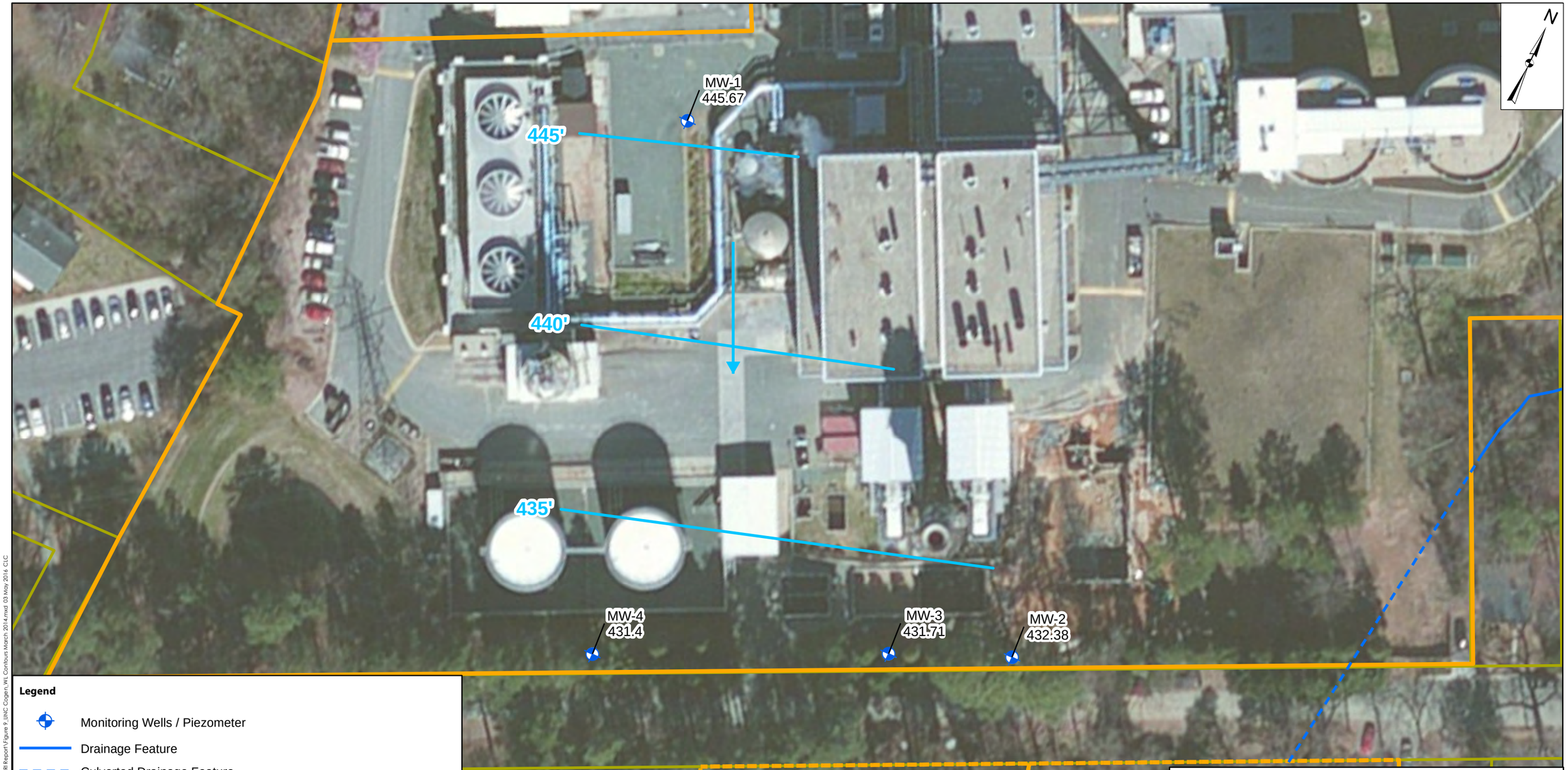


Legend

- Monitoring Wells / Piezometer
- Drainage Feature
- Culverted Drainage Feature
- Potentiometric Contours
- Cogeneration Facility Site
- UNC-Owned Parcels
- Privately Owned Parcels
- Groundwater flow direction

Notes:
1. NM indicates not measured - monitoring well installed in August 2014
2. Horizontal coordinate system US State Plane 1983 North Carolina, US survey feet.
3. Groundwater flow direction is approximate.
4. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

