FIFTH REPORT ON OPERATIONS OF RUSSELL COUNTY REGIONAL WASTEWATER TREATMENT PLANT AND ASSOCIATED ENVIRONMENTAL MONITORING

KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET

DIVISION OF WATER February, 2002





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Kentucky Department for Environmental Protection Kentucky Division of Water Water Quality Branch Frankfort, Kentucky

March 2002

This report has been approved for release:

Jeffrey W. Pratt, Director Kentucky Division of Water

Date

TABLE OF CONTENTS

TABLE OF CONTENTS	AND LIST OF FIGURES AND TABLES1-2	3
EXECUTIVE SUMMAR	Y4	
INTRODUCTION		
RUSSELL COUNTY RE	GIONAL WASTEWATER TREATMENT PLANT	
Description of Treatme	nt Facilities and Pipeline9	
Influent from Industrial	Sources)
Monitoring and Inspect	ions13	
ENVIRONMENTAL MO	NITORING18	
Lake Cumberland		
Water Quality		
Fish Tissue		,
Walleye fillets		,
Striper fillets)
Catfish fillets		
Walleye whole body		
Striper whole body		
Longnose gar whole	<i>body</i>	,
Catfish whole body		
Alewife whole body		
Shad whole body)
Sediment		
CONCLUSIONS		,
REFERENCES		,

APPENDICES

APPENDIX A:	Division of Water Compliance Sampling Inspections and	
	Biomonitoring Results	48
APPENDIX B:	August 2000 Notice of Violation and Agreed Order	67

LIST OF FIGURES AND TABLES

FIGURES

PAGE

Figure 1:	Location of Utilities - Jamestonw, KY	8
Figure 2:	Schematic of Wastewater Flow - Russell Co. WWTP - Jamestown, KY	11
Figure 3:	Jamestown Effluent Force Main Modifications Air Vent Manhole & Pipeline	12
Figure 4:	Sampling Locations for Water, Fish & Tissue, Town of Jamestown	21
Figure 5a:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1998	23
Figure 5b:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1998	23
Figure 5c:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1998	23
Figure 6a:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1999	24
Figure 6b:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1999	24
Figure 6c:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/1999	24
Figure 7a:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/2000	25
Figure 7b:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/2000	25
Figure 7c:	Chloride Concentrations (mg/l) in Lk. Cumb. at Depth of Effluent Plume/2000	25

TABLES

TABLES

PAGE

Table 1	Final Permit Limits	.7
Table 2	Discharge Monitoring Report Data, January 1998-December 2000	. 16-17
Table 3	Water Quality Data (mg/l) from Edge-of-Mixing Zone	. 19
Table 4a	Chloride Concentrations (mg/l) at Depth of the Effluent Plume-1998	. 22
Table 4b	Chloride Concentrations (mg/l) at Depth of the Effluent Plume-1999	. 22
Table 4c	Chloride Concentrations (mg/l) at Depth of the Effluent Plume-2000	. 22
Table 5	Chloride and Copper Concentrations (mg/l) at Dept of Effluent Plume- 1998	. 26
Table 6	Results from Jamestown Sediment Analyses from Lk. Cumberland 1993-2000	. 43-45

EXECUTIVE SUMMARY

For the period covered by this report (1998-2000), operations of the Russell County Regional Wastewater Treatment Plant (RCRWWTP) complied with most regulatory requirements, with satisfactory ratings by the Division of Water (division) in several compliance inspections. There was deterioration of a portion of the incoming wastewater line from Union Underwear to the RCRWWTP during the summer of 2000, which caused short-term degradation of Lily Creek before the affected portion of the pipeline was replaced following a Notice of Violation issued by the division and an Agreed Order. All treated wastewater monitoring data submitted by Jamestown to the division, including those for copper, chloride, and whole effluent toxicity, were less than permit limits except for one color reading. However, chloride loadings to the RCRWWTP were higher for this reporting period than previous periods, and there were several occasions between May 1999 and the summer of 2000 in which Union Underwear exceeded its monthly average concentration and loading limits for chloride. These problems were mostly resolved as a result of RCRWWTP issuing three notices of violation (NOVs) to Union Underwear under the pretreatment program.

Sampling by Jamestown and the division during worst-case conditions for effluent mixing, the thermally stratified conditions of late summer and early fall, indicated that pollutant concentrations were low and that the effluent remains well below the surface. These plume surveys detected chloride at concentrations greater than background (about 3 mg/l) as far downstream as the mouth of Greasy Creek. However, even the highest concentration (36 mg/l) was much less than the chronic criterion of 600 mg/l listed in Kentucky's Water Quality Standards, and the plume was in a thin horizontal layer less than one meter thick. Chloride samples taken from the edge of the mixing zone (70 ft from the diffuser) ranged from 4 to 35 mg/l. Total recoverable copper concentrations never exceeded 0.003 mg/l at any of the water quality monitoring sites, lower than any previous sampling results.

Fish tissue results were similar to previous years in that no differences were detected in pollutant concentrations from fish taken five miles above and those collected in the area of and downstream of the diffuser. Mercury was again detected in fairly high concentrations in several fish but, as in previous years, the higher concentrations were as likely to be found in fish taken from the control site five miles

upstream of the diffuser as from the area around or downstream of the diffuser. It is concluded that RCRWWTP's discharge is not the source of mercury in the lake's fish. Atmospheric deposition is believed to be the primary source of mercury.

Sediment sampling results also showed no trends or evidence of increased metal concentrations in the area of the diffuser.

INTRODUCTION

The Russell County Regional Wastewater Treatment Plant (RCRWWTP), operated by the City of Jamestown, was issued a Kentucky Pollutant Discharge Elimination System (KPDES) permit in October 1989 by the Kentucky Department for Environmental Protection (DEP), Division of Water. The permit contained limits for typical components of sanitary wastewater and several constituents found in the large wastewater contribution from Union Underwear (Table 1). The limits applied to a discharge from a submerged multiport diffuser in the main body of Lake Cumberland. Final permit limits were to have taken effect on June 1, 1992. This date was required by Section 304(1) of the Clean Water Act following the division's decision to place Lily Creek on the list of streams not meeting a water quality standard for a priority pollutant (copper) from a point source discharge (RCRWWTP). Until June 1, 1992, the plant was to continue discharging to Lily Creek about three miles above the lake, the same location at which it had discharged since 1981 (Figure 1).

Following resolution of a permit appeal by Lake Cumberland Trust, discharge to the lake began in April 1993. A condition of the final permit was monitoring of Lake Cumberland to assess any potential effects of the discharge. Environmental monitoring and plant operations from March 1993 through December 1997 were presented in the first four reports (Kentucky Division of Water, 1999, 1996, 1995, 1994a). This report covers the period from January 1998 through December 2000. It also summarizes all fish tissue and sediment data that have been collected following the plant upgrade and relocation of the discharge to the main lake.

1	Final Permit Limits ^a									
Constituent	Monthly Average	Weekly Average	Sampling Frequency							
CBOD - 5 ^b	30 ^c	45 ^c	Weekly							
Ammonia - nitrogen	$4^{d}/11^{e}$	6 ^d /16.5 ^e	Weekly							
Dissolved Oxygen	Not less than 7	Not less than 7	Weekly							
Total Suspended Solids	30	45	Weekly							
Color (ADMI Units)	100	100 ^e	4/Day							
pH (Standard Units)	6-9	6-9	Daily							
Total Residual Chlorine	0.010	0.019 ^e	4/Day							
Fecal Coliform Bacteria										
(Colonies/100 ml)	200	400	Weekly							
Chloride	2531	5062 ^e	Daily							
Copper	0.176	0.176 ^e	Weekly							
Toxicity (Acute Toxicity Units)		4.8	Quarterly							

a = mg/l unless noted otherwise b = five day carbonaceous biochemical oxygen demand c = As of Sept 2001, limits are 25 monthly average and 40 weekly average

d = May - October e = Daily maximum



RUSSELL COUNTY REGIONAL WASTEWATER TREATMENT PLANT

Description of Treatment Facilities and Pipeline

The RCRWWTP underwent upgrade and expansion in the summer of 1992. A decolorization/dechlorination basin (where chlorine is added to remove color and sulfur dioxide is then added to remove excess chlorine), a new chemical feed building, additional aeration equipment in the biological treatment (carrousel) units, floating aerators to increase dissolved oxygen in the effluent, an effluent pump station, two belt filter presses for sludge dewatering, a backup power generator, and a new operations and laboratory building were constructed (Figure 2). The new basins allowed one of the four existing biological treatment. The effect of this construction was to increase the hydraulic capacity from 2.5 to 3.6 million gallons per day (mgd) and the retention time from 30 to 38 hours when all basins are in use.

More recently, a new sludge press was installed in late 1997. This greatly increased the facility's capacity to dispose of sludge.

Treated wastewater is routed to the lake via a 24-inch pipeline that follows road right-of-ways for much of its length before entering the lake near the mouth of the Lily Creek embayment (Figure 1). It crosses the embayment and terminates in a 300-foot multiport diffuser in the main lake. The diffuser lies on the steeply sloping lake bottom and angles out slightly into the lake at an elevation of 650 feet MSL on the upstream end and 620 feet MSL on the downstream end. At normal pool elevation of 723 feet MSL, the diffuser is 73 to 103 feet deep and lies less than 100 feet horizontally from the shoreline. During the late summer and fall, the depth is usually reduced by 30 - 40 feet as the lake is gradually drawn down to generate hydro-electricity. Sixteen 2-inch diameter ports spaced at 20-foot intervals distribute the treated wastewater in both horizontal and vertical dimensions. Following repair of the pipeline in the winter of 1994, an 8-inch vent line was added where the pipeline enters the lake to release any accumulated air (Figure 3).

Influent from Industrial Sources

Because industrial wastewaters are discharged into the sanitary sewer system, Jamestown is required to have a pretreatment program approved by the division. Industries in the pretreatment program are Union Underwear and Garment Finishers. No changes were made to the pretreatment program during this reporting period.

