



Alabama Department of Environmental Management
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MARCH 24, 2020

MR DAVID DENARD
DIRECTOR
JEFFERSON COUNTY COMMISSION - ENVIRONMENTAL SERVICE DEPARTMENT
716 RICHARD ARRINGTON JR BLVD N
BIRMINGHAM AL 35203

Re: REVISED DRAFT LOCAL LIMITS
JEFFERSON COUNTY COMMISSION
VILLAGE CREEK WWTP
NPDES PERMIT NO. AL0023647

Dear Mr. Denard:

This letter is to provide notification that ADEM has revised the draft local limits documents for the Village Creek WWTP. The attached draft is identical to the proposed local limits mailed to you February 3, 2020 with the exception that the headworks allocation for Mercury is increased. Arsenic, Cyanide and Lead remain the over-allocated pollutants. A copy of this draft along with supporting information is attached for your records.

It is the Department's understanding that you are in agreement with the draft local limits and do not plan to conduct additional testing for the purpose of generating site-specific data for this POTW. In accordance with this understanding, ADEM plans to proceed with the development of final local limits based on the attached revised draft. After consideration of any comments received during the public notice period, a final determination on the local limits will be made. All permits issued to industrial users must comply with adopted local limits.

Should you have any questions about this process, please contact Alex Chavers by email at achavers@adem.alabama.gov or by phone at (334) 271-7851.

Sincerely,

Scott Ramsey, Chief
Industrial Section
Industrial/Municipal Branch
Water Division

Attachments: Draft Local Limits
Rationale for Local Limits
Local Limits/Pass Through Calculations

CC: Margaret Tanner/Jefferson County Commission
Dustin Stokes
Alex Chavers



LOCAL LIMITS

PUBLICLY OWNED TREATMENT WORKS: VILLAGE CREEK WWTP
LOCATION: BIRMINGHAM, ALABAMA
JEFFERSON COUNTY
PERMIT NUMBER: AL0023647

GENERAL PRETREATMENT PROHIBITIONS

No discharge to the Publicly Owned Treatment Works (POTW) shall exceed or otherwise violate the General Pretreatment Standards described in ADEM Administrative Code 335-6-5. Specifically the POTW shall ensure that discharges to their system comply with the following prohibitions to ensure protection of the treatment and collections systems and to ensure worker safety:

Pollutants which create a fire or explosion hazard including but not limited to waste streams with a closed cup flashpoint of less than 140 degrees Fahrenheit;

Pollutants which will cause corrosive structural damage to the treatment works but in no case discharges with a pH lower than 5.0 S.U. unless the treatment works are specifically designed to accommodate such discharges;

Solid or viscous pollutants in amounts which will cause obstruction to the flow in sewers or other interference with the operation of the treatment works;

Any pollutant, including oxygen demanding pollutants released in a discharge of such volume or strength as to cause interference in the treatment works;

Heat in amounts which will inhibit biological activity in the treatment plant resulting in interference, but in no case in such quantities that the temperature of the effluent at the treatment plant exceeds 104 degrees Fahrenheit unless the treatment plant is designed to accommodate such heat;

Pollutants which will result in the presence of toxic gases, vapors or fumes within the treatment works in a quantity that may cause acute worker health and safety problems;

Any trucked or hauled pollutants except at discharge points designated by the treatment works; and

Petroleum oil, nonbiodegradable cutting oil, or products of mineral origin in such amounts that will cause interference or pass through.

GENERAL PRETREATMENT STANDARDS AND LOCAL LIMITS

POLLUTANTS:

The total average daily loading of the substances from all sources shall not exceed the indicated mass listed below.

<u>Parameter</u>	<u>Allowable Average Daily Pollutant Load at Headworks of POTW</u> (lbs/day)
Arsenic, Total Recoverable	0.8120
Cadmium, Total Recoverable	3.588
Chromium, Total Recoverable	2227
Copper, Total Recoverable	144.1
Cyanide, Free	19.05
Lead, Total Recoverable	27.70
Mercury, Total Recoverable	0.1128
Nickel, Total Recoverable	43.40
Silver, Total Recoverable	13.80
Zinc, Total Recoverable	412.0

No future loading above the domestic wastewater concentration of Arsenic, Cyanide or Lead will be allowed. All new or expanding industrial dischargers containing these pollutants shall be limited as indicated below:

<u>Parameter</u>	<u>Allowable Average Concentration</u> (mg/l)
Arsenic, Total Recoverable	0.001
Cyanide, Free	0.04
Lead, Total Recoverable	0.05

HYDRAULIC LOADING:

The hydraulic loading on an average basis is the design capacity of the treatment plant which is 120 million gallons per day.

