



Local Pollutant Discharge Limitations Study 2020



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January 13, 2022 (Revised)

Ms. Laura Verona, District Supervisor
Michigan Department of Environment, Great
Lakes and Energy
SE Michigan District Office
27700 Donald Court
Warren, Michigan 48092-2793

RE: Re-evaluation Report: Wastewater Pollutant Discharge Limitations
Detroit Wastewater Treatment Plant

The enclosed *revised* report presents the findings of the recent re-evaluation of the wastewater pollutant discharge limitations required to protect the Detroit Wastewater Treatment Plant. The report recommends revisions to the wastewater pollutant limitations for Copper, Mercury, Available Cyanide, Phosphorus, and Total Phenol and recommends adoption of a new Local Pollutant Discharge Limitations for PFOS (perfluorooctane Sulfonic Acid).

As reported herein, we have completed the required re-evaluation supported by our technical justification and conclusions; and the work provides recommended values for the GLWA to establish Local Pollutant Discharge Limitations as part of its development of local rules and IPP Program.

The report was prepared in accordance with USEPA guidance materials, and based, except where noted, upon site specific data for the GLWA Wastewater Resource Recovery Facility and for Domestic contributions of wastewater to the sewage collection system. The report is organized to provide individual calculations for each pollutant parameter considered as well as recognized allocation methods.

Should there be any questions or comments concerning the attached report, please contact the writer, Mr. Stephen J Kuplicki, PE at 313-297-5804.

Sincerely,

Stephen Kuplicki

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INDUSTRIAL WASTE CONTROL PROGRAM

Re-evaluation of Local Pollutant Discharge Limitations

Report

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Executive Summary - 2021 Local Limits Re-evaluation Study for the GLWA Regional Sewer System

The National Pollutant Discharge Elimination System Permit (NPDES) issued to the Great Lakes Water Authority (GLWA) and the City of Detroit include a requirement for the periodic review and re-evaluation of the Local Pollutant Discharge Limitations applied under the approved Industrial Pretreatment Program. This 2021 Re-evaluation of Local Pollutant Discharge Limitations Study¹ (hereinafter “2021 Limits Study”) has applied technically based criteria to determine those Local Pollutant Discharge Limitations necessary to protect the GLWA Water Resource Recovery Facility (WRRF) from pollutant interference, inhibition or pass-through as well as worker health & safety and protection of the collection system; and protect the Southeastern Michigan Environment.

This 2021 Limits Study has been prepared in accordance with US EPA Guidance (2004) and State of Michigan EGLE guidance and the current NPDES Permit MI 0022802 and considers a number of technical criteria including but not limited to interference, inhibition and pass-through, plant and collection system criteria, and community/worker health and safety. The 2021 Limits Study identified Pollutants of Concern to the GLWA Regional Sewer System inclusive of those pollutant parameters with a specific NPDES permit limit, common metals specified for review in our NPDES permit, Per and Poly Fluoroalkyl Substances (PFAS) and other locally identified pollutants.

The 2021 Limits Study uses a large data collection effort which includes the WRRF influent and effluent streams, background & domestic source sampling, and other field data collected through the approved Industrial Pretreatment Program. GLWA has compiled and processed this data in accordance with the aforementioned criteria to calculate the Maximum Allowable Headworks Loadings (MAHL) followed by allocation of the MAHL using the Uniform Concentration and Industrial User Contribution Allocation methods. A Best Professional Judgment review is then applied to these calculated values to develop final rationally based pollutant discharge limitations.

The State of Michigan – Environment, Great Lakes, and Energy (EGLE) group provided a copy of an internal memo (dated April 5, 2021) that included special Water Quality Based Effluent Limits (WQBEL) for NPDES Permit MI0022802 in October 2021. This data was considered in the revised calculations made for the Local Pollutant Discharge Limitation calculations resulting in revisions to the original report submitted in June 2021.

Based upon our review of the information and data collected and used in this 2021 re-evaluation study, we conclude that they are representative of actual conditions observed at the WRRF, in the collection system and representative of the wastewater plant's performance during the period of the study. The final values being proposed are summarized in Table ES-1.

¹ Previous Pollutant Limitation reports were completed in 1994, 2004, 2006, 2011 and 2016.
Revision 1_January_2022

Table ES-1: 2021 Local Pollutant Discharge Limitations [Revised/New Limits in Bold]							
Pollutant Parameter	2021 Recommendation	Pollutant Parameter	2021 Recommendation	Pollutant Parameter	2021 Recommendation	Pollutant Parameter	2021 Recommendation
Metals (mg/l)		Phenols & Phenolic Compounds (mg/l)		Per-/ Poly- Fluoroalkyl Substances (ng/l)			
Arsenic	1	2-Chlorophenol	8	PFPeA	*	9Cl-PF3ONS	*
Cadmium	3	4-Chlorophenol	8	PFPeS	*	ADONA	*
Chromium	25	4-Chloro-3-Methylphenol	3	N-MeFOSAA	*	HFPO-DA	*
Copper	0.72	2,4-Dichlorophenol	6	N-EtFOSAA	*	4:2 FTSA	*
Lead	1	2,4-Dinitrophenol	30	PFOSA	*	6:2 FTSA	*
Mercury	0.0002	4-Methylphenol (p-cresol)	40	PFTeDoA	*	8:2 FTSA	*
Nickel	5	Phenol	86	PFUnDA	*	PFBS	*
Silver	1	Total Phenolic Compounds	5	PFDODA	*	PFNA	*
Zinc	12			PFTriDA	*	PFDA	*
Compatible Pollutants (mg/l)		Other Pollutants (mg/l)		PFHxA		PFNS	*
Biochemical Oxygen Demand	10,000	Cyanide, Available	1.5	PFHpA	*	PFOA	*
Total Suspended Solids	10,000	Total PCB	N.D	PFHxS	*	PFOS	65
Phosphorus	125			PFHpS	*	PFDS	*
Fats, Oils & Grease	1,500			11Cl-PF3OUdS	*	PFBA	*
Note: Revised or New Values are in Bold & Italics							

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Introduction

The Great Lakes Water Authority (GLWA) – Industrial Waste Control Group administers and implements the approved Industrial Pretreatment Program (IPP) in accordance with the terms and conditions of the NPDES Permit MI 0022802. The IPP seeks to apply federal, state and local requirements to protect the Water Resource Recovery Facility (WRRF) and regional sewer system (i.e., collection system) from harm. As part of this function, Publicly Owned Treatment Works (POTW) are required to develop technical based Local Pollutant Discharge Limits to protect the operations of the Treatment Plant and Sewage Collection System, and worker health & safety.

