National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the **Crestline WWTP**

Public Notice No.:
Public Notice Date:
Comment Period Ends:

OEPA Permit No.: **2PC00006*FD**
Application No.: **OH0020664**

Name and Address of Applicant:

Mayor and Council
Village of Crestline
100 N. Seltzer Street
Crestline, Ohio 44827

Receiving Water: **Westerly Creek**

Name and Address of Facility Where Discharge Occurs:

Crestline Wastewater Treatment Plant
100 N. Seltzer Street
Crestline, Ohio 44827
Crawford County

Subsequent Stream Network: **Paramour Creek to Sandusky River to Lake Erie**

Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration

of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Water Resource Management Section
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

The application, fact sheet, public notice, permit including effluent limitations, special conditions, comments received and other documents are available for inspection and may be copied at a cost of 25 cents per page at the Ohio Environmental Protection Agency at the address shown above any time between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Copies of the Public Notice are available at no charge at the same address.

Location of Discharge/Receiving Water Use Classification

The Crestline Wastewater Treatment Plant (WWTP) discharges to the Westerly Creek at River Mile 0.5. The approximate location of the facility is shown in Figure 1.

This segment of the Crestline STP tributary to Paramour Creek has the following designated uses under the Ohio Water Quality Standards (OAC 3745-1-12): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR). This segment of Westerly Creek is described by Ohio EPA River Code: 05-055, USEPA River Reach #04100011-013. The Village of Crestline study area is shown in Figure 2.

Facility Description

The Village of Crestline WWTP was upgraded and expanded in 1994 to treat an average daily flow of 0.95 MGD and has a hydraulic capacity of 2.2 MGD. Previously the WWTP was designated to treat an average daily flow of 0.6 MGD. The WWTP was constructed in 1948, and parts of the original WWTP are now used for storm water retention. Wet stream processes at the facility include aerated grit removal, mechanical bar screen, communition, primary settling, counter-current aeration, final settling, post aeration, and u.v. disinfection. The Village of Crestline collection system is approximately 10% combined, and 90% separated. Sludge is digested aerobically and disposed of by land application under approved sludge management plan, number 03-216-PW.

The Village of Crestline does not have a pretreatment program, and has one Significant Industrial User (SIU). To minimize inflow and infiltration they are constructing storm sewers in the combined sewer area.

Combined Sewer Overflow

They have one combined sewer overflow (CSO). Crestline needs to operate and maintain their WWTP in accordance with the CSO Operation and Maintenance Plan which was approved on November 20, 1995 by the Ohio EPA. This will involve the implementation of the nine minimum control measures for the CSO. They will also be required to complete the following:

Separation Schedule for Sewers and Combines Sewer Overflow (CSO)

- Crestline needs to completely separate their sewers and eliminate their one CSO in 5 years. Also unsewered areas of the city need to be sewered due to bacteria and water quality violations.

- A plan for complete sewer separation and CSO elimination shall be submitted 6 months after the effective date of this permit.

- Detail plans will need to be submitted 18 months after the effective date of this permit.

- Construction needs to begin within 24 months after the effective date of this permit. This involves sewer separation, elimination of the CSO, and sewering unsewered areas of the city.

- Construction shall be finished 60 months after the effective date of this permit.

Description of Existing Discharge

Table 1 presents a summary of analytical results for outfall 001 effluent samples compiled from the NPDES application, annual pretreatment reports submitted by the Village of Crestline, and from bioassay tests done by Ohio EPA. The monthly average PEQ_{avg} and daily maximum PEQ_{max} decision criteria are also included on this table.

Table 2a presents a summary of unaltered monthly operation report data for the period January 1998 to December 2002 for the Village of Crestline as well as current permit limits, and monthly average PEQ_{avg} and daily maximum PEQ_{max} values.

Tables 2b and 2c present results from acute and chronic bioassay tests conducted in accordance with the NPDES permit. Pimephales promelas (fathead minnows), and Ceriodaphnia dubia (water flea) were the test organisms.

Receiving Water Quality / Environmental Hazard Assessment

For a biological assessment of the study area, please refer to the "Biological and Water Quality Study of the Sandusky River and Tributaries (2001)" and the Upper Sandusky Total Maximum Daily Load (TMDL) report (under development). Table 2d presents a summary of the aquatic life use attainment status for the Sandusky River basin based on data collected by the Ohio EPA from June to October, 2001. The information below for paragraphs a.) through c.) were taken from the "Biological and Water Quality Study of the Sandusky River and Tributaries (2001)".

a.) Impacts

Westerly Creek received excessive loadings from residential septic systems, urban runoff and the Crestline WWTP.

Previous Ohio EPA surveys of waters withing the study area date back to 1974. Initial monitoring relied heavily on water chemistry results and was directed at evaluating municipal WWTP and combined sewer overflow (CSO) impacts. The Sandusky River downstream from Bucyrus, Spring Run downstream from Carey and Paramour Creek downstream from Crestline were found to be severely impacted. While impacts were still evident at all three of these locations, the severity was much reduced in 2001, particularly in terms of bacteriological contamination.

b.) Recreational uses

Westerly Creek in the Village of Crestline was a concern because of a combined sewer overflow and a small part of the municipal area that is not connected to the sanitary sewer system.

c.) Westerly Creek

Westerly Creek was in non-attainment upstream and downstream from the Crestline WWTP.