ORGANIC LOADING:

The organic loading (CBOD₅) is the design capacity of the treatment plant which is 167,133 pounds per day.

SOLIDS LOADING

The Total Suspended Solids loading (TSS) is the design capacity of the treatment plant which is 200,160 pounds per day.

EFFECTIVE DATE:

ISSUANCE DATE:

DRAFT

Alabama Department of Environmental Management

Rationale for Local Limits

Village Creek WWTP (AL0023647)
120 MGD activated sludge facility
Birmingham/Jefferson County

Reissuance
Prepared Date: 9/25/2018
Prepared By: Ed Hughes
Revised Date: 4/2/2019
1/24/2020
3/4/2020

Nonconventional Pollutants:

Pass Through:

Allowable pollutant loadings were based on state water quality standards applicable to streams with a use designation of Limited Warmwater Fishery. Local limits calculations were performed using a receiving stream 7Q2 of 21.83 cfs, 1Q10 of 10.07 cfs, an annual average flow of 84.58 cfs and a stream hardness of 157 mg/l as CaCO₃. The treatment plant removal rates and untreated domestic sewage pollutant concentrations were based on Best Professional Judgment using literature values and EPA recommended levels as the basis unless site specific data was available. Calculations estimate the allowable quantity of heavy metals (measured as Total Recoverable) and Free Cyanide that can be discharged into the POTW to ensure that state water quality standards for aquatic toxicity and human health criteria are met in the receiving stream during critical flow conditions. Because only the portion of heavy metals present in dissolved form is "bioavailable" to aquatic life, the calculations which evaluate aquatic toxicity take into account the relationship between "dissolved" metals and metals measured using the Total Recoverable test procedure.

The discharge from the POTW is located in the segment of Village Creek which has an approved TMDL for Zinc. To ensure consistency with the requirements of the TMDL, the background loading of 0.029 mg/l (dissolved Zinc) was included in column 8 on the spreadsheet (allocation from background non-point sources). The stream 7Q2 was used to calculate the background mass loading and the results were converted from dissolved to total recoverable Zinc. Also included in this column were Zinc, Copper and Lead loadings from upstream industrial sources (SMI Steel, American Cast Iron Pipe Co and Nucor Steel). Industrial loadings were based on permit limits. Metals reported as "Total" were considered equivalent to "Total Recoverable" for purposes of these calculations.

The allowable pollutant loadings based on pass through concerns are located in column 11 of the Local Limits-Pass Through (LL-PT) spreadsheet.

Interference:

The Department evaluated the potential for processes at the POTW to be inhibited as result of the pollutant loading entering the treatment works. Inhibition values were based on Best Professional Judgment using literature values and EPA recommended levels as the basis unless site specific information was provided by the POTW. The allowable pollutant loadings based on inhibition concerns are located in column 13 of the LL-PT spreadsheet.

Sludge Disposal:

The POTW disposes of sludge by land application. According to the most recent MWPP report, this plant generated 2698 dry metric tons of sludge annually based on an annual average flow of 45 MGD. All of this sludge was land applied. At the design flow of 120 MGD the POTW would generate 21.7 US tons per day. For POTWs that use land application as a means of disposal the LL-PT spreadsheet calculates the allowable pollutant loading to ensure that metal concentrations in the sludge comply with EPA 503 regulations for land application of biosolids. The results of these calculations are located in column 14 of the spreadsheet.

Column 15 of the LL-PT spreadsheet indicates the most stringent of the above three criteria. These loadings are considered the POTW's total headworks capacity for the pollutants of concern.

The LL-PT spreadsheet also lists the current loading of the pollutants of concern from domestic/commercial and industrial sources and determines the remaining capacity currently available. Domestic/commercial loadings are indicated in Columns 16 and current industrial loadings are shown in column 17 (a listing of each significant industrial user and their permit limits and average reported discharge level for pollutants without permit limits is shown on the attached Significant Industrial User sheet). Column 18 of that spreadsheet shows the remaining capacity after subtracting the current loadings. Negative values indicate that no additional capacity is available for these pollutants. Specifically, these calculations estimate that no additional loading of Arsenic, Cyanide or Lead above the domestic sewage concentration can be allowed; therefore, new and expanded discharges shall be limited to domestic sewage concentrations. The limiting factor for each of these pollutants is shown below:

<u>Parameter</u>	<u>Limiting Factor</u>
Arsenic, Total Recoverable	Water Quality/Human Health
Cyanide, Free	Water Quality
Lead, Total Recoverable	Water Quality

It should be noted that the available pollutant loadings shown in column 18 have been reduced by 10%, which is the percent of total capacity reserved for future growth.

