## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **FT-01: Inactive Fire Training Area, Northeast End of Runway** Between 1951 and 1958, this area was used as a fire training area. Drums of waste fuels and solvents (400 to 500 gallons per fire) were poured onto the ground and ignited. Water and foam were used to extinguish the flames. | **Soil**: In 1995, surface and subsurface samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and lead. No contaminants exceeded the Michigan Department of Environmental Quality (MDEQ)'s Generic Industrial Criteria. Some did exceed MDEQ's residential criteria, but these were below ATSDR's soil comparison values (CVs). **Groundwater**: In 1991, groundwater samples were analyzed for VOCs. No contaminants were detected above detection limits. In 1995, as part of a Remedial Investigation (RI), additional groundwater samples were analyzed for VOCs, SVOCs, and lead. Trichloroethylene (TCE), bis(2-ethylhexyl) phthalate, and lead were detected, but below MDEQ's health guidelines. | **Current Status**: No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils at FT-01 while the base was operational because access t area was restricted. Base employees may have contacted these soils in but exposures were likely infrequent. Also, these employees probably thick fireman suits and boots. This would minimize their direct contac the site's soil. Current and projected future use for this site is industrial/commercial. Available data indicate that surface and subsur concentrations are too low to pose current or future health hazards. **Groundwater**: Several of the U.S. Air Force (USAF)'s main water su wells are located near FT-01, but FT-01 is not thought to have impact No one is currently using the groundwater in the vicinity of FT-01. An potential future exposures are not expected to pose health hazards bec current contaminant concentrations are too low and (2) the groundwat conditions under FT-01 are not expected to worsen in the future. (Soil contaminants are not leaching appreciably and contaminated water loc upgradient of the site is being treated.) |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

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| **FT-02: Active Fire Training Area, Southwest Section of the Base**<br>Between 1958 and 1991, FT-02 was used as a fire training facility. Fires were started using waste fuels and solvents and extinguished using foams. The fuels were supplied by a nearby fuel tank. Starting in 1982, all fires were lit within a concrete lined pit. Water that collected in the pit was drained to an oil/water separator (OWS). FT-02 contaminants have not been detected in the OWS. | **Soil**: In 1995, as part of a RI, samples were analyzed for VOCs, SVOCs, polynuclear aromatics (PNAs), and metals. Arsenic (0.9–1.9 parts per million [ppm]) was detected in the surface soil above ATSDR's soil CV. It was also detected at elevated concentrations (0.41–2.0 ppm), along with lead (ND–121 ppm), in the subsurface. (Note: Although site documents indicated that several additional subsurface contaminants exceeded MDEQ's standards, their concentrations were below ATSDR's soil CVs.)<br>**Groundwater:** In the late 1980s, a groundwater plume was identified, migrating from FT-02 toward a wetland area. In 1995, as part of a RI, several contaminants were detected above ATSDR's drinking water CVs, including benzene (nondetect [ND]–96 parts per billion [ppb]), vinyl chloride (ND–28 ppb), arsenic (ND–18.7 ppb), and manganese (ND–409 ppb).<br>**Surface Water/Sediment**: Contaminated groundwater has migrated to a wetland area. Data collected from the wetland are summarized in Tables 6 and 7. | **Current Status**:<br>Groundwater and seep monitoring is conducted biannually.<br>A monitored natural attenuation system is being designed for the site to address groundwater contamination.<br>Soils will be remediated either through air sparging or soil vapor extraction. | **Soil:** It is unlikely that on-base residents or the general public were ex surface soils at FT-02 while the base was operational because access t area was restricted. Base employees may have contacted surface soil i past, but exposures were likely infrequent. Also, these employees prob wore thick fireman suits and boots. This would minimize their direct c with the site's soil. The area will be used for recreational activity in th Based on available data and ATSDR's exposure evaluation, current an exposures to surface and subsurface soils are not associated with healt hazards.<br>**Groundwater**: No on-base water supply wells are located in the vicini FT-02; therefore, no past or current exposures to groundwater have oc Groundwater conditions under FT-02 could worsen in the future if groundwater under SS-51 migrates to the FT-02 area, but any potentia exposures are not expected to pose health hazards because (1) the gro under FT-02 will be remediated, (2) soil treatment activities will prev additional contaminants from impacting the groundwater, and (3) grou restrictions will ensure that the groundwater under FT-02 is not used contaminants are reduced to safe levels.<br>**Wetland Area South of LF-27**: The wetland area south of LF-27 is u people who hunt deer and turkey. As explained in the main body of th hunters are not expected to experience adverse health effects by comin contact with the wetland's surface water and sediment. No tissue sam been collected from game animals that might be exposed to the wetlan contaminants. Thus, ATSDR cannot make definitive conclusions abou whether people could be eating contaminated game animals. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-03: JP-4 Spill, Southwest of Building 43 Refueling Maintenance Shop**<br>Between 1956 and 1957, JP-4 tank trucks were drained in a paved parking area. Several JP-4 spills were reported. | **Soil:** In 1991, investigators concluded that no significant contamination remains in the soils.<br>**Groundwater**: In 1991, groundwater samples were analyzed. Some contaminants, including tetrachloroethylene (PCE) (up to 44 ppb) and TCE (up to 220 ppb), were detected above ATSDR's drinking water CVs. (Investigators believe these contaminants are migrating from SS-21.) | **Current Status**:<br>No further action required. | **Soil:** It is unlikely that on-base residents or the general public were ex surface soils at SS-03 while the base was operational because access t area was restricted. Base employees may have contacted surface soil i past, but exposures were likely infrequent. Current and potential futur exposures to soils at SS-03 will not pose health hazards because no si contamination remains in the area.<br>**Groundwater**: Groundwater under SS-03 has been impacted by the A Street Plume (see Site SS-21), but no one is currently using the groun Potential future exposures are not expected to pose health hazards, ho because (1) the groundwater under this site is being remediated by the Street pump-and treat system (ASPTS) and (2) groundwater restrictio imposed under Site SS-21 will prevent people from using the water un 03 if contamination persists in this area in the future. |
| **WP-04: Inactive Waste Water Treatment Plant (WWTP)**<br>Between 1959 and 1983, the WWTP received all of the base's sanitary waste water. For a short time, it also received water from an interim water treatment plant that aerated TCE-laden groundwater. The WWTP consisted of a settling tank, trickling filters, clarifiers, sludge digesters, and sludge beds. | **Soil/Sludge**: In 1980, samples were analyzed for TCE, dichloroethene, benzene, and toluene. Then, in 1995, surface and subsurface soil samples were analyzed for VOCs, SVOCs, and metals. No contaminants exceeded MDEQ's health guidelines during either sampling event.<br>**Groundwater**: In the early 1980s, TCE (up to 65 ppb) was detected in samples near the sludge beds. In 1995, as part of a RI, additional samples were analyzed for VOCs, SVOCs, and metals. Several constituents were detected, but TCE (up to 6.9 ppb) and PCE (up to 14 ppb) were the only contaminants that exceeded MDEQ's health guidelines. The RI concluded that a TCE plume is migrating in a northeasterly direction. | **Corrective Activities**:<br>The structures associated with WP-04 have been removed and the area has been backfilled with sand.<br>**Current Status**:<br>Groundwater monitoring is conducted on a regular basis.<br>Natural attenuation is ongoing. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils at WP-04 while the base was operational because access area was restricted. Base employees may have contacted surface mater the past. Based on limited sampling, however, contaminant concentrat have never been high enough to pose health hazards.<br>**Groundwater**: In the past, groundwater under WP-04 flowed toward area-specific well AF15. As noted in the main body of the text, past ex to AF15 did not pose health hazards. No one is currently exposed to th groundwater in the vicinity of WP-04. Potential future exposures are n expected to pose health hazards because (1) the groundwater is being t by the ASPTS and (2) restrictions will ensure that the groundwater un 04 is not used until contaminants are reduced to safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
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| **SS-05: TCE Spill (Pierce's Plume)**<br>Bombs and air launch cruise missiles were stored and maintained in this area between 1956 and 1993. Throughout the 1950s, 60s, and 70s, TCE was used as a cleaning solvent in the buildings. Wastes from the buildings traveled through drain pipes to a septic tank, and then into leachfields. | **Soil**: In 1994, as part of a RI, subsurface samples were collected. Arsenic (ND–0.8 ppm) was the only constituent that exceeded ATSDR's soil CV.<br>**Groundwater**: SS-05 is the suspected source of the Pierce Point Plume, where several groundwater contaminants (e.g., TCE and PCE) have been detected above ATSDR's drinking water CVs. Contaminant concentrations are decreasing over time, however.<br>**Surface Water/Sediment**: Groundwater from SS-05 discharges to Van Etten Lake. Sediment and surface water data have been collected on numerous occasions. Data are summarized in Tables 6 and 7. | **Current Status**:<br>Natural attenuation is ongoing.<br>Groundwater and surface water monitoring is ongoing. | **Soil**: All soil contaminants associated with the leachfields are in the subsurface. These subsurface soils could be contacted if the area is ex in the future, but concentrations are too low to pose health hazards.<br>**Groundwater**: The Pierce Plume has migrated off base, impacting are private wells. Past and current health hazards associated with exposur these wells are discussed in the main body of the text of this public he assessment. Future health hazards are not expected to occur because ( of the surrounding area now receives municipal water and (2) advisori be issued against drilling new wells into contaminated areas. Because plume extends underneath off-base residences, ATSDR evaluated the for groundwater to volatilize into subsurface structures. As noted in th body of the text, health hazards are not thought to be associated with t pathway.<br>**Surface water/Sediment**: Contaminants from the Pierce Point plume discharge into Van Etten Lake. As explained in the main body of the t swimmers, fishers, and people who consume fish are not expected to experience adverse health effects. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