About 1% of the service area is not connected to the collection system and these homes are served by on-lot units. This neighborhood is adjacent to the site sampled at Patterson St. (RM 2.41) and the impact was apparent. Water quality evaluated was impaired by enrichment/low dissolved oxygen and elevated bacteria counts. The pollution source is poorly treated sewage from failed on-lot septic systems. The extension of sanitary sewers to serve this area should be investigated. Downstream from the Crestline WWTP at Oldfield Rd. (RM 0.13), the discharge provided increased flow and suspended organic

material that benefited filter feeding caddisflies and midges. Subsequently the ICI marginally met WWH expectations at RM 0.1. The fish community declined compared to the upstream site and was predominated by pollution tolerant species resulting in a poor IBI score. Water quality evaluated at this location was impaired by enrichment and elevated bacteria counts.

Storm Water

Under the provisions of the NPDES Phase II Storm Water Program Final Rule, Publically Owned Treatment Works (POTWs) with a design flow greater than 1.0 mgd or required to have a pretreatment program that discharge storm water directly to state surface waters (not to the POTW) will be required to apply for an industrial storm water discharge permit by March 10, 2003. Originally, the Phase I Storm Water Program Final Rule would have required these POTWs to obtain a storm water discharge permit, but provisions within the Intermodal Surface Transportation and Efficiency Act (ISTEA) of 1991 temporarily exempted storm water discharges associated with industrial activity that are owned or operated by municipalities serving populations less than 100,000 people (except for airports, power plants, and uncontrolled sanitary landfills) from the need to apply for a storm water discharge permit. Congress extended the NPDES permitting moratorium for these facilities to allow small municipalities additional time to comply with NPDES requirements for certain sources of industrial storm water. The ISTEA exemption ends March 10, 2003.

In Part II of the draft permit this paragraph will be inserted "Within 12 months of the effective date of this permit, the permittee shall submit the storm water data required by 40 CFR 122.26(c)[Application Form 2F testing]. This includes data for oil&grease, pH, BOD_5, COD, Total Suspended Solids, Total Phosphorus, Total Kjehldahl Nitrogen and Nitrate-Nitrite Nitrogen collected under the storm runoff conditions specified in the above rule. The data shall be submitted to the appropriate district office."

Also NPDES Phase II Storm Water Program Final Rule has expanded the No Exposure Certification exemption to all categories of industrial activity, except construction. The exemption allows facilities that do not have process related materials exposed to storm water to opt out of obtaining a storm water NPDES permit. Ohio EPA has adopted the federal "No Exposure Certification" application form and is using the federal guidance documents to determine whether facilities are eligible for the no exposure exemption. A "No Exposure Certification" guidance and application form with instructions is available at:
http://cfpub.epa.gov/npdes/stormwater/exposure.cfm?program_id=6

If you have any questions about the No Exposure Certification, please contact any of the following:

Michael Joseph	(614) 752-0782	michael.joseph@epa.state.oh.us
John Morrison	(614) 644-2259	john.morrison@epa.state.oh.us
Jason Fyffe	(614) 728-1793	jason.fyffe@epa.state.oh.us
Anthony Robinson	(614) 728-3392	anthony.robinson@epa.state.oh.us
Mark Mann	(614) 644-2023	mark.mann@epa.state.oh.us

Wasteload Allocation Results / Developing Water Quality Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria,

and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the Crestline WWTP were used to determine what parameters should undergo wasteload allocation. The sources of effluent data are as follows:

Self-monitoring data (LEAPS) January 1998 - December 2002

The average and maximum projected effluent quality (PEQ) values are presented in Table 1. For a summary of the screening results, refer to the parameter groupings at the end of this section.

Wasteload Allocation

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
NH_3-N	Average	Seasonal 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow
Wildlife		Annual 90Q10

Allocations are developed using a percentage of stream design flow (as specified in Table 3), and allocations cannot exceed the Inside Mixing Zone Maximum criteria. The data used in the WLA are listed in Tables 2 and 3. The wasteload allocation results to maintain all applicable criteria are presented in Table 4.

Reasonable Potential

The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 1) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Table 5.

Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WLA (and the WQS) must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the Preliminary Effluent Limit (PEL) for the most restrictive average and maximum WLA were selected from Table 1. The PEL_{avg} was compared to the PEQ_{avg} value from Table 1, and the PEL_{max} was compared to the PEQ_{max} value. Based on the calculated percentage of the allocated value, the parameters are assigned to group 3, 4 or 5. The listing in Table 5 (Parameter Assessment Table) reflects the hazard assessment done according to WLA procedures. Table 6 (Final Effluent Limits Table) shows the draft NPDES limits for the Village of Crestline.

Limits proposed for oil and grease, pH, and fecal coliform are based on Water Quality Standards (OAC 3745-1).

Proposed limits for total suspended solids (TSS), 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (D.O.) are all based on plant design.

Phosphorus limits are proposed in accordance with the Great Lakes Water Quality Agreement of the International Joint Commission.

The proposed limit for total residual chlorine is based on wasteload allocation. But since they are using u.v. disinfection this limit is not needed in the Final Effluents Table (Table 6).

The Ohio EPA risk assessment (Table 5) places NH_3-N (summer), NH_3-N (winter), cadmium, and zinc in group 5. This placement as well as the data in Tables 2a, and 1 (MOR and Effluent Data Tables) indicate that the reasonable potential to exceed water quality standards exists and limits are necessary to protect water quality. The thirty day average limit for NH_3-N (winter) and zinc are based on antibacksliding/existing permit (ABS/EP). The daily maximum limit for NH_3-N (winter) and zinc is based on (ABS/EP). The thirty day average limits for NH_3-N (summer) and cadmium are based on wasteload allocation (WLA), as are the daily average limits for NH_3-N (summer) and cadmium

Ohio EPA risk assessment (Table 5) places copper, nickel, and lead in group 3. This placement as well as the data in Tables 2a, and 1 (MOR and Effluent Data Tables) support that these parameters should not pose an environmental hazard and limits are not necessary to protect water quality. Monitoring at a reduced frequency is proposed to document that these pollutants continue to remain at low levels.

