllium is used as a neutron reflector and neutron moderator in nuclear reactors. It is also used in the manufacture of beryllium alloys, namely beryllium copper and beryllium aluminum. Beryllium is also used for radio components, in aerospace structures, and in inertial guidance systems.

Death may result from short exposure to very low concentrations of beryllium and its salts (Merck 1989). Contact dermatitis, chemical conjunctivitis, corneal burns, nonhealing ulceration at site of injury, and subcutaneous nodules may occur following exposure to this element. Acute effects include pneumonitis, which may result from a single exposure to beryllium and is occasionally fatal.

Studies of workers at a beryllium processing plant reported significant increases of lung cancer. There is evidence for induction of tumors by a variety of beryllium compounds via inhalation and intratracheal instillation and the induction of osteosarcomas in rabbits by intravenous or intramedullary injection in multiple studies (IRIS 1995).

BIS(2-ETHYLHEXYL)PHTHALATE

Bis(2-ethylhexyl)phthalate (BEHP) is classified as a probable human carcinogen. BEHP carcinogenicity has been studied in rats and mice.

BEHP is a developmental and reproductive toxin in rats and mice. BEHP has been extensively tested in genotoxicity assays with overall evidence indicating that it is not mutagenic in microbial or mammalian test systems.

BEHP is widely used in plastic products; as a result, it is almost ubiquitously distributed in the environment. As plasticizers, phthalic acid esters are added to synthetic plastic resins to impart

flexibility to the finished product, improve workability during fabrication, and extend or modify properties not present in the original resins. BEHP in particular is often used as an insect repellent and orchard acaricide and in the manufacture of organic pump fluids.

BEHP is a high boiling liquid with a low water solubility. It biodegrades under aerobic conditions with a half-life of several weeks to a month. BEHP is removed from the atmosphere by chemical reactions, beginning with a hydroxyl radical reaction and by deposition and rainout. BEHP in water accumulates in sediments, on suspended solids, and in lipid tissues of biota. In the soil, BEHP is strongly adsorbed to soils and organics and not readily leached.

CADMIUM

Cadmium is a metallic element. It is naturally occurring in zinc, copper, and lead ores. Since cadmium is very corrosion resistant it is used as protective coating for iron, steel, and copper. Cadmium is used in alkaline batteries, as a stabilizer for polyvinyl chloride plastics, in nickel plating, and in the manufacture of semiconductors, photocells, and jewelry. Cadmium compounds are used as pesticides, polymerization catalysts, pigments, paints, and in the photographic industry.

Cadmium is a potential carcinogen. Ingestion causes sudden nausea and salivation, vomiting, diarrhea, abdominal pain and discomfort. It is an oral poison, but irritation and emetic action are so violent that little cadmium is absorbed, and fatalities are averted. Inhalation of fumes and dust affects mainly the respiratory system and the kidneys. Cadmium fumes can cause a metal fume fever. The dust is a fire and explosion hazard.

CARBAZOLE

Carbazole is an extremely weak base manufactured from 2-biphenylamine. It forms white crystals and has a characteristic odor. Carbazole is insoluble in water, yet soluble in alcohol and ether. It is used in the manufacturing of dyes, reagents, explosives, insecticides, lubricants and formaldehyde. it is also used in making photographic plates sensitive to ultraviolet light.

Little is known of the effects carbazole presents to humans. Caution must be exercised around high heat as carbazole will emit toxic fumes of N_{ox}, which do present some health risk.

CHRYSENE

Chrysene produced carcinomas and malignant lymphoma in mice after intraperitoneal injection and skin carcinomas in mice following dermal exposure. In mouse skin painting assays, chrysene tested positive in both initiation and complete carcinogen studies. Chrysene produced chromosomal abnormalities in hamsters and mouse germ cells after gavage exposure, positive responses in bacterial gene mutation assays, and transformed mammalian cells exposed in culture. It was shown to be a complete carcinogen. Chrysene has produced positive results for initiating activity in several mouse strains when applied in combination with various promoting agents producing skin papillomas and carcinomas. Although there are no human data that specifically link exposure to chrysene to

human cancers, chrysene is component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions and cigarette smoke.

Chrysene is a PAH compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Chrysene is found is coal tar pitch used by the industry as an adhesive. People may be exposed to chrysene from environmental sources such as air, water, and soil, and from tobacco smoke and overcooked food. Typical exposures are not usually to chrysene alone, but to a mixture of similar compounds.

4,4 -DDE

4,4 -DDE is a probable human carcinogen. It has caused liver tumors in animal studies. 4,4 -DDE has a moderate acute toxicity. It is an eye and skin irritant. Chronic effects include tumors, confusion, headaches, vomiting and slight paralysis of the hands and face.
4,4 -DDE is similar to DDT. It is the principal breakdown of DDT and is used as an insecticide. It has moderate persistence in the soil.

4,4 -DDT

Historically, DDT was released to the environment during its formulation and extensive use as a pesticide in agricultural and vector control applications. Although it was banned for use in this country in 1972, it is still being used in several areas of the world. DDT and its environmental degradation products (DDE and DDD) preferentially bind to soil and sediment, where they may be subject to photodegredation on the surface and biodegredation in the subsurface. DDT, DDE, and DDD in the atmosphere are subject to photodegredation or redeposition by rain or dry deposition. However, under certain conditions, DDT may persist for long periods of time or may be converted to DDE, which persist even longer. DDT, DDE, and DDD in water are subject to sedimentation, volatilization, photodegredation, and uptake into the food chain. Both DDT and DDE bioaccumulate in organisms, and levels are subject to increase as they advance up the food chain. Bioaccumulation factors range from 10^{-3} to 10^{-6}, indicating that concentrations in biota may be up to one million times the concentration in water. The persistence of DDT, DDD, and DDE increases the contact time for biota and likelihood that these compounds will be bioaccumulated and concentrated in the food chain. DDT and its metabolites have been detected in virtually all media. Human exposure in this country results primarily from ingestion of meat, fish, poultry, and root and leafy vegetables.

DDT is probably one of the best known and most widely studied pesticides. DDT was used extensively during World War II in control of lice and other insects by application directly to humans. Numerous studies have been conducted in a variety of species. The human data are somewhat more limited. Studies in workers in DDT manufacturing plants or spray applicators who had occupational exposure to DDT over an extended period provide information on the possible adverse effects on human health. The central nervous system (CNS) is the major target in humans, while the liver is the major target organ in animals.