The general concept underlying the development of Local Pollutant Discharge Limitations ("Local Limits") is to control "toxics in toxic amounts". This 2021 Limit Study report represents the Sixth re-evaluation conducted for the GLWA/Detroit regional sewer system and has a two-fold purpose. The first to address the question of whether the existing local limits are adequate to protect the GLWA Water Resource Recovery Facility and Collection System; and the second is to provide the Great Lakes Water Authority with the Technical basis needed for implementing the approved Industrial Pretreatment Program.

GLWA has prepared this revised report in response to discussions held with The State of Michigan – Environment, Great Lakes, and Energy (EGLE) group. EGLE provided a copy of an internal memo (dated April 5, 2021) that included special Water Quality Based Effluent Limits (WQBEL) for NPDES Permit MI0022802 in October 2021. This data was considered in the revised calculations made for the Local Pollutant Discharge Limitation calculations resulting in revisions to the original report submitted in June 2021.

This 2021 Limit Study report is organized in two chapters, the first being the discussion and evaluation of traditional pollutant parameters and the second specifically addressing compounds comprising per- and poly- fluoroalkyl substances (PFAS Compounds). This separation is made in recognition of the still developing knowledge of PFAS Compounds and distinguishing these compounds from more traditional pollutants.

The NPDES Permit MI0022802 includes a requirement for "An evaluation of whether the existing local limits need to be revised shall be submitted to the Department by June 1, 2021"¹. This report has been prepared for the purpose of complying with this requirement.

GLWA has developed new and updated rules to facilitate its implementation of the approved Industrial Pretreatment Program and is in the midst of acquiring concurring resolutions from the member communities comprising the Regional sewer system. The City of Detroit Ordinance (Chapter 48, Division 3) is still in effect and GLWA continues to apply these local pollutant discharge limitations until its rules are eligible for enactment in accordance with state law.

¹ See Part I, Section B.2. of NPDES Permit MI 0022802

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The 2021 Limit Study report uses site specific analytical data collected from the Water Resource Recovery Facility, site-specific data collected from the GLWA service area and the Commercial and Industrial users in conjunction with reported state and federal values to evaluate the adequacy of existing local limits and assess revisions or additions to the existing local limits.

The evaluation was conducted in accordance with good engineering practices and applicable federal and Michigan-EGLE guidance. The evaluation calculated the Maximum Allowable Headworks Loadings (MAHL) based upon NPDES permit pass-through, aquatic toxicity pass-through, secondary treatment inhibition and sludge quality for incineration. Pollutant discharge limitations were calculated under two allocation method scenarios, namely Uniform Allocation, and the Industrial User Contribution. Best Professional Judgment was then applied to the results and the technical need to revise the wastewater pollutant discharge limitations.

Based upon our review of the information and data collected and used in this re-evaluation study, we believe they are representative of actual conditions in the collection system and representative of the Water Resource Recovery Facility's performance during the period of the study and make the following conclusions and recommendations.

GLWA has included all Pollutants of Concern in this 2021 Limit Study report which are necessary to protect the Water Resource Recovery Facility and Collection System.

GLWA is proposing new Local Pollutant Discharge Limitations for Per-fluorooctane sulfonic acid and revisions to limitations for Copper, Mercury, Available Cyanide, Phosphorus, and Total Phenolic Compounds. No other changes are being recommended at this time.

The existing and proposed Local Pollutant Discharge Limitations described herein are adequate to protect the Water Resource Recovery Facility and Collection System.

Part I - General Pollutant Discharge Limitations

General Pollutant Discharge Limitations - Provide protection to the Water Resource Recovery Facility and Collection System to conform to the requirements of the State of Michigan, Part 23 Rules and the United States Code 40 CFR 403.5 which encompass a wide range of physical property criteria, pollutant classification criteria and other criteria. The existing City of Detroit ordinance, and the GLWA proposed Rules meet or exceed state and federal requirements.

Part II - General Discussion of Limitation Development Procedure

Step 1: Identification of Pollutants of Concern

The State of Michigan requires that all POTWs evaluate the common metals and other *pollutants of concern*. The pollutant parameters that have been identified as *pollutants of concern* for the 2021 Limit Study report are summarized in Table 1 below.

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Table 1 – Pollutant of Concern – Selection Bases							
Parameter	Criteria	Parameter	Criteria	Parameter	Criteria	Parameter	Criteria
Arsenic	1,3	2-Chlorophenol	3	PFPeA	5	9Cl-PF3ONS	5
Cadmium	1,3,5	4-Chlorophenol	3	PFPeS	5	ADONA	5
Chromium	1,3	4-Chloro-3-Methylphenol	3	N-MeFOSAA	5	HFPO-DA	5
Copper	1,3,5	2,4-Dichlorophenol	3	N-EtFOSAA	5	4:2 FTSA	5
Lead	1,3	2,4-Dinitrophenol	3	PFOSA	5	6:2 FTSA	5
Mercury	1,3	4-Methylphenol (p-cresol)	3	PFTeDoA	5	8:2 FTSA	5
Nickel	1,3	Phenol	3	PFUnDA	5	PFBS	5
Silver	1,3	Total Phenolic Compounds	3	PFDODA	5	PFNA	5
Zinc	1,3	Cyanide, Available	1,3,5	PFTriDA	5	PFDA	5
		Total PCB	2,3	PFHxA	5	PFNS	5
	Biochemical Oxygen Demand		2,3	PFHpA	5	PFOA	5
	Total Suspended Solids		2,3	PFHxS	5	PFOS	5
	Phosphorus		2,3	PFHpS	5	PFDS	5
	Fats, Oils & Grease		2,3	11Cl-PF3OUdS	5	PFBA	5
Criteria:	1=Identified or Required in NPDES Permit	2=Specific Limitation in NPDES Permit	3=Current Local Pollutant Discharge Limitation	4=Included in 2016 Local Limits Study	5=Other		

Note: GLWA notes that the 2021 Local Limitations reevaluation Study did not include evaluation of the chemical parameters Iron (Fe) or 4-Nitrophenol. The 2016 study concluded that a local limit was not necessary and are not pollutants of concern for the 2021 study.

Step 2: Determination of MAHL – The Maximum Allowable headworks Loading or MAHL are the calculated mass loading in lbs/day of specific pollutant compounds that can be received at the headworks of the GLWA WRRF without adverse impact on operations or result in an NPDES Permit violation. The 2021 Limit study evaluation criteria considers the following:

- NPDES Limit Pass-through (Daily and Monthly) or Water Quality Standards were applicable
- Aquatic Toxicity Pass-through (Chronic and Acute)
- Secondary Treatment Inhibition
- Sludge Quality for Incineration
- Collection System Factors (Fire/Explosion & Fume Toxicity)

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US EPA has established Guidance for POTW ' s developing Local Limits² involving a two-step process which consists of (i) the Determination of the Maximum Allowable Headworks Loadings or MAHL, and (ii) Allocation of the MAHL among discharges. The procedures described in this report generally follow these recommended approaches.

