

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-0135615

Owner: Village of Gordonville
Address: P.O. Box 83, Gordonville, MO 63752

Continuing Authority: Same as above
Address: Same as above

Facility Name: Gordonville Wastewater Treatment Facility
Facility Address: State Route Z, Gordonville, MO 63752

Legal Description: See page two (2)
UTM Coordinates: See page two (2)

Receiving Stream: See page two (2)
First Classified Stream and ID: See page two (2)
USGS Basin & Sub-watershed No.: See page two (2)

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

FACILITY DESCRIPTION

See page two (2)

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.

January 7, 2011
Effective Date

Sara Parker Pauley
Sara Parker Pauley, Director, Department of Natural Resources

January 6, 2016
Expiration Date

John Madros
John Madros, Director, Water Protection Program

FACILITY DESCRIPTION

Outfall #001 - POTW - SIC #4952 - Certified "D" Operator Required

Septic tank/ recirculation tank/ recirculating sand filter/ UV disinfection/ Sludge storage in septic tanks/ sludge removal by contract hauler.

Design population equivalent is 860
Design flow is 64,500 gallons per day.
Design sludge production is 12.9 dry tons/year.

Legal Description: NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793829.9, Y = 4135116.2
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

Outfall #002 - Sub-surface Irrigation

Partial sub-surface irrigation of treated (including UV disinfection) wastewater. Irrigation is dependant upon hydraulic need of row crops. Discharge is permitted only in the months of June through September. Irrigation conducted by third party – land owner.

Irrigation Volume/year: 8.2 million gallons/year
Irrigation area: 20 acres
Application rates: 0.014 inches/hour; 0.33 inches/day; 2.3 inches/week; 15.1 inches/year
Field slopes: less than 4 percent
Equipment type: Subsurface drip line
Vegetation: Row Crop
Application rate is based on: Hydraulic Loading

Legal Description: NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793736.0, Y = 4134980.1
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

Outfall #S1 – Receiving stream monitoring site – 0.1 mile upstream from Outfall #001 in Hubble Creek.

Legal Description: NW ¼, NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793740.6, Y = 4135202.6
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

Outfall #S2 – Receiving stream monitoring site – 0.25 mile downstream from Outfall #001 in Hubble Creek

Legal Description: NW ¼, SW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793799.6, Y = 4133450.7
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 3 of 10	
					PERMIT NUMBER MO-0135615	
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	MGD	*		*	once/day	24 hr. total
Biochemical Oxygen Demand ₅	mg/L		45	30	once/month	composite**
Total Suspended Solids	mg/L		45	30	once/month	composite**
<i>E. coli</i> (Note 1)	#/100 mL		1030	206	once/week	grab
pH – Units	SU	***		***	once/month	grab
Ammonia as N (April 1 – Sept 30) (Oct 1 – March 31)	mg/L	18 19		7.0 7.5	once/month	grab
Temperature	°C	*		*	once/month	grab
Oil & Grease	mg/L	15		10	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>February 28, 2011</u> . THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
Whole Effluent Toxicity (WET) test	% Survival	See Special Condition #9			once/permit cycle in 4 th year 24 hr. composite**	
MONITORING REPORTS SHALL BE SUBMITTED <u>ONCE PER PERMIT CYCLE</u> ; THE FIRST REPORT IS DUE <u>January 28, 2016</u> .						
<u>Outfall #S1 & #S2 – Receiving stream monitoring (Note 2)</u>						
Flow	MGD	*		*	once/quarter****	grab
Dissolved Oxygen	mg/L	*		*	once/quarter****	grab
pH – Units	SU	*		*	once/quarter****	grab
Temperature	°C	*		*	once/quarter****	grab
Ammonia as N	mg/L	*		*	once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2011</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, II, & III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS				PAGE NUMBER 4 of 10		
				PERMIT NUMBER MO-0135615		
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 #002</u>						
Nitrate – N (Note 3)	mg/L	20		*	once/month*****	grab
Irrigation Period	hours	*		*	once/day/event*****	total
Volume Irrigated	gallons	*		*	once/day/event*****	total
Application Area	acres	*		*	once/day/event*****	total
Application Rate	inches/ hour	*		*	once/day/event*****	total
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>January 28, 2012</u> .						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I, II, & III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** A modified composite sample is made up from a minimum of six 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 6.5-9.0 pH units.
- **** Sample once per quarter in the months of March, June, September, and December.
- ***** Once per month means that the permittee shall collect one sample per month that treated wastewater is diverted to the sub-surface irrigation site. If treated wastewater is not diverted to the sub-surface irrigation location, then the permittee shall indicate a “No – Discharge” for that given month in their Annual Report. Seasonal sub-surface irrigation is only permitted during the months of June, July, August, & September. Therefore, Nitrate-N samples shall only be collected in those previously listed months.
- ***** Once per day per event means that daily measurements shall be collected during each sub-surface land application event. If treated wastewater is not diverted to the sub-surface land application site during the applicable months, then the permittee shall indicate “No – Discharge” for that given month in their Annual Report.

Note 1 - Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31. The Monthly Average Limit for *E. coli* is expressed as a geometric mean.

Note 2 – This facility is required to conduct receiving stream monitoring. Please see Part E – Receiving Water Monitoring Conditions, page 10 of 10.

Note 3 – Samples for Nitrate-N shall be collected in a location after all mechanical and UV treatment. This facility’s plans document that a manhole located after said treatment and prior to the gate valve is located approximately 202 feet west of Outfall #001. Therefore, samples shall be collected at this location. If samples are collected in a different location, the permittee will need to inform the department of the location of the sample site. If the treated wastewater is not diverted to the sub-surface irrigation location, then the permittee shall indicate “No-Discharge” for that given month in their Annual Report.

C. INFLUENT MONITORING REQUIREMENTS		PAGE NUMBER 5 of 10	
		PERMIT NUMBER MO-0135615	
The facility is required to meet a removal efficiency of 55% or more as a monthly average for Biochemical Oxygen Demand ₅ and 35% or more as a monthly average for Total Suspended Solids. 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/month*****	composite**
Total Suspended Solids	mg/L	once/month*****	composite**
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>February 28, 2011</u> .			

C. INFLUENT MONITORING REQUIREMENTS (continued)

***** Influent and Effluent samples used to determine percent removal shall be taken the same day.

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 a facility with an area-wide management plan per 10 CSR 20-6.010(3)(B) 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.
5. Report as no-discharge when a discharge does not occur during the report period.

