

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

RESPONSE ACTIVITY REVIEW PANEL PETITION

Petitioner: City of Cedar Springs

Facility: City of Cedar Springs, MI Former Wastewater Treatment Lagoons Site

730 West Street, Cedar Springs, Michigan 49319

Site ID: 41000010

Issue

On February 17, 2022, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) received a Petition for the Response Activity Review Panel regarding the City of Cedar Springs (the City), Michigan Former Wastewater Treatment Lagoons site (Site)¹. Specifically, the Petitioner is disputing EGLE Water Resources Division's (WRD's) Disapproval Letter dated November 22, 2021 (Disapproval Letter) in response to the Petitioner's Remedial Investigation Report, dated September 2, 2021 (RI Report). The Petitioner disagrees with EGLE WRD's determination that the City has not submitted sufficient information to EGLE to demonstrate delineation of the nature and extent of per- and polyfluoroalkyl substances (PFAS) under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Part 201) in groundwater at and in the vicinity of the Site. The site history, technical disputes presented in the Petition, and EGLE's responses are further described below.

Site History

The City operated a 45-acre wastewater lagoon system between 1965 and 1999 at 730 West Street NE, including parcels 725, 750, and 755 West Street NE. Historical investigations of the Site were conducted beginning in 1970. Those investigations showed that onsite soils and groundwater had been affected by wastewater discharge. The facility was initially listed as a site of contamination under Act 307 in 1985. The former wastewater treatment plant lagoons were closed in place. Residual solids in the lagoons received a designation of inertness and were mixed with agricultural lime, left in place and covered with clean soil and seed mix.

At the request of EGLE WRD, in late January 2020, the City collected groundwater samples from 5 existing shallow monitoring wells in the area surrounding their historic wastewater treatment lagoons and transferred custody of the samples to EGLE WRD for laboratory analysis of PFAS. Analytical costs were covered by EGLE WRD. EGLE requested that this sampling be completed because PFAS contamination had been identified by some residents in the area who sampled their own drinking water wells for PFAS. To date, EGLE has sampled 204 drinking water wells in the general area of the Site and to the south, 81 of which have exceeded Part 201 criteria for Perfluorooctanoic acid (PFOA).

¹ MICH COMP. LAWS § 324.20114e(7). A person who submitted a response activity plan; remedial action plan; postclosure plan; a no further action report; a request for certificate of completion or documentation of due care compliance under this part may appeal a decision made by the department regarding a dispute by submitting a petition to the director.

Results of the City's late January 2020 groundwater sampling identified the presence of PFOA above the applicable Part 201 criteria in 4 of the 5 monitoring wells and other PFAS compounds in groundwater at the Site. Shallow groundwater primarily flows to the west/southwest at the Site, while groundwater flow in the deeper aquifer has not been determined to date.

EGLE WRD issued Violation Notice No. VN-011095 (Attachment 1), to the City on October 2, 2020, in response to violations of Part 201. The Violation Notice served as the formal notification that groundwater at the former Cedar Springs Wastewater Treatment Lagoons site located at 730 West Court Street, NE, including parcels 725, 750, and 755 West Court Street, NE, is contaminated above applicable Part 201 criteria for PFOA, meaning the Site is a "Facility" as that term is defined by Part 201 of the NREPA. The Violation Notice requested that by November 16, 2020, the City submit to EGLE, for review and approval, a work plan for a Remedial Investigation/Feasibility Study (RI/FS) at the Site.

On November 16, 2020, the City submitted a RI/FS work plan in response to Violation Notice No. VN-011095. The City's work plan was determined to be inadequate and unacceptable since the work plan proposed to review existing documents with no active investigation of the groundwater plume. The City must identify the nature and extent of contamination and propose effective mitigation strategies to protect human health and the environment. EGLE WRD issued a letter, dated December 8, 2020, with their response to the City. The letter requested a revised work plan for a RI/FS at the Site by January 15, 2021. EGLE WRD later granted an extension for the work plan to February 15, 2021, per the City's request.

On February 15, 2021, the City submitted a revised RI/FS work plan for the Site. As noted in an e-mail from EGLE WRD to the City dated February 16, 2021 (Attachment 2), the RI/FS work plan for the Site was still inadequate to fulfill the requirements of an RI/FS study, which must define the nature and extent of contamination at the site.

On March 2, 2021, EGLE WRD and the City participated in a conference call to discuss the inadequacies of the February 15, 2021, RI/FS work plan and what requirements were still needed. EGLE WRD provided additional clarification to the City in an e-mail on March 8, 2021 (Attachment 3). EGLE WRD provided a 45-day extension for a revised RI/FS work plan for the Site. EGLE WRD later granted two extensions for the RI/FS work plan to June 15, 2021, and then to July 30, 2021, per the City's request.

On September 2, 2021, the City submitted the RI Report to EGLE WRD for the Site instead of the requested RI/FS work plan. The RI Report as submitted was not approvable, due to its inability to define the nature and extent of contamination at the Site as outlined in the Disapproval Letter. EGLE WRD met with the City and its consultant on November 3, 2021 and November 18, 2021, respectively, to discuss the requirements of the requested RI/FS work plan as well as cost saving options.

On November 22, 2021, EGLE WRD issued Second Violation Notice No. SVN-01124 (Attachment 4) since the City had not provided an adequate response to Violation Notice No. VN-011095. The Second Violation Notice requested an RI/FS work plan for the Site by January 3, 2022.

On January 3, 2022, the City submitted the Supplemental Remedial Investigation Work Plan for the site, dated December 30, 2021 (Attachment 5). EGLE WRD reviewed and approved the Supplemental Remedial Investigation Work Plan in lieu of a RI/FS work plan on January 26, 2022.

On February 17, 2022, EGLE received the Response Activity Review Panel Petition from the City regarding the September 2, 2022, RI Report that EGLE WRD previously disapproved.

Technical Disputes and EGLE's Response

As stated above, the Petition disagrees with WRD's determination in the Disapproval Letter that the City has not submitted sufficient information in the RI Report to EGLE to demonstrate delineation of the nature and extent of PFAS in groundwater under Part 201 at and in the vicinity of the Site. Below is EGLE's response to the Petition:

EGLE's Response Regarding Determining Nature and Extent of a Release:

1. Under Section 20114(1)(a) of Part 201, an owner or operator of property who has knowledge that the property is a facility shall determine the nature and extent of the release at the facility². EGLE WRD's Violation Notices notified the City that the Site is considered a facility under Part 201 due to PFOA concentrations above applicable Part 201 criteria in the groundwater, and requested that the City submit a work plan for Remedial Investigation/Feasibility Study (RI/FS).
2. EGLE expects that any party submitting a response activity plan will use the most up to date and applicable industry standards to complete an environmental investigation and develop an accurate site-specific conceptual site model³.
3. Sections 20118 and 20120 of Part 201 emphasizes that the department must conclude that a selection or implementation of response activity⁴ or remedial action⁵ proposed by a party, is necessary and appropriate to protect the public health, safety or welfare, or the environment. Under Section 20114(1)(h) of Part 201⁶, the department has the authority to request that the nature and extent of PFAS groundwater contamination associated with the Site be appropriately investigated for the health, safety, and welfare of area residents that depend on the groundwater for drinking water.

² MICH COMP. LAWS § 324.20114(1)(a).

³ ASTM E1689-95 (Reapproved 2014) Standard Guide for Developing Conceptual Site Models for Contaminated Sites.

⁴ MICH COMP. LAWS § 324.20118.

⁵ MICH COMP. LAWS § 324.20120.

⁶ MICH COMP. LAWS § 324.20114(1)(h).

4. Existing groundwater monitoring wells on the Site were installed under a former Part 22 Groundwater Discharge Permit associated with the historic wastewater treatment lagoons. Only 8 of the 24 existing monitoring wells located at the Site have been sampled for PFAS, which includes the 5 monitoring wells sampled in January 2020 where EGLE WRD covered the analytical costs. The other 3 of the 8 sampled monitoring wells were sampled by the City in March 2021 and results were provided in the RI Report. Of the 8 monitoring wells, 6 have reported exceedances of the Part 201 criteria for PFOA and 1 has reported an exceedance of the Part 201 criteria for PFOS. Further, the 8 monitoring wells are all screened at depths shallower than 40-feet below ground surface (bgs). No downgradient environmental monitoring wells have been installed on the Site since the discovery of PFAS at the Site in January 2020. The City did install one upgradient monitoring well off-site in March 2021 to determine if any PFAS was migrating onto the Site. The sampling results from that upgradient well were included in the RI Report and were non-detect for PFAS. The limited PFAS sampling completed to date has not defined the nature and extent of the PFAS groundwater contamination at or in the vicinity of the Site and has not adequately investigated the deeper drinking water aquifer.

