

Our ref: 11223073-LTR-9

May 10, 2022

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Michigan Department of Environment Great Lakes & Energy
Remediation and Redevelopment Division – Jackson District Office
301 East Louis Glick Highway
Jackson, Michigan 49201-1556

**2021 Hydraulic Monitoring Update and Monitoring Network Optimization
Former Willow Run Powertrain Plant, Ypsilanti, MI**

Dear Ms. Lesser:

GHD has prepared this letter on behalf of Revitalizing Auto Communities Environmental Response (RACER) Trust as part of the ongoing Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) at the Willow Run Powertrain site (Site) in Ypsilanti, Michigan.

The purpose of this letter is to:

- Describe Site changes which may influence groundwater levels and/or flow direction (or the appearance thereof).
- Document the May 2021 groundwater flow conditions, which provide evidence of stability.
- Obtain EGLE concurrence on a reduced monitoring well network and abandonment of wells no longer required.

1. Background

As part of the ongoing Resource and Recovery Act (RCRA) Corrective Action (CA) at the former Willow Run Powertrain site (Site) in Ypsilanti, Michigan, groundwater flow direction and levels are monitored on a regular basis to evaluate the stability of or changes in groundwater conditions. Since RACER took over the RCRA CA responsibilities at the Site in 2011, groundwater levels have generally been gauged on a routine basis including:

- Fall 2011, Fall 2012, April 2013, April 2014
- Quarterly between April 2015 and October 2018 (January, April, July, October)
- Semi-Annually in 2019 (April, December) and 2020 (May, October)
- Annually in 2021 (May).

The results of the monitoring events through 2020 have been presented to EGLE (formerly MDEQ) in several submittals which are listed in Section 6 (References).

2. Site Conditions

This Section provides a summary of Site changes that occurred in 2021 that may have affected hydraulic monitoring and/or groundwater flow direction. Figure 1 provides a Site map and shows the items discussed in Section 2.

2.1 Site Redevelopment

There were no Site redevelopment activities completed by the Site owners (Willow Run Arsenal of Democracy (WRAD) /American Center for Mobility (ACM); Yankee Air Museum (YAM)) between January 1 and May 7, 2021.

Repairs to the East Side Storm Drain (ESSD) (a storm sewer) were completed in December 2020 and March 2021 by Angelo lafrate Construction Company (lafrate) on behalf of the YAM. The main repair occurred between MH-100 and MH-204, south of the YAM building. A few minor leaks were also repaired at roof drain and manhole connections in the ESSD along the south side of the hangar building.

The most recent Site activity influencing groundwater conditions was the closure of the South Parcel storm sewers on June 26, 2020. This was noted in the 2020 hydraulic summary letter (GHD, March 2021).

2.2 Monitoring Well Network Changes

Two monitoring wells were installed by GHD in March 2021.

- GHD-322ML was installed along the east property line to determine parameter concentrations in the lower part of the shallow zone near GHD-322M, which is installed in the upper part of the shallow zone.
- GHD-604I was installed in the intermediate zone in the southwest part of the Site to assess vinyl chloride concentrations near the property line/Tyler Dam Drain.
- A second intermediate zone monitoring well was to be installed in the southwest at soil boring GHD-1235SB. However, there was concern that the 2-1/2" diameter sample hole had been drilled through utility bedding material (possibly associated with a sanitary sewer) and that enlarging the diameter to 8-1/4" for monitoring well installation would risk compromising any infrastructure. Therefore, the intermediate well planned for this location was not installed. The 2-1/2" diameter sample hole was allowed to collapse to about 10 ft bgs (water table) and the remaining annulus was filled with bentonite chip.

The three locations were surveyed on May 18, 2021, by Metro Consulting Associates LLC, Plymouth, Michigan. The horizontal position, ground surface and top of PVC riser (where applicable) elevations were surveyed. The datum used was SPCS MI S NAD83 / NAVD88, Int. Ft¹.

Table 1 Survey Data for 2021 Investigative Locations

Location ID	Easting (Int. Ft.)	Northing (Int. Ft.)	Ground Elev. (ft. amsl)	Ref. Pt. Elev. (ft. amsl)	Ref. Pt.	Install Date
GHD-322ML	13,346,088.372	271,334.659	714.880	717.780	to(PVC)r (SU)	March 29, 2021
GHD-604I	13,342,957.365	270,198.432	719.608	719.048	to(PVC)r (FM)	March 29, 2021
GHD-1235SB	13,342,490.133	270,298.679	720.760	NA	NA	March 30, 2021
Int. Ft.: International Feet ft. amsl: feet above mean sea level Ref. Pt. Elev.: Reference Point Elevation			to(PVC)r: top of polyvinyl chloride riser (the well) SU: stickup style (top of PVC well above ground) FM: flush mount (top of PVC well below ground)			

¹ State Plane Coordinate System Michigan, North American Datum 83 / North American Vertical Datum 88, International Feet

Monitoring well nest (CRA-887M/CRA-887I) was buried under a soil pile at the time of the 2021 hydraulic monitoring event and was therefore not gauged during that event. This nest was uncovered on June 11, 2021 (after the monitoring event) when the soil pile was removed by lafrate on behalf of ACM. Water levels and depths to bottom measured by GHD on June 25, 2021, indicated that the wells were in good condition for future use.

There were no well repairs, no reference point changes and no well decommissioning between January 1 and June 30, 2021.

2.3 French Drain Operation

The groundwater collection system (French drain) continued operation in the southeast part of the Site. During the May 2021 hydraulic monitoring event, a temporary treatment system for per- and polyfluoroalkyl substances (PFAS) was in operation treating the groundwater collected by the French Drain. The operation of the temporary treatment system (post collection) did not influence groundwater levels as all four sections of the collection system (French Drain) were pumping when water levels were recorded.

The hydraulic monitoring (groundwater levels) event was completed May 3-7, 2021. Details on the operation of each of the four lines of the French drain from April 26 (one week prior to the May 3 start) to May 7 are provided in Table 2.

- Pumps 1 and 2 (eastern legs of collection system) were operated such that there was modest variability in the sump water levels. The combined average daily pumping rates ranged from 5.6 to 12.7 US gpm. The average sump elevations on May 3 (the day the cleanout and sump water levels were measured), were 706.37 ft amsl (Sump-1) and 707.00 ft amsl (Sump-2). The May 3 sump levels are 1.3 ft and 0.6 ft higher, respectively, than in the fall 2020 hydraulic monitoring event.
- Pumps 3 and 4 (southern legs of the collection system) were operated such that levels were stable in the sumps. The combined average daily pumping rates ranged from 22.7 to 30.3 US gpm. The average sump elevations on May 3 (the day the cleanout and sump water levels were measured), were 706.16 (Sump-3) and 706.17 ft amsl (Sump-4). The sump levels are consistent with the fall 2020 hydraulic monitoring event.

Table 2 French Drain Operation

	April 26 – May 7, 2021 (Average Daily)			May 3, 2021 (Average Daily)		
Location	Levels (ft amsl)	Pumping Rates (gpm)	Combined Rates (gpm)	Level (ft amsl)	Pumping Rate (gpm)	Notes
Line 1 (Sump-1)	706.21 – 707.00 (0.79' fluctuation)	4.6 – 7.2	5.6 – 12.7	706.37	6.6	Stable Apr. 6 – 26 706.36 - 706.40 (0.04')
Line 2 (Sump-2)	706.31 - 707.03 (0.72' fluctuation)	0.0 – 6.6		707.00	0.4	Stable Apr. 1 – 25 706.60 – 706.65 (0.05')
Line 4 (Sump-4)	706.14 - 706.22 (0.08' fluctuation)	12.1 - 18.0	22.7 - 30.3	706.17	15.5	Stable Mar. 31 – May 7 706.13 – 706.22 (0.09')
Line 3 (Sump-3)	706.13 - 706.20 (0.07' fluctuation)	10.0 - 12.4		706.16	10.3	Stable Mar. 30 – May 7 706.12 – 706.20 (0.08')
Lines are in order, clockwise. ft amsl: feet above mean sea level US gpm: United States gallons per minute April 26-May 2 is the one week period prior to start of the hydraulic monitoring event on May 3, 2021. May 3, 2021: Coincides with day that Cleanout levels were recorded on the opposite end of each French drain line from the sump						

3. 2021 Groundwater Flow

As described in Section 1, groundwater flow direction and levels have been monitored on a regular basis to evaluate the stability of or changes in groundwater conditions since 2011. While many changes have occurred to the Site over that time period that affected groundwater flow direction, those changes were completed by 2018. These are described in the Comprehensive Groundwater Quality Update Report (GHD, May 2021). As documented in the summary of groundwater flow conditions provided annually to EGLE by RACER/GHD, the groundwater flow direction and levels have remained stable following these changes since 2018.

3.1 Shallow Zone Groundwater Flow

Shallow Zone Groundwater Flow

The shallow zone groundwater contour plan for May 2021 is presented as Figure 2.

Groundwater from the central and eastern parts of the Site flowed east (northeast, east, southeast) toward the Willow Run Airport property (with the French drain capturing water along a portion of the east and southeast property line). Shallow groundwater does not appear to be venting to the 84" storm sewer exception for a small area at the south end of First Flush Basin C (FFB-C).

Groundwater from the west part of the Site flowed toward the Tyler Dam Drain. This occurs via venting to the Perimeter Storm Sewer and via groundwater flow (in the northwest corner and in the southwest). In the southwest, where the shallow zone is dry (south of Airport Rd), the shallow groundwater is believed to feed the intermediate zone which is believed to be hydraulically connected to the Tyler Dam Drain.

The localized groundwater low in the north-central part of the Site (north parking lot) is due to the groundwater elevation at GHD-1016M, which is lower than expected. The low has been present since December 2019 (first water level event after GHD-1016M was re-established by extending it to the higher ground elevation). The reference point elevation was confirmed by surveyors on May 18, 2021. There are no issues with this well (i.e., sediment) or with others in the area.

Shallow Zone Groundwater Stability

The shallow zone groundwater contour plans for October 2020 and May 2021, and the change in groundwater elevation between these dates are shown on Figure 3.

The groundwater flow patterns are similar indicating stability of groundwater flow direction.

If groundwater levels are stable (responding only to climatic influences) then it is expected that any changes in elevation from one event to another would be similar across the Site (all else being equal). Because the limited changes in groundwater elevations are similar across the Site from 2020 to 2021, indicating groundwater conditions are stable.

3.2 Intermediate Zone Groundwater Flow

Intermediate Zone Groundwater Flow

The intermediate zone groundwater contour plan for May 2021 is presented as Figure 4.

Groundwater from the east part of the Site flowed east and south toward the Willow Run Airport. The French Drain is inferred to be capturing groundwater based on the depth of the drain and the similarity of response in intermediate zone water levels near the drain to those in the shallow zone. There is no indication that intermediate groundwater is venting to the 84" storm sewer, however there are no wells on the east side of the storm sewer to establish this.

Groundwater in the north, west and southwest parts of the Site flowed toward the Tyler Dam Drain. This occurs via venting to the Perimeter Storm Sewer (in north and west) and via groundwater flow toward Airport Rd (in the southwest).

Intermediate Zone Groundwater Stability

The intermediate zone groundwater contour plans for October 2020 plan and May 2021, and the change in groundwater elevation between these dates are shown on Figure 5.

The groundwater flow patterns are similar indicating stability of groundwater flow direction.

The change in groundwater elevation is similar across the Site, indicating stability of groundwater levels.

3.3 Deep Zone Groundwater

The groundwater flow direction in the deep zone was consistently southward from 2012 (initiation of deep zone monitoring) until 2019, as described in the 2019 groundwater levels letter (GHD, April 2020). Deep zone groundwater levels were not monitored in 2020 or 2021.

The deep zone is separated from the intermediate zone by approximately 50 feet of silty clay. The groundwater flow pattern (which is different than the shallow and intermediate) and the clay thickness indicate that the deep zone is not hydraulically connected to the intermediate or shallow zones.

4. Monitoring Well Network

The monitoring network consists of 342 wells, the majority on-Site. Many of the on-Site wells are greater than 10 years old, were installed for various reasons which are no longer relevant, and are clustered in certain areas. This large network is not needed based on the stability of groundwater conditions; it results in additional maintenance tasks and is an impediment to redevelopment. Therefore, following the May 2021 hydraulic event, an evaluation was completed to identify wells that are not needed and could be abandoned.

4.1 Proposed Monitoring Well Network

GHD proposes to keep only those monitoring wells which serve one or more of the following purposes:

- Groundwater Quality Monitoring
- Light Non-Aqueous Phase Liquid (LNAPL) Monitoring
- Groundwater Levels and Flow Direction Monitoring

Table 3 provides a list of monitoring locations that currently exist at the Site. It is subdivided into shallow, intermediate, and deep zone monitoring locations. The reasons for keeping each well (the anticipated uses), are provided on the left side of the table. On the right side of the table is additional information to be used if a decision needs to be made as to which well to retain in a group of wells, and to aid in prioritizing abandonments. Details on the reasons for keeping each well are provided in Section 4.1.1.

The proposed shallow zone monitoring network is provided on Figure 6. The proposed intermediate zone monitoring network is provided on Figure 7.

4.1.1 Reasons for Keeping Monitoring Wells

The reasons for keeping each well are described below along with reference to the corresponding Figure in Attachment A:

- Groundwater Quality Monitoring

- Perimeter (2021– 2023) (Figure A.1): An annual groundwater monitoring program was proposed in the “Comprehensive Groundwater Quality Update” report (May 2021) provided to EGLE. It includes shallow and intermediate zone locations along the downgradient Site perimeter areas most likely to detect or identify changes contaminant migration. Analysis is for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals.
 - Building 19 (“PCE”) Area Monitoring (Figure A.2). This area is the subject of on-going monitoring due to elevated chlorinated volatile organic compound (CVOC) concentrations. All shallow and intermediate zone monitoring wells in the area are included. These wells include several of the wells that are part of the Perimeter Groundwater Quality Monitoring Program.
- LNAPL Monitoring – This Site has a large LNAPL footprint. There has been multiple investigations and studies completed to evaluate the stability and long-term approach. The EGLE LNAPL TAPS² team reviewed the Site in 2020 and agreed that “Passive management of LNAPL in place and allowing the natural processes (NSZD³) at Willow Run is a viable option that is protective of human health and the environment with appropriate land use restrictions.” They recommended that “the long-term monitoring/management plan for the Willow Run Site should include long-term groundwater monitoring for evidence/indications of NAPL (i.e., NAPL body changes, increases in COCs, NAPL “daylighting” etc.) as well as continued methane evaluation and abatement (if necessary) as methane will continue to be generated from the NSZD processes. Monitoring will ensure the Conceptual Site Model for passive management continues to be the most viable option as the site reaches a new equilibrium from past demolition.” Based on these comments, the following bullets describe the wells maintained as part of this monitoring program.
- LNAPL Stability Monitoring (Figure A.3): The closest shallow zone wells to the outer perimeter of the various LNAPL bodies were selected. These wells will be monitored annually during groundwater levels to serve as sentinel wells to identify if any major changes are occurring. The wells include several of the wells that are part of the Perimeter Groundwater Quality Monitoring Program.
 - LNAPL - Potential NSZD/VI Monitoring (Figure A.4): RACER responsibility for vapor intrusion (VI) issues is limited to the Yankee Air Museum (building which existed prior to the sale of the property). At present, there is no VI monitoring program in place. GHD has recommended that no action be taken until the Yankee Air Museum finalizes their plan for the concrete floor of the building. The wells selected are the shallow zone monitoring wells on YAM property which were used in the LNAPL NSZD study. All wells except one have also been selected for French drain levels monitoring (see below), and therefore there is negligible additional monitoring burden created.
- Groundwater Flow Direction and Levels
- French Drain capture (Figure A.5): This includes all wells used for routine monitoring in the vicinity of the French Drain to evaluate groundwater capture. All wells are in the shallow zone.
 - Potential Northwest Infiltration Area Flow Direction and Levels (Figure A.6): An area in the northwest was set-aside during the sale of the property in 2016 to use for discharge of water collected by the French Drain. The depth of groundwater below ground due to potential mounding and flow direction would be important if that were to occur. The area has not been used to date due to detection of PFAS⁴ in the collected groundwater in the French Drain and the need to treat for it, prior to discharge. Treatment methods are currently being investigated by GHD/RACER. Since discharge to this area after treatment has not been abandoned, these wells should remain.
 - Sitewide Groundwater Flow Direction: The groundwater flow direction in the shallow and intermediate zones is used to determine where groundwater exceeding Part 201 criteria (if any), may migrate off-Site. Sitewide levels are anticipated to be completed in conjunction with the annual groundwater

² EGLE NAPL TAPS: Michigan Department of Environment, Great Lakes, and Energy, Technical Assistance and Program Support

³ NSZD: Natural Source Zone Depletion

⁴ PFAS: per- and polyfluoroalkyl substances

quality sampling events (2021-2023). All wells to be used for other purposes (listed above) are included as well as additional (“filler”) wells to re-create the May 2021 groundwater contour plan. In areas where there was more than one well to choose from the well was selected based on other information such as well condition, the availability of a log and history of analytical data.

- Shallow Zone (Figures A.7-1 and A.7-2): Figure A.7-1 shows the wells selected. Figure A.7-2 shows the May 2021 groundwater contours using all currently existing wells and a comparison using the smaller subset of wells proposed; 102 out of 276 existing shallow zone wells are proposed to be kept.
- Intermediate Zone (Figures A.8-1 and A.8-2): Figure A.8-1 shows the wells selected. Figure A.8-2 shows the May 2021 groundwater contours using all currently existing wells and a comparison using the smaller subset of wells proposed. Most of the existing wells had to be added in to have sufficient data to re-create the May 2021 groundwater contour plan; 26 of the 63 existing intermediate zone wells are proposed to be kept and monitored. Two (2) additional wells on Ypsilanti property (YCUA-MW3 and YCUA-MW4) cannot be abandoned as they are not RACER’s responsibility.

No deep zone locations are proposed to be kept.

4.2 Proposed Monitoring Well Abandonments

Wells which do not serve a purpose are proposed to be abandoned. The wells proposed for abandonment are listed in Table 3 and shown on Figure 8. Table 3 is subdivided into shallow, intermediate, and deep zones and further subdivided into wells to be kept and wells to be abandoned. The abandonments have been sub-divided into 4 groups (1,2,3,4) based on priority, with “1” being the wells having the least value. Each group is in alphanumeric order.

