Fort George G. Meade

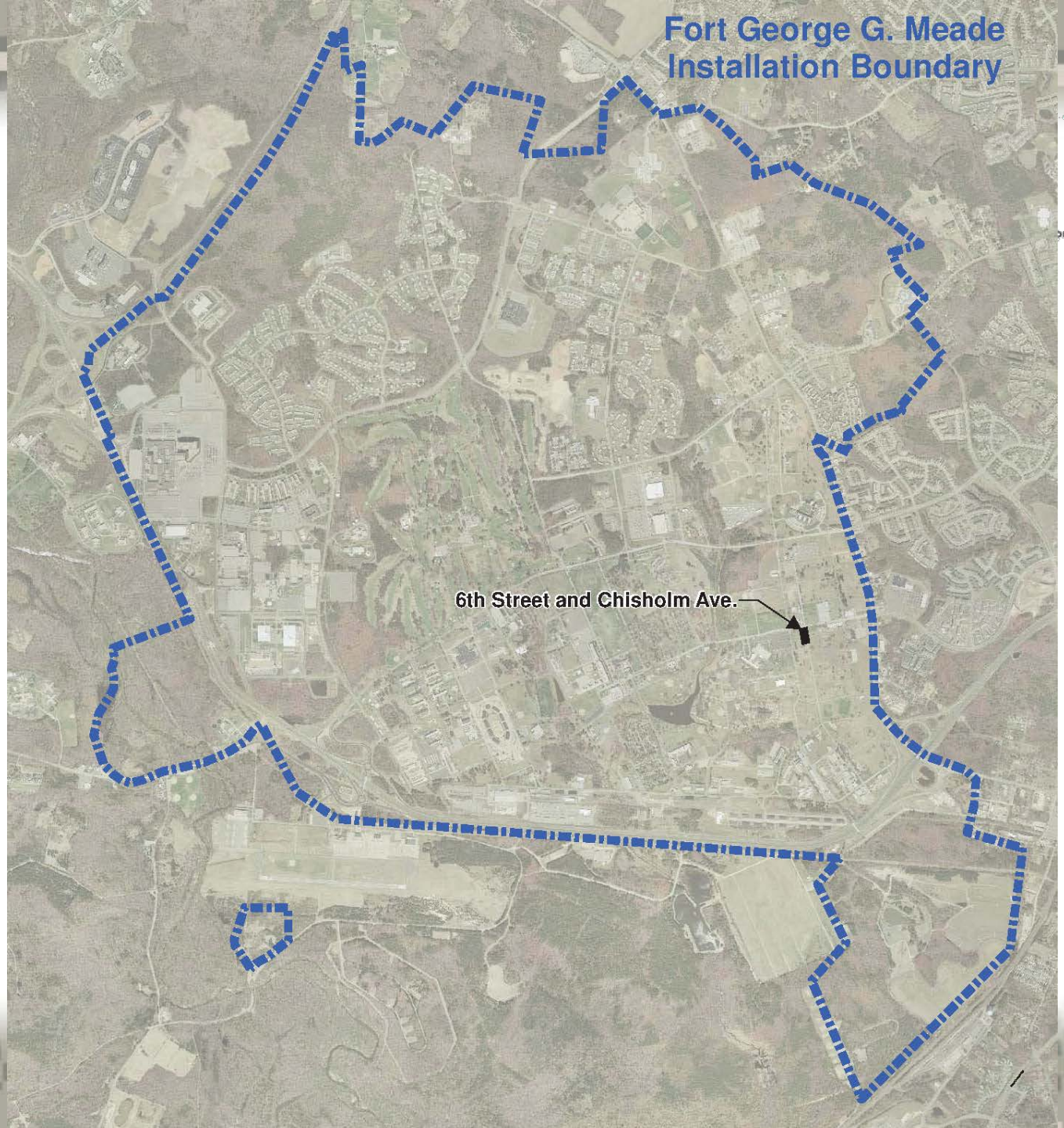
Restoration Advisory Board Meeting
May 21, 2015

Maryland Department of the Environment
Oil Control Program
Case Number 2011-0421-AA
Vacant Lot at 6th Street and Chisholm Avenue

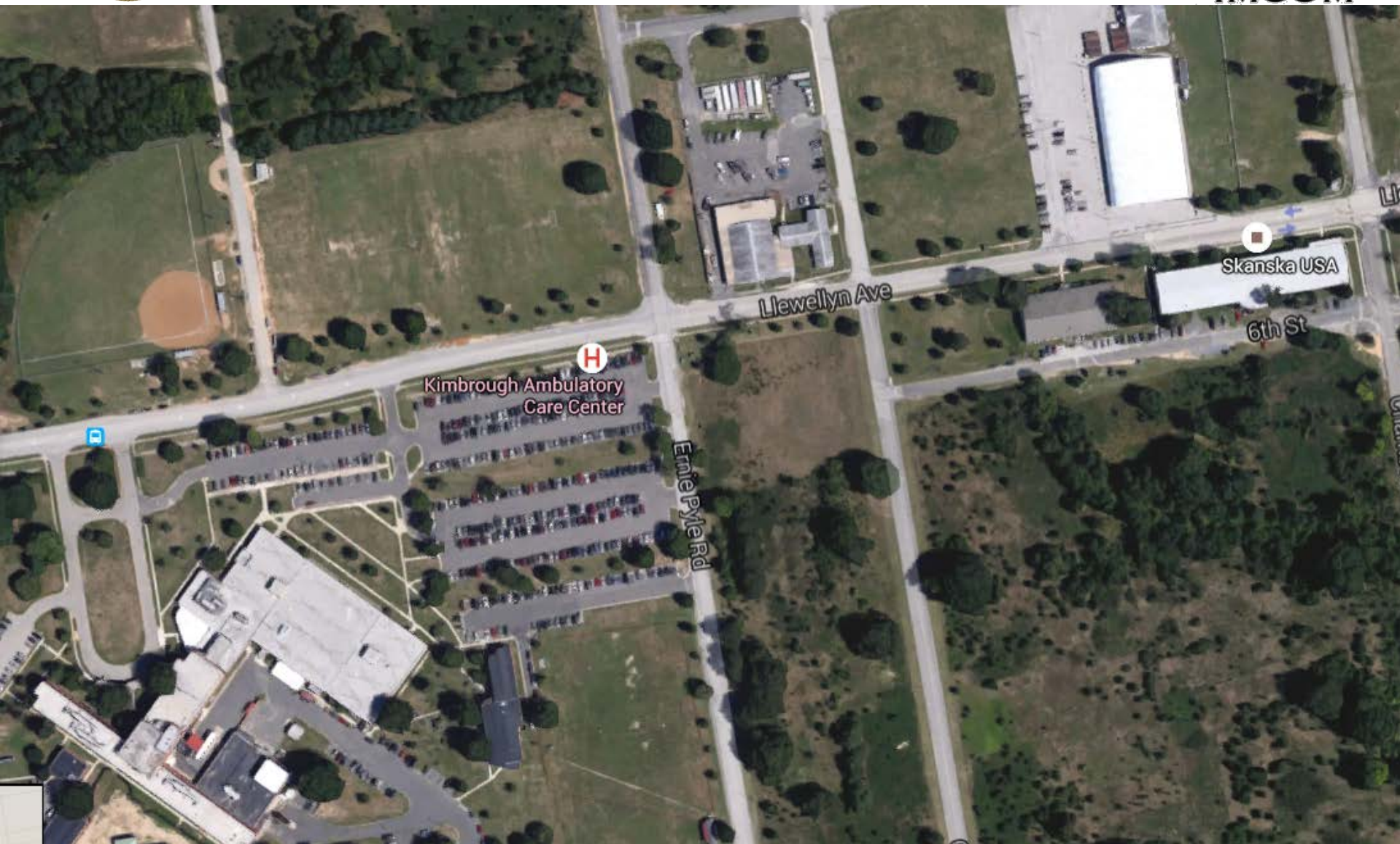
MDE OCP sites

- Last RAB update was July 2014 - PA/SI Southeast AOIs.
- Maryland Department of the Environment (MDE) Oil Control Program (OCP) is the lead agency if contaminants are petroleum related

6th Street and Chisholm Avenue Site Location on Ft Meade



Current Site Improvements



Site History

- 9 February 2009 discovery
- 19 March 2009 EPA indicates MDE should take lead
- November 2009 USAPHC Site Assessment
  - 11 borings
  - 3 temporary wells

Site identified 9 February 2009. 2009 Preliminary Site Assessment sample locations in purple.

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2009 Subsurface Soil Detections Above Action Levels

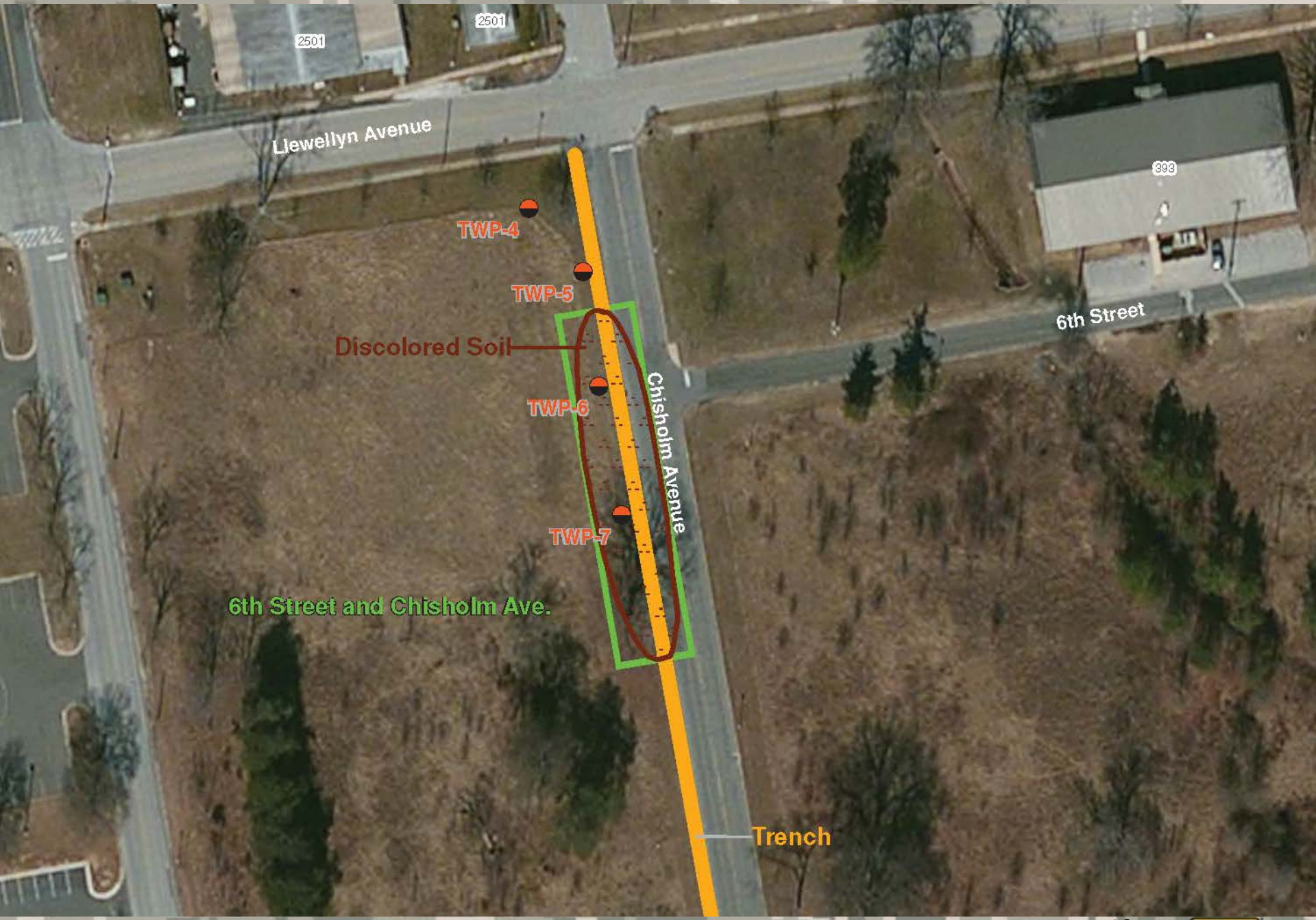
SAMPLE NUMBER	MDE June 2008 Residential Cleanup Standards (mg/kg)	MDE June 2008 Non-Residential Cleanup Standards (mg/kg)	MDE June 2008 Protection of Groundwater (mg/kg)	I3MP-01	6TH-TB-1	6TH-TB-2	6TH-TB-4	6TH-TB-5	6TH-TB-7	6TH-TB-8	6TH-TB-9	6TH-TB-10	6TH-TB-11	6TH-TB-11 DUP
SAMPLE DATE				2/10/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009	11/16/2009
BGS)				3'	4.5-5.5'	4-6'	5-7'	5-7'	5-7'	4-6'	4.5-5.5'	5-7'	5-7'	5-7'
SOURCE DOCUMENT				2009 Envr Div	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment	2010 Site Assessment
MATRIX				SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB
VOCs (mg/kg)														
Tetrachloroethene	1.2	5.3	0.0047							0.0064				
SVOCs (mg/kg)														
1,4-Dichlorobenzene	27	120	0.0042							0.0065				
Isophorone	670	3000	0.41						1.984	3.936				
Miscellaneous (mg/kg)														
TPH-G RO	230	620		1100					4400	12000			2100	2800
TPH-DRO	230	620		150					1800	2000			520	740
Metals (mg/kg)														
Arsenic	0.43	1.9	0.026		7.3	1.7	ND<1.0	1.9	3.3	1.5	5.2	6.7	1.6	1.9
Iron	5500	72000			28000	5440	2320	4900	6440	4830	16000	7260	6250	4650
Vanadium	7.8	100	730		28	8	3.7	16	17	7.4	31	15	13	17
Zinc	2300	31000	14000		ND<11.2	ND<11.1	ND<10.1	ND<10.6	ND<11.2	ND<11.1	12.5	ND<10.7	ND<11.3	ND<11.0

