LONG TERM GROUNDWATER MONITORING PLAN

APPLETON WIRE (FORMER)
908 NORTH LAWE STREET
APPLETON, WISCONSIN 54911
WDNR BRRTS #: 02-45-000015

October 19, 2017

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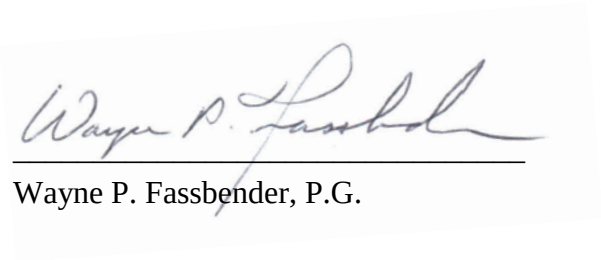
HYDROGEOLOGIST CERTIFICATION

"I, Wayne P. Fassbender, certify I am a Hydrogeologist as that term is defined in s NR 712.03 (1) Wisconsin Administrative Code; and that to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements of chs. NR 700 to 726, Wisconsin Administrative Code."



Wayne P. Fassbender, P.G. Date: 10/19/2017

Document Reference: Long Term Groundwater Monitoring Plan
Appleton Wire (former)
908 N. Lawe Street, Appleton, Wisconsin
October 26, 2017

1.0 INTRODUCTION

EnviroForensics, LLC (EnviroForensics) has been contracted by Albany International Corp. (Albany) to evaluate past investigative data collected by various consultants at the former Appleton Wire facility located at 908 N. Lawe Street, Appleton Wisconsin (Site) from 1987 to present, and to formulate a proposed plan for long term groundwater monitoring (Plan). The contaminant of concern (COC) for this Site is the metal chromium in the hexavalent state. This proposed Plan was fashioned taking into account past site data regarding soil properties, groundwater concentration trends, current hydraulic controls, and contaminant migration potential. This Plan supplements and is supported by the recent report titled: *Site Investigation Report*, and dated October 26, 2017 (SIR). The SIR provides all of the details regarding past Site operations, and the investigations performed to determine the extent and magnitude of subsurface impacts.

The objectives of this Plan are to devise a groundwater monitoring well network that is cost effective, and allows sufficient monitoring of the following:

1. Concentrations of contaminants, or lack thereof, at sentinel wells located along the Site property boundaries;
2. Changes in contaminant concentrations within the source area of impact during and after any additional remedial actions; and
3. Changes in the groundwater flow field if current pumping and treating of groundwater impacts is discontinued.

This Plan should be considered a baseline Plan. The Plan is not static because monitoring needs may be revised in the future based on changing subsurface conditions that may occur from anticipated additional remedial actions.

2.0 BACKGROUND

2.1 Location and Surroundings

The location of the Site is depicted on the U.S.G.S. 1:24,000 scale topographic quadrangle map (**Figure 1**). The Site is located at 908 North Lawe Street, Appleton, Wisconsin, and is situated in a mixed area of industrial and residential properties as seen on the aerial photograph, **Figure 2**.

Currently, the Site property is owned by Luvata Appleton, LLC and consists of one (1) single-story slab-on-grade manufacturing building of approximately 42,500 square feet and an attached warehouse of approximately 10,500 square feet. The warehouse has a partial basement in the southeast corner that has an approximate area of 1,300 square feet and is 11 feet below grade (**Figure 3**). Adjacent properties to the north, west, and south are industrial, while adjacent properties to the east are residential.

As can be seen on **Figure 1**, the topography in the immediate area of the Site is relatively flat, slightly sloping downward to the east. A surface water drainage channel leading to the Fox River exists approximately 1,200 feet from the Site to the east. The Fox River at its closest point to the Site is located approximately 2,800 feet to the southeast. Regionally, without the influence of on-Site sump, the shallow groundwater flows towards the Fox River.

2.2 Summary of Past Site Operations

Based on available information, the Site and adjacent Appleton Papers, Inc. property was owned by Albany International Corp. and operated as Appleton Wire from 1963 to 1983. The northern portion of the parcel was sold to Valley Cast in 1984, which was then sold to Luvata Appleton, LLC (Luvata) in 2006. The southern portion of the Site was sold to Appleton Papers, Inc. (now Appvion) in 1985, which has resulted in the current ownership and property boundaries shown on **Figure 2**.

An eastern portion of the facility (now a warehouse) housed a plating operation using chromic acid containing hexavalent chromium. The layout of the equipment is shown on **Figure 3**. The operation was discontinued in 1981 and the chrome plating equipment was dismantled and sold in 1982 as part of the decommissioning process. In 1985, a sump pump in the partial basement of the warehouse failed and flooding in the basement occurred. Facility employees noticed that the water was tainted yellow and notified Albany International. Initial testing showed that the water was contaminated with chromium. A groundwater recovery and treatment system was subsequently installed by STS Consultants, Inc. in 1988 to collect and treat groundwater from a sump in the partial basement. This system was enhanced in 1992 to include a French drain and

groundwater collection trench located outside on the north side of the warehouse as shown on **Figure 3**.

2.3 Extent of Chromium Impacts

From 1985 to 2017, several rounds of subsurface investigations were performed by multiple consultants to better determine the extent of chromium impacts in soil and groundwater.

Subsurface data collected over the years indicates that the releases of chromic acid containing hexavalent chromium to the subsurface have occurred along deteriorated sections of the supply piping and associated concrete secondary containment raceways. Additional releases occurred within the partial basement that housed the supply tanks for the chromic acid. Units designed to remove chromium vapor from work areas inside the warehouse were located outside on the north and south sides of the warehouse. Leakage from these air scrubbing units contributed to the impacts seen outside to the north, and possibly to a lesser degree outside to the south. This pattern of subsurface impacts fits well with historical information gathered regarding the locations of plating equipment, chromic acid conveyance systems, and plating equipment maintenance procedures. The extent of soil impacts can be seen on **Figure 4b**.

Soil impacts have migrated vertically to shallow groundwater, which is encountered at depths of between 3-8 feet on Site. The extent of groundwater impacts can be seen on **Figure 5**. As can be seen on **Figures 4b** and **5**, soil and groundwater impacts are limited to the original property boundaries and are largely limited to areas inside the warehouse and under the concrete slab to depths of between 15-20 feet. This is due to the characteristics of Site soil. Native soil consists of a thick and relatively uniform blanket of clay deposited in a glaciolacustrine environment. The clay soil overlies dolomite bedrock which is encountered at approximately 120-130 feet below ground surface. The clay soil is of very low permeability and does not readily transmit water. Migration of impacts within the clay soil is very limited with most lateral distribution occurring along man-made artificial pathways such as areas of sandy building fill and old chromic acid supply piping runs.

The shallow groundwater is not a useable source of drinking water due to the very low yield within the clay. The City of Appleton is supplied by municipal drinking water that is drawn from Lake Winnebago located approximately four miles south of the site. The dolomite aquifer is protected by over 90 feet of clay having low permeability, and there are no sensitive receptors located nearby that could be affected by site contaminants.

Residential homes exist to the east of the Site across Meade Street and are in the general down-gradient or side-gradient direction of groundwater flow from Site impacts. Some of these homes

have foundation drainage with groundwater collection sumps in the basements. Some of these sumps have been sampled for chromium in the past, with no chromium detected. In addition, monitoring well clusters have been installed between the Site and these residences to monitor the potential migration of Site impacts. To date, Site contaminants have not been detected in these wells at levels that would be of concern to human health.

3.0 PROPOSED MONITORING WELL NETWORK

3.1 Groundwater Movement

The lateral direction of groundwater flow is expected to follow local topography and nearby sources of groundwater discharge. Based on topography and local drainage features, it is expected that the direction of shallow groundwater flow is to the east towards the drainage channel following the slope of topography, or to the southeast towards the Fox River, which is the primary discharge point in this area for groundwater within the shallow unconsolidated soil.

Water table contour maps were fashioned from water level measurements taken of existing water table observation wells in January 2017 and April 2017, and from all existing and new water table observation wells measured on July 26, 2017 (**Figures 6**, **7**, and **8**). These figures show that current pumping in the sump and French drain affect localized groundwater flow and directs flow towards them. It appears that the area of groundwater capture does not extend to beyond MW-5 to the south. Without the influence of pumping, the natural direction of groundwater flow is likely to the southeast.

The velocity of groundwater flow can be calculated from the hydraulic conductivity determined by slug testing, and the hydraulic gradient established from groundwater flow maps. The calculation is as follows:

V=KI/n; where V= the groundwater flow velocity; K= the hydraulic conductivity; I= the groundwater gradient; and n= the effective porosity of the soil.

The groundwater velocity was calculated using K values of 9.7×10^{-6} and 1.4×10^{-7} centimeters per second for the upper soil and lower soil, respectively; an average hydraulic gradient of 0.016 feet per foot under natural flow conditions; and an estimated effective porosity for silty clay of 0.1. The groundwater flow velocity ranges between 1.6 and 0.023 feet per year for the upper 15 feet of soil and soil below that, respectively.

3.2 Selection of Monitoring Points to Achieve Plan Objectives

As indicated in Section 1.0, there are three main objectives to consider in developing the groundwater monitoring network. The network should be designed to monitor:

1. Concentrations of contaminants, or lack thereof, at sentinel wells located along the Site property boundaries to monitor migration of impacts;

2. Changes in contaminant concentrations within the source area of impact during and after any additional remedial actions; and
3. Changes in the groundwater flow field if current pumping and treating of groundwater impacts is discontinued.

