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Location:

Pontiac North Campus
Pontiac, Michigan

Date:

July 29, 2016

Arcadis Project No.:

B0064607.2016

Subject:

Pontiac North Campus
Former Storm Water Retention Pond and Treatment System – Summary of Environmental Conditions

Arcadis of Michigan, LLC (Arcadis) has prepared this memorandum on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust to summarize environmental conditions at the former Storm Water Retention Pond and Treatment System (Duck Pond; the Site), which is located at 200 East Montcalm Avenue and is part of the larger former Pontiac North Campus (PNC) in Pontiac, Michigan (**Figure 1**).

BACKGROUND

The PNC storm water conveyance system was built as the Site was developed in the early 1900s. The system originally conveyed storm water from the oldest portions of the PNC property, but most recently only conveyed water from the north side of former Plant 14 southward to Montcalm Avenue. In 1985, a storm water retention pond and treatment system were installed to collect and treat storm water from this system for oil and grease prior to discharge to the City of Pontiac storm sewer system (Outfall 001; **Figure 2**). A sampling port within the Duck Pond treatment building was used to collect samples to ensure compliance with the Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) permit. In 1999, as part of the re-permitting process, polychlorinated biphenyls (PCBs) were added to the analytical list for Outfall 001 and were subsequently detected at levels higher than the proposed NPDES permit limits. As a result, the former General Motors Corporation (GMC) installed an activated carbon system to treat storm water prior to discharge and began storm sewer cleaning activities.

In 2000, the United States Environmental Protection Agency (USEPA) and GMC entered into a Voluntary Corrective Action Agreement for the Site. In accordance with the Resource Conservation and Recovery

Act (RCRA), GMC prepared a Current Conditions Report (ENCORE 2001), in which Storm Sewer Outfall 001 was identified as an Area of Interest (AOI) requiring further action due to the presence of PCBs. A series of investigations and remedial measures was implemented shortly thereafter to address the PCB issue. These are described below.

HISTORICAL INVESTIGATIONS AND REMEDIAL MEASURES

Storm Sewer Cleaning Activities

In 2000, GMC initiated a storm sewer cleaning program to address PCBs detected in the storm water conveyance system (storm water and sediments). After completion of storm sewer cleaning activities, approximately 300 cubic yards of PCB-impacted sediments were removed from the Duck Pond.

Duck Pond Subsurface Investigation

In 2002, during routine cleaning and inspection of the Duck Pond, cracks in the concrete floor were observed as well as missing or degraded sections of rubber seals between the concrete slabs. A subsurface investigation was completed to determine if any potentially impacted storm water from the Duck Pond was infiltrating into the subsurface soil and/or groundwater. The investigation included the installation of soil borings and temporary well points/piezometers as shown on **Figure 2**. After the investigation, the concrete and rubber seals were repaired, and the Duck Pond was put back into service.

Storm Water Flow Redirection and Bulkhead Installation

After filing for bankruptcy in June 2009, GMC changed its name to General Motors LLC (GM LLC). In 2011, GM LLC constructed a new on-site storm water treatment facility and ceased all flow to the Duck Pond from the GM LLC-owned portions of the PNC property. In 2012, in order to cut off storm water flow from the RACER-owned portions of the PNC property to the Duck Pond, storm water flow from the north side of Montcalm Avenue was terminated by installing bulkheads at several locations along the City of Pontiac 84-inch-diameter main storm sewer line. In addition, the inlet pipe to the Duck Pond was equipped with a bulkhead to prevent any flow from entering the Duck Pond. Locations of the bulkheads are shown on **Figure 2**. The activated carbon and organic clay treatment system located within the Duck Pond building was cleaned, decommissioned, and taken out of service in 2012 as well.

Currently, storm water that accumulates in the Duck Pond retention pond discharges through a gate valve and 6-inch line to Junction Chamber No. 2 bulkhead to the City of Pontiac main storm sewer line.

SUMMARY OF ANALYTICAL RESULTS

Soil and Groundwater (2002 – 2007)

Historical soil and groundwater data collected as part of the Site RCRA Facility Investigation (RFI; Arcadis 2012) from 2002 to 2007 for the Duck Pond area are shown on **Figures 3** and **4**, respectively. PCBs were detected in soil, but at concentrations below the Toxic Substances Control Act (TSCA) limit of 1 part per million (ppm). Various metals were detected in soil at concentrations above the site-specific background concentrations as well. PCBs were also detected in groundwater; however, these samples were borehole groundwater with high suspended solids content. Various inorganic metals were also detected in groundwater at concentrations above residential and non-residential drinking water criteria.

Based on the baseline human health risk evaluation conducted as part of the RFI, all soil and groundwater constituent concentrations in the Duck Pond area are lower than applicable 2013 MDEQ Part 201 generic cleanup criteria. Applicable non-residential screening criteria for soil included saturation concentration, direct contact, soil inhalation, soil volatilization to indoor air, infinite source volatile soil inhalation, and site-specific background concentrations. Applicable screening criteria for groundwater included non-residential groundwater volatilization to indoor air, water solubility, flammability and explosivity, acute inhalation, and groundwater contact criteria.

The RFI risk evaluation concluded that no potential significant exposures to soil or groundwater exist under current and reasonably expected future land use at the Duck Pond, assuming that deed restrictions and a groundwater ordinance are in place. Current proposed corrective measures at the Site include deed restrictions, which will prohibit the use of both on-site and off-site groundwater, limit land use to non-residential uses, and limit the ability to excavate or construct any sub-grade structures without properly managing/disposing of excavated materials as required by applicable soil management requirements. The City of Pontiac adopted a groundwater ordinance encompassing the off-site areas surrounding the Duck Pond in 2013.

