CITY OF POMONA
Water Resources Department

Ashley Bell

California State Polytechnic University – Pomona

Internship Duration: December 3, 2018 – April 25, 2019

Advisor: Nichole Horton, P. E.

Organization: City of Pomona – Water Resources Department

Report Submission Date: April 25, 2019

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Acknowledgements

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I would to express my gratitude to the Water Resources Institute (WRI) at California State University – San Bernardino.

I extend a sincere thank you to the Santa Ana Watershed Project Authority (SAWPA) and the CivicSpark Fellows.

This project was supported by Santa Ana Watershed Project Authority's (SAWPA) Disadvantaged Communities Involvement (DCI) Program and Proposition 1 funding from the California Department of Water Resources (DWR).

Executive Summary

The City of Pomona Water Resources Department (Department) aims to protect and manage the natural water resources for the people of Pomona, providing the cleanest water possible to its residents and businesses. Pomona receives just over 75% of its water from aquifers located adjacent to San Antonio Canyon and the San Gabriel Mountains, and it's important that the Department stewards this natural resource. The Department addresses work within six divisions; Water Distribution & Wastewater, Administration & Engineering, Water Production & Treatment, Water Quality and Environmental Programs.

The Water Production and Treatment Division maximizes locally produced groundwater and collected surface water in order to minimalize the dependency on more expensive alternatives such as purchased water. The also acquire, store and deliver sufficient quantities of high quality potable/recycled water to the City's customers (residents and businesses) in the most effective and efficient manner. The Administration & Engineering Division provides overall administration, interagency coordination with other water agencies, fiscal control, engineering design, and the implementation of the City's Capital Improvement Plan (CIP) programs. Providing maintenance of the City of Pomona's distribution and wastewater system is the main goal and objective of the Water Distribution & Wastewater Division. This is achieved by carrying out regularly scheduled inspections of infrastructure. At times this includes repair for a variety of system infrastructure to ensure customers have a safe, stable supply of potable water and stable wastewater collections. The Water Quality Division provides cross-connection control, chemical analysis, biological testing, and water quality reporting to regulatory agencies such as the Environmental Protection Agency (EPA), California Regional Water Quality Control Board

(RWQCB), and the Los Angeles County Department of Public Health (DPH), help to ensure the City's water supply remains in compliance with State and Federal requirements. The Environmental Programs Division incorporates stormwater, energy efficiency, water conservation, conservation education, waste reduction, and pollution prevention to protect and conserve our natural resources.

This internship will focus on a diversity of efforts within the City's Water Resources Department, and includes a little bit of each of the aforementioned divisions goals, objectives, and daily operations. Support for other Departments in the City will also be included. The intern will provide support to the Public Works, Community Services and GIS Departments. Greater attention will be given to the environmental cleanup project which will be discussed in greater depth within the project objectives.

Project Objectives

Located on 1.17 acres of land, the property located on 822 West Commercial Street in the City of Pomona is currently under environmental testing and remediation. Previously, the site had been used for aboveground and underground storage tanks by the Calsol facility. Its most recent installations occurred in September of 1998. Many of these storage tanks included the following chemicals and biohazards; acetone, xylenes, toluene, meythyl ethyl ketone, isopropanol, gasoline, mineral spirits of tetrachloroethene (PCE), kerosene, and diesel fuels. Calsol is listed as a hazardous waste generator of waste oil, mixed oils, and liquids with halogenated compounds. In 1976, an accident was caused when a refuse truck attempted to beat the train, and did not. This resulted in a spill from an above ground PCE tank, which was illegally located in violation of City of Pomona Ordinance 2654 and the 1973 Uniform Fire Code. 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. After remediation, this property will be redeveloped for neighborhood use as a local plaza.

The second part of the project includes a site at 198 North Hamilton Boulevard in the City of Pomona. Formerly utilized by the Atlantic Richfield Corporation (ARCO), this property's purpose was for fuel and oil storage and distribution. Later this property was acquired and unused by the Pomona Valley Towing, Inc., transferred to the Redevelopment Agency of Pomona, and again transferred to the City of Pomona in 2003. Environmental assessments show that there are total petroleum hydrocarbons (TPH), primarily used in diesel fuel or home heating fuel range in some soils on this property.

Project Outcomes

822 West Commercial Street

Due to this property having soil contamination impacts due to PCE and other volatile organic compounds (VOCs), remedial action consisting of soil vapor extraction (SVE) is required. This SVE system will provide treatment of soil vapor by granular activated carbon absorption (GAC). Currently this is the remediation method being used for this property.

The SVE system draws in contaminated soil vapor within the local neighborhood. This causes a vacuum effect underground and draws in soil vapor to be cleaned. Figures within Appendix A identify the effect over time for the site and surrounding neighborhood. This also cleans up the soil vapor beneath the site at 198 North Hamilton Boulevard.

198 North Hamilton Boulevard

Soil excavation and off-site transportation disposal following either off-site treatment or soil reuse or off-site disposal was the preferred alternative for TPH impacted soils found at low depths. The cleanup of this site is being regulated by the state of California Department of Toxic Substances Control (DTSC). The City and DTSC have identified that excavation of the soil is not necessary. Instead the site is to be turned into a parking lot. The pavement to be installed will work as an environmental vapor cap. The SVE at the Cal Sol lot is cleaning up the soil vapor under and near it.

