CITY OF POMONA
Water Resources Department

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Internship Duration: October 30, 2019 – June 25, 2020

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Organization: City of Pomona – Water Resources Department

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Acknowledgements

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Executive Summary

The City of Pomona is the seventh largest city in Los Angeles County with a population of over 151,000 residents. A large population requires an equally large demand for clean, reliable, and abundant water. This feat is helped and accomplished by the hard working individuals at the City of Pomona Water Resources Department (Department), who aim to protect and manage the natural water resources for the population of Pomona. The City receives over 55% of its water from aquifers within the Chino, Six, and Spadra groundwater basins. From San Antonio Canyon, the City obtains 12% surface water. The remaining 33% comes is imported water from Metropolitan Water District (Via the Three Valleys Municipal Water District's Miramar plant and the Municipal Water District's Weymouth plant). The City of Pomona's Water Resources department is split into 4 divisions: Administration/Engineering, Water Production/Treatment, Water Distribution/Wastewater, and Water Quality.

The Water Distribution Division ensures high quality water is delivered to the residents and businesses of the City of Pomona safely and efficiently. This is done while maximizing locally produced groundwater and surface water, thus minimizing reliance on more costly sources of water. **Administration/Engineering** provides the fiscal, administrative, and integrity oversight and control. This division also assists water quality, production, distribution, engineering designs, and the implementation of the City's Capital Improvement Program (CIP) projects, to ensure effective and efficient operation of the water system. This division also ensures the protection and conservation of Pomona's natural water resources through education, planning, waste reduction and pollution prevention. This is done through the various areas of Environmental Programs: Stormwater, Energy Efficiency and Water Conservation. **Water Production/Treatment**

also strives to maximize local groundwater and surface water sources to minimize the purchasing of more expensive water sources from Metropolitan Water District (MWD) and Three Valleys Municipal Water District (TVMWD). They also operate and maintain the City's water treatment facilities, air stripping towers, anion exchange plants, and includes the inspection, repair and maintenance of plant equipment. This division helps achieve this by acquiring and storing sufficient quantities of high quality potable water and recycled water to serve residents and businesses. **Water Distribution/Wastewater** maintains the City's distribution system through inspections of infrastructure, operations and providing repairs to any water related utility and equipment to ensure safety and reliable service. Furthermore, this division provides safe, and efficient wastewater collection and conveyance through maintenance, engineering, and customer services. **Water Quality's** primary goal is to remain in compliance with the Environmental Protection Agency, California Department of Public Health, and Los Angeles County Department of Public Health requirements. This is achieved by providing cross-connection control, chemical analysis, bacteriological testing as well as reporting on the quality of the City's water to its customers and governmental agencies.

This internship experience will detail a diversity of efforts within the City's Water Resources Department along with support of other departments. Special attention and analysis will be placed on the CalSol environmental remediation site which will be discussed in the Project Objectives section of this report.

In mid-March, the internship had an unexpected shift from an in-office work experience to a completely online environment due to the COVID-19 pandemic. This report will also detail

how the internship changed, what the new work environment was like, and how the City of Pomona managed the situation.

Project Objectives

Located just west of the heart of the City of Pomona lies a 1.2 acre plot of land at 822 West Commercial Street. This location is referred to as the Calsol site and is listed as a hazardous waste generator of waste oil, mixed oils, and liquids with halogenated compounds. This site once stored many aboveground and underground chemical storage tanks containing acetone, xylenes, toluene, 2-butanone, isopropanol, gasoline, kerosene, mineral spirits, diesel, methylene chloride, tetrachloroethene (PCE) and trichloroethane (TCA). Its most recent installations occurred in September of 1998. Chemical storage tanks are commonly the culprit of contamination of soil and groundwater. This may be due to structural failures, mishaps in handling, and lack of inspection and maintenance.

In 1976, an accident was caused when a refuse truck attempted to beat the train before it crossed the railroad, and did not. The truck collided with the train, and the resulting truck debris struck an above ground tank containing PCE. A chemical spill from the tank occurred on the CalSol site due to this accident. Once the City of Pomona acquired the property, remediation of the land was a necessity due to most of the spill seeping into the land and possibly the groundwater. This contamination raised alarms for the City's Water Resources Department (WRD) . In response to this remediation need, the WRD is managing the environmental cleanup of the site. After remediation, this property will be redeveloped for neighborhood use as a local plaza.

