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REVISED SITE INVESTIGATION REPORT

Oshkosh Defense West Plant Site
500 West Waukau Avenue
Oshkosh, Wisconsin
BRRTS NO. 02-71-587406

February 21, 2023
File No. 20.0157080.00

PREPARED FOR:
Oshkosh Defense, LLC
c/o Godfrey & Kahn, S.C.

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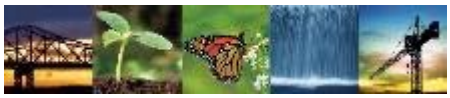

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February 21, 2023
File No. 20.0157080.00

Mr. Kevin McKnight, Hydrogeologist
Wisconsin Department of Natural Resources
625 East County Road Y, Suite 700
Oshkosh, Wisconsin 54901-9731

Subject: Revised Site Investigation Report
Oshkosh Defense West Plant Site
500 West Waukau Avenue
Oshkosh, Wisconsin
BRRTS No. 02-71-587406

Dear Mr. McKnight:

GZA GeoEnvironmental, Inc. (GZA), on behalf of Oshkosh Defense, LLC (Oshkosh/"Client") and its outside legal counsel, Godfrey & Kahn, S.C., has prepared this Revised Site Investigation Report to document a subsurface evaluation for possible per- and poly-fluoroalkyl substances (PFAS) at 500 West Waukau Avenue in Oshkosh, Wisconsin, referred to as the Oshkosh Defense, LLC West Plant (Oshkosh Defense West Plant/"Site").

The investigation focused on evaluating soil and groundwater for the presence of PFAS outside of the Oshkosh Defense West Plant where annual testing of the fire suppression system could have resulted in an area of PFAS impact, areas upgradient and downgradient of this area, and evaluating the potential for transport of PFAS from off-Site through the property by Glatz Creek. The information contained in this report is consistent with the previous Site Investigation Report submitted in March 2021,[1] and the Supplemental Site Investigation Work Plan submitted in June 2022.[2] This revised report includes results of the additional investigation activities performed to evaluate the groundwater conditions upgradient and downgradient of the historic discharge area. At this time, Oshkosh is requesting the WDNR's review of the documentation and findings provided in this report and provide its concurrence on our conclusions and path forward.

Should you have any questions or comments, please feel free to contact the undersigned at (262) 754-2578.

Very truly yours,

GZA GeoEnvironmental, Inc.

Kevin M. Hedinger
Senior Project Manager/Hydrogeologist

John C. Osborne, P.G.
Senior Principal/Hydrogeologist

J:\157000to157099\157080 Oshkosh\Report\Revised Site Investigation Report- West Plant\
FINAL 20.0157080.00 Revised SI Rpt_Oshkosh Defense West Plant 2-21-23.docx

Attachments

cc: Mr. Edward B. Witte, Godfrey & Kahn, S.C.
Mr. Kevin Tubbs, Oshkosh Defense, LLC

[1] *Site Investigation Report, Oshkosh Defense West Plant Site, 500 West Waukau Avenue, Oshkosh, Wisconsin*, dated March 29, 2021, GZA File No. 20.0157080.00.
[2] *Supplemental Site Investigation Work Plan, Oshkosh Defense West Plant Site, 500 West Waukau Avenue, Oshkosh, Wisconsin, BRRTS No. 02-71-587406*, dated June 7, 2022, GZA File No. 20.0157080.00

FIGURES (CONT.)

APPENDICES

1.0 GENERAL INFORMATION

GZA GeoEnvironmental, Inc. (GZA), on behalf of Godfrey & Kahn, S.C., outside legal counsel for Oshkosh Defense, LLC (Oshkosh/"Client"), has prepared this Revised Site Investigation Report for the property located at 500 West Waukau Avenue in Oshkosh, Wisconsin ("Site"). This report presents the results of a subsurface investigation designed to evaluate the presence of per- and poly-fluoroalkyl substances (PFAS) resulting from testing of the fire suppression system in the paint kitchen of the Oshkosh Defense, LLC West Plant (Oshkosh Defense West Plant) building. On March 29, 2021, a Site Investigation Report, along with a Release Notification Form 4400-225, were submitted to the Wisconsin Department of Natural Resources (WDNR). The WDNR subsequently assigned Bureau of Remediation and Redevelopment Tracking System (BRRTS) No. 02-71-587406 to the Site.

In a letter dated October 6, 2021, groundwater sample results from a sample collected from one monitoring well at the Site on September 13, 2021, were submitted to the WDNR. Based on the results, it was determined that one additional groundwater sample would be collected from the monitoring well. The results of the additional sample collect on October 16, 2021, were submitted to the WDNR on November 30, 2021.

The WDNR PFAS Review Committee provided comments to the soil and groundwater data collected at the Site on February 14, 2022 and requested additional monitoring wells be installed to delineate the results identified at the Site. On June 7, 2022, a Supplemental Site Investigation Work Plan was submitted to the WDNR that included installation of three additional monitoring wells and collection of one soil sample along Glatz Creek.

The Responsible Party for the Site is as follows:

Oshkosh Defense LLC
Mr. Kevin Tubbs
1917 Four Wheel Drive
Oshkosh, Wisconsin 54902
ktubbs@oshkoshcorp.com
920-502-3043

The environmental consultant for this project is:

GZA GeoEnvironmental, Inc.
Mr. Kevin Hedinger
17975 West Sarah Lane, Suite 100
Brookfield, Wisconsin 53045
kevin.hedinger@gza.com
262-754-2578

The name and address of the Site are:

Oshkosh Defense, LLC West Plant
500 West Waukau Avenue
Oshkosh, Wisconsin 54902

1.1 SITE LOCATION AND FEATURES

The Site is part of a property that covers an area of approximately 81 acres and is identified by Parcel ID No. 1413490000 in the City of Oshkosh Parcel Viewer. The Site and property are located in a commercial and industrial use area within the southwest ¼ of the southeast ¼ of Section 35, Township 18 North, Range 16 East, Winnebago County, Wisconsin, as shown

on Figure 1. The Site is located in the southwest corner of the property, near the intersection of Hughes Street and West Waukau Avenue, adjacent to the north side of the building referred to as the Oshkosh Defense West Plant. The WTM91 coordinates for the approximate center of the Site are as follows X: 636276.87731, Y: 390914.88644.

The Site is bordered on the north by an industrial storage yard that is part of Oshkosh's property; on the west by Hughes Street, beyond which is Wittman Regional Airport; on the south by industrial properties; and on the east by other Oshkosh manufacturing buildings. The Oshkosh property is secured by a fence with access through secured gates with security personnel; entry requires credentials to access the property.

The investigation at the Site focused on a grass-covered area on the north side of the Oshkosh Defense West Plant, along the approximate middle of the building. The Site is between an at-grade driveway entrance into the Oshkosh Defense West Plant building on the east and a depressed loading dock on the west. The loading dock is depressed approximately 3.5 feet below surrounding grade at the deepest point and grades rise along the driveway toward the north until it meets the surrounding grade. Along the sides of the concrete loading dock driveway, concrete aprons flank both sides that cover the side slope created due to the depressed nature of the loading dock. Walk doors are located on both the east and west sides of the loading dock, which allow for access into the building. The loading dock is used for routine delivery of supplies to the Oshkosh Defense West Plant. Located east of the sub-grade loading dock and north of the building, underlying a portion of the green space, is a 25-foot by 50-foot, subterranean extension of the Oshkosh Defense West Plant that extends approximately 15 feet deep and is accessible from inside of the Oshkosh Defense West Plant. The Oshkosh Defense West Plant is used for painting activities; therefore, it is equipped with a fire suppression system for Class B fires. The fire suppression system that utilized Alcohol-Resistant-Aqueous Film Forming Foam (AR-AFFF), which contains PFAS, was removed from service and replaced with an aqueous-only fire suppression system in July 2022. During the operation of the AR-AFFF, the fire suppression system was tested, and during testing, the foam was discharged from a pipe on the north side of the building onto the grass area and into the loading dock area. Figure 2 shows a large-scale layout of the Site areas, including the surface slope indication, underground utilities, surface covering, and pertinent features in the investigation area. Figures 3 and 4 show the Site features in the discharge area and Glatz Creek area, respectively.

Based on the previous fire suppression testing activities that discharged AR-AFFF-containing PFAS, on behalf of Oshkosh, GZA conducted a subsurface investigation, as summarized in this report. The report is being submitted in consideration of relevant sections of Wisconsin Administrative Code (Wis. Adm. Code) NR 716 to satisfy general site investigation requirements. This report is also subject to the Limitations provided in Appendix A.

1.2 POTENTIAL RECEPTORS

There are no potential receptors that are impacted by the fire suppression system testing activities at this Site. The discharge area is situated in the southwest corner of the approximate 81-acre Oshkosh property. The land use surrounding the Site includes an airport to the west and north and industrial properties to the south and east. The closest residential properties are located approximately 2,000 feet east of the Site. The City of Oshkosh supplies municipal drinking water in this area of the City of Oshkosh. City of Oshkosh water is obtained from Lake Winnebago, located east of the Site, which is part of a 5,700 square-mile watershed. A surface water feature crosses the Oshkosh property north of the discharge area; however, it is located approximately 1,500 feet north of the discharge area.

1.3 APPLICABLE STANDARDS

As of the date of this report, there are no Wisconsin regulatory standards promulgated for PFAS in soil or groundwater other than an interim drinking water standard of 70 parts per trillion for the sum of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). In consideration of adopting groundwater standards for several PFAS within Chapter NR-140 (Wis. Adin. Code), the Wisconsin Department of Health Services (DHS) provided recommended groundwater

standards to the WDNR in November 2020. However, the recommended standards have not received the legislative support required for the standards to be adopted by the WDNR. For the purposes of providing guidance and perspective on our Site investigation results, GZA used the DHS-recommended groundwater standards for the 11 PFAS awaiting approval.

There are no recommended or proposed standards for soil other than direction from the WDNR to calculate residual contaminant levels (RCLs) in soils using the United States Environmental Protection Agency (USEPA) Regional Screening Level (RSL) Calculator. Based on a discussion with the WDNR and on several factors, including: 1) the lack of certain PFAS physical/chemical parameters being available; 2) the toxicology data for individual and cumulative effects are frequently being revised; and 3) the lack of groundwater standards, the WDNR has not published calculated RCLs for the soil-to-groundwater pathway. In GZA's review of the RSLs on January 9, 2023, there are only five PFAS in the USEPA calculator database, PFBS, PFHxS, PFNA, PFOS, and PFOA. The resulting soil-to-groundwater RCLs calculated from the information on January 9, 2023, are different than the RCLs calculated by the WDNR in April 2021 during its review of soil-to-groundwater RCLs for this Site. Due to the lack of consistent physical and toxicological information to calculate soil-to-groundwater RCLs, these standards were not calculated for this report.

2.0 BACKGROUND AND SITE HISTORY

The Oshkosh Defense West Plant is used for vehicle painting activities. The paint kitchen in the Oshkosh Defense West Plant is served by a fire suppression system capable of controlling or extinguishing Class B fires involving flammable and combustible liquids. The fire suppression system was charged with AR-AFFF that contained PFAS, as specified by the National Fire Protection Association (NFPA) for high-hazard fires and was tested to ensure it was operating properly. The fire suppression system has not been discharged because of a fire, but was inspected and annually tested, in conformance with NFPA standards. The inspection and testing process for the AR-AFFF system historically included the brief discharge of AR-AFFF from the fire suppression system through a pipe on the north side of the Oshkosh Defense West Plant building. At the time of testing, AR-AFFF was discharged out of the pipe via a hose and nozzle to the grass and loading dock area on the north side of the building. Following discharge, the foam was allowed to break down in the grass and loading dock areas. The exterior area closest to the discharge pipe is currently underlain by the extension that was constructed in the 1970s and covered by approximately 9 inches of soil.

The depressed loading dock contains a storm sewer catch basin that drains water that collects in the loading dock from precipitation. A portion of the foam that was discharged during testing may have migrated to the storm sewer through breakdown of the foam and from residuals in surface water runoff in the loading dock area.

GZA's investigation focused on determining the presence of residual PFAS in soil and groundwater surrounding the AR-AFFF discharge area. PFAS are a complex class of fluorinated compounds developed in the 1950s, and used in manufacturing processes and commercially available products, including AR-AFFF. Until approximately 2000, the PFAS compounds, most commonly PFOS and PFOA, were manufactured to contain carbon chain lengths with eight completely fluorinated carbons. The strength of the carbon-fluorine bond has resulted in PFOS, PFOA, and other PFAS persisting in the environment, and the bioaccumulating nature of these compounds within humans and other organisms enhance their toxicity.

Between 2000 and 2006, chemical manufacturers committed to reducing the manufacturing of long-chain PFAS, those having a carbon chain length of eight fluorinated carbons, such as PFOS and PFOA. USEPA indicates that by 2010, 95% of long-chain PFAS was eliminated and by 2015, the elimination of long-chain PFAS manufacturing was reportedly complete.[3]

[3] Interstate Technology & Regulatory Council, *History and Use of Per-and Polyfluoroalkyl Substances (PFAS)*, April 2020.

The discharges from testing of the fire suppression system spans the time during which manufacturers phased out foams containing an eight fluorinated carbon chain length (C8 foams) to the six fluorinated carbon chain length foams (C6 foams). During the manufacturing process of the PFAS used in the C8 foam concentrate, PFOS and PFOA were the predominant form present; however, other PFAS substances may have also been present. The C8 foams, depending on the age, likely contained PFOS and PFOA, fluorotelomers, and other PFAS impurities. The fluorotelomers do not contain fully fluorinated carbon chains and can be precursors to other perfluoroalkyl substances that are generated by degradation of the fluorotelomers. Given the timing of the phase out and the testing performed, it is likely that the foam discharges contained PFOS, PFOA, fluorotelomers, and short-chain PFAS compounds. In addition, it is likely that after the phase out of PFOS and PFOA manufacturing was complete in 2015, the AR-AFFF concentrate inventory on-Site could have contained PFOS and PFOA given the long shelf life of the AR-AFFF.

The AR-AFFF historically used in the Site fire suppression system originally contained C8 AR-AFFF, specifically, ANSULITE LOW VISCOSITY 3x3 AR-AFFF Foam Concentrate. The Safety Data Sheet (SDS) for this product is provided in Appendix B. As part of each of the testing events, the AR-AFFF tank was topped off with additional concentrate to maintain a full tank. As described in further detail below, the AR-AFFF that was added to the tank changed to short-chain (C6) PFAS with the phase out of the C8 AR-AFFF from 2006 through 2015. Testing of the AR-AFFF fire suppression system was discontinued in 2019, to eliminate the need to handle and manage the resulting foam. The former system was replaced with an aqueous-only fire suppression system. Currently, Oshkosh is storing the remaining AR-AFFF foam concentrate for ultimate pick-up and safe disposal by a qualified vendor.

3.0 GEOLOGIC AND HYDROGEOLOGIC SETTING

The Site is located within a region of Winnebago County characterized by glacially derived, unconsolidated deposits of the Kewaunee Formation ranging from lake sediments associated with glacial Lake Oshkosh to various glacial till units primarily associated with the Kirby Lake Member of the Kewaunee Formation.[4] The till deposits are described as red, clayey silt that contains some coarser-grained deposits and is generally at least 3 meters thick and tend to have low relief, flat-lying topography. In the area of the Site, the Kirby Lake member is reported to include thin (less than 6 feet) patches of lake sediment. Other characteristics of these units include:

- A higher percentage of fine-grained sediment with sand, silt, and clay grain-size distributions averaging 24%, 42%, and 34%, respectively; and
- Measured hydraulic conductivity values in field tests averaging 7.19 x 10^{-5} centimeters per second (cm/sec) while laboratory testing indicated averages of 9.46 x 10^{-8} cm/sec.

The upper bedrock unit in eastern Winnebago County underlying the Site is dolomite of the Ordivician Sinnipee Group. The bedrock is generally encountered less than 40 feet below ground surface (bgs) in this portion of the County.[5]

While groundwater occurs in both the unconsolidated glacial units and bedrock formations, the glacial deposits are generally not considered part of the regional aquifer system. These fine-grained glacial deposits that cover most of the broad lowlands in the eastern portion of the County are believed to hydraulically confine the underlying bedrock aquifers and tend to restrict groundwater recharge and discharge to shallow and deeper regional groundwater systems. Based on

[4] Hooyer, T.S., Mode, W.N., *Quaternary Geology of Winnebago County, Wisconsin*, Wisconsin Geological and Natural History Survey, Bulletin 105, James M. Robertson, Director, 33 p., 2008.
[5] Olcott, P.G., *Geology and Water Resources of Winnebago County, Wisconsin*, Geological Water Supply Paper 1814, prepared in cooperation with the University of Wisconsin Geological and Natural History Survey, 61 pp., 1966.

general topography and the location of recharge areas and shallow groundwater discharge zones, the regional groundwater flow direction in the area of the Site is expected to predominantly be eastward toward Lake Winnebago.

Surface water in the Site area is controlled by storm sewer catch basins in the loading dock and surrounding roadways that flow into a sewer line north of the Site. The storm sewer water is conveyed to the east through piping along the north side of the Oshkosh Defense West Plant. The storm sewer pipe extends to the east beyond the Oshkosh Defense West Plant building approximately 500 feet where it turns to the north and eventually discharges into Glatz Creek approximately 1,300 feet north of the Site.

4.0 INVESTIGATION ACTIVITIES AND METHODS

The investigation activities at the Site consisted of advancing 10 soil boring and installing four monitoring wells for sample collection and analytical testing to determine the presence and potential distribution of PFAS in unsaturated soils and shallow groundwater. The soil borings and monitoring wells advanced and installed at the Site are shown on Figures 3 and 4.

4.1 SOIL BORINGS AND SOIL SAMPLING

On November 7, 2020, GZA provided oversight of its subcontractor, On-Site Environmental, Inc. (OSE), during the advancement of seven Geoprobe® borings (WP-B1 through WP-B6 and WP-B8) and one boring (WP-B7) advanced using hand tools on the Site at the locations identified on Figure 3. Prior to initiating the field sampling activities, GZA requested confirmation that OSE's Geoprobe® sampling systems, tooling, and ancillary equipment were fully evaluated for the presence of PFAS that could result in inducing impacts to the samples collected. OSE provided GZA with quality assurance/quality control (QA/QC) protocols for deployment of its sampling equipment to ensure the equipment is PFAS-free and sample integrity is retained.

Borings WP-B1 through WP-B5 were advanced to a depth of 10 feet bgs, WP-B8 was advanced to a depth of 5 feet bgs for visual observation of the upper soil column, and WP-B6 was advanced to a depth of 15 feet bgs to determine if bedrock was at the base of the basement and to confirm the soil types to the depth of the basement using the Geoprobe®. WP-B7 was hand-excavated with a stainless-steel trowel to a depth of 9 inches bgs or the top of the concrete basement ceiling. Geoprobe® soil samples were collected continuously from the ground surface to the terminus of the borings using 2-inch-diameter by 5-foot-long, stainless-steel sampling tubes lined with disposable acetate liners. The soil samples were visually observed and classified in accordance with the Unified Soil Classification System (USCS) and then divided into 1-foot intervals for placement into sealable plastic bags. During soil classification and soil handling, activities were completed by personnel wearing disposable latex gloves. Based on the soil classification and observations, discrete intervals were selected and the samples were placed into laboratory-supplied containers for submittal of laboratory analysis for the Wisconsin list of the PFAS. The rationale for each boring was as follows:

- Boring WP-B1 was located approximately 30 feet north of the building at the closest location on the east side of the loading dock driveway at which the boring could be advanced off the concrete apron. This location provided the most likely place along the loading dock driveway to encounter PFAS compounds in the soil from the fire suppression system testing.
- Borings WP-B2, WP-B3, and WP-B4 were located north of the building, approximately 3 to 5 feet north of the subsurface basement structure along the north side of the building wall. The surface slope on the north side of the building is toward the north. These locations allowed for advancement of the borings into native soils outside of the basement structure and allowed for the evaluation of potential migration due to the surface slope.

- Borings WP-B5 and WP-B6 were located approximately 45 feet north of the building and approximately 20 feet north of the basement structure. This area is further downslope of the discharge pipe and evaluated the potential for migration of PFAS compounds by surface water runoff.
- Boring WP-B7 was hand-excavated into the 9-inch cover soils overlying the extension structure. However, it is likely that the soils in WP-B7 were disturbed during the soil regrading in the grass area in the last several years.
- Boring WP-B8 was located between WP-B2 and WP-B6 to confirm the shallow soil lithology between these borings. No soil samples were collected for laboratory analysis from this boring.

Because of the nature of the AR-AFFF discharges being applied to the surface, the focus of analytical testing for evidence of PFAS impacts was the upper portion of the soil column. Soil samples for laboratory analysis were collected in the upper 3 feet of the subsurface and from a second sample interval that was near, but above, the observed water table at the time of drilling. Therefore, two soil samples from each boring were selected for laboratory analysis, except for boring WP-B7, in which one soil sample was selected for laboratory analysis because of the limited soil thickness.

On August 14, 2021, GZA advanced one hand auger boring (WP-SB9) near the end of the storm water sewer discharge location approximately 1,500 feet north of the Site. The storm sewer discharge drainage did not contain water at the time of the sample collection. The boring was advanced within the drainage channel in a depositional area to quantify the potential PFAS in the soils at this location. The hand auger boring was advanced with a decontaminated, stainless-steel hand auger to a depth of approximately 2 feet bgs. The location of WP-SB9 is shown on Figure 4.

On June 17, 2022, GZA advanced one hand auger boring (WP-SB10) along Glatz Creek upstream from the channel receiving water from the storm water sewer. This boring was advanced adjacent to Glatz Creek in a depositional area to quantify the potential PFAS in the soil that is being transported by or influenced by the water flow through Glatz Creek from off-Site. The hand auger boring was advanced with a decontaminated, stainless-steel hand auger to a depth of approximately 2 feet bgs. The location of WP-SB10 is shown on Figure 4.

4.2 MONITORING WELL INSTALLATION AND SAMPLING

On August 14, 2021, GZA provided oversight of its subcontractor, OSE, during the installation of one monitoring well (WP-MW-1) in accordance with Wis. Adm. Code NR 141. The monitoring well was installed near soil boring WP-B3 because this is the location at which soil samples indicated the presence of PFAS in soil. The soil boring was advanced to a depth of approximately 17 feet bgs where auger refusal was encountered. Based on the materials recovered during drilling, this is likely bedrock, as dolomite gravel was recovered. Soil samples were continuously recovered throughout the boring and observations were recorded on a boring log. Soil samples were not collected from this boring for laboratory analysis. Following soil boring activities, the monitoring well was installed in the boring to a depth of approximately 17 feet bgs. The well was constructed with 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) riser and a 10-foot-long, 0.010-inch, factory slotted well screen. The annular space around the well screen was filled with a sand filter pack to approximately 2 feet above the top of the well screen and the annular space above the sand filter pack was filled with bentonite chips to approximately the surface. The surface of the well was completed with a flush-mount, 8-inch steel manway. The location of the monitoring well is shown on Figure 3.

On June 17, 2022, GZA provided oversight of its subcontractor, OSE, during the installation of three monitoring wells (WP-MW-2 through WP-MW-4) in accordance with Wis. Adm. Code NR 141. The monitoring wells were installed around WP-MW-1 to understand the distribution of PFAS detected in groundwater and to determine the groundwater flow direction at the Site. Monitoring well WP-MW-2 was advanced to a depth of 15 feet bgs, and WP-MW-3 and WP-MW-4 were advanced to a depth of 20 feet bgs. At the base of each boring, gravel was encountered, which is likely near or at the top of the bedrock surface. Each well was constructed using 2-inch-diameter, Schedule 40 PVC riser and a 10-foot-long, 0.010-inch, factory slotted well screen. The annular space around the well screen was filled with a sand filter pack to

approximately 2 feet above the top of the well screen and the annular space above the sand filter pack was filled with bentonite chips to approximately the surface. The surface of the well was completed with a flush-mount, 8-inch steel manway. The monitoring well locations are shown on Figure 3.

On July 27, 2022, the monitoring wells were developed by surging the well and removing a volume of water using a disposable polyethylene bailer. The purpose of the well development is to remove sediment from the sand filter pack and well casing so that a representative sample can be collected. Approximately 20 gallons of groundwater were removed from each well during the development process and containerized on-Site until proper disposal is arranged.

On August 3, 2022, GZA performed groundwater sampling activities on the four monitoring wells on-Site using low-flow groundwater sampling techniques. The wells were purged with a peristaltic pump at a rate of 250 to 300 milliliter per minute (ml/min) and the groundwater elevation was monitored to limit the drawdown in the well due to pumping. During purging, a flow-through cell was used to measure the field parameters for temperature, dissolved oxygen (DO), specific conductivity, pH, oxidation-reduction potential (ORP), and turbidity. Purging continued until the field parameters stabilized with acceptable ranges. The flow-through cell was disconnected from the peristaltic pump and the groundwater sample was collected directly from the sample tube into laboratory-supplied sample containers.

The physical observations and classification of soils are presented on the soil boring logs, the monitoring well completion details are presented on the well completion records, and the well development information for each well is included on the well development forms included in Appendix C. If a boring was abandoned following advancement, the abandonment was documented on the boring abandonment forms included in Appendix C.

To conduct the laboratory analyses, GZA selected Pace Analytical Services, Inc. (Pace) of West Columbia, South Carolina (formerly Shealy Environmental Services, Inc.), which is a WDNR-certified laboratory. Following collection and recording, the soil and groundwater samples were placed into laboratory-supplied containers, placed on ice within an insulated cooler, and submitted to Pace under chain-of-custody protocol. Soil samples were submitted for the analysis of 36 PFAS, which are presently recommended for quantification by the WDNR, Method 537.1 using the liquid chromatography-tandem mass spectrometry (LC-MS/MS) procedure. The laboratory analytical reports for the soil samples submitted from the Site are provided in Appendix D.

5.0 PRESENTATION AND DISCUSSION OF RESULTS

5.1 SUBSURFACE CONDITIONS

The soil lithology encountered at the Site during the Site investigation activities consisted of approximately 0.5-foot of topsoil and grass underlain by red/brown clay to a depth of 9 to 10 feet bgs. Brown, fine to medium sand and silt layers interbedded with clay were encountered from approximately 10 feet bgs to the bottom of the borings at approximately 17 to 20 feet bgs.

During boring advancement in select borings, bedrock was encountered, or evidence of weathered bedrock was observed, at a depth of approximately 17 feet bgs. The generalized soil lithology, soil sampling intervals selected for laboratory analysis, and the soil analytical results of the detected PFAS constituents are shown on the cross-sections presented on Figures 5 and 6.

Groundwater was visually observed to be present in the silt and sand layers encountered. The overlying clay deposit appeared to be moist, but groundwater was not readily apparent. The depths to groundwater in the monitoring wells were measured during groundwater sampling activities at depths of approximately 12 to 16 feet bgs. Based on the

groundwater elevations, the groundwater flow is north/northeast at a hydraulic gradient of 0.017 feet per foot (ft/ft). Figure 7 presents the potentiometric surface map showing the resulting groundwater flow direction.

Using assumptions for aquifer properties of hydraulic conductivity and porosity, and the hydraulic gradient measured on August 3, 2022, the average linear velocity of the groundwater is calculated using the following equation:

$$v = \frac{k * i}{n}$$

Where,

v = average linear velocity, ft
k = hydraulic conductivity, ft/day = 1.417 ft/day or 5 x 10^{-4} cm/sec
i = hydraulic gradient, ft/ft = 0.017 ft/ft
n = effective porosity, unitless = 0.30

The hydraulic conductivity indicated above is likely a conservatively high value based on the range presented in Freeze and Cherry[6] and may best represent the most permeable deposits encountered during the investigation. Therefore, this hydraulic conductivity will provide a proportionately conservative average linear velocity. The effective porosity used is considered to be an average porosity for the different geologic materials encountered at the Site. Based on these parameters, the calculated groundwater average linear velocity is 0.079 feet per day (ft/day) or 29 feet per year (ft/yr). Therefore, the resulting travel time for the 150-foot distance between WP-MW-1 and WP-MW-2 is approximately 26 years.

5.2 SOIL ANALYTICAL RESULTS

A total of 12 soil samples (WP-B1 through WP-B7 and WP-SB10) were analyzed for the Wisconsin list of 36 PFAS compounds and one soil sample (WP-SB9) was analyzed for the list of PFAS detected in the soil in the discharge area. The samples collected from soil borings WP-B1 through WP-B7 are located on the north side of the West Plant building near the discharge area. Soil boring WP-SB9 is located near the storm sewer discharge approximately 1,500 feet northeast of the discharge area and approximately 30 feet south of Glatz Creek; WP-SB10 is located along Glatz Creek approximately 1,500 feet northeast of the discharge area and 125 feet upstream of the confluence with the storm sewer drainage ditch.

The soil sample analytical results from WP-B1 through WP-B7 and WP-SB9 indicate six PFAS were detected above the method detection limits (MDLs), including 1H,1H,2H,2H-perfluorooctane sulfonic acid (6:2 FTS), Perfluoroheptanoic Acid (PFHpA), Perfluorohexanoic acid (PFHxA), PFOS, PFOA, and Perfluoropentanoic acid (PFPeA). Sample WP-SB10 did not contain detections of these PFAS but did detect estimated (J-flagged) concentrations of Perfluorononanoic acid (PFNA) and Perfluoroundecanoic acid (PFUnA). As stated in the Applicable Standards section above, soil-to-groundwater pathway RCLs were not calculated due to the lack of consistent physical and toxicological information in the RSL database. A summary of the soil analytical results is presented on Table 1 and the laboratory analytical reports are provided in Appendix D. Figures 8 and 9 show the distribution of the PFAS compounds detected in soil for each boring in the discharge area and Glatz Creek area, respectively.

PFOA was detected in WP-B3 (2-3') at 4.5 micrograms per kilogram (µg/kg) and WP-SB9 (1-2') at 0.52 µg/kg. PFOS was detected in WP-B1 (1-2') at 1.3 µg/kg, WP-SB9 (1-2') at 38 µg/kg, and WP-SB10 (0-1') at 1.5 µg/kg. The soil samples from the deeper interval in borings WP-B1 and WP-B3 have reported concentrations of PFOS and PFOA less than the respective MDLs, indicating the PFOA and PFOS detections are limited to surficial soil. The soil samples from the other borings had reported concentrations less than the respective MDLs.

[6] Freeze, R.A. and Cherry, J.A., Groundwater, p. 29, Prentice-Hall, Inc., Englewood Cliffs. 1979.

6:2 FTS was detected above the MDL in samples WP-B2 (2-3'), WP-B3 (2-3'), and WP-B3 (5-6'). 6:2 FTS is a fluorotelomer with eight carbon atoms, but unlike PFOS and PFOA, only six of the carbon atoms are completely fluorinated. The structure of this fluorotelomer allows for degradation under aerobic conditions. The degradation of fluorotelomers can result in the generation of PFHxA and PFPeA. 6:2 FTS and its breakdown products are generally believed to be of lower toxicity than PFOS and PFOA due to the shorter carbon chain length, lack of bioaccumulation, and shorter half-lives.[7]

PFHpA was detected above the MDL in samples from WP-B3 (2-3'), WP-B3 (5-6'), WP-B4 (2-3'), and WP-SB9 (1-2'). PFHpA is a seven-carbon chain compound with only six fully fluorinated carbon atoms. PFHpA may be present from the degradation of fluorotelomers or other impurities in the C8 fire suppression foam discharged to the surface.

The breakdown products PFHxA and PFPeA were detected above the MDL in WP-B1 (1-2'), WP-B3 (2-3'), WP-B3 (5-6'), WP-B4 (2-3'), and WP-SB9 (1-2'). The presence of 6:2 FTS confirms that during more recent years of fire suppression testing included short-chain formulations of AR-AFFF following the phase-out of the long-chain PFAS. The soil samples in which 6:2 FTS and its breakdown products were detected above the MDLs are from borings along the north edge of the basement structure. Of these samples, the only boring with a detected concentration in the deeper interval was WP-B3 (5-6').

