Industrial Pretreatment Program Effects at a Large Water Resource Reclamation Facility

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West Lafayette, IN

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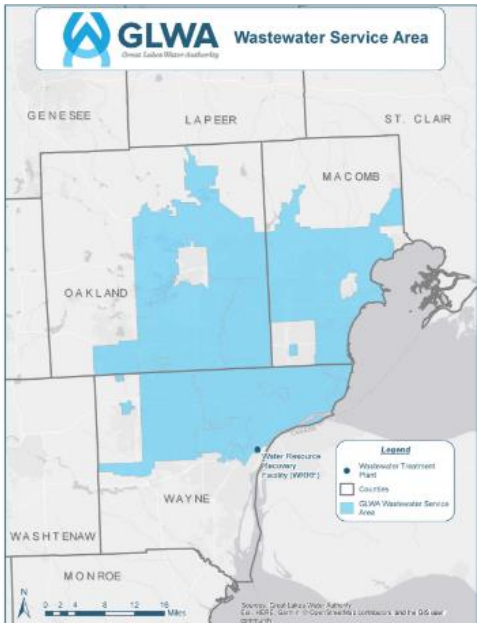
GLWA Service Area

GLWA's is a wholesale provider of Wastewater Treatment Services for 78 communities who comprise the Regional Sewer System. This system encompasses 840 sq. miles, with approx. 20% of this area being a combined sewer system.

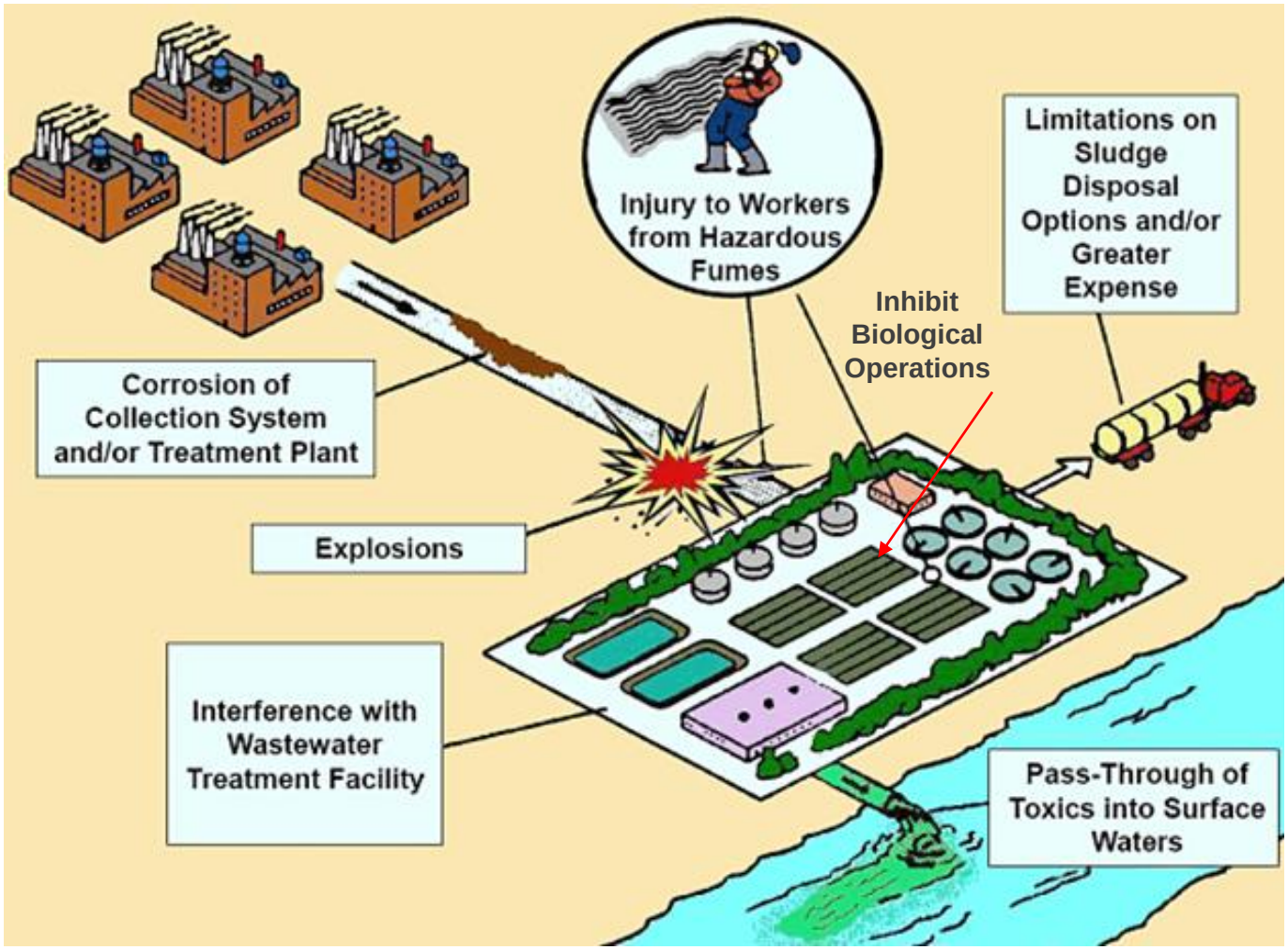
The Numbers:
- ▶ WRRF Dry Weather Flow = 550 MGD
- ▶ Primary Treatment Capacity = 1800 MGD
- ▶ Secondary Treatment Capacity = 930 MGD
- ▶ 96 Combined Sewer Overflow (CSO) to the Rouge and Detroit Rivers
- ▶ 9 CSO Screening-Detention and Disinfection facilities