Additional monitoring requirements proposed at the final effluent, influent, upstream/downstream and sludge stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

The draft permit includes a provision in Part II, regarding mercury monitoring. On June 22, 1999, EPA Method 1631 was promulgated as an approved method for mercury analysis under 40 CFR 136. The method detection level (MDL) for Method 1631 is 0.2 ng/l, compared to an MDL of 0.2 ug/l for EPA Methods 245.1 and 245.2, which used to be the most sensitive procedures. The quantification level for Method 1631 is 0.5 ng/l, while for the previous method the quantification level was 1,000 ng/l. The permit holder must use EPA Method 1631 to comply with the proposed mercury monitoring requirements.

The Ohio 305 (b) Report indicates that nutrients are one of the causes of impairment to Paramour Creek and the Sandusky River so the following nutrients will be monitored: Total Kjeldahl Nitrogen (TKN) and Nitrate+Nitrite-N (NO2+NO3-N).

The effluent limits in this section are appropriate for this discharge. In addition, any permit limits for the Crestline WWTP must be consistent with the Total Maximum Daily Load (TMDL) for the Sandusky River basin

Phosphorus per the TMDL

Four major wastewater treatment plants are located in the Upper Sandusky River watershed: Crestline, Bucyrus, Upper Sandusky, and Tiffin. The NPDES permits for each of these facilities currently include monthly and weekly concentration and loading limits for phosphorus based on the Great Lakes Water Quality Agreement of the International Joint Commission. It is proposed that these limits be continued in the renewal permits.

The data presented in Table A shows that each of these plants currently discharges a phosphorus load that is lower than the wasteload allocation assigned to it in the report, *Total Maximum Daily Loads for the Upper Sandusky River Watershed* (TMDL). To implement the TMDL wasteload allocation for phosphorus, it is proposed that the following special condition be included in Part II of the NPDES permits:

Upper Sandusky River Watershed TMDL Phosphorus Load Compliance

The permittee shall achieve the final effluent limits for total phosphorus in Part I. A. of this permit and an allowable total phosphorus load of 2.4 kg/day.

The allowable total phosphorus load may be expressed as:

2.4 kg/day total phosphorus = med Qeff x med Peff x F

where:
med Qeff = 5-year median daily effluent flow rate (MGD). This flow value shall be the median of the daily flows at station number 2PC00006001 for the previous 5 consecutive calendar years.
med Peff = median daily effluent total phosphorus concentration during January - December (mg/l).
F = conversion factor, 3.7854.

Table A. Phosphorus Discharges for Major POTWs

Facility TMDL Load	Crestline 2.4 kg/day		Bucyrus 6.4 kg/day		U. Sandusky 5.3 kg/day		Tiffin 15.1 kg/day	
Year	P_{eff}	Load	P_{eff}	Load	P_{eff}	Load	P_{eff}	Load
1998	0.89	2.4	0.62	5.1	0.41	1.9	0.50	5.6
1999	0.62	1.6	0.30	2.5	0.31	1.5	0.42	4.7
2000	0.59	1.5	0.74	6.1	0.31	1.5	0.40	4.5
2001	0.75	2.0	0.63	5.2	0.24	1.1	0.67	7.6
2002	0.59	1.5	0.52	4.3	0.45	2.1	0.49	5.5

Load (kg/day) = P_{eff} x Q_{eff} x F
P_{eff} = median daily effluent phosphorus concentration (mg/l)
Q_{eff} = 5 year median daily effluent flow rate, 1998 - 2002 (MGD)
F = conversion factor, 3.7854

Whole Effluent Toxicity

The acute and chronic information listed in Tables 2b. and 2c.were taken from data submitted by the Village of Crestline. Per Part I. C. of their 2PC00006*ED NPDES permit they are required to submit a Toxicity Reduction Evaluation (TRE) Annual Progress Report detailing what they have done in the past year to identify and eliminate the toxicity sources in their discharge. This annual report is to be submitted until they achieve compliance with the 1.0 Tu_a and 1.0 Tu_c WET limits. On July 31, 2000 Crestline submitted their annual TRE progress report for the prior year,1999. The effluent samples were not usually acutely to Ceriodaphnia dubia (water fleas), but they were chronically toxic to the water fleas. The effluent samples were not acutely nor chronically toxic to the fathead minnows. Their testing indicated that the toxicity source may have been a cationic metal or a particulate material. EDTA manipulations were not conclusive for cationic metal toxicity.

On July 30, 2001 Crestline submitted their annual TRE progress report for the prior year, 2000. The testing showed that the effluent sample was not acutely or chronically toxic to the fathead minnows. The effluent sample was not acutely toxic to the water fleas, but it was chronically toxic to the water fleas. They decided not to do any more testing on fathead minnows since consistently there were no acute or chronic toxicity. The following pollutants were ruled out for toxicity: ammonia, conductivity, chlorine and ferric chloride. Six metals were tested with only zinc having significant measurable concentrations. But there was not a good correlation between the zinc and the chronic toxicity for the water fleas. More sampling was proposed.

On July 30, 2002 Crestline submitted their annual progress report per Part I.C. of their NPDES permit. They took three effluent samples between June 2001 and December 2001. Toxicity testing for the fathead minnows had been discontinued by Crestline since previous samples had showed no acute or chronic toxicity. None of the three tests indicated acute or chronic toxicity to water fleas.