Conventional Pollutants

Temperature:

The Department is not aware of any specific circumstances related to this POTW which require a temperature limitation more stringent than general standards and prohibitions contained in ADEM Administrative code 335-6-5-.03(2)(e).

pH:

The Department is not aware of any specific circumstances related to this POTW which require a minimum pH limitation more stringent than general standards and prohibitions contained in ADEM Administrative code 335-6-5-.03(2)(b).

Hydraulic loading:

The hydraulic loading is the design capacity of the treatment plant as indicated by the POTW, 120 MGD.

Organic loading:

The organic loading (CBOD₅) is the design capacity of the treatment plant. This loading was calculated using the design flow of the POTW and an influent CBOD₅ concentration of 167 mg/l.

Total Suspended Solids loading

The Total Suspended Solids (TSS) loading was calculated using the design flow of the POTW and an influent TSS concentration of 200 mg/l.

While ADEM develops local limits and reviews compliance, POTWs are responsible for ensuring proper management of Significant Industrial Users and other sources to meet their NPDES limits and to prevent pass through and interference problems and to ensure compliance with the prohibitions contained in ADEM Administrative Code 335-6-5-.03 for protection of the treatment works, collection system and worker safety. The POTWs' responsibilities include establishing any additional limitations via local ordinances, etc. to protect the POTW and comply with their permit.

Revision Date (4/2/2019):

Local limits were calculated using the most recent version of the local limit spreadsheet. Allowable loadings were changed to be consistent with calculated values from the updated document.

The background loading of Zinc in column 8 was revised to gain consistency with the requirements contained in the TMDL for this stream segment. To further gain consistency with the TMDL, the allowable Zinc loading for acute toxicity was calculated based on the incremental stream flow of 3.11 MGD listed in the TMDL instead of the 1Q10 value of 6.51 MGD.

The discussion of sludge disposal was revised to discuss the use of actual data provided by the POTW's MWSS report for determining loading limitations related to this concern. The previous version used assumed values.

Revision Date (1/24/2020):

In this revision, metal loadings from Nucor Steel were added to the background sources in column 8 of the spreadsheet. Also industrial loadings were reduced to proposed draft permit levels where these limits were more stringent than existing permit levels. The background level of Zinc specified by the TMDL was calculated using the receiving stream 7Q2 and was converted from dissolve Zinc to total recoverable Zinc to gain consistency with the remainder of the spreadsheet.

Revision Date (3/4/2020):

Local limits for Village Creek WWTP were recalculated using the latest revision of the local limit spreadsheet. Results show an increase in the headworks loading allocation for Mercury. Arsenic, Cyanide and Lead remain the pollutants that are currently over-allocated.

LOCAL LIMIT/ PASS THROUGH CALCULATIONS

POTW NAME: Jefferson County Village Creek
 NPDES PERMIT NUMBER: AL0023647

DATE PREPARED: 3/4/2020
 PREPARED BY: Ed Hughes
 REVISED DATE: 3/4/2020

STREAM DATA AND POTW FLOW DATA									
RECEIVING STREAM CLASSIFICATION	=	LWF	3	RECEIVING STREAM TIDALLY INFLUENCED =	No				
POTW DESIGN FLOW	=		120 MGD						
FLOW FROM OTHER CONTRIBUTORS	=		2.0829 MGD						
DOMESTIC FLOW	=		119.6356 MGD						
7Q10	=		13.32 CFS	OR			8.60 MGD		
1Q10	=		10.07 CFS	OR			6.51 MGD		
7Q2	=		21.83 CFS	OR			14.10 MGD		
ANNUAL AVG FLOW	=		84.58 CFS	OR			54.64 MGD		
STREAM HARDNESS (DEFAULT VALUE 100)	=		100 MG/L AS CaCO3						