2009 Groundwater Detections Above Action Levels

SAMPLE NUMBER	MDE June 2008 Type I and II Aquifers Standards (mg/L)	6TH-TWP-1 (ug/L)		6TH-TWP-2 (ug/L)		6TH-TWP-3 (ug/L)	
SAMPLE DATE		11/18/2009		11/18/2009		11/18/2009	
SOURCE DOCUMENT		Assessment		Assessment		Assessment	
MATRIX		GW		GW		GW	
VOCs (ug/L)							
Bromomethane	0.85	2.6		1.1	J	1.4	J
Isopropylbenzene	66	180	E	ND<2		ND<2	
SVOCs (ug/L)							
2-Methylnaphthalene	2.4	8.3	J	ND<14		ND<11	
Di(2-ethylhexyl)phthalate	6	470		41		23	
Naphthalene	0.65	150		ND<14		ND<11	
Misc (ug/L)							
TPH-GRO	47	98000		ND<220		250	
TPH-DRO	47	42000		ND<99		ND<93	
Metals (ug/L)							
Aluminum	50	32800		5920		980	
Arsenic	10	10.9		2.72		ND<2	
Iron	300	153000		27400		10700	
Manganese	50	208		314		195	
Vanadium	3.7	89.3		14.9		4.45	

Site History (continued)

- December 2012 URS OCP Investigation
  - Install 4 monitoring wells
  - Collect 4 subsurface soil samples
  - Monthly well gauging
  - Quarterly groundwater sampling and analysis



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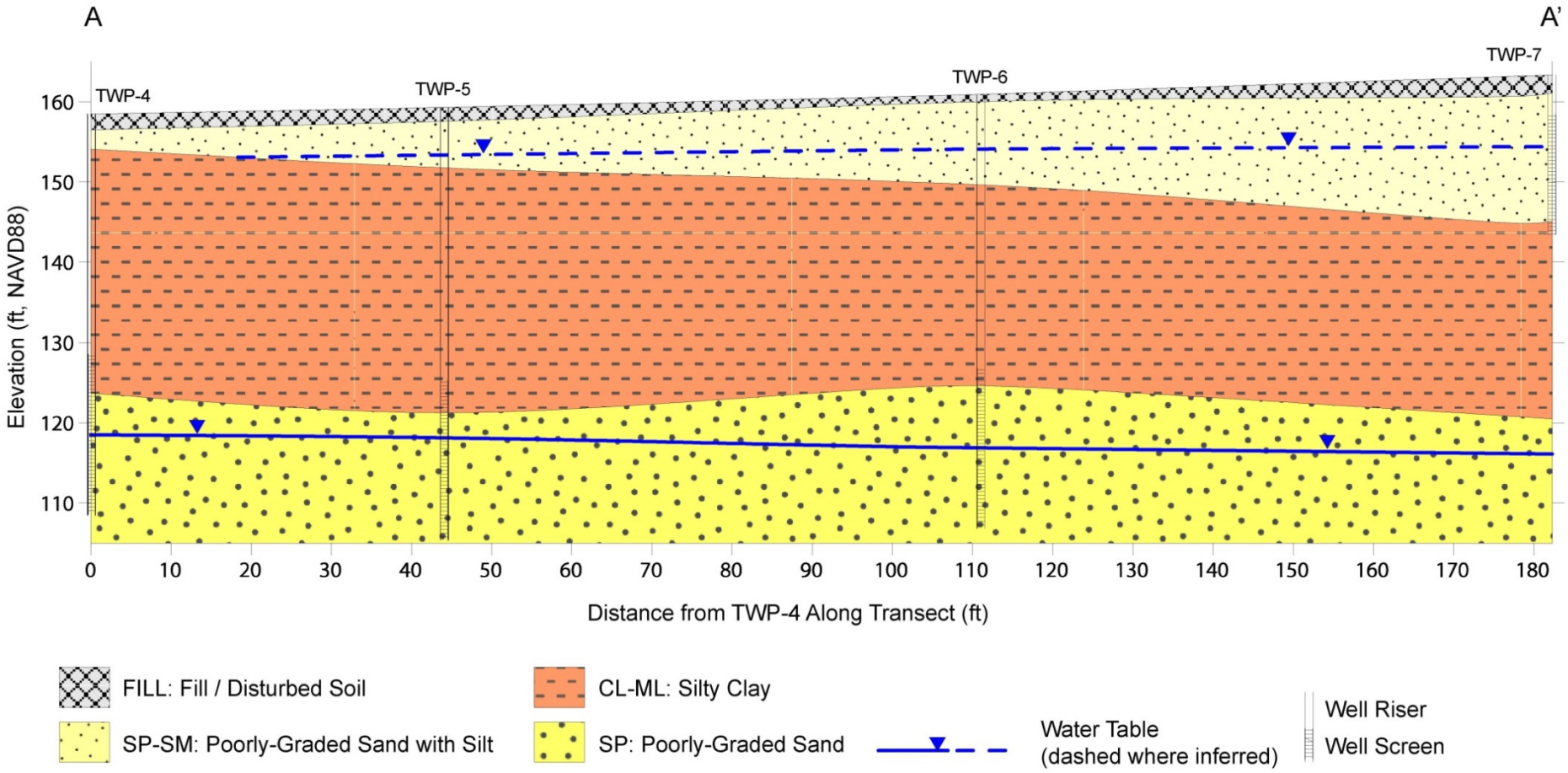
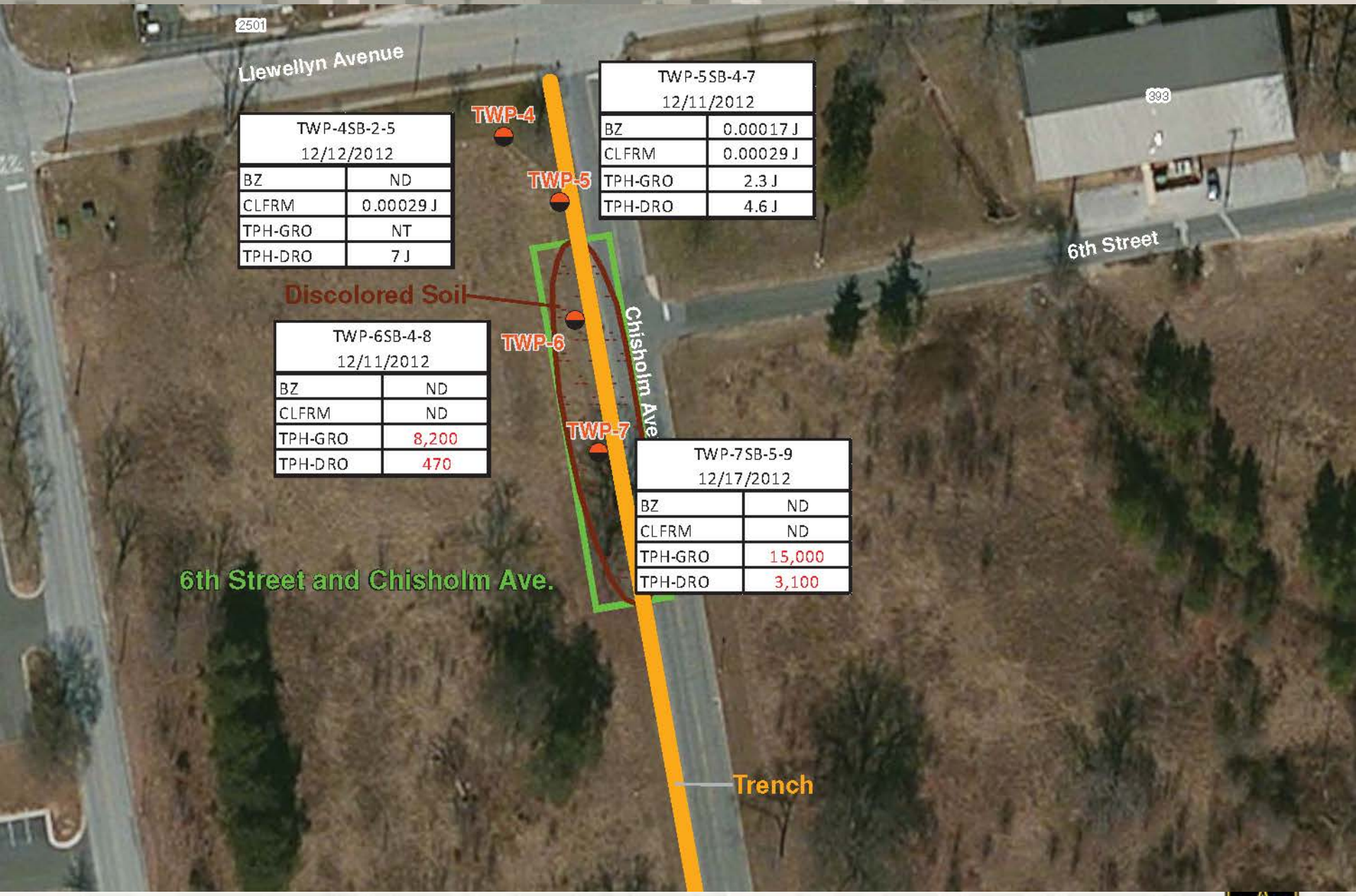
Cross-Section from TWP-4 in the North to TWP-7 in the South





