PROPOSED PLAN

OPERABLE UNITS 1, 3, 5, AND 6, WITH A PROPOSED REMEDY FOR SITE ST-11 AND AMENDMENT TO THE RECORD OF DECISION

ENVIRONMENTAL RESTORATION PROGRAM
MOUNTAIN HOME AIR FORCE BASE, IDAHO

INTRODUCTION

Mountain Home Air Force Base (MHAFB) is seeking public comment on this Proposed Plan for several Environmental Restoration Program (ERP) sites at MHAFB. These sites were included in a Record of Decision (ROD) in 1995 and included sites in Operable Units (OUs) 1, 3, 5, and 6, the Lagoon Landfill, and an Underground Storage Tank at Fire Training Area 8. OUs are logical groupings of environmental sites that typically have characteristics in common, and therefore warrant similar approaches to their investigations and, if necessary, cleanup. The locations of all ERP sites are shown on the figure on page 2. These sites have undergone additional evaluation and/or investigation since original no further action (NFA) remedies were selected for these sites in 1995. Of these sites, only Site ST-11 (the focus of this Proposed Plan) requires a fundamental change to its original remedy, while the remaining sites have undergone what is called a significant change to their original remedies. In accordance with 42 United States Code (USC) Section 9617(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); 40 Code of Federal Regulations (CFR) Section 300.435(c)(2)(i & ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP); and Section 7 of EPA 540-R-98-031, sites that undergo a fundamental change to their original remedies must include public involvement through a Proposed Plan with final documentation in a ROD Amendment, while sites that undergo only a significant change to their original remedy do not require public involvement and only require documentation in an Explanation of Significant Differences (ESD). However, since all of the sites included in this Proposed Plan had their original remedies documented in a ROD in 1995, the revised remedies for all sites are being documented in this Proposed Plan and a forthcoming ROD Amendment.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
March 18 – April 16, 2010

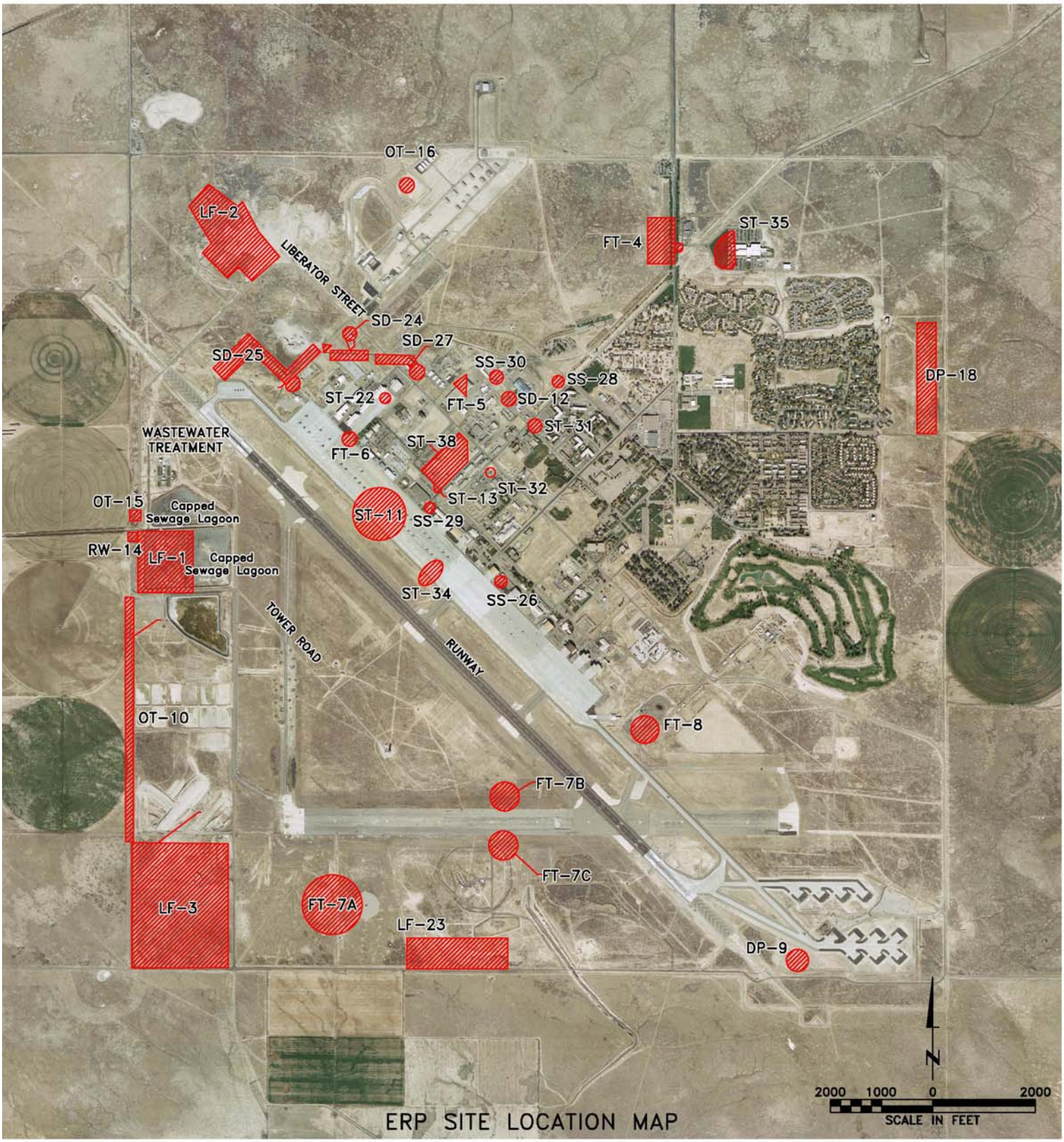
MHAFB will accept written comments on the proposed plan during the public comment period.

PUBLIC MEETING:
April 15, 2010

MHAFB will host a public meeting to explain the Proposed Plan, including all of the alternatives presented in the Feasibility Study for Site ST-11. Oral and written comments will also be accepted at the meeting. The meeting will be held at Mountain Home City Hall, 160 South 3rd East Street, Mountain Home, ID at 4:00p.m.

Most sites, except Site ST-11, retain a NFA decision with a changed land use potential to unlimited use/unrestricted exposure (UU/UE), or residential use, as opposed to the original assumption of industrial land use. Two landfill sites meet only industrial land use standards, with land use controls (LUCs) documented in prior ESDs. A third landfill site is undergoing the closure process, also under the industrial land use scenario. As such, all sites except Site ST-11 are addressed only through a brief description of current site status which is included in Table 1 at the end of this Proposed Plan.

The subject sites at MHAFB are currently in an industrial land use setting; a scenario that is not expected to change for the foreseeable future. Although CERCLA and the NCP require that site cleanups be selected considering reasonable land use scenarios, ensuring that land uses do not change over time has costs and other impacts. The Air Force has elected to consider achieving UU/UE status (suitable for residential use) for most of the MHAFB sites for purposes of enhancing mission flexibility and


OT-16
LF-2
LIBERATOR STREET
FT-4
ST-35
SD-24
SD-27
SD-25
SS-30
SS-28
DP-18
ST-22
FT-5
SD-12
ST-31
WASTEWATER TREATMENT
FT-6
ST-38
ST-32
ST-13
OT-15
Capped Sewage Lagoon
ST-11
SS-29
RW-14
LF-1
Capped Sewage Lagoon
ST-34
SS-26
TOWER ROAD
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OT-10
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FT-7C
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LF-23
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SCALE IN FEET
ERP SITE LOCATION MAP

reducing future site manpower and management requirements given that the incremental costs to achieve UU/UE are justifiable. In all cases, except one site, where additional evaluation, investigation, or cleanup action was taken to achieve UU/UE status, the costs to do so were less than if the Air Force had placed LUCs on the site. For the one site where that was not the case, the incremental costs to complete the cleanup were only 8 percent above the costs for LUCs. More details concerning the specific changes to the original remedies for all sites will be included in the upcoming amendment to the 1995 ROD.

The process for selecting a revised remedy for Site ST-11 is detailed in the remainder of this Proposed Plan. Remediation at Site ST-11 is warranted to reduce potential risks posed to human health under an UU/UE land use scenario (residential use). The Air Force is the lead agency, while the U. S. Environmental Protection Agency (EPA) and Idaho Department of Environmental Quality (DEQ) are support agencies in this matter. Under CERCLA and the Federal Facility Agreement (FFA), both the Air Force and EPA must agree on the selected remedy, and the DEQ must be given the opportunity to review, comment on, and concur with the selected remedy. This Proposed Plan is prepared in accordance with Section 117(a) (42 USC Section 9617 (a)) of CERCLA of 1980 and 40 CFR Section 300.430(f)(2 & 3) of the NCP, which require opportunities for public input in the site cleanup decision-making process.

Contamination that consists solely of petroleum products is excluded from the CERCLA definition of a hazardous substance, pollutant, or contaminant (42 USC Section 9601). However, in the MHAFB FFA, the Air Force, EPA, and DEQ agreed to address petroleum product releases at Site ST-11 following the CERCLA process, subject to DEQ's determination that this process and the remedy selected meet or exceed the requirements of applicable state laws, including Idaho Administrative Code 58, Title 1, Chapter 2, Water Quality Standards.

MHAFB is located on 5,800 acres in Elmore County, Idaho, southwest of the City of Mountain Home, Idaho. The Base was established in 1943 as MHAFB and was a training base for several bombardment groups during World War II. During the 1950s, the 9th Bombardment Wing, various air re-supply and communications wings, psychological warfare, covert operations, and unconventional warfare groups were stationed at the Base. In the 1960s, the 569th Strategic Missile Squadron and the 67th Tactical Reconnaissance Wing were resident at the Base. From 1970 to 2002, various tactical and composite air wings were stationed at the Base. From 2002 to the present, the 366th Fighter Wing with F-16C, F-15E, and F-15C and the Air Control Squadron have been stationed at the Base. Currently, the wing operates only the F-15E aircraft.