Specific EGLE Responses to the Disputes Identified in the Petition:

1. Reliance on Residential Drinking Water Wells in-lieu of Environmental Monitoring Wells

- a. **Overview:** The City used PFAS results from 11 area residential wells sampled by EGLE in combination with the results from the 8 onsite monitoring wells to propose they have delineated the horizontal and vertical PFAS groundwater contamination, shown in Figure 1 in the RI Report. It should be noted, that the City has sampled an additional 14 area residential wells near the Site for PFAS, however these residential well results are not shown on Figure 1.
- b. **EGLE's Response:**
 - i. Sampling drinking water wells does not collect the same information that installing, and sampling environmental monitoring wells does.
 1. Drinking water wells cannot be low-flow sampled, which is an industry standard⁷.
 2. Drilling logs created for drinking water wells are rarely completed by a geologist and do not contain the detail necessary for a Remedial Investigation (grain-size, sorting, environment of deposition, hydrogeologic properties, etc.) An environmental boring log and well construction diagram would provide the necessary information.

⁷ ASTM D6771-21 Standard Practice for Low-Flow Purging and Sampling Used for Groundwater Monitoring (ASTM International, 11/01/2021).

3. Well construction methods and specifications for drinking water wells⁸ differ than those used for the construction and installation of environmental monitoring wells, which also affects the quantity and quality of soil recovery⁹.
 4. The depths of existing residential wells are not at a comparable depth of the PFAS groundwater contamination found on the Site. The former lagoon area on the Site has not been fully investigated to verify that the highest concentrations of PFAS have even been identified.
- ii. While a drinking water supply well may be useful to determine the absence or presence of contamination from a risk standpoint at a particular property at the time the sample is collected, it is not a substitute for installing and sampling environmental monitoring wells. A person could be exposed to unacceptable levels of a hazardous substance if relying on drinking water wells to monitor a groundwater contaminant plume. Environmental monitoring wells and sampling points installed between the source area, and potential receptors, are necessary to demonstrate and document, there is no current, or future risk for unacceptable exposures, especially in areas where groundwater is relied on for drinking water.

2. Reliance on Groundwater Flow Data in-lieu of Installing or Sampling Environmental Monitoring Wells

- a. **Overview:** The City uses the westerly groundwater flow direction of the shallow aquifer as a basis for not sampling environmental monitoring wells to the north.
- b. **EGLE's Response:**
 - i. While EGLE acknowledges that the calculated and measured groundwater flow direction(s) at a property is part of the overall conceptual site model, the groundwater flow direction itself cannot be used in-lieu of sampling to define the nature and extent of the groundwater contamination at a property. Environmental sampling activities need to be completed in order to define the nature and extent of the groundwater contamination as required by Part 201.

3. Multiple Aquifer Investigation

- a. **Overview:** The City does not believe they need to sample the deeper drinking water aquifer due to the reported presence of a clay layer.
- b. **EGLE's Response:**

⁸ Michigan Water Well Construction and Pump Installation Code (Part 127, Act 368, PA 1978 and Administrative Rules).

⁹ ASTM D5092/D5092M-16 Standard Practice for Design and Installation of Groundwater Monitoring Wells.

- i. An inadequate amount of geologic data has been provided to document the thickness and permeability of the referenced confining layer on the Site, specifically in the former lagoon area. The cross-sections provided within the Petition in the February 12, 2021 Revised Remedial Investigation and Feasibility Study Work Plan (Figures 3-9 in the Revised RI/FS Work Plan), submitted to EGLE on February 15, 2021, rely largely on drinking water well logs located off-site as proof of a competent and continuous clay layer separating the shallow and deep aquifer. Additionally, a number of onsite soil boring logs used to generate the cross-sections were not provided in the report.
- ii. The geologic depositional environment can influence competency of a confining layer and identify potential contaminant migration pathways. Such detail is not provided in the RI Report. EGLE's [GeoWebFace](#) mapping tool identifies the quaternary geology in the vicinity of the site as "glacial outwash sand and gravel and postglacial alluvium", which is a characteristically heterogenous quaternary deposit. PFAS is highly soluble and mobile and has been documented to be present in deeper aquifers at various PFAS investigation areas across the State. As noted in the ITRC Site Characterization Considerations and Media-Specific Occurrence for PFAS factsheet, "[g]eologic heterogeneity: [b]ecause of the low regulatory limits that are used for delineation of groundwater impacts and the mobile nature of certain PFAS, extra emphasis should be placed on understanding the effects of hydrogeologic heterogeneity on the groundwater plume"¹⁰.
- iii. Area drinking water wells are installed in the deeper aquifer and have had detections of PFAS above Part 201 criteria, which is not mentioned in the RI Report. Refer to EGLE's Figure 2 and Figure 3 for residential well PFAS sample results and associated well screen elevations. The drinking water pathway is relevant, and the deeper aquifer needs to be investigated to verify that public health is being protected and no unacceptable exposures are occurring or have the potential to occur in the future. Residents rely on the area groundwater for private water supply wells.

EGLE WRD and the City have a path forward through the approved Supplemental Remedial Investigation Work Plan, dated December 30, 2021. EGLE WRD has been waiting for notification of a drilling start date.

Attachments:

Attachment 1 – EGLE Violation Notice No. VN-011095 dated October 2, 2020

Attachment 2 – E-mail from EGLE WRD to the City dated February 16, 2021

¹⁰ Interstate Technology Regulatory Council (ITRC) - Site Characterization Considerations and Media-Specific Occurrence for Per- and Polyfluoroalkyl Substances (PFAS) (updated August 2020).

Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 3 – E-mail from EGLE WRD to the City dated March 8, 2021

Attachment 4 – EGLE Second Violation Notice No. SVN-01124 dated November 22, 2021

Attachment 5 – Supplemental Remedial Investigation Work Plan, dated December 30, 2021

Figures:

Figure 1 – PFAS Exceedances in Shallow Aquifer and Groundwater Contour Map. Fishbeck. Remedial Investigation Report, dated September 2, 2021

Figure 2 – “Concentrations of PFAS Compounds Compared to Part 201 Criteria”. EGLE/AECOM Draft, dated 1/3/2022

Figure 3 – “Concentrations of PFAS Compounds Compared to Part 201 Criteria”. EGLE/AECOM Draft, dated 1/3/2022 (with screen elevation labels)

Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 1

EGLE Violation Notice No. VN-011095 dated October 2, 2020



STATE OF MICHIGAN
 DEPARTMENT OF
 ENVIRONMENT, GREAT LAKES, AND ENERGY
 LANSING



GRETCHEN WHITMER
 GOVERNOR

LIESL EICHLER CLARK
 DIRECTOR

October 2, 2020

VN No. VN-011095

VIA E-MAIL AND U.S. MAIL

Mr. Mike Womack, City Manager
 City of Cedar Springs
 P.O. Box 310
 Cedar Springs, Michigan 49319

Dear Mr. Womack:

SUBJECT: Part 201 Facility Notification and Part 22 Rules Request
 EGLE Groundwater Discharge Permit No. GW1810233
 Designated Name: Cedar Springs WWTP

On February 13, 2020, staff of the Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD), received monitoring well sampling results indicating environmental contamination is present at the City of Cedar Springs (City), Cedar Springs Wastewater Treatment Plant (WWTP) former lagoon area located at 730 West Court Street NE, including parcels 725, 750, and 755 West Court Street NE, and the current discharge fields located at 4482 and 4550 Indian Lakes Road NE, Cedar Springs, Michigan 49319. Michigan’s environmental cleanup law, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), and the Part 22, Groundwater Quality, administrative rules promulgated pursuant to Part 31, Water Resources Protection, of the NREPA (Part 22 Rules), identify actions or precautions a person needs to take with respect to environmental contamination. Owners and operators of contaminated property may have responsibilities associated with that contamination.