The environmental remediation of the two project sites located on 822 West Commercial Street and 198 North Hamilton Boulevard will hopefully lead to improved water quality and improved air quality in the localized neighborhood. Post-environmental remediation water and

soil quality testing will need to be completed in order to determine the effectiveness of the project results which will occur within the coming months.

In addition to the two main projects, other skillsets that I've acquired over the course of the internship have involved acclimating myself to engineering software such as ArcMAP GIS, EPANet, and AutoCAD. These tools were used to study hydrology systems, update city standard specifications, and construct maps of targeted areas within the Pomona area. These skills would prove beneficial for various projects that would come up in the day to day tasks assigned to me by engineering and other staff. In addition to this, I've become much more familiar with and comfortable in permit plan reviews specifically for single family homes, commercial buildings, pools, patios, and antennas; verifying parcel tracts and legal descriptions; issuing certificates of compliance; and lastly learning a wealth of water/wastewater terminology in regard to valves and backflow assemblies to name a few.

Future Intern Advice

For the duration of this internship experience with the City of Pomona Water Resources Department, I have been exposed to a wealth of valuable information, software, and resources that will no doubt be beneficial to my career as a Civil Engineer. As I move on from my internship with the Department, I would like to encourage interns following to not be afraid to ask questions on the assignments or projects that you will be involved with. Also, do not be afraid to explore other projects that catch your interest as well. Look into and become familiar with software that could prove beneficial for the internship, and the work you'll be involved with. Research what you don't know or understand. In addition look to your supervisor as a resource.

APPENDIX A

System Configuration, Concentration Readings and Levels

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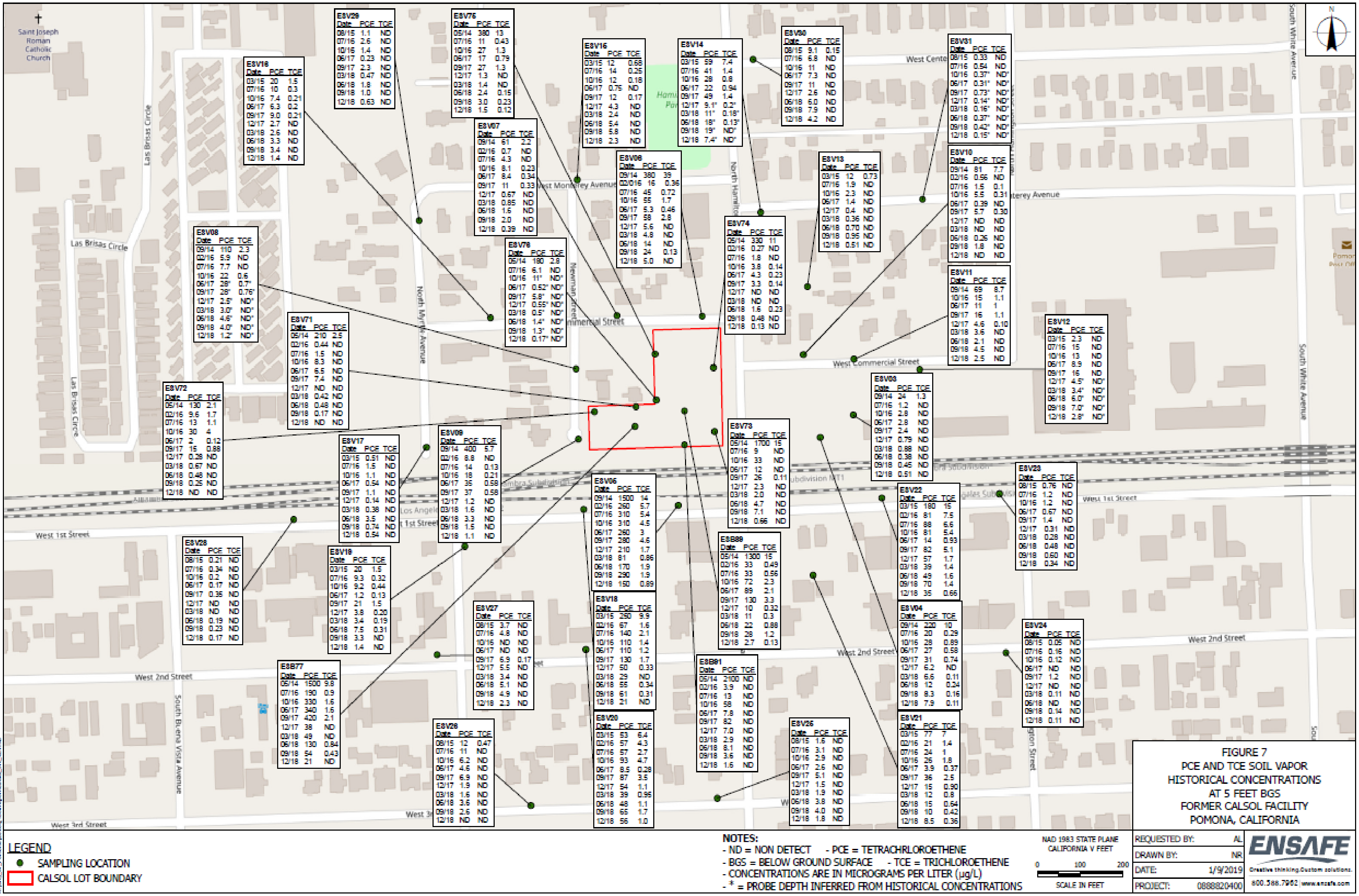
SVE System
System Manifold
LEGEND
SOIL VAPOR EXTRACTION WELLS - UPPER VADOSE ZONE
SOIL VAPOR EXTRACTION WELLS - LOWER VADOSE ZONE
SOIL VAPOR MONITORING PROBES - UPPER VADOSE ZONE
SOIL VAPOR MONITORING PROBES - LOWER VADOSE ZONE
CALSOL LOT BOUNDARY
NAD 1983 STATE PLANE CALIFORNIA V FEET
SCALE IN FEET
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


