LABELLA Associates, D.P.C.
Engineering
Architecture
Environmental
Planning

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March 21, 2017

Todd M. Caffoe
Division of Environmental Remediation
New York State Department of Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414

Re: Remedial Investigation Work Plan; Addendum 5 – P-1 Plume Area
Former Emerson Street Landfill
NYSDEC Site #828023
LaBella Project No. 210173

Dear Mr. Caffoe:

LaBella Associates, D.P.C. (LaBella) is submitting this letter on behalf of the City of Rochester (City) to the New York State Department of Environmental Conservation (NYSDEC) to propose an additional amendment to the approved Remedial Investigation Work Plan (RIWP) dated November 2012 for the Former Emerson Street Landfill (FESL), Rochester, New York (hereinafter referred to as "the Site").

The work addressed by this amendment includes tasks to further assess the nature and extent of volatile organic compounds (VOCs) in groundwater in the vicinity of the P-1 well at 1700 Emerson Street (formerly 1655 Lexington Avenue). A Site Location Map is included as Figure 1.

The objective of this addendum is to further characterize the extent of VOCs in bedrock groundwater primarily to the south-southwest of the P-1 source area. The tasks proposed herein include drilling, rock core matrix analysis, installation and sampling of four (4) newly installed shallow bedrock groundwater monitoring wells in proximity to the P-1 well, specifically, southwest of P-1. Figure 2 and 3 provides the locations of previously installed bedrock monitoring wells with total chlorinated (CVOCs) in groundwater and proposed additional monitoring well locations.

LaBella has retained GEI Consultants Inc., P.C. (GEI) to provide technical oversight and support in conducting the proposed work plan amendment. A LaBella and/or GEI representative will be on-Site during all portions of the field sampling activities in order to evaluate for evidence of impairment (i.e., elevated PID readings, staining, odors, etc.), guide the contractor on the work, and conduct the necessary Community Air Monitoring Plan (CAMP) and Health and Safety Plan (HASP). All applicable work will be completed in accordance with the approved RIWP dated November 2012.

Background

The following Work Plan and addendum have been developed for the P-1 Plume:

- Remedial Investigation Work Plan (RIWP), November 2012
- First RIWP Amendment, September 30, 2013
- Second RIWP Amendment, July 11, 2014
- Third RIWP Amendment, January 8, 2015
- Fourth RIWP Amendment, December 6, 2016

Tasks completed under the RIWP and associated addenda since 2012 include the following:

- Advancement of twenty-eight (28) test pits
- Advancement of thirty-three (33) overburden soil borings
- Installation of six (6) overburden monitoring wells
- Installation of twelve (12) shallow bedrock monitoring wells
- Installation of two (2) deeper bedrock monitoring wells
- Advancement of twenty-one (21) MIP points
- Low-flow sampling in 2014
- Passive diffusion bag (PDB) sampling in August 2016 and February 2017 (in progress)
- Pump tests at four (4) shallow bedrock monitoring wells
- EM-31 Geophysical Survey

Data obtained to date collected during the RIWP Addendum #4 is provided on Figure 3 (groundwater) Figure 4 (soil borings) and Figure 5 (test pits). Note that this data is in the process of being validated.

During installation of the most recent bedrock monitoring wells (LAB-SBW-09 through LAB-SBW-12), discrete groundwater samples were collected from LAB-SBW-09 and LAB-SBW-10 (refer to Figure 3). It should be noted that due to significant water loss during drilling, depth discrete groundwater samples were not collected from LAB-SBW-11 or LAB-SBW-12 as any depth discrete groundwater samples would be considered biased-low for VOCs. The groundwater sample collected from the top 3-feet of bedrock in LAB-SBW-09 detected 57.9 parts per million (ppm) total VOCs (57.4 ppm total CVOCs). Due to the elevated concentrations of VOCs in LAB-SBW-09 southwest of the inferred source area, additional investigation appears warranted to further delineate the extent of VOCs in bedrock groundwater. Refer to Figure 3 for contours representing total CVOCs in the top 13-fetet of bedrock groundwater updated with the recent groundwater data.

Proposed Amendment

The additional investigation activities will be completed to accomplish the following objective:

1) Further characterize the horizontal extent of VOCs, in particular CVOCs in bedrock groundwater to the southwest of P-1.

To accomplish this objective, the following tasks are proposed:

1) Drilling, rock core matrix analysis, installation, and sampling of four (4) shallow (i.e., top 23-ft. of bedrock) bedrock groundwater monitoring wells;
2) Groundwater sampling of newly installed wells using passive diffusion bags (PDBs).