Project Outcomes

822 West Commercial Street

Due to this property having PCE, TCE, and other volatile organic compounds (VOCs) soil contamination remedial action consisting of soil vapor extraction (SVE) is in progress. According to the Environmental Protection Agency, VOCs are certain compounds that may become gaseous/vaporous and may cause short- and long term adverse health effects. The SVE system is providing treatment of soil vapor by granular activated carbon (GAC) absorption. This causes a vacuum effect underground and draws in soil vapor to be cleaned and prevent it from entering the atmosphere, thus keeping the community public health safe from any negative effects. The contaminated soil vapor is then filtered through granular activated carbon (GAC) vessels and the treated air is then vented into the atmosphere.

Currently, SVE is the remediation method being used for this property and has proved successful in lowering concentrations of the dangerous VOCs. PCE and TCE are the chemicals of concern because they account for approximately 98% of the VOCs detected on the site. There are certain goals to be reached in the remediation process depending on the depth of the soil called Preliminary Cleanup Goals (PCGs). At 5 feet below ground surface (bgs) PCGs for PCE and TCE are 0.93 µg/L and 0.91 µg/L respectively. As the depth increases, more contamination is expected. At 15 feet bgs, PCGs for PCE and TCE are 7.58 µg/L and 2.39 µg/L, respectively. For PCE, as of 11/25/2019, 21 of the 39 soil vapor monitoring locations that were sampled reported that they are below the cancer risk PCG at the 15-foot interval. For TCE, as of 11/25/2019 38 of the 39 vapor monitoring locations that were sampled reported that they are below the cancer risk PCG at the 15-foot interval, with 31 sample locations below detectable limits. Although the

15-foot interval concentrations are seeing acceptable limits of PCE and TCE as the remediation process continues, the depths greater than 15-feet still contain high concentrations. Time and effort is still required to ensure there is enough contamination removal to begin utilizing the area.

As a resident of Pomona, I take great pride in knowing that the City has put fourth extensive efforts to keep the community healthy with this thorough cleanup project. I visited the site myself to gain an in-person understanding of what a remediation site looks like. Images from my site visit can be seen in appendix A.

As of June 27, 2019, an estimated total of 7,360 pounds (572.7 gallons) of VOC's have been removed by the prior Extended SVE Pilot Test and current SVE system.

Additional Project Work

In addition to the main restoration project, other skillsets that I've acquired over the course of the internship have involved acclimating myself to engineering software such as ArcMAP GIS and ArcGIS Pro, interesting projects such as City landscaping improvements, and water quality testing at water treatment plants.

I used ArcMAP GIS and ArcGIS Pro to input data on the City to archive whenever the City employees cut into the pavement to make repairs to water utilities such as mainlines, service lines, and gate valves. This gives reviewers opportunities to track trends in repairs, see where repairs have been required the most, and access immediate knowledge on the history of repairs in a certain area. I also used ArcGIS Pro to create a feature class that contained the data of work orders done throughout the city. This included fire hydrant replacement and repairs, service and mainline leak repairs, installation and replacement of meters, and replacement of service lines with updated materials. Additionally, I also input data from archived fire flow tests in ArcGIS Pro.

There are many examples of the City working to upgrade infrastructure that may be deemed as unaesthetically pleasing by the community. Two such examples are production Wells 21 and 23. Currently, these wells are surrounded by residential areas and are easily seen with only a chain link fence separating the infrastructure site and the community. By manipulating the landscape with implementation of greenery, the curb view of utilities will be softened along with the additional benefits of adding more plants into the city. My duties for the initial phases of this project were to do research on another landscape project in the City that implemented dry climate plant species for both aesthetics and ease of maintenance purposes. We did an on-site investigation to take photos of the area, used applications and databases, such as I-naturalist, to determine plant species, biological description, and water demands. We also took a look at the infrastructure that was marked by Dig Alert to see if there were any underground utilities that may be of concern when modifying the landscape. Underground lines could be damaged and cause major repercussions if unaccounted for on any project.

One day I had the fortune of doing a ride along with one of the water quality personnel. We went to two of the treatment facilities owned by the city. I assisted in taking water samples and performing one of the simple water quality tests for chlorine. I learned that some water quality samples may be taken on site while other are required to be sent to an external laboratory. The entire process can be quite tedious as you must wait for chemical reactions in the water to occur to determine results, and a lot of time to pass for air bubbles to float to the top of samples as to not affect any water quality results. It was a fun experience, nonetheless, to learn about another aspect of the City's Water Resources Department. Images I took with my phone can be seen in Appendix B.

