

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.: MO-0133515

Owner: Boone County Regional Sewer District (BCSD)
Address: 1314 North Seventh Street, Columbia, MO 65201

Continuing Authority: Same as above
Address: Same as above

Facility Name: BCSD, Kinkade Crossing WWTF
Facility Address: Honey Lane and Highway VV, Columbia, MO 65202

Legal Description: SE ¼, NE ¼, NW ¼, Sec. 12, T49N, R13W, Boone County
Latitude/Longitude: +3901046/-09219250

Receiving Stream: Unnamed tributary of Rocky Fork (U)
First Classified Stream and ID: Rocky Fork (C) (01014)
USGS Basin & Sub-watershed No.: (10300102-110005)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW - SIC #4952 Certified “C” Operator Required

Flow equalization / extended aeration / sludge holding /UV disinfection/ sludge hauled to Columbia Regional WWTP.
Design population equivalent is 671.
Design flow is 50,000 gallons per day.
Design sludge production is 9.7 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

April 3, 2009
Effective Date


Mark N. Templeton, Director
Department of Natural Resources

April 2, 2014
Expiration Date


Irene Crawford
Regional Director, Northeast Regional Office

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 4	
					PERMIT NUMBER MO-0133515	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	gpd	*		*	once/month	24 hr. estimate
Biochemical Oxygen Demand ₅ ****	mg/L		45	30	once/month	composite**
Total Suspended Solids****	mg/L		45	30	once/month	composite**
pH – Units	SU	***		***	once/month	grab
Ammonia as N (May 1 – Oct 31)	mg/L	3.7		1.9	once/month	grab
(Nov 1 – April 30)		7.5		3.7		
Temperature	°C	*		*	once/month	grab
Oil and Grease	mg/L	15		10	once/month	grab
Fecal Coliform (Note 1 & 2)	#/100mL	1000		400	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>May 28, 2009</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I & III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.
- *** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.
- **** This facility is required to meet a removal efficiency of 85% or more.

Note 1 - Final limitations and monitoring requirements for Fecal Coliform are applicable only during the recreational season from April 1 through October 31.

Note 2 - The Monthly Average Limit for Fecal Coliform is a geometric mean.

C. INFLUENT MONITORING REQUIREMENTS		PAGE NUMBER 3 of 4	
		PERMIT NUMBER MO-0133515	
The facility is required to meet a removal efficiency of 85% or more. The monitoring requirements shall become effective upon issuance and remain in effect until expiration of the permit. To determine removal efficiencies, the influent wastewater shall be monitored by the permittee as specified below:			
SAMPLING LOCATION AND PARAMETER(S)	UNITS	MONITORING REQUIREMENTS	
		MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Influent</u>			
Biochemical Oxygen Demand ₅	mg/L	once/quarter*	composite**
Total Suspended Solids	mg/L	once/quarter*	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE _____.			

MO 780-0010 (8/91)

C. INFLUENT MONITORING REQUIREMENTS (continued)

- * Sample once per quarter in the months of March, June, September, and December.
- ** A composite sample made up from a minimum of four grab samples collected within a 24 hour period with a minimum of two hours between each grab sample.

D. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
2. All outfalls must be clearly marked in the field.
3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.
4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
- (c) That the effluent limit established in part A of the permit will be exceeded.

D. SPECIAL CONDITIONS (continued)

5. Report as no-discharge when a discharge does not occur during the report period.
6. Water Quality Standards
 - (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
 - (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
 - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
 - (5) There shall be no significant human health hazard from incidental contact with the water;
 - (6) There shall be no acute toxicity to livestock or wildlife watering;
 - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.
7. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities
 - (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
 - (b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.
8. The permittee shall comply with any applicable requirements listed in 10 CSR 20-8 and 10 CSR 20-9. The monitoring frequencies contained in this permit shall not be construed by the permittee as a modification of the monitoring frequencies listed in 10 CSR 20-9. If a modification of the monitoring frequencies listed in 10 CSR 20-9 is needed, the permittee shall submit a written request to the department for review and, if deemed necessary, approval.
9. The permittee shall submit a report semi-annually in April and October with the Discharge and Monitoring reports which address measures taken to locate and eliminate sources of infiltration and inflow into the collection system serving the facility.

Date of Fact Sheet: December 26, 2006

Date of Public Notice: December 29, 2006

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FACT SHEET**

This Fact Sheet explains the applicable regulations, rationale for development of this permit and the public participation process.