The allowable effluent toxicity (AET) is a factor considered in evaluating whole effluent toxicity. The AET calculations are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum). For the Crestline WWTP, the AET values are 0.33 TU_a and 1.03 TU_c.

When the calculated AET is less than 1.0 TU_a, Allowable Effluent Toxicity is defined as:

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The AET is 30% effects in 100% effluent based on the dilution ratio of 1.1 to 1.

This is because of the following:

$$\frac{\text{Downstream flow}}{\text{Discharger flow}} = \frac{\text{Upstream flow + Discharger flow}}{\text{Discharger flow}} = \frac{0.16\text{ cfs} + 1.47\text{ cfs}}{1.47\text{ cfs}} = \frac{1.63\text{ cfs}}{1.47\text{ cfs}} = 1.1$$

Evaluating the acute toxicity results in Table 2c. under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, PEQs could not be determined for Tu_a because there is no significant mortality. Reasonable potential for acute toxicity is not demonstrated. Monitoring requirements are proposed for whole effluent toxicity for acute toxicity. Acute endpoints shall be determined from the chronic test results.

Evaluating the chronic toxicity results in Table 2c. under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, PEQs could be determined for Tu_c. The PEQ value (2.6) is greater than the WLA (of 1.03 (Tu_c)) so limits are required. Using the TSD we used the permit derivations procedures to come up with the Annual Average Limit of 1.0 and the Maximum Daily Limit of 1.7. The Annual Average Limit was calculated to be 0.84. But because of paragraph B(10) of Rule 3745-33-07, the Tuc value can't be less than 1.0, so the 1.0 value is proposed.

Table 1. Effluent Data for Crestline WWTP

Parameter		Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Self-Monitoring (LEAPS) Data						
Ammonia	summer	mg/l	257	257	1.55	2.05
Ammonia	winter	mg/l	180	180	0.17	0.39
Cadmium		µg/l	58	11	7.13	7.86
Chromium +6		µg/l	60	0	--	--
Chromium		µg/l	28	7	22.25	29.23
Copper		µg/l	59	48	12.28	18.89
Lead		µg/l	59	3	13.14	18.00
Mercury		µg/l	25	0	--	--
Nickel		µg/l	28	22	36.79	50.4
NO2		mg/l	164	164	0.09	0.21
NO3		mg/l	164	164	10.51	22.71
Phosphorus		mg/l	759	759	1.18	2.32
Zinc		µg/l	58	58	302.22	414.00

Table 2. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health[A]	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Average: Aquatic Life[A]	Outside Mixing Zone Criteria: Maximum Aquatic Life[A]	Inside Mixing Zone Max[A]
NH_3-N (summer)	mg/l	--	--	0.7	--	--
NH_3-N (winter)	mg/l	--	--	4.8	--	--
Cadmium	µg/l	730.	50.	6.3	18.	35.
Chromium, total	µg/l	14000.	100.	230.	4800.	9700.
Chromium +6	µg/l	14000.	--	11.	16.	31.
Copper	µg/l	64000.	500.	26.	43.	87.
Lead	µg/l	190.	100.	30.	570.	1100.
Mercury[B]	µg/l	0.0031	10.	0.91	1.7	3.4
Nickel	µg/l	43000.	200.	140.	1300.	2600.
Nitrite+Nitrate	mg/l	--	100.	--	--	--
Zinc	µg/l	35000.	25000.	330.	330.	660.
Chlorine tot resd	mg/l	–	–	0.011	0.019	0.038

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated.

[B] Wildlife criterion = 0.0013 µg/l

Table 2a. Effluent Characterization and Decision Criteria

Summary of current permit limits and unaltered monthly operating report (MOR) data for the Crestline WWTP outfall 2PC00006001. All values are based on annual records unless otherwise indicated. N = Number of Analyses. * = For pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; A = 7 day average. Decision Criteria: PEQ_{avg} = monthly average; PEQ_{max} = daily maximum analytical results. d = weekly.

OHIO EPA/DSW - ANALYSIS OF LEAPS DATA - 02SEP03

--- EFFLUENT CHARACTERIZATION DATA --- TABLE 1 ---
* PH - 5TH PERCENTILE SHOWN INPLACE OF 50TH. ** DISSOLVED OXYGEN - 5TH PERCENTILE SHOWN INPLACE OF 95TH.