Sample results identified groundwater impacts for perfluorooctanoic acid (PFOA) above the applicable criteria contained in the administrative rules of Part 201. The sample results exceeding groundwater protection criteria are summarized below:

Sample Location	Sample Date	Pollutant Parameter	Applicable Limit	Sample Result
MW-3A*	1/21/2020	PFOA	8 ng/l	8.3 ng/l
MW-4A*	1/21/2020	PFOA	8 ng/l	14 ng/l
MW-5A*	1/21/2020	PFOA	8 ng/l	12 ng/l
MW-7A*	1/21/2020	PFOA	8 ng/l	43 ng/l
MW-5**	1/21/2020	PFOA	8 ng/l	10 ng/l

* Located at the former lagoon area at 725, 730, 750, and 755 West Court Street

** Located at the current discharge field at 4482 and 4550 Indian Lakes Road

Former Lagoon Area

Groundwater that exceeds the applicable criteria defines a site as a “Facility” under Part 201. **This Violation Notice (VN) serves as formal notification that groundwater at the Cedar Springs WWTP former lagoon area is contaminated above applicable Part 201 criteria**, meaning the Cedar Springs WWTP former lagoon area is a “Facility” as that term is defined by Part 201. By **November 16, 2020**, the City shall submit to EGLE, for review and approval, a work plan for a Remedial Investigation/Feasibility Study at the Cedar Springs WWTP former lagoon area. This work plan shall address contamination at 725, 730, 750, and 755 West Court Street NE, Cedar Springs, Michigan 49319.

Pursuant to Section 20114 of the NREPA, an owner or operator of property who has knowledge that the property is a Facility, and who is liable under Section 20126 of the NREPA, must pursue appropriate response activities to address the release. These response activities include performing remedial investigations pursuant to the requirements of Section 324.20114(1)(a) of Part 201.

Owners and operators who have knowledge their property is a Part 201 Facility need to take certain measures, commonly called due care, to ensure that the contamination on the property does not cause unacceptable risks and is not exacerbated. The due care provisions are found in Section 20107a of Part 201, and include:

- Preventing exacerbation of the existing contamination;
- Preventing unacceptable human exposure and mitigating fire and explosion hazards to allow for the intended use of the Facility in a manner that protects the public health and safety;
- Taking reasonable precautions against the reasonably foreseeable acts or omissions of a third party;
- Providing cooperation and access to authorized persons to conduct response activities; and
- Complying with any land use or resource use restrictions in connection with response activities.

Additional guidance on complying with due care is found in Part 10 (Compliance with Section 20107a) of the Part 201 Administrative Rules.

Persons liable under Part 201 are required to take steps to clean up the contamination. These steps are found in Section 20114 of Part 201, and include, as applicable:

- Immediately taking measures to contain or remove the contamination source;

- Immediately identifying and eliminating any threat of fire or explosion or direct contact hazards;
- Notifying EGLE and affected neighbors if contamination has migrated off the property;
- Delineating the extent of the contamination; and
- Undertaking the cleanup of the contamination.

Current Discharge Fields

Concentrations of PFOA in groundwater have been identified above applicable Part 201 criteria in a compliance monitoring well (MW-5) adjacent to the City's groundwater discharge site. This exceedance of applicable Part 201 criteria is a violation of Rule 323.2204 and therefore constitutes a violation of the City's permit. In addition, numerous residential wells in the area have had detections of PFOA above applicable criteria. EGLE is requesting that the City conduct additional hydrogeologic investigation in the vicinity of its groundwater discharge site to determine the extent of groundwater impacted by PFOA compounds. This request is being made pursuant to Rule 323.2227(2)(e). Rule 323.2227(2) states that "*If the department determines that a limit on the concentration of a substance in effluent or groundwater has been exceeded, then the department may require the discharger to undertake one or more of the following.*" Subpart (e) of Rule 323.227(2) states that the permittee may be required to "*Define the extent to which groundwater quality exceeds the applicable criteria*" under section 20120a(1)(a). A work plan for the hydrogeologic investigation of the current discharge fields is requested by **November 16, 2020**.

EGLE acknowledges that City's WWTP was not a generator or user of per- and polyfluoroalkyl substances (PFAS), provides an important public service to the community, and likely received typical levels of PFAS from users of its system consistent with other similarly situated municipal wastewater treatment facilities throughout the state. These factors; however, do not negate the City's responsibility to act upon new information and take reasonable and appropriate steps to evaluate the extent of the contamination in order to insure the protection of public health from the former lagoon site and discharge fields.

If the City has any questions regarding the content of this VN, including questions pertaining to its requirements in addressing Part 201 or Part 22 requirements, please contact Mr. Eric Chatterson, Geology Specialist, Groundwater Permits Unit, WRD, at 517-241-1358; ChattersonE@Michigan.gov; or EGLE, P.O. Box 30473, Lansing, Michigan 48909-7973. Please direct all work plans and future correspondence regarding Part 201 and the Part 22 Rules to Mr. Chatterson.

EGLE encourages that City representatives become familiar with Part 201 and the Part 22 Rules, and requests that the City take the necessary steps to comply with the provisions of

Mr. Mike Womack
VN-011095
Page 4
October 2, 2020

the law that may apply. The City may want to confer with an environmental consultant to assist in complying with the provisions of Part 201 and the Part 22 Rules.

The explanations of Part 201 and the Part 22 Rules in this VN should not be considered a complete listing of the City's legal obligations under the law. The Part 201 statute and rules can be found in its entirety at the EGLE Web site: www.michigan.gov/egle, by clicking on 'Land,' 'Remediation,' then 'Site Investigation and Remediation.' The Part 22 Rules can be found at: <http://www.deq.state.mi.us/documents/deq-wmd-gwp-part22.pdf>.

Information used to prepare this VN is located at EGLE's Grand Rapids District Office located at State Office Building, 5th Floor, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503-2316. If the City wishes to review file information or meet with EGLE staff, COVID-19 protocols require that meetings and other communications be done by remote means such as by phone, e-mail, or online meetings.

If the City has factual information it would like EGLE to consider regarding this VN, please provide this with the City's written response due **November 16, 2020**.

Compliance with the terms of this VN does not relieve the City of any liability, past or present, from the failure to meet the conditions specified in, or failure to comply with, EGLE Groundwater Discharge Permit number GW1810233, Part 201, and the Part 22 Rules.

Sincerely,



Stephanie Kammer, Manager
Emerging Pollutants Section
Water Resources Division
517-897-1597

cc: Mr. Bill LaRose, City of Cedar Springs
Mr. Jon Russell, EGLE
Ms. Abigail Hendershot, EGLE
Mr. Michael Worm, EGLE
Mr. Thomas Berdinski, EGLE
Mr. Eric Chatterson, EGLE
Ms. Leslie Sorensen, EGLE
Ms. Karen Vorce, EGLE

Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 2

E-mail from EGLE WRD to the City dated February 16, 2021

Schrems, Kevin (EGLE)

From: Chatterson, Eric (EGLE)
Sent: Tuesday, February 16, 2021 3:44 PM
To: City Manager
Cc: Mary Jane Rhoades; Patterson, Tim; Vorce, Karen (EGLE); Berdinski, Thomas (EGLE); Ruhala, Sydney (EGLE); Kammer, Stephanie (EGLE)
Subject: RE: Violation Notice No. VN-011095/EGLE December 8, 2020 Letter

Mike,

I just spoke with your consultant (Tim Patterson from Fishbeck) and based on our conversation wanted to clarify where we stood on the response to VN (current discharge site). The proposed monitoring is not adequate and some form of an active (well installations) hydrogeologic investigation will be required. I think a meeting would be helpful in clarifying EGLE's expectations and minimizing the back and forth of documents. I will contact EGLE staff and work on setting a meeting up. Please feel free to call if you have any questions.

Eric Chatterson
Geology Specialist
Water Resources Division
Michigan Department of Environment, Great Lakes, and Energy
517-281-5160

From: City Manager <manager@cityofcedarsprings.org>
Sent: Monday, January 4, 2021 12:19 PM
To: Chatterson, Eric (EGLE) <CHATTERSON@michigan.gov>
Cc: Mary Jane Rhoades <MJRhoades@rhoadesmckee.com>; Patterson, Tim <tkpatterson@fishbeck.com>
Subject: Violation Notice No. VN-011095/EGLE December 8, 2020 Letter

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Mr. Chatterson,

I hope that you had a pleasant holiday. Please see attached our response to Violation Notice No. VN-011095/EGLE December 8, 2020 Letter. We have also sent a hard copy of this letter and the enclosure to you at:

Eric Chatterson
Michigan Dept of Environment, Great Lakes and Energy
Water Resources Division
525 West Allegan Street
PO Box 30473
Lansing, Michigan 48909-7973

Thanks,

Mike Womack- City Manager
City of Cedar Springs
66 S Main St, Cedar Springs, MI 49319

(616) 696-1330 x104

City Hall Hours M-Th 7:30am to 5:30 pm



Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 3

E-mail from EGLE WRD to the City dated March 8, 2021

Vorce, Karen (EGLE)

From: Chatterson, Eric (EGLE)
Sent: Monday, March 8, 2021 9:00 AM
To: City Manager
Cc: Mary Jane Rhoades; Patterson, Tim; Vorce, Karen (EGLE); Berdinski, Thomas (EGLE); Ruhala, Sydney (EGLE); Kammer, Stephanie (EGLE); Hendershott, Abigail (EGLE)
Subject: February 15th Work Plan.