In August 1990, MHAFB was listed on the EPA National Priorities List. The MHAFB FFA was signed on January 16, 1992 among the Air Force, EPA Region 10, and the Idaho Department of Health and Welfare – Division of Environmental Quality, which is now the DEQ. The FFA established respective roles and responsibilities for the Air Force, EPA, and DEQ.

There are six OUs at MHAFB. Site ST-11 is included in OU-3, which is the Basewide OU that considers sites as potential sources of contaminants to regional groundwater. Regional groundwater is present at a depth of about 375 feet below ground surface (bgs) and is a valuable resource at MHAFB since it is used as the primary source of potable water for the Base.

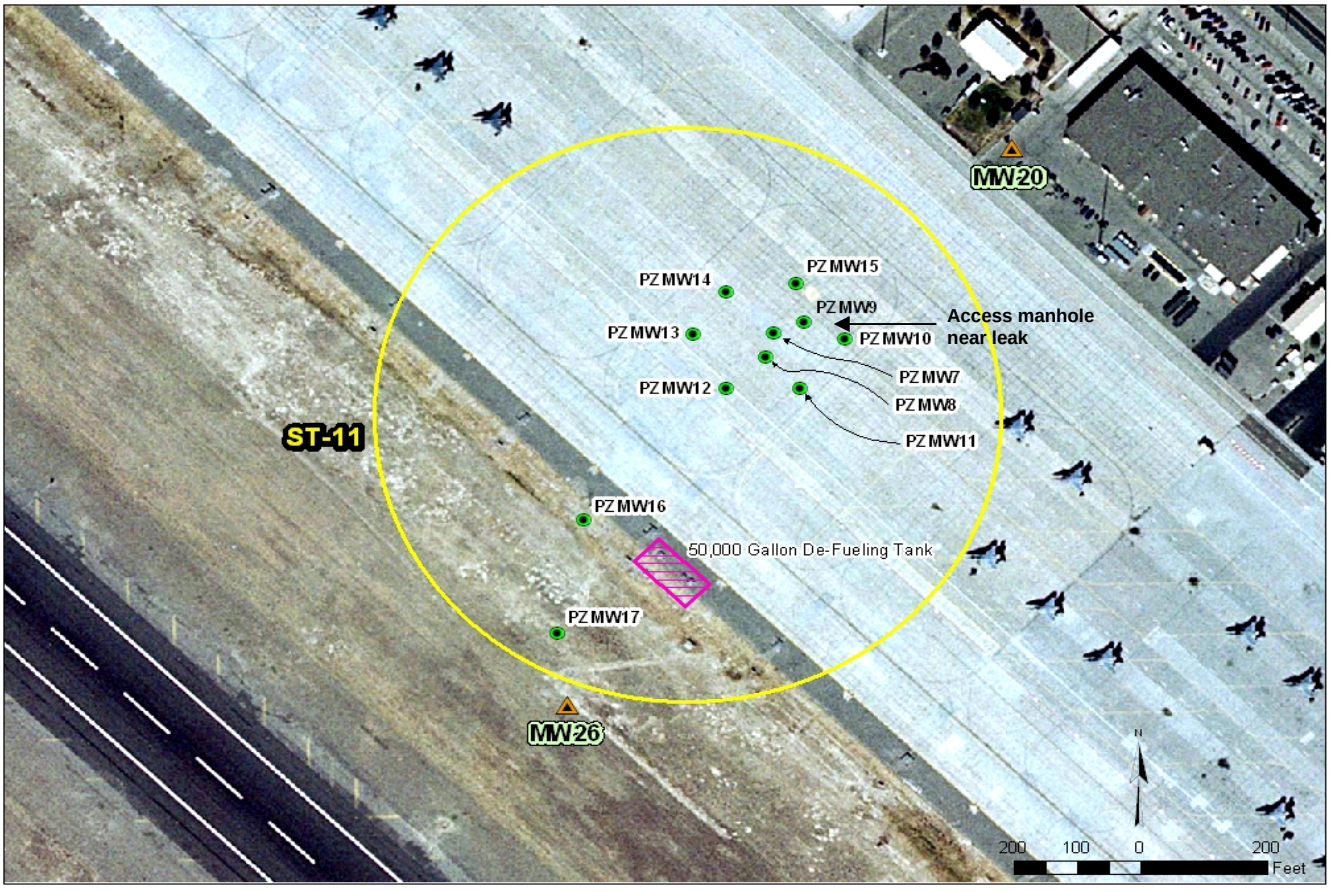
This Proposed Plan summarizes the cleanup alternatives evaluated in the Site ST-11 Feasibility Study (FS) and identifies the preferred alternative as vapor extraction (VE). VE is expected to be the most feasible, efficient, and cost effective cleanup alternative for reducing Jet Propulsion Fuel No. 4 (JP-4) (referred to from here on as "jet fuel") contamination in shallow fractured basalt bedrock and perched groundwater at a depth of about 50 feet bgs. Perched groundwater is groundwater that is separated from an underlying main body of groundwater by an unsaturated zone. The perched groundwater at Site ST-11 is present in the subsurface at shallower depths than the regional groundwater. As stated on this page, although petroleum sites are typically excluded under CERCLA, the State of Idaho considers the perched groundwater at Site ST-11 to be a potential useable resource and therefore subject to State groundwater quality regulations and standards. As a result, this site is included in the CERCLA cleanup. Additionally, the preferred alternative is expected to reduce the potential threat to deeper regional groundwater (the primary potable water resource for MHAFB) from contamination that is present in the

perched groundwater at Site ST-11. Since this contamination includes jet fuel floating on perched groundwater in one well (perched zone monitoring well [PZMW]15), the preferred alternative includes measures to physically remove the floating jet fuel from the perched groundwater. Other remedial alternatives considered include no action, institutional controls (ICs), monitored natural attenuation (MNA), and multi-phase extraction (MPE). Descriptions of these alternatives are provided later in this Proposed Plan. The FS and other documents pertaining to Site ST-11, including this Proposed Plan, are available for public review in the MHAFB information repository, the MHAFB Library, and the City of Mountain Home Public Library (see page 17 for locations and hours). The public is invited to review these documents and comment on the preferred cleanup alternative, the other alternatives considered, and the process that led to the selected alternative. Public participation is an important part of the remedial alternative selection process and can lead to changes in the selected alternative.

This Proposed Plan is also available for viewing on the MHAFB website at: http://www.mountainhome.af.mil/shared/media/document/AFD-100305-079.pdf. MHAFB will host a public meeting on April 15, 2010 to discuss the preferred alternative presented in this Proposed Plan. Community members are invited to comment on this Proposed Plan from March 18 through April 16, 2010. After considering all public comments, the Air Force will document its selection in a ROD Amendment. EPA and DEQ have an opportunity to concur with or dispute the selected remedy. The selected remedy may be the same as the preferred alternative or may be modified based on new information or public comment. Your comments are important to us, and we invite you to review and comment on all of the alternatives in the Proposed Plan.

SITE BACKGROUND

Site ST-11 is located under the aircraft parking apron in the west-central portion of the Base (see diagrams on page 2 and below). In 1957, a leak occurred in a ¾-inch vent line for a 16-inch diameter subsurface fueling pipeline. The fueling line carried jet fuel



from MHAFB's petroleum, oil, and lubricants yard to fueling hydrants along the flight line. There is a parallel four-inch diameter defueling line next to the 16-inch line. Both the four-inch and 16-inch lines are housed in a corrugated metal pipe sleeve. The leak occurred soon after the fueling system was installed during the first half of 1957. Interview information with Base personnel who were employed at MHAFB during this timeframe indicates the leak was intermittent (only during times when the fueling line was pressurized) and ongoing for a period of two or three months. During this time, it is estimated that as much as 50,000 to 90,000 gallons of fuel may have been released via the vent line leak. After the leak was discovered, the vent line was repaired and new access manholes were installed over the fueling line at the leak location near PZMW15 (see diagram below).

Site ST-11 has been the subject of numerous investigations between 1986 and 2008. In 1986 seven soil borings were drilled and sampled at locations west of the 50,000 gallon defueling tank. The soil sample results indicated that no significant fuel-related contamination was left in soils at this location.

In 1993 and 1994, an investigation was completed at Site ST-11 as part of the OU-3 Fuel Sites Remedial Investigation (RI), that included soil gas sampling under the aircraft parking apron. Ninety-nine soil gas samples were collected from 38 sample locations and analyzed for total volatile hydrocarbon compounds (a measure of the degree of fuel-related contamination) and benzene, toluene, ethylbenzene, and xylenes (BTEX) (the most common volatile fuel-related chemicals, with benzene being the most toxic of these chemicals), using a mobile field laboratory.

The soil gas sample results were used to locate 14 soil borings and two rock cores that were then drilled and sampled at Site ST-11. Seventy-six soil samples were collected from the 14 borings with the samples tested in the field using immunoassay sampling techniques. Immunoassay is a field screening test procedure where chemical concentrations are gauged by the amount of color change that occurs when a sample is added to a vial that contains a specific chemical that will react with the chemical or chemical group of concern (e.g., jet fuel). Based on the results of the field screening, 14 soil samples were analyzed for BTEX, total gasoline range organics (GRO), and the heavy metal lead by a fixed-based laboratory using analytical methods that provide better accuracy of concentrations and identification of specific jet fuel components. As part of this investigation, two rock cores were drilled and recovered to investigate the extent to which fuel had infiltrated into basalt bedrock which underlies Site ST-11 beneath the soils. Perched groundwater was encountered in each hole drilled into rock, with perched groundwater samples collected and analyzed for BTEX and total petroleum hydrocarbons.