COVID-19

My internship was somewhat altered with the COVID-19 pandemic. The City of Pomona took preventative interaction measures by allowing many of the employees, including myself, to work from home. Although this halted my ability to go out to project sites and my access to the dual-monitor set-up at my desk, I was still able to fulfill duties and work on projects from home. I was even trained to use the ArcGIS web browser tool to create and edit maps for several projects I worked on. My supervisor called and set up meetings frequently to check up on me to see if I had any questions, update me on how the City was fairing with stay at home orders, and to provide additional tasks for me to accomplish. Additionally, the City sent out constant updates on their response to the developing situation, along with providing webinars and informational newsletters on the virus and how to stay safe.

Working from home has many pros and cons. The pros include being able to sleep in a little longer, not have to emit greenhouse gasses on the way to the office, and having a slightly higher level of comfort from home. Some of the cons include a weaker computer, lack of software, and easy distractions. Thankfully, these issues were never too severe and my internship is still a fun and fulfilling experience despite these unexpected circumstances.

Future Intern Advice

My time with the City of Pomona has been an incredibly beneficial to my career as a civil/environmental engineer. I gained much knowledge that will make me more competitive in the engineering field including software knowledge from ArcGIS, water quality testing, City standards, general City functionality, and many miscellaneous nuggets of information bestowed upon me from various people throughout my internship.

A cliché when giving a future intern advice is to tell them to ask many questions regarding any assignment or anything they may be curious about that may require additional information. Not only will this speed up the process of an assignment, but it may also provide valuable information that your supervisor might have accidently forgot to mention. But an intern should also take very good and organized notes to refer back to them whenever necessary. Take some time after your day at your internship to review your notes and become prepared to be well versed in topics you have already covered, because they will likely come back. Some minor and quality of life tips would be to always bring something to take notes with while you're outside of the office, always bring an extra pen or pencil for your supervisor, and keep a few extra business cards from your supervisor on you at all times. Always be honest with your supervisor when they ask what kind of areas of project work interest you. My supervisor bent over backwards to make sure I was able to explore the various disciplines within the City, such as solid waste management and stormwater.

Last, always come into the office with a positive and willing to learn attitude and you will have a great experience!

APPENDIX A

System Configuration, Concentration Readings and Levels, in person remediation site visit

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SVE System
System Manifold
LEGEND
SOIL VAPOR EXTRACTION WELLS - UPPER VADOSE ZONE
SOIL VAPOR EXTRACTION WELLS - LOWER VADOSE ZONE
SOIL VAPOR MONITORING PROBES - UPPER VADOSE ZONE
SOIL VAPOR MONITORING PROBES - LOWER VADOSE ZONE
CALSOL LOT BOUNDARY
NAD 1983 STATE PLANE CALIFORNIA V FEET
SCALE IN FEET
FIGURE 6
SOIL VAPOR EXTRACTION
SYSTEM AS-BUILT
FORMER CALSOL FACILITY
POMONA, CALIFORNIA
REQUESTED BY: BH
DRAWN BY: NR
DATE: 8/15/2018
PROJECT: 0888820400
ENSAFE
DATA SOURCES: Google Earth Pro Imagery - Dated 10/18/2016

