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Grayling Area PFAS Remedial Investigation – Phase III

Michigan Department of Environment, Great Lakes, and Energy

Project number: 60551441

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1. Introduction

During 2016 and 2017 the Michigan Department of Military and Veterans Affairs (MDMVA) conducted a site investigation on the Grayling Army Airfield (GAAF) for the presence of per- and polyfluoroalkyl substances (PFAS) in groundwater as a result of Aqueous Film Forming Foam (AFFF) used in on-base fire training exercises. Results from this investigation showed PFAS in groundwater over United States Environmental Protection Agency (USEPA) drinking water advisory limits and Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 201 Criteria at locations along the west, south, and eastern boundaries of the base.

Following results from the on-base site investigation it was determined that there was an off-base human health concern. As a result, the MDMVA conducted an off-base residential water sampling effort, west and south of the base, including the City of Grayling municipal supply wells. Analytical results identified three residential wells over the USEPA drinking water advisory limits during this investigation.

Analytical results from on and off-base investigations conducted by the MDMVA prompted EGLE to contract AECOM in 2017 to expand sampling of residential/non-residential water supply wells around the GAAF. EGLE also requested AECOM perform a Remedial Investigation (RI) in the vicinity of the GAAF in order to better assess the extent and concentrations of PFAS in groundwater and to assist in understanding the potential risk to human health and the environment.

AECOM began Phase I of the RI in 2017 which included collection of geologic data and groundwater samples from subsurface borings using direct-push drilling technology. The second phase of the RI began in 2018 and included collection of geologic data and the installation of twenty (20) nested multilevel groundwater monitoring wells using Sonic drilling technology. Results from the first two phases of RI are summarized in the Grayling Area PFAS Remedial Investigation report (AECOM, 2019).

This RI report has been prepared for EGLE and describes the objectives, results, and conclusions from the third phase of RI activities conducted during 2019 and 2020.

1.1 Site Location

GAAF is located directly northwest of the city of Grayling in Crawford County, MI. The airfield is owned by the United States Army and occupies 923 acres of land (**Figure 1**). Residential and commercial properties share property boundaries with GAAF.

1.2 Project Purpose and Scope

The purpose of the third phase of this RI was to further delineate the nature and extent of PFAS impacted groundwater and install sentinel monitoring wells up-groundwater gradient of both the City of Grayling municipal drinking water wells (AECOM, 2019).

The third phase of the RI included the installation of 72 additional nested multilevel groundwater monitoring wells at 16 locations north, east, west, and south of the GAAF. Two of these locations (GAAF-MW021 and GAAF-MW022; **Figure 2**) are the sentinel wells for the city municipal drinking water wells. The other 14 locations were determined using residential drinking water analytical data combined with geologic data and groundwater sample analytical data from previous investigation work.

2. Environmental Setting

The following sections provide the environmental setting of the investigation area which is located in and around the City of Grayling, in Crawford County, Michigan (**Figure 1**).

2.1 Topography

Grayling is located at the southern end of the Grayling Fingers, five north-south trending uplands with interlaying valleys. The "fingers" were formed during the Wisconsian Glaciation when two lobes of the Laurentide Ice Sheet (Lake Michigan and Saginaw) formed an outwash plain (Schaetzl and Weisenborn, 2004). The Grayling Fingers are a plateau-like landform, topographically sloping from north to south. These uplands are the highest elevation in the northern portion of the Lower Peninsula and serve as a drainage divide. The northern most tip of the Fayette Finger is at an elevation of 1,519 feet above mean sea level (MSL) (feet amsl). Just south of Grayling is an east-west trending moraine with a high point of 1,290 feet amsl. The city of Grayling sits between these two features in a valley at an elevation of 1,137 feet amsl. To the north, east and southwest of the city are low lying freshwater forested/shrub wetlands.

2.2 Climate

The Great Lakes Integrated Sciences and Assessments (GLISA), a regional National Oceanic and Atmospheric and Administration (NOAA) funded center, classifies Grayling in the Northeast Lower Michigan Climate Division. Lake effect precipitation is heightened in this division and produces powerful sudden snowstorms during winter months. Annual temperatures range from ~18 °F in January to ~67 °F in July. Typically, the winds from the Great Lakes create a cooler summer with a shortened growing season and increased winter precipitation annually averaging 125-150 inches (GLISA, NWS, 2018).

2.3 Hydrogeology

Grayling is located within the Michigan Basin, an expansive under-formed intracratonic basin encompassing the Lower Peninsula, eastern half of the Upper Peninsula, Lake Michigan, Lake Huron, and parts of Wisconsin, Indiana, Ohio, and Ontario. Paleozoic sediments from an ancient sea were deposited within the basin, overlaying Precambrian and Cambrian basement rocks. The sedimentary beds dip towards the center of the basin at one degree or less (Gillespie et al., 2008).

The advance and retreat of glaciers during the Pleistocene shaped the topography of Lower Michigan creating landforms such as moraines, kettle lakes, and outwash plains. The most recent glaciation of Michigan occurred during the Wisconsin period, approximately 10,000 - 25,000 years ago. Glaciers up to one-mile-thick carved away bedrock and transported this material until deposited as unconsolidated glacial drift overlaying Paleozoic strata. Grayling is located between two landforms, Grayling Fingers to the north and a moraine located south of the city. Schaetzl and Weisenborn (2004) interpret this area as having an outwash core of over 200 feet thick and is associated with the deposition of several ice sheets. The Grayling Fingers were originally a high outwash plain that was later incised by ice retreat. The moraine south of Grayling is composed of like-age ice-contact outwash. The Au Sable River originates in this outwash plain, flows east and feeds into Lake Huron.

The Montcalm and Grayclam Series are the dominate soil types. These soils are characterized as deep, well to somewhat excessively drained and formed from glaciofluvial sediments. The Graycalm soil has 20-50% fine/very fine sand with up to 14% gravel and 3% cobbles (National Cooperative Soil Survey, 2012). The Montcalm soil consists of loamy sand, with weak fine granular structure and has up to 15% gravel and cobble content (National Cooperative Soil Survey, 2018). Small portions of the soils are used for croplands, and large areas are covered by forests predominately jack pine, northern hardwood, and oak.

Groundwater in the vicinity of Grayling occurs in a shallow, unconfined aquifer. Flow direction is generally from the north to the south-southeast towards the confluence of the Au Sable River and the East Branch of the Au Sable River.

2.4 Surface Water Hydrology

Grayling resides within the Au Sable River watershed. The river drains 1,932 square miles, has a length of approximately 150 miles and is a major tributary to Lake Huron (MDNR, 2002). The Au Sable River flows west to east near the southern portion of Grayling. The East Branch of the Au Sable River flows north to south flanking the eastern boundary of Grayling before flowing into the Au Sable River. Mean daily discharge values range from 789 cubic feet per second (ft^3/sec) in August to 1,590 ft^3/sec in April recorded at the field station in Mio, MI (MDNR, 2002). Wooded wetlands can be found, north, east, northeast and southwest of the city.

3. Phase III Field Investigation

The Phase III field investigation focused on further delineating PFAS impacted groundwater east, west, north, and south of the GAAF by installation of additional nested monitoring wells. The following sections detail the objectives and activities performed during Phase III RI activities.

3.1 Access and Utility Clearance

AECOM coordinated with EGLE and, as necessary, local and county road commissions to obtain the necessary access and permits required to complete the work for Phase III of the RI.

Subsurface utilities were cleared through Michigan Miss Dig and 3rd party private utility locate services prior to initiating the subsurface investigation. Boring locations were cleared for overhead utilities or obstructions during the site visit to determine accessibility. Additionally, the first 5 feet of each boring was advanced using hand auger methods.

3.2 Decontamination

Due to the prevalence of PFAS in articles of commerce, cross contamination may occur between sampling equipment and the samples. To ensure no cross-contamination occurred, AECOM collected equipment blanks on any non-disposable equipment, such as water tanks, submersible pumps, pressure washers, and water level meters prior to fieldwork activities. All non-dedicated equipment that came into contact with samples was decontaminated with a Liquinox (or Alconox)-deionized water mixture.

Larger pieces of equipment (e.g., drill stem, tooling) were scrubbed with a polyethylene or PVC scrub brush and Liquinox (or Alconox) water mixture and rinsed with a power washer. Water used for the power washer was supplied from the City of Grayling Municipal Water from a fire hydrant on base. Water from this hydrant was used due to the large volume needed to decontaminate these larger pieces of equipment. PFAS analytical results of water samples from the hydrant on the base water supply well were either non-detect or very low level and did not pose a cross-contamination concern to samples collected.

3.3 Monitoring Well Installation and Development

Borings at each location were drilled with a Sonic 8140DT rotosonic drill rig, owned and operated by Mateco Drilling Company. Soils were continuously logged by AECOM personnel using Environmental Sequence Stratigraphy, including lithology, grain-size, sorting, moisture, and color. Sample descriptions and monitoring well construction information were documented on boring logs (**Appendix A**). Boreholes were terminated after either encountering 3 feet of clay to avoid penetrating a competent clay layer, or refusal at depth due to lithology or mechanical limitations of the drilling equipment. Exceptions were the sentinel well clusters (GAAF-MW021 and GAAF-MW022; **Figure 2**) that terminated at approximately the same depth as the respective City of Grayling municipal drinking water well they were installed up-groundwater gradient from.

Up to three 2-inch diameter and two 1-inch diameter PVC monitoring wells were installed per boring location. Monitoring well depths and completion information are compiled in **Table 1**. **Figure 2** shows the 16 locations where the Phase III monitoring wells were installed.

The annular space of each boring was filled with sand pack from 2 feet below the bottom of each screen to 2 feet above the top of each screen. The remaining annular space between the screens and to approximately 1-foot below ground surface (bgs)was sealed with hydrated bentonite chips. Each well nest was completed at-grade (flush mount) with a steel cover and a 2-feet by 2-feet concrete pad and each individual monitoring well sealed with a j-plug type cap.

The monitoring wells were developed no sooner than 24 hours post installation by pumping and surging using a submersible or air pump. The pump intake was periodically raised and lowered to develop the

entire portion of the submerged screen. Water quality parameters were monitored during development and recorded at periodic intervals. Monitoring wells were considered adequately developed when the following conditions were met:

1. Water quality parameters stabilized.
2. An appropriate volume of water was removed (approximately 5 well volumes or amount equal to volume of water used during installation, whichever was greater).
3. Water pumped from the monitoring well was relatively clear.

3.4 Groundwater Sampling

Two groundwater sampling events are included in this report. The first is the sampling event the occurred in February 2020 included only newly installed and developed Phase III monitoring wells. The second is the March 2020 quarterly sampling event that included all RI groundwater monitoring wells (Phase II and Phase III).

Prior to each sampling event static water levels were measured and recorded from all monitoring wells included in each event. These measurements are presented in **Table 1**.

Groundwater monitoring wells were sampled using EGLE-approved, low-flow, groundwater sampling techniques. Water quality parameters (i.e. pH, temperature, specific conductance, ORP, turbidity and DO) were monitored and recorded approximately every 5 minutes during purging. Groundwater samples were collected after water quality parameters stabilized for three consecutive readings. Stabilization parameters were as follows: depth to water drawdown <0.33 feet, pH +/-0.1, Conductivity +/- 3%, Turbidity +/- 10%, DO +/- 10%, Temperature +/- 5%, and ORP +/- 10mV. If water quality parameters did not stabilize after ten readings, the well was sampled, and this deviation was documented on the groundwater sample record sheet. Groundwater Sampling Forms are included in **Appendix B**.

3.5 Site Survey

On February 17, 2020 AECOM surveyed the geographical position and elevation of each well. A Trimble RS8 RTK-GPS and a Leica NA730 were utilized to provide accurate and precise measurements within 0.03 feet horizontally and 0.01 feet vertically. The wells were located horizontally using the World Geodetic System 84 UTM Zone 16, meters, and vertically using NAVD 88, international feet. The top of casing (TOC) and ground surface elevation data for each well is tabulated in **Table 1**.

3.6 Investigation Derived Waste

Investigation Derived Waste (IDW) generated during phase III of the RI included disposable material such as soil core liners, personal protective equipment (PPE), plastic sheeting, etc., drill cuttings, well development water, purge water and decontamination water.

Disposable sampling materials and PPE were containerized and disposed of as ordinary solid waste. Drill cuttings, excess soil from sampling were containerized in a roll-off, sampled for the Michigan list of 24 PFAS plus branched and linear isomers, and transported by Northern A-1 to Wexford County Landfill LLC. Well development water, purge water, and decontamination water were containerized in a frac tank, sampled for the Michigan list of 28 PFAS plus branched and linear isomers, and transported by Northern A-1 to Northern A-1 Services Inc. for disposal The waste disposal bill of ladings are included in **Appendix C**.

3.7 Laboratory Analytical

All samples were collected in certified PFAS-free sample containers provided by the laboratory, labeled, transferred to a cooler on ice, and submitted to the laboratory, under chain-of-custody documentation, for analysis. Detailed sampling and handling procedures are provided in EGLE PFAS Sampling Guidance documents.

Vista Analytical Laboratory (Vista) in El Dorado Hills, California conducted the PFAS analysis using Modified Environmental Protection Agency's (EPA) Method 537 with isotope dilution. In 2009, USEPA published reference Method 537 for finished drinking water, but this method is not appropriate for more complex aqueous matrices. The Modified Method 537 with isotope dilution is an internal standard method. Internal standardization is a determinative technique where a chemical substance similar to the analytes of interest is added to sample extracts to quantify the target analytes.

EGLE currently has a recommended list of 28 PFAS to be reported for various environmental matrices (e.g., groundwater, soil, surface water, etc..). This PFAS list was reported for all Phase III groundwater samples. The isotope dilution method was used for analysis of groundwater samples Phase III. Isotope Dilution is widely accepted as a better technique for quantification where matrix interference may be present and/or analyte loss may occur during the sample preparation process. The Department of Defense's accreditation program using DoD QSM Version 5.1 recognizes that isotope dilution is a better technique for quantifying PFAS at low concentrations especially in complex environmental matrices due to these matrix effects and requires isotope dilution quantification where the isotopically labeled analytes of interest are available, and the target compound concentration is not so high that serial dilution or direct injection is appropriate.

One duplicate sample was collected for every 20 groundwater samples collected. Additionally, field and equipment blanks (if non-disposable equipment were used) were collected at a rate of one per every 20 samples collected. **Appendix D** contains laboratory analytical reports.

4. Results and Discussion

4.1 Groundwater Flow

Static water levels measured during the March 2020 quarterly sampling event were used to create a map showing shallow groundwater elevations and a generalized flow direction across the investigation area (**Figure 3**). Groundwater elevations using all screen intervals ranged from 1,151.93 feet above mean sea level (amsl) at GAAF-MW027 north of GAAF to 1,119.42 feet amsl at GAAF-MW009, west of the East and main Au Sable River confluence. The groundwater elevations are provided in **Table 1**.

Groundwater flow direction is generally from north to south with groundwater east of the eastern boundary of GAAF trending south-southeast toward the East Branch Au Sable River and confluence of the east and main branches of the Au Sable River. Toward the south end of the GAAF there is a slight groundwater divide where groundwater to the west of the divide flows in a south-southwesterly direction and groundwater to the east of the divide flows in an east-southeasterly direction.

Vertical gradients were evaluated and are presented in **Table 1**, where the calculated vertical gradients are relative to the shallowest screen in each well nest. Positive values represent a downward gradient and negative values represent an upward gradient. The vertical gradient in the shallow aquifer is generally downward with the exception of wells along the western portion of the GAAF area near the Au Sable River (GAAF-MW029, GAAF-MW018, GAAF-MW028, GAAF-MW030 and GAAF-MW016) where the shallow vertical flow is upward. The deeper screens in each well nest generally have an upward gradient relative to the shallow screen. The maximum downward gradient (0.1324) is at GAAF-MW013, located in the southwest portion of the site area. The maximum upward gradient (-0.0246) is at GAAF-MW021, located near the Au Sable River in the eastern portion of the site area. Flow nets showing the vertical groundwater flow were developed along three cross section transects shown in **Figure 4**. The cross-sectional flow nets are presented in **Figures 5**, **6**, and **7**.

In general, the flow nets, in conjunction with the groundwater elevation map, indicate that groundwater flows toward and likely discharges to the Au Sable River. However, in localized areas where the river has developed meander bends (e.g., near GAAF-MW033) the groundwater may flow below the river at the upstream portion of the meander bend before discharging to the river at the downstream portion of the meander bend, as evidenced by elevated total PFAS concentrations observed at GAAF-MW033 (**Table 2 and Figure 7**), which suggest that PFAS-impacted groundwater is flowing below the River at the upstream portion of the meander.

4.2 Geology

Continuous soil cores were collected from borings advanced during Phase III field activities. Visual observation and characterization of these soils confirmed the soil types collected in the two prior phases of this investigation.

Three cross-sections were drafted for this report using geologic and groundwater analytical data collected from all three phases of the RI (**Figures 5 through 10**). These cross-sections show the subsurface geology and distribution of PFAS-impacted groundwater within the aquifer along the general direction of groundwater flow from the eastern and southern boundaries of GAAF. These cross-sections generally coincide with areas having the highest concentration of PFAS measured in groundwater and drinking water wells.

Cross-section A-A' (**Figure 8**) extends from the eastern boundary of GAAF to the City of Grayling's municipal drinking water well #2. Cross-section B-B' (**Figure 9**) follows the direction of groundwater flow from the southeastern GAAF boundary to the City of Grayling's municipal drinking water well #1. Cross-section C-C' (**Figure 10**) follows the direction of groundwater flow from the southern boundary of the GAAF to the Au Sable River.

The majority of soils observed in core samples were fine to medium sands interbedded with coarse sand and fine to medium gravels that extended from ground surface to between 40 feet near the southern and eastern boundary of GAAF and greater than 160 feet west of the East Branch of the Au Sable River. The interbedded coarser units ranged from 0.5 feet to 2 feet in thickness. These sandy soils are considered the principal groundwater bearing unit for the study area.

Two distinct clay units were encountered throughout the investigation area. The most extensive of these clay units appears to be basal in relation to the principal groundwater bearing unit described above, acting as the apparent bottom of the aquifer. Soil cores from GAAF-MW022 indicate this clay is interbedded with fine to medium sands (**Figure 9**); however, the current dataset does not allow for a comprehensive understanding of the extent of this interbedding or continuity of this clay unit throughout the investigation area.

A shallower clay unit was encountered in borings near the East Branch of the Au Sable River (**Figures 8 and 9**). This clay was encountered between 30 to 40 feet bgs and extended to approximately 900 feet west of the river. The thickness of this clay ranged between 75 feet in borings nearest the river (e.g., City of Grayling Well #1) to under 20 feet in borings to the west of the river (e.g., GAAF-MW022).

4.3 Analytical Results

Analytical results discussed in this report include two sampling events. The first event was completed in February of 2020 and only includes analytical results from the monitoring wells installed during the third phase of field investigation work. The second sampling event includes the quarterly sampling event that took place in March of 2020. This event includes analytical results from the entire monitoring well network (i.e., Phase II and Phase III monitoring wells).

A summary of the analytical results from the February and March 2020 sampling events is provided in **Table 2**. Analytical results were compared to two criteria: the United States Environmental Protection Agency (EPA) Lifetime Health Advisory (LHA) criteria of 70 nanograms per liter (ng/L) for perfluorooctanoic acid (PFOA) plus perfluorooctane sulfonic acid (PFOS), and the Part 201 Drinking Water Criteria (DWC) for seven PFAS including perfluorononanoic acid (PFNA; 6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L, perfluorohexane sulfonic acid (PFHxS; 51 ng/L), perfluoro-2-propoxypropanoic acid (HFPO-DA; 370 ng/L), perfluorobutane sulfonic acid (PFBS; 420 ng/L), and perfluorohexanoic acid (PFHxA; 400,000 ng/L). **Table 3** (below) shows the number of samples with analytical results over either the EPA LHA or Part 201 DWC for these two sampling events.

Table 3 - Summary of Analytical Detections Above Criteria

Criteria	PFAS	Samples Above Applicable Criteria
PART 201 DWC	PFHxA	0
	PFOA	16
	PFNA	0
	HFPO-DA	0
	PFBS	0
	PFHxS	9
	PFOS	11
EPA LHA	PFOA+PFOS	6

Figures 11 through 18 are heat maps for each individual PFAS with Part 201 DWC. These figures are cumulative of all data collected during the RI (i.e., Phases I, II, and III) and represent the highest concentration detected at each location. The figures provide a spatial overview of individual PFAS concentrations over criteria in groundwater throughout the investigation area. **Figures 19 through 21** are heat maps for PFOA, PFOS and PFHxS and represent data collected from VAS borings and monitoring wells advanced or installed during the RI (i.e., the same information shown on **Figures 12 through 14**) along with data collected from residential drinking water wells in the investigation area.

AFFF used on the GAAF is the suspected source of PFAS impacted groundwater in the investigation area. Formulations of AFFF vary by manufacturer and can include dozens of compounds. While it is important to evaluate concentrations of individual PFAS compounds of concern as lines of evidence in evaluating and understanding the fate and transport of PFAS impacts, evaluating total PFAS (i.e., the sum of all PFAS analyzed) concentrations is an important, additional line of evidence in understanding the overall footprint of PFAS-impacted groundwater within the investigation area. **Figure 18** shows the highest concentration of total PFAS for each sample location established during the RI. The highest concentrations of PFAS detected were sample locations downgradient (i.e., along groundwater flow-paths) of on-airfield vertical aquifer sample (VAS) location with the highest concentrations located on the east, southeast, south, and southwest boundary of GAAF.

Geologic cross-sections (**Figures 8 through 10**) show that the higher concentrations of total PFAS (i.e., >70 ng/L) usually occurred in the shallower (i.e., approximately 20 feet bgs) portion of the aquifer nearest the GAAF boundary, and in the deeper (i.e., approximately 60 feet bgs) portion of the aquifer down gradient of the GAAF boundary. Near the Au Sable River, east-southeast of GAAF, the higher PFAS concentrations appear to occur above the shallow clay unit (i.e., approximately 15 to 40 feet bgs in GAAF-MW009).

As discussed in Section 4.1 and presented in the cross-section flow nets in **Figures 5 through 7**, the vertical gradient in the shallow portion of the aquifer is generally downward producing a plume that becomes deeper away from the source area at the GAAF. However, as groundwater approaches the Au Sable River, it appears that the gradient generally becomes upward and the groundwater could potentially discharge to the river in some locations. Additionally, there is a potential that an upward groundwater gradient in areas where utility lines (e.g., sanitary sewer lines) are present near the river could result in groundwater discharging into utility corridors. Further evaluation of how groundwater may or may not be interacting with the river and/or utility corridors is needed to better understand the fate and transport of PFAS.

5. Conclusions

The main objective of the third phase of RI activities was to further delineate the nature and extent of PFAS in groundwater in the vicinity of GAAF.

Given the size of the investigation area (i.e., the area between the eastern, southern, and western boundaries of the GAAF and the Main and East Branches of the Au Sable River), ease of site access, and distribution and density of monitoring wells installed to date, the extent of PFAS impact in groundwater is relatively well characterized for the purpose of understanding the general location and extent of PFAS-impacted groundwater and establishing a monitoring well network that can be used to monitor short- and long-term concentrations trends. However, the nature and extent of PFAS in areas north of GAAF, and south and east of the river are not as well understood with the current hydrogeologic dataset. Groundwater flow and analytical results in these areas suggest the potential for other, unknown PFAS sources.

Following the development and review of flow net diagrams (**Figures 5 through 7**), it appears that the groundwater gradient becomes upward as groundwater approaches the Au Sable River, which indicates that groundwater could potentially discharge to the river in some locations. Additionally, there is a potential that an upward groundwater gradient in areas where utility lines (e.g., sanitary sewer lines) are present near the river could result in groundwater discharging into utility corridors. While EGLE has undertaken efforts to evaluate discharges to the Au Sable River and the city of Grayling sanitary sewer, further evaluation of how groundwater may or may not be interacting with the river and/or utility corridors is needed to better understand the fate and transport of PFAS.

It is recommended that quarterly sampling of a small subset of key wells (e.g., sentinel wells, possibly others), and semi-annual monitoring of a larger, but limited subset of wells be considered to monitor groundwater concentrations over time. This should also include quarterly measurements of static groundwater and surface water levels and generation of groundwater flow maps to monitor for fluctuations in groundwater elevations and flow direction.

6. References

AECOM. (2019). Grayling Area PFAS Remedial Investigation Report.

Michigan Department of Natural Resources. (2002). Au Sable Natural River Plan.

Gillespie, Robb, Harrison, William B., and Grammer, G. Michael. (2008). Geology of Michigan and the Great Lakes. Michigan Geological Repository for Research and Education Western Michigan University.

Great Lakes Integrated Sciences and Assessments (GLISA) Northeast Lower Michigan Climate Division. Retrieved from http://glisa.umich.edu/division/mi04.

Schaetzl, Randall & Weisenborn, Beth. (2004). The Grayling Fingers region of Michigan: Soils, sedimentology, stratigraphy and geomorphic development. Geomorphology. 61. 251-274. 10.1016/j.geomorph.2004.01.002.

Natural Resources Conservation Service. Retrieved from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership/ncss/?cid=nrcs142p2_053528

Figures

EGLE

Prepared: 5/24/2019

Legend

Grayling Army Airfield Boundary

N

0 0.5 1 Miles

FIGURE 1
SITE OVERVIEW

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

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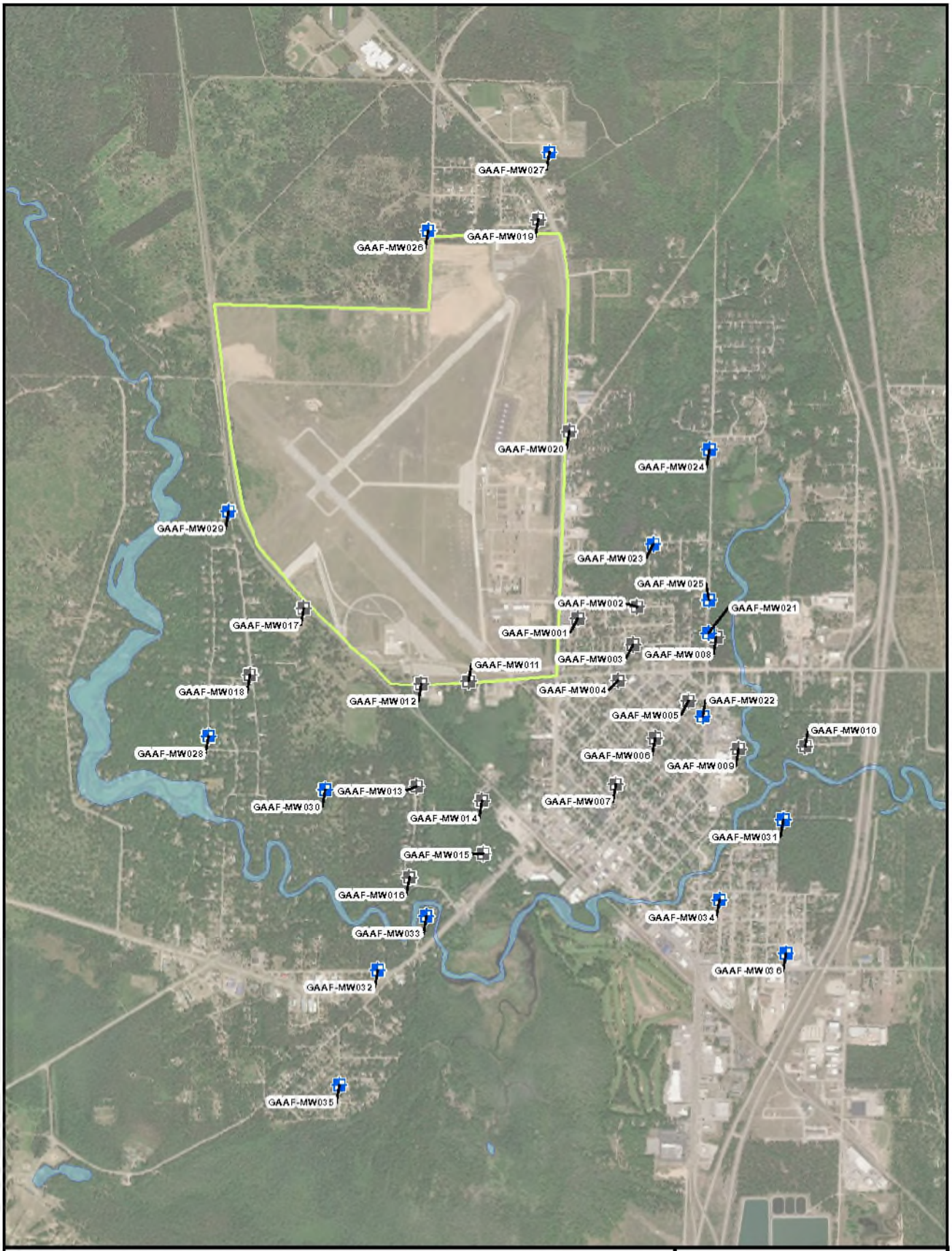

Legend

- RI Phase II Monitoring Well
- RI Phase III Monitoring Well
- Grayling Army Airfield Boundary

