

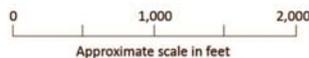
# FACT SHEET

## Union Pacific Railroad Company Passenger Depot Underground Storage Tank Site - Fall 2013

### SITE DESCRIPTION

Union Pacific Railroad Company (UPRR) is working with the Arizona Department of Environmental Quality (ADEQ) Underground Storage Tank (UST) program to manage and clean up petroleum and related compounds in perched groundwater at the Passenger Depot Site. The Passenger Depot Site is located in the northeastern part of downtown Tucson and is bounded approximately by Stone Avenue to the west, Seventh Street to the north, Second Avenue to the east, and Congress Street to the south.

Groundwater at the site is contaminated with diesel fuel associated with historical fueling operations that took place near the current depot building. Other environmental sites are present in the area and resulted in the presence of additional contaminants in groundwater including tetrachloroethene (PCE), trichloroethene (TCE), benzene and methyl tert-butyl ether (MTBE). Depth to the perched aquifer is about 60 to 90 feet below ground surface. The regional aquifer is not affected by the diesel fuel contaminants.



- Area of Potential Impact
- Former Fueling Facilities

## SITE HISTORY

ADEQ initiated an investigation in 1989 to evaluate the nature and extent of petroleum contamination in downtown Tucson. The initial investigation of the Passenger Depot Site was performed in 1991. This and subsequent investigations have indicated that petroleum was present in soil near the fueling facilities and in groundwater beneath an area of downtown Tucson. The site was accepted into the ADEQ Voluntary Remediation Program in 1998, and was moved to the UST program in 2000.

## SITE INVESTIGATION/CLEANUP ACTION

UPRR initiated remedial investigations in May 1998. As part of this and subsequent investigations, 41 monitoring wells were installed to monitor groundwater conditions. 26 remediation wells have also been installed. Interim remedial activities were conducted at the site beginning in 1993, and a full-scale remediation system began operation in 2002. Two multi-phase extraction (MPE) systems were used at the site between 2002 and 2009 to recover petroleum from groundwater. Between 2009 and 2012 different types of remediation technologies were evaluated to assess whether they were more efficient than the MPE systems, which required large quantities of electricity.

In 2012 monitored natural attenuation (MNA) was selected as the remedy for the site. MNA is a technique used to monitor or test the progress of natural degradation of contaminants in soil and groundwater. It may be used as the only remediation process if it (a) assures the protection of public health and welfare and the environment; (b) to the extent practicable, provides for the control, management, or cleanup of regulated substances so as to allow the maximum beneficial use of the water and soil of the State; and (c) be reasonable, necessary, cost-effective and technically feasible (Arizona Revised Statutes 49-1005(D)). In addition to meeting the requirements of Arizona's regulations, MNA was selected

because:

1. The Environmental Protection Agency (EPA) has recognized MNA as being effective for petroleum. MNA is being used to mitigate petroleum contamination at the Passenger Depot Site.
2. Data indicates that natural attenuation is occurring at the site. Attenuation in groundwater typically occurs through biodegradation, dilution, and dispersion. Attenuation above the perched water table occurs through biodegradation. Attenuation is demonstrated by measuring changes in concentrations of dissolved-phase compounds and the production of carbon dioxide by microorganisms.
3. The rate of attenuation can be greater than that which could be achieved through active recovery, especially in areas away from the source.
4. The petroleum present in groundwater at the site is not expanding in size, moving with the groundwater, or generating a plume of contaminants dissolved in groundwater. Therefore a groundwater containment system is not necessary. Groundwater at the site is monitored on an annual basis as described in the approved Corrective Action Plan.
5. Data indicates that petroleum in areas away from the source is difficult to recover. For typical petroleum-contaminated sites, less than half of petroleum released can be recovered by active remediation.
6. The location of the site within a highly developed area, combined with the low anticipated recovery rates for an active remediation system, would make remediation difficult to implement, inefficient to operate, and ineffective at removing all of the petroleum.

Although MNA was selected as the

remedy for the site, recovery of petroleum continues using up to 16 remediation wells near the source zone.

## HEALTH/WATER QUALITY

The *Remedial investigation Report* for the Site (Environmental Resources Management, 2000) included a risk assessment to evaluate the potential for exposure to petroleum hydrocarbons in soil and groundwater. The risk assessment concluded that residual petroleum compounds do not pose a significant risk under current and reasonably foreseeable conditions, primarily because no pathways for exposure to the petroleum were identified. Additional evaluation of potential exposure pathways was conducted for parcels of land that the City of Tucson has identified for development in the *Review of Potential Exposure Pathways for Parcels Identified by the City of Tucson for Upcoming Development* (included in the November 2013 Periodic Site Status Report for the site).

It is possible that construction workers could encounter contaminated materials during construction of deep subsurface structures (the diesel fuel is associated with the perched groundwater zone located about 60 to 90 feet below the ground surface, depending on the location) or if working with shallow soils directly beneath the release points; however this contact would likely be of limited duration and extent. Exposure to petroleum during construction can be minimized by designing new projects in the area with limited structural elements below 60 feet deep, by obtaining input from environmental professionals during design and construction, and segregating material that is impacted by petroleum.

The diesel fuel may introduce petroleum compounds to the perched groundwater zone when the petroleum is in contact with groundwater. Site data indicates that the compounds degrade naturally outside of the area containing diesel fuel. Other contaminants unrelated to the diesel fuel—including PCE, TCE, benzene and

MTBE—are present in the perched groundwater zone. No one is known to be drinking contaminated groundwater from the site, as the perched groundwater zone is not used as a drinking water source.

Vapor intrusion (VI) may occur where contaminants are present beneath existing or planned future buildings. VI is the migration of vapor through the soil and into enclosed spaces such as buildings. This could result in exposure by occupants of the buildings to contaminants that may be present in soil or groundwater. A screening-level assessment indicated that VI associated with diesel fuel at the Passenger Depot Site did not pose unacceptable risk to construction workers or residents. The collection of soil gas samples prior to construction can help assess the potential for VI at a development site. If VI is identified as a potential issue for a specific building, cost-effective methods of addressing VI, such as installing a vapor barrier beneath the building, are available.

## FOR MORE INFORMATION

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Complete public files regarding the site are located at ADEQ's Phoenix offices. Call 1 (800) 234-5677 for information. Hearing impaired persons may call ADEQ's TDD line at (602) 771-4829.

For more information on nearby

environmental sites please visit the ADEQ Web site at: [www.azdeq.gov](http://www.azdeq.gov). At the top of the page, click on Waste Programs, then on Superfund/WQARF. Look for the Site Information and Maps link.

Nearby sites include the Park-Euclid Site (<http://www.azdeq.gov/environ/waste/sps/download/tucson/parkeuclid.pdf>) and the 7th Street and Arizona Avenue Site (<http://www.azdeq.gov/environ/waste/sps/download/tucson/7thstreet.pdf>).