Based on the results of the soil and soil gas samples, seven locations were selected for drilling additional rock cores and possible installation of PZMWs. One location immediately east of the pipeline manhole did not encounter perched water and was cored to a depth of 169 feet. Field screening information indicated the fractured rock was impacted with fuel constituents (jet fuel) at concentrations greater than 1,000 parts per million (ppm) to a depth of about 88.5 feet bgs, and less than 100 ppm at 165.5 feet bgs.

Perched groundwater was encountered in the remaining six rock coring locations at the time of drilling. These six rock cores were converted to PZMWs and sampled for BTEX and GRO. Dissolved BTEX concentrations were reported in all PZMWs at the time of installation, and two of the wells had measurable thicknesses of floating fuel which was analyzed and determined to be jet fuel.

The "Limited Action" alternative was recommended for Site ST-11 in a Focused FS completed for Site ST-11 in 1995. The "Limited Action" alternative included:

- A Notice of Restriction to prohibit drilling at Site ST-11 and to prevent the use of perched groundwater as potable water.
- Leak detection to identify potential future petroleum leaks at Site ST-11.
- Sampling of the perched groundwater prior to removal of the land use restriction to determine compliance with the Federal Safe Drinking Water Act (SDWA).
- Monitoring (sampling) of the perched groundwater in accordance with an approved groundwater sampling plan for the Base's groundwater Long-Term Monitoring (LTM) program.

Following the investigations and the Focused FS, the OU-3 ROD, which included Site ST-11, was signed

in October 1995. The objectives for Site ST-11 in the ROD were:

- Protection of human health by preventing human exposure to the contaminated perched groundwater.
- Protection of the environment by preventing an inadvertent release of petroleum compounds to the regional groundwater through either accidental penetration of the perched groundwater zone or extraction and release of contaminated perched groundwater to the environment.

As part of the post-ROD LTM, PZMW7 (see diagram on page 4) was incorporated into the LTM program, and the remaining PZMWs at that time were abandoned. Sampling of PZMW7 between 1996 and 2000 indicated that benzene concentrations ranged from 4,900 to 8,350 micrograms per liter (µg/L), which exceeded the Federal Maximum Contaminant Level (MCL) of 5 µg/L established by the EPA.

The 2001 and 2006 Five-Year Remedy Reviews (documents produced every 5 years to re-evaluate the protectiveness of past remedies) evaluated Site ST-11 and the data collected to-date.

The 2001 Five-Year Remedy Review indicated that even though the selected remedy for Site ST-11 had been implemented (LTM of perched groundwater and ICs), continuing concerns about the site required evaluation to ensure the remedy remained protective of human health. The following recommendations were made:

- Install a regional groundwater monitoring well near Site ST-11 to evaluate potential jet fuel impacts to regional groundwater.
- Install additional perched groundwater monitoring wells to evaluate the extent of light non-aqueous phase liquid (LNAPL – or pure jet fuel) detected at well PZMW7 and to determine the hydrogeological characteristics of the perched aquifer.
- Complete a Focused FS and pilot test to determine if an active remediation system would be effective in removing chemicals of concern (COCs) from the subsurface.
- Verify that the Base fuel system leak detection procedures are adequate to minimize unaccounted fuel loss.
- Prepare an ESD to the 1995 OU-3 ROD to revise the then-current LUCs to incorporate EPA Region 10 IC language into the selected remedy to ensure long-term protectiveness with respect to human exposure to perched groundwater at Site ST-11. Again, an ESD is a document that is used to modify prior remedial decisions for environmental sites and is required by CERCLA if changes to prior decisions are significant.

After the Five Year Review in 2001, the following additional activities were completed at Site ST-11:

- An assessment of water level change in PZMW7 and identification of potential sources of water recharge to Site ST-11 was completed by the United States Geological Survey in March 2002. Findings from this study suggested a consistent and non-seasonal source of recharge to the perched water body (or bodies) at Site ST-11 since about 1999. However, no conclusive decision was reached about the exact source, or sources, of water recharge at Site ST-11. Indications were that recharge is either from precipitation runoff from the flight line or from leaks in the storm water or sanitary sewer drainage system adjacent to the site.
- Sixteen new soil borings were completed with collection of soil gas and soil samples for chemical analysis. Eight of the borings were completed as PZMWs (PZMWs-8, 11, 12, 13, 14, 15, 16, and 17). Six of the borings were completed as vapor extraction wells. Two borings were abandoned (PZMW10 and MW26A), and PZMW9 was converted to vapor extraction well (VEW)-4 because no perched water was found there. The locations of these PZMWs are shown on the diagram on page 4.
- Regional groundwater monitoring wells MW20 and MW26 (see diagram on page 4) were installed near Site ST-11 to monitor deeper regional groundwater quality near the site. Samples collected from these monitoring wells suggest that the site has not been a contributor to regional groundwater impacts.
- A vacuum radius of influence test was completed on the vapor extraction wells installed at Site ST-11 to evaluate the feasibility of VE as a method to remediate soils and bedrock. These tests were completed by attaching an electric powered blower to various vapor extraction wells and

extracting vapors from the subsurface. The results of the test indicate that VE would have a wide influence on the subsurface and would be a viable remedial alternative for Site ST-11.

- Groundwater levels and jet fuel thicknesses were monitored in the PZMWs.
- Several rounds of pumping tests on the perched zone groundwater were completed in 2004 to evaluate the degree of interconnectivity between the perched groundwater zones, the ability of the distinct perched groundwater zones to produce water, and to evaluate whether perched groundwater is a potential contaminant source. The results of these pumping tests suggest that perched groundwater is present in rather small, isolated "pockets" in the fractured basalt bedrock; there is generally poor interconnectivity of the various perched groundwater zones; and the movement of perched and regional groundwater and jet fuel is highly complex and probably controlled by the patterns of the bedrock fractures.
- An ESD was completed for Site ST-11 in 2004 to clarify the requirements of the ICs placed there and to provide the necessary degree of protectiveness.

Recommendations in the 2006 Five-Year Remedy Review included continuing LTM for BTEX; measuring jet fuel thickness in the PZMWs; removing jet fuel floating on the perched groundwater; drafting a focused FS; and amending the ROD to evaluate active remedial alternatives. Since the last Five Year Review in 2006, the following additional activities have taken place at Site ST-11:

- Continued measurement of water and LNAPL levels from PZMWs and regional groundwater monitoring wells and collection of perched and regional groundwater samples from the PZMWs and nearby regional monitoring wells.
- More extensive VE studies were completed in the summer of 2006 and fall of 2008 in the overburden soils and shallow basalt bedrock at Site ST-11. The main objective of these studies was to verify that VE is appropriate for the site conditions and to obtain the necessary information to design a full-scale remedial system that will meet the cleanup objectives for Site ST-11. Similar to the previous tests, these results confirmed VE would be a viable remedial alternative for Site ST-11. Additionally, airflow that will physically remove volatile contaminants and reintroduce fresh oxygen to restimulate natural biodegradation of contaminants can be expected from such a system.
- In the fall of 2008, contractors learned that a series of abandoned electrical conduits that pass through a large vault at Site ST-11 were present underneath the ramp concrete, and extend to the northeast off of the flight line. The presence of these conduits presents a feasible and cost-effective means of installing a VE system at Site ST-11.

SITE CHARACTERISTICS

The site remains an active concrete flight line parking ramp. No changes to this site use are currently anticipated. Ramp concrete is approximately 18 inches thick, is underlain by a thin layer of granular sub-base material and about 15 to 20 feet of silt and sand overburden soils. Beneath the overburden soils is fractured basalt bedrock for the remainder of the depth to regional groundwater.

The information obtained from the site investigations described in the Site Background section above, indicates the perched groundwater nearest the fuel system pipeline has the greatest impacts from benzene and free product. Jet fuel has been intermittently present in PZMW7, PZMW8, PZMW12, and PZMW15, floating on the perched groundwater's surface. Currently, jet fuel is present only at PZMW15 at a measured thickness of about 6 inches. This exceeds the State of Idaho standard of 0.1 inch maximum thickness, which defines free product (see Idaho Administrative Procedures Act [IDAPA] 58.01.02.010). IDAPA 58.01.02.852.04 requires the removal of free product to the maximum extent practicable if the thickness exceeds 0.1 inch.

The primary contaminants of concern at Site ST-11 are benzene in perched groundwater and jet fuel floating on the perched groundwater surface. The highest detections of benzene are at PZMW7 (6,500 µg/L in April 2008 and 5,900 µg/L in October 2008). These concentrations exceed the MCL of 5 µg/L.

Pure jet fuel has not been observed in the soils at Site ST-11. However, soils are contaminated with jet fuel related compounds, mostly along the alignment of the fueling line that leaked, and down to the bedrock along this pipeline alignment. The thickness of

contaminated soil decreases with increasing distance from the fueling pipeline. This contaminated zone of soil is about 300 feet long starting at the pipeline leak location and extending to the west along the pipeline. Laterally from the pipeline it extends outward for a distance of about 25 feet on both sides of the pipeline. Jet fuel related compounds (BTEX, DRO, and GRO) are present in soils at Site ST-11. BTEX concentrations range from 1.73 milligrams per kilogram (mg/kg) at PZMW12 to 308 mg/kg at PZMW8; DRO concentrations range from 300 mg/kg at PZMW12 to 9,200 mg/kg at PZMW8; and GRO concentrations range from 330 mg/kg at PZMW12 to 8,100 mg/kg at PZMW15. The maximum observed stained soil thickness at these locations is 20 feet at PZWM15. However, these contaminants are not considered a health risk as further detailed in the Summary of Site Risks section of this Proposed Plan, and no cleanup requirements are necessary to meet residential land use criteria.