Union Underwear, a subsidiary of Fruit of the Loom, operates a textile facility in Russell County with manufacturing, bleaching, dyeing, and sewing operations. The plant has been in operation since 1981, when the RCRWWTP was constructed at its present location to handle the large volume of wastewater from Union Underwear. The facility presently employs about 1100 persons, up about 300 persons from recent numbers but well below the more than 3000 persons employed in the early 1990s. It supplies other Fruit of the Loom facilities with colored fabric. As in similar facilities worldwide, the dyeing operations use large amounts of salt (sodium chloride) to fix dyes in fabric.

Figure 2. Schematic of Wastewater Flow (1993) Russell County Regional Wastewater Treatment Plant Jamestown, Kentucky (After Kenvirons, Inc.)





Figure 3. Jamestown Effluent Force Main Modifications Air Vent Manhole and Pipeline Prepared by: Kenvirons, Inc.

12

The salt then becomes a component of the wastewater, from which it is difficult and costly to remove. Copper, a component of several of the azo-dyes, is also found in the wastewater in moderately high amounts. However, the copper is tightly bound within the dye molecule and generally not bioavailable to exert toxic effects on aquatic organisms.

Expansion of the Union Underwear facility took place in 1987-88, and influent to the RCRWWTP increased from 1.5 to 2.0 mgd. Average salt use was expected to increase to about 35 tons per day, but the installation of several high-pressure dye pads and careful selection and use of dyes resulted in much lower salt requirements. Average daily influent to the RCRWWTP from Union Underwear from 1998 through 2000 was about 2.5 mgd, about the same as the previous reporting period. Average daily salt use was more than 26 tons/day in this 36-month reporting period. This constitutes a further increase in salt use from the previous reporting period's 22 tons/day. Some of the greater salt use can be attributed to a six-month period from June through November 1999 when daily salt use averaged nearly 40 tons/day.

Union Underwear continues to explore alternative dyes and dyeing methods to further reduce the use of salt in the dyeing process. The addition of polymers to Union Underwear's wastewater beginning early in 1993 resulted in much lower levels of total copper passed on to the RCRWWTP. Through operational improvements, chlorine use has also been substantially reduced, with a corresponding reduction in the use of sulfur dioxide required for dechlorination. Recently, improvements to the polymer have resulted in a decline in the amount of polymer required.

Garment Finishers, a jean washing facility, generates about 0.06 MGD of wastewater. It has not experienced problems with solids and color typical of this type of facility because of the recent innovation of using enzyme solution instead of stone washing to fade jeans.

Monitoring and Inspections

The RCRWWTP is required to conduct regular sampling of constituents listed in Table 1. Results are submitted monthly to the division in discharge monitoring reports (DMRs). Semiannual compliance sampling inspections (CSIs) and periodic compliance evaluation inspections (CEIs) are also performed by division regional office personnel. Biomonitoring results were obtained by personnel of the division's Bioassay Section in conjunction with the CSIs.

Pretreatment audits or inspections are performed on an annual basis by personnel from the division's KPDES Branch to determine compliance with the program. Pretreatment reports are also submitted semiannually by Jamestown to the division's Pretreatment Section. A more intensive characterization of the influent and effluent is performed annually and reported by Jamestown in one of the semiannual reports. The municipality requires Union Underwear to perform self-monitoring three times per week for color and chlorides, weekly for copper and conventional pollutants, and either monthly or quarterly for other metals and cyanide. All monitoring for Garment Finishers is performed by the RCRWWTP.

<u>Results</u>. The RCRWWTP's DMR data of the final effluent from January 1998 through December 2000 are shown in Table 2. Monthly average concentrations ranged from 763 - 2432 mg/l for chloride and 43 - 104 ADMI units for color. The 104 ADMI was the sole instance where permit limits were exceeded (April 1999). As discussed above, the monthly average chloride concentrations were higher in this reporting period, mostly during late 1999. Daily maximum copper concentrations ranged from <0.001 to 0.032 mg/l. The average copper concentration was less than 0.013 mg/l for the study period, which continues the declining trend in copper levels in the treated wastewater. All test results for whole effluent toxicity again were less than the permit limit of 4.8 acute toxicity units, and all monthly average total residual chlorine results were less than 0.010 mg/l.

Regular inspections by division personnel found the plant to be operating satisfactorily (Appendix A). CSIs conducted in March 1998, May 1999 and May 2000 indicated compliance with permit limits. Biomonitoring results obtained in March 2000 indicated acute toxicity well below the permit limit. Eight CEIs conducted between January 1998 and December 2000 also gave satisfactory ratings.

However, in the summer of 2000, there was deterioration of the dedicated pipeline to the Union Underwear facility. A significant release of about 15,000 gallons occurred on August 1 that resulted in short-term degradation of the waters of Lily Creek. A letter of agreement with a compliance schedule was signed on August 31 (Appendix B). The RCRWWTP agreed to rehabilitate the affected portion of the line and inform the division of any further wastewater releases. About 1100 feet of polyethylene pipe were replaced with ductile iron pipe (iron pipe with the joints duct-taped).

Pretreatment inspections were conducted by the Division in October 1998, December 1999, and November 2000 (Appendix A). While these inspections indicated that Jamestown was fully implementing its pretreatment program, some problems with chloride loadings from Union Underwear were noted during both the 1999 and 2000 inspections. The chloride loadings from Union Underwear began to increase in May 1999 and remained elevated throughout the summer of 2000. This caused the RCRWWTP to violate is monthly average concentration and loading limits for chloride on several occasions. Apparently, increased production and operational scheduling issues at Union Underwear were not fully communicated with RCRWWTP. RCRWWTP moved to open those lines of communication and address the source of the problem. Most of the issues were resolved by the November 2000 pretreatment inspection.

The RCRWWTP performed its own annual inspections and semi-annual compliance monitoring at its two pretreatment facilities of Union Underwear and Garment Finishers. In 2000, Union Underwear experienced three violations of its chloride limit (out of a total of 145 samples). The RCRWWTP issued NOV's for these violations, which resulted in re-sampling. The re-sampling demonstrated a return to compliance. The chloride violations did not place Union Underwear in significant non-compliance, therefore it was not necessary for RCRWWTP to escalate enforcement. Garment Finishers achieved consistent compliance with its discharge limitations.

Table	2. Dischar	ge Monito	oring Rep	ort Data,	, January	1998-De	cember 2	2000										
	Flow	Total R	esidual	Ch	loride	Amn	10nia-N	Сор	per	СВ	OD-5	Fecal C	Coliform	Color	Toxicity	Dissolve	ed pH	H
	(mg/d)	Chlo	rine	(m	g/l)	(m	ıg/l)	(mg	g/l)	(m	ıg/l)	Bact	teria	(ADMI	(Tu _a)	Oxygen	(Std.	Units)
		(mg	g/l)			-						(#/1	00ml)	Units)		(mg/l)		
	Mo.	Mo.	Daily	Mo.	Daily	Mo.	Wk.	Mo.	Daily	Mo.	Wk.	Mo.	Wk.	Daily				
Date	Avg.	Avg.	Max.	Avg.	Max	Avg.	Avg.	Avg.	Max	Avg.	Avg.	Avg.	Avg.	Max	Max.	Min.	Min.	Max.
1/98	2.7	< 0.01	< 0.01	1166	2250	0	0			5	8.2	0	0	90		7.0	6.7	_ ^a
2/98	3.0	< 0.01	< 0.01	1580	2300	0	0			6	10	0.2	1	84		7.8	7.1	7.8
3/98	2.9	< 0.01	< 0.01	1584	2450	0	0	0.0149	0.0186	4	5.3	0.3	1	73	1.43	7.0	7.2	7.9
4/98	2.7	< 0.01	< 0.01	1222	2050	0	0.2			2.9	4.2	0.1	0.4	79		7.2	7.4	8.2
5/98	2.7	< 0.01	< 0.01	1434	2000	0	0			3	4.5	2.5	3	71		7.2	7.7	8.3
6/98	2.6	< 0.01	< 0.01	1153	1650	0	0	0.0089	0.0098	2.6	4.3	7.1	14.3	47	1.85	7.0	7.8	8.6
7/98	2.3	< 0.01	< 0.01	1002	1400	0	0			2	4	6.5	14	43		7.1	8.1	8.4
8/98	2.3	< 0.01	< 0.01	1424	200	0	0			3	4	5.5	14	67		7.2	8.0	8.5
9/98	2.6	< 0.01	< 0.01	1900	2250	0	0	< 0.001	< 0.001	4	5	17.5	53	83	<4.80	7.0	8.0	8.4
10/98	2.3	< 0.01	< 0.01	1758	2150	0.9	10			3	5	4.3	13	84		7.4	7.6	8.5
11/98	1.6	< 0.01	< 0.01	1672	2250	0	0			4	6	1.3	2	59		7.2	7.8	8.5
12/98	1.3	< 0.01	< 0.01	763	1950	0.5	1.6	0.0032	0.0032	4	6	7.3	16	78	<4.80	7.0	7.1	8.2
1/99	2.7	< 0.01	< 0.01	1261	2000	0	0			5	14	0.3	1	91		7.0	6.9	7.7
2/99	2.7	< 0.01	< 0.01	1580	1950	0	0			4	6	1.4	2	87		7.3	7.2	- ^a
3/99	2.8	< 0.01	< 0.01	1166	2250	0	0	0.0031	0.0044	5	6	1.0	4.0	84	<4.80	7.4	7.3	8.0
4/99	2.9	< 0.01	< 0.01	1167	1500	0	0			5	8	0.4	1	104		7.3	7.3	7.9
5/99	2.8	< 0.01	< 0.01	1292	1600	0	0			5	7	3.9	12	81		7.1	7.3	8.1
6/99	2.9	< 0.01	< 0.01	1852	3000	0	0	0.0198	0.0295	6	11	2.7	9	75	<4.80	7.1	7.7	8.3

^aNot reported.