Only the breakdown products of 6:2 FTS were detected in the samples collected from WP-B1 (1-2') and WP-B4 (2-3'). The lack of 6:2 FTS in these samples appear to indicate limited migration of the breakdown products from the area of boring WP-B2 and WP-B3. Also note that given the low concentrations of 6:2 FTS detected in the soil samples, it is possible that 6:2 FTS is present, but below the MDL.

PFNA and PFUNA were only detected in sample WP-SB10 from along Glatz Creek. PFNA is a nine-carbon chain length with only eight fully fluorinated carbon atoms and PFUnA is an 11-carbon chain length with only 10 fully fluorinated carbon atoms. These PFAS are used as stain- and grease-proofing of food packages and fabrics.

The analytical results indicate limited PFAS detection in shallow soil near the discharge area north of the West Plant building. The results of the samples collected from deeper in the soil profile of the borings do not indicate notable vertical migration occurred in this area. The soil samples collected from WP-B5, WP-B6, and WP-B7 did not detect PFAS constituents at concentrations above MDLs. Borings WP-B5 and WP-B6 were located the furthest downslope to the north to evaluate the potential for lateral migration away from the discharge area. Boring WP-B7 was collected from the soil on top of the basement extension structure nearest the discharge point, but contains soils more recently placed and, therefore, may not be representative of historic discharges. The lack of PFAS constituents in samples from WP-B5 and WP-B6 indicate that the releases of AR-AFFF during testing were focused, resulting in a limited area of impact near the north edge of the basement structure and loading dock area, and not evidence of widespread migration away from the discharge point.

Along Glatz Creek, low-level concentrations of PFHpA, PFOA, PFOS, and PFPeA were detected in the sample from WP-SB9 and PFNA, PFOS, and PFUnA were detected in the sample from WP-SB10. Soil boring WP-SB10 is located more than 150 feet upstream of the channel receiving the storm sewer discharges into Glatz Creek and is not influenced by surface water runoff from the Oshkosh property. Given the spatial location of WP-SB9 and WP-SB10, the PFAS detected in WP-SB10 are background PFAS conditions from off-Site sources and are unlikely to be influenced by Oshkosh operations. The detection of PFAS in this boring is an indication that Glatz Creek is transporting and depositing low-level PFAS through surface water and sediment from sources upstream and likely off-Site of the Oshkosh property. The type of PFAS being transported is influenced by the properties upstream.

[7] National Association for Surface Finishing, 6:2 Fluorotelomer Sulfonate (6:2 FTS), Toxicology at a Glance, March 2019.

5.3 GROUNDWATER ANALYTICAL RESULTS

Groundwater samples were collected from monitoring well WP-MW-1 during three sampling events and from WP-MW-2 through WP-MW-4 during one sampling event. The monitoring wells are located in and downgradient of the discharge area and at the upgradient Site boundary. The groundwater analytical sample results from samples collected on August 3, 2022, detected 12 PFAS above the MDLs, including 6:2 FTS, PFBS, PFHpS, PFPeS, PFHxS, PFBA, PFHpA, PFHxA, PFNA, PFOA, PFPeA, and PFOS. Seven of these 12 PFAS have DHS-recommended groundwater standards, PFBS, PFHxS, PFBA, PFHxA, PFNA, PFOA, and PFOS. The other five PFAS detected in groundwater at the Site do not have DHS-recommended standards and the DHS indicated that there is insufficient health information to develop a standard in November 2020. The groundwater results from this investigation were compared to the DHS-recommended groundwater standards. The laboratory analytical reports are provided in Appendix D and are summarized on Table 2 and Figure 10.

A comparison of the groundwater results to the recommended standards indicates that the groundwater concentrations from three monitoring wells, WP-MW-1, WP-MW-2, and WP-MW-3 exceed the recommended enforcement standards (ES). The PFAS that exceed the respective ESs are shown on the table below.

Well	PFAS	Recommended ES (ng/L)*	Concentration (ng/L)
WP-MW-1	PFOA	20	50
WP--MW-2	PFHxS	40	95
WP-MW-3	PFOS	20	29

*ng/L = nanograms per liter.

The other PFAS concentrations in the samples from these monitoring wells did not exceed the recommended ESs and the concentrations reported for monitoring well WP-MW-4 did not exceed the recommended ESs.

Based on regional groundwater flow conditions, monitoring wells WP-MW-3 and WP-MW-4 are located upgradient of the AFFF discharge area and monitoring well WP-MW-2 is located downgradient of the AFFF discharge area. Ten of the 12 PFAS detected in groundwater were found in the upgradient wells, including the highest concentration of PFOS at WP-MW-3.

Groundwater sample results indicate that the concentrations of PFBS, PFPeS, PFHxS, and PFNA were similar in the samples from discharge area monitoring well WP-MW-1 and the upgradient monitoring wells MW-3 and MW-4. The detection of similar concentrations in the upgradient monitoring well and the presence of PFOS at the highest concentration detected in the monitoring wells suggests that activities in an area south of the West Plant building have affected localized groundwater quality and resulted in the presence of PFAS in groundwater that is migrating beneath the portion of the Site where fire suppression foam was historically managed.

PFBA, PFHpA, PFHxA, PFOA, and PFPeA were detected in monitoring well WP-MW-1 at higher concentrations than were detected in downgradient monitoring well WP-MW-2 or upgradient property boundary monitoring wells WP-MW-3 and WP-MW-4. These concentrations indicate that the activities in the discharge area have affected groundwater on the north side of the West Plant building.

A comparison of the PFBA, PFHpA, PFHxA, PFOA, and PFPeA concentrations detected in monitoring wells WP-MW-1 and WP-MW-2 suggests that there is notable attenuation occurring over the approximate 150-foot distance between these wells. The organic fraction and clay content of shallow soil deposits and the discontinuous nature of interbedded silt and sand layers within the clay likely contribute to the limited migration and attenuation observed.

In GZA's opinion, the PFOA concentrations in WP-MW-1 and WP-MW-2 indicate that the PFOA concentrations are delineated at the Site. The PFOS concentration in WP-MW-3, upgradient of the AFFF discharge area indicates there are PFAS from upgradient sources in groundwater that are affecting the Oshkosh property and no further delineation of PFOS

appears warranted. Although the PFHxS concentration detected in downgradient monitoring well WP-MW-2 reflects a lack of complete delineation, based on the overall groundwater results in comparison to the recommended ESs, GZA proposes follow-up groundwater monitoring and no additional expansion of sampling activities at this time.

5.4 PROPOSED ADDITIONAL INVESTIGATION

To complete the Site investigation, additional groundwater sampling of existing monitoring wells is proposed to understand seasonal variation and to confirm the concentrations detected, especially wells in which only one groundwater sample was collected to date (WP-MW-2 through WP-MW-4). It is notable that the results from the groundwater samples collected from monitoring well WP-MW-1 indicate decreasing concentrations from August 2021 to the most recent sampling event in August 2022. Depending on the results of the follow-up groundwater sampling event, further consideration will be given to determine the necessary actions.

6.0 SUMMARY AND CONCLUSIONS

The following summary and conclusions are based on the results of Site investigation activities, analytical results, and historical operations performed at the Site.

- The Oshkosh Defense West Plant had a Class B fire suppression system employing AR-AFFF substances that contain PFAS constituents. The system was tested periodically, resulting in the discharge of AR-AFFF at a 3% concentrate mixture with water.
- During the testing, the discharge of AR-AFFF occurred north of the north wall of the Oshkosh Defense West Plant building and the foam discharged onto the grassy area and into the loading dock area. Once discharged, the foam was allowed to break down in the grass and loading dock areas.
- Although the AR-AFFF used during testing did contain PFAS initially, the system testing was performed before, during, and after the phase-out period for the manufacturing of long-chain PFAS. Following testing, foam concentrate was added to maintain a fully charged system. Therefore, the products used throughout the testing likely contained both the C6 and C8 foams.
- A total of eight soil borings were advanced, six of which extended from 10 to 15 feet bgs, one of which was limited to 9 inches due to the presence of the underlying basement structure, and one which extended to 5 feet to confirm the lithology between borings.
- A total of four monitoring wells were installed at the Site. WP-MW-1 is located in the discharge area, WP-MW-2 is located approximately 150 feet downgradient to the northeast, and WP-MW-3 and WP-MW-4 are located along the upgradient property boundary south and southwest of the West Plant building, respectively. The monitoring wells were installed to depths of 15 to 17 feet bgs and are constructed as flush-mount completions with schedule 40 PVC riser and 0.010-inch well screen.
- A total of 12 soil samples were analyzed by Pace for analysis of the Wisconsin list of 36 PFAS compounds and one soil sample was analyzed for select PFAs detected in the soil in the discharge area.
- Underlying a surficial layer of topsoil in the upper 0.5-foot, geologic conditions consist of low permeability clay deposits (consistent with till of the regional Kewaunee Formation) extending to a depth of approximately 9 to 11 feet bgs. An approximately 1-foot-thick sand layer, which may represent patchy lake sediment, was encountered beneath clay. Beneath approximately 15 feet are discontinuous, interbedded silt and sand layers within the clay. Bedrock or evidence of bedrock were encountered at depths of 17 to 20 feet bgs.

- Static groundwater levels were observed at depths of 12 to 16 feet bgs. The groundwater elevations indicate that groundwater flow is to the north/northeast at a hydraulic gradient of 0.0169 ft/ft.
- Using assumed conservatively high values for hydraulic conductivity and an average effective porosity for soil encountered on-Site, and the measured hydraulic gradient on August 3, 2022, the groundwater average linear velocity is estimated at approximately 29 ft/yr. This average linear velocity results in a groundwater travel time from the discharge area at monitoring well WP-MW-1 to downgradient monitoring well WP-MW-2 (approximately 150 feet) of 26 years.
- There are no potential receptors that are affected by the PFAS-affected soil and groundwater in the discharge area. The Site is expected to remain as an industrial use property.
- The soil analytical results indicate the area affected by fire suppression foam discharges is limited to the immediate area near the building. Only six PFAS were detected in soil samples collected from borings in this area and near Glatz Creek, including 6:2 FTS, PFHpA, PFHxA, PFOA, PFOS, and PFPeA. Samples collected from boring WP-B3 had the most detections of different PFAS. This boring is near the location of the foam discharge. Borings WP-B5 and WP-B6, located north of WP-B3, did not detect PFAS in the samples analyzed.
- The sample collected from WP-SB10 along Glatz Creek detected PFUnA and PFNA, which were not detected in the discharge area. This boring is not influenced by surface water from the Site, which suggests that Glatz Creek is, or at times was, transporting surface water and sediment that contains low-level PFAS concentrations.
- In Site groundwater, 12 PFAS were detected above the MDLs, including 6:2 FTS, PFBS, PFHpS, PFPeS, PFHxS, PFBA, PFHpA, PFHxA, PFNA, PFOA, PFPeA, and PFOS.
- Groundwater samples from upgradient, background monitoring wells WP-MW-3 and WP-MW-4 had detections of 10 of the 12 PFAS detected at the Site, including the highest concentration of PFOS at WP-MW-3.
- Although background levels of PFAS do exist in groundwater migrating onto the Site, the groundwater analytical results also indicate low-level PFAS impacts that appear attributable to the historic periodic discharge of AFFF.
- The PFAS most indicative of on-Site impacts at the discharge area appear to include PFBA, PFHpA, PFHxA, PFOA, and PFPeA. The concentrations of these PFAS are higher than the upgradient and downgradient monitoring wells.
- The concentrations of PFAS detected in monitoring well WP-MW-2 indicate that there is notable attenuation over the 150-foot distance between WP-MW-1 and WP-MW-2. The attenuation and limited mobility of these compounds are likely due to the combination of organic content and clay nature of the soils and the discontinuous silt and sand layers within the saturated zone.
- Only three PFAS were detected in groundwater at concentrations that exceed the DHS-recommended ESs; PFOA in WP-MW-1, PFHxS in WP-MW-2, and PFOS in WP-MW-3.
- One additional groundwater sampling event is proposed for Site monitoring wells to confirm PFAS distribution across the Site, including background wells and monitoring wells WP-MW-2 through WP-MW-4 that were only sampled during one event in August 2022. The groundwater sampling results will be reviewed to determine the necessary actions.

In consideration of these findings, also note that this Site is and will continue to be used for industrial manufacturing with restricted access only through secured gates with security personnel. Additionally, no water supply wells exist at the Site and groundwater in the area of and surrounding the Site is not used for potable drinking water supply, as the City of Oshkosh supplies municipal water to this area of Oshkosh.

7.0 CERTIFICATIONS

"I, Kevin M. Hedinger, hereby certify that I am a hydrogeologist as that term is defined in s NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

Kevin M. Hedinger
Senior Project Manager / Hydrogeologist

February 21, 2023
Date

TABLES

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
West Plant Site
Oshkosh, Wisconsin

Sample ID (Depth)		Wisconsin Non-Industrial Direct Contact RCL (µg/kg)	Wisconsin Industrial Direct Contact RCL (µg/kg)	Soil to Groundwater Pathway RCL (µg/kg)	WP-B1		WP-B2		WP-B3		WP-B4	WP-B5	WP-B6		WP-B7	WP-SB9	WP-SB10
					WP-B1 (1-2')	WP-B1 (5-6')	WP-B2 (2-3')	WP-B2 (5-6')	WP-B3 (2-3')	WP-B3 (5-6')	WP-B4 (2-3')	WP-B5 (2-3')	WP-B6 (2-3')	WP-B6 (6-7')	WP-B7 (0-9')	WP-SB9 (1-2')	WP-SB10 (0-1')
Laboratory Sample ID					VK12014-013	VK12014-014	VK12014-011	VK12014-012	VK12014-007	VK12014-008	VK12014-005	VK12014-009	VK12014-003	VK12014-004	VK12014-015	WH17017-001	XF21009-001
Sample Date					11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	11/7/2020	8/14/2021	6/17/2022
Parameter (µg/kg)	**CAS Number**																
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	763051-92-9	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	NS	< 1.8	< 2.5	**5.6**	< 2.4	**4.2**	**2.5**	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	<2.2	<3.0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFP	13252-13-6	NS	NS	NS	< 3.7	< 5.0	< 4.1	< 4.8	< 5.2	< 4.1	< 3.9	< 4.9	< 3.8	< 4.3	< 4.4	NT	<5.9
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	756426-58-1	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	NS	NS	NS	< 1.8	< 2.5	< 2.0	< 2.4	< 2.6	< 2.1	< 2.0	< 2.4	< 1.9	< 2.1	< 2.2	NT	<3.0
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorobutanoic Acid (PFBA)	375-22-4	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorodecanoic Acid (PFDA)	335-76-2	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorododecanoic Acid (PFDoA)	307-55-1	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	**4.2**	**1.7**	**2.1**	< 1.2	< 0.95	< 1.1	< 1.1	0.28 J	<1.5
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	NS	NS	NS	**1.1**	< 1.3	< 1.0	< 1.2	**3.8**	**3.2**	**3.5**	< 1.2	< 0.95	< 1.1	< 1.1	<1.1	<1.5
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorononanoic Acid (PFNA)	375-95-1	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	0.22J
Perfluorooctanesulfonamide (FOSA)	754-91-6	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoro-n-octanoic acid (PFOA)	335-67-1	1,260	16,400	NS	< 0.92	< 1.3	< 1.0	< 1.2	**4.5**	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	0.52 J	<1.5
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1,260	16,400	NS	**1.3**	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	38	1.5
PFOS + PFOA (Calculated)	PFOS+PFOA	1,260	16,400	NS	**1.3**	ND	ND	ND	**4.5**	ND	ND	ND	ND	ND	ND	ND	1.5
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	NS	**2.9**	< 1.3	< 1.0	< 1.2	**2.8**	**4.6**	**3.0**	< 1.2	< 0.95	< 1.1	< 1.1	0.27 J	<1.5
Perfluorotetradecanoic Acid (PFTA)	376-06-7	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	<1.5
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	NS	NS	NS	< 0.92	< 1.3	< 1.0	< 1.2	< 1.3	< 1.0	< 0.99	< 1.2	< 0.95	< 1.1	< 1.1	NT	0.61J

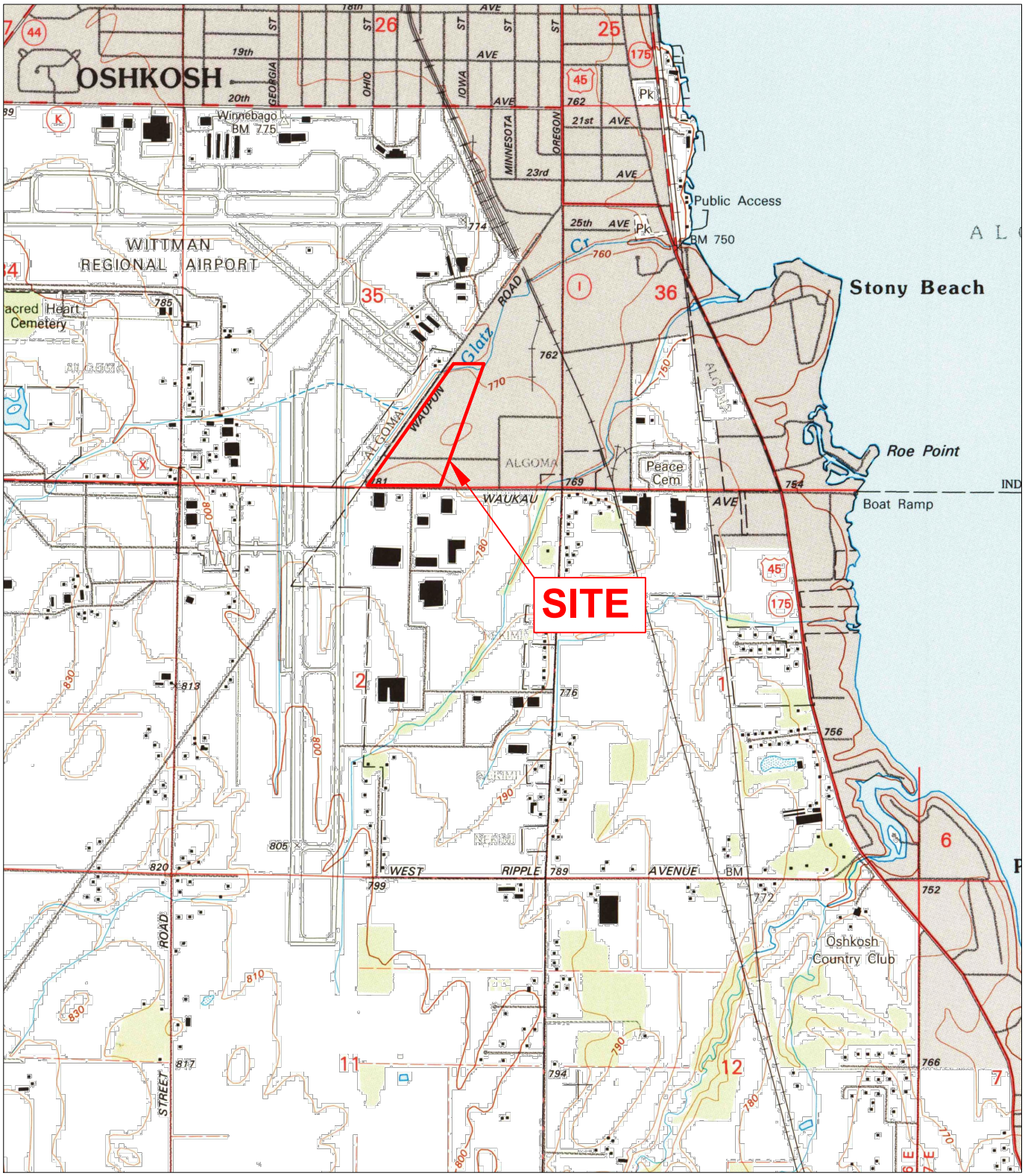
Notes:
1. The Soil-to-Groundwater Pathway Residual Contaminant Level (RCL) was calculated using the United States Environmental Protection Agency (USEPA) Regional Screening Level Web Calculator, https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search, and the Wisconsin Department of Natural Resources (WDNR) Soil RCL Determinations document, Pub-RR-890.
2. Results are presented in micrograms per kilogram (µg/kg).
3. **Bold** indicates that the parameter was detected above the method detection limit (MDL), but less than the Wisconsin non-industrial direct contact criteria listed. Underlined result indicates an exceedance of the lowest published RCL.
4. "NS" indicates there is no standard for that parameter; "ND" indicates the parameters used in the calculation were not detected; and "NT" indicates the sample was not tested for that parameter.
5. "J"-flagged concentrations indicate that the estimated result is less than the Limit of Quantitation (LOQ) and greater than or equal to the Detection Limit (DL).

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
West Plant Site
Oshkosh, Wisconsin

Sample ID		DHS-Recommended ES	DHS-Recommended PAL	WP-MW-1			WP-MW-2	WP-MW-3	WP-MW-4
Laboratory Sample ID				WH24026-001	WJ23011-001	XH08005-001	XH08005-001	XH08005-001	XH08005-001
Sample Date				8/19/2021	10/16/2021	8/3/2022	8/3/2022	8/3/2022	8/3/2022
Parameter (ng/L)	**CAS Number**								
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	NS	NS	<9.4	<8.6	<7.1	<7.7	<7.7	<7.8
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUd	763051-92-9	NS	NS	<13	<12	<7.1	<7.7	<7.7	<7.8
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	NS	NS	<31	<29	<7.1	<7.7	<7.7	<7.8
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	NS	NS	200	140	9.4 Q	<7.7	<7.7	<7.8
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	NS	NS	<17	<16	<7.1	<7.7	<7.7	<7.8
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	300	30	<41	<37	<7.1	<7.7	<7.7	<7.8
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	3,000	600	<9.4	<8.6	<7.1	<7.7	<7.7	<7.8
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	20	2	<26	<24	<7.1	<7.7	<7.7	<7.8
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	20	2	<15	<13	<7.1	<7.7	<7.7	<7.8
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	20	2	<19	<17	<7.1	<7.7	<7.7	<7.8
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	NS	NS	<25	<22	<14	<15	<15	<16
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	NS	NS	<18	<17	<7.1	<7.7	<7.7	<7.8
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	NS	NS	<25	<23	<7.1	<7.7	<7.7	<7.8
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	450,000	90,000	10 J	23 J	10	16	7.5	5.4
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	NS	NS	<15	<14	<3.6	<3.8	<3.9	<3.9
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	NS	NS	<9.7	<8.9	<3.6	0.73 J	<3.9	<3.9
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	NS	NS	<14	<13	<3.6	<3.8	<3.9	<3.9
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	20	2	<12	<11	<3.6	<3.8	<3.9	<3.9
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	NS	NS	<12	<11	2.4 J	14	3.0 J	1.7 J
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	NS	NS	<20	<19	<7.1	<7.7	<7.7	<7.8
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	40	4	**23 J**	**13 J**	**14**	**95**	**16**	**13**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	10,000	2,000	**3,800**	1,900	**2,100**	36	<3.9	7.4
Perfluoro-n-decanoic acid (PFDA)	335-76-2	300	60	<10	<9.3	<3.6	<3.8	<3.9	<3.9
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	500	100	<9.2	<8.4	<3.6	<3.8	<3.9	<3.9
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	NS	NS	1,300	560	890	15	<3.9	1.7 J
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	150,000	30,000	7,900	4,000	5,100	50	<3.9	4.9
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	30	3	<9.0	<8.2	0.53 J	**6.1**	**3.1 J**	0.56 J
Perfluoro-n-octanoic acid (PFOA)	335-67-1	20	2	**120**	**70 J**	**50**	**7.6**	<3.9	1.7 J
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	NS	NS	19,000	9,900	11,000	100	0.55 J	6.7
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	10,000	2,000	<12	<11	<3.6	<3.8	<3.9	<3.9
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	NS	NS	<10	<9.4	<3.6	<3.8	<3.9	<3.9
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	3,000	600	<12	<11	<3.6	<3.8	<3.9	<3.9
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	20	2	<39	<36	**4.4**	**17**	**29**	<3.9
PFOS + PFOA (Calculated)	PFOS+PFOA	20	2	**120**	**70 J**	**54.4**	**24.6**	**29**	1.7 J

Notes:
1. Samples were collected by GZA GeoEnvironmental, Inc. on the date indicated.
2. **Bold** concentrations indicate an exceedance of the Wisconsin Administrative Code (Wis. Adm. Code) proposed Preventive Action Limit (PAL) and **bold/underlined** concentrations indicate an exceedance of the Wis. Adm. Code proposed Enforcement Standard (ES).
3. Results are presented in nanograms per liter (ng/L).
4. "NS" indicates there is no standard for that parameter.
5. "J"-flagged concentrations indicate that the estimated result is less than the Limit of Quantitation (LOQ) and greater than or equal to the Method Detection Limit (DL).

FIGURES



NO.	ISSUE/DESCRIPTION	BY	DATE

OSHKOSH CORPORATION
DEFENSE WEST PLANT
OSHKOSH, WISCONSIN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
OSHKOSH CORPORATION
OSHKOSH, WISCONSIN

SITE LOCATION

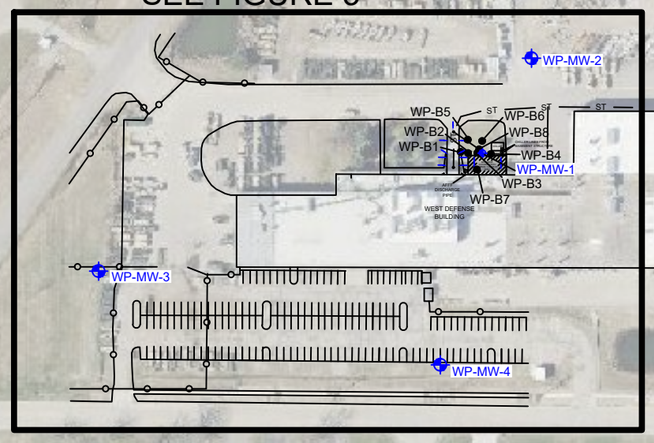
PROJ MGR: KMH	REVIEWED BY: JCO	CHECKED BY: JCO	FIGURE 1
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: AS SHOWN	
DATE: 12/29/2020	PROJECT NO. 20.0157080.01	REVISION NO.	SHEET NO.

WP-SB10

WP-SB9

SEE FIGURE 4

SEE FIGURE 3



0 100' 200' 400'

SCALE IN FEET 1" = 200'

N
W E
S

NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

SITE PLAN

PREPARED BY:
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PREPARED FOR:
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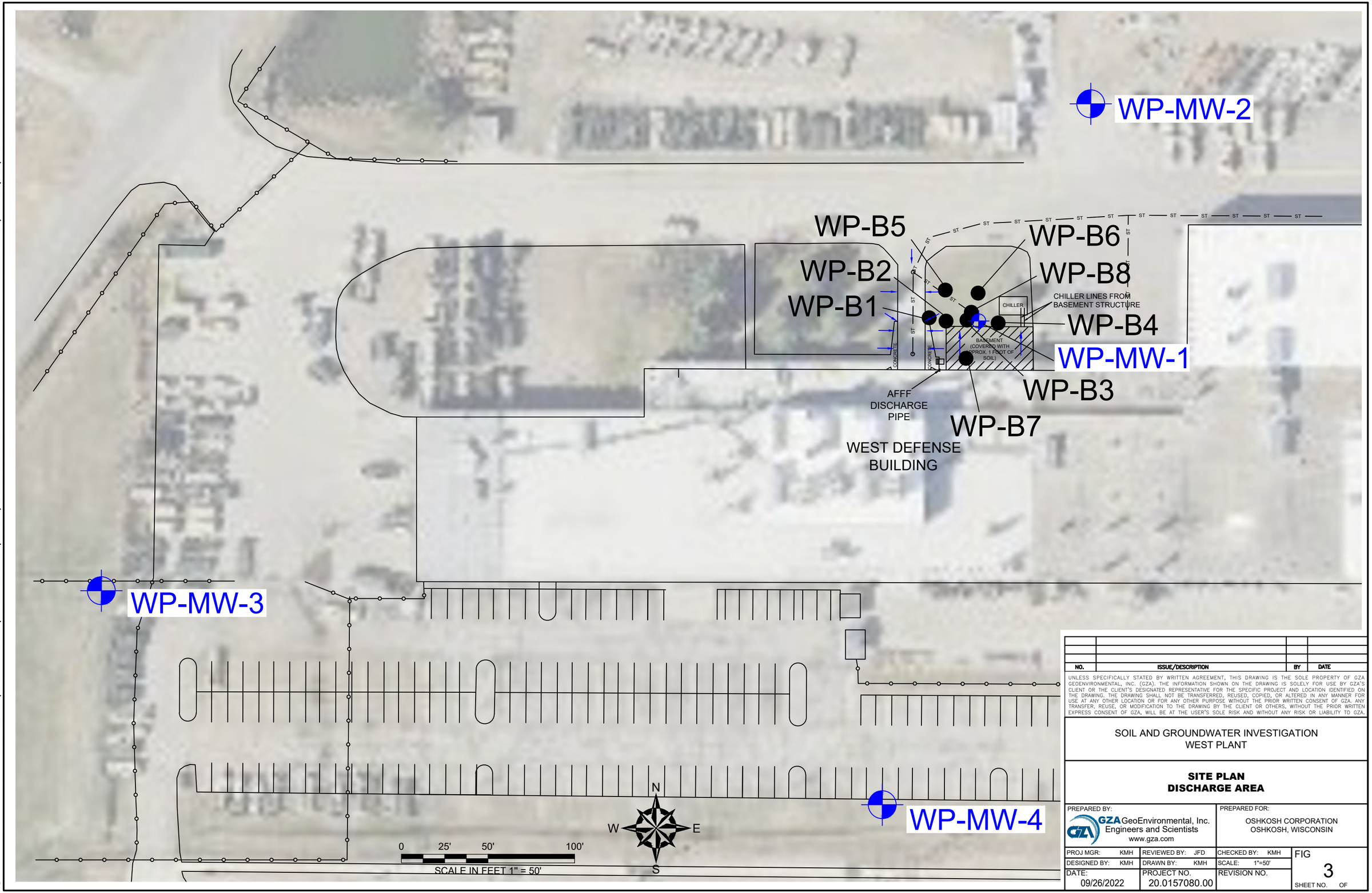
OSHKOSH, WISCONSIN

PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG 2
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