FIGURE 2
PHASE III MONITORING
WELL LOCATIONS

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

EGLE

N

0 0.25 0.5 1 Miles

Prepared: 9/15/2020

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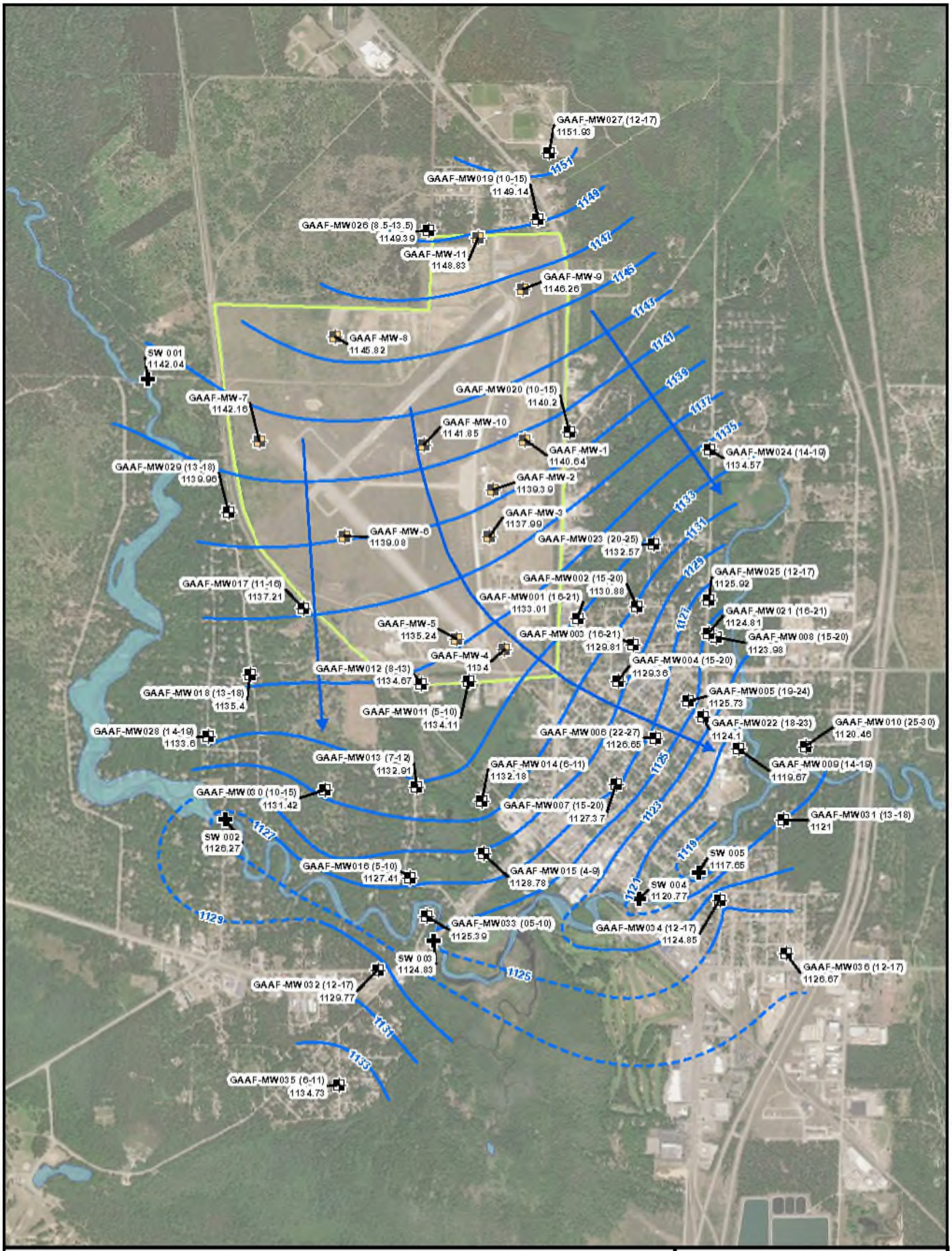

Legend

- Air National Guard Monitoring Well
- EGLE RI Monitoring Well
- Staff Gauge (Elev measurement from Feb. 2020)
- Groundwater Countours (2' interval)
- Grayling Army Airfield Boundary
- Monitoring Well ID / Groundwater Elevation (ft AMSL)
- Groundwater Flow Direction

FIGURE 3
GROUNDWATER ELEVATION AND FLOW-DIRECTION MAP
MARCH 2020

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

EGLE

N

0 0.25 0.5 1 Miles

Prepared: 9/1/2021

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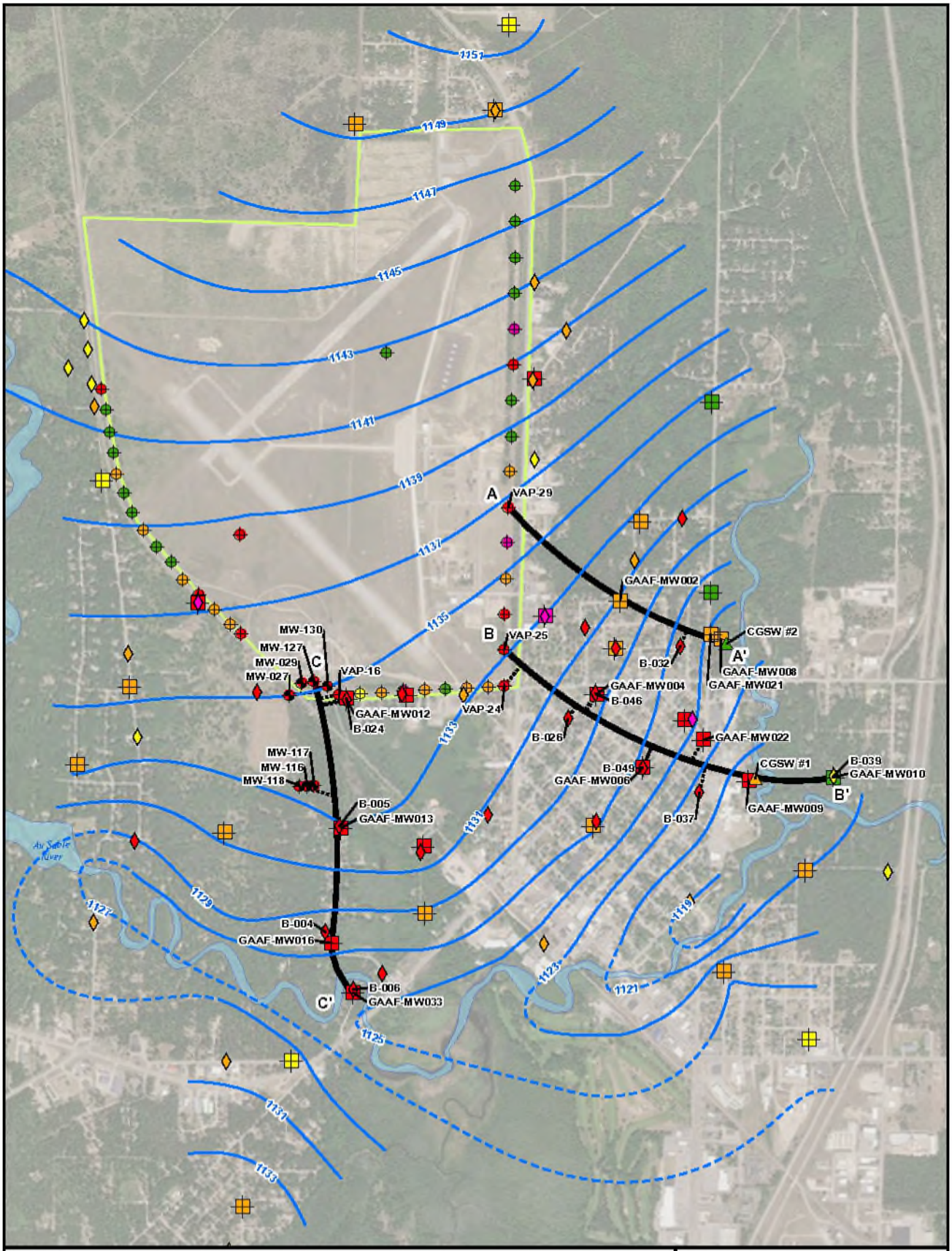

FIGURE 4
GEOLOGIC CROSS-SECTIONS

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

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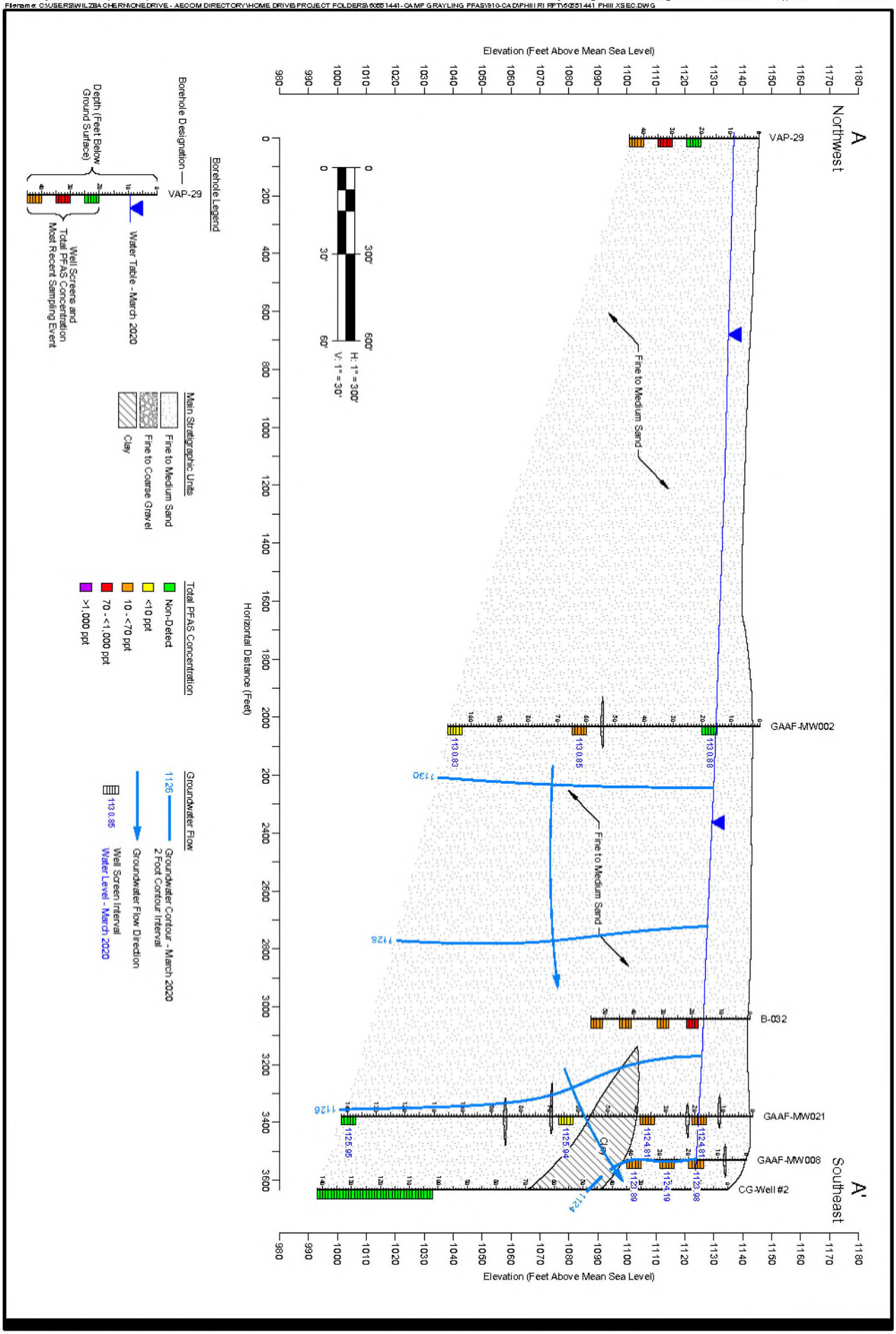

GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

GEOLOGIC CROSS SECTION A - A'
WITH GROUNDWATER FLOW NET

Project No.: 60551441 Date: 2021-09-08

Figure: 5

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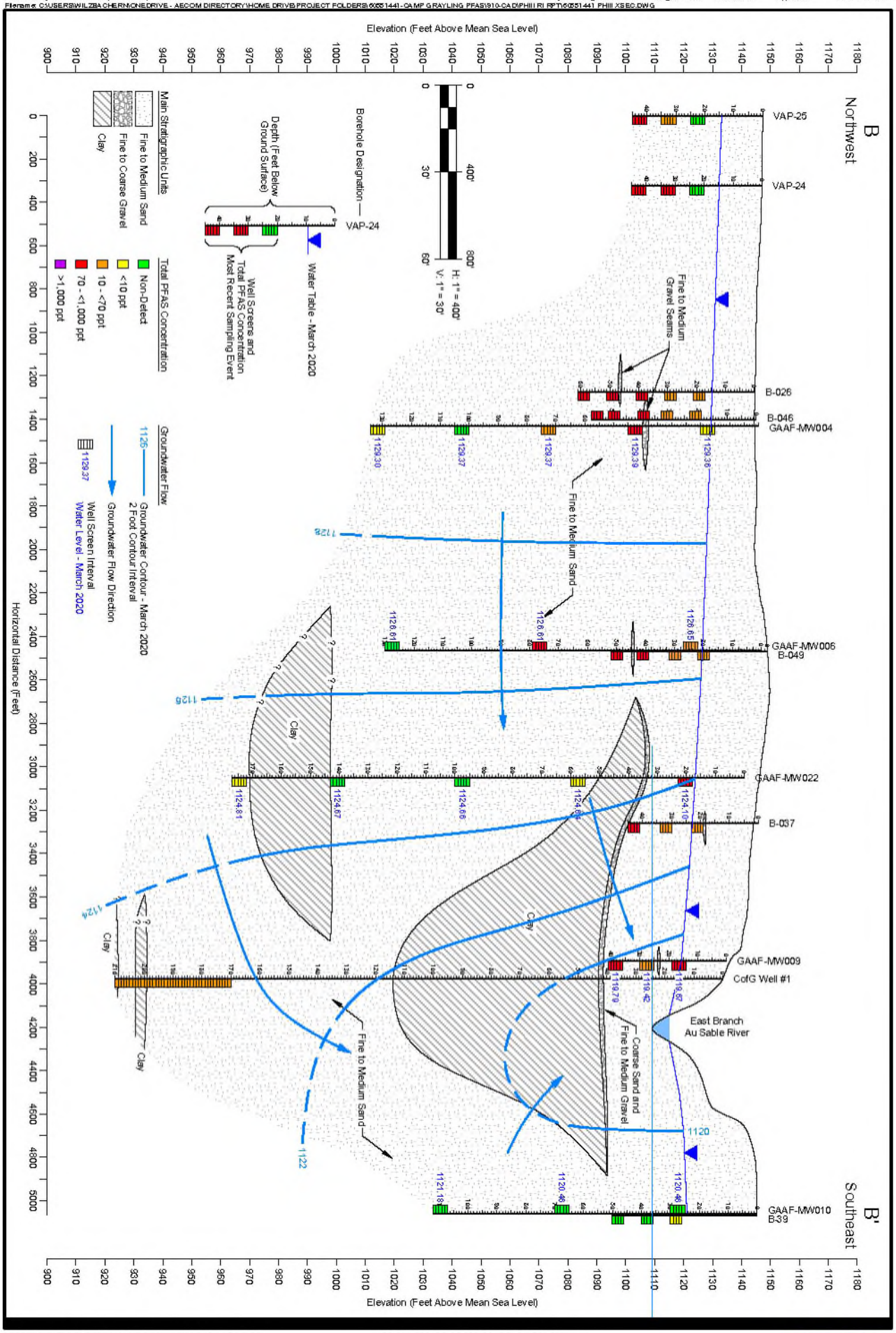

GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

GEOLOGIC CROSS SECTION B - B'
WITH GROUNDWATER FLOW NET

Project No.: 60551441 Date: 2021-09-08

Figure: 6

Last saved by: WILZBACHERN(2021-09-01) Last Plotted: 2021-09-08 Project Management Initials: Designer: NLW Checked: JM Approved: ANSI B 11" x 17"
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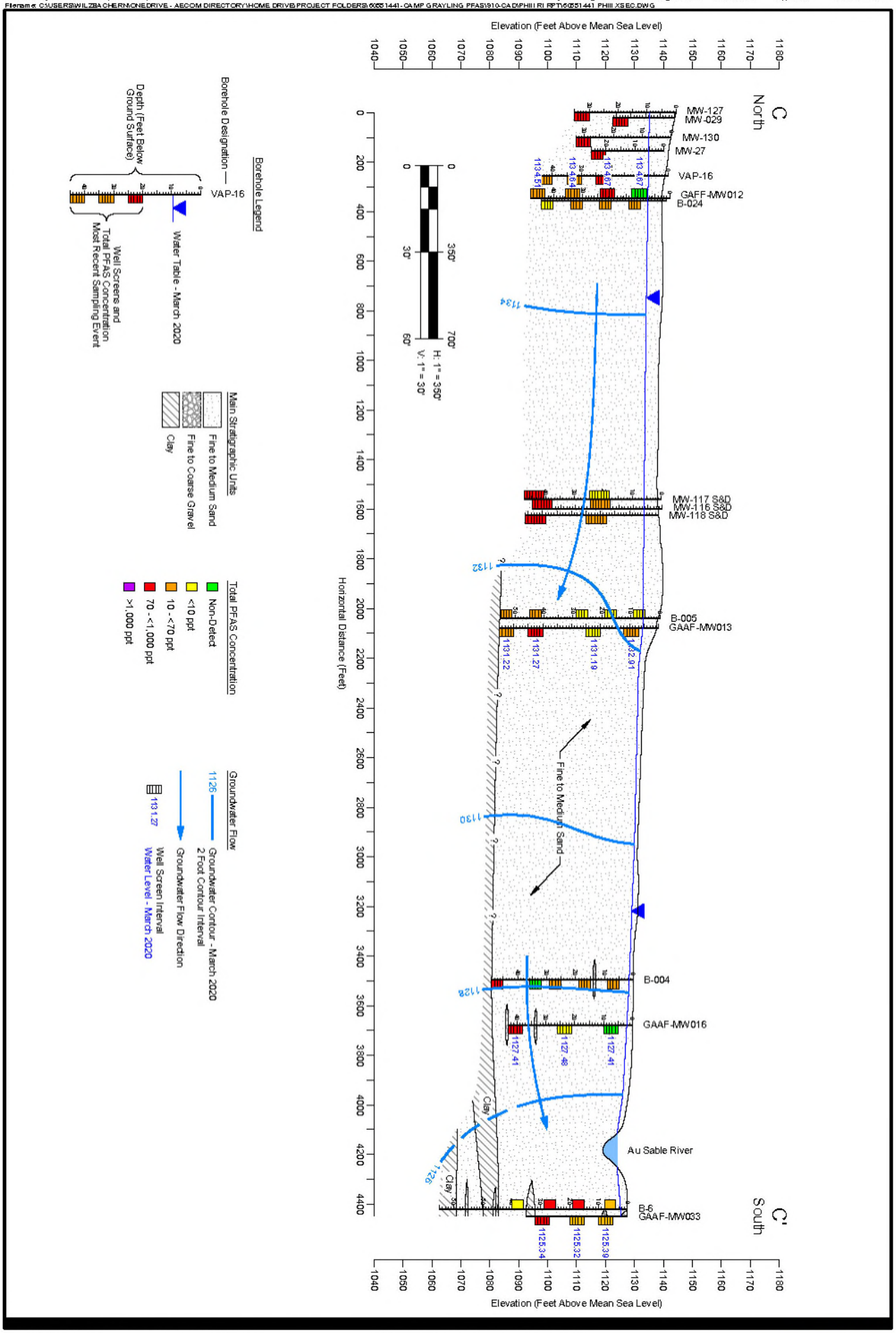

GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

GEOLOGIC CROSS SECTION C - C'
WITH GROUNDWATER FLOW NET

Project No.: 60551441 Date: 2021-09-08

Figure: 7

Last saved by: WILZBACHERN(2021-08-26) Last Plotted: 2021-08-26 Project Management Initials: Designer: NLW Checked: JM Approved: ANSI B 11" x 17"
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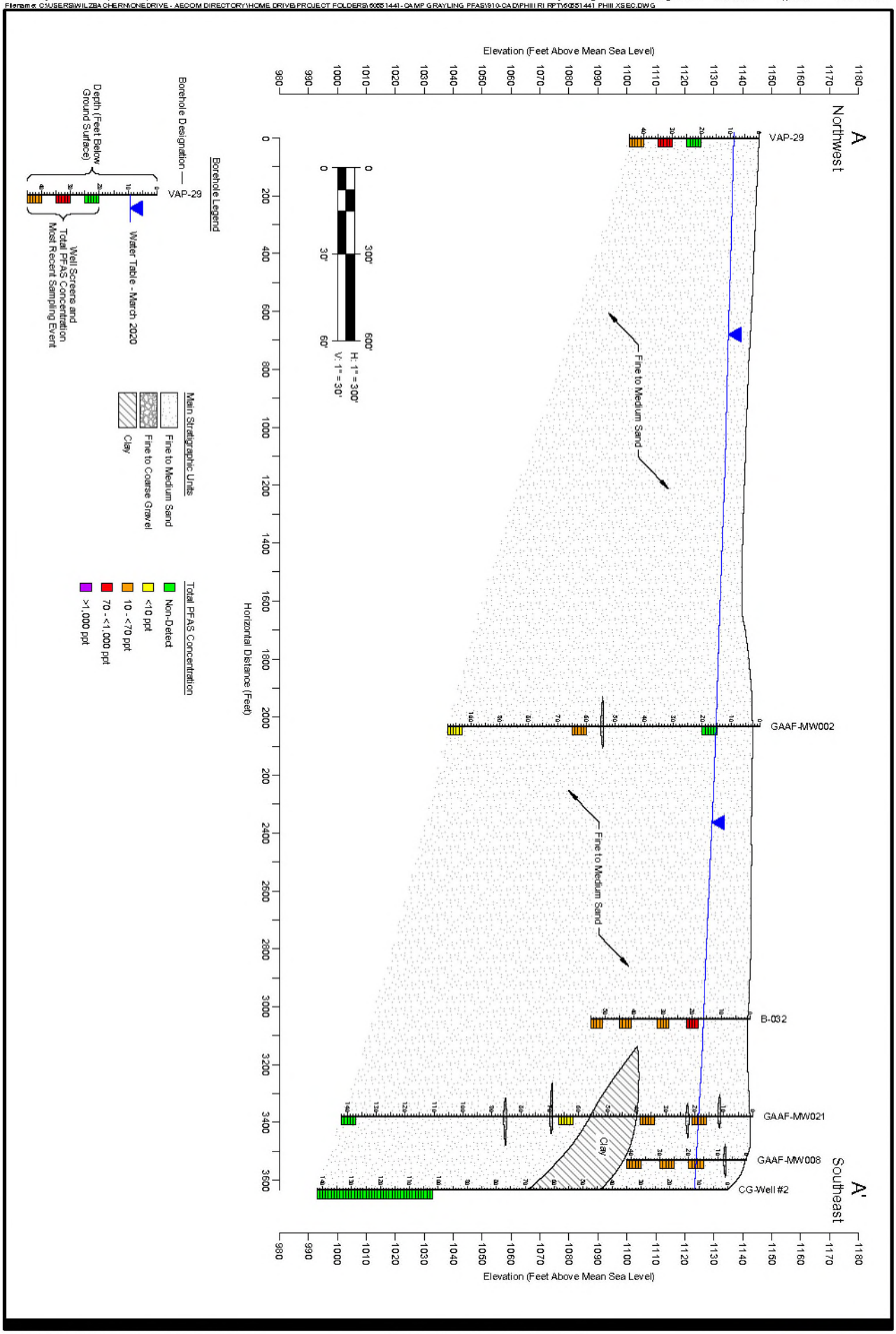

GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

GEOLOGIC CROSS SECTION A - A'

Project No.: 60551441 Date: 2021-08-26

Figure: 8

Last saved by: WILZBACHERN(2021-08-01) Last Plotted: 2021-08-01 Project Management Initials: Designer: NLW Checked: JM Approved: ANSI B 11" x 17"
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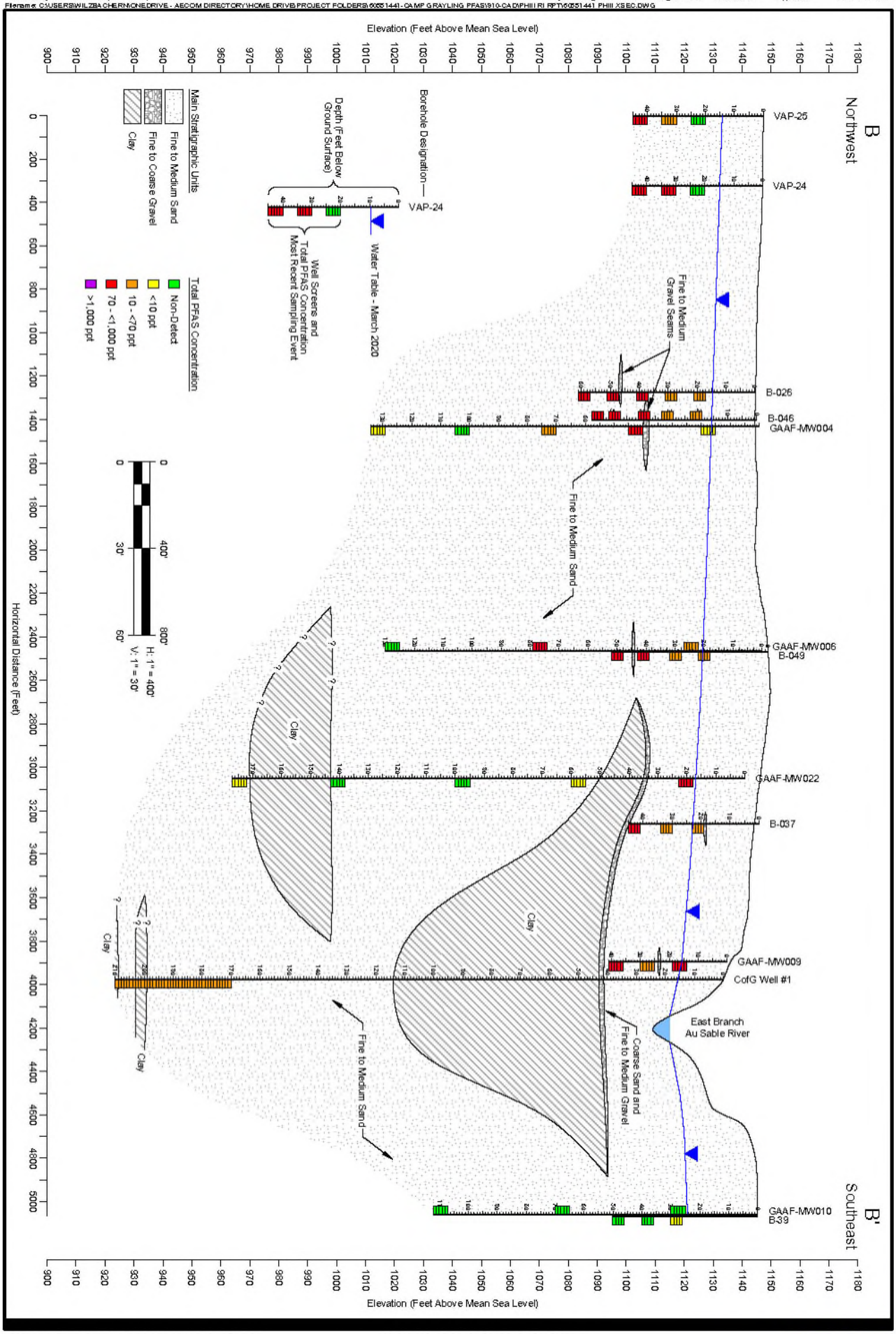

GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

GEOLOGIC CROSS SECTION B - B'

