Hughes, Ed K

To: gmccord@cityofalabaster.com
Subject: proposed local limits for Alabaster WWTP
Attachments: Alabaster WWTP LOCAL LIMITS RATIONAL Revised.docx; Alabaster PASS THRU- LOCAL LIMITS spreadsheet Revised.xlsx; Alabaster WWTP LOCAL LIMITS Revised.docx

Mr. McCord,

This is to let you know that we have made a couple of revisions to the local limit spreadsheet since we mailed the proposed local limit package to Mayor Handlon on March 12, 2019. Attached are the revised spreadsheet, rationale and proposed local limits documents for Alabaster. One change reduced the allowable Antimony; however, this does not affect local limits because Antimony is not believed to be a pollutant of concern and the second change increased the Mercury allocation from 0.0022 to 0.0070 mg/l based on the stream flow criteria requirements related to LWF classified streams.
It is our intention to place this revised version on public notice in June. If the city has any questions or would like additional time to review the attachments, please let me know by email as soon as possible.

Thanks

Ed Hughes
Senior Environmental Engineer
Industrial Municipal Branch
Water Division
ADEM

Alabama Department of Environmental Management

LOCAL LIMITS

PUBLICLY OWNED TREATMENT WORKS:	**ALABASTER WWTP**
LOCATION:	**ALABASTER, ALABAMA** **SHELBY COUNTY**
PERMIT NUMBER:	**AL0025828**

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.

Parameter	Allowable Average Daily Pollutant Load at Headworks of POTW (lbs/day)
Arsenic, Total Recoverable	0.0870
Cadmium, Total Recoverable	0.1614
Chromium, Total Recoverable	91.95
Copper, Total Recoverable	6.594
Cyanide, Free	1.388
Lead, Total Recoverable	1.209
Mercury, Total Recoverable	0.0077
Nickel, Total Recoverable	8.172
Silver, Total Recoverable	0.2762
Zinc, Total Recoverable	63.38

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

Parameter	Allowable Average Concentration (mg/l)
Cadmium, Total Recoverable	0.003
Cyanide, Free	0.04
Lead, Total Recoverable	0.05
Silver, Total Recoverable	0.01

HYDRAULIC LOADING:

The hydraulic loading on an average basis is the design capacity of the treatment plant which is 7.6 million gallons per day.

ORGANIC LOADING:

The organic loading ($CBOD_5$) is the design capacity of the treatment plant which is 10,585 pounds per day.

SOLIDS LOADING

The Total Suspended Solids loading (TSS) is the design capacity of the treatment plant which is 12,677 pounds per day.

EFFECTIVE DATE:

ISSUANCE DATE:

Rationale for Local Limits

Alabaster WWTP (AL0025828) Reissuance
7.6 MGD Oxidation ditch Prepared Date: 10/31/2018
Alabaster/ Shelby County Prepared By: Ed Hughes
Revised Date: 5/6/2019

Nonconventional Pollutants:

Pass Through:
Allowable pollutant loadings were based on state water quality standards applicable to streams with a use designated of Limited Warmwater Fishery. Local limits calculations were performed using a receiving stream 7Q2 of 5.31 cfs, 1Q10 of 1.93 cfs, an annual average flow of 26.43 cfs and a stream hardness of 50 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.

Pollutant loadings from other municipal plants in the area were considered in developing local limits for this POTW. Loadings from the Helena and the North Shelby treatment plants were not used in these calculations due to the significant distance between Alabaster's outfall and the outfalls serving these POTWs. Pelham's discharge was considered because that discharge is located approximately 3.5 miles from Alabaster. To determine the appropriate allocation for the two POTWs, the total stream allocation was divided based on the ratio of their design flows. Alabaster's design flow is 7.6 MGD and Pelham's is 4.0 MGD. Therefore, Alabaster was allocated 66% of the available stream loading for all pollutants of concern except Copper. Because Pelham's permit includes a limit for Copper, Pelham's allocation for Copper was based on the permit limit and the balance of the Copper allocation was given to Alabaster.