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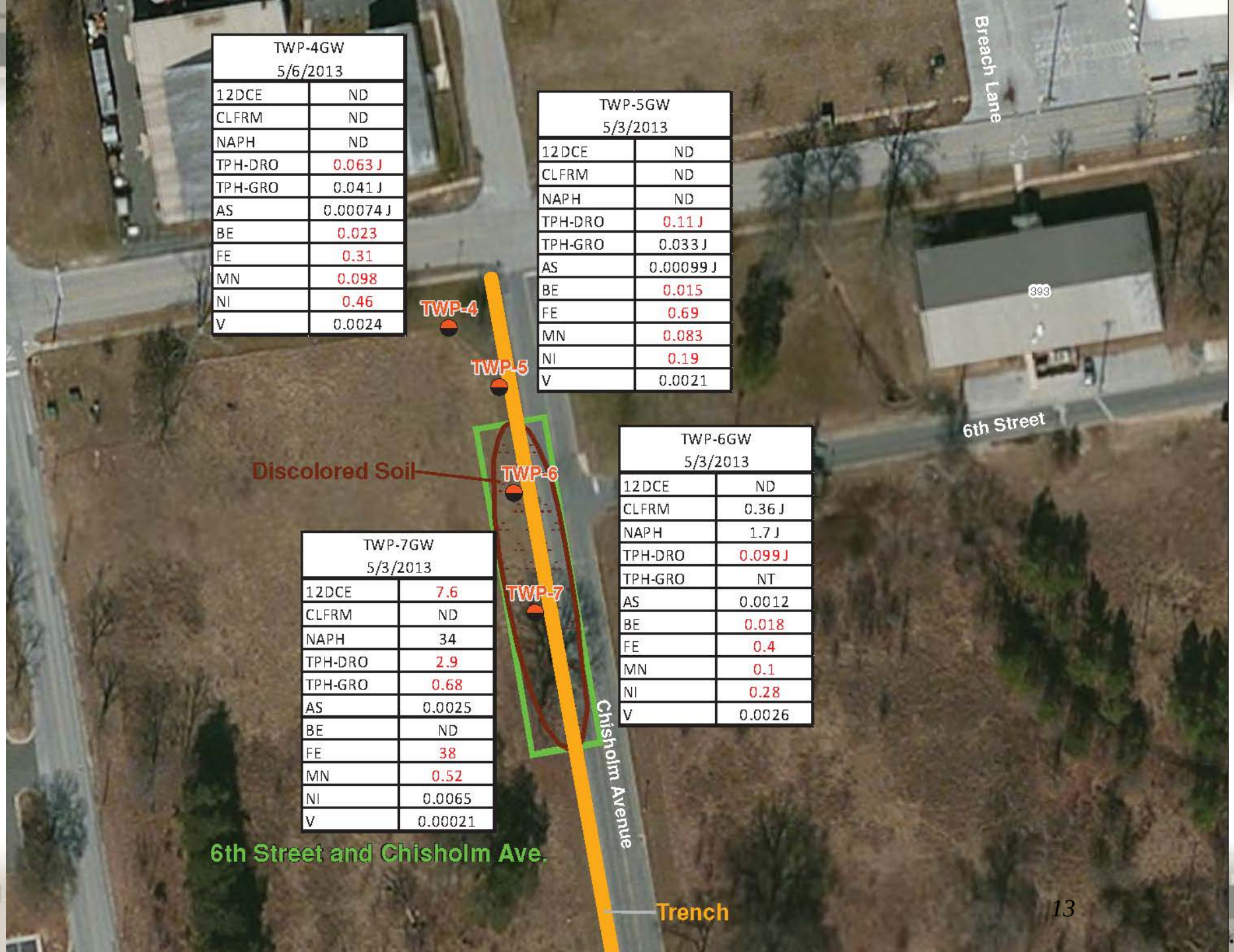


TWP-4GW 5/6/2013	
12DCE	ND
CLFRM	ND
NAPH	ND
TPH-DRO	0.063 J
TPH-GRO	0.041 J
AS	0.00074 J
BE	0.023
FE	0.31
MN	0.098
NI	0.46
V	0.0024

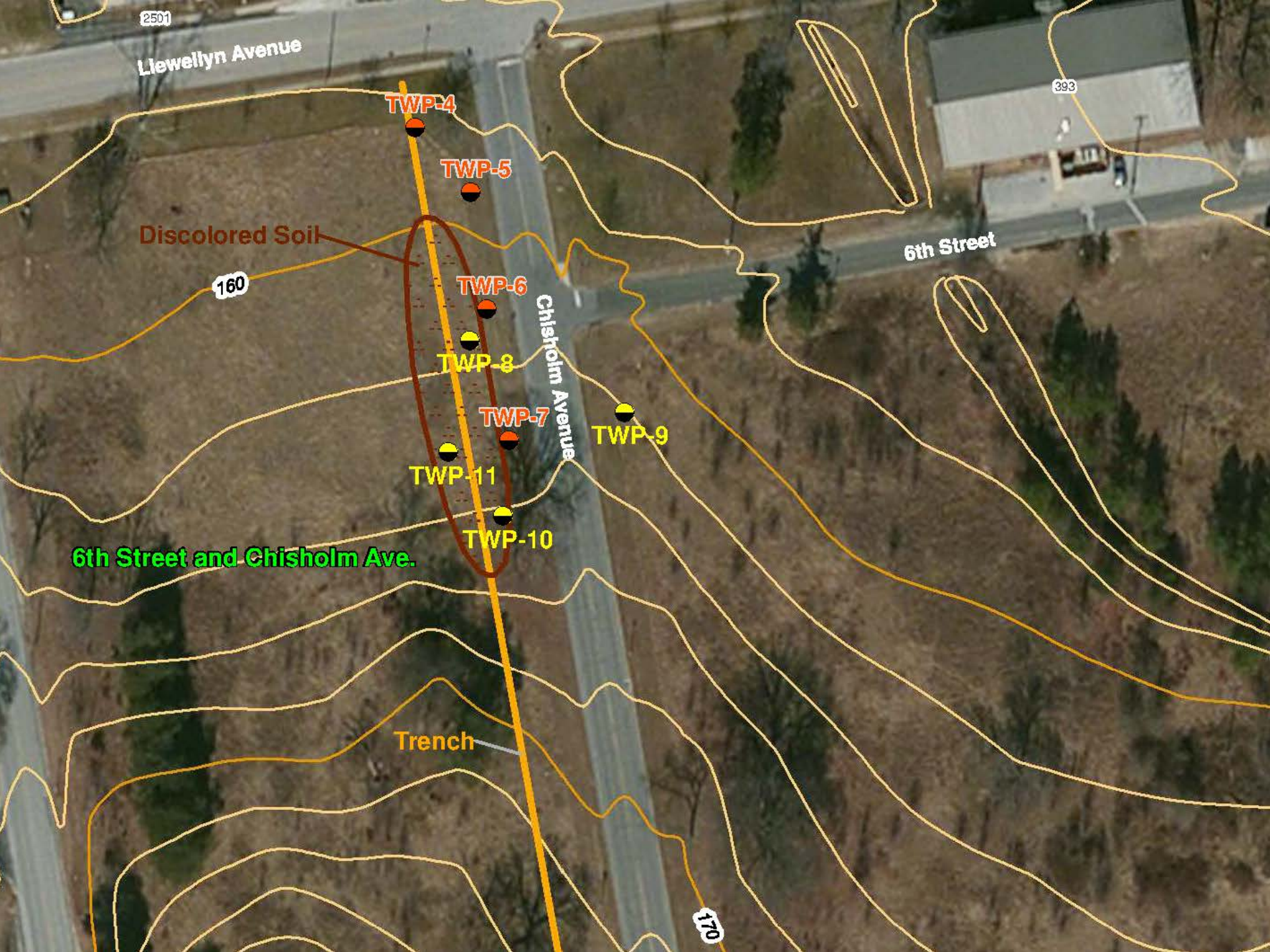
TWP-5GW 5/3/2013	
12DCE	ND
CLFRM	ND
NAPH	ND
TPH-DRO	0.11 J
TPH-GRO	0.033 J
AS	0.00099 J
BE	0.015
FE	0.69
MN	0.083
NI	0.19
V	0.0021

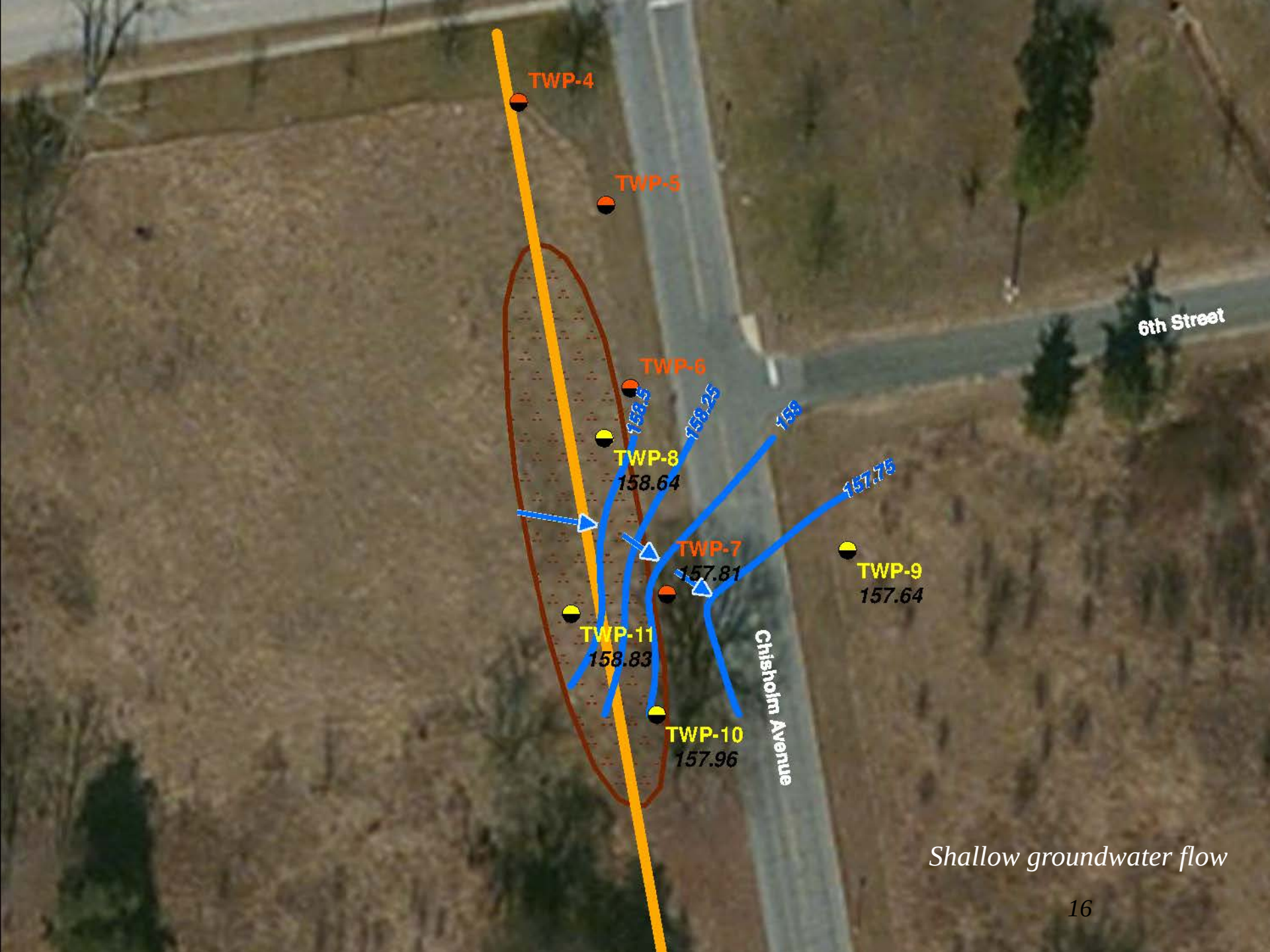
TWP-6GW 5/3/2013	
12DCE	ND
CLFRM	0.36 J
NAPH	1.7 J
TPH-DRO	0.099 J
TPH-GRO	NT
AS	0.0012
BE	0.018
FE	0.4
MN	0.1
NI	0.28
V	0.0026

TWP-7GW 5/3/2013	
12DCE	7.6
CLFRM	ND
NAPH	34
TPH-DRO	2.9
TPH-GRO	0.68
AS	0.0025
BE	ND
FE	38
MN	0.52
NI	0.0065
V	0.00021

Site History (continued)

