ENVIRONMENTAL PROJECTS

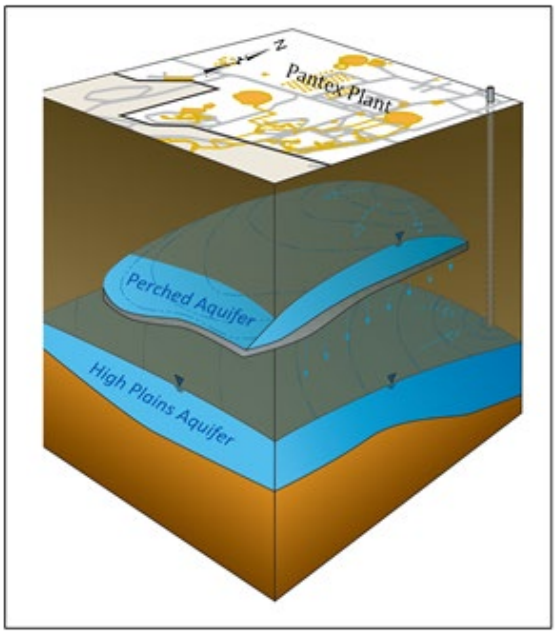
PANTEX ENVIRONMENTAL RESTORATION





Perched Groundwater Pump and Treat System

The Pantex Groundwater Resource Conservation and Recovery Act Facility Investigation Report identified impacts to perched groundwater that require corrective action. The Pantex Site Wide Human Health Risk Assessment found that perched groundwater underneath the Pantex Plant contains high explosives and other constituents that could migrate over time to the High Plains Aquifer (HPA). The HPA, commonly referred to as the Ogallala Aquifer, is the main drinking water source in the area. The area of primary concern is in the southeast corner of the main Plant and offsite, adjacent to this area. The fine-grained zone prevents vertical migration in most areas, but becomes thinner and more permeable in the southeast where migration to the High Plains Aquifer is possible.



Groundwater Beneath Pantex

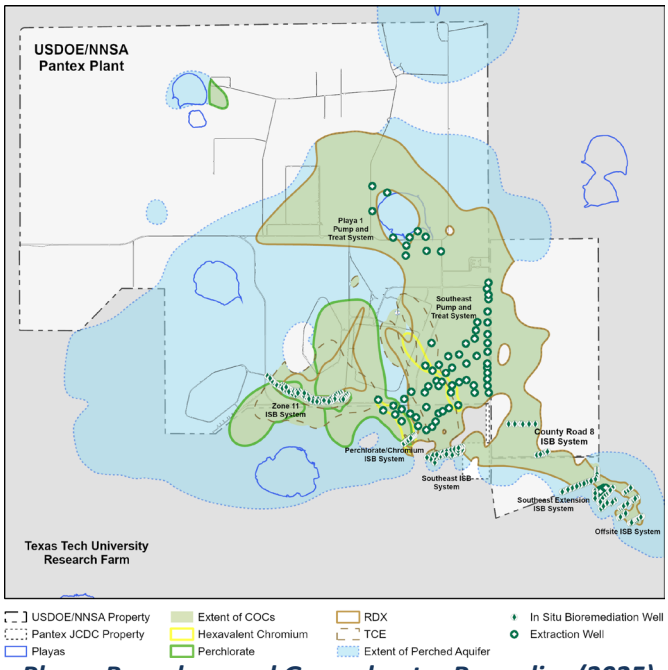
Through extensive studies using groundwater fate and transport models, Pantex recognized that recharge occurring through Playa 1 created a subsurface mounding condition, which pushes high explosives and other chemicals in the perched groundwater to the southeast. Additionally, the slope of the fine-grained zone the perched aquifer sits upon allows the water to move downgradient toward the southeast.

As part of the corrective actions specified in the Record of Decision (ROD) and the Hazardous Waste Permit (HW-50284), Pantex operates two pump and treat systems, with a total of 64 operational extraction wells that can treat up to 550 gallons per minute (gpm) of contaminated perched groundwater. The pump and treat systems were installed to address contamination in areas where there was generally greater than 15 ft of saturation in the perched aquifer. These systems are designed to remove and treat groundwater to achieve contaminant mass reduction and reduction in the saturated thickness of the perched aquifer. Reduction in saturated thickness will significantly reduce the migration of contaminants both vertically and horizontally. This will limit migration to the High Plains Aquifer and allow natural breakdown processes to occur over time.

To achieve mass reduction and reduction in saturated thickness, the pump and treat systems treat the extracted water to levels safe for residential use before the effluent is sent to the wastewater treatment facility and irrigation systems for beneficial use. The treated water is also used for industrial purposes including dust suppression, maintenance of landfill covers, and for industrial or construction operations as needed. Pantex also uses the treated

water to mix with the amendment injected into the *in situ* bioremediation systems.

The Playa 1 Pump and Treat System (P1PTS) was installed by late 2008, and the system became fully operational in January 2009. This system was installed as part of the Remedial Action selected in the ROD to reduce the mound of water beneath Playa 1 that provides the driving force for water and contaminant movement to the southeast. The system also removes contaminant mass from the water before sending the treated water to be used beneficially, if available.