D. SPECIAL CONDITIONS (continued)

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. The permittee shall comply with any applicable requirements listed in 10 CSR 20-8 and 10 CSR 20-9, unless the facility has received written notification that the Department has approved a modification to the requirements. 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.
8. The permittee shall develop and implement a program for maintenance and repair of the collection system. The permittee shall submit a report annually in November to the Southeast Regional Office 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.
9. Whole Effluent Toxicity (WET) Test shall be conducted as follows:

SUMMARY OF ACUTE WET TESTING FOR THIS PERMIT					
OUTFALL	AEC	LC50%*	FREQUENCY	SAMPLE TYPE	MONTH
001	100%	>100%	Once per permit cycle	24 hour composite	Any

* LC50 = AEC / 0.3.

Dilution Series						
100%	50%	25%	12.5%	6.25%	(Control) 100% upstream, if available	(Control) 100% Lab Water, also called synthetic water

- (a) Test Schedule and Follow-Up Requirements
 - (1) Perform a MULTIPLE-dilution acute WET test in the months and at the frequency specified above. For tests which are successfully passed, submit test results using the Department's WET test report form #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation excepting for stormwater samples.
 - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.

D. SPECIAL CONDITIONS (continued)

- (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
 - (h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
 - (i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
 - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
 - (k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
 - (l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (3) If the effluent fails the test, a multiple dilution test shall be performed for BOTH test species within 30 calendar days and biweekly thereafter (for storm water, tests shall be performed on the next and subsequent storm water discharges as they occur, but not less than 7 days apart) until one of the following conditions are met:
- (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (4) Failure of a WET test is a violation of this permit.
- (5) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (b) PASS/FAIL procedure and effluent limitations:
- (1) To pass a multiple-dilution test:
 - (a) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC) OF 30% OR LESS, the AEC must be less than three-tenths (0.3) of the LC₅₀ concentration for the most sensitive of the test organisms; **OR**,
 - (b) For facilities with an AEC greater than 30%, the LC₅₀ concentration must be greater than 100%; **AND**,

D. SPECIAL CONDITIONS (continued)

- (c) All effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required.

(c) Test Conditions

- (1) Test Type: Acute Static non-renewal
- (2) All tests, including repeat tests for previous failures, shall include both test species listed below.
- (3) Test species: *Ceriodaphnia dubia* and *Pimephales promelas* (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
- (4) Test period: 48 hours at the "Allowable Effluent Concentration" (AEC) specified above.
- (5) Upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
- (6) Unless otherwise specified above, multiple-dilution tests will be run with:
 - (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) Reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.
- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

D. SPECIAL CONDITIONS (continued)

9. WET Test (continued).

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

E. RECEIVING WATER MONITORING CONDITIONS

1. In-stream samples should be taken at the location(s) specified on page 2 of this permit. For most class P streams the mixing zone is 0.25 mile. In the event that a safe, accessible location is not present at this location, a suitable location can be negotiated with the department. Samples should be taken at least four feet from the bank or from the middle of the stream (whichever is less) and 6-inches below the surface. The upstream receiving water sample should be collected at a point upstream from any influence of the effluent, where the water is visibly flowing down stream.
2. When conducting in-stream monitoring, the permittee shall record observations that include: the time of day, weather conditions, unusual stream/lake characteristics (e.g., septic conditions, algae growth, etc.), the stream segment (e.g., riffle, pool or run) or the lake depth from where the sample was collected. These observations shall be submitted with the sample results.
3. Samples shall not be collected from areas with especially turbulent flow, still water or from the stream bank, unless these conditions are representative of the stream reach or no other areas are available for sample collection. Sampling should not be made when significant precipitation has occurred recently. The sampling event should be terminated and rescheduled if any of the following conditions occur:
 - If turbidity in the stream increases notably; or
 - If rainfall over the past two weeks exceeds 2.5 inches or exceeds 1 inch in the last 24 hours
4. Always use the correct sampling technique and handling procedure specified for the parameter of interest. Please refer to the latest edition of Standard Methods for the Examination of Water and Wastewater for further discussion of proper sampling techniques. All analyses must be conducted in accordance with an approved EPA method. Meters shall be calibrated immediately (within 1 hour) prior to the sampling event.
5. To obtain accurate measurements, D.O., temperature and pH analyses should be performed on-site in the receiving stream where possible. However, due to high flow conditions, access, etc., it may be necessary to collect a sample in a bucket or other container. When this is necessary, care must be taken not to aerate the sample upon collection. If for any reason samples must be collected from an alternate site from the one listed in the permit, the permittee shall report the location with the sample results.
6. Dissolved oxygen measurements are to be taken during the period from one hour prior to sunrise to one and one-half hour after sunrise.
7. If water quality standards are being attained consistently during a three-year period, the department will confirm the results with an assessment. If the assessment verifies that water quality standards are being achieved, the permit requirement for in-stream monitoring will be reduced or removed.
8. Please contact the department if you need additional instructions or assistance.

Missouri Department of Natural Resources
FACT SHEET
FOR THE PURPOSE OF NEW OPERATING PERMIT
OF
MO-0135615
VILLAGE OF GORDONVILLE WASTEWATER TREATMENT FACILITY

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollution 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. Missouri State Operating Permits (MSOPs) are issued by the Director of the Missouri Department of Natural Resources (Department) 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). MSOPs are issued for a period of five (5) years unless otherwise specified.

As per [40 CFR Part 124.8(a)] and [10 CSR 20-6.020(1)2.] a Factsheet shall be prepared to give pertinent information regarding the applicable regulations, rationale for the development of effluent limitations and conditions, and the public participation process for the Missouri State Operating Permit (operating permit) listed below.

A Factsheet is not an enforceable part of an operating permit.

This Factsheet is for a Major , Minor , Industrial Facility ; Variance ;
Master General Permit ; General Permit Covered Facility ; and/or permit with widespread public interest .

Part I – Facility Information

Facility Type: POTW
Facility SIC Code(s): 4952

Facility Description:

Outfall #001

This facility will serve a 20 year population projection of 860 people. The proposed facility will consist of a recirculating sand filter with the capacity to treat an average daily design flow of 64,500 gallons per day of domestic wastewater. Preceding the recirculating sand filter is a septic tank and a recirculation tank. Ultraviolet disinfection is used prior to discharge. Sludge is to be removed by a contract hauler.