A LaBella or GEI representative will be on-Site at all times during the drilling and sampling work. In the event that during the course of the investigation it is determined that containers with chemicals are encountered, the City and the NYSDEC will be contacted immediately to discuss the situation and if warranted implement any emergency actions. The following details the tasks that will be completed as part of this amendment:

Task 1: Shallow Bedrock Groundwater Evaluation

This task will be completed in a controlled and careful manner in order to assess impacts within the rock as the borings are advanced. Monitoring well installation procedures will be conducted in accordance with the RIWP dated November 2012, except as modified herein. The wells will be constructed using the same methods as the previously installed shallow bedrock wells. As stated in the RIWP, at the shallow bedrock groundwater evaluation locations the following methodology will be utilized:

Overburden Assessment

The borehole will be advanced through the overburden/fill using 4 1/4" diameter hollow-stem augers. The soil/fill will be retrieved with a four-foot stainless steel Macrocore sampler using acetate sleeves or potentially once every five feet using split spoon samplers. Soil samples will be screened with a PID and radiation meter and classified similarly to the previously completed soil borings. Due to the potential for VOCs, special care will be taken to evaluate the interface of overburden and bedrock. One sample from each location will be selected for laboratory analysis, determined based on greatest PID readings and assessment of the soil/ fill material. Samples will be collected from the bottom of the boring (i.e., top of bedrock) if no significant PID readings are encountered. Samples will be placed in a cooler on ice and sent to an ELAP laboratory for analysis of TCL and CP-51 VOCs using USEPA Method 8260.

Uppermost Shallow Bedrock Assessment (Top 3-ft. of Bedrock)

Because the upper bedrock surface is generally more highly fractured than deeper bedrock, the assessment of NAPL will initially focus on the upper three feet of bedrock. Upon reaching the bedrock surface, the augers will be removed from the borehole and a temporary 6" diameter steel casing will be driven into the bedrock approximately 2" to 3" in an attempt to seal off overburden groundwater from shallow bedrock groundwater. An HQ rock core barrel will then be advanced approximately three feet into the bedrock. In order to minimize the potential of potable water loss during rock coring, air-coring methods will be utilized during drilling. If air-coring proves to be unsuccessful, potable water will be utilized as a drilling fluid.

Following completion of the initial core interval, a section of the bedrock core (approximate 3" to 6" in length) exhibiting non-mechanical fracturing will be selected for laboratory analysis of VOC mass in the rock matrix. The selected core interval will be immediately wrapped in aluminum foil for preservation, placed in a plastic bag, and packed in ice for delivery to the laboratory. The rock core will be frozen, crushed and placed in a sample jar containing methanol for extraction via EPA Method 5035 and analyzed by EPA Method 8260 following two weeks of preservation. Currently, it is anticipated that up to two such rock cores per well will be analyzed per well via this method.

After coring the top 3-ft., an electric submersible pump will be used to purge water from the core hole. A goal is to remove 10 core hole volumes and any drilling water lost to the bedrock formation during the coring process (if used). It should be noted that it is anticipated air rotary will be utilized during the top 3-ft. During the purge process, water quality parameters (temperature, conductivity, pH, dissolved oxygen [DO], turbidity and oxidation-reduction potential [ORP]) will be monitored after the removal of each core hole volume until the ten volumes, or stability in all water quality parameters, has been reached (10% or less variation between readings for each parameter).

Following adequate purging of the bedrock core interval, a groundwater sample will then be collected from the interval and analyzed for CP-51 and TCL VOCs by USEPA Method 8260. The

sample will be sent to a laboratory for one (1) day turnaround. Locations of subsequent monitoring wells may be adjusted based on the results of the discrete depth groundwater samples from the preceding well. If the depth discrete groundwater samples indicate the need for additional wells to delineate the horizontal extent of CVOCs in bedrock groundwater, the NYSDEC will be notified.

Lower Shallow Bedrock Assessment (3-ft. to 23-ft. Below Top of Rock)
A 4" steel casing will be grouted in place and allowed to cure for a minimum of 24 hours prior to further bedrock coring.