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 landfilling. 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 Users 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 Cadmium, Cyanide, Lead or Silver 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:

Parameter	Limiting Factor
Cadmium, Total Recoverable	Water Quality
Cyanide, Free	Water Quality
Lead, Total Recoverable	Water Quality
Silver, 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 limit is the design capacity of the treatment plant as indicated by the POTW, 7.6 MGD.

Organic loading:
The organic loading limit ($CBOD_5$) 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: (5/6/2019)
A correction was made to the local limit spreadsheet for streams classified as LWF. This resulted in a change in the Mercury allocation at the headworks of the POTW. The local limit document was revised to reflect this change.

LOCAL LIMIT/ PASS THROUGH CALCULATIONS

POTW NAME: Alabaster WWTP

NPDES PERMIT NUMBER: AL0025828

DATE PREPARED: 5/2/2019

PREPARED BY: Ed Hughes

STREAM DATA AND POTW FLOW DATA						
RECEIVING STREAM CLASSIFICATION	=	LWF	3		RECEIVING STREAM TIDALLY INFLUENCED =	No
POTW DESIGN FLOW	=	7.6	MGD			
FLOW FROM OTHER CONTRIBUTORS	=	4	MGD			
DOMESTIC FLOW	=	7.575	MGD			
7Q10	=	2.57	CFS	OR	1.660	MGD
1Q10	=	1.93	CFS	OR	1.247	MGD
7Q2	=	5.31	CFS	OR	3.430	MGD
ANNUAL AVG FLOW	=	26.43	CFS	OR	17.074	MGD
STREAM HARDNESS (DEFAULT VALUE 100)	=	50	MG/L AS CaCO3			

ALLOWABLE LOADING TO STREAM BASED ON WATER QUALITY AND HH STANDARDS										
PARAMETER	1) CHRONIC TOXICITY (MG/L)	SW CHRONIC TOXICITY (MG/L)	2) MAX W Q INSTREAM (LBS/D)	3)ACUTE TOXICITY (MG/L)	SW ACUTE TOXICITY (MG/l)	4)MAX W Q INSTREAM (LBS/D)	5)HUMAN HEALTH (MG/L)	6)MAX W Q INSTREAM (LBS/D)	7)WO / HH BASED DISC LEVEL (LBS/D)	PARAMETER
ANTIMONY, TOTAL RECOVERABLE	-----	-----	-----	-----	-----	-----	0.3733333	41.287	41.287	ANTIMONY, TR
ARSENIC, TRIVALENT	0.1500	-----	18.803	0.3400	-----	36.428	0.00030	0.072	0.072	ARSENIC, TRI
CADMIUM, TOT RECOVERABLE	0.0002	-----	0.081	0.0010	-----	0.466	-----	-----	0.081	CADMIUM, TR
CHROMIUM, TOT RECOVERABLE	0.0420	-----	25.077	0.3230	-----	164.775	-----	-----	25.077	CHROMIUM, TR
CHROMIUM, HEXAVALENT	0.0110	-----	1.379	0.0160	-----	1.714	-----	-----	1.379	CHROMIUM, HEX
COPPER, TOTAL RECOVERABLE	0.0050	-----	1.600	0.0070	-----	1.928	-----	-----	1.600	COPPER, TR
CYANIDE, FREE	0.0052	-----	0.652	0.0220	-----	2.357	9.3333	1032.18	0.652	CYANIDE, FREE
LEAD, TOT RECOVERABLE	0.0012	-----	0.715	0.0301	-----	15.674	-----	-----	0.715	LEAD, TR
MERCURY, TOT RECOVERABLE	0.000012	-----	0.005	0.0024	-----	0.851	0.0000424	0.005	0.00469	MERCURY, TR
MOLYBDENUM	-----			-----	-----		-------		-------	MOLYBDENUM
NICKEL, TOT RECOVERABLE	0.0289	-----	7.182	0.2605	-----	55.267	0.9929078	109.806	7.182	NICKEL, TR
SELENIUM, TOTAL RECOVERABLE	0.0005	-----	0.063	0.0020	-----	0.214	2.4305556	268.796	0.063	SELENIUM, TR
SILVER, TOT RECOVERABLE	-----	-----	-----	0.0010	-----	0.105	-----	-----	0.105	SILVER, TR
ZINC, TOT RECOVERABLE	0.0657	-----	24.943	0.0651	-----	21.147	14.8936170	1647.09	21.147	ZINC, TR

