



Memorandum

July 27, 2016

To: Grant Trigger, RACER

Ref. No.: 17358

BT

From: Beth Landale/bw/166

Tel: 734-357-5528

Subject: RCRA Corrective Action Status Update
Willow Run Powertrain
Ypsilanti, Michigan

This memorandum has been prepared to provide an overall status update for the Resource Conservation and Recovery Act (RCRA) Corrective Action process at the Former Willow Run Powertrain Plant in Ypsilanti, Michigan (Site) managed by the Revitalizing Automotive Communities Environmental Response Trust (RACER). The memorandum is a collection and organization of the essential information RACER and MDEQ relied on to make appropriate risk management decisions and remedy recommendations. This update covers:

- Redevelopment
- Clean Up Objectives
- Reports
- RCRA Milestones
- Agency Reviews
- Interim Measures
- Data Gaps and Additional Work
- Cost Estimate
- References

For the purposes of this status update, data that has already been included in major submittals to the MDEQ has been referenced but not attached.

1. Site Boundary and Redevelopment

Since April 2011 when RACER began the Resource Conservation and Recovery Act (RCRA) Corrective Action process at the Site, the property boundary for the portion of the Site owned by RACER has changed. At the time of the bankruptcy in 2009, the Site boundary was described as shown in figures in the Current Conditions Report (CCR). The Site boundary for RCRA purposes is shown on Figure 1. The boundary of the property currently owned by RACER is shown on Figure 2.



In late 2013 the decommissioning and demolition of the main plant building was initiated. The demolition of the main plant building was completed in 2014 and the demolition of the WWTP and completion of some backfilling of former basements was completed in 2015.

In 2013, a 21-acre portion of the former Willow Run Powertrain Site was transferred to the Wayne County Airport Authority (WCAA). A Determination of Corrective Action with Controls in Place was issued to RACER by Michigan Department of Environmental Quality for the property that was transferred to WCAA. In the property transfer RACER acquired from Wayne County a 27.3-acre parcel south of the former plant where the former waste water treatment plant (WWTP) was located. The former WWTP was identified as AOI 45 in the CCR. The land the former WWTP was located on was never owned by General Motors (GM), was not included in the Part A Permit, and therefore, not subject to RCRA Corrective Action and the Area of Interest (AOI) designation was removed. The area was investigated and included in the RCRA Facility Investigation (RFI) work plans and reports for ease of implementation and data tracking.

In 2014, Michigan Aerospace Foundation (MAF) purchased an approximately 17-acre portion of the former Willow Run Powertrain Site, which includes a 144,000 square foot remaining section of the old bomber plant to renovate for the purpose of relocating the Yankee Air Museum (YAM) into the space. A Prospective Purchaser Agreement (PPA) was issued in 2014 to MAF by the Environmental Protection Agency (EPA) for the property.

A purchase and sale agreement has been signed as of July 5, 2016 for the remainder of the property with Willow Run Arsenal of Democracy Land Holdings. It is proposed that the Site will be developed and operated by the American Center for Mobility (ACM) based in Ann Arbor, Michigan as a research and test facility for autonomous and self-driving vehicles.

2. Clean up Objectives

When practicable and reasonably attainable the MDEQ and EPA seek to restore currently used or reasonably expected potential sources of drinking water. The groundwater and soil at the Site have been affected by legacy manufacturing. The MDEQ and EPA in 2009, during the bankruptcy settlement agreement process, determined that restoration of groundwater on this Site is neither practical nor necessary given the existing high quality local public water supply provided by the Ypsilanti Community Utility Authority (YCUA). Remedial alternatives identified for this Site will provide containment of groundwater contamination combined with restrictive covenants designed to address exposure to all pathways.

3. Reports

In 2011 RACER began an overall review of Site conditions and initiated the RCRA Corrective Action process proceeding with decisions based on risk management. The following section reviews the documents prepared after 2011 which summarize the characterization, interim actions and efforts to reduce, stabilize or contain LNAPL and impacted groundwater at the Site.



3.1 Current Conditions Report (CCR)

A RCRA Current Conditions Report (CCR) was prepared in 2011. The CCR summarized historical operations and previous investigations, identified AOIs, and compared data collected through September 2010 to the MDEQ Part 201 clean up criteria (updated March 25, 2011). The CCR concluded that the exceedances of soil criteria were limited to drinking water (DW), groundwater surface water interface (GSI) and direct contact (DC) pathways. Generally, exceedances of groundwater criteria were limited to drinking water and GSI pathways. However, groundwater results at a handful of locations indicated exceedances of groundwater criteria for pathways other than drinking water and GSI. The majority of these exceedances were in areas where Light non-Aqueous Phase Liquid (LNAPL) has been identified. LNAPL at the Site had been investigated over several years. Two main LNAPL areas were identified beneath the east and central portions of the plant. Smaller areas were present beneath the western portion. The central LNAPL area contained significant poly-chlorinated biphenyl (PCB) concentrations and the eastern LNAPL area was suspected of having migrated across the eastern property boundary onto the neighboring airport. The CCR formed the basis for the RCRA Facility Investigation Work Plan in 2012 (CRA, 2012).

3.2 RFI Work Plan and Addenda

The work plan was prepared to evaluate the Site overall (including all the AOCs) rather than conducting an AOI by AOI investigation due to the overlapping nature of the AOIs and the widespread commingled LNAPL areas. The MDEQ and RACER agreed that finding, stabilizing, and controlling existing sources was the appropriate early focus of the Site investigation.

The RFI Work Plan focus was on how to get meaningful results rather than fulfill standardized process steps. The RFI Work Plan was prepared to investigate soil impacts throughout the Site, shallow and intermediate zone groundwater quality outside the LNAPL areas, fill data gaps in the subsurface geology and hydrogeology. Specifically, to characterize the intermediate sand layer and deep sand layers, to investigate the deep water bearing zone, to determine Site specific background metals concentrations in soil and groundwater and to investigate data gaps at several AOIs that had not historically been investigated. Additional RFI Work Plan Addenda were prepared and the investigations completed over the next several years.

3.3 RCRA Facility Investigation (RFI) Report

A RCRA Facility Investigation (RFI) Report was prepared in September 2013 (CRA, 2013b). The RFI Report presented the results of the historical and additional field work completed between October 2010 and June 2013 to further investigate data gaps. The RFI Report primarily used tables and figures to provide investigation results. All the investigation data was screened against the MDEQ Part 201 clean up criteria (updated on September 28, 2012).

Due to the size of the Site and the number of sampling locations, the data box figures were separated into nine Site areas (West 1 – 4, Central 1-3, East 1-2, north perimeter), and the constituents were grouped as organics (VOCs and SVOCs) and inorganics (metals and PCBs). This generated 38 databox figures showing portions of the Site. To summarize the Site conditions on one figure, summary data box figures (soil and groundwater) were prepared to present only constituents with criteria exceedances other than drinking water



or GSI protection pathways. These databoxes show nine soil locations and ten groundwater sampling locations with exceedances of criteria other than drinking water and GSI. These pathways at the time were considered incomplete due to the inward groundwater gradient, the absence of drinking water and or surface water receptors on the Site and distance to offsite receptors. In addition, a perimeter soil and groundwater data box figure were each prepared showing concentrations at the property boundary that may present a concern for offsite migration (drinking water and or GSI criteria) if groundwater flow direction were to change. Soil gas sampling did not show any exceedances of non-residential criteria and groundwater quality showed little to no variation from within the LNAPL boundary to outside it.

