

PRESTO #25 REMEDIAL SYSTEM EXPANSION

SCOPE

Install three trenches to capture groundwater and gasoline from areas between the alley east of Louisiana Street and Ohio Street, and to prevent the gasoline from migrating further east, potentially under the homes along the east side of Ohio Street. Pump fluids collected by the trenches back to the existing treatment building at the rear corner of the vacant lot at 838 Louisiana Street.

HISTORY

In April 2006, a leak was discovered at the Presto #25 station on the northwest corner of the intersection of 9th Street and Louisiana, following a fire that destroyed the house at 838 Louisiana Street, located east of the station.

An investigation, administered through the Kansas Department of Health and Environment (KDHE) Petroleum Storage Tank Release Trust Fund, identified that gasoline had migrated east-northeast from the station. The majority of the gasoline was located under the house at 838 Louisiana Street and the Law Firm building to the south (842 Louisiana). Some gasoline was believed to have migrated east of the alley behind the house and law firm, and groundwater impacted with petroleum hydrocarbons was identified to have migrated as far east as the alley east of Ohio Street.

The geology of the area (generally clay soil) is not conducive to remediation of the soil and groundwater impacted by the release using conventional, cost effective remediation techniques. At that time, the decision was made to install a pump and treatment system to control and contain the plume, and remediate the recovered groundwater. Monitoring of the groundwater plume was performed on a quarterly basis to confirm the plume was not further migrating from the impacted area.

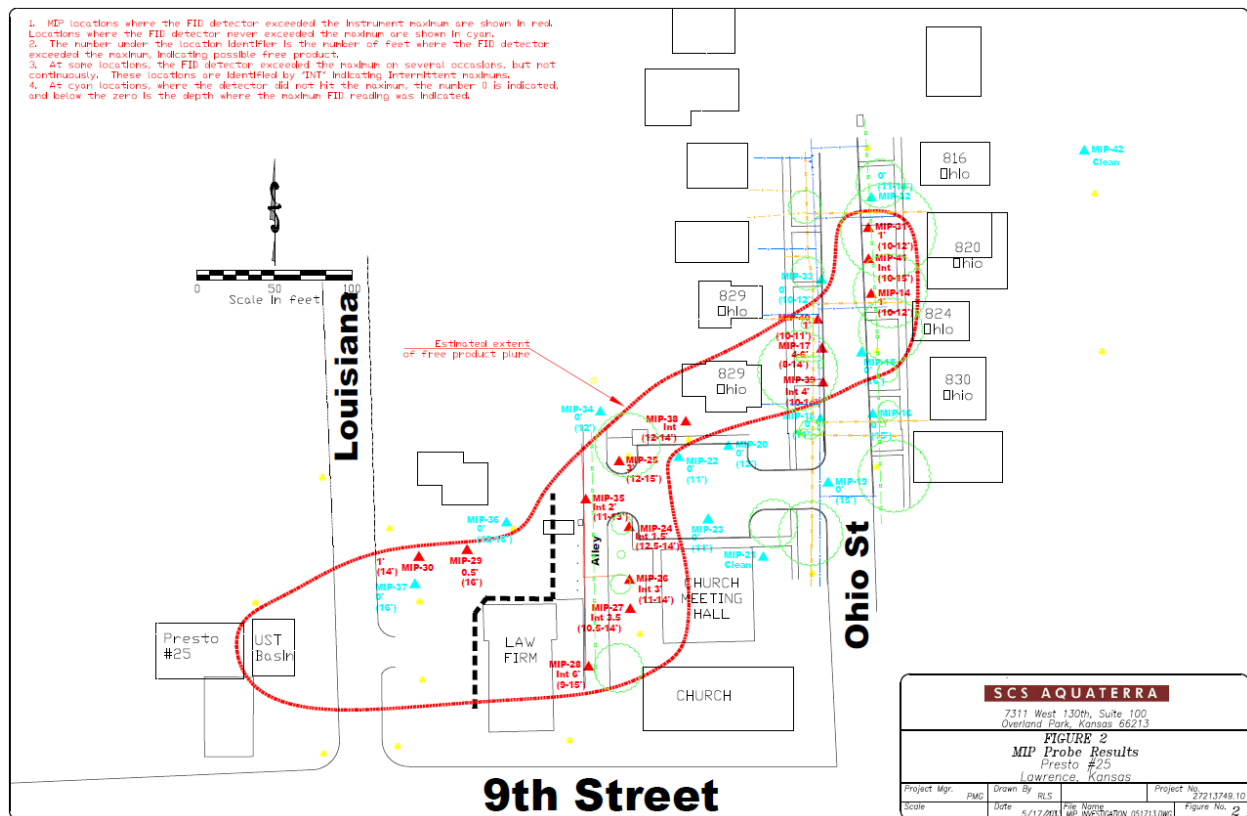
The KDHE Petroleum Storage Tank Release Trust Fund paid for installation of a cutoff trench located along the west and north side of the Law Firm building, and across the rear property of the destroyed house. The purpose of the trench was to cut off the migration pathway of the gasoline and impacted groundwater located to the west of the trench, to capture and recycle the gasoline, and treat and discharge the recovered water to the sanitary sewer. A treatment system, designed to capture and treat the gasoline and water, was installed on the northeast corner of the lot at 838 Louisiana Street.