SITE PLAN
DISCHARGE AREA

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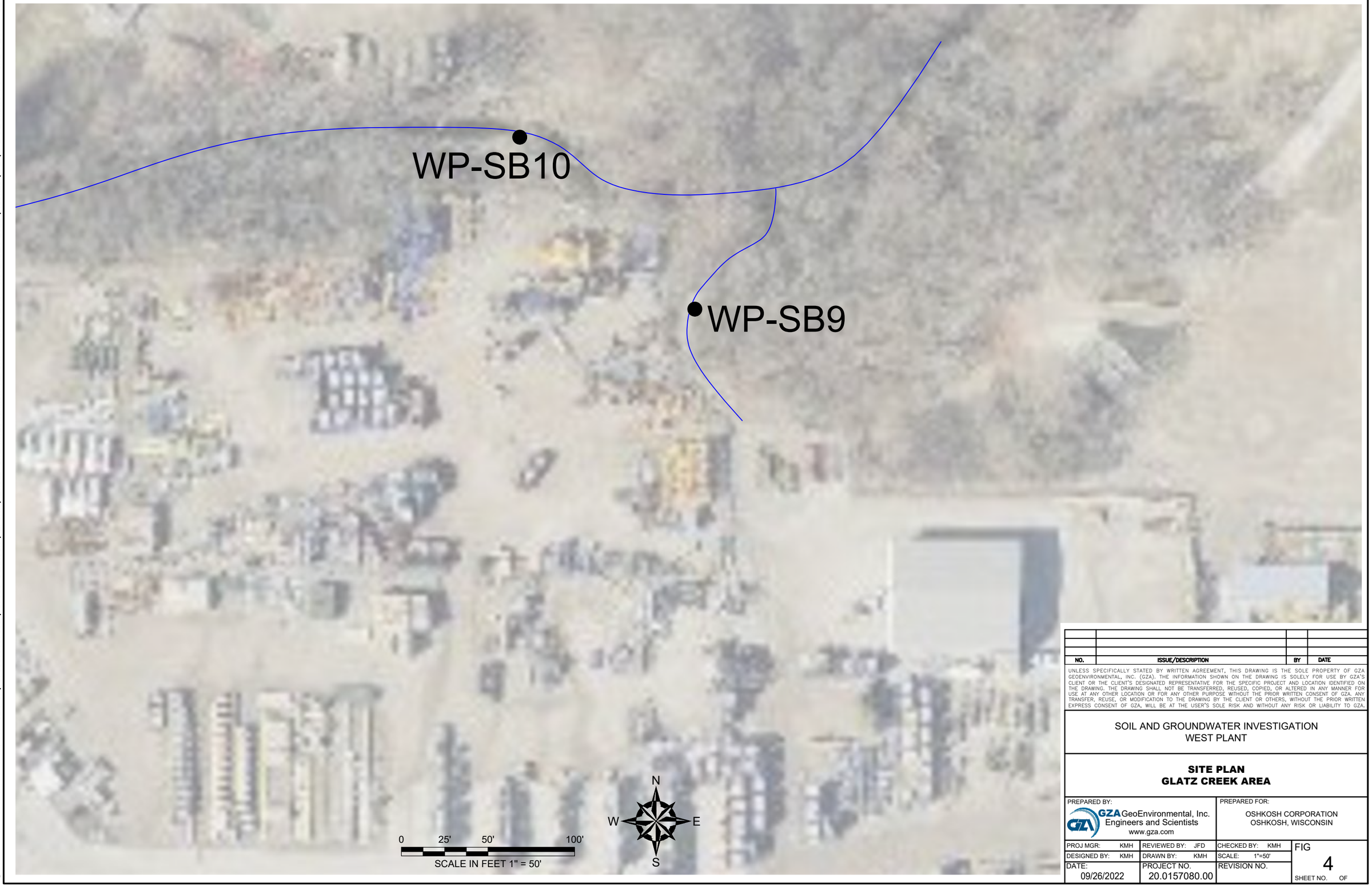
OSHKOSH, WISCONSIN

PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG 3
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
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SITE PLAN
GLATZ CREEK AREA

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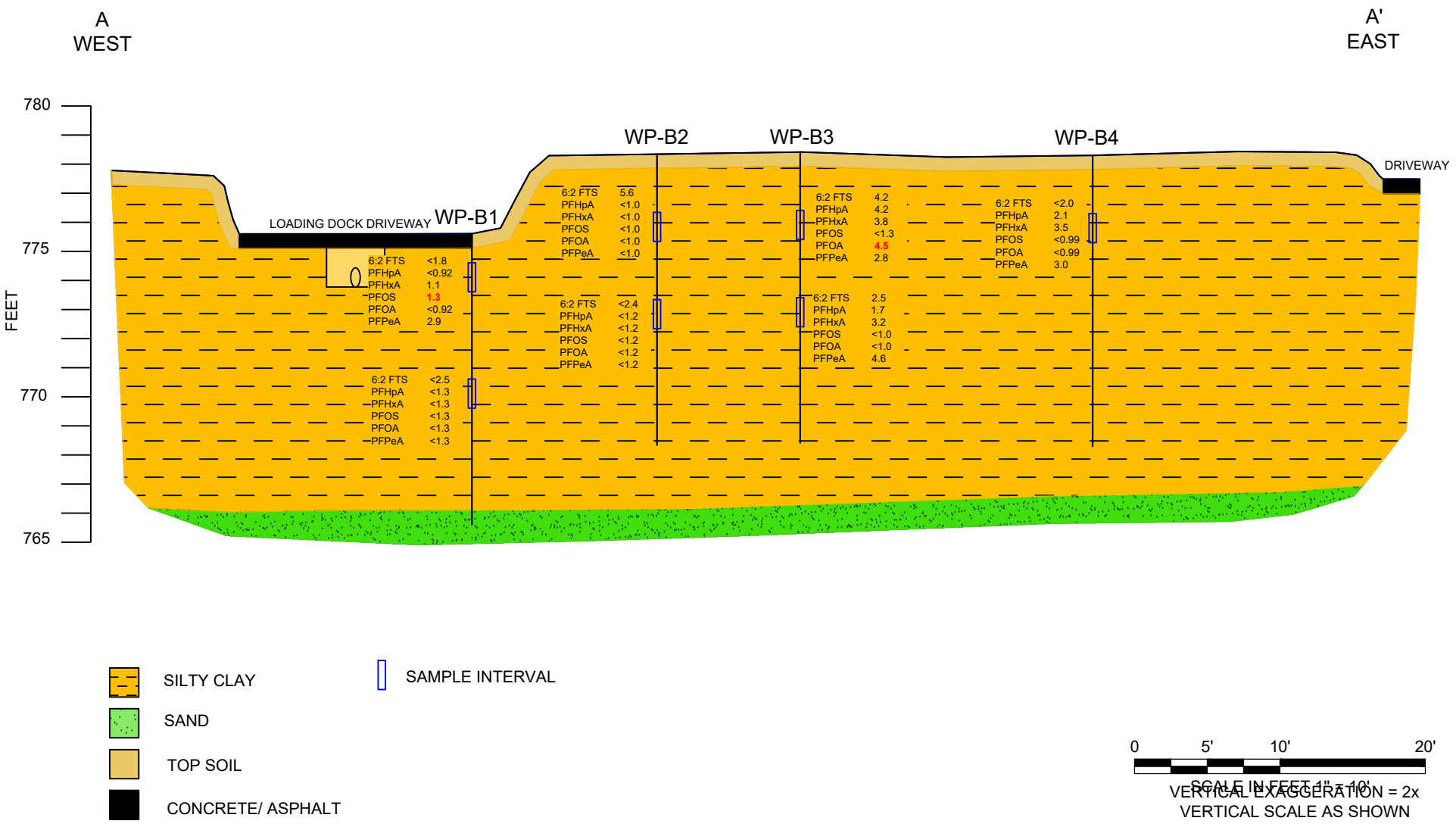
PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG 4
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



NO.	ISSUE/DESCRIPTION	BY	DATE

DEFENSE WEST PLANT
OSHKOSH, WISCONSIN

GEOLOGIC CROSS-SECTION A-A'
(WEST - EAST)

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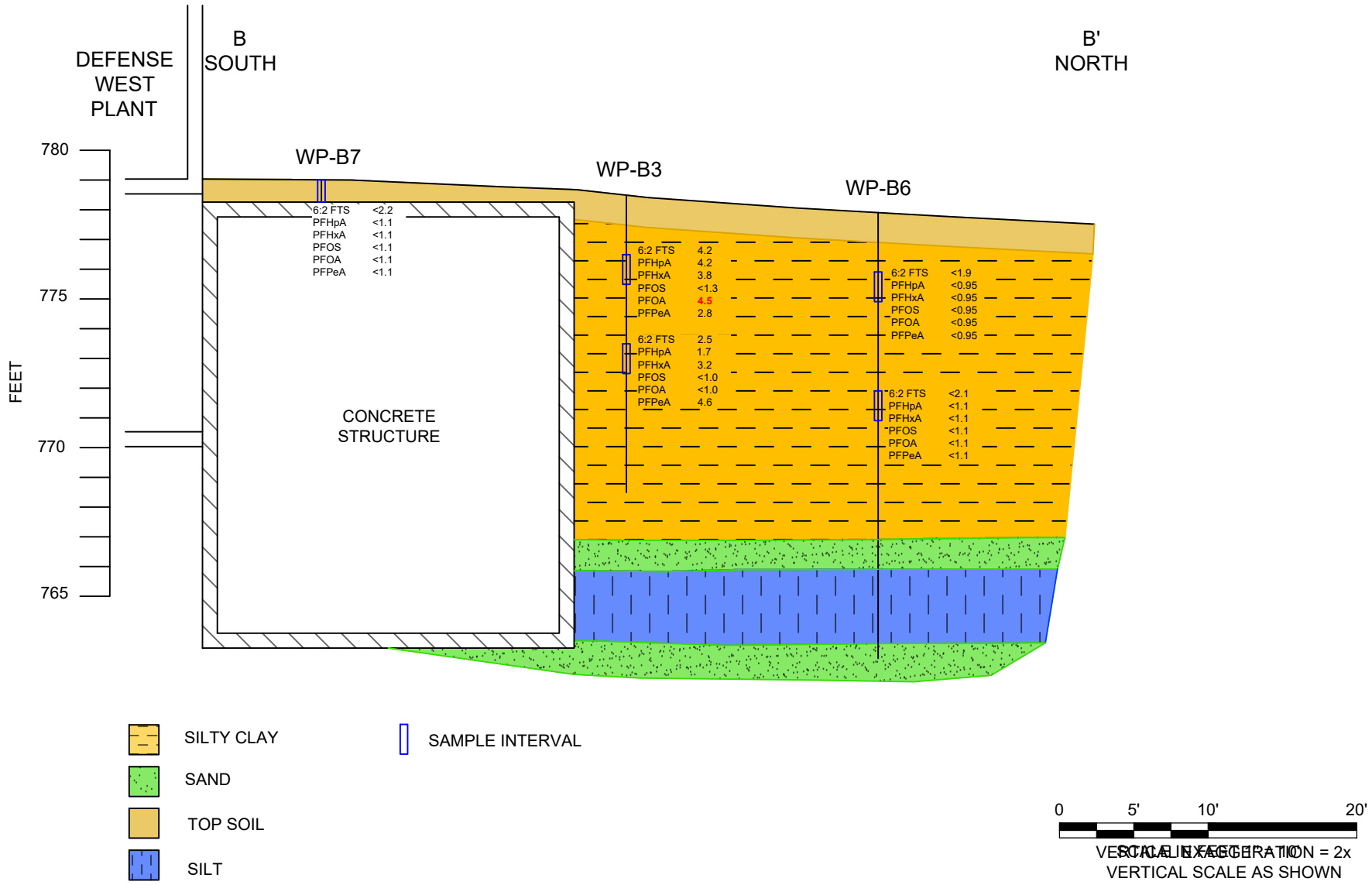
PROJ MGR: KMH	REVIEWED BY: JCO	CHECKED BY: JCO	
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: AS SHOWN	
DATE: JANUARY 2021	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. 5 1 OF 1



NO.	ISSUE/DESCRIPTION	BY	DATE

DEFENSE WEST PLANT
OSHKOSH, WISCONSIN

GEOLOGIC CROSS-SECTION B-B'
(SOUTH - NORTH)

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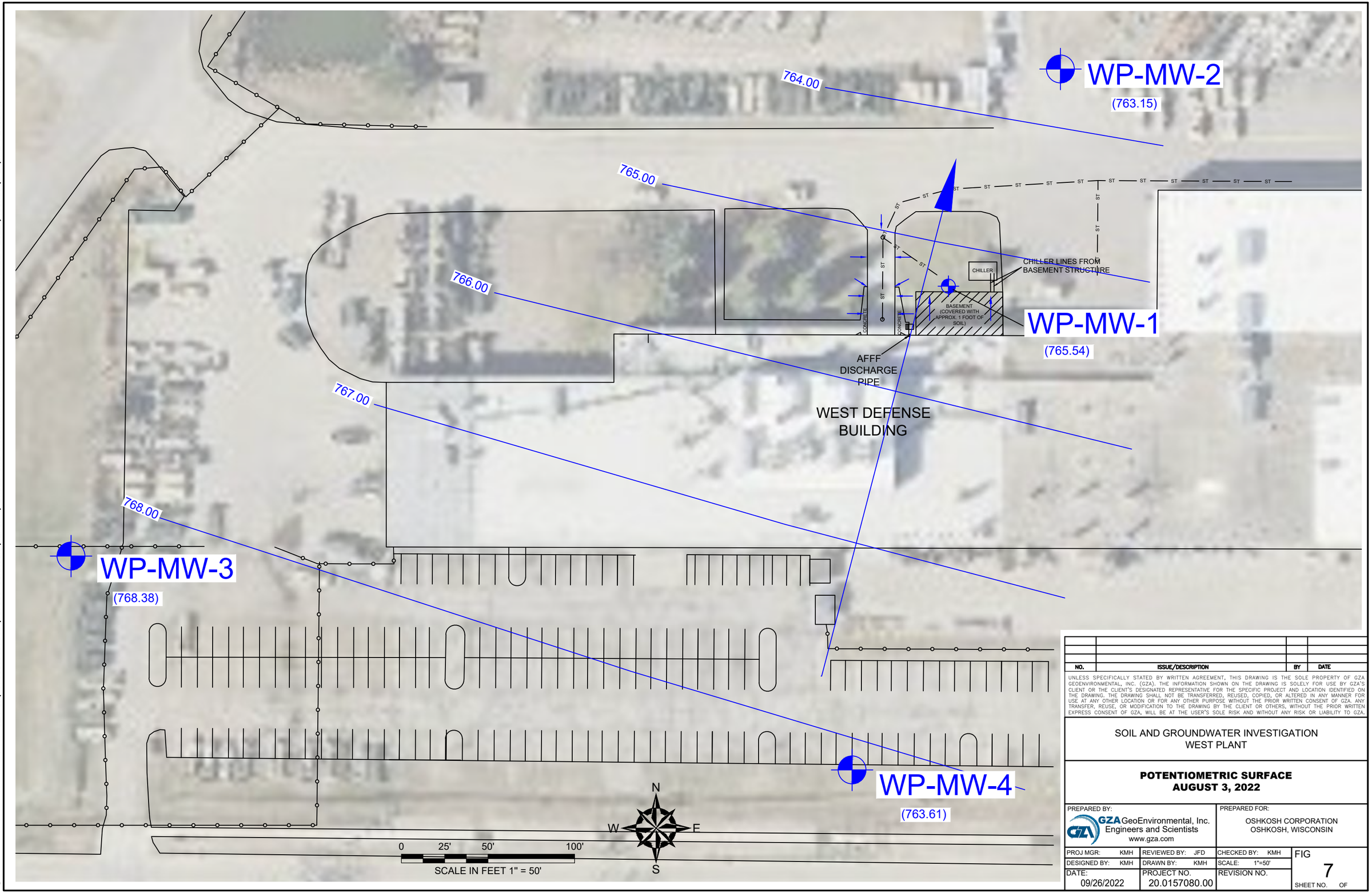
OSHKOSH, WISCONSIN

PROJ MGR: KMH	REVIEWED BY: JCO	CHECKED BY: JCO	
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: AS SHOWN	
DATE: JANUARY 2021	PROJECT NO. 20.0157080.00	REVISION NO.	6
			SHEET NO. 1 OF 1



NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

POTENTIOMETRIC SURFACE
AUGUST 3, 2022

PREPARED BY:
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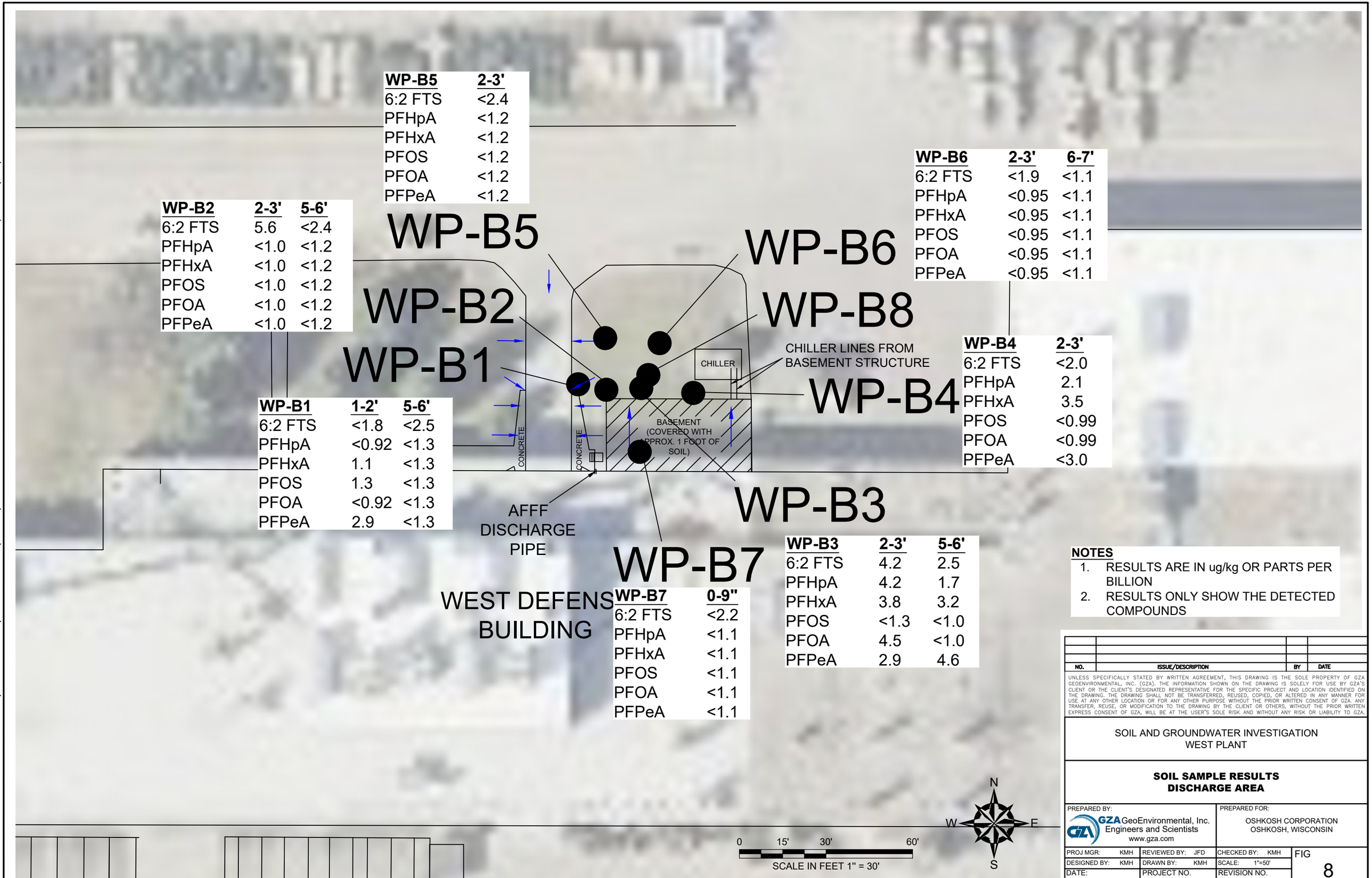
OSHKOSH, WISCONSIN

PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG 7
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



WP-B5	2-3'
6:2 FTS	<2.4
PFHpA	<1.2
PFHxA	<1.2
PFOS	<1.2
PFOA	<1.2
PFPeA	<1.2

WP-B2	2-3'	5-6'
6:2 FTS	5.6	<2.4
PFHpA	<1.0	<1.2
PFHxA	<1.0	<1.2
PFOS	<1.0	<1.2
PFOA	<1.0	<1.2
PFPeA	<1.0	<1.2

WP-B6	2-3'	6-7'
6:2 FTS	<1.9	<1.1
PFHpA	<0.95	<1.1
PFHxA	<0.95	<1.1
PFOS	<0.95	<1.1
PFOA	<0.95	<1.1
PFPeA	<0.95	<1.1

WP-B4	2-3'
6:2 FTS	<2.0
PFHpA	2.1
PFHxA	3.5
PFOS	<0.99
PFOA	<0.99
PFPeA	<3.0

WP-B1	1-2'	5-6'
6:2 FTS	<1.8	<2.5
PFHpA	<0.92	<1.3
PFHxA	1.1	<1.3
PFOS	1.3	<1.3
PFOA	<0.92	<1.3
PFPeA	2.9	<1.3

WP-B7	0-9"
6:2 FTS	<2.2
PFHpA	<1.1
PFHxA	<1.1
PFOS	<1.1
PFOA	<1.1
PFPeA	<1.1

WP-B3	2-3'	5-6'
6:2 FTS	4.2	2.5
PFHpA	4.2	1.7
PFHxA	3.8	3.2
PFOS	<1.3	<1.0
PFOA	4.5	<1.0
PFPeA	2.9	4.6

NOTES

1. RESULTS ARE IN ug/kg OR PARTS PER BILLION
2. RESULTS ONLY SHOW THE DETECTED COMPOUNDS

NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

SOIL SAMPLE RESULTS
DISCHARGE AREA

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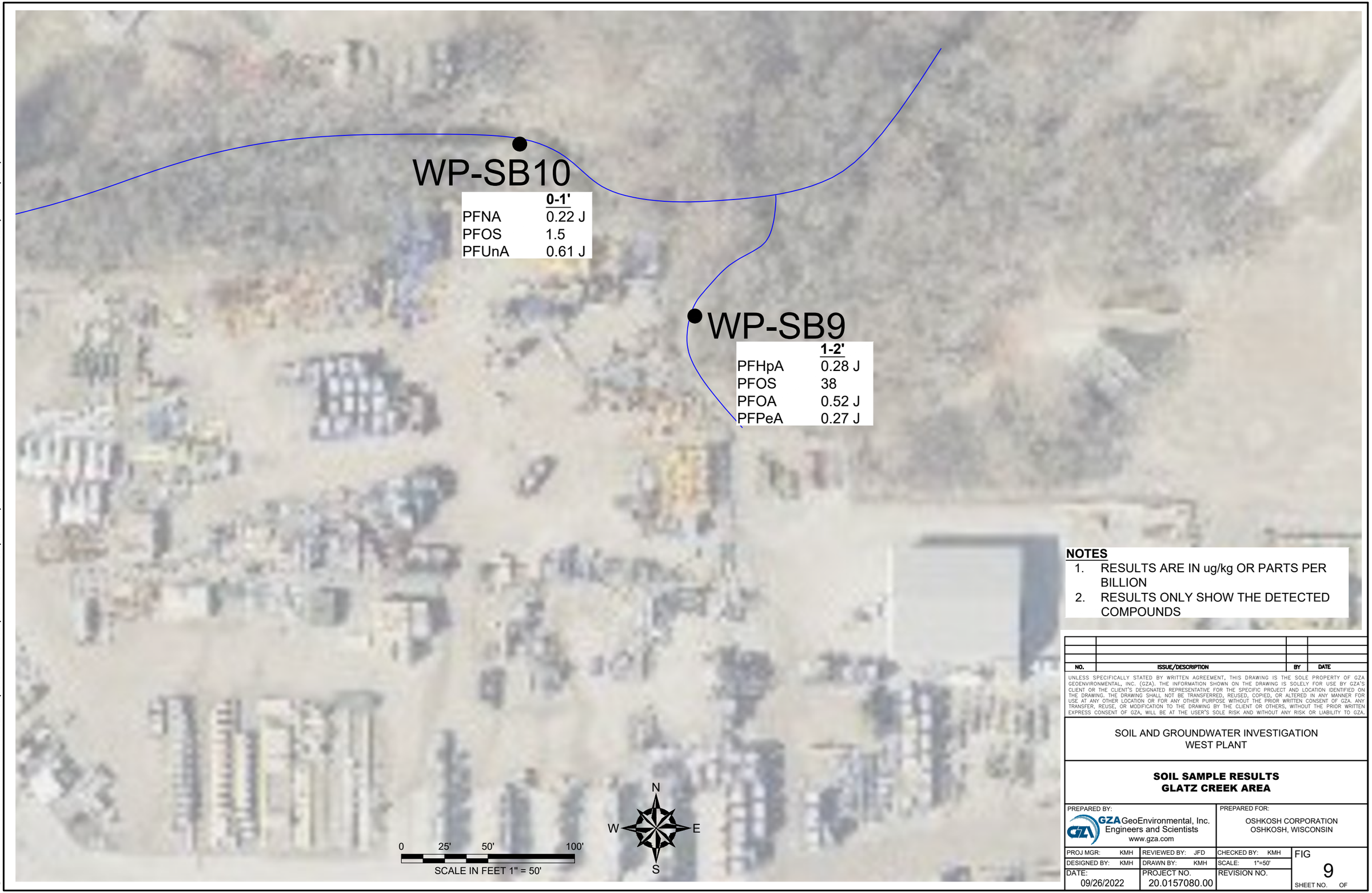
OSHKOSH, WISCONSIN

PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	8
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



NOTES

1. RESULTS ARE IN ug/kg OR PARTS PER BILLION
2. RESULTS ONLY SHOW THE DETECTED COMPOUNDS

NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

SOIL SAMPLE RESULTS
GLATZ CREEK AREA

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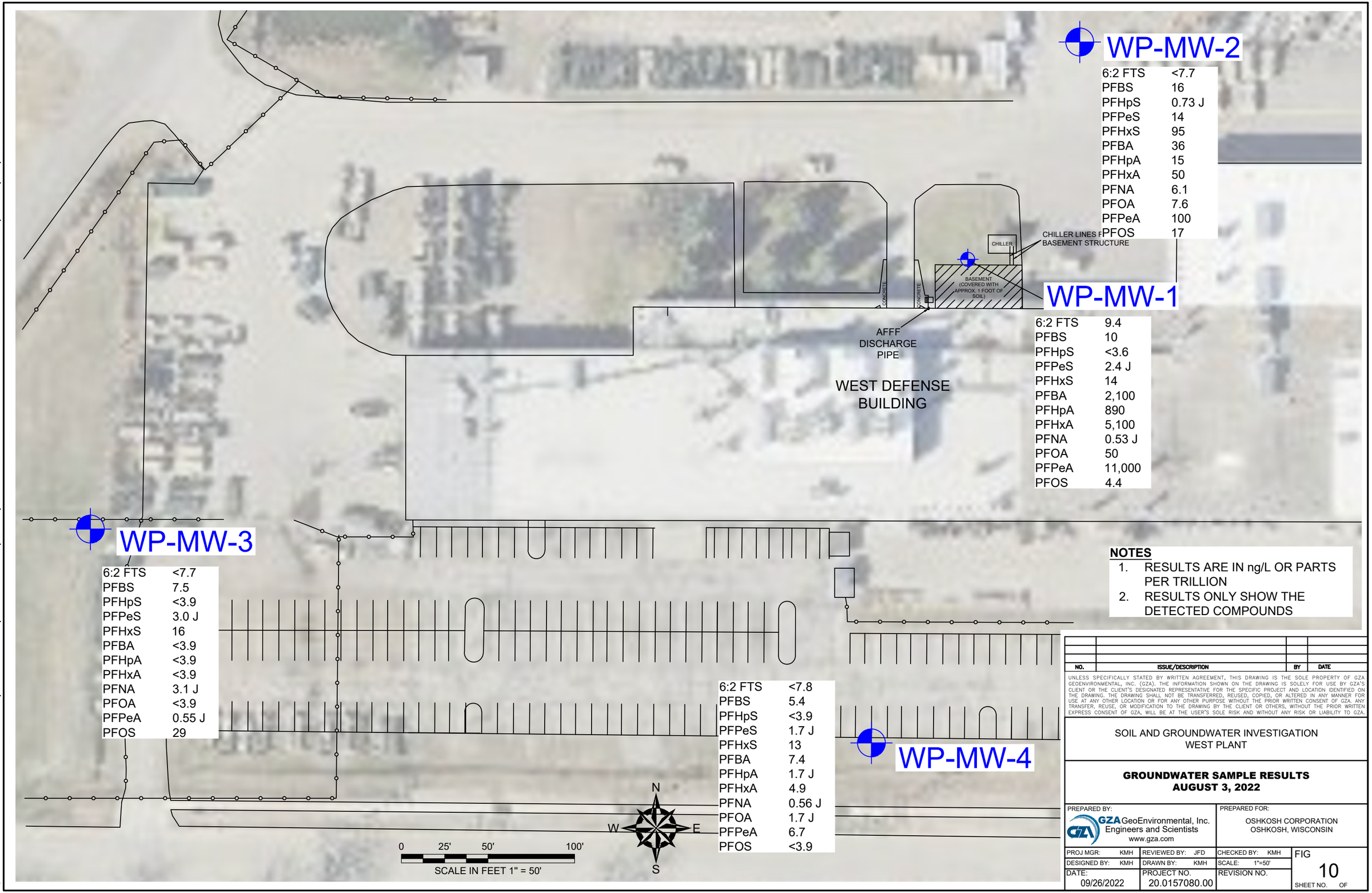
PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG 9
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF



NOTES

1. RESULTS ARE IN ng/L OR PARTS PER TRILLION
2. RESULTS ONLY SHOW THE DETECTED COMPOUNDS

NO.	ISSUE/DESCRIPTION	BY	DATE

SOIL AND GROUNDWATER INVESTIGATION
WEST PLANT

GROUNDWATER SAMPLE RESULTS
AUGUST 3, 2022

PREPARED BY:
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PROJ MGR: KMH	REVIEWED BY: JFD	CHECKED BY: KMH	FIG
DESIGNED BY: KMH	DRAWN BY: KMH	SCALE: 1"=50'	10
DATE: 09/26/2022	PROJECT NO. 20.0157080.00	REVISION NO.	SHEET NO. OF

APPENDIX A

LIMITATIONS

LIMITATIONS

Standard of Care

1. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the proposal and/or report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
2. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state, or federal agency.
3. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the report.

Subsurface Conditions

4. The generalized soil profile(s) provided in our report are based on widely spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata and the transitions between strata may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location, refer to the exploration logs.
5. Water level readings have been made in test holes (as described in the report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the report.

Compliance with Codes and Regulations

6. GZA used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various and possibly contradictory interpretations. Interpretations and compliance with codes and regulations by other parties are beyond our control.

Screening and Analytical Testing

7. GZA collected environmental samples at the locations identified in the report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future site activities and uses may result in a requirement for additional testing.
8. Our interpretation of field screening and laboratory data is presented in the report. Unless otherwise noted, GZA relied on the laboratory's quality assurance (QA)/quality control (QC) program to validate these data.
9. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the report.

Interpretation of Data

10. Our opinions are based on available information, as described in the report, and on our professional judgment. Additional observations made over time and/or space may not support the opinions provided in the report.

Additional Information

11. In the event that Client or others authorized to use this report obtain information on environmental or hazardous waste issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

Additional Services

12. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction and/or property development/ redevelopment at the site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX B

PRODUCT SAFETY DATA SHEET

Safety Data Sheet

This safety data sheet complies with the requirements of: 2012 OSHA Hazard Communication Standard (29CFR 1910.1200)

Product name ANSULITE LOW VISCOSITY 3X3 AR-AFFF Foam Concentrate

1. Identification

1.1. Product Identifier

Product name ANSULITE LOW VISCOSITY 3X3 AR-AFFF Foam Concentrate

1.2. Other means of identification

Product code 416493
Synonyms None
Chemical Family No information available

1.3. Recommended use of the chemical and restrictions on use

Recommended use Fire extinguishing agent.
Uses advised against Consumer use.

1.4. Details of the Supplier of the Safety Data Sheet

Company Name Tyco Fire Protection Products
One Stanton Street
Marinette, WI 54143-2542
Telephone: 715-735-7411
Contact point Product Stewardship at 1-715-735-7411
E-mail address psra@tycofp.com

1.5. Emergency Telephone Number

Emergency telephone CHEMTREC 001-800-424-9300 or 001-703-527-3887

2. Hazards Identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation - Category 1

2.2. Label Elements

Signal Word
DANGER

Hazard Statements
Causes serious eye damage

Precautionary Statements

Prevention
Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

2.3. Hazards Not Otherwise Classified (HNOC)
Not Applicable.

2.4. Other Information
Causes mild skin irritation.

3. Composition/information on Ingredients

3.1. Mixture
The following component(s) in this product are considered hazardous under applicable OSHA(USA)

Chemical name	CAS No.	weight-%
2-(2-Butoxyethoxy)ethanol	112-34-5	7 - 13
Caprylcaprilyl glucoside	68515-73-1	1 - 5
Sodium Decyl Sulfate	142-87-0	1 - 5

4. First aid measures

4.1. Description of first aid measures
Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. (Get medical attention immediately if symptoms occur.).

Ingestion Rinse mouth. Do not induce vomiting without medical advice. If swallowed, call a poison control center or physician immediately.