Saint Joseph Roman Catholic Church
Las Brisas Circle
West Monterey Avenue
West Commercial Street
West 1st Street
West 2nd Street
West 3rd Street
North Myrtle Avenue
Newman Street
North Hamilton
South White Avenue
South Buena Vista Avenue
ESV29 Date PCE TCE 08/15 1.1 ND 07/16 2.6 ND 10/16 1.4 ND 06/17 0.23 ND 09/17 2.3 ND 03/18 0.47 ND 06/18 1.8 ND 09/18 1.0 ND 12/18 0.63 ND
ESV75 Date PCE TCE 05/14 380 13 07/16 11 0.43 10/16 27 1.3 06/17 15 0.79 09/17 27 1.3 12/17 1.3 ND 03/18 1.4 ND 06/18 2.4 0.15 09/18 3.0 0.23 12/18 1.5 0.12
ESV16 Date PCE TCE 03/15 12 0.68 07/16 14 0.25 10/16 12 0.18 06/17 0.75 ND 09/17 12 0.17 12/17 4.3 ND 03/18 2.4 ND 06/18 5.4 ND 09/18 5.8 ND 12/18 2.3 ND
ESV14 Date PCE TCE 03/15 59 7.4 07/16 41 1.4 10/16 28 0.8 06/17 22 0.94 09/17 49 1.4 12/17 9.1* 0.2* 03/18 11* 0.18* 06/18 18* 0.13* 09/18 19* ND* 12/18 7.4* ND*
ESV30 Date PCE TCE 08/15 9.1 0.15 07/16 6.8 ND 10/16 11 ND 06/17 7.3 ND 09/17 11 ND 12/17 2.6 ND 06/18 6.0 ND 09/18 7.9 ND 12/18 4.2 ND
ESV31 Date PCE TCE 08/15 0.33 ND 07/16 0.54 ND 10/16 0.37* ND* 06/17 0.31* ND* 09/17 0.73* ND* 12/17 0.14* ND* 03/18 0.16* ND* 06/18 0.37* ND* 09/18 0.42* ND* 12/18 0.15* ND*
ESV15 Date PCE TCE 03/15 20 1.5 07/16 10 0.3 10/16 7.4 0.21 06/17 6.3 0.2 09/17 9.0 0.21 12/17 2.7 ND 03/18 2.6 ND 06/18 3.3 ND 09/18 3.4 ND 12/18 1.4 ND
ESV07 Date PCE TCE 09/14 61 2.2 02/16 0.7 ND 07/16 4.3 ND 10/16 8.1 0.23 06/17 8.4 0.34 09/17 11 0.33 12/17 0.67 ND 03/18 0.85 ND 06/18 1.6 ND 09/18 2.0 ND 12/18 0.39 ND
ESV06 Date PCE TCE 09/14 380 39 02/016 16 0.36 07/16 45 0.72 10/16 55 1.7 06/17 5.3 0.46 09/17 58 2.8 12/17 5.6 ND 03/18 4.8 ND 06/18 14 ND 09/18 24 0.13 12/18 5.0 ND
ESV13 Date PCE TCE 03/15 12 0.73 07/16 1.9 ND 10/16 2.3 ND 06/17 1.4 ND 12/17 0.4 ND 03/18 0.36 ND 06/18 0.70 ND 09/18 0.95 ND 12/18 0.51 ND
ESV10 Date PCE TCE 09/14 81 7.7 02/16 0.56 ND 07/16 1.5 0.1 10/16 5.5 0.31 06/17 0.39 ND 09/17 5.7 0.30 12/17 ND ND 03/18 ND ND 06/18 0.26 ND 09/18 1.8 ND 12/18 ND ND
ESV08 Date PCE TCE 09/14 110 2.3 02/16 5.9 ND 07/16 7.7 ND 10/16 22 0.6 06/17 28* 0.7* 09/17 28* 0.76* 12/17 2.5* ND* 03/18 3.0* ND* 06/18 4.6* ND* 09/18 4.0* ND* 12/18 1.2* ND*