Various consultants have investigated Site impacts over the past 30 years, and as seen in **Table 1**, there is a significant archive of past groundwater sampling results. Many of the existing monitoring wells have years of data and this needs to be taken into account during Plan development. The contaminant of concern is hexavalent chromium, and the past results of groundwater sampling for both total chromium and hexavalent chromium have shown that the total chromium detected in groundwater is almost all in the hexavalent state. The regulatory standards for chromium in groundwater are based on total chromium; therefore, all groundwater samples will be analyzed for total chromium.

Some of the Site monitoring wells are being proposed for abandonment because they have not shown Site impacts, are in the source area of impacts, and if compromised in the future (i.e. damaged) have a potential to act as conduits for vertical migration of contaminants to deeper zones.

Table 2 has been prepared to illustrate the various Site wells that will be monitored and the frequency of monitoring. As can be seen on **Table 2**, the monitoring of some wells are duplicated across the various frequency columns. Depending on Site actions taken, the wells will be sampled on the most frequent basis shown.

A more detailed description of specific wells to monitored is provided in the following sections.

3.2.1 Sentinal Wells

Sentinal wells are wells located near the source area or at property boundaries to monitor the potential migration of groundwater impacts. These wells are part of the base Plan, and are typically located in the down-gradient direction of groundwater flow and are monitored to ensure that contaminants are not increasing in concentration or migrating onto, or off-site. Proposed sentinal wells to be monitored include MW-1/MW-1B, MW-2/MW-2A, MW-5/MW-5A, MW-10R/MW-10B, MW-17/MW-17A, MW-21/MW-21A, MW-22/MW-22A, MW-23/MW-23A, and MW-24/MW-24A.

3.2.2 Wells to be Monitored in Source Area

The main source area for Site impacts is considered to be the existing warehouse and associated partial basement. Secondary source areas include the French drain located outside the warehouse to the north, and in the vicinity of well MW-5 located outside the warehouse to the south.

It is important that groundwater concentrations in the source areas be monitored during any additional Site remedial actions to determine reductions in contaminant concentrations (and/or conversion to less toxic species) achieved during these remedial efforts.

All groundwater monitoring wells inside the warehouse building should be monitored during remedial activities. Additional wells MW-2/MW-2A, MW-5/MW-5A located outside of the warehouse, along with the basement sump and French drain manhole should also be monitored during remediation. During remediation, water samples from some of these wells may be analyzed for species-specific valence states such as hexavalent and/or trivalent chromium in addition to total chromium. Additional analytes may also be needed to monitor remedial actions.

3.2.3 Wells to be Monitored if Hydraulic Control is Removed

When the current pump and treat system is decommissioned as part of a remediation and closure strategy, then additional wells located outside of the warehouse area may need to be monitored more frequently. These wells include: MW-2/MW-2A, MW-5/MW-5A, MW-10R/MW-10B, and MW-24/MW-24A. These wells should be sampled for total chromium.

3.2.4 Wells Proposed for Abandonment

Wells MW-5C, MW-19C, and MW-20C are proposed for abandonment because they have not been shown to contain groundwater impacts, are in source areas of impact, and could potentially become conduits for vertical migration of shallow groundwater impacts to deeper zones, if they were to become damaged.

3.3 Frequency of Sampling to Achieve Plan Objectives

The proposed frequencies of sampling for select wells are presented in **Table 2**. As previously calculated, the velocity of groundwater flow across the site is very slow and estimated at between a minimum of 0.023 feet per year and a maximum of 1.6 feet per year. Therefore, it is not anticipated that groundwater impacts will travel significantly over the period of a few years.

Given the slow groundwater travel times, it is proposed that all sentinel wells be monitored once every four (4) years.

During future remedial actions, the wells identified in Section 3.2.2 above should be monitored on a bi-annual basis to determine the effectiveness of remedial actions. If hydraulic control (pump and treat system) is discontinued, then the wells identified in Section 3.2.3 above should be monitored once per year.

As previously mentioned, additional monitoring wells may be added or abandoned depending on proposed and approved remedial actions.

4.0 GROUNDWATER SAMPLING PROCEDURES

Prior to sampling, water level measurements will be collected from the well network using an electronic water level indicator. The monitoring wells will be allowed to equilibrate to atmospheric pressure by removing well lids a minimum of 15 minutes before measuring the water levels. The depth-to-water measurements will be recorded to the nearest 0.01 foot.

Disposable bailers will be utilized to purge the well dry. After allowing the wells to recharge, water samples will be collected using the disposable bailers and the water will be passed through disposable filters having no greater than 0.45 micron pore size. Data collected during the sampling activities will be documented on Groundwater Field Sampling Forms and presented in the reporting documents.

All wells will be sampled for total chromium using EPA SW-846 Method 6010B according to the frequencies described in section 3.3 above, and presented in **Table 2**. The samples will be preserved with nitric acid. Following sample collection, containers will be placed into a cooler containing ice and transported to state certified laboratories for analysis. Proper chain-of-custody documentation will be maintained at all times.

One (1) duplicate groundwater sample will be collected for every ten (10) or fewer investigative samples, and one (1) trip blank sample will be analyzed per sample cooler for quality assurance and quality control (QA/QC) purposes.

Purge water and decontamination fluids will be processed through the current on-site treatment system. If the system is deactivated, then the sampling waste will be stored on-Site in sealed and labeled DOT 17H-rated drums, or equivalent, until arrangements are made for testing and appropriate disposal.

5.0 REPORTING

A summary report will be prepared and sent to the WDNR once per year. The report will contain a narrative, updated tables with analytical results, all applicable field sampling forms, copies of analytical results sheets, and figures showing water table elevations and direction of groundwater flow and distribution of contaminants.

In addition, brief results reports will be sent to Luvata Appleton, Appvion, and the City of Appleton as applicable within 10 days of our receipt of the analytical results from each sampling event as required by the WDNR. A copy of these off-site results reports will also be sent to the WDNR.

TABLES

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
B-1	06/05/85	**190**	190
B-2	06/05/85	**8,400**	8,400
B-3	06/05/85	**27,000**	23,000
	01/24/86	**15,400**	14,000
GMW-01	06/30/04	**5,300**	5,100
	08/01/07	**8,490**	N/A
	10/24/07	**3,085**	1,900
	01/16/08	**3,020**	2,260
	04/23/08	**2,001**	2,000
GMW-02	06/30/04	**5,700**	4,700
	08/01/04	**6,355**	N/A
	10/24/07	**6,115**	6,115
	01/16/08	**7,040**	6,800
	04/23/08	**6,600**	4,900
GMW-03	06/30/04	**5,000**	4,700
	08/01/04	**4,790**	N/A
	10/24/07	**3,545**	2,300
	01/16/08	**4,550**	3,100
	04/23/08	**3,320**	1,400
GMW-04	06/30/04	**52**	52
	08/01/04	**56**	N/A
	10/24/07	**14**	<2.0
	01/16/08	**31**	<0.002
	04/23/08	3.7	<2.0
GMW-05	06/30/04	**40**	34
	08/01/04	**55**	N/A
	10/24/07	5.6	<2.0
	01/16/08	8.5	<0.002
	04/23/08	**31.0**	<2.0
GMW-06	06/30/04	3.3	<2
	08/01/04	4.2	N/A
	10/24/07	3.5	<2.0
	01/16/08	3.3	<0.002
	04/23/08	5.2	<2.0
GMW-07	06/30/04	0.8	<2
	08/01/04	1.7	N/A
	10/24/07	2.3	<2.0
	01/16/08	**13.0**	<0.002
	04/23/08	3.1	<2.0
GMW-08	06/30/04	0.4	<2
	08/01/04	1.4	N/A
	10/24/07	**489.0**	270
	01/16/08	8.6	<0.002
	04/23/08	**101.0**	20
GMW-09	06/30/04	1.3	<2
	08/01/04	1.5	N/A
	10/24/07	2.8	<2.0
	01/16/08	9.3	<0.002
	04/23/08	4.2	<2.0
GMW-10	06/30/04	0.5	<2
	08/01/04	0.6	N/A
	10/24/07	**11.0**	<2.0
	01/16/08	0.5	<0.002
	04/23/08	2.6	<2.0
GMW-11	06/30/04	1.1	<2
	08/01/04	1.9	N/A
	10/24/07	3.6	<2.0
	01/16/08	5.6	<0.002
	04/23/08	4.1	<2.0
GP-7 (Temp)	05/12/14	**183**	29
GP-13 (Temp)	05/13/14	**2,991**	1,600
MW-1	02/09/87	**50**	50
	07/29/87	<40	NA
	09/25/87	<100	NA
	12/11/87	<100	NA
	03/21/88	1.6	NA
	06/13/88	3.0	NA
	09/08/88	9	NA
	12/15/88	2.5	NA
	03/26/92	<40	NA
	06/16/92	4.9	NA
	09/04/92	**50**	NA
	12/17/92	NS	NS
	03/25/93	<80	NA
	06/22/93	NS	NS
	09/16/93	<80	NA
	12/03/93	NS	NS