The results of the LNAPL mobility evaluation indicated that the LNAPL at the Site was already stable and the vast majority would remain in the subsurface as unrecoverable residual following any recovery efforts implemented. The overall conclusion of the report was that due to the presence of soil and groundwater impacts and stabilized LNAPL, additional investigations, institutional controls and/or interim/remedial measures to address risks to human health and the environment may be warranted.

3.4 Draft Hydraulic Control Interim Measures Work Plan (IMWP)

In February 2015 RACER submitted a Draft Hydraulic Control Interim Measures Work Plan (IMWP) (CRA, 2015) to the MDEQ. The IMWP summarized what was understood at that time about the conditions that formed the basis of design for the hydraulic control Interim Measure (IM) for the Site. Based on an evaluation of the sewers, the estimated volume of infiltrating groundwater, the infiltrating groundwater quality, long term sustainability comparisons and the pilot testing results, the selected long term hydraulic control approach for the Site included using the existing Site storm sewer network to capture and convey groundwater to a horizontal subsurface flow treatment wetland which would directly discharge to an infiltration gallery or directly to the adjacent surface water body via the existing storm sewer network and outfall. RACER presented the Draft Interim Measures Work Plan (IMWP) to the Remediation Advisory Team (RAT) on March 25, 2015. The RAT commented that the IMWP should clearly indicate that active remediation is occurring as the collection and treatment of the groundwater using the former storm sewers network is an active groundwater capture and treatment system.

3.5 Supplemental RFI Report No. 1

A Supplemental RFI Report No. 1 letter report (GHD, 2016) was prepared in March 2016 to summarize the additional field work completed after June 2013 as described below. Post demolition, groundwater elevations increased and groundwater flow direction changed such that the inward gradient previously present is no longer observed along the eastern property boundary.

In response to the changes in groundwater flow, RACER further evaluated the downgradient property boundary groundwater by installing and sampling downgradient wells on the neighboring airport property, and investigating the hydrogeology between the Site and Tyler Pond. Additional soil and groundwater investigations further defined soil impacts associated with arsenic and manganese exceedances outside the slab footprint as well as soil and groundwater impacts associated with CVOCs in the southeast. Laser Induced Fluorescence (LIF) investigations better defined the LNAPL areas on Site and confirmed the impacts had not migrated onto the neighboring airport property to the east. Soil, groundwater, LNAPL and soil gas were sampled beneath the YAM building to evaluate if vapor intrusion posed an unacceptable risk. A



soil gas evaluation to identify potential constituents of concern in soil gas was conducted and then samples were collected and analyzed for VOCs and SVOCs. The sub slab soil gas concentrations present under YAM do not pose an unacceptable risk to non-residential use of this portion of the Site. A Site wide summary of PCB investigations in soil, water and LNAPL was prepared showing PCBs are present at limited locations on the Site but are not a significant overall issue.

The letter report also included a summary of the Corrective Action Complete with Controls obtained for a portion of the property that was transferred to the Wayne County Airport Authority (WCAA). Data boxes were updated where applicable and the Site wide summary figures discussed above in the RFI Report were updated and included in this Supplemental RFI Report No. 1 to provide an updated snap shot of the Site.

4. RCRA Milestones

This Site has been designated to meet Corrective Action objectives under the Government Performance and Results Act (GPRA) of 1993 to meet Corrective Action by December 2020. Therefore, the goal is to have all interim measures implemented, optimized and a Corrective Action Complete with Controls obtained for the entire Site by December 2020. In addition to the RCRA Reports submitted as described in Section 3, additional RCRA milestones have been addressed as described below.

A Corrective Measures Implementation Plan (CMIP) for the northeast area of the Site was prepared in 2013 (CRA, 2013a) to summarize the investigation results and proposed final corrective measure for a portion of the property that was to be transferred to the WCAA. The CMIP was approved by the MDEQ and a Determination of Corrective Action with Controls in Place was issued for the property WCAA obtained in the land swap. These documents are included as an Appendix to the Supplemental RFI Report No. 1 letter report (GHD, 2016).

In March 2015, a CA725 Current Human Exposures Under Control Environmental Indicator was verified. This verifies there are no unacceptable human exposures to contamination in concentrations in excess of appropriate risk based levels.

In July 2015, a CA750 Migration of Contaminated Groundwater Under Control Environmental Indicator was verified. This verifies that the migration of contaminated groundwater has stabilized and monitoring has confirmed that contaminated groundwater remains within the original area of contaminated groundwater. This will need to be reviewed in light of the changing groundwater flow conditions, but water quality at down gradient locations do not show migration of contaminated groundwater.

These Environmental Indicators were completed to meet the Region 5 RCRA program commitments under the GPRA.

5. Agency Reviews

RACER Trust is obligated annually to propose work, budget and schedule to the MDEQ. Since 2011, the scope of work and budget has been approved by the MDEQ on an annual basis and periodically throughout the year if additional budget or scope is warranted. In addition to this annual planning and review, RACER



has reviewed project status various times with the MDEQ. The following provides a summary of the key milestone reviews.

- October 2011 – Review of Current Conditions Report and proposed RFI Work Plan approach with Jackson District MDEQ Staff.
- September 2013 – Review of Northeast Area CMIP and Land Swap with RAT.
- May 2014 – Review of LNAPL Delineation, Mobility and Recoverability Study Report with MDEQ Technical and Program Support (TAPS) LNAPL team.
- June 2014 – Review of soil gas sampling to date with MDEQ TAPS Vapor Intrusion team.
- July 2014 – Presentation to RAT and MDEQ Jackson District Staff - Review of soil, groundwater, sub slab vapor investigations.
- March 2015 – Presentation to RAT and MDEQ Jackson District Staff the draft IMWP.

6. Interim Measures

The work completed to date reflects decisions to perform several interim measures (IM) which are anticipated to address current conditions and also address reasonably foreseeable future conditions, such as hydraulic control of groundwater, chlorinated volatile organic compounds (CVOCs) in soil and groundwater, management of LNAPL impacted soils, PCBs in LNAPL and direct contact with soils. The following describes what is known to date and assumptions on how these may be addressed.

It should be noted that the planning and evaluation of the hydraulic control IM was initiated in 2014 and has undergone extensive study and design. Additional IMs are being contemplated but have not undergone the detailed evaluation and design that the hydraulic control IM has. The initiation of the hydraulic control IM was driven by the need to separate the commingled storm and infiltrating groundwater in the storm sewers to sustainably control both storm water and groundwater. The current storm water system collects all water in the storm sewers (storm and infiltrating groundwater) and pumps it through an oil/water separation system prior to discharge to the local utility authority. The cost of this system is not sustainable. Therefore, storm water and groundwater need to be separated and handled through systems more suitable to their individual characteristics. To achieve the GPRA 2020 goal, it is necessary to implement the hydraulic control as an interim measure. This approach also allows time for the system to be operated, evaluated and optimized to meet these goals.