CRESTLINE WWTP (2PC00006) OUTFALL=001

			CURRENT PERMIT		PERIOD = JAN98 THRU DEC02					
PARAMETER	**SEASON**	**UNITS**	**30 DAY**	**DAILY**	**N**	**50 PCTL**	**95 PCTL**	**RANGE**	**PEQ_{ave}**	**PEQ_{max}**
AMMONIA NH3-N	MAY-OCT	MG/L	1.5	2.3d	389	0.05	4.49	0.01-15.23	1.55	2.05
		KG/DAY	5.4	8.3d	389	0.11733	10.52	0.012-27.187		
	NOV-APR	MG/L	2.3	3.5d	374	0.05	0.92	0.01-10.61	0.17	0.39
		KG/DAY	8.3	12.6d	374	0.20802	3.2308	0.0153-30.119		
CADMIUM TOT REC	ANNUAL	UG/L	-	-	13	0	1	0-4	7.13	7.86
		KG/DAY	-	-	13	0	0.00232	0-0.0083		
CADMIUM TREC 0.001	ANNUAL	UG/L			45	0	5	0-13		
		KG/DAY			45	0	0.01115	0-0.0349		
CBOD 5 DAY	MAY-OCT	MG/L	10.	15.d	388	2	3	1-21		
		KG/DAY	36.	54.d	388	4.6858	13.5125	1.4724-143.83		
	NOV-APR	MG/L	10.	15.d	372	2	3	1-12		
		KG/DAY	36.	54.d	372	7.0704	20.696	1.3058-34.065		
CHROMIUM HEX-DIS	ANNUAL	UG/L	11.	15.	60	0	0	0-0	-	-
CHROMIUM TOT REC	ANNUAL	UG/L	-	-	28	0	19	0-23	22.25	29.23
		KG/DAY	-	-	28	0	0.03919	0-0.1113		
COD	ANNUAL	MG/L			54	16	23	10-42		
		KG/DAY			54	42.142	119.23	17.108-197.73		
FEC COLI MFM-FCBR	ANNUAL	/100ML	1000.	2000.d	390	29	3000	1-37700		
CONDUIT FLOW	ANNUAL	MGD	-	-	1796	0.701	2.087	0.246-19		
	MAY-OCT	MGD	----------		919	0.592	1.588	0.246-19		
	NOV-APR	MGD	----------		877	0.869	2.265	0.345-3.724		
COPPER TOT REC	ANNUAL	UG/L	-	-	13	7	14	0-17	12.28	18.89
		KG/DAY	-	-	13	0.01823	0.04781	0-0.0822		
COPPER TREC 0.001	ANNUAL	UG/L			47	5.8	15	0-230		
		KG/DAY			47	0.0154	0.0531	0-0.4022		
DISS. OXYGEN	MAY-OCT	MG/L	Not less than 5.0		642	8.3	7**	5.2-18		
	NOV-APR	MG/L	Not less than 5.0		602	8.3	6.8**	5.1-17		
LEAD TOT REC	ANNUAL	UG/L	-	-	13	0	0	0-511		

Table 2a. Effluent Characterization and Decision Criteria (continued)

PARAMETER	**SEASON**	**UNITS**	**30 DAY**	**DAILY**	**N**	**50 PCTL**	**95 PCTL**	**RANGE**	**PEQ_{ave}**	**PEQ_{max}**

		KG/DAY	-	-	13	0	0	0-2.4641		
LEAD TREC 0.001	ANNUAL	UG/L	-	-	47	0	8	0-20	13.14	18.00
		KG/DAY	-	-	47	0	0.01702	0-0.1322		
MERCURY HG,TOT	ANNUAL	UG/L	-	-	12	0	0	0-0	-	-
MERCURY TOT REC	ANNUAL	UG/L			13	0	0	0-0		
TOT N KJELDAHL	ANNUAL	MG/L			13	0.46	1.18	0.1-1.36		
		KG/DAY			13	1.0163	4.2068	0.2977-6.558		
NICKEL TOT REC	ANNUAL	UG/L	-	-	13	5	20	0-24	36.79	50.4
		KG/DAY	-	-	13	0.01467	0.04126	0-0.0498		
NICKEL TREC 0.01	ANNUAL	UG/L			15	14	38	0-42		
		KG/DAY			15	0.05531	0.11895	0-0.1225		
NITRATE NO3-N	ANNUAL	MG/L			164	5.18	14.02	0.1-19.65	10.51	22.71
		KG/DAY			164	18.311	31.709	0.1828-40.88		
NITRITE NO2-N	ANNUAL	MG/L			164	0.03	0.25	0.01-0.43	0.09	0.21
		KG/DAY			164	0.07801	1.2606	0.0131-3.2242		
OIL GRSE TOT	ANNUAL	MG/L	Not to exceed 10 at at any time		55	1	4	1-14		
		KG/DAY			55	4.0764	12.725	1.6919-41.438		
OIL-GRSE FREON-GR	ANNUAL	MG/L			200	2	6	1-18		
		KG/DAY			200	6.01058	23.8682	0.9652-287.66		
PH	ANNUAL	S.U.	Not less than 6.5 Nor greater than 9.0		1246	6.9*	8.3	6.3-9.2		
PHOS-T P-WET	ANNUAL	MG/L	1.0	1.5d	759	0.67	1.62	0.01-3.15	1.18	2.32
		KG/DAY	3.6	5.4d	759	1.95912	4.10673	0.0196-65.443		
RESIDUE TOT NFLT	ANNUAL	MG/L	12.	18.d	763	1	4	1-14		
		KG/DAY	43.	65.d	763	3.5693	13.16	1.1961-109		
WATER TEMP.	ANNUAL	DEG C	-	-	1244	16	21	6-22		
ZINC TOT REC	ANNUAL	UG/L	322.	360.	59	121	414	2-1151	302.22	414.00
		KG/DAY	1.2	1.3	59	0.42277	1.6156	0.0051-2.5573		

Table 2b. Summary of ACUTE toxicity test results on the Crestline WWTP effluent from outfall 2PC00006001.