1. Group ‘1’ (Abandon First):
 - The remaining deep zone wells (3),
 - Shallow and intermediate zone wells on-Site which have been destroyed (7; 7 shallow, 0 intermediate).
 - Shallow zone wells in the northeast part of the Site in which there are many other wells (59).
2. Group ‘2’: Wells not included in groups 1 or 3 (109; 87 shallow, 22 intermediate)
3. Group ‘3’: Wells located on Ypsilanti Township Property and Wayne County Airport Authority which are no longer required. There is no urgency to abandon these wells (23; 13 shallow, 10 intermediate) and access
4. Group ‘4’: Wells that do not need any action for abandonment by RACER. They were installed by others and are not RACER’s responsibility or have not been located in at least 5 years (13; 8 shallow, 5 intermediate).

5. Summary

Table 4 summarizes the number of existing, remaining and wells slated for abandonment as discussed in this letter. There are a total of 342 wells that we currently track at and around the Site, this summary proposes to reduce this number to 128.

Table 4 **Well Count Summary**

Interval	Existing	Abandon	Remain
Shallow	276	174	102
Intermediate	63	37	26
Deep	3	3	0
Total	342	214	128

Due to the consistency of groundwater flow direction and that the majority of redevelopment that might influence groundwater conditions has been completed, the frequency of the groundwater gauging events will continue annually in 2022. The event is expected to be completed in April or May, which are typically the wettest months and would coincide with the annual perimeter groundwater monitoring program. Upon concurrence by EGLE, the number of wells monitored will be reduced to that proposed in this letter and the remaining wells will be abandoned. All wells targeted for abandonment will no longer be monitored as part of the annually groundwater gauging event. The proposed abandonment procedures will be documented under separate cover.

6. **References**

September 2013 – RFI Report. Presented shallow, intermediate, and deep groundwater contours from October 2011 through April 2013.

February 2015 – Draft Interim Measure Work Plan. Described pre-demolition conditions through April 2013.

February/March 2016 – 017358 Memo-147 included as Appendix to Supplemental RFI Report No. 1. Provided groundwater contour plans from April 2012 through October 2015 and related discussion on implications to remedial options.

July 2016 – RCRA CA Status Update memo (forwarded to MDEQ as attachment to EPA review – Willow Run Remedy RACER memorandum). Provided groundwater contour plans for April and July 2016.

March 2019 – Groundwater Level Monitoring Update, November 2016 – October 2018, Letter to K. Lund, MDEQ. Ref: 017358Lund-4.

April 2020 – Light Non-Aqueous Phase Liquid Evaluation Update, Former Willow Run Powertrain Plant, Ypsilanti, MI. Ref: 017358A-RPT-45.

April 2020 – Groundwater Level Monitoring Update (through December 2019), Letter to K. Lund, EGLE. Ref: 017358Lund-8.

March 2021 – Groundwater Level Monitoring Update – 2020, Letter to K. Lund, EGLE. Ref: 11223073-LET-2-LUND-2020 GW Levels.

May 2021 – Comprehensive Groundwater Quality Update, Former Willow Run Powertrain Plant, Ypsilanti, MI. Submitted to EGLE (K. Lund). Ref: 017358A-RPT-44. Reviewed VOC, SVOC, PCB and metals data to August 2018. Proposed an annual groundwater monitoring program (2021 to 2023) as a basis for closure of groundwater issues at the Site.

July 8, 2021- NAPL TAPS Review and Recommendations

Please feel free to contact Grant Trigger, RACER at 313-670-6226 or the undersigned at 248-893-3428 should you required clarification or further information.

Regards



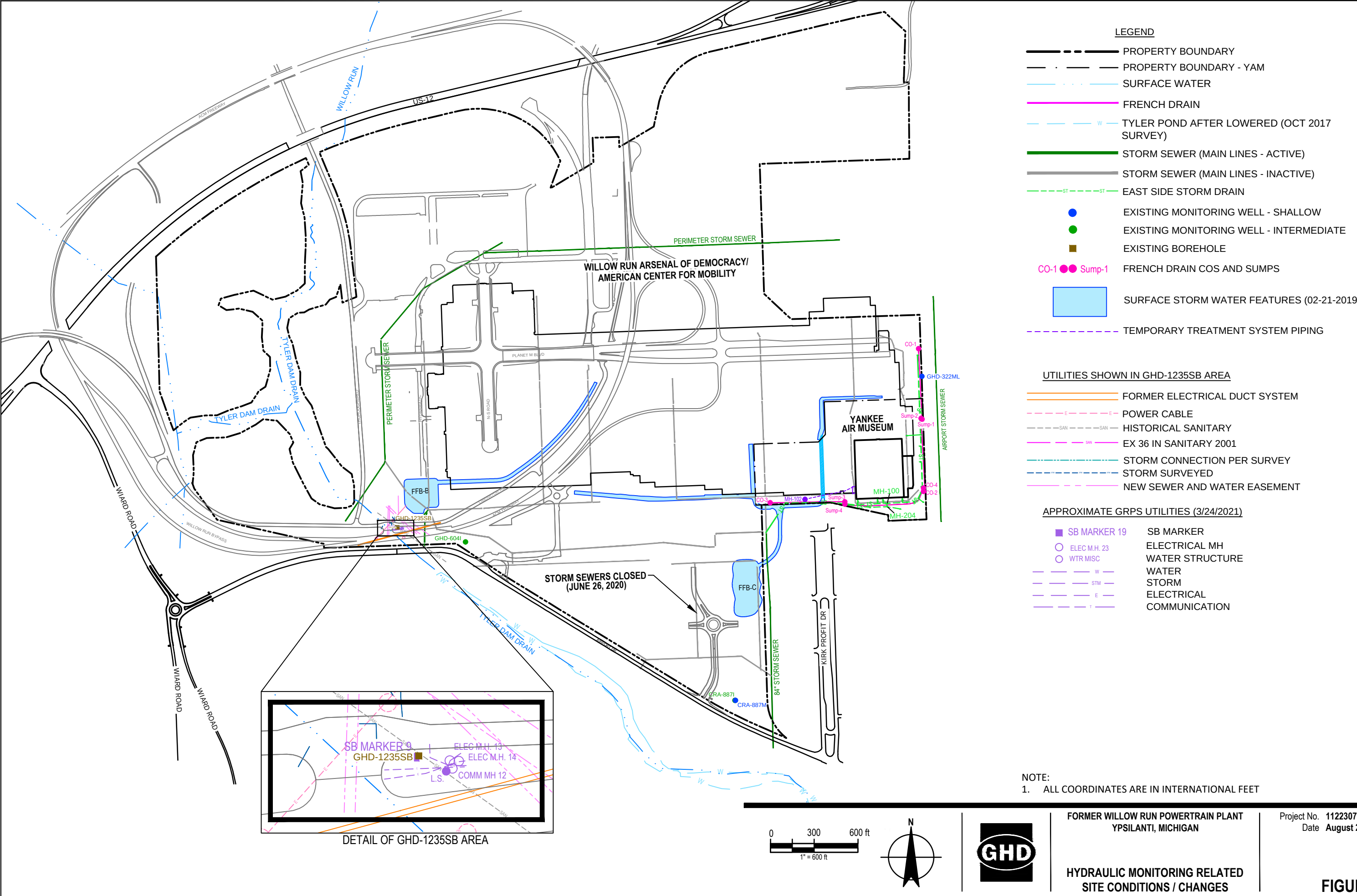
Beth Landale
Project Manager

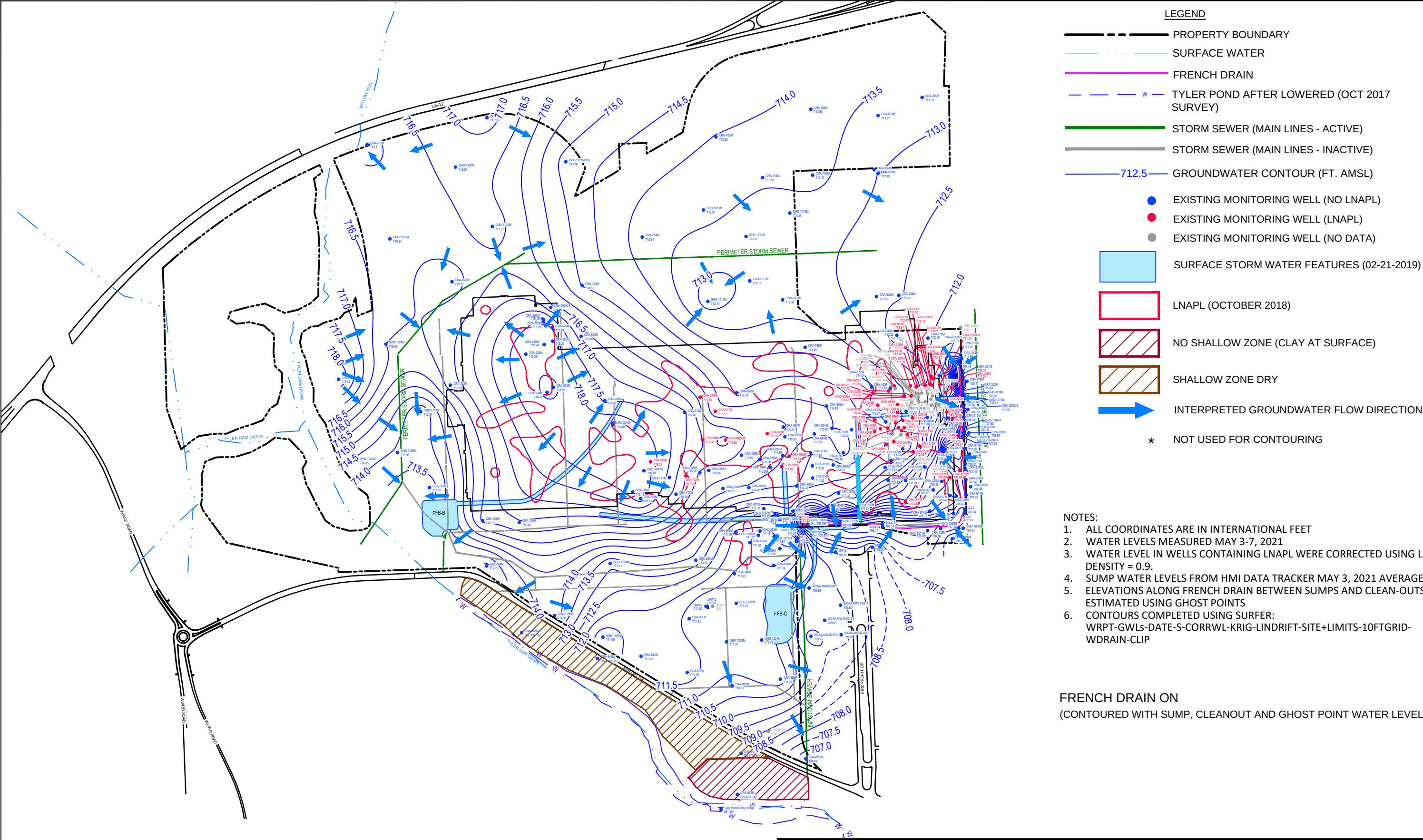
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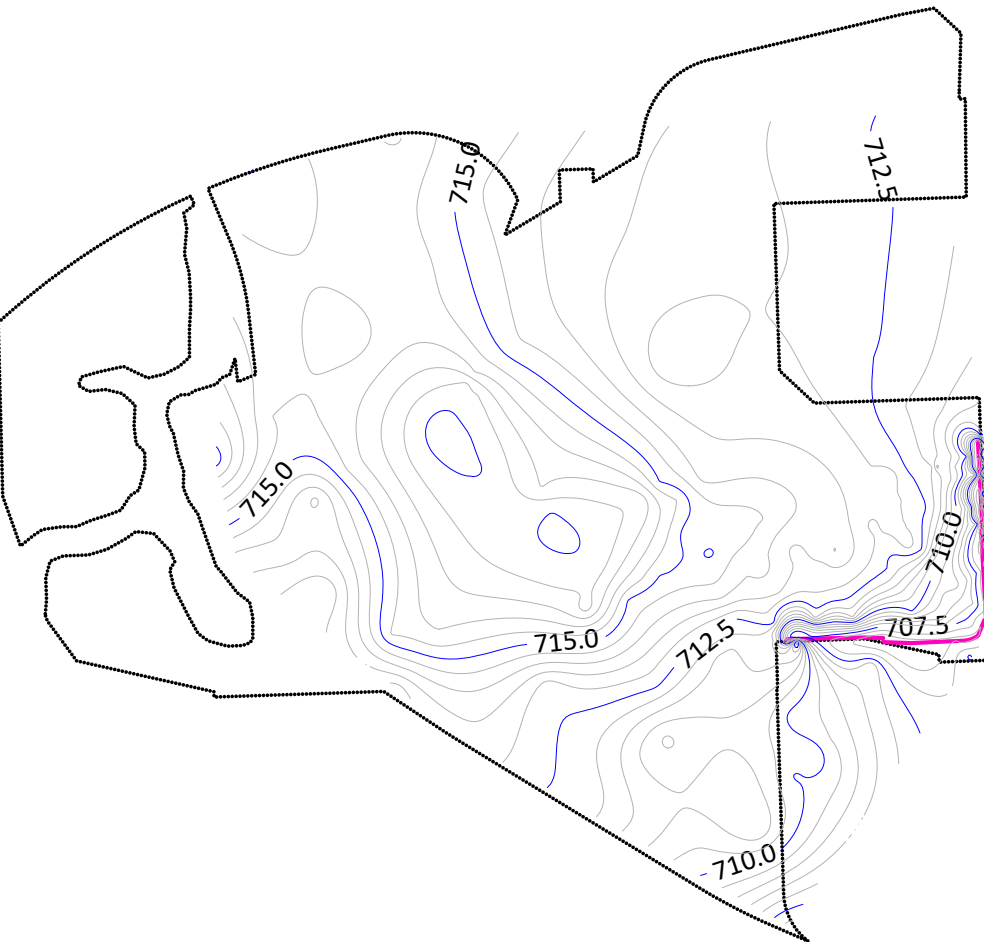
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Brad Ermisch, EGLE

Figures

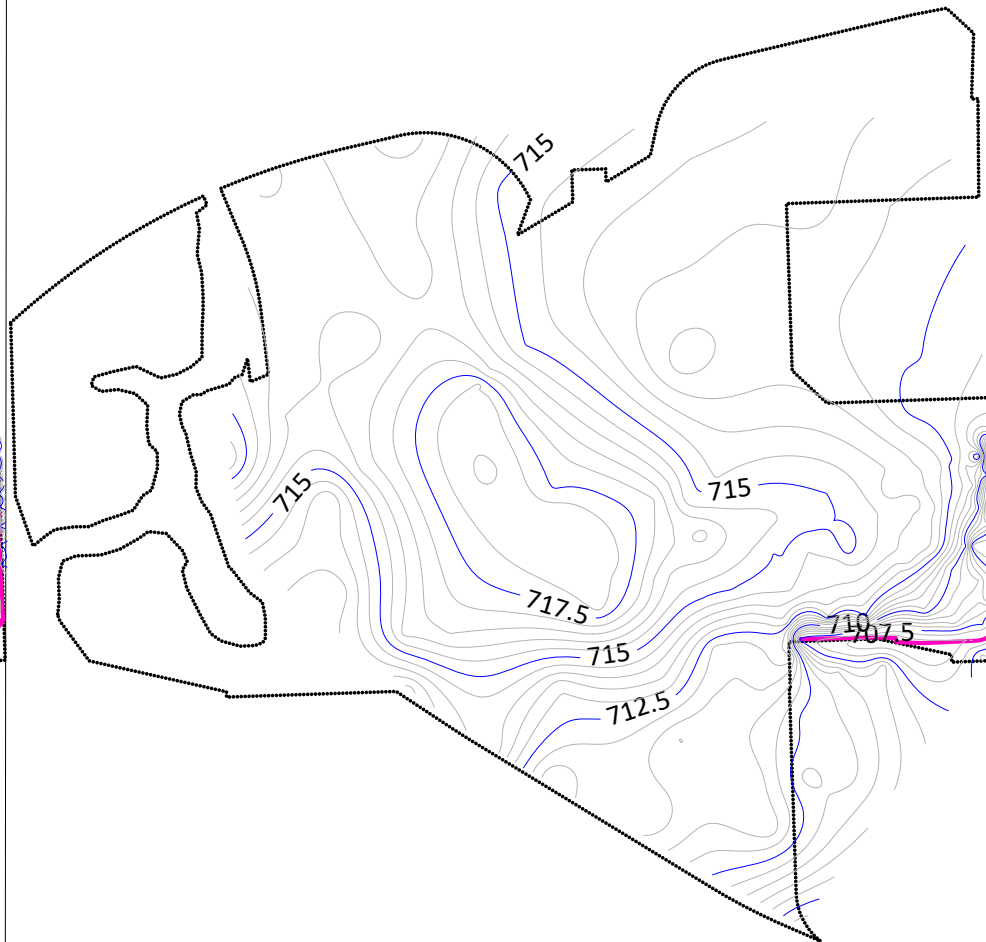




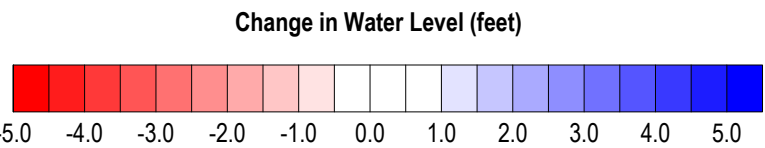
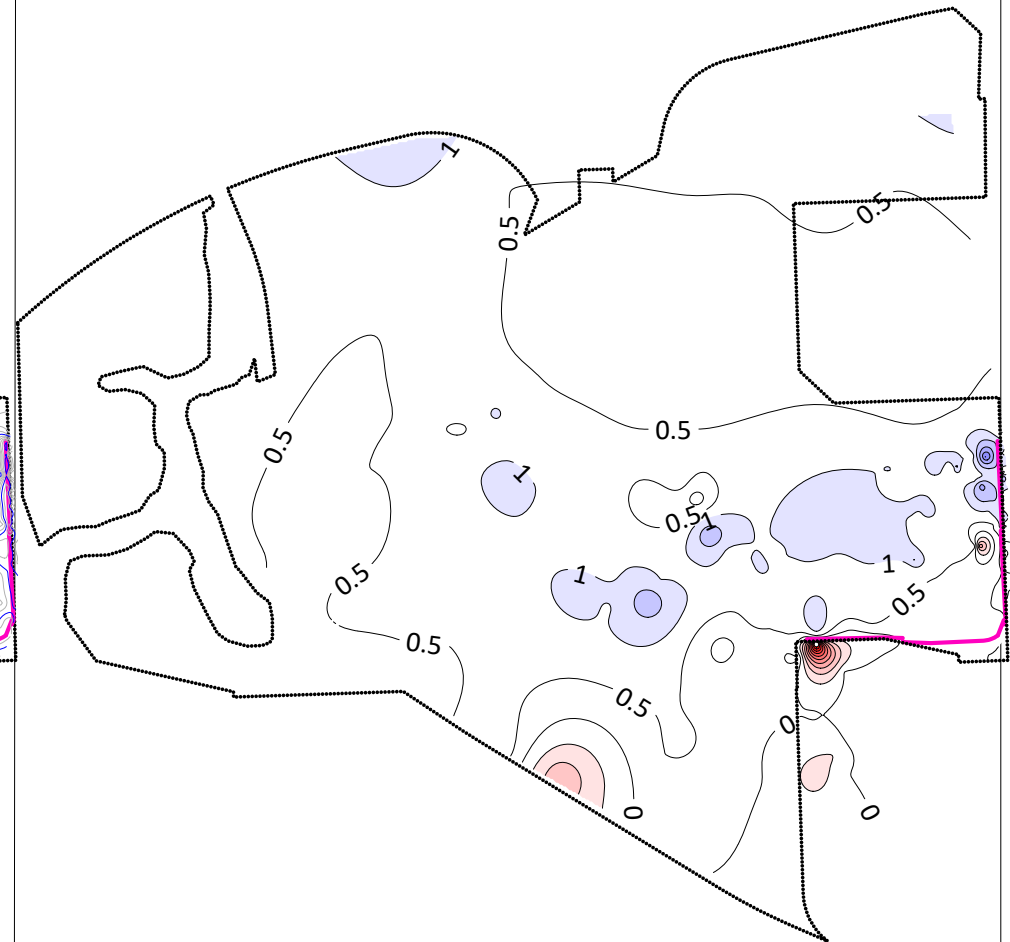
SHALLOW ZONE GROUNDWATER FLOW
OCTOBER 2020