6.1 Hydraulic Control

As discussed above a Draft Hydraulic Control IMWP (CRA, 2015) was submitted and reviewed with the MDEQ in early 2015. Following submittal of the IMWP, changes in groundwater elevations were observed due to the changes associated with the demolition of the Site. Work associated with the demolition included the discontinuation of any pumping of the former sumps, pits, basements and the steam tunnels.

In most demolitions of significant structures it is expected that groundwater levels will rise post demolition. The changes in groundwater levels have resulted in a change in groundwater flow direction along the



eastern portion of the Site. These changes indicate that the inward gradient previously present no longer characterizes Site groundwater flow (GHD, 2016). Attachment A provides the January and April 2016 groundwater contour maps. These were prepared after the Supplemental RFI Report No. 1 was issued. Site groundwater levels are measured quarterly to evaluate when the Site reaches a new equilibrium. Two consecutive quarterly events with stable groundwater levels will indicate equilibrium has been reached. The next groundwater level measuring event was conducted the week of July 18, 2016.

Investigations were completed to measure flow in the main trunk lines of the storm sewers at the Site. Due to the large diameter of the sewers, the low velocity and shallow depth for dry weather flow, precise measurement was difficult. During these investigations it became apparent that a significant amount of dry weather flow entered the Site from the neighboring airport through a connection dating back to when the two facilities were built as one in the 1940's. It was discovered that approximately 50 acres of adjacent airport drained into the RACER system. The significance of the dry weather flow contribution of this connection was not previously realized. This prompted a re-evaluation of the use of the storm sewers to provide hydraulic control and for collection/ capture of groundwater for treatment as previously planned.

One of the contingencies discussed in the IMWP was the use of a French drain system to supplement capture in areas where the inward gradient was absent. RACER is now evaluating the feasibility of a French drain along the eastern and southeastern portion of the Site as the primary groundwater collection/ capture system in lieu of using the historic storm sewers for hydraulic control.

Although the collection of the groundwater to provide hydraulic control is being reevaluated, the proposed treatment of the collected groundwater remains the same. The location, however, is no longer tied to the historic storm sewer network and has therefore been revised to better accommodate Site development plans. Figure 3 shows the revised conceptual layout. The proposed treatment involves the construction of an engineered horizontal subsurface wetland with discharge either directly to Tyler Pond under a NPDES permit or infiltration into Site soils under a Part 22 permit. The discharge location is influenced by the phosphorus concentrations. Appendix G of the IMWP (CRA, 2015) provides additional information on the proposed engineered wetland and infiltration concepts. Direct discharge or infiltration to Site soils have been discussed with the MDEQ NPDES permit engineers as an alternative modification to the existing NPDES permit.

The engineered wetland and infiltration area were designed based on influent criteria collected from the Site storm sewers during dry weather conditions. This dry weather flow was assumed to contain primarily infiltrating groundwater. An evaluation is currently underway to determine what changes in influent concentrations could be expected using the French drain to collect groundwater rather than the sewers. Groundwater samples were collected in 2015 and 2016 to evaluate groundwater concentrations along a potential layout of the French Drain (Appendix G, GHD, 2016). Following initial review of groundwater results in the area of the French drain, the influent of the proposed French drain is not expected to be significantly different; therefore, the proposed treatment train remains applicable. It is expected that oil and grease and PCBs will be lower in concentration and some chlorinated VOCs may be higher in concentration in comparison to the groundwater utilized for the pilot test. Additional sampling and analysis of groundwater in the alignment of the French drain is being completed as the French drain concept is further developed.



The initial estimated costs for the previous design are consistent with the treatment needed for the proposed effluent of the French drain. Additional groundwater sampling is being conducted the week of July 18th to continue to evaluate appropriateness of the currently proposed treatment system for the effluent expected from the French drain.

6.2 Chlorinated Volatile Organic Compound (CVOC) Impacted Soils and Groundwater

Soils in the area of former Building 19, located in the southeast area of the Site are impacted with tetrachloroethene and daughter chlorinated volatile organic compounds (CVOCs). Groundwater investigations show that soils have impacted groundwater, but that current groundwater monitoring indicates that the impacts have not migrated very far. Historical air permits for the Site identify a former glove washer within Building 19 which is thought to be the potential CVOC source. Additional characterization work is planned in August 2016 to evaluate soil excavation and disposal options including the potential to submit a one-time delisting petition for disposal of non-characteristically hazardous soil as non-hazardous.

6.3 PCBs in Oil

There are two locations onsite where PCBs have been detected above 50 ppm. One location is a monitoring well pair where LNAPL has been detected in the central portion LNAPL area. The second is in a former electrical cable pull vault in the north central portion of the former plant where oils have been detected with PCB concentrations above 50 ppm. Both areas require additional investigation to delineate the impacts. As observed in other areas of the Site, elevated PCBs in oil do not necessarily indicate elevated levels in soils. An evaluation of these areas in August 2016 will be completed to identify if excavation is an appropriate remedy for these elevated levels.

6.4 Deed Restrictions

Deed restrictions will be used to address impacts and manage future risk to human health and the environment. These include:

Restrictions in Recorded Declaration of Restrictive Covenants

- No Residential uses allowed - Non Residential Land Use only
- The building slab must remain in place and be maintained as a long term engineered cap for LNAPL impacted soils (and groundwater) beneath. This is a basic assumption included in the RCES for the Site.
- All construction activities require proper management of soil and groundwater (if encountered).

Additional Restrictions Required

- Cover will be maintained for an area south of the former plant footprint where arsenic concentrations in soil exceed the non-residential direct contact clean up criteria.
- Previous evaluations indicated that an area just southwest of the former foot print would require cover to mitigate exposure to soil particulate inhalation for manganese. Due to the proposed changes in the MDEQ Part 201 clean-up criteria, reconsideration of the need for this deed restriction is necessary.



- If buildings are constructed on Site, an evaluation of vapor intrusion is required or presumptive mitigation methods should be employed.
- Certain structures must remain intact such as the electrical duct network and former powerhouse basement.

7. Data Gaps and Additional Work

Current and ongoing work tasks include investigations intended to fill data gaps and monitoring of changing conditions.

In 2016, a focused RCRA facility investigation was completed on four undeveloped out-parcels at the property, along the western and northern property boundaries. Due to a lack of historic manufacturing operations little investigation had been completed in these areas to date. A review of historical aerials, files at the Benson Ford Research Center in Dearborn, Michigan, a figure from the 1980 hazardous waste part A treatment, storage and disposal facility permit for the Site, and analytical from historical investigations where available and/or the March 2016 supplemental field work completed were used to evaluate these out-parcels. The summary memorandums for each of these parcels should be finalized in the near future.