TEST DATE(a)	*Ceriodaphnia dubia 48 hour*						*Fathead Minnows 48 hour*					
	UP[b]	**C[c]**	**LC_{50}[d]**	**%M[i]**	**TUa[g]**	**NF[h]**	**UP[b]**	**C[c]**	**LC_{50}[d]**	**%M[i]**	**TUa[g]**	**NF[h]**
06/25/01 (E)	NT	NT	> 100%	0	< 1.0	NT	NT	NT	NT	NT	NT	NT
11/05/01 (E)	NT	NT	>100%	0	< 1.0	NT	NT	NT	NT	NT	NT	NT
12/19/01 (E)	NT	NT	>100%	0	< 1.0	NT	NT	NT	NT	NT	NT	NT
05/07/01 (E)	NT	NT	>100%	0	<1.0	NT	NT	NT	NT	NT	NT	NT
02/19/01 (E)	NT	NT	>100%	10%	0.2	NT	NT	NT	NT	NT	NT	NT
08/07/00 (E)	NT	NT	>100%	0	<1.0	NT	NT	NT	NT	NT	NT	NT
08/08/00 (E)	NT	NT	NT	NT	NT	NT	NT	NT	>100%	0	<1.0	NT
07/13/00 (E)	NT	NT	NT	NT	NT	NT	NT	NT	>100%	0	<1.0	NT
07/12/00 (E)	NT	NT	>100%	10%	0.2	NT	NT	NT	NT	NT	NT	NT
06/22/00 (E)	NT	NT	>100%	0	<1.0	NT	NT	NT	NT	NT	NT	NT
04/14/00 (E)	NT	NT	>100%	0	<1.0	NT	NT	NT	NT	NT	NT	NT
03/27/00 (E)	NT	NT	>100%	10%	0.2	NT	NT	NT	NT	NT	NT	NT
07/21/99 (E)	NT	NT	>100%	10%	0.2	NT	NT	NT	NT	NT	NT	NT

[a] O = EPA test; E = entity test
[g] TUa = Acute Toxicity Units
[h] NF = Near Field Sample In Westerly Creek
[i] %M = Percent Mortality in 100% effluent
NT = not tested

[b] UP = upstream control water
[c] C = laboratory water control
[d] LC_{50} = Median Lethal Concentration
ND = not determined

Table 2c. Summary of CHRONIC toxicity test results on the Crestline WWTP effluent from outfall 2PC00006001. (All of these tests were performed by the entity.)

Test Date (a)	*Ceriodaphnia dubia 7-Day*											*Fathead Minnows 7-Day*				
	UP[b]	C[c]	IC_{25}[d]	TU_c[e]	Survival			Reproduction			FF[i]	UP[b]	C[c]	IC_{25}[d]	TU_c[e]	FF[i]
					LOEC[f]	NOEC[g]	TU_c[h]	LOEC[f]	NOE	TU_c[h]						
12/19/01	NT	NT	>100%	< 1.0	>100%	100 %	<1.0	> 100%	100%	<1.0	NT	NT	NT	NT	NT	NT
11/05/01	NT	NT	>100%	< 1.0	>100%	100 %	< 1.0	> 100%	100%	<1.0	NT	NT	NT	NT	NT	NT
06/25/01	NT	NT	>100%	< 1.0	>100%	100%	< 1.0	> 100%	100%	<1.0	NT	NT	NT	NT	NT	NT
05/07/01	NT	NT	91.7%	1.09	>100%	100%	<1.0	>100%	75%	1.15	NT	NT	NT	NT	NT	NT
02/19/01	NT	NT	57.7 %	1.7	50%	<50%	>2.0	NA	NA	NA	NT	NT	NT	NT	NT	NT
08/08/00	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	>100%	<1	NT
08/07/00	NT	NT	90.9%	1.10	>100%	100%	<1.0	100%	75%	1.15	NT	NT	NT	NT	NT	NT
7/13/00	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	>100%	<1	NT
7/12/00	NT	NT	<50%	>2.0	75%	50%	1.63	50%	<50%	>2.0	NT	NT	NT	NT	NT	NT
6/22/00	NT	NT	TT	TT	TT	TT	TT	TT	TT	TT	NT	NT	NT	NT	NT	NT
4/14/00	NT	NT	>100%	<1.0	>100%	100%	<1.0	>100%	100%	<1.0	NT	NT	NT	NT	NT	NT
3/27/00	NT	NT	>100%	<1.0	>100%	100%	<1.0	>100%	100%	<1.0	NT	NT	NT	NT	NT	NT
7/21/99	NT	NT	>100%	<1.0	>100%	100%	<1.0	100%	75%	1.15	NT	NT	NT	NT	NT	NT

[a]O = EPA test; E = entity test
[b]UP = upstream control water
[c]C = laboratory water control
[d]IC_{25} = inhibition concentration twenty-five
[e]TU_c = chronic toxicity units based on IC_{25}
[f]LOEC = lowest observed effects concentration
[g]NOEC = no observed effects concentration
[h]TU_c = chronic toxicity units
[i]FF = far-field effect
[j]STU_c = TUc for survival
[k]GTU_c = TUc for growth
NT = not tested
ND = not determined
TT - Test terminated due to unacceptable mortality in control group.

Table 2d. Summary of the aquatic life use attainment status for the Sandusky River basin based on data collected by the Ohio EPA from June to October, 2001.