Step 3: Safety Factor Selection

EPA guidance includes the use of site-specific safety factors to address data “uncertainties” that can affect the ability of the POTW to calculate accurate local limits. A POTW may use different safety factors for different pollutants. The minimum recommended safety factor is 10% but should also consider the following elements:

- The variability of the POTW’s data.
- The amount of data the POTW used to develop its MAHLs.
- The quality of the POTW’s data.
- The amount of literature data the POTW used.
- The history of compliance with the parameter.
- The potential for IU slug loadings (e.g., as a result of chemical spills).
- The number and size of each IU with respect to the POTW's total flow rate.

Step 4: Allocation of MAHL

POTW' s use the MAHL to define an available load that can be assigned to commercial and industrial users, and all non-domestic sources, in the form of local limits. This evaluation uses the classical allocation methods, i.e., the Uniform Method and the Industrial User Contribution Method. Additionally, a Best Professional Judgment Method is used to review the MAHL-based results with actual pollutant loadings and develop a rationally based conclusion for proposing a particular Local Pollutant Discharge Limitation.

The general procedures involve calculating the MAHL for a pollutant and allocating this amount for the domestic /background loading (pounds) and an additional safety factor. A concentration-based limitation is then calculated by dividing the remaining allocation by the volume of wastewater for a set of Industrial and Commercial Users. A brief description of the allocation methods is provided below:

Uniform Method - Assumes all non-domestic sources have same potential to release the pollutant at the maximum levels at the same time, i.e. presumes an Industrial Discharge factor (or I Factor) = 1.0 This method provides for the most conservative approach.

Industrial User Contribution Method - Assumes a percentage portion of non-domestic sources have same potential to release the pollutant at the maximum levels at the same

² Local Limits Development Guidance, US EPA - Office of Wastewater Management 4203, EPA 833-R-0 4-002A, July 2004

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time, i.e. presumes I Factor is between 0 - 1.0 (The safety factor can be further adjusted to provide additional protection where warranted by Best Professional Judgment).

Additionally, the State of Michigan has recognized GLWA's use of Best Professional Judgment in ascertaining the meaning and application of wastewater pollutant discharge limitations.

The formulae used to calculate the respective MAHLs for each pollutant parameter are included with the individual pollutant calculation included in the Appendix Tab A.

Step 5: Collection System Evaluation Criteria

The 2021 Local Limit study considered other factors that may impact the development of local limits upstream of the Water Resource Recovery Facility, i.e., the Collection System. We have reviewed the previous work performed in this area and have included the findings in this report to reflect a current perspective of the matter.

Two Collection System criteria are considered, namely protection from Fire & Explosion in the receiving sewers, and Fume Toxicity to protect against worker exposure to toxic fumes in the sewer system. These afford protections to worker and community health & safety. The data necessary for these determinations apply to volatile organic compounds rather than the other pollutants of concern considered in this work.

Fire & Explosion - A maximum allowable concentration of a pollutant can be determined using LEL (Lower Explosion Levels) for a parameter. This data permits calculation of an allowable vapor phase concentration which can be converted to the corresponding liquid phase concentration (at equilibrium) using Henry's Law Constant. The applicable equations and calculation results are included in the Appendix Tab B.

Fume Toxicity - The National Institute of Occupational Safety and Health have identified vapor phase concentrations of certain chemicals that are "*Immediately Dangerous to Life or Health* (IDLH)". Henry's law Constant allows us to convert this information to the corresponding liquid phase concentration (at equilibrium). The applicable equations and calculation results are included in the Appendix Tab B.

Part III - Source Data & Information

The following discussion provides the other site-specific data and criteria utilized in the pollutant parameter calculations.

The Plant and Receiving Water Flow Criteria utilized in the calculations for the WRRF and the receiving stream are summarized in Table 2. Included are the projected average WRRF flow, the maximum permitted WRRF flow, the 95%-exceedance flow for the Detroit River, and the special dilution flow for pollutants subjected to the Detroit River waste load allocation.

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Table 2 – WRRF Flow Criteria		
Parameter	Units	Assigned Value
Projected Average flow for WRRF (Q _{WRRF})	MGD	551.2
Projected Operating Flow for Detroit WRRF(Q _{WRRF2})	MGD	930
Maximum NPDES Permit WRRF Flow (Q _{MAX})	MGD	930
95% Exceedance Flow for Detroit River (Q _{95EX})	MGD	84,030
Available Dilution Flow for Detroit River WasteLoad Allocation (Q _{DIL})	MGD	10,958
Ambient pH of Receiving Stream	Std Units	8
Ambient Hardness of Receiving Stream	mg/l	100

Other WRRF Criteria – The 2021 Local Limits Study uses other criteria from a variety of sources. The following are included:

- Michigan Rule 57 criteria are provided at Appendix Tab C.
- Incineration criteria is summarized at Table 3.
- Industrial User Flow Data and I-Factor at Table 4.

The origin of the calculation parameters is consistent with the 2016 pollutant evaluation report.

Table 3 – Incineration Criteria				
Substance	Non-Volatilization Removal Fraction (F _{NONVOL})	Sludge Sorption Fraction (F _{SORP})	Incinerator Gas Transfer Fraction (F _{GAS})	Incinerator Scrubber Removal (R _{SCRUB})
Arsenic	1	1	(1.0)	0.9807
Cadmium	1	1	(1.0)	0.9405
Chromium	1	1	(1.0)	0.9984
Copper	1	n/a	n/a	n/a
Cyanide	1	n/a	n/a	n/a
Lead	1	1	(1.0)	0.9862
Mercury	1	1	(1.0)	(1.0)
Nickel	1	1	(1.0)	0.9984
Silver	1	n/a	n/a	n/a
Zinc	1	n/a	n/a	n/a
Total Phenols	1	n/a	n/a	n/a
PCB-Arochlor1260	1	n/a	n/a	n/a

The Industrial flow values summarize in Table 4 were determined from an evaluation of existing permittee data (i.e., CY 2020 Industrial User data). The I-Factor included an Industrial User's flow value if they satisfy either of the following criteria: (i) the Industrial User is subject to a National Categorical Pretreatment Standards which includes a *categorical* pollutant

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discharge limitation for the specific parameter, and/or (ii) the Industrial User had one or more sample results at or above the pollutant's analytical detection level or surcharge concentration during the past 5-years. The resulting "I Factors" therefore include any existing industrial use having a "potential" to contribute the pollutant parameter.