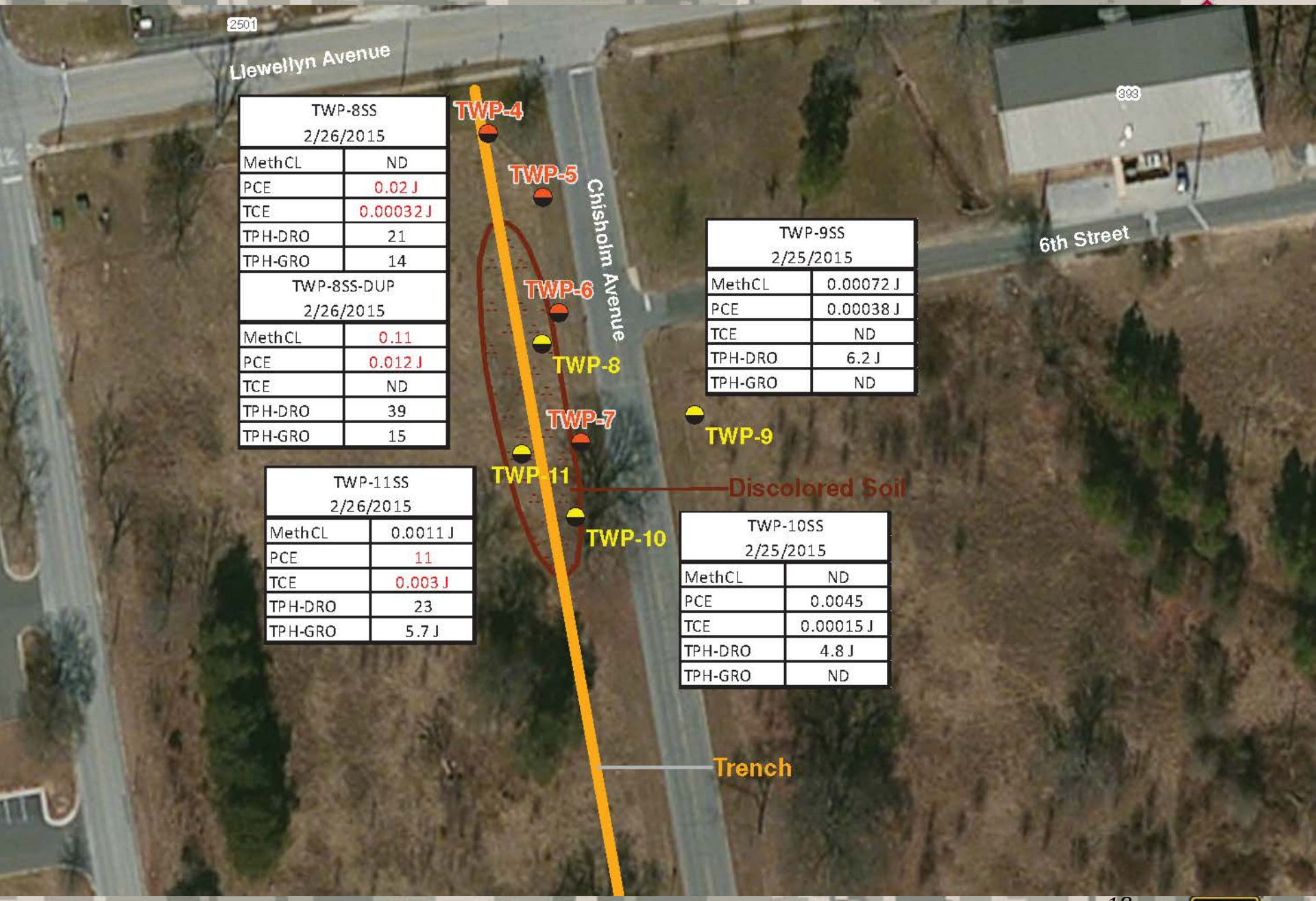
- February 2015 URS additional OCP Investigation
  - Install 4 monitoring wells
  - Collect 4 surface soil samples
  - Collect 4 subsurface soil samples


2501
Llewellyn Avenue
TWP-4
TWP-5
Discolored Soil
160
TWP-6
TWP-8
Chisholm Avenue
TWP-7
TWP-9
TWP-11
TWP-10
6th Street and Chisholm Ave.
Trench
170
393
6th Street



Shallow groundwater flow

Deep groundwater flow



TWP-8SS 2/26/2015	
MethCL	ND
PCE	0.02 J
TCE	0.00032 J
TPH-DRO	21
TPH-GRO	14

TWP-8SS-DUP 2/26/2015	
MethCL	0.11
PCE	0.012 J
TCE	ND
TPH-DRO	39
TPH-GRO	15

TWP-9SS 2/25/2015	
MethCL	0.00072 J
PCE	0.00038 J
TCE	ND
TPH-DRO	6.2 J
TPH-GRO	ND

TWP-11SS 2/26/2015	
MethCL	0.0011 J
PCE	11
TCE	0.003 J
TPH-DRO	23
TPH-GRO	5.7 J

TWP-10SS 2/25/2015	
MethCL	ND
PCE	0.0045
TCE	0.00015 J
TPH-DRO	4.8 J
TPH-GRO	ND

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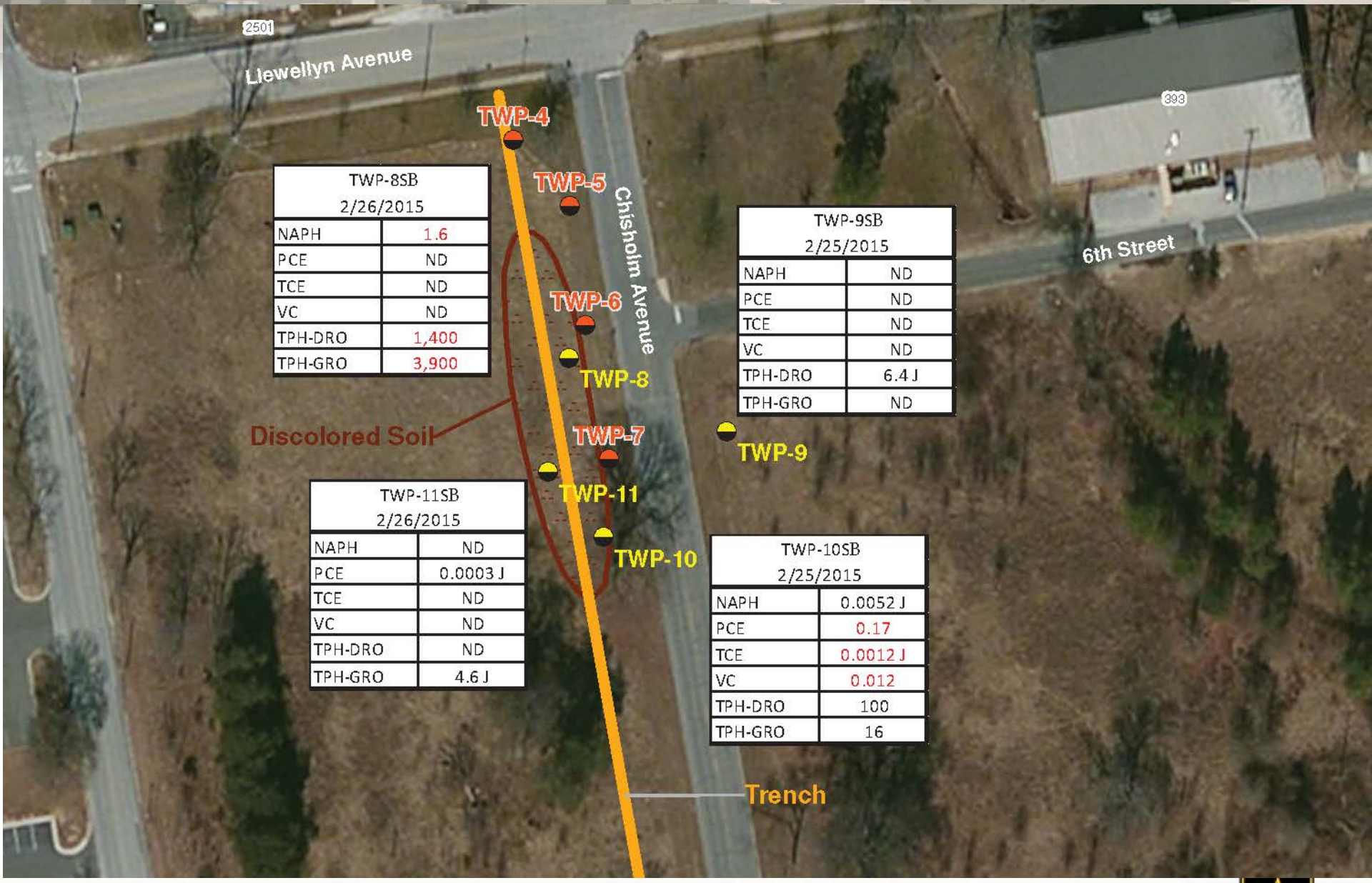

TWP-8SB 2/26/2015	
NAPH	1.6
PCE	ND
TCE	ND
VC	ND
TPH-DRO	1,400
TPH-GRO	3,900

TWP-9SB 2/25/2015	
NAPH	ND
PCE	ND
TCE	ND
VC	ND
TPH-DRO	6.4 J
TPH-GRO	ND

TWP-11SB 2/26/2015	
NAPH	ND
PCE	0.0003 J
TCE	ND
VC	ND
TPH-DRO	ND
TPH-GRO	4.6 J

TWP-10SB 2/25/2015	
NAPH	0.0052 J
PCE	0.17
TCE	0.0012 J
VC	0.012
TPH-DRO	100
TPH-GRO	16

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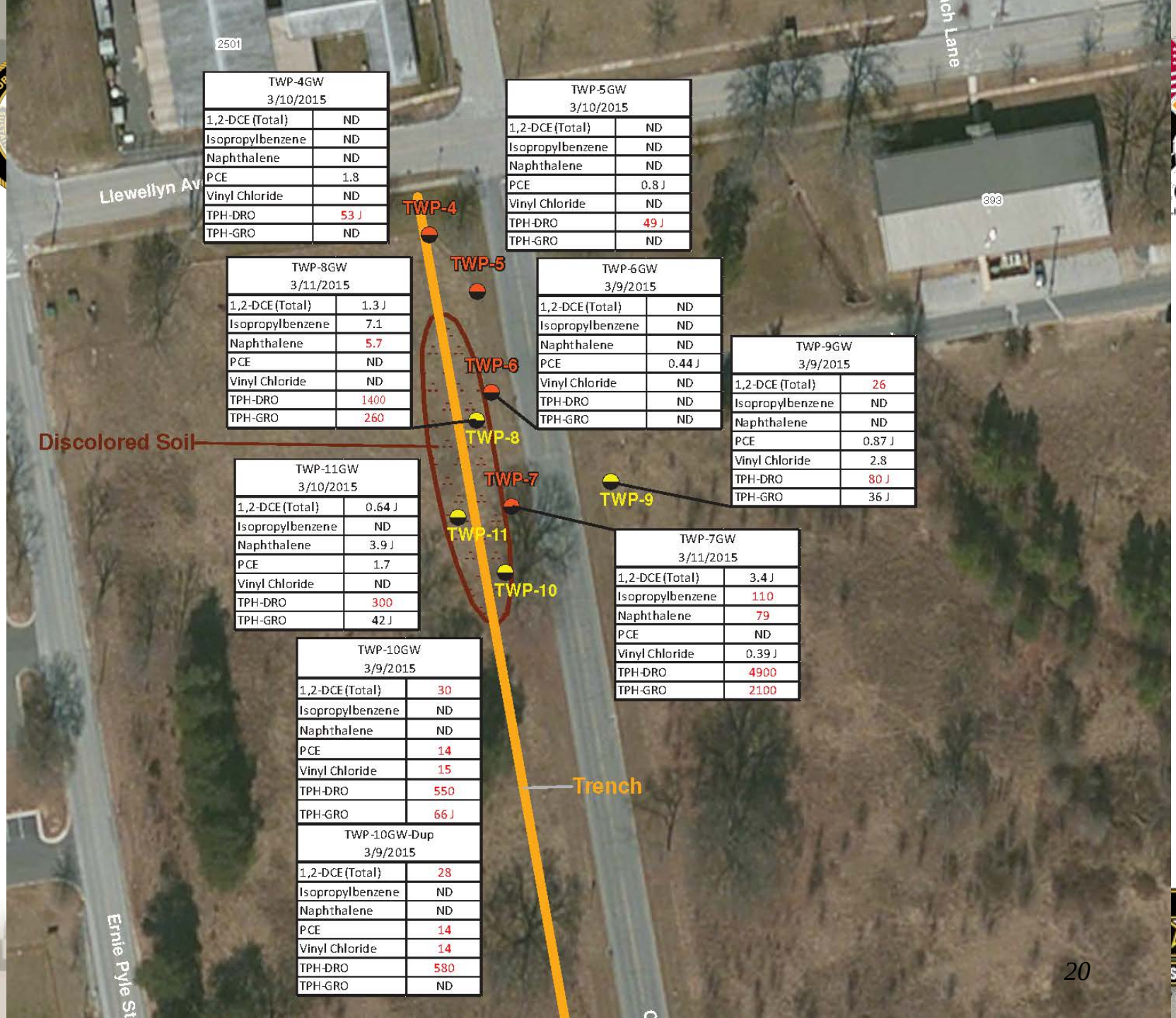