75 37.5 0 75 Feet

Potentiometric Surface Map
10 March 2014

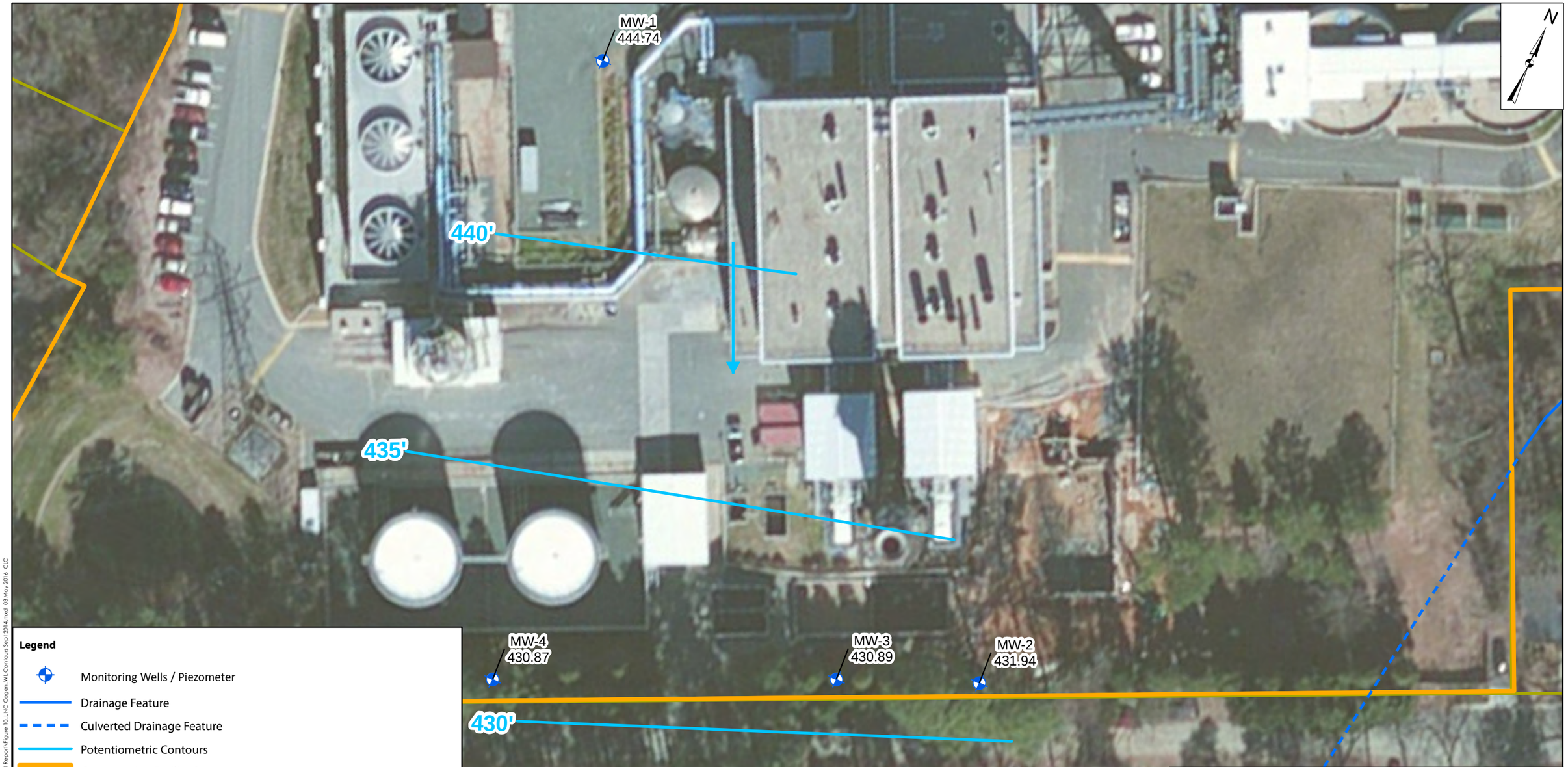
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure **9**

Path: (Raleigh-01\Data) M:\GIS\UNC-CH - GN5219 Cogeneration Facility-RI\MXD\RI Report\Figure 9_UNC Cogen_WL Contours March 2014.mxd 03 May 2016 CLC



Legend

- Monitoring Wells / Piezometer
- Drainage Feature
- Culverted Drainage Feature
- Potentiometric Contours
- Cogeneration Facility Site
- UNC-Owned Parcels
- Cogeneration Facility Site
- UNC-Owned Parcels
- Privately Owned Parcels
- Groundwater flow direction

Notes:
1. Horizontal coordinate system US State Plane 1983 North Carolina, US survey feet.
2. Groundwater flow direction is approximate.
3. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