Partial (Seasonal) Subsurface Land Application

Alternate fate of the treated effluent is subsurface land application, which may be used instead of a direct discharge to the receiving stream. Treated effluent (including UV disinfection) is diverted to the subsurface land application site for row crops via a manual gate valve, which is contained on the property of this facility. The subsurface drip land application system will consist of drip lines that vary in depth from 24" to 36" deep. Please see the Comments section below for a further description.

Have any changes occurred at this facility or in the receiving water body that effects effluent limit derivation?

- Yes.
 - No.

Application Date: August 23, 2010
Expiration Date: Not applicable
Last Inspection: Not applicable

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.1	Secondary	Domestic Municipal	0.0

Outfall #001 – Main Facility Outfall

Legal Description: NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793829.9, Y = 4135116.2 (GIS from interactive map viewer)
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

Outfall #002 – Partial Sub-surface Irrigation site

Legal Description: NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County
UTM Coordinates: X = 793736.0, Y = 4134980.1 (GIS from interactive map viewer at the center of the 20 acre field)
Receiving Stream: Hubble Creek (P)
First Classified Stream and ID: Hubble Creek (P) (02197)
USGS Basin & Sub-watershed No.: (07140107 - 060001)

Receiving Water Body’s Water Quality & Facility Performance History:

None – new facility

Comments:

On April 9, 2008, the department completed a Water Quality Review Sheet (WQRS) for this facility. As part of the 04/09/2008 WQRS, Midwest Environmental Consultants Water Resources submitted a Water Quality Study including a Streeter-Phelps Model (model) for the analysis of critical dissolved oxygen sag. The model documented that the Secondary Treatment Effluent Limit Guidelines were protective of the receiving stream’s water quality.

However, staff drafting this Fact Sheet and operating permit determined that the critical low-flow and Mixing Considerations calculations are indefensible due to the fact that these calculations used the above stream facilities’ total Design Flow. Consequently, on October 22, 2008, a new WQRS was developed that used above stream facilities’ average flows, which were obtained from submitted Discharge Monitoring Reports. Please see **Appendix A – WQRS**.

Regarding the Partial & Seasonal subsurface land application, department staff drafting this operating permit and fact sheet have reviewed the Facility’s Plans and Specifications (Plans) to determine if an instream process compliance point could be determined for sampling treated effluent wastewater prior to being land applied. As documented on the plans and specifications of this facility, there is a manhole approximately 202’ West of Outfall #001 from which effluent can be sampled – if need be.

Part II – Operator Certification Requirements

As per [10 CSR 20-6.010(8) Terms and Conditions of a Permit], permittees shall operate and maintain facilities to comply with the Missouri Clean Water Law and applicable permit conditions and regulations. Operators or supervisors of operations at regulated wastewater treatment facilities shall be certified in accordance with [10 CSR 20-9.020(2)] and any other applicable state law or regulation. As per [10 CSR 20-9.010(2)(A)], requirements for operation by certified personnel shall apply to all wastewater treatment systems, if applicable, as listed below:

Check boxes below that are applicable to the facility;

- Owned or operated by or for:
 - Municipalities
 - Public Sewer District:
 - County
 - Public Water Supply Districts:
 - Private sewer company regulated by the Public Service Commission:
 - State or Federal agencies:

Each of the above entities are only applicable if they have a Population Equivalent greater than two hundred (200) and/or fifty (50) or more service connections.

This facility currently requires an operator with a D Certification Level. Please see **Appendix B – Classification Worksheet**. Modifications made to the wastewater treatment facility may cause the classification to be modified.

Operator's Name: Elizabeth Long, P.E.
Certification Number: 9417
Certification Level: D

The listing of the operator above only signifies that staff drafting this operating permit have reviewed appropriate Department records and determined that the name listed on the operating permit application has the correct and applicable Certification Level.

Part III – Receiving Stream Information

APPLICABLE DESIGNATIONS OF WATERS OF THE STATE:

As per Missouri's Effluent Regulations [10 CSR 20-7.015], the waters of the state are divided into the below listed seven (7) categories. Each category lists effluent limitations for specific parameters, which are presented in each outfall's Effluent Limitation Table and further discussed in the Derivation & Discussion of Limits section.

- Missouri or Mississippi River [10 CSR 20-7.015(2)]:
- Lake or Reservoir [10 CSR 20-7.015(3)]:
- Losing [10 CSR 20-7.015(4)]:
- Metropolitan No-Discharge [10 CSR 20-7.015(5)]:
- Special Stream [10 CSR 20-7.015(6)]:
- Subsurface Water [10 CSR 20-7.015(7)]:
- All Other Waters [10 CSR 20-7.015(8)]:

10 CSR 20-7.031 Missouri Water Quality Standards, 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 and/or 1st classified receiving stream's beneficial water uses to be maintained are located in the Receiving Stream Table located below in accordance with [10 CSR 20-7.031(3)].

RECEIVING STREAM(S) TABLE:

WATERBODY NAME	CLASS	WBID	DESIGNATED USES*	8-DIGIT HUC	EDU**
Hubble Creek***	P	02197	LWW, AQL, WBC(B)	07140107	Ozark / Upper St. Francis / Castor

* - Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life and Human Health-Fish Consumption (AQL), Cool Water Fishery(CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation (WBC), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

** - Ecological Drainage Unit

*** - UAA has not been conducted.

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

Please see **Appendix A – WQRS**.

MIXING CONSIDERATIONS TABLE:

Please see **Appendix A – WQRS**.

MIXING ZONE (CFS) 10 CSR 20-7.031(4)(A)4.B.(II)(a)		ZONE OF INITIAL DILUTION (CFS) 10 CSR 20-7.031(4)(A)4.B.(II)(b)	
7Q10	30Q10	1Q10	7Q10
0.78	1.0	0.078	0.078

RECEIVING STREAM MONITORING REQUIREMENTS:

Because the above low-flow values and Mixing Considerations calculations were developed with data that does not use actual daily monitoring, receiving stream monitoring is being implemented. This is to determine if the effluent limitations established in the October 2008 WQRS are protective of the receiving stream's Water Quality.