4.2. Most Important Symptoms and Effects, Both Acute and Delayed
Symptoms No information available.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed
Note to physicians Treat symptomatically.

5. Fire-fighting measures

5.1. Suitable Extinguishing Media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Unsuitable Extinguishing Media
None.

5.3. Specific Hazards Arising from the Chemical

None known.

Hazardous Combustion Products	Carbon oxides, Fluorinated oxides, Nitrogen oxides (NOx), Oxides of sulfur

5.4. Explosion Data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

5.5. Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal Precautions	Ensure adequate ventilation, especially in confined areas.
For emergency responders	Use personal protection recommended in Section 8.

6.2. Environmental Precautions

Environmental Precautions	Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Cleaning Up	Pick up and transfer to properly labeled containers.

7. Handling and Storage

7.1. Precautions for Safe Handling

Advice on safe handling	Avoid contact with skin and eyes. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place.
Incompatible Materials	Strong oxidizing agents. Strong acids. Strong bases.

8. Exposure Controls/Personal Protection

8.1. Control Parameters

Exposure guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL
2-(2-Butoxyethoxy)ethanol 112-34-5	TWA: 10 ppm inhalable fraction and vapor	-	-	-

ACGIH (American Conference of Governmental Industrial Hygienists) OSHA (Occupational Safety and Health Administration of the US Department of Labor) NIOSH IDLH Immediately Dangerous to Life or Health

8.2. Appropriate Engineering Controls

Engineering controls Ensure adequate ventilation, especially in confined areas.

8.3. Individual protection measures, such as personal protective equipment

Eye/Face Protection Avoid contact with eyes. Tight sealing safety goggles.

Skin and Body Protection Wear protective gloves and protective clothing.

Respiratory Protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Ventilation Use local exhaust or general dilution ventilation to control exposure with applicable limits

8.4. General hygiene considerations

Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State Liquid
Odor Characteristic
Odor Threshold No data available

Color Light yellow

Property	Values	Remarks • Method
pH	No data available	
Melting point/freezing point	No data available	
Boiling point / boiling range	100 °C / 212 °F	
Flash Point	> 100 °C / > 212 °F	
Evaporation Rate	No data available	
Flammability (solid, gas)	No data available	
Flammability limit in air		
Upper flammability limit:	No data available	
Lower flammability limit:	No data available	
Vapor Pressure	No data available	
Vapor Density	No data available	
Specific gravity	No data available	
Water Solubility	No data available	
Solubility in Other Solvents	No data available	
Partition coefficient	No data available	
Autoignition Temperature	No data available	
Decomposition Temperature	No data available	
Kinematic viscosity	No data available	

Density 1.05

10. Stability and Reactivity

10.1. Chemical Stability

Stable under recommended storage conditions.

10.2. Reactivity

No data available

10.3. Possibility of hazardous reactions

None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

10.4. Conditions to Avoid

Extremes of temperature and direct sunlight.

10.5. Incompatible Materials

Strong oxidizing agents. Strong acids. Strong bases.

10.6. Hazardous decomposition products

Carbon oxides. Nitrogen oxides (NOx). Oxides of sulfur. Fluorinated oxides.

11. Toxicological Information

11.1. Information on Likely Routes of Exposure

Product information No data available

Inhalation No data available.

Eye Contact Severely irritating to eyes.

Skin contact May cause irritation.

Ingestion No data available.

Component Information

Acute Toxicity

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
2-(2-Butoxyethoxy)ethanol 112-34-5	= 5660 mg/kg (Rat)	= 2700 mg/kg (Rabbit)	-
Sodium Decyl Sulfate 142-87-0	= 1950 mg/kg (Rat)	-	-

11.2. Information on Toxicological Effects

Symptoms No information available.

11.3. Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin Corrosion/Irritation Irritating to skin.
Serious eye damage/eye irritation Severely irritating to eyes.
Carcinogenicity No information available.
Reproductive Toxicity No information available.
STOT - Single Exposure No information available.
STOT - Repeated Exposure No information available.
Aspiration Hazard No information available.

11.4. Numerical Measures of Toxicity - Product information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral) 18148 mg/kg
ATEmix (dermal) 23945 mg/kg

12. Ecological Information

12.1. Ecotoxicity

Not classified.

Chemical name	Algae/aquatic plants	Fish	Crustacea
2-(2-Butoxyethoxy)ethanol 112-34-5	EC50 (96h) > 100 mg/L Desmodesmus subspicatus	LC50 (96h) static = 1300 mg/L Lepomis macrochirus	EC50 (48h) > 100 mg/L Daphnia magna EC50 (24h) = 2850 mg/L Daphnia magna
n-Butanol 71-36-3	EC50 (96h) > 500 mg/L Desmodesmus subspicatus EC50 (72h) > 500 mg/L Desmodesmus subspicatus	LC50 (96h) static = 1910000 µg/L Pimephales promelas LC50 (96h) static 1730 - 1910 mg/L Pimephales promelas LC50 (96h) static 100000 - 500000 µg/L Lepomis macrochirus LC50 (96h) flow-through = 1740 mg/L Pimephales promelas	EC50 (48h) Static 1897 - 2072 mg/L Daphnia magna EC50 (48h) = 1983 mg/L Daphnia magna
Sodium Hydrogen Carbonate 144-55-8	EC50 (120h) = 650 mg/L Nitzschia linearis	LC50 (96h) static 8250 - 9000 mg/L Lepomis macrochirus	EC50 (48h) = 2350 mg/L Daphnia magna
Hexamethylenetetramine 100-97-0	-	LC50 (96h) flow-through 44600 - 55600 mg/L Pimephales promelas	EC50 (48h) 29868 - 43390 mg/L Daphnia magna
Methylene chloride 75-09-2	EC50 (72h) > 500 mg/L Pseudokirchneriella subcapitata EC50 (96h) > 500 mg/L Pseudokirchneriella subcapitata	LC50 (96h) static = 193 mg/L Lepomis macrochirus LC50 (96h) flow-through = 193 mg/L Lepomis macrochirus LC50 (96h) static 262 - 855 mg/L Pimephales promelas LC50 (96h) flow-through 140.8 - 277.8 mg/L Pimephales promelas	EC50 (48h) Static 1532 - 1847 mg/L Daphnia magna EC50 (48h) = 190 mg/L Daphnia magna
1,3-Dichloropropene 542-75-6	EC50 (96h) 2.45 - 6.45 mg/L Pseudokirchneriella subcapitata EC50 (72h) 3.12 - 10.5 mg/L Pseudokirchneriella subcapitata	LC50 (96h) semi-static = 4.5 mg/L Oncorhynchus mykiss LC50 (96h) = 2 mg/L Oncorhynchus mykiss LC50 (96h) static 3.1 - 4.9 mg/L Oncorhynchus mykiss LC50 (96h) flow-through 0.211 - 0.271 mg/L Pimephales promelas LC50 (96h) static 1.52 - 2.68 mg/L Pimephales promelas LC50 (96h) static 5.1 - 6.8 mg/L Lepomis macrochirus	EC50 (48h) Static 0.063 - 0.129 mg/L Daphnia magna EC50 (48h) = 0.09 mg/L Daphnia magna

12.2. Persistence and Degradability
No information available.

12.3. Bioaccumulation
No information available.

12.4. Other Adverse Effects
No information available

13. Disposal Considerations

13.1. Waste Treatment Methods

Disposal of wastes	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated Packaging	Do not reuse container.

14. Transport Information

DOT	NOT REGULATED
TDG	NOT REGULATED
MEX	NOT REGULATED
ICAO (air)	NOT REGULATED
IATA	NOT REGULATED
IMDG	NOT REGULATED

15. Regulatory Information

15.1. International Inventories

TSCA	Complies
DSL/NDSL	Complies
ENCS	Does not comply
IECSC	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

15.2. US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
2-(2-Butoxyethoxy)ethanol - 112-34-5	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic health hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

15.3. US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals

Chemical name	California Proposition 65
Methylene chloride - 75-09-2	Carcinogen
1,3-Dichloropropene - 542-75-6	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
2-(2-Butoxyethoxy)ethanol 112-34-5	X	-	X
n-Butanol 71-36-3	X	X	X
1-(3-Chloroallyl)-3,5,7-triaza-1-azonia Adamantane chloride 4080-31-3	X	-	-
Hexamethylenetetramine 100-97-0	X	-	-
Methylene chloride 75-09-2	X	X	X
1,3-Dichloropropene 542-75-6	X	X	X

16. Other information, including date of preparation of the last revision

NFPA	**Health Hazards** 3	**Flammability** 1	**Instability** 0	**Physical and chemical properties** -
HMIS	**Health Hazards** 3	**Flammability** 1	**Physical Hazards** 0	**Personal Protection** X

Revision date 20-Mar-2018
Revision note No information available.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

APPENDIX C

WDNR SOIL BORING LOGS, MONITORING WELL CONSTRUCTION FORMS, AND WELL/DRILLHOLE/BOREHOLE FILLING AND SEALING REPORT FORMS

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B1**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Geoprobe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**775.0'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725780**
Long **2350076**
Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/48	NA		(0-9") Loam; brown; dry. (9"-1') Base Coarse Gravel (GM); with Sand, F-C; some Silt; gray; moist (1'-3') CLAY (CL) FILL/disturbed CLAY; Some Sand, F-C; Gravel and rock fragments dispersed throughout; red/brown; dry. (3'-4') CLAY (CL); Some Sand, F-C; red/brown; hard; dry. (4'-5') No recovery.	Loam GM CL			NA						Rock dense from 2.5'-3
2	60/60	NA	5	(5'-9'4") CLAY (CL); trace Sand, F-C; red/brown; hard; dry. (9'4"-10') Poorly-graded SAND (SP-SM), F-M; little Silt; moist-wet.	SP-SM			NA						No free water in sand
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis Stats. Completeion of this form is manatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not indended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐ Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B2**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Geoprobe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**777.5'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725778** Long **2350085**

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/60	NA		(0-1.5') LOAM; brown; dry. (1.5'-5') CLAY (CL); trace Sand, F-C; trace-little rock frags; red/brown; dry.	Loam CL			NA						Rocks (0.5" diameter) at 2'2" amd 4'3".
2	60/60	NA	5	(5'-10') CLAY (CL); Some Sand, F-C; little Gravel/rock fragments, F-M; brown; dry.				NA						Clay in 5-10' run is softer in consistency and higher in sand content than above. Water assumed to be at 9' based on change in consistency to very soft. Gravel dispersed from 7.5'-10'.
			10											

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐ Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		WP-B3

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Tony Kapugi Last Name Firm On-Site Environmental Services	11-7-20	11-7-20	Geoprobe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	777.5' Feet MSL	NA inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of NE 1/4 of Section 2, T 17, R 16
Lat 725780
Long 2350097

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	71	Oshkosh, Wisconsin

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/60	NA		(0-1'9") Loam; brown; dry. (1'9"-5') CLAY (CL) FILL/disturbed CLAY; Some Sand, F-C; dispersed gravel/rock fragments throughout run; brown/red; dry.	Loam CL			NA						
2	60/33	NA	5	(5'-7'9") CLAY (CL) FILL/disturbed CLAY; Some Sand, F-C; dispersed gravel/rock fragments throughout run; brown/red; dry. (7'9"-10') No recovery.				NA						Change to softer consistency at 5'8"-consistent with higher water content.
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐ Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B4**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Geoprobe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**777.5'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725778**
Long **3350114**

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/33	NA		(0-1.5') Loam; brown; dry. (1.5'-2'9") CLAY (CL); trace Sand, F-C; trace Gravel, F; red/brown; hard; dry. (2'9"-5') No recovery.	Loam CL			NA						Hit wood chunk at 1.5'
2	60/40	NA	5	(5'-8'4") CLAY (CL); Some Sand, F-C; brown; dry (8'4"-10') No Recovery.				NA						Clay in 5-10' run has more sand conent and softer consistency than above. 7'-7.5' has petroleum odor and black smearing. At bottom of run there is a " rock and tree wood.
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B5**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Geoprobe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**777.0'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725796**
Long **2350084**

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/51	NA		(0-7") Loam; brown; dry. (7"-1'1") Clay Loam; brown; dry. (1'1"-1'10") CLAY (CL) FILL/disturbed CLAY (CL); rock fragments/gravel dispersed through; red/brown; dry. (1'10"-2') Gravel Base Course (GW); white; dry. (2"-2'9") CLAY (CL) FILL/disturbed CLAY (CL); rock fragments/gravel dispersed through; red/brown; dry. (2'9"-4'3") CLAY (CL); red/brown; dry.	Loam CL			NA						
2	60/60	NA	5	(5'-10') CLAY (CL); trace Sand, F-C; red/brown/dry.				NA						
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐ Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B6**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Geoprobe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**777.0'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725796**
Long **2350102**
Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/60	NA		(0-1.5') CLAY (CL)/ Regraded material; trace Sand, F; organic debris, wood pieces, roots; brown; dry. (1.5'-2') Base Coarse Gravel (GW); white; dry. (2'-5') CLAY (CL); trace Sand, F-C; trace Gravel, F-C; brown/red; dry.	CL			NA						
					GW									
					CL									
2	60/60	NA	5	(5'-10') CLAY (CL); trace Sand, F-C; trace Gravel, F-C; brown/red; dry.				NA						
3	60/60	NA	10	(10'-11') CLAY (CL); trace Sand, F-C; trace Gravel, F-C; brown/red; dry. (11'-11'10") Poorly-graded SAND (SM), F-M; Some Silt; brown; wet. (11'10"-14'10") SILT (MH); with Clay/Clayey SILT ; orange mottling and barves visible; brown; wet. (14'10"-15') Poorly-graded SAND (SM); with Silt ; little Clay; brown; moist.	SM			NA						
					MH									
					SM									

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		**WP-B7**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **Tony Kapugi** Last Name Firm **On-Site Environmental Services**	**11-7-20**	**11-7-20**	**Hand Auger**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	**777.5'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17**, R **16**
Lat **725757**
Long **2350097**

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	9/9	NA		(0-9") Loam; brown; dry. Geosynthetic liner discovered at 9".	Loam			NA						
			5											
			10											

I hereby certify that the information on this form is true and correct to the best of my knowledge

Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐ Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Corporation		WP-B8

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Tony Kapugi Last Name Firm On-Site Environmental Services	11-7-20	11-7-20	Geoprobe

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	777.0' Feet MSL	NA inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐/N ☐
NE 1/4 of NE 1/4 of Section 2, T 17, R 16
Lat 725785
Long 2350100

Local Grid Location
☒ N _____ Feet ☐ S
☒ E _____ Feet ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	71	Oshkosh, Wisconsin

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	60/51	NA		(0-9") Loam; brown; dry. (9"-1'5") Clay Loam; brown; dry. (1'5"-5') CLAY (CL); trace Sand, F-C; trace rock frags; red/brown; hard; dry.	Loam CL			NA						
			5											
			10											

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Signature	Firm
S. Stephenson	GZA GeoEnvironmental, Inc.

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State of Wisconsin
Department of Natural Resources

Boring Number: WP-SB9
Soil Boring Log Information
Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		WP-SB9

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **E. Stapleton** Last Name Firm **GZA**	**8-14-21**	**8-14-21**	**Hand Auger**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		WP-SB9	_____ Feet	_____ Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C☐ /N☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____
Long _____

Local Grid Location
_____ Feet ☐ N ☐ S _____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
1 (0-1)	12/12	NA	0	1: Soft lean Clay (CL), some sand F-M, brown, moist	CL									
2 (1-2)	12/12	NA		2: Same as Above										Refusal at 2'

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State of Wisconsin
Department of Natural Resources

Soil Boring Log Information

Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		WP-SB10

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name **A. Amundson** Last Name Firm **GZA**	**6-17-22**	**6-17-22**	**Hand Auger**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			_____ Feet	_____ Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C☐ /N☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____ Long _____
Local Grid Location ☒N _____ Feet ☐S ☒E _____ Feet ☐W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
1	12/12		0	(0-1') Well graded fine to coarse sand (SW), with gravel fine, some silt, wet, loose	SW									
2	12/12			(1-2') Fine to coarse sand and gravel (SWG), brown, loose, wet	SWG									End of Boring
			5											
			10											
			15											
			20											

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State of Wisconsin
Department of Natural Resources

Boring Number: WP-MW-1
Soil Boring Log Information
Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		**WP-MW-1**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Last Name Firm **On-Site Environmental Services**	**8-14-21**	**8-14-21**	**GeoProbe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		WP-MW-1	_____ Feet	**777.5'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C☐ /N☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____
Long _____

Local Grid Location
_____ Feet ☐ N ☐ S
_____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
1 (0-5)	60/55	NA	0	1: (0-15") Silty Sandy Topsoil, dark brown, dry (15"-5') very stiff lean Clay (CL), little fine sand, trace gravel (angular dolomite), reddish brown, moist	Topsoil CL									
2 (5-10)	60/51	NA	5	2: (5'-6' 3") Same as above (6'3"-7'11") Soft lean Clay (CL), some sand F-M, little Silt, reddish brown, moist (7'11"-10') Silt (ML) with clay, little fine Sand, reddish brown, moist	ML									
3 (10-15)	60/43	NA	10	3: (10'-13'4") Soft lean Clay (CL), some Sand F-M, some Silt, reddish brown, moist to wet (13'4"-13'5") Sand Seam (13'5"-15') Soft lean Clay (CL), some Sand F-M, some Silt, reddish brown, moist to wet	CL SW CL									
4 (15-17)	24/24	NA	15	4: (15'-15'2") Same as Above (15'2"-16'3") Well graded Sand (SW) F-M, trace Clay, brown, wet (16'3"-16'8") Very stiff lean Clay (CL), some sand F-M, little silt, trace gravel, brown, wet (16'8"-17') Silt (ML) with clay, little sand fine, color transition to tan-gray, wet, dolomite gravel at lower 1"	SP CL ML									Refusal at 17' - likely bedrock

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Signature	Firm

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State of Wisconsin
Department of Natural Resources

Boring Number: WP-MW-2
Soil Boring Log Information
Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		**WP-MW-2**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Last Name Firm **On-Site Environmental Services**	**6-17-22**	**6-17-22**	**GeoProbe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		WP-MW-2	_____ Feet	**776.3'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C☐ /N☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____
Long _____

Local Grid Location
_____ Feet ☐ N ☐ S
_____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
1 (0-5)	60/54	NA	0	1: (0-1.5') Asphalt; crushed, black, dry (1.5'-2'8") Base Coarse;Silty Sand; with crushed rock fragements, light brown, dry (2'8"-4.5') Lean Clay (CL); little gravel fine to coarse, little sand coarse, brown/orange, dry, curshed rock at 4'	ASPHALT FILL CL									
2 (5-10)	60/60	NA	5	2: (5-8') Same as Above, hard, dry (8-9') Poorly Graded SAND (SP-SM), with silt, brown, moist (9-10') SILT (ML), brown with orange mottling, wet	SP-SM CL ML									
3 (10-15)	60/60	NA	10	3: (10-11.5') Same as Above, wet (11.5-13') Lean Clay (CL), trace sand fine to coarse, brown with orange mottling (13-15') SILT (ML), brown with orange mottling, moist, bottom 4" weathered rock	CL ML									
			15											End of Boring

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State of Wisconsin
Department of Natural Resources

Boring Number: WP-MW-3
Soil Boring Log Information
Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		**WP-MW-3**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Last Name Firm **On-Site Environmental Services**	**6-17-22**	**6-17-22**	**GeoProbe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		WP-MW-3	_____ Feet	**780.2'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐ /N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____ Long _____

Local Grid Location
_____ Feet ☐ N ☐ E
_____ Feet ☐ S ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
1 (0-5)	60/60	NA	0	1: (0-1.5') Clay loam (Topsoil), trace rock, dark brown, dry (1.5-5') lean Clay (CL);some gravel fine to medium, little sand coarse, rock fragments, hard, brown/orange, dry	TOPSOIL CL									
2 (5-10)	60/60	NA	5	2: (5-10') Same as Above; hard										
3 (10-15)	60/60	NA	10	3: (10-14.5') Same as Above; dry; hard (14.5-15') Poorly graded SAND (SP-SM) fine, with silt, brown, wet										
4 (15-20)	60/60	NA	15	4: (15-15.5') Same as Above; wet (15.5-17') SILT (ML), brown with gray mottling, wet (17-18') Well Graded SAND (SW) fine to coarse, with silt, trace-little clay, dark gray, wet (18-20') SILT (ML), dark gray, wet	SP-SM ML SW ML									
			20	End of Boring										

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Signature	Firm

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State of Wisconsin
Department of Natural Resources

Boring Number: WP-MW-4
Soil Boring Log Information
Form 4400-122 Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Managment ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
OshKosh Defense - West Plant		**WP-MW-4**

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
First Name Last Name Firm **On-Site Environmental Services**	**6-17-22**	**6-17-22**	**GeoProbe**

WI Unique Well No.	DNR Well ID No.	Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		WP-MW-4	_____ Feet	**775.9'** Feet MSL	**NA** inches

Local Grid Origin ☐ (estimated: ☒) or Boring Location ☐
State Plane _____ N, _____ E S ☐/C ☐ /N ☐
NE 1/4 of **NE** 1/4 of Section **2**, T **17N**, R **16**
Lat _____
Long _____

Local Grid Location
_____ Feet ☐ N ☐ S
_____ Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/or Village
	71	**71**	**Oshkosh, Wisconsin**

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Compressive Strength	Moisture Content	Liquid Limit	Plastic Limit	P200	RQD/ Comments
1 (0-5)	60/60	NA	0	1: (0-0.5') Topsoil - clay loam, brown, dry (0.5-5') Lean Clay (CL), some gravel fine to medium, little sand coarse, brown/orange, hard, dry	TOPSOIL CL									
2 (5-10)	60/60	NA	5	2: (5-10') Lean Clay (CL), little gravel fine to medium, little sand coarse, fragmented rock at 8', hard, dry										
3 (10-15)	60/42	NA	10	3: (10-11') Silt (ML), brown, moist (11-11'8") Poorly graded Sand (SP-SM), with silt, brown, wet (11'8"-12') Silt (ML), brown, moist (12-12.5") Well graded Sand fine to coarse (SW), with silt, brown, wet (12'5"- 15') lean Clay (CL), with gravel fine to medium, some sand coarse, brown, dry	ML SP-SM ML SW CL									
4 (15-20)	60/60	NA	15	4: (15-18') Poorly graded fine sand (SP-SM), with silt, brown, wet (18-18'4") Well graded gravel (GW-GM), angular, with silt, wet (18'4"-19'4") Lean Clay (CL), little gravel fine to medium, little sand coarse, hard, gray 19'4"-20') Well graded Gravel (GW-GM), angular, with silt, wet	SP-SM GW-GM CL GW-GM									
			20	End of Boring										

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Signature	Firm

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State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Oshkosh Defense- West Plant	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: WP-MW-1
Facility License, Permit or Monitoring No.: MW-1	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: _____ DNR Well ID No.: _____
Facility ID: _____	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed: 08/14/2021 (m m / d d / y y y y)
Type of Well: Well Code ____ / ____	Section Location of Waste/Source: NE 1/4 of NE 1/4 of Sec. 2, T. 17 N, R. 16 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm: Gage Kapugi; On-Site Environmental
Distance from Waste/Source _____ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number: _____

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☒ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50
Hollow Stem Auger ☒ 41
Other ☐ ____

15. Drilling fluid used: Water ☐ 02 Air ☐ 01
Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
_____

E. Bentonite seal, top _____ ft. MSL or ____ 0 ft.

F. Fine sand, top _____ ft. MSL or ____ 4 ft.

G. Filter pack, top _____ ft. MSL or ____ 5 ft.

H. Screen joint, top _____ ft. MSL or ____ 7 ft.

I. Well bottom _____ ft. MSL or ____ 17 ft.

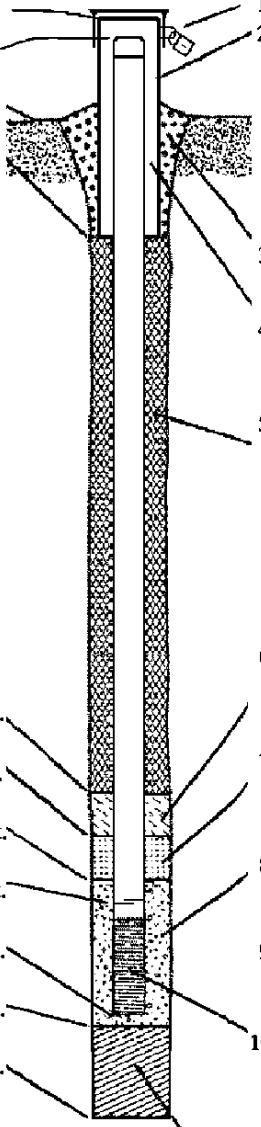
J. Filter pack, bottom _____ ft. MSL or ____ 17 ft.

K. Borehole, bottom _____ ft. MSL or ____ 17 ft.

L. Borehole, diameter 8.25 in.

M. O.D. well casing 2.37 in.

N. I.D. well casing 2.05 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 1 ft.
c. Material: Steel ☒ 04 Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____
3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐ ____
4. Material between well casing and protective pipe: Bentonite ☒ 30 Other ☐ ____
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 5 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐ ____
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Red Flint
b. Volume added 3.0 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐ ____
10. Screen material: 2" Schedule 40 PVC
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): Soil None ☐ 14 Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
Elizabeth Stapleton	GZA GeoEnvironmental, Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Oshkosh Defense- West Plant	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: WP-MW-2	
Facility License, Permit or Monitoring No.: MW-2	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.	DNR Well ID No.
Facility ID	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed: 06 / 17 / 2022 (m m / d d / y y y y)	
Type of Well: Well Code ____ / ____	Section Location of Waste/Source: NE 1/4 of NE 1/4 of Sec. 2, T. 17 N, R. 16 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm: Tony Kapugi; On-Site Environmental	
Distance from Waste/Source _____ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number	

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☒ 41 Other ☐ _____

15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
_____

E. Bentonite seal, top _____ ft. MSL or ____0 ft.

F. Fine sand, top _____ ft. MSL or ____3 ft.

G. Filter pack, top _____ ft. MSL or ____4 ft.

H. Screen joint, top _____ ft. MSL or ____6 ft.

I. Well bottom _____ ft. MSL or ____16 ft.

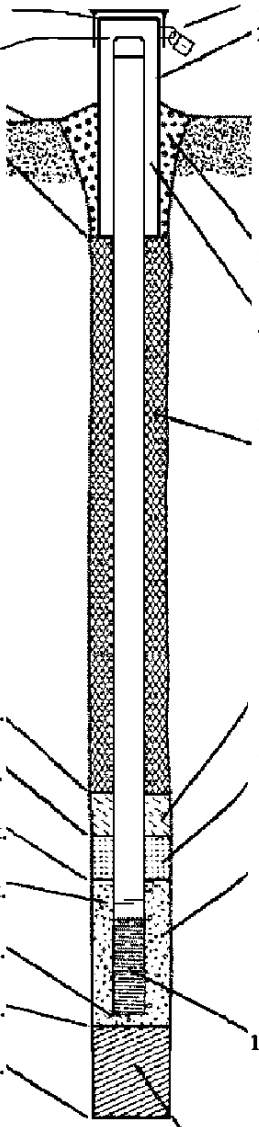
J. Filter pack, bottom _____ ft. MSL or ____16 ft.

K. Borehole, bottom _____ ft. MSL or ____16 ft.

L. Borehole, diameter 8.00 in.

M. O.D. well casing 2.35 in.

N. I.D. well casing 2.05 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 1 ft.
c. Material: Steel ☒ 04 Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☒ 30 Other ☐ ____

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 1.5 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. NSF 30x100
b. Volume added 0.25 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. NSF #5
b. Volume added 3.25 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐ ____

10. Screen material: 2" Schedule 40 PVC
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 14 Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
Elizabeth Stapleton	GZA GeoEnvironmental, Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Oshkosh Defense- West Plant	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: WP-MW-3
Facility License, Permit or Monitoring No.: MW-3	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: _____ DNR Well ID No.: _____
Facility ID: _____	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed: 06/17/2022 (m m / d d / y y y y)
Type of Well: Well Code ____ / ____	Section Location of Waste/Source: NE 1/4 of NE 1/4 of Sec. 2, T. 17 N, R. 16 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm: Tony Kapugi — On-Site Environmental
Distance from Waste/Source _____ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number: _____

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 Hollow Stem Auger ☒ 41 Other ☐ _____

15. Drilling fluid used: Water ☐ 02 Air ☐ 01 Drilling Mud ☐ 03 None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis, if required):
_____

E. Bentonite seal, top _____ ft. MSL or 0.50 ft.

F. Fine sand, top _____ ft. MSL or 5 ft.

G. Filter pack, top _____ ft. MSL or 6 ft.

H. Screen joint, top _____ ft. MSL or 8 ft.

I. Well bottom _____ ft. MSL or 18 ft.

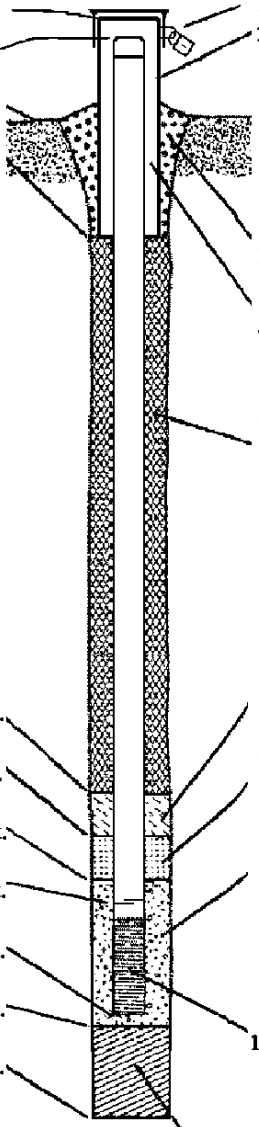
J. Filter pack, bottom _____ ft. MSL or 18 ft.

K. Borehole, bottom _____ ft. MSL or 18 ft.

L. Borehole, diameter 8.00 in.

M. O.D. well casing 2.35 in.

N. I.D. well casing 2.05 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 1 ft.
c. Material: Steel ☒ 04 Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 Concrete ☒ 01 Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☒ 30 Other ☐ ____

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 1.5 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 Tremie pumped ☐ 02 Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. NSF 30x100
b. Volume added 0.25 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. NSF #5
b. Volume added 3.5 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23 Flush threaded PVC schedule 80 ☐ 24 Other ☐ ____

10. Screen material: 2" Schedule 40 PVC
a. Screen type: Factory cut ☒ 11 Continuous slot ☐ 01 Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 14 Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
Elizabeth Stapleton	GZA GeoEnvironmental, Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Oshkosh Defense- West Plant	Local Grid Location of Well: _____ ft. ☐ N. ☐ S. _____ ft. ☐ E. ☐ W.	Well Name: WP-MW-4	
Facility License, Permit or Monitoring No.: MW-4	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: _____	DNR Well ID No.: _____
Facility ID: _____	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed: 06 / 17 / 2022 (m m / d d / y y y y)	
Type of Well: Well Code ____ / ____	Section Location of Waste/Source: NE 1/4 of NE 1/4 of Sec. 2, T. 17 N, R. 16 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm: Tony Kapugi — On-Site Environmental	
Distance from Waste/Source _____ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number: _____	

A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 | Hollow Stem Auger ☒ 41 | Other ☐ ____

15. Drilling fluid used: Water ☐ 02 | Air ☐ 01 | Drilling Mud ☐ 03 | None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top _____ ft. MSL or 0.50 ft.