RIVER MILE Fish/Macro.	IBI	Mod. Iwb	ICI	QHEI	Use Attain-Ment Status	Comments
Paramour Creek						
	Eastern Corn Belt Plains (ECBP) - WWH Use Designation					
6.3/6.3	26*	NA	20*	35.0	**NON**	TR 176, Finnegan Rd.
4.8/---	28*	NA	---	30.0	**(NON)**	SR 161
---/2.9	—	—	Fair*	—	**(NON)**	Krichbaum Rd.
1.5/1/5	20*	3.6*	G	53.0	**NON**	TR 48, Nazor Rd.
Paramour Creek tributary @ RM 5.13 (PPG trib.)						
	Eastern Corn Belt Plains (ECBP) - WWH Use Designation					
3.7/3.7	36ns	NA	30.*	39.0	Partial	PPG park, Ust. Outfall trib.
0.2/0.2	26*	NA	MG	37.5	**NON**	TR 228, Hook Rd.
Paramour Creek tributary @ RM 2.88 (East Crestline Creek)						
	Eastern Corn Belt Plains (ECBP) - WWH Use Designation					
0.1/0.1	20*	NA	F*	61.0	**NON**	TR 167, Cayer Rd.
Paramour Creek tributary @ RM 1.92 Westerly Creek)						
	Eastern Corn Belt Plains (ECBP) - WWH Use Designation					
2.4/2.4	34*	NA	12*	60.0	**NON**	Patterson St.
0.2/0.1	26*	NA	32ns	66.5	**NON**	Oldfield Rd.
Allen Run						
	Eastern Corn Belt Plains (ECBP) - WWH Use Designation					
1.2/1.2	42	NA	MGns	48.5	Full	CR35, Crestline (Boyer) Rd.

* Significant departure from ecoregion biocriterion: poor and very poor results are underlined.
ns Nonsignificant departure from biocriterion (≤4 IBI or ICI units;≤0.5 MIwb units)

Table 3. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
7Q10	cfs	annual	0.19	USGS #04195950
1Q10	cfs	annual	0.16	USGS #04195950
Harmonic Mean Flow	cfs	annual	1.44	USGS #04195950
90Q10	cfs	annual	0.32	USGS #04195950
30Q10	cfs	summer	0.24	USGS #04195950
30Q10	cfs	winter	0.40	USGS #04195950
Mixing Assumption	%	average	25	Default
	%	maximum	100	Stream-to-discharge ratio
Instream hardness	mg/l	annual	333.	LEAPS; 1999-02, n=200
Temperature	°C	summer	21.0	LEAPS; 1998-02, n=87
		winter	6.0	LEAPS; 1998-03, n=59
pH	S.U.	summer	8.3	LEAPS; 1998-02, n=87
		winter	7.8	LEAPS; 1998-03, n=59
Background Water Quality				
NH_3-N (summer)		mg/l	0.17	LEAPS; 1998-02, n=87
NH_3-N (winter)		mg/l	0.12	LEAPS; 1998-03, n=59
Cadmium		µg/l	0.	STORET; 2001, n=5, 5<MDL
Chromium +6		µg/l	0.	No representative data available
Chromium		µg/l	0.	STORET; 2001, n=5, 5<MDL
Copper		µg/l	0.	STORET; 2001, n=5, 5<MDL
Lead		µg/l	0.	STORET; 2001, n=5, 5<MDL
Mercury		µg/l	0.	No representative data available
Nickel		µg/l	0.	STORET; 2001, n=5, 5<MDL
NO2+NO3		mg/l	0.96	STORET; 2001-02, n=7, 0<MDL
Zinc		µg/l	11.2	STORET; 2001, n=5, 3<MDL
Chlorine tot resd		µg/l	0.	No representative data available
Crestline WWTP		cfs	1.47	DSW

Table 4. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum Aquatic Life	Inside Mixing Zone Maximum
		Human Health	Agri Supply	Aquatic Life		
NH_3-N (summer)	mg/l	--	--	0.8	--	--
NH_3-N (winter)	mg/l	--	--	6.1	--	--
Cadmium	µg/l	909.[A]	62.[A]	6.5	20.	35.
Chromium +6[B]	µg/l	17429.[A]	–	11.	18.	31.
Chromium, total[B]	µg/l	17429.[A]	124.	238.	5322.	9700.
Copper	µg/l	79673.[A]	622.[A]	27.	48.	87.
Lead	µg/l	237.	124.	31.	632.	1100.
Mercury[B C]	µg/l	0.004	12.[A]	0.94	1.9	3.4
Nickel	µg/l	53531.[A]	249.	145.	1441.	2600.
Zinc	µg/l	43569.[A]	31120.[A]	341.	365.	660.
Chlorine tot resd[B]	mg/l	–	–	0.011	0.019	0.038

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by Permit staff.

[C] WLA for wildlife = 0.0014 µg/l

Table 5. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

NO2 NO3
Phosphorus

Group 2: PEQ < 25% of WQS or all data below minimum detection limit; WLA not required. No limit recommended, monitoring optional.

Chromium +6 Chromium
Mercury

Group 3: PEQ_{max} < 50% of maximum PEL and PEQ_{avg} < 50% of average PEL. No limit recommended, monitoring optional.

Copper Lead
Nickel

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

No parameters fit the criteria of this group

Group 5: Maximum PEQ $\geq$ 100% of the maximum PEL or average PEQ $\geq$ 100% of the average PEL, or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits Average	Maximum
NH_3-N	mg/l	summer	0.8	--
NH_3-N	mg/l	winter	6.1	--
Cadmium	µg/l	annual	6.5	20.
Zinc	µg/l	annual	341.	365.