An HQ core barrel will be advanced to a depth of 20 feet below the bottom of the permanent casing in 10-foot increments. A groundwater sample will be collected from each 10 foot interval using the procedures outlined for the shallow top of bedrock interval except potable water may be utilized instead of air. For the bottom 10-foot interval, a temporary monitoring well completed with sand and bentonite installed to hydraulically isolate the upper 13 feet of the core hole from the lower interval. At the completion of purging and sampling of each cored interval, the HQ core hole will be reamed using a 3 7/8" roller bit, and the monitoring well will be completed as an open bedrock hole. All drilling equipment utilized during the installation and testing of each well will be decontaminated between monitoring well installations.

Details of the rock coring procedure including drill rate, water loss, and the presence of voids noted during core barrel advancement will be recorded on appropriate field forms. The retrieved rock core will be logged by a qualified GEI or LaBella representative, and will include a description of rock type, the presence of natural and mechanical breaks, calculation of rock-quality designation (RQD), voids, and the presence of any odors or staining associated with the rock core.

A well inspection camera may be utilized to observe fracture networks in existing wells during and after rock coring.

All soil and drilling fluids generated during the installation of each monitoring well will be containerized in 55 gallon drums as described in the RIWP. The location and elevation of each monitoring well will be surveyed by a LaBella representative.

Task 2: Groundwater Monitoring
VOC Analyses: Each newly installed bedrock groundwater monitoring well will be sampled at discrete intervals during installation as described in Task 1 above. Newly installed bedrock monitoring wells will be developed in accordance with the RIWP and purge water will be containerized. In addition, a minimum of one (1) week after well development, PDBs will be lowered into each of the newly installed monitoring wells at a minimum of three (3) depth intervals, corresponding to fractures and/or with similar elevations sampled in previous monitoring wells. A minimum of two (2) weeks following placement of the PDBs, the PDBs will be retrieved and the groundwater analyzed for CP-51 and TCL VOCs.

Investigation Derived Waste
Soil/fill and water encountered and derived during the work described herein will be handled in accordance with the approved RIWP. Material will be containerized and disposed of pending the appropriate analytical sampling and permit issuance.

Health and Safety and Community Air Monitoring
All fieldwork will be completed in accordance with the previously approved Health and Safety Plan and Community Air Monitoring Program as described in the NYSDEC approved RI Work Plan.

Reporting
Data and findings from this investigation will be included in a Remedial Investigation Report along with the work completed under the approved RIWP to date. In addition, a Feasibility Study will be completed to evaluate remedial alternatives for the P-1 plume.

If you have any questions, please do not hesitate to contact me at (585) 295-6611.

Sincerely,

LABELLA ASSOCIATES, D.P.C.

Daniel P. Noll, P.E.
Project Manager

cc: J. Biondolillo – City of Rochester
R. Frappa - GEI

Figure 1: Site Location Map
Figure 2: 1700 Emerson Street Previous and Proposed Bedrock Wells and Total CVOCs in Bedrock Groundwater Contours
Figure 3: Total CVOCs in Bedrock Groundwater (0-13-feet below top of rock)
Figure 4: Total CVOCs in Soil- Top of Bedrock (Greater than 20-feet bgs)
Figure 5: 2017 Test Pit Locations and Soil Sample Results

\\Projects2\ProjectsNZ-2\Rochester, City\210173 FESL\P-1 Investigation (Data, Logs, etc.)\P-1 WP\P-1 Work Plan Amendments\February 2017\FESL P-1 Work Plan Addendum #5.doc

Figures

Legend

1700 Emerson Street (former 1655 Lexington Ave)

Former Emerson Street Landfill

Notes:
1) Aerial image from Monroe County GIS 2009
2) Parcel boundaries from Monroe County GIS 2011

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FORMER EMERSON STREET LANDFILL