Mike,

As discussed in our March 2 Teams meeting, I have reviewed the Revised Remedial Investigation and Feasibility Study Work Plan (WP) dated February 15th, 2021. The scope of work proposed in the WP is not adequate to fulfill the requirements of a Remedial Investigation/Feasibility Study (RI/FS). The primary deficiency of the WP is its inability to define the nature and extent of contamination at the site. Within the site conceptual model section on Page three of the WP, the following bullet points acknowledge this deficiency. They state that "The extent of PFAS exceeding GRDWC in the shallow unconfined aquifer west (downgradient) of the Site has not been determined," and that "Potential impact by PFAs in the lower confined aquifer has not been determined." EGLE concurs with these findings. I am requesting that the City of Cedar Springs (City) resubmit a new WP plan that will address these and any other obligations the City has under Part 201 of the NREPA. Please submit a revised WP within 45 days of your receipt of this notification.

In regards to the work proposed in the WP; EGLE is of the opinion that the work proposed, although insufficient in overall scope, would be beneficial to understanding site conditions and potential impacts to the underlying aquifers. Please proceed with the proposed work. EGLE is requesting that this work be completed within 60 days of your receipt of this communication.

In regards to the proposed work at the current discharge site, as addressed in my February 16 email, EGLE is of the opinion that additional work (requested per Rule 2227 in the original VN)) is necessary and EGLE maintains this request. However, EGLE acknowledges that the additional monitoring proposed would be beneficial to understanding site conditions and impacts to potential receptors. Please proceed with the proposed monitoring. Following completion of the proposed monitoring and investigative work at both the former and current discharge sites EGLE will revisit this request.

If anyone has any questions or comments, please feel free to call me.

Eric Chatterson
Geology Specialist
Water Resources Division
Michigan Department of Environment, Great Lakes, and Energy
517-281-5160

Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 4

EGLE Second Violation Notice No. SVN-01124 dated November 22, 2021



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
GRAND RAPIDS DISTRICT OFFICE



LIESL EICHLER CLARK
DIRECTOR

November 22, 2021

Second Violation Notice No. SVN-01124

VIA E-MAIL

Mr. Mike Womack, City Manager
City of Cedar Springs
P.O. Box 310
Cedar Springs, Michigan 49319

Dear Mr. Womack:

SUBJECT: Groundwater Discharge Permit No. GW1810233
Designated Name: Cedar Springs WWTP
Part 201 Facility Notification and Part 22 Rules Request
Second Violation Notice

The Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD), issued Violation Notice No. VN-011095, to the City of Cedar Springs (City) on October 2, 2020, in response to violations of Michigan's environmental cleanup law, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); the Part 22, Groundwater Quality, Administrative Rules promulgated pursuant to Part 31, Water Resources Protection, of the NREPA (Part 22 Rules); and Groundwater Discharge Permit No. GW1810233. The Violation Notice served as the formal notification that groundwater at the former Cedar Springs Wastewater Treatment Lagoons Site located at 730 West Court Street, NE, including parcels 725, 750, and 755 West Court Street, NE, is contaminated above applicable Part 201 criteria for perfluorooctanoic acid (PFOA), meaning the City's former Wastewater Treatment Lagoons Site is a "Facility" as that term is defined by Part 201 of the NREPA. The Violation Notice requested that by November 16, 2020, the City submit to EGLE, for review and approval, a work plan for a Remedial Investigation/Feasibility Study (RI/FS) at the City's former Wastewater Treatment Lagoons Site.

Further, the Violation Notice notified the City that concentrations of PFOA in groundwater above applicable Part 201 criteria have been identified in a Compliance Monitoring Well (MW-5) adjacent to the City's current Wastewater Treatment Plant (WWTP) Groundwater Discharge Site, which is a violation of Rule 323.2204 and therefore constitutes a violation of Groundwater Discharge Permit No. GW1810233. In addition, numerous residential wells in the area have had detections of PFOA above applicable criteria. The Violation Notice requested that by November 16, 2020, the City submit to EGLE, for review and approval, a work plan for the hydrogeologic investigation of the City's current WWTP Groundwater Discharge Site to determine the extent of groundwater impacted by Per- and Polyfluoroalkyl Substances (PFAS) pursuant to Rule 323.2227(2)(e).

The City has not provided an adequate response to Violation Notice No. VN-011095.

On November 16, 2020, the City submitted a response to the Violation Notice. The City's response was determined to be inadequate and unacceptable, as outlined in the letter dated December 8, 2020, issued to the City by EGLE. The letter requested by January 15, 2021, 1) a revised work plan for an RI/FS at the former Cedar Springs Wastewater Treatment Lagoons Site and 2) a work plan for the hydrogeologic investigation in the vicinity of the current Cedar Springs WWTP Groundwater Discharge Site to determine the extent of groundwater impacted by PFAS. EGLE granted an extension for the work plans to February 15, 2021, per the City's request.

On February 15, 2021, the City submitted a work plan for the former Cedar Springs Wastewater Treatment Lagoons Site, as well as the results of the implemented November 16, 2021, draft work plan for the current Cedar Springs WWTP Groundwater Discharge Site, which was not approved by EGLE. As noted in an e-mail from EGLE to the City dated February 16, 2021, the February 15, 2021, RI/FS work plan for the former Cedar Springs Wastewater Treatment Lagoons Site was inadequate to fulfill the requirements of an RI/FS study, which must define the nature and extent of contamination at the site. Further, EGLE notified the City that the work completed at the current Cedar Springs WWTP Groundwater Discharge Site was inadequate and that an active hydrogeologic investigation, including the installation of monitoring wells, was required to define the extent of contamination in the groundwater.

On March 2, 2021, EGLE and the City participated in a conference call to discuss the inadequacies of the February 15, 2021, work plan for the former Cedar Springs Wastewater Treatment Lagoons Site and what requirements were still needed. EGLE provided additional clarification to the City in an e-mail on March 9, 2021. EGLE provided a 45-day extension for a revised RI/FS work plan for the former Cedar Springs Wastewater Treatment Lagoons Site and agreed to a "paused approach" regarding the active hydrogeologic investigation at the current Cedar Springs WWTP Groundwater Discharge Site. The "paused approach" would entail ongoing sampling of the existing monitoring wells at the current Cedar Springs WWTP Groundwater Discharge Site for PFAS for a limited timeframe until the City could complete the required active investigation. EGLE later granted two extensions for the RI/FS work plan to June 15, 2021, and then to July 30, 2021, per the City's request.

On September 2, 2021, the City submitted an RI report to EGLE for the former Cedar Springs Wastewater Treatment Lagoons Site instead of the requested RI/FS work plan. The RI report as submitted is not approvable, due to its inability to define the nature and extent of contamination at the former lagoon area, as outlined in the enclosed disapproval letter (Enclosure A).

The violation(s) identified in Violation Notice No. VN-011095 are continuing. The violations identified in the Violation Notice are violations of Part 201 and the Part 22 Rules of the NREPA, and Groundwater Discharge Permit No. GW1810233.

The City shall take immediate action to achieve and maintain compliance with the terms and conditions of Part 201 and the Part 22 Rules of the NREPA and Groundwater Discharge Permit No. GW1810233.

Cedar Springs WWTP
Groundwater Discharge Permit No. GW1810233
Part 201 Facility Notification and Part 22 Rules Request
Second Violation Notice No. SVN-01124
November 22, 2021
Page 3

Please submit to EGLE an RI/FS work plan for the former Cedar Springs Wastewater Treatment Lagoons Site, for review and approval, by January 3, 2022. At a minimum, the work plan shall define the full nature and extent of contamination at the site and address any other obligation the City has under Part 201 of the NREPA, including sampling of any additional residential wells downgradient of the known contamination plume at the former Cedar Springs Wastewater Treatment Lagoons Site that may present a potential exposure risk.