In experimental animals, liver effects, ranging from increased enzyme levels to necrosis and tumors, and neurological effects, including myoclonus, appear to be the primary effects associated with DDT and DDE exposure. Reproductive effects have also been reported. Adrenal toxicity, advancing to necrosis, appears to be the primary effect associated with DDD exposure in animals.

DIBENZ(a,h)ANTHRACENE

Dibenz(a,h)anthracene is a carcinogen via various routes and a poison to rats via the subcutaneous route. It is an experimental teratogen, neoplastic agent, and mutagen.

Dibenz(a,h)anthracene is a PAH compound. It is formed when fossil fuels, garbage, or any animal or plant material is burned, it is usually found in smoke and soot. Dibenz(a,h)anthracene is found in coal tar pitch used by the industry as an adhesive. People may be exposed to it from environmental sources such as coal tar, soots, coke oven emissions, and from overcooked food and tobacco smoke. Typical exposure is not usually to dibenz(a,h)anthracene, but to mixture of similar chemicals.

DIBENZOFURAN

Dibenzofuran is formed as a byproduct in the manufacture of chlorinated herbicides and is produced during the combustion of PCBs. It is not found in a pure form, but as a component of mixtures of dioxins and furans produced in a similar fashion. There is no data on the possible carcinogenicity of dibenzofuran alone is humans.

DIETHYLPHTHALATE

Diethylphthalate is a clear colorless liquid used as a solvent for cellulose esters, as a vehicle in pesticidal sprays, as a fixative and solvent in perfumery, as an alcohol denaturant, and as plasticizer in solid rocket propellants. Diethylphthalate can be poisonous by intravenous route. It is also known to be an experimental teratogen and may be moderately toxic if ingested. It can be an eye irritant and a systemic irritant by inhalation. Diethylphthalate is a narcotic in high concentrations. Diethylphthalate has few chronic toxic properties and seems to be devoid of any major irritating or sensitizing effects on the skin. Exposure to heated vapors may produce transient irritation of the nose and throat. Conjuctivitis, corneal necrosis, respiratory tract irritation, dizziness, nausea, and eczema are acute symptoms of exposure.

DI-N-BUTYLPHTHALATE

Di-n-butylphthalate is a colorless, oily liquid with a weak aromatic odor. It is used in plasticizing cellulose esters, and as an insect repellent. Di-n-butylphthalate is an experimental teratogen and mutagen. Human exposure causes irritation of the eyes, upper respiratory tract and mucous membrances, labored breathing, ataxia, paresis, convulsions and death.

DIOXINS AND FURANS

The polychlorinated dibenzodioxins and the polychlorinated dibenzofurans include 75 and 135 individual compounds, respectively, which are technically referred to as congeners. Only the congeners with chlorine substitutions in, at least, the 2,3,7 and 8 positions are thought to have dioxin-like toxicity. These include 17 congeners, 7 dioxins and 10 furans. An especially toxic dioxin is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), which is considered the most toxic dioxin.

Polychlorinated dibenzo-p-dioxins are formed in the manufacturing process of all chlorophenols. However, the amount formed is dependent on the degree to which the temperature and pressure are controlled during production. TCDD has been associated with the widely used herbicide and defoliant 2,4,5-T.

TCDD is a toxic substance that exhibits a delayed biological response and is highly lethal at low doses to aquatic organisms, birds, and mammals, including man. It has been shown to be acnegenic, embryolethal, teratogenic, mutagenic, carcinogenic, and to affect the immune responses in mammals. TCDD has also been shown to persist for 10 years after application to soils and to bioaccumulate in aquatic organisms.

TCDD is an extremely toxic compound exhibiting acute, subchronic and chronic effects in animals and humans. The liver appears to be the target organ of acute exposure. Retention of TCDD by the liver indicates that it apparently undergoes little or no metabolism. Acute effects of exposure include chloracne, porphyria cutanea tarda, hepatotoxicity, psychological alterations, weight loss, thymic atrophy, thrombocytopenia, suppression of cellular immunity and death. TCDD is teratogenic and fetotoxic.

FLUORANTHENE

Although fluoranthene has not exhibited the properties of a mutagen or primary carcinogen, there is concern about its toxicity. This concern is based on the fact that it is widespread in the environment and that is belongs to the PAH group which includes numerous potent carcinogens. In a 13-week mouse oral subchronic toxicity study where mice were gauged with a range of doses of fluoranthene, all treated mice exhibited nephropathy, increased salivation, increased liver enzyme levels and increased liver weights in a dose-dependent manner. Microscopic liver lesions (indicated by pigmentation) were observed in 65% and 87.5% of the mid- and high-dose mice, respectively.

Since fluoranthene is a PAH compound, it is formed when gasoline, garbage, or any animal or plant material burns, and it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Fluoranthene is found in coal tar pitch used by the industry as an adhesive. People may be exposed to fluoranthene from environmental sources such as air, water, and soil, and from tobacco smoke and overcooked food. Typical exposures are not usually to fluoranthene alone, but to a mixture of similar compounds.

FLUORENE

Mice were exposed to fluorene suspended in corn oil by gavage for 13 weeks. Increased salivation, hypoactivity, and urine-wet abdomens in males were observed in all treated animals. The percentage of mice exhibiting hypoactivity was dose-related. Labored respiration, ptosis (drooping eyelids), and unkempt appearance were also observed. A significant decrease in red blood cell count, packed cell volume, and hemoglobin concentration was observed. Increased total serum bilirubin levels were also observed. A dose-related increase in relative liver weight was observed in treated mice. Significant increases in absolute and relative spleen and kidney weights were observed in mice exposed to fluorene. Increases in the absolute and relative liver and spleen weights in high-dose males and females were accompanied by histopathological increases in the amounts of hemosiderin in the spleen and in the Kupffer cells of the liver. No ther histopathological lesions were observed.

Fluorene is a PAH compound. Because it is formed when fossil fuels, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Fluorene is found in coal tar pitch used by the industry as an adhesive. People may be exposed to fluorene from environmental sources such as air, water, and soil, and from tobacco smoke and overcooked food. Typical exposures are not usually to fluorene alone, but to a mixture of similar chemicals.

INDENO(1,2,3-c,d)PYRENE

Indeno(1,2,3-c,d)pyrene is a PAH compound. Because it is formed when fossil fuels, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Indeno(1,2,3-cd)pyrene is found in coal tar pitch used by the industry as an adhesive.