Surface Water and Sediment (2016)

On May 10, 2016, Arcadis collected two surface water and four sediment samples from within the retention basin at the Duck Pond to inform a determination of potential site reuse. The selection of the analytical parameters was based on historical exceedances from past RFI investigation activities in the Duck Pond area. The samples were analyzed for PCBs, arsenic, and mercury. The sample locations are shown on **Figure 5**. The sample results are listed in **Tables 1** and **2**.

PCBs and arsenic were detected in surface water samples; however, concentrations were below applicable MDEQ Part 201 criteria (drinking water and groundwater-surface water interface [GSI]). Arsenic and mercury were detected in sediment samples at concentrations exceeding applicable 2013 MDEQ Part 201 criteria (drinking water and GSI). PCBs were detected in two sediment samples; however, concentrations were below TSCA limits (1 ppm).

Based on the results of the 2016 sampling, it is proposed that, in order to prevent the sediment from being transported into the storm sewer system off site, all sediment be removed and disposed accordingly.

Enclosures:

Table 1 – Duck Pond Surface Water Sample Results

Table 2 – Duck Pond Sediment Sample Results

Figure 1 – Site Location

Figure 2 – Duck Pond Site Plan

Figure 3 – Duck Pond Soil Data

Figure 4 – Duck Pond Groundwater Data

Figure 5 – Duck Pond Sediment and Surface Water Sample Locations

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Tables

Table 1
Duck Pond Surface Water Samples
RACER Trust Pontiac North Campus

Location ID: Date Collected: Sample Name:	Units	Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	SW-DP-01 05/09/16 SW-DP-01-050916	SW-DP-02 05/09/16 SW-DP-02-050916
PCBs						
Aroclor-1016	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Aroclor-1221	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Aroclor-1232	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Aroclor-1242	ug/L	0.5	0.5	0.2	0.16 J	0.20 U
Aroclor-1248	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Aroclor-1254	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Aroclor-1260	ug/L	0.5	0.5	0.2	0.23 U	0.20 U
Inorganics						
Arsenic	ug/L	10	10	10	2.2	4.3
Mercury	ug/L	2	2	0.0013	0.20 U	0.20 U
Inorganics-Filtered						
Arsenic	ug/L	10	10	10	1.8 J	3.5 J
Mercury	ug/L	2	2	0.0013	0.20 U	0.20 U
Miscellaneous						
Total suspended solids (TSS)	mg/L	--	--	--	220	91

Notes:

J Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

U Indicates the analyte was analyzed for but not detected.

DP - Duck Pond

mg/l - milligrams per liter

µg/l - micrograms per liter

Table 2
Duck Pond Sediment Samples
RACER Trust Pontiac North Campus

Location ID: Date Collected: Sample Name:	Units	SDBL	Residential Drinking Water Protection	Nonresidential Drinking Water Protection	Groundwater Surface Water Interface Protection	NRDC	S-DP-01 05/09/16 S-DP-01-050916	S-DP-02 05/09/16 S-DP-02-050916	S-DP-03 05/09/16 S-DP-03-050916	S-DP-04 05/09/16 S-DP-04-050916
PCBs										
Aroclor-1016	ug/kg	--	--	--	--	--	49 U	55 U	110 U	250 U
Aroclor-1221	ug/kg	--	--	--	--	--	49 U	55 U	110 U	250 U
Aroclor-1232	ug/kg	--	--	--	--	--	49 U	55 U	110 U	250 U
Aroclor-1242	ug/kg	--	--	--	--	--	45 J	55 U	47 J	250 U
Aroclor-1248	ug/kg	--	--	--	--	--	49 U	55 U	110 U	250 U
Aroclor-1254	ug/kg	--	--	--	--	--	250	75	110 U	120 J
Aroclor-1260	ug/kg	--	--	--	--	--	49 U	55 U	110 U	250 U
Inorganics										
Arsenic	mg/kg	5.8	4.6	4.6	4.6	37	13	10	5.3	13
Mercury	mg/kg	0.13	1.7	1.7	0.05	580	0.12 J	0.039 J	0.36 U	0.68 U

Notes:

J Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.

U Indicates the analyte was analyzed for but not detected.