ESV78 Date PCE TCE 05/14 180 2.8 07/16 6.1 ND 10/16 11* ND* 06/17 0.52* ND* 09/17 5.8* ND* 12/17 0.55* ND* 03/18 0.5* ND* 06/18 1.4* ND* 09/18 1.3* ND* 12/18 0.17* ND*
ESV74 Date PCE TCE 05/14 330 11 02/16 0.27 ND 07/16 1.8 ND 10/16 3.8 0.14 06/17 4.3 0.23 09/17 3.3 0.14 12/17 ND ND 03/18 ND ND 06/18 1.6 0.23 09/18 0.48 ND 12/18 0.13 ND
ESV11 Date PCE TCE 09/14 69 8.7 10/16 15 1.1 06/17 11 1 09/17 16 1.1 12/17 4.6 0.10 03/18 3.6 ND 06/18 2.1 ND 09/18 4.5 ND 12/18 2.5 ND
ESV71 Date PCE TCE 05/14 210 2.5 02/16 0.44 ND 07/16 1.5 ND 10/16 8.3 ND 06/17 6.5 ND 09/17 7.4 ND 12/17 ND ND 03/18 0.42 ND 06/18 0.48 ND 09/18 0.17 ND 12/18 ND ND
ESV12 Date PCE TCE 03/15 2.3 ND 07/16 15 ND 10/16 13 ND 06/17 8.9 ND 09/17 16 ND 12/17 4.5* ND* 03/18 3.4* ND* 06/18 6.0* ND* 09/18 7.0* ND* 12/18 2.8* ND*
ESV72 Date PCE TCE 05/14 130 2.1 02/16 9.6 1.7 07/16 13 1.1 10/16 30 4 06/17 2 0.12 09/17 15 0.88 12/17 0.28 ND 03/18 0.67 ND 06/18 0.48 ND 09/18 0.25 ND 12/18 ND ND
ESV03 Date PCE TCE 09/14 24 1.3 07/16 1.2 ND 10/16 2.8 ND 06/17 2.8 ND 09/17 2.4 ND 12/17 0.79 ND 03/18 0.88 ND 06/18 0.38 ND 09/18 0.45 ND 12/18 0.51 ND
ESV09 Date PCE TCE 09/14 400 5.7 02/16 8.8 ND 07/16 14 0.13 10/16 18 0.21 06/17 35 0.58 09/17 37 0.58 12/17 1.2 ND 03/18 1.6 ND 06/18 3.3 ND 09/18 1.5 ND 12/18 1.1 ND
ESV17 Date PCE TCE 03/15 0.51 ND 07/16 1.5 ND 10/16 1.1 ND 06/17 0.54 ND 09/17 1.1 ND 12/17 0.14 ND 03/18 0.38 ND 06/18 3.5 ND 09/18 0.74 ND 12/18 0.54 ND
ESV73 Date PCE TCE 05/14 1700 15 07/16 9 ND 10/16 33 ND 06/17 12 ND 09/17 26 0.11 12/17 2.3 ND 03/18 2.0 ND 06/18 4.7 ND 09/18 7.1 ND 12/18 0.66 ND
ESV05 Date PCE TCE 09/14 1500 14 02/16 260 5.7 07/16 310 5.4 10/16 310 4.5 06/17 260 3 09/17 280 4.6 12/17 210 1.7 03/18 81 0.86 06/18 170 1.9 09/18 290 1.9 12/18 150 0.89
ESV23 Date PCE TCE 08/15 0.76 ND 07/16 1.2 ND 10/16 1.2 ND 06/17 0.67 ND 09/17 1.4 ND 12/17 0.31 ND 03/18 0.28 ND 06/18 0.48 ND 09/18 0.60 ND 12/18 0.34 ND
ESV22 Date PCE TCE 03/15 180 15 02/16 81 7.5 07/16 88 6.6 10/16 81 5.4 06/17 14 0.93 09/17 82 5.1 12/17 57 1.7 03/18 39 1.4 06/18 49 1.6 09/18 70 1.4 12/18 35 0.66
