Arizona

Partners: Arizona Department of Environmental Quality

Challenge: Jet fuel contamination of soils and aquifer at the former Williams Air Force Base Superfund Site (ongoing)

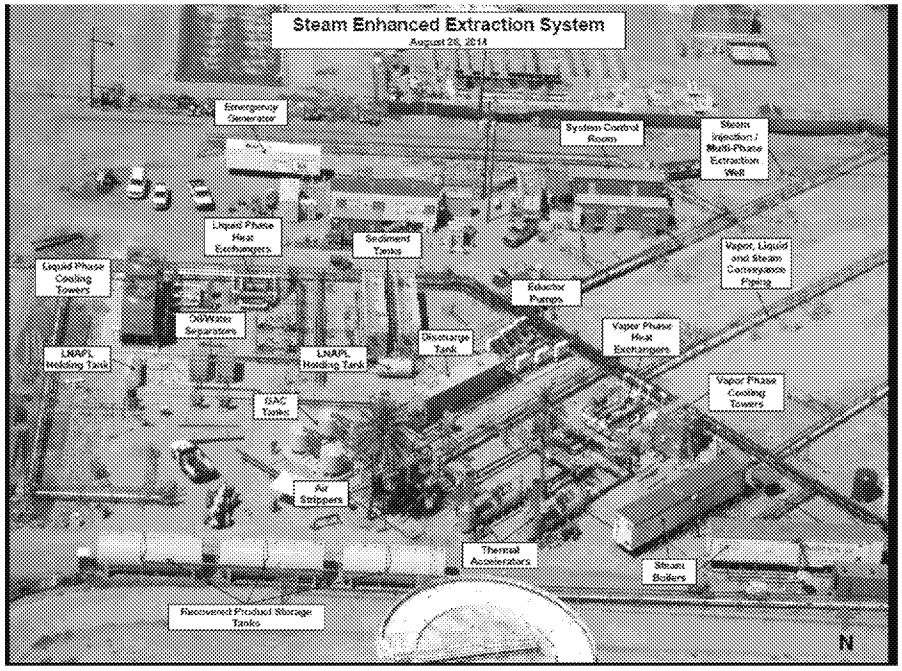
Resource: Technology Transfer and Technical Support for remediation of jet fuel

"The Arizona Department of Environmental Quality appreciates the support Office of Research and Development has provided at the former Williams Air Force Base, Site ST012 former fuel depot jet fuel release site. ORD personnel provided a comfort level to ADEQ to the extent that ADEQ could confidently champion innovative technology use at this site. ORD personnel had a knowledge base of past projects and results to assess the possible and probable outcomes of using an innovative technology, the field expertise to review the planned and actual construction installation, and mastery of theoretical and practical outcomes to confidently evaluate remediation progress." Arizona DEQ

The former Williams Air Force Base in Mesa, Arizona, was commissioned as a flight training school in 1941, and pilot training was its primary mission throughout the history of the base. Fuel storage and distribution operations were conducted at ST012, and releases from these systems contaminated the underlying soil and groundwater. The fuel reached depths of approximately 240 feet below ground surface, before the groundwater started rising, smearing the fuel within the aquifer. The base was closed in 1993, and the majority of the property has been converted to the Phoenix-Mesa Gateway Airport and college campuses, among other uses.

Around 1998, Region 9 and the Arizona Department of Environmental Quality (ADEQ) requested technical support from ORD to discuss steam enhanced extraction (SEE) with the Air Force as a potential remedy for the ST012 fuel spill. With continued technical support from ORD, a pilot study steam injection was implemented in 2008, which recovered an estimated 10,000 gallons of jet fuel. Based on the success of this pilot, a larger scale SEE remediation was initiated in 2014, and operations continued until early 2016. Three different vertical zones of the aquifer were treated, ranging from 140 to 240 feet below ground surface. The total volume of the treatment area was 410,000 cubic yards. More than 300 million pounds of steam were injected, and more than 2.6 million pounds (388,000 gallons) of petroleum hydrocarbons were recovered. The recovered jet fuel was burned in a thermal accelerator or recycled.

ORD Technical Support for this project included aiding in choosing steam injection as the remedial technology, review of all technical documents, including the design and the remedial action work plan, and monitoring the implementation of the technology. Additional ORD technical support was provided on the proposed implementation of enhanced bioremediation of the dissolved phase plume surrounding the thermally treated area.


Steam Enhanced Extraction System
August 28, 2014
Emergency Generator
System Control Room
Steam Injection / Multi-Phase Extraction Well
Liquid Phase Heat Exchangers
Sediment Tanks
Liquid Phase Cooling Towers
Vapor, Liquid and Steam Conveyance Piping
Eductor Pumps
Oil/Water Separators
Discharge Tank
Vapor Phase Heat Exchangers
LNAPL Holding Tank
LNAPL Holding Tank
Vapor Phase Cooling Towers
GAC Tanks
Air Strippers
Thermal Accelerators
Steam Boilers
Recovered Product Storage Tanks
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