60 30 0 60 Feet

Potentiometric Surface Map
09 September 2014

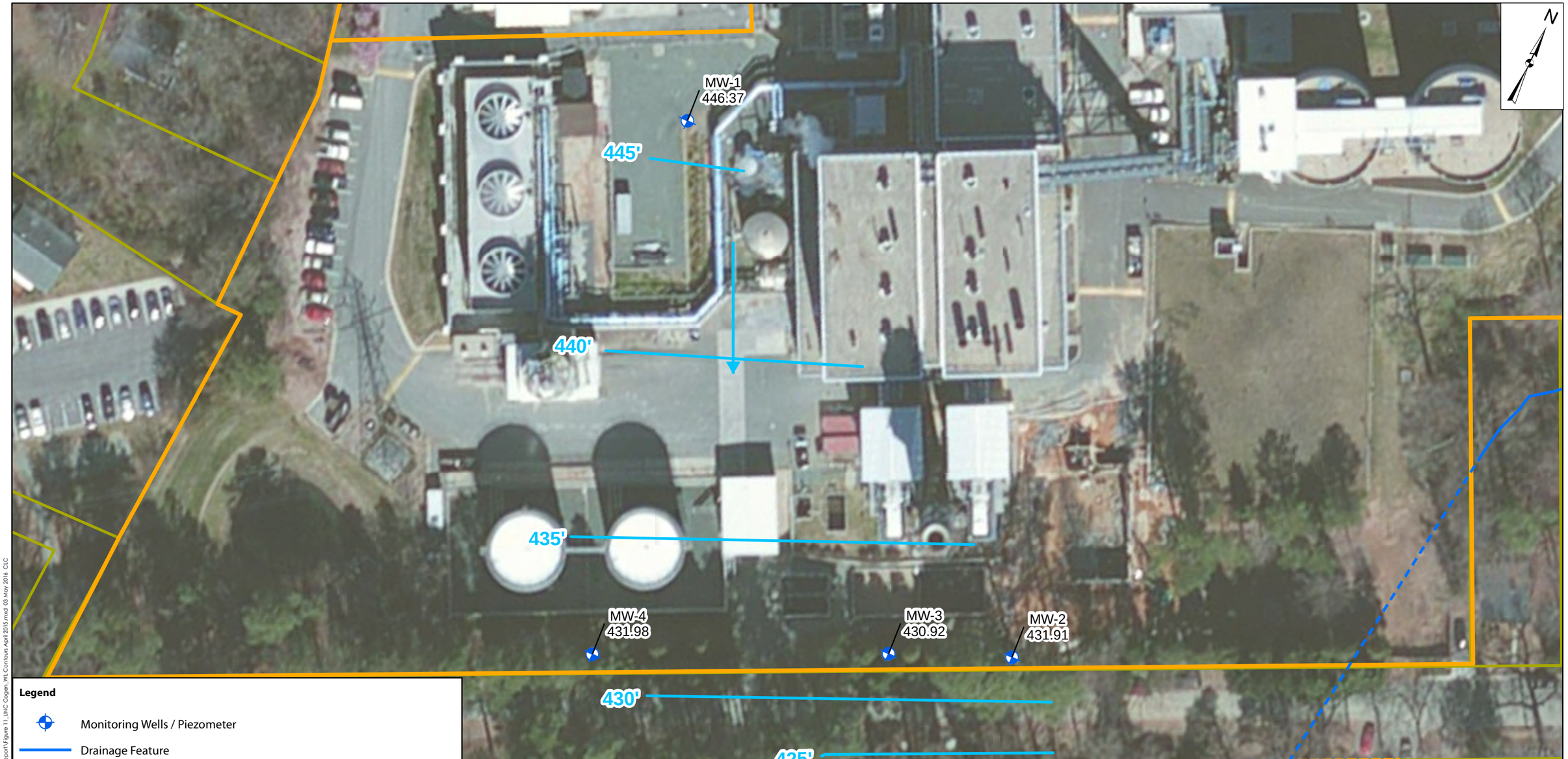
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure
10

Path: (Raleigh-01 Data) M:\GIS\UNC-CH - GN5219 Cogeneration Facility R\MXD\R Report\Figure 10_UNC Cogen_Wt Contours Sept 2014.mxd 03 May 2016 CTC



Legend

- Monitoring Wells / Piezometer
- Drainage Feature
- Culverted Drainage Feature
- Potentiometric Contours
- Cogeneration Facility Site
- UNC-Owned Parcels
- Privately Owned Parcels
- Groundwater flow direction

Notes:
1. Horizontal coordinate system US State Plane 1983 North Carolina, US survey feet.
2. Groundwater flow direction is approximate.
3. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

75 37.5 0 75 Feet

Potentiometric Surface Map
20 April 2015

UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure
11

Path: [Raleigh-01\Data] M:\GIS\UNC-CH - GN5219 Cogeneration Facility R\MXD\R Report\Figure 11_UNC Cogen_WL Contours April 2015.mxd 03 May 2016 CLC

MW-1
449.03

445'

440'

435'

MW-4
432.72

MW-3
432.99

MW-2
432.69

430'

425'

420'

MW-5
419.27

N

Legend

- Monitoring Wells / Piezometer
- Drainage Feature
- Culverted Drainage Feature
- Potentiometric Contours
- Cogeneration Facility Site
- UNC-Owned Parcels
- Privately Owned Parcels
- Groundwater flow direction

Notes:
1. Horizontal coordinate system US State Plane 1983 North Carolina, US survey feet.
2. Groundwater flow direction is approximate.
3. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

