



Photo #1: Excavation of former sewer line between MH #250052 and MH #250055, note the gas main



Photo #2: Transferring clay filtering media from filter pot to drums using a drum vacuum



Photo #3: View of subcontractor installing monitoring well MW-36



Photo #4: View inside the raw water tank during cleaning of sediment/sludge

Work Plan Overview

The U.S. EPA conditionally approved the *Off-site Interim Measure Work Plan & Response to Comments (Work Plan)* dated June 18, 2019 which proposed the removal and replacement of approximately 1,286 linear feet of sanitary sewer main along portions of Hamilton Avenue and Forsythe Street. **To date, all sanitary sewer main has been replaced (approximately 1,298 feet) and all former sanitary sewer main has been removed (approximately 1,286 feet).** Any private residential sewer laterals that tie into the existing sewer main were visually inspected (if feasible) during the work activities and replaced if the inspection determined that the existing sewer laterals were in poor condition or constructed with vitreous clay pipe (VCP). **To date, 21 sanitary sewer laterals have been inspected and 19 sewer laterals have been fully replaced and 4 sewer laterals have been partially replaced.** The *Work Plan* also proposed dewatering portions of the sewer excavation trench and treating the water with a temporary off-site groundwater treatment system consisting of a series of frac tanks and carbon filtration vessels. Once the water was treated, a confirmation batch water sample was obtained to confirm the water met drinking water standards and then the treated water was discharged to the municipal sewer system. **As of November 16, 2019, approximately 342,330 gallons of groundwater have been**

recovered and treated by the groundwater treatment system and discharged to the municipal sanitary sewer. As part of cleaning for removal of the off-site groundwater treatment system, approximately 32.04 tons of groundwater with high total solids were removed from the weir tanks and transported to the landfill for solidification and disposal. The soil being excavated was immediately placed within a lined, sealed roll-off box and then covered with a tarp for transportation back to the site until the onsite laboratory provided analytical results confirming the soil was characteristically non-hazardous. Once the laboratory confirmed it was non-hazardous, then the tarped roll-off box was transported to a permitted solid waste landfill for disposal. **As of November 16, 2019, approximately 424 roll-off boxes have been hauled to the landfill for disposal, which equals 6,740.79 tons.** This includes the on-site formerly abandoned sanitary sewer lateral excavation which was approved by the US EPA on October 17, 2019. Approximately 340.76 tons of soil were excavated and disposed at a permitted solid waste landfill between October 22 and 25, 2019. As part of cleaning for removal of the off-site groundwater treatment system, approximately 3 tons of carbon/sediment were transported to the landfill for disposal.

The *Work Plan* and subsequent *Perimeter and Work Area Air Monitoring Plan (version 2.3) (Monitoring Plan)* submitted on August 23, 2019 discussed the air monitoring program which was implemented to ensure the safety of the construction workers and occupants of the adjacent neighborhood. Air monitoring equipment was stationed along the edge of the public right-of-way in both the upwind (1 location) and downwind (2 locations) directions of the excavation work area on a daily basis in order to monitor air quality on a continuous basis during the excavation activities. Handheld portable air monitoring equipment was also utilized on an hourly basis to document conditions immediately around the excavation area. IWM Consulting also monitored for particulates using dust monitors which were positioned in the same stations/locations as the other air monitoring equipment.

Per the approved *Monitoring Plan*, grab air samples were obtained in the field adjacent to the air monitoring equipment if the average concentration for the air monitoring equipment exceeds 100 parts per billion (ppb) over a 1-hour period of time or exceeds 500 ppb over an 18-minute interval. The field samples were analyzed at the job trailer via a Hapsite instrument, which is portable Gas Chromatograph/Mass Spectrometer. The Hapsite is capable of documenting TCE and PCE concentrations as low as 0.2 ppb. The agreed upon Action Level for PCE and TCE are 6.1 ppb and 0.4 ppb, respectively. The ambient air monitoring equipment was calibrated on a daily basis.