ALLOWABLE LOADING TO STREAM BASED ON WATER QUALITY AND HH STANDARDS										
PARAMETER	1) CHRONIC	SW CHRONIC	2) MAX W Q	3) ACUTE	SW ACUTE	4) MAX W Q	5) HUMAN	6) MAX W Q	7) WQ / HH	PARAMETER
	TOXICITY	TOXICITY	INSTREAM	TOXICITY	TOXICITY	INSTREAM	HEALTH	INSTREAM	BASED DISC	
	(MG/L)	(MG/L)	(LBS/D)	(MG/L)	(MG/L)	(LBS/D)	(MG/L)	(LBS/D)	LEVEL (LBS/D)	
ANTIMONY, TOTAL RECOVERABLE	----	----	----	----	----	----	0.3733333	406.909	406.909	ANTIMONY, TR
ARSENIC, TRIVALENT	0.1500	----	296.808	0.3400	----	635.234	0.00030	0.447	0.447	ARSENIC, TRI
CADMIUM, TOT RECOVERABLE	0.00025	----	1.184	0.0020	----	9.151	----	----	1.184	CADMIUM, TR
CHROMIUM, TOT RECOVERABLE	0.0741	----	400.84789	0.5698	----	2909.660	----	----	400.848	CHROMIUM, TR
CHROMIUM, HEXAVALENT	0.0110	----	12.494	0.0160	----	17.159	----	----	12.494	CHROMIUM, HEX
COPPER, TOTAL RECOVERABLE	0.0090	----	26.216	0.0134	----	37.071	----	----	26.216	COPPER, TR
CYANIDE, FREE	0.0052	----	5.906	0.0220	----	23.593	9.3333	10172.72	5.906	CYANIDE, FREE
LEAD, TOT RECOVERABLE	0.0025	----	13.876	0.0646	----	336.207	----	----	13.876	LEAD, TR
MERCURY, TOT RECOVERABLE	0.000012	----	0.04513	0.0024	----	8.523	0.0000424	0.046	0.04513	MERCURY, TR
MOLYBDENUM	----	----	----	----	----	<	----	----	----	MOLYBDENUM
NICKEL, TOT RECOVERABLE	0.0520	----	116.967	0.4682	----	994.352	0.9929078	1082.205	116.967	NICKEL, TR
SELENIUM, TOTAL RECOVERABLE	0.0005	----	0.568	0.0020	----	2.145	2.4305556	2649.147	0.568	SELENIUM, TR
SILVER, TOT RECOVERABLE	----	----	----	0.0032	----	3.450	----	----	3.450	SILVER, TR
ZINC, TOT RECOVERABLE	0.1181	----	406.607	0.1172	----	380.810	14.8936170	16233.07	380.810	ZINC, TR

DOMESTIC	DATA VALUE	Antimony	Arsenic	Cadmium	Chromium, To	Chromium, VI	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	
	LIT VALUE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
		0.0010	0.0010	0.0030	0.0500	0.0000	0.0600	0.0400	0.0500	0.0000	0.0000	0.0200	
	DATA VALUE	Selenium	Silver	Zinc									
LIT VALUE	0.0000	0.0000	0.0000										
		0.0000	0.0100	0.1800									

TYPE OF TREATMENT =	2	Act Sludge	SLUDGE DISPOSAL	
TREATMENT INCLUDE NITIFICATION?	No		DOES THE POTW HAVE SECONDARY CLARIFICATION?	Yes
			AVERAGE TONS OF SLUDGE PER DAY (DRY WEIGHT)	21.7
			IS SLUDGE LAND APPLIED?	Yes
GROWTH ALLOCATION				
			% ALLOCATION RESERVED FOR FUTURE GROWTH =	10