F. Fine sand, top _____ ft. MSL or 3 ft.

G. Filter pack, top _____ ft. MSL or 4 ft.

H. Screen joint, top _____ ft. MSL or 6 ft.

I. Well bottom _____ ft. MSL or 16 ft.

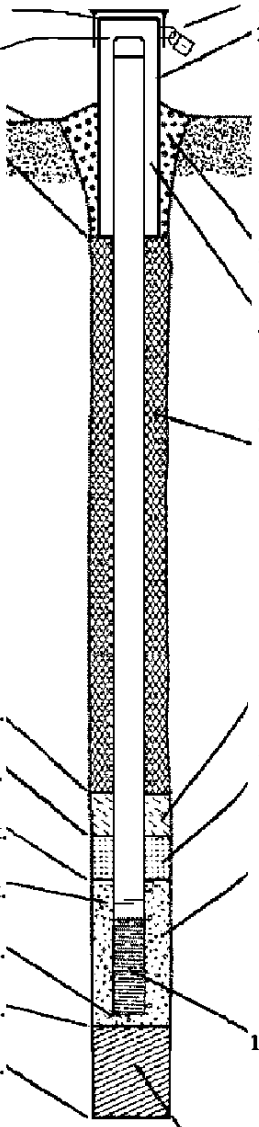
J. Filter pack, bottom _____ ft. MSL or 16 ft.

K. Borehole, bottom _____ ft. MSL or 16 ft.

L. Borehole, diameter 8.00 in.

M. O.D. well casing 2.35 in.

N. I.D. well casing 2.05 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 8 in.
b. Length: 1 ft.
c. Material: Steel ☒ 04 | Other ☐ ____
d. Additional protection? ☐ Yes ☐ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 | Concrete ☒ 01 | Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☒ 30 | Other ☐ ____

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 1.25 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 | Tremie pumped ☐ 02 | Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. _____ Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. NSF 30x100
b. Volume added 0.25 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. NSF #5
b. Volume added 3.25 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23 | Flush threaded PVC schedule 80 ☐ 24 | Other ☐ ____

10. Screen material: 2" Schedule 40 PVC
a. Screen type: Factory cut ☒ 11 | Continuous slot ☐ 01 | Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 14 | Other ☐ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Elizabeth Stapleton Yp | Firm: GZA GeoEnvironmental, Inc.

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼ SW	¼ SW	Section	Township	Range
or Gov't Lot #		35	18 N	16 ☒ E ☐ W

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
10'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B1
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	10'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B2
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
10'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	10'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions) _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B3
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
10'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	10'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B4
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
10'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	10'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B5
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
10'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	10'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B6
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
15'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	15'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions): _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
SW	SW	35	18 N	16 ☒ E ☐ W

or Gov't Lot #

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B7
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☐ Drilled ☐ Driven (Sandpoint) ☐ Dug
☒ Other (specify): Hand Auger

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
1'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	1'	0.2 bags	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

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☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☒ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #
Winnebago	___ ___ ___ ___ ___	

Latitude / Longitude (see instructions) _____ N _____ W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼ SW	¼ SW	Section	Township	Range
or Gov't Lot #		35	18 N	16 ☒ E ☐ W

Well Street Address: 2830 Hughes Street

Well City, Village or Town	Well ZIP Code
Oshkosh	54902

Subdivision Name	Lot #

Reason for Removal from Service	WI Unique Well # of Replacement Well
Soil Boring	___ ___ ___ ___ ___

3. Filled & Sealed Well / Drillhole / Borehole Information

☐ Monitoring Well
☐ Water Well
☒ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 11/7/2020

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☒ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
5'	NA

Lower Drillhole Diameter (in.)	Casing Depth (ft.)
	NA

Was well annular space grouted? ☐ Yes ☒ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

2. Facility / Owner Information

Facility Name: West Plant
Facility ID (FID or PWS):
License/Permit/Monitoring #: WP-B8
Original Well Owner:
Present Well Owner: Oshkosh Corporation
Mailing Address of Present Owner:

City of Present Owner	State	ZIP Code
Oshkosh	WI	54209

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☐ Yes	☐ No	☒ N/A
Liner(s) removed?	☐ Yes	☐ No	☒ N/A
Liner(s) perforated?	☐ Yes	☐ No	☒ N/A
Screen removed?	☐ Yes	☐ No	☒ N/A
Casing left in place?	☐ Yes	☐ No	☒ N/A
Was casing cut off below surface?	☐ Yes	☐ No	☒ N/A
Did sealing material rise to surface?	☐ Yes	☐ No	☒ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☒ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☒ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☒ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☐ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☐ Concrete
☐ Sand-Cement (Concrete) Grout ☐ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☒ Bentonite Chips ☐ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

	From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Bentonite Chips	Surface	5'	1 bag	

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
Tony Kapugi- On-Site Environmental		11/7/2020

Street or Route	Telephone Number
P.O. Box 280	(608) 837-8992

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
Sun Prairie	WI	53290		

DNR Use Only

Date Received	Noted By

Comments:

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL REPORTS
AND CHAIN-OF-CUSTODY DOCUMENTATION

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: Oshkosh Corporation

Project Number: 20.0157080

Lot Number:**VK12014**

Date Completed:12/07/2020
Revision Date: 12/08/2020

N. Saikaly

12/08/2020 11:50 AM
Approved and released by:
Project Manager II: **Nisreen Saikaly**

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: VK12014

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W" qualifier

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Sample Summary
GZA GeoEnvironmental, Inc.
Lot Number: VK12014
Project Name: Oshkosh Corporation
Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP Equipment Blank DS1	Aqueous	11/07/2020 0800	11/10/2020
002	WP Equipment Blank T2	Aqueous	11/07/2020 0810	11/10/2020
003	WP B-6 (2-3')	Solid	11/07/2020 0825	11/10/2020
004	WP B-6 (6-7')	Solid	11/07/2020 0830	11/10/2020
005	WP B-4 (2-3')	Solid	11/07/2020 0840	11/10/2020
006	WP B-4 (5-6')	Solid	11/07/2020 0845	11/10/2020
007	WP B-3 (2-3')	Solid	11/07/2020 0905	11/10/2020
008	WP B-3 (5-6')	Solid	11/07/2020 0910	11/10/2020
009	WP B-5 (2-3')	Solid	11/07/2020 0925	11/10/2020
010	WP B-5 (6-7')	Solid	11/07/2020 0930	11/10/2020
011	WP B-2 (2-3')	Solid	11/07/2020 0940	11/10/2020
012	WP B-2 (5-6')	Solid	11/07/2020 0945	11/10/2020
013	WP B-1 (1-2')	Solid	11/07/2020 1000	11/10/2020
014	WP B-1 (5-6')	Solid	11/07/2020 1005	11/10/2020
015	WP B-7 (0-9')	Solid	11/07/2020 1015	11/10/2020

(15 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: VK12014

Project Name: Oshkosh Corporation

Project Number: 20.0157080

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	WP B-4 (2-3')	Solid	PFHpA	PFAS by ID	2.1		ug/kg	16
005	WP B-4 (2-3')	Solid	PFHxA	PFAS by ID	3.5		ug/kg	16
005	WP B-4 (2-3')	Solid	PFPeA	PFAS by ID	3.0		ug/kg	16
007	WP B-3 (2-3')	Solid	6:2 FTS	PFAS by ID	4.2		ug/kg	18
007	WP B-3 (2-3')	Solid	PFHpA	PFAS by ID	4.2		ug/kg	18
007	WP B-3 (2-3')	Solid	PFHxA	PFAS by ID	3.8		ug/kg	18
007	WP B-3 (2-3')	Solid	PFOA	PFAS by ID	4.5		ug/kg	18
007	WP B-3 (2-3')	Solid	PFPeA	PFAS by ID	2.8		ug/kg	18
008	WP B-3 (5-6')	Solid	6:2 FTS	PFAS by ID	2.5		ug/kg	20
008	WP B-3 (5-6')	Solid	PFHpA	PFAS by ID	1.7		ug/kg	20
008	WP B-3 (5-6')	Solid	PFHxA	PFAS by ID	3.2		ug/kg	20
008	WP B-3 (5-6')	Solid	PFPeA	PFAS by ID	4.6		ug/kg	20
011	WP B-2 (2-3')	Solid	6:2 FTS	PFAS by ID	5.6		ug/kg	24
013	WP B-1 (1-2')	Solid	PFHxA	PFAS by ID	1.1		ug/kg	28
013	WP B-1 (1-2')	Solid	PFPeA	PFAS by ID	2.9		ug/kg	28
013	WP B-1 (1-2')	Solid	PFOS	PFAS by ID	1.3		ug/kg	28

(16 detections)

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-001**

Description: **WP Equipment Blank DS1** Matrix: **Aqueous**

Date Sampled: **11/07/2020 0800** Project Name: **Oshkosh Corporation**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/19/2020 1732	MMM	11/18/2020 1701	73958

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.4	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.4	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		94	25-150
13C2_6:2FTS		91	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		79	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		83	25-150
13C5_PFHxA		82	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		84	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-001**

Description: **WP Equipment Blank DS1** Matrix: **Aqueous**

Date Sampled: **11/07/2020 0800** Project Name: **Oshkosh Corporation**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		88	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		91	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-002**

Description: **WP Equipment Blank T2** Matrix: **Aqueous**

Date Sampled: **11/07/2020 0810** Project Name: **Oshkosh Corporation**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/19/2020 1742	MMM	11/18/2020 1701	73958

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		9.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		9.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		9.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		9.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		9.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		9.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		9.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		9.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		9.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.8	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		96	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		71	25-150
13C2_PFTeDA		64	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		74	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		87	25-150
13C4_PFHpA		86	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		80	25-150
13C6_PFDA		74	25-150
13C7_PFUdA		81	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-002**

Description: **WP Equipment Blank T2** Matrix: **Aqueous**

Date Sampled: **11/07/2020 0810** Project Name: **Oshkosh Corporation**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		83	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		88	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-003**

Description: **WP B-6 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0825** Project Name: **Oshkosh Corporation** % Solids: **84.6** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 1952	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		1.9	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		1.9	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		1.9	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		1.9	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		1.9	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		3.8	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		1.9	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		1.9	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		1.9	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		0.95	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		0.95	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	25-150
13C2_6:2FTS		80	25-150
13C2_8:2FTS		79	25-150
13C2_PFDoA		83	25-150
13C2_PFTeDA		77	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		68	25-150
13C3-HFPO-DA		85	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		78	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-003**	
Description: **WP B-6 (2-3')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 0825**	Project Name: **Oshkosh Corporation**	% Solids: **84.6**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		80	25-150
13C8_PFOS		74	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		65	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-004**

Description: **WP B-6 (6-7')** Matrix: **Solid**

Date Sampled: **11/07/2020 0830** Project Name: **Oshkosh Corporation** % Solids: **84.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2002	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.1	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.1	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.1	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.3	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.1	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.1	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.1	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.1	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		82	25-150
13C2_6:2FTS		82	25-150
13C2_8:2FTS		78	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		76	25-150
13C3_PFBS		65	25-150
13C3_PFHxS		74	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		74	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		75	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-004**

Description: **WP B-6 (6-7')** Matrix: **Solid**

Date Sampled: **11/07/2020 0830** Project Name: **Oshkosh Corporation** % Solids: **84.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		83	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		67	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
W = Reported on wet weight basis

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Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-005**

Description: **WP B-4 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0840** Project Name: **Oshkosh Corporation** % Solids: **79.9** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2013	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.0	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.0	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.0	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		3.9	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.0	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.0	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.0	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.1**		**0.99**	**ug/kg**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.5**		**0.99**	**ug/kg**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.0**		**0.99**	**ug/kg**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		0.99	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		0.99	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		87	25-150
13C2_6:2FTS		80	25-150
13C2_8:2FTS		85	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		78	25-150
13C3_PFBS		70	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		76	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		76	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-005**

Description: **WP B-4 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0840** Project Name: **Oshkosh Corporation** % Solids: **79.9** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		79	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		79	25-150
d5-EtFOSAA		79	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-007**

Description: **WP B-3 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0905** Project Name: **Oshkosh Corporation** % Solids: **75.9** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2024	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.6	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.6	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.6	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**4.2**		**2.6**	**ug/kg**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.6	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		5.2	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.6	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.6	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.6	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**4.2**		**1.3**	**ug/kg**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.8**		**1.3**	**ug/kg**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.5**		**1.3**	**ug/kg**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.8**		**1.3**	**ug/kg**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.3	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		93	25-150
13C2_6:2FTS		88	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		82	25-150
13C4_PFHpA		80	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		79	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-007**

Description: **WP B-3 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0905** Project Name: **Oshkosh Corporation** % Solids: **75.9** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		84	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		85	25-150
d5-EtFOSAA		85	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-008**

Description: **WP B-3 (5-6')** Matrix: **Solid**

Date Sampled: **11/07/2020 0910** Project Name: **Oshkosh Corporation** % Solids: **80.5** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2034	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.1	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.1	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**2.5**		**2.1**	**ug/kg**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.1	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.1	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.1	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.1	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.7**		**1.0**	**ug/kg**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**3.2**		**1.0**	**ug/kg**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.6**		**1.0**	**ug/kg**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.0	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		86	25-150
13C2_6:2FTS		78	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		70	25-150
13C3_PFHxS		74	25-150
13C3-HFPO-DA		86	25-150
13C4_PFBA		78	25-150
13C4_PFHpA		77	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		77	25-150
13C7_PFUdA		79	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-008**	
Description: **WP B-3 (5-6')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 0910**	Project Name: **Oshkosh Corporation**	% Solids: **80.5**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		84	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		77	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-009**

Description: **WP B-5 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0925** Project Name: **Oshkosh Corporation** % Solids: **85.7** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2045	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.4	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.4	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.4	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.9	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.4	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.4	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.4	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.2	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		84	25-150
13C2_6:2FTS		78	25-150
13C2_8:2FTS		82	25-150
13C2_PFDoA		76	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		62	25-150
13C3_PFHxS		70	25-150
13C3-HFPO-DA		80	25-150
13C4_PFBA		73	25-150
13C4_PFHpA		73	25-150
13C5_PFHxA		78	25-150
13C5_PFPeA		74	25-150
13C6_PFDA		70	25-150
13C7_PFUdA		75	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-009**	
Description: **WP B-5 (2-3')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 0925**	Project Name: **Oshkosh Corporation**	% Solids: **85.7**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		73	25-150
13C8_PFOSA		87	10-150
13C9_PFNA		75	25-150
d5-EtFOSAA		71	25-150
d3-MeFOSAA		70	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-011**

Description: **WP B-2 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0940** Project Name: **Oshkosh Corporation** % Solids: **84.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	12/04/2020 0032	MMM	12/01/2020 1438	75092

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.0	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.0	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**5.6**		**2.0**	**ug/kg**	**1**
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.0	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.1	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.0	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.0	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.0	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.0	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.0	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	25-150
13C2_6:2FTS		102	25-150
13C2_8:2FTS		96	25-150
13C2_PFDoA		103	25-150
13C2_PFTeDA		107	25-150
13C3_PFBS		99	25-150
13C3_PFHxS		102	25-150
13C3-HFPO-DA		108	25-150
13C4_PFBA		104	25-150
13C4_PFHpA		108	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		109	25-150
13C6_PFDA		105	25-150
13C7_PFUdA		112	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
W = Reported on wet weight basis

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-011**

Description: **WP B-2 (2-3')** Matrix: **Solid**

Date Sampled: **11/07/2020 0940** Project Name: **Oshkosh Corporation** % Solids: **84.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		105	25-150
13C8_PFOS		90	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-012**

Description: **WP B-2 (5-6')** Matrix: **Solid**

Date Sampled: **11/07/2020 0945** Project Name: **Oshkosh Corporation** % Solids: **83.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2056	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.4	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.4	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.4	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.4	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.8	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.4	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.4	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.4	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.2	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.2	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		85	25-150
13C2_6:2FTS		72	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		81	25-150
13C2_PFTeDA		79	25-150
13C3_PFBS		67	25-150
13C3_PFHxS		71	25-150
13C3-HFPO-DA		84	25-150
13C4_PFBA		75	25-150
13C4_PFHpA		75	25-150
13C5_PFHxA		76	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		76	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-012**

Description: **WP B-2 (5-6')** Matrix: **Solid**

Date Sampled: **11/07/2020 0945** Project Name: **Oshkosh Corporation** % Solids: **83.0** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		77	25-150
13C8_PFOS		72	25-150
13C8_PFOSA		86	10-150
13C9_PFNA		77	25-150
d5-EtFOSAA		73	25-150
d3-MeFOSAA		74	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-013**

Description: **WP B-1 (1-2')** Matrix: **Solid**

Date Sampled: **11/07/2020 1000** Project Name: **Oshkosh Corporation** % Solids: **82.2** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2117	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		1.8	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		1.8	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		1.8	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		1.8	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		1.8	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		3.7	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		1.8	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		1.8	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		1.8	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**1.1**		**0.92**	**ug/kg**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.9**		**0.92**	**ug/kg**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		0.92	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**1.3**		**0.92**	**ug/kg**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		91	25-150
13C2_6:2FTS		79	25-150
13C2_8:2FTS		87	25-150
13C2_PFDoA		85	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		76	25-150
13C3-HFPO-DA		83	25-150
13C4_PFBA		77	25-150
13C4_PFHpA		78	25-150
13C5_PFHxA		84	25-150
13C5_PFPeA		75	25-150
13C6_PFDA		83	25-150
13C7_PFUdA		80	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-013**	
Description: **WP B-1 (1-2')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 1000**	Project Name: **Oshkosh Corporation**	% Solids: **82.2**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		78	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		82	25-150
d5-EtFOSAA		83	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-014**

Description: **WP B-1 (5-6')** Matrix: **Solid**

Date Sampled: **11/07/2020 1005** Project Name: **Oshkosh Corporation** % Solids: **82.8** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2127	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.5	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.5	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.5	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.5	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.5	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		5.0	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.5	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.5	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.5	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.3	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.3	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		88	25-150
13C2_6:2FTS		84	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		74	25-150
13C3_PFHxS		73	25-150
13C3-HFPO-DA		88	25-150
13C4_PFBA		80	25-150
13C4_PFHpA		79	25-150
13C5_PFHxA		86	25-150
13C5_PFPeA		81	25-150
13C6_PFDA		82	25-150
13C7_PFUdA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-014**	
Description: **WP B-1 (5-6')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 1005**	Project Name: **Oshkosh Corporation**	% Solids: **82.8**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		85	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		90	10-150
13C9_PFNA		80	25-150
d5-EtFOSAA		82	25-150
d3-MeFOSAA		76	25-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range
ND = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%
H = Out of holding time	W = Reported on wet weight basis	

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.** Laboratory ID: **VK12014-015**

Description: **WP B-7 (0-9')** Matrix: **Solid**

Date Sampled: **11/07/2020 1015** Project Name: **Oshkosh Corporation** % Solids: **86.7** **11/13/2020 0210**

Date Received: **11/10/2020** Project Number: **20.0157080**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	11/23/2020 2138	SES	11/21/2020 1228	74267

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		2.2	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		2.2	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.2	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		2.2	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		4.4	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		2.2	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		2.2	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		2.2	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		1.1	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		1.1	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		89	25-150
13C2_6:2FTS		88	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		88	25-150
13C2_PFTeDA		83	25-150
13C3_PFBS		71	25-150
13C3_PFHxS		81	25-150
13C3-HFPO-DA		93	25-150
13C4_PFBA		82	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		88	25-150
13C5_PFPeA		84	25-150
13C6_PFDA		86	25-150
13C7_PFUdA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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PFAS by LC/MS/MS

Client: **GZA GeoEnvironmental, Inc.**		Laboratory ID: **VK12014-015**	
Description: **WP B-7 (0-9')**		Matrix: **Solid**	
Date Sampled: **11/07/2020 1015**	Project Name: **Oshkosh Corporation**	% Solids: **86.7**	**11/13/2020 0210**
Date Received: **11/10/2020**	Project Number: **20.0157080**		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		86	25-150
13C8_PFOS		78	25-150
13C8_PFOSA		92	10-150
13C9_PFNA		83	25-150
d5-EtFOSAA		88	25-150
d3-MeFOSAA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: VQ73958-001
Batch: 73958
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/18/2020 1701

Parameter	Result	Q	Dil	LOQ	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	ng/L	11/19/2020 1556
11Cl-PF3OUdS	ND		1	8.0	ng/L	11/19/2020 1556
8:2 FTS	ND		1	8.0	ng/L	11/19/2020 1556
6:2 FTS	ND		1	8.0	ng/L	11/19/2020 1556
4:2 FTS	ND		1	8.0	ng/L	11/19/2020 1556
GenX	ND		1	8.0	ng/L	11/19/2020 1556
ADONA	ND		1	8.0	ng/L	11/19/2020 1556
EtFOSAA	ND		1	8.0	ng/L	11/19/2020 1556
MeFOSAA	ND		1	8.0	ng/L	11/19/2020 1556
PFBS	ND		1	4.0	ng/L	11/19/2020 1556
PFDS	ND		1	4.0	ng/L	11/19/2020 1556
PFHpS	ND		1	4.0	ng/L	11/19/2020 1556
PFNS	ND		1	4.0	ng/L	11/19/2020 1556
PFOSA	ND		1	4.0	ng/L	11/19/2020 1556
PFPeS	ND		1	4.0	ng/L	11/19/2020 1556
PFHxS	ND		1	4.0	ng/L	11/19/2020 1556
PFBA	ND		1	4.0	ng/L	11/19/2020 1556
PFDA	ND		1	4.0	ng/L	11/19/2020 1556
PFDoA	ND		1	4.0	ng/L	11/19/2020 1556
PFHpA	ND		1	4.0	ng/L	11/19/2020 1556
PFHxA	ND		1	4.0	ng/L	11/19/2020 1556
PFNA	ND		1	4.0	ng/L	11/19/2020 1556
PFOA	ND		1	4.0	ng/L	11/19/2020 1556
PFPeA	ND		1	4.0	ng/L	11/19/2020 1556
PFTeDA	ND		1	4.0	ng/L	11/19/2020 1556
PFTrDA	ND		1	4.0	ng/L	11/19/2020 1556
PFUdA	ND		1	4.0	ng/L	11/19/2020 1556
PFOS	ND		1	4.0	ng/L	11/19/2020 1556

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		85	25-150
13C2_6:2FTS		97	25-150
13C2_8:2FTS		93	25-150
13C2_PFDoA		73	25-150
13C2_PFTeDA		73	25-150
13C3_PFBS		76	25-150
13C3_PFHxS		78	25-150
13C3-HFPO-DA		89	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		87	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		82	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: VQ73958-001
Batch: 73958
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/18/2020 1701

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	25-150
13C7_PFUdA		71	25-150
13C8_PFOA		84	25-150
13C8_PFOS		76	25-150
13C8_PFOSA		93	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		86	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ73958-002
Batch: 73958
Analytical Method: PFAS by ID SOP
Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/18/2020 1701

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9Cl-PF3ONS	15	18		1	121	50-150	11/19/2020 1606
11Cl-PF3OUdS	15	16		1	109	50-150	11/19/2020 1606
8:2 FTS	15	20		1	128	50-150	11/19/2020 1606
6:2 FTS	15	16		1	108	50-150	11/19/2020 1606
4:2 FTS	15	16		1	105	50-150	11/19/2020 1606
GenX	32	34		1	106	50-150	11/19/2020 1606
ADONA	15	21		1	142	50-150	11/19/2020 1606
EtFOSAA	16	18		1	110	50-150	11/19/2020 1606
MeFOSAA	16	18		1	110	50-150	11/19/2020 1606
PFBS	14	18		1	127	50-150	11/19/2020 1606
PFDS	15	20		1	127	50-150	11/19/2020 1606
PFHpS	15	18		1	118	50-150	11/19/2020 1606
PFNS	15	21		1	138	50-150	11/19/2020 1606
PFOSA	16	17		1	109	50-150	11/19/2020 1606
PFPeS	15	21		1	139	50-150	11/19/2020 1606
PFHxS	15	16		1	112	50-150	11/19/2020 1606
PFBA	16	20		1	128	50-150	11/19/2020 1606
PFDA	16	21		1	130	50-150	11/19/2020 1606
PFDoA	16	21		1	134	50-150	11/19/2020 1606
PFHpA	16	20		1	125	50-150	11/19/2020 1606
PFHxA	16	19		1	118	50-150	11/19/2020 1606
PFNA	16	19		1	121	50-150	11/19/2020 1606
PFOA	16	18		1	113	50-150	11/19/2020 1606
PFPeA	16	20		1	125	50-150	11/19/2020 1606
PFTeDA	16	21		1	129	50-150	11/19/2020 1606
PFTrDA	16	20		1	125	50-150	11/19/2020 1606
PFUdA	16	20		1	126	50-150	11/19/2020 1606
PFOS	15	19		1	131	50-150	11/19/2020 1606

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		87	25-150
13C2_6:2FTS		88	25-150
13C2_8:2FTS		84	25-150
13C2_PFDoA		66	25-150
13C2_PFTeDA		67	25-150
13C3_PFBS		66	25-150
13C3_PFHxS		68	25-150
13C3-HFPO-DA		92	25-150
13C4_PFBA		80	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		81	25-150
13C5_PFPeA		75	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ73958-002
Batch: 73958
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/18/2020 1701

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		71	25-150
13C7_PFUdA		72	25-150
13C8_PFOA		83	25-150
13C8_PFOS		60	25-150
13C8_PFOSA		88	10-150
13C9_PFNA		88	25-150
d5-EtFOSAA		74	25-150
d3-MeFOSAA		79	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: VQ74267-001
Batch: 74267
Analytical Method: PFAS by ID SOP
Matrix: Solid
Prep Method: SOP SPE
Prep Date: 11/21/2020 1228

Parameter	Result	Q	Dil	LOQ	Units	Analysis Date
9Cl-PF3ONS	ND		1	2.0	ug/kg	11/23/2020 1339
11Cl-PF3OUdS	ND		1	2.0	ug/kg	11/23/2020 1339
8:2 FTS	ND		1	2.0	ug/kg	11/23/2020 1339
6:2 FTS	ND		1	2.0	ug/kg	11/23/2020 1339
4:2 FTS	ND		1	2.0	ug/kg	11/23/2020 1339
GenX	ND		1	4.0	ug/kg	11/23/2020 1339
ADONA	ND		1	2.0	ug/kg	11/23/2020 1339
EtFOSAA	ND		1	2.0	ug/kg	11/23/2020 1339
MeFOSAA	ND		1	2.0	ug/kg	11/23/2020 1339
PFBS	ND		1	1.0	ug/kg	11/23/2020 1339
PFDS	ND		1	1.0	ug/kg	11/23/2020 1339
PFHpS	ND		1	1.0	ug/kg	11/23/2020 1339
PFNS	ND		1	1.0	ug/kg	11/23/2020 1339
PFOSA	ND		1	1.0	ug/kg	11/23/2020 1339
PFPeS	ND		1	1.0	ug/kg	11/23/2020 1339
PFHxS	ND		1	1.0	ug/kg	11/23/2020 1339
PFBA	ND		1	1.0	ug/kg	11/23/2020 1339
PFDA	ND		1	1.0	ug/kg	11/23/2020 1339
PFDoA	ND		1	1.0	ug/kg	11/23/2020 1339
PFHpA	ND		1	1.0	ug/kg	11/23/2020 1339
PFHxA	ND		1	1.0	ug/kg	11/23/2020 1339
PFNA	ND		1	1.0	ug/kg	11/23/2020 1339
PFOA	ND		1	1.0	ug/kg	11/23/2020 1339
PFPeA	ND		1	1.0	ug/kg	11/23/2020 1339
PFTeDA	ND		1	1.0	ug/kg	11/23/2020 1339
PFTrDA	ND		1	1.0	ug/kg	11/23/2020 1339
PFUdA	ND		1	1.0	ug/kg	11/23/2020 1339
PFOS	ND		1	1.0	ug/kg	11/23/2020 1339

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		85	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		89	25-150
13C2_PFTeDA		85	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		77	25-150
13C3-HFPO-DA		90	25-150
13C4_PFBA		85	25-150
13C4_PFHpA		82	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		84	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: VQ74267-001
Batch: 74267
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 11/21/2020 1228

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		89	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		88	25-150
13C8_PFOS		79	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		89	25-150
d3-MeFOSAA		93	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ74267-002
Batch: 74267
Analytical Method: PFAS by ID SOP
Matrix: Solid
Prep Method: SOP SPE
Prep Date: 11/21/2020 1228

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	1.9		1	103	50-150	11/23/2020 1350
11Cl-PF3OUdS	1.9	2.1		1	114	50-150	11/23/2020 1350
8:2 FTS	1.9	2.0		1	105	50-150	11/23/2020 1350
6:2 FTS	1.9	1.7		1	89	50-150	11/23/2020 1350
4:2 FTS	1.9	1.8		1	96	50-150	11/23/2020 1350
GenX	4.0	3.9		1	98	50-150	11/23/2020 1350
ADONA	1.9	1.9		1	101	50-150	11/23/2020 1350
EtFOSAA	2.0	1.8		1	92	50-150	11/23/2020 1350
MeFOSAA	2.0	1.9		1	95	50-150	11/23/2020 1350
PFBS	1.8	1.9		1	106	50-150	11/23/2020 1350
PFDS	1.9	2.3		1	122	50-150	11/23/2020 1350
PFHpS	1.9	1.9		1	100	50-150	11/23/2020 1350
PFNS	1.9	2.1		1	110	50-150	11/23/2020 1350
PFOSA	2.0	1.9		1	97	50-150	11/23/2020 1350
PFPeS	1.9	1.9		1	103	50-150	11/23/2020 1350
PFHxS	1.8	1.6		1	89	50-150	11/23/2020 1350
PFBA	2.0	2.0		1	98	50-150	11/23/2020 1350
PFDA	2.0	2.0		1	101	50-150	11/23/2020 1350
PFDoA	2.0	1.9		1	95	50-150	11/23/2020 1350
PFHpA	2.0	1.9		1	97	50-150	11/23/2020 1350
PFHxA	2.0	1.9		1	96	50-150	11/23/2020 1350
PFNA	2.0	1.9		1	97	50-150	11/23/2020 1350
PFOA	2.0	2.1		1	103	50-150	11/23/2020 1350
PFPeA	2.0	2.0		1	98	50-150	11/23/2020 1350
PFTeDA	2.0	2.1		1	104	50-150	11/23/2020 1350
PFTrDA	2.0	2.1		1	104	50-150	11/23/2020 1350
PFUdA	2.0	1.9		1	96	50-150	11/23/2020 1350
PFOS	1.9	1.8		1	98	50-150	11/23/2020 1350

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		75	25-150
13C3_PFHxS		82	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		88	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		87	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ74267-002
Batch: 74267
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 11/21/2020 1228

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		85	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		92	25-150
13C8_PFOS		81	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		89	25-150
d5-EtFOSAA		90	25-150
d3-MeFOSAA		98	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: VQ75092-001
Batch: 75092
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 12/01/2020 1438

Parameter	Result	Q	Dil	LOQ	Units	Analysis Date
9Cl-PF3ONS	ND		1	2.0	ug/kg	12/04/2020 1517
11Cl-PF3OUdS	ND		1	2.0	ug/kg	12/04/2020 1517
8:2 FTS	ND		1	2.0	ug/kg	12/04/2020 1517
6:2 FTS	ND		1	2.0	ug/kg	12/04/2020 1517
4:2 FTS	ND		1	2.0	ug/kg	12/04/2020 1517
GenX	ND		1	4.0	ug/kg	12/04/2020 1517
ADONA	ND		1	2.0	ug/kg	12/04/2020 1517
EtFOSAA	ND		1	2.0	ug/kg	12/04/2020 1517
MeFOSAA	ND		1	2.0	ug/kg	12/04/2020 1517
PFBS	ND		1	1.0	ug/kg	12/04/2020 1517
PFDS	ND		1	1.0	ug/kg	12/04/2020 1517
PFHpS	ND		1	1.0	ug/kg	12/04/2020 1517
PFNS	ND		1	1.0	ug/kg	12/04/2020 1517
PFOSA	ND		1	1.0	ug/kg	12/04/2020 1517
PFPeS	ND		1	1.0	ug/kg	12/04/2020 1517
PFHxS	ND		1	1.0	ug/kg	12/04/2020 1517
PFBA	ND		1	1.0	ug/kg	12/04/2020 1517
PFDA	ND		1	1.0	ug/kg	12/04/2020 1517
PFDoA	ND		1	1.0	ug/kg	12/04/2020 1517
PFHpA	ND		1	1.0	ug/kg	12/04/2020 1517
PFHxA	ND		1	1.0	ug/kg	12/04/2020 1517
PFNA	ND		1	1.0	ug/kg	12/04/2020 1517
PFOA	ND		1	1.0	ug/kg	12/04/2020 1517
PFPeA	ND		1	1.0	ug/kg	12/04/2020 1517
PFTeDA	ND		1	1.0	ug/kg	12/04/2020 1517
PFTrDA	ND		1	1.0	ug/kg	12/04/2020 1517
PFUdA	ND		1	1.0	ug/kg	12/04/2020 1517
PFOS	ND		1	1.0	ug/kg	12/04/2020 1517