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| **SS-06: Fuel Spill in the Petroleum, Oil, and Lubricant (POL) Bulk Storage Area**<br>Site SS-06 was used as a POL storage area. Four aboveground storage tanks (ASTs) were located in the area. Reports indicate that one of them, a 1.2-million gallon jet fuel AST, leaked. | **Soil**: In 1994, as part of a RI, surface and subsurface soil samples were analyzed for volatiles, PNAs, and lead. No contaminants exceeded ATSDR's soil CVs (Note: Although site documents indicated that some subsurface contaminants were above MDEQ's Generic Residential Criteria, their concentrations did not exceed ATSDR's soil CVs.<br>**Groundwater**: SS-06 has been identified as the source of the POL Bulk Storage Area Plume, an area consisting of three distinct benzene plumes and a free product plume. A 1994 sampling event indicated that several constituents exceed ATSDR's drinking water CVs, including benzene (ND–1,200 ppb), ethylbenzene (ND–1,300 ppb), TCE (ND–13 ppb), and xylene (ND–4,600 ppb). | **Current Status**:<br>The leaking AST was removed in 1992.<br>Remediation is ongoing. (The Benzene Plant pump-and-treat system [BPPTS] was installed in 1992 to prevent the northward migration of the POL Bulk Storage Area Plume.) Also, air sparging, soil vapor extraction, and bioventing are underway. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and projected future use for is industrial/commercial. Available data indicate that surface and subs soil concentrations are too low to pose current or future health hazards<br>**Groundwater**: No on-base water supply wells are located in the vicini 06; therefore, no past or current exposures to the groundwater in the P Storage Area have occurred. Also, no one is currently using the ground the vicinity of SS-06. Potential future exposures are not expected to be associated with a health hazard because (1) restrictions will ensure tha groundwater under SS-06 is not used until contaminant levels are redu safe levels and (2) the groundwater is not expected to migrate to off-si because it is being captured by the BPPTS and the ASPTS. |

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| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
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| **SS-08: TCE and Fuel Spills at the Nose Dock Area and Air Combat Command (ACC) Operational Apron**<br>Site SS-08 includes the ACC Operational Apron, nose dock, and maintenance areas. The area was used to park, clean, maintain, and refuel aircrafts. Sources of potential contamination include OWSs, the Southern Blast Fence (where small amounts of solvents were dumped), the refueling system (where a leaking fuel line was found in September 1988), and Parking Spot #19. | **Soil**: In 1993, 1994, and 1995, surface and subsurface samples were collected, but no contaminants exceeded ATSDR's soil CVs. In the mid-1990s and 1996, additional subsurface samples were collected along excavated areas. Some polycyclic aromatic hydrocarbons (PAH)s (e.g., benzo[a]pyrene at 3.7 ppm) and arsenic (ND–1.1 ppm) exceeded ATSDR's soil CVs.<br>**Groundwater**: SS-08 has been identified as the probable source of the Mission Drive Plume, a plume that was pulled in a southward direction by the pumping activities of AF18 and AF19. Several groundwater samples were collected in the vicinity of SS-08 between 1979 and 1996. The more recent sampling events indicate that several contaminants are present above ATSDR's CVs, including benzene [ND–1,400 ppb], chloroform [ND–40 ppb], methylene chloride [ND–22 ppb], PCE [ND–9 ppb], and TCE [ND–28 ppb]).<br>**Surface Water Bodies**: Some reports indicate that the Mission Drive Plume has migrated to Duell Lake and the Au Sable River. These migration pathways are discussed under the "OT-24" site. | **Corrective Activities**:<br>Contaminated soil was excavated near a leaking fuel line in October 1988.<br>Components of the refueling system have been removed or cleaned.<br>Several underground storage tanks (USTs) have been removed.<br>**Current Status**: Remediation is ongoing. (Groundwater is being remediated by the ASPTS, the BPPTS, and the Mission Drive pump-and-treat system (MDPTS). An air sparging/ soil vapor extraction system will be operational in the near future.) | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils at SS-08 while the base was operational because access t area was restricted. Base employees may have contacted surface soil i past, but exposures were likely infrequent. This area is currently being an airfield and it is expected to continue to be used for this purpose in future. Exposures to surface soils are not expected to pose current or f health hazards because detected concentrations are too low. Subsurfac could be contacted if the area is excavated in the future. Potential futu subsurface exposures are not expected to pose health hazards because contaminant concentrations are too low, however.<br>**Groundwater**: USAF's main water supply wells AF18 and AF19 hav impacted by the Mission Drive Plume. The potential for USAF's main supply wells to have posed past health hazards is evaluated within the body of the text. No one is currently using the groundwater in the vici the Mission Drive Plume. Potential future exposures are not expected associated with a health hazard because (1) the groundwater is current treated and (2) restrictions will ensure that groundwater associated wi is not used until contaminant levels are reduced to safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

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| **SS-09: JP-4 Spill, Center of SAC Instrument Runway**<br>In November 1978, a KC-135 lost an engine before take-off and spilled an estimated 125 gallons of JP-4. Some of the fuel burned when the plane caught fire and the rest was foamed and washed off the runway. | **Soil**: In 1987, subsurface soil samples were analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX), chlorobenzene, dichlorobenzenes, and total petroleum hydrocarbon (TPH). TPH was detected at 470 ppm. Additional subsurface soil samples were analyzed in 1991 for VOCs, PNAs, and methyl tert-butyl ether (MTBE). No contaminants were detected above ATSDR's soil CVs. **Groundwater**: In 1987, groundwater samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. TPH was detected at concentrations ranging from nondetect to 5,300 ppb. Additional groundwater samples were collected in 1991, but from locations that were hundreds of feet crossgradient of where the high TPH values had previously been detected. During this second sampling event, samples were analyzed for VOCs, PNAs, and MTBE. No contaminants were detected. | **Current Status**: No further action required. | **Soil**: It is highly unlikely that the general public or on-base residents a this area while the base was operational because access to the area wa restricted. Base employees may have contacted the area, but exposures have been infrequent. Future exposures are not expected because the contamination is found in subsurface soils that are inaccessible to the **Groundwater**: No on-base water supply wells are located near SS-09; therefore, no past or current exposures to groundwater have occurred. though there are no deed restrictions in place to prevent someone from a well at SS-09 in the future, ATSDR does not believe that potential f exposures will be associated with a health hazard. ATSDR was concer TPH levels could be high in this area. (As noted in previous columns, was detected at 5,300 ppb in 1987, and the location that had this detec never resampled.) Thus, ATSDR called the District Health Departmen determine whether provisions are in place to ensure that wells will not drilled into contaminated areas. ATSDR was assured that this would n allowed to happen. (The District Health Department representative sai his department must be notified when someone wants to drill a new w Because SS-09 is located near contaminated plumes, the department require samples to be collected to make sure the new well would not d from contaminated areas. The representative said that the department jurisdiction over areas that are not federally owned. [In the near future will be transferred to Oscoda Airport and will no longer be considered property.]) |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
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| **SS-10: JP-4, Northeast End of SAC Instrument Runway** In 1978, a B-52 blew a fuel vent and spilled 400 to 500 gallons of JP-4 on Taxiway E. The spill was washed off the taxiway onto oil sorbent pads and into the storm sewer. Sorbent pads were also used at the storm sewer discharge. | **Soil**: In 1987 and 1988, subsurface soil samples were analyzed for BTEX, chlorobenzene, and TPH. TPH (490 ppm) was detected once at a depth of 15 feet. In 1991, additional soil samples were collected. Contaminant concentrations did not exceed Michigan Department of Natural Resources (MDNR)'s health guidelines. **Groundwater**: In 1987 and 1988, groundwater samples were analyzed for BTEX, chlorobenzene, and TPH. No contaminants were detected. In 1991, additional groundwater samples were collected. None of the contaminants exceeded MDNR's health guidelines or EPA's maximum concentration limits (MCLs). | **Current Status**: No further action required. | **Soil**: It is highly unlikely that the general public or on-base residents a this area while the base was operational. (Site 10 is located along the f line: access was highly restricted while the base was operational.) Bas grounds maintenance employees may have contacted and may continu contact surface soils in the area. In addition, construction or remedial could access the site in the future. Because exposures would be so infr however, current and future exposures to TPH concentrations are not e to pose health hazards. **Groundwater**: No on-base water supply wells are located near SS-10; therefore, no past or current exposures to groundwater have occurred. future exposures are not expected to pose health hazards because there evidence that groundwater underlying the site was impacted by site ac |
| **SS-11: JP-4 Spill, Southwest End of SAC Instrument Runway** In May 1984, an A-7 training plane crashed. Some of the JP-4 fuel was spilled, but the exact quantity is unknown. | **Soil**: In 1988, subsurface samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. No contaminants were detected. **Groundwater**: In 1988, groundwater samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. No contaminants were detected. | **Current Status**: No further action required. | There is no evidence that this area was adversely affected by the spill. contaminants were detected.) |
| **SS-12: JP-4 Spill, Southwest to South Central Part of Taxiway** In March 1982, a B-52 hit a snowbank and broke open fuel tanks on one wing. The quantity of fuel spilled is unknown. | **Soil**: In 1988, subsurface samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. No contaminants were detected. **Groundwater**: In 1988, groundwater samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. No contaminants were detected. | **Current Status**: No further action required. | There is no evidence that this area was adversely affected by the spill. contaminants were detected.) |

