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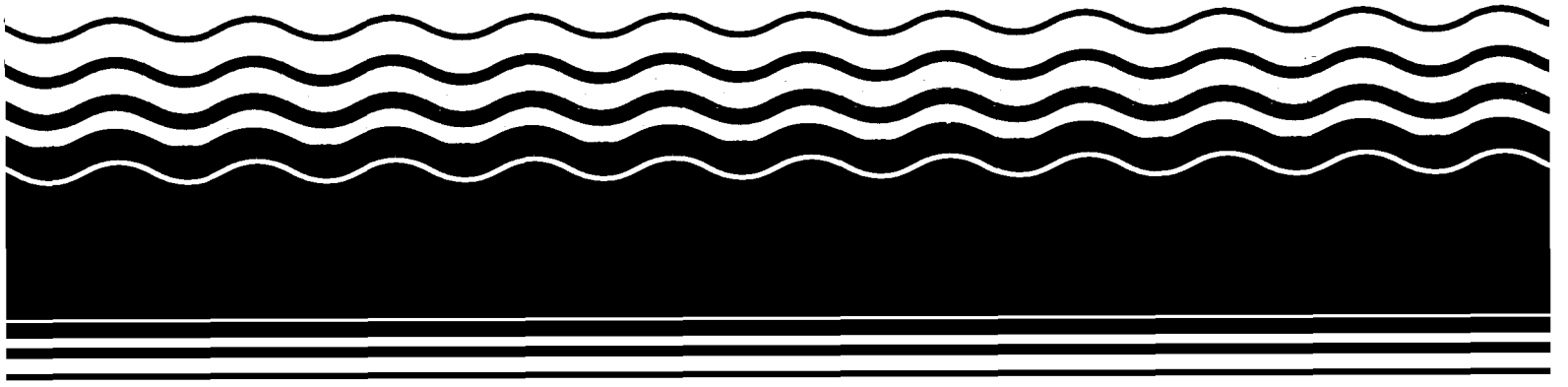
Superfund Record of Decision:

Mountain Home Air Force Base, ID



NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

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16. Abstract (Limit: 200 words)

The 7-acre Mountain Home Air Force Base (AFB) site is a fire department training area located in Mountain Home, Elmore County, Idaho. Land use in the area is predominantly rural and agricultural. An estimated 6,990 people residing within 0.6 mile of the site and several farmers in the vicinity use ground water to irrigate agricultural lands. From 1962 to 1975, the Mountain Home Air Force Base used the site for fire department training exercises. From 1962 to 1975, the fuel used in the fire training exercises was either clean fuel AVGAS or JP-4, or fuels from flight line defueling operations. Since 1975, only clean JP-4 has been used in the exercises. Each exercise began by saturating the bermed training area with water, followed directly by applying 250 to 500 gallons of fuel. The flames were extinguished with Aqueous Film Forming Foam (AFFF), or prior to 1972, with a water-based protein foam. The training session was completed with a post-exercise ignition of the residual fuel in a bermed area. The USAF investigations identified solvents and petroleum, oil, lubricant (POL) wastes in the soil. Under the Installation Restoration Program (IRP), the USAF conducted a record search, drilling, and sampling of soil borings to bedrock, the installation of monitoring wells, and hand auger samples. Corrective measures that

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Mountain Home Air Force Base, ID
First Remedial Action - Final
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Key Contaminants: None

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EPA/ROD/R10-92/038
Mountain Home Air Force Base, ID
First Remedial Action - Final

Abstract (Continued)

were taken included placing warning signs, deactivating the burn pit in 1986, and installing ground water monitoring wells. This ROD provides a final remedy for onsite soil as OU4. Future RODs will address ground water contamination as a separate operable unit. Because contaminants were found at such low concentrations, the soil was covered by crushed asphalt and has little potential to impact ecological receptors. The soil poses low risks for humans at the site and no remediation is necessary. Therefore, there are no contaminants of concern at the site.

The selected remedial action for this site is no further action. Based on the results of the human health risk assessment the USAF, EPA, and the state have determined that chemicals remaining in the soil pose no unacceptable risks to human health or the environment. There are no costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

RECORD OF DECISION

FOR

MOUNTAIN HOME AIR FORCE BASE, SITE 8

FIRE TRAINING AREA 8, OPERABLE UNIT 4

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MOUNTAIN HOME AIR FORCE BASE, MOUNTAIN HOME, IDAHO
DECLARATION FOR THE RECORD OF DECISION - SITE 8
FIRE TRAINING AREA 8, OPERABLE UNIT 4

SITE NAME AND LOCATION

Mountain Home Air Force Base, Site 8
Fire Training Area 8, Operable Unit 4
Mountain Home, Elmore County, Idaho

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected final remedial action for Fire Training Area 8 (Site 8) at Mountain Home Air Force Base in Mountain Home, Idaho. The selected remedy was chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for this operable unit.

The lead agency for this decision is the U.S. Air Force. The U.S. Environmental Protection Agency (USEPA) approves of this decision and, along with the State of Idaho Department of Health and Welfare (IDHW), has participated in the evaluation of remedial investigation data. The State of Idaho concurs with the selected remedy.

DESCRIPTION OF THE SELECTED REMEDY

No remedial action is the recommendation of the U.S. Air Force, USEPA, and IDHW. This decision is based on the results of the human health risk assessment. The assessment determined that chemicals remaining in the soil pose no unacceptable risks to human health or the environment under current and future use scenarios.

DECLARATION STATEMENT

The no action remedy is protective of human health and the environment. Because this remedy will not result in hazardous substances remaining on site above health-based levels that allow for unlimited use and unrestricted exposure, a statutory five-year review will not apply to this action.

Signature sheet for the foregoing Fire Training Area Site 8 Record of Decision between the U.S. Air Force and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare.

Dana A. Rasmussen

Dana A. Rasmussen
Regional Administrator, Region 10
U.S. Environmental Protection Agency

6/16/92
Date

Signature sheet for the foregoing Fire Training Area Site 8 Record of Decision between the U.S. Air Force and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare.

WS Hinton
Signature
Col. William S. Hinton
Commander, 366th Wing
United States Air Force
Mountain Home AFB, Idaho

8 May 92
Date

Signature sheet for the foregoing Fire Training Area Site 8 Record of Decision between the U.S. Air Force and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare.

Signature

6-9-92
Date

Richard A. Donovan
Director
Idaho Department of Health and Welfare

DECISION SUMMARY - SITE 8
FIRE TRAINING AREA 8, OPERABLE UNIT 4
MOUNTAIN HOME AIR FORCE BASE
MOUNTAIN HOME, IDAHO

INTRODUCTION

In accordance with Executive Order 12580 (Superfund Implementation) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the U.S. Air Force (USAF) performed a Remedial Investigation (RI) for Fire Training Area 8 (Site 8). The RI characterized the nature and extent of contamination in soils at Site 8 (Woodward-Clyde Consultants, 1991). A Baseline Risk Assessment was conducted to evaluate potential effects of the contaminants remaining in the soils on human health.

I. SITE NAME, LOCATION, AND DESCRIPTION

Mountain Home AFB is located about 10 miles southwest of Mountain Home in Elmore County, Idaho (Figure 1). The Base occupies an area of 9 square miles. Site 8 is located on Mountain Home AFB southeast of the power check pads on the southeast end of Taxiway B in the Northeast Quarter of Section 33, Township 4 South, Range 5 East (Figure 2).

Mountain Home AFB is located in a rural agricultural area. Several of the farmers in the vicinity of the Base use groundwater to irrigate agricultural lands. The total resident population of Mountain Home AFB is about 6,990 people living in about 1,500 housing units (United States Air Force, 1987). The nearest residence to Site 8 is located on the Base and is approximately 0.6 miles north-northeast.

The topography at Site 8 is essentially flat. A gentle downward slope toward the western site boundary directs surface water runoff to a drainage ditch running parallel with the western site boundary (see Figure 3). The drainage ditch flows to the southwest where it enters a concrete culvert, and then continues through a buried 36-inch storm drain line which runs due south. The storm drain

finally empties into the drainage ditch which crosses the southern Base boundary near the Prime Beef training area.

The Fire Training Area 8 site is adjoined by the existing fire training area to the northeast. Each fire training area occupies an area of approximately 485 by 500 feet. The two areas are completely surrounded by an 8-foot-high chain-link fence which is topped with barbed wire and secured with three locked gates. The on-site structures consist of one three-story building, one single-story shed, and a burn area in which a steel skeleton mock airplane is encircled by a 1-foot-high earthen berm 125 feet in diameter (Figure 3). Additional site facilities include a fire hydrant, a 15,000-gallon underground fuel storage tank, fuel transfer lines, an oil/water separator system, and two small pad areas at the southern end of the site for car fires and lifesaving training. The drainage system at Site 8 was installed in 1986, but was never used because fire training activities were halted that year. A trench drain is located on the north side of the bermed area (Figure 3).

II. SITE HISTORY, RESPONSE HISTORY, AND ENFORCEMENT ACTIVITIES

A. Site History

Site 8 was the Mountain Home AFB fire department training area from 1962 to 1986. The active fire training area is located to the north and adjacent to Site 8.

Fire training exercises were conducted at Site 8 twice per week from 1962-1975 and three times per month during the summer and one time per month during the winter from 1975-1986. Each exercise was initiated by saturating the bermed training area with water followed directly with the application of 250 to 500 gallons of fuel. Once ignited, the fuel burned for approximately 10 seconds before the flames were extinguished with "Aqueous Film Forming Foam" (AFFF). Prior to 1972, a water-based protein foam extinguisher was used. The training session was completed with a post-exercise ignition of the residual fuel in the bermed area.

From 1962 to 1975, fuel used in the fire training exercises was either clean fuel (AVGAS or JP-4) or fuels from flight line defueling operations that, once removed from the aircraft, are considered contaminated. AVGAS was used from 1962 to 1968, by which time the Base was entirely converted to F4s, which use JP-4. Since 1975, only clean JP-4 has been used in the exercises.

Contaminated fuel from the flight line was used in fewer than one third of the training exercises. Contaminants likely to be found in fuel removed from aircraft were water and trace amounts of lubricants.

There may have been isolated occurrences of other fuels being mixed with the AVGAS or JP-4 used in fire training exercises. For example, on one occasion approximately 200 gallons of clean diesel fuel from the U. S. Army was mixed with the standard fuels used in the exercises.

Analysis of Site 8 soils showed the presence of compounds associated with solvents and petroleum, oil, lubricant (POL) wastes. Although it was not common practice to use these materials during fire training exercises, it is possible that relatively small quantities of these wastes were used on occasion.

Until approximately 1972, the fire extinguishing agent used at Site 8 was a protein foam that was mixed with water and became aerated upon dispersal. It did not contain halogenated methane compounds. Since 1972, AFFF has been used in the exercises. AFFF, a 3M brand, FC-203CE, is a water-based mixture made up of 60 percent water and 30 percent diethylene glycol monobutyl ether (CAS #112-34-5). The remaining 10 percent of the AFFF is composed of surfactants and stabilizers. It is a synthetic material that evaporates in air; it does not contain halogenated methane compounds. Chlorodibromomethane (CBM) was not used to extinguish fires at the site because of the cost, weight, and difficulty of filling the extinguishers and servicing the vehicles that transport CBM.

B. Response History

To assure compliance with CERCLA regulations, the Department of Defense (DOD) developed the Installation Restoration Program (IRP). The IRP is the basis for response actions on Air Force installations under the provisions of CERCLA. The IRP is a multiphased, iterative process designed to identify and characterize hazardous and/or toxic waste sites and implement remedial actions on the site in a timely and cost-effective manner.

Under the IRP the USAF has conducted several phases of investigations at Site 8 which included a record search, drilling and sampling of soil borings to bedrock, the installation of monitoring wells and hand auger samples.

Mountain Home AFB was listed on the National Priorities List (NPL) in August 1990. The U.S. Air Force, (USAF), USEPA and IDHW have identified sites to investigate and/or clean up under a tri-party Federal Facility Agreement (FFA).

This agreement has been in place since January, 1991.

C. Enforcement Activities

In November, 1987, EPA Region X issued a Notice of Noncompliance (NON) under the Resource Conservation Recovery Act (RCRA) to Mountain Home AFB, consistent with Executive Order 12088 (Federal Compliance with Pollution Control Standards), for several violations of hazardous waste storage, treatment, and disposal. Fire Training Area 8 was included as one of the sites where improper waste disposal practices occurred.

Corrective measures that were taken included: the placement of warning signs, the deactivation of the burn pit in 1986 and the installation of groundwater monitoring wells. Since Site 8 is being addressed under Superfund by incorporation into the FFA, no further corrective measures need to be addressed under the NON.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Public participation requirements under CERCLA Sections 113(k)(2)(B)(i-v) and 117 were satisfied during the RI/FS process. The Mountain Home AFB Public Affairs Office has been primarily responsible for conducting the community relations program. The following community relations activities were conducted during this RI/FS process.

- Creation of a Community Relations Plan.

- Establishment of Administrative Record repositories at the following locations:

  1) Mountain Home Public Library
     790 North 10 East
     Mountain Home, Idaho 83647
     Phone: (208) 587-4716

  2) U.S. Environmental Protection Agency
     422 West Washington
     Boise, Idaho 83702
     Phone: (208) 334-9047

- Creation and distribution of a Proposed Plan for the no action alternative at the site. The purpose of the Proposed Plan was to provide the public and any interested parties with the information which was used to come to the "no action" determination, and to announce the public comment period and public meeting dates.

- Periodic news releases and fact sheets announcing various on-site activities, results of investigations, and explanations of the investigative process. These included:

  1) A news release on January 7, 1992, to the list of contacts and interested parties noted in the Community Relations Plan and to various local newspapers, radio stations, and television stations advertising the

public meeting for Site 8 at Mountain Home High School on January 22, 1992

2) A paid advertisement in the Idaho Statesman and local Mountain Home newspapers which was run from January 16, 1992, through January 22, 1992, announcing the January 22, 1992, public meeting at Mountain Home High School

- Development of a mailing list composed of persons that are interested in the project, as well as public officials

- A public comment period on the no action alternative from January 7, 1992, to February 5, 1992

- A public meeting to discuss the no action alternative and to receive public comments on January 22, 1992, at the Mountain Home High School, Mountain Home, Idaho

- Oral and written comments were considered in selection of the no action alternative. The comments and responses are summarized in the Responsiveness Summary section of this ROD.

- A responsiveness summary addressing comments and questions received during the public comment period on the RI/FS and proposed plan is included with this Record of Decision as Appendix A.

Public interest in Site 8 has been low throughout the history of site investigative activities. No public concerns or issues have been raised during this time period.

IV. SCOPE AND ROLE OF OPERABLE UNIT AND RESPONSE ACTION

The sites that are being investigated at Mountain Home AFB have been divided into 4 operable units (OUs) as described below.

- Operable Unit 1. Consists of 20 sites which are being evaluated under a Limited Field Investigation (LFI). The

LFI study will ascertain whether potential source areas with limited information on hazardous waste activity warrant further remedial investigation, interim remedial action, or no further action.

- **Operable Unit 2**. Includes two former landfills currently undergoing an RI and baseline risk assessment.

- **Operable Unit 3**. Consists of a basewide groundwater RI which will evaluate the actual and potential threat to the groundwater from contaminants associated with source areas at the base. In addition, a basewide ecological risk assessment will be performed.

- **Operable Unit 4.** A source control RI and baseline risk assessment was conducted on the soils at Site 8.

The Mountain Home Fire Training Area 8 Remedial Investigation evaluated the nature and extent of contamination in the soils. Based on the results of the RI and Baseline Risk Assessment no remedial action under CERCLA is necessary to ensure protection of human health or the environment. Groundwater contamination and a basewide ecological assessment will be addressed in a sperate operable unit.