Table	2. Dischar	ge Monite	oring Rep	ort Data,	January	1998-De	cember 2	2000 – cor	ntinued									
	Flow (mg/d)	Total R	esidual	Chl	loride g/l)	Amn (m	nonia-N	Cop	per	CB	OD-5	Fecal C	Coliform	Color	Toxicity	Dissolve	ed pH	H Unite)
	(ing/u)	(mg	g/l)	(III)	g/1)	(111	g/1)	(111)	<u>z/1)</u>	(11)	ig/1)	(#/1	00ml)	(ADMI Units)	$(1\mathbf{u}_{a})$	(mg/l)	(Stu.	Units)
	Mo.	Mo.	Daily	Mo.	Daily	Mo.	Wk.	Mo.	Daily	Mo.	Wk.	Mo.	Wk.	Daily				
Date	Avg.	Avg.	Max.	Avg.	Max	Avg.	Avg.	Avg.	Max	Avg.	Avg.	Avg.	Avg.	Max	Max.	Min.	Min.	Max.
7/99	2.7	< 0.01	< 0.01	2265	3000	0.01	0.06			7	16	17	63	98		7.2	7.2	8.3
8/99	2.6	< 0.01	< 0.01	2203	2500	0.03	0.13			9	14	30	104	77		7.1	7.6	8.4
9/99	2.7	< 0.01	< 0.01	2290	2750	0.05	0.23	0.0109	0.0114	4	6	4.3	6	75	<4.80	7.9	7.7	8.5
10/99	2.7	< 0.01	< 0.01	2432	2850	0	0			5	5.3	1	2	91		7.2	7.8	8.3
11/99	2.0	< 0.01	< 0.01	2260	3050	0	0			11	14	2.6	6	52		7.3	8.0	8.4
12/99	1.5	< 0.01	< 0.01	1456	2050	0	0	0.0061	0.0112	6	8	7.0	18	52	1.90	7.7	6.6	8.2
1/00	2.4	< 0.01	< 0.01	1353	2000	1.41	4.22			10	12.6	0	0	82		7.2	6.7	8.2
2/00	3.0	< 0.01	< 0.01	1584	2000	0	0			11	12	0.3	1	78		7.0	7.0	8.4
3/00	2.9	< 0.01	< 0.01	1703	2350	0	0	0.0147	0.0148	6	8	0.9	2	76	2.35	7.2	7.7	8.3
4/00	2.7	< 0.01	< 0.01	1418	1700	0	0			5	6	4.9	7	77		7.2	7.5	8.7
5/00	2.8	< 0.01	< 0.01	1548	2000	0	0			4	5	5.9	12	65		7.0	7.3	8.4
6/00	2.8	< 0.01	< 0.01	1837	2050	0	0	0.0149	0.0149	4	5	2.2	5	74	2.75	7.0	6.5	8.2
7/00	2.3	< 0.01	< 0.01	1511	2450	0	0			3	3	5	12	98		7.0	6.3	8.2
8/00	2.6	< 0.01	< 0.01	1692	2200	0	0			3	3	2.5	6	61		7.1	7.4	8.3
9/00	1.6	< 0.01	< 0.01	1337	1900	0	0	0.0295	0.0295	2	3	2.8	4	47	1.81	7.6	6.1	8.5
10/00	2.1	< 0.01	< 0.01	1211	1500	0	0			3	3	3.5	5	47		7.2	6.9	8.6
11/00	1.9	< 0.01	< 0.01	1465	1900	0	0.03			3	3.66	2.5	5	75		7.8	8.1	8.7
12/00	2.1	< 0.01	< 0.01	1779	2750	0	0	0.0240	0.0317	4	5.66	0.8	3	89	<1.00	7.2	7.4	8.6

ENVIRONMENTAL MONITORING

Lake Cumberland

Water Quality

Monitoring of the lake environment is a condition of the KPDES permit. A study plan was submitted by Jamestown and approved by the division prior to relocation of the outfall. The study plan was revised in September 1994 based on the experience and findings of the first year of sampling. The original study plan called for quarterly water, sediment, and fish tissue samples to be collected by Jamestown at an upstream control station and several downstream stations and for the biological community to be assessed in the vicinity of the discharge. Background conditions prior to the discharge relocation to the lake were also assessed. The first revision of the study plan reduced fish tissue and sediment sampling to annually, deleted phytoplankton sampling because the first year's sampling turned up mostly dead cells descending from the photic zone, and re-evaluated water quality sampling in the near- and far-field areas. From 1994 through 1996, the 7-foot (edge-of-ZID) samples were collected by SCUBA diving in the late summer and fall when the most favorable lake conditions were present (i.e. lower lake levels and better visibility). The most recent monitoring plan revision in November 1996 eliminated the edge-of-ZID sampling requirement because of highly variable results (see Kentucky Division of Water 1996, 1995). Jamestown again carried out quarterly (except winter) far-field plume work for this reporting period.

Near-Field Sampling. Samples were taken by Jamestown at the edge of the mixing zone (70 ft) on the dates shown in Table 3. Chloride concentrations in these samples ranged from 4 - 35 mg/l. These data are consistent with findings of earlier surveys. They also are in line with predicted dilution at the edge of the mixing zone. The number of dilutions at the edge of the mixing zone ranged from about 50 to more than 1000, corresponding to chloride concentrations at 70 feet of 25 and 3 mg/l, respectively. Model predictions used by the division to derive certain permit limits estimated 64 dilutions at the edge of the mixing zone. However, the model estimates average dilutions along the centerline of the effluent plume, which results in a very conservative prediction of dilution when applied to the plume as a whole. Although the variability of the sampling results makes comparisons to model predictions

difficult, the highest pollutant concentrations found in the lake generally appear to be consistent with the predicted dilution.

Plume Surveys. Jamestown performed quarterly plume surveys in May (spring), September (late summer), and October (fall) 1998-2000 at locations shown on Figure 4. Data for chloride from 1998 are presented in Table 4a and depicted graphically in Figures 5a, b, c. Spring, summer, and fall 1999 data are presented in Table 4b and Figures 6a, b, and c. Spring, summer, and fall 2000 data are presented in Table 4c and Figures 7a, b, and c.

Chloride levels at and downstream of the diffuser were very low at all locations on all sampling dates. The highest chloride concentration was 42 mg/l. Chloride concentrations of 14-15 mg/l were found in the spring of 1998, fall of 1999 and all samples taken in 2000 at the furthest location from the diffuser.

Table 3. Water Qu	ality Data (mg/l) from Edge-of- Town of Jamestown, 1998-2	Mixing Zone Sampling by 2000
Date	Constituent	70 feet from Diffuser
5/20/98	Chloride	5.0
	Copper	0.003
9/14/98	Chloride	4
	Copper	0.001
10/26/98	Chloride	7
	Copper	0.003
5/11/99	Chloride	12.0
	Copper	< 0.001
9/14/99	Chloride	25
	Copper	0.001
10/12/99	Chloride	16.0
	Copper	0.001
5/26/00	Chloride	35
	Copper	0.001
9/27/00	Chloride	7.5
	Copper	0.001
10/03/00	Chloride	18
	Copper	0.001

The quarterly water quality data are presented in Appendix C. Concentrations of metals were consistent with values reported in the previous annual reports. Arsenic was never found above 0.011 mg/l. Copper, nickel and lead concentrations were all at very low or below detectable limits at all locations. Lead was also found at very low levels or below detectable limits throughout the study period. Mercury was always less than the detection limit of 0.0005 mg/l.

The division collected plume data in October 1998. Again, chloride concentrations were low, ranging from 3 mg/l at 2000-3000 feet out from the diffuser to 15 mg/l about 250 feet out from the diffuser (Table 5). Upstream control and downstream samples had low chloride levels (3-5 mg/l). Copper was below detection limits (<0.001 mg/l) in all samples.





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Distance from Shoreline	А (Т	t diffusi ransect	er (1)	400 ft downstream of diffuser (Transect 2)			2000 f 0 (Tr	t down: f diffuse ransect	stream ar 3)	4000 ft downstream of diffuser (Transect 4)			Near Mouth of Greasy Creek (Transect 5)		
	5/20	9/14	10/26	5/20	9/14	10/26	5/20	9/14	10/26	5/20	9/15	10/26	5/20	9/15	10/26
200 h	17.5	35	30												
500 ft	15,5	20	15	15	30	12.5	3	10.5	2.5	3	11.5	10	15	5.5	
1000 ft	20	8	2.5	4.5	19	14.5	2.5	5.5	2.5		i i i	12.5	3.5	2	
1500 ft	2.5	18	2.5	3	9	2.5		1111			4	2.5	3		
2000 ft		35			11.5										
2500 ft		35.5			15			1	1.1.1.1						

Distance from Shoreline	At diffuser (Transect 1)			400 ft downstream of diffuser (Transect 2)			2000 ft downstream of dilfuser (Transect 3)			4000 f 0 (T)	t downs f diffuse ransect	stream er 4)	Near mouth of Greasy Creek (Transect 5)		
	5/11	9/14	10/12	5/11	9/14	10/12	5/11	9/14	10/12	5/11	9/14	10/12	5/11	9/14	10/12
200	42	15.5	26		i Cara i					111	J L II I				
500	10	3	2.5	17	15	14.5	4	11	2.5		3	2		3.5	12
1000	3	4.5	3	3	4	14	3	4	2.5	L	1 1	2.5			2.5
1500		2.5	2.5	3	2.5	13		4			1				
2000		3			_	2.5		2.5							-

Distance from Shoreline	At diffuser (Transect 1)			400 ft downstream of diffuser (Transect 2)			2000 ft downstream of diffuser (Transect 3)			4000 ft downstream of diffuser (Transect 4)			Near mouth of Greasy Creek (Transect 5)		
	5/26	9/27	10/3	5/26	9/27	10/3	5/26	9/27	10/3	5/26	9/27	10/3	5/26	9/27	10/3
200	21	28	15												
500	14	15	5.5	12	12	16.5	10	13	12	3.5	3	3	2.5	12.5	5
1000	5	2.5	2.5	7	10	12	14.5	15	3	3	4	2.5	2.5	9.5	2.5
1500	6			5	2.5	5.5	4.5	5.5		7			- 4		
2000	2.5			3.5		2.5	4	2.5		3			2		0

Figures 5a, b, and c. Chloride Concentrations (mg/l) in Lake Cumberland at Depth of Effluent Plume, Town of Jamestown Surveys, 1998.





