Hassayampa Landfill

EPA National Priorities List Site

Boundaries:

The Hassayampa Landfill Site is located about ten miles west of Buckeye, Arizona, and approximately six miles east of the Palo Verde Nuclear Generating Station. The site consists of about ten acres used for hazardous waste disposal which lies within a 47-acre sanitary landfill.

Site History:

Prior to 1977, the landfill permitted the disposal of industrial wastes (predominantly empty pesticide drums).

When the 19th Avenue Landfill was closed by the City of Phoenix in 1978, industrial waste was transported and disposed of at the Hassayampa Landfill. The Arizona Department of Health Services (ADHS) developed a manifest system to screen and track industrial waste deliveries to the landfill. The Hassayampa Landfill received industrial waste under this manifest system from approximately February 1979 to October 1980.

In December 1981, three on-site groundwater monitoring wells were constructed with ADHS funding. The first sampling in May 1982 indicated groundwater contamination by industrial solvents. The site was subsequently scored by the EPA and placed on the National Priorities List (NPL) on July 22, 1987.

EPA and certain Respondents entered into an administrative consent order on February 19, 1988 which required the Respondents to conduct a remedial investigation (RI) and feasibility study (FS) under EPA direction and oversight.

The RI and FS were completed in 1991 and 1992, respectively. Hazardous substances, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) were detected in the soil and groundwater. EPA selected remedial actions in the Record of Decision (ROD) dated August 6, 1992.

The following remedial actions were implemented at the site including:

- groundwater extraction, treatment by air stripping, and reinjection that began operation in March 1994;
- construction of a cap over the hazardous waste area to prevent direct contact with contaminated waste and soil left in place, to reduce infiltration of water, and to reduce the release of VOC vapors to the atmosphere (constructed in June 1994);
- a soil vapor extraction system and treatment system with thermal oxidation to remove VOCs and SVOCs from the vadose zone in areas where waste and soil contamination have been demonstrated to be a threat to groundwater (began operation in July 1996); and access and deed restrictions.

The soil vapor treatment system has not been operational since September 1998 when it was shut down for repairs. Subsequently, under the orders of the EPA, it was not restarted because of the potential that dioxins are produced by the thermal oxidation process.

In November 2000, EPA's contractor conducted the five-year review of the site remedies. The review found that the cap was in good condition, and the groundwater treatment had produced hydraulic containment and removed a substantial mass of VOCs. The future operation of the soil vapor extraction system was deferred until additional data are obtained.

In November 2002, ADEQ split effluent groundwater samples with the responsible parties (RPs). The samples were analyzed for 1,4- dioxane. Test results were below detection limits.

Site Status:

Since 1998, the Hassayampa Landfill Superfund Site remedy has only removed approximately 35 pounds of the contaminants of concern from the groundwater each year. Soil vapor sampling and analyses indicate extremely high concentrations of volatile organic compounds (VOCs). Groundwater concentrations have been, and are currently increasing. The extent of soil vapor contamination is undefined in the lateral direction. The current remedy (groundwater pump and treat) is not addressing the most serious concerns relating to the loss of containment of soil vapor and possibly groundwater. ADEQ believes that the implementation of the originally designated remedy has failed.

ADEQ and EPA have determined that the existing site conceptual model (SCM) can no longer be supported by the current site conditions. Therefore, EPA and ADEQ requested the Hassayampa Steering Committee (HSC) to develop a new SCM.

The HSC has recently selected a new "Supervising Contractor" (GeoSyntec Consultants). The selection was approved by ADEQ and EPA in accordance with the requirements of the existing consent decree (CD). The CD describes how the parties will work together to implement the remedy.

ADEQ and EPA communicated to the HSC the need to provide a work plan to perform work that will further identify the problem of loss of containment, and mitigate any significant existing concerns. The HSC submitted a work plan in July 2005. ADEQ and EPA provided comments on the work plan in September 2005. The parties met and the HSC was advised on how to finalize the work plan which will involve installation of new soil vapor and groundwater monitoring wells above and beneath the basalt layer.

The HSC conducted site-wide groundwater and soil vapor sampling in November 2005. Implementation of an approved new sampling and analysis plan is anticipated after January 1, 2006.