Site 01. (Upstream)

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Flow (MGD)	Once/quarter	Grab	See Outfall S1 below.
Dissolved Oxygen (mg/L)	Once/quarter	Grab	
pH Units (SU)	Once/quarter	Grab	
Temperature (°C)	Once/quarter	Grab	
Ammonia as N (mg/L)	Once/quarter	Grab	

Outfall #S1 – Receiving stream monitoring site – 0.1 mile upstream from Outfall #001 in Hubble Creek.

Legal Description: NW ¼, NW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County

UTM Coordinates: X = 793740.6, Y = 4135202.6 (GIS from interactive map viewer)

Receiving Stream: Hubble Creek (P)

First Classified Stream and ID: Hubble Creek (P) (02197)

USGS Basin & Sub-watershed No.: (07140107 - 060001)

Site 02. (Downstream)

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Flow (MGD)	Once/quarter	Grab	See Outfall S2 below.
Dissolved Oxygen (mg/L)	Once/quarter	Grab	
pH Units (SU)	Once/quarter	Grab	
Temperature (°C)	Once/quarter	Grab	
Ammonia as N (mg/L)	Once/quarter	Grab	

Outfall #S2 – Receiving stream monitoring site – 0.25 mile downstream from Outfall #001 in Hubble Creek

Legal Description: NW ¼, SW ¼, US Survey 00242, T31N, R12E, Cape Girardeau County

UTM Coordinates: X = 793799.6, Y = 4133450.7 (GIS from interactive map viewer)

Receiving Stream: Hubble Creek (P)

First Classified Stream and ID: Hubble Creek (P) (02197)

USGS Basin & Sub-watershed No.: (07140107 - 060001)

Part IV – Rationale and Derivation of Effluent Limitations & Permit Conditions

ALTERNATIVE EVALUATIONS FOR NEW FACILITIES:

As per [10 CSR 20-7.015(4)(A)], discharges to losing streams shall be permitted only after other alternatives including land application, discharges to a gaining stream and connection to a regional wastewater treatment facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.

Applicable ;

Not Applicable ;

The facility does not discharge to a Losing Stream as defined by [10 CSR 20-2.010(36)] & [10 CSR 20-7.031(1)(N)], or is an existing facility.

ANTI-BACKSLIDING:

A provision in the Federal Regulations [CWA §303(d)(4); CWA §402(c); 40 CFR Part 122.44(I)] that requires a reissued permit to be as stringent as the previous permit with some exceptions.

- New facility, backsliding does not apply.

- All limits in this operating permit are at least as protective as those previously established; therefore, backsliding does not apply.

- Limitations in this operating permit for the reissuance of this permit conform to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, and 40 CFR Part 122.44.

ANTIDegradation:

In accordance with Missouri's Water Quality Standard [10 CSR 20-7.031(2)], the Department is to document by means of Antidegradation Review that the use of a water body's available assimilative capacity is justified. Degradation is justified by documenting the socio-economic importance of a discharging activity after determining the necessity of the discharge.

- The construction permit application was received on August 25, 2008, prior to the final compliance date of August 31, 2008.
- Renewal no degradation proposed and no further review necessary.
- New and/or expanded discharge.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:

As per [10 CSR 20-6.010(3)(B)], ...An applicant may utilize a lower preference continuing authority by submitting, as part of the application, a statement waiving preferential status from each existing higher preference authority, providing the waiver does not conflict with any area-wide management plan approved under section 208 of the Federal Clean Water Act or any other regional sewage service and treatment plan approved for higher preference authority by the Department.

BIOSOLIDS, SLUDGE, & SEWAGE SLUDGE:

Bio-solids are solid materials resulting from wastewater treatment that meet federal and state criteria for beneficial uses (i.e. fertilizer). Sludge is any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. Sewage sludge is solids, semi-solids, or liquid residue generated during the treatment of domestic sewage in a treatment works; including but not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in a treatment works. Additional information regarding biosolids and sludge is located at the following web address: <http://dnr.mo.gov/env/wpp/pub/index.html>, items WQ422 through WQ449.

- Permittee land applies biosolids in accordance with Standard Conditions III and a Department approved biosolids management plan.
- Sludge/biosolids are removed by contract hauler or are stored.
- Not applicable;
This condition is not applicable to the permittee for this facility.

COMPLIANCE AND ENFORCEMENT:

Enforcement is the action taken by the Water Protection Program (WPP) to bring an entity into compliance with the Missouri Clean Water Law, its implementing regulations, and/or any terms and conditions of an operating permit. The primary purpose of the enforcement activity in the WPP is to resolve violations and return the entity to compliance.

Applicable ;
The permittee/facility is currently under enforcement action.

Not Applicable ;
The permittee/facility is not currently under Water Protection Program enforcement action.

PRETREATMENT PROGRAM:

The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a Publicly Owned Treatment Works [40 CFR Part 403.3(q)].

Pretreatment programs are required at any POTW (or combination of POTW operated by the same authority) and/or municipality with a total design flow greater than 5.0 MGD and receiving industrial wastes that interfere with or pass through the treatment works or are otherwise subject to the pretreatment standards. Pretreatment programs can also be required at POTWs/municipals with a design flow less than 5.0 MGD if needed to prevent interference with operations or pass through.

Several special conditions pertaining to the permittee's pretreatment program may be included in the permit, and are as follows:

- Implementation and enforcement of the program,
- Annual pretreatment report submittal,
- Submittal of list of industrial users,
- Technical evaluation of need to establish local limitations, and
- Submittal of the results of the evaluation

Applicable ;

This permittee has an approved pretreatment program in accordance with the requirements of [40 CSR Part 403] and [10 CSR 20-6.100] and is expected to implement and enforce its approved program.

Not Applicable ;

The permittee, at this time, is not required to have a Pretreatment Program or does not have an approved pretreatment program.

REASONABLE POTENTIAL ANALYSIS (RPA):

Federal regulation [40 CFR Part 122.44(d)(1)(i)] requires effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above narrative or numeric water quality standard.

In accordance with [40 CFR Part 122.44(d)(iii)] if the permit writer determines that any give pollutant has the reasonable potential to cause, or contribute to an in-stream excursion above the WQS, the permit must contain effluent limits for that pollutant.

Applicable ;

A RPA was conducted on appropriate parameters.

Not Applicable ;

A RPA was not conducted for this facility.