Jet fuel has been observed in the shallow fractured basalt bedrock above the perched groundwater residing in rock fractures, floating on the perched groundwater, and dissolved in perched groundwater. The extent of this contaminated bedrock is similar to the soils. The shallow fractured basalt bedrock in the area of Site ST-11 contains "pockets" of perched groundwater. These occurrences of perched groundwater are located in rather small, isolated zones in the rock that are poorly connected to each other and have little interconnectivity to water flow.

Calculations to estimate the amount of residual benzene mass left in the subsurface at Site ST-11 have been completed to estimate how much benzene may require physical removal from the site or require natural removal and degradation by stimulating natural biologic breakdown processes. A conservative estimate of benzene mass is about 430 pounds. The remaining amount of jet fuel present in the subsurface is unknown.

SCOPE AND ROLE OF RESPONSE ACTION

Site ST-11 is included in OU-3, which is the Basewide OU that includes all sites that are a potential source of contamination to regional groundwater. This action (i.e., implementation of the preferred alternative as described in detail on pages 11 and 12) will be the final action for the site, and will modify the remedy previously selected for Site ST-11 in the 1995 ROD. The objectives of the remedial action at Site ST-11 are to physically remove jet fuel (to the maximum extent practicable) from the perched groundwater surface in PZMWs and cleanup benzene in the perched groundwater to the Federal MCL of 5 µg/L.

SUMMARY OF SITE RISKS

In 1995, an RI/FS (including a baseline risk assessment [BRA]) was completed for the OU-3 Fuel Sites, which included Site ST-11. The BRA characterized the potential for adverse human health effects from exposure to environmental hazards at Site ST-11 if no action were taken. It provides the basis for taking action and identifies the COCs (chemicals that may cause an unacceptable human health risk) and chemical exposure pathways that need to be addressed by the selected remedial alternative. This section of the Proposed Plan summarizes the results of the human health and ecological risk assessments. Since the risk assessment for Site ST-11 was completed in 1995, toxicity values for some chemicals have changed. As a result, the human health risk for the hypothetical future resident for the soil pathway was recalculated in December 2009 using the most current toxicity values. The human health risk for other receptors (future occupational worker and future construction worker) was not recalculated since the residential scenario is the most stringent and would be protective of these other receptors.

Ecological Risks

An ecological risk assessment (ERA) assesses actual and potential adverse impacts on plant and animal species (ecological receptors) from chemical releases. The site is covered with concrete, is located on an active flight line, and contains no viable ecological habitat. Conclusions in the ERA for Site ST-11 were that no populations of any identified plant or animal species were at risk.

Human Health Risks

MHAFB is an active Base that is not currently scheduled for closure. Although Site ST-11 is considered an industrial site under both the current and future anticipated land use, hypothetical future residents were evaluated as potential receptors of contaminated groundwater to assess the site under the potential future unrestricted use scenario as well as the need for LUCs.

During the RI/FS in the mid 1990s, site contamination and potential human health risks were characterized based on the chemical analytical results

of soil and perched groundwater samples for jet fuel related compounds (primarily BTEX). The conclusions of the 1995 human health risk assessment were:

- For all COCs and all pathways (soil ingestion, soil dermal contact, volatile chemical inhalation, and groundwater), the estimated lifetime excess cancer risk for future occupational workers (1×10^{-6}) and future construction workers (5×10^{-10}) was below the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that unacceptable excess cancer risks are not likely at Site ST-11 (see box below for an explanation of risk values).

UNDERSTANDING RISK ASSESSMENT RESULTS

Carcinogenic and noncarcinogenic health effects were calculated for each type of human receptor.

Noncarcinogenic effects are characterized by comparing potential chemical intakes with acceptable intakes (established reference doses) to get a hazard quotient (HQ) ratio. The HQs for all chemicals of potential concern and relevant pathways are summed to yield a total hazard index (HI). An HI equal to or less than 1.0 indicates that no adverse noncarcinogenic health effects are expected to occur even to sensitive individuals over a lifetime of exposure. An HI above 1.0 indicates a potential cause for concern and the need for further evaluation of assumptions about exposure and toxicity. A noncarcinogenic effect is any noticeable deleterious change to a human receptor.

Potential carcinogenic effects are characterized in terms of the excess probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. The National Contingency Plan, through the Environmental Protection Agency's Superfund program, established a generally acceptable "target range" for excess cancer risks between 1×10^{-4} and 1×10^{-6} for Superfund site-related releases. The Agency strives to manage human health risks within this range as part of a Superfund cleanup. These values are equivalent to a 1 in 10,000 to a 1 in 1,000,000 chance of contracting cancer from the exposure. This means that due to exposure to a chemical over a specific timeframe, no more than one additional cancer case is expected in a population of 10,000 (in the case of a 1×10^{-4} risk) or 1,000,000 (in the case of 1×10^{-6}) people. The terms "excess cancer risk" and "additional cancer case" are used because historically or statistically, it is known that there will be about 300,000 cancer cases over a 70-year period in a population of 1,000,000 people due to ordinary exposures from daily activities, family history, genetics, etc.

- The calculated cancer risks for all COCs for the hypothetical future resident for soil exposure pathways (dermal contact, ingestion, and volatile chemical inhalation) totaled 4.2×10^{-7}. This is also below the target EPA risk range. The cumulative risk for the hypothetical future resident, which includes the regional groundwater pathway, was 3×10^{-6}.
- The highest total hazard index (HI), a measure of potential noncarcinogenic human health effects, for future workers (0.3), future construction workers (0.01), and hypothetical future residents (0.44) were below the EPA target value of 1.0, indicating that no unacceptable adverse non-carcinogenic human health effects are expected for any exposure scenario.
- A potential unacceptable human health risk was calculated for perched groundwater used as a drinking water source by a hypothetical future resident. The calculated excess cancer risk from this potential, but unlikely, future scenario was 1×10^{-2}. This exceeds the EPA target risk range.

The updated (2009) human health risk estimates for the hypothetical future resident for the soil pathway using the most current toxicity values is as follows:

- The calculated cancer risks for the hypothetical future resident for all COCs for the soil exposure pathways (dermal contact, ingestion, and volatile chemical inhalation) totaled 1.0×10^{-6}. This is at the lower end of the target EPA risk range. This estimate includes dermal exposure to volatile chemicals as was included in the 1995 risk assessment. However, adopting current guidance regarding dermal exposure to volatile chemicals would eliminate this component and result in a cumulative risk much lower than 1×10^{-6}.
- The HI for the hypothetical future resident was 0.36, below the EPA target value of 1.0, indicating that no unacceptable adverse non-carcinogenic human health effects are expected for any exposure scenario.

In 2006, the potential for human health risks due to intrusion of volatile chemicals from the subsurface into indoor air was evaluated. Samples of soil vapor under the floor slab and of indoor air in the nearest building to Site ST-11 (Building 1229) were collected and analyzed for jet fuel related chemicals. The HI calculated from the results for all chemicals of concern was 0.032, and the maximum cancer risk

was 5×10^{-5}, which suggests there are no unacceptable human health risks from this exposure pathway to any receptors, including hypothetical future residents. However, since EPA guidance used to calculate inhalation risks since completion of this indoor air evaluation has changed, a cursory evaluation of the human health risk accounting for these changes was completed. This re-evaluation concluded there would still be no unacceptable human health risks from this exposure pathway, including hypothetical future residents.

It is the lead agency's current judgment that the preferred alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances to the environment. Considering the summary of potential risks described above, as well as the site characteristics and State and Federal regulations, the primary basis for taking action is: a) there is an MCL exceedance and unacceptable cancer risk in the waters of the State of Idaho, 2) floating jet fuel is present at a thickness greater than the State definition (more than 0.1 inch), and 3) Site ST-11 is considered a potential threat to the regional groundwater as long as residual free product exists and perched groundwater is present with contaminants at levels above MCLs.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are site-specific goals for protecting human health and the environment developed during the RI/BRA and the FS. RAOs specify the contaminants and media of interest, chemical exposure pathways, and preliminary remediation goals (PRGs) that permit a range of remedial action alternatives to be developed. The RAOs can be developed on a media-specific, chemical-specific, or OU-specific basis and result in goals for the protection of human health or the environment. The process for developing RAOs for Site ST-11 included consideration of the calculated human health risk values, and a review of Federal and State environmental regulations and standards to help refine remediation criteria that address potential human health risks and threats to natural resources (i.e., regional groundwater).

As previously mentioned, the primary COC and medium of concern at Site ST-11 is benzene in perched groundwater at concentrations above the Federal MCL. This is the only chemical that exceeds the MCL in perched groundwater at the site. A layer of jet fuel has also historically been detected in four of the site PZMWs, and is currently present in one PZMW. The presence of this jet fuel is not compliant with Idaho Water Quality Standards (specifically, IDAPA 58.01.02.852.04 – Free Product Removal). Although benzene in perched groundwater and jet fuel within the wells presents a concern from a human health risk perspective, it is also present in shallow fractured basalt bedrock at the site that could act as a continuing source to the perched groundwater contamination.

PRGs are typically numerical values which are developed on the basis of chemical-specific regulatory standards or site-specific health risk factors. PRGs are recommended maximum concentrations of individual chemicals for a specific medium (e.g., soil, groundwater) and land use combinations. They provide long-term targets to use during development, evaluation, and selection of remedial alternatives. PRGs are typically refined at the conclusion of the remedy selection process. For Site ST-11, the following potential PRGs and preliminary cleanup levels have been identified for perched groundwater:

- MCLs established under the SDWA.
- Rules of the Department of Environmental Quality, IDAPA 58.01.02, entitled Water Quality Standards (these rules essentially emulate the Federal MCLs). These rules also define floating petroleum as 0.1 inch thickness or greater.