CITY OF ROCHESTER

P-1 PLUME REMEDIAL INVESTIGATION WORK PLAN AMENDMENT

SITE LOCATION MAP

N
W E
S

0 200 400
Feet

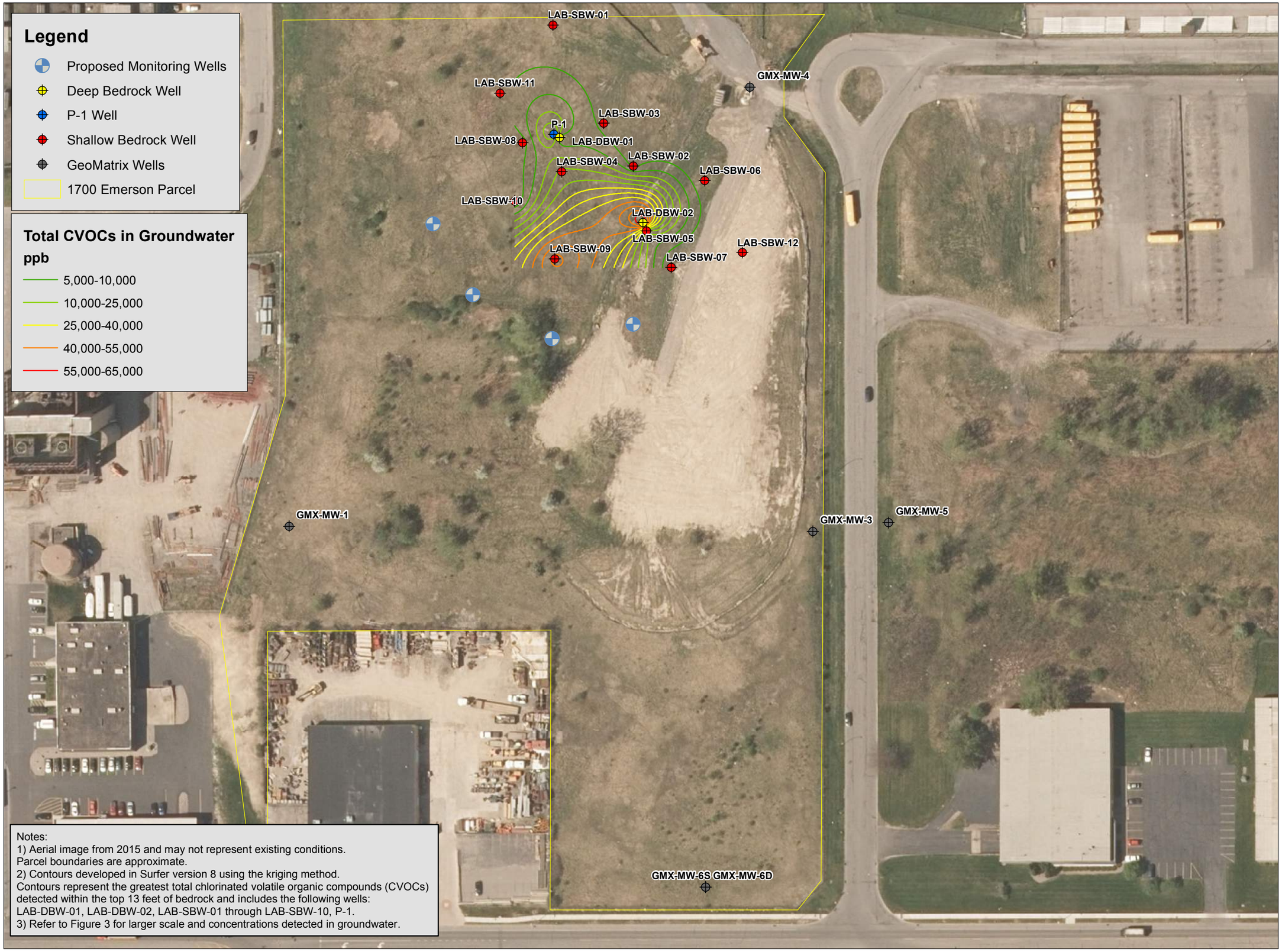
1 inch = 400 feet

Intended to print on 11x17

210173

FIGURE 1

Path: \\Projects2\Projects\NZ-2\Rochester, City\210173 FESL\Drawings\P1 Investigation\February 2017 Amendment\Figure 1- Site Location Map.mxd



Legend

- Proposed Monitoring Wells
- Deep Bedrock Well
- P-1 Well
- Shallow Bedrock Well
- GeoMatrix Wells
- 1700 Emerson Parcel

Total CVOCs in Groundwater ppb

- 5,000-10,000
- 10,000-25,000
- 25,000-40,000
- 40,000-55,000
- 55,000-65,000

Notes:
1) Aerial image from 2015 and may not represent existing conditions. Parcel boundaries are approximate.
2) Contours developed in Surfer version 8 using the kriging method. Contours represent the greatest total chlorinated volatile organic compounds (CVOCs) detected within the top 13 feet of bedrock and includes the following wells: LAB-DBW-01, LAB-DBW-02, LAB-SBW-01 through LAB-SBW-10, P-1.
3) Refer to Figure 3 for larger scale and concentrations detected in groundwater.