REMOVAL EFFICIENCY:

Removal efficiency is a method by which the Federal Regulations define Secondary Treatment and Equivalent to Secondary Treatment, which applies to Biochemical Oxygen Demand 5-day (BOD₅) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs)/municipals. Please see the United States Environmental Protection Agency's (EPA) website for interpretation of percent removal requirements for National Pollutant Discharge Elimination System Permit Application Requirements for Publicly Owned Treatment Works and Other Treatment Works Treating Domestic Sewage at www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm.

Applicable ;

Secondary Treatment is 85% removal [40 CFR Part 133.102(a)(3) & (b)(3)].

Applicable ;

Equivalent to Secondary Treatment is 65% removal [40 CFR Part 133.105(a)(3) & (b)(3)].

Applicable ;

This wastewater treatment facility is not a POTW; however, influent monitoring is being required to determine percent removal.

Not Applicable ;

Influent monitoring is not being required to determine percent removal.

SANITARY SEWER OVERFLOWS (SSOs), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:

Sanitary Sewer Systems (SSSs) are municipal wastewater collection systems that convey domestic, commercial, and industrial wastewater, and limited amounts of infiltrated groundwater and storm water (i.e. I&I), to a POTW. SSSs are not designed to collect large amounts of storm water runoff from precipitation events.

Untreated or partially treated discharges from SSSs are commonly referred to as SSOs. SSOs have a variety of causes including blockages, line breaks, sewer defects that allow excess storm water and ground water to overload the system, lapses in sewer system operation and maintenance, inadequate sewer design and construction, power failures, and vandalism. A SSO is defined as an untreated or partially treated sewage release from a SSS. SSOs can occur at any point in an SSS, during dry weather or wet weather. SSOs include overflows that reach waters of the state. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations. SSSs can back up into buildings, including private residences. When sewage backups are caused by problems in the publicly-owned portion of an SSS, they are considered SSOs.

Applicable ;

In accordance with 40 CFR Part 122.41(e), the permittee is required to develop and/or implement a program for maintenance and repair of the collection system and shall be required in this operating permit by either means of a Special Condition or Schedule of Compliance. In addition, the Department considers the development of this program as an implementation of this condition. Additionally, 40 CFR Part 403.3(o) defines a POTW to include any device and systems used in the storage, treatment, recycling and reclamation of municipal sewage or industrial wastes of liquid nature. It also includes sewers, pipes, and other conveyances only if they convey wastewater to a POTW Treatment Plant.

At this time, the Department recommends the US EPA's Guide for Evaluating Capacity, Management, Operation and Maintenance (CMOM) Programs At Sanitary Sewer Collection Systems (Document # EPA 305-B-05-002). The CMOM identifies some of the criteria used by the EPA to evaluate a collection system's management, operation, and maintenance and was intended for use by the EPA, state, regulated community, and/or third party entities. The CMOM is applicable to small, medium, and large systems; both public and privately owned; and both regional and satellite collection systems. The CMOM does not substitute for the Clean Water Act, the Missouri Clean Water Law, and both federal and state regulations, as it is not a regulation.

Not Applicable ;

This facility is not required to develop or implement a program for maintenance and repair of the collection system; however, it is a violation of Missouri State Environmental Laws and Regulations to allow untreated wastewater to discharge to waters of the state.

SCHEDULE OF COMPLIANCE (SOC):

A schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (actions, operations, or milestone events) leading to compliance with the Missouri Clean Water Law, its implementing regulations, and/or the terms and conditions of an operating permit.

Applicable ;

The time given for effluent limitations of this permit listed under Interim Effluent Limitation and Final Effluent Limitations were established in accordance with [10 CSR 20-7.031(10)].

Not Applicable ;

This permit does not contain a SOC.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP):

In accordance with 40 CFR 122.44(k) *Best Management Practices (BMPs)* to control or abate the discharge of pollutants when: (1) Authorized under section 304(e) of the Clean Water Act (CWA) for the control of toxic pollutants and hazardous substances from ancillary industrial activities; (2) Authorized under section 402(p) of the CWA for the control of storm water discharges; (3) Numeric effluent limitations are infeasible; or (4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.

In accordance with the EPA's *Developing Your Stormwater Pollution Prevention Plan, A Guide for Industrial Operators*, (Document number EPA 833-B-09-002) [published by the United States Environmental Protection Agency (USEPA) in February 2009], BMPs are measures or practices used to reduce the amount of pollution entering (regarding this operating permit) waters of the state. BMPs may take the form of a process, activity, or physical structure.

Additionally in accordance with the Storm Water Management, a SWPPP is a series of steps and activities to (1) identify sources of pollution or contamination, and (2) select and carry out actions which prevent or control the pollution of storm water discharges.

Applicable ;

A SWPPP shall be developed and implemented for each site and shall incorporate required practices identified by the Department with jurisdiction, incorporate erosion control practices specific to site conditions, and provide for maintenance and adherence to the plan.

Not Applicable ;

At this time, the permittee is not required to develop and implement a SWPPP.

VARIANCE:

As per the Missouri Clean Water Law § 644.061.4, variances shall be granted for such period of time and under such terms and conditions as shall be specified by the commission in its order. The variance may be extended by affirmative action of the commission. In no event shall the variance be granted for a period of time greater than is reasonably necessary for complying with the Missouri Clean Water Law §§644.006 to 644.141 or any standard, rule or regulation promulgated pursuant to Missouri Clean Water Law §§644.006 to 644.141.

Applicable ;

Not Applicable ;

This operating permit is not drafted under premises of a petition for variance.

WASTELOAD ALLOCATIONS (WLA) FOR LIMITS:

As per [10 CSR 20-2.010(78)], the amount of pollutant each discharger is allowed by the Department to release into a given stream after the Department has determined total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable ;

Please see **Appendix A – WQRS**.

Wasteload allocations were calculated where applicable 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

Cs = upstream concentration

Qs = upstream flow

Ce = effluent concentration

Qe = 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).

Number of Samples “n”:

Additionally, in accordance with the TSD for water quality-based permitting, effluent quality is determined by the underlying distribution of daily values, which is determined by the Long Term Average (LTA) associated with a particular Wasteload Allocation (WLA) and by the Coefficient of Variation (CV) of the effluent concentrations. Increasing or decreasing the monitoring frequency does not affect this underlying distribution or treatment performance, which should be, at a minimum, be targeted to comply with the values dictated by the WLA. Therefore, it is recommended that the actual planned frequency of monitoring normally be used to determine the value of “n” for calculating the AML. However, in situations where monitoring frequency is once per month or less, a higher value for “n” must be assumed for AML derivation purposes. Thus, the statistical procedure being employed using an assumed number of samples is “n = 4” at a minimum. For Total Ammonia as Nitrogen, “n = 30” is used.