There are animal data that specifically link exposure to indenò(1,2,3-c,d)pyrene with human cancers. It produced tumors in mice following lung implants, subcutaneous injection and dermal exposure. Indeno(1,2,3-c,d)pyrene is a component of mixtures that have been associated with human cancer. These include coal tar, soots, coke oven emissions, overcooked food and tobacco smoke.

MERCURY

Mercury is a silver-white, heavy, mobile, liquid metal utilized in gold, silver, and bronze tin-plating; tanning and dyeing; feltmaking; taxidermy; textile manufacturing; photography; extracting gold and silver from ores; paints and pigments; the preparation of drugs and disinfectants in the pharmaceutical industry; and as a chemical reagent. It is also used in barometers, thermometers, fluorescent lamps, as a catalyst in the oxidation of organic compounds, and in agricultural chemicals.

Mercury is toxic to the gastrointestinal system and central nervous system. It is an experimental turmorigenic agent. Mercury is a protoplasmic poison. It is stored in the liver, kidneys, spleen and bone, eliminated via the urine, feces, sweat, saliva, and milk. It mainly affects the central nervous system, mouth and gums. Mercury causes colitis, nephritis, and dermatitis. It is a strong allergen.

2-METHYLNAPHTHALENE

2-Methylnaphthalene is a solid at room temperature. It occurs naturally and is a component of crude oil, as well as a combustion product of natural fires. It is used in the processing of pesticides and in its pure form, is used to produce vitamin K. Major sources of emissions of 2-methylnaphthalene include refineries, automobiles, and waste water from coal gasification. 2-Methylnaphthalene is also introduced to the environmental as a constituent of cigarette smoke.

Very little data exist on the health effects of 2-methylnaphthalene to humans or animals. Inhalation is likely the most prevalent exposure route. Insufficient data exist at this time to determine its carcinogenic classification. Toxicity values are not currently available.

4-METHYLPHENOL

4-Methylphenol (p-cresol) has found wide application in the resin, explosive, petroleum, photographic, paint and agricultural industries. Acute exposure to 4-methylphenol affects primarily the central nervous system, but pulmonary edema and injury to the kidneys, liver, pancreas and spleen may also occur. Repeated exposures may also result in digestive disturbances, liver and kidney damage and skin eruptions. p-Cresol has a corrosive action on tissues producing burns and dermatitis.

METHYLENE CHLORIDE

Methylene chloride is classified as a probable human carcinogen with evidence from studies on two different animal species. There is inadequate evidence regarding methylene chloride's toxicity to humans.

As with many low molecular weight halogenated hydrocarbons, methylene chloride is an anesthetic and may cause loss of awareness, mental confusion, lightheadedness, nausea, vomiting, irritation of the eyes and respiratory tract, and headache. Continual exposure to levels exceeding 500 ppm may lead to unconsciousness and death. Both human and animal studies of acute or prolonged exposure have shown impairment or loss of function of the liver, kidney, and cardiovascular system.

Methylene chloride (also known as dichloromethane) is widely used in a variety of industrial and commercial applications including metal degreasing, paint stripping, and solvent extraction in the food processing industry. It replaced trichloroethylene as the caffeine extractant in the production of decaffeinated coffee. It is also used to extract spice oleoresins and the beer flavoring in hops.

Exposure to methylene chloride can be fatal in humans following inhalation and ingestion. A primary adverse health effect associated with short-term exposure to methylene chloride is impairment of CNS functions. Longer-term exposure also produced CNS effects. Neurotoxicity was the most prominent symptom complex reported in over 100 cases involving occupational exposure to methylene chloride.

NAPHTHALENE

Naphthalene is moderately toxic via the oral route and highly toxic via the intravenous route. Naphthalene is an experimental tumorigenic agent. Systemic reactions include: nausea, headache, hematuria, liver damage, anemia, hepatic damage, vomiting, convulsions and coma. Poisoning may occur by ingestion, inhalation, or dermal exposure of large doses of the compound.

Naphthalene is a PAH compound. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into water and onto soil and crops. Naphthalene is found in coal tar pitch used by the industry as an adhesive. It may be used as an insecticide. People may be exposed to naphthalene from environmental sources such as air, water, and soil, and from cigarette smoke and overcooked food. Typical exposures are not usually to naphthalene alone, but to a mixture of similar compounds.

PHENANTHRENE

Phenanthrene is moderately toxic via the oral route and is a skin photo-sensitizer.

Phenanthrene is a PAH compound. It is a colorless, shiny crystalline solid. Because it is formed when gasoline, garbage, or any animal or plant material burns, it is usually found in smoke and soot. This chemical combines with dust particles in the air and is carried into the water and onto soil and crops. Phenanthrene is found in coal tar pitch used by the industry as an adhesive. It is used in dyestuffs, explosives, dry synthesis, and biochemical research. People may be exposed to phenanthrene from environmental sources such as air, water, and soil, and from cigarette smoke and overcooked food. Typical exposures are not usually to phenanthrene alone, but to a mixture of similar chemicals.

PYRENE

Pyrene is an irritant to the skin and is also an experimental neoplastic agent via the dermal route. It is a condensed ring hydrocarbon. It is a colorless solid which is derived from coal tar. Pyrene is used for biochemical research.

RDX

RDX, also known as trimethylenetrinitramine, cyclonite, or hexogen, is highly explosive and has been used as a rat poison commercially. Exposure to this compound may cause epileptic-like seizures and/or CNS dysfunction. It is one of the most powerful high explosives in use today. It has more shattering power than TNT and is often mixed with TNT as a bursting charge for aerial bombs, mines, and torpedoes. Large amounts ingested orally may have serious or even fatal effects. The symptoms include dizziness, cramps, convulsions, and collapse.

SELENIUM

Selenium is a non-metallic element. It is naturally occurring in rock and soils but is unevenly distributed. Selenium is an essential element to life. Selenium is found as any one of a number of compounds. It is used in electronics, xerographic plates, photocells, magnetic computer cores, solar batteries, rubber accelerators, catalysts, and as a trace element in animal feeds.

Selenium is an experimental tumorigenic agent. It is a poison via inhalation. Heat decomposition emits toxic fumes of selenium. It can react violently with many active compounds. It is implicated in causing amyotrophic lateral sclerosis in human. The oxychloride form is a vesicant. The dust and fumes irritate the respiratory tract, inorganic compounds causes dermatitis, garlic odor of breath; common symptoms are pallor, nervousness, depression and gastrointestinal disturbances.