As described on page 3 of this Proposed Plan, although petroleum sites are typically excluded under CERCLA, under IDAPA 58.01.11.200, Groundwater Quality Standards, DEQ considers the perched groundwater a "Water of the State of Idaho" that is therefore subject to the same groundwater quality rules as regional groundwater, which is a drinking water source. This is a controlling factor for including this site in the CERCLA cleanup. The contaminated perched groundwater is also considered a potential source of contamination to regional groundwater.

The selected PRG for benzene at Site ST-11 is the MCL of 5 µg/L. Under governing law, policy, and guidance, MCLs are deemed to establish a level of risk protective of human health for all potential uses, in particular potable use.

Based on the MCL exceedance for benzene and the presence of jet fuel, the RAOs for Site ST-11 are:

- Recover free product in PZMWs that have a history of containing jet fuel (to 0.1 inch maximum thickness or any higher level determined to be the maximum extent practicable) to comply with IDAPA 58.01.02.852.04. Recovered jet fuel will be placed into the holding tank at the current Base fire training area.
- Remediate perched groundwater to achieve benzene concentrations not to exceed the MCL of 5 µg/L.

SUMMARY OF REMEDIAL ALTERNATIVES

Following is a brief summary of each alternative considered during the FS. The costs given were derived during the FS process using accepted costing methodology. Present value cost represents the total base year costs, discounted for the anticipated future value of money based on inflation, for an alternative that has a life cycle longer than one year.

Alternative 1 – No Action

Estimated Capital Cost:	*$0*
Estimated Annual Operation and Maintenance (O&M) Cost:	*$0*
Estimated Periodic Cost :	*$0*
Estimated Present Value Cost:	*$0*
Total Project Duration:	*0 years*

Alternative 1 assumes that no remedial action would be implemented for the perched groundwater at Site ST-11. The NCP requires this alternative be considered and it serves as a baseline against which other alternatives are compared. Under no action, existing site conditions would remain unchanged. Potential health risks associated with the use of perched groundwater as a potable water source at Site ST-11 would remain for hypothetical future residents from exposure to benzene at concentrations above the MCL.

Alternative 2 – Institutional Controls and Long-Term Monitoring

Estimated Capital Cost:	*$30,000*
Estimated Annual O&M Cost:	*$25,800*
Estimated Periodic Cost (includes 5-Year Review costs):	*$1,000*
Estimated Present Value Cost:	*$560,000*
Total Project Duration:	*30 years*

Alternative 2 includes LTM of the perched and regional groundwater associated with Site ST-11, and continued implementation of ICs, including informational devices and construction management for all future intrusive work at the site pursuant to the ROD, as modified by the ESD.

Alternative 2 would allow natural contaminant degradation processes (i.e., dispersion, volatilization, biodegradation, adsorption, and chemical reactions) to reduce contaminant levels over a very long period of time. The amount of the contaminants left in place would continue to diminish gradually by virtue of these processes. Perched groundwater samples from Site ST-11 PZMWs were analyzed for natural attenuation parameters during the 2000 through 2004 LTM sampling events. Natural attenuation parameters give an indication if the subsurface conditions are conducive to the degradation of contaminants through natural processes. Results of these analyses indicate that biodegradation and other natural contaminant degradation processes are occurring at slow rates. The slow degradation rates are likely due to limited oxygen in the subsurface to support rapid biodegradation; therefore, this alternative is not likely to achieve required cleanup levels in a reasonable timeframe.

Long-term groundwater monitoring of dissolved jet fuel related compounds in groundwater and measurements of floating jet fuel would be completed under this alternative to confirm that impacted perched groundwater is not migrating and potentially threatening regional groundwater. The potential human health risks associated with exposure to the perched groundwater at Site ST-11, as identified in the OU-3 Fuels Sites BRA, are currently reduced or eliminated through the ICs already implemented at Site ST-11 pursuant to the ROD, and as modified by the ESD. This alternative would not achieve RAOs in the near-term, nor would this alternative meet a goal for site closure with unrestricted use within a reasonable timeframe. Therefore, Alternative 2 was not carried forward for detailed analysis in the Site ST-11 FS.

Alternative 3 – Vapor Extraction (the Preferred Alternative)

Estimated Capital Cost:	*$444,000*
Estimated Annual O&M Cost	*$183,000*
Estimated Periodic Cost (includes 5-Year Review costs):	*$32,000*
Estimated Present Value Cost:	*$822,000*
Total Project Duration:	*2 years*

Alternative 3 includes ICs, VE, engineering controls, passive jet fuel recovery, passive bioventing, and *in situ* chemical oxidation for perched groundwater. The potential human health risks associated with exposure to the perched groundwater at Site ST-11, as identified in the OU-3 Fuels Sites BRA, are currently reduced or eliminated through the ICs already implemented at Site ST-11 pursuant to the ROD, and as modified by the ESD. However, the ICs do not protect regional groundwater. The VE system would remove recoverable jet fuel and jet fuel components (primarily benzene) from the fractured bedrock above the perched groundwater. This VE system would be constructed just east of the flight line near Building 1229. The system would consist of an electrically powered blower connected to vapor extraction lines which would be run through abandoned underground electrical conduits, and connected to existing vapor extraction wells at the site.

As access to the site allows (based on flight operations and security issues), passive bioventing would be implemented. Monitoring wells at the periphery of Site ST-11, screened at the same level as the extraction wells, would be opened to the atmosphere. This would increase the rate that fresh air would be delivered to the site subsurface. The combination of VE with passive bioventing provides for both the physical removal of volatile contaminants and enhanced biodegradation of contaminants through the addition of oxygen to the subsurface.

Because the system would be constructed near an occupied building and uncontrolled emissions of fuel hydrocarbons would initially be relatively high, air emissions control consisting of catalytic oxidation was included in the feasibility level cost estimate for this alternative. However, the Air Force is evaluating emissions from the site during pilot studies and expects that controls are not likely to be necessary.

To install air conveyance piping from the wellheads to the remediation system, it would be necessary to saw cut 18-inch thick concrete and excavate a trench from the existing vault with the abandoned electrical conduits to the existing vapor extraction wells. The trench would be approximately 25 feet long by 4 feet wide by 2.5 feet deep. Upon installation of the pipe, the trench would be backfilled with the appropriate sub-base and concrete per MHAFB specifications. Once started, the system would run nearly continuously with minimal access to secure areas of the flight line required. Continuous operation of a VE based remediation system would reduce the amount of contaminants and is expected to achieve site RAOs.

Other components of this alternative would include:

- Passive removal of jet fuel using petroleum absorbing materials/canisters and/or fuel bailers placed into affected wells with disposal of the recovered fuel at the current fire training area.
- After VE efforts are complete (based on observations of VE system performance indicating little benefit to continue VE), a chemical oxidizing compound (i.e. hydrogen peroxide or permanganate) may be injected into wells that still have benzene concentrations exceeding the MCL of 5 µg/L.

Alternative 3 is expected to present some minor implementation obstacles due to site access restrictions from flight operations particularly during the construction phase. However, the technical and administrative feasibility of installing, operating, and maintaining this remedial system at Site ST-11 is expected to be manageable.

Alternative 4 – Monitored Natural Attenuation

Estimated Capital Cost:	*$100,000*
Estimated Annual O&M Cost:	*$25,000*
Estimated Periodic Cost (includes 5-Year Review costs):	*$1,000*
Estimated Present Value Cost:	*$620,000*
Total Project Duration:	*30 years*

Alternative 4 is similar to Alternative 2 with the addition of analyzing groundwater samples for natural attenuation parameters and assessment of contaminant degradation. Major components of this alternative include ICs, engineering controls, passive jet fuel recovery, and MNA.

The potential human health risks associated with exposure to the perched groundwater at Site ST-11, as identified in the OU-3 Fuels Sites BRA, are reduced or eliminated through the ICs currently implemented at Site ST-11 pursuant to the ROD, and as modified by the ESD. However, the ICs do not protect regional groundwater.

Engineering controls and MNA would include inspection and maintenance of the site and its infrastructure and perched/regional groundwater

monitoring. Perched groundwater from PZMWs would be periodically monitored at Site ST-11 as well as regional groundwater from wells MW20 and MW26. Free product thickness would be measured periodically until RAOs are achieved. Passive removal of jet fuel would be completed using petroleum absorbing materials/canisters and/or fuel bailers placed into affected wells, with disposal of the recovered fuel at the current fire training area.

Alternative 4 would allow natural attenuation processes (i.e., dispersion, volatilization, biodegradation, adsorption, and chemical reactions) to reduce contaminant levels. The amount of the contaminants left in place would continue to diminish gradually by virtue of these processes. Perched groundwater samples from Site ST-11 PZMWs were analyzed for natural attenuation parameters during the 2000 through 2004 LTM sampling events. Natural attenuation parameters give an indication if the subsurface conditions are conducive to the degradation of contaminants through natural processes. Results of these analyses indicate that biodegradation and other natural contaminant degradation processes are occurring at slow rates due to limited available subsurface oxygen. Due to the limited available oxygen, biodegradation rates are very slow and are not likely to achieve RAOs in a reasonable timeframe. Although the land use is unlikely to change from industrial to residential in the foreseeable future, RAOs are based on unrestricted (residential) use. Therefore, Alternative 4 was not carried forward for detailed analysis in the Site ST-11 FS.

Alternative 5 – Multi-Phase Extraction (MPE)

Estimated Capital Cost:	*$689,000*
Estimated Annual O&M Cost:	*$207,000*
Estimated Periodic Cost (includes 5-Year Review costs):	*$52,000*
Estimated Present Value:	*$1,129,000*
Total Project Duration:	*2 years*

Alternative 5 involves the removal of jet fuel and the active remediation of vapor and perched groundwater to reduce benzene levels to concentrations not to exceed the MCL. The major components of this alternative include ICs, engineering controls, MPE, passive jet fuel recovery, passive bioventing, and *in situ* chemical oxidation for perched groundwater.