Not Applicable ;

Wasteload allocations were not calculated.

WLA MODELING:

There are two general types of effluent limitations, technology-based effluent limits (TBELs) and water quality based effluent limits (WQBELs). If TBELs do not provide adequate protection for the receiving waters, then WQBEL must be used.

Applicable ;

Please see **Appendix A – WQRS**.

Not Applicable ;

A WLA study was either not submitted or determined not applicable by Department staff.

WATER QUALITY STANDARDS:

Per [10 CSR 20-7.031(3)], General Criteria shall be applicable to all waters of the state at all times including mixing zones. Additionally, [40 CFR 122.44(d)(1)] directs the Department to establish in each NPDES permit to include conditions to achieve water quality established under Section 303 of the Clean Water Act, including State narrative criteria for water quality.

WHOLE EFFLUENT TOXICITY (WET) TEST:

A WET test is a quantifiable method of determining if a discharge from a facility may be causing toxicity to aquatic life by itself, in combination with or through synergistic responses when mixed with receiving stream water.

Applicable ;

Under the federal Clean Water Act (CWA) §101(a)(3), requiring WET testing is reasonably appropriate for site-specific Missouri State Operating Permits for discharges to waters of the state issued under the National Pollutant Discharge Elimination System (NPDES). WET testing is also required by 40 CFR 122.44(d)(1). WET testing ensures that the provisions in the 10 CSR 20-6.010(8)(A)7. and the Water Quality Standards 10 CSR 20-7.031(3)(D),(F),(G),(I)2.A & B are being met. Under [10 CSR 20-6.010(8)(A)4], the Department may require other terms and conditions that it deems necessary to assure compliance with the Clean Water Act and related regulations of the Missouri Clean Water Commission. In addition the following MCWL apply: §§644.051.3 requires the Department to set permit conditions that comply with the MCWL and CWA; 644.051.4 specifically references toxicity as an item we must consider in writing permits (along with water quality-based effluent limits, pretreatment, etc...); and 644.051.5 is the basic authority to require testing conditions. WET test will be required by all facilities meeting the following criteria:

- Facility is a designated Major.
- Facility continuously or routinely exceeds its design flow.
- Facility (industrial) that alters its production process throughout the year.
- Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
- Facility has Water Quality-based Effluent Limitations for toxic substances (other than NH₃)
- Facility is a municipality or domestic discharger with a Design Flow ≥ 22,500 gpd.
- Other – please justify.

Not Applicable ;

At this time, the permittee is not required to conduct WET test for this facility.

303(d) LIST & TOTAL MAXIMUM DAILY LOAD (TMDL):

Section 303(d) of the federal Clean Water Act requires that each state identify waters that are not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect such beneficial uses of water as whole body contact (such as swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock and wildlife. The 303(d) list helps state and federal agencies keep track of waters that are impaired but not addressed by normal water pollution control programs.

A TMDL is a calculation of the maximum amount of a given pollutant that a body of water can absorb before its water quality is affected. If a water body is determined to be impaired as listed on the 303(d) list, then a watershed management plan will be developed that shall include the TMDL calculation

Applicable ;

Not Applicable ;

This facility does not discharge to a 303(d) listed stream.

Part V – Effluent Limits Determination

Outfall #001 – Main Facility Outfall

Effluent limitations derived and established in the below Effluent Limitations Table are based on current operations of the facility. Future permit action due to facility modification may contain new operating permit terms and conditions that supercedes the terms and conditions, including effluent limitations, of this operating permit.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*		*		
BOD ₅	MG/L	1, 8		45	30		
TSS	MG/L	1		45	30		
ESCHERICHIA COLI	**	1, 2, 3		1030	206		
pH	SU	1	6.5 – 9.0		6.5 – 9.0		
AMMONIA AS N (MAY 1 – OCT 31)	MG/L	5	18		7.0		
AMMONIA AS N (NOV 1 – APR 30)	MG/L	5	19		7.5		
TEMPERATURE	°C	9	*		*		
OIL & GREASE	MG/L	1	15		10		
WHOLE EFFLUENT TOXICITY (WET) TEST	% Survival	11	Please see WET Test in the Derivation and Discussion Section below.				
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

** - # of colonies/100mL; the Monthly Average for *E. coli* is a geometric mean.

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #001 – DERIVATION AND DISCUSSION OF LIMITS:

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD₅).** 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average [10 CSR 20-7.015(8)(B)1].
- **Total Suspended Solids (TSS).** 45 mg/L as a Weekly Average and 30 mg/L as a Monthly Average [10 CSR 20-7.015(8)(B)1].
- **Escherichia coli (E. coli).** Monthly average of 206 per 100 ml as a geometric mean and Weekly Average of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C). Weekly Average effluent variability will be evaluated in development of a future effluent limit. An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d).
- **pH.** pH shall be maintained in the range from six to nine (6.5 – 9.0) 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] default pH 7.8 SU. **Please see Appendix A – WQRS.**

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

Chronic WLA: $C_e = ((0.10 + 1.0)1.5 - (1.0 * 0.9))/0.10$
 $C_e = 7.5 \text{ mg/L}$

Acute WLA: $C_e = ((0.10 + 0.078)12.1 - (0.078 * 0.9))/0.10$
 $C_e = 21 \text{ mg/L}$

$LTA_c = 7.5 \text{ mg/L} (0.780) = \mathbf{5.9 \text{ mg/L}}$
 $LTA_a = 21 \text{ mg/L} (0.321) = 6.7 \text{ mg/L}$

[CV = 0.6, 99th Percentile, 30 day avg.]
[CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 5.9 mg/L (3.11) = 18 mg/L
AML = 5.9 mg/L (1.19) = 7.0 mg/L

[CV = 0.6, 99th Percentile]
[CV = 0.6, 95th Percentile, n =30]

Winter: November 1 – April 30

Chronic WLA: $C_e = ((0.10 + 1.0)3.1 - (1.0 * 2.6))/0.10$
 $C_e = 8.1 \text{ mg/L}$

Acute WLA: $C_e = ((0.10 + 0.078)12.1 - (0.078 * 2.6))/0.10$
 $C_e = 20 \text{ mg/L}$

$LTA_c = 8.1 \text{ mg/L} (0.780) = \mathbf{6.3 \text{ mg/L}}$
 $LTA_a = 20 \text{ mg/L} (0.321) = 6.4 \text{ mg/L}$

[CV = 0.6, 99th Percentile, 30 day avg.]
[CV = 0.6, 99th Percentile]

Use most protective number of LTA_c or LTA_a.