Figure 5b







Figures 6a, b, and c. Chloride Concentrations (mg/l) in Lake Cumberland at Depth of Effluent Plume, Town of Jamestown Surveys in 1999.

Figure 6a



Figure 6b.



Figure 6c.



Figures 7a, b, and c. Chloride Concentrations (mg/l) in Lake Cumberland at Depth of Effluent Plume, Town of Jamestown Surveys in 2000.











Distance from Shoreline (ft)	Upstream	n Control	At Di	fuser	500 ft Dov of Dif	wnstream fuser	2000 ft Downstream of Diffuser		
	Chloride	Copper	Chloride	Copper	Chloride	Copper	Chloride	Copper	
145			11.4	< 0.001					
250			, I		4.23	< 0.001	I		
330			15.1	< 0.001					
400	2.82	< 0.001			1	1	J		
500					3.34	< 0.001			
1000	3.37	.<0.001	5.43	< 0.001	5.05	< 0.001			
2000			3.4	< 0.001	2.65	< 0.001			
3000			2.82	<0.001	2.65	<0.001			
_									

Fish Tissue

Fish tissue samples have been collected by Jamestown since the spring of 1993 by gill nets placed at the depth of the diffuser and at a depth mid-way between the diffuser and the surface. The upstream control station (Station 4) was located nearly five miles up the lake near the mouth of Harmon Creek. Samples were also collected in the area of the diffuser (Station 2) and at a site located about 4000 feet downstream of the diffuser (Station 3). Right side fillets were taken from predator fish such as striper, catfish, and walleye to determine human consumption risk. The remaining portion of the fish was used for whole body sample if the fish was of adequate size in order to determine ecological risks. Whole body samples were used for forage fish such as alewives and shad for similar purposes, and several of these fish were composited into a single sample when the fish were small. The division collected fish tissue samples in December 1996. Only right side fillets were used in the analysis.

All sites were fished until samples were obtained, but not for more than three nights. Because some types of fish were not caught on all sample dates, the number of samples is not equal between sites and dates. The following figures illustrate all fish tissue collected and analyzed to date, except those species that were captured only on a single occasion. These data are presented in Appendix C. When data are compared between graphs, it is important to keep in mind that individual graphs may be on different scales. The values represented are the average concentrations of each parameter in question or the average of composited samples of fish for each parameter. Many of the laboratory analyses contained metal levels below detectable limits. In these instances, levels were plotted on the following graphs at two-thirds of the detectable limits. These estimated values are marked above the appropriate bar with an asterisk.

Walleye fillets

Data for walleye fillets are presented for each station below. The erratic nature of the plotted data made drawing conclusions difficult. These data appeared to be random, with each parameter fluctuating over time in no discernible pattern. There were no apparent differences in metal concentrations between walleye fillets taken upstream or downstream from the diffuser. At Station 2,

the highest level of arsenic was found in August 1993, at 7.1 mg/Kg. Copper levels were highest in August 1995 at 1.74 mg/Kg with the remaining levels at < 1.0 mg/Kg. Lead was typically non-detectable. The higher value seen at Station 2 in May 1993 resulted from an estimated value.



Estimated values were calculated when the reported value of a contaminant was less than the detectable limits. Because different laboratories with varying detectable limits were used throughout the study, sometimes the estimated values were greater than detected values. Mercury concentrations remained consistent throughout the reporting period from < 0.12 to 1.1 mg/Kg. Data from a Natural Resource Defense Council (NRDC) report in 1998 found average mercury concentrations across the nation to be 0.510 ppm in 1992.





At these levels, concentrations expressed in mg/Kg and ppm are directly comparable. The greatest average of composited walleye fillets was found in April 1993 at 0.63 mg/Kg of mercury. The highest individual level of mercury was also found at that time at 1.1 mg/Kg. Nickel was found at a level of 7.97 mg/Kg at Station 2 in May 1995. The rest of the nickel levels were below 1.0 mg/Kg. At Station 3, the apparent rise in metal levels is a result of estimated values for all constituents except mercury. Unfortunately, there were no data collected at this location before the effluent was discharged through the diffuser directly to the lake. Without this information, no reliable determination of a trend can be made. Since constituents such as metals can vary from individual to individual, it is tenuous to speculate on the meaning of the data. The results at Station 4 were similar to those of Station 2. All parameter values were highly variable and showed no discernible trend. Arsenic levels were highest in May 1994. Mercury concentrations were highest in August 1996. The greatest levels of lead were in May 1994. Mercury concentrations ranged from 0.13 mg/Kg in October 1994 to 1.08 mg/Kg in August 1996. Nickel levels were also stable; however, they were much higher in September 1997. While two of the fillets in this sample had nickel concentrations of 3.0 mg/Kg or less, the remaining fillet had a level of 27 mg/Kg.

Striper fillets

Analysis of striper fillets indicated the same random pattern as walleye fillets. The concentration of each individual metal rose and fell over time. The striper fillet data for all three sampling locations are shown below. It should be noted that there were no stripers caught and analyzed prior to the use of the pipeline. Without any data to compare pre-treatment conditions, it is not possible to establish a cause and effect relationship. However, if there was an effect, a trend should become evident. While the highest concentrations of metals were found in August 1995 at Station 2, analyses on all dates indicated levels here were well below any regulated limits. Sampling performed by the division in December 1996 indicated that levels were as low or lower than levels found in August 1993. The remaining parameters were stable. Similar results were found at Station 4, where copper levels were higher in August 1995 and August 1996. However, division data collected in December 1996 showed that copper concentrations were at 1994 levels. Any trend appeared to be lake-wide and not restricted to the Lily Creek or downstream areas.

The highest mercury concentration was found at Station 4 in March 1994 at an average of 0.69 mg/Kg. NRDC (1998) did not report any mercury data from 1992 on striped bass inhabiting freshwater.







Catfish fillets

Data from channel catfish fillets were available only from Stations 2 and 4 because none were collected at Station 3 throughout the study. Arsenic levels at both sites were always less than the detectable limits. Copper levels were 1.0 mg/Kg or less over the study period. Lead concentrations appeared highest in May 1994 at Station 4, but these values were estimated from below detectable limits from each sample. The division found lead to be below the detectable limits of 0.22 mg/Kg in 1996. The highest mercury value found was at Station 4 in May 1994 (0.39 mg/Kg). NRDC reported (1998) average channel catfish mercury levels across the nation were 0.09 ppm in 1992. The division found mercury concentrations in these fish of 0.093 and 0.088 mg/Kg at Lily Creek and Conley Bottom, respectively, and 0.18 mg/Kg at Harmon Creek, in 1996. Nickel concentrations were all below detectable limits. Similar to the striper data, there were no data collected from either station prior to the utilization of the pipeline. Direct comparison of division data taken in December 1996 from both stations indicated that there was no substantial difference in the remaining parameters.





Walleye whole body

In order to determine if contaminants were accumulating within predatory fish in areas other than the edible portion, whole body analyses were conducted. Evidence of increased concentrations of metals in the whole body component of fish taken at Lily Creek or at the downstream station could indicate the diffuser had had an ecological impact. Presented below are the whole body analyses of walleye caught at each station. Metal concentrations remained low and relatively stable throughout the study. Copper concentrations were higher in May 1995 at Station 3 (14.5 mg/Kg) and in August 1995 at Stations 2 and 4 (25.4 and 26.4 mg/Kg, respectively). Since this pattern was seen at all sites, it was unlikely that the cause was the pipeline. In August 1996 at Station 4, copper levels decreased over 50 percent from the previous year to 9.6 mg/Kg.






Striper whole body

The results from striper whole body analyses mirror those found in walleye. The majority of metals investigated showed little or no fluctuation over time. Copper levels rose in August 1995 at each station. Moderate increases were noted at Station 2 and 3. Copper concentrations were much higher (24.6 mg/Kg) at Station 4. August 1996 results from Station 3 and 4 also indicated elevated copper levels (27.0 and 23.6 mg/Kg, respectively). There were no data available from Station 2 in 1996. Again, this increase was observed at all stations, both upstream and downstream from the diffuser.







Longnose gar whole body

The data from the longnose gar whole body analyses are not as extensive as those previously discussed. At Station 2, gar were only captured on three occasions (see below). Gar were collected a single time at Station 3 (data not illustrated). None of these collections contained more than one fish. Results from surveys at Station 4 are presented below. These numbers compare closely to those from the other predatory fish analyses seen above. Higher copper concentrations were seen in May 1995 and 1996.





Catfish whole body

Fewer channel catfish were caught than any of the predatory species analyzed for whole body metal concentration. Catfish whole body data collected at Station 2 are available only for October 1994. All values found were reported to be less than the detectable limits. At Station 4, arsenic, lead and nickel were found to be lower than detectable limits (see figure below). Copper concentrations were 1.0 mg/Kg or less and mercury levels were 0.29 mg/Kg or less. Data from 1998 are from a single individual. The apparent rise in arsenic concentrations is the result of an estimated level.



Alewife whole body

Alewives are a planktivorous species that form a food base for larger predators. Metal concentrations for alewives from Stations 2, 3 and 4 are presented below. Copper levels were highest at Station 2 in August 1995 (37 mg/Kg). Lead concentrations at Station 2 were highest in August 1996 at 1.2 mg/Kg. Mercury levels were consistently under 0.3 mg/Kg, and arsenic levels remained below detectable limits at all stations. Except for May 1995, nickel was below detectable limits. On that



date, nickel was found at 0.91, 2.8 and 1.87 mg/Kg at Stations 2, 3 and 4, respectively. There were no detectable trends over time.