SILVER

Silver is a white metal that is more malleable than any other metal except gold. It is an excellent conductor of heat and electricity. It is used for coinage, most frequently alloyed with copper or gold; for manufacturing tableware, mirrors, jewelry, and ornaments; for electroplating; for use in the manufacture of medicinal chemicals; in processing foods and beverages; in handling organic acids; as a catalyst in hydrogeneration and oxidation processes; and as an ingredient of dental alloys.

Silver is an experimental tumorigenic agent. Absorption through skin can cause systemic skin effects. Absorption of silver into the system can cause argyria (grayish green dye coloration of skin, mucous membrane, and eyes) with no symptoms. Silver compounds may be an irritant to the skin and mucous membranes.

THALLIUM

Thallium is a bluish-white, very soft, inelastic, easily fusible heavy metal. It oxidizes superficially in air, forms alloys with other metals and readily amalgamates with mercury. In a mixture with 97-98% inert substances, thallium salts are used as poison for rats and other rodents. It is also alloyed with mercury for switches and closures which can operate at subzero temperatures.

Thallium has been proven to cause nausea, vomiting, diarrhea, tingling, weakness, coma and death as symptoms for acute toxicity. Long-term exposure to thallium causes polyneuritis (weakness and pain in extremities) and loss of hair.

TOLUENE

Toluene is also known as methylbenzene. It is a colorless liquid with a sweet, pungent, benzene-like odor. It is derived from coal tar. Toluene is used in the manufacture of benzene, as a chemical feed, as a solvent for paints and coatings, and as a fuel component.

Toluene is an experimental mutagen and skin and eye irritant. It causes moderate human central nervous system psychotrophic effects via the inhalation and subcutaneous route. Repeated exposure

to small doses can cause headache, nausea, eye irritation, loss of appetite, bad taste, lassitude, and impairment of coordination and reaction time. Toluene affects the central nervous system, kidney, and liver. Fatal exposure can cause the subject to go from intoxication to coma. It is a dangerous fire and explosion hazard and is also a powerful oxidizer.

ZINC

Zinc is a metal with many uses in industry. It can found in pure form or mixed with other metals to form alloys such as brass, or chemical salts such as zinc chloride. Zinc compounds are found naturally in air soil and water, and are present in most foods. Zinc is an essential trace element that is involved with enzyme functions, protein synthesis and carbohydrate metabolism.

Zinc is absorbed via ingestion and inhalation and is widely distributed throughout the body. Ingestion of excessive amounts of zinc may cause fever and gastrointestinal distress. Inhalation exposure to zinc dust of fumes has been associated with pulmonary fibrosis and metal fume fever. Chronic exposure to zinc has produced anemia.

Elevated exposures to zinc have produced reduced fetal copper levels in experimental studies. Premature deliveries and one stillbirth was observed in a "small group" of women given zinc supplements late in pregnancy. Increased number of fetal resorptions have also been seen in studies in rats receiving zinc supplementation; however, zinc deficiencies may also have adverse fetal effects.

APPENDIX Q

TEST TRENCH LOGS

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)		SHEET: 1	OF 1
CLIENT: AFCEE - PAFB	JOB NUMBER: 01F00000049.00.16005		
CONTRACTOR: GARROW BROS. INC.	LOCATION: EOD RANGE (SS-026)		
DATE STARTED: 9-16-99	GROUND ELEVATION: NORTH END -180.0', SOUTH END -179.1'		
DATE COMPLETED: 9-16-99	OPERATOR: Craig Clookey.		
PIT NUMBER: EOD-TP-1	GEOLOGIST: STEVE MOELLER / SCOTT FISCHER		
	GROUND WATER: NOT ENCOUNTERED.		

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	—	—	REGRADED SOIL & FILL: FINE SAND - BROWN, DRY, AND GLASS, BRICK, BROKEN FLATWARE, ASPHALT, RUBBER HOSE, AND VEGITATION.
1.5			
2			FINE SAND - BROWN, MOIST. (NATIVE SOIL).
3	—	—	
4			
5			TEST PIT COMPLETED 4.0'
6			
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS; 43' LONG, 4' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED OVER AREA OF SUSPECTED FILL IN HFA GRID E-76.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-16-99	GROUND ELEVATION:	WEST END -180.6', EAST END -183.7'
DATE COMPLETED:	9-16-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-2	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	—	—	REGRADED SOIL ; FINE SAND - BROWN, DRY, SOME BURNT WOOD.
2			
3			
4			TEST PIT COMPLETED AT 4.0'
5			
6			
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS ; 30' LONG, 4' DEEP, AND 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED OVER AREA OF SUSPECTED FILL IN HFA GRID E-76.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)	SHEET: 1 OF 1
CLIENT: PAFB-AFCEE	JOB NUMBER: 01F0000049.00.16005
CONTRACTOR: GARROW BROS. INC.	LOCATION: EOD RANGE (SS-026)
DATE STARTED: 9-16-99	GROUND ELEVATION: WEST END -184.9', EAST END -185.4'
DATE COMPLETED: 9-16-99	OPERATOR: Craig Clookey
PIT NUMBER: EOD-TP-3	GEOLOGIST: STEVE MOELLER / SCOTT FISCHER
	GROUND WATER: NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	SURFACE DEBRIS - GLASS, BRICK, FLATWARE, WOOD, BOULDERS, ASPHALT REGRADED SOIL: FINE SAND - BROWN, DRY, SOME ORGANIC MATERIAL.
1			
2			FINE SAND - BROWN, MOIST
3	—	—	— ORANGISH BROWN.
4			
5			
6			TEST PIT COMPLETED 6.0'
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 42' LONG, 6' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F0000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-16-99	GROUND ELEVATION:	WEST END - 184.8', EAST END - 185.8'
DATE COMPLETED:	9-16-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-4	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED.