During the first week of excavation activities, paired Hapsite field sampling and grab (5-minute flow regulator) summa canister samples were collected on a daily basis and the summa canister samples were submitted to a fixed laboratory for analysis. Additionally, two (2) sets of upwind and downwind summa canister samples (equipped with 24-hour flow regulators) were obtained for laboratory analysis. The purpose of the paired sampling was to verify the Hapsite field readings and to determine if a correlation could be made regarding Hapsite field readings vs. fixed laboratory analytical results. The purpose of the 24-hour samples were to document the air quality within the project area over a 24-hour period of time as opposed to a quick 5-minute sampling period.

One set (upwind and downwind) of 24-hour summa canisters was obtained at a rate of 1 set per week throughout the duration of the excavation portion of the project. Additional Hapsite field samples and/or paired Hapsite/5-minute grab summa canisters were only obtained if alarm conditions exist for the field deployed air monitoring equipment.

If for any reason the laboratory analytical results indicate that the ALs are being exceeded, the work activities were stopped and appropriate vapor mitigation measures (wetting of soil, application of a foam

suppressant, covering with clean soil, etc.) was implemented. **All of the laboratory analytical results received to date confirm that the ALs were not exceeded and work stoppage was not required.**

General Comments:

The Off-site Interim Measure work activities were started on August 26, 2019. The work activities started on the south end of the project area at sewer manhole #250040. This is the manhole immediately north of the Ross Court and Forsythe Street intersection. As of November 8, 2019, all sewer main replacement and removal activities on Forsythe Street and Hamilton Avenue have been completed. Additionally, all private sewer laterals have been evaluated and replaced, as necessary.

A qualified contractor has been secured to complete the sewer lining portion of the project. It is anticipated that the sewer cleaning and video inspection will take place the week of November 18, 2019 and the sewer lining should be completed prior to the end of 2019.

Per the *Work Plan*, the excavation activities extended to a depth 2 feet below the invert of the existing sewer main. The saturated sandy soils located along the perimeter of the excavation were unstable and sidewall slumping occurred when the excavation extended beyond the limits of the trench box. Dewatering activities were ceased on October 22, 2019. All of the groundwater treatment equipment should be demobilized during the week of November 18, 2019.

Per the approved Pilot Study Work Plan, injections of a PlumeStop and Micro-ZVI mixture were completed by Regenesys in the vicinity of monitoring well MW-35 and injection wells located within the sanitary sewer main trench situated on the southern portion of the work area. Injection activities were completed on October 22 and 23, 2019. The first subsequent groundwater sampling event should be completed during the week of November 25, 2019.

To date, two (2) complaints have been received from local residents during work activities due to long work hours trying to set the initial (250040) and second (250050) manholes and reconnecting sanitary sewer service. An update was sent out to project area residents following the noise complaint to explain why the long work hours were required. Moving forward, it is anticipated that long work hours will not be necessary since sanitary main installation work has been completed.

Sewer Main and Lateral Replacement Summary:

Total Manhole Structures Replaced to Date: 6 (MH #250040; MH #250050; MH #250051; MH #250052; MH #250053; and MH #250056)

Total Linear Feet of Sewer Main Replaced to Date: ~1,298 feet

Total Linear Feet of Sewer Main Removed to Date: ~1,286 feet

Total Linear Feet of Sewer Laterals Replaced to Date: ~1,292.25 feet

Total Linear Feet of Onsite Sewer Lateral Removed to Date: ~248 feet

Total # of Sewer Laterals Inspected to Date: 21 (includes the one that was determined to be plugged and inactive/abandoned)

Total # of Sewer Laterals Replaced to Date: 19

***Total # of Partial Sewer Laterals Replaced to Date:** 4

*Indicates that the entire lateral did not need replaced based upon the construction type and condition observed but per the project scope the line was replaced to the edge of the public right-of-way and an exterior cleanout port was installed (since one was not already present at the property).