75 37.5 0 75 Feet

Potentiometric Surface Map
18 November 2015

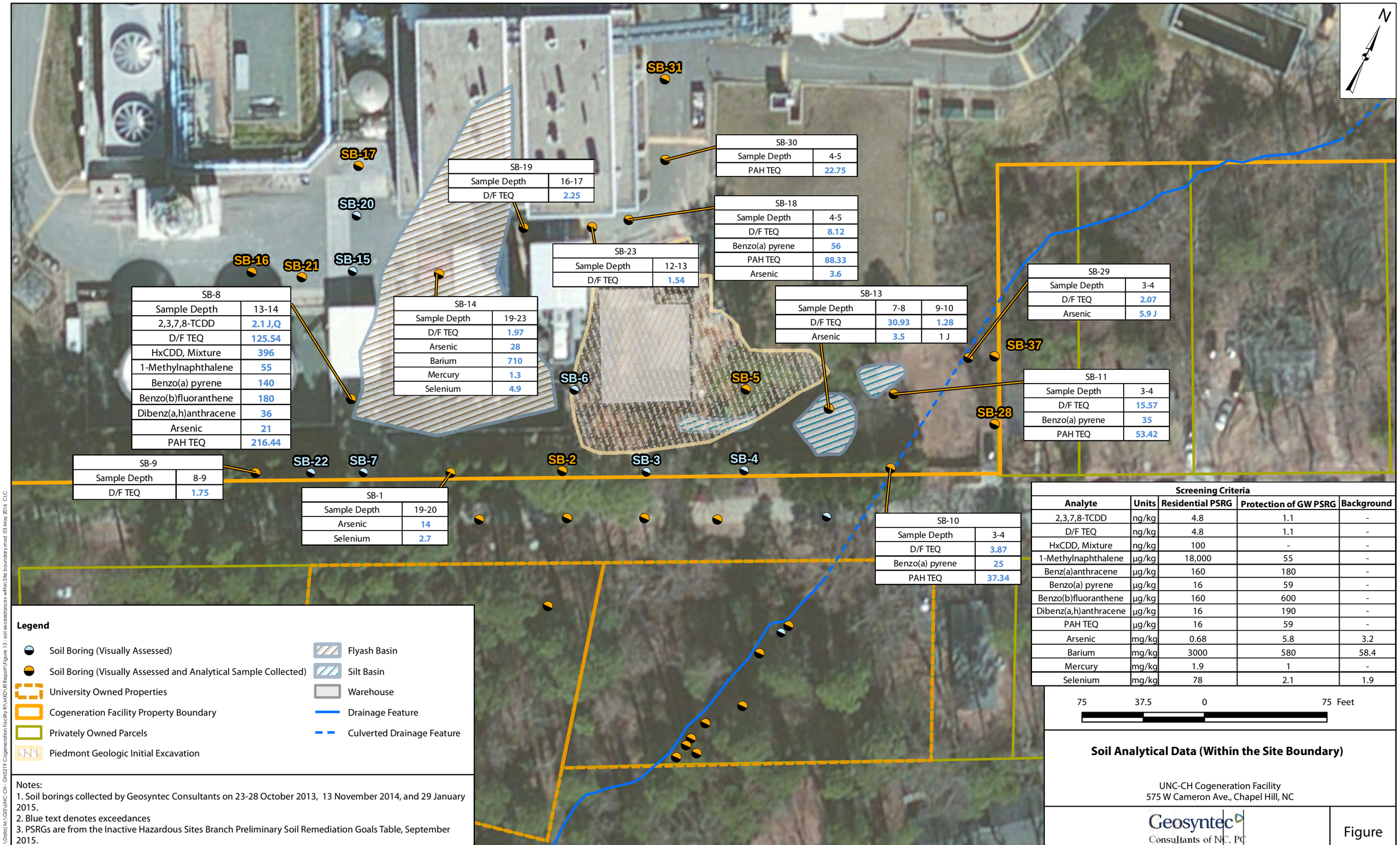
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure
12

Path: \\Raleigh-01\Data\M:\GIS\UNC-CH - GN5219 Cogeneration Facility Rn\MXD\R Report\Figure 12_UNC Cogen_WL Contours Nov 2015.mxd 03 May 2016 CLC



Legend

- Soil Boring (Visually Assessed)
- Soil Boring (Visually Assessed and Analytical Sample Collected)
- University Owned Properties
- Cogeneration Facility Property Boundary
- Privately Owned Parcels
- Piedmont Geologic Initial Excavation
- Flyash Basin
- Silt Basin
- Warehouse
- Drainage Feature
- Culverted Drainage Feature

Notes:
1. Soil borings collected by Geosyntec Consultants on 23-28 October 2013, 13 November 2014, and 29 January 2015.
2. Blue text denotes exceedances
3. PSRGs are from the Inactive Hazardous Sites Branch Preliminary Soil Remediation Goals Table, September 2015.
4. "J" and "Q" indicate estimated concentration.
5. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

Screening Criteria				
Analyte	**Units**	**Residential PSRG**	**Protection of GW PSRG**	**Background**
2,3,7,8-TCDD	ng/kg	4.8	1.1	-
D/F TEQ	ng/kg	4.8	1.1	-
HxCDD, Mixture	ng/kg	100	-	-
1-Methylnaphthalene	µg/kg	18,000	55	-
Benz(a)anthracene	µg/kg	160	180	-
Benzo(a) pyrene	µg/kg	16	59	-
Benzo(b)fluoranthene	µg/kg	160	600	-
Dibenz(a,h)anthracene	µg/kg	16	190	-
PAH TEQ	µg/kg	16	59	-
Arsenic	mg/kg	0.68	5.8	3.2
Barium	mg/kg	3000	580	58.4
Mercury	mg/kg	1.9	1	-
Selenium	mg/kg	78	2.1	1.9

75 37.5 0 75 Feet

Soil Analytical Data (Within the Site Boundary)