MPE is a technology that simultaneously extracts both groundwater and soil vapor to remove contaminants. The groundwater table is lowered in order to dewater the saturated zone so that the VE process can be applied to the newly exposed soil. This allows the contaminants in the previously saturated soil to be removed by the induced vapor flow and extracted. In addition, contaminants present in the extracted groundwater are also removed.

The potential human health risks associated with exposure to the perched groundwater at Site ST-11, as identified in the OU-3 Fuels Sites BRA, are currently reduced or eliminated through the ICs already implemented at Site ST-11 pursuant to the ROD, and as modified by the ESD.

Engineering controls would include inspection and maintenance of the site and its infrastructure, and perched/regional groundwater monitoring. Perched groundwater from PZMWs would be periodically monitored at Site ST-11 as well as regional groundwater from wells MW20 and MW26. Free product thickness would be measured periodically until RAOs are achieved.

A MPE remediation system would be constructed just east of the flight line near Building 1229. The MPE system would consist of an electrically powered high-vacuum liquid-ring pump, suction piping, and vapor extraction wells. The suction piping would be connected to existing PZMWs and three new PZMWs installed in the western portion of the site. Additional wells are considered necessary since the generally lower vapor extraction rates of this system, in comparison to the VE system, will require more wells to achieve the necessary airflow rates in the subsurface.

The MPE system would extract groundwater and bedrock vapor simultaneously through a single extraction line lowered through the PZMW to just above the groundwater surface. The high vacuum would draw in the bedrock vapor and small volumes of groundwater would be trapped in the high velocity airflow and carried up the extraction line in droplet form. By removing groundwater and bedrock vapor simultaneously, a zone of lowered groundwater levels is created around the extraction well exposing additional fractured bedrock to the air flow for accelerated remediation of the saturated zone. The additional benefits of MPE over VE are minimal at Site ST-11 due to limited thickness of the perched groundwater.

As access to the site allows (based on flight operations and security issues), passive bioventing

would be implemented. Monitoring wells at the periphery of the site, screened at the same level as the extraction wells, would be opened to the atmosphere. This would increase the rate that fresh air would be delivered to the site subsurface. The combination of VE with passive bioventing would provide for both the physical removal of contaminants and enhanced biodegradation of contaminants through the addition of oxygen to the subsurface.

Because the system would be constructed near an occupied building and uncontrolled emissions of fuel hydrocarbons would initially be relatively high, air emissions control consisting of catalytic oxidation is included in the feasibility level cost estimate for this alternative. Even though the Air Force is evaluating emissions from the site during pilot studies and has determined that controls will not likely be necessary, initial extraction operations will be sampled and vapor concentrations will be checked against criteria to assure treatment is not required.

To install air conveyance piping from the wellheads to the remediation system, it would be necessary to saw cut and excavate a trench through the flight line apron concrete from the eastern portion of Site ST-11 to the western portion of the site where the new wells would be installed. The trench would be approximately 400 feet long by 4 feet wide by 2.5 feet deep. Upon installation of the pipe, the trench would be backfilled with the appropriate sub-base and concrete per MHAFB specifications. Once started, the system could be run nearly continuously with minimal access to secure areas of the flight line required. Continuous operation of the MPE system would reduce the amount of contaminants and is expected to achieve site RAOs.

Other components of this alternative would include:

- Passive removal of jet fuel using petroleum absorbing materials/canisters and/or fuel bailers placed into affected wells with disposal of the recovered fuel at the current fire training area.
- After MPE efforts are complete (based on observations of MPE system performance indicating little benefit to continue MPE), a chemical oxidizing compound (i.e. hydrogen peroxide or permanganate) may be injected into wells that still have benzene concentrations exceeding the MCL of 5 µg/L.

Alternative 5 is expected to present some minor implementation obstacles due to site access restrictions from flight operations, particularly during the construction phase. However, the technical and administrative feasibility of installing, operating, and maintaining this remedial system at Site ST-11 is expected to be manageable.

Evaluation of Alternatives

The evaluation of alternatives consists of an assessment of individual alternatives against each of nine evaluation criteria, as specified in the NCP, and a comparative analysis that focuses upon the relative performance of each alternative against those criteria. These criteria were developed to address CERCLA requirements for cleanup of hazardous waste sites. These nine criteria are divided into three groups: threshold, primary balancing, and modifying. Threshold criteria are requirements that each alternative must meet in order to be eligible for selection. All alternatives must satisfy the two threshold criteria (numbers [Nos.] 1 and 2 below) of overall protection of human health and the environment, and compliance with Applicable or Relevant and Appropriate Requirements (ARARs). ARARs are the state and federal laws, rules, and regulations pertinent to site cleanup activities. The primary balancing criteria (Nos. 3 through 7) are used for comparison among the alternatives, and the modifying criteria (Nos. 8 and 9) are used to satisfy State and community requirements and concerns and will be evaluated after the public has had the opportunity to review and comment on this Proposed Plan and the recommended remedial decision for the site.

The nine evaluation criteria are described below, with a brief summary of the detailed alternatives evaluation in the FS report at the information repository (see page 17). Alternatives 1, 3, and 5 were carried forward for detailed analysis. Since Alternatives 2 and 4 were not carried forward for detailed analysis in the FS, they are not included in the evaluation of alternatives.

1. **Overall Protection of Human Health and the Environment** *(determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through ICs, engineering controls, or treatment)*

Potential health risks for exposure to perched groundwater under a hypothetical future residential use scenario would remain under Alternative 1 if no

action is taken. However, ICs already implemented at Site ST-11 provide protection of human health by limiting access and thereby restricting an exposure pathway under Alternatives 3 (VE) and 5 (MPE). Alternatives 3 and 5, which would actively remediate subsurface perched groundwater and shallow bedrock would provide additional protection by reducing the amount of the contaminants through VE, bioventing, chemical oxidation, and jet fuel removal.

2. **Compliance with ARARs** *(evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver to these is justified)*

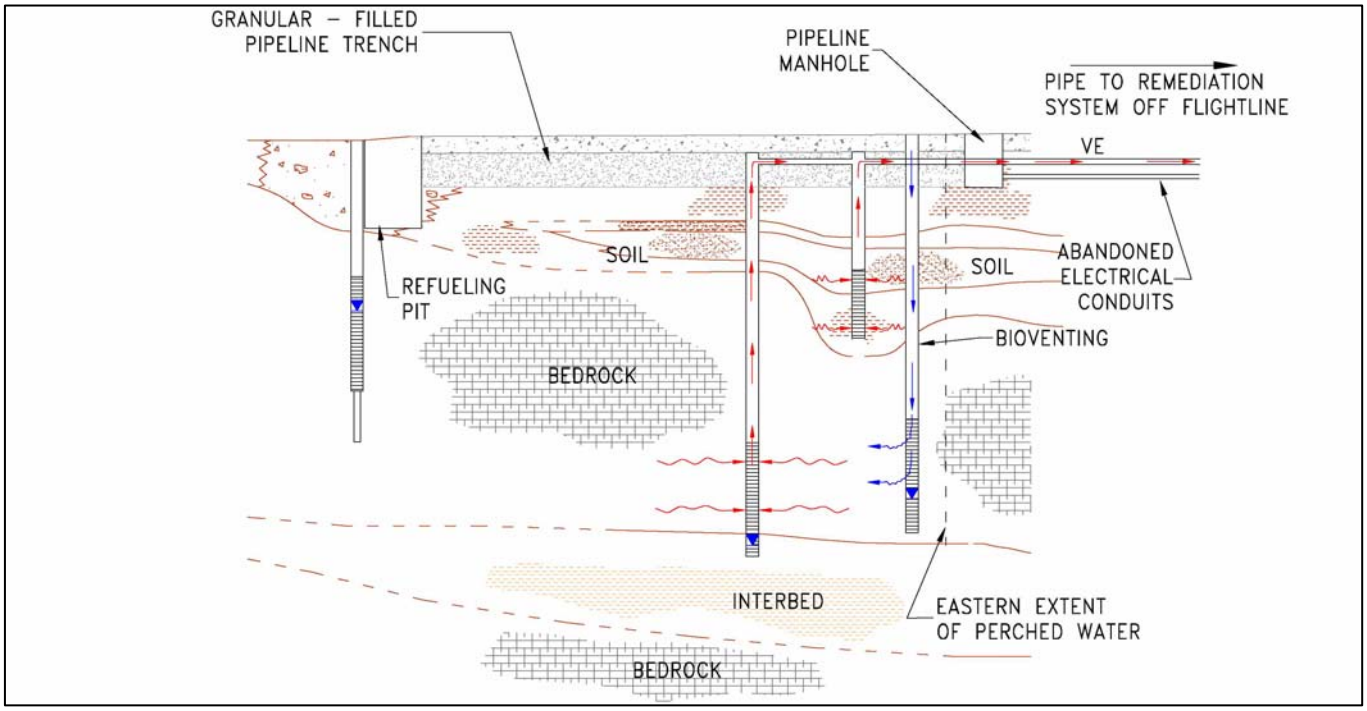
Alternative 1 (No Action) would not meet groundwater ARARs since ARAR achievement would not be confirmed. Alternatives 3 (VE) and 5 (MPE) are expected to achieve ARARs.