PARAMETER	7) MAX WQ INSTREAM (LBS/D)	8) ALLOCATION FROM BACKGROUND (LBS/D)	9) ALLOWABLE DISC FRDM POTW (LBS/D)	10) REMOVAL RATE (%)	11) ALLOWABLE DISCHARGE (WQ / HH) (LBS/D)	12) INHIBITION TRESHOLD CONC (MG/L)	13) ALLOWABLE DISCHARGE (INHIBITION) (LBS/D)	14) ALLOWABLE DISCHARGE (SLUDGE) (LBS/D)	15) ALLOWABLE DISCHARGE LOCAL LIMIT (LBS/D)	16) DOMESTIC INFLUENT LOADING (LBS/D)	17) INDUSTRIAL INFLUENT LOADING (LBS/D)	18) AVAILABLE CAPACITY FOR GROWTH (LBS/D)	LIMITING FACTOR
ANTIMONY, TOT RECOVERABLE	406.9090	0	406.9090	0	406.9090			406.9090	0.9978	0.0000		365.3201	WATER QUALITY
ARSENIC, TRIVALENT	0.4466	0	0.4466	45	0.8120	0.100	100.0800	7.233333333	0.8120	0.9978	0.0000	-0.1671	WATER QUALITY
CADMIUM, TOT RECOVERABLE	1.1839	0	1.1839	67	3.5876	1.000	1000.8000	5.505970149	3.5876	2.9933	0.0976	0.4470	WATER QUALITY
CHROMIUM, TOT RECOVERABLE	400.8479	0	400.8479	82	2226.9327	5.000	5004.0000	-----	2226.9327	49.8881	0.6592	1958.7468	WATER QUALITY
CHROMIUM, HEXAVALENT	12.4936	0	12.4936	83	73.4919	1.000	1000.8000	-----	73.4919	0.0000	0.0095	66.1341	WATER QUALITY
COPPER, TOTAL RECOVERABLE	26.2160	6.041	20.1750	86	144.1069	1.000	1000.8000	217	144.1069	59.8658	0.7865	75.1092	WATER QUALITY
CYANIDE, FREE	5.9061	0	5.9061	69	19.0519	0.100	100.0800	-----	19.0519	39.9105	0.0150	-18.7863	WATER QUALITY
LEAD, TOT RECOVERABLE	13.8755	3.072	10.8035	61	27.7014	1.000	1000.8000	59.76393443	27.7014	49.8881	0.0197	-19.9858	WATER QUALITY
MERCURY, TOT RECOVERABLE	0.0451	0	0.0451	60	0.1128	0.100	100.0800	4.123	0.1128	0.0000	0.0000	0.1015	WATER QUALITY
MOLYBDENUM		0						3.255	3.2550	0.0000	0.0000	-----	SLUDGE
NICKEL, TOT RECOVERABLE	116.9667	0	116.9667	42	201.6667	1.000	1000.8000	43.4	43.4000	19.9553	0.8932	20.2964	SLUDGE
SELENIUM	0.5679	0	0.5679	50	1.1358			8.68	1.1358	0.0000	0.0000	1.0222	WATER QUALITY
SILVER, TOT RECOVERABLE	3.4497	0	3.4497	75	13.7989	0.250	250.2000	-----	13.7989	9.9776	0.0901	3.3581	WATER QUALITY
ZINC, TOT RECOVERABLE	380.8098	12.803	368.0068	79	1752.4134	1.000	1000.8000	412.0253165	412.0253	179.5973	0.5554	208.6853	SLUDGE

Comments

Item 1: Allowable concentration instream based on above noted stream conditions and state standard to protect aquatic life from chronic toxicity.

Item 2: Mass of pollutant allowed instream based on above noted stream conditions and chronic criteria calculated as shown below:

Item 2 = stream 7Q10 x 8.34 x Item 1. If stream segment is tidally influenced, the more stringent of freshwater and saltwater criteria is used.

Item 3: Allowable concentration instream based on above noted stream conditions and state standard to protect aquatic life from acute toxicity.

Item 4: Mass of pollutant allowed instream based on above noted stream conditions and acute criteria and calculated as shown below:

Item 4 = stream 1Q10 x 8.34 x Item 3. For LWF streams, Item 4 = stream 7Q2 x 8.34 x Item 3.

If stream segment is tidally influenced, the more stringent of freshwater and saltwater criteria is used.

Item 5: Allowable concentration instream based on above noted stream conditions and state human health standard for a stream with this use classification.

Item 6: Mass of pollutant allowed instream based on above noted stream condition, the human health standard and calculated as shown below:

Item 6 = Annual average stream flow x 8.34 x Item 5 (for carcinogens) and 7Q10 x 8.34 x Item 5 (for non-carcinogens).

Item 7: The most stringent of the requirements calculated in Items 2,4 and 6.

Item 8: Amount allocated to other facilities discharging to this stream segment.

Item 9: Remaining allocation available.

Item 10: Pollutant removal rates based on the treatment process.

Item 11: The calculated allowable discharge into the POTW based on water quality and human health concerns.

Item 12: Concentration of pollutant that could cause inhibition of biological processes utilized at the treatment plant.

Item 13: Allowable discharge into the POTW based on levels to prevent inhibition of biological treatment processes.

Item 14: Allowable discharge into the POTW based on levels to meet EPA 503 standards for land application of sludge, if sludge is land applied.

Item 15: Allowable discharge into the POTW based on the more stringent of Items 11, Item 13 and item 14 requirements. This column contains the Local Limits for this POTW.

Item 16: Domestic influent (lbs/d) based on domestic flow and sampled domestic influent data if available or literature values if not.

Item 17: Industrial influent (lbs/d) based on monthly average permit limits and actual average values for the past 2 to 5 years (depending on availability) for "monitor only" pollutants as shown on SIUs sheet. Values reported as less than detect are not included in average calculation.

Item 18: Available capacity remaining for new sources after subtracting capacity being utilized by industrial sources, domestic sources (including commercial sources and septage disposal) and capacity reserved for future growth.