Since the no action decision does not result in hazardous substances, pollutants, or contaminants remaining at the site above health based levels that preclude unlimited use and unrestricted exposure, a five year review is not necessary.

V. SUMMARY OF SITE CHARACTERISTICS

A. Site Geology and Hydrogeology

Figure 6 shows a geologic map of the Mountain Home AFB area. The Mountain Home Plateau is underlain by over 10,000 feet of volcanic and sedimentary rocks which were deposited on the Idaho Batholith. The primary geologic groups of concern under Site 8 are the Idaho Group and the Snake River Group. The uppermost unit of the Idaho Group is the Bruneau Formation which is made up of predominantly

basalt flows with laterally discontinuous unconsolidated sedimentary deposits. Overlying the Idaho Group are the basalt flows of the Snake River Group.

The basalt sequence of the Snake River Group consists of overlying layers of individual basalt flows with interbed deposits. The basalt flows are characterized by horizontal zones (flow tops), flow interiors and vertical discontinuities (fractures). The interbed deposits range from unconsolidated to semiconsolidated silts and clays to gravel.

A diagrammatic cross-section of the local geology is shown on Figure 4. Soils within Site 8 consist of a layer of unconsolidated silt and sand, ranging in thickness from 12 to 21 feet, which overlies a thick sequence of basalt and interbed sediments.

Groundwater in the vicinity of Mountain Home AFB is present in both volcanic basalt and associated interflow zones. The regional aquifer is developed within the deep Glenns Ferry Formation and the Bruneau Formation of the Idaho Group.

Groundwater at Mountain Home AFB is obtained from nine production wells completed in the Bruneau Formation (see locations on Figure 5). These base production wells range in depth from 379 feet to 610 feet below ground surface (BGS). The water table at the Base occurs at a depth of about 350 feet BGS.

Regional groundwater flow is from areas of recharge to areas of discharge. In the vicinity of Mountain Home AFB, the regional groundwater flow (1981) is in a southerly direction toward the Snake River at a gradient of about 1 foot per 200 feet. Local groundwater flow directions and gradients vary and are difficult to determine. Additional data are required to determine the effects of base production well and off-site pumping on the local groundwater flow direction and gradient.

No surface water bodies are present in the vicinity of Site 8. Any precipitation which accumulates on the site either ponds on the surface pending evaporation or infiltration, or runs off the site to the drainage ditch on the northwestern side of the site.

Most surface water on the Base drains to Canyon Creek via a series of ditches that collect and direct runoff to a stormwater lift station on the western boundary of the Base. On rare occasions, after heavy rainfall, stormwater can be transferred to the Base sewage lagoons by lift pumps. Located about 4 miles west of the Base, Canyon Creek is an intermittent stream which drains into the Snake River. The Snake River is located about 2.5 miles south of the Base and flows through a canyon 300 to 500 feet deep. Springs along the north canyon wall of the Snake River are discharge points for the regional aquifer.

Adjacent land use at Site 8 consists of industrial and service oriented activities for Base personnel. These facilities include horse stables to the north and east, aircraft taxiways and runway to the west, and other associated structures. The nearest resident to Site 8 is approximately 0.6 miles to the northeast in the Base housing area.

B. Nature and Extent of Contamination

To identify the nature and extent of contamination, soil samples were collected from a total of fourteen borings to bedrock and six surface soil sampling locations. Surface and subsurface soils from boring samples were analyzed for volatile organic compounds (VOCs), total recoverable petroleum hydrocarbon (TRPH), and lead. Surface soil samples were analyzed for semivolatile compounds and metals. Site-related organic compounds that were identified in soil samples are acetone, benzene, 2-butanone (methyl ethyl ketone), ethylbenzene, 4-methyl-2-pentanone (methyl isobutyl ketone), methylene chloride, tetrachloroethylene, toluene, trichloroethylene, and xylenes. Results show the highest concentrations are generally within and below the bermed area; concentrations decrease with depth (vertically) and horizontally from the bermed area. Soils below the bermed area contain detectable concentrations of chemicals to bedrock (the top of the basalt, approximately 10 to 13 feet below ground surface). TRPH analyses also show that surface soils contain more than 1,000 ppm in an area extending about 150 feet north and northwest of the bermed area (Figure 6). South and east of the bermed area, the 1,000 ppm TRPH surface soil isopleth coincides with the bermed area

boundary. At depth, the extent of the 1,000 ppm TRPH zone is mostly confined to the upper 8 feet, except a point directly below the bermed area where the 1,000 ppm TRPH concentration is found at depths up to 10 feet. Arsenic was detected in concentrations ranging from 2.3 mg/kg to 3.2 mg/kg. Cadmium was not detected in any of the six samples. Chromium was detected in all samples in concentrations ranging from 8.7 mg/kg to 10.6 mg/kg. Lead concentrations ranged from 8.7 mg/kg to 41 mg/kg, with one sample at 500 mg/kg. Analytical results are shown in Tables 1 to 8, and 11.

The background metals data set consists of a number of soil samples collected during the OU1 investigations from sites that were determined to be uncontaminated by organic analytes and/or metals of concern. Background ranges based on this data are summarized in Table 9. In addition, Table 10 compares the Mountain Home AFB background data with literature values for soils in southwest Idaho and in the United States.

Metals concentrations detected in soils at Site 8 were found not to exceed background ranges.

In general, mobility of chemicals detected in Site 8 soils ranges from low to high. The compounds with the highest mobility are the VOCs. VOCs are generally highly soluble in water, do not adsorb to soil particles readily, and have high vapor pressures making volatilization into the air a significant mechanism for contaminant exposure. TRPH has a wide range of values for factors which affect mobility due to the large number of constituents which make up TRPH. These constituents have low to moderate mobility based on solubility. The constituents in TRPH also have a high adsorption rate onto soil particles and are generally low to moderately volatile. The metals are probably the least mobile of the site contaminants due to their high adsorption to soil, low solubility in water under normal pH conditions, and their lack of volatility. All of the site contaminants have the potential to be transported in fugitive dust emissions if the contaminants exist on or near the surface.

The carcinogenicity and toxicity of site chemicals of concern vary widely. In general, the contaminants with the highest carcinogenic and toxic effects are the VOCs. The only VOC which is classified as a confirmed human carcinogen is benzene. Compounds considered probable carcinogens include methylene chloride, and possibly tetrachloroethylene and trichloroethylene (TCE). Compounds not classified as human carcinogens due to lack of data include ethylbenzene, 2-butanone, 4-methyl-2-pentanone, toluene, and xylenes. The higher molecular weight constituents which make up the majority of TRPH exhibit low carcinogenicity. Acute toxic effects are also not found for these compounds, and for practical purposes may be considered nontoxic.

Among the chemicals with noncarcinogenic effects, xylenes and 4-methyl-2-pentanone are the most toxic. All of these compounds are volatile organics that may cause adverse health effects via inhalation exposures if released to air. In addition, exposure could result from ingestion and dermal absorption pathways.

VI. SUMMARY OF SITE RISKS

The baseline risk assessment evaluated potential risks to human health associated with site-specific chemicals, assuming that no action is taken to remediate the site.

Health risks were evaluated quantitatively for chemicals of concern in soils following USEPA risk assessment guidance for Superfund sites (*USEPA, 1989c, Risk Assessment Guidance for Superfund. Vol. I: Human Health Evaluation Manual. EPA/540/1-89/002*). Exposure pathways evaluated quantitatively include soil ingestion, dermal contact with soil, and inhalation of vapor-phase and particulate-bound chemicals released from soil. The groundwater exposure pathway was evaluated by using a vadose zone fate and transport model. Lead exposures were modeled using EPA's Integrated Uptake/Biokinetic (IUBK) model.

The results of the quantitative risk assessment provide an upper-bound estimate of potential risk under reasonable maximum current exposure conditions and under hypothetical future on-site residential exposure conditions. The results of the risk

assessment show that reasonable maximum exposures to soils and airborne contaminants are not expected to result in adverse noncarcinogenic health effects (indicated by a hazard index less than 1.0) or excess cancer risks that exceed cancer risk criteria used in Superfund (10^{-4} to 10^{-6}).

A basewide ecological assessment will be performed as part of the final operable unit for the entire Base (OU3). Site 8 will be considered along with the other sites on the Base as posing potential risks for ecological receptors.

A. Data Evaluation and Chemicals of Concern

A total of 84 soil samples from 14 borings and 6 additional surface soil samples were analyzed for the presence of potentially hazardous compounds associated with fuels used at the site. Surface and subsurface boring samples were analyzed for VOCs, TRPH, and lead. Surface soil samples were analyzed for semivolatile compounds and metals. A summary of analytical results for chemicals detected in the samples is shown in Tables 1 through 5 and 8.

Chemicals of concern are those compounds detected in soils that are related to past activities at the site and that may pose a health risk to exposed individuals. Volatile organic chemicals of concern are acetone, benzene, 2-butanone (methyl ethyl ketone), ethylbenzene, 4-methyl-2-pentanone (methyl isobutyl ketone), tetrachloroethylene, toluene, trichloroethylene (TCE), and xylenes. All but three volatile organic compounds that were detected in soil samples were considered chemicals of concern. Concentrations of chemicals of concern in site soils are summarized in Tables 11 and 12.

Hypothetical childhood exposures to lead were addressed via USEPA's Integrated Uptake/Biokinetic Model.

Exposures to TRPH were evaluated qualitatively because fuel mixtures (such as JP-4) are not highly toxic compared to the pure compounds addressed under CERCLA and there are no toxicity factors by which to quantitatively evaluate health risks.

No semivolatile compounds were detected in the soil samples collected for semivolatile analysis. Concentrations of metals of potential concern (arsenic, cadmium, and chromium) were not elevated above ranges typically found in soil samples from unaffected areas at Mountain Home AFB and relevant literature values. Therefore, they are not considered to be chemicals of concern.

B. Exposure Assessment and Chemical Intakes

The exposure assessment included evaluation of transport mechanisms for current and future land use scenarios, including wind erosion and particulate transport, volatilization of soil contaminants to the atmosphere, and vadose zone infiltration to groundwater. Surface water transport was not considered a complete exposure pathway. A conceptual site model illustrating the various exposure pathways is shown on Figure 7.

Potentially exposed individuals included:

- Fire fighters
- Hypothetical trespassers on site
- Recreational users at horse stables adjacent to the site
- Base residential receptors
- Base employees working near the site
- Hypothetical future on-site residents
- Future construction or remediation workers at the site

Residential, occupational, and recreational exposure points are shown on Figure 8.

Potentially complete exposure pathways for current and future land use included:

- Dermal contact with soils at the site
- Incidental ingestion of soils at the site
- Inhalation of particulate-bound and volatile contaminants released to air from soils

- Exposure to groundwater if impacted by chemicals of concern released from the soil

Transport of chemicals of concern to groundwater by infiltration of precipitation and irrigation water was addressed using a fate and transport model.

Mean and reasonable maximum soil concentrations of chemicals of concern were used to estimate exposures via direct contact and soil ingestion pathways. Estimates of exposure point concentrations in air were calculated using air dispersion modeling, based on estimated emission rates from the soil surface and site-specific meteorological conditions. The exposure point concentrations were estimated to support a conservative assessment of potential risks to the human populations.

Chronic daily intakes for each chemical were calculated based on the exposure point concentrations and pathway-specific intake assumptions such as inhalation rates, soil ingestion rates, dermal absorption rates, body weights, exposure frequencies and durations. The intake assumptions used to estimate chronic daily intakes were obtained from the Superfund Exposure Assessment Manual (SEAM), the Exposure Factors Handbook, and USEPA Region X Supplemental Risk Assessment Guidance for Superfund. Conservative estimates of specific site-related activities such as exposure frequency were made after discussion with Base personnel.

Pathway-specific intake assumptions for the three highest exposed receptors (occupational receptor, remediation worker, and hypothetical on-site resident) are included in Tables 13 through 19. Intake factors for these receptors are summarized in Table 20. These intakes factors were combined with the exposure point concentrations and documented toxicity values for carcinogenic and noncarcinogenic effects to derive the numerical calculation of risks.

C. Toxicity Assessment

The toxicity assessment addressed the potential for a chemical of concern to cause adverse effects in potentially exposed receptors

and estimated the relationship between extent of exposure and extent of toxic injury (i.e. dose-response relationship). Qualitative and quantitative toxicity information for the chemicals of concern was acquired through evaluation of relevant scientific literature. The most directly relevant data come from studies in humans. Most of the useable information on the toxic effects of chemicals comes from controlled experiments in animals. Tables 21 and 22 have been provided to show cancer slope factors and reference doses used to calculate risk.

TRPH

It is difficult to quantitatively address health risks of petroleum hydrocarbons (TRPH) in soils when the majority of specific chemicals in the mixtures cannot be quantified or identified. Depending on the product (crude oil, jet fuel, diesel fuel, etc.), any number of branched or straight chain, cyclic, and aromatic carbon compounds may be present. Many toxicological and epidemiological studies have been performed on common petroleum hydrocarbon mixtures to predict general toxic properties. Many of the chemicals measured as "total petroleum hydrocarbons" are common to low-toxicity chemical mixtures such as mineral oil, paraffins, lubricating oils, and petroleum-derived chemicals that are also used as food additives.

Available evidence suggests that typical TRPH mixtures are not particularly toxic. Certain constituents of TRPH that are known to be toxic (benzene, toluene, ethylbenzene, and xylenes (BTEX)) have been analyzed in soil samples at the site and are included in the quantitative health risk assessment. It is concluded that other components of TRPH would not add significantly to the resulting estimates of potential health risks.

D. Risk Characterization

The potential for adverse noncarcinogenic effects is evaluated by comparing projected daily intakes of the chemicals with reference doses considered safe for daily exposures for a lifetime. The resulting ratio is called a hazard index. Hazard indexes are summed for all chemicals and exposure pathways to obtain a total

hazard index for the exposed individual. If the hazard index exceeds 1, there may be concern for potential noncarcinogenic effects, and a more detailed and critical evaluation of the exposure assumptions and risks, including consideration of specific target organs affected, is required to ascertain if the cumulative exposure would, in fact, be likely to harm exposed individuals.

Carcinogenic risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. The numerical estimate of excess lifetime cancer risk is calculated by multiplying the estimated daily intake by the cancer slope factor (SF). In order to evaluate cancer risk from simultaneous exposure to several carcinogens, incremental cancer risks are additive.

For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6}. The 10^{-6} risk level is used as a point of departure for establishing remediation goals for the risks from constituents at specific sites.

A summary of the potential health risks associated with the various receptor populations at Mountain Home AFB is given in Table 23. The cumulative carcinogenic risks for all exposure pathways estimated for each of these identified receptor populations ranged from 4.6E-09 to 4.9E-06 for the average exposure scenarios and 1.2E-08 to 3.9E-05 for the reasonable maximum exposure (RME) scenarios. The maximum estimated carcinogenic risk (hypothetical on-site residential) was 3.9E-05 (4 in 100,000). This risk level may be overstated by an order of magnitude or more because of the highly conservative assumptions used to estimate air concentrations of VOCs.

The estimates of noncarcinogenic effects, represented as the hazard index, ranged from 2.7E-04 to 8.4E-02 for the average exposure scenarios and from 7.10E-04 to 3.2E-01 for the reasonable maximum exposure (RME) scenarios. The estimates of noncarcinogenic effects, represented as the hazard index, are below 1.0 for all

receptors. Hazard indexes below 1.0 indicate that no adverse health effects are expected from the exposures.

Inhalation of VOCs was the greatest contributor to both carcinogenic risk and noncarcinogenic hazard indexes by four orders of magnitude compared to the other pathways or intake routes. It is concluded that the other pathways do not significantly contribute to risk.