In the first two years of system operation, over 1,100 gallons of gasoline was recovered. The recovered gasoline was recycled by using the gasoline to operate farm equipment.

WHY THE EXPANSION IS NEEDED

In August 2012, the groundwater monitoring system used to monitor the impacted groundwater around the site detected rising levels of petroleum hydrocarbons in a well (MW-21) located in front of the home at 824 Ohio Street (east side of Ohio St). In March 2013, liquid gasoline was detected in the well.

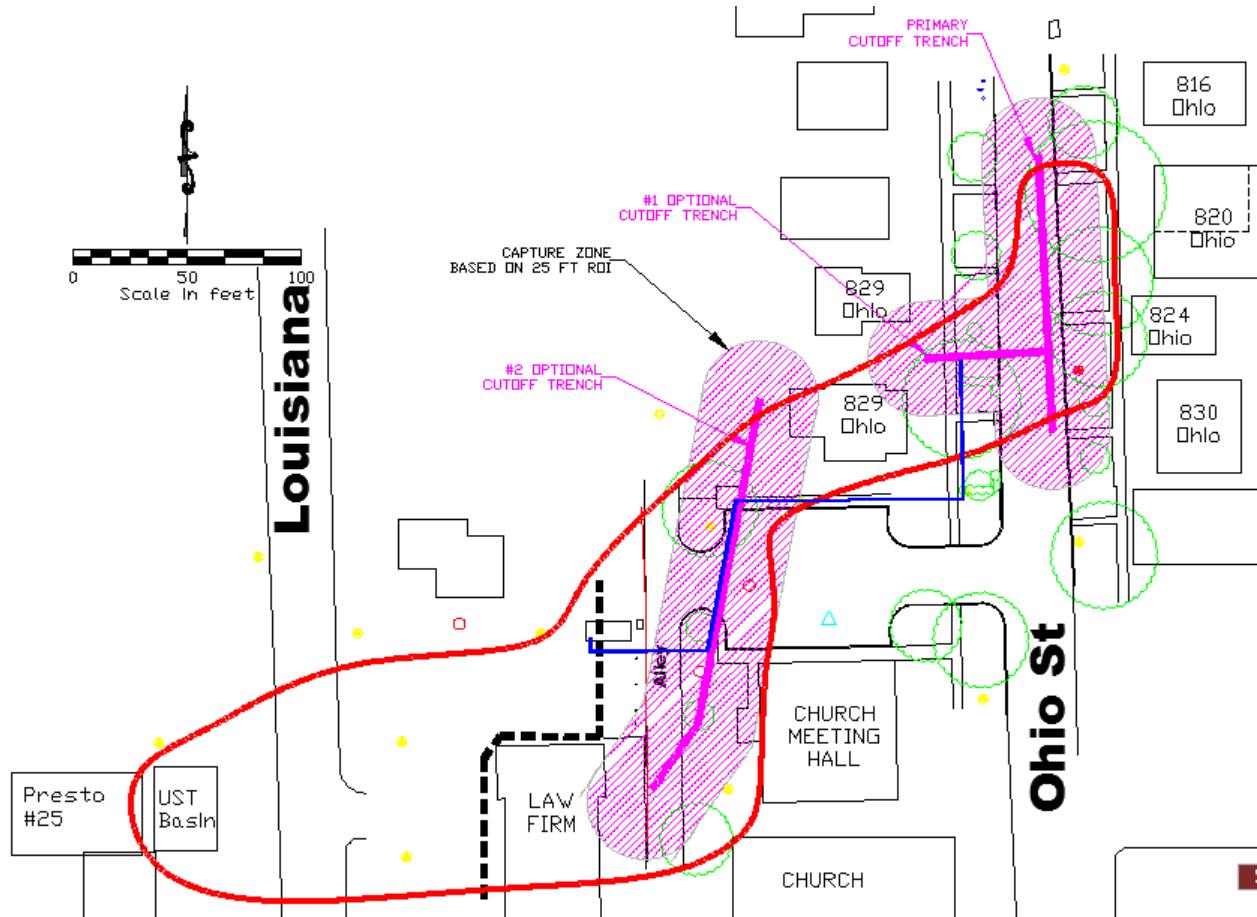
In April 2013, KDHE immediately ordered an emergency investigation of the area between the cutoff trench and the homes on the east side of Ohio Street. The results of the investigation activities and historical data indicated the probable presence of gasoline within the area shown by the red line on the map below.