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	SURFICIAL AND BURIED DEBRIS: METAL, CONCRETE, BED SPRINGS, WOOD, ASPHALT. IN A MATRIX OF FINE SAND - BROWN, DRY, SOME ORGANIC MATERIAL.
1			
2			FINE SAND - BROWN, MOIST
3	—	—	- ORANGISH BROWN
4			
5			TEST PIT COMPLETED AT 5.0'
6			
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 50' LONG, 5' DEEP AND 5' WIDE. NO PID READINGS ABOVE BACKGROUND

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)		SHEET: 1 OF 1	
CLIENT: PAFB - AFCEE		JOB NUMBER: 01F00000049.00.16005	
CONTRACTOR: GARROW BROS. INC.		LOCATION: EOD RANGE (SS-026)	
DATE STARTED: 9-16-99		GROUND ELEVATION: NORTH END - 186.2', SOUTH END - 185.0'	
DATE COMPLETED: 9-16-99		OPERATOR: Craig Clookey	
PIT NUMBER: EOD-TP-5		GEOLOGIST: STEVE MOELLER / SCOTT FISCHER	
		GROUND WATER: NOT ENCOUNTERED	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	SURFICIAL AND BURIED DEBRIS OF RUSTY METAL, ASPHALT, CONCRETE, GLASS AND FLAT WARE. IN A MATRIX OF FINE SAND - BROWN, DRY SOME ORGANICS AND ROOTS.
1			
2			FINE SAND - ORANGISH BROWN, MOIST
3	—	—	
4			
5			TEST PIT COMPLETED AT 5.0'
6			
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBEL 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 62' LONG, 5' DEEP AND 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-16-99	GROUND ELEVATION:	NORTH END -185.7', SOUTH END -176.6'
DATE COMPLETED:	9-16-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-6	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	—	—	SURFICIAL DEBRIS : RUSTED METAL, FEW 55 gal. DRUMS, FILING CABINET, COPPER SHEETING FINE SAND, DARK BROWN, DRY, SOME ORGANICS AND ROOTS.
2			FINE SAND - ORANGISH BROWN, MOIST.
3			
4			
5	—	—	
6			
7			
8			TEST PIT COMPLETED AT 8.0'
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS ± 76' LONG, 8' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-16-99	GROUND ELEVATION:	NORTH END -186.3', SOUTH END -180.2'
DATE COMPLETED:	9-16-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-7	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	-	-	SPARSE SURFICIAL DEBRIS: CONCRETE, BRICKS, GLASS, FLATWARE. FINE SAND - DARK BROWN, DRY.
1			
2			FINE SAND - ORANGISH BROWN, MOIST
3			
4			
5			
6			
7			
8			TEST PIT COMPLETED AT 8.0'
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 88' LONG, 8' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-20-99	GROUND ELEVATION:	NORTH END -185.1', SOUTH END -180.4'
DATE COMPLETED:	9-20-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-8	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	—	—	SURFICIAL AND BURIED DEBRIS: ASPHALT (MOSTLY), CONCRETE, BRICK, SHINGLES, DRUM FRAGMENTS, DRUM LID WITH "DANGER HIGH EXPLOSIVES", WOOD AND PLYWOOD, CLAY PIPE, AMMUNITION CANS.
2			— REGRADED SOIL: FINE SAND - DARK BROWN, DRY.
3			FINE SAND - ORANGISH BROWN, MOIST.
4	—	—	
5			
6			
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 59' LONG, 6' DEEP, 5' WIDE, NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, TOP AND SIDE OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB-AFCEE	JOB NUMBER:	01F0000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-20-99	GROUND ELEVATION:	NORTH END -160.4', SOUTH END -155.0'
DATE COMPLETED:	9-20-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-9	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	FINE SAND - DARK BROWN, DRY, SOME ORGANICS AND ROOTS
1–5	—	—	FINE SAND - ORANGISH BROWN, MOIST
5			TEST PIT COMPLETED AT 5.0'
6–12			

COMMENTS: TEST PIT EXCAVATED WITH KOBEL 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 17' LONG, 5' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND. NO SURFICIAL OR BURIED DEBRIS.

TEST PIT LOCATED IN SATELLITE FILL AREA, SIDE AND BOTTOM OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)	SHEET: 1 OF 1
CLIENT: PAFB - AFCEE	JOB NUMBER: 01F0000049.00.16005
CONTRACTOR: GARROW BROS. INC.	LOCATION: EOD RANGE (SS-026)
DATE STARTED: 9-20-99	GROUND ELEVATION: NORTH END -161.4', SOUTH END -155.9'
DATE COMPLETED: 9-20-99	OPERATOR: Craig Clookey
PIT NUMBER: EOD-TP-10	GEOLOGIST: STEVE MOELLER / SCOTT FISCHER
	GROUND WATER: NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	FINE SAND - DARK BROWN, DRY, SOME ORGANICS AND ROOTS
1			
2			FINE SAND - ORANGISH BROWN, MOIST
3			
4	—	—	
5			
6			TEST PIT COMPLETED AT 6.0'
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 12' LONG, 6' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND. NO SURFICIAL OR BURIED DEBRIS.

TEST PIT LOCATED IN SATELLITE FILL AREA, SIDE AND BOTTOM OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)		SHEET: 1 OF 1	
CLIENT: PAFB - AFCEE		JOB NUMBER: 01F0000049.00.16005	
CONTRACTOR: GARROW BROS. INC.		LOCATION: EOD RANGE (SS-026)	
DATE STARTED: 9-20-99		GROUND ELEVATION: NORTH END -168.0', SOUTH END -156.1'	
DATE COMPLETED: 9-20-99		OPERATOR: Craig Clookey	
PIT NUMBER: EOD-TP-11		GEOLOGIST: STEVE MOELLER / SCOTT FISCHER	
		GROUND WATER: NOT ENCOUNTERED	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	—	—	SURFICIAL DEBRIS: RUSTY AMMUNITION CANS, RUSTED AND CRUSHED 55 gal. DRUMS, CHAIN-LINK FENCE, CONCRETE, ASPHALT, GLASS, bag piece LABLED "ASBESTOS", CLAY PIPE, FIBERGLASS INSULATION, BLACK TAR, REGRADED FINE SAND, BROWN, DRY
2			FINE SAND - ORANGISH BROWN, MOIST
3	—	—	
4			
5			
6			TEST PIT COMPLETED AT 5.0'
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 28' LONG, 5' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND. SAMPLE TAKEN (SS-026-SF-1) FOR TCL VOC, TCL SVOC, TCL PCB, TAL METALS ANALYSES.