Shad whole body

Shad are also a planktivorous species that form a food base for larger predators. Metal concentrations for shad from Stations 2, 3 and 4 are presented below. Estimated values were used since arsenic and mercury concentrations at Station 2 were always below detectable limits. Average copper levels ranged from < 1.0 mg/Kg, in August 1994 to 1.4 mg/Kg found in May 1993. Lead and nickel levels were above detectable limits only in August 1995 (0.34 and 1.3 mg/Kg, respectively). Data from September 1998 are all estimates. At Station 3, arsenic was always below detectable limits. Copper and lead were highest in August 1996 at 7.7 and 1.55 mg/Kg, respectively. Mercury was found above detectable limits only in August 1996 at 0.54 mg/Kg. Average nickel levels were highest in August 1996 at 0.54 mg/Kg. Average nickel levels were highest in August 1995 at 1.46 mg/Kg. Arsenic was above detectable limits at Station 4 at 0.37 mg/Kg only in April 1993. Copper was highly variable at this site and ranged from 0.7 mg/Kg in October 1993 to over 35 mg/Kg in April 1993. Lead levels were from < 0.5 mg/Kg in October 1993 to 3.6 mg/Kg in August 1995. Mercury was typically below detectable limits. It was found twice above detectable limits in April 1993 at 0.44 mg/Kg and in August 1996 at 0.79 mg/Kg. Nickel was usually below detectable limits, with the highest average concentration of 5.3 mg/Kg (April 1993).







Discussion and follow-up study

As stated in previous reports, there were no apparent differences in tissue concentrations in fish from upstream and downstream sites. Jamestown's data show mercury was present in high concentrations (between 0.5 and 1.0 mg/Kg) in several fish both at the control site and below the diffuser. One whole body sample of a striper exceeded 3.0 mg/Kg, and one whole body gar sample was near 1 mg/kg. Although all but one sample of sport fish were less than 1.0 mg/Kg, several were greater than 0.5 mg/Kg. However, there was no pattern to the location of fish with elevated mercury concentrations – they occurred both up- and downstream of the diffuser. Relatively high levels of mercury in fish also were detected in previous sampling by both the division and Jamestown in areas throughout the lake (Kentucky Division of Water, 1996, 1995, 1994a, 1992a) but the analyses of the treated wastewater indicates that the RCRWWTP discharge is not the source of the mercury. In December 1996, the division conducted a survey throughout the lake of sport and rough fish to better understand the distribution of mercury in fish tissue. The results of that survey were presented previously (Division of Water, 1999). Mercury concentrations in the tissue of the four species analyzed were randomly scattered. No trends were evident by species or location.

Previously, the division compared fish tissue concentrations to Food and Drug Administration action levels (1.0 mg/Kg for mercury) in order to issue fish consumption advisories. Fish tissue data presented in this report, as well as data from other areas of the state, were evaluated using a new risk-based, tiered approach. In April 2000, the Department for Public Health, the Department for Environmental Protection, and the Department of Fish and Wildlife Resources issued a statewide fish consumption advisory for women of child bearing age and children under six years of age to not consume more than one meal per week of fish.

Sediment

Data from sediment sampling by Jamestown at three sites from 1993 to 2000 are presented in Table 6. Sediment copper levels fluctuated over the entire study period at all sites. There is no

evidence of sustained elevated copper or other metal levels in the sediments near the diffuser (Site 2) or 400 feet downstream of the diffuser (Site 3) compared to the upstream control site (Site 1). Except for the final sample set in September 1997, there was a general increase in sediment copper concentrations from 1993 to 1996 from about 20 ppm to slightly more than 30 ppm. However, this was true for all sites and cannot be attributed to the discharge. The mean concentration of copper in Kentucky aquatic sediments is 34 ppm (Kentucky Division of Water, 2001). The mean concentration in 63 Illinois lakes was 41 ppm (Kelly et al., 1981). The authors also state that that concentration is comparable to means for other lakes, including Lake Erie. There was a dramatic reduction in arsenic, copper, nickel and lead concentrations in September 1997 that cannot be fully explained at this time. One possible explanation is that two floods occurred in December 1996 and March 1997 that may have flushed existing and deposited new sediments. This apparent decline appears to be continuing.

1401						chie Hinary Se.				unu, 17	2000
3/3/93	Arsenic ma/Ka	Copper ma/Ka	Nickel	Lead	Mercury ma/Ka	3/30/93	Arsenic ma/Ka	Copper ma/Ka	Nickel ma/Ka	Lead	Mercury ma/Ka
	iiig/itg	iiig/itg	iiig/itg	iiig/itg	iiig/itg		iiig/itg	iiig/itg	iiig/itg	iiig/itg	iiig/itg
Site 1 Rep 1	11.80	18.6	42.9	15.0	0.12	Site 1 Rep 1	2.59	25.0	51.8	23.7	<0.05
Site 1 Rep 2	7.67	19.5	45.6	16.1	0.09	Site 1 Rep 2	3.82	25.2	66.0	24.2	0.05
Site 1 Rep 3	11.80	18.0	48.9	14.6	0.12	Site 1 Rep 3	3.74	36.7	73.9	27.2	<0.05
Site 2 Rep 1	10.10	19.7	46.7	7.83	0.12	Site 2 Rep 1	3.21	26.9	71.5	24.9	<0.05
Site 2 Rep 2	10.00	21.7	52.9	17.8	0.14	Site 2 Rep 2	14.30	23.6	46.7	23.6	0.05
Site 2 Rep 3	3.69	22.8	53.1	20.6	0.13	Site 2 Rep 3	13.20	24.9	58.6	24.9	<0.05
Site 3	4.78	8.9	19.7	7.9	0.03	Site 3 Rep 1	3.34	22.0	63.5	22.4	<0.05
						Site 3 Rep 2	15.60	23.7	61.9	26.4	0.06
						Site 3 Rep 3	3.97	19.6	<1.25	20.3	0.05
5/11/93	Arsenic	Copper	Nickel	Lead	Mercury	8/8/93	Arsenic	Copper	Nickel	Lead	Mercury
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Rep 1	3.71	21.2	42.6	19.3	0.05	Site 1 Rep 1	0.88	21.7	46.3	28.2	0.09
Site 1 Rep 2	<1.25	24.5	47.2	20.8	0.07	Site 1 Rep 2	1.64	33.3	56.6	28.2	0.11
Site 1 Rep 3	3.22	19.5	38.5	17.9	0.03	Site 1 Rep 3	0.78	32.9	52.0	26.5	0.07
Site 2 Rep 1	7.61	23.1	57.6	20.8	0.07	Site 2 Rep 1	1.25	34.3	59.3	26.9	0.07
Site 2 Rep 2	10.90	21.7	54.0	19.5	0.05	Site 2 Rep 2	1.05	25.9	57.9	22.8	0.09
Site 2 Rep 3	3.29	14.5	51.8	12.8	0.04	Site 2 Rep 3	1.11	35.6	57.8	14.2	0.11
Site 3 Rep 1	4.92	19.1	40.1	17.0	0.05	Site 3 Rep 1	2.05	35.0	59.7	28.6	0.13
Site 3 Rep 2	5.22	19.3	40.6	20.8	0.06	Site 3 Rep 2	0.88	34.3	60.2	27.1	0.11
Site 3 Rep 3	5.21	22.1	44.7	22.2	0.05	Site 3 Rep 3	1.47	33.0	54.0	24.6	0.15
3/16/94	Arsenic	Copper	Nickel	Lead	Mercury	5/17/94	Arsenic	Copper	Nickel	Lead	Mercury
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Rep 1	3.52	36.1	59.0	24.5	0.03	Site 1 Rep 1	16.40	26.8	53.8	28.1	0.12
Site 1 Rep 2	2.06	25.0	60.0	21.0	0.04	Site 1 Rep 2	15.70	25.4	49.6	26.6	0.10
Site 1 Rep 3	<1.25	25.5	60.0	23.1	0.07	Site 1 Rep 3	11.20	23.1	41.3	16.6	0.11

Table 6. Results from Jamestown Sediment Analyses from Lake Cumberland, 1993-2000.