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| **SS-13: Motor Gasoline (MOGAS) Spill, Building 394 (Motor Pool)**<br>In the mid-1970s, an unknown quantity of MOGAS was spilled. Fire hydrants were opened to dilute the spill. Attempts to excavate contaminated soils were hampered by frozen ground. The spill was never contained or removed. | **Soil**: In 1994, as part of a RI, surface and subsurface samples were analyzed for volatiles, PNAs, and metals. Lead (4.7–89.8 ppm) was detected in surface soils at concentrations exceeding health guidelines commonly used by ATSDR.<br>**Groundwater**: In 1994, as part of a RI, groundwater samples from the POL Bulk Storage Area were analyzed for volatiles, BTEX, MTBE, and PNAs. (Note: Samples collected from the POL Bulk Storage Area are considered representative of conditions underlying SS-06, SS-13, and ST-40 because these sites are very close in proximity.) Several constituents exceeded ATSDR's drinking water CVs, including benzene (ND–1,200 ppb), ethylbenzene (ND–1,300 ppb), TCE (ND–13 ppb), and xylene (ND–4,600 ppb). | **Current Status**: No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and projected future use for is industrial/commercial. Exposures to detected lead concentrations ar expected to pose health hazards under this land use scenario.<br>**Groundwater**: No on-base water supply wells are located in the vicini 13; therefore, no past or current exposures to groundwater in the POL Storage Area have occurred. Potential future exposures are not expect cause a health hazard because (1) restrictions will ensure that the grou under SS-13 is not used until contaminants are reduced to safe levels the groundwater is not expected to migrate to off-site areas because it captured by the BPPTS and the ASPTS. |
| **SS-14: JP-4 Spill, Southwest of Building 3029**<br>Tank trucks were drained in this area in 1956 or 1957. | **Soil**: In 1987, subsurface samples were analyzed for BTEX, chlorobenzene, dichlorobenzenes, and TPH. No contaminants were detected.<br>**Groundwater**: In 1987, groundwater samples were analyzed for BTEX, chlorobenzene, TPH, and dichlorobenzenes. No contaminants were detected. | **Current Status**: No further action required. | There is no evidence that this area was adversely affected by the spill. contaminants were detected.) |

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| **OT-16: Jet Engine Test Cell, Building 5098**<br>Building 5098 was constructed in 1972 and was used to test engines until 1990s. Fuels and solvents that spilled to the floor were washed down a floor drain and passed through an OWS. Prior to 1988, discharge from the OWS was directed to a dry well. After that, it was directed to an AST. Records indicate that the OWS overflowed on several occasions. | **Soil**: In 1995, as part of a RI, several samples were analyzed for volatiles and metals. Benzo(a)pyrene (ND to 0.33 ppm in surface soil and ND to 3.0 ppm in subsurface soils) and arsenic (1.0 to 1.7 ppm in surface soil and 0.38–1.8 ppm in subsurface soils) were detected above ATSDR's soil CVs. (Note: Although site documents indicated that several other contaminants were above MDEQ's Generic Residential Criteria, their concentrations did not exceed ATSDR's CVs.)<br>**Groundwater**: In 1991, several contaminants were detected in the groundwater. A sampling effort conducted in 1995 revealed that several constituents are present at concentrations above ATSDR's drinking water CVs, including benzene (ND–300 ppb), TCE (ND–16 ppb), toluene (ND–1,600 ppb), and xylene (ND–3,400 ppb). Additional samples will be collected during summer 2000 to fill in data gaps.<br>**Surface Water/Sediment**: Contaminated groundwater has migrated to a wetland area. Data collected from the wetland are summarized in Tables 6 and 7. | **Corrective Activities**:<br>The drywell and surrounding soils were excavated in 1989.<br>The AST spill was cleaned using absorbent material. Soils were removed at a later date.<br>The AST was removed and the floor drain in the test bay was plugged in 1990.<br>**Current Status**: A groundwater remedy will be chosen in 2000. (Base representatives propose natural attention; regulators will decide if this is an adequate solution after reviewing data from the summer 2000 sampling event.) | **Soil:** It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. This area will be used for recreation activity in the future. Based on available data and ATSDR's evaluatio potential current and future exposures, contaminants detected in the s not expected to pose health hazards.<br>**Groundwater**: USAF's area-specific well AF25 is located near OT-16 investigators have concluded that the well (which is located crossgradi not been impacted by the groundwater at OT-16. Groundwater conditi under OT-16 could worsen if groundwater under SS-51 migrates to th area, but any potential future exposures are not expected to cause heal hazards because (1) the groundwater under the site will be remediated restrictions will ensure that the groundwater under OT-16 is not used contaminants are reduced to safe levels.<br>**Wetland Area South of LF-27**: The wetland area south of LF-27 is u people who hunt deer and turkey. As explained in the main body of th hunters are not expected to experience adverse health effects by comin contact with the wetland's surface water and sediment. No tissue sam been collected from game animals that might be exposed to the wetlan contaminants. Thus, ATSDR cannot make definitive conclusions abou whether people could be eating contaminated game animals. |

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| **SS-17: Fuel Oil Spill, Near Building 25**<br>In 1978, 100 gallons of heating oil was spilled from an AST. The oil was absorbed directly into the ground. | **Soil**: In 1991 and 1995, samples were analyzed for VOCs and PAHs. During both occasions, some PAHs (e.g., benzo[a]pyrene at 2.6 ppm in surface soil and 8.2 ppm in the subsurface) were detected above ATSDR's soil CVs. None of the contaminants exceeded MDEQ's Generic Industrial Criteria, however.<br>**Groundwater**: SS-17 has been impacted by the Arrow Street Plume. In 1991, 1994, and 1996, groundwater samples were collected from the SS-17/SS-21 area. (The groundwater investigations at SS-17 are done is conjunction with SS-21 given the close proximity of the sites.) Several contaminants have been detected above ATSDR's drinking water CVs, including benzene, cis-1,2-dichloroethene, PCE, TCE, and toluene. | **Current Status**: Remediation is ongoing (Groundwater is being treated by the ASPTS.) | **Soil:** It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soils in the pas exposures were likely infrequent. Current and projected future use for is industrial/commercial. Based on available data and ATSDR's evalu potential current and future exposures, contaminant concentrations in t surface and subsurface are not expected to pose a health hazard.<br>**Groundwater**: Groundwater under SS-17 has been impacted by the A Street Plume (see Site SS-21). This plume impacted some of USAF's water supply wells. (Potential past health hazards associated with exp these wells are discussed within the main body of the text.) No one is using the groundwater in the vicinity of SS-17. Potential future exposu not expected to be associated with health hazards because (1) the grou under this site is being remediated by the ASPTS and (2) restrictions ensure that the water under SS-17 is not used until contaminants are r to safe levels. |

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| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-19: JP-4 Spill, Building 393, Motor Pool**<br>About 400 to 500 gallons of JP-4 were spilled in Building 393 and flushed down the floor drain into an OWS in the mid-1970s. JP-4 was released to the sanitary sewer system in the process. SS-19 consists of the floor area where the spill occurred, the floor drain, and the sanitary lines leading to and from the OWS. (The OWS is addressed as ST-67.) | **Soil**: In 1991, one soil sample was collected beneath the floor slab of Building 393 and analyzed for VOCs and PNAs. No contaminants were detected above ATSDR's soil CVs.<br>**Groundwater**: No groundwater samples were collected. | **Current Status**: No further action required. | **Soil**: Wastes were released to the subsurface. Therefore, past and curr public exposures to impacted surface soils has not occurred. In the fut people could be exposed to soils if the area is excavated. Based on ava data, however, soil contaminants are too low to pose health hazards.<br>**Groundwater**: No on-base water supply wells are located in the vicini 19; therefore, no past or current exposures to groundwater have occurr Potential future exposures are not expected to pose health hazards bec the groundwater under this site is being remediated by the BPPTS and groundwater restrictions imposed under Site SS-06 will prevent peopl using the water under SS-19 unless sampling data clearly show that th is safe to drink. |
| **SS-20: JP-4 Spill, Building 5001**<br>In 1971, 250 gallons of JP-4 spilled inside Building 5001. The spill was contained within the building. | In 1985, a Phase I investigation was performed and investigators concluded that there was no evidence of contamination at this site. As a followup, subsurface soil samples were collected in 1991. No contaminants were detected above ATSDR's soil CVs. | **Current Status**: No further action required. | There is no evidence that this site contains contaminants at concentrati are high enough to pose health hazards. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-21: TCE Spill (Arrow Street Plume), Northwest of Building 43** In 1962, a 500-gallon UST, containing waste oil and TCE, was installed. It was removed in 1977 when a leak was detected. It is unknown when the tank started leaking. | **Soil**: In 1991, one surface sample and several subsurface soil samples were analyzed for VOCs. No contaminants exceeded ATSDR's soil CVs. **Groundwater**: Site 21 is the source of the Arrow Street Plume, a plume that was identified in the late 1970s. The area under Site 21 has also been impacted by contaminants migrating from other sources (i.e., SS-06, SS-08, and SS-47). In 1991, 1994, and 1996, groundwater samples were collected. Several contaminants were above ATSDR's drinking water CVs, including benzene, cis-1,2-dichloroethene, PCE, TCE, and toluene. | **Corrective Activities**: The UST and about 245 $yd^3$ were removed in 1977. **Current Status**: Groundwater remediation is ongoing (The ASPTS became operational in 1981.) Efforts are underway to optimize the efficacy of the treatment system. | **Soil**: The original chemical release was to the subsurface, therefore, n exposures to surface soils were or are occurring. Remedial workers m contacted subsurface soil in the past, but these workers used protectiv least level C) while performing their activities. Potential future subsur exposures are not expected to pose a hazard because (1) contaminant concentrations are too low and (2) restrictions are in place to limit exc activities. **Groundwater**: The Arrow Street Plume impacted some of USAF's m supply wells. (Potential past health hazards associated with exposures wells are discussed within the main body of the text. ) No one is curre using the groundwater in the vicinity of SS-21. Potential future exposu not expected to cause health hazards because (1) the groundwater und site is being remediated by the ASPTS and (2) restrictions will ensure water is not used until contaminant concentrations are reduced to safe |