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P-1 PLUME REMEDIAL INVESTIGATION WORK PLAN ADDENDUM #5

1700 Emerson Street
Previous and Proposed Bedrock Wells
Total CVOCs in Groundwater Contours
(0-13-feet below top of rock)

N
W E
S

0 50 100
Feet

1 inch = 100 feet

Intended to print on 11x17

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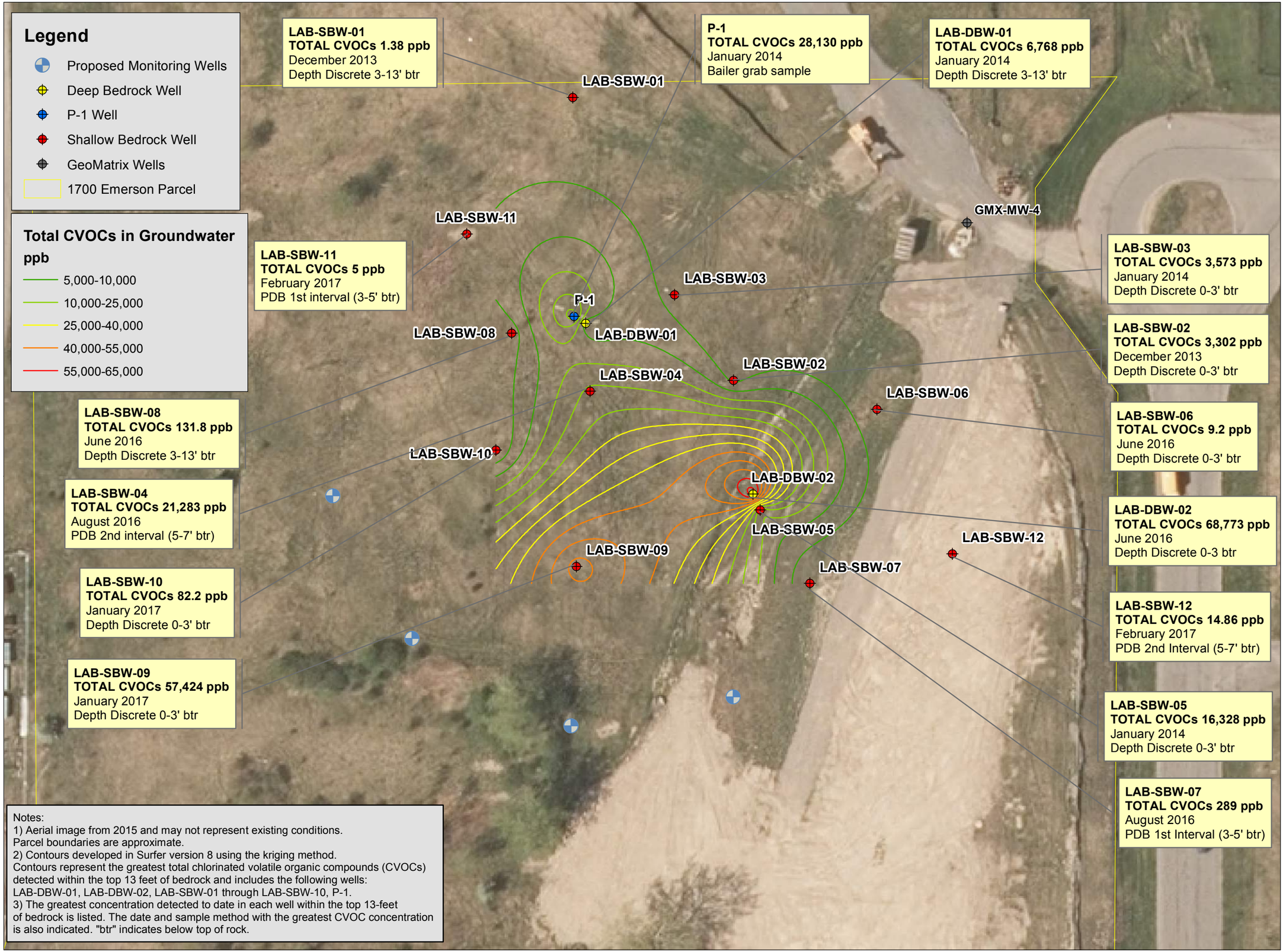
FIGURE 2

Path: \\Projects2\Projects\NZ-2\Rochester. City\210173 FESL\Drawings\P1 Investigation\February 2017 Amendment\Figure 2.mxd



Notes:
1) Aerial image from 2015 and may not represent existing conditions. Parcel boundaries are approximate.
2) Contours developed in Surfer version 8 using the kriging method. Contours represent the greatest total chlorinated volatile organic compounds (CVOCs) detected within the top 13 feet of bedrock and includes the following wells: LAB-DBW-01, LAB-DBW-02, LAB-SBW-01 through LAB-SBW-10, P-1.
3) The greatest concentration detected to date in each well within the top 13-feet of bedrock is listed. The date and sample method with the greatest CVOC concentration is also indicated. "btr" indicates below top of rock.