TWP-4GW 3/10/2015	
1,2-DCE (Total)	ND
Isopropylbenzene	ND
Naphthalene	ND
PCE	1.8
Vinyl Chloride	ND
TPH-DRO	53 J
TPH-GRO	ND

TWP-5GW 3/10/2015	
1,2-DCE (Total)	ND
Isopropylbenzene	ND
Naphthalene	ND
PCE	0.8 J
Vinyl Chloride	ND
TPH-DRO	49 J
TPH-GRO	ND

TWP-8GW 3/11/2015	
1,2-DCE (Total)	1.3 J
Isopropylbenzene	7.1
Naphthalene	5.7
PCE	ND
Vinyl Chloride	ND
TPH-DRO	1400
TPH-GRO	260

TWP-6GW 3/9/2015	
1,2-DCE (Total)	ND
Isopropylbenzene	ND
Naphthalene	ND
PCE	0.44 J
Vinyl Chloride	ND
TPH-DRO	ND
TPH-GRO	ND

TWP-9GW 3/9/2015	
1,2-DCE (Total)	26
Isopropylbenzene	ND
Naphthalene	ND
PCE	0.87 J
Vinyl Chloride	2.8
TPH-DRO	80 J
TPH-GRO	36 J

TWP-11GW 3/10/2015	
1,2-DCE (Total)	0.64 J
Isopropylbenzene	ND
Naphthalene	3.9 J
PCE	1.7
Vinyl Chloride	ND
TPH-DRO	300
TPH-GRO	42 J

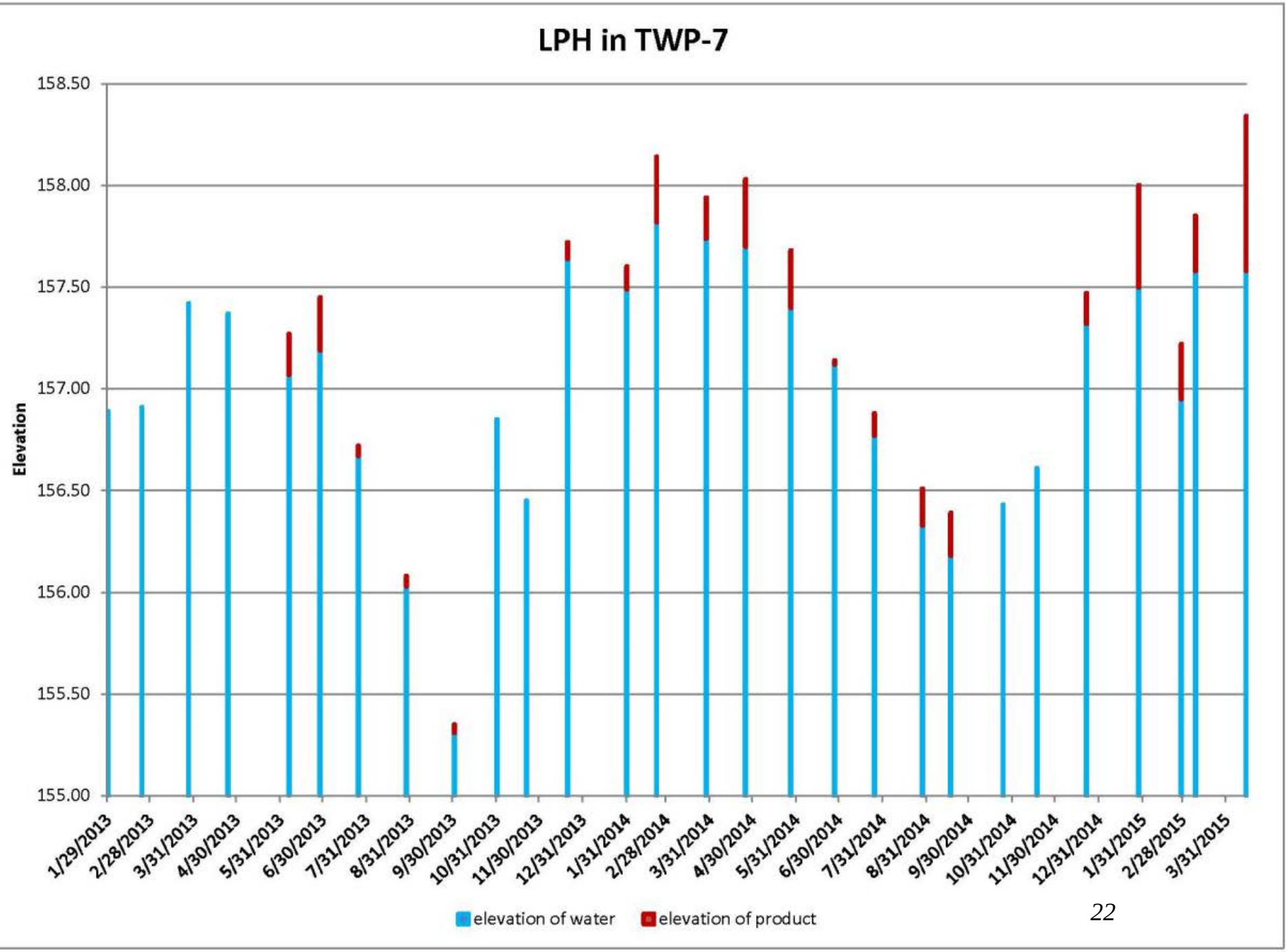
TWP-7GW 3/11/2015	
1,2-DCE (Total)	3.4 J
Isopropylbenzene	110
Naphthalene	79
PCE	ND
Vinyl Chloride	0.39 J
TPH-DRO	4900
TPH-GRO	2100

TWP-10GW 3/9/2015	
1,2-DCE (Total)	30
Isopropylbenzene	ND
Naphthalene	ND
PCE	14
Vinyl Chloride	15
TPH-DRO	550
TPH-GRO	66 J

TWP-10GW-Dup 3/9/2015	
1,2-DCE (Total)	28
Isopropylbenzene	ND
Naphthalene	ND
PCE	14
Vinyl Chloride	14
TPH-DRO	580
TPH-GRO	ND

Site History (continued)

- 27 months of well gauging completed
- 7th Round of quarterly sampling completed March 2015

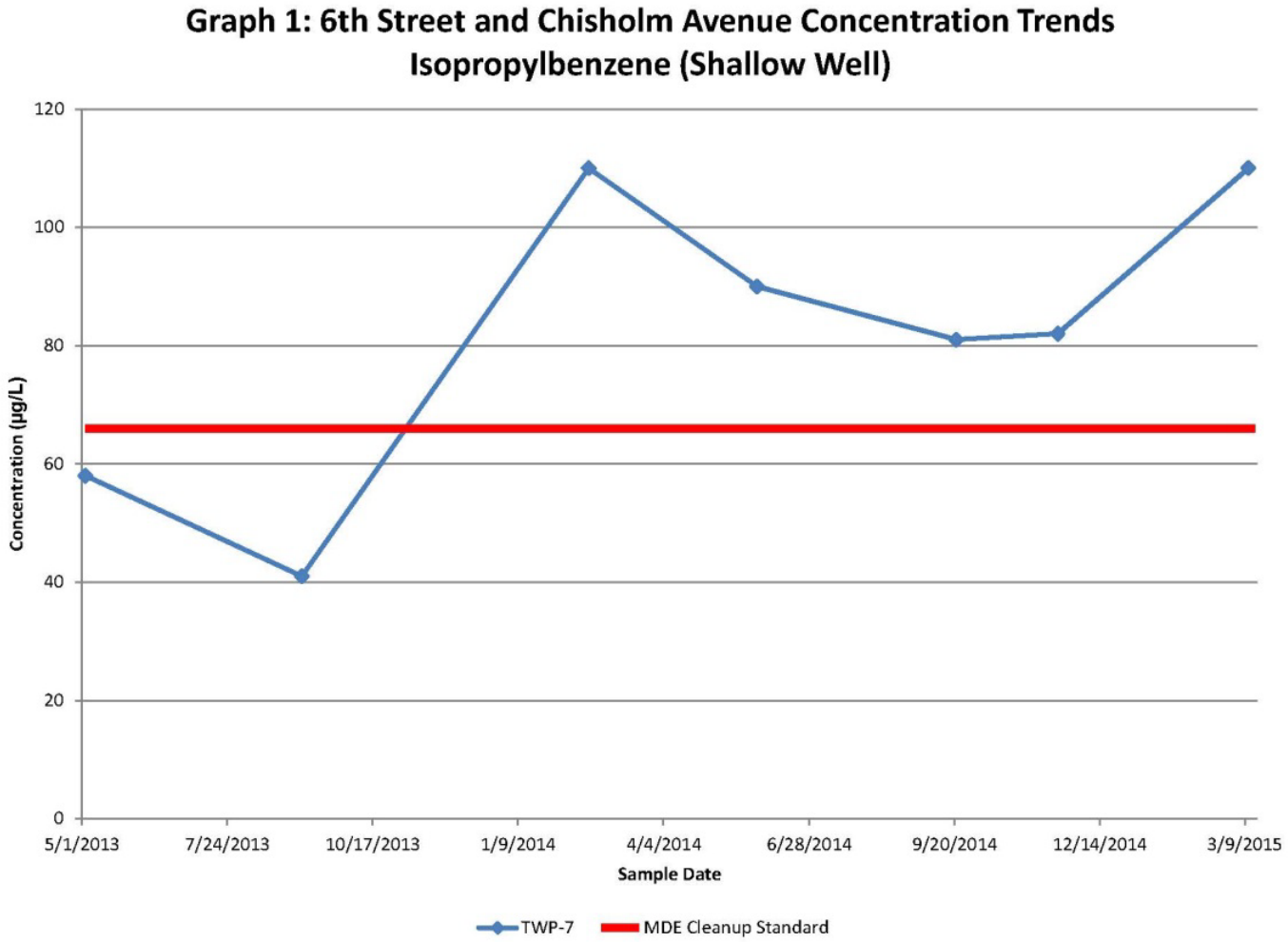

LPH in TWP-7
Elevation
158.50
158.00
157.50
157.00
156.50
156.00
155.50
155.00
1/29/2013
2/28/2013
3/31/2013
4/30/2013
5/31/2013
6/30/2013
7/31/2013
8/31/2013
9/30/2013
10/31/2013
11/30/2013
12/31/2013
1/31/2014
2/28/2014
3/31/2014
4/30/2014
5/31/2014
6/30/2014
7/31/2014
8/31/2014
9/30/2014
10/31/2014
11/30/2014
12/31/2014
1/31/2015
2/28/2015
3/31/2015
elevation of water
elevation of product