The maximum excess cancer risk level of 4E-05 is within USEPA's target range of 10^{-4} to 10^{-6} (1 in 10,000 to 1 in 1,000,000).

E. Health Effects of Lead Exposures

The IUBK model was used to estimate blood levels in children age 0 - 7, who are assumed to be exposed to site soils. Results of the IUBK model runs are summarized in Table 24. Mean blood lead levels resulting from 7 years of childhood exposure to average or maximum soil lead concentrations at Site 8 are 1.5 and 3.7 µg/dl, respectively, well below the level of concern of 10 to 15 µg/dl. In the maximum exposure scenario (100 mg/day, 500 ppm lead), mean blood lead level is estimated to be 3.7 µg/dl. The modeling results show that given conservative exposure assumptions and maximum soil lead concentrations, exposure to soil lead at Site 8 is not likely to result in blood lead levels that exceed the level of concern of 10 to 15 µg/dl.

F. TRPH Exposures

Risks due to exposures to TRPH were addressed qualitatively because of the lack of toxicity values for fuels. The qualitative assessment of TRPH is not likely to result in an underestimation of risk because risks due to exposures to specific organic chemical constituents of TRPH (benzene, toluene, ethylbenzene, and xylenes) were evaluated quantitatively. TRPH at Site 8 are not impacting human health under the conservative exposure scenarios evaluated in the baseline human health risk assessment.

G. Impacts on Groundwater

The potential for chemicals of concern to migrate through the unsaturated (vadose) zone and enter groundwater at a depth of 370 feet was evaluated by a fate and transport model (Multimed). The model used infiltration of precipitation under the current use scenario. Because of the low concentrations of chemicals of concern observed in soils, a non-aqueous phase was not considered. Mean concentrations of selected chemicals of concern (BTEX and trichloroethene) in soil were used to calculate dissolved-phase concentrations in leachate.

Results of the vadose zone modeling showed that none of the chemicals modeled reached groundwater at 370 feet. The modeling results suggest that transport of chemicals of concern in soils at Site 8 to groundwater does not occur.

H. Human Health Risk Summary

The results of the risk assessment show that reasonable maximum exposures to soils and airborne contaminants are not expected to result in adverse noncarcinogenic health effects (indicated by a hazard index less than 1.0) or excess cancer risks that exceed cancer risk criteria used in Superfund (10^{-4} to 10^{-6}). The maximum excess cancer risk for hypothetical on-site residents of 4×10^{-5} is within USEPA's target range of 10^{-4} to 10^{-6} (1 in 10,000 to 1 in 1,000,000). The results of the exposure/toxicity assessment for TRPH and lead showed that no toxic effects were likely from these constituents. The soils are covered by crushed asphalt and have little potential to impact ecological receptors, and computer modeling indicates that existing concentrations of dissolved phase chemicals in soils could not reach regional groundwater.

I. Ecological Risk Characterization

The ecological risk assessment evaluates the potential impacts to biota that may result from exposures to hazardous compounds.

In the vicinity of Mountain Home AFB the natural vegetation is composed of sagebrush, winterfat, shadscale, grasses and forbs.

Wildlife species include small and large mammals including but not limited to coyote, black-tailed jackrabbit, cottontail and several varieties of small rodents. Many varieties of birds and waterfowl are found in the area. Endangered species in the area are the peregrine falcon and bald eagle.

An ecological risk assessment was not performed at Site 8 for the following reasons: The site and the surrounding area contains very little biota habitat; the site is covered with crushed asphalt; the site is fenced limiting access to mammals and the site is relatively small with respect to the entire base.

A basewide ecological risk assessment will be addressed in the final ROD for OU 3. A basewide ecological risk assessment will be performed because minimal ecological impact is expected from any one waste source in an area as industrialized as Mountain Home AFB. The basewide approach will evaluate the additive ecological risks at habitats.

J. Uncertainties in the Risk Assessment

At all stages of this risk assessment, conservative estimates and assumptions were made so as not to underestimate potential risk and to increase confidence in the results of the risk assessment. The chief uncertainties pertinent to this risk assessment lie in the estimation of exposure point concentrations, the assumptions regarding human exposure conditions, and the methods used to calculate subchronic hazard indexes. The assumptions used most likely overestimate actual risk by two or more orders of magnitude. Specific factors that tend to overestimate or underestimate actual risk are discussed in detail in the RI.

VII THE SELECTED REMEDY

The U.S. Air Force, with approval of the US EPA has determined that no remedial action is necessary at Site 8 to ensure protection of human health and the environment. The State of Idaho concurs on the decision to take no action at Site 8. This decision is based on the results of the human health risk assessment, which determined

that the contaminants remaining in the soils at Site 8 pose no unacceptable risks to human health and the environment.

VIII. EXPLANATION OF SIGNIFICANT CHANGES

The Proposed Plan for Fire Training Area 8, Operable Unit 4 at Mountain Home AFB was released for public comment on January 7, 1992. The Proposed Plan identified no action as the selected remedy for the site. Public comments on the Proposed Plan were evaluated at the end of the 30-day comment period, and it was determined that no significant changes to the Proposed Plan were necessary.

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION
MOUNTAIN HOME AIR FORCE BASE, SITE 8
FIRE TRAINING AREA 8, OPERABLE UNIT 4

A. OVERVIEW

To comply with Section 117 of CERCLA, the United States Environmental Protection Agency (USEPA) and the United States Air Force (USAF) held a public comment period and a public meeting for interested parties to comment on the No-Action Proposed Plan for Site 8. The public comment period was held from January 7, 1992, to February 15, 1992, and the public meeting was held on January 22, 1992, at the Mountain Home High School in Mountain Home, Idaho.

The purpose of this responsiveness summary is to document the USEPA's and USAF's responses to comments received during the public comment period and the public meeting. These comments were considered prior to selection of the final remedy for Site 8 at Mountain Home Air Force Base (AFB) which is detailed in the Record of Decision (ROD).

B. BACKGROUND ON COMMUNITY INVOLVEMENT

The USAF, in conjunction with the USEPA, is responsible for conducting the community relations program for this site. A Community Relations Plan (CRP) was established for Mountain Home AFB in April 1991. Community Relations activities included the establishment of an administrative record, periodic news releases, publication of fact sheets, development of a mailing list of interested parties, a public comment period, a public meeting, and the publication of the Proposed Plan.

Community relations activities are discussed in more detail in Section III of the Record of Decision (ROD).

C. SUMMARY OF COMMENTS RECEIVED AND RESPONSES

Comments and questions raised during the public comment period on the Proposed Plan for Fire Training Area 8 are summarized below.

Many of the questions raised at the public meeting concerned the characterization data, groundwater monitoring, and geologic and hydrogeologic information used to evaluate the soil contamination. Unless specifically addressed below, the information is available in the Remedial Investigation Report available at the administrative record location.

1. One commentor had several questions related to groundwater contamination at the Base. The concern was whether contaminants detected in the soil have also been detected in the groundwater.

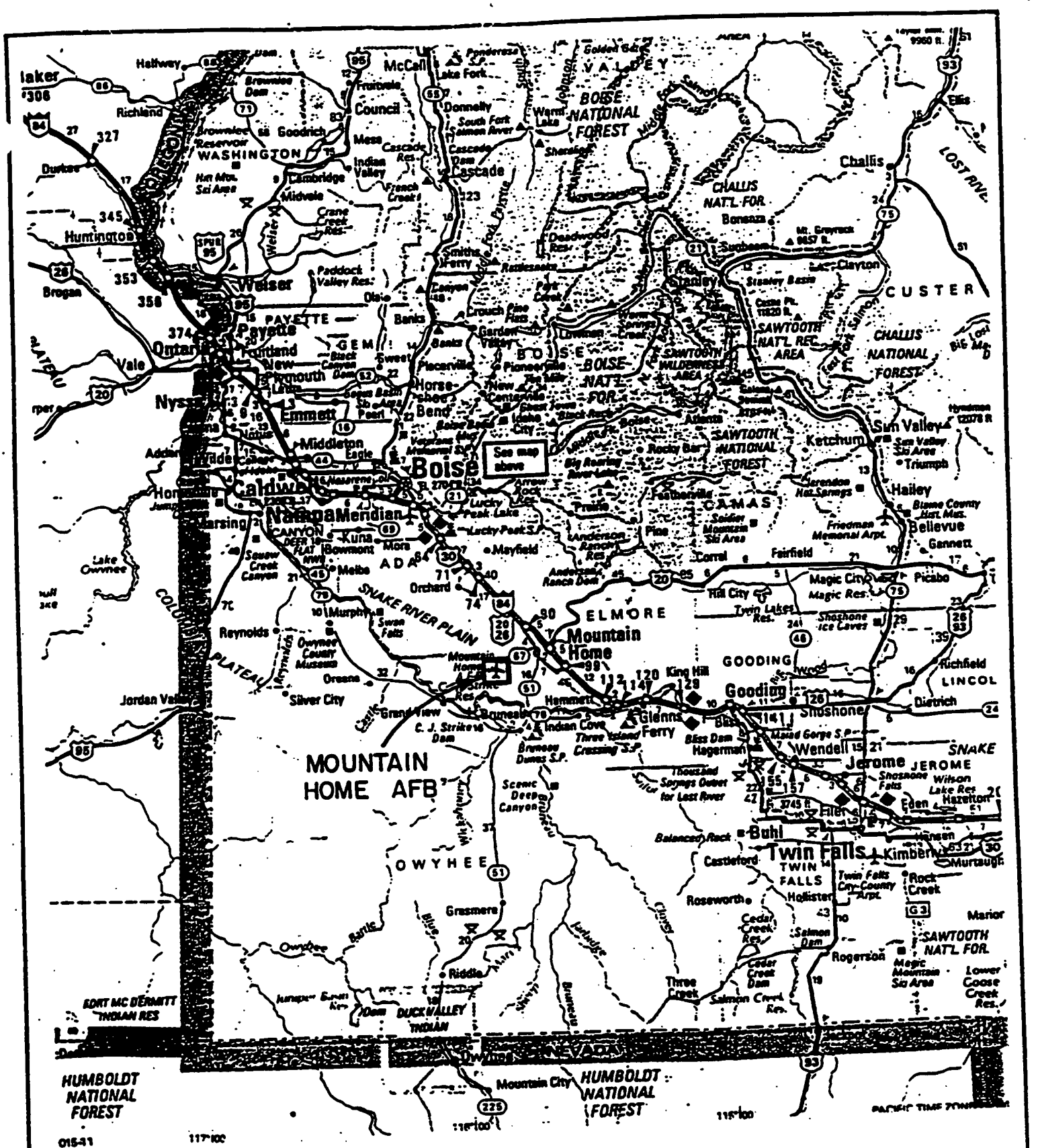
Response: This investigation was focused on the risk to human health and the environment due to existing soil contamination. This was evaluated through the potential for ingestion and inhalation, as well as the potential for migration of these contaminants to the groundwater. A thorough groundwater assessment was not within the scope of this investigation. Groundwater contamination at the Base is being investigated under Operable Unit 3. The groundwater is used for drinking water at the Base and is monitored on a quarterly basis. Trichloroethylene (TCE) has been detected in soils at the Fire Training Area as well as the groundwater at levels ranging from 1.0 to 1.8 ppb; this is below the MAL of 5 ppb. Groundwater contamination will be evaluated in Operable Unit 3.

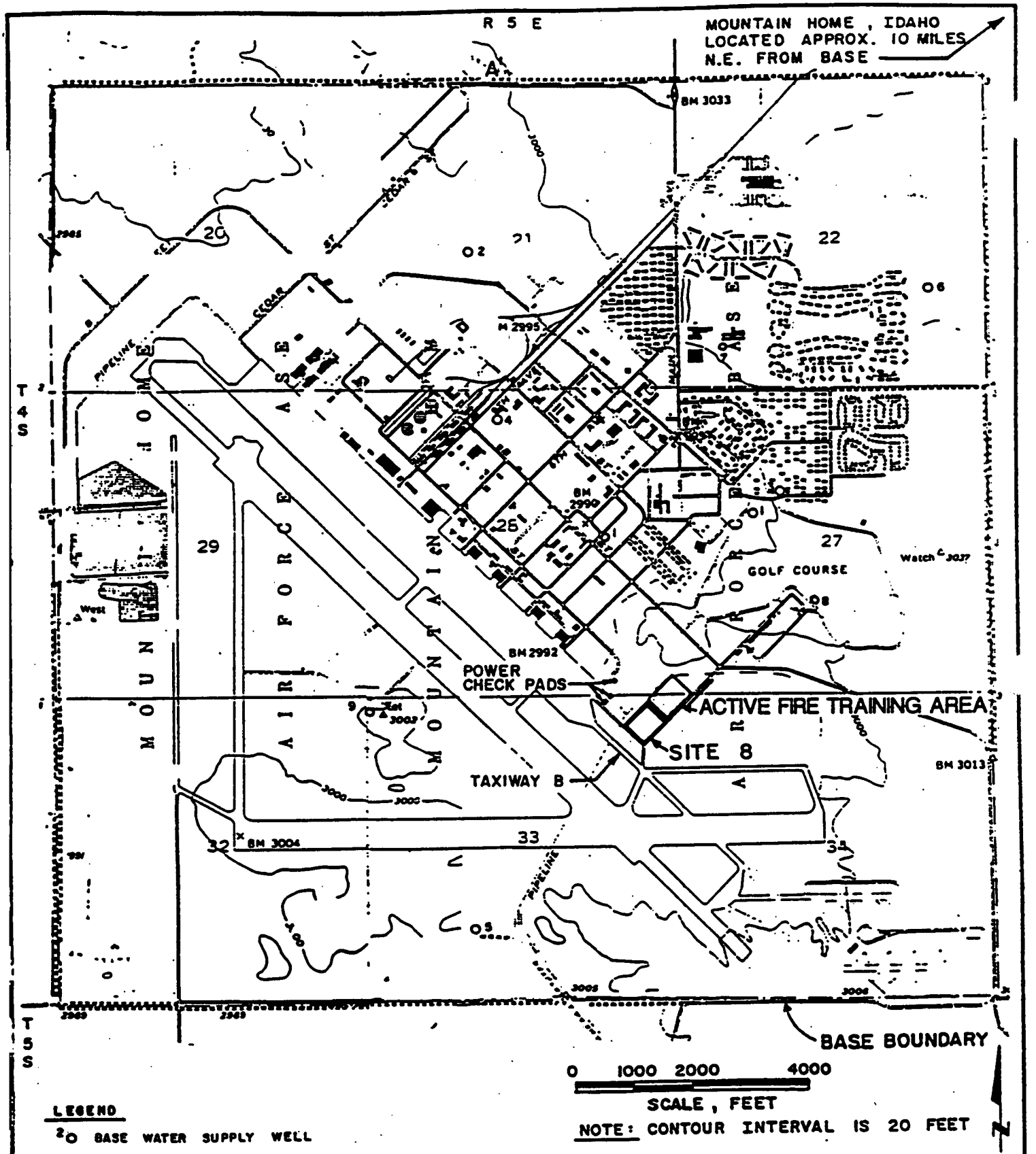
2. One commentor was interested in the parameters used to assess the fate and transport of contaminants in the soil to groundwater.

Response: The purpose of the groundwater model was to estimate the potential for soil contaminants to migrate to the aquifer through the vadose zone as a result of natural infiltration. Basalt cores have been obtained from various location on the Base and the fractures have been evaluated. The model does account for some degree of fracturing in the basalt. The fate and transport model used conservative parameter estimates; the uncertainty of using the selected parameters is discussed in the RI report. Geologic confining units were not accounted for in the model. Soil infiltration rates have been measured in the field and conservative values were used in the fate and transport model.