SDBL - State Default Background Level

NRDC - Non Residential Direct Contact Criteria

DP - Duck Pond

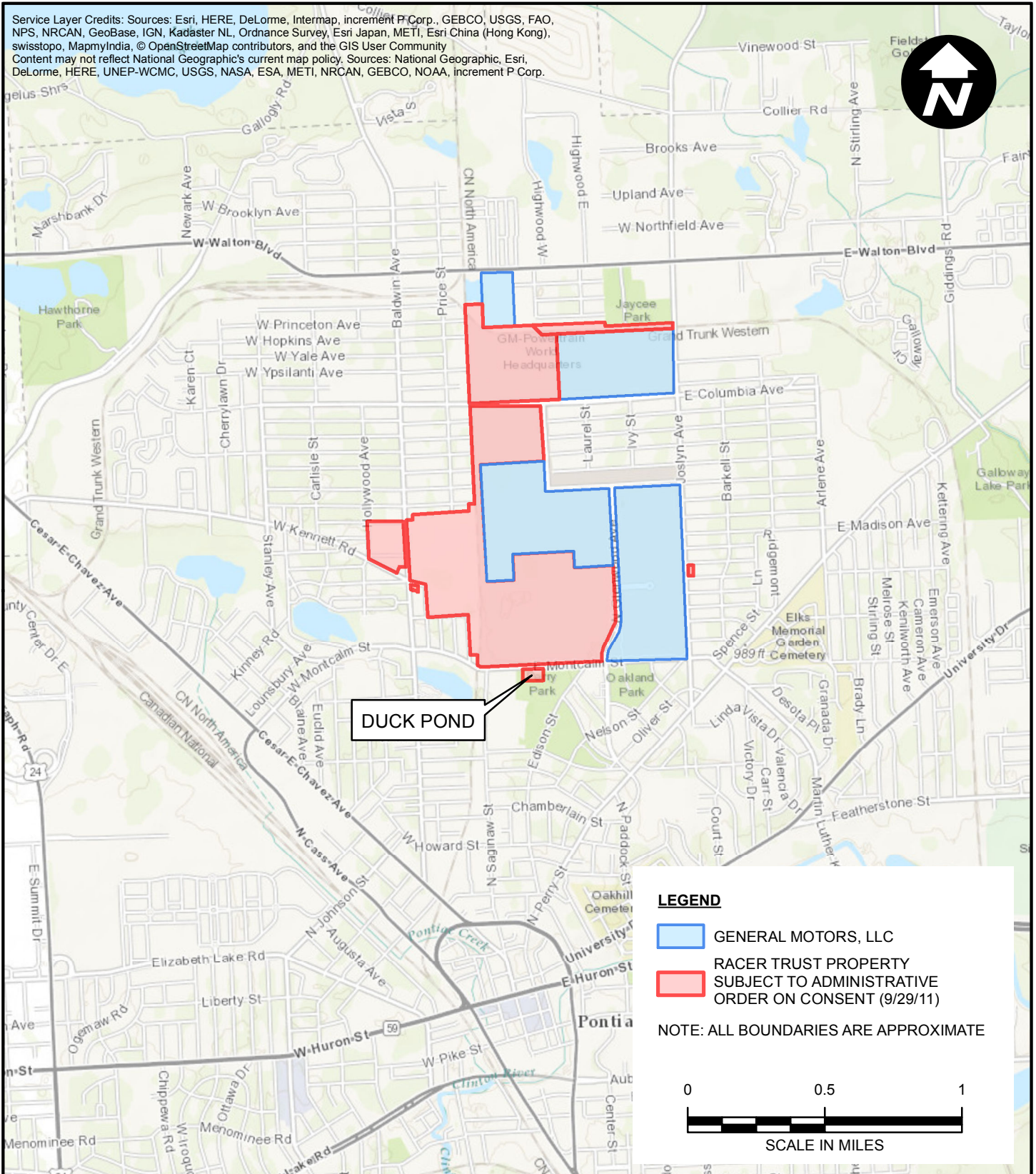
mg/kg - milligrams per kilogram

µg/kg - micrograms per kilogram

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Figures

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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LEGEND

- GENERAL MOTORS, LLC
- RACER TRUST PROPERTY
- SUBJECT TO ADMINISTRATIVE ORDER ON CONSENT (9/29/11)

NOTE: ALL BOUNDARIES ARE APPROXIMATE



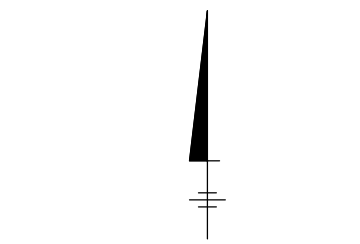
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RACER TRUST PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN	
<h2 style="margin: 0;">SITE LOCATION</h2>	
ARCADIS	Design & Consultancy for natural and built assets
FIGURE 1	

CITY: SYRACUSE DIV/GROUP: IMDV DB: A.FOX.G.STOWELL PM: (Redd) LVR:(OH)ON="OFF" REF: G:\ENVCAD\SYRACUSE\ACT15064607\ADM1\00003\DWG\64607B01.DWG LAYOUT: 2 SAVED: 10/27/2015 1:13 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-LD2B-PDF-GMS PLOTSTYLETABLE: PLT\FULL.CTB PLOTTED: 11/6/2015 7:14 AM BY: STOWELL GARY

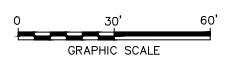
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- LEGEND:**
- GROUNDWATER MONITORING WELL LOCATION
 - SOIL BORING
 - PROPERTY BOUNDARY
 - 6\"/> SANITARY SEWER
 - 18\"/> STORM SEWER
 - STORM SEWER OUTFALL
 - MANHOLE
 - BULKHEAD
 - RCP = REINFORCED CONCRETE PIPE.

SOURCE:

1. ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, SWISS TOPO, AND THE GIS USER COMMUNITY.



RACER TRUST PONTIAC NORTH CAMPUS PONTIAC, MICHIGAN	
DUCK POND SITE MAP	
Design & Consultancy for natural and built assets	FIGURE 2

DP-03	
Depth(ft BGS)	(12 - 14.5)
Date	10/03/2002
Carbon Disulfide	5.1 U [1.8 J]
Dichloromethane	3.2 J [6.0]
Toluene	2.0 J [1.6 J]
Total Xylenes	1.7 J [1.6 J]
Benzo(a)anthracene	370 U [150 J]
Chrysene	370 U [44 J]
Fluoranthene	370 U [50 J]
Pyrene	370 U [39 J]
Arsenic	4,420 [3,400]
Barium	69,400 J [45,400 J]
Beryllium	113 U [180]
Cadmium	233 J [236 J]
Chromium	14,100 J [9,950 J]
Cobalt	5,350 [4,220]
Copper	16,500 J [12,500 J]
Lead	471,000 [249,000]
Mercury	77.2 [85.2]
Nickel	131,000 [60,400]
Vanadium	14,900 [11,300]