SHALLOW ZONE GROUNDWATER FLOW
MAY 2021



SHALLOW ZONE - CHANGE IN GROUNDWATER ELEVATION
OCTOBER 2020 to MAY 2021



- LEGEND**
- Major Contour (ft amsl) - 2.5 ft intervals
 - Minor Contour (ft amsl) - 0.5 ft intervals
 - French Drain

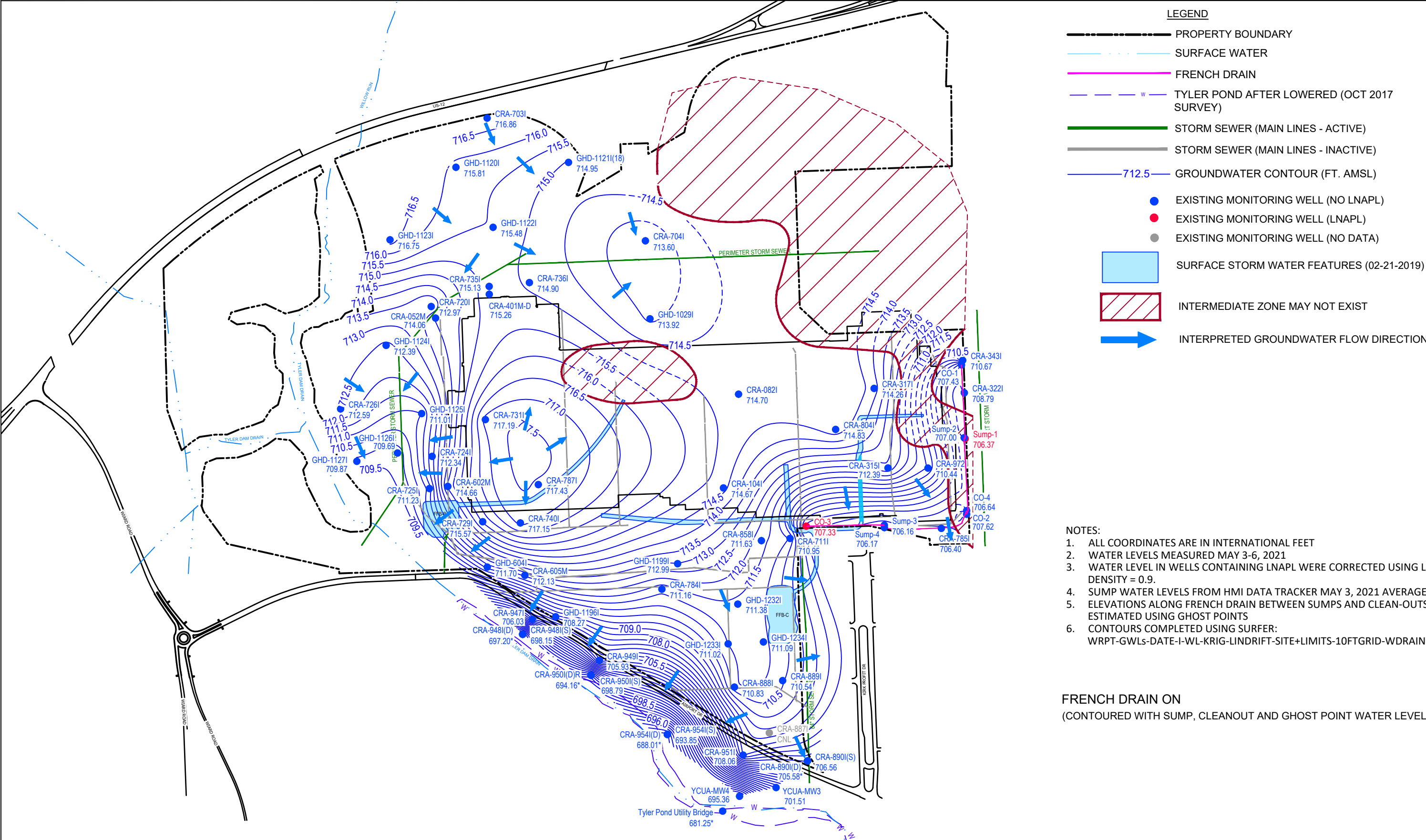
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YPSILANTI, MICHIGAN

SHALLOW ZONE GROUNDWATER FLOW
OCT. 2020 AND MAY 2021

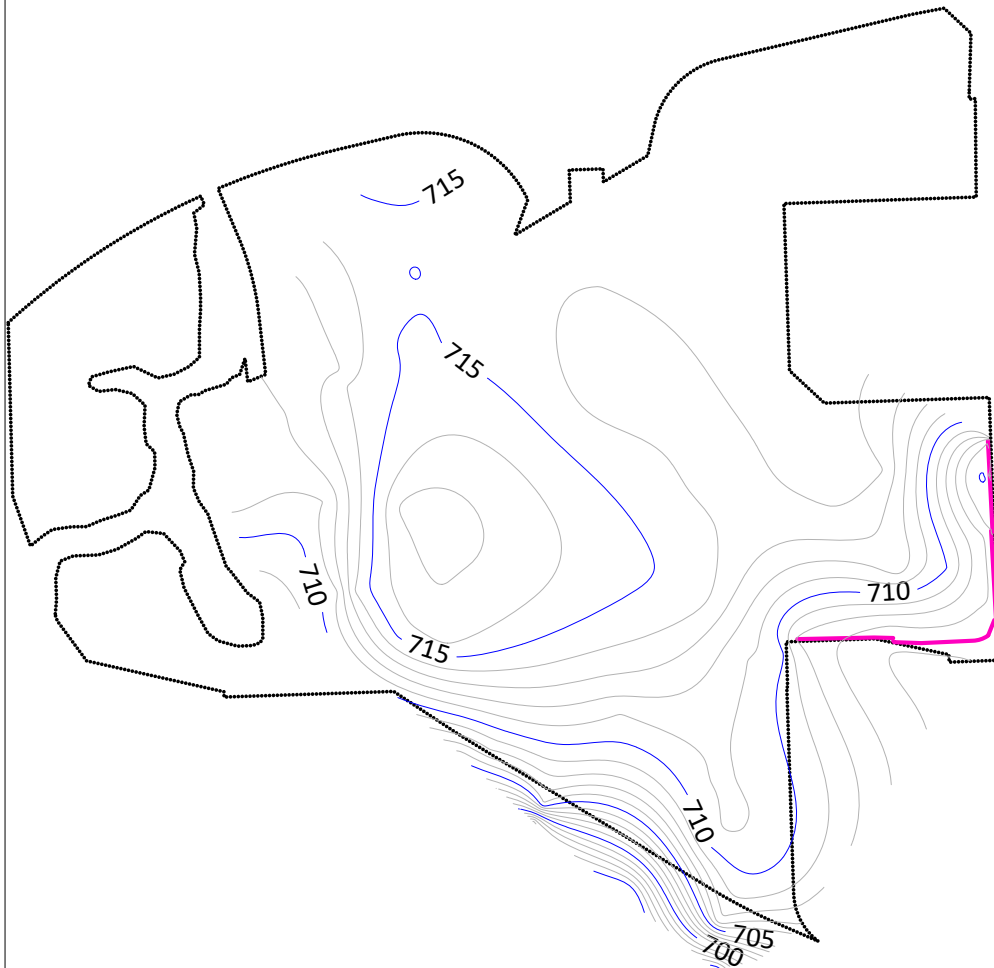
Project No. 11223073
Date August 2021

FIGURE 3

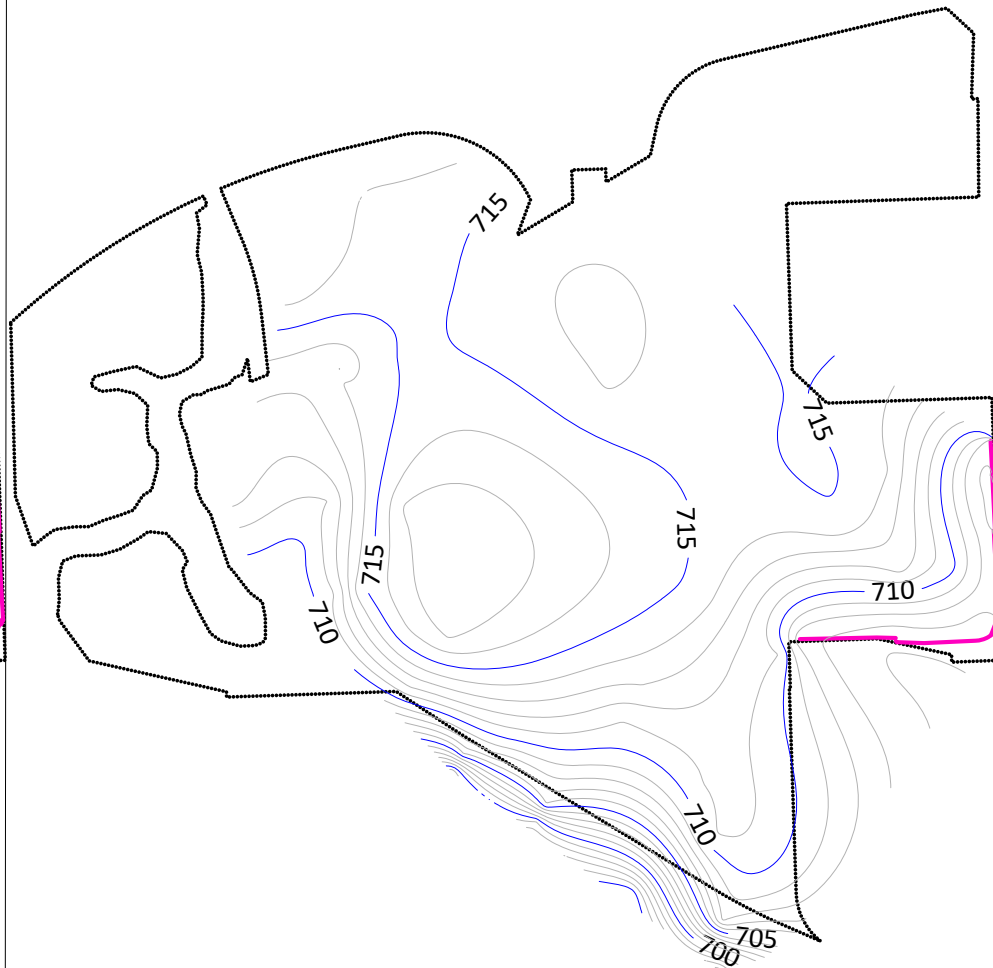
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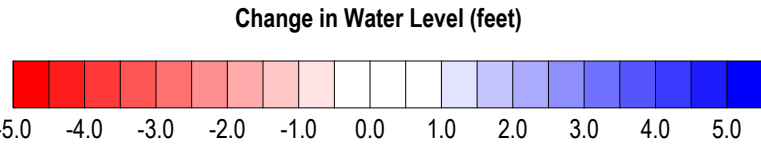
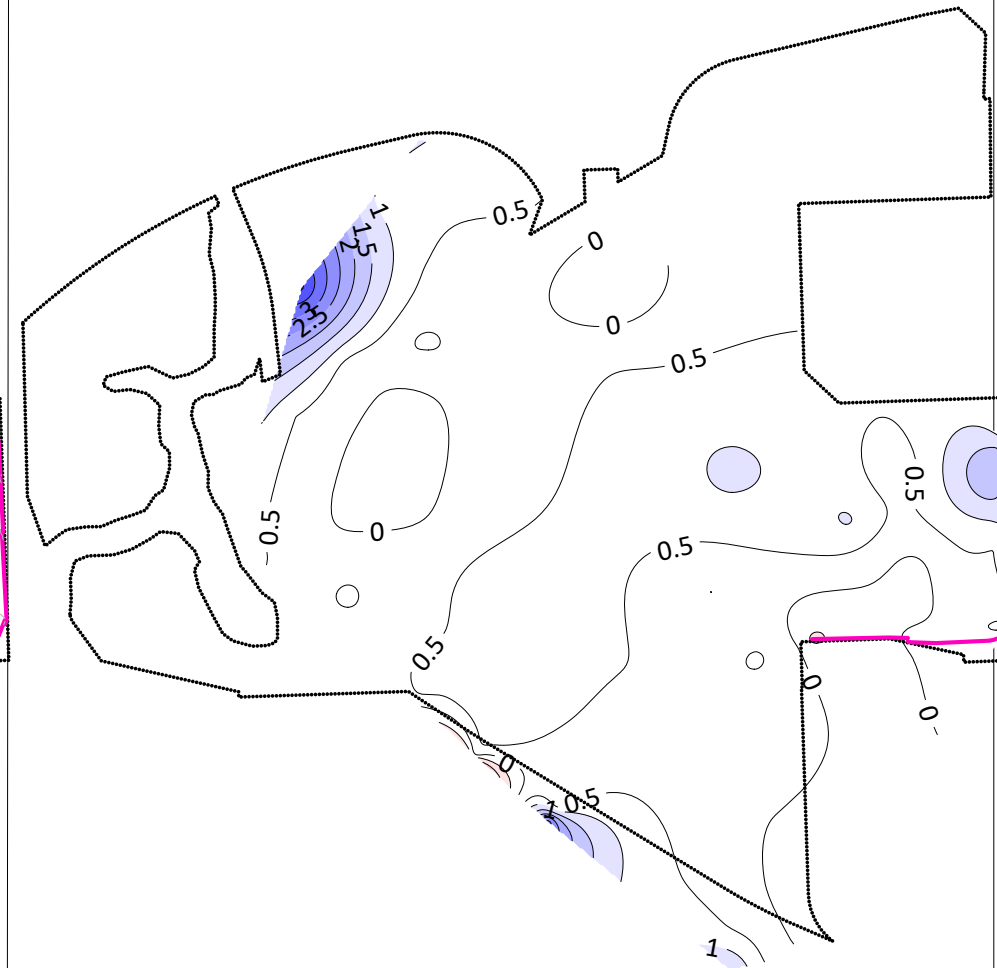
INTERMEDIATE ZONE GROUNDWATER FLOW
OCTOBER 2020



INTERMEDIATE ZONE GROUNDWATER FLOW
MAY 2021



INTERMEDIATE ZONE - CHANGE IN GROUNDWATER ELEVATION
OCTOBER 2020 to MAY 2021



LEGEND

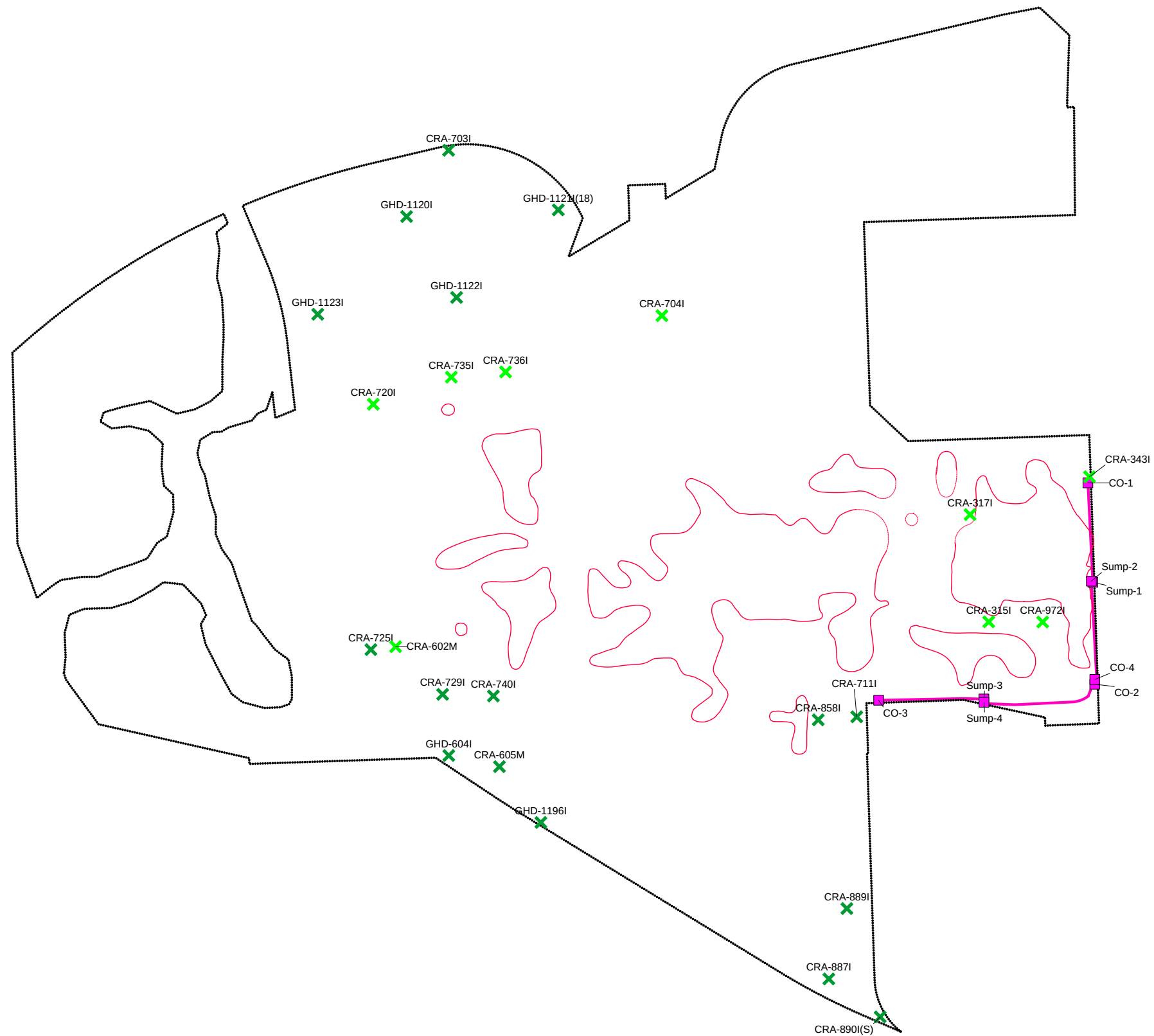
- Major Contour (ft amsl) - 2.5 ft intervals
- Minor Contour (ft amsl) - 0.5 ft intervals
- French Drain