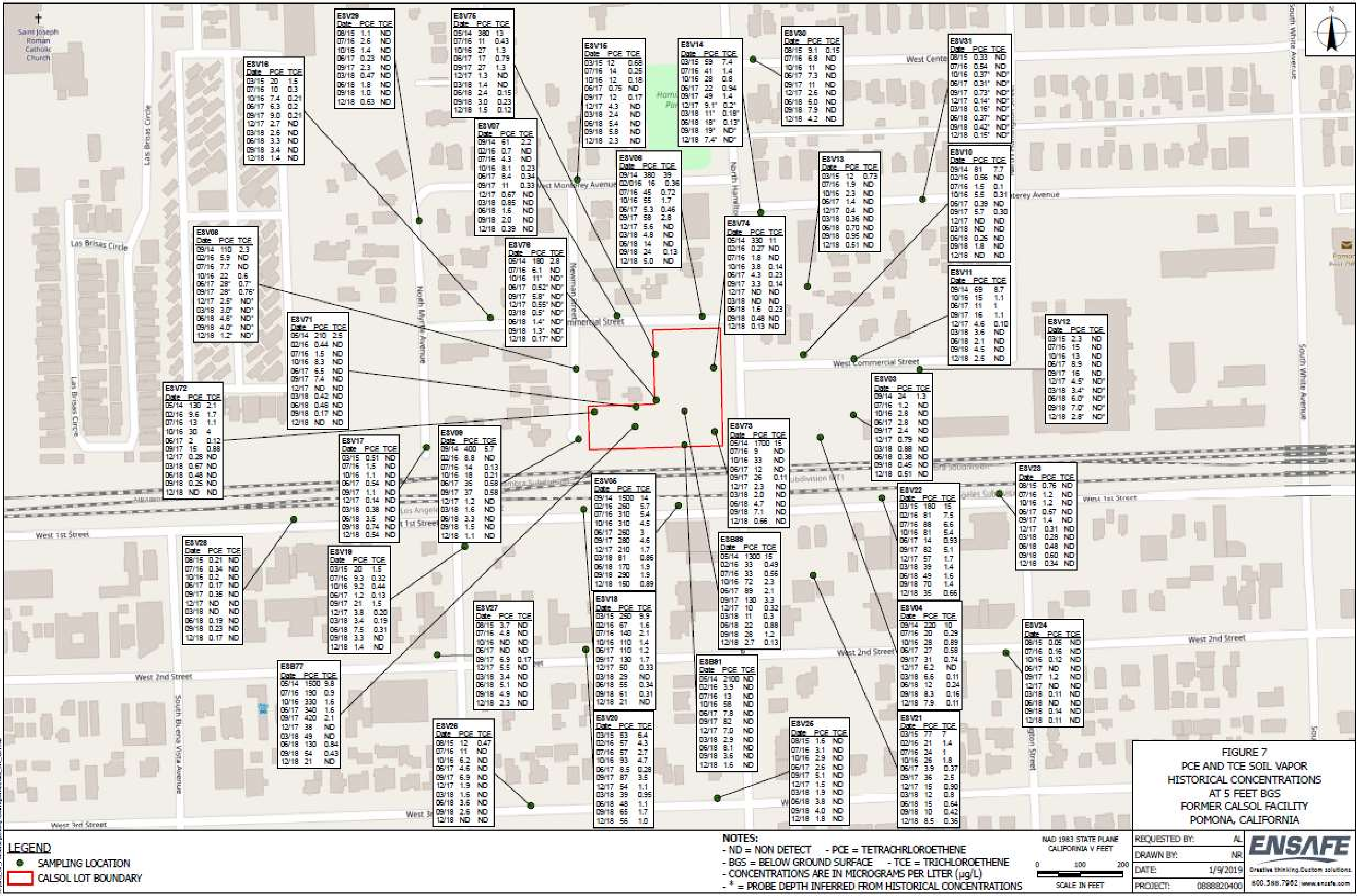
FIGURE 7
PCE AND TCE SOIL VAPOR
HISTORICAL CONCENTRATIONS
AT 5 FEET BGS
FORMER CALSOL FACILITY
POMONA, CALIFORNIA
LEGEND
SAMPLING LOCATION
CALSOL LOT BOUNDARY
NOTES:
- ND = NON DETECT - PCE = TETRACHRLOROETHENE
- BGS = BELOW GROUND SURFACE - TCE = TRICHLOROETHENE
- CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
- * = PROBE DEPTH INFERRED FROM HISTORICAL CONCENTRATIONS
