

## EXECUTIVE SUMMARY

**Objective.** This baseline risk assessment is part of the Remedial Investigation/Feasibility Study (RI/FS) at Hill Air Force Base (Hill AFB) Operable Unit 3 (OU 3). The base is listed on the National Priority List (NPL) and is currently regulated under a Federal Facilities Agreement between Hill AFB, the U.S. Environmental Protection Agency Region VIII, and the Utah Department of Health. The purpose of the agreement is to establish a framework and schedule for developing, implementing, and monitoring appropriate remedial actions at Hill AFB in accordance with the National Contingency Plan. The objective of this risk assessment is to assess the magnitude and probability of current and future public and environmental health threats posed by chemical contamination identified during the RI field investigations at OU 3. This document addresses current and future risks based on the assumption that no attempt is made to prevent or mitigate exposure to existing contaminants. Thus, it provides a baseline for evaluating potential remedial alternatives during the FS process.

**Site History.** Operable Unit 3 is located at the southeast end of Hill AFB and consists of six sites: the Buildings 510 and 514 Fuel Tank Area; the sodium hydroxide storage tanks area; the Industrial Waste Treatment Plant (IWTP) sludge drying beds; Berman Pond; Ponds 1 and 3; and the off-base Layton area. Buildings 510 and 514 were part of the refueling vehicle maintenance facility where excess fuel was drained from vehicles prior to maintenance. Building 510 has a history of solvent usage and/or storage. Several underground tanks used for storage of fuel and solvents were located near these buildings in the past. At the sodium hydroxide tank site, located south of Building 514, piping connections leading to the tanks leaked an estimated 280,000 gallons of sodium hydroxide solution into the ground in 1980 and in 1984. The IWTP sludge drying beds received sludge from paint stripping, chromium-plating, and industrial waste from 1956 to 1976. Prior to their being lined in 1976, excess fluids from the waste sludge percolated into the underlying soil. Berman Pond is currently filled and capped, but, at one time, it received storm water runoff from the southern portion of Hill AFB and the IWTP sludge drying beds. Pond 1 was connected to Berman Pond. Pond 3 receives storm water runoff from five storm drains located on the southern end of Hill AFB and is connected to a storm sewer system that empties into Kay's Creek. The off-base Layton area is considered part of Operable Unit 3 because surface water and groundwater from the shallow, unconfined aquifer beneath it contain contaminants detected at the on-base portion of OU 3.

**Site Hydrogeology.** Operable Unit 3 is underlain by a shallow, unconfined aquifer, with groundwater at a depth range from about 10 to 100 feet. The direction of groundwater flow is towards the west, northwest, and southwest. The aquifer is recharged by infiltration of precipitation and discharges to seeps, springs, and field drains. Wells completed in the shallow aquifer generally produce low yields. At OU 3, the regional Sunset and Delta aquifers occur at approximately 400 and 600 feet below ground surface, respectively. These aquifers contain high quality water, and wells completed in these aquifers typically produce high yields. The Delta aquifer provides drinking water for most communities surrounding Hill AFB as well as Hill AFB itself.

**Nature and Extent of Contamination.** Soils and shallow groundwater were found to be contaminated at OU 3. The soils were found to be contaminated at the surface and subsurface by metals and by volatile organic compounds (VOCs). Groundwater in the shallow, unconfined aquifer was found to contain metals, several VOCs, and phenols. Pond sediments contained metals and several semi-volatile organic compounds, including benzo(a)pyrene. Most of the groundwater contamination is in the low part-per-

million range. Soil contamination generally increases with depth down to the shallow aquifer. Thirty nine contaminants were determined to be of concern in eight different media.

**Exposure Assessment.** There are currently two potential exposure pathways for humans in the vicinity of OU 3. These include exposure of casual visitors to surface water and sediments at Ponds 1 and 3, and exposure to shallow groundwater and surface water off base through irrigation of food crops. For the latter pathway it is not clear, however, whether the contaminants found in the groundwater off base have migrated from the base or come from other sources unrelated to Hill AFB. Pathways that may become complete under future land use scenarios include exposure to surface and subsurface soils by future on-base residents and construction workers and future domestic use of water from the shallow aquifer, both on and off base.

**Human Risk Characterization.** For current exposures, there were no significant estimated risks. If land use changes, some day several other potential contaminant pathways may be created. For the future pathways analyzed, the use of shallow groundwater in a residence built on the site of the on-base portion of OU 3 yielded the highest cancer risk. This risk was estimated to be  $3 \times 10^{-3}$  for residents, and exceeds the NCP potentially acceptable range. The only future exposure scenarios that yield a noncarcinogenic hazard index greater than 1 involve construction workers excavating on-base portions of OU 3 and the on-base residents using the shallow groundwater as a source of drinking water. A hazard index of 3 was estimated for the construction worker and 30 for future residents, based largely on a probably very conservative assumption about chromium.

**Uncertainties.** The calculated risk estimates for OU 3 depend on exposure assumptions and land use scenarios that were highly conservative and potentially overestimated potential exposure doses. Exposure duration and estimates of media contacts were also conservative. The discontinuous and diffuse nature of the contaminant plume at OU 3 prevented the determination of specific sources of contaminants in the shallow aquifer. In fact, the on-base and off-base plumes in the shallow aquifer may not be from the same sources. It is not clear whether the off-base shallow aquifer is hydraulically connected to the on-base shallow aquifer and whether the contaminants originate from the base or from off-base sources (e.g., dry cleaners, service stations, the Utah Department of Highways Maintenance Station, or leaking storm water sewers).

**Environmental Risk Characterization.** There were no environmental risks quantified for OU 3. There were no environmentally significant exposure pathways completed where there was quantitative data to support risk analysis. Potential exposure pathways included exposure to surface water on base (Ponds 1 and 3) and off base in surface drains and Kay's Creek. The contaminants of concern were primarily metals, which could bioaccumulate, and PAHs. There are large uncertainties associated with this assessment because there was only one sampling round with few samples for pond water and sediment.