If you have any factual information you would like to share with us regarding the violations identified in this Second Violation Notice, please provide them with your written response.

Compliance with the terms of this Second Violation Notice does not relieve the City of any liability, past or present, from failing to meet the conditions specified in, or failing to comply with, EGLE Groundwater Discharge Permit No. GW1810233, and Part 201 and the Part 22 Rules of the NREPA.

The WRD reserves its right to take all necessary and appropriate enforcement actions for all violations observed to-date and any violations that occur in the future. This may include civil action seeking fines, enforcement costs, injunctive relief, and potential criminal prosecution.

Due to the severity of the noncompliance, the matter is being considered for escalated enforcement.

We anticipate and appreciate the City's cooperation in resolving this matter. Should the City require further information regarding this Second Violation Notice or the City would like to arrange a meeting to discuss it, please contact Mr. Eric Chatterson, Geology Specialist, Groundwater Permits Unit, WRD, at 517-241-1358; ChattersonE@Michigan.gov; or EGLE, WRD, Emerging Pollutants Section, P.O. Box 30473, Lansing, Michigan 48909-7973.

Sincerely,



Stephanie Kammer, Manager
Emerging Pollutants Section
Water Resources Division
517-897-1597

sk/sea

Enclosure: Disapproval Letter for RI report submitted on September 2, 2021

cc: Mr. Bill LaRose, City of Cedar Springs (electronic)
Ms. Abigail Hendershott, MPART
Mr. Jon Russell, EGLE
Mr. Dave Pingel, EGLE
Mr. Michael Worm, EGLE
Ms. Sydney Ruhala, EGLE
Mr. Eric Chatterson, EGLE
Ms. Karen Vorce, EGLE

Response Activity Review Panel
EGLE's Response to City of Cedar Springs Petition
April 7, 2022

Attachment 5

Supplemental Remedial Investigation Work Plan, dated December 30, 2021

Supplemental Remedial Investigation Work Plan

**Cedar Springs Former Wastewater Treatment Lagoons Site
730 West Court Street
Cedar Springs, Michigan**

**Prepared For:
City of Cedar Springs**

**December 30, 2021
Project No. 201460**

1.0 Introduction.....1

 1.1 Background1

 1.2 Objectives and Scope.....1

2.0 Remedial Investigative Activities.....2

 2.1 Unconfined Aquifer.....2

 2.2 Confined Aquifer.....2

 2.2.1 Pre-Determined Monitoring Wells.....2

 2.2.2 Groundwater Flow Mapping2

 2.2.3 Vertical Aquifer Profile and Fourth Monitoring Well.....2

 2.3 Development.....2

 2.4 Surveying.....2

 2.5 Monitoring Well Sampling2

 2.6 Laboratory Analysis.....2

 2.7 Investigation Derived Waste.....2

3.0 Reporting.....2

4.0 Schedule2

List of Figures

Figure 1 – Site Location Map

Figure 2 – Proposed Monitoring Well Cluster Locations

List of Abbreviations/Acronyms

- EGLE Michigan Department of Environment, Great Lakes, and Energy (formerly the MDEQ)
- PFAS per-and polyfluoroalkyl substances
- PFOA perfluorooctanoic acid
- PFOS perfluorooctanesulfonic acid

1.0 Introduction

This Supplemental Remedial Investigation Work Plan (Work Plan) has been prepared by Fishbeck on behalf of the City of Cedar Springs (City) in response to EGLE's demand for additional delineation of Per- and Polyfluoroalkyl Substances (PFAS) impacts in groundwater with respect to the former Cedar Springs wastewater lagoon area (site) (Figure 1).

This Work Plan was with the scope prepared as requested by Michigan Department of Environment, Great Lakes, and Energy (EGLE) during telephone conversations between representatives of Fishbeck and EGLE on November 18, 2021, and December 22, 2021.

1.1 Background

Remedial investigative activities are being performed by the City under the regulatory oversight of EGLE and in response to Violation Notice No. VN-011095 dated October 2, 2020, and Second Violation Notice No. SVN-01124.

The generalized hydrostratigraphy of the site consists of the following:

- A laterally extensive sequence of sand beginning near the ground surface and extending to approximately 30 feet below ground surface (bgs). The water table is located approximately 10 feet bgs. The resulting approximately 20-foot-thick saturated zone exhibits unconfined aquifer properties. Groundwater in this water-bearing zone is towards the west.
- A 40- to 70-foot-thick clay confining layer is present beneath the unconfined aquifer and extends to a depth of approximately 70- to 100- feet bgs.
- A lower confined aquifer is present beneath the clay confining layer beginning at a depth estimated at 70- to 100- feet bgs. The physical characteristics of this water-bearing zone have not been locally documented.

Within the PFAS group of chemicals, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), have been identified in the unconfined aquifer at concentrations greater than applicable Part 201 Cleanup Criteria. Additional background information can be found in the *Draft Revised Remedial Investigation and Feasibility Study Work Plan, Cedar Springs Former Wastewater Treatment Lagoons Site* (Fishbeck, February 2021), and the *Draft Remedial Investigation Report, Cedar Springs Former Wastewater Treatment Lagoons Site* (Fishbeck, September 2021).

1.2 Objectives and Scope

The objectives of this Work Plan are to respond to EGLE's requirement that the City:

1. Delineate PFAS impacts in the unconfined aquifer to the north and south of the former wastewater lagoon area; and
2. Demonstrate that PFAS impacts identified in the unconfined aquifer beneath the site have not migrated through the 40-70 foot thick clay confining layer and impacted the lower confined aquifer.

The scope of the proposed investigation is limited to what is presented herein. The proposed activities are anticipated to be sufficient to achieve the above objectives. Further investigation is not contemplated beyond this current Work Plan. Unless otherwise specified herein, the general investigation methods and procedures associated with the activities described in this report will be consistent with the *Draft Revised Remedial Investigation and Feasibility Study Work Plan* (Fishbeck, 2021) and are incorporated by reference herein.

2.0 Remedial Investigative Activities

The following section describes the remedial investigation activities to be performed. Drilling oversight will be completed under the supervision of a Fishbeck geologist. Refer to Figure 2 for a map depicting site features, existing monitoring wells, and locations of the proposed vertical aquifer profile and monitoring wells. Prior to initiating subsurface investigative activities, MISS Dig will be notified a minimum of 72-hours prior to the start of field activities, and any other necessary permits will be obtained.

2.1 Unconfined Aquifer

Delineation activities will be performed using the sonic method of drilling to install three monitoring wells. A nominal 6-inch diameter borehole will be advanced to the base of the target well screen interval using the dual walled drilling approach via a 4-inch diameter inner core barrel and 6-inch diameter outer drive casing. Continuous soil samples will be obtained at each location for geological logging (standard operating procedure [SOP] 04-30).

The locations of the three monitoring wells have been pre-determined. One of the wells will be positioned along the north side of the central former wastewater lagoon, while the other two wells will be installed within the 16 Mile Road Right-of-Way (ROW) to the south of the former wastewater lagoon area. Unless geological data collected during borehole advancement suggests otherwise, the monitoring wells will be screened from approximately 25 to 30 feet bgs (i.e., immediately above the contact between the unconfined aquifer and the clay confining layer).

Each monitoring well will be constructed with 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) well casing and factory slotted 0.010-inch well screen. A sand filter pack will be placed in the interval from the base of the well screen to 1 to 2 feet above the top of the well screen. A bentonite seal, approximately 2 feet thick, will be placed above the filter pack. A bentonite grout placed above the bentonite pellet seal will extend to approximately 2 feet bgs. A flush-mounted or aboveground, steel protective well cover will be cemented in place around the well.

2.2 Confined Aquifer

Delineation activities will be performed using the sonic method of drilling to install four monitoring wells and perform one vertical aquifer profile (VAP) location. To further minimize potential hydraulic communication between the unconfined and confined aquifers, at each location a temporary 7 or 8-inch diameter override casing will be advanced approximately five feet into the clay confining layer. Drilling, soil sample collection, and logging will be performed consistent with the methods described above.

2.2.1 Pre-Determined Monitoring Wells

The locations of three of the monitoring wells have been pre-determined and positioned adjacent to the proposed shallow monitoring wells. This will result in three pairs of shallow/deep monitoring wells which will allow for the determination of vertical hydraulic gradients between the unconfined and confined aquifers and the determination of the groundwater flow direction within the confined aquifer.

The three monitoring wells will be screened from approximately 115 to 120 feet bgs.¹ The monitoring wells will be constructed consistent with the approach described above.