ESV28 Date PCE TCE 08/15 0.21 ND 07/16 0.34 ND 10/16 0.2 ND 06/17 0.17 ND 09/17 0.35 ND 12/17 ND ND 03/18 ND ND 06/18 0.19 ND 09/18 0.23 ND 12/18 0.17 ND
ESV19 Date PCE TCE 03/15 20 1.5 07/16 9.3 0.32 10/16 9.2 0.44 06/17 1.2 0.13 09/17 21 1.5 12/17 3.8 0.20 03/18 3.4 0.19 06/18 7.5 0.31 09/18 3.3 ND 12/18 1.4 ND
ESB89 Date PCE TCE 05/14 1300 15 02/16 33 0.49 07/16 33 0.56 10/16 72 2.3 06/17 89 2.1 09/17 130 3.3 12/17 10 0.32 03/18 11 0.3 06/18 22 0.88 09/18 28 1.2 12/18 2.7 0.13
ESV18 Date PCE TCE 03/15 250 9.9 02/16 67 1.6 07/16 140 2.1 10/16 110 1.4 06/17 110 1.2 09/17 130 1.7 12/17 50 0.33 03/18 29 ND 06/18 55 0.34 09/18 51 0.31 12/18 21 ND
ESV27 Date PCE TCE 08/15 3.7 ND 07/16 4.8 ND 10/16 ND ND 06/17 ND ND 09/17 6.9 0.17 12/17 5.5 ND 03/18 3.4 ND 06/18 5.1 ND 09/18 4.9 ND 12/18 2.3 ND
ESV04 Date PCE TCE 09/14 220 10 07/16 20 0.29 10/16 28 0.89 06/17 27 0.58 09/17 31 0.74 12/17 6.2 ND 03/18 6.6 0.11 06/18 12 0.24 09/18 8.3 0.16 12/18 7.9 0.11
ESV24 Date PCE TCE 08/15 0.05 ND 07/16 0.16 ND 10/16 0.12 ND 06/17 ND ND 09/17 1.2 ND 12/17 ND ND 03/18 0.11 ND 06/18 ND ND 09/18 0.14 ND 12/18 0.11 ND
ESB77 Date PCE TCE 05/14 1500 9.8 07/16 190 0.9 10/16 330 1.6 06/17 340 1.6 09/17 420 2.1 12/17 38 ND 03/18 49 ND 06/18 130 0.84 09/18 54 0.43 12/18 21 ND
ESB91 Date PCE TCE 05/14 2100 ND 02/16 3.9 ND 07/16 13 ND 10/16 58 ND 06/17 7.8 ND 09/17 82 ND 12/17 7.0 ND 03/18 2.9 ND 06/18 8.1 ND 09/18 3.6 ND 12/18 1.6 ND
ESV20 Date PCE TCE 03/15 53 6.4 02/16 57 4.3 07/16 57 2.7 10/16 93 4.7 06/17 8.5 0.28 09/17 87 3.5 12/17 54 1.1 03/18 39 0.95 06/18 48 1.1 09/18 65 1.7 12/18 56 1.0
ESV28 Date PCE TCE 08/15 12 0.47 07/16 11 ND 10/16 6.2 ND 06/17 4.6 ND 09/17 6.9 ND 12/17 1.9 ND 03/18 1.6 ND 06/18 3.6 ND 09/18 2.6 ND 12/18 ND ND
ESV26 Date PCE TCE 08/15 1.6 ND 07/16 3.1 ND 10/16 2.9 ND 06/17 2.6 ND 09/17 5.1 ND 12/17 1.5 ND 03/18 1.9 ND 06/18 3.8 ND 09/18 4.0 ND 12/18 1.8 ND
ESV21 Date PCE TCE 03/15 77 7 02/16 21 1.4 07/16 24 1 10/16 26 1.8 06/17 3.9 0.37 09/17 36 2.5 12/17 15 0.90 03/18 12 0.8 06/18 15 0.64 09/18 10 0.42 12/18 8.5 0.36
N
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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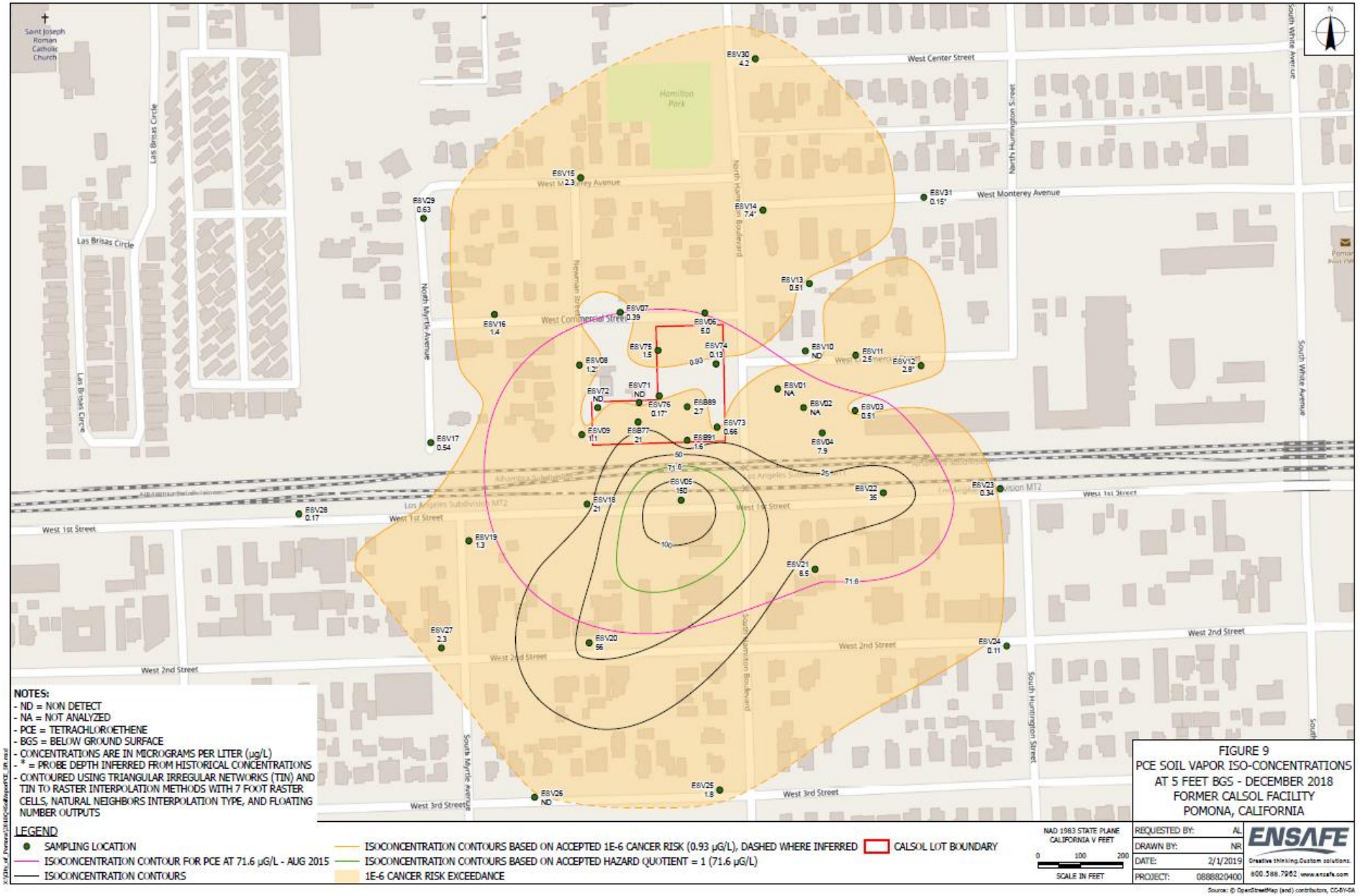