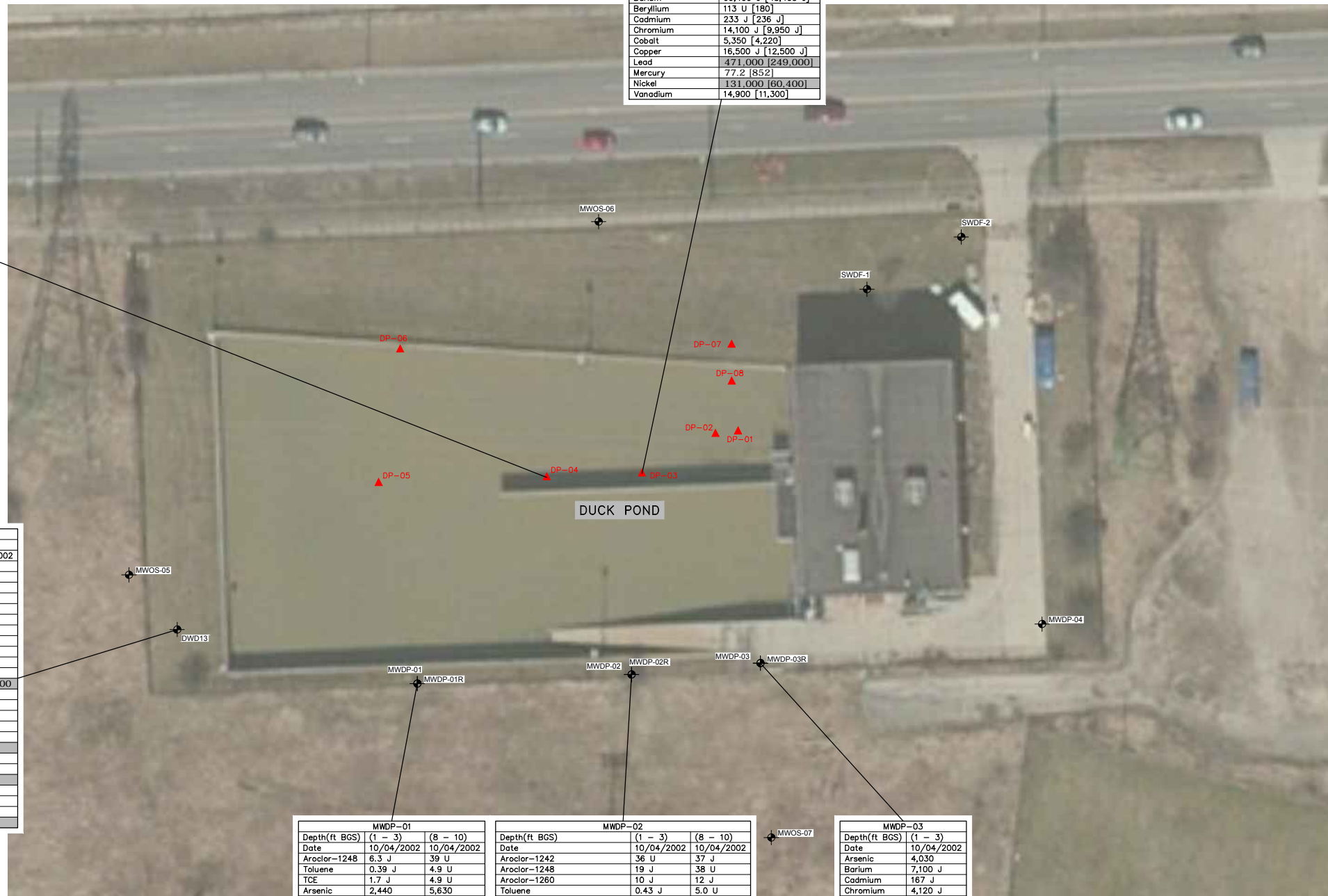
DP-04	
Depth(ft BGS)	(13 - 14.5)
Date	10/03/2002
Dichloromethane	25
Toluene	0.64 J
Total Xylenes	1.2 J
Arsenic	5,160
Barium	53,700 J
Beryllium	141
Cadmium	329 J
Chromium	13,500 J
Cobalt	7,030
Copper	17,400 J
Lead	8,430
Manganese	383,000
Nickel	18,400
Vanadium	17,600
Zinc	42,500

DWD13		
Depth(ft BGS)	(0 - 2)	(4 - 6)
Date	01/08/2002	01/08/2002
Toluene	2.5 J	0.56 J
2-Methylnaphthalene	370 U	60 J
Benzo(a)anthracene	370 U	62 J
Benzo(b)fluoranthene	74 J	78 J
bis(2-Ethylhexyl)phthalate	91 J	370 U
Chrysene	67 J	77 J
Fluoranthene	110 J	160 J
Phenanthrene	62 J	140 J
Pyrene	67 J	92 J
Antimony	324 J	524 J
Arsenic	4,290	5,290
Barium	55,200	2,290,000
Beryllium	213	162
Cadmium	294 J	1,390
Chromium	13,400 J	19,800
Cobalt	5,380 J	3,760
Copper	19,200	38,500
Lead	20,000 J	56,200
Manganese	381,000 J	301,000
Mercury	126	4,650
Nickel	15,100 J	42,000
Selenium	243 J	222 J
Thallium	618 J	329 J
Vanadium	14,300	15,100
Zinc	44,500 J	79,900