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	25-150
13C2_6:2FTS		100	25-150
13C2_8:2FTS		90	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		101	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		101	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: VQ75092-001
Batch: 75092
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 12/01/2020 1438

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		100	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		99	25-150
13C8_PFOS		88	25-150
13C8_PFOSA		94	10-150
13C9_PFNA		97	25-150
d5-EtFOSAA		94	25-150
d3-MeFOSAA		104	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ75092-002
Batch: 75092
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 12/01/2020 1438

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	% Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	1.8		1	96	50-150	12/04/2020 1528
11Cl-PF3OUdS	1.9	1.9		1	101	50-150	12/04/2020 1528
8:2 FTS	1.9	2.0		1	104	50-150	12/04/2020 1528
6:2 FTS	1.9	1.9		1	103	50-150	12/04/2020 1528
4:2 FTS	1.9	2.1		1	112	50-150	12/04/2020 1528
GenX	4.0	3.7		1	93	50-150	12/04/2020 1528
ADONA	1.9	2.1		1	114	50-150	12/04/2020 1528
EtFOSAA	2.0	1.9		1	93	50-150	12/04/2020 1528
MeFOSAA	2.0	1.8		1	92	50-150	12/04/2020 1528
PFBS	1.8	1.9		1	107	50-150	12/04/2020 1528
PFDS	1.9	1.8		1	92	50-150	12/04/2020 1528
PFHpS	1.9	2.2		1	115	50-150	12/04/2020 1528
PFNS	1.9	2.1		1	109	50-150	12/04/2020 1528
PFOSA	2.0	2.0		1	101	50-150	12/04/2020 1528
PFPeS	1.9	1.8		1	96	50-150	12/04/2020 1528
PFHxS	1.8	1.8		1	102	50-150	12/04/2020 1528
PFBA	2.0	2.1		1	106	50-150	12/04/2020 1528
PFDA	2.0	1.9		1	96	50-150	12/04/2020 1528
PFDoA	2.0	2.0		1	101	50-150	12/04/2020 1528
PFHpA	2.0	2.1		1	106	50-150	12/04/2020 1528
PFHxA	2.0	1.9		1	97	50-150	12/04/2020 1528
PFNA	2.0	2.1		1	106	50-150	12/04/2020 1528
PFOA	2.0	2.2		1	109	50-150	12/04/2020 1528
PFPeA	2.0	2.0		1	101	50-150	12/04/2020 1528
PFTeDA	2.0	2.3		1	113	50-150	12/04/2020 1528
PFTrDA	2.0	1.8		1	92	50-150	12/04/2020 1528
PFUdA	2.0	1.9		1	96	50-150	12/04/2020 1528
PFOS	1.9	1.9		1	102	50-150	12/04/2020 1528

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		109	25-150
13C2_PFTeDA		96	25-150
13C3_PFBS		91	25-150
13C3_PFHxS		98	25-150
13C3-HFPO-DA		103	25-150
13C4_PFBA		99	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		99	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
* = RSD is out of criteria
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: VQ75092-002
Batch: 75092
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 12/01/2020 1438

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		105	25-150
13C7_PFUdA		106	25-150
13C8_PFOA		99	25-150
13C8_PFOS		92	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		100	25-150
d5-EtFOSAA		92	25-150
d3-MeFOSAA		97	25-150

LOQ = Limit of Quantitation

ND = Not detected at or above the LOQ

N = Recovery is out of criteria

P = The RPD between two GC columns exceeds 40%

* = RSD is out of criteria

+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

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Number 113142

Client: GZA Geoenvironmental Inc	Report to Contact: Kevin Hedinger	Telephone No. / E-mail: 262-754-2560 / kevin.hedinger@gza.com	Quote No.
Address: 17975 W Sarah Lane Suite 100	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page 1 of 2
City: Brookfield State: WI Zip Code: 53045	Printed Name: Elizabeth Stapleton Yu		VK12014
Project Name: Oshkosh Corporation			
Project No.: 20.0157080	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS (WI 36 list)	Remarks / Cooler I.D.
WP Equipment Blank DS 1	11/7/20	800	G	X			1							X	
WP Equipment Blank T 2		810	G	X			1							X	
WP B-6 (2-3')		825	G	-	X		1							X	
WP B-6 (6-7')		830	G		X		1							X	
WP B-4 (2-3')		840	G		X		1							X	
WP B-4 (5-6')		845	G		X		1							X	On hold
WP B-3 (2-3')		905	G		X		1							X	
WP B-3 (5-6')		910	G		X		1							X	
WP B-5 (2-3')		925	G		X		1							X	
WP B-5 (6-7')		930	G		X		1							X	On hold

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1. [signature]	11/7/20	1220	1. [signature]	11/7/20	1220
2. [signature]	11/9/20	1230	2. FEDEX	11/9/20	1230
3.			3.		
4. Fed Ex	11/10/20	0925	4. Laboratory received by [signature]	11/10/20	0925

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on ice (Circle): (Yes) No Ice Pack — Receipt Temp. 4.5 °C — Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical®

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www.pacelabs.com

Number 113146

Client: GZA GeoEnvironmental Inc	Report to Contact: Kevin Hedinger	Telephone No. / E-mail: 262-754-2560 / kevin.hedinger@gza.com
Address: 17975 W Sarah Lane Suite 100	Sampler's Signature: X Elizabeth Stapleton Yu	Quote No
City: Brookfield / State: WI / Zip Code: 53045	Printed Name: Elizabeth Stapleton Yu	Page 2 of 2
Project Name: Oshkosh Corporation		VK12014
Project No: 20.0157080	P.O. No.	

Analysis (Attach list if more space is needed): PFAs (Mil 36 list)

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Temperature	Matrix: Aqueous	Matrix: Solid	Matrix: Wipe/Air/Other	No. of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAs (Mil 36 list)	Remarks / Cooler I.D.
WP B-2 (2-3')	11/7/20	940	6		X		1							X	
WP B-2 (5-6')		945	6		X		1							X	*On hold
WP B-1 (1-2')		1000	6		X		1							X	
WP B-1 (5-6')		1005	6		X		1							X	
WP B-7 (0-9")		1015	6		X		1							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)	Sample Disposal: ☐ Return to Client ☒ Disposal by Lab	Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown
QC Requirements (Specify)		

	Date	Time		Date	Time
1. Relinquished by: Elizabeth Stapleton Yu	11/7/20	1220	1. Received by:	11/7/20	1220
2. Relinquished by:	11/9/20	1230	2. Received by: FEDEX	11/9/20	1230
3. Relinquished by:	Date	Time	3. Received by:	Date	Time
4. Relinquished by: Fed Ex	11/10/20	0925	4. Laboratory received by:	11/10/20	0925

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle): (Yes) No Ice Pack — Receipt Temp: 4.5 °C — Temp Blank: ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s), PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: GZA Cooler inspected by/date: KSC / 11/12/2020 Lot #: VK12014

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: AHD

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.5 / 4.5 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers? No time
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☑ Yes	☐ No		21. Was the quote number listed on the container label? If yes, Quote # 24122

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: AHD Date: 11/12/2020

Comments:

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: 20.0157080 Oshkosh- West Plant PFAS Sampling

Project Number: 20.0157080

Lot Number:**WH17017**

Date Completed:09/12/2021

09/13/2021 10:25 AM
Approved and released by:
Project Manager II: **Karen L. Coonan**

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: WH17017

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

Where applicable, all soil sample results (including LOQ and DL if requested) are corrected for dry weight unless flagged with a "W" qualifier.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Surrogate recovery for the following sample was outside the upper control limit: WH17017-003. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: WH17017

Project Name: 20.0157080 Oshkosh- West Plant PFAS Sampling

Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP-SB9 (1-2')	Solid	08/14/2021 1300	08/17/2021
002	WP EQUIP BLANK 1 - HAND AUGER	Aqueous	08/14/2021 1520	08/17/2021
003	WP EQUIP BLANK 2 - DRIVE SHOE	Aqueous	08/14/2021 1530	08/17/2021

(3 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: WH17017

Project Name: 20.0157080 Oshkosh- West Plant PFAS Sampling

Project Number: 20.0157080

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WP-SB9 (1-2')	Solid	PFHpA	PFAS by ID	0.28	J	ug/kg	5
001	WP-SB9 (1-2')	Solid	PFOA	PFAS by ID	0.52	J	ug/kg	5
001	WP-SB9 (1-2')	Solid	PFPeA	PFAS by ID	0.27	J	ug/kg	5
001	WP-SB9 (1-2')	Solid	PFOS	PFAS by ID	38		ug/kg	5
002	WP EQUIP BLANK 1 - HAND AUGER	Aqueous	PFOS	PFAS by ID	2.9	J	ng/L	6

(5 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: WH17017-001
Description: WP-SB9 (1-2') | Matrix: Solid
Date Sampled: 08/14/2021 1300 | Project Name: 20.0157080 Oshkosh- West | % Solids: 77.1 08/17/2021 2133
Date Received: 08/17/2021 | Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/28/2021 0052	SES	08/26/2021 1150	13393

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		2.2	0.34	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.28	J	1.1	0.16	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.1	0.20	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.52	J	1.1	0.24	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.27	J	1.1	0.18	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	38		1.1	0.39	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		90	25-150
13C4_PFHpA		94	25-150
13C5_PFHxA		95	25-150
13C5_PFPeA		93	25-150
13C8_PFOA		95	25-150
13C8_PFOS		80	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: WH17017-002
Description: WP EQUIP BLANK 1 - HAND AUGER
Matrix: Aqueous
Date Sampled: 08/14/2021 1520
Project Name: 20.0157080 Oshkosh- West
Date Received: 08/17/2021
Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/09/2021 1826	SES	09/08/2021 1730	14782

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		11	2.6	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		5.3	0.59	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		5.3	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		5.3	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		5.3	0.72	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.9	J	5.3	2.6	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		124	25-150
13C4_PFHpA		95	25-150
13C5_PFHxA		89	25-150
13C5_PFPeA		87	25-150
13C8_PFOA		84	25-150
13C8_PFOS		90	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: WH17017-003
Description: WP EQUIP BLANK 2 - DRIVE SHOE
Matrix: Aqueous
Date Sampled: 08/14/2021 1530
Project Name: 20.0157080 Oshkosh- West
Date Received: 08/17/2021
Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/09/2021 1836	SES	09/08/2021 1730	14782

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	10	2.5	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		5.0	0.56	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		5.0	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		5.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		5.0	0.68	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		5.0	2.5	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	244	25-150
13C4_PFHpA		90	25-150
13C5_PFHxA		90	25-150
13C5_PFPeA		93	25-150
13C8_PFOA		88	25-150
13C8_PFOS		93	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ13393-001
Batch: 13393
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 08/26/2021 1150

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
6:2 FTS	ND		1	2.0	0.31	ug/kg	08/27/2021 1438
PFHpA	ND		1	1.0	0.14	ug/kg	08/27/2021 1438
PFHxA	ND		1	1.0	0.18	ug/kg	08/27/2021 1438
PFOA	ND		1	1.0	0.21	ug/kg	08/27/2021 1438
PFPeA	ND		1	1.0	0.16	ug/kg	08/27/2021 1438
PFOS	ND		1	1.0	0.36	ug/kg	08/27/2021 1438

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		93	25-150
13C4_PFHpA		97	25-150
13C5_PFHxA		99	25-150
13C5_PFPeA		92	25-150
13C8_PFOA		102	25-150
13C8_PFOS		91	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ13393-002
Batch: 13393
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 08/26/2021 1150

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	1.9	2.0		1	105	50-150	08/27/2021 1448
PFHpA	2.0	1.9		1	96	50-150	08/27/2021 1448
PFHxA	2.0	1.9		1	93	50-150	08/27/2021 1448
PFOA	2.0	1.9		1	96	50-150	08/27/2021 1448
PFPeA	2.0	1.9		1	93	50-150	08/27/2021 1448
PFOS	1.9	1.7		1	91	50-150	08/27/2021 1448

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		95	25-150
13C4_PFHpA		100	25-150
13C5_PFHxA		101	25-150
13C5_PFPeA		95	25-150
13C8_PFOA		98	25-150
13C8_PFOS		92	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: WQ14782-001
Batch: 14782
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/08/2021 1730

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
6:2 FTS	ND		1	8.0	2.0	ng/L	09/09/2021 1411
PFHpA	ND		1	4.0	0.45	ng/L	09/09/2021 1411
PFHxA	ND		1	4.0	0.69	ng/L	09/09/2021 1411
PFOA	ND		1	4.0	0.83	ng/L	09/09/2021 1411
PFPeA	ND		1	4.0	0.54	ng/L	09/09/2021 1411
PFOS	ND		1	4.0	2.0	ng/L	09/09/2021 1411

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		90	25-150
13C4_PFHpA		81	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		95	25-150
13C8_PFOA		79	25-150
13C8_PFOS		95	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ14782-002
Batch: 14782
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/08/2021 1730

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	15	16		1	106	50-150	09/09/2021 1422
PFHpA	16	16		1	101	50-150	09/09/2021 1422
PFHxA	16	16		1	102	50-150	09/09/2021 1422
PFOA	16	18		1	110	50-150	09/09/2021 1422
PFPeA	16	18		1	111	50-150	09/09/2021 1422
PFOS	15	16		1	107	50-150	09/09/2021 1422

Surrogate	Q	% Rec	Acceptance Limit
13C2_6:2FTS		89	25-150
13C4_PFHpA		84	25-150
13C5_PFHxA		87	25-150
13C5_PFPeA		87	25-150
13C8_PFOA		80	25-150
13C8_PFOS		78	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive · West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Pace Analytical®

Number 124341

Client	Report to Contact	Telephone No. / E-mail	Quote No.
GZA GeoEnvironmental Inc	Kevin Hedinger	kevin.hedinger@gza.com	

Address: 17975 W Sarah Lane Suite 100
Sampler's Signature: x [signature]
City: Brookfield State: WI Zip Code: 53045
Printed Name: Elizabeth Stapleton Yu
Project Name: Oshkosh Corp - West Plant
Project No.: 20.0157080
P.O. No.:
Analysis (Attach list if more space is needed)
Page ___ of ___
Lot # Bar Code (lab use only): WH17017
KLC2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Other	6:2 FTS, PFHpA	PFHxA, PFPeA,	PFOS, PFOA
WP-SB9 (1-2')	8/14/21	1300	G		X		X							X	X	X
WP Equip Blank 1-hand auger	|	1520	G	X			X							X	X	X
WP Equip Blank 2-Drive Shoe	|	1530	G	X			X							X	X	X

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

Relinquished by	Date	Time	Received by	Date	Time
1. Relinquished by			1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: fedex	8-17-21	915	4. Laboratory received by: [signature]	8-17-21	915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 4.7 °C
Temp Blank ☐ Y ☒ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: KDRW / 8/17/2021 Lot #: WH17017

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: 21-1425

4.7 / 4.7 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☑ Yes	☐ No		21. Was the quote number listed on the container label? If yes, Quote # 23164

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 8/17/2021

Comments:

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: Oshkosh

Lot Number:**XF21009**

Date Completed:07/07/2022

Kathy Smith

07/07/2022 11:25 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: XF21009

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. The extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

For solid samples:

CF = DF * FV / Ws/S/1000

FV is volume of extract (mL)
Ws is initial sample weight (gram)
S is %Solids
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Concentration (ug/kg) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-

dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

Where applicable, all soil sample results (including LOQ and DL if requested) are corrected for dry weight unless flagged with a "W" qualifier.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: XF21009

Project Name: Oshkosh

Project Number:

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	SB-10 (0-1)	Solid	06/17/2022 1640	06/21/2022

(1 sample)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: XF21009

Project Name: Oshkosh

Project Number:

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	SB-10 (0-1)	Solid	PFNA	PFAS by ID	0.22	J	ug/kg	5
001	SB-10 (0-1)	Solid	PFUdA	PFAS by ID	0.61	J	ug/kg	6
001	SB-10 (0-1)	Solid	PFOS	PFAS by ID	1.5		ug/kg	6

(3 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XF21009-001
Description: SB-10 (0-1) | Matrix: Solid
Date Sampled: 06/17/2022 1640 | Project Name: Oshkosh | % Solids: 67.1 06/22/2022 2358
Date Received: 06/21/2022 | Project Number:

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	07/05/2022 1220	MMM	06/30/2022 1207	46657

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		3.0	0.23	ug/kg	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		3.0	0.25	ug/kg	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		3.0	0.40	ug/kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		3.0	0.45	ug/kg	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		3.0	0.32	ug/kg	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		5.9	0.86	ug/kg	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		3.0	0.22	ug/kg	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		3.0	0.53	ug/kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		3.0	0.43	ug/kg	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		3.0	0.34	ug/kg	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		3.0	0.51	ug/kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		3.0	0.58	ug/kg	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		3.0	0.49	ug/kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		1.5	0.19	ug/kg	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		1.5	0.33	ug/kg	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		1.5	0.26	ug/kg	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		1.5	0.33	ug/kg	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		1.5	0.26	ug/kg	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		1.5	0.27	ug/kg	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		1.5	0.38	ug/kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		1.5	0.26	ug/kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		1.5	0.61	ug/kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		1.5	0.23	ug/kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		1.5	0.26	ug/kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		1.5	0.21	ug/kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		1.5	0.27	ug/kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.22	J	1.5	0.22	ug/kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		1.5	0.31	ug/kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		1.5	0.23	ug/kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		1.5	0.28	ug/kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		1.5	0.25	ug/kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.61	J	1.5	0.27	ug/kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.5		1.5	0.53	ug/kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		102	25-150
13C2_6:2FTS		108	25-150
13C2_8:2FTS		114	25-150
13C2_PFDoA		106	25-150
13C2_PFTeDA		101	25-150
13C3_PFBS		98	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		91	25-150
13C4_PFBA		94	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.		Laboratory ID: XF21009-001	
Description: SB-10 (0-1)		Matrix: Solid	
Date Sampled: 06/17/2022 1640	Project Name: Oshkosh	% Solids: 67.1	06/22/2022 2358
Date Received: 06/21/2022	Project Number:		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		93	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		92	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		102	25-150
13C8_PFOA		95	25-150
13C8_PFOS		98	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		95	25-150
d-EtFOSA		89	10-150
d5-EtFOSAA		110	25-150
d9-EtFOSE		94	10-150
d-MeFOSA		93	10-150
d3-MeFOSAA		103	25-150
d7-MeFOSE		103	10-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: XQ46657-001
Batch: 46657
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 06/30/2022 1207

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	2.0	0.16	ug/kg	07/01/2022 1730
11Cl-PF3OUdS	ND		1	2.0	0.17	ug/kg	07/01/2022 1730
8:2 FTS	ND		1	2.0	0.27	ug/kg	07/01/2022 1730
6:2 FTS	ND		1	2.0	0.31	ug/kg	07/01/2022 1730
4:2 FTS	ND		1	2.0	0.22	ug/kg	07/01/2022 1730
GenX	ND		1	4.0	0.58	ug/kg	07/01/2022 1730
ADONA	ND		1	2.0	0.15	ug/kg	07/01/2022 1730
EtFOSA	ND		1	2.0	0.36	ug/kg	07/01/2022 1730
EtFOSAA	ND		1	2.0	0.29	ug/kg	07/01/2022 1730
EtFOSE	ND		1	2.0	0.23	ug/kg	07/01/2022 1730
MeFOSA	ND		1	2.0	0.35	ug/kg	07/01/2022 1730
MeFOSAA	ND		1	2.0	0.40	ug/kg	07/01/2022 1730
MeFOSE	ND		1	2.0	0.33	ug/kg	07/01/2022 1730
PFBS	ND		1	1.0	0.13	ug/kg	07/01/2022 1730
PFDS	ND		1	1.0	0.22	ug/kg	07/01/2022 1730
PFHpS	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFNS	ND		1	1.0	0.22	ug/kg	07/01/2022 1730
PFOSA	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFPeS	ND		1	1.0	0.19	ug/kg	07/01/2022 1730
PFDOS	ND		1	1.0	0.26	ug/kg	07/01/2022 1730
PFHxS	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFBA	ND		1	1.0	0.42	ug/kg	07/01/2022 1730
PFDA	ND		1	1.0	0.16	ug/kg	07/01/2022 1730
PFDoA	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFHpA	ND		1	1.0	0.14	ug/kg	07/01/2022 1730
PFHxA	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFNA	ND		1	1.0	0.15	ug/kg	07/01/2022 1730
PFOA	ND		1	1.0	0.21	ug/kg	07/01/2022 1730
PFPeA	ND		1	1.0	0.16	ug/kg	07/01/2022 1730
PFTeDA	ND		1	1.0	0.19	ug/kg	07/01/2022 1730
PFTrDA	ND		1	1.0	0.17	ug/kg	07/01/2022 1730
PFUdA	ND		1	1.0	0.18	ug/kg	07/01/2022 1730
PFOS	ND		1	1.0	0.36	ug/kg	07/01/2022 1730

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		98	25-150
13C2_6:2FTS		103	25-150
13C2_8:2FTS		102	25-150
13C2_PFDoA		92	25-150
13C2_PFTeDA		95	25-150
13C3_PFBS		93	25-150
13C3_PFHxS		97	25-150
13C3-HFPO-DA		104	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ46657-001
Batch: 46657
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 06/30/2022 1207

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		97	25-150
13C4_PFHpA		96	25-150
13C5_PFHxA		92	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		96	25-150
13C7_PFUdA		100	25-150
13C8_PFOA		95	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		103	10-150
13C9_PFNA		95	25-150
d-EtFOSA		107	10-150
d5-EtFOSAA		104	25-150
d9-EtFOSE		101	10-150
d-MeFOSA		107	10-150
d3-MeFOSAA		100	25-150
d7-MeFOSE		102	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ46657-002
Batch: 46657
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 06/30/2022 1207

Parameter	Spike Amount (ug/kg)	Result (ug/kg)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	1.9	1.6		1	87	50-150	07/01/2022 1741
11Cl-PF3OUdS	1.9	1.7		1	91	50-150	07/01/2022 1741
8:2 FTS	1.9	1.6		1	85	50-150	07/01/2022 1741
6:2 FTS	1.9	1.9		1	101	50-150	07/01/2022 1741
4:2 FTS	1.9	1.6		1	86	50-150	07/01/2022 1741
GenX	4.0	3.7		1	93	50-150	07/01/2022 1741
ADONA	1.9	1.7		1	88	50-150	07/01/2022 1741
EtFOSA	2.0	2.1		1	103	50-150	07/01/2022 1741
EtFOSAA	2.0	1.9		1	96	50-150	07/01/2022 1741
EtFOSE	2.0	1.9		1	94	50-150	07/01/2022 1741
MeFOSA	2.0	1.9		1	93	50-150	07/01/2022 1741
MeFOSAA	2.0	1.8		1	91	50-150	07/01/2022 1741
MeFOSE	2.0	2.4		1	121	50-150	07/01/2022 1741
PFBS	1.8	1.7		1	98	50-150	07/01/2022 1741
PFDS	1.9	1.8		1	92	50-150	07/01/2022 1741
PFHpS	1.9	1.9		1	98	50-150	07/01/2022 1741
PFNS	1.9	1.7		1	87	50-150	07/01/2022 1741
PFOSA	2.0	1.8		1	90	50-150	07/01/2022 1741
PFPeS	1.9	2.0		1	106	50-150	07/01/2022 1741
PFDOS	1.9	2.3		1	117	50-150	07/01/2022 1741
PFHxS	1.8	1.6		1	90	50-150	07/01/2022 1741
PFBA	2.0	1.9		1	94	50-150	07/01/2022 1741
PFDA	2.0	1.9		1	95	50-150	07/01/2022 1741
PFDoA	2.0	2.0		1	100	50-150	07/01/2022 1741
PFHpA	2.0	1.9		1	94	50-150	07/01/2022 1741
PFHxA	2.0	1.9		1	93	50-150	07/01/2022 1741
PFNA	2.0	1.9		1	94	50-150	07/01/2022 1741
PFOA	2.0	1.8		1	90	50-150	07/01/2022 1741
PFPeA	2.0	1.9		1	95	50-150	07/01/2022 1741
PFTeDA	2.0	1.9		1	96	50-150	07/01/2022 1741
PFTrDA	2.0	1.9		1	94	50-150	07/01/2022 1741
PFUdA	2.0	1.8		1	89	50-150	07/01/2022 1741
PFOS	1.9	1.7		1	91	50-150	07/01/2022 1741

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		114	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		114	25-150
13C2_PFDoA		107	25-150
13C2_PFTeDA		108	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		110	25-150
13C3-HFPO-DA		123	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ46657-002
Batch: 46657
Analytical Method: PFAS by ID SOP

Matrix: Solid
Prep Method: SOP SPE
Prep Date: 06/30/2022 1207

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		112	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		113	25-150
13C5_PFPeA		108	25-150
13C6_PFDA		110	25-150
13C7_PFUdA		121	25-150
13C8_PFOA		111	25-150
13C8_PFOS		112	25-150
13C8_PFOSA		123	10-150
13C9_PFNA		110	25-150
d-EtFOSA		121	10-150
d5-EtFOSAA		119	25-150
d9-EtFOSE		109	10-150
d-MeFOSA		114	10-150
d3-MeFOSAA		117	25-150
d7-MeFOSE		117	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

ALL SHADED AREAS are for LAB USE ONLY

Company: GZA GeoEnvironmental	Billing Information: Alle@gza.com
Address: 7775 W. Sarah Lane 100 Brookfield WI	
Report To: Kevin.Hedinger@gza.com	Email To: Same
Copy To:	Site Collection Info/Address:
Customer Project Name/Number: Oshkosh - Wisp Plant 20.0157080	State: WI County/City: Time Zone Collected: [ ] PT [ ] MT [X] CT [ ] ET
Phone: 262-784-1761 Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [X] No
Collected By (print): Alex Amundson	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Normal Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Container Preservative Type **: U

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other

Analyses: Wisconsin List of 33 PFAS

XF21009

KES?

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA -- Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Cnts
SB-10 (0-1)	SL	G	6/17/22	1640				1

Kevin M 6/20/2022

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radiochem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2781281

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#:
Cooler 1 Temp Upon Receipt: 4.9 °C
Cooler 1 Therm Corr. Factor: °C
Cooler 1 Corrected Temp: °C
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Kevin M Hedinger	6/20/2022 15:30		
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature) FedEx	Date/Time: 6/21/22 1000	Received by/Company: (Signature)	Date/Time: 6/21/22 1000

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: of:

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: KSC / 06/21/2022 Lot #: XF21009

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: 22-480

4.9 / 4.9 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA.

Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KNR Date: 06/21/2022

Comments:

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Lot Number:**WH24026**

Date Completed:09/20/2021

09/21/2021 2:29 PM
Approved and released by:
Project Manager II: **Karen L. Coonan**

The electronic signature above is the equivalent of a handwritten signature.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: WH24026

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Surrogate recovery for the following sample was outside the upper control limit: WH24026-002. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: WH24026

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP-MW-1	Aqueous	08/19/2021 1810	08/24/2021
002	Field Blank	Aqueous	08/19/2021 1820	08/24/2021

(2 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: WH24026

Project Name: Oshkosh GW PFAS Sampling

Project Number: 20.0157080

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WP-MW-1	Aqueous	6:2 FTS	PFAS by ID	200		ng/L	5
001	WP-MW-1	Aqueous	PFBS	PFAS by ID	10	J	ng/L	5
001	WP-MW-1	Aqueous	PFHxS	PFAS by ID	23	J	ng/L	5
001	WP-MW-1	Aqueous	PFBA	PFAS by ID	3800		ng/L	5
001	WP-MW-1	Aqueous	PFHpA	PFAS by ID	1300		ng/L	5
001	WP-MW-1	Aqueous	PFHxA	PFAS by ID	7900		ng/L	5
001	WP-MW-1	Aqueous	PFOA	PFAS by ID	120		ng/L	5
001	WP-MW-1	Aqueous	PFPeA	PFAS by ID	19000		ng/L	5
002	Field Blank	Aqueous	PFBA	PFAS by ID	0.66	J	ng/L	7
002	Field Blank	Aqueous	PFOS	PFAS by ID	2.4	J	ng/L	7

(10 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: WH24026-001
Description: WP-MW-1 | Matrix: Aqueous
Date Sampled: 08/19/2021 1810 | Project Name: Oshkosh GW PFAS Sampling
Date Received: 08/24/2021 | Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	20	09/15/2021 1842	MMM	09/13/2021 1227	15147
2	SOP SPE	PFAS by ID SOP	50	09/18/2021 2100	NK1	09/13/2021 1227	15147

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		160	9.4	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		160	13	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		160	31	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	200		160	39	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		160	17	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		160	41	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		160	9.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		160	26	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		160	15	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		160	19	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		310	25	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		160	18	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		160	25	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	10	J	78	8.1	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		78	15	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		78	9.7	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		78	14	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		78	12	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		78	12	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		160	20	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	23	J	78	11	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3800		78	12	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		78	10	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		78	9.2	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1300		78	8.7	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	7900		78	13	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		78	9.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	120		78	16	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	19000		200	27	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		78	12	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		78	10	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		78	12	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		78	39	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		125	25-150		100	25-150
13C2_6:2FTS		145	25-150		101	25-150
13C2_8:2FTS		116	25-150		96	25-150
13C2_PFDoA		112	25-150		114	25-150
13C2_PFTeDA		113	25-150		101	25-150
13C3_PFBS		107	25-150		98	25-150
13C3_PFHxS		100	25-150		94	25-150
13C3-HFPO-DA		118	25-150		96	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: WH24026-001
Description: WP-MW-1
Matrix: Aqueous
Date Sampled: 08/19/2021 1810
Project Name: Oshkosh GW PFAS Sampling
Date Received: 08/24/2021
Project Number: 20.0157080

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C4_PFBA		105	25-150		93	25-150
13C4_PFHpA		119	25-150		98	25-150
13C5_PFHxA		104	25-150		95	25-150
13C5_PFPeA		96	25-150		95	25-150
13C6_PFDA		99	25-150		102	25-150
13C7_PFUdA		108	25-150		99	25-150
13C8_PFOA		115	25-150		98	25-150
13C8_PFOS		91	25-150		93	25-150
13C8_PFOSA		99	10-150		97	10-150
13C9_PFNA		115	25-150		103	25-150
d-EtFOSA		111	10-150		97	10-150
d5-EtFOSAA		104	25-150		107	25-150
d9-EtFOSE		115	10-150		95	10-150
d-MeFOSA		98	10-150		88	10-150
d3-MeFOSAA		99	25-150		99	25-150
d7-MeFOSE		98	10-150		108	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: WH24026-002
Description: Field Blank | Matrix: Aqueous
Date Sampled: 08/19/2021 1820 | Project Name: Oshkosh GW PFAS Sampling
Date Received: 08/24/2021 | Project Number: 20.0157080

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	09/15/2021 1853	MMM	09/13/2021 1227	15147

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.5	0.51	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.5	0.71	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	8.5	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.5	0.93	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.5	2.2	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.5	0.52	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		8.5	1.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.5	0.80	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		8.5	1.0	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		17	1.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.5	1.0	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		8.5	1.4	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.3	0.44	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.3	0.83	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.3	0.53	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.3	0.76	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.3	0.65	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.3	0.63	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		8.5	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.3	0.59	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.66	J	4.3	0.64	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.3	0.56	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.3	0.50	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.3	0.48	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.3	0.73	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.3	0.49	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.3	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.3	0.58	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.3	0.64	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.3	0.57	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.3	0.67	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.4	J	4.3	2.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		115	25-150
13C2_6:2FTS	N	252	25-150
13C2_8:2FTS		86	25-150
13C2_PFDoA		82	25-150
13C2_PFTeDA		87	25-150
13C3_PFBS		89	25-150
13C3_PFHxS		91	25-150
13C3-HFPO-DA		94	25-150
13C4_PFBA		97	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: WH24026-002
Description: Field Blank
Matrix: Aqueous
Date Sampled: 08/19/2021 1820
Project Name: Oshkosh GW PFAS Sampling
Date Received: 08/24/2021
Project Number: 20.0157080