| **SS-22: Pesticide Spill, Near Building 140** Between 1970 and 1989, tank trucks containing commercial pesticides, insecticides, and herbicides were washed east of Building 140. | In 1991, soil and groundwater was collected. No contaminants were detected above MDNR's Type B criteria. | **Current Status**: No further action required. | There is no evidence that this site was ever adversely impacted by site activities. Any contaminants that might have traveled to the groundwa aquifer will be remediated by the ASPTS. Also, groundwater restrictio ensure that the water under SS-22 is not used in the future unless data show that contaminants do not exceed safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-23: Landfill, Southeast of POL Bulk Storage**<br>Wood debris, auto parts, small quantities of oil, and unknown solvents were reportedly disposed in LF-23 between 1951 and 1953. A geophysical investigation identified five areas where debris may have been buried. | **Soil**: In 1995, as part of a RI, several surface and subsurface samples were analyzed for VOCs, SVOCs, metals, pesticides, and polychlorinated biphenyls (PCBs). In surface soils, lead (229 ppm) was detected above soil CVs that are commonly used by ATSDR. In the subsurface, lead (455 ppm) and benzo(a)pyrene (6.0 ppm) exceeded these guidelines. (Note: Although site documents indicated that concentrations of several other contaminants exceeded MDEQ's guidelines, their concentrations did not exceed ATSDR's CVs.)<br>**Groundwater**: In 1990, groundwater samples were analyzed for VOCs, but none exceeded ATSDR's drinking water CVs. In 1995, additional groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Methylene chloride (8 ppb) was detected above MDEQ's health guidelines, but investigators concluded that the detection was probably a laboratory contaminant. | **Current Status**:<br>No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and projected future use for is industrial/commercial. Based on available data and ATSDR's expos evaluation, exposures to the surface soil and subsurface soil will not b associated with current or future health hazards.<br>**Groundwater**: No on-base water supply wells are located in the vicini LF-23; therefore, past and current exposures to groundwater have not Potential future exposures are not expected to pose health hazards bec contaminant concentrations are currently low and are not expected to i in the future. (Groundwater under LF-23 is being treated by the BPPT soil contaminants are not leaching appreciably to the groundwater and contaminated water located upgradient of the site is being treated.) |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **OT-24: Three Pipes Drainage Ditch**<br>OT-24 consists of an underground network of storm sewers and the 3-pipes drainage ditch. Some of the water that is directed through this system is directed to an OWS retention pond before flowing into the 3-pipes drainage system. The ditch discharges to the Au Sable River. | **Groundwater**: The Mission Drive Plume extends under OT-24. Contaminants have been present in this area at concentrations exceeding ATSDR's CVs for several years. In the mid-1990s, an RI was performed. The results indicated that TCE and dichloroethene are the main constituents in the area, but that several others are also present at concentrations exceeding ATSDR's drinking water CVs, including: 1,1,1-trichloroethane, methylene chloride, PCE, 1,2-dichloroethane, benzene, and arsenic.<br>**Surface Water/Sediment**:<br>*3-Pipes Drainage Ditch*. Surface water and sediment samples were analyzed for VOCs, SVOCs, PCBs, and metals in 1994. Arsenic (1–3 ppb), TCE (6.2–37 ppb), and PCE (0.6–1.2 ppb) were detected in the water samples above drinking water CVs and arsenic (0.57–1.4 ppm) was detected above ATSDR's soil CVs in sediments.<br>*OWS Retention Pond*. Surface water and sediment samples were analyzed for VOCs in 1994. No contaminants exceeded ATSDR's drinking water or soil CVs.<br>*Au Sable River*. Surface water and sediment samples were collected during the RI. Data are summarized in Tables 6 and 7.<br>*Duell Lake*. Surface water and sediment samples were collected during the RI. Data are summarized in Tables 6 and 7. | **Current Status**: Groundwater remediation is ongoing (The MDPTS became operational in the mid-1980s. Efforts are underway to optimize the efficacy of the treatment system. For example, new wells will be installed by mid-2000 to capture a portion of the Mission Drive Plume that has not been captured by the MDPTS.) | **Soil:** No soils are associated with OT-24.<br>**Groundwater**: Groundwater in the vicinity of the OT-24 area has bee impacted by the Mission Drive Plume. This plume impacted USAF's water supply wells AF18 and AF19. (Potential past health hazards ass with exposures to these wells are summarized in the main body of the No one is currently using the groundwater in the vicinity of OT-24. Po future exposures are not expected to cause health hazards because (1) groundwater under this site is being remediated by the MDPTS and (2 restrictions will ensure that the water is not used. Because the plume underneath on-base housing areas, ATSDR evaluated the potential for groundwater to volatilize into subsurface structures. As noted in the m of the text, health hazards are not thought to be associated with this pa<br>**Surface Water/Sediment**:<br>***Three Pipes Drainage Ditch***. It is unlikely that people have been ex to the ditch because the area is not easily accessible. (A fence blocks a Even if people trespass, infrequent exposures to such low contaminant concentrations would not pose health hazards.<br>***OWS Retention Pond***: It is unlikely that people have contacted this a (According to site representatives, this pond has always been surround locked fence.) Even if people trespass in the area, contaminant concen are too low to pose health hazards.<br>***Au Sable River***: Humans may contact the Au Sable River while fishi wading, and swimming. As described in the main body of the text, exp to the Au Sable River are not associated with public health hazards.<br>***Duell Lake***: Evidence indicates that the Mission Drive Plume has im Duell Lake. As discussed in the main body of the text, exposures to th will not pose health hazards to visiting duck hunters. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-26: Landfill, East of SAC Alert Apron**<br>Between 1949 and 1951, LF-26 was reportedly used for the disposal of wood, coal, ash, broken concrete, and automobile parts. One report indicated that drums of solvents and other materials were buried in 15-foot deep trenches. | **Soil**: In 1994, as part of a RI, several surface and subsurface soil samples were collected. Arsenic (4.8 ppm in surface soil and 19.3 ppm in the subsurface) and lead (87.1 ppm in the surface and 405 ppm in the subsurface) were detected above CVs that are commonly used by ATSDR. (Note: Although site documents indicated that several other constituents exceeded MDEQ's health guidelines, their concentrations were below ATSDR's soil CVs.)<br>**Groundwater**: In the early 1990s, samples were analyzed for VOCs, SVOCs, and metals. Lead (ND–660 ppb) was detected above guidelines that are commonly used by ATSDR. Between 1994 and 1996, as part of a RI, additional samples were analyzed for volatiles, PNAs, pesticides, PCBs, and metals. Contaminants detected above ATSDR's drinking water CVs included heptachlor epoxide (ND–0.04 ppb), antimony (ND–7.8 ppb), arsenic (ND–2.3 ppb), and manganese (ND–94.3 ppb). | **Current Status**:<br>No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soils in the pas past exposures were likely infrequent. This area will be used for recre activity in the future. Based on available data and ATSDR's exposure evaluation, contaminants in the surface and subsurface soils are too lo pose current or future health hazards.<br>**Groundwater**: No on-base water supply wells are located in the vicini LF-26; therefore, no past or current exposures to groundwater have oc Potential future exposures are not expected to pose health hazards bec current contaminant concentrations are too low to pose a health hazard contaminant concentrations are not expected to increase in the future. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-27: Landfill, South of the Center of SAC Instrument Runway**<br>LF-27 reportedly received coal ash and construction debris between 1950 and 1972. | **Soil**: In 1995, samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. In the surface soil, arsenic (0.68–13.1 ppm) and lead (2.8–166 ppm) exceeded soil CVs commonly used by ATSDR. These same metals were detected at elevated concentrations in the subsurface as well (arsenic at 0.44–12.8 ppm; and lead at ND–288 ppm). (Note: Although site documents indicated that several additional subsurface contaminants exceeded MDEQ's criteria, their concentrations did not exceed ATSDR's soil CVs.)<br>**Groundwater**: In 1995 and 1996, groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Some constituents were detected above ATSDR's drinking water CVs.<br>**Surface water/sediment**: Investigators suspect that landfill leachate is seeping into an adjacent wetland area. Data collected from the wetland are summarized in Tables 6 and 7. | **Corrective Activities**:<br>In 1990, visible debris was removed from the surface.<br>**Current Status**:<br>Groundwater is being treated with intrinsic bioremediation.<br>Groundwater and surface water monitoring will begin in the near future. | **Soil:** It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soils in the pas exposures were likely infrequent. This area will be used for recreation activity in the future, but contaminant concentrations are not expected health hazards given the frequency of exposure that is anticipated.<br>**Groundwater**: No on-base water supply wells are located in the vicini LF-27; therefore, no past or current exposures to groundwater have oc Groundwater conditions under LF-27 could worsen in the future if groundwater under SS-51 migrates to the LF-27 area, but potential fut exposures are not expected to pose a health hazard because (1) the groundwater is being remediated, and (2) restrictions will ensure that groundwater is not used until contaminants are reduced to safe levels.<br>**Wetland Area South of LF-27**: The wetland area south of LF-27 is u people who hunt deer and turkey. As explained in the main body of th hunters are not expected to experience adverse health effects by comin contact with the wetland's surface water and sediment. No tissue sam been collected from game animals that might be exposed to the wetlan contaminants. Thus, ATSDR cannot make definitive conclusions abou whether people could be eating contaminated game animals. |