Project No.: 60551441 Date: 2021-08-26

Figure: 9

Last saved by: WILZBACHERN(2021-08-20) Last Plotted: 2021-08-20 Project Management Initials: Designer: NLW Checked: JM Approved: ANSI B 11" x 17"
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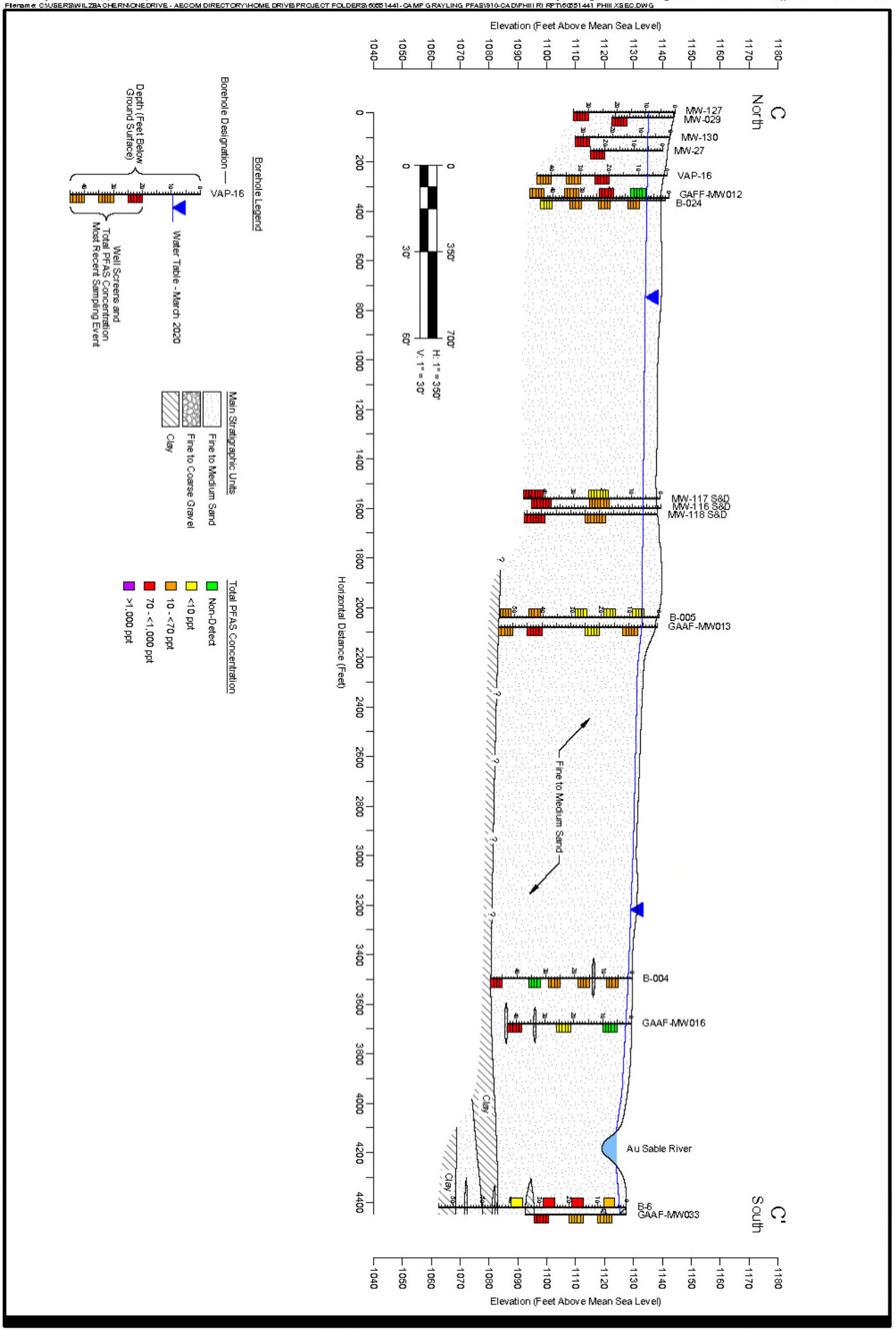
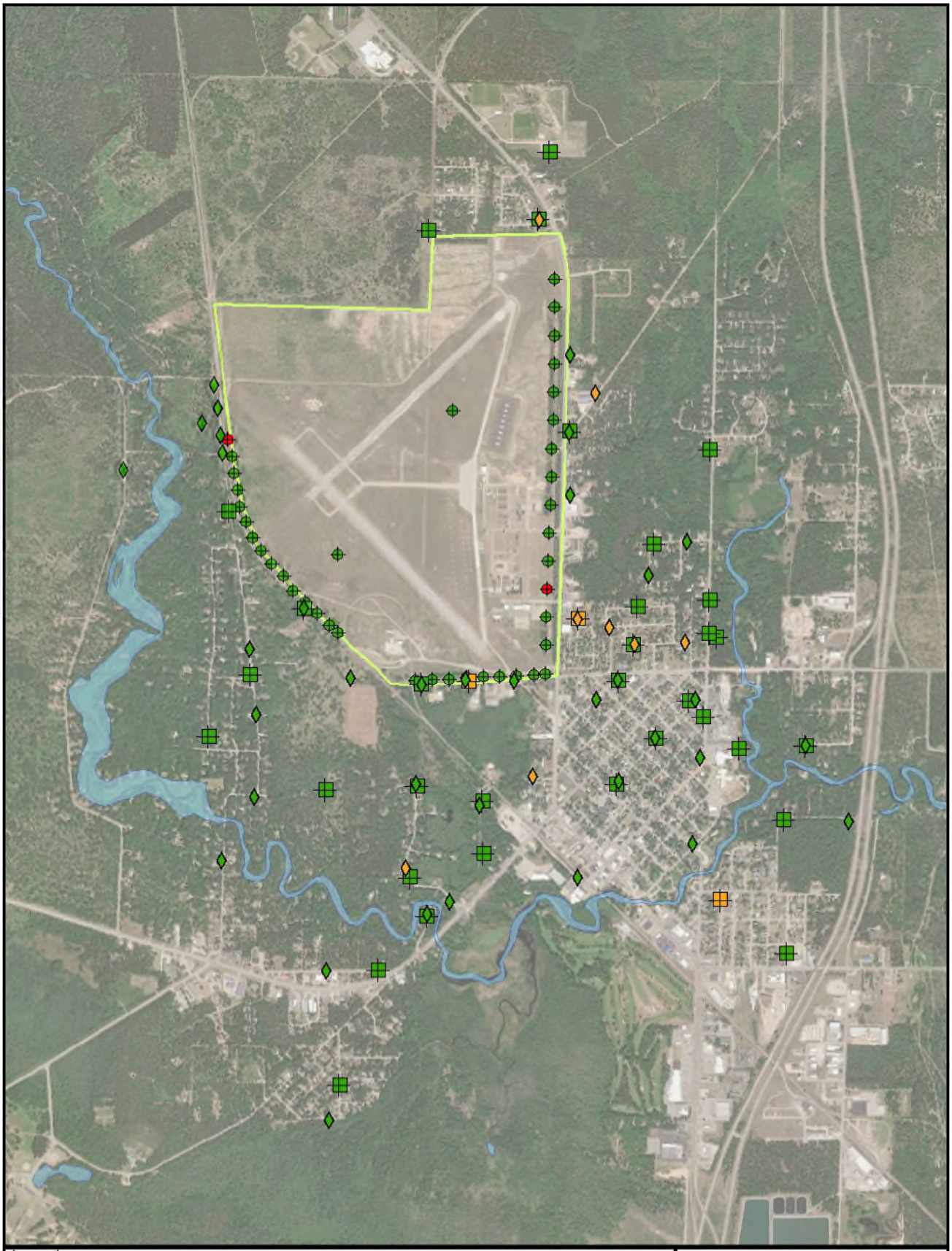


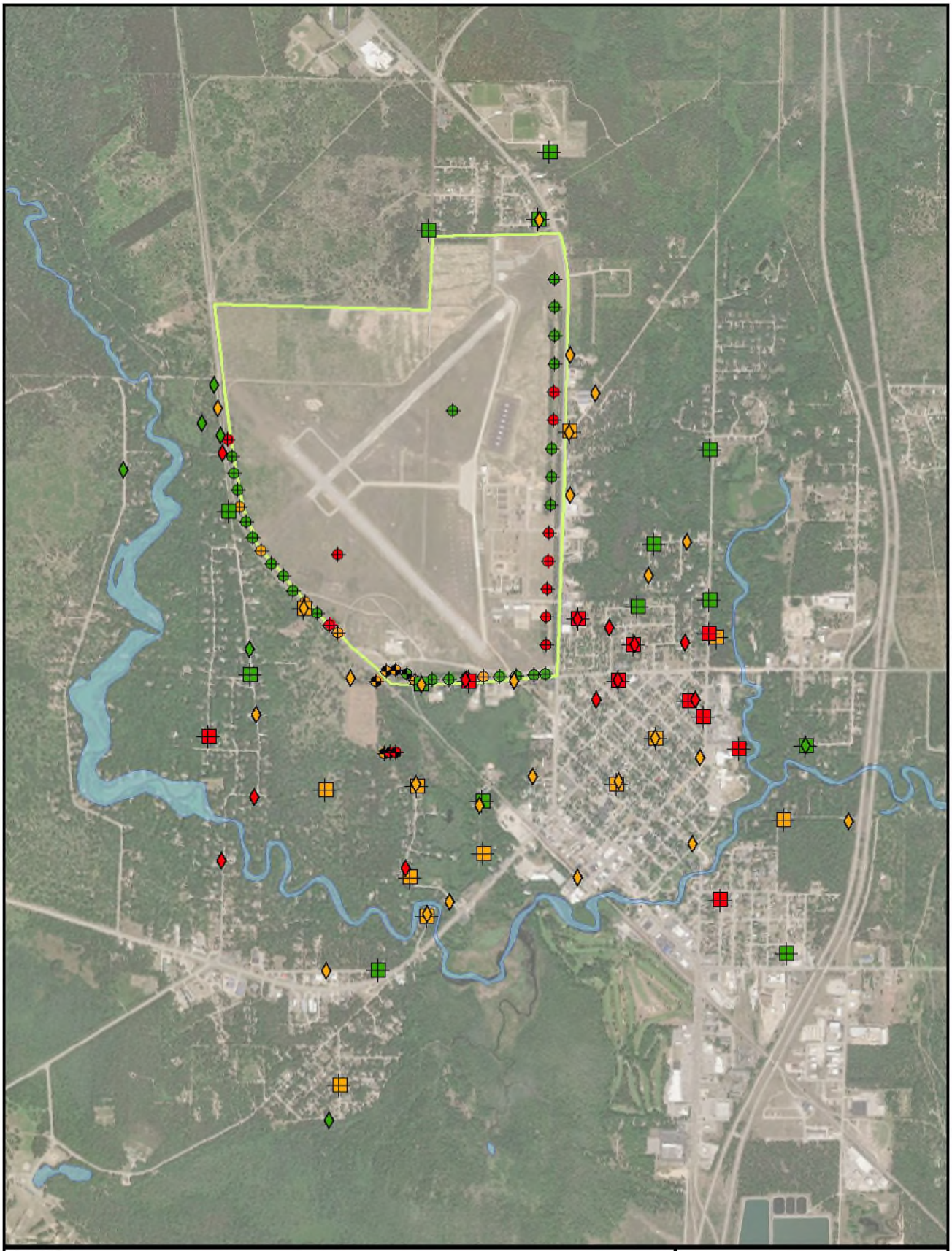
GRAYLING AIRFIELD PHASE III RI REPORT
CRAWFORD COUNTY, MICHIGAN

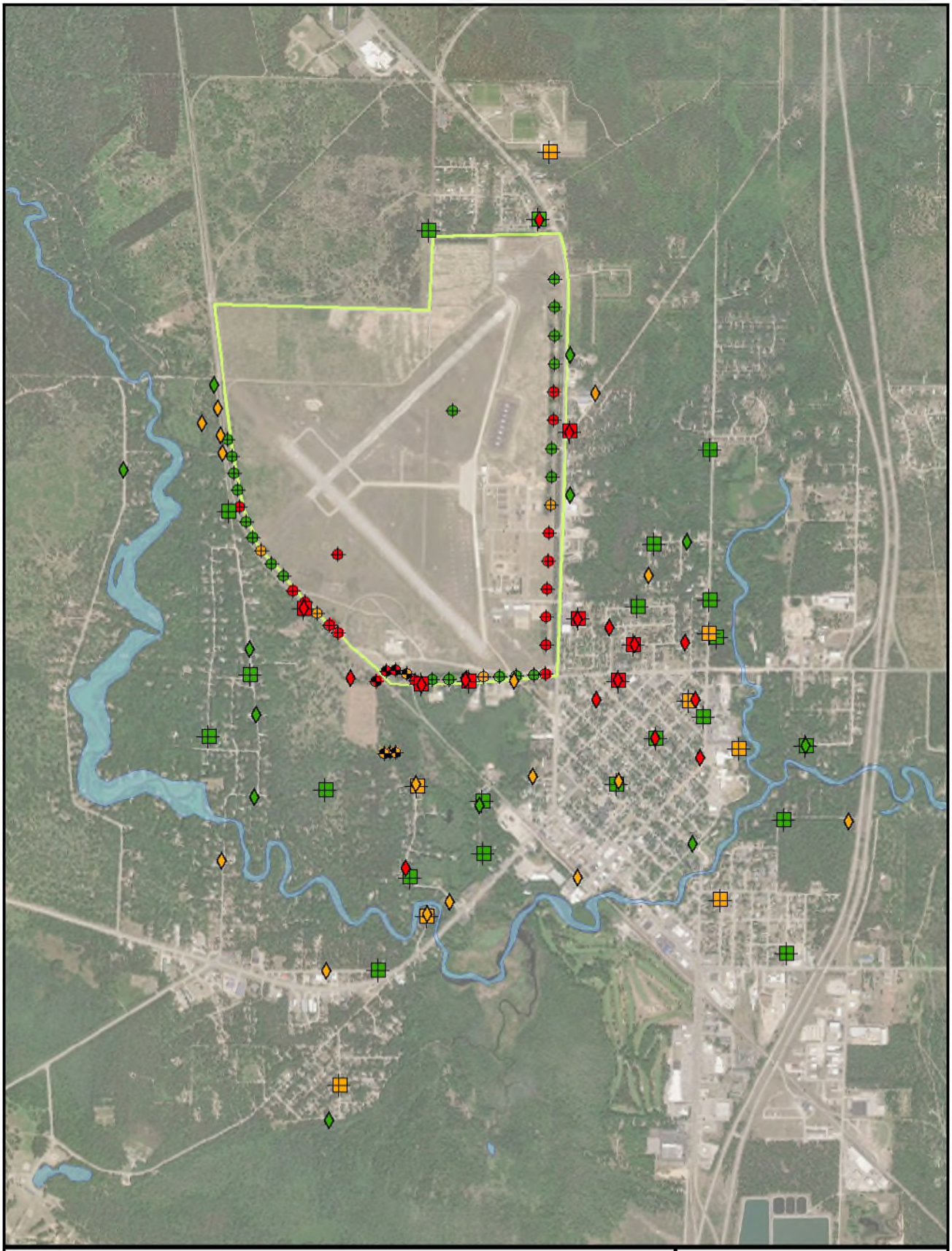
GEOLOGIC CROSS SECTION C - C'

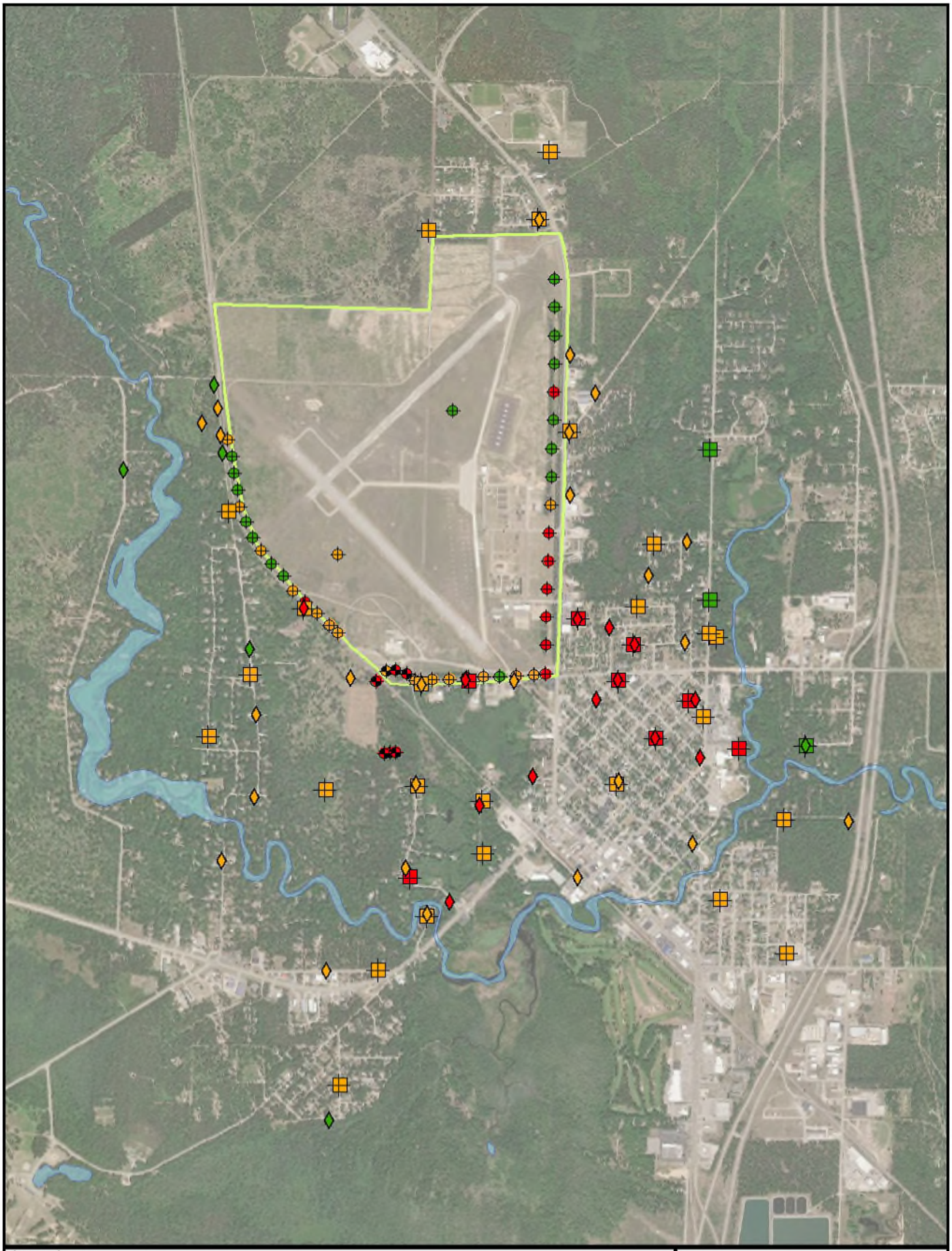
Project No.: 60551441 Date: 2021-08-26

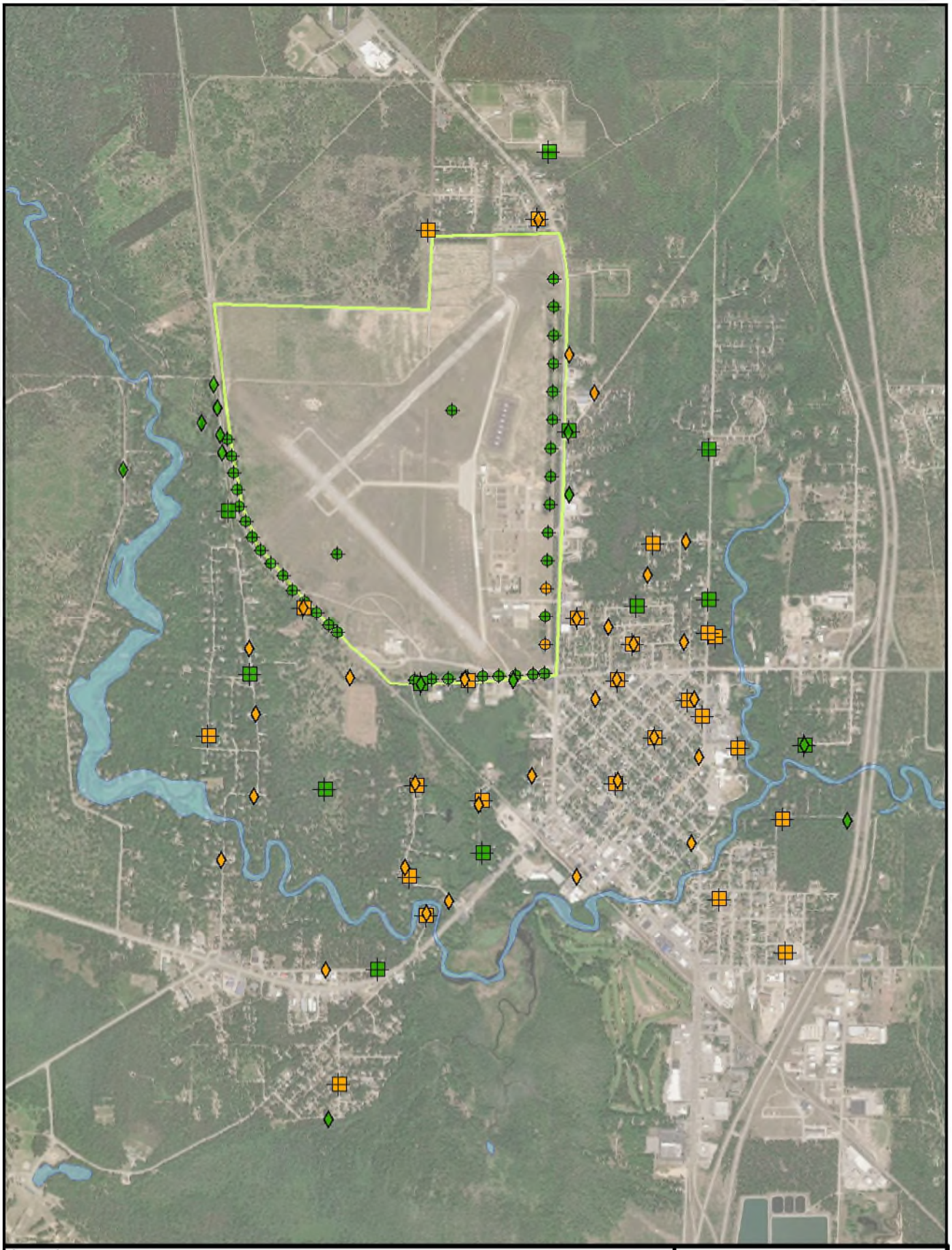
Figure: 10


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
PFNA, ng/L or ppt
Non-Detect
>ND to 6
>6
FIGURE 11
PFNA HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
Grayling
AAF Airport
Au Sable
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXD\ARI_Phase_III_Report_Figures\Figure_11_Grayling_PFNA_March2020.mxd


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
PFOA, ng/L or ppt
Non-Detect
>ND to 8
>8
FIGURE 12
PFOA HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
Grayling
AuSable
Airport
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXDs\RI_Phase_III_Report_Figures\Figure_12_Grayling_PFOA_March2020.mxd


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
PFOS, ng/L or ppt
Non-Detect
>ND to 16
>16
FIGURE 13
PFOS HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
Grayling
AAF Airport
Au Sable
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXDs\RI_Phase_III_Report_Figures\Figure_13_Grayling_PFOS_March2020.mxd


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
PFHxS, ng/L or ppt
Non-Detect
>ND to 51
>51
FIGURE 14
PFHxS HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
Grayling
AAF Airport
Au Sable
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXD\ARI_Phase_III_Report_Figures\Figure_14_Grayling_PFHxS_March2020.mxd


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
PFBS, ng/L or ppt
Non-Detect
>ND to 420
>420
FIGURE 15
PFBS HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXDs\RI_Phase_III_Report_Figures\Figure_15_Grayling_PFBS_March2020.mxd

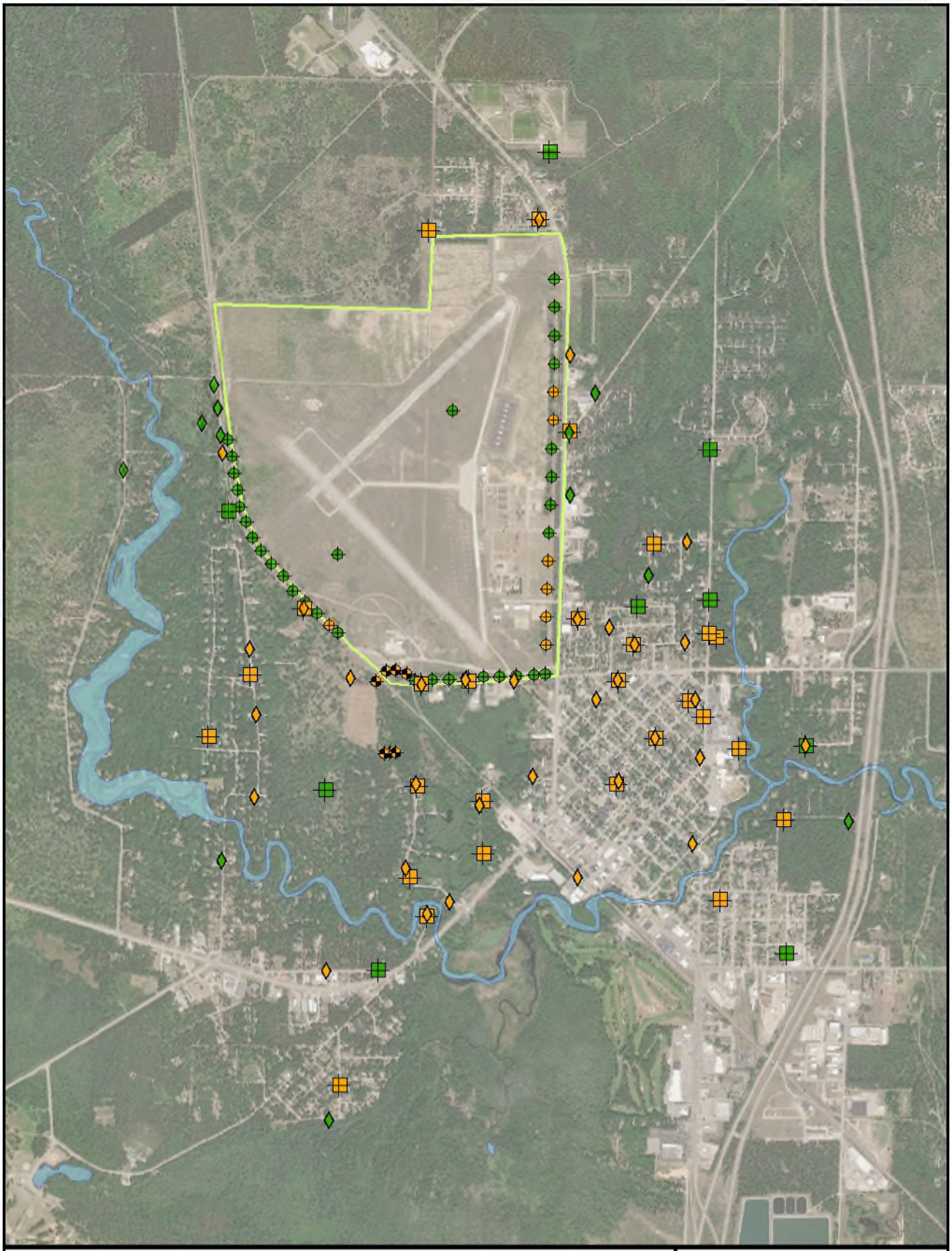


FIGURE 16
PFHxA HEAT MAP

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXDs\RI_Phase_III_Report_Figures\Figure_16_Grayling_PFHxA_March2020.mxd

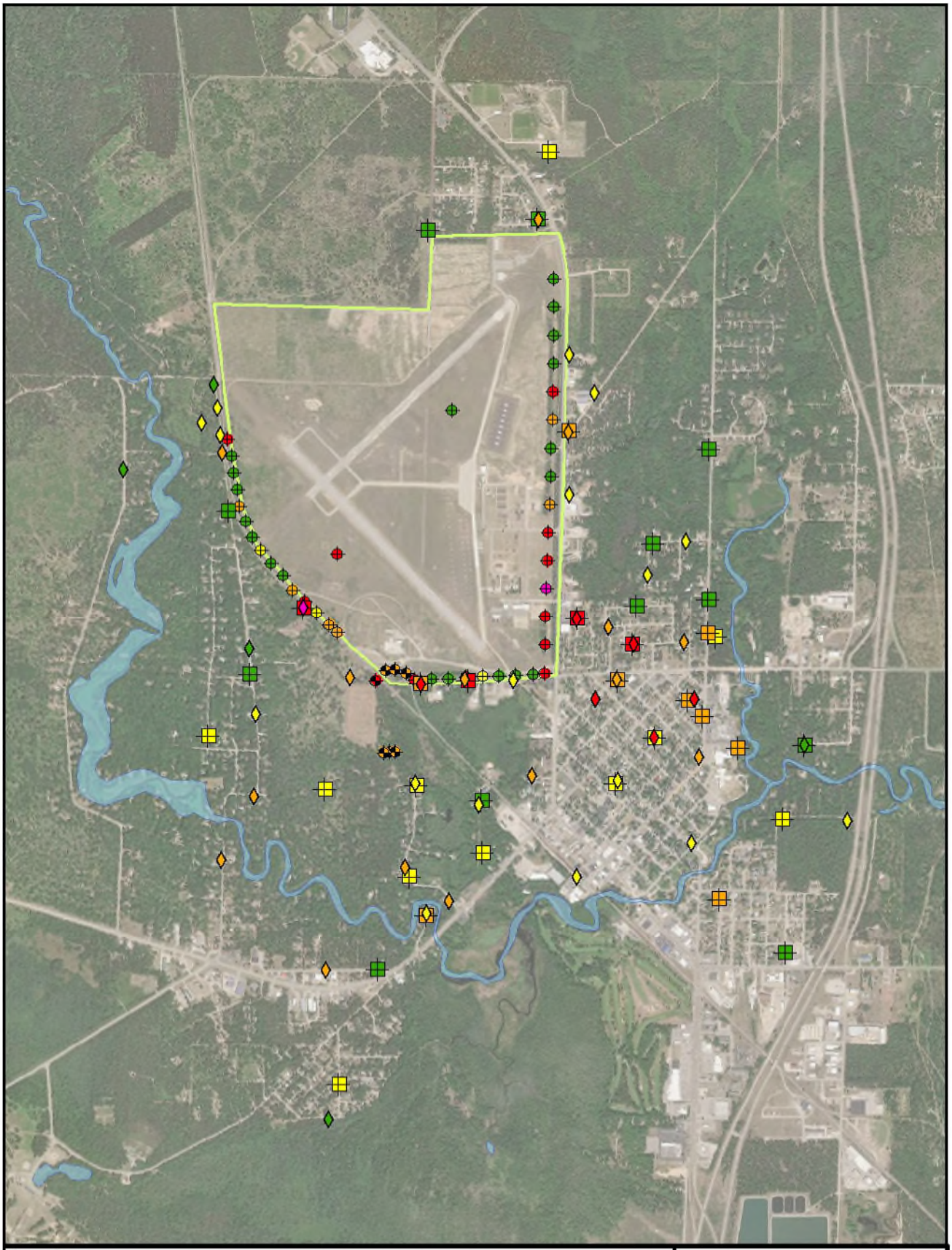
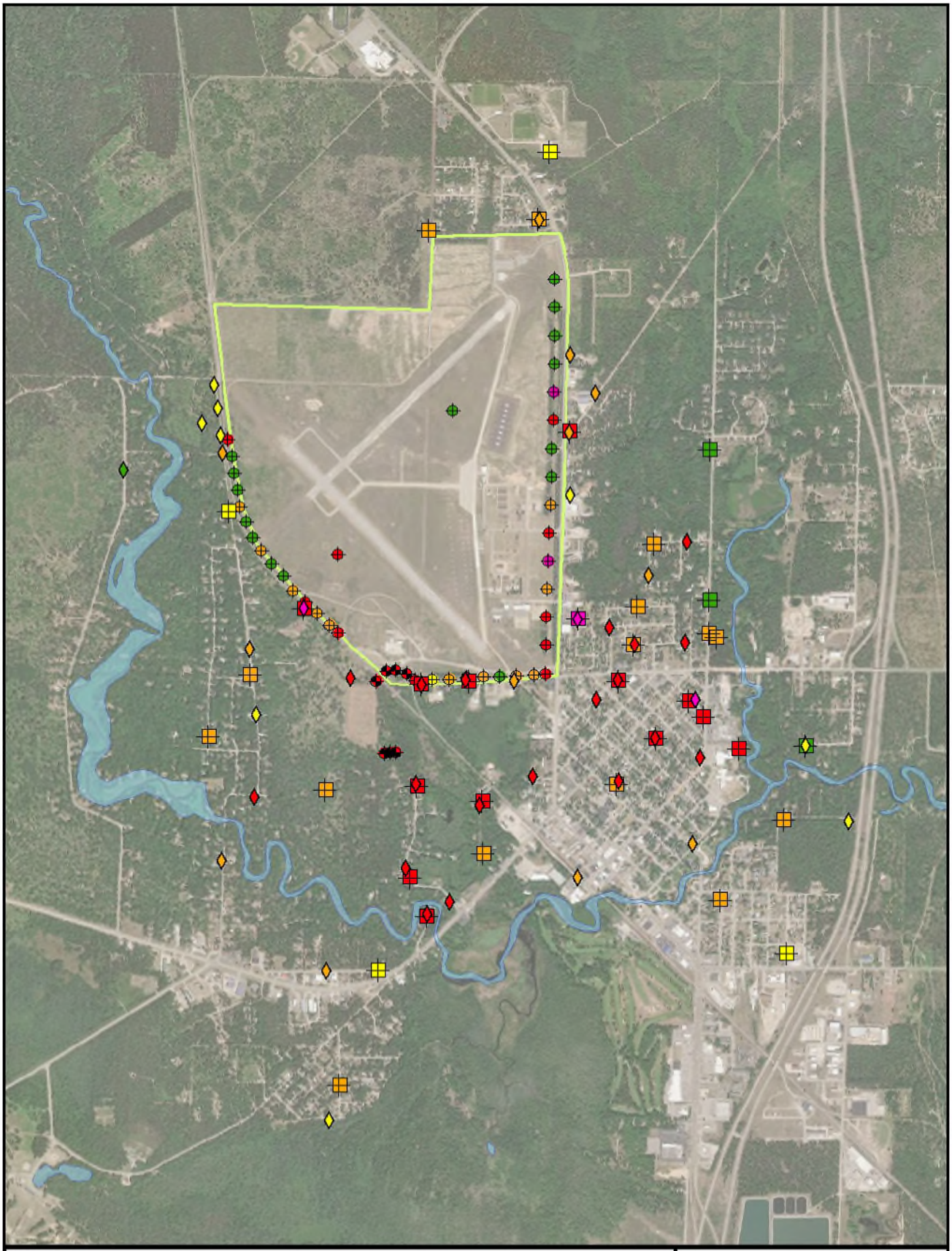