¹ During a telephone conversation on December 22, 2021, between representatives of Fishbeck and EGLE, EGLE indicated that the proposed wells were to be installed approximately 10 to 20 feet below the bottom of the clay confining layer. As such, the actual screen intervals will be subject to change based on field conditions.

2.2.2 Groundwater Flow Mapping

Following installation of the three deep monitoring wells, static water level measurements will be collected using an electric tape and recorded to the nearest 0.01 foot (SOP 18-04). The static water level data will be converted to groundwater elevation data and used to generate a groundwater elevation contour map of the confined aquifer. Once the groundwater flow direction has been determined for the confined aquifer, the location of the VAP/fourth monitoring well will be determined. The location of the VAP/monitoring well will be positioned hydraulically downgradient of the former wastewater lagoon area. The proposed location will be provided to EGLE for review and concurrence prior to installation. EGLE will be kept informed of the investigation progress and a reasonable attempt will be made to determine the appropriate location for the VAP during a single drilling mobilization.

2.2.3 Vertical Aquifer Profile and Fourth Monitoring Well

One VAP will be performed in the confined aquifer to evaluate the potential vertical distribution of PFAS impacts to the underlying water-bearing zone. VAP will be performed using either push-ahead or temporary monitoring well sampling methods. Sampling will occur at approximately 10-foot intervals beginning just below the clay confining layer and extending to the bottom of confined aquifer or 200 feet bgs, whichever occurs first.

Groundwater sampling will be conducted in accordance with low-flow sampling procedures (SOPs 10-01 and 10-02) using a peristaltic pump or inertial pump, as appropriate, based on the depth to groundwater. As a deviation to the SOP, if stabilization of the field parameters is not achieved after 30 minutes of purging a groundwater sample will be obtained. Appropriate groundwater quality control samples will be obtained during VAP (SOP 10-11). All materials used for groundwater sampling will be Teflon and PFAS free.

Following VAP, a fourth permanent monitoring well will be installed in the borehole. The well will be screened in the middle of the confined aquifer, from approximately 145 to 150 feet bgs. The final screen interval will be adjusted based on geological observations. The monitoring well will be constructed consistent with the approach described above.

2.3 Development

Each well will be developed until free of suspended sediment.

2.4 Surveying

The wells will be surveyed by a Michigan licensed surveyor following completion to establish the horizontal coordinates and the top-of-casing elevation.

2.5 Monitoring Well Sampling

Groundwater elevation measurements will be collected from onsite monitoring wells prior to sampling activities using a decontaminated, electronic water level indicator meter, and recorded to the nearest 0.01 foot from the marked survey point on the top of the well casing.

Groundwater sampling will be conducted in accordance with low-flow sampling procedures consistent with the methods described above with one exception – the sample duration to allow for stabilization will be increased from 30 to 45 minutes.

2.6 Laboratory Analysis

Groundwater samples will be submitted for laboratory analysis of PFAS (28 compound list) using USEPA Method 537M. One duplicate sample and one field blank will be collected during the groundwater sampling for quality assurance/quality control (QA/QC) purposes.

2.7 Investigation Derived Waste

Investigation derived waste (IDW) generated from this investigation will include soil cuttings generated during drilling, decontamination water, development water, and purge water. The IDW will be sampled and stored onsite. Final disposition of the IDW will be determined following review of the laboratory analytical results.

3.0 Reporting

The remedial investigative activities and findings will be incorporated into the *Draft Remedial Investigation Report* (Fishbeck September 2021) and resubmitted for EGLE review. The updated report will include soil boring/well construction logs, vertical aquifer profile sample results, monitoring well construction details, monitoring well sampling results, an updated map illustrating the VAP and well locations, and a groundwater elevation contour map of the confined aquifer.

4.0 Schedule

Field activities will begin within 60 days following EGLE approval of the Work Plan. If circumstances outside of the City's control develop to prevent achieving this target schedule (i.e., obtaining access for drilling locations, authorization approval, contractor availability, inclement weather, etc.), we will communicate the schedule changes to EGLE.

Figures



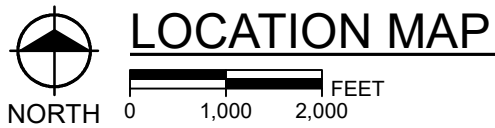
Hard copy is intended to be 8.5"x11" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

City of Cedar Springs
Kent County, Michigan
Supplemental Remedial Investigation Work Plan

PROJECT NO.
201460









FIGURE NO.
1

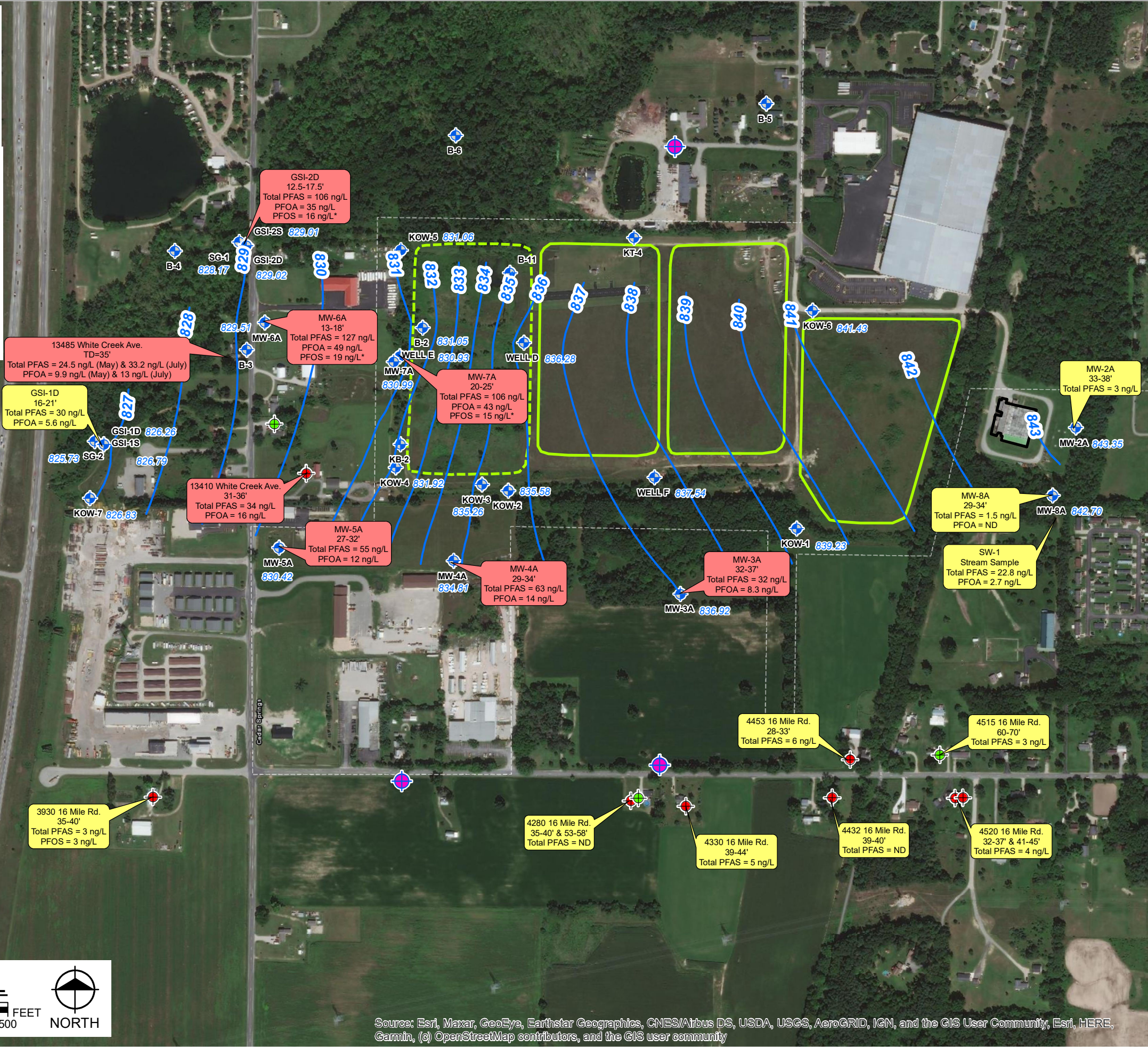
©Copyright 2020
All Rights Reserved



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

LEGEND

-  Proposed Monitoring Well Cluster Location
-  Shallow Residential Well - Sampled by EGLE
-  Deep Residential Well - Sampled by EGLE
-  Shallow Groundwater Contour (ft amsl) - March 2021
-  Monitoring Well
-  Lagoon
- ND** No PFAS detected
- *** Exceeds PFOS GSI Criteria
-  Well was sampled and exceeded the Part 201 PFAS criteria.
-  Well was sampled and did NOT exceed the Part 201 PFAS criteria.