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YPSILANTI, MICHIGAN

INTERMEDIATE ZONE GROUNDWATER
FLOW - OCT. 2020 AND MAY 2021

Project No. 11223073
Date August 2021

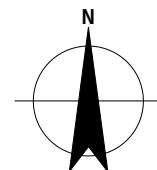
FIGURE 5



LEGEND

- Intermediate Zone Monitoring Well (selected for one or more of: Groundwater Quality, Northwest Levels)
- Intermediate Zone Monitoring Well (Sitewide flow only)
- French Drain Sumps and Cleanouts (selected for Groundwater Quality and/or French Drain Levels)

0 300 600ft

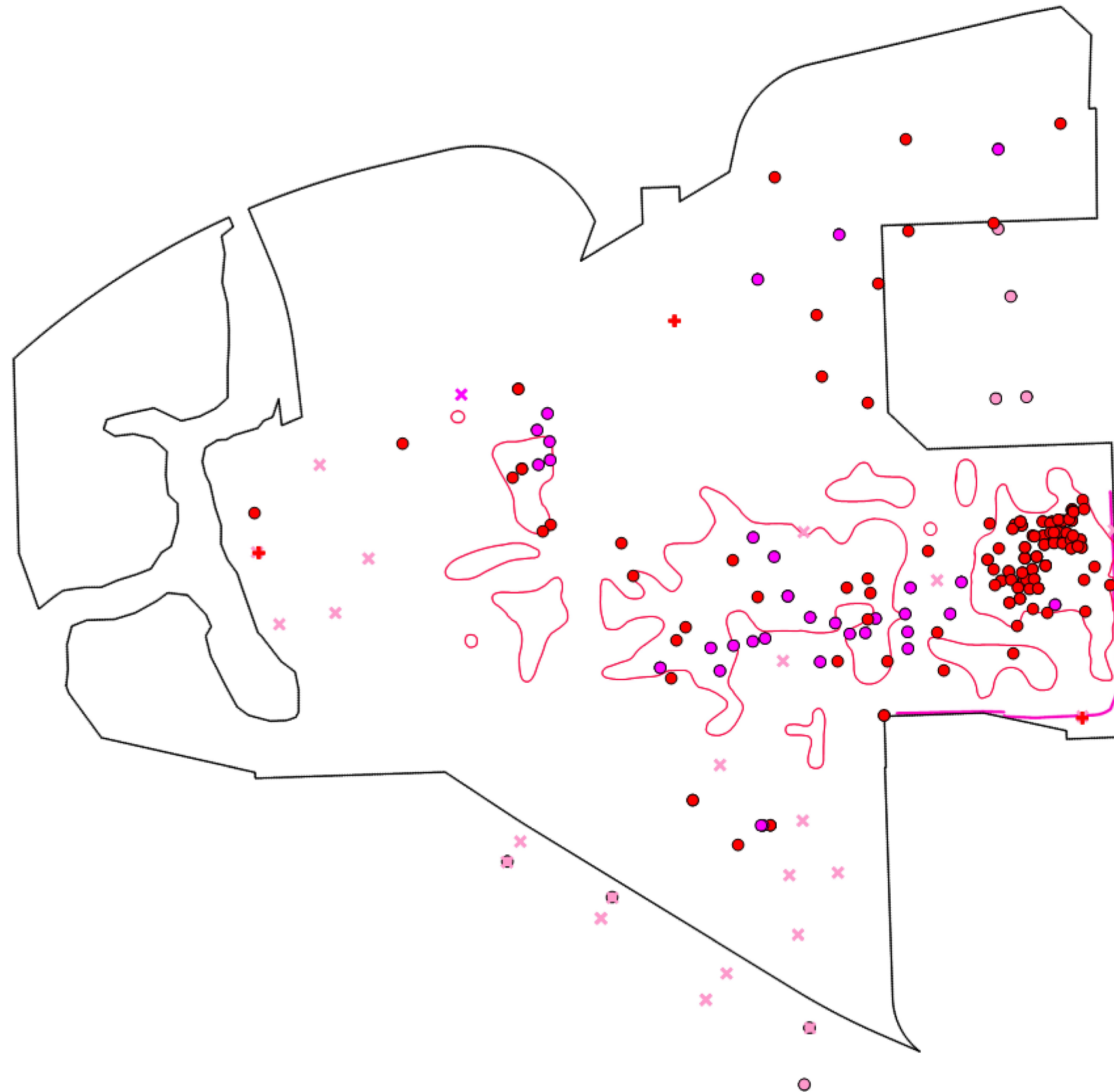


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FORMER WILLOW RUN POWERTRAIN SITE
YPSILANTI, MICHIGAN**

**INTERMEDIATE GROUNDWATER ZONE
MONITORING NETWORK**

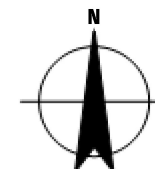
Project No. **11223073**
Date **January 2022**

FIGURE 7



LEGEND

- × + Priority #1 Abandonments (Shallow, Intermediate, Deep Zones, respectively)
- × + Priority #2 Abandonments (Shallow, Intermediate, Deep Zones, respectively)
- × + Priority #3 Abandonments (Shallow, Intermediate, Deep Zones, respectively)



**RACER TRUST
FORMER WILLOW RUN POWERTRAIN SITE
YPSILANTI, MICHIGAN**

**PROPOSED MONITORING WELL
ABANDONMENTS**

Project No. **11223073**
Date **January 2022**

FIGURE 8

Tables

Table 3
Monitoring Well Network Rationalization
Former Willow Run Powertrain Site
Ypsilanti, Michigan

Monitoring Location	Groundwater Zone	GW Quality - Perimeter (2021 - 2023) (VOCs, SVOCs, Metals)	GW Quality - Bldg 19 (VOCs)	LNAPL Stability	LNAPL - NSZD/VI	GW Flow - French Drain	GW Flow / Elevation	GW Flow - Sitewide	Keep Well?	Abandonment Priority	Abandonment Notes / Rationale (No Specific Use + ...)	Condition (May 2021)	In Concentrated Well Area in NE?	In an AOI? (AOI #)	VOC Data	SVOC Data	Metals Data	PCB Data	PFAS Data	TPH Data	Stratigraphy & Instrumentation Log?	S/ Well Nest?	GW Level Data	Well Type (SU, FM, Vault, A/B)
MH-102	French Drain	✓				✓	✓		NA	NA		OK	No	NA	2017-2021	2017-2021	2017-2021	2017-2021	2018-2021	No Data	NA	NA	NA	NA
CO-1	French Drain					✓	✓		NA	NA		OK	No	NA	NA	NA	NA	NA	2018	No Data	NA	No	2018-2021	NA
CO-2	French Drain					✓	✓		NA	NA		OK	No	NA	NA	NA	NA	NA	2018	No Data	NA	No	2018-2021	NA
CO-3	French Drain					✓	✓		NA	NA		OK	No	NA	NA	NA	NA	NA	2018	No Data	NA	No	2018-2021	NA
CO-4	French Drain					✓	✓		NA	NA		OK	No	NA	NA	NA	NA	NA	2018	No Data	NA	No	2018-2021	NA
Sump-1	French Drain	✓				✓	✓		NA	NA		OK	No	Yes (1)	2017-2020	2017-2020	2017-2020	2017	2018-2020	No Data	NA	NA	2017-2021	NA
Sump-2	French Drain	✓				✓	✓		NA	NA		OK	No	Yes (1)	2017-2020	2017-2020	2017-2020	2017	2018-2020	No Data	NA	NA	2017-2021	NA
Sump-3	French Drain	✓	✓			✓	✓		NA	NA		OK	No	No	2017-2020	2017-2020	2017-2020	2017	2018-2020	No Data	NA	NA	2017-2021	NA
Sump-4	French Drain	✓	✓			✓	✓		NA	NA		OK	No	No	2017-2020	2017-2020	2017-2020	2017	2018-2020	No Data	NA	NA	2017-2021	NA
CRA-027R	Shallow					✓	✓		Y	-		OK	No	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-050M	Shallow			✓			✓		Y	-		OK	No	No	1989-2010	2004-2008	1991-2010	2004-2008	No Data	No Data	Yes	No	2002-2021	SU
CRA-061M	Shallow		✓				✓		Y	-		OK	No	Yes (17)	1991-2021	2016-2021	2016-2021	2016-2018	No Data	1991	Yes	No	2002-2021	FM
CRA-106M	Shallow	✓	✓	✓		✓	✓		Y	-		OK	No	Yes (6)	1993-2021	1993-2021	2021	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-124M	Shallow					✓	✓		Y	-		OK	No	No	1992-2018	1993-2018	2007-2018	2007-2018	No Data	1992	Yes	No	2002-2021	FM
CRA-133M	Shallow					✓	✓		Y	-		OK	No	No	1992-2016	1997-2016	2004-2016	2004-2016	No Data	1992	Yes	Yes	2002-2021	FM
CRA-137M	Shallow		✓				✓		Y	-		OK	No	Yes (17)	1989-2021	1989-2021	2007-2021	2007-2015	No Data	1991	Yes	No	2002-2021	FM (w temp EXT)
CRA-140M	Shallow		✓				✓		Y	-		OK	No	No	1993-2021	2004-2021	1993-2021	2004-2015	2019	No Data	Yes	No	2002-2021	FM (w temp EXT)
CRA-214M-A	Shallow								Y	-	No specific use but in same BH as 'B'. So can't be abandoned yet.	Damaged (PVC SU broken at gs).	No	Yes (22)	1997-2007	1997-2007	2004-2007	2004-2007	No Data	1995	No	No	2002-2019	SU (A/B) (SU broken)
CRA-214M-B	Shallow					✓	✓		Y	-	Repair if possible.	Damaged (PVC SU broken at gs).	No	Yes (22)	2018	2018	2018	2018	No Data	No Data	No	No	2002-2020	SU (A/B) (SU broken)
CRA-217M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	1992-2021	1993-2021	2007-2021	2007	2018	1992	Yes	No	2002-2021	FM
CRA-218M-A	Shallow						✓		Y	-	No specific use but in same BH as 'B'. So can't be abandoned yet.	OK	Yes (1)	1997	1997	1997	No Data	No Data	No Data	1995	No	No	2002-2021	SU (A/B)
CRA-218M-B	Shallow					✓	✓		Y	-		OK	Yes (1)	1997	1997	1997	No Data	No Data	No Data	1995	No	No	2002-2021	SU (A/B)
CRA-219M	Shallow					✓	✓		Y	-		OK	Yes (1)	1997	1997	1997	No Data	No Data	No Data	1995	No	No	2002-2021	SU
CRA-222M	Shallow					✓	✓		Y	-	Had marked for removal but has had LNAPL present in recent past	OK	Yes (1)	2016	2016	2016	2016	2016	No Data	No Data	No	No	2002-2021	FM
CRA-223M	Shallow					✓	✓		Y	-	Had marked for removal but has had LNAPL present in recent past	OK	No	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-225M	Shallow					✓	✓		Y	-		OK	No	Yes (1)	1992-2001	1993-2001	No Data	No Data	No Data	1992	No	No	2002-2021	FM
CRA-239M	Shallow					✓	✓		Y	-		Unknown (covered by pipes)	No	Yes (36)	1997-2018	1997-2018	1997-2018	2018	2018	1995	No	No	No Data	FM
CRA-267M	Shallow			✓			✓		Y	-		OK	No	Yes (23)~	2012-2018	2012-2018	2012-2018	2012-2018	2019	No Data	No	Yes	2012-2021	FM
CRA-315M	Shallow					✓	✓		Y	-		OK	No	Yes (36)	2010-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2002-2021	FM
CRA-320M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	2004-2021	2004-2021	2004-2021	2004-2018	2020	No Data	Yes	No	2002-2021	SU
CRA-321M	Shallow			✓		✓	✓		Y	-		OK	No	No	2004-2020	2004-2020	2004-2020	2004-2015	2018	No Data	Yes	No	2002-2021	FM
CRA-322M	Shallow	✓		✓		✓	✓		Y	-		OK	No	Yes (1)	2004-2021	2004-2021	2004-2021	2004-2018	No Data	No Data	Yes	Yes	2002-2021	SU (FM w EXT)
CRA-342M	Shallow	✓		✓		✓	✓		Y	-		OK (06/2021)	No	No	2004-2018	2004-2018	2004-2018	2004-2018	No Data	No Data	Yes	No	2007-2021	FM
CRA-343M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	2004-2021	2004-2021	2004-2021	2004-2018	2020	No Data	Yes	Yes	2007-2021	SU (FM w temp? EXT)
CRA-604M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	2008-2021	2008-2021	2008-2021	2008-2018	No Data	No Data	Yes	Yes	2008-2021	FM
CRA-609M	Shallow	✓	✓	✓		✓	✓		Y	-		OK	No	No	2008-2020	2008-2020	2008-2020	2008-2015	2019	No Data	Yes	No	2008-2021	FM (w temp EXT)
CRA-611M	Shallow			✓		✓	✓		Y	-		OK	No	Yes (1)	2008-2020	2008-2020	2008-2020	2008-2015	2020	No Data	Yes	No	2008-2021	FM
CRA-612M	Shallow			✓		✓	✓		Y	-		OK	No	Yes (1)	2008-2015	2008-2015	2008-2015	2008-2015	No Data	No Data	Yes	No	2008-2021	FM
CRA-613M	Shallow	✓		✓		✓	✓		Y	-		OK	No	Yes (1)	2008-2020	2008-2020	2008-2020	2008-2015	2018	No Data	Yes	No	2008-2021	FM
CRA-614M	Shallow			✓		✓	✓		Y	-		OK	No	Yes (1)	2008-2020	2008-2020	2008-2020	2008-2015	2018	No Data	Yes	No	2008-2021	FM
CRA-615M	Shallow	✓		✓	✓	✓	✓		Y	-		OK	No	Yes (1)	2008-2020	2008-2020	2008-2020	2008-2015	No Data	No Data	Yes	No	2008-2021	FM
CRA-616M	Shallow			✓		✓	✓		Y	-		OK	No	Yes (1)	2008-2020	2008-2020	2008-2020	2008-2015	No Data	No Data	Yes	No	2008-2021	FM
CRA-617M	Shallow			✓		✓	✓		Y	-		OK	No	Yes (1)	2016	2016	2016	2016	No Data	No Data	Yes	No	2010-2021	FM
CRA-623M	Shallow			✓			✓		Y	-		OK	No	No	2008-2018	2008-2018	2008-2018	2008-2018	No Data	No Data	Yes	No	2008-2021	FM
CRA-701M	Shallow					✓	✓		Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2016	No Data	No Data	Yes	No	2012-2021	SU
CRA-703M	Shallow					✓	✓		Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	2018	No Data	Yes	Yes	2012-2021	SU
CRA-713M	Shallow			✓			✓		Y	-		OK (soft bottom)	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-722M	Shallow			✓			✓		Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-725M	Shallow	✓		✓			✓		Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-729M	Shallow	✓		✓			✓		Y	-		OK	No	Yes (18)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-740M	Shallow	✓		✓			✓		Y	-		OK	No	Yes (18)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-756M	Shallow	✓	✓	✓		✓	✓		Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-799M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-806M	Shallow	✓		✓		✓	✓		Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2018	2018	No Data	Yes	No	2012-2021	FM
CRA-807M	Shallow		✓				✓		Y	-		OK	No	Yes (6)	2012-2021	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-827ML	Shallow	✓		✓		✓	✓		Y	-		OK	No	Yes (1)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-837ML	Shallow	✓		✓		✓	✓		Y	-		OK	No	Yes (1)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-884M	Shallow	✓					✓		Y	-		Damaged (FM missing)	No	No	2013-2021	2013-2021	2013-2021	2013-2018	No Data	No Data	Yes	No	2014-2021	FM
CRA-887M	Shallow	✓					✓		Y	-		OK (06/2021)	No	No	2013-2018	2013-2018	2013-2018	2013-2018	No Data	No Data	Yes	Yes	2014-2019	FM
CRA-889M	Shallow	✓					✓		Y	-		OK	No	No	2015-2021	2015-2021	2015-2021	2015-2018	2019	No Data	Yes	Yes	2014-2021	FM
CRA-962M	Shallow	✓					✓		Y	-		OK (under sediment)	No	No	2015-2021	2015-2021	2015-2021	2015-2018	No Data	No Data	Yes	No	2014-2021	FM
CRA-970M	Shallow					✓	✓		Y	-		OK	No	No	2014	2014	2014	2014	No Data	No Data	Yes	No	2014-2021	FM
CRA-971M	Shallow					✓	✓		Y	-		OK	No	Yes (39)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	FM
CRA-972M	Shallow					✓	✓		Y	-		OK	No	No	2014	2014	2014	2014	No Data	No Data	Yes	Yes	2014-2021	FM
CRA-973M	Shallow					✓	✓		Y	-		OK	No	No	2014	2014	2014	2014	2018	No Data	Yes	No	2014-2021	FM