FIGURE 17
PFOA + PFOS HEAT MAP

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXDs\RI_Phase_III_Report_Figures\Figure_17_Grayling_PFOA_PFOS_March2020.mxd


Legend
Phase I VAS Sampling Location
Phase II and Phase III Monitoring Well - March 2020 Sampling
AMEC VAS Sampling Location
AMEC Monitoring Well
Grayling Army Airfield Boundary
Total PFAS, ng/L or ppt
Non-Detect
>ND to 10
>10 to 70
>70 to 1,000
>1,000
FIGURE 18
TOTAL PFAS HEAT MAP
GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN
EGLE
N
0
0.25
0.5
1
Miles
Prepared: 8/23/2021
Grayling
AAF Airport
Au Sable
L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Camp_Grayling\MXD\ARI_Phase_III_Report_Figures\Figure_18_Grayling_TotalPFAS_March2020.mxd

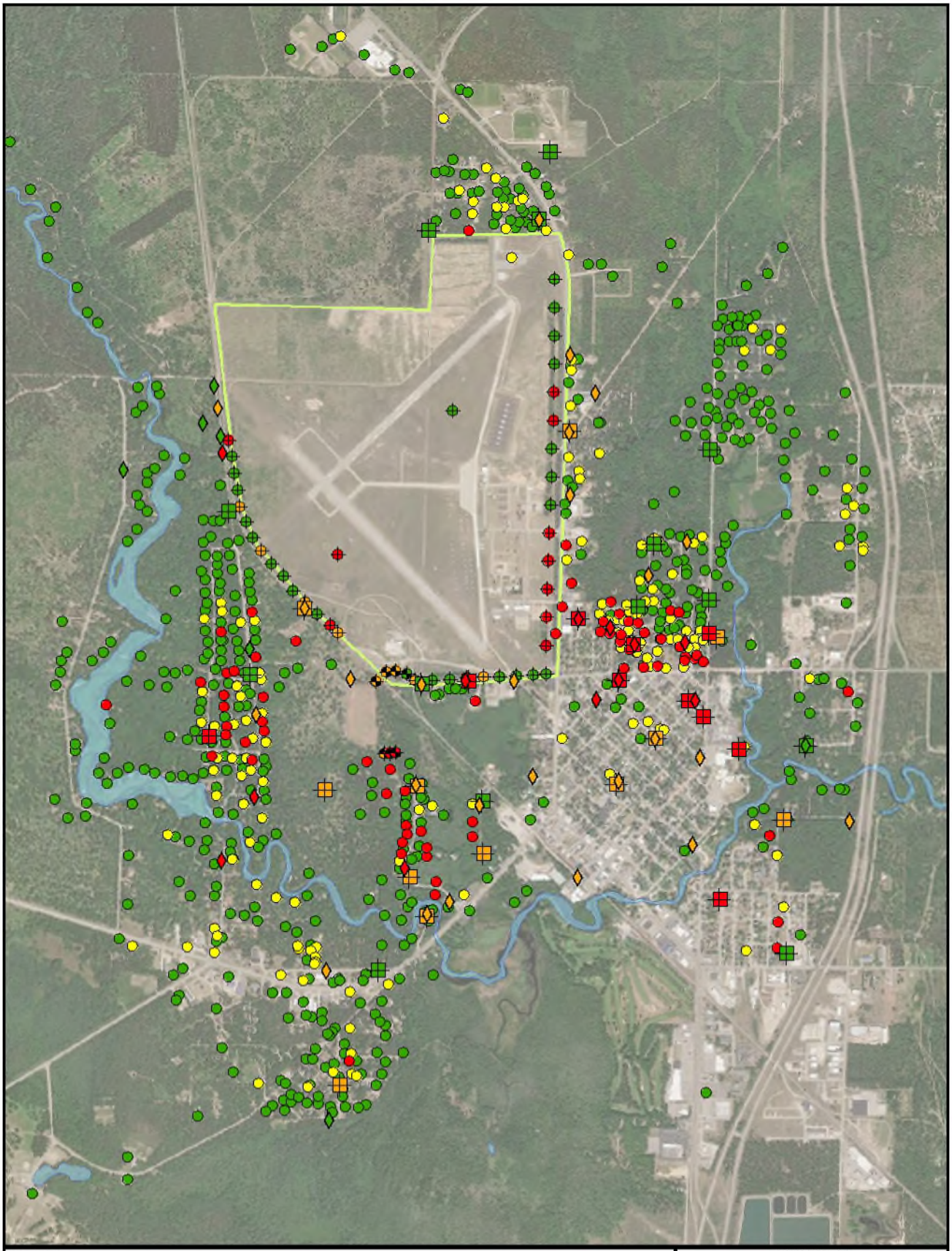


FIGURE 19
RI MONITORING WELL, VAS, AND RESIDENTIAL DRINKING WATER ANALYTICAL RESULTS
PFOA

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

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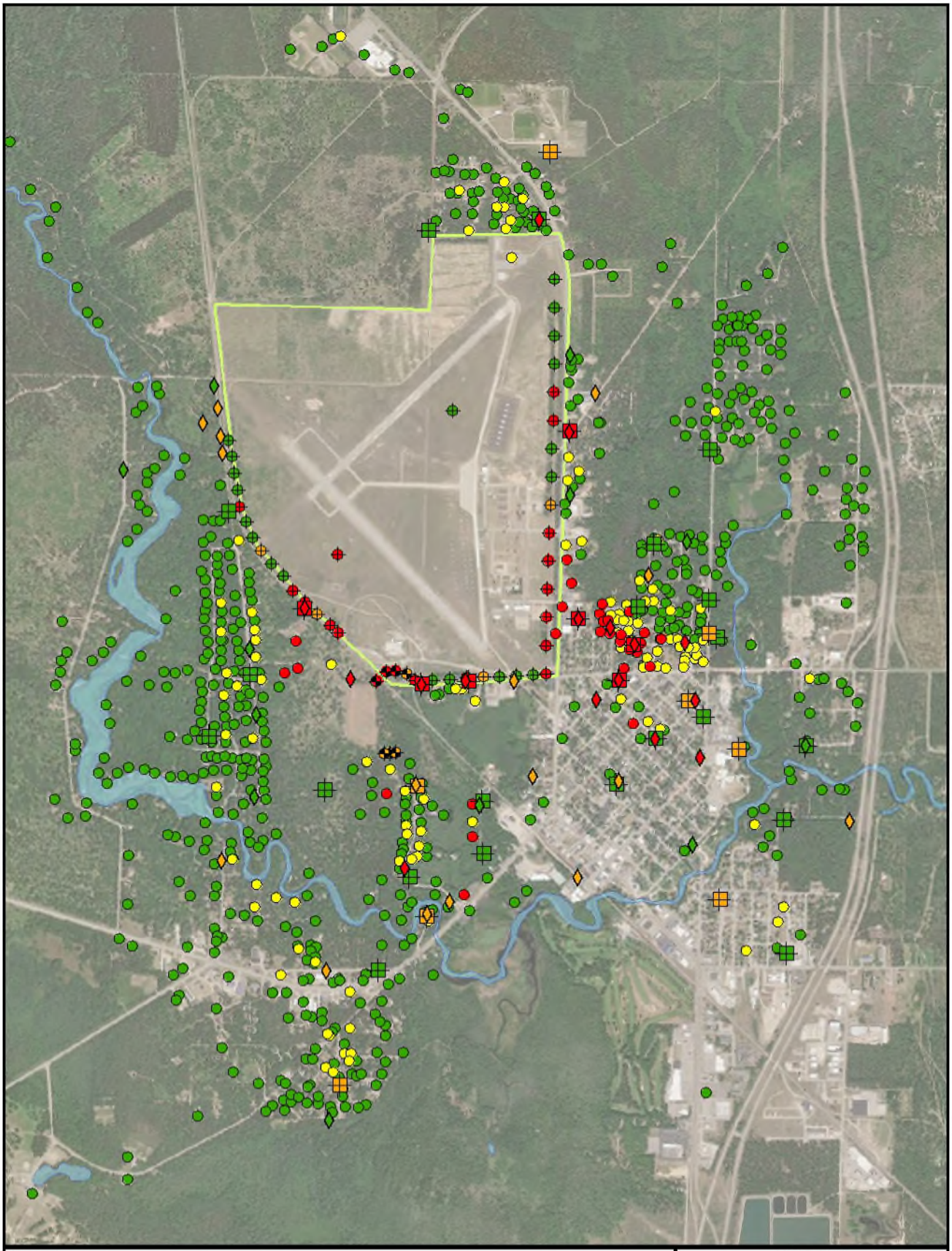

Legend

- Phase I VAS Sampling Location
- Phase II and Phase III Monitoring Well - March 2020 Sampling
- AMEC VAS Sampling Location
- AMEC Monitoring Well
- Residential Well - Samples Collected through March 2020
- Grayling Army Airfield Boundary

PFOS, ng/L or ppt

- Non-Detect
- >ND to 16
- >16

FIGURE 20
RI MONITORING WELL, VAS, AND RESIDENTIAL DRINKING WATER ANALYTICAL RESULTS
PFOS

GRAYLING AREA PFAS
CRAWFORD COUNTY, MICHIGAN

EGLE

N

0 0.25 0.5 1 Miles

Prepared: 12/6/2021

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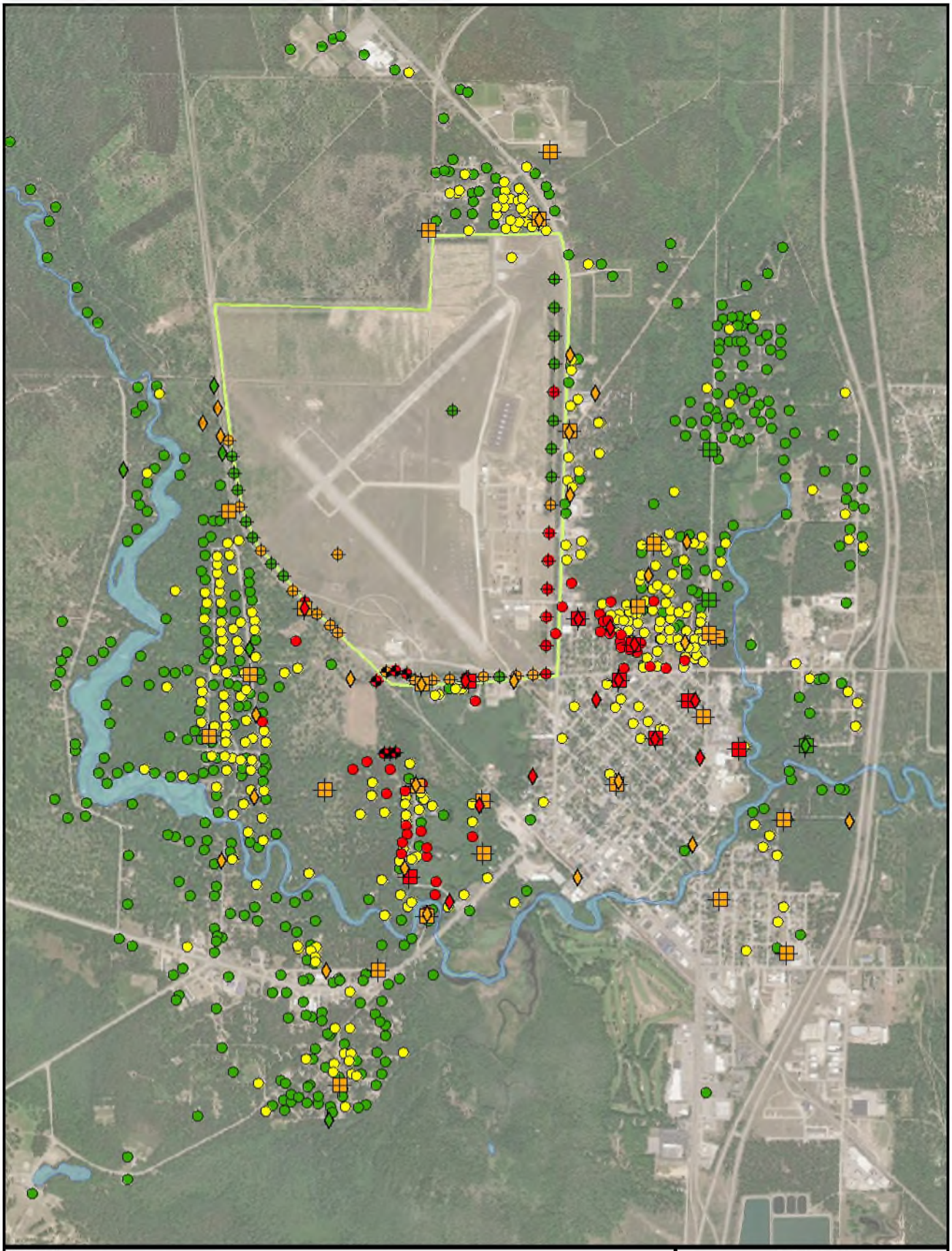

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Tables

DRAFT

Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	Screened Interval (ft bgs)	Well Casing Diameter	Easting (ft)	Northing (ft)	TOC Elevation (ft AMSL)	Surface Elevation (ft AMSL)	Total Boring Depth (ft bgs)	DTW (ft bgs) Feb 2020	Groundwater Elevation (ft AMSL) Feb 2020
GAAF-MW001	GAAF-MW001 (16-21)	16-21	2-in	19594018.78	494807.12	1147.82	1148.09	65.00	NM	NM
	GAAF-MW001 (37-42)	37-42	2-in	19594018.82	494807.34	1147.80	1148.09	65.00	NM	NM
	GAAF-MW001 (56-61)	56-61	2-in	19594018.52	494807.26	1147.71	1148.09	65.00	NM	NM
GAAF-MW002	GAAF-MW002 (15-20)	15-20	2-in	19595066.93	495013.14	1145.85	1146.05	110.00	NM	NM
	GAAF-MW002 (60-65)	60-65	2-in	19595067.26	495013.21	1145.73	1146.05	110.00	NM	NM
	GAAF-MW002 (103-108)	103-108	2-in	19595067.14	495013.08	1145.65	1146.05	110.00	NM	NM
GAAF-MW003	GAAF-MW003 (16-21)	16-21	2-in	19594995.99	494344.54	1146.12	1146.44	110.00	NM	NM
	GAAF-MW003 (47-52)	47-52	2-in	19594995.87	494344.32	1146.16	1146.44	110.00	NM	NM
	GAAF-MW003 (99-104)	99-104	2-in	19594995.68	494344.44	1146.09	1146.44	110.00	NM	NM
GAAF-MW004	GAAF-MW004 (15-20)	15-20	2-in	19594735.64	493706.86	1145.48	1145.87	147.00	NM	NM
	GAAF-MW004 (40-45)	40-45	1-in	19594735.48	493706.65	1145.39	1145.87	147.00	NM	NM
	GAAF-MW004 (70-75)	70-75	2-in	19594735.75	493706.62	1145.33	1145.87	147.00	NM	NM
	GAAF-MW004 (100-105)	100-105	1-in	19594735.60	493706.56	1145.28	1145.87	147.00	NM	NM
	GAAF-MW004 (129-134)	129-134	2-in	19594735.90	493706.76	1145.22	1145.87	147.00	NM	NM
GAAF-MW005	GAAF-MW005 (19-24)	19-24	2-in	19595969.72	493352.31	1145.14	1145.38	160.00	NM	NM
	GAAF-MW005 (52-57)	52-57	1-in	19595969.77	493352.60	1145.00	1145.38	160.00	NM	NM
	GAAF-MW005 (85-90)	85-90	2-in	19595969.43	493352.28	1145.05	1145.38	160.00	NM	NM
	GAAF-MW005 (115-120)	115-120	1-in	19595969.39	493352.64	1144.91	1145.38	160.00	NM	NM
	GAAF-MW005 (145-150)	145-150	2-in	19595969.58	493352.74	1144.92	1145.38	160.00	NM	NM
GAAF-MW006	GAAF-MW006 (22-27)	22-27	2-in	19595382.89	492696.02	1146.68	1146.85	130.00	NM	NM
	GAAF-MW006 (74-79)	74-79	2-in	19595383.18	492695.99	1146.61	1146.85	130.00	NM	NM
	GAAF-MW006 (125-130)	125-130	2-in	19595383.05	492696.17	1146.55	1146.85	130.00	NM	NM
GAAF-MW007	GAAF-MW007 (15-20)	15-20	2-in	19594694.05	491884.70	1142.51	1142.75	140.00	NM	NM
	GAAF-MW007 (42-47)	42-47	1-in	19594694.09	491884.38	1142.46	1142.75	140.00	NM	NM
	GAAF-MW007 (70-75)	70-75	2-in	19594693.96	491884.45	1142.33	1142.75	140.00	NM	NM
	GAAF-MW007 (98-103)	98-103	1-in	19594693.93	491884.21	1142.29	1142.75	140.00	NM	NM
	GAAF-MW007 (125-130)	125-130	2-in	19594694.24	491884.48	1142.25	1142.75	140.00	NM	NM
GAAF-MW008	GAAF-MW008 (15-20)	15-20	2-in	19596465.33	494476.23	1141.03	1141.41	50.00	NM	NM
	GAAF-MW008 (25-30)	25-30	2-in	19596465.00	494475.95	1141.24	1141.41	50.00	NM	NM
	GAAF-MW008 (36.5-41.5)	36.5-41.5	2-in	19596465.28	494475.87	1140.84	1141.41	50.00	NM	NM
GAAF-MW009	GAAF-MW009 (14-19)	14-19	2-in	19596859.93	492505.19	1134.62	1134.86	50.00	NM	NM
	GAAF-MW009 (25-30)	25-30	2-in	19596859.87	492505.34	1134.32	1134.86	50.00	NM	NM
	GAAF-MW009 (36-41)	36-41	2-in	19596860.17	492505.39	1134.51	1134.86	50.00	NM	NM
GAAF-MW010	GAAF-MW010 (25-30)	25-30	2-in	19598034.11	492558.10	1144.49	1145.43	115.00	NM	NM
	GAAF-MW010 (65-70)	65-70	2-in	19598033.96	492557.75	1144.37	1145.43	115.00	NM	NM
	GAAF-MW010 (97-112)	97-112	2-in	19598034.17	492557.80	1145.00	1145.43	115.00	NM	NM
GAAF-MW011	GAAF-MW011 (5-10)	5-10	2-in	19592092.51	493699.44	1137.27	1137.70	60.00	NM	NM
	GAAF-MW011 (28-33)	28-33	2-in	19592092.59	493699.70	1137.30	1137.70	60.00	NM	NM
	GAAF-MW011 (40-45)	40-45	2-in	19592092.33	493699.85	1137.26	1137.70	60.00	NM	NM
GAAF-MW012	GAAF-MW012 (8-13)	8-13	2-in	19591255.69	493649.72	1141.96	1142.13	55.00	NM	NM
	GAAF-MW012 (19-24)	19-24	2-in	19591256.06	493649.58	1141.88	1142.13	55.00	NM	NM
	GAAF-MW012 (31-36)	31-36	2-in	19591255.78	493649.82	1141.80	1142.13	55.00	NM	NM
	GAAF-MW012 (43-48)	43-48	2-in	19591255.84	493649.33	1141.68	1142.13	55.00	NM	NM
GAAF-MW013	GAAF-MW013 (7-12)	7-12	2-in	19591179.58	491847.41	1137.90	1138.32	60.00	NM	NM
	GAAF-MW013 (20-25)	20-25	2-in	19591179.26	491847.50	1137.93	1138.32	60.00	NM	NM
	GAAF-MW013 (40-45)	40-45	2-in	19591179.44	491847.13	1137.95	1138.32	60.00	NM	NM
	GAAF-MW013 (50-55)	50-55	2-in	19591179.18	491847.18	1137.84	1138.32	60.00	NM	NM
GAAF-MW014	GAAF-MW014 (6-11)	6-11	2-in	19592327.87	491593.83	1136.32	1136.55	60.00	NM	NM
	GAAF-MW014 (25-30)	25-30	2-in	19592328.14	491593.74	1136.18	1136.55	60.00	NM	NM
	GAAF-MW014 (50-55)	50-55	2-in	19592328.07	491593.59	1136.15	1136.55	60.00	NM	NM

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	DTW (ft bgs) March 2020	Groundwater Elevation (ft AMSL) March 2020	Vertical Gradient
GAAF-MW001	GAAF-MW001 (16-21)	14.81	1133.01	
	GAAF-MW001 (37-42)	14.85	1132.95	0.0027
	GAAF-MW001 (56-61)	14.78	1132.93	0.0019
GAAF-MW002	GAAF-MW002 (15-20)	14.97	1130.88	
	GAAF-MW002 (60-65)	14.88	1130.85	0.0007
	GAAF-MW002 (103-108)	14.82	1130.83	0.0006
GAAF-MW003	GAAF-MW003 (16-21)	16.31	1129.81	
	GAAF-MW003 (47-52)	16.38	1129.78	0.0008
	GAAF-MW003 (99-104)	16.33	1129.76	0.0005
GAAF-MW004	GAAF-MW004 (15-20)	16.12	1129.36	
	GAAF-MW004 (40-45)	16.00	1129.39	-0.0013
	GAAF-MW004 (70-75)	15.96	1129.37	-0.0001
	GAAF-MW004 (100-105)	15.91	1129.37	-0.0001
	GAAF-MW004 (129-134)	15.92	1129.30	0.0005
GAAF-MW005	GAAF-MW005 (19-24)	19.41	1125.73	
	GAAF-MW005 (52-57)	19.33	1125.67	0.0020
	GAAF-MW005 (85-90)	19.30	1125.75	-0.0002
	GAAF-MW005 (115-120)	BROKEN	NM	NM
	GAAF-MW005 (145-150)	19.18	1125.74	-0.0001
GAAF-MW006	GAAF-MW006 (22-27)	20.03	1126.65	
	GAAF-MW006 (74-79)	20.00	1126.61	0.0007
	GAAF-MW006 (125-130)	19.94	1126.61	0.0004
GAAF-MW007	GAAF-MW007 (15-20)	15.14	1127.37	
	GAAF-MW007 (42-47)	15.13	1127.33	0.0014
	GAAF-MW007 (70-75)	15.10	1127.23	0.0025
	GAAF-MW007 (98-103)	14.93	1127.36	0.0002
	GAAF-MW007 (125-130)	14.90	1127.35	0.0002
GAAF-MW008	GAAF-MW008 (15-20)	17.05	1123.98	
	GAAF-MW008 (25-30)	17.05	1124.19	-0.0209
	GAAF-MW008 (36.5-41.5)	16.95	1123.89	0.0041
GAAF-MW009	GAAF-MW009 (14-19)	14.95	1119.67	
	GAAF-MW009 (25-30)	14.90	1119.42	0.0220
	GAAF-MW009 (36-41)	14.72	1119.79	-0.0055
GAAF-MW010	GAAF-MW010 (25-30)	24.03	1120.46	
	GAAF-MW010 (65-70)	23.91	1120.46	0.0001
	GAAF-MW010 (97-112)	23.82	1121.18	-0.0100
GAAF-MW011	GAAF-MW011 (5-10)	3.16	1134.11	
	GAAF-MW011 (28-33)	3.16	1134.14	-0.0011
	GAAF-MW011 (40-45)	3.15	1134.11	0.0001
GAAF-MW012	GAAF-MW012 (8-13)	7.29	1134.67	
	GAAF-MW012 (19-24)	7.21	1134.67	-0.0003
	GAAF-MW012 (31-36)	7.16	1134.64	0.0013
	GAAF-MW012 (43-48)	7.17	1134.51	0.0044
GAAF-MW013	GAAF-MW013 (7-12)	4.99	1132.91	
	GAAF-MW013 (20-25)	6.74	1131.19	0.1324
	GAAF-MW013 (40-45)	6.68	1131.27	0.0496
	GAAF-MW013 (50-55)	6.62	1131.22	0.0391
GAAF-MW014	GAAF-MW014 (6-11)	4.14	1132.18	
	GAAF-MW014 (25-30)	6.33	1129.85	0.1231
	GAAF-MW014 (50-55)	6.30	1129.85	0.0531

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	Screened Interval (ft bgs)	Well Casing Diameter	Easting (ft)	Northing (ft)	TOC Elevation (ft AMSL)	Surface Elevation (ft AMSL)	Total Boring Depth (ft bgs)	DTW (ft bgs) Feb 2020	Groundwater Elevation (ft AMSL) Feb 2020
GAAF-MW015	GAAF-MW015 (4-9)	4-9	2-in	19592348.40	490661.87	1132.46	1132.82	60.00	NM	NM
	GAAF-MW015 (25-30)	25-30	2-in	19592348.75	490661.86	1132.30	1132.82	60.00	NM	NM
	GAAF-MW015 (45-50)	45-50	2-in	19592348.73	490661.50	1132.23	1132.82	60.00	NM	NM
GAAF-MW016	GAAF-MW016 (5-10)	5-10	2-in	19591046.62	490248.20	1128.89	1129.34	50.00	NM	NM
	GAAF-MW016 (21-26)	21-26	2-in	19591046.82	490248.66	1128.90	1129.34	50.00	NM	NM
	GAAF-MW016 (38-43)	38-43	2-in	19591046.98	490248.30	1128.80	1129.34	50.00	NM	NM
GAAF-MW017	GAAF-MW017 (11-16)	11-16	2-in	19589185.18	494988.27	1147.33	1147.50	150.00	NM	NM
	GAAF-MW017 (24-29)	24-29	2-in	19589185.04	494988.41	1147.19	1147.50	150.00	NM	NM
	GAAF-MW017 (45-50)	45-50	2-in	19589184.89	494988.32	1147.18	1147.50	150.00	NM	NM
	GAAF-MW017 (80-85)	80-85	2-in	19589185.01	494988.13	1147.13	1147.50	150.00	NM	NM
GAAF-MW018	GAAF-MW018 (13-18)	13-18	2-in	19588234.99	493811.86	1148.92	1149.21	100.00	NM	NM
	GAAF-MW018 (30-35)	30-35	2-in	19588235.19	493811.47	1148.96	1149.21	100.00	NM	NM
	GAAF-MW018 (60-65)	60-65	2-in	19588235.11	493811.85	1148.82	1149.21	100.00	NM	NM
	GAAF-MW018 (95-100)	95-100	2-in	19588235.02	493811.44	1148.84	1149.21	100.00	NM	NM
GAAF-MW019	GAAF-MW019 (10-15)	10-15	2-in	19593322.87	501853.75	1157.04	1157.30	100.00	NM	NM
	GAAF-MW019 (27-32)	27-32	1-in	19593322.78	501853.55	1157.01	1157.30	100.00	NM	NM
	GAAF-MW019 (50-55)	50-55	2-in	19593322.57	501853.85	1157.01	1157.30	100.00	NM	NM
	GAAF-MW019 (75-80)	75-80	1-in	19593322.40	501853.60	1156.93	1157.30	100.00	NM	NM
	GAAF-MW019 (95-100)	95-100	2-in	19593322.71	501853.58	1156.89	1157.30	100.00	NM	NM
GAAF-MW020	GAAF-MW020 (10-15)	10-15	2-in	19593869.78	498109.50	1148.33	1148.40	100.00	NM	NM
	GAAF-MW020 (30-35)	30-35	1-in	19593869.56	498109.70	1148.21	1148.40	100.00	NM	NM
	GAAF-MW020 (55-60)	55-60	2-in	19593869.52	498109.38	1148.25	1148.40	100.00	NM	NM
	GAAF-MW020 (75-80)	75-80	1-in	19593869.90	498109.67	1148.15	1148.40	100.00	NM	NM
	GAAF-MW020 (95-100)	95-100	2-in	19593869.77	498109.80	1148.15	1148.40	100.00	NM	NM
GAAF-MW021	GAAF-MW021 (16-21)	16-21	2-in	19596328.62	494543.65	1143.06	1143.44	145.00	18.32	1124.74
	GAAF-MW021 (34-39)	34-39	1-in	19596328.62	494543.65	1143.04	1143.44	145.00	18.31	1124.73
	GAAF-MW021 (62-67)	62-67	2-in	19596328.62	494543.65	1143.05	1143.44	145.00	17.01	1126.04
	GAAF-MW021 (137-142)	137-142	2-in	19596328.62	494543.65	1143.01	1143.44	145.00	17.02	1125.99
GAAF-MW022	GAAF-MW022 (18-23)	18-23	2-in	19596228.52	493079.74	1140.20	1140.96	180.00	16.20	1124.00
	GAAF-MW022 (55-60)	55-60	2-in	19596228.52	493079.74	1140.66	1140.96	180.00	16.10	1124.56
	GAAF-MW022 (95-100)	95-100	2-in	19596228.52	493079.74	1140.11	1140.96	180.00	15.53	1124.58
	GAAF-MW022 (138-143)	138-143	1-in	19596228.52	493079.74	1140.64	1140.96	180.00	15.15	1125.49
	GAAF-MW022 (172-177)	172-177	2-in	19596228.52	493079.74	1139.94	1140.96	180.00	15.21	1124.73
GAAF-MW023	GAAF-MW023 (20-25)	20-25	2-in	19595352.57	496120.43	1145.68	1146.17	100.00	13.29	1132.39
	GAAF-MW023 (36-41)	36-41	1-in	19595352.57	496120.43	1145.80	1146.17	100.00	13.40	1132.40
	GAAF-MW023 (60-65)	60-65	2-in	19595352.57	496120.43	1145.71	1146.17	100.00	13.32	1132.39
	GAAF-MW023 (80-85)	80-85	1-in	19595352.57	496120.43	1145.86	1146.17	100.00	13.50	1132.36
	GAAF-MW023 (95-100)	95-100	2-in	19595352.57	496120.43	1145.79	1146.17	100.00	13.36	1132.43
GAAF-MW024	GAAF-MW024 (14-19)	14-19	2-in	19596342.97	497787.17	1139.67	1140.02	45.00	5.90	1133.77
	GAAF-MW024 (24-29)	24-29	2-in	19596342.97	497787.17	1139.72	1140.02	45.00	5.95	1133.77
	GAAF-MW024 (35-40)	35-40	2-in	19596342.97	497787.17	1139.71	1140.02	45.00	5.90	1133.81
GAAF-MW025	GAAF-MW025 (12-17)	12-17	2-in	19596333.97	495133.01	1131.57	1132.37	40.00	5.87	1125.70
	GAAF-MW025 (23-26)	23-26	2-in	19596333.97	495133.01	1131.17	1132.37	40.00	6.00	1125.17
	GAAF-MW025 (32-35)	32-35	2-in	19596333.97	495133.01	1131.64	1132.37	40.00	5.95	1125.69
GAAF-MW026	GAAF-MW026 (8.5-13.5)	8.5-13.5	2-in	19591381.48	501656.74	1159.37	1159.68	100.00	10.09	1149.28
	GAAF-MW026 (25-30)	25-30	1-in	19591381.48	501656.74	1159.26	1159.68	100.00	9.98	1149.28
	GAAF-MW026 (45-50)	45-50	2-in	19591381.48	501656.74	1159.28	1159.68	100.00	10.00	1149.28
	GAAF-MW026 (70-75)	70-75	1-in	19591381.48	501656.74	1158.93	1159.68	100.00	9.68	1149.25
	GAAF-MW026 (95-100)	95-100	2-in	19591381.48	501656.74	1159.35	1159.68	100.00	10.09	1149.26