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

TYPE OF TREATMENT =	2	Act Sludge
TREATMENT INCLUDE NITIFICATION?		

SLUDGE DISPOSAL

DOES THE POTW HAVE SECONDARY CLARIFICATION?	Yes
AVERAGE TONS OF SLUDGE PER DAY (DRY WEIGHT)	N/A
IS SLUDGE LAND APPLIED?	No

GROWTH ALLOCATION

% ALLOCATION RESERVED FOR FUTURE GROWTH =	10

PARAMETER	7) MAX WQ INSTREAM (LBS/D)	8) ALLOCATION FROM BACKGRQUND (LBS/D)	9) ALLOWABLE DISC FROM 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, TOTAL RECOVERABLE	41.2870	14.0376	27.2494	0	27.2494				27.2494	0.0632	0.0000	24.4676	WATER QUALITY
ARSENIC, TRIVALENT	0.0725	0.0246	0.0478	45	0.0870	0.100	6.3384	--------	0.0870	0.0632	0.0000	0.0214	WATER QUALITY
CADMIUM, TOT RECOVERABLE	0.0807	0.0274	0.0532	67	0.1614	1.000	63.3840	--------	0.1614	0.1895	0.0146	-0.0385	WATER QUALITY
CHROMIUM, TOT RECOVERABLE	25.0769	8.5261	16.5507	82	91.9485	5.000	316.9200	--------	91.9485	3.1588	0.3565	79.5898	WATER QUALITY
CHROMIUM, HEXAVALENT	1.3789	0.4688	0.9101	83	5.3533	1.000	63.3840	------	5.3533	0.0000	0.0000	4.8180	WATER QUALITY
COPPER, TOTAL RECOVERABLE	1.6002	0.6770	0.9232	86	6.5942	1.000	63.3840	--------	6.5942	3.7905	0.4316	2.1349	WATER QUALITY
CYANIDE, FREE	0.6518	0.2216	0.4302	69	1.3878	0.100	6.3384	------	1.3878	2.5270	0.0083	-1.0328	WATER QUALITY
LEAD, TOT RECOVERABLE	0.7146	0.2430	0.4716	61	1.2093	1.000	63.3840	--------	1.2093	3.1588	0.0104	-1.7639	WATER QUALITY
MERCURY, TOT RECOVERABLE	0.0047	0.0016	0.0031	60	0.0077	0.100	6.3384	--------	0.0077	0.0000	0.0000	0.0070	WATER QUALITY
MOLYBDENUM		0.0000				-		--------	0.0000	0.0000	0.0000	-------	---------
NICKEL, TOT RECOVERABLE	7.1817	2.4418	4.7399	42	8.1723	1.000	63.3840	--------	8.1723	1.2635	0.4962	5.7713	WATER QUALITY
SELENIUM	0.0627	0.0213	0.0414	50	0.0827			--------	0.0827	0.0000	0.0000	0.0745	WATER QUALITY
SILVER, TOT RECOVERABLE	0.1046	0.0356	0.0690	75	0.2762	0.250	15.8460	------	0.2762	0.6318	0.0021	-0.3219	WATER QUALITY
ZINC, TOT RECOVERABLE	21.1465	7.1898	13.9567	79	66.4605	1.000	63.3840	--------	63.3840	11.3716	0.3086	46.5334	INHIBITION

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 critria is used.

Item 3: Allowable concentration instream based 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 critria 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 treament 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 availablity) 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.