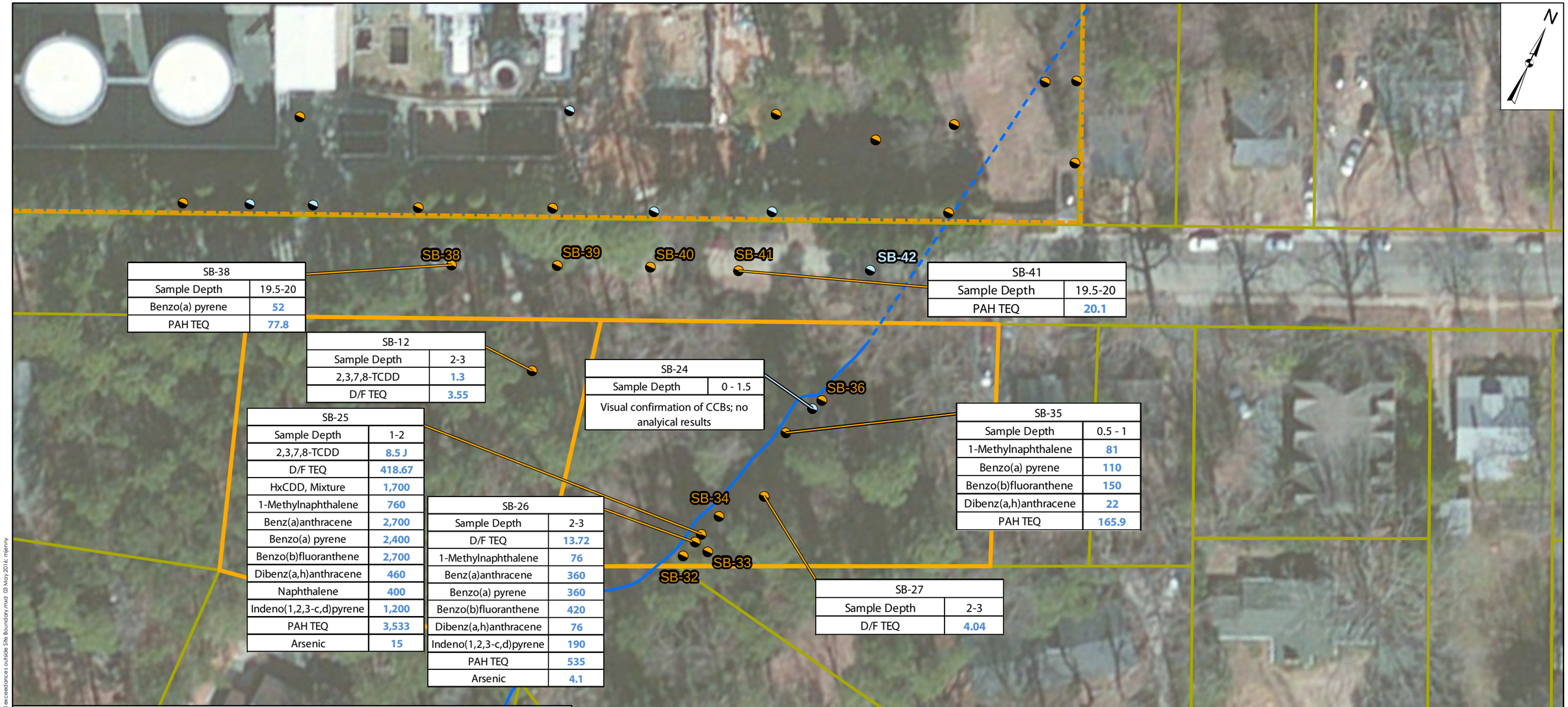
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure **13**

Path: (Raleigh-01\Data) M:\GIS\UNC-CH - GN5219 Cogeneration Facility RI\MXD\RI Report\Figure 13 - soil exceedances within Site boundary.mxd 03 May 2016 CLC



SB-38	
Sample Depth	19.5-20
Benzo(a) pyrene	52
PAH TEQ	77.8

SB-41	
Sample Depth	19.5-20
PAH TEQ	20.1

SB-12	
Sample Depth	2-3
2,3,7,8-TCDD	1.3
D/F TEQ	3.55

SB-24	
Sample Depth	0 - 1.5
Visual confirmation of CCBs; no analyical results	

SB-35	
Sample Depth	0.5 - 1
1-Methylnaphthalene	81
Benzo(a) pyrene	110
Benzo(b)fluoranthene	150
Dibenz(a,h)anthracene	22
PAH TEQ	165.9

SB-25	
Sample Depth	1-2
2,3,7,8-TCDD	8.5 J
D/F TEQ	418.67
HxCDD, Mixture	1,700
1-Methylnaphthalene	760
Benz(a)anthracene	2,700
Benzo(a) pyrene	2,400
Benzo(b)fluoranthene	2,700
Dibenz(a,h)anthracene	460
Naphthalene	400
Indeno(1,2,3-c,d)pyrene	1,200
PAH TEQ	3,533
Arsenic	15

SB-26	
Sample Depth	2-3
D/F TEQ	13.72
1-Methylnaphthalene	76
Benz(a)anthracene	360
Benzo(a) pyrene	360
Benzo(b)fluoranthene	420
Dibenz(a,h)anthracene	76
Indeno(1,2,3-c,d)pyrene	190
PAH TEQ	535
Arsenic	4.1