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	DTW (ft bgs) March 2020	Groundwater Elevation (ft AMSL) March 2020	Vertical Gradient
GAAF-MW015	GAAF-MW015 (4-9)	3.68	1128.78	0.0364
	GAAF-MW015 (25-30)	4.29	1128.01	-0.0091
	GAAF-MW015 (45-50)	4.03	1128.20	0.0142
GAAF-MW016	GAAF-MW016 (5-10)	1.48	1127.41	
	GAAF-MW016 (21-26)	1.42	1127.48	-0.0043
	GAAF-MW016 (38-43)	1.39	1127.41	-0.0002
GAAF-MW017	GAAF-MW017 (11-16)	10.12	1137.21	
	GAAF-MW017 (24-29)	10.07	1137.12	0.0073
	GAAF-MW017 (45-50)	10.02	1137.16	0.0016
	GAAF-MW017 (80-85)	10.20	1136.93	0.0041
GAAF-MW018	GAAF-MW018 (13-18)	13.52	1135.40	
	GAAF-MW018 (30-35)	13.48	1135.48	-0.0045
	GAAF-MW018 (60-65)	13.47	1135.35	0.0010
	GAAF-MW018 (95-100)	13.39	1135.45	-0.0006
GAAF-MW019	GAAF-MW019 (10-15)	7.90	1149.14	
	GAAF-MW019 (27-32)	7.90	1149.11	0.0018
	GAAF-MW019 (50-55)	7.90	1149.11	0.0007
	GAAF-MW019 (75-80)	7.90	1149.03	0.0017
	GAAF-MW019 (95-100)	7.78	1149.11	0.0003
GAAF-MW020	GAAF-MW020 (10-15)	8.13	1140.20	
	GAAF-MW020 (30-35)	8.05	1140.16	0.0022
	GAAF-MW020 (55-60)	8.04	1140.21	-0.0002
	GAAF-MW020 (75-80)	7.98	1140.17	0.0004
	GAAF-MW020 (95-100)	7.94	1140.21	-0.0001
GAAF-MW021	GAAF-MW021 (16-21)	18.25	1124.81	
	GAAF-MW021 (34-39)	18.23	1124.81	0.0000
	GAAF-MW021 (62-67)	17.11	1125.94	-0.0246
	GAAF-MW021 (137-142)	17.06	1125.95	-0.0094
GAAF-MW022	GAAF-MW022 (18-23)	16.10	1124.1	
	GAAF-MW022 (55-60)	16.02	1124.64	-0.0146
	GAAF-MW022 (95-100)	15.45	1124.66	-0.0073
	GAAF-MW022 (138-143)	15.97	1124.67	-0.0047
	GAAF-MW022 (172-177)	15.13	1124.81	-0.0046
GAAF-MW023	GAAF-MW023 (20-25)	13.11	1132.57	
	GAAF-MW023 (36-41)	13.22	1132.58	-0.0006
	GAAF-MW023 (60-65)	13.14	1132.57	0.0000
	GAAF-MW023 (80-85)	13.25	1132.61	-0.0007
	GAAF-MW023 (95-100)	13.17	1132.62	-0.0007
GAAF-MW024	GAAF-MW024 (14-19)	5.10	1134.57	
	GAAF-MW024 (24-29)	5.10	1134.62	-0.0050
	GAAF-MW024 (35-40)	5.11	1134.6	-0.0014
GAAF-MW025	GAAF-MW025 (12-17)	5.65	1125.92	
	GAAF-MW025 (23-26)	5.78	1125.39	0.0482
	GAAF-MW025 (32-35)	5.74	1125.9	0.0010
GAAF-MW026	GAAF-MW026 (8.5-13.5)	9.98	1149.39	
	GAAF-MW026 (25-30)	9.88	1149.38	0.0006
	GAAF-MW026 (45-50)	9.91	1149.37	0.0005
	GAAF-MW026 (70-75)	8.71	1150.22	-0.0135
	GAAF-MW026 (95-100)	9.98	1149.37	0.0002

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	Screened Interval (ft bgs)	Well Casing Diameter	Easting (ft)	Northing (ft)	TOC Elevation (ft AMSL)	Surface Elevation (ft AMSL)	Total Boring Depth (ft bgs)	DTW (ft bgs) Feb 2020	Groundwater Elevation (ft AMSL) Feb 2020
GAAF-MW027	GAAF-MW027 (12-17)	12-17	2-in	19593519.89	503036.74	1155.13	1155.52	80.00	3.75	1151.38
	GAAF-MW027 (27-32)	27-32	1-in	19593519.89	503036.74	1154.84	1155.52	80.00	3.47	1151.37
	GAAF-MW027 (42-47)	42-47	2-in	19593519.89	503036.74	1155.12	1155.52	80.00	3.74	1151.38
	GAAF-MW027 (57-62)	57-62	1-in	19593519.89	503036.74	1155.04	1155.52	80.00	3.65	1151.39
	GAAF-MW027 (72-77)	72-77	2-in	19593519.89	503036.74	1155.16	1155.52	80.00	3.78	1151.38
GAAF-MW028	GAAF-MW028 (14-19)	14-19	2-in	19587505.25	492731.44	1144.27	1144.52	100.00	10.78	1133.49
	GAAF-MW028 (34-39)	34-39	1-in	19587505.25	492731.44	1144.21	1144.52	100.00	10.72	1133.49
	GAAF-MW028 (45-50)	45-50	2-in	19587505.25	492731.44	1144.25	1144.52	100.00	10.77	1133.48
	GAAF-MW028 (65-70)	65-70	1-in	19587505.25	492731.44	1144.25	1144.52	100.00	10.79	1133.46
	GAAF-MW028 (85-90)	85-90	2-in	19587505.25	492731.44	1144.23	1144.52	100.00	10.78	1133.45
GAAF-MW029	GAAF-MW029 (13-18)	13-18	2-in	19587853.74	496691.38	1147.46	1147.83	85.00	7.80	1139.66
	GAAF-MW029 (28-33)	28-33	1-in	19587853.74	496691.38	1147.44	1147.83	85.00	7.78	1139.66
	GAAF-MW029 (43-48)	43-48	2-in	19587853.74	496691.38	1147.74	1147.83	85.00	7.77	1139.97
	GAAF-MW029 (58-63)	58-63	1-in	19587853.74	496691.38	1147.42	1147.83	85.00	7.78	1139.64
	GAAF-MW029 (73-78)	73-78	2-in	19587853.74	496691.38	1147.43	1147.83	85.00	7.79	1139.64
GAAF-MW030	GAAF-MW030 (10-15)	10-15	1-in	19589559.87	491789.38	1145.78	1146.00	45.00	14.40	1131.38
	GAAF-MW030 (20-25)	20-25	2-in	19589559.87	491789.38	1145.80	1146.00	45.00	14.43	1131.37
	GAAF-MW030 (30-35)	30-35	1-in	19589559.87	491789.38	1145.73	1146.00	45.00	14.33	1131.40
	GAAF-MW030 (40-45)	40-45	2-in	19589559.87	491789.38	1145.61	1146.00	45.00	14.23	1131.38
GAAF-MW031	GAAF-MW031 (13-18)	13-18	2-in	19597645.31	491262.16	1126.82	1127.13	90.00	6.06	1120.76
	GAAF-MW031 (27-32)	27-32	1-in	19597645.31	491262.16	1126.93	1127.13	90.00	6.21	1120.72
	GAAF-MW031 (45-50)	45-50	2-in	19597645.31	491262.16	1126.77	1127.13	90.00	6.00	1120.77
	GAAF-MW031 (70-75)	70-75	1-in	19597645.31	491262.16	1126.79	1127.13	90.00	6.05	1120.74
	GAAF-MW031 (82-87)	82-87	2-in	19597645.31	491262.16	1126.89	1127.13	90.00	6.10	1120.79
GAAF-MW032	GAAF-MW032 (12-17)	12-17	2-in	19590490.18	488609.44	1139.58	1139.87	75.00	10.32	1129.26
	GAAF-MW032 (22-27)	22-27	1-in	19590490.18	488609.44	1139.55	1139.87	75.00	10.31	1129.24
	GAAF-MW032 (32-37)	32-37	2-in	19590490.18	488609.44	1139.61	1139.87	75.00	10.33	1129.28
	GAAF-MW032 (53-58)	53-58	1-in	19590490.18	488609.44	1139.63	1139.87	75.00	10.35	1129.28
	GAAF-MW032 (69-74)	69-74	2-in	19590490.18	488609.44	1139.87	1139.87	75.00	10.34	1129.53
GAAF-MW033	GAAF-MW033 (05-10)	5-10	2-in	19591347.30	489561.59	1127.37	1127.57	35.00	2.27	1125.10
	GAAF-MW033 (15-20)	15-20	2-in	19591347.30	489561.59	1127.35	1127.57	35.00	2.28	1125.07
	GAAF-MW033 (27-32)	27-32	2-in	19591347.30	489561.59	1127.35	1127.57	35.00	2.22	1125.13
GAAF-MW034	GAAF-MW034 (12-17)	12-17	2-in	19596519.20	489851.17	1134.88	1135.27	100.00	10.51	1124.37
	GAAF-MW034(30-35)	30-35	1-in	19596519.20	489851.17	1134.91	1135.27	100.00	10.98	1123.93
	GAAF-MW034 (50-55)	50-55	2-in	19596519.20	489851.17	1134.92	1135.27	100.00	10.98	1123.94
	GAAF-MW034 (70-75)	70-75	1-in	19596519.20	489851.17	1134.75	1135.27	100.00	10.85	1123.90
	GAAF-MW034 (95-100)	95-100	2-in	19596519.20	489851.17	1134.86	1135.27	100.00	10.91	1123.95
GAAF-MW035	GAAF-MW035 (6-11)	6-11	2-in	19589812.43	486580.08	1139.03	1139.31	70.00	5.02	1134.01
	GAAF-MW035 (15-20)	15-20	1-in	19589812.43	486580.08	1138.89	1139.31	70.00	5.20	1133.69
	GAAF-MW035 (30-35)	30-35	2-in	19589812.43	486580.08	1139.02	1139.31	70.00	5.32	1133.70
	GAAF-MW035 (55-60)	55-60	1-in	19589812.43	486580.08	1139.03	1139.31	70.00	5.35	1133.68
	GAAF-MW035 (65-70)	65-70	2-in	19589812.43	486580.08	1138.87	1139.31	70.00	5.20	1133.67
GAAF-MW036	GAAF-MW036 (12-17)	12-17	2-in	19597696.99	488903.45	1133.23	1134.27	100.00	7.01	1126.22
	GAAF-MW036 (25-30)	25-30	1-in	19597696.99	488903.45	1133.98	1134.27	100.00	7.75	1126.23
	GAAF-MW036 (43-48)	43-48	2-in	19597696.99	488903.45	1133.26	1134.27	100.00	7.07	1126.19
	GAAF-MW036 (70-75)	70-75	1-in	19597696.99	488903.45	1133.83	1134.27	100.00	7.66	1126.17
	GAAF-MW036 (95-100)	95-100	2-in	19597696.99	488903.45	1133.94	1134.27	100.00	7.74	1126.20

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	DTW (ft bgs) March 2020	Groundwater Elevation (ft AMSL) March 2020	Vertical Gradient
GAAF-MW027	GAAF-MW027 (12-17)	3.20	1151.93	
	GAAF-MW027 (27-32)	2.96	1151.89	0.0027
	GAAF-MW027 (42-47)	3.21	1151.91	0.0007
	GAAF-MW027 (57-62)	3.13	1151.91	0.0004
	GAAF-MW027 (72-77)	3.24	1151.92	0.0002
GAAF-MW028	GAAF-MW028 (14-19)	10.67	1133.6	
	GAAF-MW028 (34-39)	10.59	1133.62	-0.0010
	GAAF-MW028 (45-50)	10.64	1133.61	-0.0003
	GAAF-MW028 (65-70)	10.65	1133.6	0.0000
	GAAF-MW028 (85-90)	10.63	1133.6	0.0000
GAAF-MW029	GAAF-MW029 (13-18)	7.50	1139.96	
	GAAF-MW029 (28-33)	7.45	1139.99	-0.0020
	GAAF-MW029 (43-48)	7.44	1140.3	-0.0113
	GAAF-MW029 (58-63)	7.45	1139.97	-0.0002
	GAAF-MW029 (73-78)	7.45	1139.98	-0.0003
GAAF-MW030	GAAF-MW030 (10-15)	14.36	1131.42	
	GAAF-MW030 (20-25)	14.36	1131.42	0.0000
	GAAF-MW030 (30-35)	14.30	1131.43	-0.0005
	GAAF-MW030 (40-45)	14.17	1131.44	-0.0007
GAAF-MW031	GAAF-MW031 (13-18)	5.82	1121	
	GAAF-MW031 (27-32)	5.92	1121.01	-0.0007
	GAAF-MW031 (45-50)	5.75	1121.02	-0.0006
	GAAF-MW031 (70-75)	5.79	1121	0.0000
	GAAF-MW031 (82-87)	5.86	1121.03	-0.0004
GAAF-MW032	GAAF-MW032 (12-17)	9.81	1129.77	
	GAAF-MW032 (22-27)	9.85	1129.7	0.0070
	GAAF-MW032 (32-37)	9.89	1129.72	0.0025
	GAAF-MW032 (53-58)	9.92	1129.71	0.0015
	GAAF-MW032 (69-74)	9.88	1129.99	-0.0039
GAAF-MW033	GAAF-MW033 (05-10)	1.98	1125.39	
	GAAF-MW033 (15-20)	2.03	1125.32	0.0070
	GAAF-MW033 (27-32)	2.01	1125.34	0.0023
GAAF-MW034	GAAF-MW034 (12-17)	10.03	1124.85	
	GAAF-MW034(30-35)	10.61	1124.3	0.0306
	GAAF-MW034 (50-55)	10.63	1124.29	0.0147
	GAAF-MW034 (70-75)	10.47	1124.28	0.0098
	GAAF-MW034 (95-100)	10.63	1124.23	0.0075
GAAF-MW035	GAAF-MW035 (6-11)	4.30	1134.73	
	GAAF-MW035 (15-20)	4.75	1134.14	0.0656
	GAAF-MW035 (30-35)	4.88	1134.14	0.0246
	GAAF-MW035 (55-60)	4.90	1134.13	0.0122
	GAAF-MW035 (65-70)	4.75	1134.12	0.0103
GAAF-MW036	GAAF-MW036 (12-17)	6.56	1126.67	
	GAAF-MW036 (25-30)	7.31	1126.67	0.0000
	GAAF-MW036 (43-48)	6.59	1126.67	0.0000
	GAAF-MW036 (70-75)	7.19	1126.64	0.0005
	GAAF-MW036 (95-100)	7.28	1126.66	0.0001

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Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	Screened Interval (ft bgs)	Well Casing Diameter	Easting (ft)	Northing (ft)	TOC Elevation (ft AMSL)	Surface Elevation (ft AMSL)	Total Boring Depth (ft bgs)	DTW (ft bgs) Feb 2020	Groundwater Elevation (ft AMSL) Feb 2020
GAAF-MW1	GAAF-MW1	NA	2-in	19593091.40	497955.99	1150.77	1151.01	NA	NA	NA
GAAF-MW2	GAAF-MW2		2-in	19592525.17	497080.69	1150.59	1150.92			
GAAF-MW3	GAAF-MW3		2-in	19592460.42	496257.94	1150.37	1150.63			
GAAF-MW4	GAAF-MW4		2-in	19592729.93	494257.32	1142.83	1143.08			
GAAF-MW5	GAAF-MW5		2-in	19591875.79	494448.05	1147.31	1147.58			
GAAF-MW6	GAAF-MW6		2-in	19589909.80	496261.24	1147.49	1147.86			
GAAF-MW7	GAAF-MW7		2-in	19588398.96	497936.14	1149.48	1149.75			
GAAF-MW8	GAAF-MW8		2-in	19589743.11	499779.30	1154.95	1155.27			
GAAF-MW9	GAAF-MW9		2-in	19593047.37	500620.86	1157.19	1157.48			
GAAF-MW10	GAAF-MW10		2-in	19591303.81	497875.75	1151.83	1152.17			
GAAF-MW11	GAAF-MW11		2-in	19592257.94	501531.59	1156.48	1156.88			
SW 001	NA	NA	NA	19586431.89	499026.09	1150.25	NA	NA	8.21	1142.04
SW 002				19587798.38	491262.73	1133.73			7.46	1126.27
SW 003				19591475.46	489124.57	1133.51			8.68	1124.83
SW 004				19595096.85	489860.21	1131.67			10.89	1120.78
SW 005				19596154.07	490331.69	1127.93			10.28	1117.65
SW 006				19596925.53	493863.68	1123.31			NM	NM

Notes:
bgs - Below ground surface
AMSL - Above mean sea level
NM - Not measured
NA - Not available
Vertical Gradient -
Compared to shallow screen
Positive value is downward gradient
Negative value is upward gradient

DRAFT

Table 1
Grayling Area PFAS Monitoring Well Completion Information and Groundwater Elevations
Grayling, Crawford County, Michigan

Location	Monitoring Well ID	DTW (ft bgs) March 2020	Groundwater Elevation (ft AMSL) March 2020	Vertical Gradient
GAAF-MW1	GAAF-MW1	10.13	1140.64	NA
GAAF-MW2	GAAF-MW2	11.2	1139.39	
GAAF-MW3	GAAF-MW3	12.38	1137.99	
GAAF-MW4	GAAF-MW4	8.83	1134	
GAAF-MW5	GAAF-MW5	12.07	1135.24	
GAAF-MW6	GAAF-MW6	8.41	1139.08	
GAAF-MW7	GAAF-MW7	7.32	1142.16	
GAAF-MW8	GAAF-MW8	9.13	1145.82	
GAAF-MW9	GAAF-MW9	10.93	1146.26	
GAAF-MW10	GAAF-MW10	9.96	1141.85	
GAAF-MW11	GAAF-MW11	7.65	1148.83	
SW 001	NA	NM	NM	NA
SW 002				
SW 003				
SW 004				
SW 005				
SW 006				

Notes:
bgs - Below ground surface
AMSL - Above mean sea level
NM - Not measured
NA - Not available
Vertical Gradient -
Compared to shallow screen
Positive value is downward gradient
Negative value is upward gradient

Table 2
PFAS Nomenclature
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Chemical Name	Abbreviation	Cas Number
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTeDA	376-06-7
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoro-2-propoxypropanoic acid	HFPO-DA	13252-13-6
Perfluorodecane sulfonic acid	PFDS	335-77-3
Perfluorobutane sulfonic acid	PFBS	375-73-5
Perfluoropentane sulfonic acid	PFPeS	2706-91-4
Perfluorohexane sulfonic acid	PFHxS	355-46-4
Perfluoroheptane sulfonic acid	PFHpS	375-92-8
Perfluorooctane sulfonic acid	PFOS	1763-23-1
Perfluorononane sulfonic acid	PFNS	68259-12-1
Perfluorooctanesulfonamide	PFOSA	754-91-6
4:2 Fluorotelomer sulfonic acid	4:2 FTS	757124-72-4
6:2 Fluorotelomer sulfonic acid	6:2 FTS	27619-97-2
8:2 Fluorotelomer sulfonic acid	8:2FTS	39108-34-4
N-Ethyl Perfluorooctane sulfonamindo acetic acid	EtFOSAA	2991-50-6
N-Methyl Perfluorooctane sulfonamide	MeFOSAA	2355-31-9

- Perfluoroalkyl Carboxylic Acids (**PFCAs**)
- Perfluoropolyether carboxylic acids **(PFPE)**
- Perfluoroalkane Sulfonic Acids (**PFSAs**)
- Perfluoroalkane Sulfonamides (**FASAs**)
- Fluorotelomer Sulfonic Acids (**FTSAs**)
- N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAAs**)
- N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAAs**)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW001	GAAF-MW001	GAAF-MW001	GAAF-MW002	GAAF-MW002	GAAF-MW002	GAAF-MW003
Well Screen Interval (ft bgs)		(16-21)	(37-42)	(56-61)	(15-20)	(60-65)	(103-108)	(16-21)
Sample ID		GW2003170855RAP	GW2003170935RAP	GW2003171015RAP	GW2003171450GSC	GW2003171355GSC	GW2003170945GSC	GW2003171105RAP
Sample Date		3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/17/2020
Lab Report		2000667	2000667	2000667	2000667	2000667	2000667	2000667
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.11	**56.5**	**6.42**	< 2.02	< 1.98	< 2.02	< 2.02
PFPeA	ng/l	< 2.11	**193**	**27.9**	< 2.02	< 1.98	< 2.02	**1.97 J**
PFHxA	ng/l	< 2.11	**185**	**32.3**	< 2.02	< 1.98	< 2.02	**2.2 J**
PFHpA	ng/l	< 2.11	**52.6**	**11.2**	< 2.02	< 1.98	< 2.02	< 2.02
PFOA	ng/l	**2.25 J**	**70.3**	**12.9**	< 2.02	< 1.98	< 2.02	< 2.02
PFNA	ng/l	< 2.11	**3.68 J**	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFDA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFUnA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFDoA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFTrDA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFTeDA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
11Cl-PF3OUdS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
9Cl-PF3ONS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
ADONA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
HFPO-DA	ng/l	< 3.16	< 2.90	< 3.01	< 3.04	< 2.96	< 3.02	< 3.02
PFDS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFBS	ng/l	**1.83 J**	**20.4**	**4.08 Q**	< 2.02	< 1.98	< 2.02	**3.58 J, Q**
PFPeS	ng/l	< 2.11	**18.4**	**7.72**	< 2.02	< 1.98	< 2.02	< 2.02
PFHxS	ng/l	**8.62**	**366**	**129**	< 2.02	**8.08**	**4.98**	**2.35 J**
PFHpS	ng/l	< 2.11	**18.9**	**11.2**	< 2.02	< 1.98	< 2.02	< 2.02
PFOS	ng/l	< 2.11	**161**	**89.8**	< 2.02	< 1.98	< 2.02	< 2.02
PFNS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFOSA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
4:2 FTS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
6:2 FTS	ng/l	< 2.11	**280**	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
8:2 FTS	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
EtFOSAA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	**7.36**	**4.45**	**5.41**
MeFOSAA	ng/l	< 2.11	< 1.93	< 2.01	< 2.02	< 1.98	< 2.02	< 2.02
PFOA+PFOS	ng/l	**2.25**	**231.3**	**102.7**	ND	ND	ND	ND
Total PFAS	ng/l	**12.7**	**1425.78**	**332.52**	ND	**15.44**	**9.43**	**15.51**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW003	GAAF-MW003	GAAF-MW004	GAAF-MW004	GAAF-MW004	GAAF-MW004	GAAF-MW004
Well Screen Interval (ft bgs)		(47-52)	(99-104)	(15-20)	(40-45)	(70-75)	(100-105)	(129-134)
Sample ID		GW2003171145RAP	GW2003171225RAP	GW2003181355GSC	GW2003181315GSC	GW2003181105GSC	GW2003181025GSC	GW2003180930GSC
Sample Date		3/17/2020	3/17/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020
Lab Report		2000667	2000667	2000675	2000675	2000675	2000667	2000667
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**163**	< 2.04	**4.28**	**11.4**	< 2.00	< 2.00	< 1.99
PFPeA	ng/l	**596**	< 2.04	< 1.95	**30.2**	< 2.00	< 2.00	< 1.99
PFHxA	ng/l	**505**	< 2.04	< 1.95	**33.4**	< 2.00	< 2.00	< 1.99
PFHpA	ng/l	**177**	< 2.04	< 1.95	**13.5**	< 2.00	< 2.00	< 1.99
PFOA	ng/l	**32.8**	< 2.04	< 1.95	**16.8**	**3.19 J**	< 2.00	< 1.99
PFNA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFDA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFUnA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFDoA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFTrDA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFTeDA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
11Cl-PF3OUdS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
9Cl-PF3ONS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
ADONA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
HFPO-DA	ng/l	< 2.99	< 3.06	< 2.92	< 2.91	< 3.00	< 3.00	< 2.99
PFDS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFBS	ng/l	**4.18**	< 2.04	< 1.95	**2.95 J**	< 2.00	< 2.00	< 1.99
PFPeS	ng/l	**4**	< 2.04	< 1.95	**4.48**	< 2.00	< 2.00	< 1.99
PFHxS	ng/l	**212**	< 2.04	< 1.95	**153**	**14.8**	< 2.00	**2.19 J**
PFHpS	ng/l	**7.44**	< 2.04	< 1.95	**4.34 Q**	< 2.00	< 2.00	< 1.99
PFOS	ng/l	**72.6**	< 2.04	< 1.95	**45.3**	**8.66**	< 2.00	< 1.99
PFNS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFOSA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
4:2 FTS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
6:2 FTS	ng/l	**255**	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
8:2 FTS	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
EtFOSAA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
MeFOSAA	ng/l	< 1.99	< 2.04	< 1.95	< 1.94	< 2.00	< 2.00	< 1.99
PFOA+PFOS	ng/l	**105.4**	ND	ND	**62.1**	**11.85**	ND	ND
Total PFAS	ng/l	**2029.02**	ND	**4.28**	**315.37**	**26.65**	ND	**2.19**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW005	GAAF-MW005	GAAF-MW005	GAAF-MW005	GAAF-MW006	GAAF-MW006	GAAF-MW006
Well Screen Interval (ft bgs)		(19-24)	(52-57)	(85-90)	(145-150)	(22-27)	(74-79)	(125-130)
Sample ID		GW2003171705MK	GW2003171635MK	GW2003171600MK	GW2003171520MK	GW2003171530RAP	GW2003171630RAP	GW2003180930RAP
Sample Date		3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/17/2020	3/18/2020
Lab Report		2000667	2000667	2000667	2000667	2000667	2000667	2000667
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**3.69 J**	**55.9**	< 2.01	< 2.05	**3.9 J**	**5.08**	< 1.92
PFPeA	ng/l	**2.17 J**	**171**	< 2.01	< 2.05	**2.02 J**	**11.2**	< 1.92
PFHxA	ng/l	**1.84 J, Q**	**172**	< 2.01	< 2.05	**3.7 J**	**11.4**	< 1.92
PFHpA	ng/l	< 1.95	**69.7**	< 2.01	< 2.05	< 1.98	**3.42 J, Q**	< 1.92
PFOA	ng/l	**3.72 J**	**60.7**	< 2.01	< 2.05	**5.69**	**4.01**	< 1.92
PFNA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFDA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFUnA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFDoA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFTrDA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFTeDA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
11Cl-PF3OUdS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
9Cl-PF3ONS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
ADONA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
HFPO-DA	ng/l	< 2.92	< 2.99	< 3.01	< 3.07	< 2.96	< 2.98	< 2.87
PFDS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFBS	ng/l	**4.72**	**21.2**	< 2.01	< 2.05	**7.14**	**3.75 J**	< 1.92
PFPeS	ng/l	< 1.95	**35.1**	< 2.01	< 2.05	< 1.98	**4.5**	< 1.92
PFHxS	ng/l	**4.8**	**399**	**3.04 J**	< 2.05	**3.55 J**	**65**	< 1.92
PFHpS	ng/l	< 1.95	**3.57 J**	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFOS	ng/l	< 1.95	**2.75 J**	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFNS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFOSA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
4:2 FTS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
6:2 FTS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
8:2 FTS	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
EtFOSAA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
MeFOSAA	ng/l	< 1.95	< 1.99	< 2.01	< 2.05	< 1.98	< 1.98	< 1.92
PFOA+PFOS	ng/l	**3.72**	**63.45**	ND	ND	**5.69**	**4.01**	ND
Total PFAS	ng/l	**20.94**	**990.92**	**3.04**	ND	**26**	**108.36**	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW007	GAAF-MW007	GAAF-MW007	GAAF-MW007	GAAF-MW007	GAAF-MW007	GAAF-MW008
Well Screen Interval (ft bgs)		(15-20)	(42-47)	(70-75)	(70-75)	(98-103)	(125-130)	(15-20)
Sample ID		GW20031813OOMK	GW20031812 25MK	GW20031811 50MK	GW20031811 50MK-FD	GW20031810 55MK	GW20031810 05MK	GW20031810 30RAP
Sample Date		3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020
Lab Report		2000675	2000675	2000675	2000675	2000675	2000667	2000667
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**5.84**	< 1.95	< 1.95	< 1.95	**10.5**	< 2.01	**1.86 J**
PFPeA	ng/l	**4.01**	**2.78 J**	**3.1 J**	**3.15 J**	**23.4**	< 2.01	**2.75 J**
PFHxA	ng/l	**4.66 Q**	**3.97**	**3.42 J, Q**	**2.86 J, Q**	**17.2**	< 2.01	< 1.96
PFHpA	ng/l	< 2.00	**1.46 J**	< 1.95	< 1.95	**1.69 J**	< 2.01	< 1.96
PFOA	ng/l	**2.57 J**	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	**1.76 J**
PFNA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFDA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFUnA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFDoA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFTrDA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFTeDA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
11Cl-PF3OUdS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
9Cl-PF3ONS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
ADONA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
HFPO-DA	ng/l	< 3.00	< 2.93	< 2.93	< 2.92	< 2.88	< 3.01	< 2.94
PFDS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFBS	ng/l	**26.3**	**2.01 J, Q**	< 1.95	< 1.95	< 1.92	< 2.01	**15.4**
PFPeS	ng/l	< 2.00	**3.19 J**	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFHxS	ng/l	**2.27 J**	**17.3**	**2.76 J**	< 1.95	**6.17**	< 2.01	**8.78**
PFHpS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFOS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFNS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFOSA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
4:2 FTS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
6:2 FTS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
8:2 FTS	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
EtFOSAA	ng/l	< 2.00	< 1.95	< 1.95	**2.01 J**	< 1.92	< 2.01	< 1.96
MeFOSAA	ng/l	< 2.00	< 1.95	< 1.95	< 1.95	< 1.92	< 2.01	< 1.96
PFOA+PFOS	ng/l	**2.57**	ND	ND	ND	ND	ND	**1.76**
Total PFAS	ng/l	**45.65**	**30.71**	**9.28**	**8.02**	**58.96**	ND	**30.55**