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Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-1 (continued)	03/15/94	<70	NA
	06/16/94	NS	NS
	09/20/94	**13**	NA
	12/13/94	NS	NS
	03/31/95	**39**	NA
	06/15/95	NS	NS
	09/07/95	7.2	NA
	12/11/95	NS	NS
	03/15/96	**15**	NA
	06/27/96	NS	NS
	09/05/96	6.4	NA
	12/03/96	NS	NS
	04/26/97	**11**	NA
	04/30/98	**60**	NA
	10/22/98	7	NA
	04/16/99	**12**	NA
	10/19/99	9.3	NA
	04/17/00	**22**	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/16/03	2.9	NA
	04/19/04	2.8	<2.0
	04/11/05	**82**	16
	07/18/05	<30	<2
	04/11/06	1.7	<2.0
	04/29/07	4	<2.0
	04/23/08	4.4	<2.0
	04/07/09	4.6	<0.1
	04/13/10	**26**	<3.0
	04/27/11	3	<3
	04/10/12	1.7	<3
	04/15/13	2.6	<2.6
	04/09/14	4.2	<3.0
	04/21/15	0.5	<0.5
	04/14/16	0.35	<2
	06/29/17	<2.5	NA
	08/31/17	<2.5	NA
MW-1B	06/29/17	<2.5	NA
	08/31/17	<2.5	NA
MW-2	02/09/87	**70**	70
	07/29/87	<40	NA
	09/25/87	**100**	NA
	12/11/87	**100**	NA
	03/21/88	**85**	NA
	06/13/88	**140**	NA
	09/08/88	**71**	NA
	12/15/88	**130**	NA
	03/26/92	<40	NA
	06/16/92	**17**	NA
	09/04/92	<40	NA
	12/17/92	NS	NS
	03/25/93	<80	NA
	06/22/93	NS	NS
	09/16/93	<80	NA
	12/03/93	NS	NS
	03/15/94	<70	NA
	06/16/94	NS	NS
	09/20/94	**19**	NA
	12/13/94	NS	NS
	03/31/95	**19**	NA
	06/15/95	NS	NS
	09/07/95	**14**	NA
	12/11/95	NS	NS
	03/15/96	**11**	NA
	06/27/96	NS	NS
	09/05/96	**29**	NA
	12/03/96	NS	NS
	04/26/97	9.2	NA
	10/29/97	**10**	NA
	04/30/98	**11**	NA
	10/22/98	9.3	NA
	04/16/99	7.7	NA
	10/19/99	6.8	NA
	04/17/00	**22**	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/16/03	<1.1	NA

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908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-2 (continued)	04/19/04	1.0	<2.0
	04/11/05	1.3	<2.0
	04/11/06	0.4	<2.0
	04/29/07	1.5	<2.0
	04/23/08	2.4	<2.0
	04/07/09	8.3	<.1
	04/13/10	5	<3.0
	04/27/11	3	<3.0
	04/10/12	0.7	<3.0
	04/15/13	0.4	<.4
	04/09/14	0.6	<0.6
	04/21/15	0.94	<0.94
	04/14/16	4.9	<2
	06/29/17	**29.5**	NA
	08/31/17	<2.5	NA
MW-2A	03/26/92	<40	NA
	06/16/92	1.5	NA
	09/04/92	<40	NA
	12/17/92	NS	NS
	03/25/93	<80	NA
	06/22/93	NS	NS
	09/16/93	<80	NA
	12/03/93	NS	NS
	03/15/94	<70	NA
	06/16/94	NS	NS
	09/20/94	*14*	NA
	12/13/94	NS	NS
	03/31/95	**17**	NA
	06/15/95	NS	NS
	09/07/95	3.9	NA
	12/11/95	NS	NS
	03/15/96	3.6	NA
	06/27/96	NS	NS
	09/05/96	1.2	NA
	12/03/96	NS	NS
	04/26/97	0.3	NA
	04/30/98	2.5	NA
	04/16/99	2.4	NA
	04/17/00	**23**	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/16/03	<1.1	NA
	04/19/04	0.6	<2.0
	04/11/05	0.4	<2.0
	04/11/06	<0.2	<2.0
	04/29/07	0.7	<2.0
	04/23/08	<0.4	<2.0
	04/07/09	1.5	<0.1
	04/13/10	5	<3.0
	04/27/11	2	<3.0
	04/10/12	0.5	<3.0
	04/15/13	<0.2	<0.2
	04/09/14	0.4	<0.4
	04/21/15	0.11	<0.11
	04/14/16	0.56	<2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-5*	03/26/92	**33,000**	NA
	06/16/92	**27,000**	NA
	09/04/92	**33,000**	NA
	12/17/92	**28,000**	NA
	03/25/93	**29,000**	NA
	06/22/93	**24,000**	NA
	09/16/93	**25,000**	NA
	12/03/93	**26,000**	NA
	03/15/94	**26,000**	NA
	06/16/94	**2,013**	NA
	09/20/94	**29,000**	NA
	12/13/94	**19,000**	NA
	03/31/95	**19,960**	NA
	06/15/95	**21,190**	NA
	09/07/95	**25,400**	NA
	12/11/95	**18,000**	NA
	03/15/96	**15,830**	NA
	06/27/96	**18,000**	NA
	09/05/96	**14,000**	NA
	12/03/96	**24,000**	NA

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Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-5* (continued)	01/23/97	**22,000**	NA
	04/26/97	**17,000**	NA
	07/16/97	**20,000**	NA
	10/29/97	**1,600**	NA
	01/20/98	**18,000**	NA
	04/30/98	**15,000**	NA
	07/10/98	**18,000**	NA
	10/22/98	**21,000**	NA
	01/19/99	**14,000**	NA
	04/16/99	**15,000**	NA
	07/23/99	**14,000**	NA
	10/19/99	**18,175**	NA
	01/10/00	**12,000**	NA
	04/17/00	**8,500**	NA
	07/20/00	**11,000**	NA
	10/25/00	**8,500**	NA
	01/17/01	**14,000**	NA
	04/06/01	**7,900**	NA
	07/20/01	**10,000**	NA
	10/16/01	**12,000**	NA
	01/14/02	**11,000**	NA
	04/18/02	**5,500**	NA
	07/23/02	**788**	NA
	10/30/02	**1,500**	NA
	01/20/03	**19,000**	NA
	04/16/03	**7,000**	NA
	07/10/03	**33**	NA
	10/07/03	**3,300**	NA
	01/30/04	**1,200**	NA
	04/19/04	**7,900**	10,000
	07/26/04	**6,700**	6,300
	10/11/04	**6,500**	6,500
	01/12/05	**6,460**	6,300
	04/11/05	**5,085**	4,500
	07/18/05	**4,900**	4,900
	10/11/05	**5,100**	4,900
	01/10/06	**10,880**	10,000
	04/11/06	**4,455**	3,880
	07/27/06	**3,190**	3,400
	10/18/06	**5,100**	4,500
	01/09/07	**2,900**	2,800
	04/29/07	**2,895**	2,500
	07/24/07	**2,465**	2,465
	10/24/07	**3,205**	2,700
	01/16/08	**2,335**	2,300
	04/23/08	**2,067**	1,700
	07/15/08	**2,425**	1,700
	10/23/08	**2,400**	1,800
	01/22/09	**2,024**	1,900
	04/07/09	**2,116**	1,700
	07/07/09	**2,200**	2,000
	10/11/09	**2,500**	2,300
	01/19/10	**2,015**	1,900
	04/13/10	**1,600**	1,400
	07/29/10	**1,800**	1,300
	10/19/10	**1,700**	1,400
	01/13/11	**1,500**	1,400
	04/27/11	**1,200**	1,200
	07/19/11	**1,100**	1,000
	10/11/11	**1,100**	1,000
	01/10/12	**1,140**	950
	04/10/12	**1,200**	1,100
	08/08/12	**1,200**	49
	10/09/12	**1,139**	1,100
	01/08/13	**1,500**	1,310
	04/15/13	**1,166**	1,166
	07/10/13	**1,300**	1,300
	10/14/13	**1,338**	1,300
	01/15/14	**1,594**	1,730
	04/09/14	**1,430**	1,280
	07/08/14	**1,300**	1,180
	10/14/14	**960**	960
	01/13/15	**784**	670
	04/21/15	**576**	514
	07/15/15	**605**	591
	10/20/15	**604**	512
	01/21/16	**444**	408

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-5* (continued)	04/14/16	**462**	430
	07/14/16	**536**	466
	10/18/16	**37**	48
	06/29/17	**120**	NA
DUP-3	06/29/17	**122**	NA
MW-5* (continued)	8/31/2017	**256**	NA
MW-5A*	02/09/87	**80**	80
	07/29/87	**8,000**	NA
	09/25/87	**2,100**	NA
	12/11/87	**14,400**	NA
	03/21/88	**26,000**	NA
	06/13/88	**7,800**	NA
	09/08/88	**3,000**	NA
	12/15/88	**7,100**	NA
	03/26/92	**5,600**	NA
	06/16/92	**7,600**	NA
	09/04/92	**13,000**	NA
	12/17/92	**1,500**	NA
	03/25/93	**2,200**	NA
	06/22/93	**1,400**	NA
	09/16/93	**3,800**	NA
	12/03/93	**10,000**	NA
	03/15/94	**900**	NA
	06/16/94	**312**	NA
	09/20/94	**350**	NA
	12/13/94	**580**	NA
	03/31/95	**568**	NA
	06/15/95	**228**	NA
	09/07/95	**1,928**	NA
	12/11/95	**24**	NA
	03/15/96	**552**	NA
	06/27/96	**490**	NA
	09/05/96	**2,200**	NA
	12/03/96	**1,600**	NA
	01/23/97	**170**	NA
	04/26/97	**68**	NA
	07/16/97	**40**	NA
	10/29/97	**140**	NA
	01/20/98	**1,500**	NA
	04/30/98	**130**	NA
	07/10/98	**150**	NA
	10/22/98	**160**	NA
	01/19/99	**900**	NA
	04/16/99	**99**	NA
	07/23/99	**76**	NA
	10/19/99	**104**	NA
	01/10/00	**1,200**	NA
	04/17/00	**880**	NA
	07/20/00	**400**	NA
	10/25/00	**1,100**	NA
	01/17/01	**280**	NA
	04/06/01	**65**	NA
	07/20/01	**11**	NA
	10/16/01	**16**	NA
	01/14/02	**78**	NA
	04/18/02	**380**	NA
	07/23/02	**207**	NA
	10/30/02	**45**	NA
	01/20/03	**1,200**	NA
	04/16/03	**270**	NA
	07/10/03	**1,200**	NA
	10/07/03	**16**	NA
	01/30/04	**23**	NA
	04/19/04	**480**	82
	07/26/04	**40**	<4
	10/11/04	**12**	12
	01/12/05	**30**	<2
	04/11/05	**13**	10
	07/18/05	<30	<2
	10/11/05	**26**	<2
	01/10/06	3.5	<2
	04//11/06	**36**	<2
	07/27/06	**755**	720