PROPOSED MONITORING WELL CLUSTER LOCATIONS



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community









Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

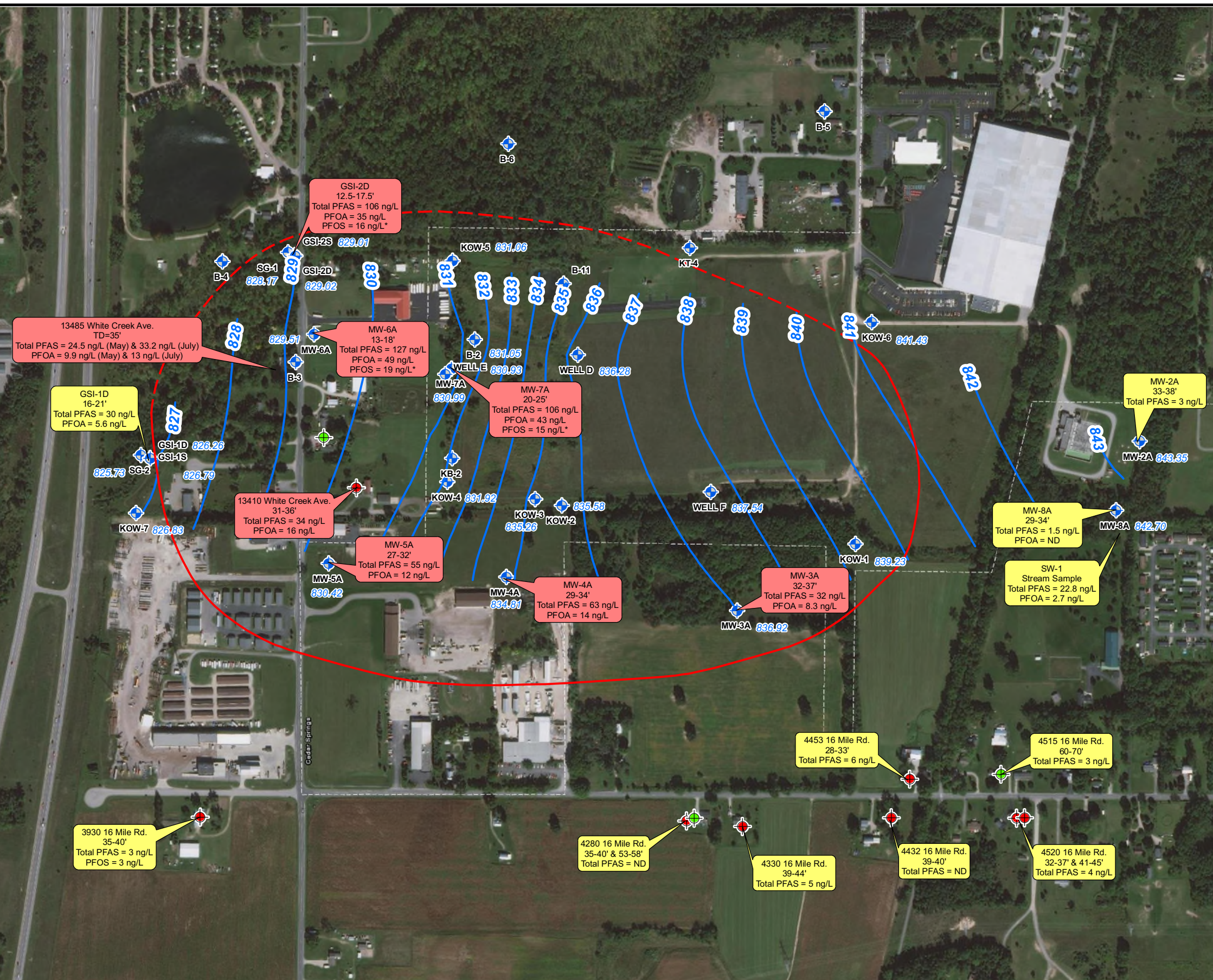
PLOT INFO: Z:\2020\201460\CAD\GIS\mapdoc\FIG01_SuppReport_ProposedWellLocations.mxd Date: 12/29/2021 4:39:43 PM User: bahannah

Figure 1

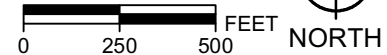
PFAS Exceedances in Shallow Aquifer and Groundwater Contour Map. Fishbeck.
Remedial Investigation Report, dated September 2, 2021

LEGEND

-  Shallow Residential Well - Sampled by EGLE
-  Deep Residential Well - Sampled by EGLE
-  PFOA Exceedance Contour
-  Inferred PFOA Exceedance Contour
-  Groundwater Contour (ft amsl) - March 2021
-  Monitoring Well
- ND** No PFAS detected
- *** Exceeds PFOS GSI Criteria
-  Well was sampled and exceeded the Part 201 PFAS criteria.
-  Well was sampled and did NOT exceed the Part 201 PFAS criteria.



**PFAS EXCEEDANCES IN SHALLOW AQUIFER
AND GROUNDWATER CONTOUR MAP**



Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

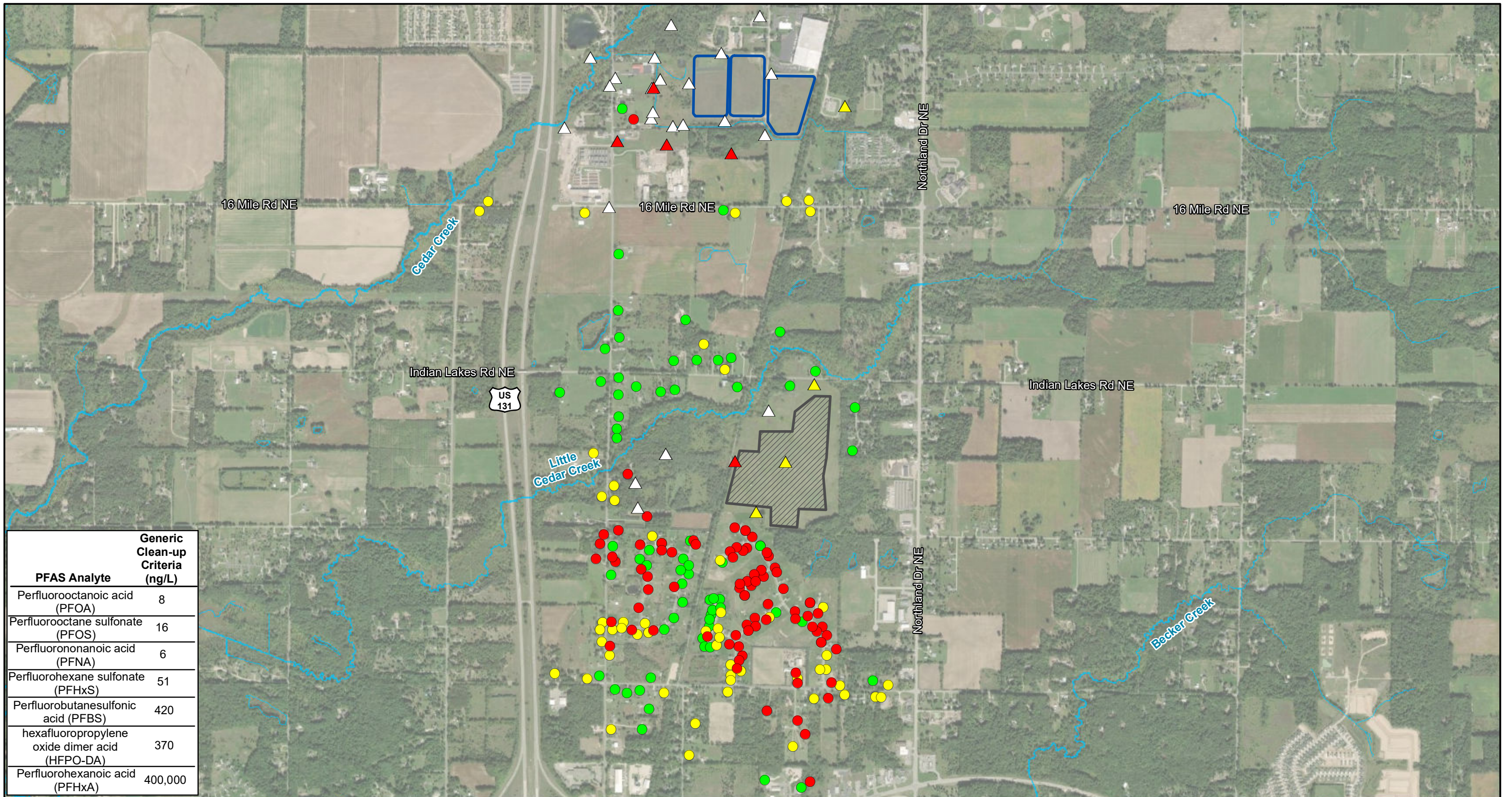
PROJECT NO.
201460

FIGURE NO.
1

PLOT INFO: Z:\2020\201460\CAD\GIS\mxd\PFASExceedances_GWContour_2021_0825.mxd Date: 8/25/2021 4:55:30 PM User: palepczyk