NAD 1983 STATE PLANE CALIFORNIA V FEET
0 100 200
SCALE IN FEET
REQUESTED BY: AL
DRAWN BY: NR
DATE: 1/9/2019
PROJECT: 0888820400
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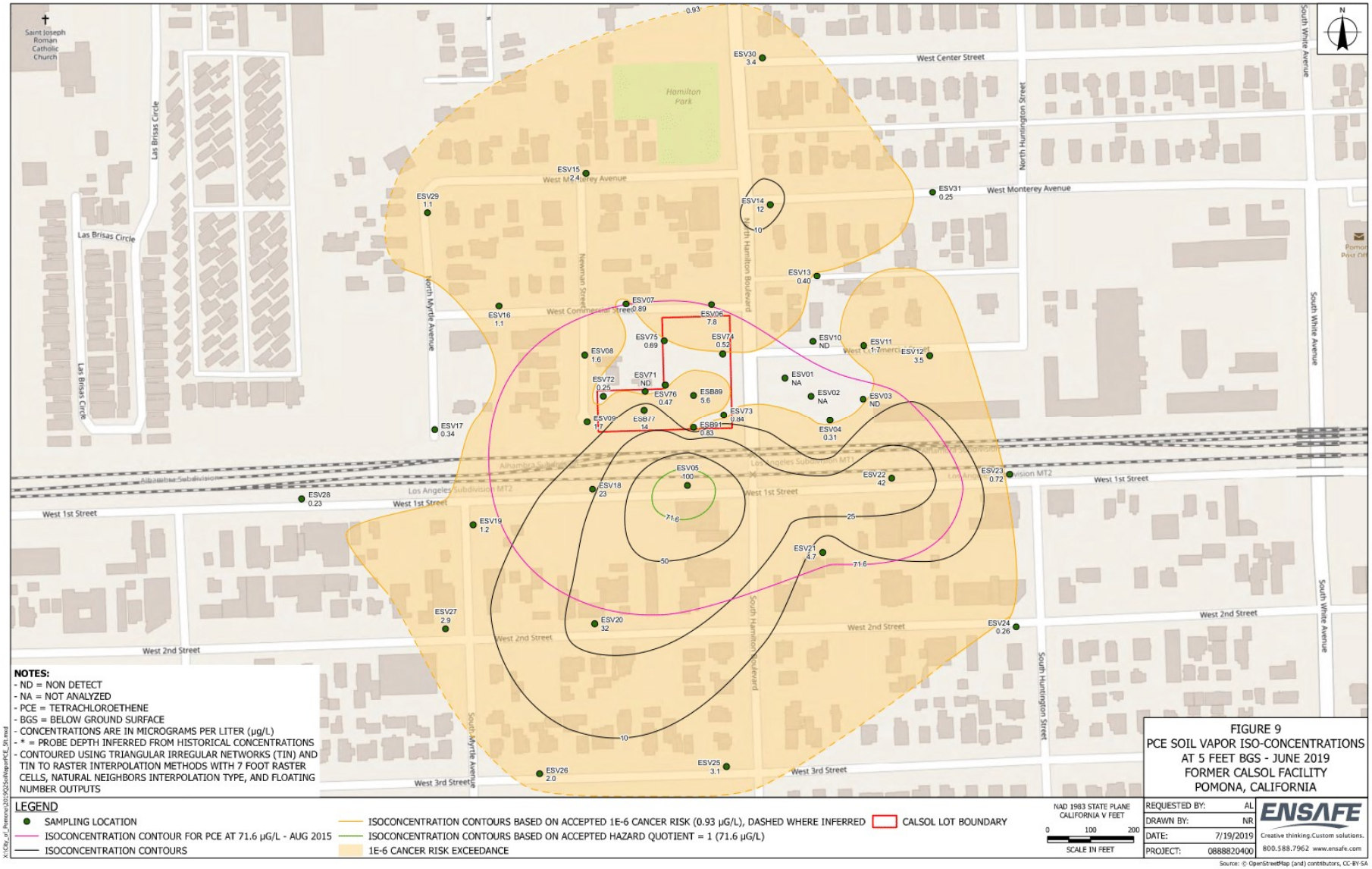
West Commercial Street
West 1st Street
West 2nd Street
West 3rd Street
North Myrtle Avenue
Newman Street
South White Avenue
Las Brisas Circle