APPENDIX B

FIGURES AND TABLES


MOUNTAIN HOME AFB
See map above
SOURCE : FROM RAND McNALLY ROAD ATLAS, 1990. THE STATE OF IDAHO.
0 10 20 30
SCALE, MILES
N
Woodward–Clyde Consultants
ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
VICINITY MAP — SITE 8
DRWN BY SCR
DATE 2-12-91
CHK'D BY JPM
DATE 2-15-91
PROJECT NO. 89MCI140
FIG. NO. 1



LEGEND

^{2}O BASE WATER SUPPLY WELL

NOTE : BASE MAP FROM U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAPS OF CRATER RINGS SW, ID. (1956) AND CRATER RINGS SE, ID. (1956).

Sources: Resources Conservation Company (RCC), 1989. Installation Restoration Program Phase IV-A, Remedial Action Plan and Conceptual Documents, Site 8, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha, NE. February, 1989.

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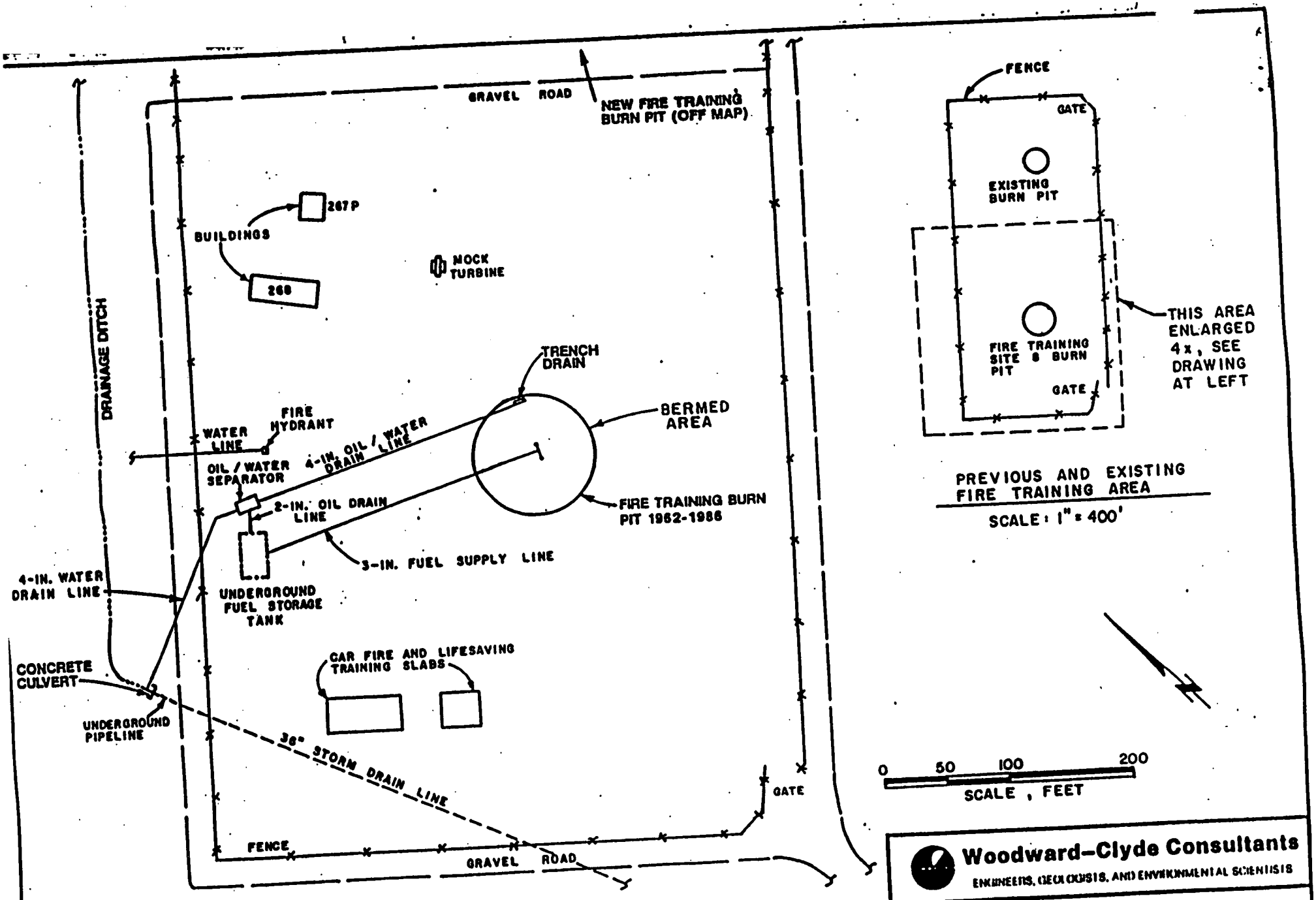
BASE LOCATION MAP - SITE 8

DRN. BY ECR	DATE 4-11-91	PROJECT NO. 89MC1140.	FIG. NO. 2
CHK'D BY SEM	DATE 5-4-92		



SOURCE: RCC, FEB. 1989

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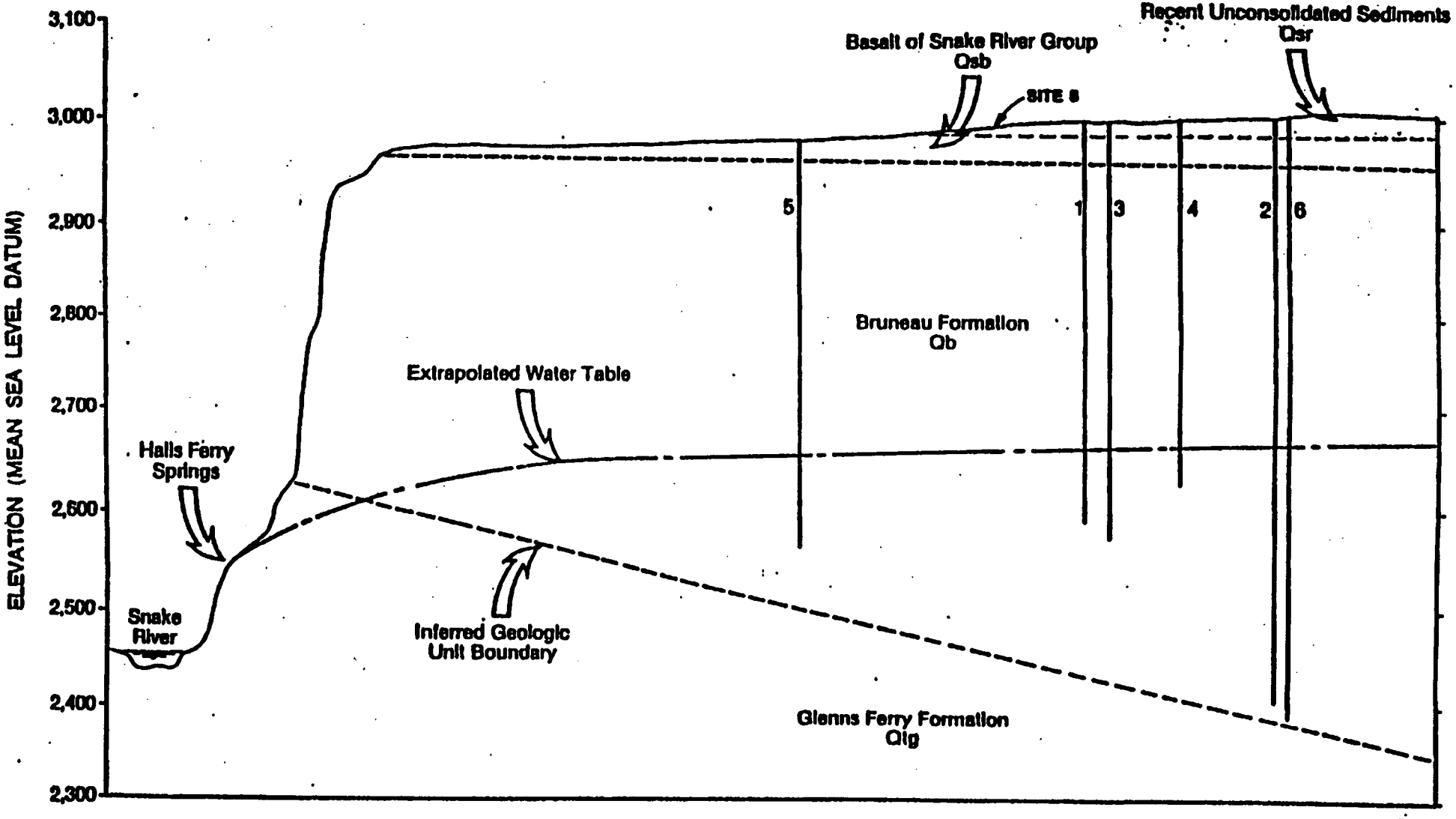
FACILITIES LOCATION PLAN – SITE 8

DRN. BY SCR	DATE 4-11-91	PROJECT NO 89MC1140	FIG NO 3
CHK'D BY SEM	DATE 5-9-92		



Scale in Miles
0 0.5 1.0

Source: Idaho Dept. of Reclamation, WIB No. 4.

Note: Wells 1 to 6 are Mountain Home AFB wells.

Source: CH2M Hill, 1983. Installation Restoration Program Records Search for Mountain Home AFB, Idaho. Contract No. F08637-80-G0010-0017. Gainesville, Florida. (July, 1983).

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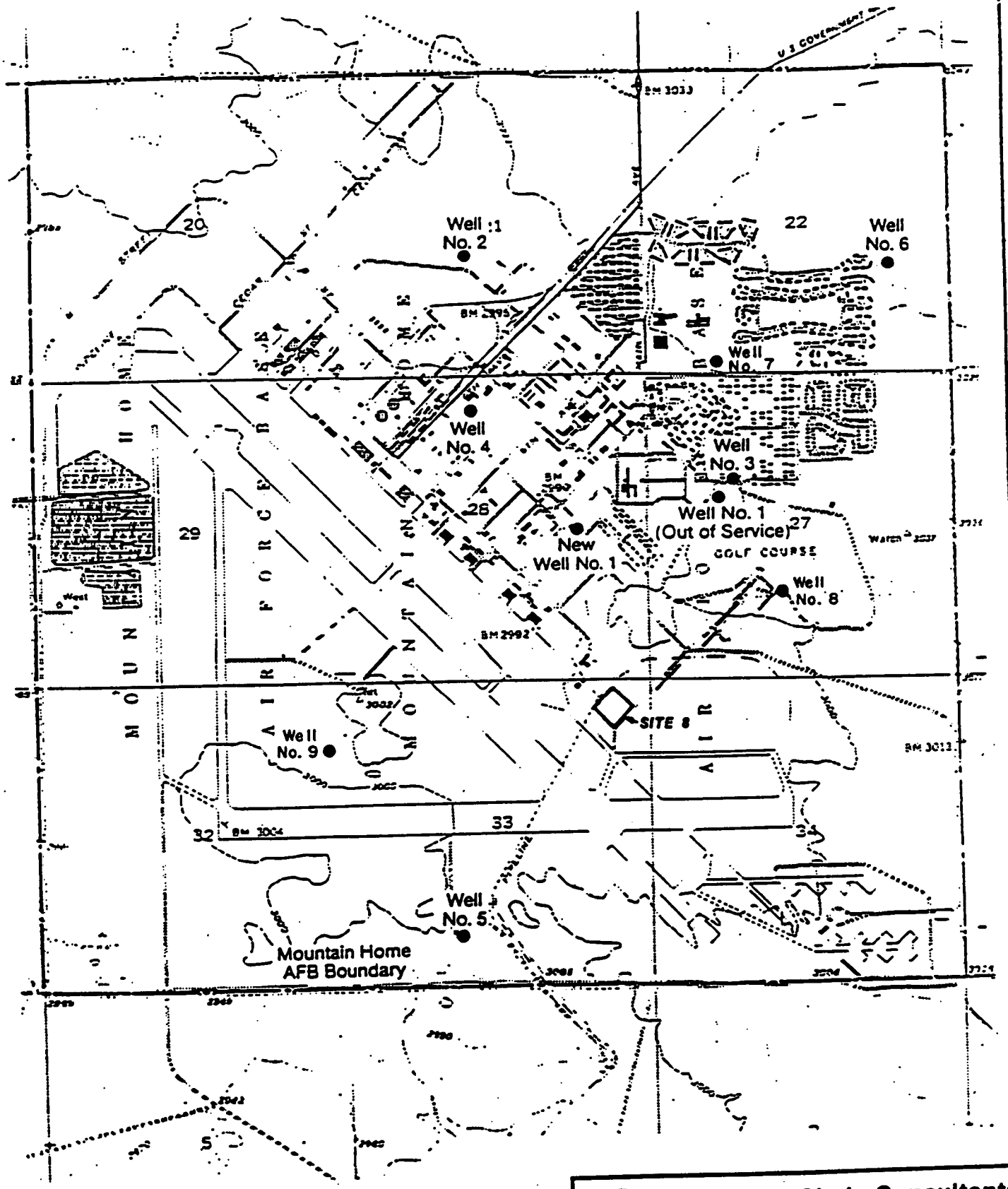
DIAGRAMMATIC CROSS-SECTION FROM THE SNAKE RIVER TO MOUNTAIN HOME AFB

DRN. BY SCR	DATE 4-26-91	PROJECT NO. 89 '140	FIG. 4
CHK'D BY SEM	DATE 4-27-91		



SOURCE: CH2M HILL, 1983

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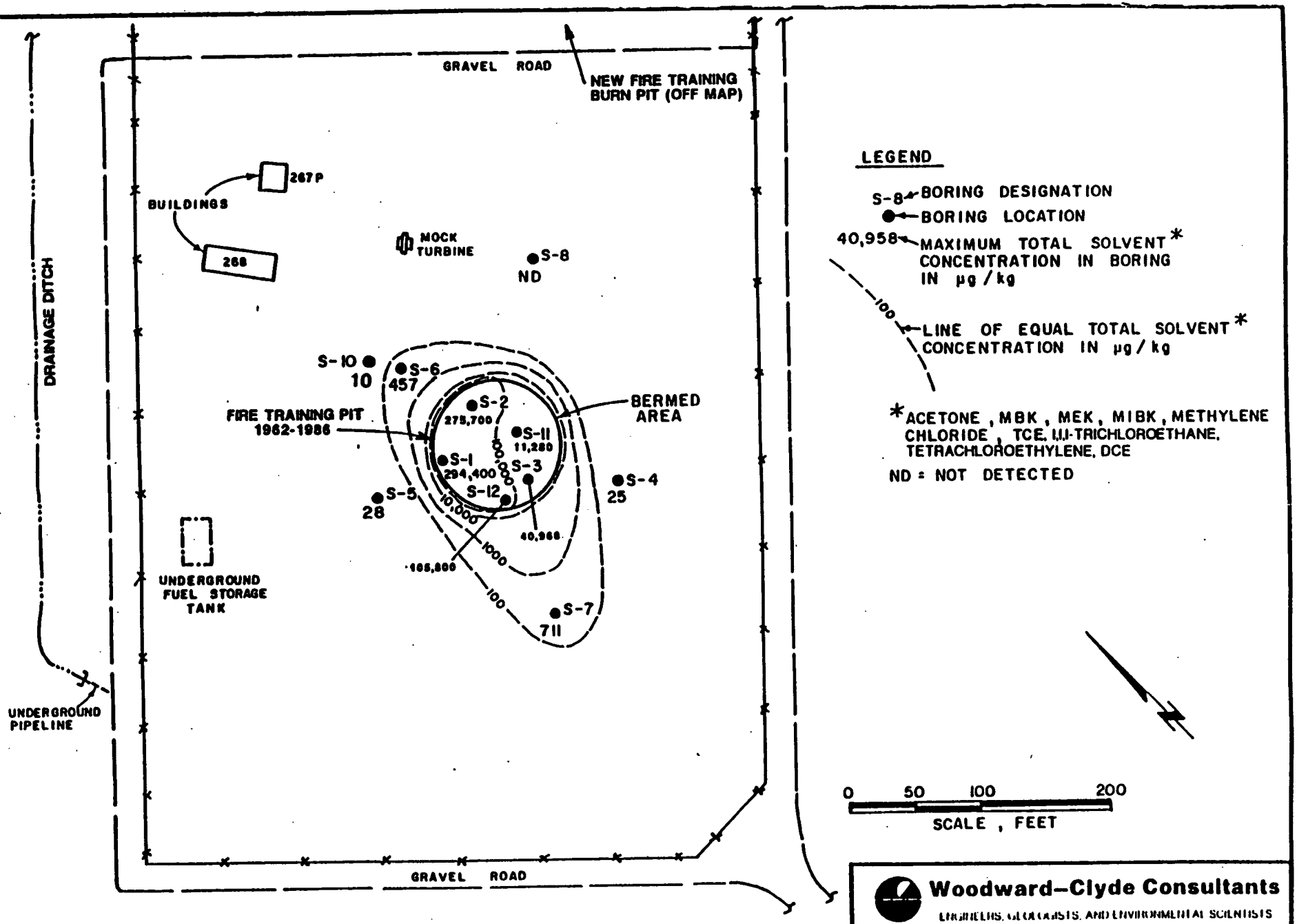
WATER WELL LOCATION MAP