TEST PIT LOCATED IN SATELLITE FILL AREA, SIDE AND BOTTOM OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-20-99	GROUND ELEVATION:	NORTH END - 168.6', SOUTH END - 154.2'
DATE COMPLETED:	9-20-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-12	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1–2	—	—	SURFICIAL & BURIED DEBRIS : CONCRETE, ASPHALT, BRICK, AMMUNITION CANS, PIECES OF 55gal. DRUMS, GYPSUM BOARD, TIRES, BLACK TAR, WIRE, STEEL CABLE. REGRADED SOIL - FINE SAND, DARK BROWN, DRY-MOIST
3–4	—	—	FINE SAND, ORANGISH BROWN, MOIST.
5–12			TEST PIT COMPLETED AT 4.0'

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS : 26' LONG, 4' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATELLITE FILL AREA, SIDE AND BOTTOM OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT:	EOD RANGE (SS-026)	SHEET: 1 OF 1	
CLIENT:	PAFB - AFCEE	JOB NUMBER:	01F00000049.00.16005
CONTRACTOR:	GARROW BROS. INC.	LOCATION:	EOD RANGE (SS-026)
DATE STARTED:	9-20-99	GROUND ELEVATION:	NORTH END -162.8', SOUTH END -154.2'
DATE COMPLETED:	9-20-99	OPERATOR:	Craig Clookey
PIT NUMBER:	EOD-TP-13	GEOLOGIST:	STEVE MOELLER / SCOTT FISCHER
		GROUND WATER:	NOT ENCOUNTERED

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
1	-	-	SURFICIAL AND BURIED DEBRIS - PIECES OF TELEPHONE POLE (up to 8' long), RUSTY METAL, RUBBER HOSE. 6 BOMB TAIL T743 DELAY Arming Vane containers, REGRADED SOIL - FINE SAND, DARK BROWN, Dry
2			FINE SAND - ORANGISH BROWN, MOIST
3			
4	-	-	
5			
6			TEST PIT COMPLETED 6.0'
7			
8			
9			
10			
11			
12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 29' long, 6' DEEP, 5' WIDE. NO PID READINGS ABOVE Background.

TEST PIT LOCATED IN SATELLITE FILL AREA, SIDE AND BOTTOM OF SLOPE.

TEST PIT LOG

URS Greiner
282 Delaware Avenue
Buffalo, New York 14202
(716) 856-5636

PROJECT: EOD RANGE (SS-026)		SHEET: 1 OF 1	
CLIENT: PAFB-AFCEE		JOB NUMBER: 01F0000049.00.16005	
CONTRACTOR: GARROW BROS. INC.		LOCATION: EOD RANGE (SS-026)	
DATE STARTED: 9-20-99		GROUND ELEVATION: NORTH END -175.7', SOUTH END -159.2'	
DATE COMPLETED: 9-20-99		OPERATOR: Craig Clookey	
PIT NUMBER: EOD-TP-14		GEOLOGIST: STEVE MOELLER / SCOTT FISCHER	
		GROUND WATER: NOT ENCOUNTERED.	

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	DESCRIPTION
0	—	—	REGRADED SOIL: DARK BROWN FINE SAND, ½" DIAMETER BY 20' LONG STEEL CABLE, COBBLES AND BOULDERS.
1–7	—	—	FINE SAND, ORANGISH BROWN, MOIST ↓
7			TEST PIT COMPLETED AT 7.0'
8–12			

COMMENTS: TEST PIT EXCAVATED WITH KOBELCO 115 SRDR TRACKED EXCAVATOR. TEST PIT DIMENSIONS: 30' LONG, 7' DEEP, 5' WIDE. NO PID READINGS ABOVE BACKGROUND.

TEST PIT LOCATED IN SATTELITE FILL AREA, SIDE AND BOTTOM OF SLOPE

APPENDIX R

1999 VOC AND SVOC TIC FORM 1S

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

55-026
SF-1

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909212-01A

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0401004.D

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: not dec. 13.3 Data Analyzed: 09/27/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~541-05-9~~	Cyclotrisiloxane, hexamethyl	7.605	~~11~~	~~NJB~~ R
2.					
3.					
4.					
5.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-026
SF-2

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909212-02A

Sample wt/vol: 4.9 (g/mL) G Lab File ID: 0501005.D

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: not dec. 14.6 Data Analyzed: 09/27/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~110-54-3~~	Hexane	~~1.807~~	~~8~~	~~NJ~~ R
2.	~~541-05-9~~	~~Cyclotrisiloxane, hexamethyl~~	~~7.605~~	~~13~~	~~NJB~~ R
3.		~~Unknown~~	~~15.482~~	~~8~~	~~J~~ R
4.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
SF-4

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-01A

Sample wt/vol: 4.8 (g/mL) G Lab File ID: 0801008.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. 37.4 Data Analyzed: 09/24/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	~~1634-04-4~~	~~Propane, 2-methoxy-2-methyl-~~	~~1.628~~	~~28~~	~~NJ~~	R
2.	~~110-54-3~~	~~Hexane~~	~~1.782~~	~~35~~	~~NJ~~	R
3.		~~Unknown~~	~~15.489~~	~~34~~	~~JB~~	R
4.						
5.						M 12/15/99
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
SF-4DUP

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-02A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1701017.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. 37.3 Data Analyzed: 09/24/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~Unknown~~	~~15.409~~	~~11~~	~~JB~~
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
SF-5

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-03A

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 1001010.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. 42.9 Data Analyzed: 09/24/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
SF-6

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-06A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 1101011.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. 56.0 Data Analyzed: 09/24/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	~~110-54-3~~	Hexane	~~1.790~~	~~39~~	~~NJ~~
2.					
3.					
4.					
5.					
6.					
7.					
8.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-1

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909016-10A

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 0301003.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 24.1 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
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9.					
10.					
11.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-2

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909016-11A

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0401004.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 23.6 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-3

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909016-12A

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 0501005.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 12.5 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
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18.					
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28.					
29.					
30.					