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		90	25-150
13C5_PFHxA		93	25-150
13C5_PFPeA		99	25-150
13C6_PFDA		85	25-150
13C7_PFUdA		83	25-150
13C8_PFOA		96	25-150
13C8_PFOS		80	25-150
13C8_PFOSA		82	10-150
13C9_PFNA		97	25-150
d-EtFOSA		60	10-150
d5-EtFOSAA		90	25-150
d9-EtFOSE		87	10-150
d-MeFOSA		72	10-150
d3-MeFOSAA		99	25-150
d7-MeFOSE		82	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ15147-001
Batch: 15147
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	09/14/2021 1800
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	09/14/2021 1800
8:2 FTS	ND		1	8.0	1.6	ng/L	09/14/2021 1800
6:2 FTS	ND		1	8.0	2.0	ng/L	09/14/2021 1800
4:2 FTS	ND		1	8.0	0.87	ng/L	09/14/2021 1800
GenX	ND		1	8.0	2.1	ng/L	09/14/2021 1800
ADONA	ND		1	8.0	0.48	ng/L	09/14/2021 1800
EtFOSA	ND		1	8.0	1.4	ng/L	09/14/2021 1800
EtFOSAA	ND		1	8.0	0.75	ng/L	09/14/2021 1800
EtFOSE	ND		1	8.0	0.95	ng/L	09/14/2021 1800
MeFOSA	ND		1	16	1.3	ng/L	09/14/2021 1800
MeFOSAA	ND		1	8.0	0.93	ng/L	09/14/2021 1800
MeFOSE	ND		1	8.0	1.3	ng/L	09/14/2021 1800
PFBS	ND		1	4.0	0.41	ng/L	09/14/2021 1800
PFDS	ND		1	4.0	0.78	ng/L	09/14/2021 1800
PFHpS	ND		1	4.0	0.50	ng/L	09/14/2021 1800
PFNS	ND		1	4.0	0.71	ng/L	09/14/2021 1800
PFOSA	ND		1	4.0	0.61	ng/L	09/14/2021 1800
PFPeS	ND		1	4.0	0.59	ng/L	09/14/2021 1800
PFDOS	ND		1	8.0	1.0	ng/L	09/14/2021 1800
PFHxS	ND		1	4.0	0.55	ng/L	09/14/2021 1800
PFBA	ND		1	4.0	0.60	ng/L	09/14/2021 1800
PFDA	ND		1	4.0	0.52	ng/L	09/14/2021 1800
PFDoA	ND		1	4.0	0.47	ng/L	09/14/2021 1800
PFHpA	ND		1	4.0	0.45	ng/L	09/14/2021 1800
PFHxA	ND		1	4.0	0.69	ng/L	09/14/2021 1800
PFNA	ND		1	4.0	0.46	ng/L	09/14/2021 1800
PFOA	ND		1	4.0	0.83	ng/L	09/14/2021 1800
PFPeA	ND		1	4.0	0.54	ng/L	09/14/2021 1800
PFTeDA	ND		1	4.0	0.60	ng/L	09/14/2021 1800
PFTrDA	ND		1	4.0	0.53	ng/L	09/14/2021 1800
PFUdA	ND		1	4.0	0.63	ng/L	09/14/2021 1800
PFOS	ND		1	4.0	2.0	ng/L	09/14/2021 1800

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		143	25-150
13C2_6:2FTS		92	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		115	25-150
13C2_PFTeDA		126	25-150
13C3_PFBS		114	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		125	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: WQ15147-001
Batch: 15147
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		111	25-150
13C4_PFHpA		121	25-150
13C5_PFHxA		123	25-150
13C5_PFPeA		109	25-150
13C6_PFDA		115	25-150
13C7_PFUdA		118	25-150
13C8_PFOA		119	25-150
13C8_PFOS		128	25-150
13C8_PFOSA		105	10-150
13C9_PFNA		124	25-150
d-EtFOSA		104	10-150
d5-EtFOSAA		105	25-150
d9-EtFOSE		108	10-150
d-MeFOSA		107	10-150
d3-MeFOSAA		110	25-150
d7-MeFOSE		115	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ15147-002
Batch: 15147
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	13		1	88	50-150	09/14/2021 1810
11Cl-PF3OUdS	15	13		1	88	50-150	09/14/2021 1810
8:2 FTS	15	13		1	83	50-150	09/14/2021 1810
6:2 FTS	15	15		1	102	50-150	09/14/2021 1810
4:2 FTS	15	15		1	100	50-150	09/14/2021 1810
GenX	32	25		1	79	50-150	09/14/2021 1810
ADONA	15	16		1	104	50-150	09/14/2021 1810
EtFOSA	16	17		1	105	50-150	09/14/2021 1810
EtFOSAA	16	16		1	103	50-150	09/14/2021 1810
EtFOSE	16	16		1	102	50-150	09/14/2021 1810
MeFOSA	16	18		1	114	50-150	09/14/2021 1810
MeFOSAA	16	16		1	97	50-150	09/14/2021 1810
MeFOSE	16	14		1	89	50-150	09/14/2021 1810
PFBS	14	15		1	103	50-150	09/14/2021 1810
PFDS	15	13		1	87	50-150	09/14/2021 1810
PFHpS	15	16		1	104	50-150	09/14/2021 1810
PFNS	15	15		1	96	50-150	09/14/2021 1810
PFOSA	16	16		1	103	50-150	09/14/2021 1810
PFPeS	15	16		1	107	50-150	09/14/2021 1810
PFDOS	15	15		1	98	50-150	09/14/2021 1810
PFHxS	15	14		1	99	50-150	09/14/2021 1810
PFBA	16	17		1	107	50-150	09/14/2021 1810
PFDA	16	16		1	99	50-150	09/14/2021 1810
PFDoA	16	18		1	112	50-150	09/14/2021 1810
PFHpA	16	17		1	106	50-150	09/14/2021 1810
PFHxA	16	15		1	95	50-150	09/14/2021 1810
PFNA	16	16		1	97	50-150	09/14/2021 1810
PFOA	16	16		1	103	50-150	09/14/2021 1810
PFPeA	16	15		1	94	50-150	09/14/2021 1810
PFTeDA	16	18		1	112	50-150	09/14/2021 1810
PFTrDA	16	16		1	103	50-150	09/14/2021 1810
PFUdA	16	18		1	110	50-150	09/14/2021 1810
PFOS	15	15		1	101	50-150	09/14/2021 1810

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		141	25-150
13C2_6:2FTS		91	25-150
13C2_8:2FTS		104	25-150
13C2_PFDoA		102	25-150
13C2_PFTeDA		117	25-150
13C3_PFBS		112	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		133	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ15147-002
Batch: 15147
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/13/2021 1227

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		112	25-150
13C4_PFHpA		107	25-150
13C5_PFHxA		117	25-150
13C5_PFPeA		125	25-150
13C6_PFDA		122	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		119	25-150
13C8_PFOS		111	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		128	25-150
d-EtFOSA		90	10-150
d5-EtFOSAA		112	25-150
d9-EtFOSE		108	10-150
d-MeFOSA		101	10-150
d3-MeFOSAA		107	25-150
d7-MeFOSE		113	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

PaceAnalytical®

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Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 124340

Client: GZA GeoEnvironmental Inc	Report to Contact: Kevin Hedinger	Telephone No. / E-mail: kevin.hedinger@gza.com
Address: 17975 W Sarah Lane Suite 100	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed): PFAS, WI List 33
City: Brookfield State: WI Zip Code: 53045	Printed Name: Elizabeth Stapleton Yu	Quote No.: Page 1 of 1
Project Name: Oshkosh Corporation		WH24026 KLC2
Project No.: 20.0157080	P.O. No.:	

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS, WI List 33	Remarks / Cooler I.D.
WP-MW-1	8/19/21	1810	G	X			X							X	
Field Blank	〃	1820	—	X			X							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify):

Relinquished by	Date	Time	Received by	Date	Time
1. [signature]	8/23/21	900	1. FedEx	8/23/21	900
2.			2.		
3.			3.		
4. FedEx	8/24/21	1015	4. Laboratory received by [signature]	8/24/21	1015

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on Ice (Circle) (Yes) No Ice Pack; Receipt Temp. 4.2 °C; Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: JSM / 08/24/2021 Lot #: WEI24026

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.2 / 4.2 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # _____

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JSM Date: 08/24/2021

Comments:

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: OshKosh Corporation

Project Number: 20.0157080.00

Lot Number:**WJ23011**

Date Completed:11/12/2021

11/12/2021 9:49 AM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: WJ23011

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation:

Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, Fecal Coliform SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, Solid Chemical Material: TOC Walkley-Black.

If you have any questions regarding this report please contact the Pace Project Manager listed on the cover page.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: WJ23011

Project Name: OshKosh Corporation

Project Number: 20.0157080.00

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP-MW-1	Aqueous	10/16/2021 0855	10/20/2021

(1 sample)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: WJ23011

Project Name: OshKosh Corporation

Project Number: 20.0157080.00

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WP-MW-1	Aqueous	6:2 FTS	PFAS by ID	140		ng/L	5
001	WP-MW-1	Aqueous	PFBS	PFAS by ID	23	J	ng/L	5
001	WP-MW-1	Aqueous	PFHxS	PFAS by ID	13	J	ng/L	5
001	WP-MW-1	Aqueous	PFBA	PFAS by ID	1900		ng/L	5
001	WP-MW-1	Aqueous	PFHpA	PFAS by ID	560		ng/L	5
001	WP-MW-1	Aqueous	PFHxA	PFAS by ID	4000		ng/L	5
001	WP-MW-1	Aqueous	PFOA	PFAS by ID	70	J	ng/L	6
001	WP-MW-1	Aqueous	PFPeA	PFAS by ID	9900		ng/L	6

(8 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: WJ23011-001
Description: WP-MW-1 | Matrix: Aqueous
Date Sampled: 10/16/2021 0855 | Project Name: OshKosh Corporation
Date Received: 10/20/2021 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	20	11/11/2021 1901	MMM	11/09/2021 1201	21762

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		140	8.6	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		140	12	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		140	29	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	140		140	36	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		140	16	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		140	37	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		140	8.6	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		140	24	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		140	13	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		140	17	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		280	22	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		140	17	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		140	23	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	23	J	71	7.4	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		71	14	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		71	8.9	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		71	13	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		71	11	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		71	11	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		140	19	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	13	J	71	9.8	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1900		71	11	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		71	9.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		71	8.4	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	560		71	8.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4000		71	12	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		71	8.2	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	70	J	71	15	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	9900		71	9.7	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		71	11	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		71	9.4	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		71	11	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		71	36	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		99	25-150
13C2_6:2FTS		104	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		108	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		100	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		116	25-150
13C4_PFBA		103	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.			Laboratory ID: WJ23011-001
Description: WP-MW-1			Matrix: Aqueous
Date Sampled: 10/16/2021 0855	Project Name: OshKosh Corporation		
Date Received: 10/20/2021	Project Number: 20.0157080.00		

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		96	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		94	25-150
13C6_PFDA		111	25-150
13C7_PFUdA		107	25-150
13C8_PFOA		98	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		99	10-150
13C9_PFNA		105	25-150
d-EtFOSA		115	10-150
d5-EtFOSAA		121	25-150
d9-EtFOSE		98	10-150
d-MeFOSA		109	10-150
d3-MeFOSAA		127	25-150
d7-MeFOSE		106	10-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: WQ21762-001
Batch: 21762
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/09/2021 1201

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	11/10/2021 1806
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	11/10/2021 1806
8:2 FTS	ND		1	8.0	1.6	ng/L	11/10/2021 1806
6:2 FTS	ND		1	8.0	2.0	ng/L	11/10/2021 1806
4:2 FTS	ND		1	8.0	0.87	ng/L	11/10/2021 1806
GenX	ND		1	8.0	2.1	ng/L	11/10/2021 1806
ADONA	ND		1	8.0	0.48	ng/L	11/10/2021 1806
EtFOSA	ND		1	8.0	1.4	ng/L	11/10/2021 1806
EtFOSAA	ND		1	8.0	0.75	ng/L	11/10/2021 1806
EtFOSE	ND		1	8.0	0.95	ng/L	11/10/2021 1806
MeFOSA	ND		1	16	1.3	ng/L	11/10/2021 1806
MeFOSAA	ND		1	8.0	0.93	ng/L	11/10/2021 1806
MeFOSE	ND		1	8.0	1.3	ng/L	11/10/2021 1806
PFBS	ND		1	4.0	0.41	ng/L	11/10/2021 1806
PFDS	ND		1	4.0	0.78	ng/L	11/10/2021 1806
PFHpS	ND		1	4.0	0.50	ng/L	11/10/2021 1806
PFNS	ND		1	4.0	0.71	ng/L	11/10/2021 1806
PFOSA	ND		1	4.0	0.61	ng/L	11/10/2021 1806
PFPeS	ND		1	4.0	0.59	ng/L	11/10/2021 1806
PFDOS	ND		1	8.0	1.0	ng/L	11/10/2021 1806
PFHxS	ND		1	4.0	0.55	ng/L	11/10/2021 1806
PFBA	ND		1	4.0	0.60	ng/L	11/10/2021 1806
PFDA	ND		1	4.0	0.52	ng/L	11/10/2021 1806
PFDoA	ND		1	4.0	0.47	ng/L	11/10/2021 1806
PFHpA	ND		1	4.0	0.45	ng/L	11/10/2021 1806
PFHxA	ND		1	4.0	0.69	ng/L	11/10/2021 1806
PFNA	ND		1	4.0	0.46	ng/L	11/10/2021 1806
PFOA	ND		1	4.0	0.83	ng/L	11/10/2021 1806
PFPeA	ND		1	4.0	0.54	ng/L	11/10/2021 1806
PFTeDA	ND		1	4.0	0.60	ng/L	11/10/2021 1806
PFTrDA	ND		1	4.0	0.53	ng/L	11/10/2021 1806
PFUdA	ND		1	4.0	0.63	ng/L	11/10/2021 1806
PFOS	ND		1	4.0	2.0	ng/L	11/10/2021 1806

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	25-150
13C2_6:2FTS		93	25-150
13C2_8:2FTS		95	25-150
13C2_PFDoA		87	25-150
13C2_PFTeDA		89	25-150
13C3_PFBS		102	25-150
13C3_PFHxS		93	25-150
13C3-HFPO-DA		115	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: WQ21762-001
Batch: 21762
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/09/2021 1201

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		99	25-150
13C4_PFHpA		101	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		100	25-150
13C6_PFDA		93	25-150
13C7_PFUdA		88	25-150
13C8_PFOA		97	25-150
13C8_PFOS		94	25-150
13C8_PFOSA		96	10-150
13C9_PFNA		92	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		111	25-150
d9-EtFOSE		86	10-150
d-MeFOSA		67	10-150
d3-MeFOSAA		106	25-150
d7-MeFOSE		93	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ21762-002
Batch: 21762
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/09/2021 1201

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	99	50-150	11/10/2021 1817
11Cl-PF3OUdS	15	14		1	96	50-150	11/10/2021 1817
8:2 FTS	15	15		1	100	50-150	11/10/2021 1817
6:2 FTS	15	14		1	90	50-150	11/10/2021 1817
4:2 FTS	15	16		1	104	50-150	11/10/2021 1817
GenX	32	33		1	104	50-150	11/10/2021 1817
ADONA	15	15		1	100	50-150	11/10/2021 1817
EtFOSA	16	15		1	95	50-150	11/10/2021 1817
EtFOSAA	16	15		1	95	50-150	11/10/2021 1817
EtFOSE	16	16		1	99	50-150	11/10/2021 1817
MeFOSA	16	18		1	111	50-150	11/10/2021 1817
MeFOSAA	16	13		1	79	50-150	11/10/2021 1817
MeFOSE	16	13		1	83	50-150	11/10/2021 1817
PFBS	14	13		1	92	50-150	11/10/2021 1817
PFDS	15	14		1	93	50-150	11/10/2021 1817
PFHpS	15	15		1	97	50-150	11/10/2021 1817
PFNS	15	15		1	100	50-150	11/10/2021 1817
PFOSA	16	15		1	97	50-150	11/10/2021 1817
PFPeS	15	15		1	98	50-150	11/10/2021 1817
PFDOS	15	13		1	87	50-150	11/10/2021 1817
PFHxS	15	14		1	94	50-150	11/10/2021 1817
PFBA	16	15		1	96	50-150	11/10/2021 1817
PFDA	16	17		1	103	50-150	11/10/2021 1817
PFDoA	16	16		1	102	50-150	11/10/2021 1817
PFHpA	16	15		1	92	50-150	11/10/2021 1817
PFHxA	16	15		1	96	50-150	11/10/2021 1817
PFNA	16	16		1	100	50-150	11/10/2021 1817
PFOA	16	16		1	101	50-150	11/10/2021 1817
PFPeA	16	16		1	98	50-150	11/10/2021 1817
PFTeDA	16	17		1	107	50-150	11/10/2021 1817
PFTrDA	16	14		1	90	50-150	11/10/2021 1817
PFUdA	16	16		1	98	50-150	11/10/2021 1817
PFOS	15	16		1	108	50-150	11/10/2021 1817

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	25-150
13C2_6:2FTS		99	25-150
13C2_8:2FTS		105	25-150
13C2_PFDoA		95	25-150
13C2_PFTeDA		98	25-150
13C3_PFBS		110	25-150
13C3_PFHxS		105	25-150
13C3-HFPO-DA		127	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: WQ21762-002
Batch: 21762
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/09/2021 1201

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		107	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		109	25-150
13C5_PFPeA		106	25-150
13C6_PFDA		103	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		104	25-150
13C8_PFOS		101	25-150
13C8_PFOSA		104	10-150
13C9_PFNA		106	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		127	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		51	10-150
d3-MeFOSAA		146	25-150
d7-MeFOSE		110	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 127142

Client: GZA GeoEnvironmental Inc	Report to Contact: Kevin Hedinger	Telephone No. / E-mail: Kevin.Hedinger@gza.com	Quote No.
Address: 17975 W. Sarah Lane STE 100	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 1 of 1
City: Brookfield / State: WI / Zip Code: 53045	Printed Name: Alex Amundson		
Project Name: Oshkosh Corporation			
Project No.: 20.0157080.00	P.O. No		

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid / Wipe / Aqueous	No. of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	VOCs WS Lyr 33	Remarks / Cooler I.D.
WP-MW-1	10/16/21	0855	G	X		X							X	

NJ23011

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	10-19-21	2200	1. Received by: FedEx	10-19-21	2200
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	10/20/21	0915	4. Laboratory received by	10/20/21	0915

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on Ice (Circle) (Yes) No Ice Pack — Receipt Temp 3.6 °C — Temp Blank Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: KSC / 10/23/2021 Lot #: WJ23011

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.6 / 3.6 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☐ Yes	☑ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☐ No	☑ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☑ Yes	☐ No		21. Was the quote number listed on the container label? If yes, Quote # 25431

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: JRG2 Date: 10/22/2021

Comments:

Report of Analysis

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, Suite 100
Brookfield, WI 53045
Attention: Kevin Hedinger

Project Name: Oshkosh Corp-West Plant

Project Number: 20.0157080.00

Lot Number:**XH08005**

Date Completed:09/05/2022

09/06/2022 12:37 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
GZA GeoEnvironmental, Inc.
Lot Number: XH08005

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

The method blank, laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for prep batch 52265 exceeded acceptance criteria for the following analytes: 6:2 FTS EIS. The data has been reported.

The method blank associated with batch 52513 had 6:2 FTS detected at a concentration that was above the MDL but below the PQL. All samples associated with this method blank that have detections for 6:2 FTS have been flagged with a "B".

Surrogate recovery for the following samples was outside the upper control limit: XH08005-001, XH08005-004, XH08005-005, XH08005-006. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample XH08005-002 had surrogates recovered outside of the acceptance limits due to confirmed matrix interference.

The MS/MSD associated with sample XH08005-002 had compounds recovered outside of the acceptance limits. The LCS was recovered within the required acceptance limits; therefore, this demonstrates a matrix effect and data quality is not impacted.

Sample Summary

GZA GeoEnvironmental, Inc.

Lot Number: XH08005

Project Name: Oshkosh Corp-West Plant

Project Number: 20.0157080.00

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	WP-MW-3	Aqueous	08/03/2022 1314	08/05/2022
002	WP-MW-1	Aqueous	08/03/2022 1318	08/05/2022
003	WP-MW-4	Aqueous	08/03/2022 1130	08/05/2022
004	WP-MW-2	Aqueous	08/03/2022 1359	08/05/2022
005	WP-FB-1	Aqueous	08/03/2022 1346	08/05/2022
006	WP-EB-1	Aqueous	08/03/2022 1350	08/05/2022
007	Trip	Aqueous	08/03/2022	08/05/2022

(7 samples)

Detection Summary

GZA GeoEnvironmental, Inc.

Lot Number: XH08005

Project Name: Oshkosh Corp-West Plant

Project Number: 20.0157080.00

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	WP-MW-3	Aqueous	PFBS	PFAS by ID	7.5		ng/L	6
001	WP-MW-3	Aqueous	PFPeS	PFAS by ID	3.0	J	ng/L	6
001	WP-MW-3	Aqueous	PFHxS	PFAS by ID	16		ng/L	6
001	WP-MW-3	Aqueous	PFNA	PFAS by ID	3.1	J	ng/L	6
001	WP-MW-3	Aqueous	PFPeA	PFAS by ID	0.55	J	ng/L	6
001	WP-MW-3	Aqueous	PFOS	PFAS by ID	29		ng/L	6
002	WP-MW-1	Aqueous	6:2 FTS	PFAS by ID	9.4	Q	ng/L	8
002	WP-MW-1	Aqueous	PFBS	PFAS by ID	10		ng/L	8
002	WP-MW-1	Aqueous	PFPeS	PFAS by ID	2.4	J	ng/L	8
002	WP-MW-1	Aqueous	PFHxS	PFAS by ID	14		ng/L	8
002	WP-MW-1	Aqueous	PFBA	PFAS by ID	2100		ng/L	8
002	WP-MW-1	Aqueous	PFHpA	PFAS by ID	890		ng/L	8
002	WP-MW-1	Aqueous	PFHxA	PFAS by ID	5100		ng/L	8
002	WP-MW-1	Aqueous	PFNA	PFAS by ID	0.53	J	ng/L	8
002	WP-MW-1	Aqueous	PFOA	PFAS by ID	50		ng/L	8
002	WP-MW-1	Aqueous	PFPeA	PFAS by ID	11000		ng/L	8
002	WP-MW-1	Aqueous	PFOS	PFAS by ID	4.4		ng/L	8
003	WP-MW-4	Aqueous	PFBS	PFAS by ID	5.4		ng/L	10
003	WP-MW-4	Aqueous	PFPeS	PFAS by ID	1.7	J	ng/L	10
003	WP-MW-4	Aqueous	PFHxS	PFAS by ID	13		ng/L	10
003	WP-MW-4	Aqueous	PFBA	PFAS by ID	7.4		ng/L	10
003	WP-MW-4	Aqueous	PFHpA	PFAS by ID	1.7	J	ng/L	10
003	WP-MW-4	Aqueous	PFHxA	PFAS by ID	4.9		ng/L	10
003	WP-MW-4	Aqueous	PFNA	PFAS by ID	0.56	J	ng/L	10
003	WP-MW-4	Aqueous	PFOA	PFAS by ID	1.7	J	ng/L	10
003	WP-MW-4	Aqueous	PFPeA	PFAS by ID	6.7		ng/L	10
004	WP-MW-2	Aqueous	PFBS	PFAS by ID	16		ng/L	12
004	WP-MW-2	Aqueous	PFHpS	PFAS by ID	0.73	J	ng/L	12
004	WP-MW-2	Aqueous	PFPeS	PFAS by ID	14		ng/L	12
004	WP-MW-2	Aqueous	PFHxS	PFAS by ID	95		ng/L	12
004	WP-MW-2	Aqueous	PFBA	PFAS by ID	36		ng/L	12
004	WP-MW-2	Aqueous	PFHpA	PFAS by ID	15		ng/L	12
004	WP-MW-2	Aqueous	PFHxA	PFAS by ID	50		ng/L	12
004	WP-MW-2	Aqueous	PFNA	PFAS by ID	6.1		ng/L	12
004	WP-MW-2	Aqueous	PFOA	PFAS by ID	7.6		ng/L	12
004	WP-MW-2	Aqueous	PFPeA	PFAS by ID	100		ng/L	12
004	WP-MW-2	Aqueous	PFOS	PFAS by ID	17		ng/L	12

(37 detections)

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-001
Description: WP-MW-3 | Matrix: Aqueous
Date Sampled: 08/03/2022 1314 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/26/2022 1308	MMM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.7	0.84	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.7	1.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	0.72	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.7	0.92	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		15	1.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	0.90	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.7	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	7.5		3.9	0.40	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.75	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	3.0	J	3.9	0.57	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.7	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	16		3.9	0.53	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.9	0.43	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.9	0.66	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	3.1	J	3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.9	0.80	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.55	J	3.9	0.53	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	29		3.9	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		124	25-150
13C2_6:2FTS	N	365	25-150
13C2_8:2FTS		114	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		123	25-150
13C3_PFHxS		122	25-150
13C3-HFPO-DA		112	25-150
13C4_PFBA		104	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-001
Description: WP-MW-3 | Matrix: Aqueous
Date Sampled: 08/03/2022 1314 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		111	25-150
13C5_PFHxA		120	25-150
13C5_PFPeA		116	25-150
13C6_PFDA		120	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		120	25-150
13C8_PFOS		113	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		115	25-150
d-EtFOSA		82	10-150
d5-EtFOSAA		104	25-150
d9-EtFOSE		88	10-150
d-MeFOSA		81	10-150
d3-MeFOSAA		102	25-150
d7-MeFOSE		93	10-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-002
Description: WP-MW-1 | Matrix: Aqueous
Date Sampled: 08/03/2022 1318 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/26/2022 1330	MMM	08/25/2022 1750	52265
2	SOP SPE	PFAS by ID SOP	50	08/30/2022 1208	ALM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	9.4	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.78	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.1	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.1	0.85	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.1	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	10		3.6	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.6	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.6	0.45	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.6	0.64	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.6	0.55	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.4	J	3.6	0.53	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.1	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	14		3.6	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2100		180	27	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.6	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	890		180	20	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	5100		180	31	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.53	J	3.6	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	50		3.6	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	11000		180	24	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.6	0.54	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.6	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.6	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.4		3.6	1.8	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		134	25-150		101	25-150
13C2_6:2FTS	N	299	25-150		105	25-150
13C2_8:2FTS		113	25-150		105	25-150
13C2_PFDoA		99	25-150		104	25-150
13C2_PFTeDA		101	25-150		107	25-150
13C3_PFBS		105	25-150		107	25-150
13C3_PFHxS		98	25-150		106	25-150
13C3-HFPO-DA		110	25-150		104	25-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-002
Description: WP-MW-1 | Matrix: Aqueous
Date Sampled: 08/03/2022 1318 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C4_PFBA		59	25-150		103	25-150
13C4_PFHpA		97	25-150		104	25-150
13C5_PFHxA		70	25-150		103	25-150
13C5_PFPeA		41	25-150		105	25-150
13C6_PFDA		122	25-150		106	25-150
13C7_PFUdA		105	25-150		101	25-150
13C8_PFOA		117	25-150		106	25-150
13C8_PFOS		112	25-150		107	25-150
13C8_PFOSA		101	10-150		105	10-150
13C9_PFNA		111	25-150		105	25-150
d-EtFOSA		92	10-150		108	10-150
d5-EtFOSAA		97	25-150		107	25-150
d9-EtFOSE		94	10-150		104	10-150
d-MeFOSA		76	10-150		94	10-150
d3-MeFOSAA		101	25-150		104	25-150
d7-MeFOSE		96	10-150		104	10-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-003
Description: WP-MW-4 | Matrix: Aqueous
Date Sampled: 08/03/2022 1130 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/29/2022 1605	MMM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.8	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.8	1.6	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		7.8	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.8	0.85	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.8	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.8	0.47	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.8	1.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.8	0.73	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.8	0.93	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		16	1.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.8	0.91	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.8	1.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	5.4		3.9	0.40	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.9	0.76	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.9	0.49	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.9	0.69	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.9	0.60	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.7	J	3.9	0.58	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.8	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	13		3.9	0.54	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.4		3.9	0.58	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.9	0.46	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	J	3.9	0.44	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.9		3.9	0.67	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.56	J	3.9	0.45	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	J	3.9	0.81	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	6.7		3.9	0.53	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.9	0.58	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.9	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.9	0.61	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.9	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		139	25-150
13C2_6:2FTS		113	25-150
13C2_8:2FTS		108	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		106	25-150
13C3_PFBS		116	25-150
13C3_PFHxS		114	25-150
13C3-HFPO-DA		116	25-150
13C4_PFBA		76	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.			Laboratory ID: XH08005-003
Description: WP-MW-4			Matrix: Aqueous
Date Sampled: 08/03/2022 1130		Project Name: Oshkosh Corp-West Plant	
Date Received: 08/05/2022		Project Number: 20.0157080.00	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		117	25-150
13C5_PFHxA		118	25-150
13C5_PFPeA		108	25-150
13C6_PFDA		113	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		120	25-150
13C8_PFOS		116	25-150
13C8_PFOSA		109	10-150
13C9_PFNA		122	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		102	25-150
d9-EtFOSE		90	10-150
d-MeFOSA		69	10-150
d3-MeFOSAA		104	25-150
d7-MeFOSE		90	10-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
ND = Not detected at or above the DL	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis			S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-004
Description: WP-MW-2 | Matrix: Aqueous
Date Sampled: 08/03/2022 1359 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/26/2022 1403	MMM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.7	0.64	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.7	1.5	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.7	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.7	0.84	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.7	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.7	0.46	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.7	1.3	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.7	0.72	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.7	0.91	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		15	1.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.7	0.89	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.7	1.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	16		3.8	0.40	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.8	0.75	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	0.73	J	3.8	0.48	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.8	0.68	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.8	0.59	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	14		3.8	0.57	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.7	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	95		3.8	0.53	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	36		3.8	0.57	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.8	0.50	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.8	0.45	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	15		3.8	0.43	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	50		3.8	0.66	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	6.1		3.8	0.44	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.6		3.8	0.79	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	100		3.8	0.52	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.8	0.57	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.8	0.51	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.8	0.60	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	17		3.8	1.9	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		146	25-150
13C2_6:2FTS	N	371	25-150
13C2_8:2FTS		100	25-150
13C2_PFDoA		77	25-150
13C2_PFTeDA		80	25-150
13C3_PFBS		113	25-150
13C3_PFHxS		116	25-150
13C3-HFPO-DA		112	25-150
13C4_PFBA		101	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: XH08005-004
Description: WP-MW-2
Matrix: Aqueous
Date Sampled: 08/03/2022 1359
Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022
Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		115	25-150
13C5_PFHxA		114	25-150
13C5_PFPeA		111	25-150
13C6_PFDA		104	25-150
13C7_PFUdA		89	25-150
13C8_PFOA		116	25-150
13C8_PFOS		105	25-150
13C8_PFOSA		98	10-150
13C9_PFNA		106	25-150
d-EtFOSA		77	10-150
d5-EtFOSAA		85	25-150
d9-EtFOSE		73	10-150
d-MeFOSA		75	10-150
d3-MeFOSAA		89	25-150
d7-MeFOSE		82	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-005
Description: WP-FB-1 | Matrix: Aqueous
Date Sampled: 08/03/2022 1346 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/26/2022 1414	MMM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		7.1	0.59	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		7.1	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	7.1	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		7.1	0.77	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		7.1	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		7.1	0.43	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		7.1	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		7.1	0.67	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		7.1	0.84	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		7.1	0.83	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		7.1	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.37	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.69	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.44	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.63	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		7.1	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.49	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.42	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.61	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.74	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.56	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.8	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		121	25-150
13C2_6:2FTS	N	262	25-150
13C2_8:2FTS		117	25-150
13C2_PFDoA		114	25-150
13C2_PFTeDA		94	25-150
13C3_PFBS		127	25-150
13C3_PFHxS		120	25-150
13C3-HFPO-DA		116	25-150
13C4_PFBA		121	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-005
Description: WP-FB-1 | Matrix: Aqueous
Date Sampled: 08/03/2022 1346 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		115	25-150
13C5_PFHxA		124	25-150
13C5_PFPeA		117	25-150
13C6_PFDA		123	25-150
13C7_PFUdA		113	25-150
13C8_PFOA		123	25-150
13C8_PFOS		116	25-150
13C8_PFOSA		107	10-150
13C9_PFNA		119	25-150
d-EtFOSA		93	10-150
d5-EtFOSAA		113	25-150
d9-EtFOSE		105	10-150
d-MeFOSA		85	10-150
d3-MeFOSAA		114	25-150
d7-MeFOSE		105	10-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-006
Description: WP-EB-1 | Matrix: Aqueous
Date Sampled: 08/03/2022 1350 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/26/2022 1425	MMM	08/25/2022 1750	52265