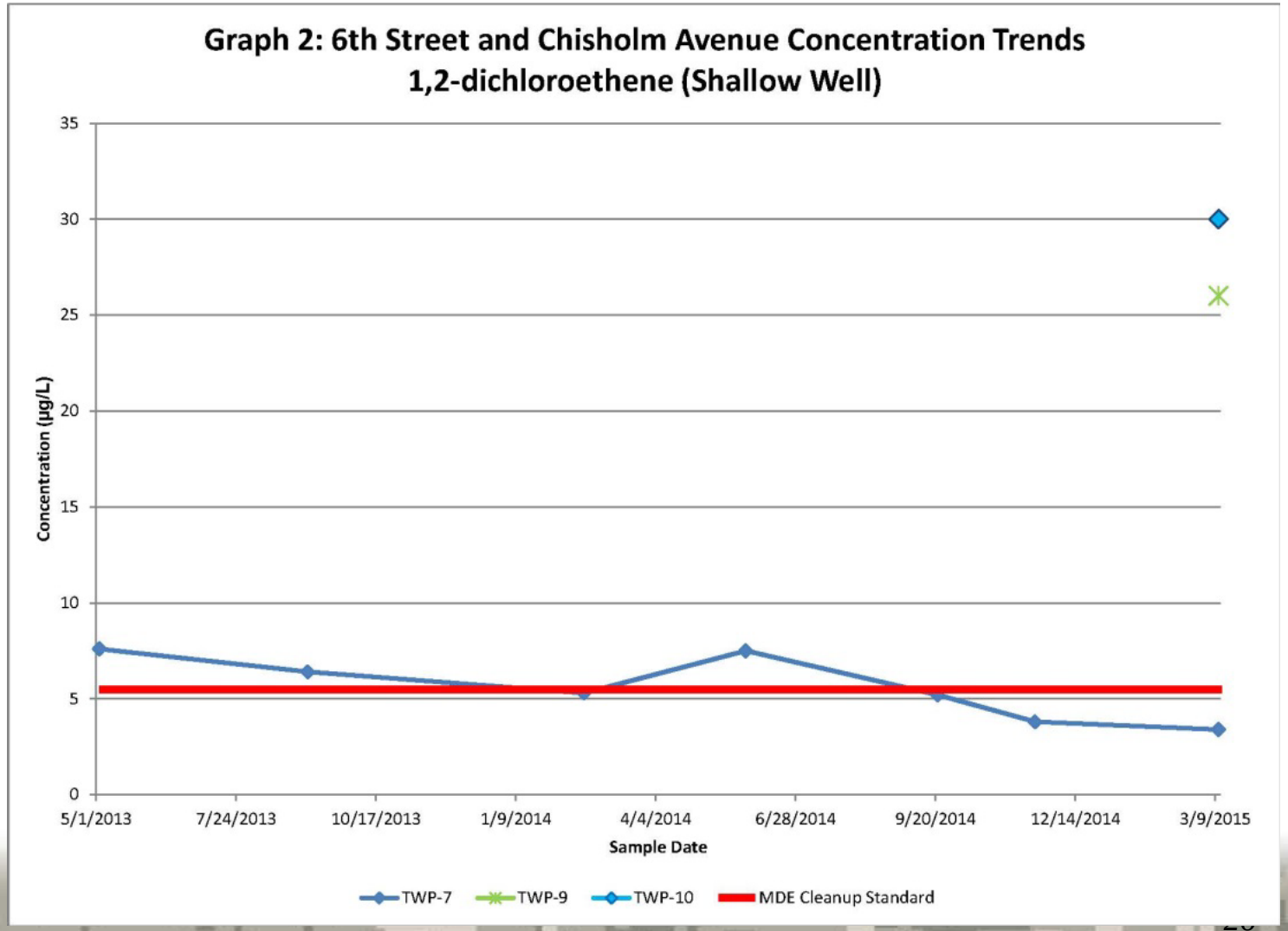
Quarterly Sampling Detections (1 of 2)

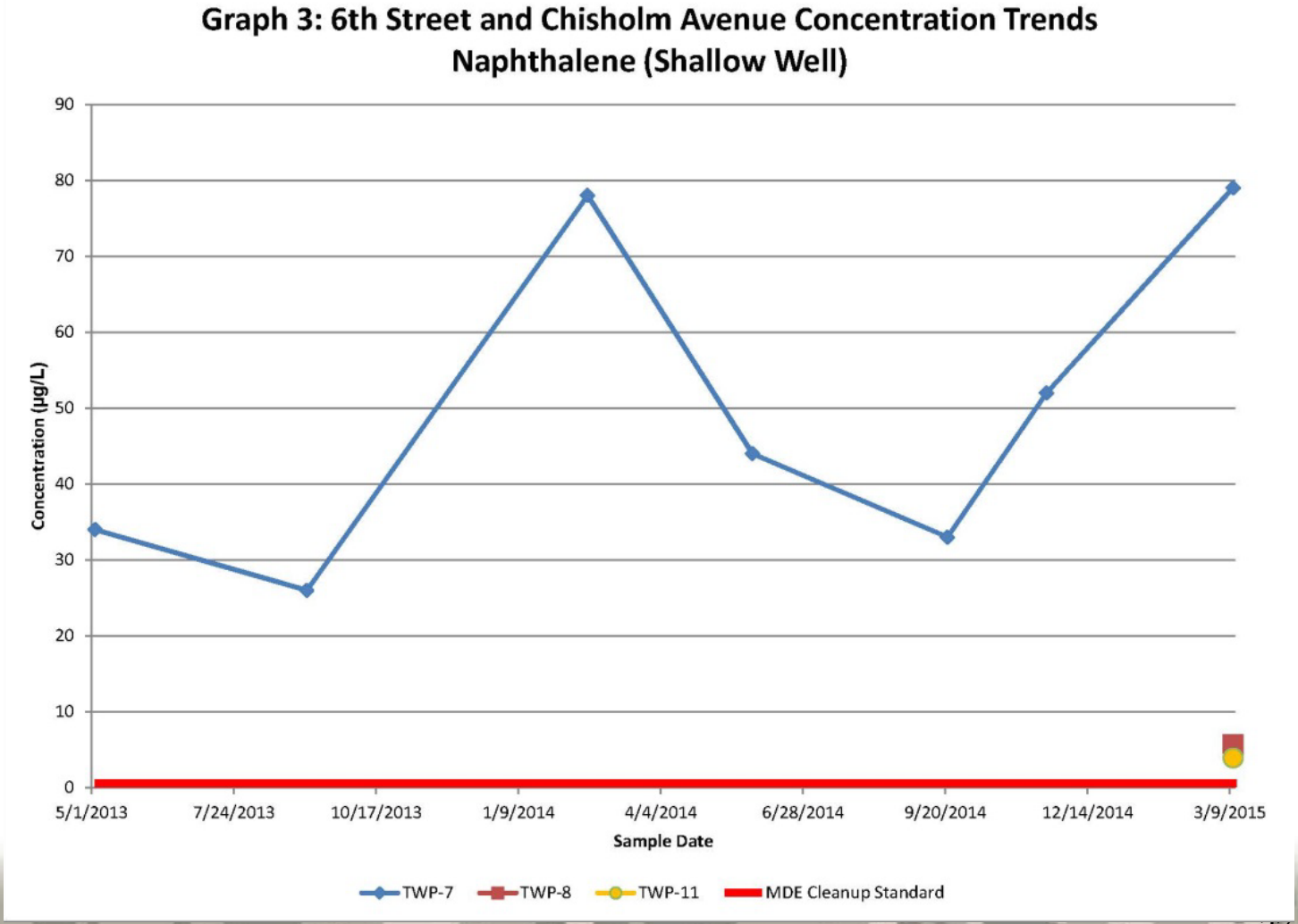
Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (Total) (µg/L)	Total BTEX (µg/L)	Methyl tert-Butyl Ether (µg/L)	Isopropylbenzene (µg/L)	1,2-Dichloroethene (µg/L)	Naphthalene (µg/L)	Methylene Chloride (µg/L)	TPH-DRO (µg/L)	TPH-GRO (µg/L)
MDE June 2008 Type I and II Aquifers Standards		5	1000	700	10000		20	66	5.5	0.65	5	47[1]	47[1]
TWP-4GW	5/6/2013											63 J	41 J
TWP-4GW	9/5/2013										0.29 J	71 J	
TWP-4GW	2/19/2014											220 B	
TWP-4GW	5/28/2014												26 J
TWP-4GW	9/22/2014										0.99 BJ	58 J	49 BJ
TWP-4	11/19/2014											80 J	
TWP-4	3/11/2015											53 J	
TWP-5GW	5/3/2013						0.17 J					110 J	33 J
TWP-5GW	9/5/2013						0.23 J					55 J	
TWP-5GW	2/20/2014						0.16 J					84 BJ	
TWP-5GW	5/28/2014						0.22 J						
TWP-5GW	9/22/2014						0.2 J				0.86 BJ		
TWP-5	11/20/2014						0.18 J					73 J	
TWP-5	3/11/2015						0.15 J					49 J	
TWP-6GW	5/3/2013						0.11 J	0.98 J		1.7 J		99 J	
TWP-6GW	9/6/2013						0.23 J				0.92 J		
TWP-6GW-Dup	9/6/2013						0.23 J				0.4 J		
TWP-6GW	2/20/2014						0.24 J					76 BJ	
TWP-6GW	5/29/2014						0.22 J					56 J	28 J
TWP-6GW-Dup	5/29/2014						0.21 J						27 J
TWP-6GW	9/22/2014						0.24 J				1.4 B		44 BJ
TWP-6GW-Dup	9/22/2014						0.28 J				0.41 BJ		46 BJ
TWP-6	11/20/2014						0.21 J					64 J	
TWP-6	3/11/2015										0.64 J		

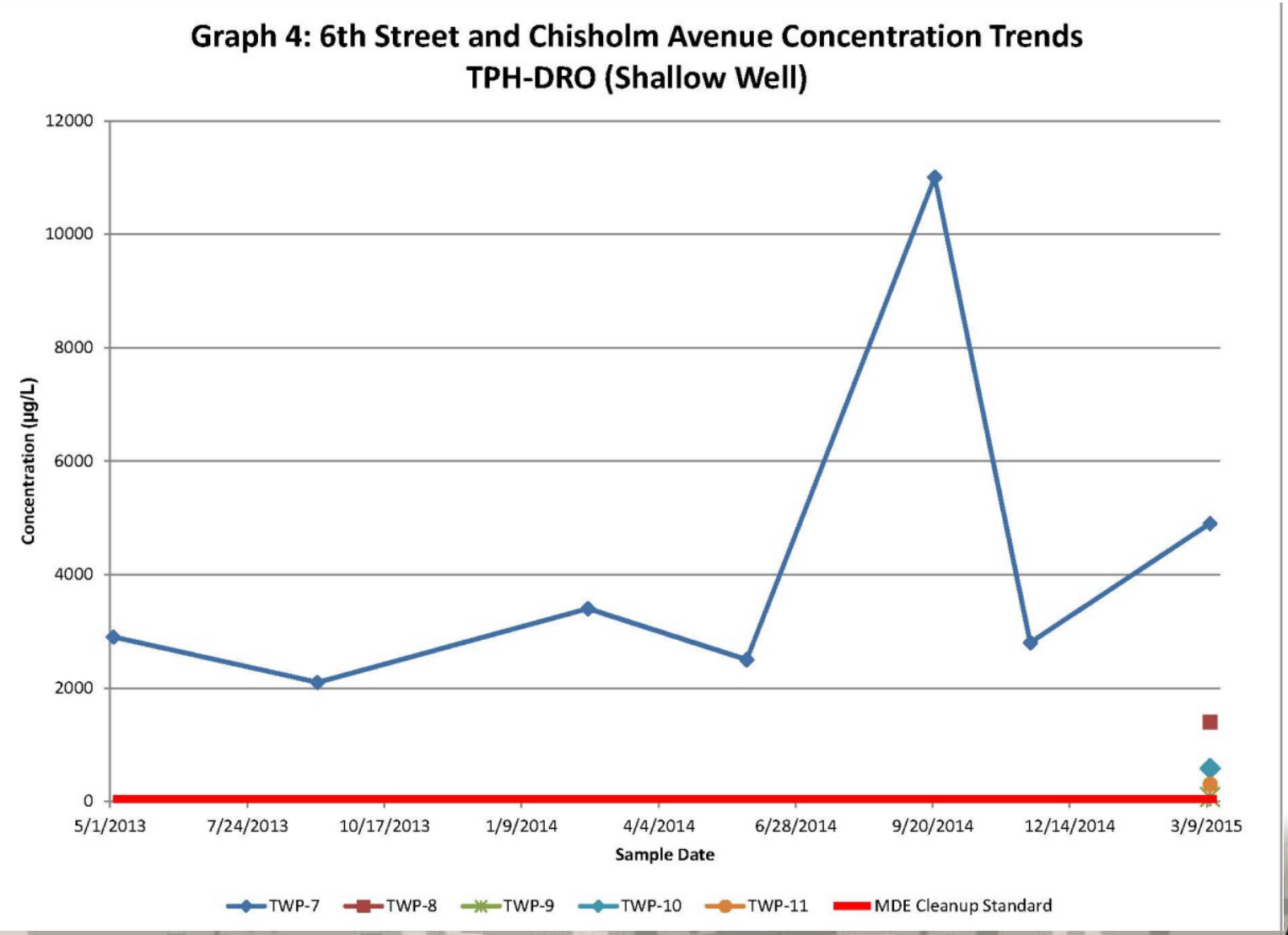
Quarterly Sampling Detections (1 of 2)

Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (Total) (µg/L)	Total BTEX (µg/L)	Methyl tert-Butyl Ether (µg/L)	Isopropylbenzene (µg/L)	1,2-Dichloroethene (µg/L)	Naphthalene (µg/L)	Methylene Chloride (µg/L)	TPH-DRO (µg/L)	TPH-GRO (µg/L)
MDE June 2008 Type I and II Aquifers Standards		5	1000	700	10000		20	66	5.5	0.65	5	47[1]	47[1]
TWP-7GW	5/3/2013			34	0.58 J	34.58		58	7.6	34		2900	680
TWP-7GW	9/6/2013			23	0.48 J	23.48		41	6.4	26	0.25 J	2100	620
TWP-7GW	2/20/2014			63	3.6	66.6		110	5.3	78		3400	1700
TWP-7GW	5/29/2014			35	1.8 J	36.8		90	7.5	44		2500	1500
TWP-7GW	9/22/2014			30	0.88 J	30.88		81	5.2	33	6.0	11000	940 B
TWP-7	11/20/2014		0.3 J	43	2 J	45.3		82	3.8	52		2800	1200
TWP-7	3/11/2015		0.32 J	61	2.9 J	64.22		110	3.4 J	79	2.6 J	4900	2100
TWP-8	3/11/2015		0.29 J	2.8	2.3 J	5.39		7.1	1.3 J	5.7	0.38 J	1400	260
TWP-9	3/11/2015								26			80 J	36 J
TWP-10	3/11/2015		0.31 J			0.31			30			550	66 J
TWP-10Dup	3/11/2015		0.32 J			0.32			28			580	
TWP-11	3/11/2015								0.64 J	3.9 J		300	42 J

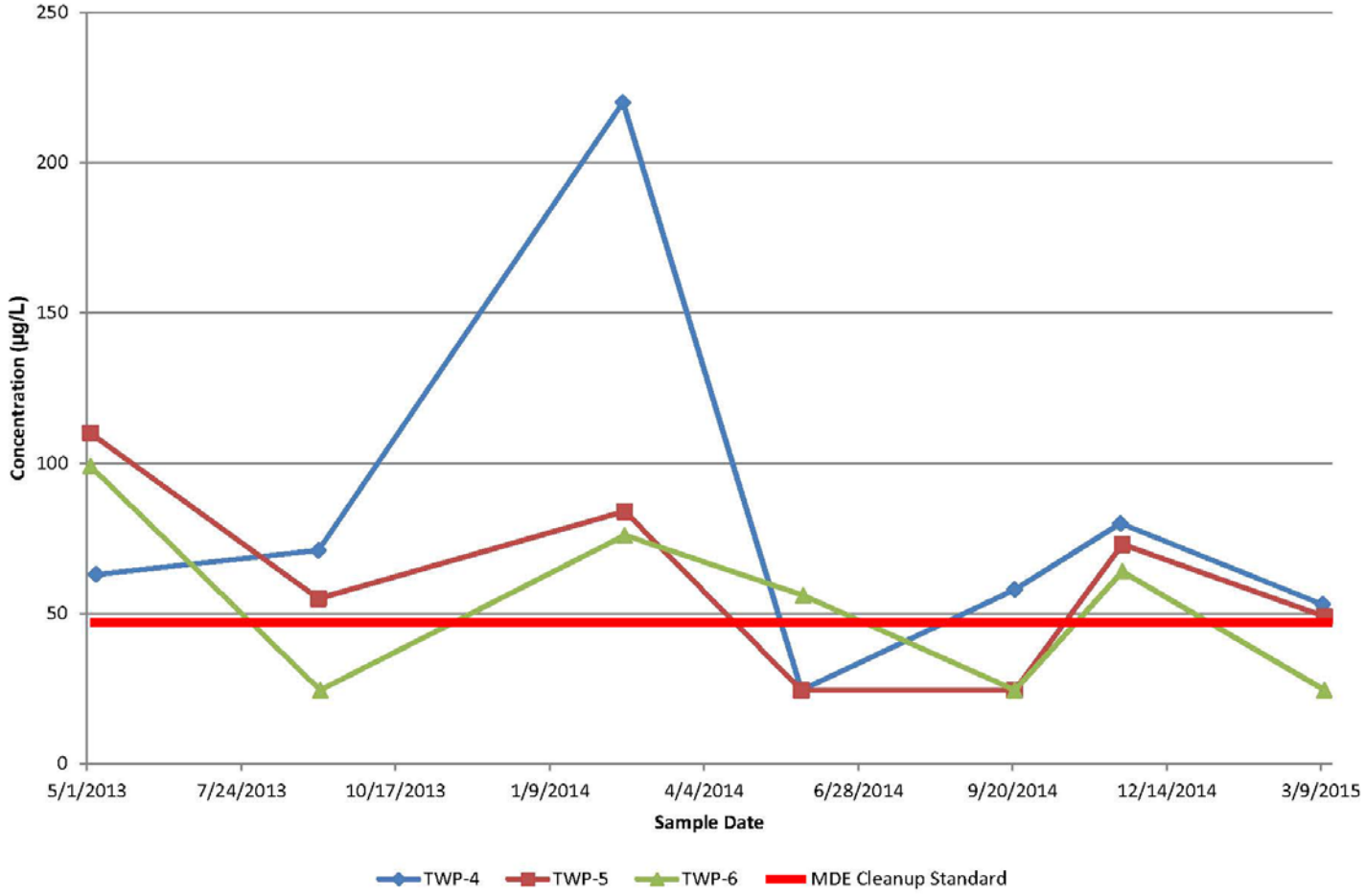

Graph 1: 6th Street and Chisholm Avenue Concentration Trends
Isopropylbenzene (Shallow Well)
Concentration (µg/L)
120
100
80
60
40
20
0
5/1/2013
7/24/2013
10/17/2013
1/9/2014
4/4/2014
6/28/2014
9/20/2014
12/14/2014
3/9/2015
Sample Date
TWP-7
MDE Cleanup Standard


Graph 2: 6th Street and Chisholm Avenue Concentration Trends
1,2-dichloroethene (Shallow Well)
Concentration (µg/L)
35
30
25
20
15
10
5
0
5/1/2013
7/24/2013
10/17/2013
1/9/2014
4/4/2014
6/28/2014
9/20/2014
12/14/2014
3/9/2015
Sample Date
TWP-7
TWP-9
TWP-10
MDE Cleanup Standard

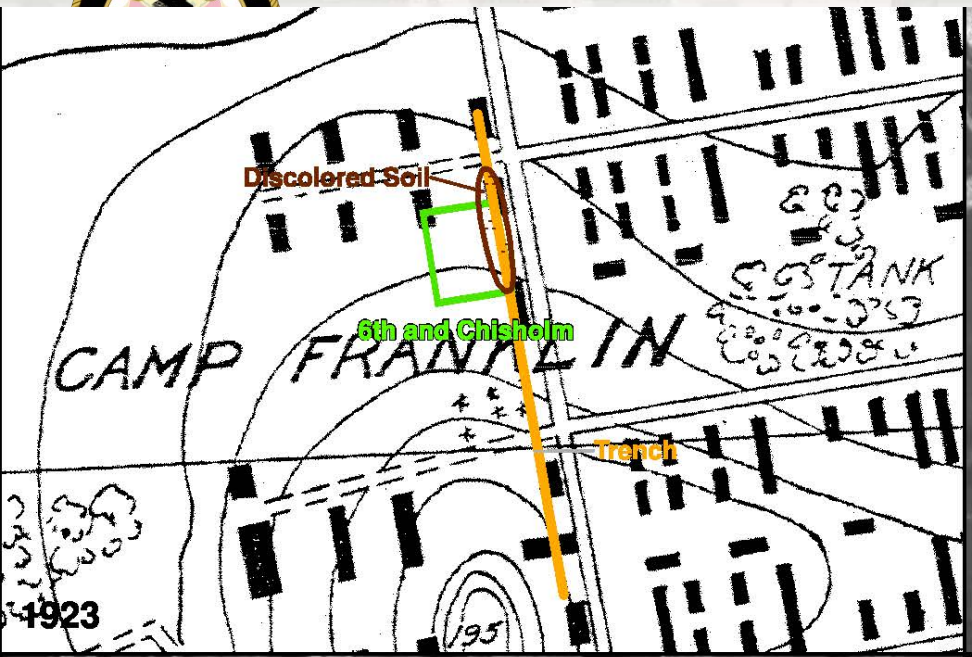

Graph 3: 6th Street and Chisholm Avenue Concentration Trends
Naphthalene (Shallow Well)
Concentration (µg/L)
90
80
70
60
50
40
30
20
10
0
5/1/2013
7/24/2013
10/17/2013
1/9/2014
4/4/2014
6/28/2014
9/20/2014
12/14/2014
3/9/2015
Sample Date
TWP-7
TWP-8
TWP-11
MDE Cleanup Standard

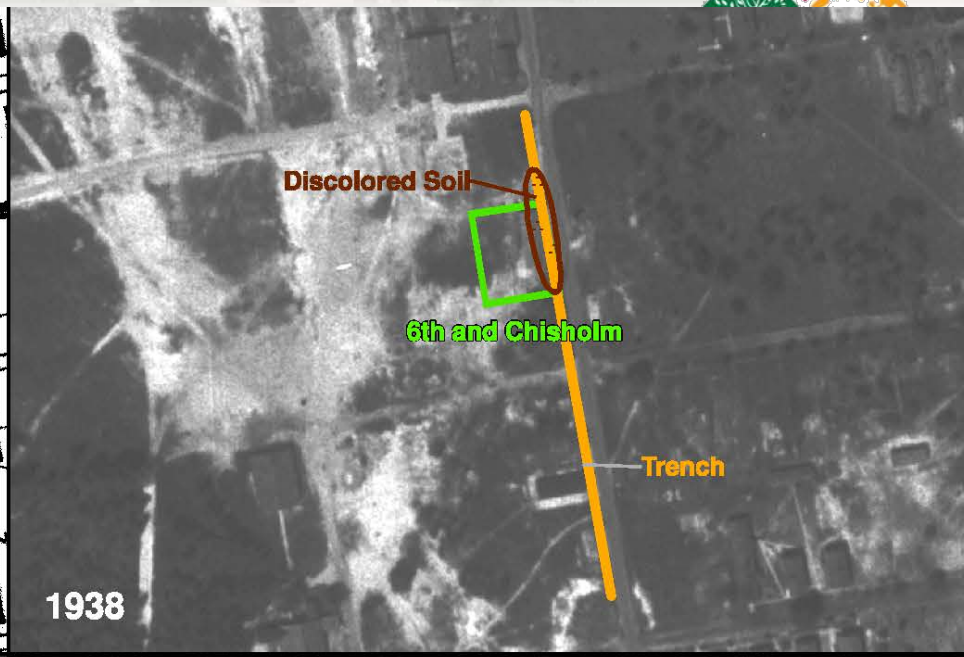

Graph 4: 6th Street and Chisholm Avenue Concentration Trends
TPH-DRO (Shallow Well)
Concentration (µg/L)
12000
10000
8000
6000
4000
2000
0
5/1/2013
7/24/2013
10/17/2013
1/9/2014
4/4/2014
6/28/2014
9/20/2014
12/14/2014
3/9/2015
Sample Date
TWP-7
TWP-8
TWP-9
TWP-10
TWP-11
MDE Cleanup Standard