| **LF-28: Landfill, East of the Eastern SAC Overrun**<br>Some reports indicate that LF-28 was used for domestic and industrial waste disposal between 1953 and 1958. | In 1991, investigations were conducted to determine whether a landfill was actually located at this site. Ground-penetrating-radar and electromagnetic terrain conductivity surveys were conducted. Also, groundwater and soil data were analyzed. Investigators concluded that there is no evidence of a landfill in this area. | **Corrective Activities**: Materials in the landfill have been excavated and removed.<br>**Current Status**:<br>No further action required. | There is no evidence that this site was ever adversely impacted by site activities. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-29: Domestic Waste Disposal, Northern portion of Alert Apron**<br>Reports indicate that domestic waste and some base cleanup refuse was disposed in this area between 1958 and 1959. | **Soil**: In 1995, subsurface samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. No contaminants exceeded ATSDR's soil CVs.<br>**Groundwater**: In 1991, groundwater samples were analyzed for VOCs, PAHs, pesticides, PCBs, and metals. No contaminants exceeded ATSDR's drinking water CVs or state or federal criteria. | **Corrective Activities:** Materials in the landfill were excavated and removed in 1959.<br>**Current Status**: No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. No sampling data are available to indicate whether contami were present before the landfill was removed, but exposures to base e were likely infrequent. Current and future exposures will not be associ with a health hazard because contaminant levels are too low.<br>**Groundwater**: No on-base water supply wells are located near LF-29; therefore, no past or current exposures to groundwater have occurred. future exposures are not expected to pose health hazards because there evidence that groundwater underlying the site has been impacted by si activities. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-30 and LF-31: Northern Landfills**<br>Between 1960 and 1973, Landfill 30 received domestic and commercial waste. Between 1971 and 1979, two 6,000-gallon tanker trailers were used to store waste jet fuel, oils, solvents, thinners, and lubricants.<br>Landfill 31 was opened in 1973 and accepted sanitary waste and hardfill until it was closed and capped in 1979. Some reports indicate that it received paint cans and metal as well. | **Soil**: In 1994, as part of a RI, surface and subsurface soil samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. In the surface soil, arsenic (0.4–1.4 ppm) was the only contaminant that exceeded ATSDR's soil CVs. In the subsurface, some PAHs (e.g., benzo[a]pyrene at ND–1.3 ppm), arsenic at 0.28–1.9 ppm, and lead 1.4–276 ppm exceeded these values. (Note: Although site documents indicated that other subsurface constituents exceeded MDEQ's criteria, their concentrations did not exceed ATSDR's soil CVs.)<br>**Groundwater**: LF-30 and LF-31 are the sources of the Northern Landfill Plume, a plume that was discovered in 1979. Between 1979 and 1995, contaminant concentrations have been detected above ATSDR's drinking water CVs on numerous occasions. These contaminants include TCE, benzene, vinyl chloride, and 1,2-dichloroethene.<br>**Surface Water/Sediment**: The Northern Landfill plume discharges to Van Etten Lake. Samples collected from the lake are summarized in Tables 6 and 7. | **Corrective Activities**:<br>Truck trailers were removed in 1979.<br>LF-30 and LF-31 have been covered with soil. In addition, an engineered cap rests on top of 11 acres.<br>**Current Status**:<br>A pump-and-treat and air sparging system will be installed by mid 2001.<br>A monitoring plan is being developed. | **Soil**: It is unlikely that on-base residents or the general public were ex landfill soils before the landfill was capped because access to the area restricted. No sampling data are available to indicate surface soil cont concentrations before capping, but exposures to base employees were l infrequent. The cap eliminates the potential for people to be exposed t in the future. Exposures to the subsurface are not expected to occur be restrictions are in place to prevent digging in this area. Additionally, contaminant concentrations detected in the surface and subsurface are enough to pose health hazards.<br>**Groundwater**: The Northern Landfill Plume has migrated off base, i areas with private wells. Past and current potential health hazards ass with exposures to these wells are discussed in the main body of the te Future health hazards are not expected to occur because (1) the groun under this site will be remediated, (2) most of the surrounding area no receives municipal water, and (3) advisories will be issued against dri new wells into contaminated areas. Because the plume extends undern base residences, ATSDR evaluated the potential for groundwater to vo into subsurface structures. As explained in the main body of the text, hazards are not thought to be associated with this pathway.<br>**Surface Water/Sediment**: Contaminants from the Pierce Point Plume discharge into Van Etten Lake. As explained in the main body of the t swimmers, fishers, and people who consume fish are not expected to experience adverse health effects. |
| **WP-32 and WP-33: Surface Impoundment Lagoons**<br>The sewage lagoon system consisted of three aerated lagoons and eight seepage lagoons. | According to site representatives, contaminants were not detected during site investigations. | **Corrective Activities**:<br>Sludge and aeration equipment were removed in 1996 and 1997.<br>**Current Status**:<br>No further action required. | There is no evidence that this area was adversely affected by the site's activities. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **OT-35: Sludge Spreading Areas** Between the 1960s and 1982, sludge from the waste treatment plant was spread along the runway and taxiway. | **Soil**: In 1991, subsurface samples were analyzed for VOCs, PAHs, and metals. Arsenic (0.076–0.45 ppm) exceeded ATSDR's soil CV. **Groundwater**: In 1991, groundwater samples were analyzed for volatiles and metals. PCE (ND–1.5 ppb) was detected above ATSDR's drinking water CV. | **Current Status**: No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted them in the past, but p exposures were likely infrequent. Past and current exposures to subsur soils have not occurred, but these soils could be accessed in the future area is excavated. Contaminant concentrations are not high enough to health hazards, however. **Groundwater**: No potable water sources are in the immediate vicinity 35; therefore past and current exposures to area groundwater have not occurred. Potential future exposures are not expected to cause health h because contaminant concentrations are currently too low and they wil continue to decrease because the area is being remediated by the MDP |
| **ST-40: Leaking UST, Building 351** In May 1990, a leak was detected in a 2,000-gallon, underground, waste oil recovery tank. | **Soil**: In 1994, surface and subsurface soil samples were analyzed for volatiles, PNAs, and lead. No contaminants exceeded ATSDR's soil CVs. **Groundwater**: In 1994, groundwater samples from the POL Bulk Storage Area were analyzed for volatiles, BTEX, MTBE, and PNAs. (Note: Samples collected from the POL Bulk Storage Area are considered representative of conditions underlying SS-06, SS-13, and ST-40 because these sites are very close in proximity.) Several constituents exceeded ATSDR's drinking water CVs, including benzene (ND–1,200 ppb), ethylbenzene (ND–1,300 ppb), TCE (ND–13 ppb), and xylene (ND–4,600 ppb). | **Corrective Activities**: The tank was removed in July 1990. **Current Status**: Soil remediation is ongoing. (A bioventing system is operational.) Groundwater remediation is ongoing by the BPPTS and the ASPTS. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. (Surface soil sampling confirmed that no contaminants are present at concentrations that wou health hazards.) Remedial workers may have been exposed to subsurf when they removed the UST, but these workers used protective gear ( level C) while performing their activities. Potential future subsurface exposures are not expected to pose health hazards because contaminan concentrations are too low. **Groundwater**: No base water supply wells are located in the vicinity 40; therefore, no past or current exposures to groundwater have occurr Potential future exposures are not expected to be associated with a hea hazard because (1) restrictions will ensure that groundwater is not use contaminants are reduced to safe levels and (2) the groundwater is not expected to migrate to off-site areas in the future because it is being c by the BPPTS and the ASPTS. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **OT-41: Leaking UST, Building 5011**<br>USTs were located in this area in the past. At least one contained JP-4 jet fuel and another contained MOGAS. In May 1990, a gasoline leak was detected in one of the USTs. | **Soil**: In 1992 and 1995, subsurface samples were collected and analyzed for a variety of contaminants, but none exceeded ATSDR's soil CVs.<br>**Groundwater**: Groundwater samples were collected between 1991 and 1996. Benzene, toluene, PCE, TCE, and naphthalene have been detected above ATSDR's drinking water CVs, but concentrations of some of these chemicals appear to be decreasing over time. | **Corrective Activities**:<br>USTs were removed in 1991.<br>**Current Status**:<br>Natural attenuation is ongoing.<br>Monitoring activities are ongoing. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the USTs, but the workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low.<br>**Groundwater**: No base water supply wells are located in the vicinity 41; therefore, no past or current exposures to groundwater have occurr Potential future exposures are not expected to cause a health hazard b (1) the groundwater is being remediated and (2) restrictions will ensur groundwater is not used until contaminants are reduced to safe levels. |
| **SS-42: JP-4 Fuel Pump Spill, Aerospace Ground Equipment Shop (Building 5009)**<br>A fuel pump was used as an above ground tank without installing an antisiphoning device. About 1,500 gallons of JP-4 was spilled in November 1991. | **Soil**: In 1992 and 1995, samples were collected and analyzed for a variety of contaminants, but none exceeded ATSDR's soil CVs.<br>**Groundwater**: In 1991, free product was identified floating on the groundwater. Groundwater samples were collected between 1991 and 1996. BTEX, TCE, PCE, and naphthalene have been detected above ATSDR's drinking CVs, but concentrations of some of these chemicals appear to be decreasing over time. | **Corrective Activities**:<br>In 1992, auto-skimming equipment was installed in a recovery well and about 750 gallons of product was recovered.<br>Natural attenuation is ongoing.<br>Monitoring activities are ongoing. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted them in the past, but p exposures were likely infrequent. Contaminant concentrations are not enough to pose current or future health hazards.<br>**Groundwater**: No on-base water supply wells are located in the vicin OT-42; therefore, no past or current exposures to groundwater have oc Potential future exposures are not expected to be associated with a hea hazard because (1) the groundwater is being remediated and (2) restri will ensure that groundwater is not used until contaminants are reduce levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SD-43: Dry Well, Munitions Maintenance Squadron (Building 5044)**<br>In 1991, a dry well sump was discovered. The sump was connected to a floor drain in building 5044. The building was originally used as a battery shop. The well is thought to have been used for disposing of battery acid. | **Soil**: In 1992, subsurface soil samples were collected. Alpha-hexachlorocyclohexane (0.006 ppm) was detected above MDEQ's health guidelines, but below ATSDR's soil CV.<br>**Groundwater**: In 1992, groundwater samples were collected. PCE (5.2 ppb) and manganese (270 ppb) were the only contaminants detected above MDEQ's health guidelines. (They also exceeded ATSDR's drinking water CVs.) PCE was not detected in a subsequent sampling round. | **Corrective Activities**:<br>The drywell was removed in 1991.<br>**Current Status**:<br>No further action required. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the drywell, but t workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low.<br>**Groundwater**: No on-base water supply wells are located in the vicini SD-43; therefore, no past or current exposures to groundwater have oc Potential future exposures are not expected to cause health hazards be contaminants are currently too low to pose hazards and (2) groundwat conditions are not expected to worsen in the future. (Evidence indicate soil contaminants are not leaching appreciably to the underlying groun |