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-5A* (continued)	10/18/06	5.2	5.2
	01/09/07	2.3	<2.0
	04/29/07	**12**	10
	07/24/07	2.4	<2.0
	10/24/07	2.7	<2.0
	01/16/08	**10**	<2.0
	04/23/08	**167**	20
	07/15/08	6.4	<1.0
	10/23/08	**18**	10
	01/22/09	**248**	210
	04/07/09	**630**	590
	07/07/09	7	<4.0
	10/11/09	**33**	<3.0
	01/19/10	**24**	<3.0
	04/13/10	7	7
	07/29/10	6	<3.0
	10/19/10	5	5
	01/13/11	5	5
	04/27/11	**27**	14
	07/19/11	<3	<3
	10/11/11	**11**	7
	01/10/12	**94**	60
	04/10/12	4.2	<3.0
	08/08/12	**49**	<3.0
	10/09/12	**39**	26
	01/08/13	7.9	<3.0
	04/15/13	3.7	<3.0
	07/10/13	**1,300**	<3.0
	10/14/13	**65**	67
	01/15/14	**23**	21
	04/09/14	**12**	7
	07/08/14	4	<3
	10/14/14	5	<3
	01/13/15	3.1	<3
	04/21/15	1.2	<1.2
	07/15/15	4.6	<0.1
	10/20/15	**16**	<2.0
	01/21/16	7.8	<2.0
	04/14/16	1.2	9
	07/14/16	**12**	6
	10/18/16	0.79	<2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-5C	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-10R	01/19/99	3.7	NA
	04/16/99	4.4	NA
	07/23/99	8.3	NA
	10/19/99	1	NA
	01/10/00	<11	NA
	04/17/00	**13**	NA
	07/20/00	**16**	NA
	10/25/00	<11	NA
	01/17/01	<11	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/30/03	1.1	NA
	04/19/04	1.2	<2.0
	04/11/05	1.2	<2.0
	07/18/05	<30	<2.0
	04/11/06	1	<2.0
	04/29/07	1.5	1.5
	04/23/08	3.5	3.5
	04/07/09	4.4	<0.1
	04/13/10	**11**	<3.0
	04/27/11	5	<3.0
	04/10/12	5.5	<3.0
	04/15/13	0.5	<0.5
	04/09/14	0.5	<0.5
	04/21/15	0.41	<0.41
	04/14/16	0.31	<2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-10B	06/29/17	2.8 J	NA
	8/31/2017	<2.5	NA

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-17	03/26/92	<40	NA
	06/16/92	1.3	NA
	09/04/92	<40	NA
	12/17/92	NS	NS
	03/25/93	<80	NA
	06/22/93	NS	NS
	09/16/93	<80	NA
	12/30/93	NS	NS
	03/15/94	<70	NA
	06/16/94	NS	NS
	09/20/94	**15**	NA
	12/13/94	NS	NS
	03/31/95	9.8	NA
	06/15/95	NS	NS
	09/07/95	8.1	NA
	12/11/95	NS	NS
	03/15/96	3.6	NA
	06/27/96	NS	NS
	09/05/96	2.4	NA
	12/03/96	NS	NS
	04/26/97	0.5	NA
	04/30/98	1.7	NA
	04/16/99	2.9	NA
	04/17/00	<11	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/16/03	<1.1	NA
	04/19/04	1.7	<2.0
	04/11/05	0.3	<2.0
	04/11/06	1.5	<2.0
	04/29/07	0.8	<2.0
	04/23/08	<0.4	<2.0
	04/07/09	1.7	<0.1
	04/13/10	**12**	<3.0
	04/27/11	2	<3.0
	04/10/12	0.4	<3.0
	04/15/13	<0.2	<0.2
	04/09/14	0.8	<0.8
	04/21/15	0.39	<0.39
	04/14/16	0.68	<2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-17A	03/26/92	<40	NA
	06/16/92	**26**	NA
	09/04/92	<40	NA
	12/17/92	NS	NS
	03/25/93	<80	NA
	06/22/93	NS	NS
	09/16/93	<80	NA
	12/03/93	NS	NS
	03/15/94	<70	NA
	06/16/94	NS	NS
	09/20/94	**22**	NA
	12/13/94	NS	NS
	03/31/95	**14**	NA
	06/15/95	NS	NS
	09/07/95	6.4	NA
	12/11/95	NS	NS
	03/15/96	3.4	NA
	06/27/96	NS	NS
	09/05/96	0.7	NA
	12/03/96	NS	NS
	04/26/97	<0.2	NA
	04/30/98	1.5	NA
	04/16/99	0.9	NA
	04/17/00	<11	NA
	04/06/01	<11	NA
	04/18/02	<11	NA
	04/16/03	<1.1	NA
	04/19/04	0.2	<2.0
	04/11/05	0.3	<2.0

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-17A (continued)	04/11/06	<0.2	<2.0
	04/29/07	0.2	<2.0
	04/23/08	<0.4	<2.0
	04/07/09	0.3	<0.1
	04/13/10	0.9	<3.0
	04/27/11	3	<3.0
	04/10/12	0.5	<3.0
	04/15/13	<0.2	<0.2
	04/09/14	<0.2	<0.2
	04/21/15	0.17	<0.17
	04/14/16	<0.2	<2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-18	08/13/02	<12	NA
	04/16/03	<1.1	NA
	04/19/04	<0.2	<2.0
	04/11/05	<0.2	<2.0
	04/11/06	<0.2	<2.0
	04/29/07	0.3	<2.0
	04/23/08	1.1	<4.0
	04/07/09	3.8	<0.1
	04/13/10	6.9	<3.0
	04/27/11	0.4	<3.0
	04/10/12	0.2	<3.0
	04/15/13	<0.2	<0.2
	04/09/14	0.4	<0.4
	04/21/15	<0.1	<0.1
	04/14/16	1.6	<2
	06/29/17	3.5 J	NA
	8/31/2017	<2.5	NA
MW-18A	08/13/02	<12	NA
	04/16/03	<1.1	NA
	04/19/04	<0.2	<2.0
	04/11/05	0.4	<2.0
	04/11/06	1.5	<2.0
	04/29/07	0.3	<2.0
	04/23/08	1.1	<4.0
	04/07/09	3.8	<2.0
	04/13/10	6.9	<3.0
	04/27/11	0.4	<3.0
	04/10/12	0.2	<3.0
	04/15/13	<0.2	<0.2
	04/09/14	3.3	<3.0
	04/21/15	**15**	<3.0
	04/14/16	<0.2	2
	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-19	07/13/09	**13,000**	15,000
	07/28/09	**22,000**	20,000
	10/11/09	**5,300**	4,000
	01/19/10	**3,030**	2,600
	04/13/10	**5,270**	5,270
	07/29/10	**6,400**	3,900
	10/19/10	**7,100**	4,800
	01/13/11	**7,100**	7,100
	04/27/11	**15,000**	15,000
	07/19/11	**9,400**	8,700
	10/11/11	**21,000**	17,000
	01/10/12	**41,100**	40,000
	04/10/12	**21,672**	23,000
	08/08/12	**26,000**	26,000
	10/09/12	**14,187**	13,000
	01/08/13	**12,575**	11,000
	04/15/13	**16,300**	16,300
	07/10/13	**19,000**	19,000
	10/14/13	**15,440**	16,000
	04/09/14	**20,005**	20,005
	07/08/14	**18,000**	17,000
	10/14/14	**21,600**	21,300
	01/13/15	**18,050**	15,000
	04/21/15	**18,587**	18,000
	07/15/15	**17,200**	16,000
	10/20/15	**18,000**	18,000
	01/21/16	**15,295**	17,000
	04/14/16	**18,420**	18,100
	07/14/16	**16,227**	17,600
	10/18/16	**18,618**	17,100