DRN. BY LCR	DATE 4-23-91	PROJECT NO. 89MC114Q	FIG. NO. 5
CHK'D BY SEH	DATE 5-4-92		



SOURCE: RCC, FEB. 1989

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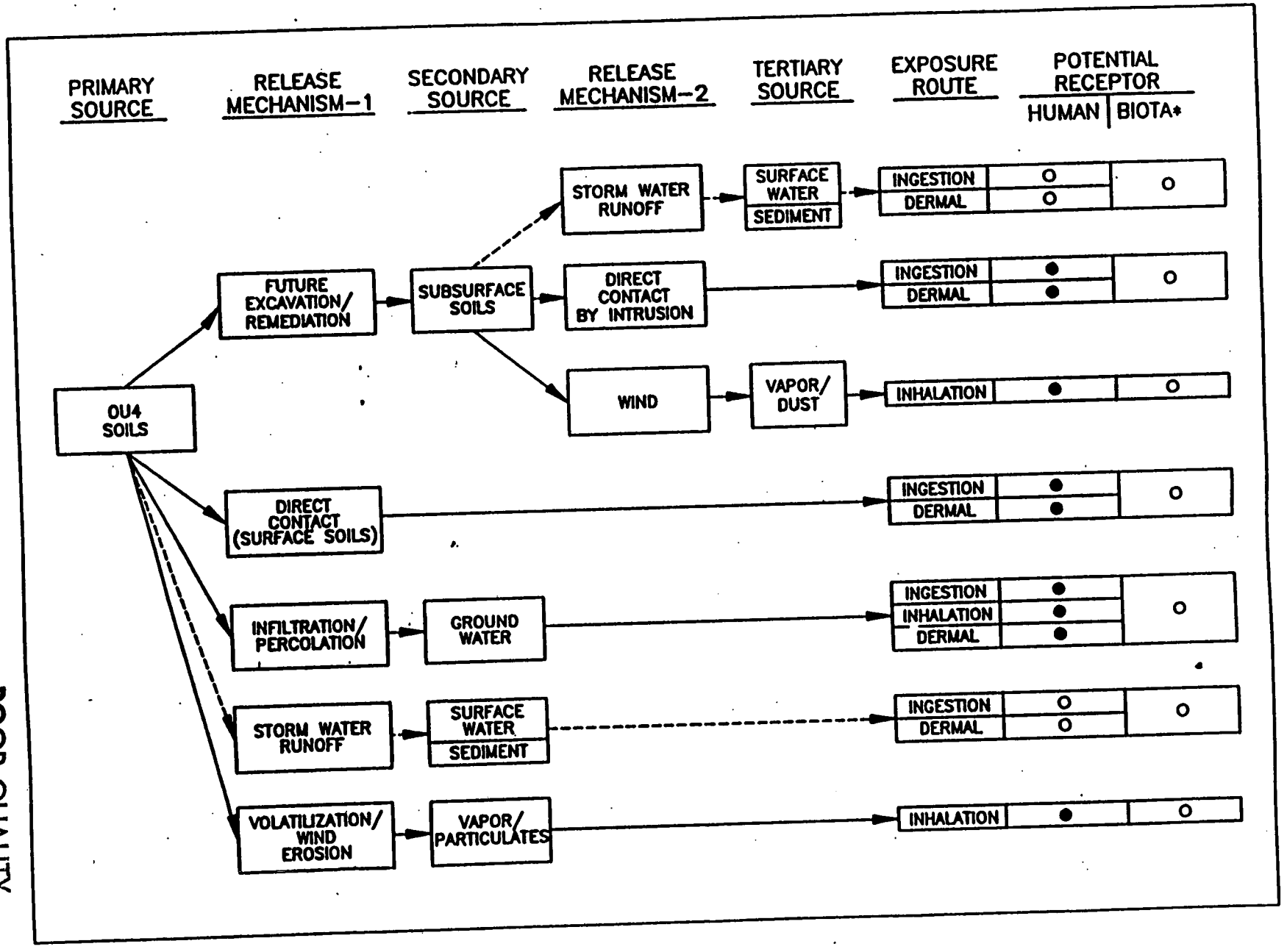
HORIZONTAL DISTRIBUTION OF ORGANIC SOLVENTS IN SOIL – SITE 8

DRN. BY SCR	DATE 4-9-91	PROJECT NO. 89MC1140	FIG NO 6
CHK'D BY SEM	DATE 5-9-92		



POOR QUALITY ORIGINAL

O INCOMPLETE PATHWAY

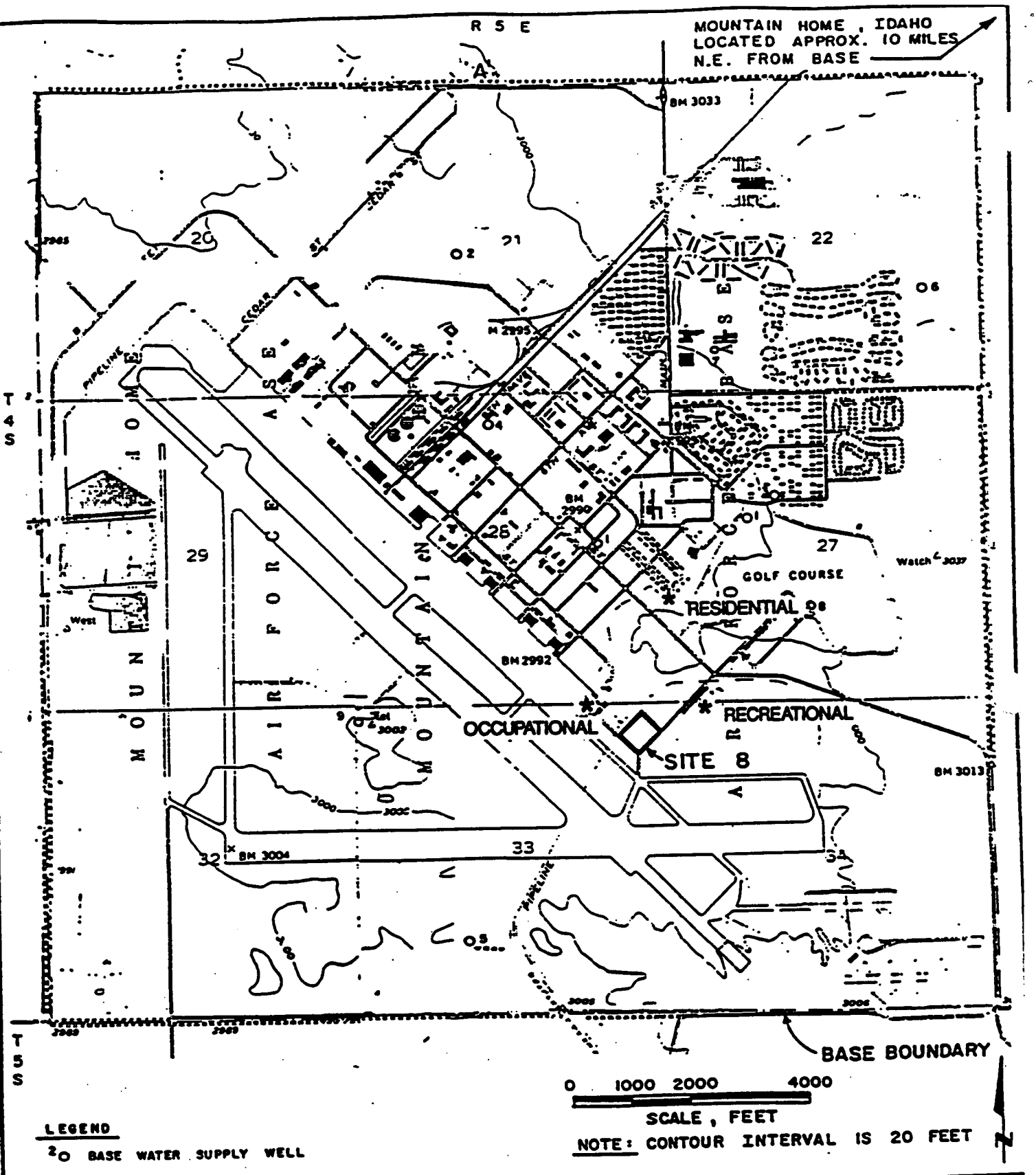
● POTENTIALLY COMPLETE PATHWAY

Source: Woodward-Clyde Consultants (WCC), 1991. Installation Restoration Program, [illegible] Operable Unit 4, Mountain

* SITE 8 HAS LITTLE POTENTIAL TO IMPACT BIOTA

FIGURE 7
CONCEPTUAL SITE MODEL

ACT14001



LEGEND

^{2}O BASE WATER SUPPLY WELL

NOTE: BASE MAP FROM U.S.G.S. 7.5 MINUTE SERIES TOPOGRAPHIC MAPS OF CRATER RINGS SW, ID. (1956) AND CRATER RINGS SE, ID. (1956).

SOURCE: RCC, FEB. 1989

Woodward–Clyde Consultants

ENGINEERS, GEOLOGISTS, AND ENVIRONMENTAL SCIENTISTS

OFF-SITE EXPOSURE POINTS - SITE 8

DRN. BY	DATE	PROJECT NO.	FIG. NO.
SCR	4-11-91	89MC1140	8
CHK'D BY SEM	DATE 5-4-92		

TABLE 1

DAMES & MOORE INVESTIGATION (1985)
ANALYSIS RESULTS

Boring No.	DM-4		DM-5		DM-6	
Sample No.	1	4	2	6	3	7
Sample Depth (ft)	0-1.5	4.5-6	1.5-3	7.5-9	3-4.5	9-10.5
Moisture Content (%)	8.4	10.0	8.4	6.9	12.0	3.0
TOX[1] (μg/L)[2]	670	790	890	250	4,700	490
TOC (mg/g)[2]	11.0	2.4	9.9	0.27	3.9	0.12
Oil & Grease (mg/g)[2]	29.0	8.0	67.0	0.48	0.09	ND
Phenol (μg/g)[2]	ND	ND	ND	ND	ND	ND
Lead (μg/g)[2]	33	23	39	24	27	13

Source: Dames & Moore, 1986, Installation Restoration Program Phase II - Confirmation/ Quantification - Stage 1, Final Report USAF Contract No. F33615-83-4002.

1 Concentration in water extract.
2 As reported by Dames & Moore (1986).
ND = Not detected

TABLE 2

TRPH, LEAD, AND PCB ANALYSES RESULTS (September, 1986)
BORINGS S-1 THROUGH S-8

Site Sample Designation	Depth (ft)	Moisture (%)	TRPH (mg/kg)	Lead (mg/kg)	PCB (µg/kg)
S-1-1	0 - 1.5	11.0	3,385.0	34.0	<1,000
S-1-5	3 - 4.5	15.0	115.0	37.0	NA
S-1-6 (FD)	3 - 4.5	16.0	155.0	36.0	NA
S-1-7	6 - 7.5	6.7	16.0	16.0	NA
S-1-10	9 - 10.5	4.7	13.0	NA	NA
S-1-11	12 - 13.5	14.0	23.0	15.0	NA
S-2-1	0 - 1.5	10.0	1,367.0	28.0	<1,000
S-2-2 (FD)	0 - 1.5	10.0	3,367.0	33.0	<1,000
S-2-3 (FB)	0 - 1.5	NA	* .30	<0.05	<10
S-2-4	3 - 4.5	12.0	417.0	30.0	NA
S-2-5	6 - 7.5	10.0	637.0	20.0	NA
S-2-8	9 - 10.5	6.8	<5.0	NA	NA
S-3-1	0 - 1.5	14.0	657.0	26.0	<1,000
S-3-4	3 - 4.5	12.0	246.0	24.0	NA
S-3-5	6 - 7.5	9.2	537.0	17.0	NA
S-3-7	9 - 10.5	6.6	<5.0	NA	NA
S-3-8	12 - 13.5	15.0	58.0	18.0	NA
S-3-9 (FD)	12 - 13.5	14.0	14.0	13.0	NA
S-3-10 (FB)	12 - 13.5	NA	* .56	<0.05	NA
S-4-1	0 - 1.5	13.0	<5.0	22.0	NA
S-4-2	3 - 4.5	12.0	<5.0	26.0	NA
S-4-3	6 - 7.5	10.0	<5.0	18.0	NA
S-4-4 (FD)	6 - 7.5	9.8	9.0	17.0	NA
S-4-5 (FB)	6 - 7.5	NA	* .78	<0.05	NA
S-4-6	9 - 10.5	6.1	<5.0	NA	NA
S-4-7	12 - 13.5	2.9	12.0	11.0	NA
S-4-10	15 - 16.5	13.0	<5.0	NA	NA
S-4-11	18 - 19.5	12.0	25.0	34.0	NA
S-5-1	0 - 1.5	11.0	14.0	18.0	NA
S-5-2	3 - 4.5	17.0	12.0	28.0	NA
S-5-3 (FD)	3 - 4.5	17.0	13.0	27.0	NA
S-5-4 (FB)	3 - 4.5	NA	* .41	<0.05	NA
S-5-5	6 - 7.5	8.2	9.0	14.0	NA
S-5-8	9 - 10.5	8.7	<5.0	NA	NA

TABLE 2 (Continued)
TRPH, LEAD, AND PCB ANALYSES RESULTS (September, 1986)
BORINGS S-1 THROUGH S-8

Site Sample Designation	Depth (ft)	Moisture (%)	TRPH (mg/kg)	Lead (mg/kg)	PCB (µg/kg)
S-6-1	0 - 1.5	4.3	14,000.0	500.0	NA
S-6-2	3 - 4.5	7.5	219.0	41.0	NA
S-6-5	6 - 7.5	7.3	<5.0	12.0	NA
S-6-6	9 - 10.5	5.9	6.0	NA	NA
S-6-7	12 - 13.5	12.0	44.0	16.0	NA
S-7-1	0 - 1.5	16.0	<5.0	24.0	NA
S-7-2	3 - 4.5	13.0	21.0	28.0	NA
S-7-5	6 - 7.6	6.6	7.0	10.0	NA
S-7-8	9 - 10.5	5.8	6.0	NA	NA
S-7-9	12 - 13.5	20.0	19.0	24.0	NA
S-8-1	0 - 1.5	5.9	2,279.0	5.3	NA
S-8-2	3 - 4.5	13.0	785.0	22.0	NA
S-8-3 (FD)	3 - 4.5	14.0	495.0	22.0	NA
S-8-4 (FB)	3 - 4.5	NA	* 1.50	<0.05	NA
S-8-5	6 - 7.5	15.0	58.0	26.0	NA
S-8-6	9 - 10.5	7.2	25.0	NA	NA
S-8-7	12 - 13.5	6.4	39.0	7.6	NA
S-9-1 (FB)	0.0	10.0	24.0	33.0	<1,000

Source: Resources Conservation Company (RCC), 1989b, Installation Restoration Program Phase IV-A, Remedial Action Plan and Conceptual Documents, Site 8, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha, NE. February, 1989.