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P-1 PLUME REMEDIAL INVESTIGATION WORK PLAN ADDENDUM #5

Total CVOCs in Bedrock Groundwater (0-13-feet below top of rock)

N
W E
S

0 25 50
Feet

1 inch = 50 feet

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FIGURE 3

Legend

- Proposed Monitoring Wells
- Deep Bedrock Well
- P-1 Well
- Shallow Bedrock Well
- Soil Boring
- Soil Boring/ Overburden Well
- GeoMatrix Wells
- 1700 Emerson Parcel

Total CVOCs in Soil > 20-ft bgs

ppb

- 1,000-5,000
- 5,000-50,000
- 50,000-100,000
- 100,000-500,000
- 500,000-700,000

2013-SB-04 (24-24.9)
VOCs 188.6 ppb
CVOCs 49.5 ppb
BTEX 47.5 ppb

LAB-SBW-01 (24-27)
VOCs 647.2 ppb
CVOC 67.2 ppb
BTEX 95.7 ppb

2013-SB-07 (26.5-27)
VOCs 678 ppb
CVOCs 20.3 ppb
BTEX 67.7 ppb

2013-SB-06 (26.5-27)
VOCs 378.8 ppb
CVOCs 7.5 ppb
BTEX 2.7 ppb

2013-SB-01 (21-22)
VOCs 2,925,400 ppb
CVOCs 401,640 ppb
BTEX 2,274,300 ppb

2013-SB-05 (25.5-26)
VOCs 1,870.7 ppb
CVOCs 18.6 ppb
BTEX 14.7 ppb

2017-SB-29 (24.5-25)
VOCs 343.39 ppb
CVOCs 0 ppb
BTEX 6.76 ppb

2013-SB-03 (24.5-25)
VOCs 453.2 ppb
CVOCs 412.9 ppb
BTEX 17.9 ppb

2017-SB-28 (23-24)
VOCs 521.3 ppb
CVOCs 14.4 ppb
BTEX 30.21 ppb

2013-SB-14 (23.5-24.5)
VOCs 105,809.3 ppb
CVOCs 1,070 ppb
BTEX 56,959.3 ppb

2017-SB-26 (22-23)
VOCs 86.93 ppb
CVOC 0 ppb
BTE 39.48 ppb

LAB-SBW-03 (23-24)
VOCs 964,750 ppb
CVOC 1,290 ppb
BTEX 540,300 ppb

LAB-OBW-01 (23-24)
VOCs 4,891,210 ppb
CVOCs 769,370 ppb
BTEX 3,646,600 ppb

2013-SB-13 (23-23.5)
VOCs 398.8 ppb
CVOCs 19.9 ppb
BTEX 27.5 ppb

2016-SB-22 (23-24)
VOCs 2,637.7 ppb
CVOCs 0 ppb
BTEX 438.9 ppb

LAB-SBW-11 (23-23.5)
VOCs 144.69 ppb
CVOC 0 ppb
BTEX 14.48 ppb

2013-SB-08 (25-25.3)
VOCs 145.4 ppb
CVOCs 10.6 ppb
BTEX 16.9 ppb

2013-SB-10 (24-24.4)
VOCs 184,920.5 ppb
CVOCs 5,380.5 ppb
BTEX 128,200 ppb

2016-SB-18 (23-24)
VOCs 41,630 ppb
CVOCs 3,630 ppb
BTEX 23,650 ppb

2013-SB-02 (22.5-23.2)
VOCs 792.5 ppb
CVOCs 288.5 ppb
BTEX 103.6 ppb

2013-SB-11 (23.5-24)
VOCs 2,931.1 ppb
CVOCs 500.6 ppb
BTEX 850.8 ppb

2016-SB-24 (20-21)
VOCs 124.8 ppb
CVOCs 0 ppb
BTEX 26.7 ppb

2013-SB-17 (24-24.5)
VOCs 2,907.4 ppb
CVOCs 526.4 ppb
BTEX 848.6 ppb

LAB-SBW-02 (23.5-24)