Based on the Interim Measures discussed above, there is additional work that is in progress or is planned in the coming months. This work includes:

- Continued work with the three dimensional hydraulic model to confirm that the French drain can establish hydraulic containment and develop final design parameters for hydraulic control. This includes the installation of additional intermediate borings and wells used to better define the intermediate zone for model construction. (field work completed early July 2016)
- Installation of additional deep borings to approximately 90 feet to confirm the thickness and continuity of the confining clay unit beneath the intermediate zone (field work completed early July 2016)
- Additional definition of CVOC soil impacts to guide decision making for feasibility alternative evaluation and remedy selection. (work scheduled for August 2016)
- Groundwater sampling to predict effluent concentrations from French drain and inform treatment train design revision if necessary. (field work began the week of July 18, 2016)
- Continued quarterly groundwater level measurements (next event completed the week of July 18, 2016)
- Evaluation of wells that can be abandoned to aid in Site redevelopment. (work scheduled to begin following the July 2016 groundwater level monitoring event.)
- LNAPL transmissivity testing and/or evaluation once groundwater levels have stabilized (2 consecutive quarters without significant rise).
- Soil sampling to evaluate PCBs surrounding one well and one former electrical vault containing oils with PCB concentrations greater than 50 ppm. (work scheduled for August 2016)
- Inspection and sampling of electrical cables to define closure strategy and limits of applicable deed restrictions for RCRA and TSCA purposes.



All of the above investigations, IMs and design for long term remedies are under continued coordination with Site development teams and design plans. The ACM site layout is still under development.

8. Budget Analysis

This section serves to provide a summary of the total budget allocated to the Site in the bankruptcy Settlement Agreement and the remaining budget as of May 31, 2016. Attachment A of the Settlement Agreement funded the Site with three budgets specific to the Site.

- The Minimum Estimated Property Funding budget is the capital budget for work completed from 2011 through 2019.
- The Reserve Property Funding budget is available after the Minimum Estimated budget is expended.
- The Long Term OMM Property Funding provides for budget from 2019 through to 2109 for this project.

The following table provides a summary of the budgets. It should be noted that these funding accounts are in interest bearing accounts, therefore some funds (i.e. Reserve Property Funding) has increased over time.

Funding Budget	Budget Per Settlement Agreement (2011)	Budget Remaining (5/31/2016)
Minimum Estimated Property Funding	\$22,761,031	\$18,767,179
Reserve Property Funding	\$4,016,652	\$4,273,953
Long Term OMM Property Funding	\$9,001,771	\$9,578,412
Total Property Funding	\$35,779,454	\$32,619,544

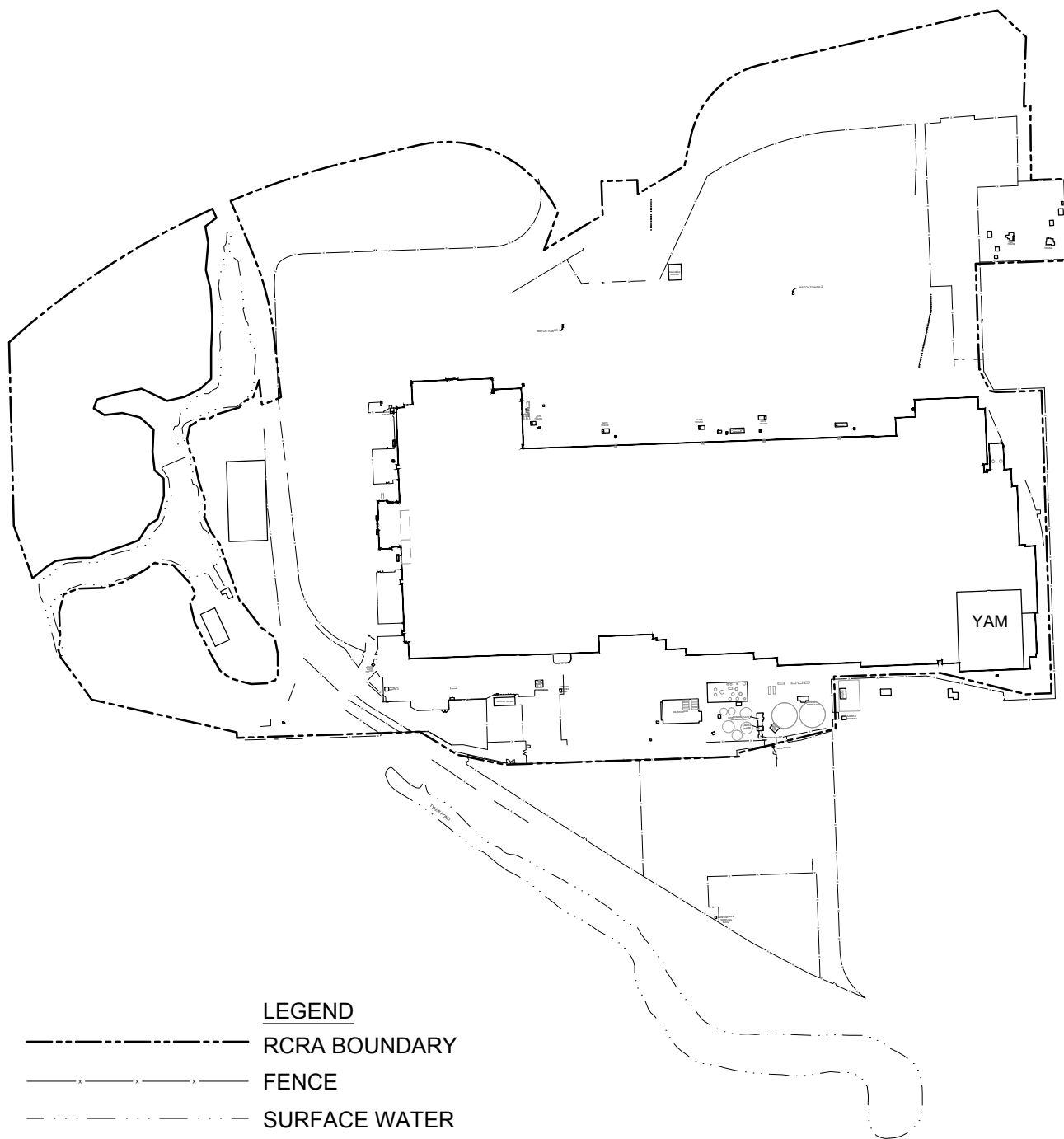
A cost estimate of the projected costs through to the end of the project will be completed under separate cover so that a comparison against the Total Property funding remaining can be completed. It will include cost estimates for the expected additional work, data gap analysis, design, and IM's. This will be provided in a future memorandum, expected in August 2016.

