CITY CORP
RUSSELLVILLE WATER & SEWER

August 3, 2023

Division of Environmental Quality
Office of Water Quality – Pretreatment Program
5301 Northshore Drive
North Little Rock, AR 72118

Re: Technically Based Local Limits evaluation approval

Dear Ms. Belcourt:

In reference to Permit No. AR0021768, AFIN 58-00105 Section B.1, City Corporation – Russellville Water & Sewer would like to submit the attached evaluation documents for approval, regarding the need for technically based local limits for the City Corporation Pretreatment Program as Section 6.0, Appendix C. By performing the evaluation, City Corporation has determined that technically based local limits are not necessary at this time.

If you have questions or concerns regarding the Appendix C: Technically Based Local Limits document or the 2021 TBLL excel file, please feel free to contact Greg Kremers, Wastewater & Pretreatment Operations Director at 479-968-2080 ext 236.

Sincerely,

Steve Mallett, Jr.
Chief Executive Officer

cc: Greg Kremers, Wastewater & Pretreatment Operations Director
Michael Hall, Pretreatment Coordinator

Appendix C

CITY CORP
RUSSELLVILLE WATER & SEWER

Technically Based Local Limits

August 3, 2023

1. Introduction

1.1 Background

The Clean Water Act Section 307(b) provides the statutory authority for the National Pollutant Discharge System (NPDES) and the General Pretreatment Regulations for Existing and New Sources of Pollutants (40 Code of Federal Regulations (CFR)) developed by The Environmental Protection Agency (EPA). The purpose of these regulations is to protect water quality by reducing the level of pollutants entering Publicly Owned Treatment Works (POTWs). Limiting pollutants helps reduce interference in the treatment facility and prevent pass through into receiving waters and biosolids used for land application. In addition, the regulations encourage opportunities to recycle and reclaim wastewater and address health and safety concerns for POTW workers. The regulations provide guidance for implementation of the National Pretreatment Program at the state and local level. City Corporation, Russellville Water and Sewer System is required by Arkansas Department of Energy and Environment – Division of Environmental Quality (DEQ) NPDES Permit Number: AR0021768 Section B.1. option (2).

1.2 Scope of Work

The purpose of Appendix G – Technically Based Local Limits is to determine if there is a need for City Corporation to enforce different limitations for POCs (pollutants of concern) than what is currently being enforced or if the limits should remain the same (based on EPA's categorical standards). Local limits are site-specific. This document will provide justification based on the removal efficiency of the POTW, Water Quality Based Effluent Limitations of the Outfall Stream (Whig Creek), Literature Inhibition Values, Domestic background data, and Class A Sludge Requirements in accordance with 40 CFR 503. The MAHLs (Maximum Allowable Headworks Loadings) and MAILs (Maximum Allowable Industrial Loadings) and to be included in this document are Cadmium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Zinc, Chromium, Cyanide, Arsenic, Molybdenum, and Beryllium. TBLLs should be re-evaluated and established for each permit period, 5 years if there have been significant changes to the City's industry make-up or discharge characteristics.

2. Local Limits Calculations

2.1 Removal Efficiencies

The Removal Efficiency of the POTW was calculated using a combination of the ADRE (Average Daily Removal Efficiency) Method and MRE (Mean Removal Efficiency) Method provided in the EPA's most recent Local Limits Development Guidance, EPA 833-R-04-002A, July 2004. These two were used in conjunction because both would be more reliable methods than using the EPAs recommended removal efficiencies provided in EPA's Local Limits Development Guidance Appendices, Appendix R. Also, between the two methods there were numbers provided in one method while missing in the other method due to calculation errors. See Table 1. The more conservative or lower value from the two methods was used in determining MAHL and MAILs.

Table 1: ADRE vs. MRE vs EPA's Recommended Removal Efficiencies

	ADRE	MRE	EPA % REM
Cadmium	NONE	100	67
Copper	79	80	86
Lead	100	100	61
Mercury	85	91	60
Nickel	41	52	42
Selenium	NONE	55	75
Silver	NONE	100	75
Zinc	62	66	79
Chromium	96	99	82
Cyanide	NONE	NONE	69
Arsenic	58	55	45
Molybdenum	NONE	NONE	50
Beryllium	NONE	NONE	50

Removal Efficiency Used in Calculating MAHL and MAIL

The data used in calculating the ADRE methods and MRE was compiled from approximately 5 years of data from influent and effluent samples dating from January 2016 to December 2020 and can be found as attached or in the supplemental excel file "Supplemental TBLL".

2.2 MAHL and MAIL

The Maximum Allowable Headworks Loading and Maximum Allowable Industrial Loading were calculated using the information provided from the WQS Limits tab on the Supplemental TBLL excel file and are determined by DEQ.