VOCs 397,992 ppb
CVOC 5,012 ppb
BTEX 322,100 ppb

2013-SB-16 (23-24)
VOCs 178.3 ppb
CVOCs 43.4 ppb
BTEX 53.2 ppb

2017-SB-32 (22-23)
VOCs 364.8 ppb
CVOCs 0 ppb
BTEX 165.9 ppb

2017-SB-30 (22-23)
VOCs 371.91 ppb
CVOCs 0 ppb
BTEX 113.82 ppb

LAB-SBW-12 (25.5-26)
VOCs 22,623 ppb
CVOC 0 ppb
BTEX 21,440 ppb

LAB-DBW-01 (23.5-24.5)
VOCs 3,197 ppb
CVOCs 47.3 ppb
BTEX 249 ppb

LAB-SBW-10 (22-23)
VOC 70.62 ppb
CVOCs 0 ppb
BTEX 25.06 ppb

2017-SB-33 (24-25)
VOCs 402.36 ppb
CVOCs 10.2 ppb
BTEX 35.04 ppb

2013-SB-15 (23.5-24)
VOCs 2,734 ppb
CVOCs 3,521.9 ppb
BTEX 31 ppb

LAB-SBW-04 (23-23.5)
VOCs 67,830 ppb
CVOC 2,610 ppb
BTEX 6,280 ppb

LAB-SBW-09 (20-21)
VOCs 7,221.11 ppb
CVOCs 37.61 ppb
BTEX 440 ppb

2017-SB-31 (21-23)
VOCs 853.4 ppb
CVOCs 0 ppb
BTEX 248.2 ppb

2016-SB-19 (22.5-23.5)
VOCs 45,449 ppb
CVOCs 34,600 ppb
BTEX 9,820 ppb

2013-SB-09 (22-22.7)
VOCs 323,332 ppb
CVOCs 221.5 ppb
BTEX 312,930 ppb

2013-SB-12 (23-23.5)
VOCs 1,173.2 ppb
CVOCs 24.4 ppb
BTEX 510.4 ppb

2016-SB-25 (20.5-21.5)
VOCs 72,150 ppb
CVOC 2,300 ppb
BTE 33,200 ppb

2016-SB-20 (23-23.6)
VOCs 17,110 ppb
CVOCs 9,460 ppb
BTEX 1,8800 ppb

2016-SB-21 (22-22.3)
VOCs 1,682.9 ppb
CVOCs 2.8 ppb
BTEX 195 ppb

LAB-SBW-05 (22-23)
VOCs 3,859.1 ppb
CVOC 44.2 ppb
BTEX 663 ppb

2013-SB-07
2013-SB-06
LAB-SBW-01
2013-SB-03
2017-SB-27
2017-SB-26
2013-SB-04
2013-SB-05
2013-SB-13
2017-SB-29
2013-SB-10
2017-SB-28
GMX-MW-4
LAB-SBW-11
2013-SB-17
2013-SB-02
2013-SB-01
2013-SB-14
LAB-OBW-01
2016-SB-24
2016-SB-22
2013-SB-08
LAB-SBW-03
P-1
2013-SB-15
2016-SB-18
LAB-SBW-08
LAB-DBW-01
2013-SB-11
2016-SB-23
2013-SB-16
2013-SB-12
LAB-SBW-04
LAB-SBW-02
2017-SB-30
2016-SB-19
2017-SB-32
LAB-SBW-06
2016-SB-20
LAB-SBW-10
2016-SB-25
2016-SB-21
2013-SB-09
2017-SB-31
LAB-DBW-02
2017-SB-33
LAB-SBW-05
LAB-SBW-12
LAB-SBW-09
LAB-SBW-07

Notes:
1) Aerial image from 2015 and may not represent existing conditions. Parcel boundaries are approximate.
2) Contours developed in Surfer version 8 using the kriging method. Contours represent total chlorinated volatile organic compounds (CVOCs) detected at depths greater than 20-feet bgs (i.e., top of bedrock).
3) Not all data has been validated.