GLWA's *Traditional* Industrial Pretreatment Program (IPP) is implemented to control the discharges from Categorical Industrial Users and Significant Industrial Users and includes Monitoring, Surveillance and Investigation of a variety of incidents that include but not limited to Spills, Upsets, Bypasses, Dumping Complaints, Discharges to Rivers.

Current IPP Coupled with Minimization/Best Management Program Approach (Currently PCB, Mercury, PFAS Compounds.

Pretreatment Program (in a Nutshell):



Pretreatment Program Intent (c.1978)

i. Prevent introduction of pollutants into POTW which will interfere with the operation of the POTW or contaminate the sewage sludge[1].

ii. Prevent the introduction of pollutants into POTW's which will pass-through the treatment works in receiving waters or the atmosphere or be otherwise incompatible with the work.

iii. Improve opportunities to recycle and reclaim wastewater and the sludges resulting from wastewater treatment.

[1] – a.k.a. Biosolids

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Pretreatment Equation

Biosolids Quality = f (Treatment, Regulation)

- Treatment Technologies include physical, biological, chemical forms of removing pollutants from Wastewater.
- Regulation – include Legal Principles

But …Focus Remains on Water Quality with Biosolids Quality a Side Effect

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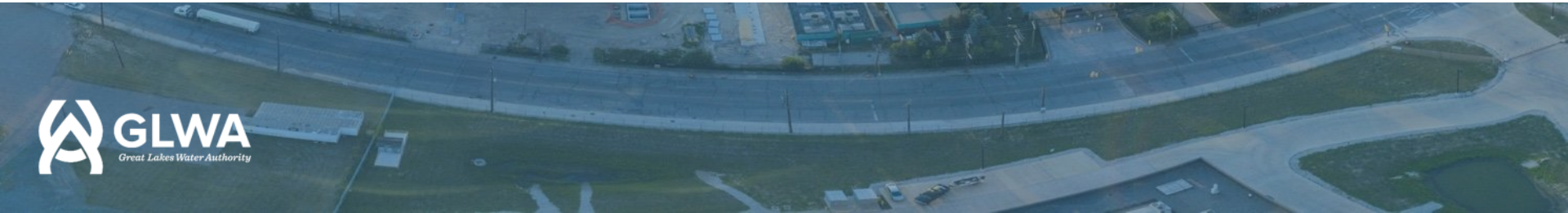
Pretreatment Program Focus:

- (Local) control of indirect dischargers
- Assigns responsibilities to (local) POTW to identify and address compliance to protect treatment works, collection system and meet Water Quality Requirements.
  - Create Legal Authorities and Procedures
  - Dedicate Resources
  - Include Local Initiatives
- GLWA Manages a Mature Program (~42 years) that has been locally and nationally successful (Probably beyond the originator's dreams)

Our Story is Your Story

WHERE WE'VE BEEN



Before Pretreatment

Prevent the occurrence of combatting fires on our Lakes, Rivers and Streams.

Photo – City of Detroit (1969) Rouge River Fire downstream of Rouge Mfg. Plant

Wastewater Challenges:

Industrial Discharge - 1994

Plating Shop Residues
(during EPA Cleanup)
2016

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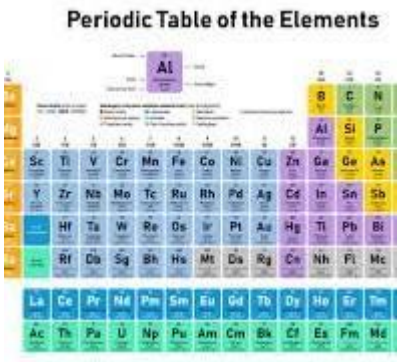
Regulation: What to Control?

- Toxic Pollutants – pollutants identified in Clean Water Act 33 USC 1317
- Pollutants of Concern – subjective consideration of local *pollutant challenges*
- Emerging Contaminants - recently identified chemical materials deemed dangerous – distinguish from "pollutants"



Reminder: All Other Pollutants – not identifiable or quantifiable - Shouldn't be interpreted as OK

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Regulation: How Much to Control?

- Before Regulation: Wastewater identifiable by color:
  - Chrome – Yellow
  - Copper – Blue
  - Nickel – Blue-green

Conclusion – Need to Control

Year	Pollutant Measure: Units	Objective	Comment
1970's	Parts per Thousand (10^{-3})	Doable	Technical Control
1980's	Parts per Million (10^{-6})	Achievable	+ > Management Control
1990	Parts per Billion (10^{-9})	Can Do	+ >> Management Control
2000 & 2010	Parts per Trillion (10^{-12})	If We Try Harder	+ >>> Management Control
2020	Parts per Quadrillion (10^{-15})	How?	+ Prayer?

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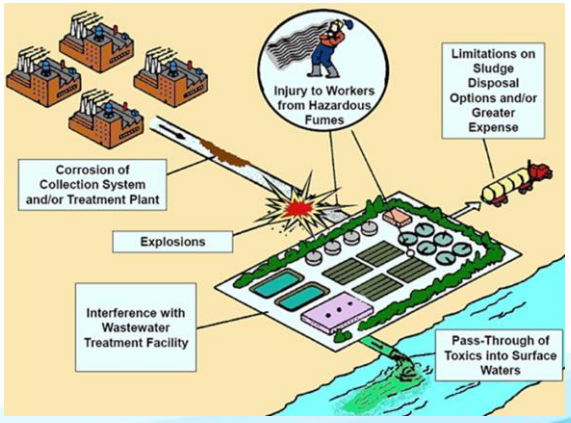
POTW – IPP Control By:

- Ordinance or Rule – *Mandatory R*equirements
- Permit – Facility Specific *Command/Control M*echanism and Requirements
- Other (Best Management Programs) – *Voluntary*