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-4

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 909016-02A

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 0601006.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 16.4 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
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29.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-5

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909016-15A

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 0701007.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 4.2 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	22.294	19	J
2.					
3.					
4.					
5.					
6.					
7.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26
CAS-6

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909016-16A

Sample wt/vol: 5.5 (g/mL) G Lab File ID: 0801008.D

Level: (low/med) LOW Date Received: 09/02/99

% Moisture: not dec. 21.8 Data Analyzed: 09/10/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-1
-216

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1101011.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. _____ Data Analyzed: 09/22/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-1DUP-26

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-10A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1201012.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. _____ Data Analyzed: 09/22/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-2
-26

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-11A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1301013.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. _____ Data Analyzed: 09/22/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-24-001

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS9912

Matrix: (soil/water) WATER Lab Sample ID: 9910075-06A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1001010.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-001

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS991Z

Matrix: (soil/water) WATER Lab Sample ID: 9910075-01A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0501005.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
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11.					
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-002

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS9912

Matrix: (soil/water) WATER Lab Sample ID: 9910075-02A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0601006.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-003

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS991Z

Matrix: (soil/water) WATER Lab Sample ID: 9910075-03A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0701007.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-004

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS9912

Matrix: (soil/water) WATER Lab Sample ID: 9910075-04A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0801008.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-005

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS9912

Matrix: (soil/water) WATER Lab Sample ID: 9910075-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0901009.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-005DUP

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS991Z

Matrix: (soil/water) WATER Lab Sample ID: 9910075-07A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1101011.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

EB1-091599

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-07A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 0901009.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. _____ Data Analyzed: 09/22/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

TB1-091599

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-08A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1001010.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: not dec. _____ Data Analyzed: 09/22/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

TB100699

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS9912

Matrix: (soil/water) WATER Lab Sample ID: 9910075-10A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1201012.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: not dec. _____ Data Analyzed: 10/19/99

GC Column:J&W DB-624 ID: 0.18 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-SF-1

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909212-01B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A0801008.D

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: 13 decanted: (Y/N) N Date Extracted: 09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/29/99

Injection Volume: 2.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.940	47700	NJ
2.	90-12-0	Naphthalene, 1-methyl-	10.643	5860	NJ
3.		Dimethylnaphthalene Isomer	11.861	3360	J
4.		Dimethylnaphthalene Isomer	12.065	3950	J
5.		Dimethylnaphthalene Isomer	12.100	2520	J
6.		Unknown	14.363	5750	J
7.	73510-62-0	3,4-Dihydropyrrolo[1',2':3,4	14.711	6900	NJ
8.	1430-97-3	9H-Fluorene, 2-methyl-	15.443	6760	NJ
9.	132-65-0	Dibenzothiophene	16.080	8740	NJ
10.	832-64-4	Phenanthrene, 4-methyl-	17.319	8460	NJ
11.	779-02-2	Anthracene, 9-methyl-	17.379	8990	NJ
12.	613-12-7	Anthracene, 2-methyl-	17.451	6500	NJ
13.	203-64-5	4H-Cyclopenta[def]phenanthre	17.547	17200	NJ
14.	605-02-7	Naphthalene, 1-phenyl-	17.861	7820	NJ
15.	84-65-1	9,10-Anthracenedione	17.957	8430	NJ
16.		Unknown	18.609	25600	J
17.	2381-21-7	Pyrene, 1-methyl-	19.528	10700	NJ
18.	3442-78-2	Pyrene, 2-methyl-	19.625	9610	NJ
19.	3353-12-6	Pyrene, 4-methyl-	19.685	6220	NJ
20.	192-97-2	Benzo[e]pyrene	22.860	7460	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-SF-1DL

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909212-01BD

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 0201002.D

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: 13 decanted: (Y/N) N Date Extracted:09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/01/99

Injection Volume: 2.0(uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	123-42-2	2-Pentanone, 4-hydroxy-4-met	3.928	49300	NJD
2.	90-12-0	Naphthalene, 1-methyl-	10.650	10100	NJD
3.		Unknown	14.364	8400	JD
4.	132-65-0	Dibenzothiophene	16.064	12000	NJD
5.	779-02-2	Anthracene, 9-methyl-	17.300	11600	NJD
6.	613-12-7	Anthracene, 2-methyl-	17.360	14500	NJD
7.	203-64-5	4H-Cyclopenta[def]phenanthre	17.516	33300	NJD
8.	612-94-2	Naphthalene, 2-phenyl-	17.853	10200	NJD
9.	84-65-1	9,10-Anthracenedione	17.925	7900	NJD
10.		Unknown	18.828	33300	JD
11.	243-42-5	Benzo[b]naphtho[2,3-d]furan	19.141	21400	NJD
12.	2381-21-7	Pyrene, 1-methyl-	19.323	33200	NJD
13.	3353-12-6	Pyrene, 4-methyl-	19.503	82100	NJD
14.	243-17-4	11H-Benzo[b]fluorene	19.612	68300	NJD
15.	3442-78-2	Pyrene, 2-methyl-	19.672	39600	NJD
16.	613-59-2	Naphthalene, 2-(phenylmethyl	19.709	27800	NJD
17.		Unknown	20.035	14600	JD
18.	239-35-0	Benzo[b]naphtho[2,1-d]thioph	20.495	23600	NJD
19.	195-19-7	Benzo[c]phenanthrene	21.076	40800	NJD
20.	192-97-2	Benzo[e]pyrene	22.862	40400	NJD
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-SF-2

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909212-02B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A0401004.D

Level: (low/med) LOW Date Received: 09/21/99

% Moisture: 15 decanted: (Y/N) N Date Extracted:09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/29/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	10574-37-5	2-Pentene, 2,3-dimethyl-	3.489	252	NJ
2.		Unknown	3.751	1070	J
3.		~~Unknown~~	~~3.977~~	~~15200~~	~~JB~~ R
4.		Unknown	4.488	322	J
5.		~~Unknown~~	~~4.941~~	~~2490~~	~~JB~~ R
6.	56712-06-2	TETRADECANOL-018	16.844	196	NJ
7.	638-53-9	Tridecanoic acid	17.483	634	NJ
8.	629-76-5	1-Pentadecanol	18.317	163	NJ
9.		Unknown Aliphatic	19.539	478	J
10.	2136-70-1	Ethanol, 2-(tetradecyloxy)-	20.596	1300	NJ
11.		Unknown Aliphatic	21.545	632	J
12.	40710-42-7	1-Hentetracontanol	21.569	830	NJ
13.	7683-64-9	2,6,10,14,18,22-Tetracosahex	22.215	1860	NJ
14.	7225-64-1	Heptadecane, 9-octyl-	22.435	1280	NJ
15.		Unknown Aliphatic	22.497	1380	J
16.		Unknown Aliphatic	23.291	1050	J
17.		Unknown Aliphatic	23.365	843	J
18.		Unknown	25.767	724	J
19.		Unknown	25.865	1230	J
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-SF-4