9. References

- CRA, 2011 Current Conditions Report, Former General Motors Powertrain Willow Run
- CRA, 2012 Resource Conservation and Recovery Act Facility Investigation Work Plan, Former Willow Run Powertrain Plant
- CRA, 2013a Corrective Measures Implementation Plan, Northeast Area, Former Willow Run Plant



- CRA, 2013b Resource Conservation and Recovery Act Facility Investigation (RFI) Report, Former General Motors Powertrain Willow Run
- CRA, 2015 Draft Hydraulic Control Interim Measures Work Plan, Powertrain Plant
- GHD, March 21, 2016 Supplemental RFI Report No. 1 Letter Report, Former Willow Run Powertrain Facility



- LEGEND**
- RCRA BOUNDARY
 - x - x - x - FENCE
 - - - - - SURFACE WATER
 - SLAB/FORMER BUILDING

0 400 800ft

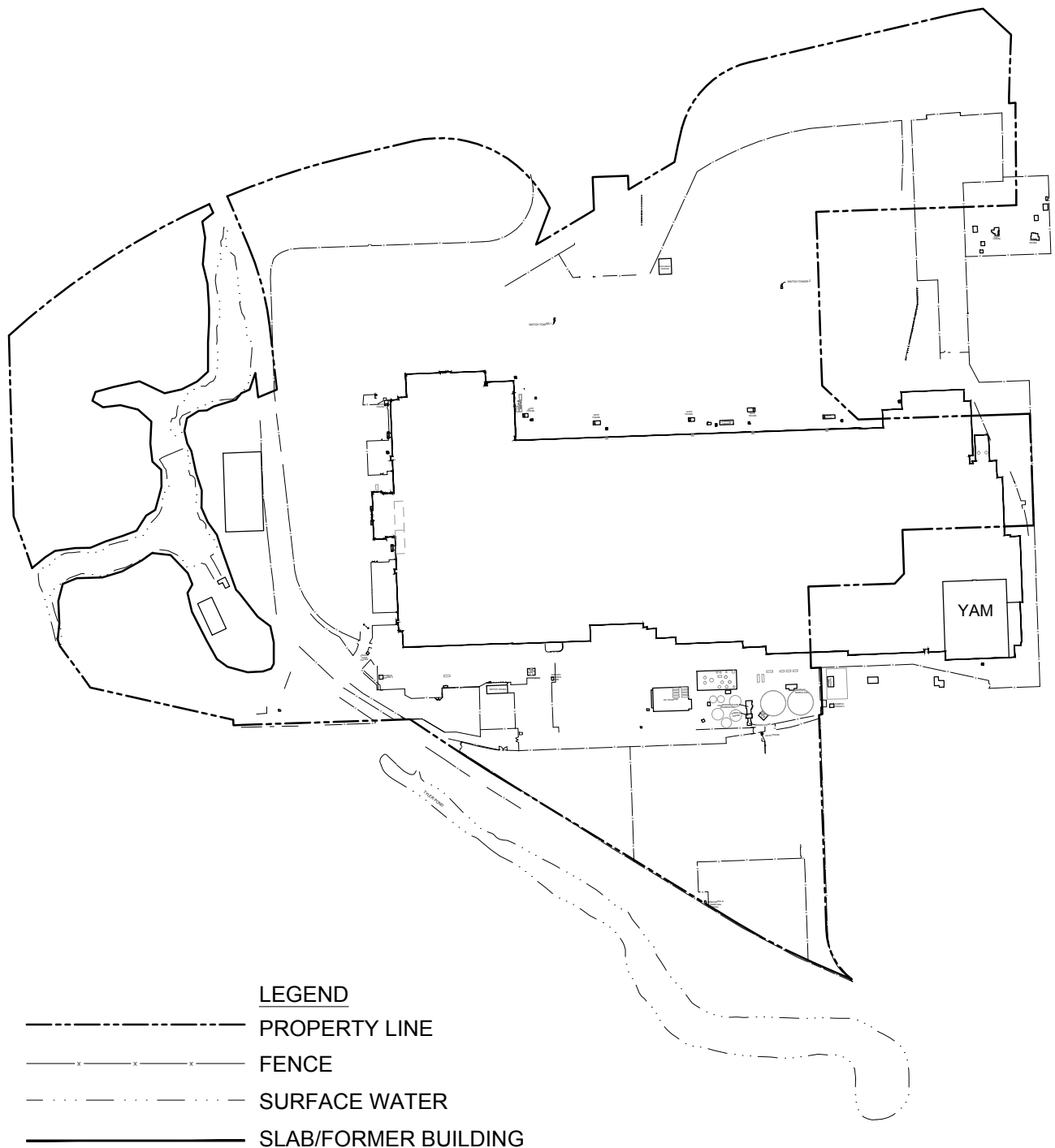


WILLOW RUN POWERTRAIN
YPSILANTI, MICHIGAN

017358-T01
Jul 27, 2016

RCRA BOUNDARY

FIGURE 1



0 400 800ft



WILLOW RUN POWERTRAIN
YPSILANTI, MICHIGAN

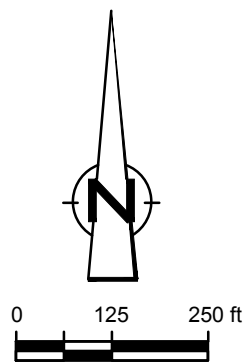
CURRENT PROPERTY
BOUNDARY

017358-T01
Jul 27, 2016

FIGURE 2



GHD
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Plymouth, Michigan 48170
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Client
**FORMER POWERTRAIN PLANT
YPSILANTI, MICHIGAN**