It is unknown if the gasoline had moved into the area in 2006 and had not previously been detected, or was now moving into the area. In mid-May 2013, to protect the residents in the affected area, KDHE authorized the design of an expansion of the treatment system, installation of explosion-proof sump pumps in residences potentially affected by the gasoline, and installation of vapor monitors in potentially impacted homes.

Based on the data from the emergency investigation, design engineers proposed the installation of three collection trenches to capture the gasoline that is believed to be in the affected area. Based on experience with operating the 2006 trench and test results conducted around the trench, the new trenches should be able to capture gasoline from the soils above the trench and for a distance of approximately 25 to 35 feet radially from the trench. The limited capture zone is due

to the low permeable clay soils present in the area. Due to the limited capture area, multiple trenches were proposed to prevent the gasoline from migrating further east and under the houses on the east side of Ohio Street and to capture gasoline that is believed to be located under the house at 829 Ohio Street. On the map below, the trenches are shown by the pink lines and the capture zone is shown by the pink cross hatch areas.



The design engineers proposed the installation of a recovery trench in the center of Ohio Street as opposed to the area to the east of Ohio Street, in order to protect the trees along the street. At a May 29, 2013 meeting with city staff, KDHE presented the findings of the investigation and the conceptual design plan. City staff agreed with the need to protect the trees, but requested the trench be located in the center of the northbound side of the street. Bids for the construction were obtained at the end of June 2013.

TRENCH DETAILS

The trench in Ohio Street will be approximately 2 feet wide and 18 feet deep. A water collection pipe will run along the bottom of the trench from the south end to a concrete manhole located on the north end of the trench. An explosion-proof sump pump will be installed in the manhole to pump the water and gasoline from the trench to the existing treatment building. In addition to

the water piping, the trench will include wells to allow a vacuum to be applied to the trench. Known as soil vapor extraction (SVE), the vacuum can capture gasoline trapped on the soil by converting the gasoline from a liquid to a vapor and pulling the vapor from the trench.

The trench will be backfilled with free draining crushed concrete from the bottom of the trench to 4.5 feet below the surrounding pavement grade. The water and SVE piping will be located above the concrete and the remainder of the trench will be backfilled with flowable fill. Flowable fill is a mixture of cement and sand that has been designed for use in utility trenches in streets that can be easily excavated by utility crews installing utility lines. The flowable fill is poured into the trench like concrete and provides excellent strength with no settlement.

STREET RESTORATION

One day after placement of the flowable fill, the pavement can be replaced over the flowable fill. As requested by city staff, the edges of the undisturbed pavement will be saw-cut to provide a straight and clean pavement edge and the replacement pavement section above the flowable fill will consist of 6 inches of concrete overlain by 2 inches of asphalt to match the existing pavement grade.

Other than the manhole at the south end of the trench and a cleanout (standard water valve box), all infrastructure associated with the trenches in the street will be covered with pavement.

Tubing to obtain vacuum readings from within the trench will be extended to a box to be located in the grass area between the street and sidewalk in front of the house at 829 Ohio Street. The box for access to the tubing will be a typical plastic valve box installed for lawn irrigation systems. The water lines and SVE lines will be extended underground from the trench to the existing treatment building.

SUMMARY

- The probable presence of gasoline in the area between the existing cutoff trench and the residences on the east site of Ohio Street has resulted in KDHE authorizing use of monies from the Petroleum Storage Tank Release Trust Fund to install additional collection trenches in the area.
- The geology in the area is not conducive to conventional remedial techniques, and the proposed pump and treatment alternative, while expensive, is the best option to both protect the residents of the area and capture the gasoline release from underground storage tanks.
- The proposed trench has been designed to be installed with the least inconvenience possible, in a manner to protect the trees along the street, and to accomplish the goal of capturing and collecting the gasoline in the area.
- When the trench is installed, the only visible signs of the remedial system will be:
 - A standard sewer manhole in the street pavement at the north end of the trench,
 - A pipe cleanout using a standard water valve box at the south end of the street, and

- A plastic irrigation valve box in the grass between the street and the sidewalk in front of 829 Ohio Street.
- The water and gasoline pumped from the trenches will be treated using the existing treatment system on the rear of the property at 838 Louisiana Street. Recovered gasoline will be taken off site for recycling and groundwater will be treated by air stripping and discharge to the City sanitary sewer system as per current operations. The KDHE Petroleum Storage Tank Release Trust Fund has and will continue to pay the City of Lawrence for the volume of water discharged to the sanitary sewer system.