| **ST-44: Leaking UST, Alert Facility (Building 5350)**<br>In October 1991, a 20,000-gallon heating fuel tank failed a tightness test. | **Soil**: Three composite samples were collected when the tank was removed in 1992. No contaminants were detected above their detection limits.<br>**Groundwater**: Two monitoring wells were installed at both ends of the tank in 1992. Samples were analyzed for BTEX, MTBE, and PAHs. No contaminants were detected above MDNR health guidelines. | **Corrective Activities**:<br>The tank was emptied when it failed the tightness test.<br>The tank and surrounding soils were removed in July 1992.<br>**Current Status**:<br>No further action required. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the UST, but thes workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low.<br>**Groundwater**: No on-base supply wells are located nearby; therefore, or current exposures to groundwater have occurred. Potential future ex are not expected to pose health hazards because contaminant concentr are too low. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **ST-45: Leaking UST, Defense Reutilization Management Office (DRMO) Area (Building 5608)**<br>In 1991, a heating oil UST failed a tightness test. | **Soil**: Soil samples were collected in 1992 and 1994, revealing that some contaminants were present above MDEQ's health guidelines. Additional soil samples were collected in 1996; no contaminants exceeded MDEQ's health guidelines or ATSDR's soil CVs.<br>**Groundwater**: Groundwater samples were collected in 1992 and 1994, revealing that some contaminants were present above MDEQ's health guidelines. Additional samples were collected in 1995, 1996, and 1997. No contaminants were detected at levels that exceeded MDEQ's health guidelines during the latter two sampling events. (Note: Although the Remedial Action Plan for this site indicated that 1,2,4-trimethylbenzene [48 ppb] exceeded MDEQ's residential standards, the standard was raised to 1,000 ppb in June 1998.) | **Corrective Activities**:<br>The tank was pumped empty in 1991.<br>The tank was removed in May 1992.<br>**Current Status**:<br>No further action required. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the UST, but thes workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low.<br>**Groundwater**: No on-base supply wells are located nearby; therefore, or current exposures to groundwater have occurred. Potential future ex are not expected to pose health hazards because (1) contaminant concentrations are too low and (2) groundwater conditions are not exp worsen in the future because soil contaminants are not leaching apprec into the underlying groundwater. |
| **ST-46: Leaking UST (Building 7297)**<br>Three USTs were located at ST-46. In May 1990, a diesel fuel leak was detected in one of them. | **Soil**: No samples were collected prior to soil removal activities. Subsurface samples were collected, however, in 1990 and 1992. The results indicated that some low levels of contaminants remain and that some PAHs (e.g., benzo[a]pyrene at 1.6 ppm) exceed ATSDR's soil CVs.<br>**Groundwater**: In 1990, free product was identified floating on the water table and light nonaqueous phase liquid (LNAPL) was detected in 1992. Investigators concluded that the LNAPL was migrating from SS-06. | **Corrective Activities**:<br>The tank was emptied upon discovery of the leak.<br>In October 1990, three USTs were removed, about 1,080 $yd^3$ of soil was excavated, and about ¼ inch of free product was removed.<br>**Current Status**:<br>Groundwater is being remediated by on-base PTS systems. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the UST, but thes workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low.<br>**Groundwater**: No on-base supply wells are located nearby; therefore, or current exposures to groundwater have occurred. Future exposure t groundwater under this site is not expected to cause health hazards be the groundwater is being remediated by on-base PTS systems and (2) restrictions will prevent the groundwater from being used until conta levels are reduced to safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-47: Base Gas Station** Three USTs were located at the Base Gas Station. In 1987, on-base employees documented a release from one that contained premium grade gasoline. (About 400 gallons leaked from a valve.) | **Soil**: In 1993, subsurface samples were collected. None of the detected contaminants exceeded MDEQ's health guidelines or ATSDR's soil CVs. **Groundwater**: In 1993 and 1994, groundwater samples were collected. Several constituents, including benzene (ND–2,600 ppb), 1,2-dichloroethane (ND–100 ppb) TCE (ND–510 ppb), toluene (ND–5,900 ppb), xylene (ND–3,000 ppb), and lead (ND–25 ppb) were detected at concentrations exceeding ATSDR's drinking water CVs and MDEQ's health guidelines. (The TCE and 1,2-dichloroethane are thought to have migrated from SS-21.) | **Corrective Activities**: The USTs were emptied in 1993 and removed in 1996. Soils underlying the USTs have been removed. **Current Status**: Groundwater monitoring efforts are ongoing. | **Soil**: Surface soils are not likely to be impacted by site activities becau contaminants were released to the subsurface. Remedial workers may been exposed to subsurface soil when they removed the USTs, but the workers used protective gear (at least level C) while performing their activities. Potential future subsurface exposures are not expected to po health hazards because contaminant concentrations are too low. **Groundwater**: Contaminants from SS-47 that migrated to the ground not associated with health hazards. By the time the contaminants were released, nearby water supply wells were not operating as potable sour Potential future exposures to groundwater are not expected to cause he hazards because (1) the ASPTS is treating the water and (2) restrictio ensure that the groundwater is not used until contaminant concentratio reduced to safe levels. |
| **SS-48: Locomotive Shop (Building 3020)** In 1988, WAFB discovered that an AST was leaking. | A RI was conducted and no contaminants were detected above MDNR health guidelines in soil or groundwater samples. | **Corrective Activities**: Soils have been removed. **Current Status**: No Remedial Action required. | There is no evidence that this site contains contaminants at concentrati are high enough to pose health hazards. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **OT-49: EOD Range, Northwest Section of the Base**<br>Starting in 1961, this area was used for the disposal and demolition of unused munitions and ordnance. (Materials were placed in a pit, covered with diesel fuel, and ignited.) The area was closed in 1991, but a few isolated disposal/detonation events were authorized after that time. | **Soil**: In 1994, subsurface soil samples were analyzed for PAHs, nitroamines, nitroaromatics, inorganics, BTEX, and MTBE. Arsenic (ND–4.4 ppm) was the only contaminant detected above ATSDR's soil CV. (Note: Although the Closure Certification Report indicated that concentrations of antimony and vanadium exceeded MDNR's guidelines, they were below ATSDR's soil CVs.)<br>**Groundwater**: In 1994, samples were analyzed for VOCs, PAHs, nitroamines, nitroaromatics, and inorganics. Four constituents were detected above ATSDR's drinking water CVs: antimony (ND–5.8 ppb), arsenic (ND–2.9 ppb), manganese (ND–589 ppb), and thallium (ND–8.1 ppb). | **Corrective Activities**:<br>Clearing activities were conducted in 1992 and 1993 to remove all unexploded munitions and ordnance.<br>**Current Status**:<br>MDNR approved WAFB's Closure Plan for this site in May 1994. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted contaminants in the su in the past, but exposures were infrequent. Current and future exposur not be associated with health hazards because contaminant concentrati too low.<br>**Groundwater**: No on-base water supply wells are located nearby; ther past and current exposures to groundwater have not occurred. Any pot future exposures are not expected to be associated with health hazards current contaminant concentrations are too low to pose a health hazard contaminant concentrations are not expected to increase in the future. |
| **SS-51: KC-135 Crash Site, Midway on the Runway**<br>A KC-135 aircraft crashed in October 1988. About 3,000 gallons of JP-4 jet fuel were in the fuel tanks at the time of the crash. | **Soil**: In 1992 and 1993, as part of a RI, surface and subsurface soil samples were analyzed for VOCs and SVOCs. No constituents were detected above Target Method Detection Limits.<br>**Groundwater**: Between 1989 and 1991, sampling results indicated that free-phase product was present. A groundwater plume (traveling in a south/southeasterly direction) was identified in 1992. Several contaminants detected in the plume exceeded ATSDR's drinking water CVs, including benzene (ND–280 ppb), ethylbenzene (ND–2,400 ppb), toluene (ND–3,700 ppb), and xylene (ND–9,700 ppb). | **Current Status**:<br>Groundwater monitoring is conducted on a regular basis.<br>Groundwater is being addressed with monitored natural attenuation. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted contaminants in the su in the past, but exposures were infrequent. Current and future exposur not be associated with a health hazard because contaminant concentrat too low.<br>**Groundwater**: No on-base water supply wells are in the immediate vi SS-51; therefore past and current exposures to groundwater have not o ATSDR does not expect health hazards to arise in the future because ( groundwater is being remediated and (2) restrictions will prohibit the groundwater until contaminant levels are reduced to safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-52: KC-135 Cockpit Trainer Spill, Northeast of the POL Bulk Storage Facilities**<br>In April 1991, a surface soil stain was discovered. The stain may have been from a heating oil spill. | **Soil**: An RI was performed. No contaminants of concern were detected above MDNR health guidelines.<br>**Groundwater**: No samples were collected. | **Corrective Activities**:<br>In 1991, seven drums of stained soil were removed.<br>**Current Status**:<br>No Further Remedial Action Planned. | There is no evidence that this site ever contained contaminants at concentrations that could pose health hazards. Due to the lack of grou data, it is impossible to state whether contaminants migrated to the aq Even if they had, no past health hazards would have resulted because base water supply wells were located nearby. Potential future exposur groundwater are not expected to pose health hazards because there is evidence that the groundwater was adversely affected by site activities |