Project

No.	Issue	Drawn	Approved	Date
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Drawn	DMG	Designer		
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Drafting Check	BL	Design Check	BL	
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Project Manager	B.L.	Date	Jul 27, 2016	
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This document shall not be used for construction unless signed and sealed for construction.	Scale	AS SHOWN		
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Original Size	Arch D	Bar is one inch on original size drawing	0	1"
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Project No.	017358-T01			
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Title	CONCEPTUAL LAYOUT			
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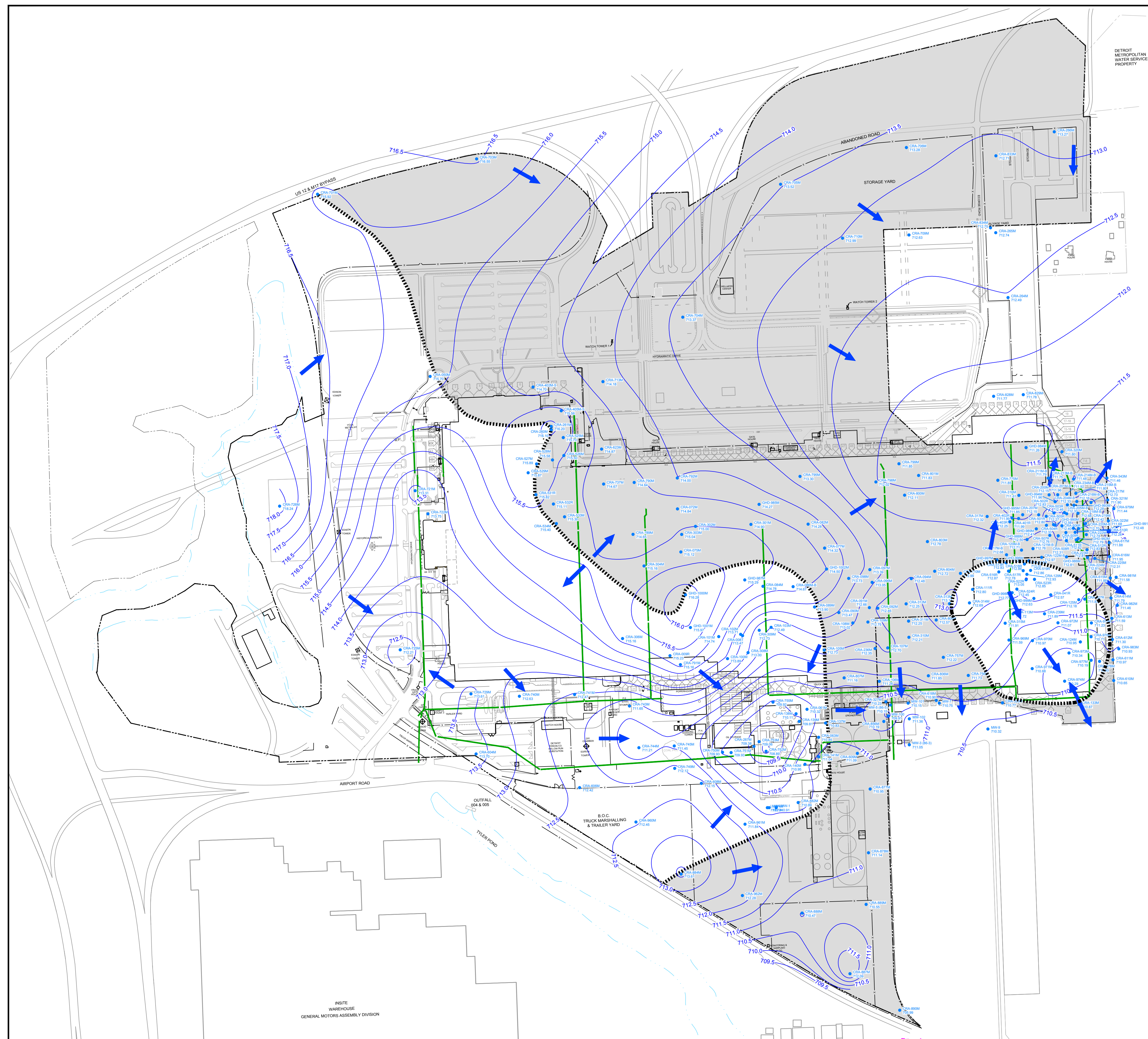
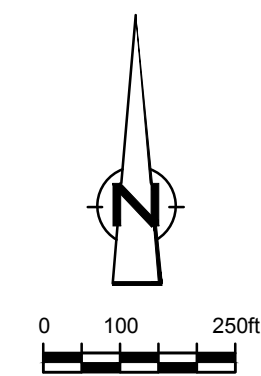
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FIGURE 3

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Attachment A

January and April 2016 Groundwater Contour Maps

[illegible]

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- LEGEND**
- CRA-799M
 - PROPERTY BOUNDARY
 - ESTIMATED STORM SEWER (MAIN LINES)
 - SURFACE WATER
 - 711.85
 - 712.00
 - GROUNDWATER ELEVATION (FT AMSL) (JANUARY 2016)
 - GROUNDWATER CONTOUR (FT AMSL)
 - INTERPRETED GROUNDWATER FLOW DIRECTION
 - APPROXIMATE FLOW DIVIDE (BEFORE ON AND OFF-SITE FLOW)
 - INTERPRETED AREA OF OFF-SITE FLOW (YAM PROPERTY INCLUDED IN ON-SITE AREA)

- NOTES:
1. WATER LEVELS IN WELLS CONTAINING LNAPL WERE CORRECTED USING LNAPL DENSITY = 0.9.
 2. ALL COORDINATES ARE IN INTERNATIONAL FEET.
 3. GHD-984M TO 1002M ADDED.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

SHALLOW GROUNDWATER
CONTOURS - JANUARY 2016

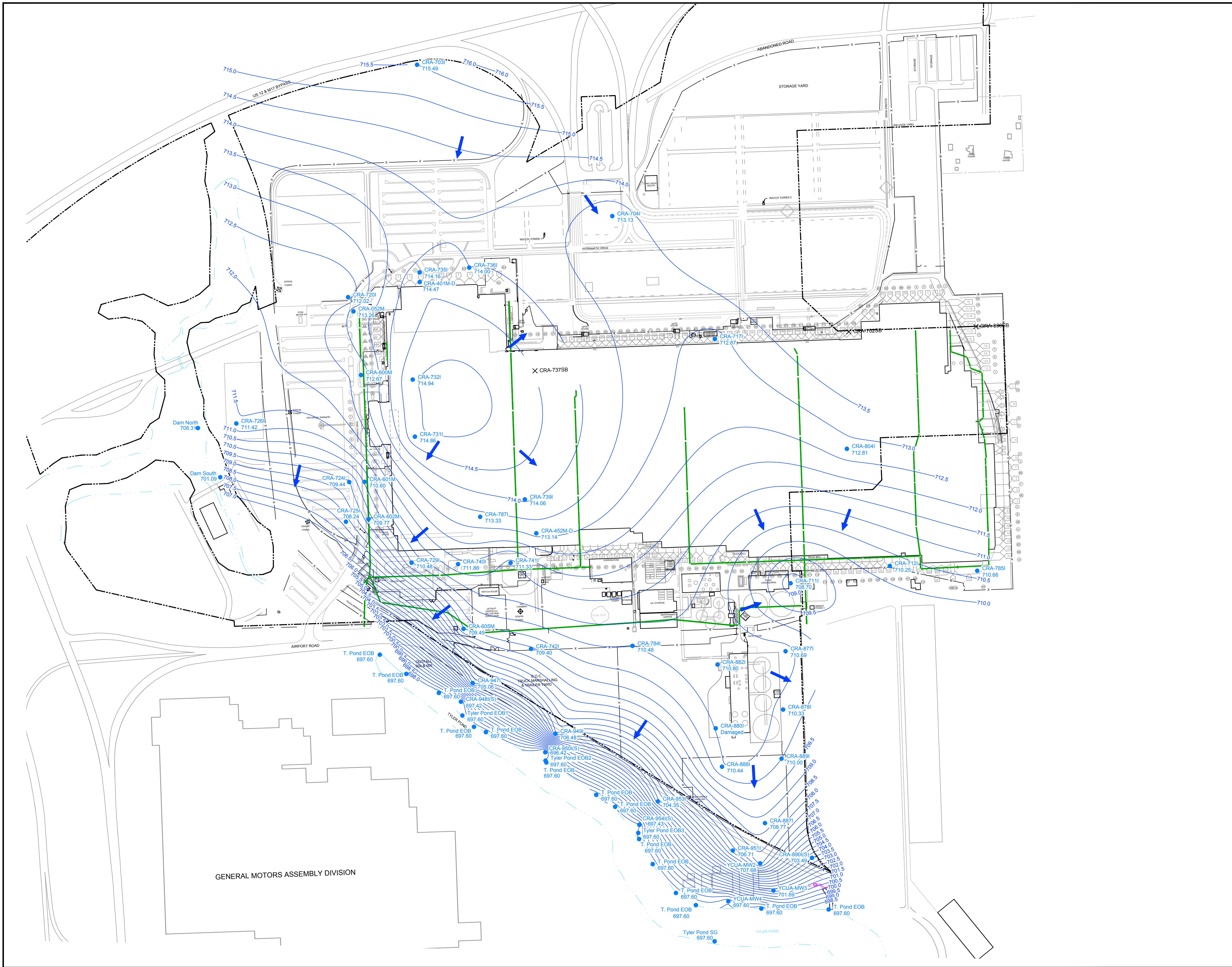
JANUARY 2016 CONTOUR PLANS

FORMER POWERTRAIN PLANT
YPSILANTI, MICHIGAN

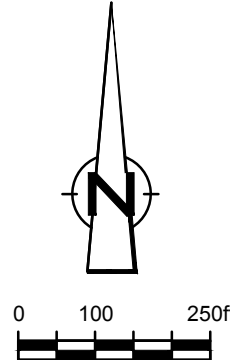


Source Reference:

Project Manager: B. L.	Reviewed By: W.B.	Date: JULY 2016	
Scale: 1"=250'	Project N ^o : 017358-T01	Report N ^o : MEMO166	Drawing N ^o : A-1



No	Revision	Date	Initial



- LEGEND**
- EXISTING MONITORING WELL LOCATION
 - X CRA-702SB SOIL BORING LOCATION WHERE INTERMEDIATE ZONE NOT FOUND
 - PROPERTY BOUNDARY
 - SURFACE WATER
 - GROUNDWATER ELEVATION (FT. AMSL) (JANUARY 2016)
 - * NOT USED FOR CONTOURING
 - 713.0 GROUNDWATER CONTOUR (FT. AMSL)
 - INTERPRETED GROUNDWATER FLOW DIRECTION
 - ESTIMATED STORM SEWER (MAIN LINES)

- NOTES:**
- LNAPL NOT OBSERVED IN ANY INTERMEDIATE WELLS.
 - ALL COORDINATES ARE IN INTERNATIONAL FT.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

INTERMEDIATE GROUNDWATER
CONTOURS - JANUARY 2016

JANUARY 2016 CONTOUR PLANS

FORMER POWERTRAIN PLANT
YPSILANTI, MICHIGAN

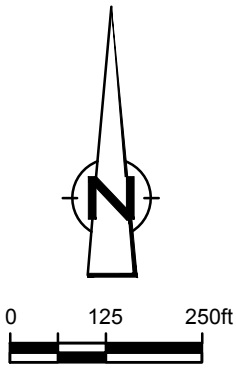


Source Reference:			
Project Manager:	Reviewed By:	Date:	
B. L.	W. B.	JULY 2016	
Scale:	Project N ^o :	Report N ^o :	Drawing N ^o :
1"=250'	017358-T01	MEMO166	A-2



WILLOW RUN AIRPORT PROPERTY

Nº	Revision	Date	Initial



LEGEND

- CRA-742D EXISTING MONITORING WELL LOCATION
- PROPERTY BOUNDARY
- SURFACE WATER
- 697.34 GROUNDWATER ELEVATION (FT. AMSL) (JANUARY 2016)
- 704.0 GROUNDWATER CONTOUR (FT. AMSL)
- ➡ INTERPRETED GROUNDWATER FLOW DIRECTION
- ESTIMATED STORM SEWER (MAIN LINES)
- * DEPTH OF TYLER POND: 678 AMSL

- NOTES:
- ALL COORDINATES ARE IN INTERNATIONAL FEET.
 - SATURATED ZONE FOR DEEP WELLS RANGES FROM 632.6 TO 651.7 AMSL

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.



Approved

DRAWING STATUS

Status	Date	Initial

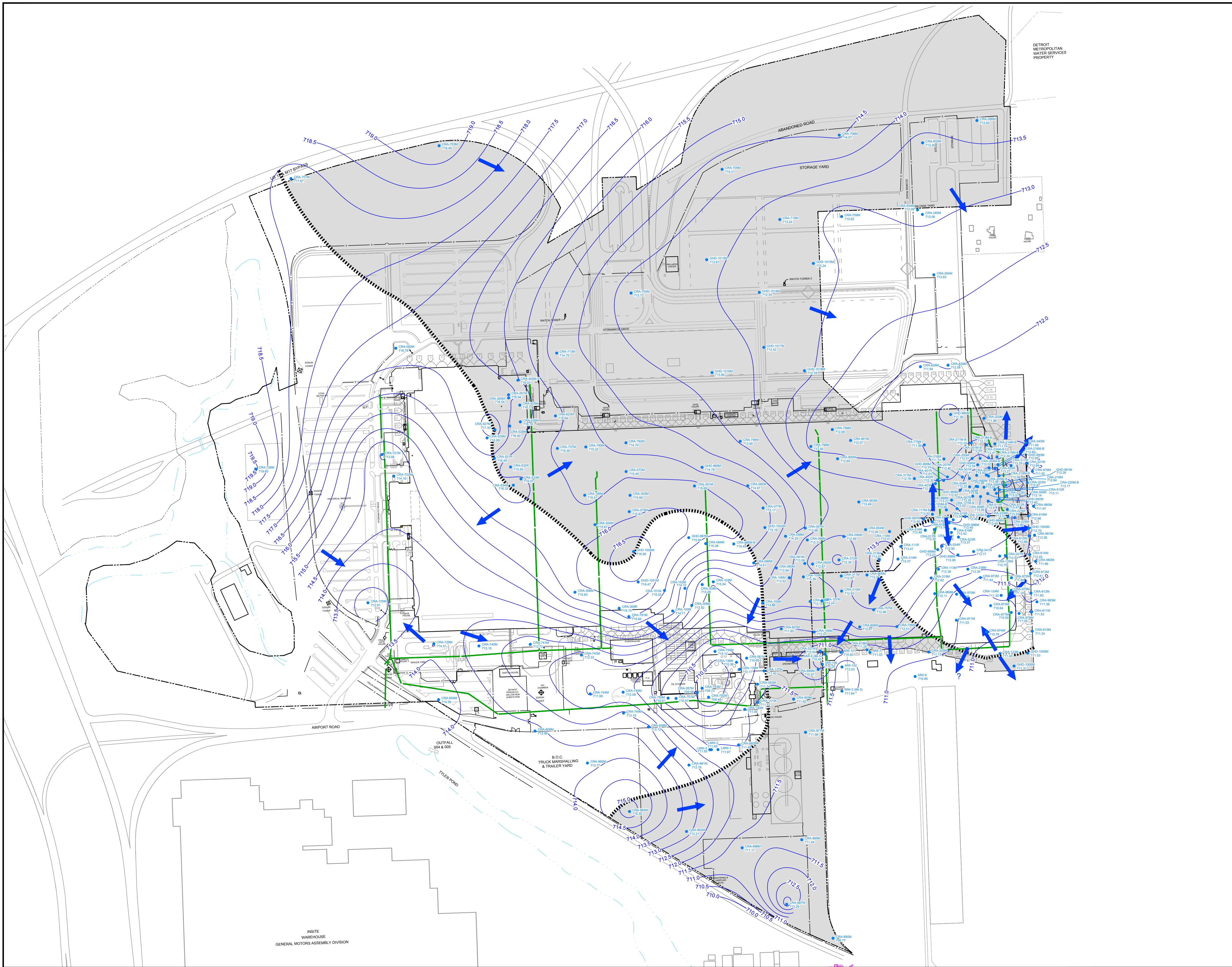
DEEP GROUNDWATER
CONTOURS - JANUARY 2016

JANUARY 2016 CONTOUR PLANS

FORMER POWERTRAIN PLANT
YPSILANTI, MICHIGAN



Source Reference:			
Project Manager:	Reviewed By:	Date:	
B. L.	W. B.	JULY 2016	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
1:250	017358-T01	MEMO166	A-3