Table 3
Monitoring Well Network Rationalization
Former Willow Run Powertrain Site
Ypsilanti, Michigan

Monitoring Location	Groundwater Zone	GW Quality - Perimeter (2021 - 2023) (VOCs, SVOCs, Metals)	GW Quality - Bldg 19 (VOCs)	LNAPL Stability	LNAPL - NSZD/VI	GW Flow - French Drain	GW Flow / Elevation	GW Flow - Sitewide	Keep Well?	Abandonment Priority	Abandonment Notes / Rationale (No Specific Use + ...)	Condition (May 2021)	In Concentrated Well Area in NE?	In an AOI? (AOI #)	VOC Data	SVOC Data	Metals Data	PCB Data	PFAS Data	TPH Data	Stratigraphy & Instrumentation Log?	S/ Well Nest?	GW Level Data	Well Type (SU, FM, Vault, A/B)
CRA-976M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	FM
CRA-977M	Shallow				✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2014	2014	2014	2014	No Data	No Data	Yes	No	2014-2021	FM
CRA-978M	Shallow				✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2014	2014	2014	2014	No Data	No Data	Yes	No	2014-2021	FM
CRA-979M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	2015	2015	2015	2015	No Data	No Data	Yes	No	2014-2021	FM
CRA-980M	Shallow			✓	✓	✓	✓	✓	Y	-		OK	No	No	2015	2015	2015	2015	No Data	No Data	Yes	No	2014-2021	FM
CRA-981M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	2015	2015	2015	2015	No Data	No Data	Yes	No	2014-2021	FM
CRA-982M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	2015	2015	2015	2015	No Data	No Data	Yes	No	2014-2021	FM
CRA-983M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	2015	2015	2015	2015	No Data	No Data	Yes	No	2014-2021	FM
GHD-322ML	Shallow	✓		✓			✓	✓	Y	-		OK	No	Yes (1)	2021	2021	2021	No Data	No Data	No Data	Yes	Yes	2021	SU
GHD-859M	Shallow		✓				✓	✓	Y	-		OK	No	No	2017-2021	2018	2018	2018	No Data	No Data	Yes	No	2017-2021	FM (w temp EXT)
GHD-984M	Shallow	✓		✓			✓	✓	Y	-		OK	No	No	2018-2021	2018-2021	2018-2021	2018	No Data	No Data	Yes	No	2015-2021	FM
GHD-986M	Shallow				✓			✓	Y	-		OK (soft bottom)	No	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM
GHD-1004M	Shallow				✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2016	2016	2016	2016	2018	No Data	Yes	No	2016-2021	FM
GHD-1005M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	No	2016-2021	2016-2021	2016-2021	2016-2018	2018-2020	No Data	Yes	No	2016-2021	FM
GHD-1006M	Shallow				✓	✓	✓	✓	Y	-		OK	No	No	2016-2020	2016-2020	2016-2020	2016	2020	No Data	Yes	No	2016-2021	FM
GHD-1009M	Shallow				✓	✓	✓	✓	Y	-		OK (no standard sized lid)	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2016-2021	FM
GHD-1016M	Shallow			✓				✓	Y	-		OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	No	2016-2021	FM
GHD-1120M	Shallow						✓	✓	Y	-		OK	No	No	2016	2016	2016	2016	2018	No Data	Yes	Yes	2016-2021	SU
GHD-1121M(18)	Shallow						✓	✓	Y	-		OK (soft bottom)	No	No	2016-2018	2016-2018	2016-2018	2016-2018	No Data	No Data	Yes	Yes	2016-2019	SU
GHD-1122M	Shallow						✓	✓	Y	-		Damaged (FM)	No	No	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1123M	Shallow						✓	✓	Y	-		Damaged (jplug too high for lid)	No	No	2016	2016	2016	2016	2016	No Data	Yes	Yes	2016-2021	FM
GHD-1125M	Shallow			✓				✓	Y	-		OK	No	No	No Data	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1134M	Shallow		✓				✓	✓	Y	-		OK	No	Yes (6)	2017-2021	2018-2020	2018-2020	2018	No Data	No Data	Yes	No	2017-2021	FM
GHD-1145M	Shallow		✓				✓	✓	Y	-		OK	No	No	2017-2021	2018-2020	2018-2020	2018	No Data	No Data	Yes	No	2017-2021	FM (w temp EXT)
GHD-1151M	Shallow		✓					✓	Y	-		OK	No	Yes (6)	2017-2021	2017-2018	2017-2018	2017-2018	No Data	No Data	Yes	No	2017-2021	FM
GHD-1196M	Shallow	✓						✓	Y	-		OK	No	No	2021	2021	2021	No Data	No Data	No Data	Yes	Yes	2019-2021	FM
GHD-1197M	Shallow	✓						✓	Y	-		OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2019-2021	FM
GHD-1198M	Shallow			✓				✓	Y	-		OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2019-2021	FM
GHD-1209M	Shallow		✓			✓	✓	✓	Y	-		Damaged (top of PVC; jplug doesn't fit allowing water & sediment in)	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2018-2021	FM
GHD-1210M	Shallow			✓	✓	✓	✓	✓	Y	-		OK	No	No	2020	2020	2020	No Data	No Data	No Data	Yes	No	2018-2021	FM
GHD-1211M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	No	2018-2021	FM
GHD-1212M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2018-2021	2018-2021	2018-2021	2018	No Data	No Data	Yes	No	2018-2021	FM
GHD-1213M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2018	2018	2018	2018	No Data	No Data	Yes	No	2018-2021	FM
GHD-1214M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2018-2021	2018-2021	2018-2021	2018	No Data	No Data	Yes	No	2018-2021	FM
GHD-1215M	Shallow	✓		✓	✓	✓	✓	✓	Y	-		OK	No	Yes (1)	2018-2021	2018-2021	2018-2021	2018	No Data	No Data	Yes	No	2018-2021	FM (w temp EXT)
GHD-1220M	Shallow		✓			✓	✓	✓	Y	-		OK	No	No	2020-2021	2020-2021	2020-2021	No Data	No Data	No Data	Yes	No	2019-2021	FM (w temp EXT)
GHD-1223M	Shallow		✓			✓	✓	✓	Y	-		OK	No	No	2020-2021	2020-2021	2020-2021	No Data	2020	No Data	Yes	No	2019-2021	FM (w temp EXT)
GHD-1226M	Shallow	✓	✓	✓	✓	✓	✓	✓	Y	-		OK	No	No	2020-2021	2020-2021	2020-2021	No Data	2020	No Data	Yes	No	2019-2021	FM (w temp EXT)
GHD-1229M	Shallow	✓	✓	✓	✓	✓	✓	✓	Y	-		OK	No	Yes (42)~	2020-2021	2020-2021	2020-2021	No Data	2020	No Data	Yes	No	2019-2021	FM
IG-1	Shallow	✓	✓	✓	✓	✓	✓	✓	Y	-		OK	No	Yes (42)	2020-2021	2021	2021	No Data	No Data	No Data	No	No	2019-2021	FM (w temp EXT)
IG-2	Shallow								Y	-	Keep: Infiltration Gallery with IG-1	OK	No	Yes (42)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2019-2021	FM (w temp EXT)
MW-6	Shallow					✓	✓	✓	Y	-		OK	No	No	1992-1994	1992	1992	No Data	No Data	No Data	No	No	2017-2021	FM
MW-9	Shallow					✓	✓	✓	Y	-		Damaged (broken lid)	No	No	2014	No Data	No Data	No Data	No Data	No Data	No	No	2014-2021	FM
MW-101	Shallow					✓	✓	✓	Y	-		OK	No	Yes (42)	2014	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	FM
CRA-605M	Intermediate	✓					✓	✓	Y	-		OK	No	No	2008-2021	2008-2021	2008-2021	2008-2018	No Data	No Data	Yes	No	2008-2021	FM
CRA-703I	Intermediate						✓	✓	Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	SU
CRA-711I	Intermediate	✓	✓						Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2013	No Data	No Data	Yes	No	2012-2021	FM (w temp EXT)
CRA-725I	Intermediate	✓						✓	Y	-		OK	No	No	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-729I	Intermediate	✓						✓	Y	-		OK	No	Yes (18)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-740I	Intermediate	✓						✓	Y	-		OK	No	Yes (18)	2012-2021	2012-2021	2012-2021	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-858I	Intermediate	✓	✓					✓	Y	-		OK	No	No	2016-2021	2016-2021	2016-2021	2016-2018	No Data	No Data	Yes	No	2016-2021	FM (w temp EXT)
CRA-887I	Intermediate	✓						✓	Y	-		OK (06/2021)	No	No	2014-2018	2014-2018	2014-2018	2014-2018	No Data	No Data	Yes	Yes	2014-2019	FM
CRA-889I	Intermediate	✓						✓	Y	-		OK	No	No	2018-2021	2018-2021	2018-2021	2018	2019	No Data	Yes	Yes	2014-2021	FM
CRA-890I(S)	Intermediate	✓						✓	Y	-		OK	No	No	2018-2021	2018-2021	2018-2021	2018	No Data	No Data	Yes	Yes	2014-2021	FM
CRA-890I(D)	Intermediate (Deep)	✓						✓	Y	-		OK	No	No	2014-2021	2014-2021	2014-2021	2014	No Data	No Data	Yes	Yes	2014-2021	FM
GHD-604I	Intermediate	✓						✓	Y	-		OK	No	No	2021	2021	2021	No Data	No Data	No Data	Yes	Yes	2021	FM
GHD-1120I	Intermediate						✓	✓	Y	-		OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2016-2021	SU
GHD-1121I(18)	Intermediate						✓	✓	Y	-		OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2019	SU
GHD-1122I	Intermediate						✓	✓	Y	-		Damaged (FM)	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1123I	Intermediate						✓	✓	Y	-		Damaged (jplug too high for lid)	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1196I	Intermediate	✓						✓	Y	-		OK	No	No	2021	2021	2021	No Data	No Data	No Data	Yes	Yes	2019-2021	FM
CRA-315I	Intermediate							✓	Y	-		OK	No	Yes (36)	2016-2018	2016-2018	2016-2018	2016-2018	No Data	No Data	Yes	Yes	2016-2021	FM
CRA-317I	Intermediate							✓	Y	-		OK	No	No	2016-2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
CRA-343I	Intermediate							✓	Y	-		OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2016-2021	SU
CRA-602M	Intermediate							✓	Y	-		OK	No	No	2008-2018	2008-2018	2008-2018	2008-2018	No Data	No Data	Yes	No	2008-2021	FM
CRA-704I	Intermediate							✓	Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-720I	Intermediate							✓	Y	-		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM

Table 3
Monitoring Well Network Rationalization
Former Willow Run Powertrain Site
Ypsilanti, Michigan

Monitoring Location	Groundwater Zone	GW Quality - Perimeter (2021 - 2023) (VOCs, SVOCs, Metals)	GW Quality - Bldg 19 (VOCs)	LNAPL Stability	LNAPL - NSZD/VI	GW Flow - French Drain	GW Flow / Elevation	GW Flow - Sitewide	Keep Well?	Abandonment Priority	Abandonment Notes / Rationale (No Specific Use + ...)	Condition (May 2021)	In Concentrated Well Area in NE?	In an AOI? (AOI #)	VOC Data	SVOC Data	Metals Data	PCB Data	PFAS Data	TPH Data	Stratigraphy & Instrumentation Log?	S/ Well Nest?	GW Level Data	Well Type (SU, FM, Vault, A/B)	
CRA-735I	Intermediate							✓	Y	-	-	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM	
CRA-736I	Intermediate							✓	Y	-	-	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM	
CRA-972I	Intermediate							✓	Y	-	-	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM	
CRA-113M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	No	Yes (36)	1997-2013	1997-2013	1997-2013	2000-2013	No Data	1995	Yes	No	2002-2021	FM	
CRA-125M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK (underwater)	No	Yes (36)	1992-2016	1993-2016	1997-2016	2016	No Data	1995	Yes	No	2002-2021	FM	
CRA-216M-A	Shallow								N	2	No specific use but in same BH as 'B'	OK	Yes	No	2000	2000	No Data	2000	No Data	No Data	No	No	2002-2021	FM (A/B)	
CRA-216M-B	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	Yes	No	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)	
CRA-220M-A	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	Yes	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	SU (A/B)	
CRA-220M-B	Shallow								N	2	No specific use but in same BH as 'A'	OK	Yes	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	SU (A/B)	
CRA-224M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK (soft bottom)	No	Yes (1)	No Data	No Data	No Data	No Data	2018	No Data	No	No	2002-2021	FM	
CRA-228M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	No	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2015-2021	FM	
CRA-282M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	No	Yes (36)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2018-2021	FM	
CRA-969M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	No	Yes (36)	2014-2017	2014	2014	2014	No Data	No Data	Yes	No	2014-2021	FM	
GHD-999M	Shallow								N	2	Other Well in close proximity - was used for flow only	OK	No	Yes (36)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM	
CRA-015M	Shallow								N	2		OK	No	Yes (36, 3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Partial (strat, DTB)	No	No	2002-2021	FM
CRA-082M	Shallow								N	2	Nested w 082I	OK	No	Yes (3/2)	1992-2010	2007-2008	1992-2010	2007-2008	No Data	No Data	Partial (strat, DTB)	Yes	2002-2021	FM	
CRA-084M	Shallow								N	2		OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Partial (strat, DTB)	No	No	2002-2021	FM
CRA-089R	Shallow								N	2		OK	No	Yes (21)	No Data	No Data	1989	No Data	No Data	1989	Yes	No	2002-2021	FM	
CRA-091M	Shallow								N	2		OK	No	Yes (6)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM	
CRA-096M	Shallow								N	2		OK	No	Yes (6)	1992	No Data	1992	No Data	No Data	1992	Yes	No	2002-2021	FM	
CRA-097M	Shallow								N	2		OK	No	Yes (6)	1992	No Data	1992	No Data	No Data	No Data	Yes	No	2002-2021	FM	
CRA-098M	Shallow								N	2		OK	No	Yes (6)	1992-1993	1992	No Data	No Data	No Data	1992	Yes	No	2002-2021	FM	
CRA-104M	Shallow								N	2	Nested w 104I	OK	No	Yes (19, 3/2)	1992-2018	1992-2018	2018	2018	No Data	No Data	Yes	Yes	2002-2021	FM	
CRA-107M	Shallow								N	2		OK	No	Yes (6)~	1993-2018	1993-2018	2016-2018	2016-2018	No Data	No Data	Yes	No	2002-2021	FM	
CRA-260M	Shallow								N	2		OK	No	Yes (11,37)	1989-2018	2003-2018	2003-2018	2003-2018	No Data	No Data	No	No	2003-2021	FM	
CRA-266M	Shallow								N	2		OK	No	Yes (12)~	1989-2018	2012-2018	1989-2018	1989-2018	No Data	No Data	Yes	No	2012-2021	SU	
CRA-304M	Shallow								N	2		OK	No	No	2007	2007	2007	2007	No Data	No Data	Yes	No	2002-2021	FM	
CRA-317M	Shallow								N	2	Nested w 317I	OK	No	No	2007-2018	2007-2018	2007-2018	2007-2018	No Data	No Data	Yes	Yes	2002-2021	FM	
CRA-318M	Shallow								N	1		OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM	
CRA-520R	Shallow								N	1		OK	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM	
CRA-529M	Shallow								N	2		OK	No	Yes (37)	2007-2013	2007-2013	2007-2013	2007-2013	No Data	No Data	Yes	No	2006-2021	FM	
CRA-533M	Shallow								N	2		OK	No	Yes (37)	2018	2018	2018	2018	No Data	No Data	Yes	No	2006-2019	FM	
CRA-534M	Shallow								N	2		OK	No	Yes (37)	2007	2007	2007	2007	No Data	No Data	Yes	No	2006-2021	FM	
CRA-704M	Shallow								N	2	Nested w 704I	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM	
CRA-705M	Shallow								N	2		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM	
CRA-706M	Shallow								N	2		OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM	
CRA-709M	Shallow								N	2		Damaged (heaved FM and possibly well)	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM	
CRA-726M	Shallow								N	2	Nested w 726I	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM	
CRA-757M	Shallow								N	2		OK	No	Yes (36)	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM	
CRA-043R	Unk (S assumed)								N	1	Destroyed	Destroyed (sediment)	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	No Data	FM	
CRA-273M	Unk (S assumed)								N	1	Destroyed	Destroyed (sediment)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	No Data	FM	
CRA-789M	Shallow								N	2		OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM	
CRA-791M	Shallow								N	2		OK	No	Yes (9)	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM	
CRA-803M	Shallow								N	2		OK	No	No	2012-2016	2012-2016	2012-2016	2012-2016	No Data	No Data	Yes	No	2012-2021	FM	
CRA-804M	Shallow								N	2	Nested w 804I	OK (soft bottom)	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM	
CRA-805M	Shallow								N	2		OK													