| **SS-53: Parking Spot 19, Operational Apron**<br>In October 1988, a pressure check test on the fuel line revealed a leak. | This site is located within SS-08. Data pertaining to SS-53 are summarized under the SS-08 site. | See Site SS-08. | See Site SS-08. |
| **SS-54: Aqueous Film Forming Foam (AFFF) Spill, Hangar 5063**<br>In 1991, 80 gallons of AFFF spilled near a storm sewer inlet. | **Soil**: In 1994, surface and subsurface samples were collected during a Site Investigation. Results indicated that the soil has not been impacted by the AFFF spill.<br>**Groundwater**: No samples were collected. | **Current Status**:<br>No further action required. | There is no evidence that this site ever contained contaminants at concentrations that could pose health hazards. Due to the lack of grou data, it is impossible to state whether contaminants migrated to the aq Even if they had, no past health hazards would have resulted because base water supply wells were located nearby. Potential future exposur groundwater are not expected to pose health hazards because (1) the groundwater is being remediated by an on-base PTS system and (2) re will ensure that no one uses the groundwater unless contaminants are levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-55: Small Arms Firing Range (SAFR), Northwestern part of base**<br>This area was used for small arms fire training between the 1960s and 1982. Lead slugs, lead shot, steel shot, and metal-jacketed bullets were fired into a sandy berm (80' by 200' at base and 17' high). Metal fragments, containing lead and copper, are embedded in the berm and surrounding area. | **Soil**: In 1995 (prior to soil removal activities), surface and subsurface samples were analyzed for lead, copper, and antimony. Lead (4.0–21,100 ppm) and antimony (ND–284 ppm) were detected above ATSDR's soil CVs, with the highest concentrations present in the top foot of soil. In 1998 (after soil removal activities), additional samples were analyzed for lead. Concentrations (up to 7,840 ppm) remained above health guidelines in the top foot of soil.<br>**Groundwater**: In 1995, groundwater samples in the vicinity of SS-55 were analyzed for lead, but it was not detected above commonly used CVs (i.e., 15 ppb) in locations that were crossgradient or downgradient of SAFR. In August 1998, additional samples were analyzed for lead, copper, and antimony. All three contaminants exceeded drinking water CVs that are commonly used by ATSDR. A third sampling event took place during the summer of 2000. Preliminary results indicate that lead, copper, and antimony detections did not exceed CVs. MDEQ and USAF are currently talking about whether additional groundwater sampling rounds are necessary. | **Corrective Activities**:<br>In August 1998, Maectite® was applied to the berm and to a small area behind the berm. The chemical fixated the soil. About 175yd³ of fixated soil was then removed and disposed off site.<br>Hotspots that were left behind will be removed in 2001.<br>**Current Status**: Additional investigations are ongoing. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted contaminants in the su in the past, but exposures were infrequent. Much of the contaminated has already been removed from the site. Hot spots that remain will be in 2001. Confirmation samples will be collected after the removal acti make sure that all areas with lead concentrations exceeding 400 ppm a removed. Once contaminants have been removed, the site will be cons acceptable for reuse.<br>**Groundwater**: USAF's area-specific well AF16 is located crossgradie 55. This well was used as a potable water source in the past, but avail indicate that the well was not impacted by site activities (See Table 4) is currently using the groundwater under SS-55. Future harmful expos not expected to occur. The most recent groundwater sampling results i that contaminants do not exceed CVs. MDEQ will review these result the agency determines that these results must be confirmed, USAF wil asked to perform additional sampling. If concentrations are detected at elevated levels in subsequent sampling rounds, then a ban (prohibiting groundwater use) would be placed on the site and a remedial activity initiated. If the water proved to be only slightly contaminated, the base forego the remedial activity, but would work with Township of Oscod deed restrictions placed on the property. (The State of Michigan curre owns the property, but the property will be transferred to the Townshi Oscoda soon.) |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-56: Fuel Spill, Air Force Beach**<br>SS-56 is located on the Air Force Beach. The site consists of Building 1115 (a shed used for fuel container storage), fuel storage tanks, and fuel dispenser lines. The lines were fed by USTs until 1989 when the ASTs replaced them. Fuel from a ruptured dispensing line was released to Van Etten Lake during the winter of 1990 and identified by ice fishermen. | **Soil**: In 1992, surface and subsurface samples were analyzed for BTEX, PNAs, lead, and MTBE. Lead was the only contaminant detected, but at concentrations that are too low to pose health hazards.<br>**Groundwater**: In 1992, three groundwater samples were analyzed for BTEX, PNAs, lead, and MTBE. Lead was detected, but at concentrations that are too low to pose health hazards.<br>**Van Etten Lake**: In 1995, sediment samples were collected from Van Etten lake and analyzed for BTEX, PNAs, lead, and MTBE. Sampling locations were chosen after site investigators determined the location where the distribution line ruptured. Lead was the only contaminant detected, but it was detected at concentrations (0.9–2.0 ppm) that are too low to pose health hazards. | **Corrective Activities**:<br>Free-floating product removed.<br>The fuel distribution lines were removed in 1990.<br>Building 1115 was removed in 1993.<br>**Current Status**:<br>No further action required. | Based on available data, no contaminants were present in soil, ground sediment at high enough levels to pose health hazards. |
| **SS-57: Base Operational Apron**<br>This site consists of a WWII refueling hydrant system which underlies the Base Operation Apron. Most of the system was abandoned in 1972. | **Soil**: In 1995, subsurface soil samples were collected along the hydrant's pipelines and from the sidewalls of UST excavations. The samples were analyzed for BTEX, MTBE, PNAs, and lead. Some PNAs (e.g., benzo[a]pyrene [ND–62 ppm]) were detected above ATSDR's soil CVs. In 1996, additional subsurface samples were collected and analyzed for VOCs, SVOCs, and metals. Arsenic (ND–0.69 ppm) was detected above ATSDR's soil CVs. Additional soil samples were collected during the summer of 1999; the results indicated that there are elevated contaminant concentrations in the soil.<br>**Groundwater**: This site has been impacted by the Arrow Street plume (see Site 21). Therefore, several contaminants have been detected in the groundwater underlying the site. | **Corrective Activities**:<br>In 1995, the hydrant piping system was abandoned in place and the associated USTs were removed.<br>**Current Status**: A feasibility study has been drafted. Enhanced bioremediation of soil and groundwater has been identified as a proposed remedial action. | **Soil**: Contaminants at this site were released to the subsurface. Remed workers may have been exposed to these soils when they removed the system. Available data indicate that contaminant concentrations were t to pose health hazards to these workers. Construction workers could al exposed to subsurface soils in the future if the area is excavated. Futur exposures are not expected to pose health hazards because (1) workers protective gear and (2) the soil under the site will be remediated in th future.<br>**Groundwater**: Groundwater under SS-21 has been impacted by the A Street Plume (see Site SS-21). This plume impacted some of USAF's water supply wells. (Potential past health hazards associated with exp these wells are discussed within the main body of the text.) No one is using the groundwater in the vicinity of SS-57. Any future exposures a expected to cause health hazards because (1) the groundwater under th being remediated by the ASPTS and (2) restrictions will ensure that th under SS-57 is not used until contaminants are reduced to safe levels. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-58: USTs at Military Family Housing Units**<br>Eleven underground oil tanks, located in the vicinity of the on-base housing area, were abandoned in place in the early 1980s. Residual fuel or sludge may have leaked subsequent to abandonment. At least one tank—Unit 1752—had a confirmed release. | **Soil**: Subsurface soil samples were collected sometime before 1990 and in 1992. No contaminants exceeded ATSDR's soil CVs.<br>**Groundwater:** Groundwater samples were collected in 1985, 1991, 1992, and 1993. Benzene (16 ppb) was the only contaminant detected above ATSDR's drinking water CVs. (The detection was reported in 1985 and was not repeated in subsequent sampling events.) | **Corrective Activities**:<br>Unit 1752 and associated soils have been removed.<br>**Current Status**:<br>No further action required. | **Soil**: Contaminants at this site were released to the subsurface. Remed workers may have been exposed to these soils when they removed the line, tank, and soils. In addition, construction workers could be expose subsurface soils in the future if the area is excavated. All available dat indicate that contaminant concentrations were and are too low to pose hazards.<br>**Groundwater**: No on-base water supply wells are located nearby; ther past and current exposures to groundwater did not occur. Based on ava data, any potential future exposures would not be associated with a he hazard because contaminant concentrations are too low. |
| **SS-59: AFFF Release (Building 5306)**<br>In January 1989, a tank containing AFFF cracked and released about 500 gallons of AFFF onto the soil adjacent to Building 5306. | **Soil/sediment**: In 1992, 1994, and 1995, samples were collected. Butyl Carbitol (ND–6.7 ppm) and diethylene glycol (ND–6 ppm) were detected in the subsurface during the 1994 event, but the detection was not repeated in the samples collected in the following year.<br>**Groundwater**: In 1995, groundwater samples were analyzed for Butyl Carbitol, diethylene glycol, and butyl ether. No contaminants were detected. | **Current Status**:<br>No further action required. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and future exposures to the and subsurface will not pose health hazards because contaminant concentrations are too low.<br>**Groundwater**: No on-base water supply wells are located nearby; ther no past or current exposures to groundwater have occurred. Based on data, any potential future exposures will not pose health hazards beca is no evidence that the area has been impacted by the AFFF release. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-60: AFFF Release, Base Operational Apron**<br>For about 10 years, WAFB routinely emptied AFFF/water mixtures off the edge of the Base Operations Apron. This practice was stopped in 1992, when WAFB learned that AFFF contains a harmful substance. | **Soil**: In 1992, three soil samples were analyzed for Butyl Carbitol. The contaminant was not detected above detection limits. | **Current Status**: Originally, MDNR was reluctant to allow WAFB to close out this site because the Agency questioned the sensitivity of Butyl Carbitol's detection limit. This issue has been resolved and USAF is pursuing a "No Further Action" status. | There is no evidence that this site was adversely affected by site activi |