Plume Boundary and Groundwater Remedies (2025)

The Southeast Pump and Treat System (SEPTS) has been operating since 1995 when it started as a treatability study. It has been expanded with more extraction wells and the capacity to treat boron, perchlorate and hexavalent chromium to become part of the final remedy for the southeastern portion of the groundwater plumes. The purpose of this system is to remove water and contaminant mass. While the primary goal is to beneficially use the water, the SEPTS retains the capability for injection back into the perched zone, as necessary. Three injection wells near Playa 2 and one well near the SEPTS provides a long-term solution for management of treated water when other beneficial use is not available. The pump and treat systems remove high explosives (primarily RDX), solvents (such as TCE), hexavalent chromium, perchlorate, PFAS, and boron.

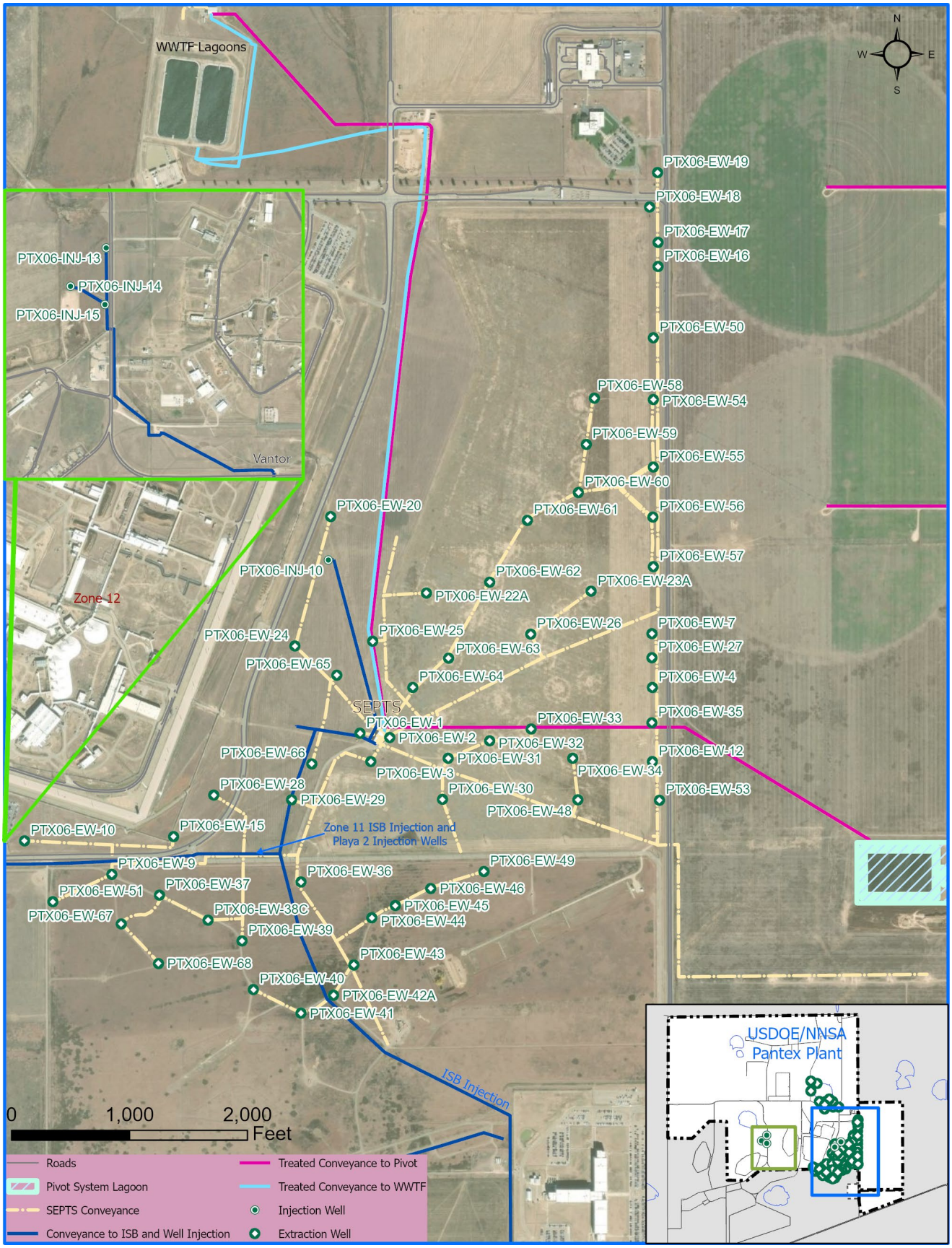
The systems treat the water through a series of granular activated carbon tanks to remove organic contaminants including high explosives, PFAS and solvents. Hexavalent chromium, boron, and perchlorate are removed through ion exchange resin beds.



Ion Exchange and Effluent Tanks at SEPTS

The systems have treated an average of 176 million gallons of water and removed an average of 1,000 lbs of contaminants per year since the start of Remedial Action. By the end of 2025, Pantex treated 3.6 billion gallons of impacted perched water, removing about 17,996 lbs of contaminants during the process. Pantex has beneficially used about 53% of the treated water since the start of the Remedial Action.

In areas under the influence of the pump and treat systems, water levels have declined at a rate of about 1 foot per year in most wells. Higher rates of decline have been observed in some areas. It is expected to take several years of extracting water to fully affect the perched groundwater gradients in the southeastern area of the plume, thereby reducing movement of high explosives and other chemicals to the southeast. This action is one of several positive steps Pantex is taking to protect the HPA.



SEPTS Wellfield 2025

Perched Groundwater Pump and Treat Systems



P1PTS Facility
Playas
Roads
Extraction Well
P1PTS Well Conveyance
Treated Conveyance to Pivot
Treated Conveyance to WWTF

*Please see SEPTS map above for a depiction of the full Pivot and WWTF conveyance.

P1PTS Wellfield 2025