Table 2: MAHL Development

	Water Quality	Sludge	Inhibition	MAHL
	lbs/day	lbs/day	lbs/day	lbs/day
Cadmium	0.29	0.45	51.54	0.29
Copper	2.27	19.27	51.54	2.27
Lead	0.36	4.87	51.54	0.36
Mercury	0.00	0.24	5.15	0.24
Nickel	8.47	3.63	51.54	3.63
Selenium	0.64	0.64	10.31	0.64
Silver	0.19	0.00	12.89	0.19
Zinc	11.60	42.62	41.23	11.60
Chromium	380.67	0.00	51.54	51.54
Cyanide	0.96	0.00	5.15	0.96
Arsenic	39.97	0.48	5.15	0.48
Molybdenum	0.00	0.53	10.31	0.53
Beryllium	0.61	0.00	5.15	0.61

Loading used to calculate MAHL; The most limiting loading was used

Table 3: MAIL Development

	MAHL	Domestic	Allocation for Safety Factor (10%)	MAIL
	lbs/day	lbs/day	lbs/day	lbs/day
Cadmium	0.29	0.01	0.26	0.25
Copper	2.27	1.39	2.04	0.65
Lead	0.36	0.06	0.32	0.26
Mercury	0.24	0.01	0.21	0.20
Nickel	3.63	0.16	3.26	3.11
Selenium	0.64	0.11	0.58	0.47
Silver	0.19	0.00	0.17	0.17
Zinc	11.60	4.78	10.44	5.66
Chromium	51.54	0.01	46.39	46.38
Cyanide	0.96	0.21	0.87	0.66
Arsenic	0.48	1.51	0.43	0.00
Molybdenum	0.53	0.17	0.48	0.31
Beryllium	0.61	0.01	0.55	0.54

The MAHL was then used to calculate the MAIL, Maximum Allowable Industrial Loading. The Safety Factor used in the development of MAIL was 10% of the MAHL and was the recommended value from the EPA Local Limits Guidance Manual dated July 2004. It is used to address data "uncertainties" that can affect the ability of the POTW to calculate accurate local limits. The Allocation for Safety Factor loading is 10% of the MAHL subtracted from the MAHL. Domestic loading is the result of sampling from areas throughout the collection system before any loading from industrial users. The MAIL is then found by subtracting the Domestic Background Loading from the Safety Factor. The Maximum amount of industrial loading is the estimated maximum loading of a pollutant that can be received at a POTW's headworks from all permitted industrial users and other controlled sources without causing pass through or interference.

2.3 Industrial Loadings of POCs

The data used to provide this information can be found in the Supplemental TBLL Excel Document. The data dates range from January 2016 to December 2020. The concentrations from each industry that is permitted under City Corporations Pretreatment Program that discharge any quantity of the listed POCs was added to the table. Aqua Contour Cutting, Grace Manufacturing, POM, and Taber are the only industrial categorical users permitted through the City Corporation Pretreatment Program.

Table 4: Comparison of MAIL to Average POC Loadings from Industries

Average Metal Loadings from Industries									
	Cd Daily	Cu Daily	Pb Daily	Hg Daily	Ni Daily	Ag Daily	Zinc Daily	Cr Daily	Cn Daily
	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day	Loading lb/day
Aqua Contour	0.00	0.01			0.00	0.00	0.01	0.00	0.00
Bridgestone							0.049		
Grace	0.00	0.041	0.029		0.175	0.00	0.011	0.732	0.001
Hackney Ladish				0.00		0.004	0.036		
Mahle		0.001				0.00	0.009	0.005	0.003
POM	0.00	0.00	0.00		0.00	0.00	0.001	0.001	0.00
Taber							0.079	0.00	0.00
Average	0.00	0.012	0.015	0.00	0.058	0.001	0.028	0.148	0.001
Total	0.00	0.048	0.029	0.00	0.175	0.004	0.195	0.738	0.004
MAIL	0.25	0.65	0.26	0.20	3.11	0.17	5.66	46.38	0.66
% of MAIL	0.0%	7.4%	11.2%	0.0%	5.6%	2.4%	3.4%	1.6%	0.6%

The row labeled "% of MAIL" is the percentage total pollutant loading of the MAIL. Section 6.1.1 of the EPA's latest Local Limits Development Guidance recommends that local limits are needed when the maximum daily influent loading of a toxic pollutant exceeds 80% of the MAHL any time in the 12-month period preceding the analysis. The totals for each pollutant as a percentage of MAIL does not exceed 80% for any of the pollutants evaluated in this document.

3. Conclusion

By comparing the percentage pollutants to MAIL and none of them exceed 80% shows that local limits do not need to be allocated at this time.

City Corporation believes it has demonstrated technically based local limits are not necessary at this time per 40 CFR 403.8(f)(4).

See the additional spreadsheets (Supplemental Material for TBLL 2021) for more thorough analysis of the calculations used for the evaluation for Technically Based Local Limits. The Technically Based Local Limits will be updated continuously and officially reevaluated every permitting period (5 years). The next due will be in the year 2028.

References

Local Limits Development Guidance. EPA 833-R-04-002A. Washington, DC: U.S. Environmental Protection Agency, Office of Wastewater Management 4023, July 2004

Local Limits Development Guidance Appendices. EPA 833-R-04-002B. Washington, DC: U.S. Environmental Protection Agency, Office of Wastewater Management 4203, July 2004