Table 4 – Industrial User Flow Information			
	Specific Industrial (I) Flow	Total Industrial Flow	¹FACTOR
Arsenic	12,893,968	26,228,865	49.16%
Cadmium	11,806,591	26,228,865	45.02%
Chromium	22,128,482	26,228,865	84.36%
Copper	24,729,057	26,228,865	94.28%
Cyanide	24,307,953	26,228,865	92.65%
Iron	23,302,098	26,228,865	88.84%
Lead	24,981,486	26,228,865	95.24%
Mercury	25,359,837	26,228,865	96.68%
Nickel	21,181,854	26,228,865	80.76%
Silver	14,735,542	26,228,865	56.18%
Zinc	24,668,604	26,228,865	94.05%
Total PCB	917,880	26,228,865	3.5%
Total Phenol	20,301,827	26,228,865	77.40%
Individual Phenolic Compounds	20,301,827	26,228,865	77.40%
BOD	12,343,894	26,228,865	47.06%
TSS	10,811,921	26,228,865	41.22%
Phosphorus	8,015,135	26,228,865	30.56%
FOG	7,560,663	26,228,865	28.83%
PFOS/PFOA	4.89	26,228,865	18.65%

Site-specific Data

Background data for the 2021 Local Limits study was collected throughout 2020 from the three (3) influent interceptors and Zug (or equivalent) discharge of the GLWA Water Resource Recovery Facility, and from background areas selected to establish the baseline levels of domestic source contributions. The Analytical data result summaries are included in the Appendix Tabs D and E respectively.

Water Resource Recovery Facility - Sample data was collected from the three interceptors conveying wastewater influent into the Water Resource Recovery Facility and the facility discharge. The data were used to calculate the median removal rate and the second decile method was used to calculate a minimum removal rate. Average and minimum removal rates were calculated using actual data for the Waterer Resource Recovery Facility except where a negative removal rate was calculated (second decile method). This situation only occurred for Arsenic, Cyanide (Total, Amenable, and Available), and Silver. For these pollutant parameters, the removal rate values were taken from the EPA Development Document Guidance

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Appendices -Appendix R-2 dated July 2004. This information is summarized at Appendix Tab D.

Background Areas – These areas are the same used in prior studies and are approximately 2.5 sq. miles in area and include a combination of residential, institutional, recreational, and light commercial dischargers. No Categorical or SIU dischargers are located in these areas. The Analytical data result summaries are included in theAppendix Tab E.

Although these areas were used in prior studies, IWC group staff conducted a field review of any existing industrial and commercial activities and validate the representativeness of these areas for background and Domestic contributions. As a result of the survey, staff concluded that Commercial and Industrialsources identified within these areas are Minor Industrial Users and qualified as Background/Domestic sources. The survey reports are included at Appendix Tab F.

Part IV – Calculations of WRRF Removal Rates and MAHL

The criteria assembled and the analytical data results obtained during the 2021 Local Limits Study (See Part III) were processed through established formulae (See Part II) to calculate the respective MAHL loading and local pollutant calculations. Removal rate calculations are found at Appendix Tab C while MAHL calculations are found at Appendix Tab A. Tables 5 and Table 6 summarize the Controlling MAHL values for the 2021 study *Pollutants of Concern*. The following discussion summarizes the results for all pollutant parameters of concern except for PFAS Compounds which are addressed in the next section.

Table 5 – Summary of Loading Results					
Note: The Values placed in BOLD Text represent the “Controlling” Headworks Loading from the 2021 Local Limits Study					
	NPDES Limit Pass-through	AquaticToxicity Pass-through	Secondary Treatment Inhibition	Sludge Quality for Incineration	Controlling Maximum Allowable HeadworksLoad
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Arsenic	1,420.38	29,563.2	459.5	2,125.3	459.5
Cadmium	B	181.28	5,406.3	1,149.3	181.28
Chromium	14,795.65	19,735.6	6,295.0	41,441.8	6,295.0
Copper	238.41	494.22	5,891.48	B	238.41
Cyanide (Available)	342.7	985.34	12,590.0	B	342.7
Lead	2,592.25	3,818.2	10,686.9	679.46	679.5
Mercury	0.25	559.4	510.6	74.6	0.25
Nickel	B	7,022.6	5,343.4	1,811,515.0	5,343.4
Silver	202.2	14.1	B	B	14.1
Zinc	7,194.01	10,322.4	3,147.5	B	3147.5
Total Phenol	B	1,613	B	B	1,613
2-Chlorophenol	B	1,951.2	22,976.8	B	1,951.2

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Table 5 – Summary of Loading Results					
4-Chlorophenol	B	29,226.5	B	B	29,226.5
4-Chloro-3-Methylphenol	B	7,168.8	B	B	7,168.8
2,4-Dichlorophenol	B	9,926.0	294,102.7	B	9,926.0
2,4-Dinitrophenol	B	14,889.0	B	B	14,889.0
4-Methylphenol	B	24,815.0	B	B	24,815.0
Phenol	B	121,341.6	19,979.8	B	19,979.8
Total PCB	0.12	B	B	B	0.12
B = Value not Determined based on NPDES Permit, WQS or WQBEL Value					

Table 6 – Summary of Loading Results – Compatible Pollutants				
Note: The Values placed in BOLD Text represent the “Controlling” Headworks Loading from the 2021 Local Limits Study				
	Monthly Average Load	Weekly Load	Design Load	Maximum Allowable Headworks Load
	lbs/day	lbs/day	lbs/day	lbs/day
BOD	2,167,620	1,894,991.5	1,690,000	1,690,000
TSS	2,813,482.3	2,720,933.5	2,230,000	2,230,000
Phosphorus (0.7)	20,359.2	N/A	210,000	- -
Phosphorus (0.6)	17,450.7	B	210,000	17,450.7
FOG	B	149,523.5	B	149,523.5

Part V – PFAS Compounds

Michigan EGLE has identified a list of 28 PFAS Compounds as *Emerging Contaminants* and assigned IPP Coordinators the responsibility to implement actions to *reduce, control and eliminate* sources of PFAS Compounds, specifically PFOS and PFOA. Beginning in 2018, GLWA initiated efforts to identify sources of PFAS Compounds, and to reduce, control and eliminate contributions through the regional sewer system. Although GLWA’s *minimization program* was approved a little more than a year ago, we have identified a number of sources and note that there has been progress in achieving the program objectives. In continuation of these efforts, GLWA committed to include Michigan-EGLE’s list of perfluoroalkyl/polyfluoroalkyl compounds in its 2021 Local Limits Study as specified in NPDES permit MI0022802. There is limited State of Michigan criteria and literature information currently available to fully assess these compounds so that the traditional Local Limits analysis results in no data available to calculate local pollutant discharge limits for these PFAS Compounds.