Waste Disposal Summary:

Thus far, all roll off boxes which have been sampled for waste characterization purposes confirm the soil is characteristically and categorically non-hazardous per the approved Contained-In letter from the Indiana Department of Environmental Management.

***Total # of Roll-off Boxes Sent to Landfill to date for Project: 424**

****Total Tons of soil disposed at the Landfill to date for the Project: 6,740.79**

Total # of vacuum truckloads of sediment sent to landfill to date for the Project: 1

Total Tons of carbon/sediment removed from the offsite water treatment system: 3

* Includes 5 boxes generated during the new gas line installation activities

** Based upon scale tickets provided by the landfill and includes the 340.76 tons removed from on-site excavation activities.

Last soil disposal ticket pertains to non-hazardous carbon removed from the offsite waste water treatment system (3 tons).

Approximate total gallons of groundwater treated by off-site system: 342,330

Total gallons of treated groundwater discharged to the sanitary sewer: 342,330

Total Tonnage of groundwater removed from the weir tanks and solidified at the landfill: 32.04

Air Sampling Summary:

No total VOC exceedances with Perimeter Area RAEs or work area ppb RAE have been observed during this reporting period. Only occasional elevated readings were observed for 1-3 minute spans but the elevated readings always occur when the asphalt is being removed or when the new PVC sewer piping is being cut.

Because no documented exceedances (perimeter or work area) were noted throughout this reporting period, work continued without interruption and no vapor suppression activities have been implemented.

Per the request from the U.S. EPA and the approved Perimeter and Work Area Air Monitoring Program, IWM Consulting did obtain a series of paired Hapsite and grab (5-minute) summa canister samples for laboratory analysis during the first week of work activities. We have also obtained a series of paired (upwind and downwind) 24-hour summa canister samples for laboratory analysis.

All of the laboratory analytical results received to date confirm that the ALs are not being exceeded. A discussion of the paired Hapsite and laboratory analytical results is provided below.

Hapsite & Laboratory Results Comparison/Discussion

The first laboratory analytical report was received for the split grab sample obtained on August 27, 2019. The Hapsite PCE and TCE values were 0.718 ppbV and 2.32 ppbV, respectively. The corresponding laboratory analytical report documented PCE and TCE concentrations of <0.2 ppbV and <0.2 ppbV, respectively.

The second laboratory analytical report was received for the split grab sample obtained on August 28, 2019. The Hapsite PCE and TCE values were 0.193 ppbV and 0.322 ppbV, respectively. The

corresponding laboratory analytical report documented PCE and TCE concentrations of 0.048 ppbV and 0.037 ppbV, respectively.

The laboratory analytical report for the first set of 24-hour samples obtained on August 27-28, 2019 indicated a PCE and TCE concentration of 0.16 ppbV and <0.016 ppbV, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.045 ppbV and 0.059 ppbV, respectively.

The third laboratory analytical report was received for the split grab sample obtained on August 29, 2019. The Hapsite PCE and TCE values were 0.808 ppbV and 0.568 ppbV, respectively. The corresponding laboratory analytical report documented PCE and TCE concentrations of 0.23 ppbV and 0.22 ppbV, respectively.

The fourth laboratory analytical report was received for the split grab sample obtained on August 30, 2019. The Hapsite PCE and TCE values were 0.102 ppbV and 0.370 ppbV, respectively. The corresponding laboratory analytical report documented PCE and TCE concentrations of 4.1 ppbV and 0.046 ppbV, respectively.

The laboratory analytical report for the second set of 24-hour samples obtained on August 29-30, 2019 indicated a PCE and TCE concentration of 0.044 ppbV and 0.042 ppbV, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.057 ppbV and 0.10 ppbV, respectively. The duplicate sample, obtained from the downwind location, exhibited similar PCE and TCE concentrations of 0.041 ppbV and 0.062 ppbV, respectively.