MDL = 6.3 mg/L (3.11) = 19 mg/L
AML = 6.3 mg/L (1.19) = 7.5 mg/L

[CV = 0.6, 99th Percentile]
[CV = 0.6, 95th Percentile, n =30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	18	7.0
Winter	19	7.5

- **Temperature.** Monitoring requirement due to the toxicity of Ammonia varies by temperature.
- **Oil & Grease.** Conventional pollutant, effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **WET Test.** WET Testing schedules and intervals are established in accordance with the Department’s Permit Manual; Section 5.2 *Effluent Limits / WET Testing for Compliance Bio-monitoring*. It is recommended that WET testing be conducted during the period of lowest stream flow.
 - Chronic
 - Acute
 - No less than ONCE/PERMIT CYCLE:**
 - Municipality or domestic facility with a design flow \geq 22,500 gpd, but less than 1.0 MGD.
 - No less than ONCE/YEAR:**
 - Facility is designated as a Major facility or has a design flow \geq 1.0 MGD.
 - Facility continuously or routinely exceeds their design flow.
 - Facility exceeds its design population equivalent (PE) for BOD₅ whether or not its design flow is being exceeded.
 - Facility has Water Quality-based effluent limitations for toxic substances (other than NH₃).
 - No less than TWICE/YEAR:**
 - Facility is subject to production processes alterations throughout the year.
 - Facility handles large quantities of toxic substances, or substances that are toxic in large amounts.
 - Facility has been granted seasonal relief of numeric limitations.

Acute and/or Chronic Allowable Effluent Concentrations (AECs) for facilities that discharge to unclassified, Class C, Class P (with default Mixing Considerations), or Lakes [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] are 100%, 50%, 25%, 12.5%, & 6.25%.

Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

$$\text{Acute AEC\%} = ((\text{design flow}_{\text{cfs}} + \text{ZID}_{7\text{Q}10}) / \text{design flow}_{\text{cfs}})^{-1}] \times 100 = \#\#\%$$

- **Minimum Sampling and Reporting Frequency Requirements.** Department guidance states that new facilities are to have a minimum sampling and reporting frequency of once/month. This requirement shall be implemented for a minimum of three (3) years or until renewal. It is the responsibility of the permittee to request that the sampling and reporting frequency be modified to minimum requirements at such time as listed above. If the modification is made prior to this facility’s next renewal, then the permittee will need to submit a modification application and modification fee.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
FLOW	ONCE/DAY	ONCE/MONTH
BOD ₅	ONCE/MONTH	ONCE/MONTH
TSS	ONCE/MONTH	ONCE/MONTH
<i>E. COLI</i>	ONCE/WEEK	ONCE/MONTH
PH	ONCE/MONTH	ONCE/MONTH
AMMONIA AS N (MAY 1 – OCT 31)	ONCE/MONTH	ONCE/MONTH
AMMONIA AS N (NOV 1 – APR 30)	ONCE/MONTH	ONCE/MONTH
TEMPERATURE	ONCE/MONTH	ONCE/MONTH
OIL & GREASE	ONCE/MONTH	ONCE/MONTH

Outfall #002 – Partial Sub-surface Irrigation.

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
NITRATE	MG/L	9	20		*		
IRRIGATION PERIOD	HOURS	1	*		*		
VOLUME IRRIGATED	GALLONS	1	*		*		
APPLICATION AREA	ACRES	1	*		*		
APPLICATION RATE	INCHES/HOUR	1	*		*		
MONITORING FREQUENCY	Please see Minimum Sampling and Reporting Frequency Requirements in the Derivation and Discussion Section below.						

* - Monitoring requirement only.

Basis for Limitations Codes:

- | | |
|--|------------------------------------|
| 1. State or Federal Regulation/Law | 7. Antidegradation Policy |
| 2. Water Quality Standard (includes RPA) | 8. Water Quality Model |
| 3. Water Quality Based Effluent Limits | 9. Best Professional Judgment |
| 4. Lagoon Policy | 10. TMDL or Permit in lieu of TMDL |
| 5. Ammonia Policy | 11. WET Test Policy |
| 6. Dissolved Oxygen Policy | 12. Antidegradation Review |

OUTFALL #002 – DERIVATION AND DISCUSSION OF LIMITS:

- Nitrate-N.** As part of the process to obtain a WQRS and/or construction permit, a Geohydrologic Evaluation of Liquid-Waste Treatment Site (Geohydro Evaluation) project number LWE08156 was finalized by a State of Missouri Registered Geologist on March 3, 2008. As part of the Geohydro Evaluation remarks section, it stated, "...If the recirculating filter bed should ever cease to function properly, the resulting effluent could contaminate surface and shallow groundwaters supplies, including the surface water of Hubble Creek." The Geohydro Evaluation also indicated that this facility will be constructed within one mile of several mapped faults, and 0.75 mile from a cluster of sinkholes to this facility's Northeast. Due to these facts and that this facility allows for seasonal (June, July, August, & September) sub-surface irrigation, it is reasonably expected to allow wastewater effluents to reach an aquifer.

However, this facility has been design for nitrogen removal, that is Total Nitrogen (TN). Conventional Recirculating Sand Filters send treated effluent from the sand filter back to the recirculation tank at a rate of 80% with 20% being discharged. This treatment facility consist of an on-site denitrification system that allows the permittee to send 80% of the treated effluent from the sand filter back to "Head" of the treatment facility, which in this case is a large septic tank with two (2) chambers. Systems that use this method yield an average of 64% TN reduction, with effluent TN concentrations averaging 20 mg/L (Intermittent Sand Filters: New Frontiers for an Ancient Art), <http://septictankinfo.com/VenhSandFilter.html#DNR>.

Therefore, it is the best professional judgment consideration of staff drafting this fact sheet, that a Nitrate-N effluent limitation of 20 mg/L as a Daily Maximum be established rather than requiring monitoring only for Daily Maximum and Monthly Average. In addition to the establishing of an effluent limitation, please see the Minimum Sampling and Reporting Frequency Requirements for Nitrate. The 20 mg/L Daily Maximum limitation is based on the draft template for Sub-Surface Discharging Guidance Document, which is currently under development.