NOTES:
- ND = NON DETECT
- NA = NOT ANALYZED
- PCE = TETRACHLOROETHENE
- BGS = BELOW GROUND SURFACE
- CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
- * = PROBE DEPTH INFERRED FROM HISTORICAL CONCENTRATIONS
- CONTOURED USING TRIANGULAR IRREGULAR NETWORKS (TIN) AND TIN TO RASTER INTERPOLATION METHODS 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 - DECEMBER 2018
FORMER CALSOL FACILITY
POMONA, CALIFORNIA

REQUESTED BY:	AL
DRAWN BY:	NR
DATE:	2/1/2019
PROJECT:	0888820400

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APPENDIX B

Pomona Water Reclamation Plant Visit


CAUTION DO NOT ENTER


PipeStax XL
DO NOT ENTER


PipeStax XL
PipeStax XL
CAUTION DO NOT ENTER


CAUTION DO NOT ENTER

APPENDIX C

Hydrant Flow Testing


JONES

APPENDIX D

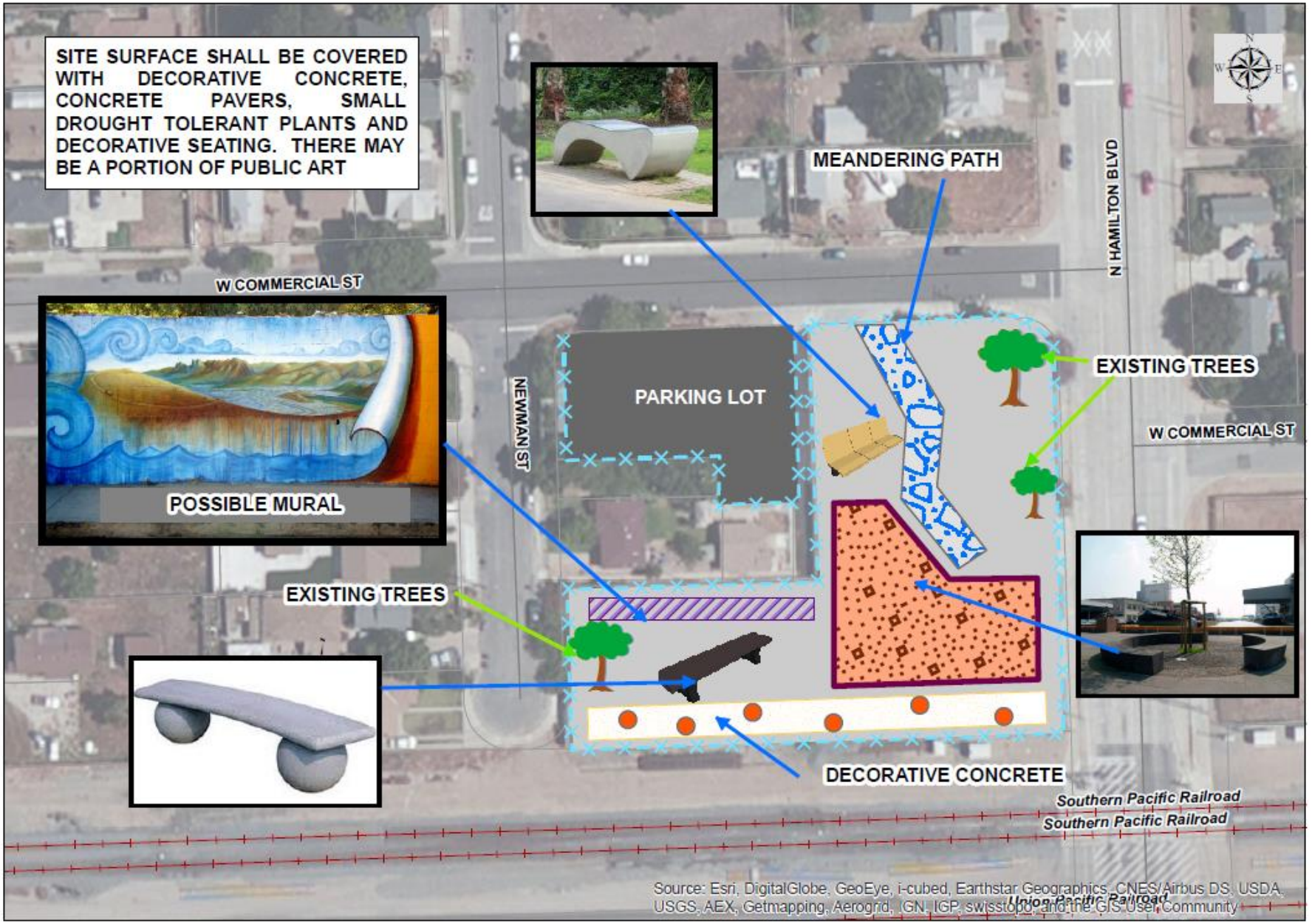
822 West Commercial Street


INF
To
HEAT X-CHANGER
EVER TITE


SVE-2018-145
SVE-2018-128
SVE-2018-107
SVE-2018-103


EMPTY
EMPTY

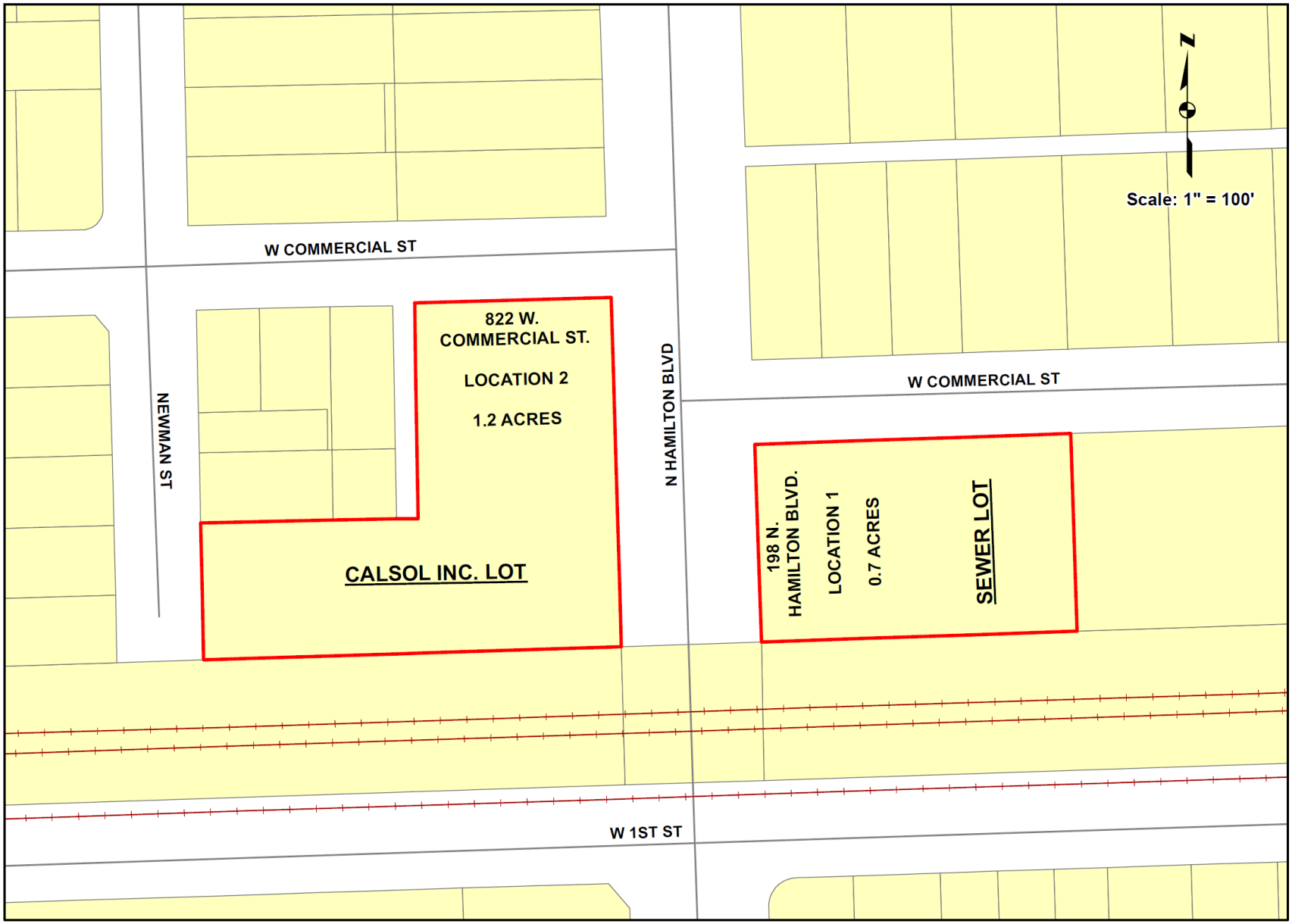
822 W. COMMERCIAL ST. CALSOL LOT - CONCEPTUAL URBAN PLAZA

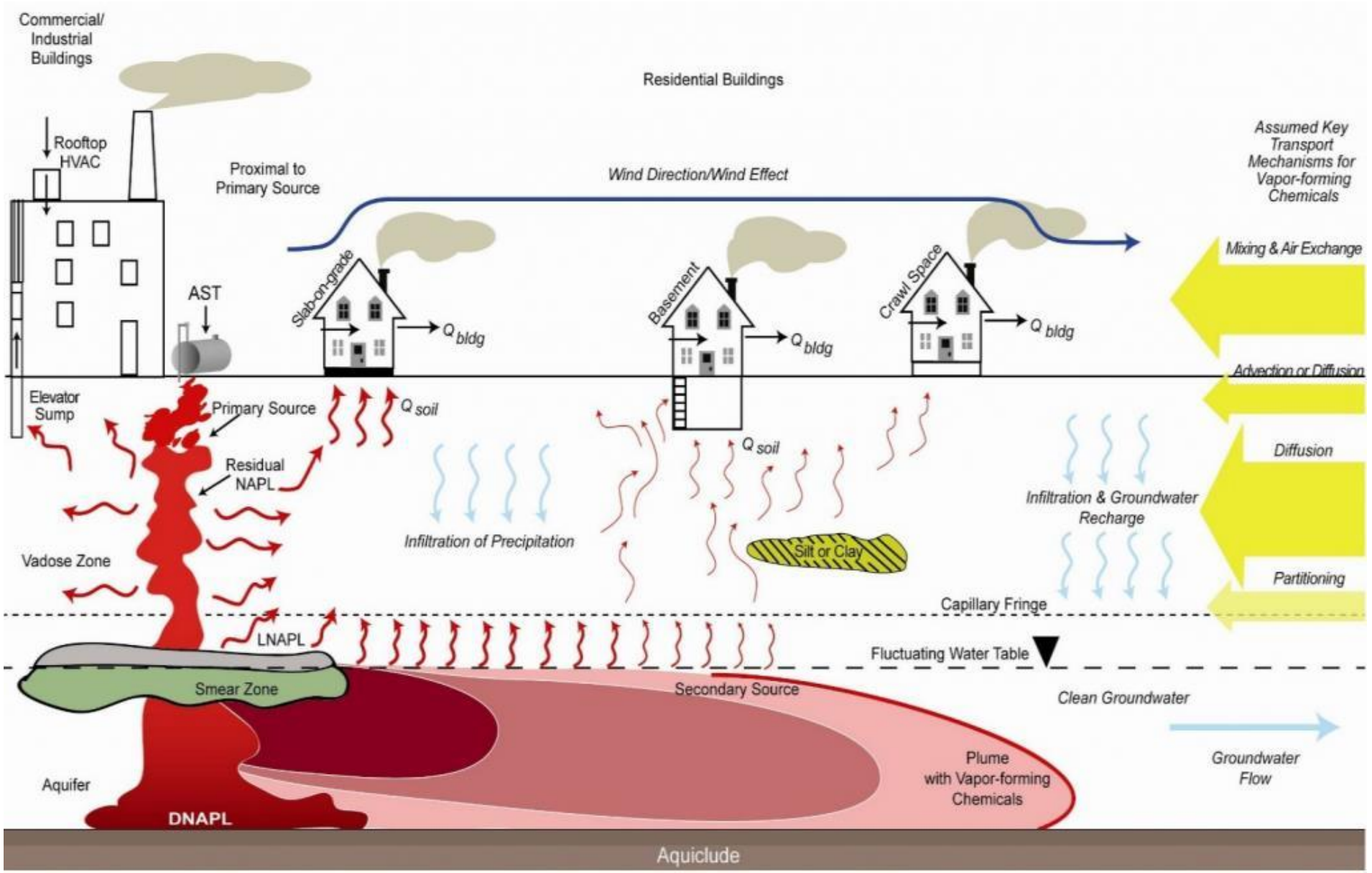


APPENDIX E

198 North Hamilton Boulevard

Attachment 1 - Project Area Site Plan




Commercial/
Industrial
Buildings
Residential Buildings
Rooftop
HVAC
Proximal to
Primary Source
Wind Direction/Wind Effect
Assumed Key
Transport
Mechanisms for
Vapor-forming
Chemicals
Mixing & Air Exchange
AST
Slab-on-grade
Basement
Crawl Space
Q bldg
Q bldg
Q bldg
Advection or Diffusion
Elevator
Sump
Primary Source
Q soil
Q soil
Residual
NAPL
Diffusion
Infiltration & Groundwater
Recharge
Infiltration of Precipitation
Silt or Clay
Vadose Zone
Partitioning
Capillary Fringe
LNAPL
Fluctuating Water Table
Smear Zone
Secondary Source
Clean Groundwater
Plume
with Vapor-forming
Chemicals
Groundwater
Flow
Aquifer
DNAPL
Aquiclude