No	Revision	Date	Initial

LEGEND

- CRA-264M EXISTING MONITORING WELL LOCATION
- PROPERTY BOUNDARY
- ESTIMATED STORM SEWER (MAIN LINES)
- SURFACE WATER
- 712.83 GROUNDWATER ELEVATION (FT AMSL) (APRIL 2016)
- GROUNDWATER CONTOUR (FT AMSL)
- INTERPRETED GROUNDWATER FLOW DIRECTION
- APPROXIMATE FLOW DIVIDE (BETWEEN ON AND OFF-SITE FLOW)
- INTERPRETED AREA OF OFF-SITE FLOW (YAM PROPERTY INCLUDED IN ON-SITE AREA)

NOTES:

1. WATER LEVELS IN WELLS CONTAINING LNAPL WERE CORRECTED USING LNAPL DENSITY = 0.9
2. ALL COORDINATES ARE IN INTERNATIONAL FEET.
3. GHD-1004M TO GHD-1006M ADDED.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS		
Status	Date	Initial

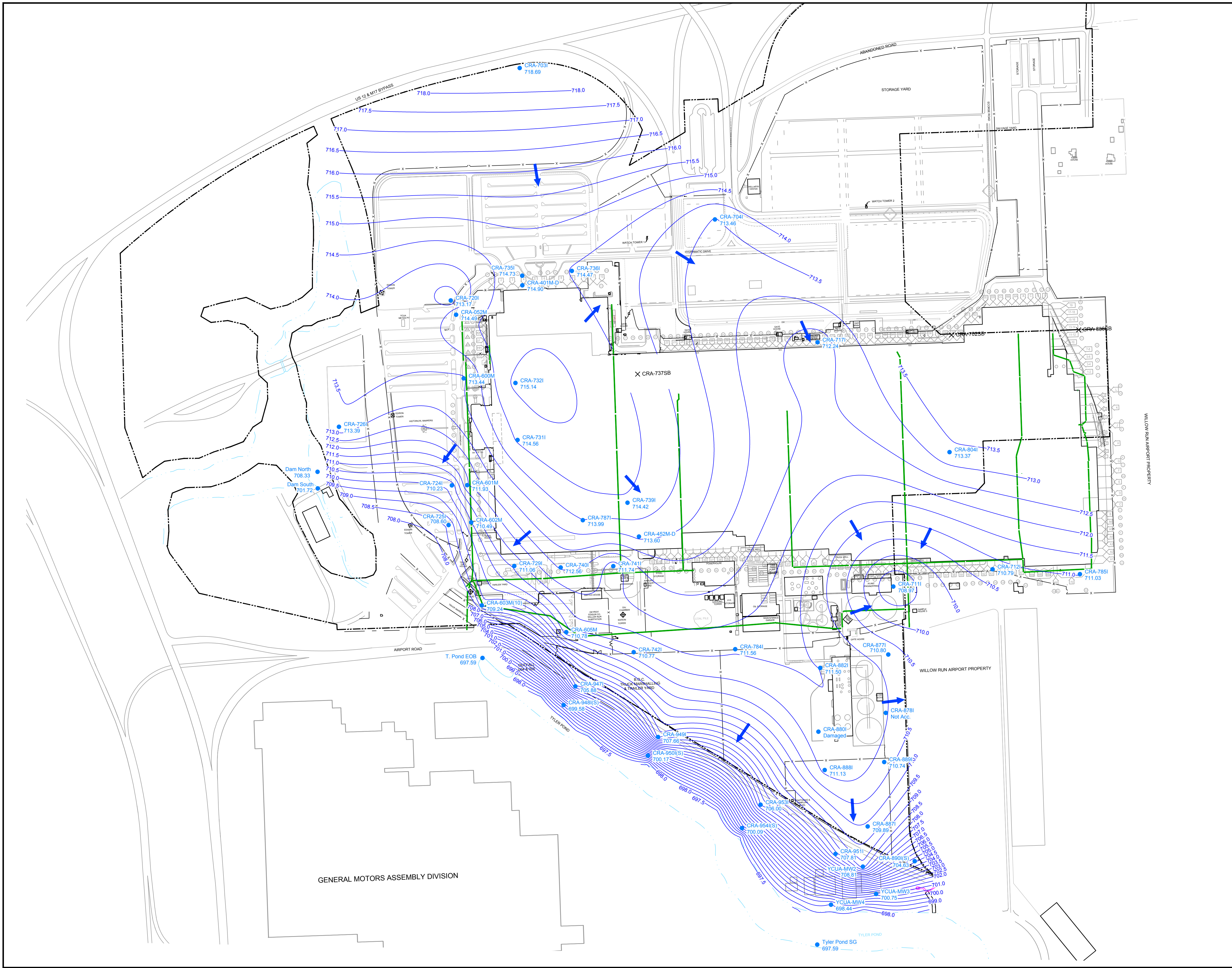
SHALLOW GROUNDWATER CONTOURS - APRIL 2016

APRIL 2016 CONTOUR PLANS

FORMER POWERTRAIN PLANT YPSILANTI, MICHIGAN

Source Reference:

Project Manager:	Reviewed By:	Date:
B. L.	W.B.	JULY 2016
Scale:	Project N°:	Report N°:
1"=250'	017358-T01	MEMO166
		Drawing N°:
		A-4



No.	Revision	Date	Initial

0 100 250ft

LEGEND

- CRA-804 EXISTING MONITORING WELL LOCATION
- ✕ CRA-702SB SOIL BORING LOCATION WHERE INTERMEDIATE ZONE NOT FOUND
- PROPERTY BOUNDARY
- SURFACE WATER
- 713.37 GROUNDWATER ELEVATION (FT. AMSL) (APRIL 2016)
- * NOT USED FOR CONTOURING
- 713.0 GROUNDWATER CONTOUR (FT. AMSL)
- ➔ INTERPRETED GROUNDWATER FLOW DIRECTION
- ESTIMATED STORM SEWER (MAIN LINES)

NOTES:

1. LNAPL NOT OBSERVED IN ANY INTERMEDIATE WELLS.
2. ALL COORDINATES ARE IN INTERNATIONAL FEET.

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

INTERMEDIATE GROUNDWATER CONTOURS - APRIL 2016

APRIL 2016 CONTOUR PLANS

FORMER POWERTRAIN PLANT YPSILANTI, MICHIGAN

GHD

Source Reference:

Project Manager:	Reviewed By:	Date:
B. L.	W.B.	JULY 2016

Scale:	Project N°:	Report N°:	Drawing N°:
1"=250'	017358-T01	MEMO166	A-5