NPDES PERMIT NUMBER: MO-0133515

FACILITY NAME: BCSD, Kinkade Crossing WWTF

OWNER NAME: Boone County Regional Sewer District

LOCATION: Sec. 12, T49N, R13W, Boone County:

RECEIVING STREAM: Unnamed Tributary of Rocky Fork

FACILITY CONTACT PERSON: Tom Ratermann TELEPHONE: (573)443-2774

FACILITY DESCRIPTION

The Boone County Regional Sewer District, Kinkade Crossing Wastewater Treatment Facility is an extended aeration wastewater treatment system. The treatment facility is designed to treat the waste from a 39 lot single-family development and nearby existing and proposed facilities consisting of houses, apartments, a convenience store, and a restaurant with a population equivalent of 671 and a design flow of 50,000 gallons per day.

The facility discharges treated wastewater into an unnamed tributary to Rocky Fork. The discharge point is designated as Outfall #001. Approximately 0.3 miles below the discharge point, the flow enters the classified portion of the Rocky Fork. At this location, Rocky Fork is listed as a Class C stream. The beneficial uses of this classified portion of the stream include livestock and wildlife watering, protection of warm water aquatic life and human health - fish consumption, and whole body contact recreational category B.

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States, and the release of storm water from certain point sources. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Permits in Missouri are issued by the Director of the Department of Natural Resources under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended).

10 CSR 20-7.031 Missouri Water Quality Standards, Missouri Department of Natural Resources (the Department) "defines the Clean Water Commission water quality objectives in terms of water uses to be maintained and the criteria to protect those uses." The receiving stream's beneficial water uses to be maintained are livestock and wildlife watering, protection of aquatic life, and whole body contact recreational category B.

To protect these beneficial uses and the water quality of the receiving stream, effluent limitations are being established under federal and state laws.

EFFLUENT LIMIT DERIVATION & RATIONALE

See the attached Water Quality Review Sheet, which was developed for the facility.

This permit will be issued for a period of five years.



Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
NPDES Permits and Engineering Section

Water Quality Review Sheet
Determination of Effluent Limits

FACILITY INFORMATION

FACILITY NAME: BCSD, Hinton WWTF NPDES #: NEW

FACILITY TYPE/DESCRIPTION: Proposed 50,000 gpd facility to serve 39 lot single-family development and nearby existing and proposed facilities.

EDU: Ozark/Moreau/Loutre Drainages 8-DIGIT HUC: 10300102 COUNTY: Boone

LEGAL DESCRIPTION: NE NW, Sec. 12, T49N, R13W LATITUDE/LONGITUDE: +3903041/-09219522

WATER QUALITY HISTORY: None, new facility. A nearby facility, Lake Heights Estates MHP (MO-0098710), is under a settlement agreement with the department and would be eliminated by the proposed WWTF.

OUTFALL CHARACTERISTICS

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	OTHER
001	0.0775	Secondary	Trib. to Rocky Fork	

RECEIVING WATERBODY INFORMATION

WATERBODY	CLASS	WBID	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)	*DESIGNATED USES
Trib. to Rocky Fork	U	----	0.0	0.0	0.0	General Criteria
Rocky Fork	C	1014	0.0	0.0	0.1	LWW, AQL, WBC

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warm water Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

COMMENTS: Discharge is approximately 0.3 miles from the classified segment of Rocky Fork. A Use Attainability Analysis (UAA) was conducted for Rocky Fork in July 2005 and the whole body contact recreation designated use was retained.

MIXING CONSIDERATIONS

Mixing Zone (MZ): Not allowed, 7Q10 less than 0.1 cfs [10 CSR 20-7.031(4)(A)4.B.(I)(a)].

Zone of Initial Dilution (ZID): Not allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

$$A.E.C.\% = \left(\frac{DesignFlow + ZIDFlow}{DesignFlow} \right)^{-1} \times 100$$

PERMIT LIMITS AND INFORMATION

TMDL WATERSHED: N W.L.A. STUDY CONDUCTED: N DISINFECTION REQUIRED: Y USE ATTAINABILITY ANALYSIS: Y

OUTFALL #001– Main Facility Outfall

WET TEST (Y OR N): N FREQUENCY: _____ A.E.C. _____ LIMIT: _____

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MONITORING FREQUENCY
FLOW	MGD	*		*	ONCE/DAY
BIOCHEMICAL OXYGEN DEMAND (BOD ₅)***	MG/L		45	30	ONCE/MONTH
TOTAL SUSPENDED SOLIDS***	MG/L		45	30	ONCE/MONTH
pH	SU	6 – 9		6 - 9	ONCE/MONTH
TOTAL AMMONIA NITROGEN (MAY 1 – OCT 31)	MG/L	3.7		1.9	ONCE/MONTH
TOTAL AMMONIA NITROGEN (NOV 1 – APR 30)	MG/L	7.5		3.7	ONCE/MONTH
FECAL COLIFORM**	NOTE 1	1000		400	ONCE/MONTH
TOTAL RESIDUAL CHLORINE	MG/L	0.017		0.008	ONCE/MONTH

* - Monitoring Requirement Only, ** – During the recreational season (Apr 1 – Oct 31), Note 1 – colonies/100 mL

*** - This facility is required to meet a removal efficiency of 85% or more for BOD₅ and TSS. Influent BOD₅ and TSS data should be reported to ensure removal efficiency requirements are met.

RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements are recommended at this time.

DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations were calculated using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration
 C_s = upstream concentration
 Q_s = upstream flow
 C_e = effluent concentration
 Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

Outfall #001 – Main Facility Outfall

- **Biochemical Oxygen Demand (BOD₅)**. 30 mg/L monthly average, 45 mg/L weekly average [10 CSR 20-7.015(8)(B)1].
- **Total Suspended Solids (TSS)**. 30 mg/L monthly average, 45 mg/L weekly average [10 CSR 20-7.015(8)(B)1].
- **pH**. pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015(8)(B)2.]
- **Total Ammonia Nitrogen**. Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg/L)	Total Ammonia Nitrogen CMC (mg/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer: May 1 – October 31, Winter: November 1 – April 30

Summer

Chronic WLA: $C_e = ((0.0775 + 0.0)1.5 - (0.0 * 0.0))/0.0775$
 $C_e = 1.5 \text{ mg/L}$

Acute WLA: $C_e = ((0.0775 + 0.0)12.1 - (0.0 * 0.0))/0.0775$
 $C_e = 12.1 \text{ mg/L}$

$LTA_c = 1.5 \text{ mg/L} (0.780) = 1.2 \text{ mg/L}$ [CV = 0.6, 99th Percentile, n = 30]

$LTA_a = 12.1 \text{ mg/L} (0.321) = 3.9 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

$MDL = 1.2 \text{ mg/L} * 3.11 = 3.7 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

$AML = 1.2 \text{ mg/L} * 1.55 = 1.9 \text{ mg/L}$ [CV = 0.6, 95th Percentile, n = 4]

Winter

Chronic WLA: $C_e = ((0.0775 + 0.0)3.1 - (0.0 * 0.0))/0.0775$
 $C_e = 3.1 \text{ mg/L}$

Acute WLA: $C_e = ((0.0775 + 0.0)12.1 - (0.0 * 0.0))/0.0775$
 $C_e = 12.1 \text{ mg/L}$

$$LTA_c = 3.1 \text{ mg/L} (0.780) = 2.4 \text{ mg/L}$$

$$LTA_a = 12.1 \text{ mg/L} (0.321) = 3.9 \text{ mg/L}$$

[CV = 0.6, 99th Percentile, n = 30]

[CV = 0.6, 99th Percentile]

$$MDL = 2.4 \text{ mg/L} * 3.11 = 7.5 \text{ mg/L}$$

$$AML = 2.4 \text{ mg/L} * 1.55 = 3.7 \text{ mg/L}$$

[CV = 0.6, 99th Percentile]

[CV = 0.6, 95th Percentile, n = 4]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.7	1.9
Winter	7.5	3.7

- **Fecal Coliform.** Discharge shall not contain more than a monthly geometric mean of 400 colonies/100 mL and a daily maximum of 1000 colonies/100 mL during the recreational season (April 1 – October 31) [10 CSR 20-7.015(8)(B)4.]
- **Total Residual Chlorine (TRC).** Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L

Chronic WLA: $C_e = ((0.0775 + 0.0)10 - (0.0 * 0.0))/0.0775$
 $C_e = 10 \text{ µg/L}$

Acute WLA: $C_e = ((0.0775 + 0.0)19 - (0.0 * 0.0))/0.0775$
 $C_e = 19 \text{ µg/L}$

$$LTA_c = 10 \text{ µg/L} (0.527) = \mathbf{5.3 \text{ µg/L}}$$

$$LTA_a = 19 \text{ µg/L} (0.321) = 6.1 \text{ µg/L}$$

[CV = 0.6, 99th Percentile]

[CV = 0.6, 99th Percentile]

$$MDL = 5.3 \text{ µg/L} * 3.11 = 16.5 \text{ µg/L}$$

$$AML = 5.3 \text{ µg/L} * 1.55 = 8.2 \text{ µg/L}$$

[CV = 0.6, 99th Percentile]

[CV = 0.6, 95th Percentile, n = 4]

Total Residual Chlorine effluent limits of 0.008 mg/L monthly average, 0.017 mg/L daily maximum are recommended if chlorine is used as a disinfectant. Standard compliance language for TRC, including the minimum level (ML), should be included in the permit.

Reviewer: John Hoke
 Date: March 15, 2006
 Unit Chief: Refaat Mefrakis

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or anecdotal information are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.