| **ST-61: JP-4 UST concrete vault, Building 5306**<br>Four JP-4 USTs ruptured in December 1992, while being removed from a concrete containment vault. Although a small amount of fuel spilled, it was thought to be contained completely within the vault. | **Soil**: In 1996, surface and subsurface samples were analyzed for VOCs and SVOCs. No contaminants exceeded ATSDR's soil CVs.<br>**Groundwater**: In 1996, groundwater samples were analyzed for VOCs and SVOCs. A few contaminants (i.e., phenol [ND–5.1 ppb], dichlorobromomethane [ND–1.3 ppb], and chloroform [ND–7.3 ppb]) were detected slightly above ATSDR's drinking water CVs. | **Current Status:** No Further Action required. (This decision is listed in a document that has been signed by the Air Force and the USEPA. MDEQ concurs with the decision.) | **Soil:** Surface soils are not likely to be impacted by site activities beca contaminants were released to the subsurface. People could contact th if the area is excavated in the future. Potential exposures are not expe pose future health hazards, however, because contaminant concentrati too low.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because (1) contami concentrations are too low and (2) groundwater conditions are not exp worsen in the future. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **LF-62: Potential Landfill Area, Northeast of Runway 24**<br>Reports indicate that miscellaneous construction debris was deposited in this area in the 1950s. | **Soil**: In 1996, a geophysical survey was performed and investigators concluded that there was no indication of previous landfill operations. Soil samples were analyzed for SVOCs, pesticides, PCBs, and metals. Arsenic (0.75 ppm) was the only contaminant that exceeded ATSDR's soil CV. (It was detected in a composite sample.)<br>**Groundwater**: No groundwater samples have been collected. | **Corrective Activities:** Area swept and cleared to a depth of 3 feet.<br>**Current Status:** No Further Action required. (This decision is listed in a document that has been signed by the Air Force and the USEPA. MDEQ concurs with the decision.) | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and future exposures to the and subsurface will not pose health hazards because contaminant concentrations are too low.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because there is no that the groundwater has been impacted by activities at LF-62. |
| **LF-63: Potential Landfill Area, West of Weapons Storage Area**<br>Reports indicate that construction debris was deposited in this area in the 1940s and 1950s. Also, some reports indicate that the LF-63 area is located within a bombing range that was used during WWI. The area may, therefore, have been used for munition disposal. UXO could be buried in the area. | **Soil**: In 1996, a geophysical survey was performed and investigators concluded that there was no indication of previous landfill operations. Soil samples were analyzed for SVOCs, pesticides, PCBs, and metals. Arsenic (0.56 ppm) was detected above ATSDR's soil CV. Also, one sample contained some SVOCs at concentrations that exceeded ATSDR's soil CVs. These contaminants were recorded as nondetect, however, in a replicate sample. (Investigators explain the discrepancy between the original and the replicate composite sample by saying that the former probably contained foreign matter.)<br>**Groundwater**: No groundwater samples have been collected. | **Corrective Activities:** Area swept and cleared to a depth of 3 feet.<br>**Current Status:** No Further Action required. (This decision is listed in a document that has been signed by the Air Force and the USEPA. MDEQ concurs with the decision.) | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Future use of this area will be restri commercial/industrial usage. Current and future exposures to the surfa subsurface will not pose health hazards because contaminant concentr are too low.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because there is no that the groundwater has been impacted by activities at LF-63. |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **ST-64: Storage tanks near Facility 5002**<br>A 50-gallon fuel oil UST was located at ST-64. It was installed in the 1950s and removed and replaced by a 275-gallon diesel fuel AST in 1992. Investigators noticed stained soil underneath the AST in 1995. | **Soil**: Soil samples were collected in 1992 and 1996 and analyzed for BTEX and PNAs. PNAs were detected at concentrations exceeding ATSDR's soil CVs in surface and subsurface soils. In the surface soil, the maximum detections of these contaminants were benzo[a]pyrene (30 ppm), benzo[a]anthracene (40 ppm), benzo[b]fluoranthene (27 ppm), benzo(k)fluoranthene (12 ppm), chrysene (41 ppm), and indeno[1,2,3-c,d]pyrene (36 ppm). Concentrations of these contaminants in the subsurface were significantly lower, although a few did exceed ATSDR's soil CVs, reaching concentrations of 1.8 ppm.<br>**Groundwater**: No groundwater samples have been collected. | **Corrective Activities**: Contaminated soil was removed from the site.<br>**Current Status**: The site will officially be labeled as a "No Further Action" site in the near future. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Potential future exposures are not e to pose a public health hazard because the contaminated soils have be removed from the site.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because there is no that the groundwater has been impacted by activities at LF-64. Further any contaminants that may have reached the water will be captured by MDPTS. |
| **ST-65: ASTs near Facility 5013**<br>Two different gasoline ASTs have serviced Facility 5013 throughout the base's history. The first AST was removed from service in 1992 when the second one was installed. (It is still operational.) | **Soil**: In 1992, soil samples were collected under the AST and analyzed for BTEX, PNAs, and lead. (Several PNAs were detected at concentrations ranging from 1.0 to 4.5 ppm.). Additional samples were collected in 1996 and analyzed for BTEX, PNAs, MTBE, and lead. Lead, the only contaminant detected, was present in the surface (ND–73 ppm) and subsurface (ND–6.1 ppm).<br>**Groundwater**: No groundwater samples have been collected. | **Current Status**: The site will officially be labeled as a "No Further Action" site in the near future. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Current and future exposures to the and subsurface will not pose health hazards because contaminant concentrations are too low.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because there is no that the groundwater has been impacted by activities at LF-65. Further any contaminants that may have reached the water will be captured by MDPTS. |

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| Site Name<br>Site Description/Waste Disposal History | Investigation Results/ Environmental Monitoring Results | Corrective Activities and Current Status | ATSDR's Evaluation of Public Health Hazards |
|---|---|---|---|
| **SS-66 Alert Apron**<br>The Alert Apron was constructed in 1959 or 1960. The area was used to stage aircrafts. Only minor maintenance and fueling/defueling activities took place. Other sites included within the Alert Apron's boundary are addressed under LF-29 and OT-44. | **Soil**: In 1996, 27 soil borings were drilled across the Alert Apron area. Several subsurface samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Several contaminants were detected, but only n-nitrosodi-n-propylamine (0.33 ppm) and arsenic (0.3–1.03 ppm) were detected above health guidelines that are commonly used by ATSDR.<br>**Groundwater**: The groundwater under this site is discussed under SS-05. | **Current Status**:<br>The site will officially be labeled as a "No Further Action" site in the near future. | **Soil**: It is unlikely that on-base residents or the general public were ex surface soils while the base was operational because access to the area restricted. Base employees may have contacted surface soil in the past, exposures were likely infrequent. Available data indicate that some su contaminants are present at concentrations above ATSDR's soil CVs. exposure occurs in the future via excavation, these concentrations are t to pose health hazards.<br>**Groundwater:** See SS-05 |
| **ST-67: OWS 393**<br>According to site representatives, an OWS was installed around 1980. Water and products from Building 393 were washed down the floor drain and directed to the OWS. As indicated under the SS-19 description, JP-4 was flushed down the floor drain on at least one occasion. | **Soil**: In 1993, subsurface soil samples were collected from four borings. Some volatiles were detected above MDNR's standards, but the concentrations were well below ATSDR's CVs. Lead (130 ppm) was detected at elevated concentrations in a sample collected 5 feet deep, but other samples contained much lower concentrations.<br>**Groundwater**: No samples were collected. | **Corrective Activities:** The OWS has been emptied, cleaned, and closed in place.<br>**Current Status**:<br>The site will officially be labeled as a "No Further Action" site in the near future. | **Soil**: Lead contamination at this site is present in the subsurface. Thus unlikely that on-base residents or the general public were exposed to t soils. Workers could be exposed to lead contaminants for short duratio area is excavated in the future. Concentrations are too low to pose a h hazard to this population, however.<br>**Groundwater:** No on-base water supply wells are located nearby; the no past or current exposures to groundwater have occurred. Potential f exposures are not expected to pose health hazards because there is no that the groundwater has been impacted by activities at LF-67. Further any contaminants that may have reached the water will be captured by BPPTS. |
| **ST-68**<br>This site consists of an OWS at Facility 5067. (The site is located within the boundaries of SS-06.) | **Soil:** According to site representatives, soil samples were collected and no contaminants exceeded health-based guidelines. | **Current Status**:<br>USAF will pursue a "No Further Action" status for this site. | There is no evidence that this site was adversely impacted by site acti |

## Appendix A. Evaluation of Potential Public Health Hazards Associated With the IRP Sites at Wurtsmith Air Force Base (WAFB)

References: Air Force 1990, 1993, 1995; AFBCA 1993, 1997, 1998, 1999a, 1999b, 1999c, 1999d, 1999e, 1999f, 1999g, 1999h, 1999i, 1999j, 2000a, 2000b, 2000d, 2000e, 2001a; AFCEE 1994a, 1994b, 1994c, 1995a, 1995b, 1995c, 1995d, 1995e, 1995f, 1995g, 1995h, 1996a, 1996b, 1996c, 1996d, 1996e, 1996f, 1996g, 1996h, 1996i, 1996j, 1996k, 1997a, 1997b, 1997c, 1997d, 1997e, 1997f, 1998a, 1998b, 1998c, 1998d, 1998e, 1998f, 1998g, 1998h, 1998i, 1998j, 1998k, 1998l, 1998m, 1998n, 1998o, 1998p, 1998q, 1999, 2000; ATSDR 1998a; BRAC 1996; District 1999a, 2000e; USAF 2000, 2001; USEPA 2000a; USGS 1983, 1991; WWES 1993, 1994, 1995a, 1995b.