3. **Long-Term Effectiveness and Permanence** *(considers the ability of an alternative to maintain protection of human health and the environment over time)*

Under Alternative 1 (No Action), contaminant mass would be reduced through natural processes over time. However, this process would not be measured and the time to reduce concentrations to acceptable concentrations would likely take an unacceptable length of time (centuries). Alternatives 3 (VE) and 5 (MPE) provide long-term effectiveness through a combination of ICs, engineering controls, and active remediation. Alternatives 3 and 5 are expected to reduce benzene concentrations in perched groundwater to not exceed the MCL and reduce thicknesses of floating jet fuel to not exceed 0.1 inch, or to the maximum extent practicable. Compared to Alternative 1, Alternatives 3 and 5 provide a higher degree of long-term effectiveness by permanently reducing the amount of contaminants.

4. **Reduction of Long-Term Toxicity, Mobility, and Volume Through Treatment** *(evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present)*

Alternative 3 (VE) will reduce the mass of contaminants by physically removing them from the soil. Alternatives 3 (VE) and 5 (MPE) will reduce the mass of contaminants by accelerating the natural breakdown processes through passive bioventing and physically removing them from the soil and perched groundwater. In addition, both Alternatives 3 and 5 will treat perched groundwater by injecting a chemical oxidizing compound. Alternative 1 (No Action) would not reduce the toxicity, mobility, and volume of contaminants.



Site ST-11 Conceptual Remediation System Layout

5. **Short-Term Effectiveness** *(considers the length of time needed to achieve RAOs and the risks the alternative poses to workers, residents, and the environment during implementation)*

Alternative 1 (No Action) has no short-term effects, but the time to achieve RAOs would be much longer than for active remediation alternatives. The short-term risks associated with Alternatives 3 (VE) and 5 (MPE) from construction and remedial implementation would be minimized through the administration of a site-specific Health and Safety Program. Alternative 3 is expected to achieve RAOs faster than Alternative 1 based on the results of the Site ST-11 VE pilot tests completed. Contaminant mass is expected to be quickly removed from the site subsurface with Alternative 3. Alternative 5 is expected to achieve RAOs within a time period similar to Alternative 3, with both alternatives expected to achieve RAOs in 2 years. However, it is possible that the lower volume of air that would be mobilized using Alternative 5 would not result in as large an area of influence as the influence expected from Alternative 3. As such, the timeframe for achieving RAOs for Alternative 5 may be longer than the timeframe for Alternative 3. In addition, since public access to MHAFB and the flight line is limited, the active remediation alternatives (3 and 5) would have no appreciable short-term impacts to the community.

6. **Implementability** *(considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services)*

Alternative 1 (No Action) does not pose technical or administrative challenges. The primary administrative obstacle for both Alternatives 3 (VE) and 5 (MPE) is site access restrictions caused by flight operations and Base security, mainly during construction. Implementing these alternatives would require the close cooperation of Base personnel to provide site access and facility support. These administrative obstacles for Alternatives 3 and 5 would continue during remedy operation, but overall, minimal access will be required once construction is complete. None of these obstacles are expected to preclude implementation of the remedy.

7. **Costs**

No capital, O&M, or periodic costs are associated with Alternative 1 (No Action). The total present value, using a discount rate of 2.7%, is $822,000 for Alternative 3 (VE) and $1,129,000 for Alternative 5 (MPE).

8. **State/Support Agency Acceptance** *(considers whether the State agrees with the analyses and recommendations as described in the RI, FS, and Proposed Plan)*

The DEQ supports the preferred alternative. The DEQ will have the opportunity to comment further on the preferred alternative during the public comment period, which is discussed in more detail in the Community Participation section of this Proposed Plan.

9. **Community Acceptance** *(considers whether the local community agrees with the analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.)*

Community acceptance of the preferred alternative will be evaluated based on public comment. The amendment to the 1995 ROD will include a response to comments and will fully evaluate this criterion.

PREFERRED ALTERNATIVE

Based on the evaluation of alternatives, the preferred remedial alternative for Site ST-11 is **Alternative 3 – Vapor Extraction** (see diagram on page 15).

The recommendation to implement Alternative 3 is based largely on the assessment that the residual mass of benzene is low enough and the mass recovery rate of the remedial system high enough that VE, coupled with passive bioventing and passive jet fuel removal, will reduce the benzene source concentrations and jet fuel levels on the perched groundwater. The elimination of the benzene source through physical removal and aerobic biologic degradation is expected to result in perched groundwater restoration.

Alternative 3 was preferred over Alternative 5 due to the expectation that Alternative 3 will achieve the site cleanup objectives in essentially the same timeframe, with lower cost and less physical and operational disruption to the flight line. The EPA and DEQ concur with the preferred alternative. Public acceptance of this alternative will be evaluated at the end of the public comment period, which is discussed in the next section (Community Participation).

Based on information currently available, the Air Force believes the preferred alternative meets threshold criteria and provides the best balance of

trade-offs among other alternatives with respect to balancing and modifying criteria. The Air Force expects Alternative 3 to meet the CERCLA requirements for: 1) protection of human health and the environment; 2) compliance with ARARs; 3) cost effectiveness; 4) use of permanent solutions and alternative treatment technologies to the maximum practical extent; and 5) preference for treatment as principal element of cleanup. However, the choice of preferred alternative can change in response to public comments or new information.

COMMUNITY PARTICIPATION

The public is encouraged to participate in the remedy selection process. In order to facilitate public involvement, MHAFB has established an information repository of ERP documents and will host a public meeting on this Proposed Plan.

MHAFB also has a Restoration Advisory Board (RAB), with Richard Roller being the contact for this board (his contact information is below).

Information Repository

The MHAFB Information Repository, including the Administrative Record containing all documents pertinent to the site, is located at:

1181 Desert Street, Building 1296
Mountain Home AFB, ID 83648
Phone: (208) 828-1685

A copy of this Proposed Plan is also available at:

MHAFB Library
520 Phantom Ave
Building 2427
Mountain Home AFB, ID 83648
(208) 828-2326

Library Hours:

Monday-Thursday:	11:00 a.m. to 8:00 p.m.
Friday	11:00 a.m. to 6:00 p.m.
Weekends:	12:00 p.m. to 6:00 p.m.

City of Mountain Home Public Library
790 North 10th East Street
Mountain Home, ID 83647
(208) 587-4716

Library Hours:

Monday-Friday:	10:00 a.m. to 7:00 p.m.
Saturday:	9:00 a.m. to 5:00 p.m.

Public Meeting

MHAFB will host a public meeting on the Proposed Plan for OUs 1, 3, 5, and 6, with a Proposed Remedy for Site ST-11 and Amendment to the Record of Decision on April 15, 2010.

Date:	April 15, 2010
Time:	4:00 p.m. to 5:00 p.m.
Location:	Mountain Home City Hall 160 South 3rd East Street Mountain Home, ID 83647

Public Comment Period

The public comment period for this Proposed Plan will run from March 18 through April 16, 2010. Written comments should be sent to Mr. Richard Roller, the MHAFB ERP Manager, at the address that follows.

Comments received at the public meeting and during the comment period will be considered in the selection of the final remedy. These comments will be addressed in the responsiveness summary section of the upcoming amendment to the 1995 ROD.

Contact for More Information

MHAFB
Mr. Richard Roller
366 CES/CEAN - ERP Manager and RAB Contact
1100 Liberator Street, Building 1297
Mountain Home AFB, ID 83648
Phone: (208) 828-6667
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EPA Region 10
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Remedial Project Manager
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E-mail: Hale.Ellie@epa.gov

DEQ
Mr. Dean Nygard
Site Remediation Manager
Waste and Remediation Division
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E-mail: Dean.Nygard@deq.idaho.gov

ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
BRA	Baseline Risk Assessment
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
DEQ	Idaho Department of Environmental Quality
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
ERP	Environmental Restoration Program
ESD	Explanation of Significant Differences
FFA	Federal Facility Agreement
FS	Feasibility Study
GRO	gasoline range organics
HI	hazard index
HQ	hazard quotient
IC	Institutional Control
IDAPA	Idaho Administrative Procedures Act
JP-4	Jet Propulsion Fuel No. 4
LNAPL	light non-aqueous phase liquid
LTM	Long-Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
µg/L	micrograms per liter
MHAFB	Mountain Home Air Force Base
MNA	monitored natural attenuation
MPE	multi-phase extraction
NCP	National Contingency Plan
NFA	No Further Action
Nos.	numbers
NTCRA	Non-Time Critical Removal Action
O&M	Operation and Maintenance
OU	Operable Unit
ppm	parts per million
PRG	preliminary remediation goal
PZMW	perched zone monitoring well
RAB	Restoration Advisory Board
RAO	Remedial Action Objectives
RI	Remedial Investigation
ROD	Record of Decision
SDWA	Safe Drinking Water Act
UU/UE	unlimited use/unrestricted exposure
USC	United States Code
VE	vapor extraction
VEW	vapor extraction well

PUBLIC COMMENT SHEET

PROPOSED PLAN OPERABLE UNITS 1, 3, 5, AND 6, WITH A PROPOSED REMEDY FOR SITE ST-11 AND AMENDMENT TO THE RECORD OF DECISION

Please use the space below to submit your comments on the Proposed Plan for OUs 1, 3, 5, and 6, with a Proposed Remedy for Site ST-11 and Amendment to the Record of Decision. If you need more space for your comments, attach additional pages. After completing this comment sheet, you may submit it at the April 15, 2010 public meeting or mail it to the following address: Mr. Richard Roller, ERP Manager, 1100 Liberator Street, Building 1297, Mountain Home AFB, ID, 83648. Comments must be postmarked by April 16, 2010.

If you have any questions about the public comment period, please contact Mr. Richard Roller at (208) 828-6667.