Site 2 Rep 1	<1.25	23.5	58.5	15.9	0.08	Site 2 Rep 1	11.90	37.3	60.5	53.4	0.11
Site 2 Rep 2	<1.25	24.3	49.0	23.1	0.07	Site 2 Rep 2	14.70	28.5	61.3	19.9	0.10
Site 2 Rep 3	<1.25	27.5	58.4	22.2	0.10	Site 2 Rep 3	17.10	32.8	65.7	24.0	0.13
Site 3 Rep 1	0.22	31.0	48.5	28.4	0.08	Site 3 Rep 1	15.30	26.5	46.7	19.7	0.14
Site 3 Rep 2	<1.25	27.3	48.7	21.9	0.12	Site 3 Rep 2	16.00	27.8	54.9	20.8	0.15
Site 3 Rep 3	<1.25	23.0	48.5	16.8	0.08	Site 3 Rep 3	88.90	29.8	63.2	26.5	0.17
9/16/94	Arsenic	Copper	Nickel	Lead	Mercurv	5/10/95	Arsenic	Copper	Nickel	Lead	Mercurv
0,10,01	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	0,10,00	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Rep 1	0.37	25.1	43.3	23.3	<0.029	Site 1 Rep 1	14.17	34.84	66.96	21.52	<0.608
Site 1 Rep 2	2.02	22.9	49.9	20.3	<0.029	Site 1 Rep 2	14.00	34.11	64.35	22.49	<0.330
Site 1 Rep 3	3.33	22.7	10.8	19.9	<0.029	Site 1 Rep 3	10.97	32.27	75.34	24.20	<0.485
Site 2 Rep 1	2.22	20.5	43.1	17.6	<0.029	Site 2 Rep 1	24.33	34.20	74.69	18.88	<0.485
Site 2 Rep 2	7.45	21.7	52.1	17.7	<0.029	Site 2 Rep 2	8.17	30.23	63.72	21.10	<0.584
Site 2 Rep 3	1.75	20.5	41.8	16.6	<0.029	Site 2 Rep 3	10.91	32.39	60.48	18.51	<0.462
Site 3 Rep 1	2.13	21.9	40.4	21.0	<0.029	Site 3 Rep 1	12.82	34.88	65.43	19.82	<0.690
Site 3 Rep 2	6.56	26.5	41.5	22.0	<0.029	Site 3 Rep 2	13.33	35.26	57.52	25.81	<0.614
Site 3 Rep 3	2.64	20.7	40.8	17.3	<0.029	Site 3 Rep 3	11.73	35.01	57.03	23.46	<0.526
8/30/95	Arsenic	Copper	Nickel	Lead	Mercurv	5/13/96	Arsenic	Copper	Nickel	Lead	Mercurv
0,00,00	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	0/10/00	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Rep 1	15.89	33.21	55.63	22.12	<0.733	Site 1 Rep 1	29.56	36.50	56.89	21.07	<0.51
Site 1 Rep 2	14.72	33.25	60.63	22.80	<0.652	Site 1 Rep 2	24.20	35.54	50.96	27.17	<0.30
Site 1 Rep 3	14.94	33.52	61.02	20.22	<0.699	Site 1 Rep 3	22.40	36.23	51.69	21.93	<0.64
Site 2 Rep 1	18.10	32.47	61.19	18.89	<0.892	Site 2 Rep 1	23.67	36.16	59.17	19.07	<0.66
Site 2 Rep 2	16.63	31.74	58.12	17.59	<0.815	Site 2 Rep 2	19.18	34.65	48.72	27.22	<0.43
Site 2 Rep 3	15.78	31.90	59.38	18.83	<0.673	Site 2 Rep 3	26.35	37.75	55.97	15.10	<1.03
Site 3 Rep 1	16.37	32.92	61.00	21.76	<0.655	Site 3 Rep 1	23.15	36.68	51.95	18.23	<0.81
Site 3 Rep 2	15.71	31.74	57.26	19.31	<0.620	Site 3 Rep 2	19.91	35.65	45.81	26.00	<0.30
Site 3 Rep 3	21.29	31.64	60.06	23.12	<0.736	Site 3 Rep 3	23.55	35.83	43.88	20.05	<0.41
8/12/96	Arsenic	Copper	Nickel	Lead	Mercury	9/9/97	Arsenic	Copper	Nickel	Lead	Mercury
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Rep 1	18.81	31.80	62.45	22.74	<0.63	Site 1 Rep 1	4.70	12.80	24.10	10.60	0.063
Site 1 Rep 2	26.16	32.42	66.21	24.11	<0.59	Site 1 Rep 2	4.85	15.00	29.10	12.50	0.086
Site 1 Rep 3	19.98	34.18	62.31	29.97	<0.69	Site 1 Rep 3	7.78	14.48	10.80	12.60	0.081
Site 2 Rep 1	22.83	33.27	62.72	32.36	<0.62	Site 2 Rep 1	4.93	14.00	30.70	12.10	0.076
Site 2 Rep 2	23.35	31.64	61.46	29.09	<0.62	Site 2 Rep 2	5.30	16.50	31.50	12.30	0.064
Site 2 Rep 3	25.99	32.50	66.12	30.26	<0.67	Site 2 Rep 3	6.74	12.70	21.10	9.70	0.093
Site 3 Rep 1	20.88	32.71	54.71	23.94	<0.66	Site 3 Rep 1	8.02	12.20	21.60	9.74	0.061
Site 3 Rep 2	23.27	32.31	52.50	30.23	<0.56	Site 3 Rep 2	7.90	18.10	30.50	16.80	0.087
Site 3 Rep 3	20.16	30.99	52.96	28.01	<0.48	Site 3 Rep 3	5.21	15.20	23.70	14.80	0.060
9/14/98	Arsenic	Copper	Nickel	Lead	Mercury	9/14/99	Arsenic	Copper	Nickel	Lead	Mercury
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	Oite 4 Dars 4	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Site 1 Kep 1	9.83	0.21	12.50	5.95	0.021		2.18	ö.4/	15.30	9.28	0.022
Site 1 Rep 2	9.32	5.38	11.60	5.16	0.022	Site 1 Rep 2	2.59	9.24	17.40	8.92	0.021
Site 1 Rep 3	10.30	5.35	10.90	5.45	0.018	Site 1 Rep 3	2.34	8.73	16.80	8.28	0.022
Site 2 Rep 1	12.30	10.30	17.20	8.79	0.024	Site 2 Rep 1	1.40	/.51	14.30	7.82	0.014
Site 2 Rep 2	9.61	12.60	22.30	8.96	0.035	Site 2 Rep 2	1.40	10.70	16.40	10.70	0.014

Site 2 Rep 3	10.80	10.90	16.30	7.81	0.031	Site 2 Rep 3	1.81	7.37	14.10	7.07	0.011
Site 3 Rep 1	9.78	2.91	6.31	1.89	0.028	Site 3 Rep 1	1.89	7.66	14.60	7.56	0.012
Site 3 Rep 2	12.80	6.64	15.40	6.13	0.029	Site 3 Rep 2	1.39	9.04	15.80	9.29	0.016
Site 3 Rep 3	10.10	10.80	21.00	6.51	0.026	Site 3 Rep 3	1.81	8.55	16.10	8.20	0.016
9/27/00	Arsenic	Copper	Nickel	Lead	Mercury						
	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg						
Site 1 Rep 1	3.72	6.97	14.50	7.70	0.032						
Site 1 Rep 2	4.76	7.07	14.60	7.68	0.030						
Site 1 Rep 3	4.06	8.92	14.50	8.77	0.029						
Site 2 Rep 1	3.95	8.96	16.30	9.17	0.028						
Site 2 Rep 2	3.53	7.22	16.00	7.83	0.027						
Site 2 Rep 3	4.33	8.96	15.90	9.17	0.028						
Site 3 Rep 1	3.77	7.30	15.60	8.12	0.029						
Site 3 Rep 2	3.10	6.45	14.70	6.85	0.025						
Site 3 Rep 3	3.09	7.62	15.40	8.79	0.030						

CONCLUSIONS

This is the fifth report on environmental monitoring and operations at the Russell County Regional Wastewater Treatment Plant (RCRWWTP) following an expansion and upgrade of treatment facilities and relocation of the discharge to Lake Cumberland in April 1993. Most regulatory requirements were met during the reporting period (January 1998 - December 2000). The most significant problem during this period was the deterioration of a portion of the dedicated polyurethane pipe from Union Underwear to the RCRWWTP, which resulted in a release of wastewater to Lily Creek in August 1999. An Agreed Order was signed and the affected portion of the line was replaced. Discharge monitoring data submitted by Jamestown and inspections conducted by the division indicated that the facility operated satisfactorily. Permit limits for chloride, copper, and whole effluent toxicity were met in all samples. However, chloride loading from Union Underwear to the RCRWWTP was higher in this reporting period than in past years and exceeded pretreatment limits for several months in the latter half of 1999.

In Lake Cumberland, chronic criteria for chloride and copper were met within a very short distance of the pipe. Sampling conducted by Jamestown and the division showed chloride concentrations in the lake less than 40 mg/l at the edge of the mixing zone (70 feet from the ports) and also at transects further down-lake from the diffuser. As has been found in previous environmental monitoring, the highest concentrations of chloride in water were found in a thin layer (usually less than one meter thick) during thermally stratified lake conditions. Copper concentrations were well below water quality criteria and less than in previous years.

This and other studies have found mercury levels in fish to be relatively high in several areas of the lake, but the RCRWWTP is not the source of the mercury. Atmospheric deposition is widely believed to be the source of mercury in aquatic environments. Sediment sampling again did not indicate problems stemming from the lake discharge.

REFERENCES

- Kelly, M., R. Hite, and K. Rogers 1981. Analysis of surficial sediment from 63 Illinois lakes. Lake Reservoir Management 248-253. Illinois Environmental Protection Agency.
- Kentucky Division of Water 2001. Summary of Bulk Sediment data from Kentucky streams and rivers from 1980-1994.
- _____1999. Fourth Report on Operations of Russell County Regional Treatment Plant and Associated Environmental Monitoring.
- _____1996. Third Annual Report on Operations of Russell County Regional Treatment Plant and Associated Environmental Monitoring.
- _____1995(a). Second Annual Report on Operations of Russell County Regional Wastewater Treatment Plant and Associated Environmental Monitoring.
- _____1995(b). Unpublished profile data provided to Kentucky Division of Water, July 27, 1995.
- _____1994(a). Annual Report on Operations of Russell County Wastewater Treatment Plant and Associated Environmental Monitoring.
- _____1994(b). 1994 Kentucky Report to Congress on Water Quality.
- _____1992(a). Lake Cumberland/Lily Creek Sediment and Fish Tissue Investigation. Technical Report No. 49.
- _____1992(b). 1992 Kentucky Report to Congress on Water Quality.
- _____1990. 1990 Kentucky Report to Congress on Water Quality.
- ____1988. 1988 Kentucky Report to Congress on Water Quality.
- _____1986. Kentucky Report to Congress on Water Quality.
- Kyle, Amy D. 1998. Contaminated Catch. National Resource Defense Council.
- Town of Jamestown. 1996. Personal communication, October 1996.
- U.S. Army Corps of Engineers. 1996. Personal communication, October 1996.