Table 6. Final effluent limits and monitoring requirements for the Crestline WWTP outfall 2PC00006001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis
Flow	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M[c]
Temperature	°C	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/l	- - - - - - - - - - Not less than 5.0 - - - - - - - - - - -				PD
$CBOD_5$	mg/l	10.	15.[d]	36.	54.[d]	PD
Suspended Solids	mg/l	12.	18.[d]	43.	65.[d]	PD
Ammonia-N	mg/l					
Summer		0.8	1.2[d]	2.9	4.3[d]	WLA
Winter		2.3	3.5[d]	8.3	12.6[d]	ABS/EP
Phosphorus*	mg/l	1.0	1.5[d]	3.6	5.4[d]	IJC
Fecal coliform						
Summer only	#/100 ml	1000.	2000.[d]	–	–	WQS
Oil and Grease	mg/l	- - - - - - Not to exceed 10.0 at any time - - - - - -				WQS
pH	S.U.	- - - - - - - - - - - - - 6.5 to 9.0 - - - - - - - - - - - - -				WQS
TKN		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
NO2+NO3-N		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Hex. Chromium (Dissolved)	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Chromium, T. R.	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Mercury, T.	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Copper, T. R.	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Lead, T. R.	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Nickel, T. R.	µg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M
Cadmium, T. R.	µg/l	6.5	20.	0.023	0.072	WLA
Zinc, T. R.	µg/l	322.	360.	1.2	1.3	ABS/EP
Whole Effluent Toxicity						
Acute	Tua	–	–	–	–	WET
Chronic	Tuc	1.0**	1.7	–	–	WET

Table 6. Con't.

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[a] Effluent loadings based on average design discharge flow of 0.95 MGD.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l)); AD = Antidegradation (OAC 3745-1-05); BPJ = Best Professional Judgment; BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation; EP = Existing Permit; IJC = 1988 revision of the 1972 Great Lakes Water Quality Agreement of the International Joint Commission; M = Monitoring; PD = Plant Design Criteria; RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A)); TMDL = Total Maximum Daily Load for the Upper Sandusky watershed; WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.

* The TMDL load for phosphorus is based on the *Total Maximum Daily Loads for the Upper Sandusky River Watershed* (TMDL). See text on page 8 of this fact sheet.

** - Average Annual Limit instead of a maximum daily limit.

Figure 1. Approximate location of the Crestline WWTP.

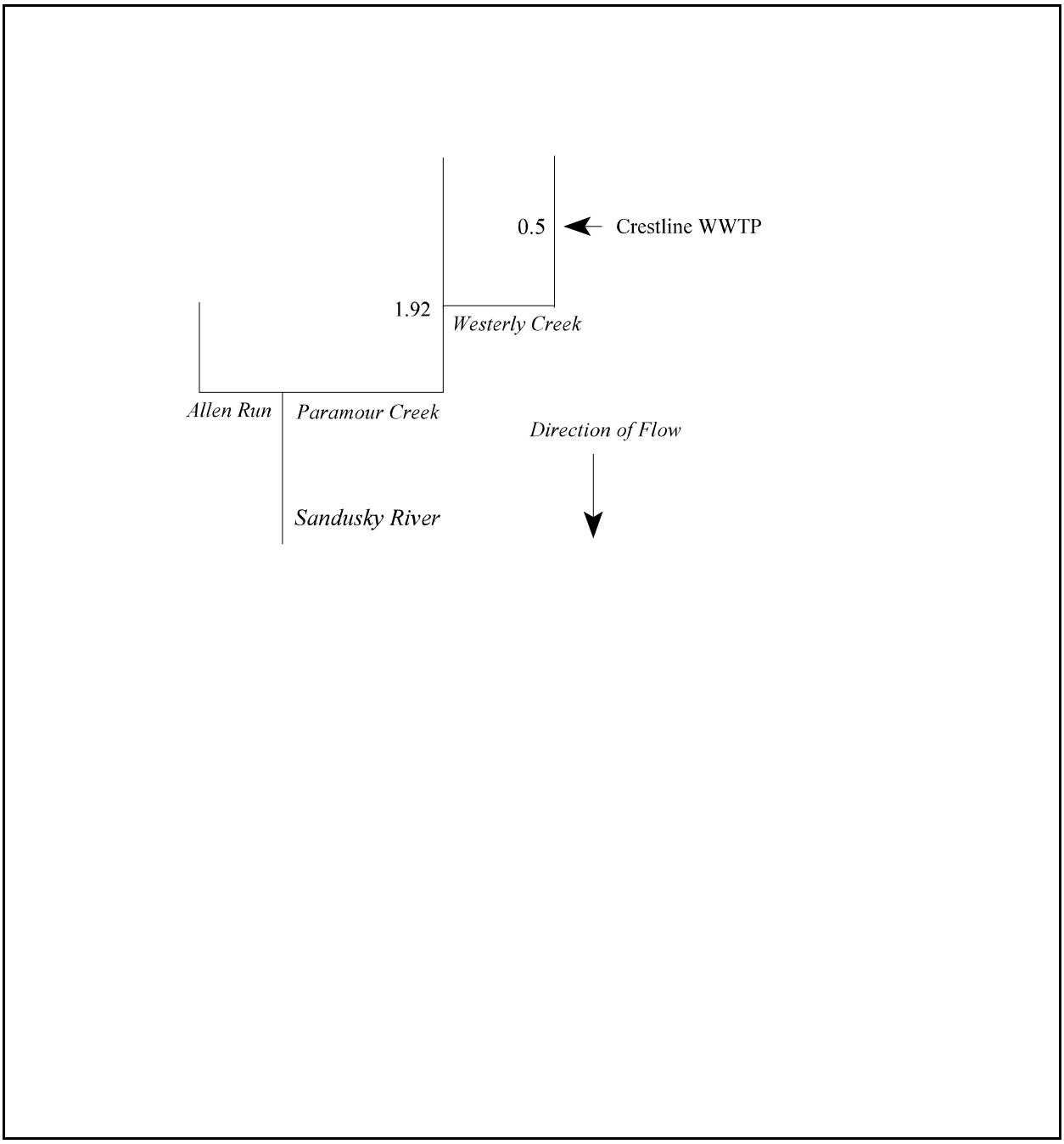

Figure 2. Schematic of Study Area.