Name _____

Address _____

City _____

State _____ Zip _____

TABLE 1
SUMMARY OF CURRENT ERP SITE STATUS
MOUNTAIN HOME AFB, IDAHO

Environmental Restoration Program (ERP) Site	Site Name	Applicable Operable Unit (OU) No(s).	Post-1995 Record of Decision (ROD) Actions	Did the Prior Changed Remedy Undergo Public Review?	Considered a Threat to Regional Groundwater?	Does the site meet unlimited use/unrestricted exposure (UU/UE) criteria?	Post-ROD Action
LF-01	Lagoon Landfill	OU-2 OU-3 (Long-Term Monitoring [LTM])	An Explanation of Significant Differences (ESD) was completed in 2006 to implement Land Use Controls (LUCs). Site LF-01 was closed under the industrial use scenario.	Yes	No	No	LUCs
LF-02	B-Street Landfill	OU-2 OU-3 (LTM)	An ESD was completed in 2006 to implement LUCs. Site LF-02 was closed under the industrial use scenario.	Yes	No	No	LUCs
LF-03	Current Base Landfill	OU-1 OU-3 (LTM)	LF-03 was operated under a Conditional Use Permit issued by Elmore County. The Idaho Department of Health and Welfare, Central District Office provides oversight for the LF-03 permit. Institutional controls are currently in place for the asbestos cell. The remaining two cells consist of municipal solid waste and scrap metal/wood, and no hazardous materials have been, or are currently, placed in these cells of the landfill. Landfill cells closed prior to 1984 are ERP and cells closed after 1984 are covered under the state permit issued by Elmore County. LTM of LF-03 is provided by sampling nearby monitoring well MW17-2 as part of the regional groundwater LTM.	No	No	No	LUCs & LTM (Under Elmore County permit)
FT-04	Fire Training Area 4	OU-1 OU-3 (LTM)	Site FT-04 underwent further investigation/evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
FT-05	Fire Training Area 5	OU-1 OU-3 (LTM)	Site FT-05 underwent further investigation/evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
FT-06	Fire Training Area 6	OU-1 OU-3 (LTM)	Site FT-06 underwent further investigation/ evaluation and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
FT-7A, B, and C	Fire Training Area 7	OU-1 OU-3 (LTM)	Site FT-07A,B and C underwent further investigation/evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
FT-08	Fire Training Area 8	OU-4 OU-3 (LTM)	Site FT-08 underwent further investigation, which concluded that detected bedrock vapor concentrations measured at Site FT-08 during the vapor extraction (VE) pilot study and LTM sampling do not pose an unacceptable risk to human health. Therefore, the bedrock vapor is not considered to be a threat to regional groundwater quality. However, if monitoring results of bedrock vapor and groundwater through the Basewide OU-3 LTM demonstrate a statistically significant increasing trend in bedrock vapor concentrations and/or a statistically significant increasing trend in trichloroethene concentrations in groundwater at Site FT-08, a contingency remedy will be identified and implemented for these media. Site soils were addressed in the OU-4 ROD Amendment for Site FT-08 signed in September 2009.	No	Not determined	No	OU-3 - No proposed action at this time OU-4 - Amended remedy
DP-09	Waste Oil Disposal Area	OU-1 OU-3 (LTM)	Site DP-09 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
OT-10	Oiled Base Perimeter Road	OU-1 OU-3 (LTM)	Site OT-10 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-11	Fuel Hydrant System Spill	OU-3 Fuel Sites	Site ST-11 underwent further monitoring, and LTM of perched groundwater has indicated some perched zone wells exhibit benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations exceeding Maximum Contaminant Levels (MCLs), and free-product Jet Propulsion Fuel Type 4 (JP-4) is present on perched groundwater. In addition, light non-aqueous phase liquid present in one perched zone monitoring well exceeds the State of Idaho standard of 0.1 inch maximum thickness, which defines free product. An ESD was completed in 2004 to clarify and enhance the ICs for the site. Pilot studies for VE were completed and indicate VE technology is effective for volatile organic compound recovery in both shallow soils and deeper bedrock at the site. A Feasibility Study was completed to evaluate remedial alternatives for fuel constituents in perched zone groundwater, and identified VE as the Preferred Alternative.	No	Yes	No	Amended remedy

TABLE 1
SUMMARY OF CURRENT ERP SITE STATUS
MOUNTAIN HOME AFB, IDAHO

Environmental Restoration Program (ERP) Site	Site Name	Applicable Operable Unit (OU) No(s).	Post-1995 Record of Decision (ROD) Actions	Did the Prior Changed Remedy Undergo Public Review?	Considered a Threat to Regional Groundwater?	Does the site meet unlimited use/unrestricted exposure (UU/UE) criteria?	Post-ROD Action
SD-12	Old Entomology Shop	OU-1, OU-6, OU-3 (LTM)	Site SD-12 underwent further investigation/ evaluation and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-13	POL/MOGAS Tank Site	OU-3	Site ST-13 underwent further investigation and is currently undergoing continued LTM for regional groundwater and occurrence of light non-aqueous phase liquid. Monitoring well MW-24 samples have measurable BTEX, but have not exceeded the MCL for benzene since April 2007. Light non-aqueous phase liquid was not observed in MW24 in 2009. The site now meets UU/UE criteria.	No	No	Yes	NFA at this time. Review LTM and available information for 2011 Five-Year Review
RW-14	Low-Level Radioactive Waste Disposal Area	OU-5 OU-3 (LTM)	Site RW-14 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
OT-15	Corker Material Burial Site	OU-1 OU-3 (LTM)	Site OT-15 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
OT-16	Munitions Burial Site	OU-1 OU-6 OU-3 (LTM)	A non-time critical removal action (NTCRA) was completed in 2008 through the Engineering Evaluation/Cost Analysis (EE/CA) and Action Memorandum process. The site now meets UU/UE criteria.	Yes	No	Yes	NFA
DP-18	World War II Material Burial Trench	OU-1 OU-3 (LTM)	Site DP-18 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-22	USTs - Building 1333	OU-1 OU-3 (LTM)	Site ST-22 underwent further investigation and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
LF-23	Solid Waste Disposal Area	OU-1 OU-3 (LTM)	An NTCRA was completed in 2007 through the EE/CA and Action Memorandum process. During the NTCRA, approximately 2 feet of coal ash was encountered in the shallow subsurface of the excavation, overlying a mix of native soil and solid waste (primarily construction debris). Additional work was completed in September 2009 to define the nature and extent of contamination of the coal ash and complete a site-specific screening level risk assessment to quantitatively estimate the potential risks to human health posed by constituents of the coal ash deposit south of and overlapping the historical ERP site boundary for Site LF-23. Preliminary results indicate coal ash Area A meets the criteria for UU/UE and coal ash Area B will require LUCs through an ESD.	Yes - NTCRA	No	The area surrounding the former test pit LF23-10B and the area within the historic ERP site boundary (including coal ash Area A)	LUCs for coal ash Area B only
SD-24	LOX Loading Plant	OU-1 OU-6 OU-3 (LTM)	Site SD-24 underwent further investigation as well as a removal and disposal action in 2004 and treatment of residual soil contamination in 2008. Based on the results of the treatment activities, the soil at Site SD-24 now meets UU/UE criteria. The regional groundwater and bedrock vadose zone vapor at Site SD-24 continues to be sampled as part of the LTM program. The need for further active remediation of the fractured bedrock at Site SD-24 is not known at this time until additional data can be obtained. A pilot study consisting of the operation of a bedrock vapor extraction (VEP) system is ongoing to collected the additional necessary data. Monitoring and operation of the VE system will continue until mid-2010, after which data will be evaluated to determine if remedial action is necessary for the bedrock vadose zone vapor at Site SD-24.	No	Yes	No	Not determined
SD-25	Flightline Storm Drain	OU-6 OU-3 (LTM)	Site SD-25 underwent further investigation/ evaluation and a sediment removal and disposal action. The potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
SS-26	Drum Accumulation Pad	OU-1 OU-3 (LTM)	Site SS-26 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
SD-27	Wash Rack - Building 1354	OU-1 OU-6 OU-3 (LTM)	An NTCRA was completed in 2007 through the EE/CA and Action Memorandum process. The site now meets UU/UE criteria.	Yes	No	Yes	NFA
SS-28	Wash Water Accumulation Basin	OU-1 OU-3 (LTM)	Site SS-28 underwent further investigation/ evaluation and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA

TABLE 1
SUMMARY OF CURRENT ERP SITE STATUS
MOUNTAIN HOME AFB, IDAHO

Environmental Restoration Program (ERP) Site	Site Name	Applicable Operable Unit (OU) No(s).	Post-1995 Record of Decision (ROD) Actions	Did the Prior Changed Remedy Undergo Public Review?	Considered a Threat to Regional Groundwater?	Does the site meet unlimited use/unrestricted exposure (UU/UE) criteria?	Post-ROD Action
SS-29	Drum Storage Area	OU-1 OU-6 OU-3 (LTM)	An NTCRA was completed in 2007 through the EE/CA and Action Memorandum process. The site now meets UU/UE criteria.	Yes	No	Yes	NFA
SS-30	DRMO Storage Area	OU-1 OU-3 (LTM)	Site SS-30 underwent further investigation/ evaluation and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-31	Old Base Exchange Gas Station	OU-3 Fuel Sites	Site ST-31 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-32	Old Military Gas Station	OU-3 Fuel Sites	Site ST-32 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-34	Flightline Fuel Hydrant #9 Leak Area	OU-3 Fuel Sites	Site ST-34 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-35	JP-4 Pipeline Leak	OU-3 Fuel Sites	Site ST-35 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA
ST-39	15,000-gallon UST at FT-08	OU-6 OU-3 (LTM)	Site ST-39 underwent further evaluation, and the potential land use changed from restricted to UU/UE.	No	No	Yes	NFA

Note: Sites that underwent further investigation/evaluation required additional data collection to make a determination regarding land use potential, while no additional data were required to make this determination for sites that underwent only further evaluation.