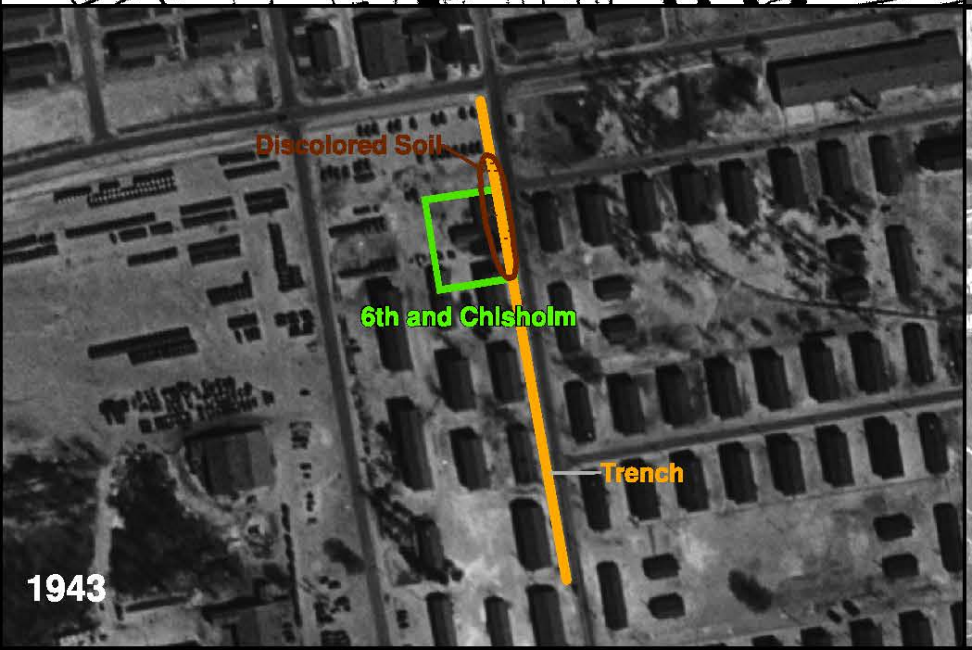
Graph 5: 6th Street and Chisholm Avenue Concentration Trends
TPH-DRO (Deep Wells)

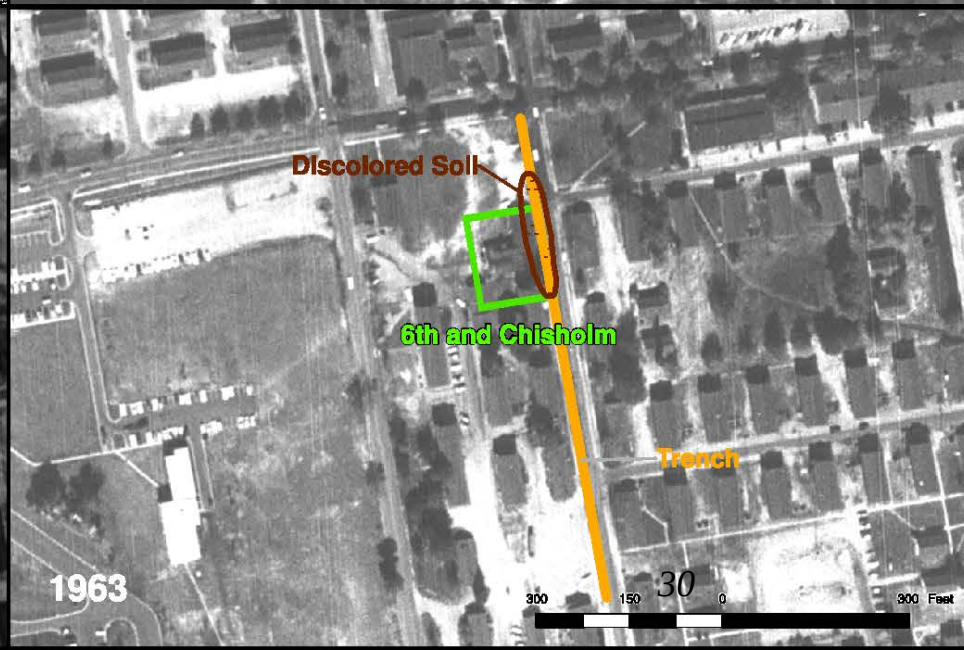


Historic Site Conditions

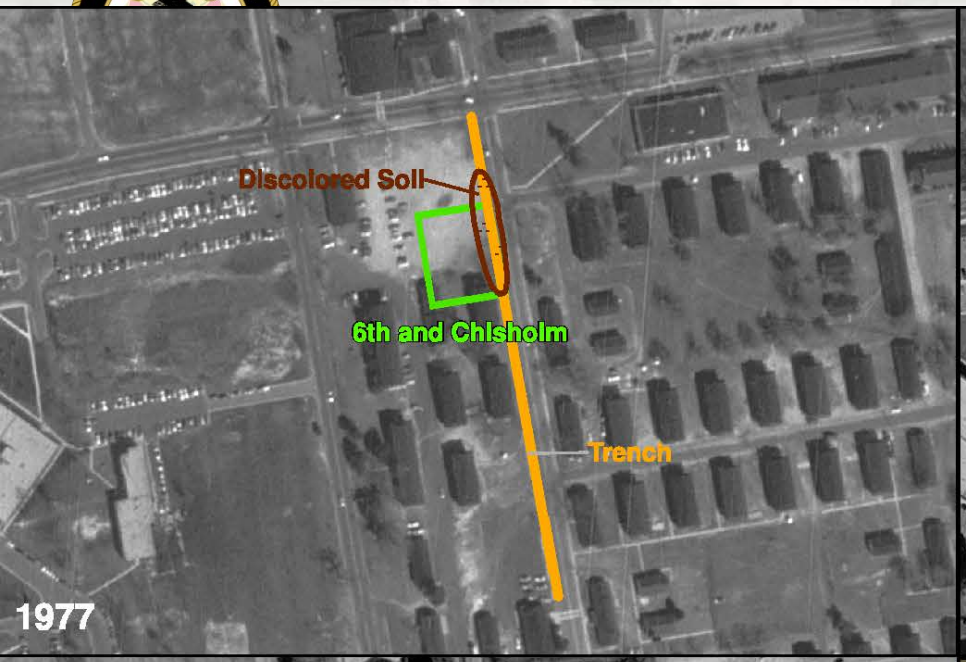


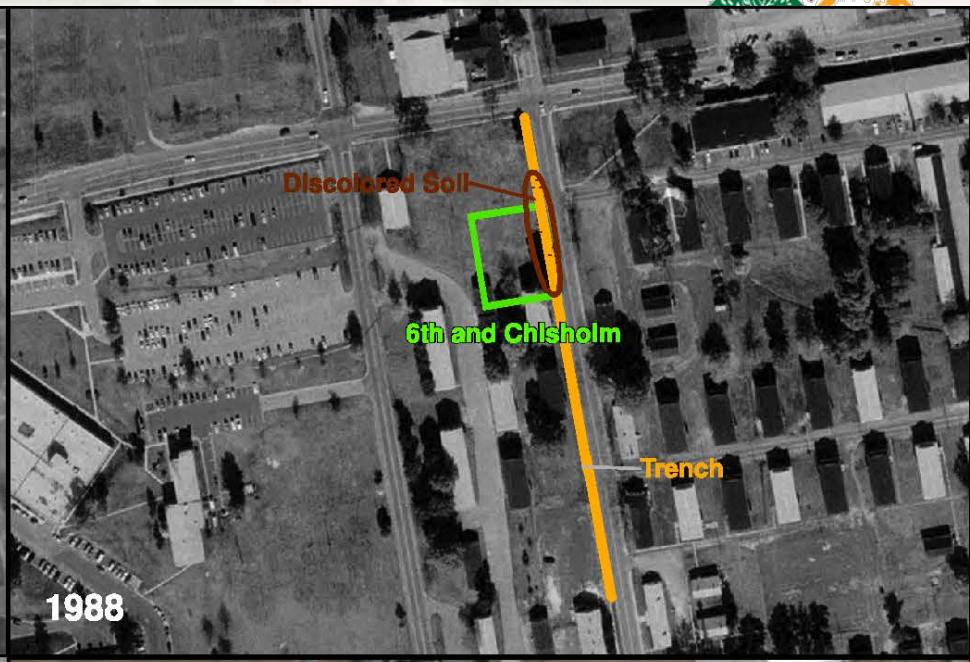


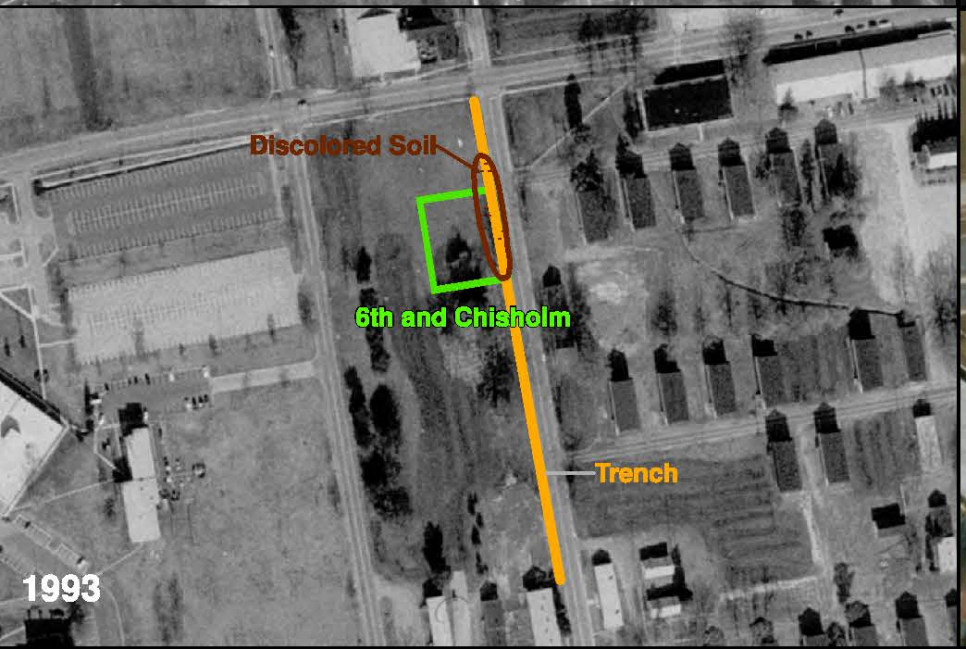




Historic Site Conditions







Questions?

How many are animals?
Why do birds have feathers?
What are birds?

Acronyms and Abbreviations

- EPA – U.S. Environmental Protection Agency
- MDE – Maryland Department of the Environment
- RAB – Restoration Advisory Board
- USACHPPM – U.S. Army Center for Health Promotion and Preventive Medicine

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