SB-27	
Sample Depth	2-3
D/F TEQ	4.04

Legend

- Soil Boring (Visually Assessed)
- Soil Boring (Visually Assessed and Analytical Sample Collected)
- Cogeneration Facility Property Boundary
- University Owned Parcels
- Privately Owned Parcels
- Drainage Feature
- Culverted Drainage Feature

Notes:
1. Soil borings were collected by Geosyntec Consultants from 23-28 October 2013, 12 November 2014, and 22-23 April 2015.
2. Blue text denotes exceedances.
3. A duplicate was collected at SB-12 and SB-40. The higher of the two results is reported.
4. PSRGs are from the Inactive Hazardous Sites Branch Prelminary Soil Remediation Goals Table, September 2015.
5. "J" indicates estimated concentration
6. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

Screening Criteria				
Analyte	**Units**	**Residential PSRG**	**Protection of GW PSRG**	**Background**
2,3,7,8-TCDD	ng/kg	4.8	1.1	-
D/F TEQ	ng/kg	4.8	1.1	-
HxCDD, Mixture	ng/kg	100	-	-
1-Methylnaphthalene	µg/kg	18,000	55	-
Benz(a)anthracene	µg/kg	160	180	-
Benzo(a) pyrene	µg/kg	16	59	-
Benzo(b)fluoranthene	µg/kg	160	600	-
Dibenz(a,h)anthracene	µg/kg	16	190	-
Naphthalene	µg/kg	3800	210	-
Indeno(1,2,3-c,d)pyrene	µg/kg	160	2,000	-
PAH TEQ	µg/kg	16	59	-
Arsenic	mg/kg	0.68	5.8	3.2

80 40 0 80 Feet

Soil Analytical Data (Outside the Site Boundary)

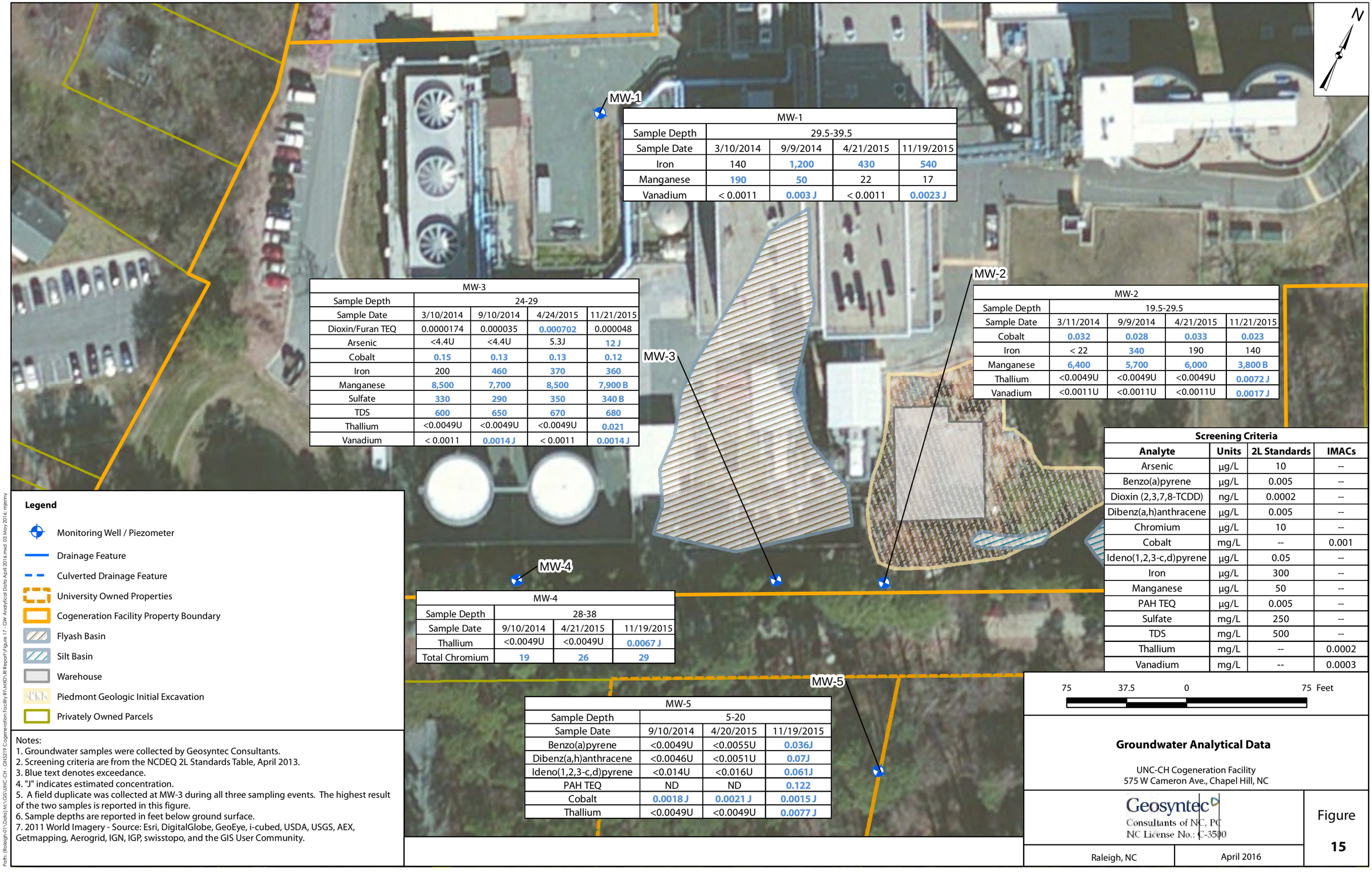
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure **14**