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Data Collection: WRRF Influent and Effluent:

Data collection for PFAS Compounds has been based upon Michigan-EGLE's guidance of collecting a minimum of six (6) influent and effluent samples for PFAS compounds for the WRRF and background sites. These data are provided in attachments A and B and summarized in Tables 7 and 8 below.

Table 7 - GLWA Background Results (All values in ng/l)					
PFPeA	8.673	PFHxA	6.31	PFBS	10.573
PFPeS	0	PFHpA	1.62	PFNA	0
N-MeFOSAA	0	PFHxS	4.800	PFDA	0
N-EtFOSAA	0	PFHpS	0	PFNS	0
PFOSA	0	11Cl-PF3OUdS	0	PFOA	4.330
PFTeDA	0	9Cl-PF3ONS	0	PFOS	9.183
PFUnDA	0	ADONA	0	PFDS	0
PFDoDA	0	HFPO-DA	0	PFBA	17.359
PFTriDA	0	4:2 FTSA	0		
		6:2 FTSA	150.903		
		8:2 FTSA	0.033		

Table 8 - GLWA WRRF Mean (All values in ng/l)							
	Mean Influent	Mean Effluent	% Overall Removal		Mean Influent	Mean Effluent	% Overall Removal
PFPeA	8.77	9.49	n/d	9Cl-PF3ONS	ID	ID	n/d
PFPeS	0.31	0.31	n/d	ADONA	ID	ID	n/d
N-MeFOSAA	0	0	n/d	HFPO-DA	0.46	0	n/d
N-EtFOSAA	0	0	n/d	PFBS	13.85	17.14	n/d
PFOSA	0	0	n/d	PFNA	0.1	0	n/d
PFTeDA	0	0	n/d	PFDA	0	0	n/d
PFUnDA	0	0	n/d	PFNS	0	0	n/d
PFDoDA	0	0	n/d	PFOA	7.39	8.24	n/d
PFTriDA	0	0	n/d	PFOS	17.95	17.83	n/d
PFHxA	12.22	22.57	n/d	PFDS	0	0	n/d
PFHpA	3.14	3.59	n/d	PFBA	11.07	12.86	n/d
PFHxS	7.6	7.84	n/d	4:2 FTSA	0	0	n/d
PFHpS	0	0	n/d	6:2 FTSA	45.67	37.57	n/d
11Cl-PF3OUdS	ID	ID	n/d	8:2 FTSA	2.48	2.71	n/d
ID – Insufficient Data (EGLE list modification mid-year)				n/d = unable to determine second decile removal rate = 0%			

NPDES Limits and Water Quality Criteria for Individual PFAS Compounds

NPDES Permit MI0022802 does not have specific effluent limitations for the PFAS compounds. In the absence of specific effluent limitations, local limit calculations should be based upon federal and/or state water quality standards. The NPDES permit identifies the Water Quality Standard for PFOS at 11 ng/l and the Water Quality Based Effluent Limitation (WQBEL) of 8,040 ng/l for PFOA. Additional criteria has been obtained from Michigan's Rule 57 as appropriate.

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Safety Factors – PFAS Compounds

Limited actual and literature information is available on the fate of PFAS compounds in municipal POTWs such as the GLWA WRRF. As such, GLWA considered using a higher safety factor for evaluating individual PFAS compounds, however decided against doing so after evaluating the domestic and system information collected during the study and improvements in the WRRF effluent quality resulting from its implementation of the PFOA and PFOS Minimization Program. A Safety Factor of 10% was used in the calculations for the 2021 Local Limits Study.

To date, GLWA has identified approximately 50 active sources of PFAS Compounds which include active industrial users, groundwater remediation projects and stormwater discharges with highly variable concentrations of PFAS compounds. As stated in the introduction, we recognize the progress made by a number of the identified sources in reducing, controlling and eliminating these compounds from their wastewater discharge. Although, the sampling database is relatively small, and results have been variable, our professional opinion does not warrant use of a safety factor much higher than the default value of 10%. During the past 3 years, we have been vigilant in identifying sources of PFAS compounds and have been successful in identifying *new* sources of discharge. As such GLWA is recommending that a safety factor of 10% be used for the PFAS calculations.

Local Limit Calculations – Individual PFAS Compounds

The data inputs and general equations for calculating the Maximum Allowable Headworks Loading (MAHL) is well established in US EPA and State of Michigan guidance. These values are summarized in Table 11. In addition to consideration of individual local limitation MAHL.

Local Limit Allocation – Individual PFAS Compounds

Our local pollutant limitation studies since 1995 have limited the allocation methods to (i) the Uniform Allocation Method, (ii) the Industrial User Method, and (iii) Best Professional Judgment using methods (i) and/or (ii). Although the federal and state guidance permits additional allocation methods to be considered, we deem them impracticable for a regional system of our size. Based on 2020 records reported in the May 2020 status report to the State of Michigan, the following Industrial volume flow rates are available for PFAS sources.

Table 9 – Industrial Flow Allocation Values – PFAS Compounds	
Total Industrial Flow	29.229 MGD
Total Industrial Flow (PFAS Sources)	4.89 MGD

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Local Limit Calculations – Total PFAS Compounds

GLWA considered creating a surrogate parameter of Total PFAS to regulate the 28 PFAS Compounds currently identified by EGLE. Following discussions with EGLE, GLWA agreed that further study was necessary to develop such a surrogate value and is no longer proposing regulation of this value.

Calculation Results

Calculations are included as Appendix A – Tab A and provide the following results.

Table 10 - GLWA WRRF Calculation Results (All values in ng/l)					
	Uniform Allocation	Industrial User Allocation		Uniform Allocation	Industrial User Allocation
PFPeA	N/A	N/A	9Cl-PF3ONS	N/A	N/A
PFPeS	N/A	N/A	ADONA	N/A	N/A
N-MeFOSAA	N/A	N/A	HFPO-DA	N/A	N/A
N-EtFOSAA	N/A	N/A	PFBS	N/A	N/A
PFOSA	N/A	N/A	PFNA	N/A	N/A
PFTeDA	N/A	N/A	PFDA	N/A	N/A
PFUnDA	N/A	N/A	PFNS	N/A	N/A
PFDoDA	N/A	N/A	PFOA	148,598	797,031
PFTriDA	N/A	N/A	PFOS	24.24	65
PFHxA	N/A	N/A	PFDS	N/A	N/A
PFHpA	N/A	N/A	PFBA	N/A	N/A
PFHxS	N/A	N/A	4:2 FTSA	N/A	N/A
PFHpS	N/A	N/A	6:2 FTSA	N/A	N/A
11Cl-PF3OUdS	N/A	N/A	8:2 FTSA	N/A	N/A
Supporting Documentation is attached in Appendix .					