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-19 (continued)	06/29/17	**23,600**	25,000
	8/31/2017	**13,600**	NA
MW-19A	07/13/09	**30**	50
	07/28/09	**40**	40
	10/11/09	3	<3.0
	01/19/10	4.3	<3.0
	04/13/10	8.2	<3.0
	07/29/10	3	<3.0
	10/19/10	1	<3.0
	01/13/11	1	1
	04/27/11	3	3
	07/19/11	**143**	<3
	10/11/11	4	4
	01/10/12	4	<3.0
	04/10/12	1.8	<3.0
	08/08/12	**6,100**	5,400
	10/09/12	**22**	40
	01/08/13	8.1	<3.0
	04/15/13	**500**	<3.0
	04/09/14	1.8	<1.8
	07/08/14	3.8	<3
	10/14/14	4	<3
	01/13/15	**321**	<3
	04/21/15	1.5	<1.5
	07/15/15	**97**	<2.0
	10/20/15	1.7	<2.0
	01/21/16	**121**	<2.0
	04/14/16	**233**	<2.0
	07/14/16	1	2
	10/18/16	3.5	<2
	06/29/17	8.1 J	<3.9
	8/31/2017	3.7 J	NA
MW-19C	06/29/17	<2.5	<3.9
	8/31/2017	<2.5	NA
MW-20	06/02/14	**338,000**	338,000
	07/08/14	**283,000**	89,000
	10/14/14	**330,000**	297,000
	01/13/15	**199,000**	155,000
	04/21/15	**248,900**	248,900
	07/15/15	**248,150**	247,000
	10/20/15	**385,000**	385,000
	01/21/16	**212,000**	234,000
	04/14/16	**412,750**	279,000
	07/14/16	**287,875**	326,000
	10/18/16	**269,075**	283,000
	06/28/17	**265,000**	273,000
	8/31/2017	**331,000**	NA
MW-20A	06/02/14	**1,200**	1,060
	07/08/14	**230**	15
	10/14/14	**117**	<3
	01/13/15	**11**	<3
	04/21/15	1.1	<1.1
	07/15/15	**192**	<2.0
	10/20/15	**23**	<2.0
	01/21/16	5.4	<2.0
	04/14/16	**66**	8
	07/14/16	5.3	4
	10/18/16	**140**	<19
	06/28/17	6.5 J	<3.9
	8/31/2017	4.3 J	NA
MW-20C	06/28/17	**10.0**	<19
	8/31/2017	<2.5	NA
MW-21	06/02/14	2.6	<30
	07/08/14	**210**	<3
	10/14/14	<0.1	<3
	01/13/15	0.63	<3
	04/21/15	5.9	<3.0
	07/15/15	2.6	<2.0
	10/20/15	1.7	<2.0
	01/21/16	0.89	<2.0
	04/14/16	2.2	<2.0
	07/14/16	0.62	4
	10/18/16	0.29	<19
	06/28/17	**16.1**	<3.9
	8/31/2017	<2.5	NA

TABLE 1
GROUNDWATER ANALYTICAL RESULTS (CHROMIUM)
Former Appleton Wire
908 N. Lawe St., Appleton, WI 54911

Monitoring Well Identification	Sample Date	Dissolved Chromium	Hexavalent Chromium
Public Health Enforcement Standard		**100**	**NE**
Public Health Preventive Action Limit		**10**	**NE**
MW-21A	06/02/14	1.8	<30
	07/08/14	1.1	<3
	10/14/14	<0.1	<3
	01/13/15	<0.1	<3
	04/21/15	0.054	<0.54
	07/15/15	0.1	<2.0
	10/20/15	0.51	<2.0
	01/21/16	0.21	<2
	04/14/16	0.6	<2.0
	07/14/16	<0.2	8
	10/18/16	<0.2	<19
	06/28/17	6.1 J	<3.9
	8/31/2017	<2.5	NA
MW-22	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-22A	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-23	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-23A	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-24	06/29/17	<2.5	NA
	8/31/2017	2.6 J	NA
MW-24A	06/29/17	<2.5	NA
	8/31/2017	<2.5	NA
MW-25	06/28/17	<2.5	<3.9
	8/31/2017	<2.5	NA
MW-25A	06/28/17	<2.5	<3.9
	8/31/2017	<2.5	NA
MW-26	06/28/17	**72,900**	82,500
DUP-1	06/28/17	**72,800**	88,000
MW-26	8/31/2017	**84,900**	NA
MW-26A	6/28/2014	7.9 J	<3.9
	8/31/2017	<2.5	NA
MW-27	6/28/2014	**7,350**	8,500
DUP-2	6/28/2017	**7,080**	8,800
MW-27	8/31/2017	**6,490**	NA
MW-27B	6/28/2014	**13.9**	7.4 J
	8/31/2017	<2.5	NA
MW-28	6/28/2017	**3,890**	3,200
	8/31/2017	**390**	NA
MW-28A	6/28/2017	8.4 J	4.6 J
	8/31/2017	<2.5	NA
MW-29	6/29/2017	**951**	1,000
DUP-4	6/29/2017	**947**	NA
MW-29	8/31/2017	**228**	NA
MW-29A	6/29/2017	<2.5	<3.9
	8/31/2017	<2.5	NA
MW-30	6/28/2017	**3,980**	4,000
	8/31/2017	**3,540**	NA
MW-30A	6/28/2017	2.7 J	<19
	8/31/2017	<2.5	NA
UB-1	06/19/17	3.5 J	NA
UB-2	06/19/17	<2.5	NA

Notes:
* As of 8/13/02 the designations for MW-05 and MW-05A were switched to assign the "A" suffix to the piezometer formerly designated as MW-05
All concentrations reported in units of micrograms per liter (µg/l)
Only detected compounds are listed
Bolded and Orange Shaded values indicates an exceedance of the Public Health Enforcement Standard
Bolded and Blue Shaded values indicates an exceedance the Public Health Preventive Action Limit
J = Analyte concentration detected between the laboratory Reporting Limit and the laboratory Method Detection Limit
NE = Not Established
NA = Not Analyzed

TABLE 2

GROUNDWATER MONITORING PLAN SPREADSHEET

Former Appleton Wire Facility

908 N. Lawe Street

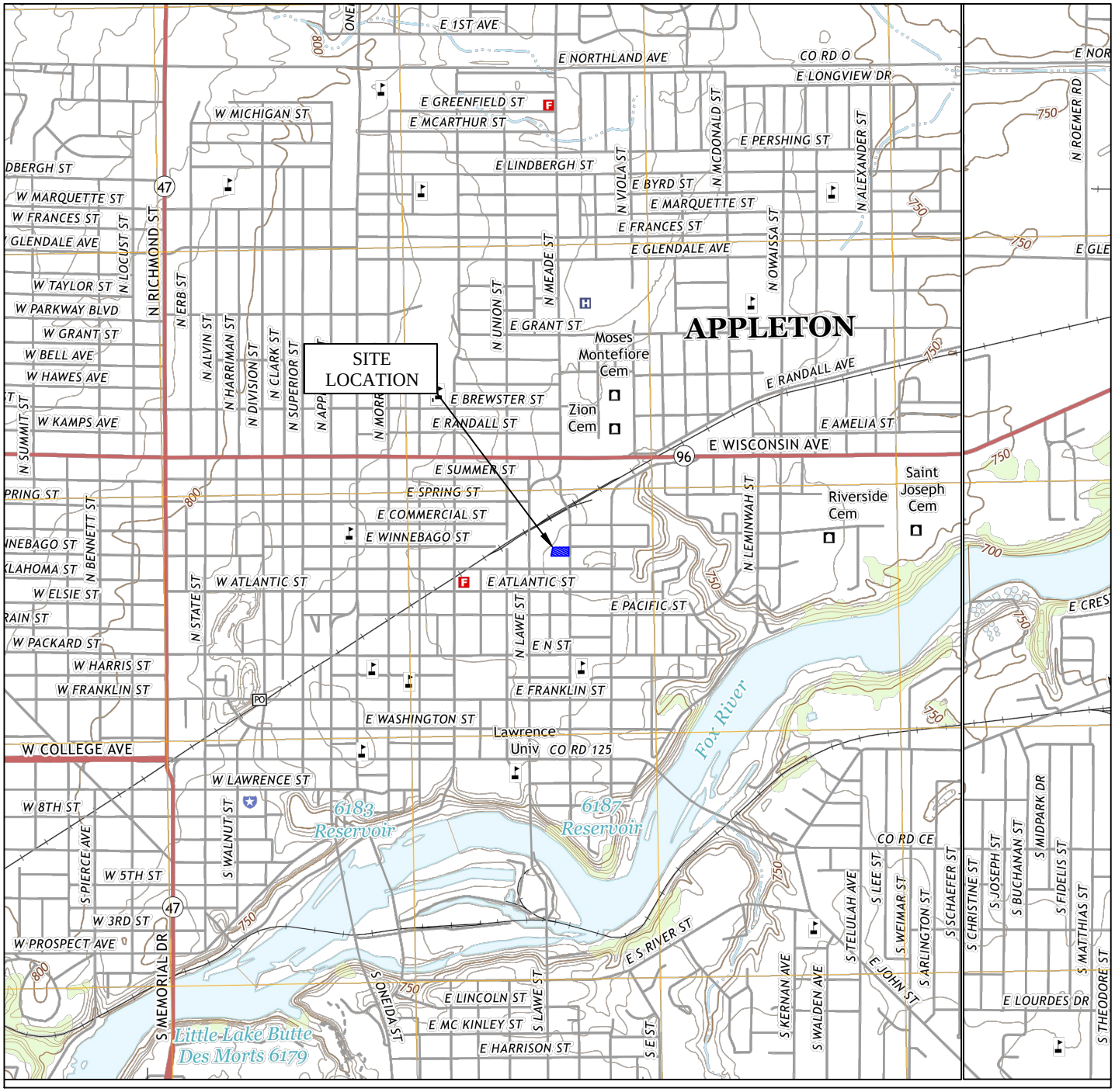
Appleton, Wisconsin

		Frequency of Monitoring		
	Monitoring Well ID	**Bi-annual** (Remediation Monitoring)	**Annually** (Hydraulic Control Eliminated)	**Once every 4 years** (Sentinel Wells)
1	MW-1			C
2	MW-1B			C
3	MW-2	C	C	C
4	MW-2A	C	C	C
5	MW-5	C	C	C
6	MW-5A	C	C	C
7	MW-5C	**To Be Abandoned**		
8	MW-10R		C	C
9	MW-10B		C	C
10	MW-17			C
11	MW-17A			C
12	MW-18			C
13	MW-18A			C
14	MW-19	C		
15	MW-19A	C		
16	MW-19C	**To Be Abandoned**		
17	MW-20	C		
18	MW-20A	C		
19	MW-20C	**To Be Abandoned**		
20	MW-21	C		C
21	MW-21A			C
22	MW-22			C
23	MW-22A			C
24	MW-23			C
25	MW-23A			C
26	MW-24		C	C
27	MW-24A		C	C
28	MW-25	C		
29	MW-25A	C		
30	MW-26	C		
31	MW-26A	C		
32	MW-27	C		
33	MW-27B	C		
34	MW-28	C		
35	MW-28A	C		
36	MW-29	C		
37	MW-29A	C		
38	MW-30	C		
39	MW-30A	C		
40	Basement Sump	C		
41	French Drain Manhole	C		