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P-1 PLUME REMEDIAL INVESTIGATION WORK PLAN ADDENDUM #5

Total CVOCs in Soil- Top of Bedrock (Greater than 20-feet bgs)

N
W E
S

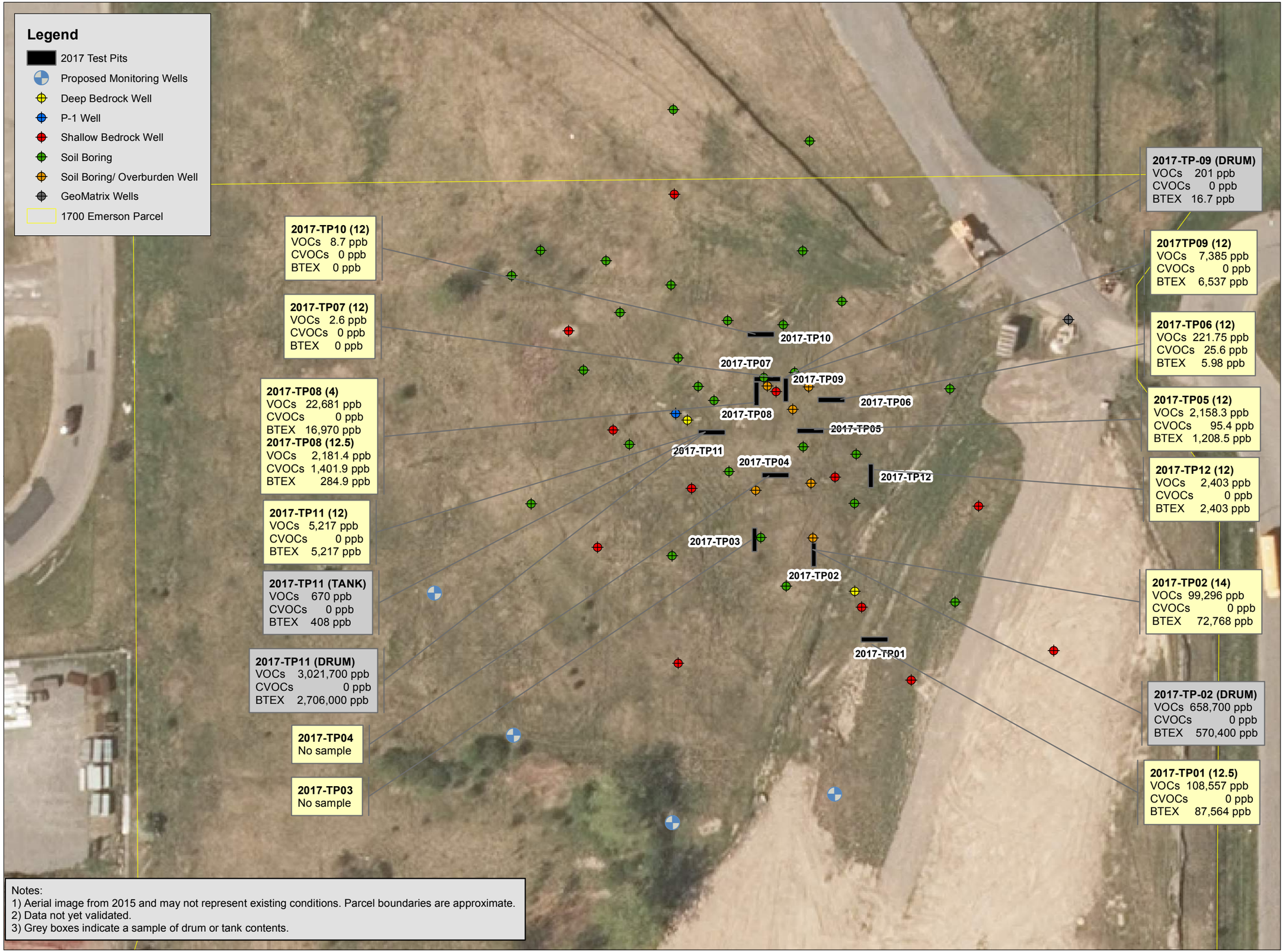
0 25 50
Feet

1 inch = 50 feet

Intended to print on 11x17

210173

FIGURE 4



Notes:
1) Aerial image from 2015 and may not represent existing conditions. Parcel boundaries are approximate.
2) Data not yet validated.
3) Grey boxes indicate a sample of drum or tank contents.

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P-1 PLUME REMEDIAL INVESTIGATION WORK PLAN ADDENDUM #5

2017 Test Pit Locations and Soil Sample Results

N
W E
S

0 25 50
Feet

1 inch = 50 feet

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FIGURE 5