Conclusions – PFAS Compound Local Limitations

Based on the local limitation study of 2020, we are recommending the following:

- Individual PFAS Compound Limitation - PFOS: This contaminant is limited to specific industrial processes and applications and a uniform method is not supported. While PFOS is present in the WRRF influent and poses a risk for pass-through violation, the success of the PFOA/PFOS Minimization Program lends confidence that a local limitation based on the Industrial User allocation method is appropriate, and rounded to a value of 65 ng/l.
- Individual PFAS Compound Limitation - PFOA: Although PFOA is present in the WRRF influent, the concentrations are well below levels which would pose a risk for pass-through violation. Actual loadings are significantly below the MAHL and it is our best professional judgement that we do not establish an individual limit for PFOA at this time.

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Table 11 – PFAS Compound Criteria & MAHL Calculation Results

	CAS No.	NPDES Permit Discharge Limit*		Aquatic Toxicity Discharge Standard		WWTP Removal Efficiency			Sludge Incinerator Emission Limit (g/d)	Secondary Treatment Inhibition Concentration (mg/l)	NPDES Permit Limit Pass-through (lbs/day)	Aquatic Toxicity Pass-through (lbs/day)	Secondary Treatment Inhibition (lbs.day)
		Daily Maximum (ng/l)	30-Day Average (ng/l)	Acute (ng/l)	Chronic (ng/l)	Avg. Primary (%)	Min. Overall (%)	Avg. Overall (%)					
PFPeA	2706903	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFPeS	2706914	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
N-MeFOSAA	2355319	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
N-EtFOSAA	2991506	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFOSA	754916	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFTeDoA	376067	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFUnDA	2058948	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFDoDA	307551	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFTriDA	72629948	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFHxA	307244	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFHpA	375859	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFHxS	355464	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFHpS	375928	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
11Cl-PF3OUdS	763051929	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
9Cl-PF3ONS	756426581	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
ADONA	919005144	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
HFPO-DA	13252136	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
4:2 FTSA	757124724	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
6:2 FTSA	27619972	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
8:2 FTSA	39108344	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFBS	375735	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFNA	375951	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFDA	335762	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFNS	68259121	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFOA**	630206	420	8.04e3	15,000	880	0	0	0	n/a	n/a	36.95	95,306.7	n/a
PFOS***	1763231	11	n/a	1,600	140	0	0	0	n/a	n/a	0.0505	15,175.8	n/a
PFDS	335773	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
PFBA	375224	n/a	n/a	n/a	n/a	0	0	0	n/a	n/a	n/a	n/a	n/a
n/a – Not available or not applicable		* = Or federal/state water quality standard			** = Controlling Total PFAS Compounds			*** = Controlling Individual PFAS Compound					

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Part VII – Actual vs. Calculated MAHL Loadings

Best Professional Judgment has been used to evaluate the actual headworks loading to the calculated MAHL values before making a final decision on revising or proposing a Local Pollutant Discharge Limitation. Table 12 summarizes the values calculated during the 2021 interceptor influent measurements against the calculated MAHL values.

Part VII – Individual Recommendations for Pollutants Evaluated During the 2021 Local Limits Study

Arsenic - A limitation for Arsenic should be adopted on the grounds that (i) there is an existing local limitation, and (ii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 49.16% (12.894 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have arsenic as a pollutant.

The current limitation for Arsenic is 1.0 mg/l, which is less than the values calculated from the UserContribution Method and Industrial User Method. There is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter based on the limited commercial use for Arsenic; the actual headworks load (See Table 12) is 25.9 lbs./day or 5.5% of the Controlling MAHL; and fewer than 49.2% of the Industrial and Commercial Users have the potential to contribute Arsenic. Therefore, the limitation of 1.0 mg/l will be adequate to protect the GLWA Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 1.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Cadmium - A local limitation for Cadmium should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 45.02% (11.807 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have cadmium as a pollutant.

The current limitation for Cadmium is 1.0 mg/l³. The 2016 Local Limits Study and the GLWA Rules recommended changing the Cadmium limit to 3.0 mg/l. There is no technical support for a change or revision in the proposed wastewater discharge pollutant limitation for this parameter based on the limited commercial use for Cadmium; the actual headworks load (See Table 12) is 1.11 lbs./day or 0.6% of the Controlling MAHL; and fewer than 45.02% of the Industrial and Commercial Users have the potential to contribute Cadmium. Cadmium loadings have significantly decreased at the Water Resource Recovery Facility as a result of declining use as an Electroplating material in the local area. Therefore, the limitation of 3.0 mg/l limitation will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 3.0 mg/l is justified based on Best Professional Judgment (BPJ).**

³ City of Detroit Ordinance
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Table 12_Summary of Recommended Local Pollutant Discharge Limitations