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CRA-327M	Shallow								N	1	Destroyed	Destroyed (sediment)	No	Yes (42)~	2004-2016	2004-2015	2004-2015	2004-2015	No Data	No Data	Yes	No	2002-2019	FM
CRA-608M	Shallow								N	1	Destroyed	Destroyed (TOC damaged; well pulled up/compromised).	No	No	2008-2010	2008-2010	2008-2010	2008-2010	No Data	No Data	Yes	Yes	2008-2018	FM
CRA-402M-S	Shallow								N	1	Destroyed	Destroyed (heaved, PVC loose in hole).	No	No	2003-2010	2003-2008	2003-2010	2003-2008	No Data	No Data	Yes	No	2003-2018	FM
CRA-527M	Shallow								N	1	Destroyed (assumed).	Damaged (no lid or jplug - filled with water).	No	Yes (11, 37)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2018	FM
LMW-1	Shallow								N	1	Destroyed	Destroyed (bent) then CNL	No	No	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2014-2019	SU
CRA-001M	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-001R	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2015-2021	FM
CRA-003R	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2015-2021	FM
CRA-004R	Shallow								N	1	Other wells in area, no log, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2015-2021	FM
CRA-005RA	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-005RB	Shallow								N	1	Other wells in area, no log, no GW analytical (same BH as 005RA)	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-006R	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2011-2021	FM
CRA-120M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-120M-B	Shallow								N	1	Other wells in area, no log, no GW analytical (same BH as 120M-A)	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-121M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-121M-B	Shallow								N	1	Other wells in area, no log, no GW analytical (same BH as 121M-A)	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-122M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-122M-B	Shallow								N	1	Other wells in area, no log, no GW analytical (same BH as 122M-A)	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-129M	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-204M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-204M-B	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-205M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (10)	No Data	No Data	No Data	No Data	No Data	1995	No	No	2002-2021	FM (A/B)
CRA-205M-B	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (10)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM (A/B)
CRA-206M	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (10)	1992	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-207M	Shallow								N	1	Other wells in area, no log, no GW analytical	OK	Yes	Yes (10)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2021	FM
CRA-208M-A	Shallow								N	1	Other wells in area, no log, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2003-2018	FM (A/B)
CRA-208M-B	Shallow								N	1	Other wells in area, no log, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2003-2018	FM (A/B)
CRA-401R	Shallow								N	1	Other wells in area	CNL (soil disturbance in area)	Yes	No	2004	2004	2004	2004	No Data	No Data	Yes	No	2004-2020	FM
CRA-402R	Shallow								N	1	Other wells in area	OK	Yes	Yes (10)	2004	2004	2004	2004	No Data	No Data	Yes	No	2004-2021	FM
CRA-403R	Shallow								N	1	Other wells in area	OK	Yes	No	2004	2004	2004	2004	No Data	No Data	Yes	No	2004-2021	FM
CRA-501R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-502R	Shallow								N	1	Other wells in area, no GW analytical	CNL (concrete broken up and thin soil layer in area)	Yes	Yes (10)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2020	FM
CRA-503R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-504R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	Vault
CRA-505R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2018	FM
CRA-506R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	Vault
CRA-507R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	FM
CRA-508R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	Vault
CRA-509R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	Vault
CRA-510R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2017	FM
CRA-511R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2017	FM
CRA-512R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2019	FM
CRA-513R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-515R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-516R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-517R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-518R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-519R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-521R	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (33, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2018	FM
CRA-522R	Shallow								N	1	Other wells in area, no GW analytical	Underwater	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-523R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	FM
CRA-524R	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2005-2021	Vault
GHD-988M	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM
GHD-989M	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM
GHD-990M	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2017	FM
GHD-991M	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2018	FM
GHD-992M	Shallow								N	1	Other wells in area, no GW analytical	CNL (beneath large soil pile)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2017	FM
GHD-993M	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	Yes (10)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM
GHD-995M	Shallow								N	1	Other wells in area	OK	Yes	Yes (10)	2016	2016	2016	2016	No Data	No Data	Yes	No	2015-2021	FM
GHD-996M	Shallow								N	1	Other wells in area	OK	Yes	Yes (33, 22)	2016	2016	2016	2016	No Data	No Data	Yes	No	2015-2021	FM
GHD-998M	Shallow								N	1	Other wells in area, no GW analytical	OK	Yes	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2015-2021	FM
CRA-100M	Shallow								N	2		OK	No	Yes (3/2)	1992-2018	2018	2018	2018	No Data	1992	No	No	2002-2021	FM
CRA-261M	Shallow								N	2		OK	No	Yes (11,37)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2003-2021	FM
CRA-276M	Shallow								N	2		OK	No	Yes (36, 3/2)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2015-2021	FM
LMW-2	Shallow								N	2	No log, no GW analytical.	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2014-2021	SU
LMW-3	Shallow								N	2	No log, no GW analytical.	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2014-2021	SU
CRA-086M-A	Shallow								N	2	-	OK	No	Yes (3/2)	1993	No Data	No Data	No Data	No Data	No Data	Partial (strat, DTB)	No	2002-2021	FM (A/B)

Table 3
Monitoring Well Network Rationalization
Former Willow Run Powertrain Site
Ypsilanti, Michigan

Monitoring Location	Groundwater Zone	GW Quality - Perimeter (2021 - 2023) (VOCs, SVOCs, Metals)	GW Quality - Bldg 19 (VOCs)	LNAPL Stability	LNAPL - NSZD/VI	GW Flow - French Drain	GW Flow / Elevation	GW Flow - Sitewide	Keep Well?	Abandonment Priority	Abandonment Notes / Rationale (No Specific Use + ...)	Condition (May 2021)	In Concentrated Well Area in NE?	In an AOI? (AOI #)	VOC Data	SVOC Data	Metals Data	PCB Data	PFAS Data	TPH Data	Stratigraphy & Instrumentation Log?	S/ Well Nest?	GW Level Data	Well Type (SU, FM, Vault, A/B)
CRA-086M-B	Shallow								N	2	No GW analytical	OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Partial (strat, DTB)	No	2002-2021	FM (A/B)
CRA-101M	Shallow								N	2		OK	No	Yes (21, 3/2)	1992-2016	1992-2016	2016	2016	No Data	1992	Partial (strat, DTB)	No	2002-2021	FM
CRA-102M	Shallow								N	2		OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Partial (strat, DTB)	No	2002-2021	FM
CRA-103M	Shallow								N	2		OK	No	Yes (3/2)	2007-2013	2007-2013	2007-2013	2007-2013	No Data	No Data	Partial (strat, DTB)	No	2002-2021	FM
CRA-009R	Shallow								N	2	No GW analytical	OK	No	Yes (21)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2001-2021	FM
CRA-017R	Shallow								N	2	No GW analytical	OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2001-2021	FM
CRA-041R	Shallow								N	2	No GW analytical	Damage (stickup bent)	No	Yes (36, 22)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-089M	Shallow								N	2	No GW analytical	OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-090M	Shallow								N	2		OK	No	Yes (6)	1993	1993	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-092M	Shallow								N	2		OK	No	Yes (6)	1993	1993	1993	No Data	No Data	1993	Yes	No	2002-2021	FM
CRA-094M	Shallow								N	2		OK	No	No	2007-2013	2007-2013	1993-2013	2007-2013	No Data	1993	Yes	No	2002-2021	FM
CRA-105M	Shallow								N	2		OK	No	Yes (3/2)	1992-2018	2007-2018	2007-2018	2007-2018	No Data	No Data	Yes	No	2002-2021	FM
CRA-108M	Shallow								N	2		OK (soft bottom)	No	Yes (6)	1993	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-109M	Shallow								N	2		OK	No	Yes (6)	1993-2013	1993-2013	2007-2013	2007-2013	No Data	No Data	Yes	No	2002-2021	FM
CRA-263M	Unk (S assumed)								N	4	Not Part of Network. Destroyed (assumed)/CNL.. No Action.	Destroyed (assumed), CNL since 07/2015.	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	No	No	2011-2013	FM
CRA-110M	Shallow								N	2		OK	No	Yes (22)	1997-2013	1997-2013	1997-2013	2007-2013	No Data	1995	Yes	No	2002-2021	FM
CRA-309M	Shallow								N	2	No GW analytical	OK	No	Yes (3/2)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-310M	Shallow								N	2	-	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	No	2002-2021	FM
CRA-311M	Shallow								N	2	-	Damaged (broken 6" lid)	No	No	2007-2018	2007-2018	2007-2018	2007-2018	No Data	No Data	Yes	No	2002-2021	FM
CRA-312M	Shallow								N	2	-	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	No	2002-2021	FM
CRA-313M	Shallow								N	2	No GW analytical	OK (soft bottom)	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2021	FM
CRA-405M-S	Shallow								N	2	-	OK	No	Yes (37)~	2003-2010	2003-2008	2003-2010	2003-2008	No Data	No Data	Yes	No	2003-2021	FM
CRA-525M	Shallow								N	2	No GW analytical.	OK	No	Yes (11)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2021	FM
CRA-526M	Shallow								N	2	No GW analytical.	OK	No	Yes (11)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2021	FM
CRA-528M	Shallow								N	2	No GW analytical.	OK	No	Yes (11, 37)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2006-2021	FM
CRA-710M	Shallow								N	2	-	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-833M	Shallow								N	2	-	OK	No	Yes (12)	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	SU
GHD-1013M	Shallow								N	2	-	OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	No	2016-2021	FM
CRA-264M	Shallow								N	3	WCAA Property (NE) - Destroyed (assumed)	SU was broken to about 0.10' ags; later reported Destroyed.	No	Yes (12)	1989-2013	2012-2013	1989-2013	1989-2013	No Data	No Data	Yes	No	2011-2018	SU (SU destroyed)
CRA-265M	Shallow								N	3	WCAA Property (NE)	OK	No	Yes (12)	1989-1990	No Data	1989-1990	1989-1990	No Data	No Data	Yes	No	2011-2021	SU
CRA-828M	Shallow								N	3	WCAA Property (NE)	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-829M	Shallow								N	3	WCAA Property (NE)	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-948M	Shallow								N	3	Ypsilanti Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2014-2020	SU
CRA-949M	Shallow								N	3	Ypsilanti Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2019	SU
CRA-951M	Shallow								N	3	Ypsilanti Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2015-2017	SU
CRA-952M	Shallow								N	3	Ypsilanti Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2015-2020	SU
CRA-053M	Shallow								N	4	Not Part of Network. Destroyed or Abandoned/CNL. No Action.	CNL since 2007/no record of decom.	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2002-2007	FM
CRA-128M	Shallow								N	4	Not Part of Network. Destroyed or Concreted Over/CNL. No Action.	CNL since 2003/no record of decom.	No	No	1993-1997	1997	1997	No Data	No Data	1995	Yes	No	2002-2003	FM
CRA-215M-A	Shallow								N	4	Not Part of Network. Inaccessible (under test track). No Action.	Unknown (under east end test track)	Yes	Yes (22)	1997-2016	1997-2016	2016	2016	No Data	1995	No	No	2002-2017	FM (A/B)
CRA-215M-B	Shallow								N	4	see CRA-215M-A	Unknown (under east end test track)	Yes	Yes (22)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002-2017	FM (A/B)
CRA-253M	Shallow								N	4	Not Part of Network. Destroyed/CNL. No Action.	Destroyed (sediment). CNL since 04/2015.	No	Yes (6)	1993	1993	No Data	No Data	No Data	No Data	Yes	No	No Data	FM
MW-103	Shallow								N	4	Not Part of Network. Damaged. Not RACER Responsibility.	Damaged (obstruction; difficult to get wls).	No	No	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2014-2016	SU
MW-104	Shallow								N	4	Not Part of Network. Destroyed (assumed). Not RACER Responsibility.	CNL/no record of decom (WCAA).	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	No Data	SU
CRA-052M	Intermediate								N	2	-	OK	No	Yes (14)	1992-2010	2004-2008	1992-2010	2004-2008	No Data	No Data	Yes	No	2002-2021	FM
CRA-724I	Intermediate								N	2	-	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
CRA-731I	Intermediate								N	2	-	OK	No	Yes (37)	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-784I	Intermediate								N	2	-	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-787I	Intermediate								N	2	-	OK	No	Yes (37)	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	No	2012-2021	FM
GHD-1029I	Intermediate								N	2	-	OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	No	2016-2021	FM
CRA-401M-D	Intermediate								N	2	-	OK	No	Yes (37)	2003-2010	2003-2008	2003-2010	2003-2008	No Data	No Data	Yes	No	2003-2021	FM
CRA-804I	Intermediate								N	2	Nested w 804M	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-888I	Intermediate								N	2	Nested w 888M	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2014-2021	FM
CRA-082I	Intermediate								N	2	Nested w 082M	OK	No	Yes (3/2)	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2016-2021	FM
CRA-104I	Intermediate								N	2	Nested w 104M	OK	No	Yes (19, 3/2)	2016-2018	2016-2018	2016-2018	2016-2018	No Data	No Data	Yes	Yes	2016-2021	FM
CRA-322I	Intermediate								N	2	Nested w 322M, 322ML; WCAA side of Fr. Drain	OK	No	Yes (1)	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2016-2021	FM
CRA-726I	Intermediate								N	2	Nested w 726M	OK	No	No	2012-2018	2012-2018	2012-2018	2012-2018	No Data	No Data	Yes	Yes	2012-2021	FM
CRA-785I	Intermediate								N	2	Nested w 133M	OK	No	No	2012-2016	2012-2016	2012-2016	2012-2016	No Data	No Data	Yes	Yes	2012-2021	FM
GHD-1124I	Intermediate								N	2	Nested w 1124M	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1125I	Intermediate								N	2	Nested w 1125M	OK (soft bottom)	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1126I	Intermediate								N	2	Nested w 1126M	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	FM
GHD-1127I	Intermediate								N	2	Nested w 1127M	OK	No	No	2018	2018	2018	2018	No Data	No Data	Yes	Yes	2016-2021	SU
GHD-1232I	Intermediate								N	2	Nested w 1232M; S Parcel near former WWTP	OK	No	Yes (45)	No Data	No Data	No Data	No Data	2019	No Data	Yes	Yes	2019-2021	FM (w temp EXT)
GHD-1233I	Intermediate								N	2	Nested w 1233M; S Parcel near former WWTP	OK	No	No	No Data	No Data	No Data	No Data	2019	No Data	Yes	Yes	2019-2021	FM (w temp EXT)
GHD-1234I	Intermediate								N	2	Nested w 1234M; S Parcel near former WWTP	OK	No	Yes (45)	No Data	No Data	No Data	No Data	2019	No Data	Yes	Yes	2019-2021	FM (w temp EXT)
GHD-1199I	Intermediate								N	2	Nested w 267M	OK	No	Yes (43)	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2019-2021	SU (FM w temp? EXT)
CRA-947I	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	SU
CRA-948I(D)	Intermediate (Deep)								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2014-2021	SU

Table 3
Monitoring Well Network Rationalization
Former Willow Run Powertrain Site
Ypsilanti, Michigan

Monitoring Location	Groundwater Zone	GW Quality – Perimeter (2021 - 2023) (VOCs, SVOCs, Metals)	GW Quality - Bldg 19 (VOCs)	LNAPL Stability	LNAPL - NSZD/VI	GW Flow - French Drain	GW Flow / Elevation	GW Flow - Sitewide	Keep Well?	Abandonment Priority	Abandonment Notes / Rationale (No Specific Use + ...)	Condition (May 2021)	In Concentrated Well Area in NE?	In an AOI? (AOI #)	VOC Data	SVOC Data	Metals Data	PCB Data	PFAS Data	TPH Data	Stratigraphy & Instrumentation Log?	S/I Well Nest?	GW Level Data	Well Type (SU, FM, Vault, A/B)
CRA-948I(S)	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2014-2021	SU
CRA-949I	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	Yes	2014-2021	SU
CRA-950I(D)R	Intermediate (Deep)								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	SU
CRA-950I(S)	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	SU
CRA-951I	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2014-2021	SU
CRA-953I	Intermediate								N	3	Ypsi. Twp. Property (Destroyed)	Destroyed (ran over). Was a SU.	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2019	SU (SU destroyed)
CRA-954I(D)	Intermediate (Deep)								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	SU
CRA-954I(S)	Intermediate								N	3	Ypsi. Twp. Property	OK	No	No	No Data	No Data	No Data	No Data	No Data	No Data	Yes	No	2014-2021	SU
YCUA-MW3	Intermediate								N	4	Not RACER Responsibility (Ypsi. Twp. Property, installed by others)	OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	No	2014-2021	SU
YCUA-MW4	Intermediate								N	4	Not RACER Responsibility (Ypsi. Twp. Property, installed by others)	OK	No	No	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2014-2021	SU
CRA-032R	Unk (I assumed)								N	4	Not Part of Network: Destroyed / CNL (buried, in vault). No Action.	Believed buried/not decom'd.	Yes	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002	Vault
CRA-033R	Unk (I assumed)								N	4	Not Part of Network: Destroyed / CNL (buried, in vault). No Action.	Believed buried/not decom'd.	Yes	Yes (1)	No Data	No Data	No Data	No Data	No Data	No Data	No	No	2002	Vault
YCUA-MW1	Intermediate								N	4	Not Part of Network. Not RACER Responsibility.	Severe damage; cannot get wl.	No	No	2016	2016	2016	2016	No Data	No Data	Yes	Yes	2014-2017	SU
CRA-704D	Deep								N	1	Deep zone wells not required.	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-726D	Deep								N	1	Deep zone wells not required.	OK	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
CRA-785D	Deep								N	1	Deep zone wells not required. Destroyed.	Destroyed (screen full of sediment which cannot be removed)	No	No	2012-2013	2012-2013	2012-2013	2012-2013	No Data	No Data	Yes	No	2012-2021	FM
Tyler Pond Utility Bridge	Surface Water								NA	NA	-	-	NA	No	No Data	No Data	No Data	No Data	No Data	No Data	NA	NA	NA	NA

Notes:

Table Organization

- French Drain Monitoring Locations
- Shallow Zone (Wells to keep for specific reasons except Site-wide flow, Wells to keep for Site-wide flow only ('filler wells'), Wells to abandon in priority order - 1,2,3). All sub-groups in alpha/numeric order.
- Intermediate Zone (Wells to keep for specific reasons except Site-wide flow, Wells to keep for Site-wide flow only ('filler wells'), Wells to abandon in priority order - 1,2,3). All sub-groups in alpha/numeric order.
- Deep Zone (Wells to abandon in priority order - 1,2,3). All sub-groups in alpha/numeric order.
- Surface Water Monitoring Location