Notes:
C = total chromium analysis

ENVIROforensics

FIGURES



Scale 1:24,000

1 1/2 0 1 Mile

1000 0 1000 2000 3000 4000 5000 6000 7000 Feet

N

Source: US Geological Survey, Appleton, Wisconsin, 7.5 Minute Series, 2016
Source: US Geological Survey, kaukauna, Wisconsin, 7.5 Minute Series, 2016

No.	Date	Revision	Approved

ENVIRO forensics
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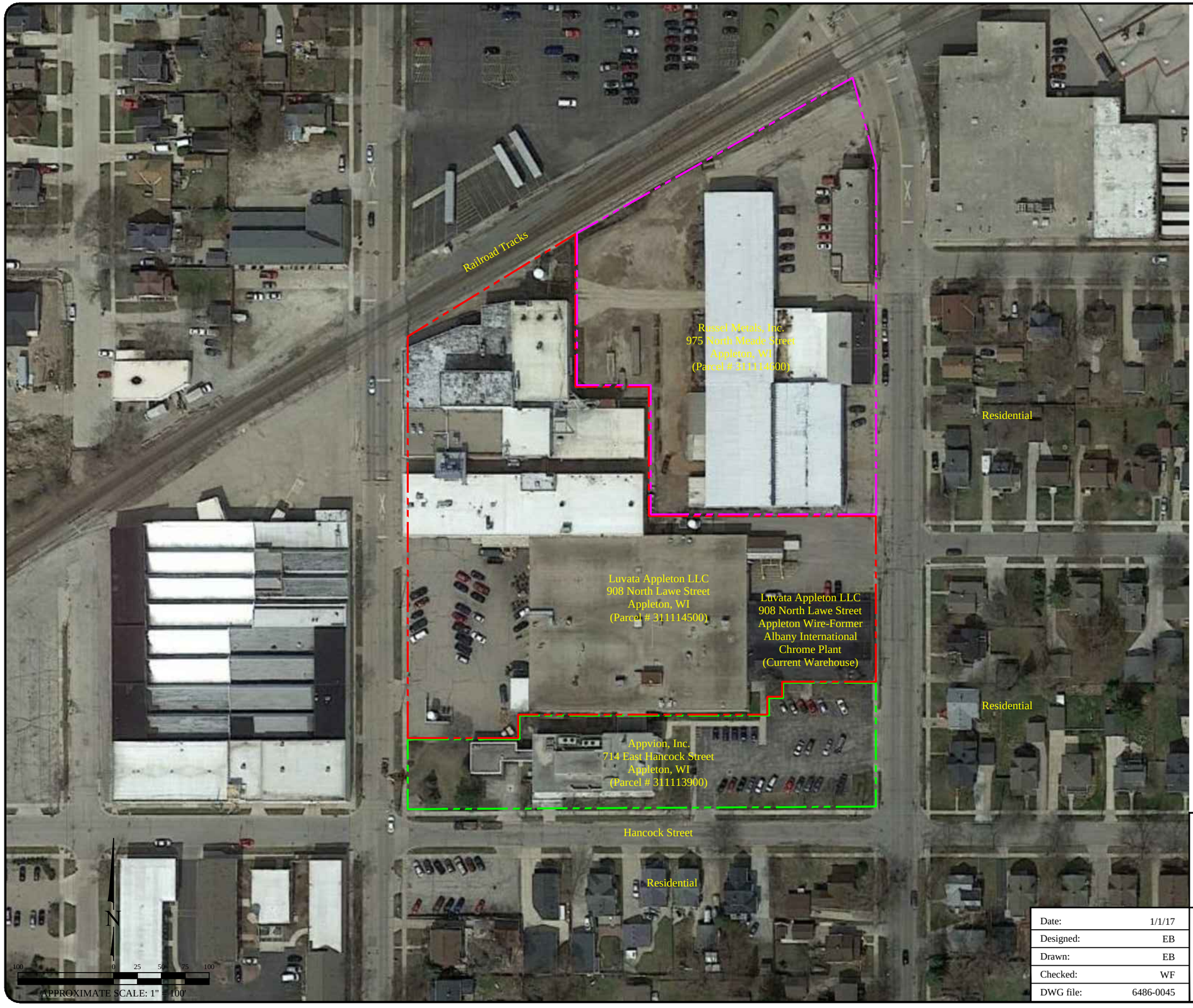
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Date:	1/11/17
Designed:	EB
Drawn:	EB
Checked:	WF
DWG file:	6486-0044

SITE TOPOGRAPHIC MAP
Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Figure
1
Project
6486



Legend

Property boundary

SITE AERIAL PHOTOGRAPH

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Date:	1/1/17
Designed:	EB
Drawn:	EB
Checked:	WF
DWG file:	6486-0045

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Figure 2

Project 6486


Legend
Property boundary
Underground gas utility line
Underground water utility line
Underground sanitary utility line
Fiber optics line
Underground storm utility line
Pipe chase
French drain and associated piping
Sump
Former Sump
Floor drain
Manhole
B-1 Soil boring (STS) (TW = Temp well)
GP-1 Soil boring (Badger)
GMW01 Abandoned Temp well (McMahon)
C-1 Soil samples collected through concrete floor (STS)
C-3 Soil samples collected through concrete wall (STS)
MW-1 Monitoring well (STS)
MW-18 Monitoring well (McMahon)
MW-19 Monitoring well (Badger)
MW-10 Monitoring well abandoned (MW-10 in 1998) and (MW-11 in 1991)
MW-4 Monitoring well (EnviroForensics)
GP-14 Soil boring (EnviroForensics)
WS-1 Soil samples collected through concrete wall (EnviroForensics)
Dairy tile floor
MW-19 Water table observation well (with 10 foot screen length)
MW-19A Piezometer (with 5 foot screen length set within the 30-40' depth interval)
MW-1B Piezometer (with 5 foot screen length set within the 40-50' depth interval)
MW-19C Piezometer (with 5 foot screen length set within the 50-60' depth interval)
Russel Metals, Inc.
975 North Meade Street
Luvata Appleton LLC
908 North Lawe Street
Luvata Appleton LLC
908 North Lawe Street
Appleton Wire-Former Albany International Chrome Plant
(Current Warehouse)
Appvion, Inc.
714 East Hancock Street
820 Residence
814 Residence
806 Residence
802 Residence
Residential
North Meade Street
Hancock Street
Sidewalk
Asphalt
Gravel
Grass
Concrete
Concrete (Former Transformer)
Concrete (Former Air Scrubber)
Concrete Basement
Former Air Scrubber
Former No. 2 Wire Plating Machine
Former No. 1 Wire Plating Machine
N
APPROXIMATE SCALE: 1" = 20'

SITE PLAN SHOWING ALL DATA COLLECTION POINTS

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Figure	3
Project	6486
Date:	6/29/17
Designed:	EB
Drawn:	EB
Checked:	WF
DWG file: 6486-0314	

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No.	Date	Revision	Approved

SOIL ANALYTICAL RESULTS MAP WITH SELECT ISO-CONCENTRATION LINES SHOWING LATERAL DISTRIBUTION OF CHROMIUM IMPACTS

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Figure 4B
Project 6486

Date: 6/29/17
Designed: EB
Drawn: EB
Checked: WF
DWG file: 6486-0740

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EnviroForensics.com

No.	Date	Revision	Approved

Legend

- Property boundary
- GAS — Underground gas utility line
- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- UGT — Fiber optics line
- STM — Underground storm utility line
- Pipe chase
- French drain and associated piping
- Sump
- Floor drain
- B-3 — Soil boring (STS)
- GP-1 — Soil boring (Badger)
- C-1 — Soil samples collected through concrete floor (STS)
- C-3 — Soil samples collected through concrete wall (STS)
- MW-1 — Monitoring well (STS)
- MW-18 — Monitoring well (McMahon)
- MW-19 — Monitoring well (Badger)
- MW-10 — Monitoring well abandoned (MW-10 in 1998) and (MW-11 in 1991)
- MW-4 — Monitoring well (EnviroForensics)
- GP-14 — Soil boring (EnviroForensics)
- WS-1 — Soil samples collected through concrete wall (EnviroForensics)
- Dairy tile floor