Footnotes:
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NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW008	GAAF-MW008	GAAF-MW009	GAAF-MW009	GAAF-MW009	GAAF-MW010	GAAF-MW010
Well Screen Interval (ft bgs)		(25-30)	(36.5-41.5)	(14-19)	(25-30)	(36-41)	(25-30)	(65-70)
Sample ID		GW2003181115RAP	GW2003181215RAP	GW2003181355RAP	GW2003181445RAP	GW2003181605RAP	GW2003181645GSC	GW2003181610GSC
Sample Date		3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/18/2020
Lab Report		2000675	2000675	2000675	2000675	2000675	2000675	2000675
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.02	< 1.99	**60.7**	**5.37**	**5.19**	< 1.98	< 1.99
PFPeA	ng/l	**1.75 J**	< 1.99	**177**	**6.14**	**11.4**	< 1.98	< 1.99
PFHxA	ng/l	< 2.02	**2.19 J**	**152**	**7.32 Q**	**16.3**	< 1.98	< 1.99
PFHpA	ng/l	< 2.02	< 1.99	**82**	< 1.97	**9.47**	< 1.98	< 1.99
PFOA	ng/l	< 2.02	< 1.99	**26.3**	**4.8**	**12.1**	< 1.98	< 1.99
PFNA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFDA	ng/l	< 2.02	< 1.99	**1.33 J, Q**	< 1.97	< 2.02	< 1.98	< 1.99
PFUnA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFDoA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFTrDA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFTeDA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
11Cl-PF3OUdS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
9Cl-PF3ONS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
ADONA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
HFPO-DA	ng/l	< 3.04	< 2.99	< 2.92	< 2.95	< 3.02	< 2.98	< 2.99
PFDS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFBS	ng/l	< 2.02	< 1.99	**4.48**	**4.84**	**7.61**	< 1.98	< 1.99
PFPeS	ng/l	< 2.02	< 1.99	< 1.95	**3.95**	**8.83**	< 1.98	< 1.99
PFHxS	ng/l	**18.3**	**14.4**	**5.51**	**29.8**	**89.5**	< 1.98	< 1.99
PFHpS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFOS	ng/l	< 2.02	< 1.99	**2.46 J**	**2.01 J**	**2.23 J**	< 1.98	< 1.99
PFNS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFOSA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
4:2 FTS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
6:2 FTS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
8:2 FTS	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
EtFOSAA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
MeFOSAA	ng/l	< 2.02	< 1.99	< 1.95	< 1.97	< 2.02	< 1.98	< 1.99
PFOA+PFOS	ng/l	ND	ND	**28.76**	**6.81**	**14.33**	ND	ND
Total PFAS	ng/l	**20.05**	**16.59**	**511.78**	**64.23**	**162.63**	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
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ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW010	GAAF-MW011	GAAF-MW011	GAAF-MW011	GAAF-MW012	GAAF-MW012	GAAF-MW012
Well Screen Interval (ft bgs)		(107-112)	(5-10)	(28-33)	(40-45)	(8-13)	(19-24)	(19-24)
Sample ID		GW2003181530GSC	GW2003181620MK	GW2003181550MK	GW2003181520MK	GW2003191120MK	GW2003191040MK-FD	GW2003191040MKK
Sample Date		3/18/2020	3/18/2020	3/18/2020	3/18/2020	3/19/2020	3/19/2020	3/19/2020
Lab Report		2000675	2000675	2000675	2000675	2000669	2000669	2000669
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.95	< 1.94	**5.34**	**3.63 J**	< 1.96	**3.24 J**	**3.3 J**
PFPeA	ng/l	< 1.95	< 1.94	**7.96**	**10.4**	< 1.96	**3.61 J**	**3.44 J**
PFHxA	ng/l	< 1.95	< 1.94	**5.65 Q**	**13.9**	< 1.96	**1.93 J, Q**	**2.76 J, Q**
PFHpA	ng/l	< 1.95	< 1.94	**5.35 Q**	**7.13**	< 1.96	**1.9 J**	**2.78 J**
PFOA	ng/l	< 1.95	< 1.94	**11.5**	**18.8**	< 1.96	< 1.95	< 1.90
PFNA	ng/l	< 1.95	< 1.94	< 1.98	**1.99 J**	< 1.96	< 1.95	< 1.90
PFDA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFUnA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFDoA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFTrDA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFTeDA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
11Cl-PF3OUdS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
9Cl-PF3ONS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
ADONA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
HFPO-DA	ng/l	< 2.93	< 2.91	< 2.96	< 2.95	< 2.94	< 2.92	< 2.85
PFDS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFBS	ng/l	< 1.95	< 1.94	**1.4 J, Q**	**2.47 J**	< 1.96	< 1.95	< 1.90
PFPeS	ng/l	< 1.95	< 1.94	< 1.98	**8.31**	< 1.96	< 1.95	< 1.90
PFHxS	ng/l	< 1.95	< 1.94	**13.9**	**299**	< 1.96	**6.49**	**6.96**
PFHpS	ng/l	< 1.95	< 1.94	< 1.98	**38.5**	< 1.96	< 1.95	< 1.90
PFOS	ng/l	< 1.95	< 1.94	**2.37 J**	**502**	< 1.96	**70.5**	**65**
PFNS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFOSA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
4:2 FTS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
6:2 FTS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
8:2 FTS	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
EtFOSAA	ng/l	< 1.95	< 1.94	**2 J**	< 1.97	< 1.96	< 1.95	< 1.90
MeFOSAA	ng/l	< 1.95	< 1.94	< 1.98	< 1.97	< 1.96	< 1.95	< 1.90
PFOA+PFOS	ng/l	ND	ND	**13.87**	**520.8**	ND	**70.5**	**65**
Total PFAS	ng/l	ND	ND	**55.47**	**906.13**	ND	**87.67**	**84.24**

Footnotes:
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Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW012	GAAF-MW012	GAAF-MW013	GAAF-MW013	GAAF-MW013	GAAF-MW013	GAAF-MW014
Well Screen Interval (ft bgs)		(31-36)	(43-48)	(7-12)	(20-25)	(40-45)	(50-55)	(6-11)
Sample ID		GW2003190955MK	GW2003190915MK	GW2003190930RAP	GW2003191020RAP	GW2003191115RAP	GW2003191255RAP	GW2003201020GSC
Sample Date		3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/20/2020
Lab Report		2000669	2000669	2000669	2000669	2000669	2000669	2000673
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.95	< 1.92	**4.69**	**1.67 J**	**4**	**3.92 J**	< 2.01
PFPeA	ng/l	< 1.95	**1.48 J**	**3.85 J**	**1.82 J**	**10.5**	**10.6**	< 2.01
PFHxA	ng/l	**1.53 J**	**1.75 J**	**3.47 J, Q**	< 2.04	**6.58**	**8.44**	< 2.01
PFHpA	ng/l	< 1.95	**1.7 J**	**1.84 J, Q**	< 2.04	**2.96 J, Q**	**3.89 J**	< 2.01
PFOA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	**4.22**	< 1.98	< 2.01
PFNA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFDA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFUnA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFDoA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFTrDA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFTeDA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
11Cl-PF3OUdS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
9Cl-PF3ONS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
ADONA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
HFPO-DA	ng/l	< 2.93	< 2.88	< 3.15	< 3.06	< 2.95	< 2.98	< 3.01
PFDS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFBS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	**2.14 J**	< 2.01
PFPeS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	**2.57 J, Q**	**3.37 J**	< 2.01
PFHxS	ng/l	**8.78**	**13.1**	**1.69 J**	< 2.04	**49**	**22.7**	< 2.01
PFHpS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFOS	ng/l	**2.84 J**	< 1.92	**3.54 J**	< 2.04	< 1.97	< 1.98	< 2.01
PFNS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFOSA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
4:2 FTS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
6:2 FTS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
8:2 FTS	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
EtFOSAA	ng/l	**4.09**	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
MeFOSAA	ng/l	< 1.95	< 1.92	< 2.10	< 2.04	< 1.97	< 1.98	< 2.01
PFOA+PFOS	ng/l	**2.84**	ND	**3.54**	ND	**4.22**	ND	ND
Total PFAS	ng/l	**17.24**	**18.03**	**19.08**	**3.49**	**79.83**	**55.06**	ND

Footnotes:
ng/l = Nanograms per liter
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Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW014	GAAF-MW014	GAAF-MW015	GAAF-MW015	GAAF-MW015	GAAF-MW016	GAAF-MW016
Well Screen Interval (ft bgs)		(25-30)	(50-55)	(4-9)	(25-30)	(45-50)	(5-10)	(21-26)
Sample ID		GW2003200930GSC	GW2003200900GSC	GW2003191440MK	GW2003191400MK	GW2003191320MK	GW2003191440RAP	GW2003191520RAP
Sample Date		3/20/2020	3/20/2020	3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/19/2020
Lab Report		2000673	2000673	2000669	2000669	2000669	2000669	2000669
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.01	**8.22**	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFPeA	ng/l	**1.41 J**	**17.7**	< 2.01	**5.55**	< 1.95	< 2.03	**1.91 J**
PFHxA	ng/l	< 2.01	**19.7**	< 2.01	**3.52 J**	< 1.95	< 2.03	< 2.01
PFHpA	ng/l	< 2.01	**1.41 J**	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFOA	ng/l	< 2.01	< 1.96	< 2.01	**1.9 J**	< 1.95	< 2.03	< 2.01
PFNA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFDA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFUnA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFDoA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFTrDA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFTeDA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
11Cl-PF3OUdS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
9Cl-PF3ONS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
ADONA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
HFPO-DA	ng/l	< 3.01	< 2.94	< 3.01	< 2.93	< 2.93	< 3.05	< 3.01
PFDS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFBS	ng/l	< 2.01	**6.08**	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFPeS	ng/l	< 2.01	**16.5**	< 2.01	< 1.95	**3.83 J**	< 2.03	< 2.01
PFHxS	ng/l	**8.7**	**34.6**	< 2.01	**3.81 J**	**6.1**	< 2.03	**5.53**
PFHpS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFOS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFNS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFOSA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
4:2 FTS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
6:2 FTS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
8:2 FTS	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
EtFOSAA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
MeFOSAA	ng/l	< 2.01	< 1.96	< 2.01	< 1.95	< 1.95	< 2.03	< 2.01
PFOA+PFOS	ng/l	ND	ND	ND	**1.9**	ND	ND	ND
Total PFAS	ng/l	**10.11**	**104.21**	ND	**14.78**	**9.93**	ND	**7.44**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW016	GAAF-MW017	GAAF-MW017	GAAF-MW017	GAAF-MW017	GAAF-MW018	GAAF-MW018
Well Screen Interval (ft bgs)		(38-43)	(11-16)	(24-29)	(45-50)	(80-85)	(13-18)	(30-35)
Sample ID		GW2003191555RAP	GW2003191430GSC	GW2003191350GSC	GW2003191320GSC	GW2003191235GSC	GW2003200905RAP	GW2003200955RAP
Sample Date		3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/19/2020	3/20/2020	3/20/2020
Lab Report		2000669	2000669	2000669	2000669	2000669	2000673	2000673
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**18.6**	**2.48 J**	**2.69 J**	< 1.95	**2.58 J**	< 1.98	**3.13 J**
PFPeA	ng/l	**76.2**	**3.64 J**	**4.64**	< 1.95	**5.47**	< 1.98	**4.83**
PFHxA	ng/l	**51.3**	**2.82 J**	**7.08**	< 1.95	**8.29**	< 1.98	**5.83**
PFHpA	ng/l	**13.7**	< 2.03	**2.58 J, Q**	< 1.95	**2.85 J, Q**	< 1.98	**6.43**
PFOA	ng/l	**5.33**	< 2.03	**2.73 J**	< 1.95	**1.38 J**	< 1.98	< 1.99
PFNA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFDA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFUnA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFDoA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFTrDA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFTeDA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
11Cl-PF3OUdS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
9Cl-PF3ONS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
ADONA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
HFPO-DA	ng/l	< 2.96	< 3.05	< 3.06	< 2.93	< 2.95	< 2.98	< 2.99
PFDS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFBS	ng/l	**3.79 J**	< 2.03	**1.6 J, Q**	< 1.95	< 1.97	< 1.98	< 1.99
PFPeS	ng/l	**9.05**	< 2.03	**1.9 J**	< 1.95	< 1.97	< 1.98	< 1.99
PFHxS	ng/l	**78.7**	**20.7**	**30.8**	< 1.95	**21.9**	< 1.98	**1.43 J**
PFHpS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFOS	ng/l	< 1.98	**20.3**	**117**	< 1.95	**67.1**	< 1.98	< 1.99
PFNS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFOSA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
4:2 FTS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
6:2 FTS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
8:2 FTS	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
EtFOSAA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
MeFOSAA	ng/l	< 1.98	< 2.03	< 2.04	< 1.95	< 1.97	< 1.98	< 1.99
PFOA+PFOS	ng/l	**5.33**	**20.3**	**119.73**	ND	**68.48**	ND	ND
Total PFAS	ng/l	**256.67**	**49.94**	**171.02**	ND	**109.57**	ND	**21.65**

Footnotes:
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ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location	GAAF-MW018	GAAF-MW018	GAAF-MW018	GAAF-MW019	GAAF-MW019	GAAF-MW019	GAAF-MW019
Well Screen Interval (ft bgs)	(60-65)	(95-100)	(95-100)	(10-15)	(27-32)	(50-55)	(75-80)
Sample ID	GW20032010000MK	GW2003200910MK	GW2003200910MK-FD	GW2003231645MK	GW2003231605MK	GW2003231530MK	GW2003231435MK
Sample Date	3/20/2020	3/20/2020	3/20/2020	3/23/2020	3/23/2020	3/23/2020	3/23/2020
Lab Report	2000673	2000673	2000673	2000758	2000758	2000758	2000758
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	**2.75 J**	< 1.96	< 2.00
PFPeA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	**2.72 J**	< 1.96	< 2.00
PFHxA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	**9.89**	< 1.96	< 2.00
PFHpA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFOA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFNA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFDA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFUnA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFDoA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFTrDA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFTeDA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
11Cl-PF3OUdS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
9Cl-PF3ONS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
ADONA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
HFPO-DA	ng/l	< 3.01	< 2.93	< 2.94	< 3.06	< 3.05	< 2.94	< 3.00
PFDS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFBS	ng/l	< 2.01	< 1.95	< 1.96	**1.69 J**	**2.58 J, Q**	< 1.96	< 2.00
PFPeS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	**1.91 J, Q**	< 1.96	< 2.00
PFHxS	ng/l	**1.86 J**	< 1.95	< 1.96	< 2.04	**18.2**	**4.12**	< 2.00
PFHpS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFOS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFNS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFOSA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
4:2 FTS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
6:2 FTS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
8:2 FTS	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
EtFOSAA	ng/l	**1.41 J**	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
MeFOSAA	ng/l	< 2.01	< 1.95	< 1.96	< 2.04	< 2.03	< 1.96	< 2.00
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	**3.27**	ND	ND	**1.69**	**38.05**	**4.12**	ND

Footnotes:
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ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW019 (95-100)	GAAF-MW020 (10-15)	GAAF-MW020 (30-35)	GAAF-MW020 (55-60)	GAAF-MW020 (75-80)	GAAF-MW020 (95-100)	GAAF-MW021 (16-21)
Well Screen Interval (ft bgs)								
Sample ID		GW20032313345MK	GW20032313315RAP	GW20032314400RAP	GW20032314450RAP	GW20032315540RAP	GW20032316630RAP	GW20021115525MK
Sample Date		3/23/2020	3/23/2020	3/23/2020	3/23/2020	3/23/2020	3/23/2020	2/11/2020
Lab Report		2000758	2000758	2000758	2000758	2000758	2000758	2000343
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.98	< 1.95	**3.56 J**	< 2.09	< 1.96	< 1.94	**1.8 J**
PFPeA	ng/l	< 1.98	< 1.95	**5.69**	< 2.09	< 1.96	< 1.94	**3.57 J**
PFHxA	ng/l	< 1.98	< 1.95	**5.01 Q**	< 2.09	< 1.96	< 1.94	**4.63**
PFHpA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	**1.47 J**
PFOA	ng/l	< 1.98	< 1.95	**4.5**	< 2.09	< 1.96	< 1.94	**9.11**
PFNA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFDA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFUnA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFDoA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFTrDA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFTeDA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
11Cl-PF3OUdS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
9Cl-PF3ONS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
ADONA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
HFPO-DA	ng/l	< 2.98	< 2.92	< 3.00	< 3.14	< 2.94	< 2.91	< 3.02
PFDS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFBS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	**3.72 J**
PFPeS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFHxS	ng/l	< 1.98	**2.45 J**	**8.66**	< 2.09	< 1.96	< 1.94	**3.81 J**
PFHpS	ng/l	< 1.98	< 1.95	**3.03 J, Q**	< 2.09	< 1.96	< 1.94	< 2.02
PFOS	ng/l	< 1.98	< 1.95	**50.6**	< 2.09	< 1.96	< 1.94	**4.19**
PFNS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFOSA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
4:2 FTS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
6:2 FTS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
8:2 FTS	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
EtFOSAA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
MeFOSAA	ng/l	< 1.98	< 1.95	< 2.00	< 2.09	< 1.96	< 1.94	< 2.02
PFOA+PFOS	ng/l	ND	ND	**55.1**	ND	ND	ND	**13.3**
Total PFAS	ng/l	ND	**2.45**	**81.05**	ND	ND	ND	**32.3**

Footnotes:
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Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW021	GAAF-MW021	GAAF-MW021	GAAF-MW021	GAAF-MW021	GAAF-MW021	GAAF-MW021
Well Screen Interval (ft bgs)		(16-21)	(34-39)	(34-39)	(62-67)	(62-67)	(137-142)	(137-142)
Sample ID		GW2003241320GSC	GW2002111435MK	GW2003241200GSC	GW2002111350MK	GW2003241045GSC	GW2002111305MK	GW2003240940GSC
Sample Date		3/24/2020	2/11/2020	3/24/2020	2/11/2020	3/24/2020	2/11/2020	3/24/2020
Lab Report		2000759	2000343	2000758	2000343	2000758	2000343	2000758
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**2.83 J**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFPeA	ng/l	**5.8**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFHxA	ng/l	**5.26 Q**	< 1.97	**1.36 J**	< 1.96	< 1.94	< 1.99	< 2.04
PFHpA	ng/l	**2.14 J, Q**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFOA	ng/l	**16.5**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFNA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFDA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFUnA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFDoA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFTrDA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFTeDA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
11Cl-PF3OUdS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
9Cl-PF3ONS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
ADONA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
HFPO-DA	ng/l	< 2.99	< 2.95	< 2.95	< 2.94	< 2.91	< 2.99	< 3.06
PFDS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFBS	ng/l	**7.89**	< 1.97	< 1.97	**1.95 J**	**1.67 J**	< 1.99	< 2.04
PFPeS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFHxS	ng/l	**6.96**	**15.4**	**16.4**	< 1.96	< 1.94	< 1.99	< 2.04
PFHpS	ng/l	**1.49 J, Q**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFOS	ng/l	**3.35 J**	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFNS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFOSA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
4:2 FTS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
6:2 FTS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
8:2 FTS	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
EtFOSAA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
MeFOSAA	ng/l	< 1.99	< 1.97	< 1.97	< 1.96	< 1.94	< 1.99	< 2.04
PFOA+PFOS	ng/l	**19.85**	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	**52.22**	**15.4**	**17.76**	**1.95**	**1.67**	ND	ND

Footnotes:
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ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW022 (18-23)	GAAF-MW022 (18-23)	GAAF-MW022 (55-60)	GAAF-MW022 (55-60)	GAAF-MW022 (55-60)	GAAF-MW022 (94-100)	GAAF-MW022 (94-100)
Well Screen Interval (ft bgs)		GW2002111605GSC	GW2003241515MK	GW2002111305GSC	GW2003241350MK	GW2003241350MK-FD	GW2002111530GSC	GW2003241130MK
Sample ID		2/11/2020	3/24/2020	2/11/2020	3/24/2020	3/24/2020	2/11/2020	3/24/2020
Sample Date		2000343	2000759	2000343	2000759	2000759	2000343	2000758
Lab Report								
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**7.45**	**7.24**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFPeA	ng/l	**17.8**	**17.5**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFHxA	ng/l	**15.5**	**15.9**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFHpA	ng/l	**7.52**	**8.17 Q**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFOA	ng/l	**7.46**	**10.6**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFNA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFDA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFUnA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFDoA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFTrDA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFTeDA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
11Cl-PF3OUdS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
9Cl-PF3ONS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
ADONA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
HFPO-DA	ng/l	< 2.93	< 2.87	< 3.01	< 2.88	< 2.92	< 2.98	< 2.92
PFDS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFBS	ng/l	**3.03 J**	**3.5 J**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFPeS	ng/l	**2.13 J**	**2.8 J**	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFHxS	ng/l	**42.7**	**37.8**	**2.4 J**	**2.09 J**	**1.73 J**	< 1.98	< 1.95
PFHpS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFOS	ng/l	**4.74**	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFNS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFOSA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
4:2 FTS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
6:2 FTS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
8:2 FTS	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
EtFOSAA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
MeFOSAA	ng/l	< 1.95	< 1.92	< 2.01	< 1.92	< 1.95	< 1.98	< 1.95
PFOA+PFOS	ng/l	**12.2**	**10.6**	ND	ND	ND	ND	ND
Total PFAS	ng/l	**108.33**	**103.51**	**2.4**	**2.09**	**1.73**	ND	ND

Footnotes:
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J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location	GAAF-MW022	GAAF-MW022	GAAF-MW022	GAAF-MW022	GAAF-MW023	GAAF-MW023	GAAF-MW023
Well Screen Interval (ft bgs)	(138-143)	(138-143)	(172-177)	(172-177)	(20-25)	(20-25)	(36-41)
Sample ID	GW2002111400GSC	GW2003241025MK	GW2002111455GSC	GW2003240940MK	GW2002121005MK	GW2003241010RAP	GW2002120925MK
Sample Date	2/11/2020	3/24/2020	2/11/2020	3/24/2020	2/12/2020	3/24/2020	2/12/2020
Lab Report	2000343	2000758	2000343	2000758	2000343	2000758	2000343
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	**2.61 J**	< 2.09	**2.94 J**
PFPeA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	**7.69**	**2.63 J**	**2.97 J**
PFHxA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	**7.46**	< 2.09	**2.64 J, Q**
PFHpA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	**4.34**	**2.34 J, Q**	< 1.98
PFOA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFNA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFDA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFUnA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFDoA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFTrDA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFTeDA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
11Cl-PF3OUdS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
9Cl-PF3ONS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
ADONA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
HFPO-DA	ng/l	< 3.02	< 3.04	< 3.11	< 2.95	< 3.13	< 3.14	< 2.98
PFDS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFBS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	**2.6 J**	**2.01 J**	< 1.98
PFPeS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFHxS	ng/l	< 2.02	< 2.02	**4.07 J**	< 1.97	**2.54 J**	**1.61 J**	**3.39 J**
PFHpS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFOS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFNS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFOSA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
4:2 FTS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
6:2 FTS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
8:2 FTS	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
EtFOSAA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
MeFOSAA	ng/l	< 2.02	< 2.02	< 2.07	< 1.97	< 2.08	< 2.09	< 1.98
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	**4.07**	ND	**27.24**	**8.59**	**11.94**

Footnotes:
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ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW023	GAAF-MW023	GAAF-MW023	GAAF-MW023	GAAF-MW023	GAAF-MW023	GAAF-MW023
Well Screen Interval (ft bgs)		(36-41)	(60-65)	(60-65)	(80-85)	(80-85)	(95-100)	(95-100)
Sample ID		GW2003241115RAP	GW2002121135MK	GW2003241215RAP	GW2002121225MK	GW2003241410RAP	GW2002121045MK	GW2003241510RAP
Sample Date		3/24/2020	2/12/2020	3/24/2020	2/12/2020	3/24/2020	2/12/2020	3/24/2020
Lab Report		2000758	2000343	2000758	2000343	2000737	2000343	2000759
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**2.35 J**	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFPeA	ng/l	**5.05**	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFHxA	ng/l	**3.44 J, Q**	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFHpA	ng/l	**1.4 J, Q**	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFOA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFNA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFDA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFUnA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFDoA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFTrDA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFTeDA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
11Cl-PF3OUdS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
9Cl-PF3ONS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
ADONA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
HFPO-DA	ng/l	< 2.92	< 3.02	< 3.04	< 2.96	< 3.02	< 2.96	< 2.96
PFDS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFBS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFPeS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFHxS	ng/l	**1.67 J**	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFHpS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFOS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFNS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFOSA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
4:2 FTS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
6:2 FTS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
8:2 FTS	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
EtFOSAA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
MeFOSAA	ng/l	< 1.95	< 2.02	< 2.02	< 1.98	< 2.02	< 1.98	< 1.98
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	**13.91**	ND	ND	ND	ND	ND	ND

Footnotes:
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BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW024 (14-19)	GAAF-MW024 (14-19)	GAAF-MW024 (24-29)	GAAF-MW024 (24-29)	GAAF-MW024 (35-40)	GAAF-MW024 (35-40)	GAAF-MW025 (12-17)
Well Screen Interval (ft bgs)								
Sample ID		GW2002120945GSC	GW2003241640GSC	GW2002120910GSC	GW2003241530GSC	GW2002120815GSC	GW2003241420GSC	GW2002121645GSC
Sample Date		2/12/2020	3/24/2020	2/12/2020	3/24/2020	2/12/2020	3/24/2020	2/12/2020
Lab Report		2000343	2000759	2000343	2000759	2000343	2000759	2000344
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFPeA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFHxA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFHpA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFOA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFNA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFDA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFUnA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFDoA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFTrDA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFTeDA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
11Cl-PF3OUdS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
9Cl-PF3ONS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
ADONA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
HFPO-DA	ng/l	< 3.06	< 2.99	< 3.04	< 3.02	< 2.99	< 3.01	< 2.98
PFDS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFBS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFPeS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFHxS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFHpS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFOS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFNS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFOSA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
4:2 FTS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
6:2 FTS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
8:2 FTS	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
EtFOSAA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
MeFOSAA	ng/l	< 2.04	< 1.99	< 2.02	< 2.02	< 1.99	< 2.01	< 1.98
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	ND	ND