NOTES:
- ND = NON DETECT
- NA = NOT ANALYZED
- PCE = TETRACHLOROETHENE
- BGS = BELOW GROUND SURFACE
- CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
- * = PROBE DEPTH INFERRED FROM HISTORICAL CONCENTRATIONS
- CONTOURED USING TRIANGULAR IRREGULAR NETWORKS (TIN) AND TIN TO RASTER INTERPOLATION METHODS WITH 7 FOOT RASTER CELLS, NATURAL NEIGHBORS INTERPOLATION TYPE, AND FLOATING NUMBER OUTPUTS

LEGEND
- SAMPLING LOCATION
- ISOCONCENTRATION CONTOUR FOR PCE AT 71.6 µG/L - AUG 2015
- ISOCONCENTRATION CONTOURS
- ISOCONCENTRATION CONTOURS BASED ON ACCEPTED 1E-6 CANCER RISK (0.93 µG/L), DASHED WHERE INFERRED
- ISOCONCENTRATION CONTOURS BASED ON ACCEPTED HAZARD QUOTIENT = 1 (71.6 µG/L)
- 1E-6 CANCER RISK EXCEEDANCE
- CALSOL LOT BOUNDARY

NAD 1983 STATE PLANE CALIFORNIA V FEET
0 100 200
SCALE IN FEET

FIGURE 9
PCE SOIL VAPOR ISO-CONCENTRATIONS AT 5 FEET BGS - JUNE 2019
FORMER CALSOL FACILITY
POMONA, CALIFORNIA

REQUESTED BY:	AL
DRAWN BY:	NR
DATE:	7/19/2019
PROJECT:	0888820400

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WASTE


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OUTLET
INLET


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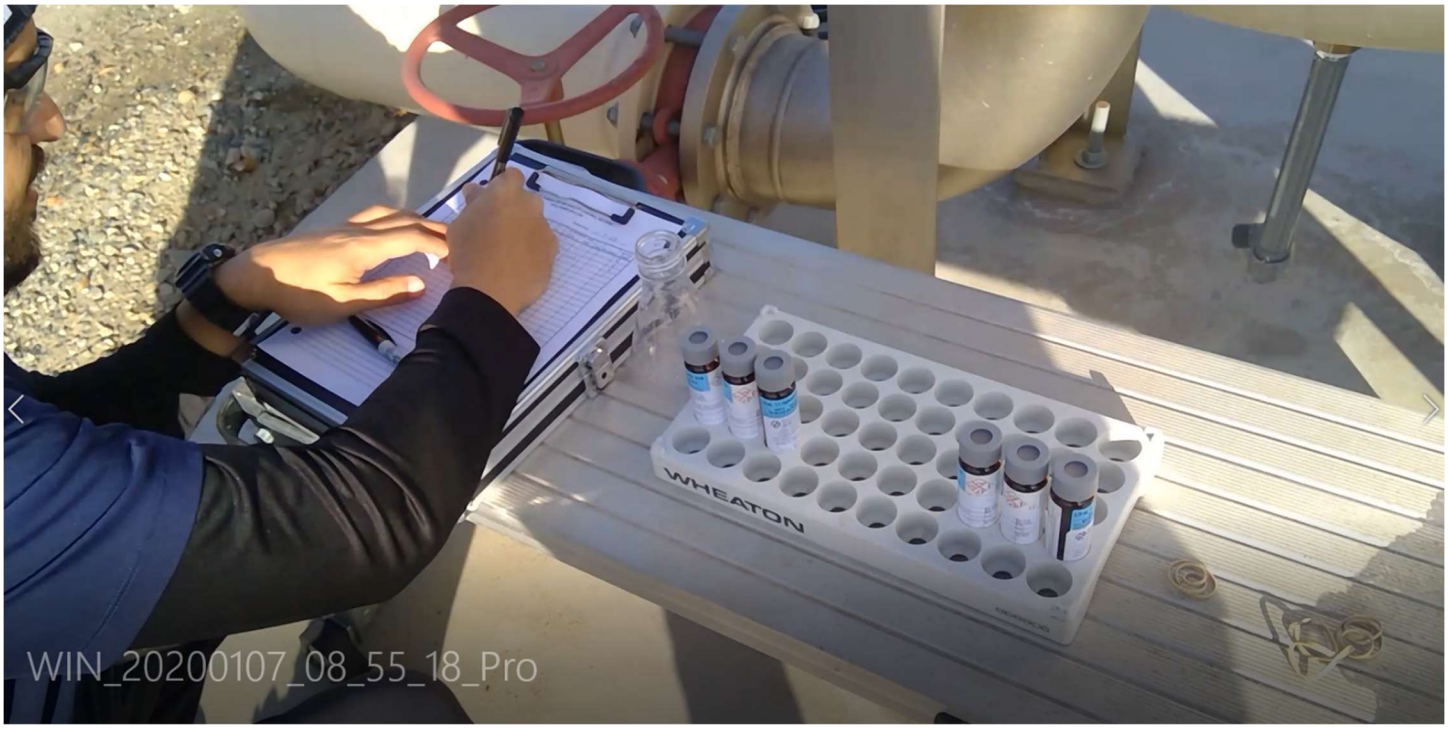
APPENDIX B

Water quality testing at water wells and treatment plant effluent locations


WHEATON
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APPENDIX C

Landscaping project