Path: (Raleigh-01\Data)M:\GIS\UNC-CH - GN3219 Cogeneration Facility R\MXD\R Report\Figure 14 - soil exceedances outside Site Boundary.mxd 03 May 2016 mjenny



MW-1				
Sample Depth	29.5-39.5			
Sample Date	3/10/2014	9/9/2014	4/21/2015	11/19/2015
Iron	140	1,200	430	540
Manganese	190	50	22	17
Vanadium	< 0.0011	0.003 J	< 0.0011	0.0023 J

MW-3				
Sample Depth	24-29			
Sample Date	3/10/2014	9/10/2014	4/24/2015	11/21/2015
Dioxin/Furan TEQ	0.0000174	0.000035	0.000702	0.000048
Arsenic	<4.4U	<4.4U	5.3J	12 J
Cobalt	0.15	0.13	0.13	0.12
Iron	200	460	370	360
Manganese	8,500	7,700	8,500	7,900 B
Sulfate	330	290	350	340 B
TDS	600	650	670	680
Thallium	<0.0049U	<0.0049U	<0.0049U	0.021
Vanadium	< 0.0011	0.0014 J	< 0.0011	0.0014 J

MW-2				
Sample Depth	19.5-29.5			
Sample Date	3/11/2014	9/9/2014	4/21/2015	11/21/2015
Cobalt	0.032	0.028	0.033	0.023
Iron	< 22	340	190	140
Manganese	6,400	5,700	6,000	3,800 B
Thallium	<0.0049U	<0.0049U	<0.0049U	0.0072 J
Vanadium	<0.0011U	<0.0011U	<0.0011U	0.0017 J

MW-4			
Sample Depth	28-38		
Sample Date	9/10/2014	4/21/2015	11/19/2015
Thallium	<0.0049U	<0.0049U	0.0067 J
Total Chromium	19	26	29

MW-5			
Sample Depth	5-20		
Sample Date	9/10/2014	4/20/2015	11/19/2015
Benzo(a)pyrene	<0.0049U	<0.0055U	0.036J
Dibenz(a,h)anthracene	<0.0046U	<0.0051U	0.07J
Ideno(1,2,3-c,d)pyrene	<0.014U	<0.016U	0.061J
PAH TEQ	ND	ND	0.122
Cobalt	0.0018 J	0.0021 J	0.0015 J
Thallium	<0.0049U	<0.0049U	0.0077 J

Screening Criteria			
Analyte	Units	2L Standards	IMACs
Arsenic	µg/L	10	--
Benzo(a)pyrene	µg/L	0.005	--
Dioxin (2,3,7,8-TCDD)	ng/L	0.0002	--
Dibenz(a,h)anthracene	µg/L	0.005	--
Chromium	µg/L	10	--
Cobalt	mg/L	--	0.001
Ideno(1,2,3-c,d)pyrene	µg/L	0.05	--
Iron	µg/L	300	--
Manganese	µg/L	50	--
PAH TEQ	µg/L	0.005	--
Sulfate	mg/L	250	--
TDS	mg/L	500	--
Thallium	mg/L	--	0.0002
Vanadium	mg/L	--	0.0003

Legend

- Monitoring Well / Piezometer
- Drainage Feature
- Culverted Drainage Feature
- University Owned Properties
- Cogeneration Facility Property Boundary
- Flyash Basin
- Silt Basin
- Warehouse
- Piedmont Geologic Initial Excavation
- Privately Owned Parcels

Notes:
1. Groundwater samples were collected by Geosyntec Consultants.
2. Screening criteria are from the NCDEQ 2L Standards Table, April 2013.
3. Blue text denotes exceedance.
4. "J" indicates estimated concentration.
5. A field duplicate was collected at MW-3 during all three sampling events. The highest result of the two samples is reported in this figure.
6. Sample depths are reported in feet below ground surface.
7. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

75 37.5 0 75 Feet

Groundwater Analytical Data

UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure **15**

Path: (Raleigh-01\Data) M:\GIS\UNC-CH - GN5219 Cogeneration Facility R\MXD\BI Report\Figure 17 - GW Analytical Data April 2016.mxd 03 May 2016 mjenny

Legend

- Soil Boring (Interpreted to be clean)
- Soil Boring (Interpreted to be impacted)
- Monitoring Well
- University Owned Properties
- Cogeneration Facility Property Boundary
- Privately Owned Parcels
- Piedmont Geologic Initial Excavation
- Flyash Basin
- Silt Basin
- Warehouse
- Drainage Feature
- Culverted Drainage Feature

Notes:
1. Soil borings collected by Geosyntec Consultants on 23-28 October 2013, 13 November 2014, and 29 January 2015.
2. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