Analyte	Soil to Groundwater Residual Contaminant Level	Non-Industrial Residual Contaminant Level	Industrial Residual Contaminant Level
Total Cr	NE	NE	NE
Cr (VI)	3.84*	0.301	6.36
PCE	4.5	33,000	145,000

Note:
1. Bold shaded blue values exceed WDNR Soil to Groundwater Residual Contaminant Level
2. Bold shaded green values exceed WDNR Non-Industrial Residual Contaminant Level
3. Bold shaded orange values exceed WDNR Industrial Residual Contaminant Level
4. Bold values exceed laboratory detection levels
5. Cr and Cr (VI) standards and analytical results are reported in milligram per kilogram (mg/kg)
6. PCE standards and analytical results are reported in micrograms per kilogram (µg/kg)
7. Cr (VI) = Hexavalent Chromium
8. Cr = Chromium
9. PCE = Tetrachloroethene
10. NA = Not analyzed
11. NS = Not sampled
12. Soil samples collected greater than 10 feet below ground surface are considered saturated soil samples
13. * = Calculated using EPA Risk-Based Screening Level Calculator
14. Sample locations without data boxes are not sampled at this time

- Total chromium concentrations 40 mg/kg (Background)
- Total chromium concentrations 100 mg/kg
- Total chromium concentrations 500 mg/kg
- MW-19 — Water table observation well (with 10 foot screen length)
- MW-19A — Piezometer (with 5 foot screen length set within the 30-40' depth interval)
- MW-1B — Piezometer (with 5 foot screen length set within the 40-50' depth interval)
- MW-19C — Piezometer (with 5 foot screen length set within the 50-60' depth interval)

Legend

- Property boundary
- Underground gas utility line
- Underground water utility line
- Underground sanitary utility line
- Fiber optics line
- Underground storm utility line
- Pipe chase
- French drain and associated piping
- Sump
- Former Sump
- Floor drain
- Manhole
- B-1: Soil boring (STS) (TW = Temp well)
- MW-1: Monitoring well (STS)
- MW-18: Monitoring well (McMahon)
- MW-19: Monitoring well (Badger)
- GMW01: Abandoned Temp well (McMahon)
- MW-4: Monitoring well (EnviroForensics)
- UB-1: Temp Well (EnviroForensics)
- Dairy tile floor

Analyte	Public Health Preventive Action Limit	Public Health Enforcement Standard
Dissolved Cr	10	100
Cr (VI)	NE	NE

Note:
1. Bolded and orange shaded values exceed the Public Health Enforcement Standard
2. Bolded and blue shaded values exceed the Public Health Preventive Action Limit
3. Bolded values are above detection limits
4. J = Analyte concentration less that laboratory detection limits
5. Samples analyzed using EPA SW-846 Method 8260
6. All results reported in units of micrograms per liter (µg/L)
7. Cr (VI) = Hexavalent Chromium
8. Cr = Chromium
9. ND = Not detected
10. NA = Not analyzed
11. NE = Not established

- Area exceeding ES for Total chromium >100 µg/L
- Area exceeding PAL for Total chromium >10 µg/L
- Total chromium concentrations >5,000 µg/L
- Total chromium concentrations >25,000 µg/L
- Dashed boundaries are inferred

- MW-19: Water table observation well (with 10 foot screen length)
- MW-19A: Piezometer (with 5 foot screen length set within the 30-40' depth interval)
- MW-1B: Piezometer (with 5 foot screen length set within the 40-50' depth interval)
- MW-19C: Piezometer (with 5 foot screen length set within the 50-60' depth interval)

Russel Metals, Inc.
975 North Meade Street

Luvata Appleton LLC
908 North Lawe Street

Appvion, Inc.
714 East Hancock Street

Luvata Appleton LLC
908 North Lawe Street
Appleton Wire-Former Albany International Chrome Plant
(Current Warehouse)

Former No. 2 Wire Plating Machine

Former No. 1 Wire Plating Machine

Former Air Scrubber

Concrete

Concrete Basement

Concrete (Former Transformer)

Concrete (Former Air Scrubber)

Asphalt

Gravel

Grass

Sidewalk

Residential

North Meade Street

Hancock Street

820 Residence

814 Residence

802 Residence

MW-22	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-22A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-17A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

GMW11	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**1.9**	**3.6**	**5.6**	**4.1**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

GMW10	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**0.6**	**11.0**	**0.5**	**2.6**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

GMW09	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**1.5**	**2.8**	**9.3**	**4.2**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

GMW08	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**1.4**	**489.0**	**8.6**	**101.0**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

MW-17	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

B-3(TW)	6/5/05	1/24/86
Dissolved Cr	**27,000**	**15,400**
Cr (VI)	**23,000**	**14,000**

MW-26A	6/28/17	8/31/17
Dissolved Cr	**7.9 J**	<2.5
Cr (VI)	<3.9	NA

MW-26	6/28/17	8/31/17
Dissolved Cr	**72,900**	**84,500**
Cr (VI)	**82,500**	NA

MW-25A	6/28/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	<3.9	NA

MW-25	6/28/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	<3.9	NA

MW-19A	6/29/17	8/31/17
Dissolved Cr	**8.1 J**	**3.7 J**
Cr (VI)	<3.9	NA

MW-19	6/29/17	8/31/17
Dissolved Cr	**23,600**	**13,600**
Cr (VI)	**25,000**	NA

MW-19C	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	<3.9	NA

MW-21	6/28/17	8/31/17
Dissolved Cr	**16.1**	<2.5
Cr (VI)	<3.9	NA

MW-21A	6/28/17	8/31/17
Dissolved Cr	**6.1 J**	<2.5
Cr (VI)	<3.9	NA

MW-29	6/29/17	8/31/17
Dissolved Cr	**951**	**228**
Cr (VI)	**1,000**	NA

MW-29A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	<3.9	NA

MW-28	6/28/17	8/31/17
Dissolved Cr	**3,890**	**390**
Cr (VI)	**3,200**	NA

MW-28A	6/28/17	8/31/17
Dissolved Cr	**8.4 J**	<2.5
Cr (VI)	**4.6 J**	NA

B-2(TW)	6/5/05
Dissolved Cr	**8,400**
Cr (VI)	**8,400**

MW-2	6/29/17	8/31/17
Dissolved Cr	**29.5**	<2.5
Cr (VI)	NA	NA

MW-2A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

GMW02	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**6,355**	**6,115**	**7,040**	**6,600**
Cr (VI)	**4,700**	NA	**6,115**	**6,800**	**4,900**

GMW03	6/30/04	8/1/07	10/4/07	1/16/08	4/23/08
Total Chromium	**5,300**	**4,790**	**3,545**	**4,550**	**3,320**
Cr (VI)	**4,700**	NA	**2,300**	**3,100**	**1,400**

GMW04	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**56**	**14**	**31**	**3.7**
Cr (VI)	**52**	NA	<2.0	<0.002	<2.0

MW-18	6/29/17	8/31/17
Dissolved Cr	**3.5 J**	<2.5
Cr (VI)	NA	NA

MW-18A	6/29/17	8/31/17
Dissolved Cr	ND	ND
Cr (VI)	NA	NA

MW-1	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-1B	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

UB-1	6/19/17
Dissolved Cr	**3.5 J**
Cr (VI)	NA

Manhole	6/15/17	8/9/17
Dissolved Cr	**3,300**	**3,200**
Cr (VI)	**3,640**	NA

MW-23A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-23	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-30A	6/28/17	8/31/17
Dissolved Cr	**2.7 J**	<2.5
Cr (VI)	<19	NA

MW-30	6/28/17	8/31/17
Dissolved Cr	**3,980**	**3,540**
Cr (VI)	**4,000**	NA

MW-20	6/28/17	8/31/17
Dissolved Cr	**263,000**	**131,000**
Cr (VI)	**273,000**	NA

MW-20C	6/28/17	8/31/17
Dissolved Cr	**10.0**	<2.5
Cr (VI)	<19	NA

MW-20A	6/28/17	8/31/17
Dissolved Cr	**6.5 J**	**4.3 J**
Cr (VI)	<3.9	NA

MW-27B	6/28/17	8/31/17
Dissolved Cr	**13.9**	<2.5
Cr (VI)	**7.4 J**	NA

Sump	6/15/17	8/9/17
Dissolved Cr	**23,000**	**39,000**
Cr (VI)	**24,500**	NA

MW-27	6/28/17	8/31/17
Dissolved Cr	**7,350**	**6,490**
Cr (VI)	**8,500**	NA

MW-10R	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-10B	6/29/17	8/31/17
Dissolved Cr	**2.8 J**	<2.5
Cr (VI)	NA	NA

GMW07	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**1.7**	**2.3**	**13.0**	**3.1**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

GMW06	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**4.2**	**3.5**	**3.3**	**5.2**
Cr (VI)	<2.0	NA	<2.0	<0.002	<2.0

GMW05	6/30/04	8/1/04	10/24/07	1/16/08	4/23/08
Total Chromium	**5,300**	**55**	**5.6**	**8.5**	**31.0**
Cr (VI)	**34**	NA	<2.0	<0.002	<2.0

B-1(TW)	6/5/85
Dissolved Cr	**190**
Cr (VI)	**190**

GMW01	6/30/04	8/1/07	10/4/07	1/16/08	4/23/08
Total Chromium	**5,300**	**8,490**	**3,085**	**3,620**	**2,001**
Cr (VI)	**5,100**	NA	**1,900**	**2,260**	**2,000**