Figure 2

“Concentrations of PFAS Compounds Compared to Part 201 Criteria”. EGLE/AECOM
Draft, dated 1/3/2022



PFAS Analyte	Generic Clean-up Criteria (ng/L)
Perfluorooctanoic acid (PFOA)	8
Perfluorooctane sulfonate (PFOS)	16
Perfluorononanoic acid (PFNA)	6
Perfluorohexane sulfonate (PFHxS)	51
Perfluorobutanesulfonic acid (PFBS)	420
hexafluoropropylene oxide dimer acid (HFPO-DA)	370
Perfluorohexanoic acid (PFHxA)	400,000

EGLE

AECOM

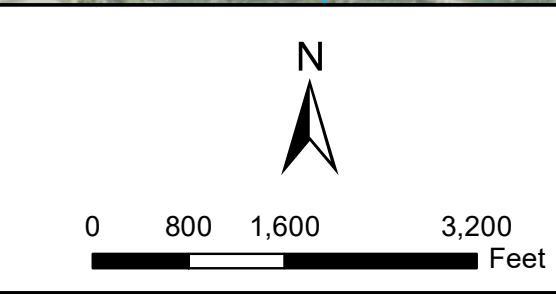
Prepared: 1/3/2022



Legend

- Residential Well Sampling Location
- △ Groundwater Sampling Location
- PFAS Compounds (ppt)**
- Non-Detect for Part 201 PFAS Compounds
- Detection below Part 201 PFAS Criteria, but no Exceedance
- One or more Part 201 PFAS Criteria Exceeded
- △ Monitoring well not sampled in January 2020

- ▨ Discharge Area
- ▭ Former Wastewater Treatment Lagoon



DRAFT

FIGURE 2

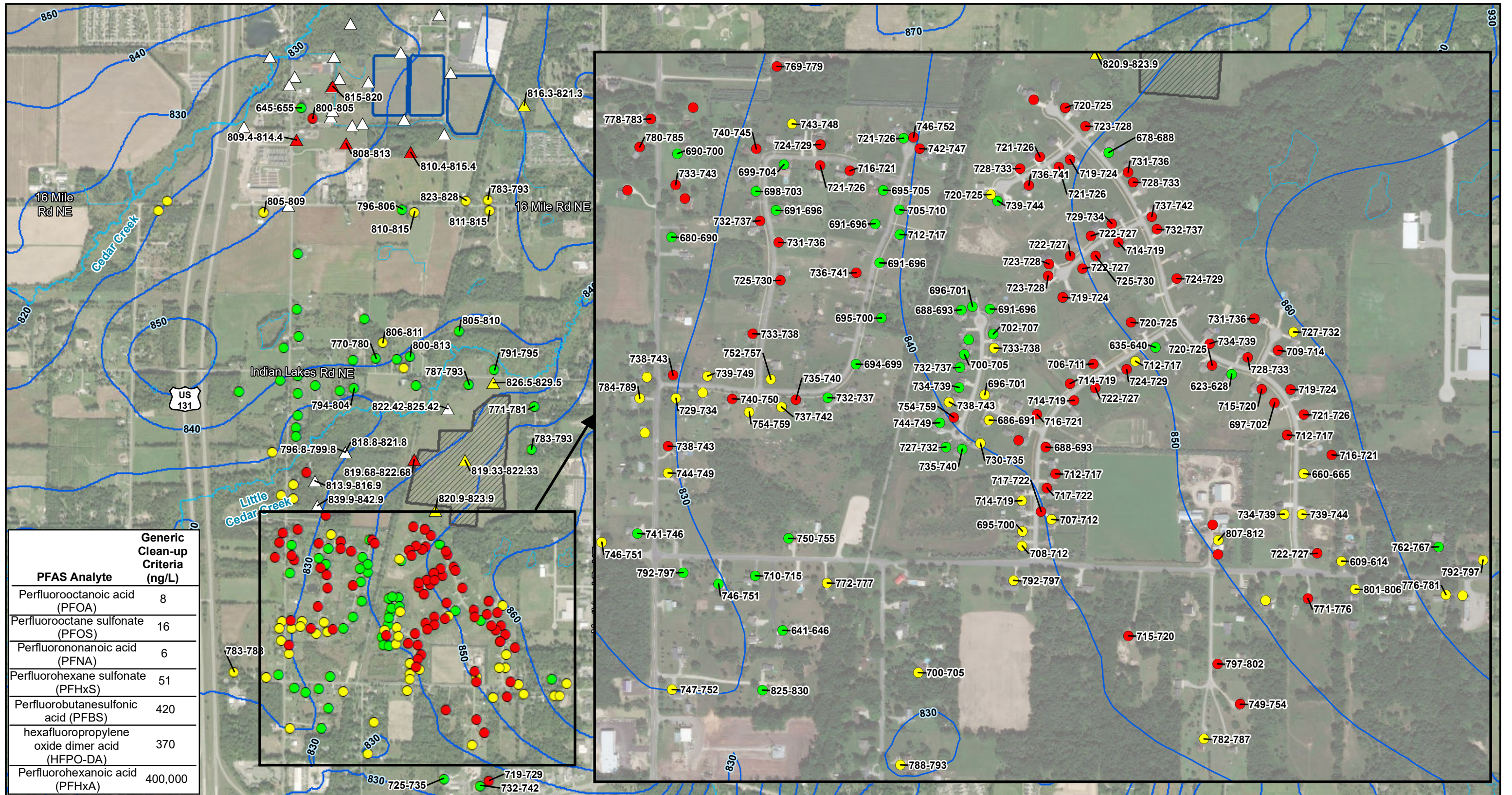
CONCENTRATIONS OF PFAS COMPOUNDS (ppt) COMPARED TO PART 201 CRITERIA

CEDAR SPRINGS WWTP INVESTIGATION

KENT COUNTY, MI

Figure 3

“Concentrations of PFAS Compounds Compared to Part 201 Criteria”. EGLE/AECOM
Draft, dated 1/3/2022 (with screen elevation labels)



PFAS Analyte	Generic Clean-up Criteria (ng/L)
Perfluorooctanoic acid (PFOA)	8
Perfluorooctane sulfonate (PFOS)	16
Perfluorononanoic acid (PFNA)	6
Perfluorohexane sulfonate (PFHxS)	51
Perfluorobutanesulfonic acid (PFBS)	420
hexafluoropropylene oxide dimer acid (HFPO-DA)	370
Perfluorohexanoic acid (PFHxA)	400,000

EGLE

AECOM

Prepared: 1/3/2022



Legend

- Residential Well Sampling Location
- △ Groundwater Sampling Location
- PFAS Compounds (ppt)**
- Non-Detect for Part 201 PFAS Compounds
- Detection below Part 201 PFAS Criteria, but no Exceedance
- One or more Part 201 PFAS Criteria Exceeded
- △ Monitoring well not sampled in January 2020
- ▨ Discharge Area
- ▭ Former Wastewater Treatment Lagoon
- Regional First Encountered GW contours
- Screen elevation (ft.amsl)
- no label = screen elevation unknown

North Arrow

Scale: 0 800 1,600 3,200 Feet

DRAFT

FIGURE 3

CONCENTRATIONS OF PFAS COMPOUNDS (ppt) COMPARED TO PART 201 CRITERIA

CEDAR SPRINGS WWTP INVESTIGATION

KENT COUNTY, MI