Establish Local Pollutant Limitations Using Headworks Study



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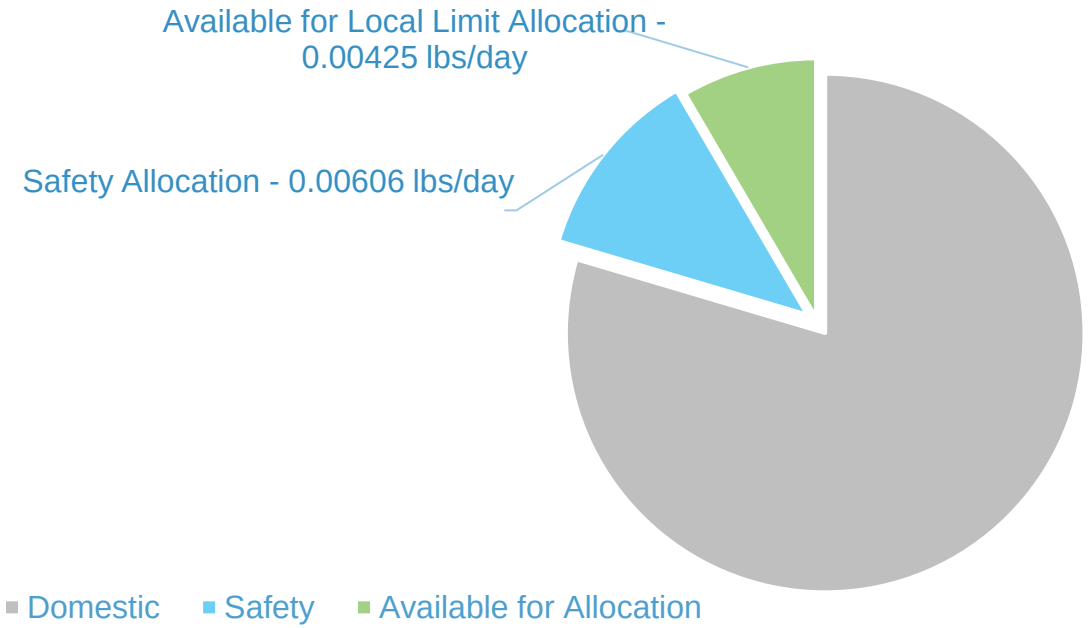
Example: Maximum Allowable Headworks (MAHL)
Proposed PFOS Limit = 65 ng/l
Rule Amendment late 2024

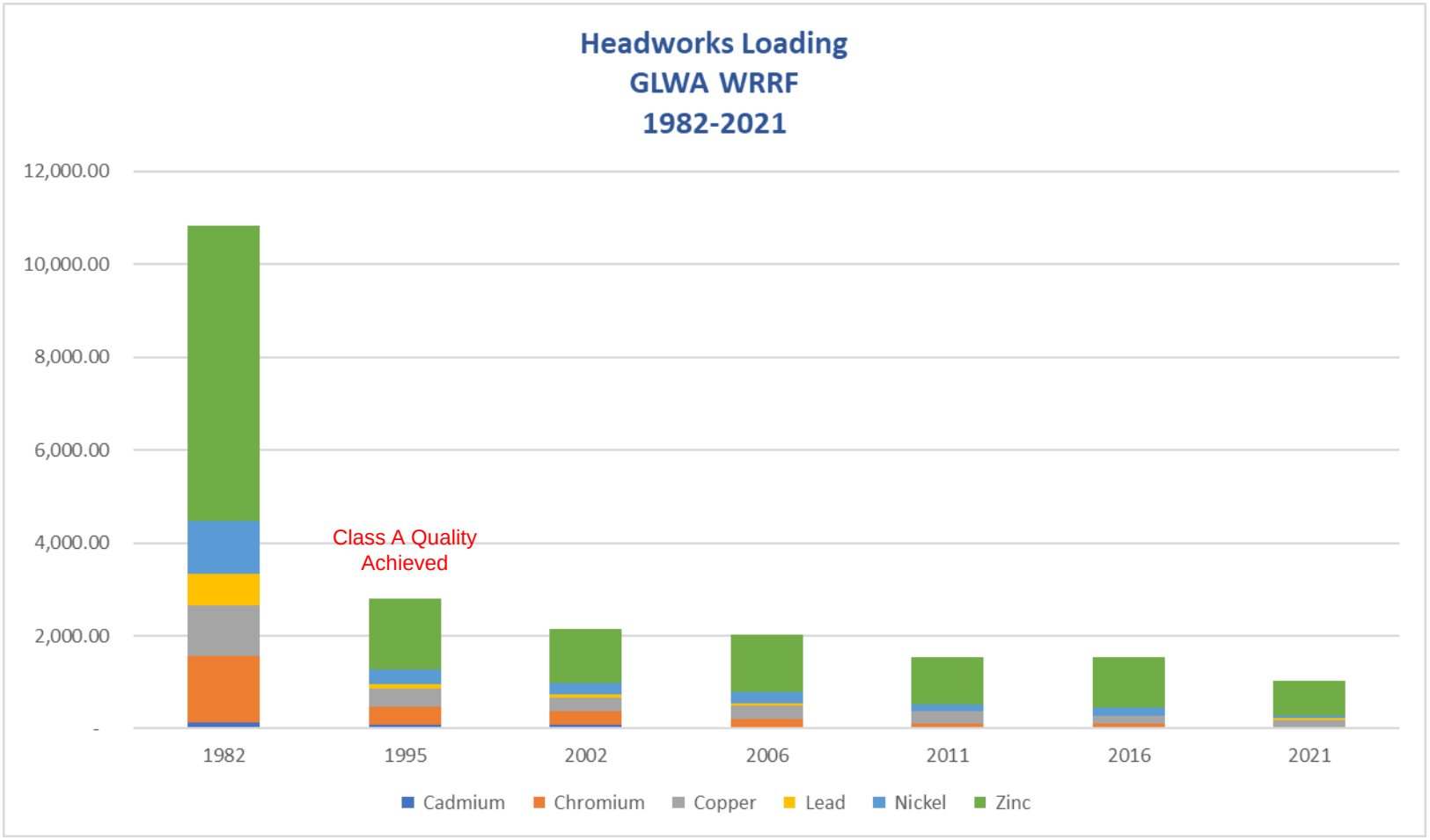
MAHL for PFOS (lbs/day) = Water Quality Standard
0.0505 lbs/day (weight < 5 - 5¢ pieces)