* Values are in mg/L
FD = Field duplicate
FB = Field blank
NA = Not analyzed

TABLE 3

VOLATILE ORGANICS ANALYSIS RESULTS (µg/kg)
BORINGS S-1 THROUGH S-8 (September, 1986)

Site Sample Designation	Depth (ft)	Acetone	TCE (Trichloroe thylene)	Methylene Chloride	Benzene	Ethyl benzene	Xylenes	Toluene	MIBK (4-Methyl 2-Pentanone)	MEK (2-Butanone)	MBK (2-Hexanone)	1,1,1-Trichloro ethane
S-1-1	0 - 1.5	18,000	7,400	5,500U	6,000	51,000	350,000	93,000	49,000	7,900U	220,000	2,000U
S-1-2 (FD)	0 - 1.5	6,300	3,400	1,600U	2,100	17,000	170,000	39,000	28,000	3,100U	150,000	790U
S-1-5	3 - 4.5	35,000	4U	9U	5U	6U	6U	4U	210	450	13	4U
S-1-7	6 - 7.5	2,100	3U	6U	3U	4U	4U	3U	9	18	4U	3U
S-1-8 (FD)	6 - 7.5	3,000	15U	36U	19U	23U	26U	17U	39U	69U	21U	17U
S-1-11	12 - 13.5	1,000	13U	57	16U	19U	22U	14U	53	57U	17U	15U
S-2-1	0 - 1.5	5,300	2,400	1,100U	5,000	33,000	280,000	69,000	48,000	2,200U	220,000	560U
S-2-4	3 - 4.5	12,000	1,000U	2,400	1,200	2,600	22,000	1,800	2,600U	4,600U	1,400U	1,200U
S-2-5	6 - 7.5	10,000	5U	11U	6U	7U	8U	5U	100	21U	6U	5U
S-2-6 (FD)	6 - 7.5	6,300K	19U	110	23U	28U	32U	21U	51	85U	26U	22U
S-2-7	6 - 7.5	13*	1U*	3U*	2U*	2U*	2U*	2U*	4U*	6U*	2U*	2U*
S-3-1	0 - 1.5	380	4U	10U	5U	6U	16	5U	11U	19U	6U	5U
S-3-4	3 - 4.5	580	7U	17U	9U	11U	24	8U	19U	33U	10U	8U
S-3-5	6 - 7.5	880	7U	17U	9U	140	1,400	8U	31	32U	8J	8U
S-3-8	12 - 13.5	39,000	8	15U	8U	10U	11U	7U	1,200	750	9U	10
S-4-1	0 - 1.5	19U	2U	5U	3U	3U	4U	3U	6U	10U	3U	3U
S-4-2	3 - 4.5	16	1U	3U	2U	2U	2U	2U	4U	6U	2U	2U
S-4-3	6 - 7.5	25	1U	3U	2U	2U	2U	2U	4U	6U	2U	2U
S-4-7	12 - 13.5	8	1U	3U	2U	2U	2U	1U	3U	6U	2U	1U
S-4-8 (FD)	12 - 13.5	12	2U	4U	2U	3U	3U	2U	5U	8U	3U	2U
S-4-9 (FB)	12 - 13.5	12U*	1U*	12U*	2U*	2U*	2U*	2U*	4U*	6U*	2U*	2U*
S-4-11	18 - 19.5	14	2U	6	2U	3U	3U	2U	5U	9U	3U	2U
S-5-1	0 - 1.5	14	2U	24B	2U	2U	3U	2U	4U	7U	2U	2U
S-5-2	3 - 4.5	14	2U	23B	2U	2U	3U	2U	4U	7U	2U	2U
S-5-5	6 - 7.5	24	1U	25B	2U	2U	2U	2U	4U	6U	2U	2U

TABLE 3 (Continued)

VOLATILE ORGANICS ANALYSIS RESULTS (µg/kg)
BORINGS S-1 THROUGH S-8 (September, 1986)

Site Sample Designation	Depth (ft)	Acetone	TCE (Trichloroe thylene)	Methylene Chloride	Benzene	Ethyl benzene	Xylenes	Toluene	MIBK (4-Methyl 2-Pentanone)	MEK (2-Butanone)	MBK (2-Hexanone)	1,1,1-Trichloro ethane
S-6-1	0 - 1.5	300	27	124B	9J	880	11,000	900	47U	27	25U	21U
S-6-2	3 - 4.5	14U	2U	12B	2U	3U	3U	2U	4U	8U	2U	2U
S-6-3 (FD)	3 - 4.5	14U	2U	13B	2U	3U	3U	2U	4U	8U	2U	2U
S-6-4	3 - 4.5	12U*	1U*	13B*	2U*	2U*	2U*	2U*	4U*	6U*	2U*	2U*
S-6-5	6 - 7.5	13U	2U	28B	2U	2U	3U	2U	4U	7U	2U	2U
S-6-7	12 - 13.5	19	2U	36B	2U	3U	3U	2U	4U	8U	2U	2U
S-7-1	0 - 1.5	700	2U	32B	2U	3U	3U	2	5U	8U	2U	2U
S-7-2	3 - 4.5	14U	2U	28B	2U	3U	3U	2U	4U	8U	2U	2U
S-7-5	6 - 7.5	17	1U	17B	2U	2U	2U	2U	4U	6U	2U	2U
S-7-6 (FD)	6 - 7.5	11U	1U	8B	2U	2U	2U	2U	4U	6U	2U	2U
S-7-7 (FB)	6 - 7.5	12U*	1U*	6B*	2U*	2U*	2U*	2U*	4U*	6U*	2U*	2U*
S-7-9	12 - 13.5	15U	2U	21B	2U	3U	3U	2U	5U	8U	2U	2U
S-8-1	0 - 1.5	13U	2U	24B	2U	2U	3U	2U	4U	7U	2U	2U
S-8-2	3 - 4.5	13U	2U	8B	2U	2U	3U	2U	4U	7U	2U	2U
S-8-5	6 - 7.5	15U	2U	10B	2U	3U	3U	2U	5U	8U	3U	2U
S-8-7	12 - 13.5	12U	1U	24B	2U	2U	2U	2U	4U	6U	2U	2U
S-9-4 (FB)	0.0	18U	2U	15	3U	3U	4U	2U	6U	10U	3U	3U

Source: Resources Conservation Company (RCC), 1989b, Installation Restoration Program Phase IV-A, Remedial Action Plan and Conceptual Documents, Site 8, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha, NE. February, 1989.

Qualifiers listed are qualifiers assigned by the laboratory.

* Values are in µg/L.

FD Field duplicate

FB Field blank

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as the sample. Indicates possible/probable blank contamination.

TABLE 4

TRPH ANALYSIS RESULTS (March, 1988)
BORINGS S-10, S-11, AND S-12

Site Sample Designation	Depth (ft)	Moisture (%)	TRPH (mg/kg)
S-10-1(0)S	0 - 1.5	9.3	4,600
S-10-2(0)S	2 - 3.5	14.9	100
S-10-3(0)S	2 - 3.5	15.3	81
S-10-4(0)S	4 - 5.5	10.8	34
S-10-7(0)S	8 - 9.5	6.1	33
S-10-8(0)L	8 - 9.5	NA	<5*
S-10-9(0)S	10 - 11.5	5.1	29
S-10-10(0)S	12 - 13.5	3.5	16
S-10-11(0)S	14 - 15.5	18.2	44
S-10-12(0)S	16 - 17.5	18.3	40
S-10-13(0)S	18 - 19.5	19.0	46
S-10-14(0)S	20 - 21.5	15.7	50
S-10-15(0)B	B0	6.7	49
S-10-16(0)B	B6.5	2.5	36
S-10-18(0)B	B13	1.3	47
S-10-19(0)B	B20	1.7	24
S-11-1(0)S	0 - 1.5	6.6	2,600
S-11-2(0)S	2 - 3.5	13.4	1,900
S-11-4(0)S	4 - 5.5	12.6	90
S-11-6(0)S	6 - 7.5	11.0	890
S-11-8(0)S	10 - 11.5	5.1	630
S-11-10(0)S	12 - 13.5	7.7	780
S-11-14(0)B	B0	8.1	40
S-11-15(0)L	B0	NA	<5*
S-11-17(0)B	B6.5	2.6	31
S-11-18(0)B	B13	2.4	31
S-11-19(0)B	B20	5.1	26
S-12-1(0)S	0 - 1.5	6.2	4,800
S-12-2(0)L	0 - 1.5	NA	<5*
S-12-4(0)S	4 - 5.5	9.3	220
S-12-5(0)S	4 - 5.5	8.8	200
S-12-6(0)S	6 - 7.5	17.4	5,400
S-12-7(0)S	8 - 9.5	17.4	7,500
S-12-9(0)S	10 - 11.5	5.6	410
S-12-10(0)S	12 - 13.5	5.3	91
S-12-11(0)S	14 - 15.5	17.6	400
S-12-14(0)B	B0	3.5	25
S-12-15(0)B	B0	2.9	72
S-12-16(0)B	B6.5	0.9	55
S-12-17(0)B	B13	1.4	55
S-12-18(0)B	B20	1.4	42

NA = Not analyzedL=Liquid sample (field blank)
S = Soil sampleB=Basalt sample *Values are in mg/L

Source: Resources Conservation Company (RCC), 1989b, Installation Restoration Program Phase IV-A, Remedial Action Plan and Conceptual Documents, Site 8, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha, NE. February, 1989.

TABLE 5

VOLATILE ORGANICS ANALYSIS RESULTS (µg/kg)
BORINGS S-10, S-11, AND S-12 (March, 1988)

Site Sample Designation	Depth (ft)	Methylene Chloride	Acetone	Chloroform	Ethylbenzene	Toluene	TCE (Trichloro-ethylene)	Xylenes	Benzene	MEK (2-Butanone)	Tetrachloro ethylene	Trans-1,2-Dichloro-ethylene
S-10-1(0)S	0	3.7UJ	10.7U	2.3U	1.9U	1.4U	1.3U	2.2U	1.6U	R	1.1U	2.5U
S-10-1(0)L	TB	2.1U*	5.4*	0.5J*	1.5U*	1.2U*	1.1U*	1.3U*	0.8U*	R	1.0U*	1.4U*
S-10-2(0)S	2	2.6UJ	10.4U	2.2U	1.9U	1.3U	1.3U	2.1U	1.5U	R	1.1U	2.4U
S-10-3(0)S	2	19UJ	10.1U	2.2U	1.8U	1.3U	1.2U	0.6	1.5U	R	1.0U	2.3U
S-10-4(0)S	4	22UJ	12.3U	2.7U	2.2U	1.6U	1.5U	2.6U	1.8U	R	1.3U	2.9U
S-10-7(0)S	8	5UJ	10.6U	2.3U	0.4	1.4U	1.3U	2.2U	1.5U	R	1.1U	2.5U
S-10-8(0)L	8	1.2UJ*	3.5U*	1.2U*	1.5U*	1.2U*	1.1U*	1.3U*	0.8U*	R	1.0U*	1.4U*
S-10-9(0)S	10	2.8UJ	11.1U	2.4U	2.0U	1.4U	1.3U	2.3U	1.6U	R	1.1U	2.6U
S-10-10(0)S	12	1.8UJ	9.0U	1.9U	1.6U	1.2U	1.1U	1.9U	1.3U	R	0.9U	2.1U
S-10-11(0)S	14	2.4UJ	12.9U	2.8U	2.3U	1.7U	1.6U	2.7U	1.9U	R	1.3U	3.0U
S-10-12(0)S	16	2.5UJ	11.4U	2.4U	2.1U	1.5U	1.4U	2.3U	1.7U	R	1.2U	2.6U
S-10-13(0)S	18	12U	10	2.0U	1.7U	1.2U	1.1U	2.0U	1.4U	R	1.0U	2.2U
S-10-14(0)L	TB	7.2UJ*	6.4*	1.2U*	1.5U*	0.6J*	1.1U*	1.3U*	0.8U*	R	1.0U*	1.4U*
S-10-14(0)S	20	12U	8.4J	2.4U	2.0U	1.4U	1.3U	2.3U	1.6U	R	1.1U	2.6U
S-11-1(0)S	0	740U	140U	210U	26,000	88,000	5,700	330,000	6,800	R	140U	260U
S-11-S(0)S	2	280U	6,100U	200U	13,000	22,000	1,800	150,000	1,300	710J	140U	250U
S-11-4(0)S	4	460U	1,600U	260U	4,600	5,300	250	50,000	230	R	120U	190U
S-11-6(0)S	6	1,100U	6,300U	200U	1,500	880	180U	21,000	91U	470J	140U	250U
S-11-8(0)S	10	390U	11,000J	230U	6,800	6,900	280	65,000	210U	R	100U	170U
S-11-12(0)L	TB	10U*	9.7U*	0.9U*	1.0U*	0.6U*	0.8U*	1.5U*	0.4U*	R	0.6U*	1.1U*

TABLE 5 (Continued)

VOLATILE ORGANICS ANALYSIS RESULTS (µg/kg)
BORINGS S-10, S-11, AND S-12 (March, 1988)

Site Sample Designation	Depth (ft)	Methylene Chloride	Acetone	Chloroform	Ethylbenzene	Toluene	TCE (Trichloro-ethylene)	Xylenes	Benzene	MEK (2-Butanone)	Tetrachloro ethylene	Trans-1,2-Dichloro-ethylene
S-12-1(0)S	0	2,700	1,500U	2,300U	29,000	84,000	13,000	330,000	5,600	R	8,400	2,800U
S-12-2(0)L	0	15U*	15U*	1.1*	1.0U*	0.6U*	0.8U*	1.5U*	0.4U*	R	0.6U*	1.1U*
S-12-4(0)S	4	310U	39,000	200U	18,000	22,000	4,000	200,000	730		2,000	25OU
S-12-5(0)S	4	430U	29,000	190J	11,000	13,000	1,900	150,000	360	R	1,400	250U
S-12-6(0)S	6	680U	87,000	450U	37,000	55,000	13,000	370,000	2,700	R	5,800	550U
S-12-7(0)S	8	800U	87,000	450U	18,000	22,000	6,400	220,000	1,600	R	3,600	330J
S-12-9(0)S	10	500U	17,000	200U	1,800	1,200	250	23,000	87U	R	410	240U
S-12-10(0)S	12	890U	25,000	410U	1,500	1,400	460	16,000	390	R	590	500U
S-12-11(0)S	14	360U	22,000	110U	340	350	120	4,100	49U	R	73U	130U
S-12-12(0)L	TB	13U*	8.8*	0.9U*	1.0U*	0.6U*	0.8U*	1.5U*	0.4U*	R	0.6U*	1.1U*

Source: Resources Conservation Company (RCC), 1989b, Installation Restoration Program Phase IV-A, Remedial Action Plan and Conceptual Documents, Site 8, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha, NE. February, 1989.