MWDP-01		
Depth(ft BGS)	(1 - 3)	(8 - 10)
Date	10/04/2002	10/04/2002
Aroclor-1248	6.3 J	39 U
Toluene	0.39 J	4.9 U
TCE	1.7 J	4.9 U
Arsenic	2,440	5,630
Barium	19,800 J	47,900 J
Beryllium	114 U	251
Cadmium	72.8 J	552 J
Chromium	4,700 J	14,100 J
Cobalt	4,000	6,640
Copper	6,450 J	14,500 J
Lead	3,270	9,330
Manganese	136,000	269,000
Nickel	5,990	15,700
Vanadium	7,150	20,400
Zinc	17,600	39,400

MWDP-02		
Depth(ft BGS)	(1 - 3)	(8 - 10)
Date	10/04/2002	10/04/2002
Aroclor-1242	36 U	37 J
Aroclor-1248	19 J	38 U
Aroclor-1260	10 J	12 J
Toluene	0.43 J	5.0 U
Total Xylenes	1.7 J	9.9 U
n-Hexane Extractable Material	362 U	808
Anthracene	360 U	68 J
Benzo(a)anthracene	360 U	150 J
Benzo(a)pyrene	360 U	140 J
Benzo(b)fluoranthene	360 U	180 J
Benzo(g,h,i)perylene	360 U	110 J
Benzo(k)fluoranthene	360 U	84 J
Carbazole	360 U	42 J
Chrysene	360 U	180 J
Fluoranthene	54 J	330 J
Indeno(1,2,3-cd)pyrene	360 U	85 J
Phenanthrene	42 J	280 J
Pyrene	46 J	290 J
Antimony	2,200 U	304 J
Arsenic	9,300	6,180
Barium	60,200 J	57,900 J
Beryllium	220	117 U
Cadmium	847	578 J
Chromium	20,600 J	12,900 J
Cobalt	7,460	4,840
Copper	27,200 J	23,500 J
Lead	21,300	20,400
Manganese	694,000	271,000 J
Mercury	56.4	155
Nickel	22,900	15,400
Vanadium	21,700	15,200
Zinc	49,800	51,800 J

MWDP-03	
Depth(ft BGS)	(1 - 3)
Date	10/04/2002
Arsenic	4,030
Barium	7,100 J
Cadmium	167 J
Chromium	4,120 J
Cobalt	2,410
Copper	6,860 J
Lead	3,080
Manganese	147,000 J
Nickel	4,720
Vanadium	6,790
Zinc	18,800 J



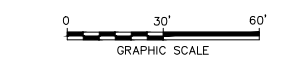
LEGEND:

- GROUNDWATER MONITORING WELL LOCATION
- SOIL BORING
- CONSTITUENT CONCENTRATION EXCEEDS SITE SPECIFIC BACKGROUND CRITERIA (SSBC)
- CONSTITUENT CONCENTRATION EXCEEDS MICHIGAN STATEWIDE DEFAULT BACKGROUND LEVELS (SDBL)

Constituent	Units	Criteria		
		SDBL	SSBC	TSCA
PCB's	PPM	--	--	1.0
Arsenic	µg/kg	5,800	8,050	--
Barium	µg/kg	75,000	75,000	--
Cadmium	µg/kg	1,200	--	--
Chromium	µg/kg	--	23,200	--
Cobalt	µg/kg	6,800	11,800	--
Copper	µg/kg	32,000	--	--
Lead	µg/kg	21,000	33,200	--
Manganese	µg/kg	440,000	631,000	--
Mercury	µg/kg	130	--	--
Nickel	µg/kg	20,000	29,000	--
Vanadium	µg/kg	--	27,700	--
Zinc	µg/kg	47,000	76,300	--

- NOTES:**
- ALL SAMPLE LOCATIONS ARE APPROXIMATE.
 - DUPLICATE ANALYSES ARE PRESENTED IN BRACKETS.
 - J - ESTIMATED CONCENTRATION.
 - U - NOT DETECTED.
 - ALL UNITS ARE IN µg/g (MICROGRAMS PER KILOGRAM).
 - BGS = BELOW GROUND SURFACE.
 - TSCA - TOXIC SUBSTANCES CONTROL ACT.

- SOURCE:**
- ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, SWISSTOPO, AND THE GIS USER COMMUNITY.