Substance	CAS No.	Controlling MAHL 2021	Actual WRRF MAHL 2021	2016 Recommended Limits	2021 Recommended Limits	Justification for Recommended Limit
		lbs/day	lbs/day	mg/l	mg/l	
Arsenic	7440-38-2	459.5	25.59	1.00	1.00	BPJ-No Change Req'd
Cadmium	7440-43-9	181.28	1.11	3.00	3.00	BPJ-Actual <<MAHL
Chromium	7440-47-3	6,295.0	32.99	25.00	25.00	BPJ-Actual <<MAHL
Copper	7440-50-8	238.41	154.21	7.00	0.72	Revised Value
CN, Total			36.5			
CN, Amenable			6.79			
CN, Available		342.7	6.79	4.00	1.5	Revise Parameter, BPJ
Lead	7439-92-1	679.5	43.11	1.00	1.00	BPJ-No Change Req'd
Mercury	7439-97-6	0.25	0.154	0.01	0.0002	Revised Value
Nickel	7440-02-0	5,343.4	49.68	5.00	5.00	BPJ-No Change Req'd
Silver	7440-22-4	14.1	7.23	1.00	1.00	BPJ-Actual <<MAHL
Zinc	7440-66-6	3,147.50	759.39	12.00	12.00	BPJ-No Change Req'd
Total Phenol		1,613.03	436.23	1.00	5.00	Revised Value
Total PCB	1336-36-3	0.12	0.18	ND	Non-Detect	BPJ-No Change Req'd
2-Chlorophenol	95-57-8	1,951.2	*	8.00	8.00	BPJ-No Change Req'd
4-Chlorophenol	106-48-9	29,226.5	*	8.00	8.00	BPJ-No Change Req'd
4-Chloro-3-Methylphenol	59-50-7	7,168.8	*	3.00	3.00	BPJ-No Change Req'd
2,4-Dichlorophenol	120-83-2	9,926	*	6.00	6.00	BPJ-No Change Req'd
2,4-Dinitrophenol	51-28-5	14,889	3.56	30.00	30.00	BPJ-No Change Req'd
4-Methylphenol	106-44-5	24,815	21.85	40.00	40.00	BPJ-No Change Req'd
Phenol	108-95-2	19,979.80	13.9	86.00	86.00	BPJ-Actual <<MAHL
PFPeA	2706903	n/c	0.04			
PFPeS	2706914	n/c	0.001			
N-MeFOSAA	2355319	n/c				
N-EtFOSAA	2991506	n/c				
PFOSA	754916	n/c				
PFTeDoA	376067	n/c				
PFUnDA	2058948	n/c				
PFDoDA	307551	n/c				
PFTriDA	72629948	n/c				
PFHxA	307244	n/c	0.056			
PFHpA	375859	n/c	0.014			
PFHxS	355464	n/c	0.035			
PFHpS	375928	n/c				
11Cl-PF3OUdS	763051929	n/c				
9Cl-PF3ONS	756426581	n/c				
ADONA	919005144	n/c				
HFPO-DA	13252136	n/c	0.002			
4:2 FTSA	757124724	n/c				
6:2 FTSA	27619972	n/c	0.21			
8:2 FTSA	39108344	n/c	0.011			
PFBS	375735	n/c	0.064			
PFNA	375951	n/c	0.00045			
PFDA	335762	n/c				
PFNS	68259121	n/c				
PFOA**	630206	36.9466	0.034		No Value Recmd.	BPJ - No value Recmd
PFOS***	1763231	0.0505	0.083		6.50E-05	New Limit Value
PFDS	335773	n/c				
PFBA	375224	n/c	0.051			
BOD/CBOD		1,690,000	507,315.00	10,000.00	10,000.00	BPJ-No Change Req'd
TSS		2,230,000	597,320.70	10,000.00	10,000.00	BPJ-No Change Req'd
P		17,450.71	10,047.80	150.00	125.00	Revised Value
FOG		149,523.46	77,031.10	1,500.00	1,500.00	BPJ-No Change Req'd

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Chromium - A local limitation for Chromium should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 84.36% (22.13 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Chromium as a pollutant.

The current limitation for Chromium (both oxidation states) is 25.0 mg/l⁴. There is no technical support for a change or revision in the proposed wastewater discharge pollutant limitation for this parameter based on the actual headworks load (See Table 12) is 32.99 lbs./day or 0.52% of the Controlling MAHL; and fewer than 84.36% of the Industrial and Commercial Users have the potential to contribute Chromium. Therefore, the limitation of 25 mg/l will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 25.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Copper- A local limitation for copper should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 94.28% (24.73 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have copper as a pollutant. There is technical support for a change or revision in the proposed wastewater discharge pollutant limitation for this parameter based on the actual headworks load (See Table 12) is 154.21 lbs./day or 64.6% of the Controlling MAHL; and that 94.28% of the Industrial and Commercial Users have the potential to contribute Copper. Therefore, the proposed limitation of 0.72 mg/l should be adopted to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 0.72 mg/l is justified based on Best Professional Judgment (BPJ).**

Cyanide - There are three Cyanide forms of interest to the wastewater process, namely Total Cyanide, Amenable Cyanide and Available Cyanide. Cyanide is an ionic complex that freely disassociates in water to the *free* CN⁻ form. A local limitation for Available Cyanide should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 92.65% (24.30 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have some form of Cyanide or Cyanide complexes as a pollutant.

The current limitation for Available Cyanide is 1.0 mg/l⁵. There is technical support for a change or revision in the proposed wastewater discharge pollutant limitation for this parameter based on the actual headworks load (See Table 12) is 6.79 lbs./day or 1.98% of the Controlling MAHL; and that 92.65% of the Industrial and Commercial Users have the potential to contribute Cyanide. Therefore, the proposed limitation of 1.5 mg/l should be adopted to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 1.5 mg/l is justified based on Best Professional Judgment (BPJ).**

⁴ City of Detroit Ordinance

⁵ City of Detroit Ordinance

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Lead - A local limitation for lead should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 95.24% (24.98 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have lead as a pollutant.

The current limitation for lead is 1.0 mg/l⁶, which is less than the values calculated from the User Contribution Method and Industrial User Method. Additionally, the actual mass Headworks loading is well below the calculated MAHL. There is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter. The limitation will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 1.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Mercury - A local limitation for Mercury should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, (iii) the parameter is a *pollutant of Concern* by EGLE, and (iv) the parameter is specially regulated by our NPDES permit MI 0022802.

The current limitation for Mercury is Non-Detect⁷, using U.S. EPA analytical method 245.1. The NPDES permit MI 0022802 includes a requirement of a Mercury minimization program and the program has been dutifully implemented for more than 30 years. The use of a non-numerical value has required GLWA and regulated parties to look for interference or analytical error in assessing compliance. Substituting a numerical value removes much of this ambiguity. **Therefore, the Local Limit should be revised to 0.2 ug/l is justified based on Best Professional Judgment (BPJ).**

Nickel - A local limitation for Nickel should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 80.76% (21.18 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Nickel as a pollutant.

The current limitation for Nickel is 5.0 mg/l⁸, which is less than the values calculated from the UserContribution Method and Industrial User Method. There is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter. This limitation will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 5.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Silver - A local limitation for Silver should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE.

⁶ City of Detroit Ordinance

⁷ City of Detroit Ordinance

⁸ City of Detroit Ordinance

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Approximately 36.03% (7.28 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Silver as a pollutant.

The current limitation for Silver is 1.0 mg/l⁹ is greater than the values calculated from the User Contribution and Industrial User Methods. Inasmuch as photographic and medical usage of silver has greatly decreased and the commodity value for silver remains high; we believe that there is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter. Additionally, the actual Headworks loading is 51.3% of the calculated MAHL. The limitation will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 1.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Zinc - A local limitation for Zinc should be adopted on the grounds that (i) there is an existing local limitation, (ii) the pollutant is regulated under one or more National Categorical Pretreatment Point Source Categories, and (iii) the parameter is a *Pollutant of Concern* by EGLE. Approximately 94.05% (24.67 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Zinc as a pollutant.