Qualifiers listed are qualifiers assigned during data validation.

- J Indicates an estimated value when result is less than specified detection limit.
- U Indicates that analyte was below detection limit.
- S Indicates a soil sample.
- L Indicates a liquid sample.
- TB Trip blank
- R Indicates data rejected.
- * Values are in µg/L

TABLE 6

CONCENTRATION OF TRICHLOROETHYLENE (TCE) IN GROUNDWATER

Sample Designation	TCE (µg/L) 4-6-89	4-5-90
MW09-01	1.0	1.8
MW09-02	Trace	1.8
MW10-01	Trace	1.3
MW10-02	NS	1.2
MW11-01	1.5	1.3
MW11-02	NS	1.4

NS = Not sampled

Source: U.S. Army Corps of Engineers files.

TABLE 7
SUMMARY OF CONCENTRATIONS OF VOLATILE ORGANICS DETECTED IN MOUNTAIN HOME AFB PRODUCTION WELLS

Concentration (µg/l)	Date Sampled																
	10/21/87	10/29/87	12/27/88	2/28/89	5/30/89	8/28/89	10/17/89	11/6/89	12/18/89	1/14/90	2/14/90	4/2/90	10/13/90	11/13/90	1/9/91	2/13/91	3/20/91
BPW-1																	
TCE	0.00	NS	0.50	1.70	1.80	1.20	1.50	1.30	0.70	1.10	NS	1.90	1.20	NS	2.00	NS	NS
Bromoform	0.00	NS	0.00	1.30	0.70	0.00	2.50	3.80	2.83	12.70	NS	3.70	1.10	NS	0.00	NS	NS
Bromodichloromethane	0.00	NS	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Chlorodibromomethane	0.00	NS	0.00	0.00	0.00	0.00	1.00	1.60	0.60	1.70	NS	1.10	0.00	NS	0.00	NS	NS
Chloroform	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.20	0.00	NS	0.00	NS	NS
Total Trihalomethanes	0.00	NS	0.00	1.30	0.70	0.00	3.70	5.40	3.43	14.40	NS	5.00	1.10	NS	0.00	NS	NS
BPW-2																	
TCE	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Bromoform	0.00	0.00	0.00	6.00	6.20	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Bromodichloromethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Chlorodibromomethane	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Chloroform	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
Total Trihalomethanes	0.00	0.00	0.00	6.00	7.70	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	0.00	NS	NS
BPW-4																	
TCE	0.00	1.00	0.90	0.50	0.00	1.00	1.20	1.30	1.60	NS	0.66	1.10	NS	NS	NS	0.00	NS
Bromoform	15.00	12.00	0.00	6.40	8.70	3.27	0.00	0.00	1.83	NS	7.70	0.40	NS	NS	NS	0.00	NS
Bromodichloromethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	NS	0.00	0.00	NS	NS	NS	0.00	NS
Chlorodibromomethane	3.10	3.00	0.00	0.00	2.20	0.00	0.00	0.00	1.65	NS	1.20	0.00	NS	NS	NS	0.00	NS
Chloroform	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	NS	NS	0.00	NS
Total Trihalomethanes	18.10	15.00	0.00	6.40	10.90	3.27	0.00	0.00	3.91	NS	8.90	0.40	NS	NS	NS	0.00	NS
BPW-5																	
TCE	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.20	0.00	NS	0.00	0.00	NS
Bromoform	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	NS
Bromodichloromethane	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	NS
Chlorodibromomethane	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	NS
Chloroform	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	NS
Total Trihalomethanes	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	NS

TABLE 7 (Continued)

SUMMARY OF CONCENTRATIONS OF VOLATILE ORGANICS DETECTED IN MOUNTAIN HOME AFB PRODUCTION WELLS

Concentration (µg/l)	Date Sampled																
	10/21/87	10/29/87	12/27/88	2/28/89	5/30/89	8/28/89	10/17/89	11/6/89	12/18/89	1/14/90	2/14/90	4/2/90	10/13/90	11/13/90	1/9/91	2/13/91	3/20/91
BPW-6																	
TCE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	NS	0.00	0.00	NS
Bromoform	0.00	0.00	0.00	1.70	4.10	0.00	0.00	0.00	0.00	NS	6.30	0.00	NS	NS	0.00	0.00	NS
Bromodichloromethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.44	0.00	NS	NS	0.00	0.00	NS
Chlorodibromomethane	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	NS	2.60	0.00	NS	NS	0.00	0.00	NS
Chloroform	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	NS	NS	0.00	0.00	NS
Total Trihalomethanes	0.00	0.00	0.00	2.20	5.30	0.00	0.00	0.00	0.00	NS	9.34	0.00	NS	NS	0.00	0.00	NS
BPW-7																	
TCE	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	0.00	NS	NS	NS
Bromoform	4.00	NS	10.40	1.40	7.80	0.00	8.20	2.40	0.93	NS	0.00	7.00	0.00	0.00	NS	NS	NS
Bromodichloromethane	0.00	NS	2.20	0.00	0.80	0.00	0.60	0.70	0.00	NS	0.00	0.80	0.00	0.00	NS	NS	NS
Chlorodibromomethane	0.00	NS	7.90	0.00	2.70	0.00	2.70	2.00	0.00	NS	0.00	3.00	0.00	0.00	NS	NS	NS
Chloroform	0.00	NS	0.80	0.00	0.00	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	0.00	NS	NS	NS
Total Trihalomethanes	4.00	NS	21.30	1.40	11.30	0.00	11.50	05.10	0.93	NS	0.00	10.80	0.00	0.00	NS	NS	NS
BPW-9																	
TCE	0.00	NS	NS	0.70	NS	0.00	1.20	1.40	1.40	NS	0.00	1.40	1.00	NS	1.50	1.00	1.80
Bromoform	0.00	NS	NS	0.00	NS	0.00	0.00	0.00	0.00	NS	53.80	0.00	0.00	NS	0.00	0.00	0.00
Bromodichloromethane	0.00	NS	NS	0.00	NS	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	0.00
Chlorodibromomethane	0.00	NS	NS	0.00	NS	0.00	0.00	0.00	0.00	NS	2.90	0.00	0.00	NS	0.00	0.00	0.00
Chloroform	0.00	NS	NS	0.00	NS	0.00	0.00	0.00	0.00	NS	0.00	0.00	0.00	NS	0.00	0.00	0.00
Total Trihalomethanes	0.00	NS	NS	0.00	NS	0.00	0.00	0.00	0.00	NS	56.70	0.00	0.00	NS	0.00	0.00	0.00

NS = Not Sampled

Source: Mountain Home AFB files.

TABLE 8

WCC SOIL DATA ANALYSIS
SITE 8 NOVEMBER 1991
TRACE METALS (ARSENIC, CADMIUM, CHROMIUM, LEAD) (mg/kg)

	Arsenic		Cadmium		Chromium		Lead	
Site Sample Designation	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit	Result	Reporting Limit
FT-8-001	2.5	1.0	ND[1]	0.50	16.1	1.0	10.6	1.5
FT-8-002	2.8	2.0	ND	0.50	12.7	1.0	9.2	1.0
FT-8-003	2.3	1.0	ND	0.50	13.8	1.0	10.4	1.0
FT-8-004	2.6	1.0	ND	0.50	15.0	1.0	8.7	1.0
FT-8-005	2.9	1.0	ND	0.50	12.5	1.0	8.7	1.0
FT-8-006	3.2	2.0	ND	0.50	13.5	1.0	9.7	1.0

Source: Laboratory analytical results are shown in Appendix B.

[1] ND - Non Detect

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December 1991.

TABLE 9

SUMMARY OF BACKGROUND METALS CONCENTRATIONS BASED ON LFI SITE DATA (mg/kg)

Metal	Range	Mean
Arsenic	0.8 - 19	4
Barium	17 - 277	105
Beryllium	0.1 - 1.2	0.5
Cadmium	0.3 - 1.8	0.5
Chromium	2 - 17	8
Lead	2 - 17	6.5
Mercury	<0.1 - 0.41	0.07
Zinc	13 - 69	32

Source: Woodward-Clyde Consultants (WCC), 1992, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 2, LF-02, Mountain Home AFB, Idaho. Draft Report. Prepared for U.S. Army Corps of Engineers, Omaha, NE. April, 1992.

TABLE 10

COMPARISON OF LFI BACKGROUND RANGES TO LITERATURE VALUES

Metal	Background Range	Background Mean
Arsenic		
Site Data	0.8 - 19	4
ATSDR[1]	0.1 - 80	6
USGS[2]	--	6.5
Barium		
Site Data	17 - 277	105
ATSDR		
USGS	70 - 5,000	700
Beryllium		
Site Data	0.1 - 1.2	0.5
ATSDR	0.6 - 6.0	3 - 5
USGS	--	<1
Cadmium		
Site Data	0.3 - 1.8	0.5
ATSDR	--	0.3
Chromium		
Site Data	2 - 24	8
ATSDR	2 - 71	43
USGS	--	30
Lead		
Site Data	2 - 24	6.5
ATSDR	--	10 - 30
USGS	--	30 - 700
Mercury		
OU1 Site	<0.1 - 0.41	0.07
USGS		0.05
Zinc		
Site Data	13 - 69	32
USGS	--	28

(1) Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profiles. U.S. Dept. of Health and Human Services.

(2) USGS 1984.

Source: Woodward-Clyde Consultants (WCC), 1992, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 2, LF-02, Mountain Home AFB, Idaho. Draft Report. Prepared for U.S. Army Corps of Engineers, Omaha, NE. April, 1992.

TABLE 11
CONCENTRATIONS OF CHEMICALS OF CONCERN: SURFACE SOILS, mg/kg

Sample	Depth (ft)	Acetone	Trichloro ethylene	Benzene	4-Methyl 2-pentanone (MIBK)	Toluene	Ethyl-benzene	Xylenes	2-Butanone (MEK)		Methylene chloride		Tetrachloro ethylene
S-1-1	0 - 1.5	1.6E+01	7.4E+00	6.0E+00	4.9E+01	9.3E+01	5.1E+01	3.5E+02	4.0E+00		2.8E+00		7.5E-01
S-2-1	0 - 1.5	5.3E+00	2.4E+00	5.0E+00	4.8E+01	6.9E+01	3.3E+01	2.8E+02	1.1E+00		5.5E-01		4.2E-01
S-3-1	0 - 1.5	3.8E-01	2.0E-03	2.5E-03	5.5E-03	2.5E-03	3.0E-04	1.6E-02	9.5E-03		5.0E-03		2.0E-03
S-4-1	0 - 1.5	9.5E-03	1.0E-03	1.5E-03	3.0E-03	1.5E-03	1.5E-03	2.0E-03	5.0E-03		2.5E-03		1.0E-03
S-5-1	0 - 1.5	1.4E-02	1.0E-03	1.0E-03	2.0E-03	1.0E-03	1.0E-03	1.5E-03	3.5E-03			B	5.0E-04
S-6-1	0 - 1.5	3.0E-01	2.7E-02	9.0E-03	2.4E-02	9.0E-01	5.5E-01	1.1E+01	2.7E-02			B	6.0E-03
S-7-1	0 - 1.5	7.0E-01	1.0E-03	1.0E-03	2.5E-03	1.0E-03	1.5E-03	1.5E-03	4.0E-03			B	1.0E-03
S-8-1	0 - 1.5	5.5E-03	1.0E-03	1.0E-03	2.0E-03	1.0E-03	1.0E-03	1.5E-03	3.5E-03			B	5.0E-04
S-10-1	0	5.4E-03	6.5E-04	8.0E-04	1.7E-03	7.0E-04	9.5E-04	1.1E-03		R	1.9E-03		5.5E-04
S-11-1	C	7.0E-03	5.7E+00	6.8E+00	2.2E-01	6.8E+01	2.6E+01	3.3E+02		R	3.7E-01		7.0E-02
S-12-1	0	7.5E-01	1.3E+01	5.6E+00	2.3E+00	8.4E+01	2.9E+01	3.3E+02		R	1.4E+00		5.4E+00
Mean		2.32	2.59	2.13	9.05	30.45	12.72	118.27	0.64		0.72		0.88
N		11	11	11	11	11	11	11	8		7		11
Stnd Dev		6.17	4.13	2.64	18.61	40.47	17.66	155.20	1.30		0.94		2.39
Stnd Error		1.56	1.25	0.88	5.61	12.20	5.32	46.79	0.46		0.36		0.72
T(n-1), 0.05		2.228	2.228	2.228	2.228	2.228	2.228	2.228	2.365		2.447		2.228
95% UCL		5.79	5.37	4.04	21.55	57.63	24.58	222.53	1.73		1.59		2.48

Source: Tables 3 and 5

R: Rejected data. B: Method blank contaminant.

Values in boxes were detected above the sample reporting limit.

All other values are one-half the sample reporting limit.

TABLE 12
CONCENTRATIONS OF CHEMICALS OF CONCERN: SOILS, mg/kg

Sample	Depth (ft)	Acetone	Trichloro ethylene	Benzene	4-Methyl 2-pentanone (MIBK)	Toluene	Ethyl-benzene	Xylenes	2-Butanone (MEK)		Methylene chloride	Tetrachloro ethylene
S-10-9	10	5.6E-03	6.5E-04	6.0E-04	1.7E-03	7.0E-04	1.0E-03	1.2E-03		R	1.4E-03	5.5E-04
S-10-10	12	4.5E-03	5.5E-04	6.5E-04	1.4E-03	6.0E-04	8.0E-04	9.5E-04		R	9.0E-04	4.5E-04
S-10-11	14	6.5E-03	8.0E-04	9.5E-04	2.0E-03	8.5E-04	1.2E-03	1.4E-03		R	1.2E-03	6.5E-04
S-10-12	16	5.7E-03	7.0E-04	8.5E-04	1.8E-03	7.5E-04	1.1E-03	1.2E-03		R	1.2E-03	6.0E-04
S-10-13	18	1.0E-02	5.5E-04	7.0E-04	1.5E-03	6.0E-04	8.5E-04	1.0E-03		R	8.0E-03	5.0E-04
S-10-14	20	8.4E-03	6.5E-04	8.0E-04	1.7E-03	7.0E-04	1.0E-03	1.2E-03		R	8.0E-03	5.5E-04
S-11-1	0	7.0E-03	5.7E+00	6.8E+00	2.2E-01	8.8E+01	2.6E+01	3.3E+02		R	3.7E-01	7.0E-02
S-11-2	2	3.1E+00	1.8E+00	1.3E+00	2.1E-01	2.2E+01	1.3E+01	1.5E+02	7.1E-01		1.4E-01	7.0E-02
S-11-4	4	8.0E-01	2.5E-01	2.3E-01	4.2E-01	5.3E+00	4.6E+00	5.0E+01		R	2.3E-01	6.0E-02
S-11-6	6	3.2E+00	9.0E-02	4.6E-02	2.1E-01	8.8E-01	1.5E+00	2.1E+01	4.7E-01		5.5E-01	7.0E-02
S-11-8	10	1.1E+01	2.8E-01	1.1E-01	3.7E-01	6.9E+00	6.8E+00	6.5E+01		R	2.0E-01	5.0E-02
S-12-1	0	7.5E-01	1.3E+01	5.6E+00	2.3E+00	6.4E+01	2.9E+01	3.3E+02		R	1.4E+00	6.4E+00
S-12-4	4	3.9E+01	4.0E+00	7.3E-01	2.1E-01	2.2E+01	1.8E+01	2.0E+02		R	1.6E-01	2.0E+00
S-12-5	4	2.9E+01	1.9E+00	3.6E-01	2.1E-01	1.3E+01	1.1E+01	1.5E+02		R	2.2E-01	1.4E+00
S-12-6	6	6.7E+01	1.3E+01	2.7E+00	4.5E-01	5.5E+01	3.7E+01	3.7E+02		R	3.4E-01	5.6E+00
S-12-7	8	6.7E+01	6.4E+00	1.2E+00	4.6E-01	2.2E+01	1.8E+01	2.2E+02		R	4.0E-01	3.6E+00
S-12-9	10	1.7E+01	2.5E-01	4.4E-02	2.0E-01	1.2E+00	1.6E+00	2.3E+01		R	2.5E-01	4.1E-01
S-12-10	12	2.6E+01	4.6E-01	3.9E-01	4.2E-01	1.4E+00	1.5E+00	1.6E+01		R	4.5E-01	5.9E-01
S-12-11	14	2.2E+01	1.2E-01	2.5E-02	1.1E-01	3.5E-01	3.4E-01	4.1E+00		R	1.8E-01	3.7E-02
Mean		8.19	1.05	0.67	1.92	8.85	4.66	47.16	0.30		0.21	0.44
N		55	55	55	55	55	55	55	33		40	55
Stnd Dev		18.44	2.81	1.55	9.06	22.82	10.79	102.27	0.79		0.48	1.44
Stnd Error		2.49	0.38	0.21	1.22	3.08	1.45	13.79	0.14		0.08	0.19
T(n-1), 0.05		2.021	2.021	2.021	2.021	2.021	2.021	2.021	2.042		2.042	2.021
95% UCL		13.21	1.81	0.99	4.39	15.07	7.60	75.03	0.58		0.36	0.63

Source: Tables 3 and 8

R: Rejected data. B: Method blank contaminant.