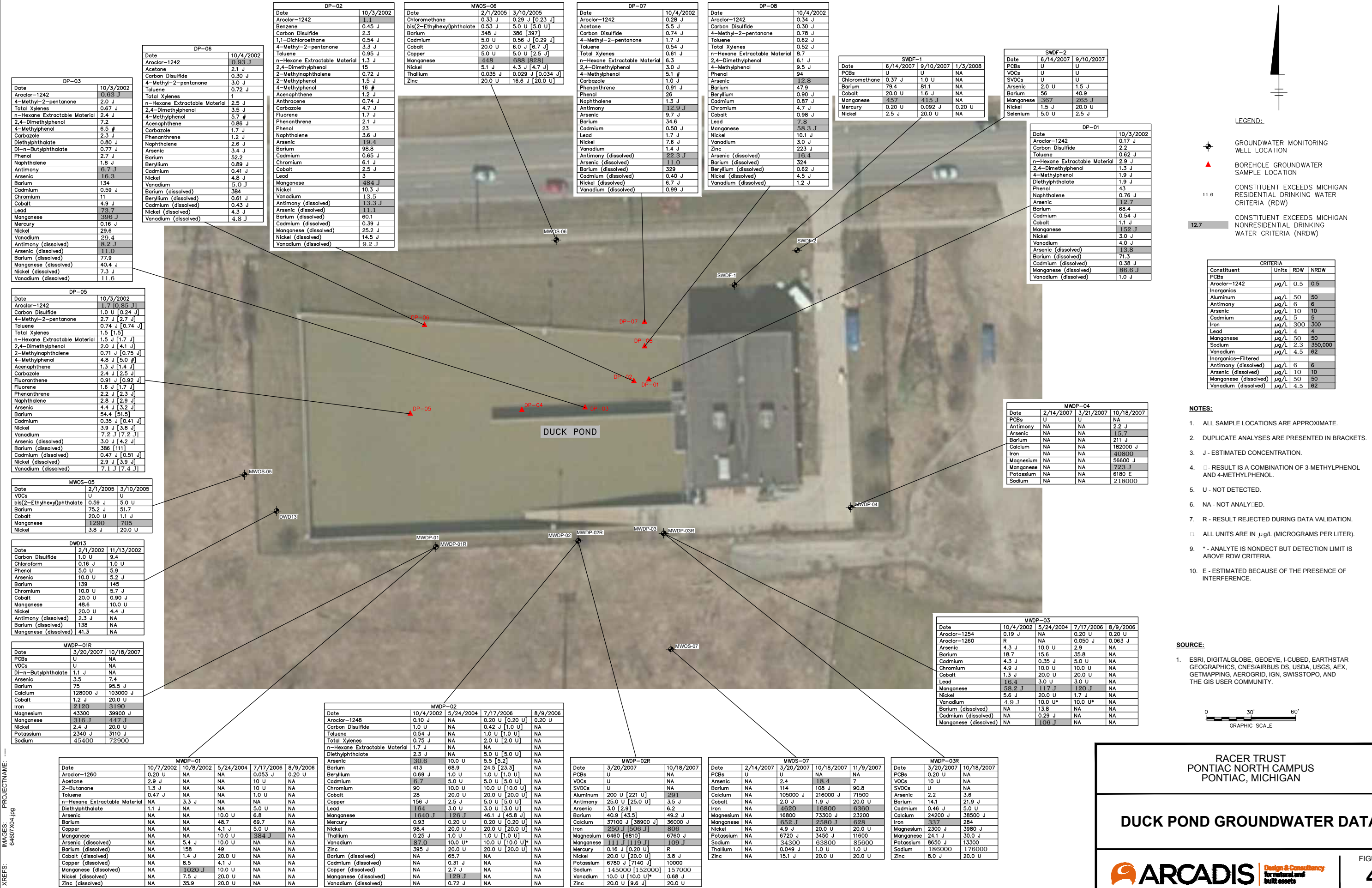
RACER TRUST
PONTIAC NORTH CAMPUS
PONTIAC, MICHIGAN

DUCK POND SOIL DATA

Design & Consultancy
for natural and built assets

FIGURE
3

CITY: SYRACUSE DIV:GROUP:IMDV DB:A.FOX G.STOWELL PM:(Red) LVR:OP:ONE-OFF=REF- C:ENVCAD:SYRACUSE:ACT:TB0064607AD:AD100003:DWG:64607C03.DWG LAYOUT: 4 - SAVED: 10/30/2015 4:37 PM ACADVER: 19.1S (LMS TECH) PAGES:SETUP: C-LD2B-PDF-GMS PLOTSTYLE:TABLE: PLT-FULL.CTB PLOTTED: 10/30/2015 4:42 PM BY: STOWELL, GARY



DP-03

Date	10/3/2002
Aroclor-1242	0.63 J
4-Methyl-2-pentanone	2.0 J
Total Xylenes	0.67 J
n-Hexane Extractable Material	2.4 J
2,4-Dimethylphenol	7.2 J
4-Methylphenol	6.5 #
Carbazole	2.3 J
Diethylthiathate	0.80 J
Di-n-Butylphthalate	0.77 J
Phenol	2.7 J
Naphthalene	1.8 J
Antimony	6.7 J
Arsenic	16.3 J
Barium	134 J
Cadmium	0.59 J
Chromium	11 J
Cobalt	4.9 J
Lead	73.7 J
Manganese	396 J
Mercury	0.16 J
Nickel	29.6 J
Vanadium	29.4 J
Antimony (dissolved)	8.2 J
Arsenic (dissolved)	11.0 J
Barium (dissolved)	77.9 J
Manganese (dissolved)	40.4 J
Nickel (dissolved)	7.3 J
Vanadium (dissolved)	11.6 J

DP-05

Date	10/3/2002
Aroclor-1242	1.7 [0.85 J]
Carbon Disulfide	1.0 U [0.24 J]
4-Methyl-2-pentanone	2.7 J [2.7 J]
Toluene	0.74 J [0.74 J]
Total Xylenes	1.5 [1.5]
n-Hexane Extractable Material	1.5 J [1.7 J]
2,4-Dimethylphenol	2.0 J [4.1 J]
4-Methylnaphthalene	0.71 J [0.75 J]
4-Methylphenol	4.8 J [5.0 #]
Acenaphthene	1.3 J [1.4 J]
Carbazole	2.4 J [2.5 J]
Fluoranthene	0.91 J [0.92 J]
Fluorene	1.6 J [1.7 J]
Phenanthrene	2.2 J [2.3 J]
Naphthalene	2.8 J [2.9 J]
Arsenic	4.4 J [3.2 J]
Barium	54.4 [51.5]
Cadmium	0.35 J [0.41 J]
Nickel	3.9 J [3.8 J]
Vanadium	7.2 J [7.2 J]
Arsenic (dissolved)	3.0 J [4.2 J]
Barium (dissolved)	386 [111]
Cadmium (dissolved)	0.47 J [0.51 J]
Nickel (dissolved)	2.9 J [3.9 J]
Vanadium (dissolved)	7.1 J [7.4 J]