Footnotes:
ng/l = Nanograms per liter
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< = Result below detection limit
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Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
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and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW025 (12-17)	GAAF-MW025 (23-26)	GAAF-MW025 (23-26)	GAAF-MW025 (32-35)	GAAF-MW025 (32-35)	GAAF-MW026 (8.5-13.5)	GAAF-MW026 (8.5-13.5)
Well Screen Interval (ft bgs)		GW2003241635MK	GW2002121610GSC	GW2003250945MK	GW2002121535GSC	GW2003251025MK	GW2002121700MK	GW2003241625RAP
Sample ID		3/24/2020	2/12/2020	3/25/2020	2/12/2020	3/25/2020	2/12/2020	3/24/2020
Sample Date		2000759	2000344	2000759	2000343	2000759	2000344	2000759
Lab Report								
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	**3.92 J**	**12**
PFPeA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	**2.29 J**
PFHxA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	**3.51 J**
PFHpA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	**1.71 J, Q**	< 2.08
PFOA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFNA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFDA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFUnA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFDoA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFTrDA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFTeDA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
11Cl-PF3OUdS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
9Cl-PF3ONS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
ADONA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
HFPO-DA	ng/l	< 2.98	< 3.04	< 2.94	< 3.00	< 3.01	< 3.05	< 3.13
PFDS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFBS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	**1.83 J, Q**
PFPeS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFHxS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	**1.96 J**
PFHpS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFOS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFNS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFOSA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
4:2 FTS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
6:2 FTS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
8:2 FTS	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
EtFOSAA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
MeFOSAA	ng/l	< 1.98	< 2.02	< 1.96	< 2.00	< 2.01	< 2.03	< 2.08
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	**5.63**	**21.59**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW026 (25-30)	GAAF-MW026 (25-30)	GAAF-MW026 (45-50)	GAAF-MW026 (45-50)	GAAF-MW026 (70-75)	GAAF-MW026 (70-75)	GAAF-MW026 (70-75)
Well Screen Interval (ft bgs)		GW2002131115MK	GW2003250940RAP	GW2002131035MK	GW2003251040RAP	GW2002121605MK	GW2002121605MK-FD	GW2003301300MK
Sample ID		2/13/2020	3/25/2020	2/13/2020	3/25/2020	2/12/2020	2/12/2020	3/30/2020
Sample Date		2000344	2000759	2000344	2000759	2000343	2000344	2000776
Lab Report								
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFPeA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFHxA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFHpA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFOA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFNA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFDA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFUnA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFDoA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFTrDA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFTeDA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
11Cl-PF3OUdS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
9Cl-PF3ONS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
ADONA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
HFPO-DA	ng/l	< 3.22	< 2.94	< 2.99	< 3.07	< 3.01	< 2.91	< 2.94
PFDS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFBS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFPeS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFHxS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFHpS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFOS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFNS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFOSA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
4:2 FTS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
6:2 FTS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
8:2 FTS	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
EtFOSAA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
MeFOSAA	ng/l	< 2.15	< 1.96	< 1.99	< 2.05	< 2.01	< 1.94	< 1.96
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW026	GAAF-MW026	GAAF-MW027	GAAF-MW027	GAAF-MW027	GAAF-MW027	GAAF-MW027
Well Screen Interval (ft bgs)		(95-100)	(95-100)	(12-17)	(12-17)	(27-32)	(27-32)	(42-47)
Sample ID		GW2002121450MK	GW2003251205RAP	GW2002131500GSC	GW2003251415GSC	GW2002131410GSC	GW2003251245GSC	GW2002131145GSC
Sample Date		2/12/2020	3/25/2020	2/13/2020	3/25/2020	2/13/2020	3/25/2020	2/13/2020
Lab Report		2000343	2000759	2000344	2000760	2000344	2000759	2000344
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFPeA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFHxA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFHpA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFOA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFNA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFDA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFUnA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFDoA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFTrDA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFTeDA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
11Cl-PF3OUdS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
9Cl-PF3ONS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
ADONA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
HFPO-DA	ng/l	< 2.95	< 3.15	< 2.96	< 3.05	< 3.01	< 3.09	< 3.13
PFDS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFBS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFPeS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFHxS	ng/l	< 1.97	< 2.10	**6.63**	**7**	**1.93 J**	< 2.06	< 2.08
PFHpS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFOS	ng/l	< 1.97	< 2.10	**5.37**	**2.52 J**	**6.62**	< 2.06	< 2.08
PFNS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFOSA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
4:2 FTS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
6:2 FTS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
8:2 FTS	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
EtFOSAA	ng/l	< 1.97	< 2.10	< 1.98	< 2.01	< 2.01	< 2.06	< 2.08
MeFOSAA	ng/l	< 1.97	< 2.10	< 1.98	< 2.03	< 2.01	< 2.06	< 2.08
PFOA+PFOS	ng/l	ND	ND	**5.37**	**2.52**	**6.62**	ND	ND
Total PFAS	ng/l	ND	ND	**12**	**9.52**	**8.55**	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW027	GAAF-MW027	GAAF-MW027	GAAF-MW027	GAAF-MW027	GAAF-MW028	GAAF-MW028
Well Screen Interval (ft bgs)		(42-47)	(57-62)	(57-62)	(72-77)	(72-77)	(12-17)	(14-19)
Sample ID		GW2003251145GSC	GW2002131110GSC	GW2003251035GSC	GW2002131035GSC	GW2003250920GSC	GW2002131725GSC	GW2003251610MK
Sample Date		3/25/2020	2/13/2020	3/25/2020	2/13/2020	3/25/2020	2/13/2020	3/25/2020
Lab Report		2000759	2000344	2000759	2000344	2000759	2000344	2000760
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	**3.94**
PFPeA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFHxA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFHpA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFOA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFNA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFDA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFUnA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFDoA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFTrDA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFTeDA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
11Cl-PF3OUdS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
9Cl-PF3ONS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
ADONA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
HFPO-DA	ng/l	< 3.09	< 2.98	< 3.10	< 2.99	< 3.01	< 2.90	< 2.85
PFDS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFBS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	**2.05 J**	**1.98 J**
PFPeS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFHxS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	**2.31 J**
PFHpS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFOS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFNS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFOSA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
4:2 FTS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
6:2 FTS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
8:2 FTS	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
EtFOSAA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.92
MeFOSAA	ng/l	< 2.06	< 1.98	< 2.07	< 1.99	< 2.01	< 1.93	< 1.90
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	**2.05**	**8.23**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW028	GAAF-MW028	GAAF-MW028	GAAF-MW028	GAAF-MW028	GAAF-MW028	GAAF-MW028
Well Screen Interval (ft bgs)		(34-39)	(34-39)	(45-50)	(45-50)	(45-50)	(65-70)	(65-70)
Sample ID		GW2002131710MK	GW2003251510MK	GW2002131655GSC	GW2003251430MK	GW2003251430MK-FD	GW2002131610MK	GW2003251350MK
Sample Date		2/13/2020	3/25/2020	2/13/2020	3/25/2020	3/25/2020	2/13/2020	3/25/2020
Lab Report		2000344	2000760	2000344	2000760	2000760	2000344	2000760
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**4.05**	**1.76 J**	**3.07 J**	**2.71 J**	**2.81 J**	**3.64 J**	**2.82 J**
PFPeA	ng/l	**6.74**	**5.61**	**8.62**	**7.89**	**6.86**	**6.88**	**6.32**
PFHxA	ng/l	**7.7**	**5.2**	**9.97**	**7.6**	**8.39**	**10.9**	**9.75**
PFHpA	ng/l	**3.62 J, Q**	**3.85**	**2.64 J**	< 1.94	< 1.97	**3.08 J, Q**	**1.34 J, Q**
PFOA	ng/l	**7.89**	**8.6**	**5.31**	**4.27**	**2.87 J**	**4.33**	**4.43**
PFNA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFDA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFUnA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFDoA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFTrDA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFTeDA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
11Cl-PF3OUdS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
9Cl-PF3ONS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
ADONA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
HFPO-DA	ng/l	< 3.00	< 2.86	< 3.00	< 2.91	< 2.95	< 2.98	< 2.88
PFDS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFBS	ng/l	**2.98 J**	**3.15 J**	**4.07**	**2.78 J**	**3.18 J**	**4.02**	**3.14 J**
PFPeS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFHxS	ng/l	**2.02 J**	**1.51 J**	**2.54 J**	< 1.94	< 1.97	**2.1 J**	< 1.92
PFHpS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFOS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFNS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFOSA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
4:2 FTS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
6:2 FTS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
8:2 FTS	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
EtFOSAA	ng/l	< 2.00	< 1.87	< 2.00	< 2.03	< 1.93	< 1.98	**5.06 B**
MeFOSAA	ng/l	< 2.00	< 1.91	< 2.00	< 1.94	< 1.97	< 1.98	< 1.92
PFOA+PFOS	ng/l	**7.89**	**8.6**	**5.31**	**4.27**	**2.87**	**4.33**	**4.43**
Total PFAS	ng/l	**35**	**29.68**	**36.22**	**25.25**	**24.11**	**34.95**	**32.86**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW028	GAAF-MW028	GAAF-MW029	GAAF-MW029	GAAF-MW029	GAAF-MW029	GAAF-MW029
Well Screen Interval (ft bgs)		(85-90)	(85-90)	(13-18)	(13-18)	(28-33)	(28-33)	(43-48)
Sample ID		GW2002131520MK	GW20032511135MK	GW2002171630MK	GW2003251400RAP	GW2002171555MK	GW2003251505RAP	GW2002171520MK
Sample Date		2/13/2020	3/25/2020	2/17/2020	3/25/2020	2/17/2020	3/25/2020	2/17/2020
Lab Report		2000344	2000759	2000371	2000760	2000371	2000760	2000371
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**5.18**	**2.22 J**	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFPeA	ng/l	**3.46 J**	**2.85 J**	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFHxA	ng/l	**3.53 J, Q**	**3.17 J, Q**	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFHpA	ng/l	**2.46 J**	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFOA	ng/l	**2.74 J**	**2.41 J**	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFNA	ng/l	**2.04 J, Q**	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFDA	ng/l	**1.9 J**	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFUnA	ng/l	**2.36 J, Q**	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFDoA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFTrDA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFTeDA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
11Cl-PF3OUdS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
9Cl-PF3ONS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
ADONA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
HFPO-DA	ng/l	< 3.05	< 2.93	< 2.93	< 3.04	< 3.04	< 2.82	< 3.05
PFDS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFBS	ng/l	< 2.03	**2.79 J**	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFPeS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFHxS	ng/l	**2.21 J**	< 1.95	< 1.95	< 2.02	**4.52**	**3.79**	< 2.03
PFHpS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFOS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFNS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFOSA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
4:2 FTS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
6:2 FTS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
8:2 FTS	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
EtFOSAA	ng/l	< 2.03	< 1.95	< 1.95	< 1.95	< 2.02	< 1.88	< 2.03
MeFOSAA	ng/l	< 2.03	< 1.95	< 1.95	< 2.02	< 2.02	< 1.88	< 2.03
PFOA+PFOS	ng/l	**2.74**	**2.41**	ND	ND	ND	ND	ND
Total PFAS	ng/l	**25.88**	**13.44**	ND	ND	**4.52**	**3.79**	ND

Footnotes:
ng/l = Nanograms per liter
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NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW029 (43-48)	GAAF-MW029 (58-63)	GAAF-MW029 (58-63)	GAAF-MW029 (58-63)	GAAF-MW029 (73-78)	GAAF-MW029 (73-78)	GAAF-MW030 (10-15)
Well Screen Interval (ft bgs)		GW2003251620RAP	GW2002171440MK	GW2002171440MK-FD	GW2003260925RAP	GW2002171340MK	GW2003261050RAP	GW2002171240GSC
Sample ID		3/25/2020	2/17/2020	2/17/2020	3/26/2020	2/17/2020	3/26/2020	2/17/2020
Sample Date		2000760	2000371	2000371	2000760	2000371	2000760	2000371
Lab Report								
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFPeA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFHxA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFHpA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFOA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFNA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFDA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFUnA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFDoA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFTrDA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFTeDA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
11Cl-PF3OUdS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
9Cl-PF3ONS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
ADONA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
HFPO-DA	ng/l	< 2.98	< 2.98	< 3.00	< 2.91	< 2.96	< 3.05	< 2.98
PFDS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFBS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFPeS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFHxS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFHpS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFOS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFNS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFOSA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
4:2 FTS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
6:2 FTS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
8:2 FTS	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
EtFOSAA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 1.94	< 1.98
MeFOSAA	ng/l	< 1.98	< 1.98	< 2.00	< 1.94	< 1.98	< 2.03	< 1.98
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW030	GAAF-MW030	GAAF-MW030	GAAF-MW030	GAAF-MW030	GAAF-MW030	GAAF-MW030
Well Screen Interval (ft bgs)		(10-15)	(20-25)	(20-25)	(30-35)	(30-35)	(40-45)	(40-45)
Sample ID		GW20032611110MK	GW2002171315GSC	GW2003261010MK	GW2002171355GSC	GW2003260925MK	GW2002171435GSC	GW2003251605GSC
Sample Date		3/26/2020	2/17/2020	3/26/2020	2/17/2020	3/26/2020	2/17/2020	3/25/2020
Lab Report		2000760	2000371	2000760	2000371	2000760	2000371	2000760
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFPeA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFHxA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFHpA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFOA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	**1.79 J**
PFNA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFDA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFUnA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFDoA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFTrDA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFTeDA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
11Cl-PF3OUdS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
9Cl-PF3ONS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
ADONA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
HFPO-DA	ng/l	< 2.84	< 2.93	< 2.85	< 2.96	< 2.90	< 3.07	< 3.09
PFDS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFBS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFPeS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	**1.41 J**	< 2.06
PFHxS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	**27.1**	**24.9**
PFHpS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFOS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFNS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFOSA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
4:2 FTS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
6:2 FTS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
8:2 FTS	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
EtFOSAA	ng/l	< 1.92	< 1.95	< 1.96	< 1.98	**1.51 J, B**	< 2.05	< 2.01
MeFOSAA	ng/l	< 1.89	< 1.95	< 1.90	< 1.98	< 1.93	< 2.05	< 2.06
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	**1.79**
Total PFAS	ng/l	ND	ND	ND	ND	**1.51**	**28.51**	**26.69**

Footnotes:
ng/l = Nanograms per liter
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ND = Result below detection limit
NA = Analyte not analyzed
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Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW031 (13-18)	GAAF-MW031 (13-18)	GAAF-MW031 (27-32)	GAAF-MW031 (27-32)	GAAF-MW031 (45-50)	GAAF-MW031 (45-50)	GAAF-MW031 (70-75)
Well Screen Interval (ft bgs)								
Sample ID		GW20021811300SC	GW20032612050RAP	GW20021811000SC	GW20032615050RAP	GW20021810150SC	GW20032614000RAP	GW20021809400SC
Sample Date		2/18/2020	3/26/2020	2/18/2020	3/26/2020	2/18/2020	3/26/2020	2/18/2020
Lab Report		2000371	2000760	2000371	2000737	2000371	2000737	2000371
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**1.69 J**	**2.53 J**	< 2.02	< 1.96	< 1.97	**1.79 J**	< 2.02
PFPeA	ng/l	**2.75 J**	**3.68 J**	**2.6 J**	**2.93 J**	**2.3 J**	**2.98 J**	< 2.02
PFHxA	ng/l	**3.01 J, Q**	**3.69 J**	**3 J, Q**	**3.15 J**	**2.69 J, Q**	**4.04**	< 2.02
PFHpA	ng/l	< 1.95	**2.05 J**	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFOA	ng/l	**1.48 J**	**2.79 J**	< 2.02	**2.43 J**	< 1.97	**2.59 J**	< 2.02
PFNA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFUnA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFDoA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFTrDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFTeDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
11Cl-PF3OUdS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
9Cl-PF3ONS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
ADONA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
HFPO-DA	ng/l	< 2.92	< 2.98	< 3.04	< 2.94	< 2.95	< 2.99	< 3.04
PFDS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFBS	ng/l	**5.62**	**6.77**	< 2.02	**1.74 J, Q**	**1.97 J**	**1.78 J, Q**	< 2.02
PFPeS	ng/l	**1.63 J, Q**	**1.44 J**	**1.73 J**	**1.57 J**	< 1.97	< 1.99	< 2.02
PFHxS	ng/l	**6.19**	**11.4**	**13.9**	**13.6**	**7.98**	**11.4**	< 2.02
PFHpS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFOS	ng/l	< 1.95	< 1.98	**2.37 J**	< 1.96	< 1.97	< 1.99	< 2.02
PFNS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFOSA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
4:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
6:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
8:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
EtFOSAA	ng/l	< 1.95	< 2.07	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
MeFOSAA	ng/l	< 1.95	< 1.98	< 2.02	< 1.96	< 1.97	< 1.99	< 2.02
PFOA+PFOS	ng/l	**1.48**	**2.79**	**2.37**	**2.43**	ND	**2.59**	ND
Total PFAS	ng/l	**22.37**	**34.35**	**23.6**	**25.42**	**14.94**	**24.58**	ND

Footnotes:
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Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW031	GAAF-MW031	GAAF-MW031	GAAF-MW032	GAAF-MW032	GAAF-MW032	GAAF-MW032
Well Screen Interval (ft bgs)		(70-75)	(82-87)	(82-87)	(12-17)	(12-17)	(22-27)	(22-27)
Sample ID		GW2003261610RAP	GW2002180905GSC	GW2003271055MK	GW2002181245MK	GW2003270945MK	GW2002181155MK	GW2003270905MK
Sample Date		3/26/2020	2/18/2020	3/31/2020	2/18/2020	3/29/2020	2/18/2020	3/27/2020
Lab Report		2000737	2000371	2000737	2000374	2000737	2000371	2000737
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFPeA	ng/l	< 1.98	**1.75 J**	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFHxA	ng/l	< 1.98	**1.7 J**	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFHpA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFOA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFNA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFDA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFUnA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFDoA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFTrDA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFTeDA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
11Cl-PF3OUdS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
9Cl-PF3ONS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
ADONA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
HFPO-DA	ng/l	< 2.96	< 3.13	< 3.00	< 2.88	< 3.04	< 3.01	< 2.92
PFDS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFBS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFPeS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFHxS	ng/l	< 1.98	**6.68**	< 2.00	< 1.92	**1.39 J**	< 2.01	< 1.95
PFHpS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFOS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFNS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFOSA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
4:2 FTS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
6:2 FTS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
8:2 FTS	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
EtFOSAA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
MeFOSAA	ng/l	< 1.98	< 2.08	< 2.00	< 1.92	< 2.02	< 2.01	< 1.95
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	**10.13**	ND	ND	**1.39**	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW032 (32-37)	GAAF-MW032 (32-37)	GAAF-MW032 (53-58)	GAAF-MW032 (53-58)	GAAF-MW032 (69-74)	GAAF-MW032 (69-74)	GAAF-MW032 (69-74)
Well Screen Interval (ft bgs)								
Sample ID		GW2002181120MK	GW2003261540MK	GW2002181020MK	GW2003261455MK	GW2002180915MK	GW2003261400MK	GW2003261400MK-FD
Sample Date		2/18/2020	3/26/2020	2/18/2020	3/26/2020	2/18/2020	3/26/2020	3/26/2020
Lab Report		2000371	2000737	2000371	2000737	2000371	2000760	2000760
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFPeA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFHxA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFHpA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFOA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFNA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFDA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFUnA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFDoA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFTrDA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFTeDA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
11Cl-PF3OUdS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
9Cl-PF3ONS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
ADONA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
HFPO-DA	ng/l	< 2.92	< 2.95	< 3.00	< 2.88	< 2.95	< 2.92	< 2.85
PFDS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFBS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFPeS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFHxS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFHpS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFOS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFNS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFOSA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
4:2 FTS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
6:2 FTS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
8:2 FTS	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
EtFOSAA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.98	**1.67 J, B**
MeFOSAA	ng/l	< 1.95	< 1.97	< 2.00	< 1.92	< 1.97	< 1.95	< 1.90
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	ND	**1.67**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW033 (5-10)	GAAF-MW033 (5-10)	GAAF-MW033 (15-20)	GAAF-MW033 (15-20)	GAAF-MW033 (27-32)	GAAF-MW033 (27-32)	GAAF-MW034 (12-17)
Well Screen Interval (ft bgs)								
Sample ID		GW2002181550GSC	GW2003270935RAP	GW2002181515GSC	GW2003271030RAP	GW2002181440GSC	GW2003271115RAP	GW2002181720MK
Sample Date		2/18/2020	3/28/2020	2/18/2020	3/30/2020	2/18/2020	3/27/2020	2/18/2020
Lab Report		2000374	2000737	2000374	2000737	2000374	2000737	2000374
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**7.72**	**4.04 J**	**12.4**	**12**	**12.6**	**13.5**	**1.89 J**
PFPeA	ng/l	**16.5**	**4.37**	**19.7**	**18.2**	**40**	**47.4**	< 1.95
PFHxA	ng/l	**12.5**	**4.55**	**12.6 Q**	**16**	**31.1**	**37.4**	**1.4 J**
PFHpA	ng/l	< 2.05	**1.86 J**	< 2.00	< 2.09	< 1.99	**1.34 J, Q**	< 1.95
PFOA	ng/l	**1.81 J**	**6.3**	< 2.00	< 2.09	< 1.99	< 1.94	**3.71 J**
PFNA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFDA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFUnA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFDoA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFTrDA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFTeDA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
11Cl-PF3OUdS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
9Cl-PF3ONS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
ADONA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
HFPO-DA	ng/l	< 3.07	< 3.10	< 3.00	< 3.14	< 2.99	< 2.91	< 2.93
PFDS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFBS	ng/l	**2.78 J**	**1.67 J**	**3.5 J**	**3.25 J**	**2.6 J**	**3.14 J, Q**	**1.95 J**
PFPeS	ng/l	**2.03 J, Q**	< 2.07	**1.85 J**	**3.26 J**	**4.67 Q**	**4.32**	< 1.95
PFHxS	ng/l	**2.12 J**	**2.12 J**	**3.56 J**	**4.15 J**	**6.9**	**12**	**5.92**
PFHpS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFOS	ng/l	< 2.05	**3.72 J**	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFNS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFOSA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
4:2 FTS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
6:2 FTS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
8:2 FTS	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
EtFOSAA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
MeFOSAA	ng/l	< 2.05	< 2.07	< 2.00	< 2.09	< 1.99	< 1.94	< 1.95
PFOA+PFOS	ng/l	**1.81**	**10.02**	ND	ND	ND	ND	**3.71**
Total PFAS	ng/l	**45.46**	**28.63**	**53.61**	**56.86**	**97.87**	**119.1**	**14.87**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW034 (12-17)	GAAF-MW034 (30-35)	GAAF-MW034 (30-35)	GAAF-MW034 (50-55)	GAAF-MW034 (50-55)	GAAF-MW034 (70-75)	GAAF-MW034 (70-75)
Well Screen Interval (ft bgs)		GW2003301435MK	GW2002181645MK	GW2003301715MK	GW2002181610MK	GW2003301640MK	GW2002181535MK	GW2003301355MK
Sample ID		3/30/2020	2/18/2020	3/30/2020	2/18/2020	3/30/2020	2/18/2020	3/30/2020
Sample Date		2000776	2000374	2000776	2000374	2000776	2000374	2000776
Lab Report								
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**10.8**	**5.22**	**6.04**	**2.07 J**	**1.72 J**	**4.88**	**3.42 J**
PFPeA	ng/l	**7.25**	**23.8**	**27.4**	**9.57**	**5.62**	**11.2**	**7.91**
PFHxA	ng/l	**6.04**	**9.86**	**11**	**3.82 J**	**3.02 J, Q**	**8.06**	**6.77**
PFHpA	ng/l	**1.99 J, Q**	**2.04 J**	**2.55 J, Q**	**1.85 J, Q**	**1.38 J**	**22**	**16.5**
PFOA	ng/l	**6.07**	**5.54**	**4.51**	**3.78 J**	**4.26**	**9.87**	**11.4**
PFNA	ng/l	< 2.02	< 1.96	**1.62 J, Q**	< 1.99	< 2.01	< 1.98	< 2.02
PFDA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFUnA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFDoA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFTrDA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFTeDA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
11Cl-PF3OUdS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
9Cl-PF3ONS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
ADONA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
HFPO-DA	ng/l	< 3.02	< 2.94	< 2.98	< 2.99	< 3.01	< 2.96	< 3.02
PFDS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFBS	ng/l	**2.66 J**	**4.03 Q**	**3.32 J**	**1.72 J, Q**	< 2.01	**2.31 J**	**2.64 J**
PFPeS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFHxS	ng/l	**4 J**	< 1.96	**1.83 J**	**1.52 J**	< 2.01	**2.53 J**	**2.42 J**
PFHpS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFOS	ng/l	< 2.02	**2.94 J**	**3.08 J**	**2.37 J**	< 2.01	< 1.98	**2.18 J**
PFNS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFOSA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
4:2 FTS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
6:2 FTS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
8:2 FTS	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
EtFOSAA	ng/l	< 1.98	< 1.96	< 1.98	< 1.99	**3.7 J**	< 1.98	< 2.02
MeFOSAA	ng/l	< 2.02	< 1.96	< 1.98	< 1.99	< 2.01	< 1.98	< 2.02
PFOA+PFOS	ng/l	**6.07**	**8.48**	**7.59**	**6.15**	**4.26**	**9.87**	**13.58**
Total PFAS	ng/l	**38.81**	**53.43**	**61.35**	**26.7**	**19.7**	**60.85**	**53.24**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW034	GAAF-MW034	GAAF-MW034	GAAF-MW035	GAAF-MW035	GAAF-MW035	GAAF-MW035
Well Screen Interval (ft bgs)		(70-75)	(95-100)	(95-100)	(6-11)	(6-11)	(15-20)	(15-20)
Sample ID		GW2003301355MK-FD	GW2002181500MK	GW20033301600MK	GW2002191530GSC	GW2003301305RAP	GW2002191455GSC	GW2003301345RAP
Sample Date		3/30/2020	2/18/2020	3/30/2020	2/19/2020	3/30/2020	2/19/2020	3/30/2020
Lab Report		2000776	2000374	2000776	2000376	2000776	2000374	2000776
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	**3.3 J**	**2.73 J**	**5.19**	**6.13**	**10.4**	**2.22 J**	**3.2 J**
PFPeA	ng/l	**8.35**	< 1.93	**10.5**	**3.5 J**	**3.96 J**	< 2.11	**2.01 J**
PFHxA	ng/l	**7**	**1.84 J, Q**	**7.19**	**2.68 J**	**4 J**	< 2.11	< 2.02
PFHpA	ng/l	**15.5**	< 1.93	**8.88**	< 2.08	< 2.08	< 2.11	< 2.02
PFOA	ng/l	**11.9**	**3.22 J**	**6.31**	< 2.08	**1.77 J**	**2.15 J**	**2.85 J**
PFNA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFDA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFUnA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFDoA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFTrDA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFTeDA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
11Cl-PF3OUdS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
9Cl-PF3ONS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
ADONA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
HFPO-DA	ng/l	< 2.95	< 2.90	< 3.00	< 3.13	< 3.13	< 3.16	< 3.02
PFDS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFBS	ng/l	**2.28 J**	**2.12 J**	**1.86 J, Q**	< 2.08	< 2.08	**8.69**	**7.13**
PFPeS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFHxS	ng/l	**3.25 J**	**5.48**	**3.65 J**	< 2.08	< 2.08	**3.37 J**	**2.24 J**
PFHpS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFOS	ng/l	< 1.97	**1.51 J**	**2.07 J**	**3.02 J**	**1.6 J**	**1.97 J**	< 2.02
PFNS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFOSA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
4:2 FTS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
6:2 FTS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
8:2 FTS	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
EtFOSAA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
MeFOSAA	ng/l	< 1.97	< 1.93	< 2.00	< 2.08	< 2.08	< 2.11	< 2.02
PFOA+PFOS	ng/l	**11.9**	**4.73**	**8.38**	**3.02**	**3.37**	**4.12**	**2.85**
Total PFAS	ng/l	**51.58**	**16.9**	**45.65**	**15.33**	**21.73**	**18.4**	**17.43**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW035	GAAF-MW035	GAAF-MW035	GAAF-MW035	GAAF-MW035	GAAF-MW035	GAAF-MW036
Well Screen Interval (ft bgs)		(30-35)	(30-35)	(55-60)	(55-60)	(65-70)	(65-70)	(12-17)
Sample ID		GW2002191410GSC	GW20033301430RAP	GW2002191130GSC	GW2003301520RAP	GW2002190955GSC	GW2003301645RAP	GW2002191505MK
Sample Date		2/19/2020	3/30/2020	2/19/2020	3/30/2020	2/19/2020	3/30/2020	2/19/2020
Lab Report		2000374	2000776	2000374	2000776	2000374	2000776	2000374
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFPeA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFHxA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFHpA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFOA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFNA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFUnA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFDoA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFTrDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFTeDA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
11Cl-PF3OUdS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
9Cl-PF3ONS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
ADONA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
HFPO-DA	ng/l	< 2.92	< 2.98	< 3.02	< 2.95	< 2.95	< 2.92	< 3.01
PFDS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFBS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	**1.77 J**
PFPeS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFHxS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	**2.67 J**
PFHpS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFOS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFNS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFOSA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
4:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
6:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
8:2 FTS	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
EtFOSAA	ng/l	< 1.95	< 2.00	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
MeFOSAA	ng/l	< 1.95	< 1.98	< 2.02	< 1.97	< 1.97	< 1.95	< 2.01
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND	ND	ND	ND	**4.44**

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW036	GAAF-MW036	GAAF-MW036	GAAF-MW036	GAAF-MW036	GAAF-MW036	GAAF-MW036
Well Screen Interval (ft bgs)		(12-17)	(25-30)	(25-30)	(43-48)	(43-48)	(70-75)	(70-75)
Sample ID		GW2003301620RL	GW2002191420MK	GW2003301530RL	GW2002191205MK	GW2003301435RL	GW2002191115MK	GW2002191115MK-FD
Sample Date		3/30/2020	2/19/2020	3/30/2020	2/19/2020	3/30/2020	2/19/2020	2/19/2020
Lab Report		2000776	2000374	2000776	2000374	2000776	2000374	2000374
Compound	Units	Result	Result	Result	Result	Result	Result	Result
PFBA	ng/l	< 1.99	< 1.96	**1.53 J**	< 2.07	< 1.95	< 2.00	< 1.95
PFPeA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFHxA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFHpA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFOA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFNA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFDA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFUnA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFDoA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFTrDA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFTeDA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
11Cl-PF3OUdS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
9Cl-PF3ONS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
ADONA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
HFPO-DA	ng/l	< 2.99	< 2.94	< 2.98	< 3.11	< 2.93	< 3.00	< 2.92
PFDS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFBS	ng/l	**2.28 J**	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFPeS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFHxS	ng/l	**4.75**	< 1.96	**1.64 J**	< 2.07	**1.54 J**	< 2.00	< 1.95
PFHpS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFOS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFNS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFOSA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
4:2 FTS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
6:2 FTS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
8:2 FTS	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
EtFOSAA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
MeFOSAA	ng/l	< 1.99	< 1.96	< 1.98	< 2.07	< 1.95	< 2.00	< 1.95
PFOA+PFOS	ng/l	ND	ND	ND	ND	ND	ND	ND
Total PFAS	ng/l	**7.03**	ND	**3.17**	ND	**1.54**	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Table 2
Phase III Groundwater Monitoring Well Analytical Results
Grayling, Crawford County, Michigan