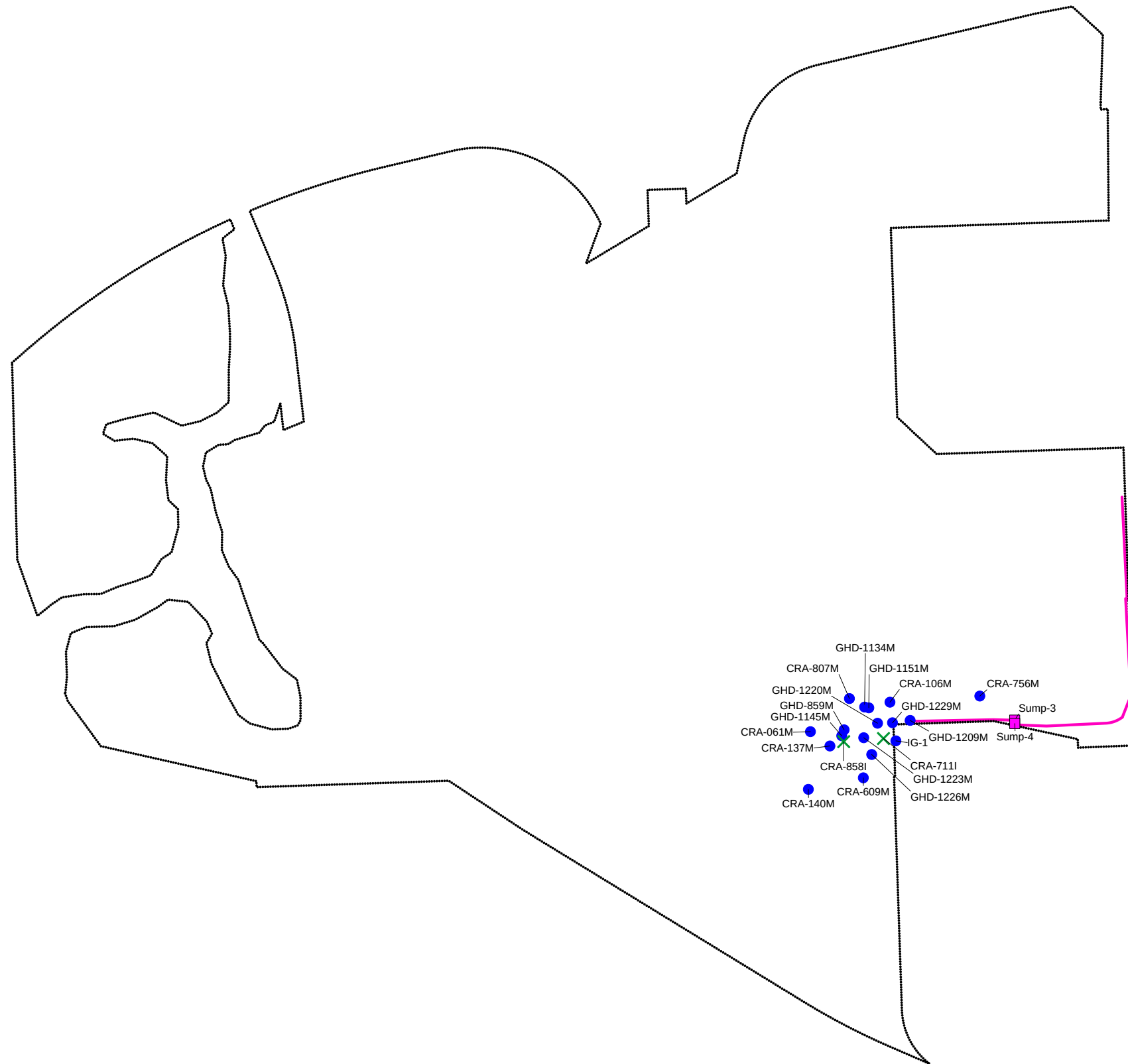
Abbreviations

- GW: Groundwater
- LNAPL: Light Non-Aqueous Phase Liquid
- NSZD/VI: Natural Source Zone Depletion / Vapor Intrusion
- AOI: Area Of Interest
- VOCs: volatile organic compounds, SVOCs: semi-volatile organic compounds; PCBs: polychlorinated biphenyls; PFAS: per- and polyfluoroalkyl substances; TPH: total petroleum hydrocarbons.
- SU: stick-up style protective casing (top of well is above ground)
- FM: flush mount style protective casing (top of well is below ground)
- temp EXT: temporary extension (will be converted to a FM in future)

Attachments

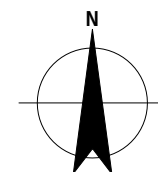
Attachment A

Rationale for Retaining Monitoring Wells



LEGEND

- Shallow Zone Monitoring Well (selected)
- ✕ Intermediate Zone Monitoring Well (selected)
- French Drain Sump (selected)

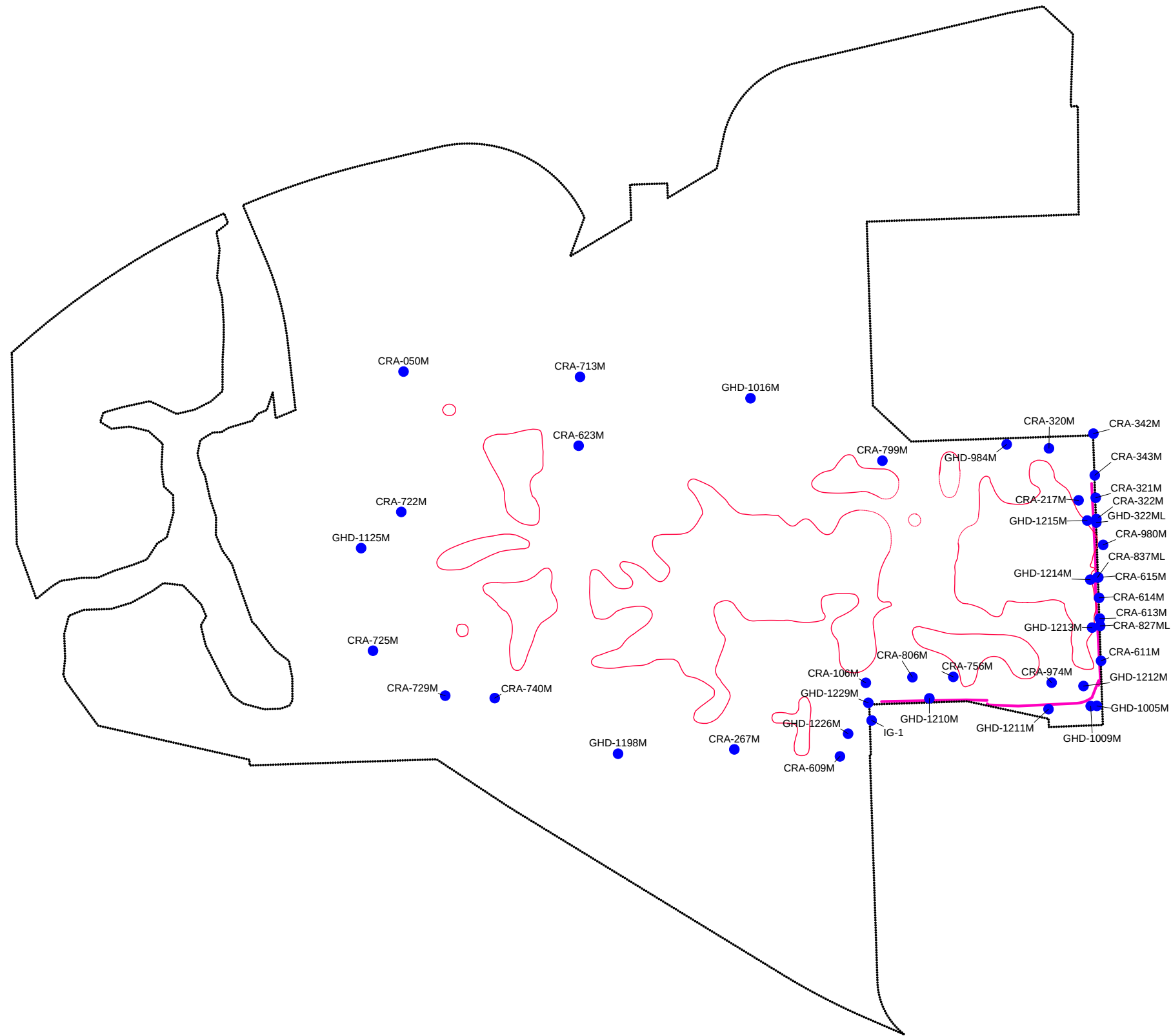


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GROUNDWATER QUALITY -
BUILDING 19 ("PCE") AREA

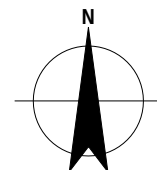
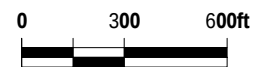
Project No. 11223073
Date January 2022

FIGURE A.2



LEGEND

- Shallow Zone Monitoring Well (selected)
- ✕ Intermediate Zone Monitoring Well (selected)
- French Drain Sump (selected)

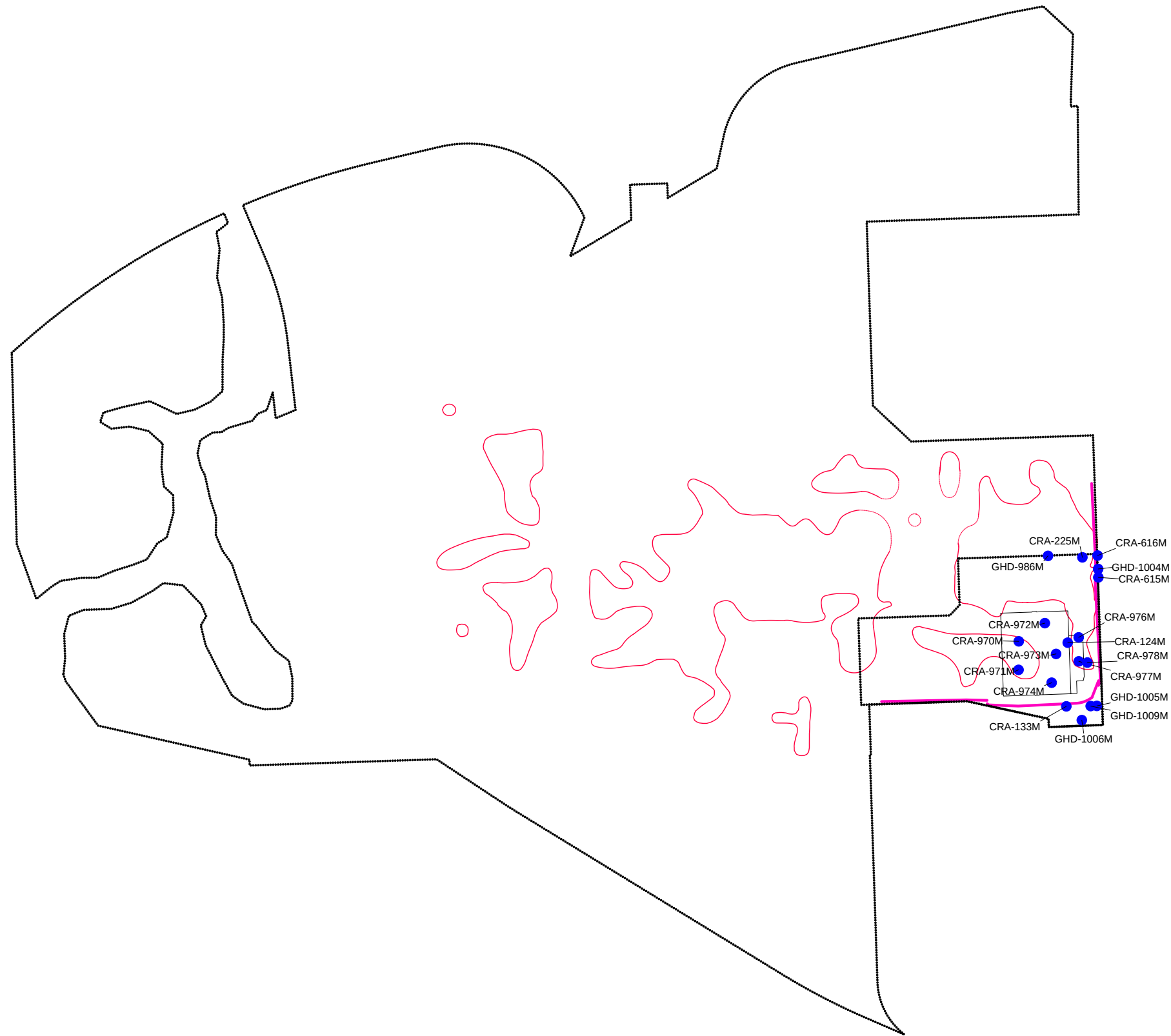


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LNAPL STABILITY

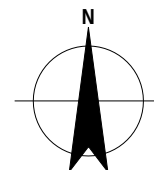
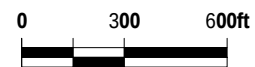
Project No. 11223073
Date January 2022

FIGURE A.3



LEGEND

- Shallow Zone Monitoring Well (selected)
- ✕ Intermediate Zone Monitoring Well (selected)
- French Drain Sump (selected)

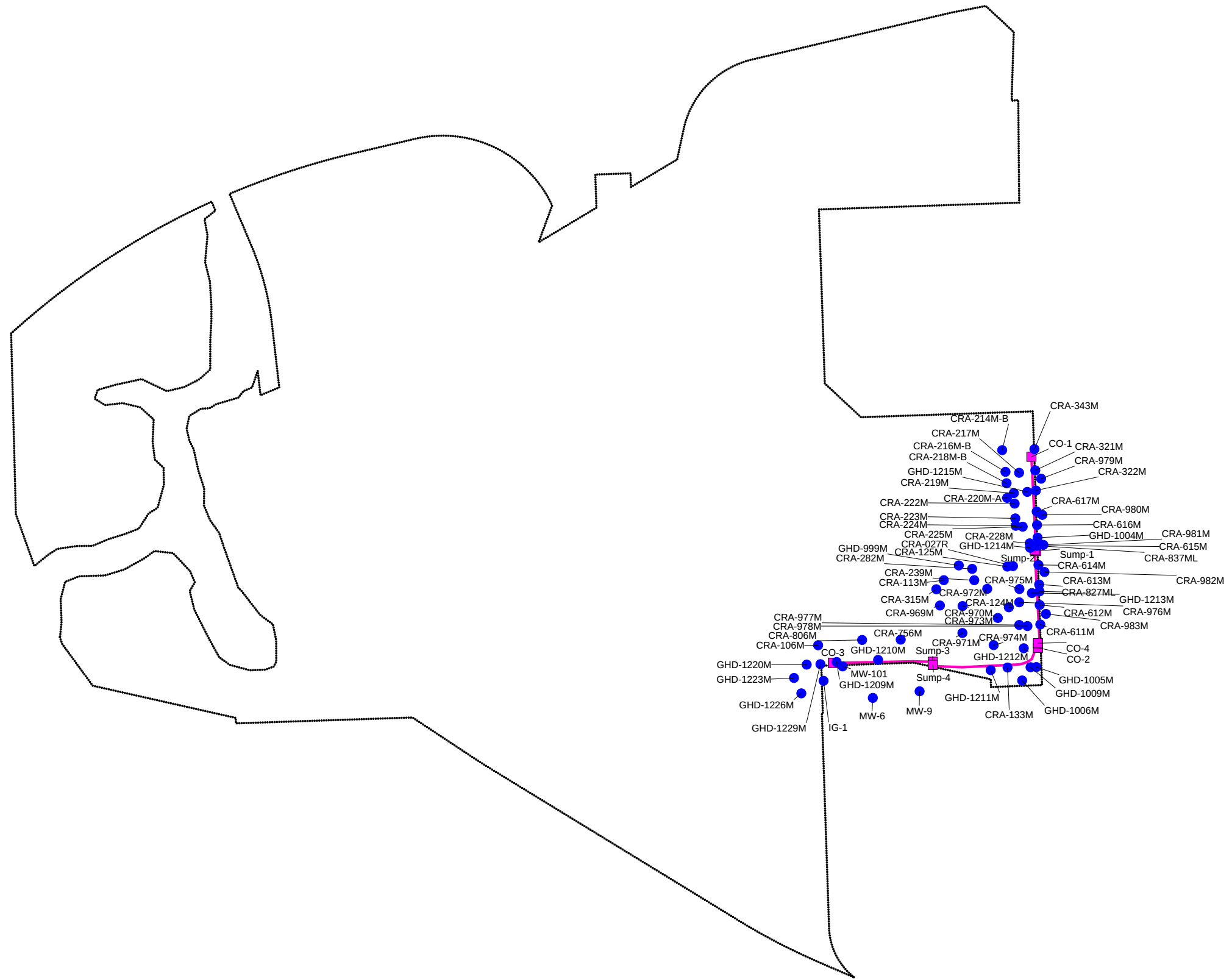


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LNAPL
POTENTIAL NSZD MONITORING

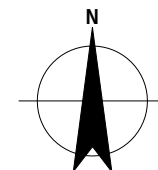
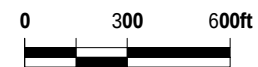
Project No. 11223073
Date January 2022

FIGURE A.4



LEGEND

- Shallow Zone Monitoring Well (selected)
- ✕ Intermediate Zone Monitoring Well (selected)
- French Drain Sump (selected)