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-01B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 0201002.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: 37 decanted: (Y/N) N Date Extracted: 09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	4.518	19300	J
2.		Unknown	5.281	1720	J
3.		Unknown	5.937	2760	J
4.	57-10-3	Hexadecanoic acid	17.564	799	NJ
5.		Unknown	17.975	715	J
6.		Unknown	19.307	1880	J
7.		Unknown	20.156	546	J
8.		Unknown	20.533	542	J
9.		Unknown Aliphatic	20.667	1110	J
10.		Unknown	21.617	666	J
11.	19047-85-9	Phosphonic acid, dioctadecyl	21.642	996	NJ
12.		~~Unknown~~	~~22.277~~	~~911~~	~~JB~~
13.		Unknown Aliphatic	22.509	872	J
14.		Unknown Aliphatic	22.558	892	J
15.	13475-75-7	Pentadecane, 8-hexyl-	23.365	742	NJ
16.		Unknown	23.439	1070	J
17.		Unknown	23.806	690	J
18.		Unknown	25.054	875	J
19.		Unknown	25.164	1040	J
20.		Unknown	25.275	621	J
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-2G-
SF-4DUP

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-02B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 0301003.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: 37 decanted: (Y/N) N Date Extracted: 09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 19

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	4.422	39400	J
2.		Unknown	5.245	1560	J
3.		Unknown	20.157	795	J
4.		Unknown	20.522	448	J
5.	2136-70-1	Ethanol, 2-(tetradecyloxy)-	20.667	620	NJ
6.	54833-48-6	Heptadecane, 2,6,10,15-tetra	21.615	826	NJ
7.	18733-57-8	Silane, trichloroeicosyl-	21.640	1160	NJ
8.		Unknown	22.163	418	J
9.		~~Unknown~~	~~22.285~~	~~892~~	~~JB~~ R
10.		Unknown Aliphatic	22.504	1110	J
11.		Unknown	22.565	1300	J
12.		Unknown	23.163	757	J
13.		Unknown	23.371	760	J
14.	36653-82-4	1-Hexadecanol	23.432	1570	NJ
15.		Unknown	23.798	533	J
16.		Unknown	24.067	589	J
17.		Unknown	25.044	850	J
18.		Unknown	25.166	745	J
19.		Unknown	25.985	452	J
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-
SF-5

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-03B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 0401004.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: 43 decanted: (Y/N) N Date Extracted:09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	3.945	2520	J
2.		~~Unknown~~	~~4.123~~	~~9260~~	~~JB~~ R
3.		~~Unknown~~	4.995	~~1860~~	~~JB~~ R
4.	57-10-3	Hexadecanoic acid	17.578	955	NJ
5.		Unknown Aliphatic	19.611	226	J
6.		Unknown	20.218	592	J
7.		Unknown	20.534	646	J
8.		Unknown	20.668	1150	J
9.	629-73-2	1-Hexadecene	21.618	824	NJ
10.		Unknown	21.642	1120	J
11.		~~Unknown~~	~~22.289~~	~~789~~	~~JB~~ R
12.		Unknown Aliphatic	22.508	1000	J
13.		Unknown	22.557	1030	J
14.		Unknown	23.437	874	J
15.	59-02-9	Vitamin E	23.780	617	NJ
16.		Unknown	25.053	1170	J
17.		Unknown	25.163	1060	J
18.		Unknown	25.591	1170	J
19.		Unknown	25.762	1580	J
20.	1058-61-3	Stigmast-4-en-3-one	25.995	545	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

SS-26-
SF-6

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-06B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: 0701007.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: 56 decanted: (Y/N) N Date Extracted:09/22/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.		~~Unknown~~	~~4.017~~	~~15900~~	~~JB~~	R
2.		~~Unknown~~	~~5.019~~	~~3180~~	~~JB~~	R
3.		Unknown	17.453	877	J	
4.		Unknown	17.526	927	J	
5.	57-10-3	Hexadecanoic acid	17.623	3390	NJ	
6.		Unknown	18.786	4060	J	
7.	57-11-4	Octadecanoic acid -	18.908	1680	NJ	
8.		Unknown Aliphatic	20.671	2180	J	
9.		Unknown Aliphatic	21.622	1660	J	
10.		Unknown	21.646	1960	J	
11.		~~Unknown~~	~~22.281~~	~~2540~~	~~JB~~	R
12.		Unknown Hydrocarbon	22.513	3000	J	
13.		Unknown	22.562	2410	J	
14.		Unknown Aliphatic	23.370	2410	J	
15.		Unknown	23.443	1410	J	
16.		Unknown	25.048	1610	J	
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-1
-26

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-09B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1101011.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/19/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	15.311	3	J
2.		~~Unknown~~	~~16.704~~	~~3~~	~~JB~~ R
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-1DUP
-36

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-010B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1201012.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/19/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	15.299	5	J
2.					
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

LS-SF-2
-26

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) SOIL Lab Sample ID: 9909170-11B

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A0301003.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: 0 decanted: (Y/N) N Date Extracted:09/20/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/29/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	9.587	3	J
2.		~~Unknown~~	~~10.276~~	~~5~~	~~JB~~ R
3.		Unknown	15.431	17	J
4.		~~Unknown~~	~~16.612~~	~~7~~	~~JB~~ R
5.	112-39-0	Hexadecanoic acid, methyl es	17.197	3	NJ
6.	13360-61-7	1-Pentadecene	19.777	2	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-005

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9910075-05B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 0601006.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:10/11/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.		~~Unknown~~	~~10.290~~	~~5~~	~~JB~~	R
2.		Unknown	15.468	21	J	
3.	314-40-9	2,4(1H,3H)-Pyrimidinedione,	17.697	7	NJ	
4.	0-00-0	~~2,6,10,15,19,23-HEXAMETHYL-2~~	~~22.227~~	~~10~~	~~NJ~~	R
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

MW-26-005DUP

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9910075-07B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 0701007.D

Level: (low/med) LOW Date Received: 10/07/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:10/11/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 11/03/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		~~Unknown~~	~~10.287~~	~~4~~	~~JB~~
2.		Unknown	15.463	23	J
3.	314-40-9	2,4(1H,3H)-Pyrimidinedione,	17.690	8	NJ
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

NYSDEC SAMPLE NO.

EB1-091599

Lab Name: Buck Environmental Labs Contract:

Lab Code: 10795 Case No.: SAS No.: SDG No.: URS99

Matrix: (soil/water) WATER Lab Sample ID: 9909170-07B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1001010.D

Level: (low/med) LOW Date Received: 09/16/99

% Moisture: _____ decanted: (Y/N)___ Date Extracted:09/19/99

Concentrated Extract Volume: 1000(uL) Date Analyzed: 10/22/99

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	10.454	3	J
2.		Unknown	16.711	4	JB
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