APPENDIX A DIVISION OF WATER COMPLIANCE SAMPLING INSPECTIONS AND BIOMONITORING RESULTS

JAMES E. BICKFORD Structure



COMMONWEALTH OF KENTLICKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGISTAL OFFICE 102 BORD STALL ST COLUMBIA KY 47278-1408 December 28, 2000

Honorable June McGaba Mayor, City of Jamestöwn P. O. Box 587 Jamestöwn, Kentucky 42629

> RE: Russell County Regional WWTP KPDES No. KY0062995 Russell County Inspection Date: 11/16/00

Dear Mayor McGaha-

Please find enclosed your copy of a Compliance Evaluation Inspection conducted by Crystal Davis on the above date, of the Kentucky Division of Water At the time of this inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely.

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

Enclosure

Frankfort Central Office files
Columbia Regional Office files





PAUL E PATTON

COMMONWEALTH OF RENTLICES NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLOMBIA REGIONAL CITALS 102 BUNIESVILLE 51 COLUMBA, KY 42726-1405 October 9, 2000

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional WWTP KPDES No. KY0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of a Compliance Evaluation Inspection conducted by Crystal Davis on September 22, 2000, of the Kentucky Division of Water. At the time of this inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely,

Jold Sproles

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

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PAUL E PATTON GOVENNON

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 BURGESMILLE ST COLUMBIA, KY 42728-1409 August 16, 2000

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional WWTP KPDES No. KY0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of a Compliance Evaluation Inspection conducted by Crystal Davis on August 10, 2000, of the Kentucky Division of Water. At the time of this inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely,

Sara Gold Spholes Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

Enclosure

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Columbia Regional Office files, Crystal Davis



GOVENING

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 BURKESVILLE ST COLUMPIA NY 2000 1400

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

RE: Russell County Regional Wastewater Treatment Plant K Y0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of the Compliance Sampling Inspection Report (including appropriate laboratory reports) conducted by James Woody of the Kentucky Division of Water on May 10, 1999. The analytical data from this inspection indicates compliance with your facility's Kentucky Pollution Discharge Elimination System permit

Should you have any questions regarding this report, please feel free to contact this office.

Sincerely, old Joro

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

Enclosure

 Frankfort Central Office files Columbra Regional Office files



Governor

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 BURKESVILLE 51 COLUMBIA KY 42725-1408 March 1, 2000

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional WWTP KPDES No. KY0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of a Compliance Evaluation Inspection Report conducted by James Woody on February 9, 2000, of the Kentucky Division of Water. At the time of the inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely, proles

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

Enclosures

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PAUL E PATTON

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 BUNKESWILLE ST COLUMBA IN 42729-1408 January 13, 2000

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional Wastewater Treatment Plant KPDES No. KY0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of a Compliance Evaluation Inspection Report conducted by James Woody of the Kentucky Division of Water, on December 27, 1999 At the time of the inspection your facility received a rating of Satisfactory.

Should you have any questions feel free to contact this office.

Sincerely,

ld Scroles

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

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COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBLE PROTECTION 102 BUILDING 103 BUIL

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

RE: Russell County Regional Wastewater Treatment Plant KPDES No. KY0062995 Russell County

Dear Mayor McGaha:

Please find enclosed your copy of a Compliance Evaluation Inspection Report conducted by James Woody of the Kentucky Division of Water, on October 1, 1999. At the time of the inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely,

low Sara Gold Spoles

Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

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PAUL E. PATTON

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 BURKESVILLE ST COLUMBER 4,4239 1400

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

RE: Russell County Regional Wastewater Treatment Plant KY0062995 Russell County

Dear Mayor McGaha-

Please find enclosed your copy of the Compliance Sampling Inspection Report (including appropriate laboratory reports) conducted by James Woody of the Kennicky Division of Water on May 5, 1999. The analytical data from this inspection indicates compliance with your facility's Kentucky Pollution Discharge Elimination System permit.

A copy of the Compliance Evaluation Inspection conducted on July 8, 1999 by Mr. Woody is also enclosed. At the time of both of these inspections your facility received ratings of Satisfactory.

Should you have any questions regarding either of these reports, please feel free to contact this office.

Sincerely, proles

Safa Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb Enclosure

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Columbia Regional Office files



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COMMONWEALTH OF KENTLICKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COLUMBIA REGIONAL OFFICE 102 Europevali St COLUMBIA KY A272B-1408

January 20, 1999

Honorable Donnie Wilkerson Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional Wastewater Treatment Plant KPDES NO. KY0095257 Russell County

Dear Mayor Wilkerson:

Please find enclosed your copy of a Compliance Evaluation Inspection Report conducted by James Woody of the Kentucky Division of Water, on January 5, 1999. At the time of the inspection your facility received a rating of Satisfactory.

Should you have any questions feel free to contact this office.

Sincerely,

fold Sproles ana Sara Gold Spioles

Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

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PAUL E PATION

COMMONWEALTH OF KENTUCLY

DEPARTMENT FOR ENVIRONMENTAL PROTECTION CABINET COLUMBA PROJONAL DIFFE

102 HUMBESVELLE ST COLUMINA KY 47726

June 11, 1998

Honorable Donnie Wilkerson Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

> RE: Russell County Regional STP KV0062995 Russell County

Dear Mayor Wilkerson:

Please find enclosed your copy of the Compliance Sampling Inspection Report (including appropriate laboratory reports) conducted by James Woody of the Kentucky Division of Water on March 24, 1998. At the time of inspection your facility received a rating of <u>Satisfactory</u>. The analytical data from this inspection indicates compliance with your facility's KPDES permit.

Should you have any questions regarding this report, please feel free to contact this office.

Sprag Sprales

Sara Gold Sproles Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SGS/bjb

Enclosure

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S E. BICKFORD SECRETARY



PAUL E. PATTON GOVERNUE

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION COUMBIA REGIONAL OFFICE 102 BURKESVILLE ST COLUMBIA KY 42726 January 27, 1998

Honorable Donnie Wilkerson Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629553

> RE: Russell County Regional WWTP KPDES No. KY0062995 Russell County

Dear Mayor Wilkerson:

Please find enclosed your copy of the Compliance Evaluation Inspection conducted by James Woody of the Kentucky Division of Water, on January 9, 1998. At the time of inspection your facility received a rating of <u>Satisfactory</u>.

Should you have any questions feel free to contact this office.

Sincerely.

Sara Gold, Environmental Control Supervisor Division of Water Phone: (502) 384-4734

SEG/bjb

Enclosure

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PAUL E. PARTON

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION FRANKFORT OFFICE PARK 14 RELLY RD FRANKFORT KY 40601

April 19, 2000

Mr. Ottis Skaggs, Superintendent Jamestown Wastewater Treatment Plant P.O. Box 587 878 Fox Road Jamestown, KY 42629

RE: Toxicity Test Results for Jamestown WWTP (KY0062995).

Dear Mr. Skaggs;

On March 8, 2000, the Division of Water initiated acute toxicity tests on effluent from the Jamestown WWTP (KY0062995) using the fathead minnow (<u>Pimephales promelas</u>) and the daphnid (<u>Ceriodaphnia dubia</u>). Samples were grabs collected on March 7, at 19:00 and March 8, at 07:15, 2000. Results showed no toxicity to the minnow (LC50>100%; TUa<1.00) or the daphnid (LC50=57.33%; TUa=1.74) above the permit limit of 4.8 TUa.

Because neither test species failed, no further action is required by the Jamestown WWTP. Please continue with your next regularly scheduled test.

If you have any questions please contact me at 502-564-3410.

Sincerely,

Charles A. Roth, Supervisor

Division of Water

C)

Sandy Gruzesky, Municipal Section Columbia Regional Office DOW Files



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PAUL E PATTON -

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION FRANKFORT OFFICE PARK 14 BUILLY RD

FRAMEFORT KY 40501

November 27, 2000

Mr. Terry Lawless Director of Public Works City of Jamestown P.O. Box 597 Jamestown, Kentucky 42629

Re-

Pretreatment Compliance Inspection Russell County Regional WWTP KPDES Permit No.: EY0062995 Russell County, Kentucky

Dear Mr. Lawless:

This is to inform you of the findings of the Pretreatment Compliance Inspection (PCI) conducted in Jamestown on November 17, 2000. The purpose of the PCI was to determine whether the Russell County Regional (RCR) Pretreatment Program is being thoroughly implemented, is meeting all state and federal pretreatment requirements, and to provide for an exchange of information between the city and the Division of Water.

This report provides findings on program implementation and industrial user (IO) compliance. The wastewater treatment plant's effluent quality relies heavily upon the pretreatment program for accurate local limits and IU compliance. In turn, IU compliance relies on correctly written permits, thorough monitoring, and effective enforcement.

Findings and Conclusions

This PCI indicated that the RCR Pretreatment Program is being implemented efficiently. All significant industrial users (SIUs) are operating under, and are in compliance with, adequate discharge permits. The city has conducted compliance monitoring and inspections of all SIUs and effective enforcement action has been taken when necessary.

A new industry. Bruss, is proposing to locate in Russell County Industrial Park. The industry will be involved with auto parts (phosphate coating, rubber molding), and appears at this point to be categorical. Local limits will need to be re-evaluated and should be coordinated with the upcoming permit KPDES permit application and re-issuance in 2001



Build an Recycled Paper An Equal Opportunity Employer M/F/D 61 Mr. Terry Lawless Russell County Begional WWTP/XV0062995 Page 7W0

Communication with Fruit of the Loom appears to have improved since the last PCI. Nowever, the problem now appears to be obtaining representative and accurate flow measurements for the discharge from the industrial user. This has become particularly critical since the last permit revision incorporated loading limitations for the industrial user. It's imperative that an effective means of flow measurement, acceptable to both parties, be implemented as soon as possible.

Your cooperation and patience during this inspection is appreciated. Should you have any questions regarding this matter, please contact me at (502) 564-2225, extension 431.