Horizontal Extents of Impacted Soil (Within the Site Boundary)

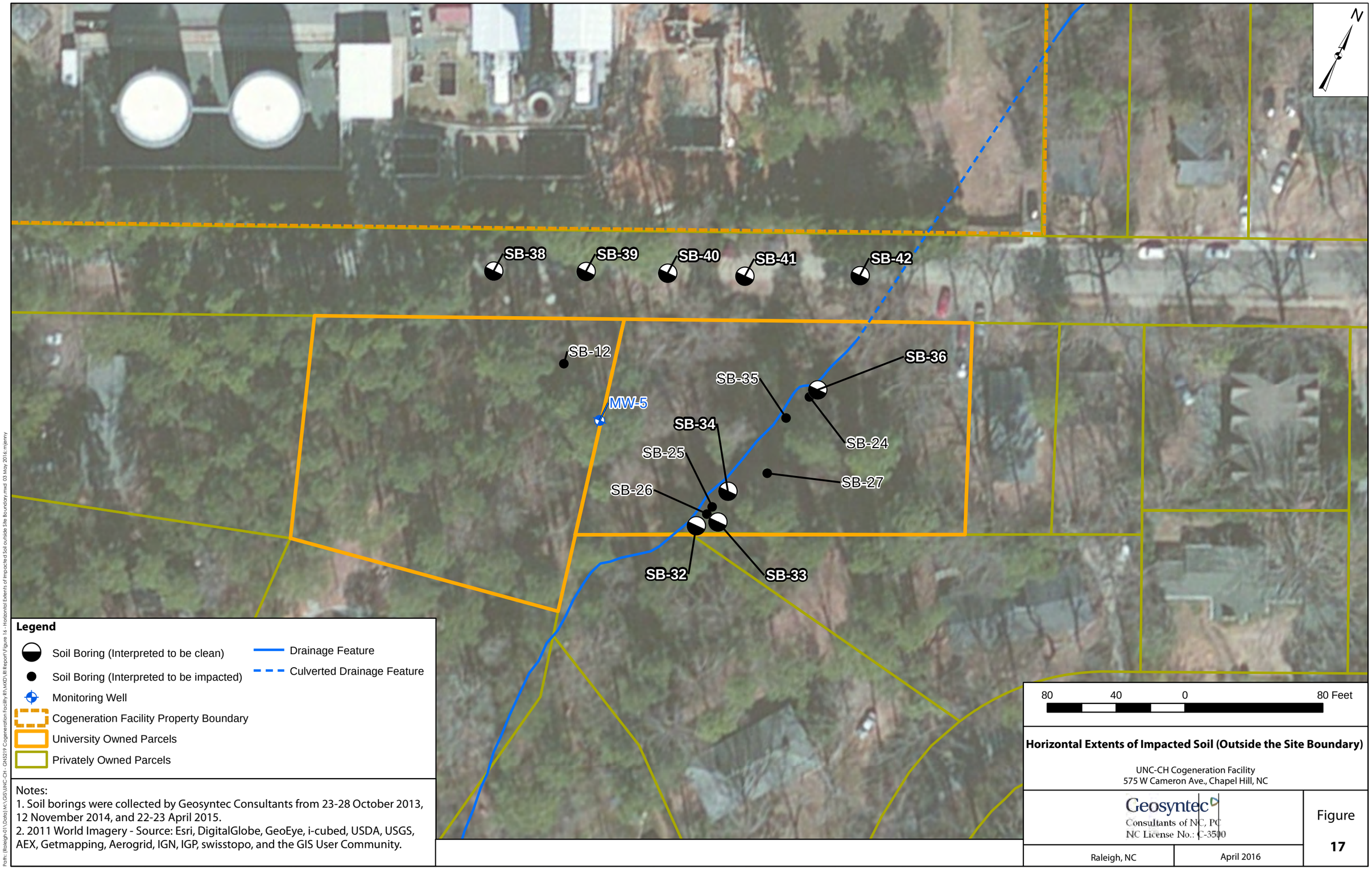
UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure 16

Path: (Raleigh-01\Data) M:\GIS\UNC-CH - GN5219 Cogeneration Facility RFs.MXD\IR Report\Figure 15 - Horizontal Extents of Impacted Soil within Site boundary.mxd 03 May 2016 CLC



Legend

- Soil Boring (Interpreted to be clean)
- Soil Boring (Interpreted to be impacted)
- Monitoring Well
- Cogeneration Facility Property Boundary
- University Owned Parcels
- Privately Owned Parcels
- Drainage Feature
- Culverted Drainage Feature

Notes:
1. Soil borings were collected by Geosyntec Consultants from 23-28 October 2013, 12 November 2014, and 22-23 April 2015.
2. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

80 40 0 80 Feet

Horizontal Extents of Impacted Soil (Outside the Site Boundary)

UNC-CH Cogeneration Facility
575 W Cameron Ave., Chapel Hill, NC

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | April 2016

Figure **17**

Path: (Raleigh-01\Data) M:\GIS\UNC-CH - GNS219 Cogeneration Facility RFs\MXD\R Report\Figure 16 - Horizontal Extents of Impacted Soil outside Site Boundary.mxd 03 May 2016 mjenny