The current limitation for Zinc is 7.3 mg/l¹⁰, which is below the values calculated from the User Contribution Method and Industrial User Method. The limitation recommended by the 2016 Local Limits Study and GLWA Rules recommended revising the Zinc limit to 12.0 mg/l and this will be adequate to protect the Water Resource Recovery Facility and receiving stream and the 2021 study affirms this proposed value. **Therefore, the Local Limit of 12.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Total Phenols -The current limitation for Total Phenol is 1.0 mg/l¹¹ of phenolic compounds, and the alternate election of monitoring for specific phenolic compounds in lieu of the surrogate parameter is a rational alternative. The 2021 evaluation study supports revising the limitation to 5.0 mg/l and this revised limitation will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local “Total Phenol” Limit of 5.0 mg/l is justified based on Best Professional Judgment (BPJ). Additionally, the continued use of the seven individual phenolic compounds¹² as an alternative is rational and justified.**

Total PCB - A local limitation for PCB should be adopted on the grounds that (i) there is an existing local limitation, and (ii) the parameter is a pollutant of concern in our NPDES permit MI0022802. The specific Arochlor of PCB (Polychlorinated Biphenyls) which are of concern to the Department are 1016, 1221, 1232, 1242, 1248, 1254, and 1260.

PCB have been the subject of the Detroit PCB/Hg Minimization program since 1991, and as noted in the past 30 volumes, there has been a noted decrease in PCB detection for all arochlors

⁹ City of Detroit Ordinance

¹⁰ City of Detroit Ordinance

¹¹ City of Detroit Ordinance

¹² The parameter 4-Nitrophenol was not deemed a *Pollutant of Concern* in the 2021 study

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monitored. Because of the manufacturing history of the Detroit system and the persistent nature of this chemical compound, regulation and monitoring should continue.

The current limitation for Total PCB is Non-Detect. **Therefore, the Local Limit should be retained as Non-Detect; justified based on Best Professional Judgment (BPJ).**

Compatible Pollutants

Biochemical Oxygen Demand (BOD) - A local limitation for BOD should be adopted on the grounds that (i) there is an existing local limitation, and (ii) BOD is a compatible pollutant specifically treated at the Water Resource Recovery Facility. Approximately 97.61% (25.60 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have BOD as a pollutant above domestic surcharge level.

The current limitation for BOD is 7500 mg/l¹³, which is less than the values calculated from the Uniform Method and Industrial User Contribution Method. The Water Resource Recovery Facility is designed to treat this specific pollutant and there is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter. The limitation recommended by the 2016 Local Limits Study and GLWA Rules was 10,000 mg/l, and the 2021 evaluation study supports this proposed limitation of 10,000 mg/l as adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, keeping the Local Limit at 10,000.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Total Suspended Solid (TSS) - A local limitation for TSS should be adopted on the grounds that (i) there is an existing local limitation, and (ii) TSS is a compatible pollutant specifically treated at the Water Resource Recovery Facility. Approximately 98.36% (25.8 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have TSS as a pollutant above the domestic surcharge level.

The current limitation for TSS is 7500 mg/l¹⁴, which is less than the values calculated from the Uniform Method and Industrial User Contribution Method. The Water Resource Recovery Facility is designed to treat this specific pollutant and there is no technical support for a change or revision in the wastewater discharge pollutant limitation for this parameter. The limitation recommended by the 2016 Local Limits Study and GLWA Rules was 10,000 mg/l, and the 2021 evaluation study supports this proposed limitation of 10,000 mg/l as adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 10,000.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Phosphorus - A local limitation for Phosphorus should be adopted on the grounds that (i) there is an existing local limitation, and (ii) Phosphorus is a compatible pollutant specifically treated at the Water Resource Recovery Facility. Approximately 91.86% (24.11 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Phosphorus as a pollutant above the domestic surcharge level.

¹³ City of Detroit Ordinance

¹⁴ City of Detroit Ordinance

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The NPDES limitation include seasonal limitations of 0.7 and 0.6 for the winter/summer season. Because of this change, the amount of Phosphorus for the MAHL has decreased proportionally. Actual headworks loadings however are 65% of the MAHL and suggest that the facility has additional capacity for consideration in limits calculations.

The current limitation for Phosphorus is 250 mg/l¹⁵, which is greater than the values calculated from the User Contribution Method and Industrial User Method. There is technical support for a revision of the wastewater discharge pollutant limitation for this parameter based upon the lower seasonal NPDES limitation of 0.6 mg/l. Adoption of a revised pollutant discharge limitation of 125 mg/l will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 125.0 mg/l is justified based on Best Professional Judgment (BPJ).**

Fats, Oils & Grease - A local limitation for Fats, Oils & Grease should be adopted on the grounds that (i) there is an existing local limitation, and (ii) Fats, Oil & Grease is a compatible pollutant specifically treated at the Water Resource Recovery Facility. Approximately 89.68% (23.52 MGD) of the Industrial Wastewater received for treatment at the Water Resource Recovery Facility has the potential to have Fats, Oils & Grease as a pollutant above the domestic surcharge level.

A local limitation for Fats, Oils & Grease is 1500 mg/l¹⁶, which is greater than the values calculated from the User Contribution Method and Industrial User Method. The actual Headworks Loading is less than 51% of the calculated MAHL. The limitation recommended by the 2016 Local Limits Study and GLWA Rules will be adequate to protect the Water Resource Recovery Facility and receiving stream. **Therefore, the Local Limit of 1500.0 mg/l is justified based on Best Professional Judgment (BPJ).**

PFAS Compounds

A local limitation for PFOS should be adopted on the grounds that (i) this is a parameter identified in the NPDES permit, and (ii) GLWA has developed a program to reduce, control and eliminate this material from its system. We have observed a continued downward concentration of PFOS in our combined influent over the past year and attribute these reductions to the successful implementation of the minimization program.

PFOS concentrations have been found in 4.89 MGD (18.65%) of our Users under a Wastewater Discharge Control Permit. PFOS was a new parameter included in the 2021 Local Limits Study and a limitation of 65 ng/l (ppt) is recommended. **This value is justified based on Best Professional Judgment (BPJ).**

PFOA was also evaluated as part of the 2021 Local Limits Study, however the actual Headworks loading is significantly below (less than 0.1%) the Calculated MAHL. We recommend NOT adopting a local limit for this parameter. **Therefore, the recommendation of “No Local Limit” is justified based on Best Professional Judgment (BPJ).**

¹⁵ City of Detroit Ordinance

¹⁶ City of Detroit Ordinance

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GLWA included 26 other PFAS compounds based on the Michigan EGLE lists produced in 2019 and 2020. No criteria are available from Michigan's Rule 57 which resulted in no value being calculated. **Therefore, "No Local Limit" can be proposed.**

NOTE: GLWA understands that the State of Michigan is reviewing its Water Quality data sets and may propose new values in the future. GLWA will process this information as it becomes available.