DRAFT

Location		GAAF-MW036	GAAF-MW036	GAAF-MW036
Well Screen Interval (ft bgs)		(70-75)	(95-100)	(95-100)
Sample ID		GW2003301400RL	GW200219104OMK	GW2003301325RL
Sample Date		3/30/2020	2/19/2020	3/30/2020
Lab Report		2000776	2000374	2000776
Compound	Units	Result	Result	Result
PFBA	ng/l	< 1.99	< 2.02	< 1.95
PFPeA	ng/l	< 1.99	< 2.02	< 1.95
PFHxA	ng/l	< 1.99	< 2.02	< 1.95
PFHpA	ng/l	< 1.99	< 2.02	< 1.95
PFOA	ng/l	< 1.99	< 2.02	< 1.95
PFNA	ng/l	< 1.99	< 2.02	< 1.95
PFDA	ng/l	< 1.99	< 2.02	< 1.95
PFUnA	ng/l	< 1.99	< 2.02	< 1.95
PFDoA	ng/l	< 1.99	< 2.02	< 1.95
PFTrDA	ng/l	< 1.99	< 2.02	< 1.95
PFTeDA	ng/l	< 1.99	< 2.02	< 1.95
11Cl-PF3OUdS	ng/l	< 1.99	< 2.02	< 1.95
9Cl-PF3ONS	ng/l	< 1.99	< 2.02	< 1.95
ADONA	ng/l	< 1.99	< 2.02	< 1.95
HFPO-DA	ng/l	< 2.99	< 3.04	< 2.93
PFDS	ng/l	< 1.99	< 2.02	< 1.95
PFBS	ng/l	< 1.99	< 2.02	< 1.95
PFPeS	ng/l	< 1.99	< 2.02	< 1.95
PFHxS	ng/l	< 1.99	< 2.02	< 1.95
PFHpS	ng/l	< 1.99	< 2.02	< 1.95
PFOS	ng/l	< 1.99	< 2.02	< 1.95
PFNS	ng/l	< 1.99	< 2.02	< 1.95
PFOSA	ng/l	< 1.99	< 2.02	< 1.95
4:2 FTS	ng/l	< 1.99	< 2.02	< 1.95
6:2 FTS	ng/l	< 1.99	< 2.02	< 1.95
8:2 FTS	ng/l	< 1.99	< 2.02	< 1.95
EtFOSAA	ng/l	< 1.99	< 2.02	< 1.95
MeFOSAA	ng/l	< 1.99	< 2.02	< 1.95
PFOA+PFOS	ng/l	ND	ND	ND
Total PFAS	ng/l	ND	ND	ND

Footnotes:
ng/l = Nanograms per liter
ft bgs = feet below ground surface
< = Result below detection limit
ND = Result below detection limit
NA = Analyte not analyzed
J = The detected amount is below the reporting limit
Q = The ion transition ratio is outside the acceptance criteria
BOLD values = Analyte above dectetion
Above EPA Lifetime Health Advisory:
70 ng/L PFOA+PFOS
Above Michigan Part 201 Drinking Water Criteria:
PFNA (6 ng/L), PFOA (8 ng/L), PFOS (16 ng/L),
PFHxS (51 ng/l), HFPO-DA (370 ng/L), PFBS (420 ng/L),
and PFHxA (400,000 ng/L)

Appendix A

AECOM FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

PROJECT INFORMATION

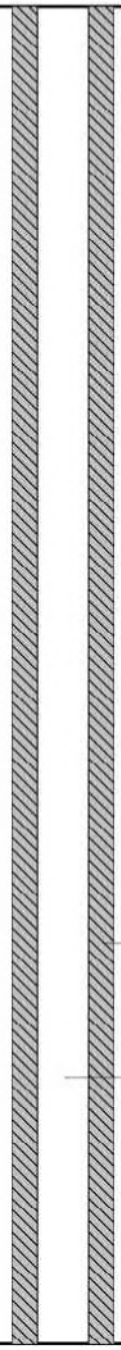
PROJECT:	**Grayling Area PFAS**
SITE LOCATION:	**Grayling, MI**
PROJECT NO.:	**60661441**
PROJECT MANAGER:	**Matt VanderEide**
LOGGED BY:	**Kelly Moss**
CREATED BY:	**Stanley Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Mateco**
CREW CHIEF:	**Jeff Croel**
DRILL RIG TYPE:	**Geoprobe 8140DT**
DRILLING METHOD:	**Sonic**
HOLE DIAMETER:	**8 1/4"**
DATE START:	**10/1/19**
DATE END:	**10/9/19**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger					TOPSOIL
					SP	SP: 10YR(4/6) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 15% fine sand, 70% medium sand, 15% coarse sand, loose, dry, with twigs and organics
					SP	SP: 10YR(5/6) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 15% fine sand, 70% medium sand, 15% coarse sand
					SP	SP: 10YR(6/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular grain, trace silt, 15% fine sand, 70% medium sand, 15% coarse sand, organic 2.5Y(3/2) black seams and lighter 10YR(6/4) sand seams intermixed thrcughout
					SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 15% fine sand, 70% medium sand, 15% coarse sand
5	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 5% fine sand, 70% medium sand, 20% coarse sand, 5% sub angular fine gravel, wet, max gravel 20mm, with a few twigs, at 7.5ft bgs a 2.5Y(3/2) organic seam
10						

WELL CONSTRUCTION



FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED COARSE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, trace fine sand, 60% medium sand, 30% coarse sand, 10% fine gravel, trace coarse gravel, massive, wet, non cohesive	11
							12
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 45% medium sand, 25% coarse sand, 20% fine gravel, 10% coarse gravel, max gravel 55mm	13
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace silt, trace fine sand, 60% medium sand, 30% coarse sand, 10% fine gravel, trace coarse gravel, wet, gravel range 7-10mm, firing upward	14
15							15
	Sonic						16
▼							17
							18
							19
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 40% medium sand, 30% coarse sand, 20% fine gravel, 10% coarse gravel	20
20							21
					SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 30% medium sand, 35% coarse sand, 20% fine gravel, 15% coarse gravel, max gravel 40mm	22

Sand Pack

GAAF-MW021- 21 (2" ID)

Sand Pack

FIELD BOREHOLE LOG

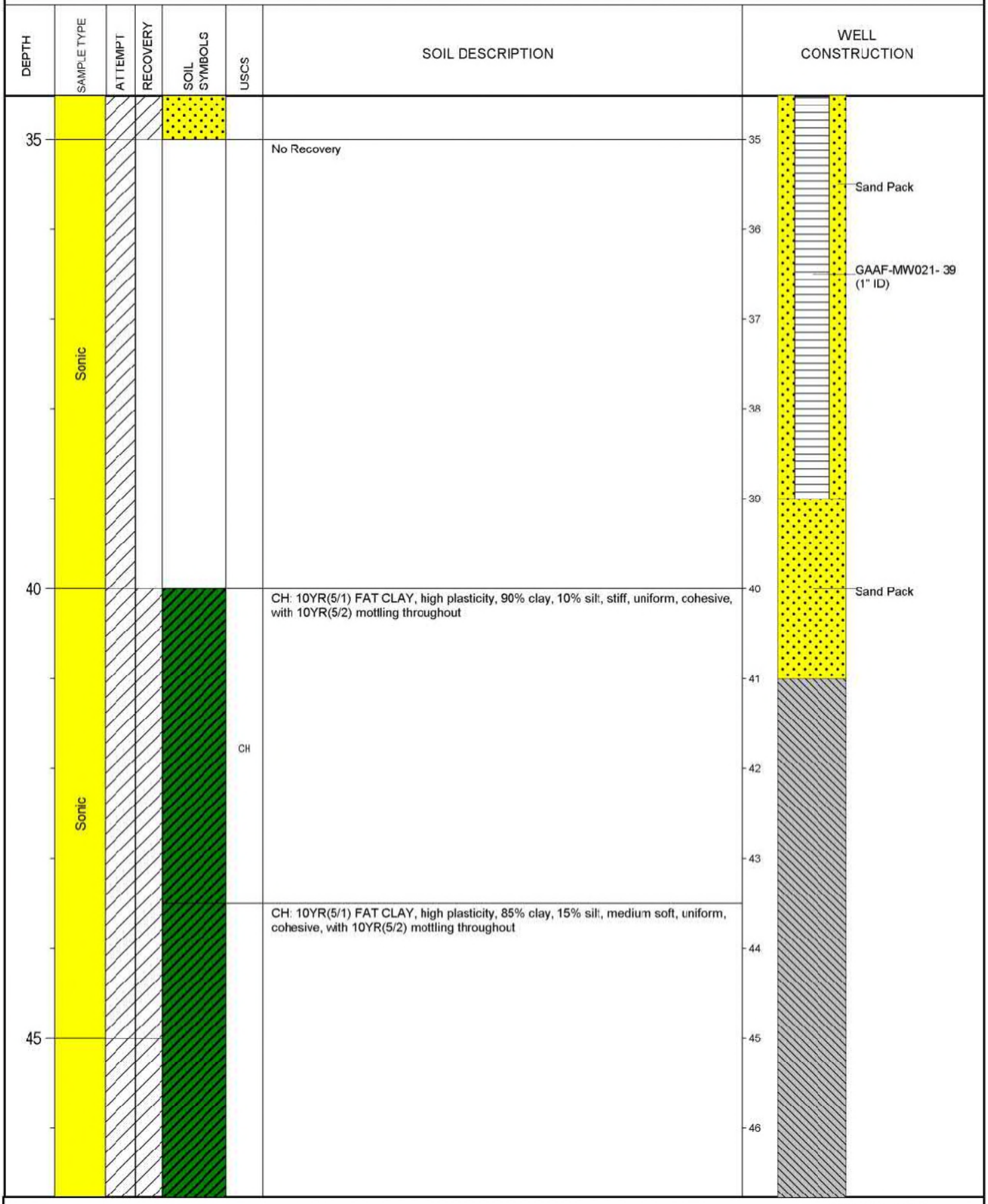
BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
	Sonic					
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace silt, trace fine sand, 40% medium sand, 30% coarse sand, 20% fine gravel, 10% coarse gravel
					SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 5% fine sand, 70% medium sand, 20% coarse sand, 5% fine gravel, dense, wet, fining downward
25						
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 60% medium sand, 30% coarse sand, 10% fine gravel, trace coarse gravel, dense, wet
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 50% medium sand, 30% coarse sand, 15% fine gravel, 5% coarse gravel, coarsening downward
30						No Recovery
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 60% medium sand, 30% coarse sand, 10% fine gravel, trace coarse gravel, wet, fining upward
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 50% medium sand, 30% coarse sand, 15% fine gravel, 5% coarse gravel, wet

WELL CONSTRUCTION	
23	
24	
25	
26	
27	Bentonite Seal
28	
29	
30	
31	
32	
33	2" PVC
34	

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**



FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
50	Sonic				CH	CH Continued: 10YR(5/1) FAT CLAY, high plasticity, 85% clay, 15% silt, medium soft, uniform, cohesive, with 10YR(5/2) mottling throughout	Bentonite Seal
					SC	SC: 10YR(5/1) POORLY SORTED FINE SAND WITH SILT AND CLAY, low plasticity, sub rounded sand grains, 30% clay, 20% silt, 30% fine sand, 20% medium sand, medium soft, uniform, cohesive, with 10YR(5/2) mottling throughout	
					CH	CH: 10YR(5/1) FAT CLAY, high plasticity, 85% clay, 15% silt, medium soft, cohesive	
55	Sonic					SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, trace fine sand, 50% medium sand, 30% coarse sand, 15% fine gravel, 5% coarse gravel	

47 48 49 50 51 52 53 54 55 56 57 58 59

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
					SW	SW Continued: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains, trace fine sand, 50% medium sand, 30% coarse sand, 15% fine gravel, 5% coarse gravel	
60	Sonic				SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 60% medium sand, 30% coarse sand, 10% sub angular fine gravel, wet, few clay nodules	60
							61 — 2" PVC
							62
							63 — Sand Pack
							64
					SW	SW: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 15% fine sand, 60% medium sand, 25% coarse sand, trace fine gravel, uniform, wet, fining downwards	GAAF-MW021- 67 (2" ID)
65	Sonic						65
							66
							67
							68 — Sand Pack
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 40% medium sand, 25% coarse sand, 30% fine gravel, 5% coarse gravel, wet, max gravel 20mm, fining upward	69
70					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 40% medium sand, 25% coarse sand, 35% fine gravel, trace coarse gravel	70
							71

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
						SW Continued: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 40% medium sand, 25% coarse sand, 35% fine gravel, trace coarse gravel	
						SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 20% coarse sand, 10% fine gravel, trace coarse gravel, uniform, wet, max gravel 25mm	
75	Sonic				SP		
80	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, uniform, wet	

72 73 74 75 76 77 78 79 80 81 82 83

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
						SP Continued: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, uniform, wet	84
85	Sonic				SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace fine sand, 40% medium sand, 20% coarse sand, 30% fine gravel, 10% coarse gravel, max gravel 50mm	85
					SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, wet	86 87 88 89
90	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace silt, 10% fine sand, 70% medium sand, 20% coarse sand, trace fine gravel, uniform, wet, with a small clay lens	90 91 92 93 94
95					SM	SM: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH SILTY SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace clay, 20% silt, 10% fine sand, 55% medium sand, 15% coarse sand, trace fine gravel, interbedded with silty sand	95

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, trace silt, 10% fine sand, 70% medium sand, 20% coarse sand, trace fine gravel, uniform, wet	
100	Sonic					No Recovery	Bentonite Seal
105	Sonic					SW: 10YR(5/4) POORLY SORTED MEDIUM TO COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 25% coarse sand, trace fine gravel, 5% coarse gravel, uniform, wet, gravel range 20-30mm, 40mm max	

96 97 98 99 100 101 102 103 104 105 106 107 108

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
					SW	SW Continued: 10YR(5/4) POORLY SORTED MEDIUM TO COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 25% coarse sand, trace fine gravel, 5% coarse gravel, uniform, wet, gravel range 20-30mm, 40mm max	109
110	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub rounded gravel, trace silt, 10% fine sand, 50% medium sand, 30% coarse sand, 5% fine gravel, 5% coarse gravel, uniform, wet, with 5GY(4/1) mottling	110 111 112 113 114
115					SP	SP: 5B(4/1) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 5% silt, 10% fine sand, 50% medium sand, 30% coarse sand, 5% fine gravel, trace coarse gravel, with 5GY(4/1) mottling.	115 116
	Sonic				SP	SP: 10YR(6/2) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 30% coarse sand, trace fine gravel, trace coarse gravel, color change from blue grey to tan	117
					SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 30% coarse sand, trace fine gravel, trace coarse gravel	118 119
120						SP: 10YR(5/3) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, 10% fine sand, 60% medium sand, 30% coarse sand, dense	120

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic				SP	wet, with 10YR(5/5) mottling	121
							122
						SP: 10YR(5/3) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and sub angular gravel, 10% fine sand, 60% medium sand, 30% coarse sand, trace fine gravel, dense, wet, with 5GY(4/1) mottling	123
							124
125							125
	Sonic				SP		126
							127
							128
					SM	SM: 10YR(5/3) POORLY SORTED MEDIUM SILTY SAND, non plastic, sub rounded to sub angular sand grains, 20% silt, 20% fine sand, 45% medium sand, 15% coarse sand	129
					SP	SP: 10YR(5/3) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, 10% fine sand, 60% medium sand, 30% coarse sand	
130						SP: 10YR(5/3) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 40% fine sand, 45% medium sand, 15% coarse sand, dense, wet	130
							131
	onic				SP		132

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
						SP Continued: 10YR(5/3) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 40% fine sand, 45% medium sand, 15% coarse sand, dense, wet	133
						SP: 10YR(5/3) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains, trace silt, 50% fine sand, 40% medium sand,10% coarse sand, fining downward	134
135	Sonic				SP		135
						SP: 10YR(5/3) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains, trace silt, 60% fine sand, 40% medium sand, uniform, wet	136
							137
					SP		138
							139
140						SP: 10YR(5/3) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains, trace silt, 60% fine sand, 40% medium sand, uniform, wet	140
							141
	Sonic				SP		142
							143
							144

2" PVC

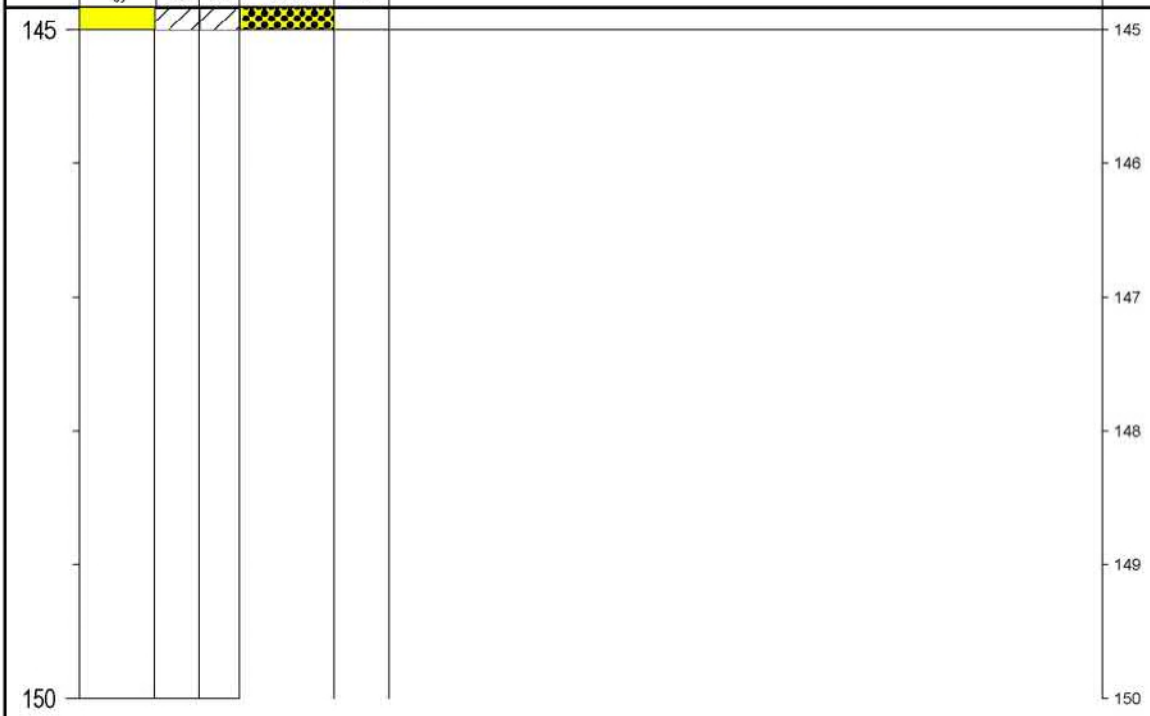
Sand Pack

GAAF-MW021- 142
(2" ID)

Sand Pack

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW021**
TOTAL DEPTH: **145'**



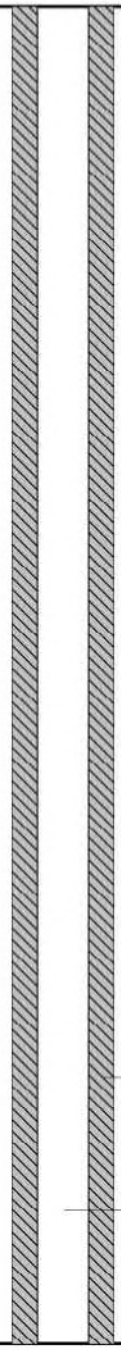
AECOM FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Grayling Area PFAS**	CONTRACTOR:	**Mateco**
SITE LOCATION:	**Grayling, MI**	CREW CHIEF:	**Jeff Croel**
PROJECT NO.:	**60661441**	DRILL RIG TYPE:	**Geoprobe 8140DT**
PROJECT MANAGER:	**Matt VanderEide**	DRILLING METHOD:	**Sonic**
LOGGED BY:	**Kelly Moss/ Stanley Krenz**	HOLE DIAMETER:	**8 1/4"**
CREATED BY:	**Stanley Krenz**	DATE START:	**10/23/19**
		DATE END:	**11/5/19**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
0	Hand Auger			SM	SM: 10YR(2/2) POORLY SORTED MEDIUM SILTY SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 15% silt, 20% fine sand, 40% medium sand, 10% coarse sand, 15% sub rounded to sub angular fine gravel, trace coarse gravel, with organics, grass, and twigs
				SP	SP: 10YR(4/6) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, trace silt, 40% fine sand, 60% medium sand, trace coarse sand, trace fine gravel, loose, moist, sharp color contact
				SW	SW: 10YR(5/6) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, 30% fine sand, 60% medium sand, 10% coarse sand, trace fine gravel, trace coarse gravel, loose, moist, sharp color contact, coarsening downward
				SW	SW: 10YR(5/6) POORLY SORTED MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, 20% fine sand, 55% medium sand, 15% coarse sand, 5% fine gravel, 5% coarse gravel, loose, moist
5	Sonic			SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, 20% fine sand, 55% medium sand, 15% coarse sand, 5% fine gravel, 5% coarse gravel, loose, moist, gravel max 25mm, coarsening downward
				SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 25% medium sand, 50% coarse sand, 5% fine gravel, trace coarse gravel, 10% coarse gravel, wet, coarse gravel 40mm max
10					

WELL CONSTRUCTION

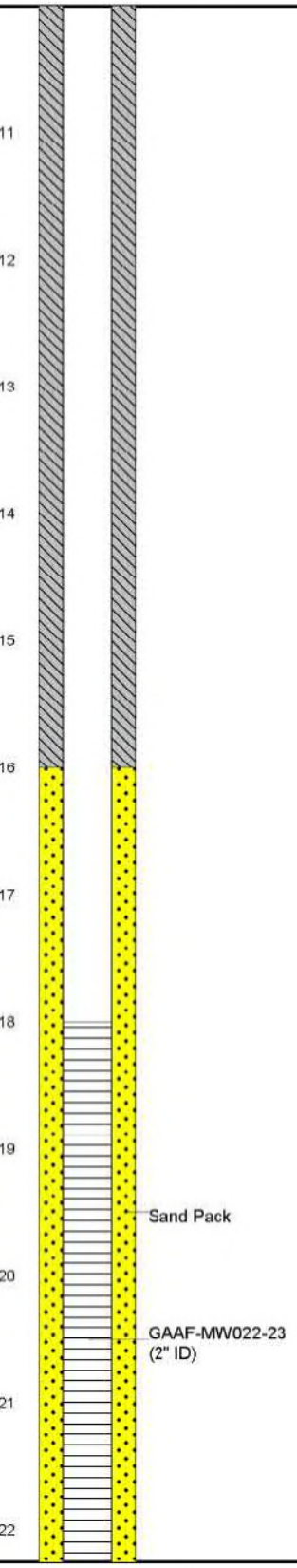


FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND, non plastic, sub rounded to sub angular sand grains and gravel, 5% fine sand, 20% medium sand, 60% coarse sand, 5% fine gravel, 10% coarse gravel, wet
					SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 25% medium sand, 50% coarse sand, 5% fine gravel, 10% coarse gravel, wet
					SW	SW: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, trace silt, 60% fine sand, 30% medium sand, 5% coarse sand, 5% fine gravel, trace coarse gravel, moist, fining downward
15	Sonic				SW	SW: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular, trace silt, 35% fine sand, 50% medium sand, 10% coarse sand, 5% fine gravel, trace coarse gravel, wet
20					SW	SW: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 35% fine sand, 50% medium sand, 10% coarse sand, 5% fine gravel, trace coarse gravel, wet

WELL CONSTRUCTION



FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic					SW Continued: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 35% fine sand, 50% medium sand, 10% coarse sand, 5% fine gravel, trace coarse gravel, wet, at 22.5 ft bgs large 60mm pebble	
					SP	SP: 10YR(5/4) WELL SORTED FINE SAND, non plastic, sub rounded sand grains, trace silt, 75% fine sand, 25% medium sand, dense, wet, uniform, fining downward	
25						SP: 10YR(5/4) WELL SORTED FINE SAND, non plastic, sub rounded sand grains, trace silt, 75% fine sand, 25% medium sand, trace sub rounded coarse gravel, dense, wet, uniform, at 27 ft bgs a 45mm pebble	
	Sonic				SP		
						SP: 10YR(5/4) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, trace silt, 55% fine sand, 35% medium sand, 5% coarse sand, 5% fine gravel, dense, wet	
30							
	Sonic				SP		
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 20% fine sand, 50% medium sand, 20% coarse sand, 10% fine gravel, trace coarse gravel, max gravel 55mm, coarsening downward	
						SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, trace fine sand, 10% medium sand, 35% coarse sand, 35% fine gravel, 20% coarse gravel, max gravel 55mm,	

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
35	Sonic				SW	coarsening downward	
					CL	CL: 10YR(4/1) FAT CLAY, high plasticity, sub rounded sand grains, 70% clay, 20% silt, 5% fine sand, stiff, cohesive, with 5YR(5/2) mottling, sharp contact	
					CL	CL: 10YR(4/1) FAT CLAY, high plasticity, sub rounded sand grains, 90% clay, 10% silt, medium stiff, cohesive, with 5YR(5/2) mottling	Bentonite Seal
40	Sonic				CL	CL: 10YR(4/1) FAT CLAY, high plasticity, sub rounded grain, 90% clay, 10% silt, soft, cohesive, with 5YR(5/2) mottling	
					CL	CL: 10YR(4/1) POORLY SORTED FAT CLAY WITH SAND, high plasticity, sub rounded to sub angular sand grains and sub angular gravel, 55% clay, 25% silt, 5% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, stiff, cohesive, with 5YR(5/2) mottling, sharp contact	
45					CL	CL: 10YR(4/1) FAT CLAY, high plasticity, sub rounded sand grains, 90% clay, 10% silt, trace fine sand, medium stiff, cohesive, with 5YR(6/2) mottling	

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic					CL Continued: 10YR(4/1) FAT CLAY, high plasticity, sub rounded sand grains, 90% clay, 10% silt, trace fine sand, medium stiff, cohesive, with 5YR(6/2) mottling	47
					CL	CL: 10YR(4/1) FAT CLAY WITH SILT, high plasticity, sub rounded sand grains, 80% clay, 20% silt, trace fine sand, increasing stiffness with depth, cohesive, with 5YR(5/2) mottling	48
							49
50					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM TO COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 50% medium sand, 20% coarse sand, 20% fine gravel, trace coarse gravel, loose, wet	50
							51
	Sonic				SP	SP: 10YR(5/4) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains, trace silt, 60% fine sand, 40% medium sand, trace coarse sand, uniform	52
							53
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM TO COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 30% medium sand, 25% coarse sand, 20% fine gravel, 15% coarse gravel, gravel range 50-60mm	54
55							55
							56
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 50% fine sand, 40% medium sand, 5% coarse sand, 5% fine gravel, trace coarse gravel	57
							58
						SW: 10YR(5/4) POORLY SORTED MEDIUM TO COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 25% medium sand, 25% coarse sand, 20% fine gravel, 20% coarse gravel, gravel range	59

2" PVC
Sand Pack
GAAF-MW022-60 (2" ID)

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
					SW	50-60mm	
60	Sonic				SP	SP: 10YR(5/4) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded sand grains and gravel, trace silt, 50% fine sand, 40% medium sand,10% coarse sand, trace fine gravel, dense, wet	
					SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 5% fine sand, 25% medium sand, 30% coarse sand, 30% fine gravel, 10% coarse gravel, at 61 ft bgs a 70mm cobble	
					SW	SW: 10YR(5/4) POORLY SORTED FINE TO MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 30% fine sand, 35% medium sand, 10% coarse sard, 20% fine gravel, 5% coarse gravel, fining downward	
65	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic. sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, trace coarse gravel, dense, wet, at 66 ft bgs a 130mm cobble	
70						SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic. sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, wet	

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
	Sonic				SP	SP Continued: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 60% medium sand, 25% coarse sand, 5% fine gravel, wet	72
					SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 35% medium sand, 30% coarse sand, 20% fine gravel, 5% coarse gravel, at 72.5 ft bgs a 60mm cobble	73
					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 55% medium sand, 25% coarse sand, 10% fine gravel, trace coarse gravel, wet, fining downward	74
75							75
	Sonic				SP	SP: 10YR(5/4) WELL SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 10% fine sand, 70% medium sand, 15% coarse sand, 5% fine gravel, trace coarse gravel, uniform, wet	76
							77
							Bentonite Seal
							78
							79
80							80
	Sonic				SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 5% fine sand, 25% medium sand, 60% coarse sand, 10% fine gravel, trace coarse gravel, uniform, wet	81
							82
							83

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**

DEPTH	SAMPLE TYPE	ATTEMPT	RECOVERY	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	WELL CONSTRUCTION
					SW	SW: 10YR(5/4) POORLY SORTED COARSE SAND WITH GRAVEL, non plastic, sub rounded to sub angular sand grains and gravel, 5% fine sand, 20% medium sand, 55% coarse sand, 10% fine gravel, 10% coarse gravel, wet, max gravel 35mm	84
85					SW	SW: 10YR(5/4) POORLY SORTED MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, 25% fine sand, 60% medium sand, 10% coarse sand, trace fine gravel, 5% coarse gravel, fining downward	85
	Sonic				SP	SP: 10YR(5/4) WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 70% fine sand, 30% medium sand, trace coarse sand, dense, wet, uniform	86 87 88 89
90					SP	SP: 10YR(5/4) WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 70% fine sand, 30% medium sand, dense, wet, uniform	90 91 92 93 94
	Sonic				SP	SP: 10YR(5/4) WELL SORTED FINE SAND, non plastic, sub rounded to sub angular sand grains, trace silt, 60% fine sand, 40% medium sand, trace coarse sand, fining upward	95
95						SP: 10YR(5/4) WELL SORTED FINE TO MEDIUM SAND, non plastic, sub rounded to sub angular sand grains and gravel, trace silt, 40% fine sand, 50% medium sand, 10% coarse sand, trace fine gravel	

2" PVC

FIELD BOREHOLE LOG

BOREHOLE NO: **GAAF-MW022**
TOTAL DEPTH: **180'**