

EXECUTIVE SUMMARY

This Phase II PITT Well Field Design Report presents the well field design for the partitioning interwell tracer tests (PITTs) to be conducted during the Dense Nonaqueous Phase Liquid (DNAPL) Source Delineation Project at Operable Unit 2 (OU2) at Hill Air Force Base (AFB), Utah. The design, completed as Phase II of the project, is part of the *Source Delineation Work Plan* (SDWP) for Hill AFB (USAF 1997a), and will be implemented during Phase III, the PITT well field installation.

The objectives of the well field design work are:

- To determine the optimum location for each well array to be installed so that the alluvium contaminated with DNAPL in the paleochannel within the containment wall will be included in the total swept volume of the PITTs
- To determine the optimum location for the injection wells, extraction wells, and monitor wells within each well array
- To determine the proper screened interval for each well
- To make preliminary determinations of PITT design parameters, such as injection and extraction rates, water-levels, and test durations.

Phase II of the Source Delineation Project is divided into two tasks: (1) a preliminary geosystem model was constructed to guide the well field design process, and (2) numerical modeling was conducted to help design the PITT well array for each zone to be tested.

The preliminary geosystem model containing the basic hydrogeologic data compiled from the available information about the source zone and obtained from the tasks completed during Phase I of this project was incorporated into two numerical models. The simulation approach involved first modeling the hydrologic processes during the PITTs on a site-wide scale with MODFLOW, and then using UTCHEM to model each individual PITT well array. Modeling with each simulator was conducted concurrently as part of an iterative process to arrive at the final well field design.

The well field for the DNAPL source zone inside the containment wall consists of well arrays divided among four PITT zones. The well array in each PITT zone, is configured as a three-row dual-line drive, with one row of three injection wells aligned east-west between two rows containing three extraction wells each, also aligned east-west. Each test zone covers a distance of approximately 110 feet along the centerline of the paleochannel, with the row of injection wells equidistant from the row of extraction wells. In each row, the wells are spaced approximately 10 feet apart, making the well lines approximately 20 feet wide. A monitor well will be installed between each line of injection wells and extraction wells.

The PITT well field design includes a total of eighteen 4-inch-diameter extraction wells and twelve 4-inch-diameter injection wells. Of these, seven existing wells at OU2 will be used as extraction wells, and 3 existing wells will be used as injection wells. In addition to the injection and extraction wells, two 2-inch monitor wells are to be used in each well array, for a total of eight wells. Of these eight, three existing monitor wells will be incorporated into the PITT well field. A total of 25 new wells will be installed inside the containment wall at OU2 for the source delineation project.