In January 2006, EPA initiated the second Five-Year Review of the cleanup remedy for the site that will culminate in the issuance of a report of its findings.

Site Hydrogeology:

The site is located on the broad southward-sloping alluvial plain of the Hassayampa River basin. The basin is bounded on the east by the White Tank Mountains, on the south by the Buckeye Hills, and on the west by the Palo Verde Hills. The altitude of the land surface is approximately 910 to 915 feet above mean sea level.

Regional hydrogeologic units in the area of the site include in order of increasing depth: recent alluvial deposits, basin-fill deposits, and the bedrock complex. Groundwater levels in the vicinity of the site generally lie below the base of the recent alluvial deposits. However, where saturated, the recent alluvial deposits may yield moderate quantities of groundwater to wells. The thickness of the basin-fill deposits appears to exceed 1,200 feet in the vicinity of the landfill.

The basin-fill deposits comprise the principal source of groundwater to wells in the area of the site, and are generally referred to as the regional aquifer. Within a three mile radius of the site, 349 groundwater wells have been identified, 172 of which potentially service individual residences. These wells yield groundwater from the regional basin-fill deposits aquifer. The reported depths range from five feet below land surface to 250 below land surface. The nearest downgradient domestic well is about 2,500 feet south of the site. The basin-fill deposits have been classified in order of increasing depth into the upper, middle, and lower alluvium units. The upper alluvial unit (UAU) beneath the site was subdivided in order of increasing depth into the upper alluvium deposits, basaltic lava flow unit, subunit A, and subunit B. The upper alluvium subunit consists of a coarse-grained part and a fine-grained part. The average depth to the base of the coarse-grained part is about 34 feet, while the average depth to the base of the fine-grained part is about 58 feet. The basaltic lava-flow consists of vesicular, basaltic rock and is part of the Arlington Mesa basalt flows. This subunit appears to thin and dip towards the north.

The presence of contaminated groundwater in subunit A indicates that the basaltic lava flow unit is not an impermeable unit. The part of the UAU from the base of the basaltic lava-flow subunit to the top of the middle alluvial unit (MAU) is the uppermost water bearing part of the regional aquifer.

The direction of groundwater flow in subunits A and B is generally to the south, although local variations in the flow direction may occur. The average depth to the water table beneath the site is 73 feet.

Contaminants:

The current contaminants of concern for groundwater include various volatile organic compounds (VOCs): 1,1-dichloroethene; trichlorotrifuoroethane; 1,1,1-trichloroethane; 1,1-dichloroethane; trichloroethene; tetrachloroethene; trichlorofluoromethane; 1,2- dichloroethene; 1,2-dichloropropane; and toluene. Soils beneath the waste pits contain VOCs, heavy metals, pesticides, and lime wastes. Contaminants of concern at the site may change as new data become available.

Public Health Impacts:

Risk assessment results indicate that potential health risks may exist for individuals who ingest the contaminated groundwater or come into direct contact with hazardous wastes present. The landfill is capped, therefore, there is no potential for adverse health effects due to inhalation of VOCs in the air. Contamination in the groundwater is contained within the site boundaries. The groundwater contamination is restricted to the shallow aquifer which is not used as a potable water source.

Community Involvement Activities:

The site is located in a very sparsely populated area. A fact sheet was distributed to residents and commercial businesses in the vicinity of the site in January 2006 announcing the beginning of the second Five-Year Review. EPA held an Open House on January 11, 2006 for the community to come and learn about how the Five-Year Review will be conducted.

Information Repository:

Interested parties can review site information at the information repository at the Buckeye Library located at 310 North Sixth Street in Buckeye, (602) 386-2778. Site information is also available for review at the ADEQ main office located at 1110 West Washington Street in Phoenix. With 24 hour notice, an appointment to review related documentation is available Monday through Friday from 8:30 a.m. to 4:30 p.m., at the ADEQ Records Management Center, 1110 W. Washington Street in Phoenix, Arizona. Please contact (602) 771-4380 or (800) 234-5677 to schedule an appointment to review these documents.

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*In Arizona, but outside the Phoenix area, call toll-free at (800) 234-5677.
**Call EPA's toll-free message line at (800) 231-3075.