Values in boxes were detected above the sample reporting limit.

All other values are one-half the sample reporting limit.

TABLE 13

INTAKE ASSUMPTIONS - INHALATION VOCs AND PARTICULATES OCCUPATIONAL RECEPTORS

Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
VOCs				
Inhalation Rate (M^3/hr) (IR)[1]	1.50	2.50	1.50	2.50
Exposure Time (hrs/day) (ET)	8	8	8	8
Exposure Frequency (days/yr) (EF)	250	250	250	250
Exposure Duration (years) (ED)[2]	9	25	9	25
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	3,285	9,125
Particulate				
Inhalation Rate (M^3/hr) (IR)[1]	1.50	2.50	1.50	2.50
Exposure Time (hrs/day) (ET)	8	8	8	8
Exposure Frequency (days/yr) (EF)	250	250	250	250
Exposure Duration (years) (ED)[2]	9	25	9	25
Deposition Factor (DF)[3]	0.25	0.25	0.25	0.25
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	3,285	9,125

[1] Activity level equivalent to simple construction or stacking firewood (EPA 1989b).
[2] Medial and 90th percentile duration in one residence (EPA 1989a).
[3] Twenty-five percent of inhaled particles are deposited in the lung; it is assumed that all of the VOCs in that fraction are absorbed (Midwest Research Institute 1985).
[4] Carcinogens: 70 years x 365 days/year. Noncarcinogens: 9 or 30 years x 365 days/year.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 14

INTAKE ASSUMPTIONS - INHALATION VOCs AND PARTICULATES CONSTRUCTION/REMEDIATION WORKERS

Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
VOCs				
Inhalation Rate (M^3/hr) (IR)[1]	2.5	2.5	2.5	2.5
Exposure Time (hrs/day) (ET)	8	8	8	8
Exposure Frequency (days/yr) (EF)[2]	20	40	20	40
Exposure Duration (years) (ED)	1	1	1	1
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	20	40
Particulate				
Inhalation Rate (M^3/hr) (IR)[1]	2.5	2.5	2.5	2.5
Exposure Time (hrs/day) (ET)	8	8	8	8
Exposure Frequency (days/yr) (EF)	20	40	20	40
Exposure Duration (years) (ED)	1	1	1	1
Deposition Factor (DF)[3]	0.25	0.25	0.25	0.25
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	20	40

[1] Activity level equivalent to bicycling or digging trenches (EPA 1989b).
[2] Estimated duration of earth moving activities.
[3] Midwest Research Institute 1985.
[4] Carcinogens: 70 years x 365 days/year. Noncarcinogens: 1 year x 20 or 40 days/year.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 15

INTAKE ASSUMPTIONS - SOIL INGESTION REMEDIATION/CONSTRUCTION WORKERS

Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
Remediation Workers				
Ingestion Rate (mg/day) (IR)[1]	100	100	100	100
Exposure Frequency (days/yr) (EF)[2]	20	40	20	40
Exposure Duration (years) (ED)	1	1	1	1
Conversion Factor (mg/kg) (CF)	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[3]	25,550	25,550	20	40

1 Upper bound estimate of adult soil ingestion rate (10 times higher than estimated normal soil ingestion behavior) (EPA 1989b).
2 Estimated duration of earth-moving activities.
3 Carcinogens: 70 years x 365 days/year. Noncarcinogens: 1 year x 20 or 40 days/year.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 16

INTAKE ASSUMPTIONS - DERMAL CONTACT REMEDIATION WORKERS

Population/Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
Remediation Workers				
Body Surface Area Exposed (cm^2)[1]	970	1,940	970	1,940
Dermal Absorption[2]	13%	33%	13%	33%
Adherence Factor (mg/cm^2)[3]	0.5	1.5	0.5	1.5
Exposure Frequency (days/yr) (EF)[4]	20	40	20	40
Exposure Duration (years) (ED)	1	1	1	1
Conversion Factor (kg/mg) (CF)	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[5]	25,550	25,550	365	365

[1] Average = 5% of total adult body surface of 19,400 cm^2 (EPA 1989a); RME = 10% of 19,400 cm^2.
[2] Estimated fraction of volatile organic compounds adhered to soil particles that is absorbed through skin; based on McKone 1989 (see text).
[3] Soil adherence factors based on Driver et al. 1989.
[4] Estimated duration of earth-moving activities.
[5] Carcinogens: 70 years x 365 days/year. Noncarcinogens: 1 year x 365 days/year.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 17

INTAKE ASSUMPTIONS - INHALATION PARTICULATES AND VOCs HYPOTHETICAL ON-SITE RESIDENTS

Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
VOCs				
Inhalation Rate (M^3/hr) (IR)[1]	0.83	0.83	0.83	0.83
Exposure Time (hrs/day) (ET)	24	24	24	24
Exposure Frequency (days/yr) (EF)	270	365	270	365
Exposure Duration (years) (ED)[2]	9	30	9	30
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	3,285	10,950
Particulate				
Inhalation Rate (M^3/hr) (IR)[1]	0.83	0.83	0.83	0.83
Exposure Time (hrs/day) (ET)	24	24	24	24
Exposure Frequency (days/yr) (EF)	270	365	270	365
Exposure Duration (years) (ED)	9	30	9	30
Deposition Factor (DF)[3]	0.25	0.25	0.25	0.25
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[4]	25,550	25,550	3,285	10,950

1 Activity level equivalent to level walking at 2 mph (EPA 1989b).
2 Median and 90th percentile duration in one residence (EPA 1989a).
3 Midwest Research Institute 1985.
4 Carcinogens: 70 years x 365 days/year. Noncarcinogens: 9 or 30 years x 365 days/year.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 18

INTAKE ASSUMPTIONS - DERMAL CONTACT HYPOTHETICAL ON-SITE RESIDENTS

Population / Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
Body Surface Area Exposed (cm^2)[1]	2,910	6,400	2,910	6,400
Dermal Absorption[2]	13%	33%	13%	33%
Adherence Factor (mg/cm^2)[3]	0.5	1.5	0.5	1.5
Exposure Frequency (days/yr)[(1)] (EF)[4]	52	78	52	78
Exposure Duration (years) (ED)[5]	9	30	9	30
Conversion Factor (mg/kg) (CF)	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[6]	25,550	25,550	3,285	10,950

[1] Average = 15% of total adult body surface of 19,400 cm^2 (EPA 1989a); RME = 33% of 19,400 cm^2.
[2] Estimated fraction of volatile organic compounds adhered to soil particles that is absorbed through skin; based on McKone 1989 (see text).
[3] Soil adherence factors based on Driver et al 1989.
[4] Equivalent to 2 days/week for 6 months (average) and 3 days/week for 6 months (RME).
[5] Median and 90th percentile duration in one residence (EPA 1989a).
[6] Carcinogens: 70 years x 365 days/year. Noncarcinogens: 9 or 30 years x 365 days/year (RME).

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 19

INTAKE ASSUMPTIONS - SOIL INGESTION
HYPOTHETICAL ON-SITE RESIDENTS

Parameter	Carcinogenic		Noncarcinogenic	
	AVE	RME	AVE	RME
Adult 6 < 30				
Ingestion Rate (mg/day) (IR)[1]	10	100	10	100
Exposure Frequency (days/yr) (EF)	270	365	270	365
Fraction Ingested from Contaminated Site (FC)[6]	0.25	0.5	0.25	0.5
Conversion Factor (kg/mg) (CF)	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Exposure Duration (years) (ED)[2]	9	24	9	24
Body Weight (kg) (BW)	70	70	70	70
Averaging Time (days) (AT)[3]	25,550	25,550	3,285	8,760
Child 0 < 6				
Ingestion rate (mg/day) (IR)[1]	100	200	100	200
Exposure Frequency (days/yr) (EF)	270	365	270	365
Fraction Ingested from Contaminated Site (FC)[6]	0.25	0.5	0.25	0.5
Exposure Duration (years) (ED)	6	6	6	6
Conversion Factor (kg/mg) (CF)	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Body weight (kg) (BW)[4]	15	15	15	15
Averaging Time (days) (AT)[5]	25,550	25,550	2,190	2,190

1 Average and upper bound estimate of soil ingestion rates (EPA 1989b).
2 Nine years = median duration in one residence (EPA 1989a); 24 years = 90th percentile duration in one residence (30 years) minus 6 years of childhood exposure.
3 Carcinogens: 70 years x 365 days/year. Noncarcinogens: 9 or 24 years x 365 days/year.
4 Time weighted average body weight, age 0<6 (EPA 1989b).
5 Carcinogens: 70 years x 365 days/year. Noncarcinogens: 6 years x 365 days/year.
6 It is assumed that the resident spends 25% (average) and 50 % (RME) of his outdoor time in contact with contaminated soils at home; indoor dust and soils at other locations such as schoolyards and parks comprise the remaining fraction of total soil/dust ingestion.

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.

TABLE 20

INTAKE FACTOR SUMMARY

Receptor	Pathway	Carcinogenic		Noncarcinogenic	
		Average	RME	Average	RME
Occupational	Inhalation - VOCs	1.51E-02	6.99E-02	1.17E-01	1.96E-01
	Inhalation - Particulates	3.77E-03	1.76E-02	2.94E-02	4.89E-02
Remediation Worker	Inhalation - VOCs	2.24E-04	4.47E-04	1.57E-02	3.13E-02
	Inhalation - Particulates	5.59E-05	1.12E-04	3.91E-03	7.83E-03
	Dermal - Soil	7.05E-10	2.15E-08	4.94E-08	1.50E-06
	Ingestion - Soil	1.12E-09	2.24E-09	7.83E-08	1.57E-07
Hypothetical On-Site Resident	Inhalation - VOCs	2.71E-02	1.22E-01	2.11E-01	2.85E-01
	Inhalation - Particulates	6.77E-03	3.05E-02	5.26E-02	7.11E-02
	Dermal - Soil	4.95E-08	4.15E-06	3.85E-07	9.63E-06
	Ingestion - Soil	3.40E-09	2.45E-07	2.64E-08	7.14E-07

TABLE 21

SLOPE FACTORS: CARCINOGENS

Chemical	Slope Factor (SF) $(mg/kg/day)^{-1}$	Weight-of-Evidence Classification	Type of Cancer
Inhalation Route			
Benzene	2.9E-02	A	Nonlymphocytic leukemia
Trichloroethylene	6.0E-03	B2	Lung
Methylene Chloride	1.6E-03	B2	Lung, liver
Tetrachloroethylene	1.8E-03	B2	Leukemia, liver
Oral/Dermal Route			
Benzene	2.9E-02	A	Nonlymphocytic leukemia
Trichloroethylene	1.1E-02	B2	Liver
Methylene Chloride	7.5E-03	B2	Liver
Tetrachloroethylene	5.1E-02	B2	Liver

Source: EPA IRIS database or EPA, 1991a. Health Effects Assessment Summary Tables (HEAST).

TABLE 22

REFERENCE DOSES: NONCARCINOGENS

Chemical	Subchronic RfD (mg/kg/day)	Chronic RfD (mg/kg/day)	Critical Effect	RfD Basis	Uncertainty Factor	
					Subchronic	Chronic
Inhalation Route						
Acetone	NA	NA				
2-Butanone (MEK)	9.00E-01	9.00E-02	CNS effects	Inhalation	100	1,000
Ethylbenzene	2.90E-01	2.90E-01	Developmental toxicity	Inhalation	300	300
4-Methyl-2-pentanone (MIBK)	2.00E-01	2.00E-02	Liver and kidney effects		100	1,000
Methylene chloride	8.60E-01	8.60E-01	N/A	Inhalation	100	100
Tetrachloroethylene	NA	NA				
Toluene	6.00E-01	6.00E-01	CNS effects	Inhalation	100	100
Xylenes	8.60E-02	8.60E-02	CNS effects	Inhalation	100	100
Oral/Dermal Route						
Acetone	1.00E+00	1.00E-01	Kidney toxicity	Gavage	100	1,000
2-Butanone (MEK)	5.00E-01	5.00E-02	Fetotoxicity	Inhalation	100	1,000
Ethylbenzene	1.00E+00	1.00E-01	Liver & kidney toxicity	Gavage	100	1,000
4-Methyl-2-pentanone (MIBK)	5.00E-01	5.00E-02	Liver & kidney effects	Gavage	100	1,000
Methylene chloride	6.00E-02	6.00E-02	Liver toxicity	Drinking water	100	100
Tetrachloroethylene	1.00E-01	1.00E-02	Liver toxicity	Gavage	100	1,000
Toluene	2.00E+00	2.00E-01	Liver & kidney effects	Gavage	100	1,000
Xylenes	4.00E+00	2.00E+00	Hyperactivity	Gavage	100	100

NA = Not available.
Source: EPA, 1991a. Health Effects Assessment Summary Tables (HEAST).

TABLE 23

SUMMARY OF HEALTH RISKS

Scenario / Receptor	Average Exposure			Reasonable Maximum Exposure		
	Cancer Risk	Subchronic Hazard Index	Chronic Hazard Index	Cancer Risk	Subchronic Hazard Index	Chronic Hazard Index
Off-site Resident	4.57E-09	2.71E-04		1.21E-08	7.03E-04	
Occupational	3.22E-07		7.00E-03	2.91E-06		3.43E-02
Fire Fighter	3.75E-07	2.22E-02		1.08E-06	6.18E-02	
Trespasser	1.76E-08	1.04E-03		1.85E-07	1.01E-02	
Recreational	6.11E-09	3.62E-04		4.77E-08	2.78E-03	
Remediation / Resident	4.33E-09	7.73E-04		1.69E-08	3.19E-03	
Remediation Worker	4.70E-07	8.39E-02		1.84E-06	3.22E-01	
Hypothetical On-site Resident						
Adult	4.94E-06		1.64E-01	3.90E-05		4.00E-01
Child 0-6 (Soil Ing.)	5.51E-09	5.10E-05		5.35E-08	4.76E-04	

Source: Woodward-Clyde Consultants (WCC), 1991, Installation Restoration Program, Remedial Investigation/Baseline Risk Assessment, Operable Unit 4, Mountain Home AFB, Idaho. Prepared for the U.S. Army Corps of Engineers, Omaha District, Omaha, NE. December, 1991.