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		6.9	0.57	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		6.9	1.4	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND	Q	6.9	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		6.9	0.76	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		6.9	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		6.9	0.42	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		6.9	1.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		6.9	0.65	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		6.9	0.82	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		14	1.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		6.9	0.81	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		6.9	1.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		3.5	0.36	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		3.5	0.67	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		3.5	0.43	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		3.5	0.62	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		3.5	0.53	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		3.5	0.51	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		6.9	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		3.5	0.48	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		3.5	0.45	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		3.5	0.41	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		3.5	0.39	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		3.5	0.60	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		3.5	0.40	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		3.5	0.72	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		3.5	0.47	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		3.5	0.52	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		3.5	0.46	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		3.5	0.54	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		3.5	1.7	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		120	25-150
13C2_6:2FTS	N	207	25-150
13C2_8:2FTS		121	25-150
13C2_PFDoA		114	25-150
13C2_PFTeDA		115	25-150
13C3_PFBS		124	25-150
13C3_PFHxS		121	25-150
13C3-HFPO-DA		121	25-150
13C4_PFBA		123	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: XH08005-006
Description: WP-EB-1
Matrix: Aqueous
Date Sampled: 08/03/2022 1350
Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022
Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		122	25-150
13C5_PFHxA		124	25-150
13C5_PFPeA		120	25-150
13C6_PFDA		128	25-150
13C7_PFUdA		115	25-150
13C8_PFOA		126	25-150
13C8_PFOS		124	25-150
13C8_PFOSA		113	10-150
13C9_PFNA		121	25-150
d-EtFOSA		96	10-150
d5-EtFOSAA		115	25-150
d9-EtFOSE		109	10-150
d-MeFOSA		93	10-150
d3-MeFOSAA		122	25-150
d7-MeFOSE		115	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc. | Laboratory ID: XH08005-007
Description: Trip | Matrix: Aqueous
Date Sampled: 08/03/2022 | Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022 | Project Number: 20.0157080.00

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP	1	08/31/2022 1401	ALM	08/29/2022 1015	52513

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	MDL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	ND		8.3	0.68	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	ND		8.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	ND		8.3	0.90	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	ND		8.3	2.1	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	ND		8.3	0.50	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	ND		8.3	1.4	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	ND		8.3	0.78	ng/L	1
2-N-ethylperfluoro-1-octanesulfonamido-ethanol (EtFOSE)	1691-99-2	PFAS by ID SOP	ND		8.3	0.98	ng/L	1
N-methylperfluoro-1-octanesulfonamide (MeFOSA)	31506-32-8	PFAS by ID SOP	ND		17	1.3	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	ND		8.3	0.96	ng/L	1
2-N-methylperfluoro-1-octanesulfonamido-ethanol (MeFOSE)	24448-09-7	PFAS by ID SOP	ND		8.3	1.3	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	ND		4.1	0.43	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	ND		4.1	0.80	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	ND		4.1	0.52	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	ND		4.1	0.74	ng/L	1
Perfluoro-1-octanesulfonamide (PFOSA)	754-91-6	PFAS by ID SOP	ND		4.1	0.63	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	ND		4.1	0.61	ng/L	1
Perfluorododecanesulfonic acid (PFDOS)	79780-39-5	PFAS by ID SOP	ND		8.3	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	ND		4.1	0.57	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	ND		4.1	0.54	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	ND		4.1	0.49	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	ND		4.1	0.46	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	ND		4.1	0.71	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	ND		4.1	0.48	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	ND		4.1	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	ND		4.1	0.56	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	ND		4.1	0.62	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	ND		4.1	0.55	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	ND		4.1	0.65	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	ND		4.1	2.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		101	25-150
13C2_6:2FTS		136	25-150
13C2_8:2FTS		94	25-150
13C2_PFDoA		105	25-150
13C2_PFTeDA		102	25-150
13C3_PFBS		106	25-150
13C3_PFHxS		108	25-150
13C3-HFPO-DA		100	25-150
13C4_PFBA		110	25-150

LOQ = Limit of Quantitation
ND = Not detected at or above the DL
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: GZA GeoEnvironmental, Inc.
Laboratory ID: XH08005-007
Description: Trip
Matrix: Aqueous
Date Sampled: 08/03/2022
Project Name: Oshkosh Corp-West Plant
Date Received: 08/05/2022
Project Number: 20.0157080.00

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C4_PFHpA		107	25-150
13C5_PFHxA		103	25-150
13C5_PFPeA		108	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		105	25-150
13C8_PFOA		110	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		101	10-150
13C9_PFNA		109	25-150
d-EtFOSA		90	10-150
d5-EtFOSAA		111	25-150
d9-EtFOSE		96	10-150
d-MeFOSA		70	10-150
d3-MeFOSAA		104	25-150
d7-MeFOSE		97	10-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
ND = Not detected at or above the DL
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
S = MS/MSD failure

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QC Summary

PFAS by LC/MS/MS - MB

Sample ID: XQ52265-001
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	08/26/2022 1152
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	08/26/2022 1152
8:2 FTS	ND		1	8.0	1.6	ng/L	08/26/2022 1152
6:2 FTS	ND		1	8.0	2.0	ng/L	08/26/2022 1152
4:2 FTS	ND		1	8.0	0.87	ng/L	08/26/2022 1152
GenX	ND		1	8.0	2.1	ng/L	08/26/2022 1152
ADONA	ND		1	8.0	0.48	ng/L	08/26/2022 1152
EtFOSA	ND		1	8.0	1.4	ng/L	08/26/2022 1152
EtFOSAA	ND		1	8.0	0.75	ng/L	08/26/2022 1152
EtFOSE	ND		1	8.0	0.95	ng/L	08/26/2022 1152
MeFOSA	ND		1	16	1.3	ng/L	08/26/2022 1152
MeFOSAA	ND		1	8.0	0.93	ng/L	08/26/2022 1152
MeFOSE	ND		1	8.0	1.3	ng/L	08/26/2022 1152
PFBS	ND		1	4.0	0.41	ng/L	08/26/2022 1152
PFDS	ND		1	4.0	0.78	ng/L	08/26/2022 1152
PFHpS	ND		1	4.0	0.50	ng/L	08/26/2022 1152
PFNS	ND		1	4.0	0.71	ng/L	08/26/2022 1152
PFOSA	ND		1	4.0	0.61	ng/L	08/26/2022 1152
PFPeS	ND		1	4.0	0.59	ng/L	08/26/2022 1152
PFDOS	ND		1	8.0	1.0	ng/L	08/26/2022 1152
PFHxS	ND		1	4.0	0.55	ng/L	08/26/2022 1152
PFBA	ND		1	4.0	0.60	ng/L	08/26/2022 1152
PFDA	ND		1	4.0	0.52	ng/L	08/26/2022 1152
PFDoA	ND		1	4.0	0.47	ng/L	08/26/2022 1152
PFHpA	ND		1	4.0	0.45	ng/L	08/26/2022 1152
PFHxA	ND		1	4.0	0.69	ng/L	08/26/2022 1152
PFNA	ND		1	4.0	0.46	ng/L	08/26/2022 1152
PFOA	ND		1	4.0	0.83	ng/L	08/26/2022 1152
PFPeA	ND		1	4.0	0.54	ng/L	08/26/2022 1152
PFTeDA	ND		1	4.0	0.60	ng/L	08/26/2022 1152
PFTrDA	ND		1	4.0	0.53	ng/L	08/26/2022 1152
PFUdA	ND		1	4.0	0.63	ng/L	08/26/2022 1152
PFOS	ND		1	4.0	2.0	ng/L	08/26/2022 1152

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		116	25-150
13C2_6:2FTS	N	155	25-150
13C2_8:2FTS		109	25-150
13C2_PFDoA		100	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		123	25-150
13C3_PFHxS		114	25-150
13C3-HFPO-DA		118	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ52265-001
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		123	25-150
13C4_PFHpA		116	25-150
13C5_PFHxA		123	25-150
13C5_PFPeA		117	25-150
13C6_PFDA		113	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		121	25-150
13C8_PFOS		111	25-150
13C8_PFOSA		105	10-150
13C9_PFNA		114	25-150
d-EtFOSA		82	10-150
d5-EtFOSAA		104	25-150
d9-EtFOSE		100	10-150
d-MeFOSA		71	10-150
d3-MeFOSAA		107	25-150
d7-MeFOSE		112	10-150

LOQ = Limit of Quantitation
DL = Detection Limit

ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52265-002
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	50-150	08/26/2022 1203
11Cl-PF3OUdS	15	12		1	83	50-150	08/26/2022 1203
8:2 FTS	15	16		1	106	50-150	08/26/2022 1203
6:2 FTS	15	15		1	101	50-150	08/26/2022 1203
4:2 FTS	15	16		1	107	50-150	08/26/2022 1203
GenX	32	37		1	115	50-150	08/26/2022 1203
ADONA	15	15		1	100	50-150	08/26/2022 1203
EtFOSA	16	21		1	131	50-150	08/26/2022 1203
EtFOSAA	16	16		1	103	50-150	08/26/2022 1203
EtFOSE	16	20		1	122	50-150	08/26/2022 1203
MeFOSA	16	24		1	148	50-150	08/26/2022 1203
MeFOSAA	16	16		1	100	50-150	08/26/2022 1203
MeFOSE	16	15		1	94	50-150	08/26/2022 1203
PFBS	14	14		1	98	50-150	08/26/2022 1203
PFDS	15	13		1	86	50-150	08/26/2022 1203
PFHpS	15	15		1	100	50-150	08/26/2022 1203
PFNS	15	14		1	92	50-150	08/26/2022 1203
PFOSA	16	16		1	102	50-150	08/26/2022 1203
PFPeS	15	15		1	101	50-150	08/26/2022 1203
PFDOS	15	14		1	90	50-150	08/26/2022 1203
PFHxS	15	15		1	100	50-150	08/26/2022 1203
PFBA	16	16		1	101	50-150	08/26/2022 1203
PFDA	16	17		1	104	50-150	08/26/2022 1203
PFDoA	16	16		1	101	50-150	08/26/2022 1203
PFHpA	16	16		1	100	50-150	08/26/2022 1203
PFHxA	16	16		1	102	50-150	08/26/2022 1203
PFNA	16	15		1	96	50-150	08/26/2022 1203
PFOA	16	16		1	101	50-150	08/26/2022 1203
PFPeA	16	16		1	99	50-150	08/26/2022 1203
PFTeDA	16	17		1	107	50-150	08/26/2022 1203
PFTrDA	16	16		1	99	50-150	08/26/2022 1203
PFUdA	16	17		1	105	50-150	08/26/2022 1203
PFOS	15	15		1	99	50-150	08/26/2022 1203

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		116	25-150
13C2_6:2FTS	N	158	25-150
13C2_8:2FTS		115	25-150
13C2_PFDoA		104	25-150
13C2_PFTeDA		105	25-150
13C3_PFBS		123	25-150
13C3_PFHxS		121	25-150
13C3-HFPO-DA		119	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52265-002
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		122	25-150
13C4_PFHpA		117	25-150
13C5_PFHxA		122	25-150
13C5_PFPeA		122	25-150
13C6_PFDA		119	25-150
13C7_PFUdA		106	25-150
13C8_PFOA		124	25-150
13C8_PFOS		115	25-150
13C8_PFOSA		106	10-150
13C9_PFNA		120	25-150
d-EtFOSA		73	10-150
d5-EtFOSAA		104	25-150
d9-EtFOSE		102	10-150
d-MeFOSA		62	10-150
d3-MeFOSAA		111	25-150
d7-MeFOSE		108	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: XH08005-001DU
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Parameter	Sample Amount (ng/L)	Result (ng/L)	Q	Dil	% RPD	%RPD Limit	Analysis Date
9Cl-PF3ONS	ND	ND		1	0.00	20	08/26/2022 1319
11Cl-PF3OUdS	ND	ND		1	0.00	20	08/26/2022 1319
8:2 FTS	ND	ND		1	0.00	20	08/26/2022 1319
6:2 FTS	ND	11		1	200	20	08/26/2022 1319
4:2 FTS	ND	ND		1	0.00	20	08/26/2022 1319
GenX	ND	ND		1	0.00	20	08/26/2022 1319
ADONA	ND	ND		1	0.00	20	08/26/2022 1319
EtFOSA	ND	ND		1	0.00	20	08/26/2022 1319
EtFOSAA	ND	ND		1	0.00	20	08/26/2022 1319
EtFOSE	ND	ND		1	0.00	20	08/26/2022 1319
MeFOSA	ND	ND		1	0.00	20	08/26/2022 1319
MeFOSAA	ND	ND		1	0.00	20	08/26/2022 1319
MeFOSE	ND	ND		1	0.00	20	08/26/2022 1319
PFBS	7.5	7.2		1	4.8	20	08/26/2022 1319
PFDS	ND	ND		1	0.00	20	08/26/2022 1319
PFHpS	ND	ND		1	0.00	20	08/26/2022 1319
PFNS	ND	ND		1	0.00	20	08/26/2022 1319
PFOSA	ND	ND		1	0.00	20	08/26/2022 1319
PFPeS	3.0	2.9	J	1	0.090	20	08/26/2022 1319
PFDOS	ND	ND		1	0.00	20	08/26/2022 1319
PFHxS	16	17		1	3.5	20	08/26/2022 1319
PFBA	ND	ND		1	0.00	20	08/26/2022 1319
PFDA	ND	ND		1	0.00	20	08/26/2022 1319
PFDoA	ND	ND		1	0.00	20	08/26/2022 1319
PFHpA	ND	ND		1	0.00	20	08/26/2022 1319
PFHxA	ND	ND		1	0.00	20	08/26/2022 1319
PFNA	3.1	3.1	J	1	2.3	20	08/26/2022 1319
PFOA	ND	ND		1	0.00	20	08/26/2022 1319
PFPeA	0.55	0.55	J	1	0.36	20	08/26/2022 1319
PFTeDA	ND	ND		1	0.00	20	08/26/2022 1319
PFTrDA	ND	ND		1	0.00	20	08/26/2022 1319
PFUdA	ND	ND		1	0.00	20	08/26/2022 1319
PFOS	29	29		1	1.1	20	08/26/2022 1319

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		130	25-150
13C2_6:2FTS	N	421	25-150
13C2_8:2FTS		116	25-150
13C2_PFDoA		108	25-150
13C2_PFTeDA		109	25-150
13C3_PFBS		131	25-150
13C3_PFHxS		120	25-150
13C3-HFPO-DA		118	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - Duplicate

Sample ID: XH08005-001DU
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		109	25-150
13C4_PFHpA		128	25-150
13C5_PFHxA		123	25-150
13C5_PFPeA		122	25-150
13C6_PFDA		124	25-150
13C7_PFUdA		112	25-150
13C8_PFOA		127	25-150
13C8_PFOS		119	25-150
13C8_PFOSA		109	10-150
13C9_PFNA		118	25-150
d-EtFOSA		96	10-150
d5-EtFOSAA		111	25-150
d9-EtFOSE		97	10-150
d-MeFOSA		84	10-150
d3-MeFOSAA		111	25-150
d7-MeFOSE		105	10-150

LOQ = Limit of Quantitation
DL = Detection Limit

ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: XH08005-002MS
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Parameter	Sample Amount (ng/L)	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	ND	13	12		1	88	50-150	08/26/2022 1341
11Cl-PF3OUdS	ND	13	10		1	78	50-150	08/26/2022 1341
8:2 FTS	ND	14	15		1	109	50-150	08/26/2022 1341
6:2 FTS	9.4	14	25		1	118	50-150	08/26/2022 1341
4:2 FTS	ND	13	13		1	96	50-150	08/26/2022 1341
GenX	ND	29	31		1	110	50-150	08/26/2022 1341
ADONA	ND	13	16		1	116	50-150	08/26/2022 1341
EtFOSA	ND	14	19		1	130	50-150	08/26/2022 1341
EtFOSAA	ND	14	16		1	113	50-150	08/26/2022 1341
EtFOSE	ND	14	19		1	133	50-150	08/26/2022 1341
MeFOSA	ND	14	21		1	148	50-150	08/26/2022 1341
MeFOSAA	ND	14	15		1	102	50-150	08/26/2022 1341
MeFOSE	ND	14	15		1	104	50-150	08/26/2022 1341
PFBS	10	13	23		1	98	50-150	08/26/2022 1341
PFDS	ND	14	11		1	80	50-150	08/26/2022 1341
PFHpS	ND	14	15		1	114	50-150	08/26/2022 1341
PFNS	ND	14	13		1	92	50-150	08/26/2022 1341
PFOSA	ND	14	14		1	98	50-150	08/26/2022 1341
PFPeS	2.4	13	14		1	88	50-150	08/26/2022 1341
PFDOS	ND	14	12		1	84	50-150	08/26/2022 1341
PFHxS	14	13	28		1	104	50-150	08/26/2022 1341
PFBA	1200	14	1200	N	1	323	50-150	08/26/2022 1341
PFDA	ND	14	15		1	103	50-150	08/26/2022 1341
PFDoA	ND	14	16		1	112	50-150	08/26/2022 1341
PFHpA	660	14	660	N	1	-3.9	50-150	08/26/2022 1341
PFHxA	1800	14	2000	N	1	1140	50-150	08/26/2022 1341
PFNA	0.53	14	14		1	94	50-150	08/26/2022 1341
PFOA	50	14	67		1	125	50-150	08/26/2022 1341
PFPeA	3300	14	3400	N	1	636	50-150	08/26/2022 1341
PFTeDA	ND	14	16		1	110	50-150	08/26/2022 1341
PFTrDA	ND	14	16		1	110	50-150	08/26/2022 1341
PFUdA	ND	14	15		1	106	50-150	08/26/2022 1341
PFOS	4.4	13	16		1	89	50-150	08/26/2022 1341

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		139	25-150
13C2_6:2FTS	N	255	25-150
13C2_8:2FTS		106	25-150
13C2_PFDoA		93	25-150
13C2_PFTeDA		99	25-150
13C3_PFBS		107	25-150
13C3_PFHxS		101	25-150
13C3-HFPO-DA		113	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MS

Sample ID: XH08005-002MS
Batch: 52265
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/25/2022 1750

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		61	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		68	25-150
13C5_PFPeA		43	25-150
13C6_PFDA		116	25-150
13C7_PFUdA		101	25-150
13C8_PFOA		119	25-150
13C8_PFOS		116	25-150
13C8_PFOSA		112	10-150
13C9_PFNA		116	25-150
d-EtFOSA		75	10-150
d5-EtFOSAA		95	25-150
d9-EtFOSE		89	10-150
d-MeFOSA		72	10-150
d3-MeFOSAA		99	25-150
d7-MeFOSE		89	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ52513-001
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Parameter	Result	Q	Dil	LOQ	MDL	Units	Analysis Date
9Cl-PF3ONS	ND		1	8.0	0.48	ng/L	08/31/2022 1222
11Cl-PF3OUdS	ND		1	8.0	0.66	ng/L	08/31/2022 1222
8:2 FTS	ND		1	8.0	1.6	ng/L	08/31/2022 1222
6:2 FTS	5.1	J	1	8.0	2.0	ng/L	08/31/2022 1222
4:2 FTS	ND		1	8.0	0.87	ng/L	08/31/2022 1222
GenX	ND		1	8.0	2.1	ng/L	08/31/2022 1222
ADONA	ND		1	8.0	0.48	ng/L	08/31/2022 1222
EtFOSA	ND		1	8.0	1.4	ng/L	08/31/2022 1222
EtFOSAA	ND		1	8.0	0.75	ng/L	08/31/2022 1222
EtFOSE	ND		1	8.0	0.95	ng/L	08/31/2022 1222
MeFOSA	ND		1	16	1.3	ng/L	08/31/2022 1222
MeFOSAA	ND		1	8.0	0.93	ng/L	08/31/2022 1222
MeFOSE	ND		1	8.0	1.3	ng/L	08/31/2022 1222
PFBS	ND		1	4.0	0.41	ng/L	08/31/2022 1222
PFDS	ND		1	4.0	0.78	ng/L	08/31/2022 1222
PFHpS	ND		1	4.0	0.50	ng/L	08/31/2022 1222
PFNS	ND		1	4.0	0.71	ng/L	08/31/2022 1222
PFOSA	ND		1	4.0	0.61	ng/L	08/31/2022 1222
PFPeS	ND		1	4.0	0.59	ng/L	08/31/2022 1222
PFDOS	ND		1	8.0	1.0	ng/L	08/31/2022 1222
PFHxS	ND		1	4.0	0.55	ng/L	08/31/2022 1222
PFBA	ND		1	4.0	0.60	ng/L	08/31/2022 1222
PFDA	ND		1	4.0	0.52	ng/L	08/31/2022 1222
PFDoA	ND		1	4.0	0.47	ng/L	08/31/2022 1222
PFHpA	ND		1	4.0	0.45	ng/L	08/31/2022 1222
PFHxA	ND		1	4.0	0.69	ng/L	08/31/2022 1222
PFNA	ND		1	4.0	0.46	ng/L	08/31/2022 1222
PFOA	ND		1	4.0	0.83	ng/L	08/31/2022 1222
PFPeA	ND		1	4.0	0.54	ng/L	08/31/2022 1222
PFTeDA	ND		1	4.0	0.60	ng/L	08/31/2022 1222
PFTrDA	ND		1	4.0	0.53	ng/L	08/31/2022 1222
PFUdA	ND		1	4.0	0.63	ng/L	08/31/2022 1222
PFOS	ND		1	4.0	2.0	ng/L	08/31/2022 1222

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		101	25-150
13C2_6:2FTS		122	25-150
13C2_8:2FTS		103	25-150
13C2_PFDoA		103	25-150
13C2_PFTeDA		104	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		104	25-150
13C3-HFPO-DA		105	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ52513-001
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		109	25-150
13C4_PFHpA		106	25-150
13C5_PFHxA		104	25-150
13C5_PFPeA		107	25-150
13C6_PFDA		102	25-150
13C7_PFUdA		104	25-150
13C8_PFOA		109	25-150
13C8_PFOS		100	25-150
13C8_PFOSA		102	10-150
13C9_PFNA		106	25-150
d-EtFOSA		76	10-150
d5-EtFOSAA		105	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		67	10-150
d3-MeFOSAA		104	25-150
d7-MeFOSE		101	10-150

LOQ = Limit of Quantitation
DL = Detection Limit

ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52513-002
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	98	50-150	08/31/2022 1233
11Cl-PF3OUdS	15	13		1	88	50-150	08/31/2022 1233
8:2 FTS	15	16		1	107	50-150	08/31/2022 1233
6:2 FTS	15	15		1	100	50-150	08/31/2022 1233
4:2 FTS	15	17		1	111	50-150	08/31/2022 1233
GenX	32	34		1	107	50-150	08/31/2022 1233
ADONA	15	14		1	92	50-150	08/31/2022 1233
EtFOSA	16	18		1	110	50-150	08/31/2022 1233
EtFOSAA	16	16		1	98	50-150	08/31/2022 1233
EtFOSE	16	19		1	119	50-150	08/31/2022 1233
MeFOSA	16	18		1	115	50-150	08/31/2022 1233
MeFOSAA	16	15		1	97	50-150	08/31/2022 1233
MeFOSE	16	15		1	92	50-150	08/31/2022 1233
PFBS	14	14		1	98	50-150	08/31/2022 1233
PFDS	15	14		1	90	50-150	08/31/2022 1233
PFHpS	15	15		1	99	50-150	08/31/2022 1233
PFNS	15	14		1	93	50-150	08/31/2022 1233
PFOSA	16	16		1	99	50-150	08/31/2022 1233
PFPeS	15	15		1	98	50-150	08/31/2022 1233
PFDOS	15	15		1	94	50-150	08/31/2022 1233
PFHxS	15	14		1	98	50-150	08/31/2022 1233
PFBA	16	16		1	101	50-150	08/31/2022 1233
PFDA	16	15		1	96	50-150	08/31/2022 1233
PFDoA	16	16		1	101	50-150	08/31/2022 1233
PFHpA	16	15		1	96	50-150	08/31/2022 1233
PFHxA	16	16		1	100	50-150	08/31/2022 1233
PFNA	16	15		1	95	50-150	08/31/2022 1233
PFOA	16	16		1	102	50-150	08/31/2022 1233
PFPeA	16	15		1	96	50-150	08/31/2022 1233
PFTeDA	16	16		1	100	50-150	08/31/2022 1233
PFTrDA	16	17		1	108	50-150	08/31/2022 1233
PFUdA	16	16		1	98	50-150	08/31/2022 1233
PFOS	15	15		1	102	50-150	08/31/2022 1233

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		92	25-150
13C2_6:2FTS		111	25-150
13C2_8:2FTS		98	25-150
13C2_PFDoA		101	25-150
13C2_PFTeDA		103	25-150
13C3_PFBS		101	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		101	25-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52513-002
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		104	25-150
13C4_PFHpA		109	25-150
13C5_PFHxA		98	25-150
13C5_PFPeA		105	25-150
13C6_PFDA		108	25-150
13C7_PFUdA		103	25-150
13C8_PFOA		105	25-150
13C8_PFOS		96	25-150
13C8_PFOSA		97	10-150
13C9_PFNA		103	25-150
d-EtFOSA		63	10-150
d5-EtFOSAA		103	25-150
d9-EtFOSE		93	10-150
d-MeFOSA		52	10-150
d3-MeFOSAA		99	25-150
d7-MeFOSE		96	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
ND = Not detected at or above the DL
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ52513-003
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	14		1	95	2.7	50-150	30	08/31/2022 1244
11Cl-PF3OUdS	15	13		1	84	4.1	50-150	30	08/31/2022 1244
8:2 FTS	15	17		1	108	1.3	50-150	30	08/31/2022 1244
6:2 FTS	15	15		1	96	4.5	50-150	30	08/31/2022 1244
4:2 FTS	15	15		1	99	12	50-150	30	08/31/2022 1244
GenX	32	34		1	106	0.83	50-150	30	08/31/2022 1244
ADONA	15	14		1	92	0.24	50-150	30	08/31/2022 1244
EtFOSA	16	18		1	115	3.8	50-150	30	08/31/2022 1244
EtFOSAA	16	15		1	97	1.6	50-150	30	08/31/2022 1244
EtFOSE	16	21		1	128	7.8	50-150	30	08/31/2022 1244
MeFOSA	16	19		1	121	5.3	50-150	30	08/31/2022 1244
MeFOSAA	16	16		1	98	0.86	50-150	30	08/31/2022 1244
MeFOSE	16	15		1	94	1.6	50-150	30	08/31/2022 1244
PFBS	14	14		1	99	1.5	50-150	30	08/31/2022 1244
PFDS	15	15		1	98	7.9	50-150	30	08/31/2022 1244
PFHpS	15	15		1	102	2.5	50-150	30	08/31/2022 1244
PFNS	15	14		1	94	0.88	50-150	30	08/31/2022 1244
PFOSA	16	16		1	101	2.0	50-150	30	08/31/2022 1244
PFPeS	15	15		1	98	0.65	50-150	30	08/31/2022 1244
PFDOS	15	14		1	92	2.6	50-150	30	08/31/2022 1244
PFHxS	15	14		1	99	0.84	50-150	30	08/31/2022 1244
PFBA	16	16		1	102	0.30	50-150	30	08/31/2022 1244
PFDA	16	17		1	104	7.5	50-150	30	08/31/2022 1244
PFDoA	16	16		1	101	0.13	50-150	30	08/31/2022 1244
PFHpA	16	17		1	105	8.6	50-150	30	08/31/2022 1244
PFHxA	16	16		1	98	2.4	50-150	30	08/31/2022 1244
PFNA	16	16		1	97	2.2	50-150	30	08/31/2022 1244
PFOA	16	16		1	97	5.0	50-150	30	08/31/2022 1244
PFPeA	16	16		1	101	5.1	50-150	30	08/31/2022 1244
PFTeDA	16	16		1	101	1.3	50-150	30	08/31/2022 1244
PFTrDA	16	17		1	106	2.4	50-150	30	08/31/2022 1244
PFUdA	16	15		1	95	3.4	50-150	30	08/31/2022 1244
PFOS	15	15		1	100	2.3	50-150	30	08/31/2022 1244

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		99	25-150
13C2_6:2FTS		109	25-150
13C2_8:2FTS		97	25-150
13C2_PFDoA		97	25-150
13C2_PFTeDA		100	25-150
13C3_PFBS		99	25-150
13C3_PFHxS		103	25-150
13C3-HFPO-DA		99	25-150

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+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ52513-003
Batch: 52513
Analytical Method: PFAS by ID SOP

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/29/2022 1015

Surrogate	Q	% Rec	Acceptance Limit
13C4_PFBA		102	25-150
13C4_PFHpA		103	25-150
13C5_PFHxA		100	25-150
13C5_PFPeA		104	25-150
13C6_PFDA		98	25-150
13C7_PFUdA		99	25-150
13C8_PFOA		104	25-150
13C8_PFOS		97	25-150
13C8_PFOSA		95	10-150
13C9_PFNA		102	25-150
d-EtFOSA		71	10-150
d5-EtFOSAA		100	25-150
d9-EtFOSE		88	10-150
d-MeFOSA		63	10-150
d3-MeFOSAA		99	25-150
d7-MeFOSE		99	10-150

LOQ = Limit of Quantitation
DL = Detection Limit
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 137451

Client: GZA GeoEnvironmental Inc.
Address: 17975 W. Sarah Lane #100
City: Brookfield State: WI Zip Code: 53045
Project Name: Oshkosh Corp - West Plant
Project No.: 20.0157080.00
P.O. No.:

Report to Contact: Kevin Hedinger
Sampler's Signature: x Sheryl Stephenson
Printed Name: Sheryl Stephenson

Telephone No. / E-mail: 262-424-1761 Kevin.Hedinger@gza.com
Analysis (Attach list if more space is needed): PFAS

Quote No.:
Page 1 of 1

XH08005
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	PFAS	Remarks / Cooler I.D.
WP-MW-3	8/3/22	1314	G	X			2							X	
WP-MW-1	8/3/22	1318	G	X			2							X	
WP-MW-4	8/3/22	1130	G	X			2							X	
WP-MW-2	8/3/22	1359	G	X			2							X	
WP-FB-1	8/3/22	1346	G	X			2							X	
WP-EB-1	8/3/22	1350	G	X			2							X	
Trip	8/3/22	–	–	X			1							X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify):

Relinquished by	Date	Time	Received by	Date	Time
1. [signature]	8-4-22	1600	1. FedEx	8-4-22	1600
2.			2.		
3.			3.		
4. FedEx	8/5/22	0720	4. Laboratory received by [signature] (for SG)	8-5-22	0720

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on Ice (Circle) (Yes) No Ice Pack — Receipt Temp. 2.8 °C — Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N8-01

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: GZA Cooler Inspected by/date: KSC / 08/08/2022 Lot #: XH08005

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.8 / 2.8 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☐ Temperature Blank ☑ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☐ Yes	☑ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 25164

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (if #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1