MWOS-05

Date	2/1/2005	3/10/2005
VOCs	U	U
bis(2-Ethylhexyl)phthalate	0.59 J	5.0 U
Barium	75.2 J	51.7 J
Cobalt	20.0 U	1.1 J
Manganese	1290 J	705 J
Nickel	3.8 J	20.0 U

DWD13

Date	2/1/2002	11/13/2002
Carbon Disulfide	1.0 U	9.4 J
Chloroform	0.16 J	1.0 U
Phenol	5.0 U	5.9 J
Arsenic	10.0 U	5.2 J
Barium	139 J	145 J
Chromium	10.0 U	5.7 J
Cobalt	20.0 U	0.80 J
Manganese	48.6 J	10.0 U
Nickel	20.0 U	4.4 J
Antimony (dissolved)	2.3 J	NA
Barium (dissolved)	138 J	NA
Manganese (dissolved)	41.3 J	NA

MWDP-01R

Date	3/20/2007	10/18/2007
PCBs	U	NA
VOCs	U	NA
Di-n-Butylphthalate	1.1 J	NA
Arsenic	3.5 J	7.4 J
Barium	75 J	95.5 J
Calcium	128000 J	103000 J
Cobalt	1.2 J	20.0 U
Iron	2120 J	3190 J
Magnesium	43300 J	39900 J
Manganese	316 J	447 J
Nickel	2.4 J	20.0 U
Potassium	2340 J	3110 J
Sodium	45400 J	72900 J

MWDP-01

Date	10/7/2002	10/8/2002	5/24/2004	7/17/2006	8/9/2006
Aroclor-1260	0.20 U	NA	NA	0.053 J	0.20 U
Acetone	2.9 J	NA	NA	10 U	NA
2-Butanone	1.3 J	NA	NA	10 U	NA
Toluene	0.47 J	NA	NA	1.0 U	NA
n-Hexane Extractable Material	NA	3.3 J	NA	NA	NA
Diethylthiathate	1.1 J	NA	NA	5.0 U	NA
Arsenic	NA	NA	10.0 U	6.8 J	NA
Barium	NA	NA	48.7 J	69.7 J	NA
Copper	NA	NA	4.1 J	5.0 U	NA
Manganese	NA	NA	10.0 U	38.4 J	NA
Arsenic (dissolved)	NA	5.4 J	10.0 U	NA	NA
Barium (dissolved)	NA	158 J	49 J	NA	NA
Cobalt (dissolved)	NA	1.4 J	20.0 U	NA	NA
Copper (dissolved)	NA	8.5 J	4.1 J	NA	NA
Manganese (dissolved)	NA	1020 J	10.0 U	NA	NA
Nickel (dissolved)	NA	7.5 J	20.0 U	NA	NA
Zinc (dissolved)	NA	35.9 J	20.0 U	NA	NA

MWDP-02

Date	10/4/2002	5/24/2004	7/17/2006	8/9/2006
Aroclor-1248	0.10 J	NA	0.20 U [0.20 U]	0.20 U
Carbon Disulfide	1.0 U	NA	0.42 J [1.0 U]	NA
Toluene	0.54 J	NA	1.0 U [1.0 U]	NA
Total Xylenes	0.75 J	NA	2.0 U [2.0 U]	NA
n-Hexane Extractable Material	1.7 J	NA	NA	NA
Diethylthiathate	2.3 J	NA	5.0 U [5.0 U]	NA
Arsenic	30.6 J	10.0 U	5.5 [5.2]	NA
Barium	413 J	68.9 J	24.5 [23.3]	NA
Beryllium	0.69 J	1.0 U	1.0 U [1.0 U]	NA
Cadmium	6.7 J	5.0 U	5.0 U [5.0 U]	NA
Chromium	90 J	10.0 U	10.0 U [10.0 U]	NA
Cobalt	28 J	20.0 U	20.0 U [20.0 U]	NA
Copper	156 J	2.5 J	5.0 U [5.0 U]	NA
Lead	164 J	3.0 U	3.0 U [3.0 U]	NA
Manganese	1640 J	126 J	46.1 J [45.8 J]	NA
Mercury	0.93 J	0.20 U	0.20 U [0.20 U]	NA
Nickel	98.4 J	20.0 U	20.0 U [20.0 U]	NA
Thallium	0.25 J	1.0 U	1.0 U [1.0 U]	NA
Vanadium	87.0 J	10.0 U*	10.0 U [10.0 U]	NA
Zinc	395 J	20.0 U	20.0 U [20.0 U]	NA
Barium (dissolved)	NA	65.7 J	NA	NA
Cadmium (dissolved)	NA	0.31 J	NA	NA
Copper (dissolved)	NA	2.7 J	NA	NA
Manganese (dissolved)	NA	129 J	NA	NA
Vanadium (dissolved)	NA	0.72 J	NA	NA

MWDP-02R

Date	3/20/2007	10/18/2007
PCBs	U	NA
VOCs	U	NA
SVOCs	U	NA
Aluminum	200 U [221 U]	291 J
Antimony	25.0 U [25.0 U]	3.5 J
Arsenic	4620 J	16900 J
Barium	40.9 [43.5]	49.2 J
Calcium	37100 J [38900 J]	36000 J
Iron	250 J [506 J]	806 J
Magnesium	6460 [6810]	6760 J
Manganese	111 J [119 J]	109 J
Mercury	0.16 J [0.20 U]	R
Nickel	20.0 U [20.0 U]	3.8 J
Potassium	6780 J [7140 J]	10000 J
Sodium	145000 [152000]	157000 J
Vanadium	10.0 U [10.0 U]	0.68 J
Zinc	20.0 U [9.6 J]	20.0 U