Sincerely Tot

Herb Bay, P.E. Environmental Engineer Municipal Soction KPDES Branch Division of Water

HRIDE

Cynthia Leasor, Hall & Associates Columbia Regional Office Division of Water Files JAMES E. BICKFORD SECRETARY



PAUL E PATTON

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION FRANKFORT OFFICE PARK 14 RELLY BD

FRANKFORT KY 40501

January 5, 3000

Terry Lawless, Director Public Works City of Jamestown P.O. Box 587 Jamestown, Kentucky 42629

> Re: Pretreatment Compliance Inspection Russell County Regional WWTF

RPDES No.: RY0062995 Russell County, Kentucky

Dear Mr. Lawless:

This is to inform you of the findings of the pretreatment compliance inspection conducted in Jamestown on December 8, 1999. The purpose of the inspection was to determine whether the Russell County Regional (RCR) Pretreatment Program is being thoroughly implemented, is meeting all state and federal pretreatment requirements, and to provide for an exchange of information between the city and the Division of Water.

This report provides findings on program implementation and industrial user (IO) compliance. The wastewater treatment plant's effluent quality relies heavily upon the pretreatment program for accurate local limits and IU compliance. In turn, IU compliance relies on correctly written permits, thorough monitoring, and effective enforcement.

Findings and Conclusions

This inspection indicated that the BCR Pretreatment Program is being implemented efficiently. All significant industrial users (SIUs) are operating under, and are in compliance with, adequate discharge permits. The city has conducted compliance monitoring and inspections of all SIUs and effective enforcement action has been taken when necessary.

As part of this visit, Fruit of the Loom, Inc. was inspected and the file reviewed. There is recent concern with elevated chloride values for both the influent and effluent of the POTW facility. It is important that the control authority be kept informed and aware of any process changes at the industry causing abnormal fluctuations of pollutant discharge. The control authority and industry need to have effective communication to ensure efficient operation of the treatment facility. It is suggested that the control authority meet with the industrial user (10) to discuss options to address the situation, including revision of the IU permit, if necessary.



Mr. Terry Lawless Russell County Regional WWTP/KY0062995 Page Two

A new categorical industry. Stephens Pipe and Steel, is scheduled to begin operation in the near future. Please keep us informed of any new developments.

Thank you for your cooperation and patience during this inspection and should you have any questions regarding this matter, please contact me at (502) 564-2225, extension 431.

Sincerely.

car

Herb Ray Environmental Engineer Municipal Section RPDES Branch Division of Water

HR:pg

C: Cynthia Leasor, Hall & Associates Columbia Regional Office Division of Water Files



PAUL E PATTON GOVENNES

COMMONWEALTH OF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION FRANKFORT OFFICE PAIR 14 REALY RD FRANKFORT RY 40601

November 10, 1998

Terry Lawless, Supervisor Public Works City of Jamestown P.O. Box 99 Jamestown, Kentucky 42629

> Re: Pretreatment Audit City of Jamestown KPDES No.: KY0062995 Russell County

Dear Mr. Lawless:

This is to inform you of the findings of the pretreatment audit conducted in Jamestown on October 28, 1998. The purpose of the audit was to determine whether the Jamestown Pretreatment Program is being thoroughly implemented, is meeting all state and federal pretreatment requirements and to provide for an exchange of information between the city and the Division of Water.

This report provides findings on program implementation and significant industrial user (SIU) compliance. The wastewater treatment plant's effluent quality relies heavily upon the pretreatment program for accurate local limits and IU compliance. In turn, IU compliance relies on correctly written permits, thorough monitoring and effective enforcement.

Findings and Conclusions

This PCI indicated that the Jamestown Pretreatment Program is being implemented efficiently. All significant industrial users (SIDs) are operating under, and are in compliance with, adequate discharge permits. The city has conducted compliance monitoring and inspections of all SIDs and effective enforcement action has been taken when necessary.

Files reviewed during the audit consisted of Union Underwear Inc., and Garment Finishers. An industrial inspection of both facilities was conducted during the audit.



Mr. Terry Lawless Page Two

Thank you for your cooperation and patience during this audit and should you have any questions regarding this matter, please contact me at (502) 564-2225, extension 477.

Sincerely,

Daymond Talley () Environmental Engineer Asst. Sr. Municipal Section KPDES Branch Division of Water

DT:jk

c: Ernest Hall, Hall & Associates, Inc. Columbia Regional Office Division of Water Files

APPENDIX B AUGUST 2000 NOTICE OF VIOLATION AND AGREED ORDER

COMMONWEALTH OF RENTUCKY NATURAL RESC. CES AND ENVIRONMENTAL PROT. TION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION DIVISION OF WATER FRANKFORT, KENTUCKY 40601

NOTICE OF VIOLATION

TO: <u>Honorable June McGaha</u> Responsible Party Mayor, City of Jamestown I.D.#(IF APPLICABLE): KY0062995

P. O. Box 587 COUNTY: Russell

Jamestown, Kentucky 42629 DATE OF VIOLATION: observed 8/1/00, City, State, Zip ongoing

This is to advise you that, as specified below, you are in violation of the provisions of () KRS 146, () KRS 151, () KRS 223, (X) KRS 224

Regulation: 401 KAR 5:031, 5:065 Section:

A description of the violation(s) follows: Degradation of the Waters of

The Commonwealth. Discharging pollutants which would not meet Kentucky

Pollution Discharge Elimination System permit limits.

Remedial measures required include, but are not limited to: Immediately

cease all unpermitted discharges. Attend regional office conference on

August 28, 2000 at 1:00 pm, central time.

Remedial measures must be completed by: Immediately, August 28, 2000

Violations of the above cited statutes and regulations are subject to penalties of up to \$25,000 per day. Compliance with remedial measure deadlines does not provide exemption from liability for violations during the period of remediation. Any person who knowingly violates the aforementioned statutes may be subject to criminal prosecution. To discuss this Notice of Violation, please contact the undersigned at: (502) 384-4734

Issued	By:	au	a Serol	les/	Date:
		1	0		Date:

Name of person to whom copy was delivered:

Date:____

How Delivered:

Address

X Certified Mail

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JAMES E BICKEGHU



PAUL E PATTON

COMMONALALITIOF KENTUCKY NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET DEPARTMENT FOR ENVIRONMENTAL PROTECTION CONTAMINA RECOMMENDAL OFFICE 102 BURKESMELL ST CONTAMINA RE 47228-1406 August 10, 2000

CERTIFIED NO 7099 3400 0004 5645 9636 RETURN RECEIPT REQUESTED

Honorable June McGaha Mayor, City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629

Dear Mayor McGaha: :

This letter serves as a follow-up to a release of wastewater from the dedicated line serving the Fruit of the Loom facility to the Russell County Regional Wastewater Treatment Plant. This release occurred on August 1, 2000. Following this release and facility inspections, there remains several areas of concern regarding your operation.

Due to the significance of the violations noted the enclosed Notice of Violation is being issued and a Regional Office Conference is being scheduled for Monday, August 28, 2000 at 1:00 PM, Central Time at the Columbia Regional Office. A map showing our location is enclosed for your benefit. Failure of you and/or your representative to attend this meeting could result in your facility being referred for further enforcement action. Such action can include an administrative penalty in the amount of \$25,000.00 per day per violation being assessed.

Should you have any questions feel free to contact me at my office.

Sincerely, moles

Safa Gold Sproles Environmental Control Supervisor Division of Water Phone: 270-384-4734

SGS/bjb Enclosures

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Terry Lawless, City of Jamestown Frankfort Central Office files Columbia Regional Office files, Crustal Davis



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LETTER OF AGREEMENT AND COMPLIANCE SCHEDULE

City of Jamestown P. O. Box 587 Jamestown, Kentucky 42629 August 31, 2000

During an investigation of a release of wastewater from the dedicated line serving the Fruit of the Loom facility in Russell County on August 1, 2000, the City of Jamestown was found to be in violation of Kentucky Water Quality Regulations. In response to this investigation a regional office conference was held at the Columbia Regional Office on August 31, 2000. The purpose of this conference was to discuss with representatives from the City of Jamestown the corrective actions needed to bring this site back into compliance with the applicable regulations. As a result of the conference, this Letter of Agreement and Compliance Schedule was prepared.

Representatives of the City of Jamestown understand by their signatures on this document that they agree to perform each of the remedial measures listed below by the date specified at the end of each measure. It is further understood that failure to comply with this schedule could result in an immediate referral to our Enforcement Branch which could result in fines and penalties.

The remedial actions to be taken and the dates for completion are as follows:

- Immediately take the necessary actions to prevent any further discharge of process water from the Fruit of the Loom line. If necessary, the City of Jamestown shall internally inspect this sewer line in the affected portions of the sewer system to determine the locations requiring rehabilitation.
- The City of Jamestown shall develop plans for rehabilitation of the affected portion of the sewer system. A schedule shall be developed for completion of the rehabilitation or modifications. This schedule should be submitted to the Columbia Regional Office by September 29, 2000.
- The City of Jamestown shall complete the necessary rehabilitation or modifications in accordance with the approved schedule.
 - The City of Jametown shall notify the Columbia Regional Office at least twenty-four (24) hours prior to beginning rehabilitation activities.
 - In the event of an accidental spill or discharge the Division of Water must be notified by the most rapid means at (502) 564-2380 or 1-800-928-2380. The Columbia Regional Office Division of Water should also be notified at (270) 384-4734.

LETTER OF AGREEMENT AND COMPLIANCE SCHEDULE. City of Jamestown August 31, 2000 Page Two

The owner or legal representative understands and agrees, as evidence of his signature on this document, that failure to complete the remedial actions herein prescribed will constitute violations of Kentucky Water Quality Regulations and KRS 224, and shall be subject to any administrative or legal actions deemed necessary by the Cabinet to remedy outstanding non-compliances issued by the Division of Water before or after execution/of this Letter of Agreement and Compliance Schedule.

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Owner or Legal Representative

nur thespector t Division of Water Representative, Title

Having reviewed this Letter of Agreement and Compliance Schedule, 1 recommend compliance with its terms be accepted by the Division of Water as settlement. of violations previously described

Signature: Title: Date:

8-31-00 Date

31-00

Date.