Uncontrollable: Domestic
0.04019 lbs/day

Applicable to GLWA WRRF

Pollutant Changes - Regulation



Progress Headworks Loading
GLWA (Detroit) WRRF

Parameter	1982 Load (lbs/day)	2021 Load (lbs/day)	% Reduction
Cadmium	120.5	1.1	99.1%
Chromium	1,433.4	32.9	97.7%
Copper	1,089.3	154.2	85.8%
Lead	688.2	43.1	93.7%
Nickel	1,146.3	49.6	95.7%
Zinc	6,363.3	759.3	88.1%
∑ Metals	**10,841**	**1,040.5**	**90.4%**

Regulatory View: Improved Biosolids Quality for Soil Amendment/Land-App but *at-risk* for contaminants, i.e. PFAS

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Local Regulatory Efforts to meet Challenges…

Local Initiatives	Date (Legal Authority)	Status
Centralized Waste Treatment	December 1996	Supplements EPA 2003 Category (40 CFR 437)
Groundwater Discharge Permits	December 1996	Includes Brownfield, UST Properties, Construction, Commercial & Residential Property Demolition
PCB and Mercury Source Control Program	January 2005	Formal adoption of 1993 Program Initiative
PFOS, PFOA and PFAS Compound Source Control	*New* – Late 2022	2020 Program Implementation 2024 – Adoption of Local Limit for PFOS (Perfuorooctane Sulfonic Acid)
Next?	*TBD*	

Conclusions

- ✓ Nationally and Locally - CWA and its Regulatory Progeny has Delivered on its Promises
- ✓ GLWA Operates & Implements an Advanced Regulatory Program
  - ✓ Program has Contributed to SE Michigan Environment
  - ✓ Economic Cost but Improves *Quality of Life*
- ✓ Program Will Continue to Evolve with SE Michigan's Changing Industry Base
- ✓ Balance Control Methods with Voluntary Methods

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We Can Support Biosolids Quality Objectives Using Regulatory Controls