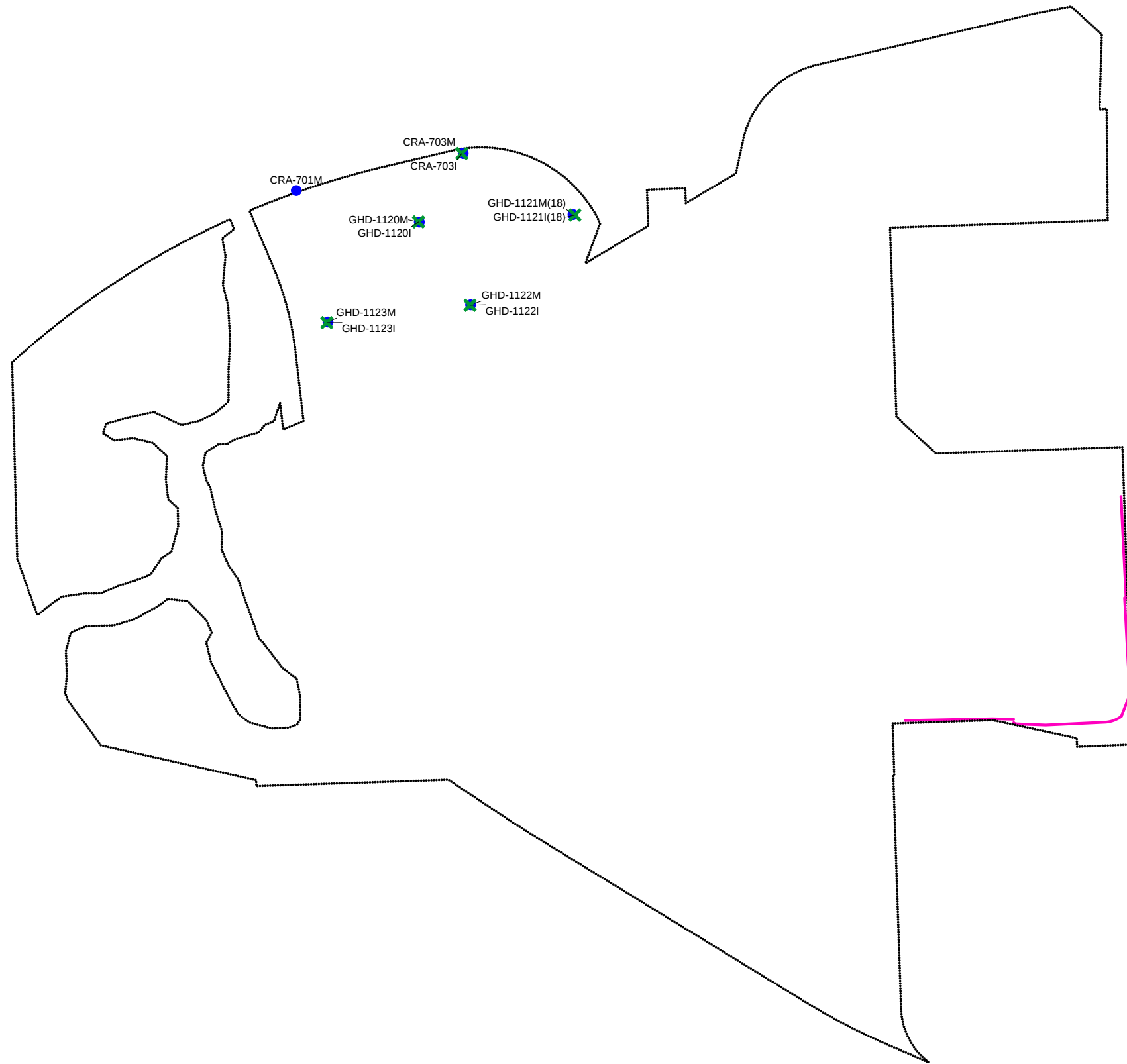


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FRENCH DRAIN CAPTURE

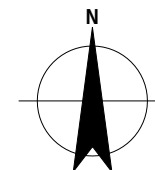
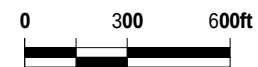
Project No. 11223073
Date January 2022

FIGURE A.5



LEGEND

- Shallow Zone Monitoring Well (selected)
- ✕ Intermediate Zone Monitoring Well (selected)
- French Drain Sump (selected)

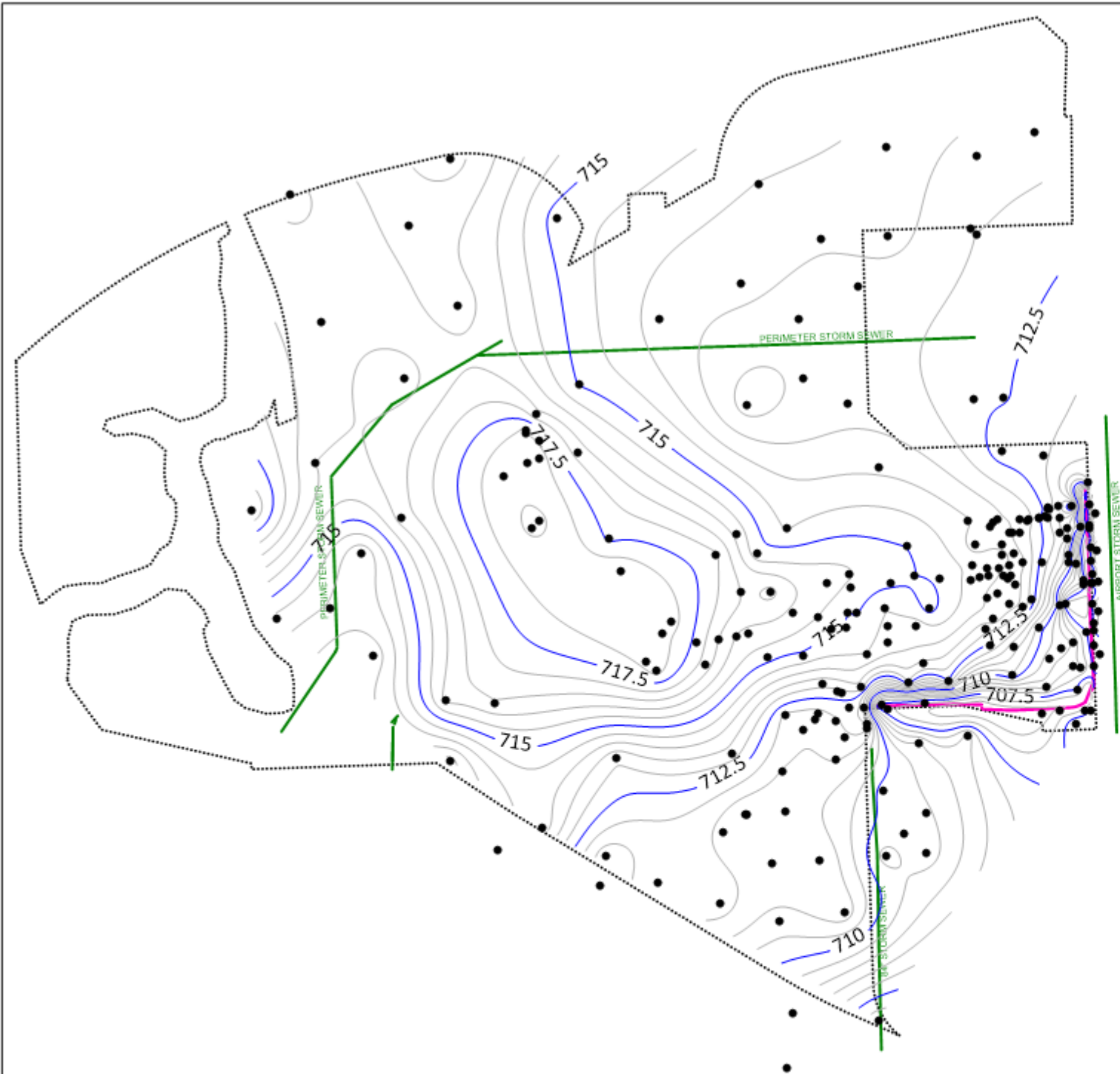


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FORMER WILLOW RUN POWERTRAIN SITE
YPSILANTI, MICHIGAN

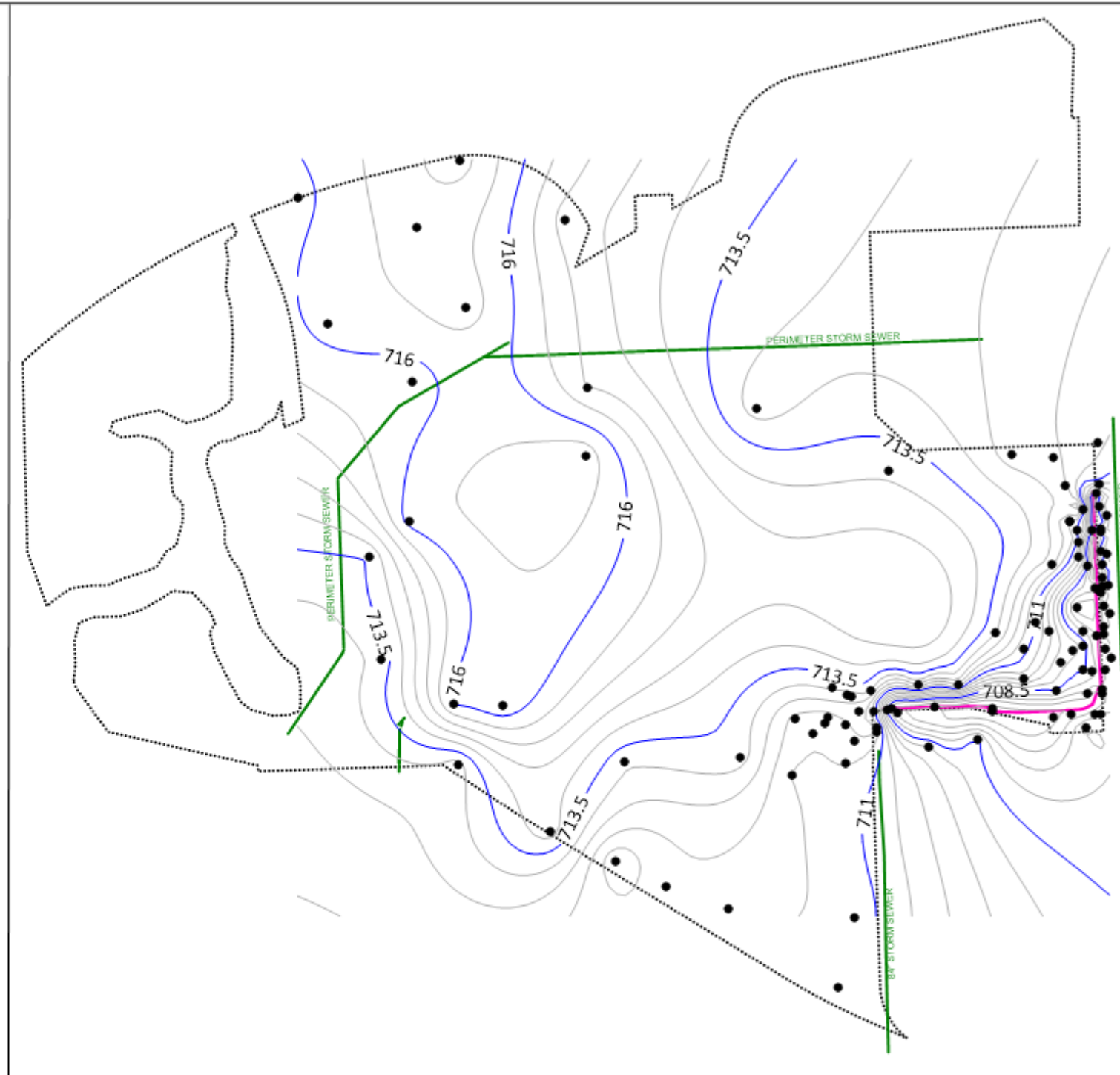
FLOW DIRECTION AND ELEVATION -
NORTHWEST INFILTRATION AREA

Project No. 11223073
Date January 2022

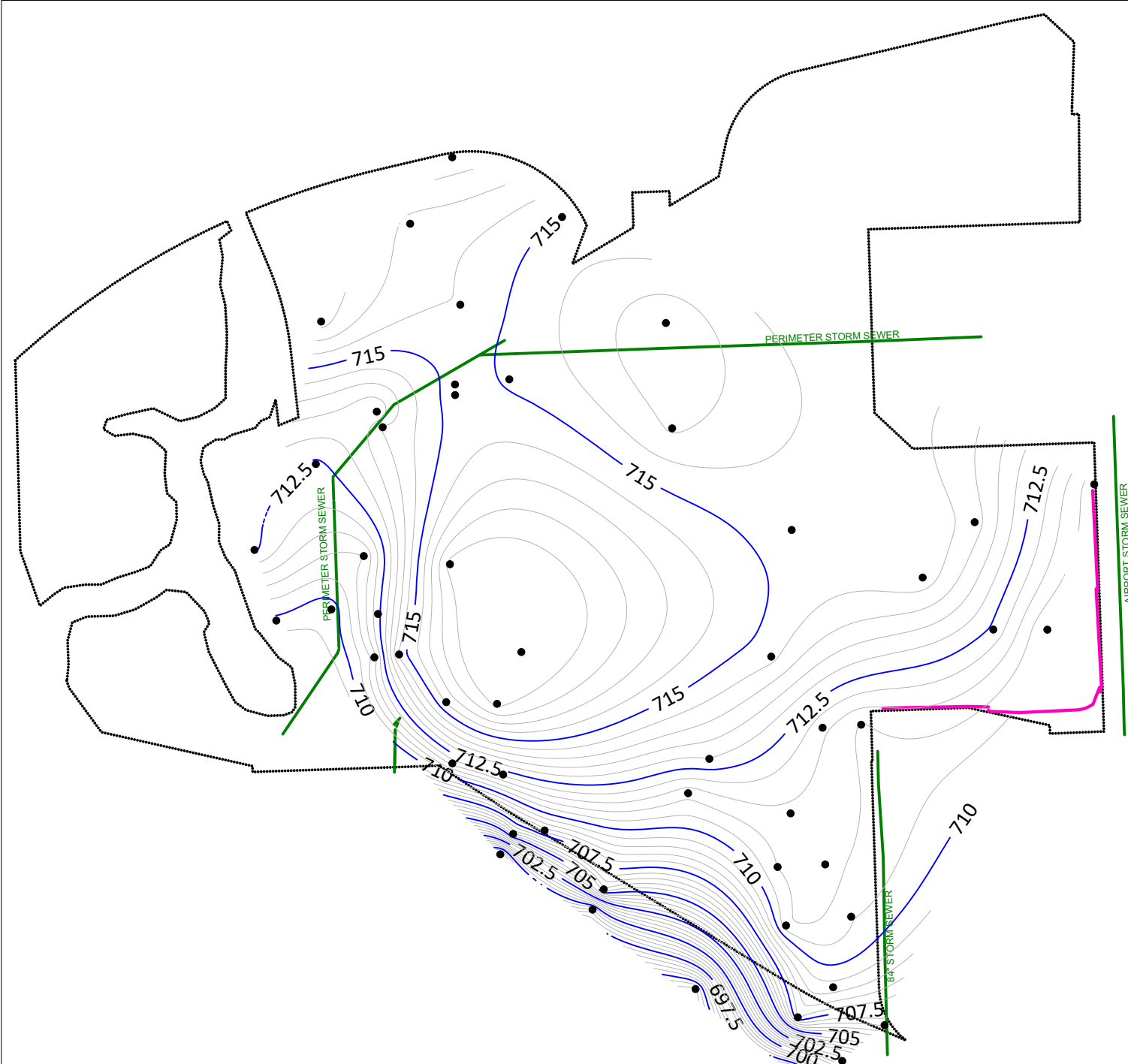
FIGURE A.6



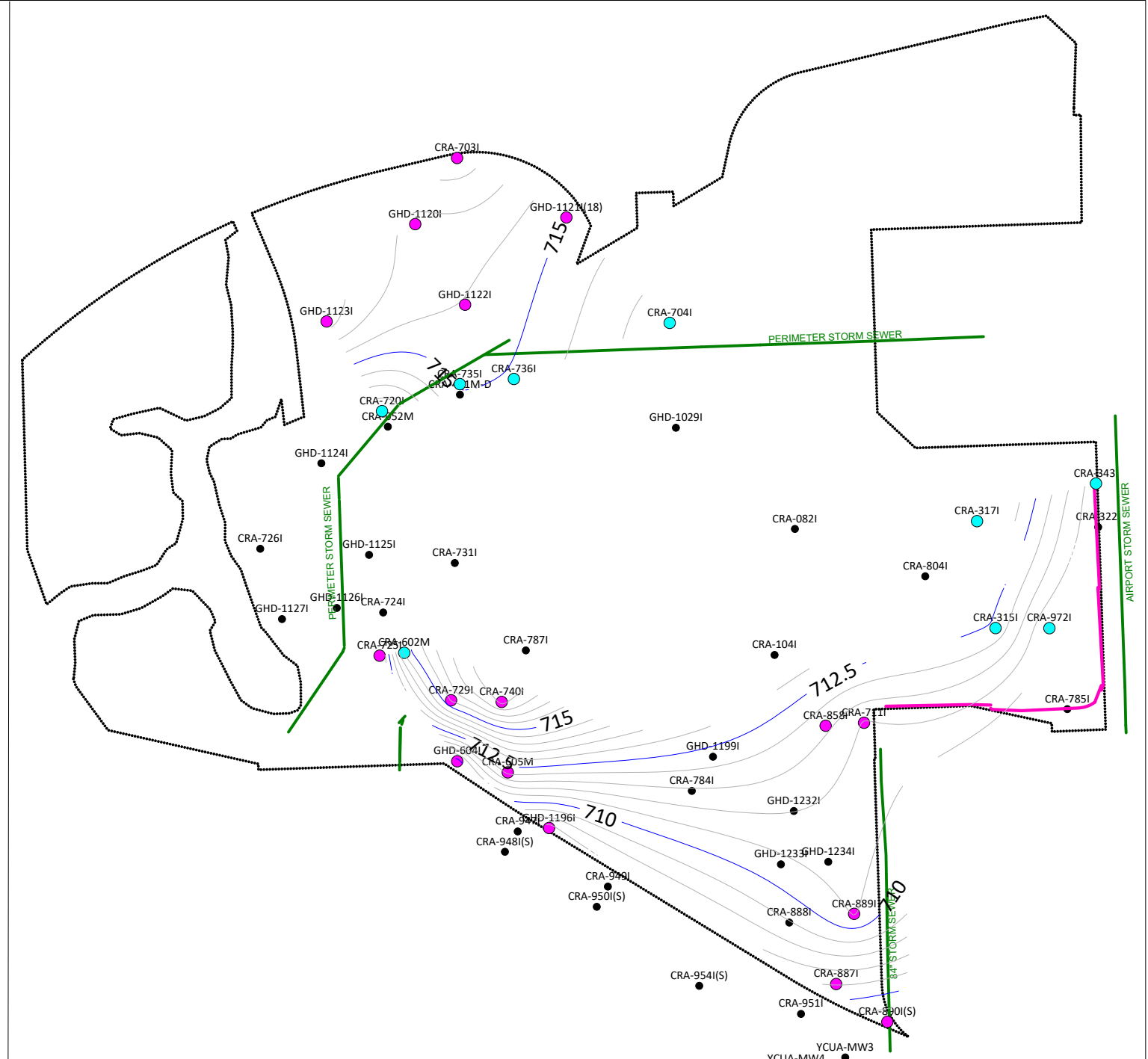
SHALLOW ZONE GROUNDWATER FLOW - MAY 2021
(ALL EXISTING LOCATIONS USED)



SHALLOW ZONE GROUNDWATER FLOW - MAY 2021
(SUBSET OF EXISTING LOCATIONS USED)



INTERMEDIATE ZONE GROUNDWATER FLOW - MAY 2021
(ALL EXISTING LOCATIONS USED)



INTERMEDIATE ZONE GROUNDWATER FLOW - MAY 2021
(SUBSET OF EXISTING LOCATIONS USED)