The fifth laboratory analytical report was received for the split grab sample obtained on August 31, 2019. However, Hapsite field analysis was not performed for the August 31, 2019 split grab samples as the unit ran out of nitrogen and nitrogen was not delivered that day as scheduled. The corresponding laboratory analytical report documented PCE and TCE concentrations of 0.048 ppbV and 0.11 ppbV, respectively.

The laboratory analytical report for the third set of 24-hour samples obtained on September 3-4, 2019 indicated a PCE and TCE concentration of <0.015 ppbV and 0.14 ppbV, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.038 ppbV and 0.07 ppbV, respectively.

The sixth laboratory analytical report was received for the split grab sample obtained on September 10, 2019. The Hapsite PCE and TCE values were 0.027 ppbV and 0.073 ppbV, respectively. The corresponding laboratory analytical report documented PCE and TCE concentrations of 0.055 ppbV and 0.048 ppbV, respectively. This verifies that the alarm condition exhibited by the AreaRAE Pro Unit 2 was due to asphalt petroleum vapors.

The laboratory analytical report for the fourth set of 24-hour samples obtained on September 10-11, 2019 indicated a PCE and TCE concentration of 0.036 ppbV and 0.097 ppbV, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.074 ppbV and 0.038 ppbV, respectively.

The laboratory analytical report for the fifth set of 24-hour samples obtained on September 17-18, 2019 indicated a PCE and TCE concentration of 0.12 ppbV and 0.016 ppbV, respectively, for the upwind

sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.25 ppbV and 0.06 ppbv, respectively.

The laboratory analytical report for the sixth set of 24-hour samples obtained on September 25-26, 2019 indicated a PCE and TCE concentration of 0.061 ppbV and 0.038 ppbV, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.13 ppbV and 0.17 ppbv, respectively. Additionally, an ambient air sample was collected from the back porch of one residence within the project area and indicated a PCE and TCE concentration of 0.058 ppbV and 0.029 ppbV, respectively. Wind was from the southwest during the majority of this sampling event.

The laboratory analytical report for the seventh set of 24-hour samples obtained on October 3-4, 2019 indicated a PCE and TCE concentration of 1.8 ppbV and 0.21 ppbv, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.42 ppbV and <0.014 ppbv, respectively.

The laboratory analytical report for the eighth set of 24-hour samples obtained on October 9-10, 2019 indicated a PCE and TCE concentration of 0.049 ppbV and <0.016 ppbv, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.03 ppbV and <0.016 ppbv, respectively.

The laboratory analytical report for the ninth set of 24-hour samples obtained on October 15-16, 2019 indicated a PCE and TCE concentration of 0.032 ppbV and <0.016 ppbv, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.25 ppbV and <0.04 ppbv, respectively.

The laboratory analytical report for the tenth set of 24-hour samples obtained on October 23-24, 2019 indicated a PCE and TCE concentration of 0.91 ppbV and <0.015 ppbv, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.65 ppbV and <0.015 ppbv, respectively.

The laboratory analytical report for the eleventh set of 24-hour samples obtained on November 7-8, 2019 indicated a PCE and TCE concentration of 0.029 ppbV and 0.014 ppbv, respectively, for the upwind sampling location. The analytical results for the downwind sampling location had PCE and TCE concentrations of 0.14 ppbV and 0.026 ppbv, respectively. The duplicate sample, obtained from the downwind location, exhibited similar PCE and TCE concentrations of 0.029 ppbV and 0.016 ppbv, respectively.

All of the laboratory analytical results received to date confirm that the ALs are not being exceeded and the 24-hr analytical results further suggest that an upwind source of PCE or TCE may be present in the project area.

Based upon the six (6) sets of comparison results that have been received, it appears that the Hapsite unit is providing results (specifically TCE) which are typically higher than laboratory analyzed samples, with the exception of a higher PCE concentration in the downwind grab sample obtained on August 30 and September 10, 2019.

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