MWOS-07

Date	2/14/2007	3/20/2007	10/18/2007	11/9/2007
PCBs	U	U	NA	NA
Arsenic	NA	2.4 J	18.4 J	7 J
Barium	NA	114 J	108 J	90.8 J
Calcium	NA	105000 J	216000 J	71500 J
Cobalt	NA	2.0 J	1.9 J	20.0 U
Iron	NA	4620 J	16900 J	6360 J
Magnesium	NA	16800 J	73300 J	23200 J
Manganese	NA	652 J	2580 J	628 J
Nickel	NA	4.9 J	20.0 U	20.0 U
Potassium	NA	6720 J	3450 J	11600 J
Sodium	NA	34300 J	63800 J	85600 J
Thallium	NA	0.049 J	1.0 U	1.0 U
Zinc	NA	15.1 J	20.0 U	20.0 U

MWDP-03R

Date	3/20/2007	10/18/2007
PCBs	0.20 U	NA
VOCs	10 U	NA
SVOCs	U	NA
Arsenic	2.2 J	3.6 J
Barium	14.1 J	21.9 J
Cadmium	0.46 J	5.0 U
Calcium	24200 J	38500 J
Iron	357 J	284 J
Magnesium	2300 J	3980 J
Manganese	24.1 J	30.0 J
Potassium	8650 J	13300 J
Sodium	186000 J	176000 J
Zinc	8.0 J	20.0 U

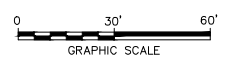
- LEGEND:**
- ◆ GROUNDWATER MONITORING WELL LOCATION
 - ▲ BOREHOLE GROUNDWATER SAMPLE LOCATION
 - 11.6 CONSTITUENT EXCEEDS MICHIGAN RESIDENTIAL DRINKING WATER CRITERIA (RDW)
 - 12.7 CONSTITUENT EXCEEDS MICHIGAN NONRESIDENTIAL DRINKING WATER CRITERIA (NRDW)

CRITERIA

Constituent	Units	RDW	NRDW
PCBs			
Aroclor-1242	µg/L	0.5	0.5
Inorganics			
Aluminum	µg/L	50	50
Antimony	µg/L	6	6
Arsenic	µg/L	10	10
Cadmium	µg/L	5	5
Iron	µg/L	300	300
Lead	µg/L	4	4
Manganese	µg/L	50	50
Sodium	µg/L	2.3	350,000
Vanadium	µg/L	4.5	62
Inorganics-Filtered			
Antimony (dissolved)	µg/L	6	6
Arsenic (dissolved)	µg/L	10	10
Manganese (dissolved)	µg/L	50	50
Vanadium (dissolved)	µg/L	4.5	62

- NOTES:**
- ALL SAMPLE LOCATIONS ARE APPROXIMATE.
 - DUPLICATE ANALYSES ARE PRESENTED IN BRACKETS.
 - J - ESTIMATED CONCENTRATION.
 - - RESULT IS A COMBINATION OF 3-METHYLPHENOL AND 4-METHYLPHENOL.
 - U - NOT DETECTED.
 - NA - NOT ANALY. ED.
 - R - RESULT REJECTED DURING DATA VALIDATION.
 - ALL UNITS ARE IN µg/L (MICROGRAMS PER LITER).
 - * - ANALYTE IS NONDETECT BUT DETECTION LIMIT IS ABOVE RDW CRITERIA.
 - E - ESTIMATED BECAUSE OF THE PRESENCE OF INTERFERENCE.

- SOURCE:**
- ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR, GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, SWISSTOPO, AND THE GIS USER COMMUNITY.



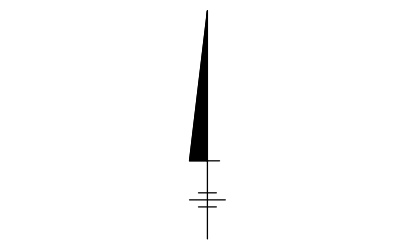
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PONTIAC, MICHIGAN

DUCK POND GROUNDWATER DATA

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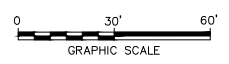
FIGURE
4

CITY: SYRACUSE DIV/GROUP: IMDV DB: A.FOX.G.STOWELL PM:(Redd) LVR:(PHONE="OFF")REF: ENVCAD/SYRACUSE/ACT/1600646072016000020DWG64607B02.DWG LAYOUT: 2 SAVED: 7/19/2016 7:51 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: C-LD2B-PDF-GMS PLOTSTYLE/TABLE: PLT/FULL.CTB PLOTTED: 7/19/2016 7:54 AM BY: STOWELL, GARY XREFS: IMAGES: PROJECTNAME: 64607X04.jpg



- LEGEND:**
- SURFACE WATER SAMPLE LOCATION ON MAY 9, 2016
 - SEDIMENT SAMPLE LOCATION ON MAY 9, 2016
 - PROPERTY BOUNDARY
 - SANITARY SEWER
 - STORM SEWER
 - ▲ STORM SEWER OUTFALL
 - MANHOLE
 - BULKHEAD
 - RCP = REINFORCED CONCRETE PIPE.

- SOURCE:**
1. ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, SWISSTOPO, AND THE GIS USER COMMUNITY.



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**DUCK POND SEDIMENT AND SURFACE
WATER SAMPLE LOCATIONS**

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FIGURE
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