MW-5	6/29/17	8/31/17
Dissolved Cr	**120**	**256**
Cr (VI)	NA	NA

MW-24A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-24	6/29/17	8/31/17
Dissolved Cr	<2.5	**2.6 J**
Cr (VI)	NA	NA

MW-5A	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

MW-5C	6/29/17	8/31/17
Dissolved Cr	<2.5	<2.5
Cr (VI)	NA	NA

UB-2	6/19/17
Dissolved Cr	<2.5
Cr (VI)	NA

APPROXIMATE SCALE: 1" = 20'

GROUNDWATER ANALYTICAL RESULTS MAP SHOWING CONCENTRATIONS EXCEEDING REGULATORY STANDARDS AND DISTRIBUTION OF IMPACTS

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Figure 5
Project 6486

Date: 9/21/17
Designed: EB
Drawn: EB
Checked: WF
DWG file: 6486-0461

No.	Revision	Date	Approved

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

N

40 0 10 20 30 40

APPROXIMATE SCALE: 1" = 40'

Legend

- Property boundary
- GAS — Underground gas utility line
- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- UGT — Fiber optics line
- STM — Underground storm utility line
- Pipe chase
- French drain and associated piping
- Sump
- Former Sump
- FD — Floor drain
- Manhole
- MW-1 — Monitoring well (STS)
- MW-18 — Monitoring well (McMahon)
- MW-19 — Monitoring well (Badger)
- MW-10 — Monitoring well abandoned (MW-10 in 1998) and (MW-11 in 1991)
- MW-4 — Monitoring well (EnviroForensics)
- Dairy tile floor
- 761 — Groundwater elevation contour
- 758.64 — Groundwater elevation (feet above mean sea level)

Gravel
Asphalt
Residential
Luvata Appleton LLC
908 North Lawe Street
Appleton Wire-Former Albany International Chrome Plant
(Current Warehouse)
Concrete
(Former Air Scrubber)
Concrete
(Former Transformer)
Grass
Gravel
Basement
820 Residence
814 Residence
806 Residence
802 Residence
Sidewalk
Appvion, Inc.
714 East Hancock Street
Hancock Street

MW-22 MW-22A
MW-17A MW-17 762.91
PZ-1/MW-11
MW-23A MW-23
MW-26 MW-26A
MW-30A MW-30
PZ-10/MW-10
MW-25A MW-25
MW-20 760.91 MW-20C MW-20A
MW-27B MW-27
761.47 MW-10R MW-10B
MW-21 763.64 MW-21A
MW-19 763.69 MW-19A MW-19C
MW-28 MW-28A
MW-29 MW-29A
MW-5 760.53 PZ-5/MW-5A MW-5C
MW-2A MW-2 762.21
MW-24A MW-24
MW-13 759
MW-1 758.64
MW-18 761.49 MW-18A

WATER TABLE CONTOUR MAP
JANUARY 10, 2017

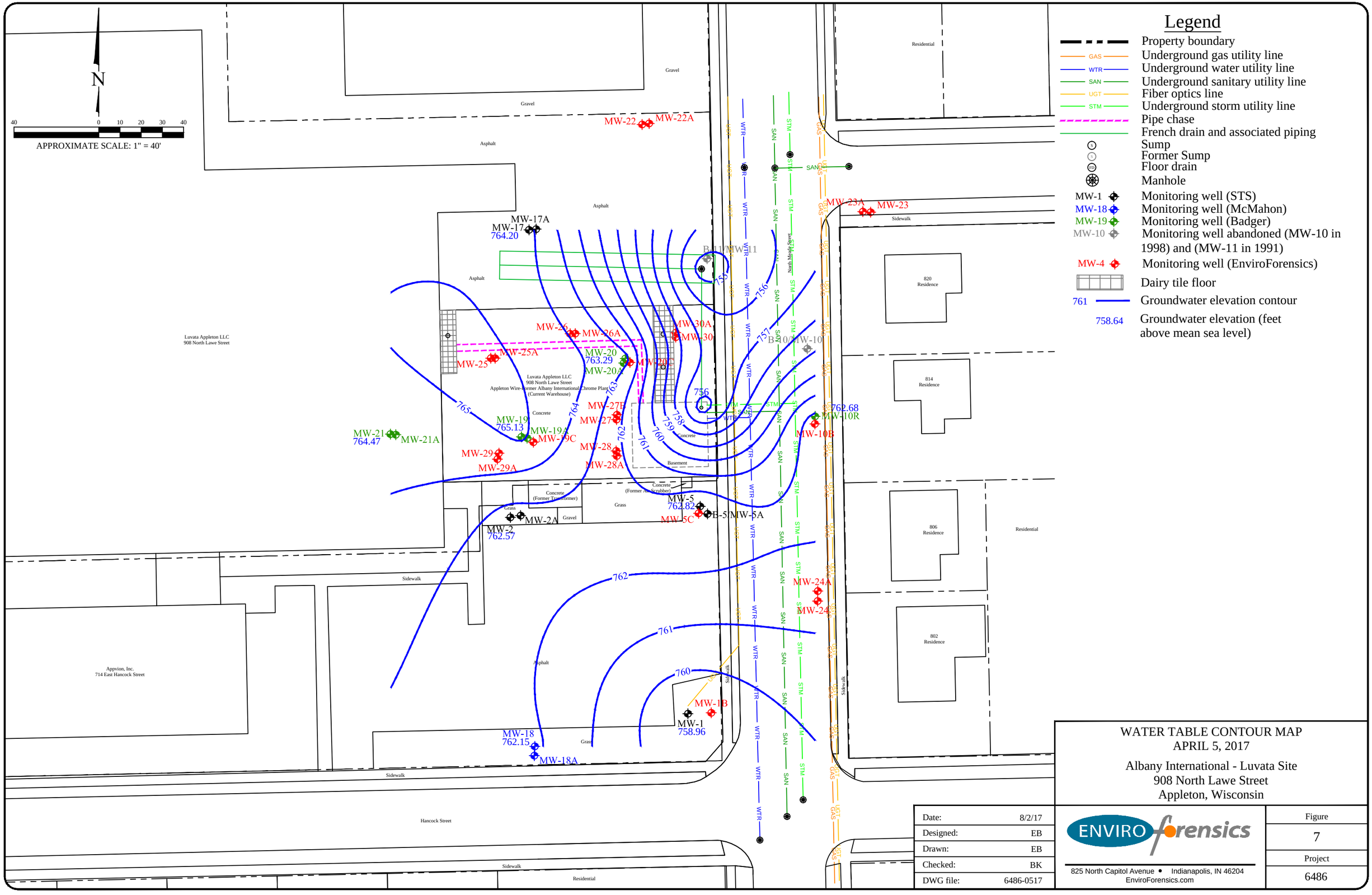
Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Date:	8/2/17
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6486-0516

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure 6

Project 6486



WATER TABLE CONTOUR MAP
APRIL 5, 2017

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Date:	8/2/17
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6486-0517

ENVIRO forensics
825 North Capitol Avenue • Indianapolis, IN 46204
EnviroForensics.com

Figure
7

Project
6486

N

40 0 10 20 30 40

APPROXIMATE SCALE: 1" = 40'

Legend

- Property boundary
- GAS — Underground gas utility line
- WTR — Underground water utility line
- SAN — Underground sanitary utility line
- UGT — Fiber optics line
- STM — Underground storm utility line
- Pipe chase
- French drain and associated piping
- Sump
- Former Sump
- Floor drain
- Manhole
- MW-1 — Monitoring well (STS)
- MW-18 — Monitoring well (McMahon)
- MW-19 — Monitoring well (Badger)
- MW-10 — Monitoring well abandoned (MW-10 in 1998) and (MW-11 in 1991)
- MW-4 — Monitoring well (EnviroForensics)
- Dairy tile floor
- 761 — Groundwater elevation contour
- 758.35 — Groundwater elevation (feet above mean sea level)

Gravel
Asphalt
Residential
Luvata Appleton LLC
908 North Lawe Street
Appleton West-Former Albany International Chrome Plant
(Current Warehouse)
Concrete
Basement
Concrete (Former Air Scrubber)
Concrete (Former Transformer)
Grass
Gravel
Sidewalk
Appvion, Inc.
714 East Hancock Street
Hancock Street
820 Residence
814 Residence
806 Residence
802 Residence
North Mezz Sump

MW-22 765.74
MW-22A
MW-17A
MW-17 762.89
MW-11/MW-11
754.50
755
MW-16 762.83
MW-26A
MW-30A
MW-30 760.58
B-10/MW-10
MW-25A
MW-25 764.95
MW-20 761.73
MW-20B
MW-20A
MW-27B
MW-27 760.59
MW-19 763.33
MW-19A
MW-19C
MW-21 763.53
MW-21A
MW-29 763.60
MW-29A
MW-28 761.20
MW-28A
MW-23A
MW-23 761.54
761.84
MW-10R
MW-10B
MW-3 763.79
B-5/MW-5A
MW-5C
MW-2A
MW-2 762.13
MW-24A
MW-24 761.28
MW-18B
MW-1 758.35
MW-18 761.53
MW-18A

WATER TABLE CONTOUR MAP
JULY 26, 2017

Albany International - Luvata Site
908 North Lawe Street
Appleton, Wisconsin

Date:	8/15/17
Designed:	EB
Drawn:	EB
Checked:	BK
DWG file:	6486-0666

ENVIRO forensics

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Figure 8

Project 6486