- All other Parameters.** Parameters established for purpose of sub-surface partial irrigation are based on Missouri State Regulation [10 CSR 20-6.015(4)(C)]. The irrigated time period ranges from June to September annually at a maximum rate of 15.1 inches/year (0.014 inches/hour or 0.33 inches per day). The application rate is based on hydraulic loading.

- **Minimum Sampling and Reporting Frequency Requirements.** The sampling and reporting frequency requirements are also based on [10 CSR 20-6.015(4)(C)], which will be established in the operating permit as follows:

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
NITRATE	ONCE/MONTH*	ONCE/YEAR
IRRIGATION PERIOD	ONCE/DAY/EVENT**	ONCE/YEAR
VOLUME IRRIGATED	ONCE/DAY/EVENT**	ONCE/YEAR
APPLICATION AREA	ONCE/DAY/EVENT**	ONCE/YEAR
APPLICATION RATE	ONCE/DAY/EVENT**	ONCE/YEAR

* Once per month means that the permittee shall collect one sample per month that treated wastewater is diverted to the sub-surface irrigation site. If treated wastewater is not diverted to the sub-surface irrigation location, then the permittee shall indicate a “No – Discharge” for that given month in their Annual Report. Seasonal sub-surface irrigation is only permitted during the months of June, July, August, & September. Therefore, Nitrate-N samples shall only be collected in those previously listed months.

** Once per day per event means that daily measurements shall be collected during each sub-surface land application event. If treated wastewater is not diverted to the sub-surface land application site during the applicable months, then the permittee shall indicate “No – Discharge” for that given month in their Annual Report.

Part VI – Administrative Requirements

On the basis of preliminary staff review and the application of applicable standards and regulations, the Department, as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions contained herein and within the operating permit. The proposed determinations are tentative pending public comment.

PUBLIC NOTICE:

The Department shall give public notice that a draft permit has been prepared and its issuance is pending. Additionally, public notice will be issued if a public hearing is to be held because of a significant degree of interest in and water quality concerns related to a draft permit. No public notice is required when a request for a permit modification or termination is denied; however, the requester and permittee must be notified of the denial in writing.

The Department must issue public notice of a pending operating permit or of a new or reissued statewide general permit. The public comment period is the length of time not less than 30 days following the date of the public notice which interested persons may submit written comments about the proposed permit.

For persons wanting to submit comments regarding this proposed operating permit, then please refer to the Public Notice page located at the front of this draft operating permit. The Public Notice page gives direction on how and where to submit appropriate comments.

- The Public Notice period for this operating permit was from November 7, 2008 to December 10, 2008. No responses received or responses to the Public Notice of this operating permit do not warrant the modification of effluent limits and/or the terms and conditions of this permit.

DATE OF FACT SHEET: OCTOBER 24, 2008

COMPLETED BY:

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Part VII – Appendices

APPENDIX A - WQRS

Facility Information

FACILITY NAME: Village of Gordonville WWTF NPDES #: n/a

FACILITY TYPE/DESCRIPTION: The Village of Gordonville has a 40% grant and direct loan to construct a new wastewater facility collection and treatment system. The treatment system will consist of sedimentation followed by a recirculating sand filter with UV disinfection. Only sanitary wastes will be discharge to the facility. Design flow is 0.065 MGD.

EDU*: Ozark/Upper St. Francis/Castor (OUSFC) 8- DIGIT HUC: 07140107 COUNTY: Cape Girardeau
* - Ecological Drainage Unit

LEGAL DESCRIPTION: NW ¼ USPS 242, T31N, R12E LATITUDE/LONGITUDE: 37.31712 degrees, 89.67315 degrees

WATER QUALITY HISTORY: New facility.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.10	Secondary	Hubble Creek	0.0

Receiving Waterbody Information

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES **
			1Q10	7Q10	30Q10	
Hubble Creek	P	2197	0.1	0.1	1.0	LWW, AQL, WBC(B)

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

COMMENTS: Geohydrological Evaluation was reviewed with the request. Stream is considered gaining; however, sinkholes were noted north of the site. No Section 303 (d) or TMDL listing for this waterbody.

MEC Water Resource, on behalf of Waters Engineering, submitted a report, Water Quality Review and Impact Summary, with Streeter Phelps Dissolved Oxygen modeling (See Appendix A), BOD wasteload allocation determinations, and calculations of ammonia limits using the ammonia decay formula. The Derivation and Discussion of Limits section below discusses their results. Appendix B has a map of the discharge location. UV disinfection is proposed; therefore no total residual chlorine limits will be determined.

Antidegradation Policy

IN ACCORDANCE WITH MISSOURI’S WATER QUALITY STANDARD [10 CSR 20-7.031(2)] AND FEDERAL ANTIDEGRADATION POLICY AT TITLE 40 CODE OF FEDERAL REGULATION (CFR) SECTION 131.12 (A), THE DEPARTMENT IS TO DEVELOP A STATEWIDE ANTIDEGRADATION POLICY AND CORRESPONDING PROCEDURES TO IMPLEMENT THE POLICY. A PROPOSED DISCHARGE TO A WATER BODY WILL BE REQUIRED TO UNDERGO A LEVEL OF ANTIDEGRADATION REVIEW WHICH DOCUMENTS THAT THE USE OF A WATER BODY’S AVAILABLE ASSIMILATIVE CAPACITY IS JUSTIFIED. EFFECTIVE TENTATIVELY AUGUST 2008 (DEPENDING ON THE RULEMAKING PROCESS), A FACILITY WILL BE REQUIRED TO USE MISSOURI’S ANTIDEGRADATION RULE AND IMPLEMENTATION PROCEDURE. THIS PROCEDURE WILL BE APPLICABLE TO NEW

AND EXPANDED WASTEWATER FACILITIES. IF THE FACILITY SUBMITS A COMPLETE CONSTRUCTION PERMIT APPLICATION PRIOR TO AUGUST 29, 2008, NO ANTIDegradation REVIEW IS REQUIRED.

General Assumptions of the Water Quality Review Sheet

1. A Water Quality Review Sheet (WQRS) assumes that [10 CSR 20-6.010(3) Continuing Authorities] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQRS does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made subsequent to the drafting of this WQRS may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supercede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQRS does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQRS may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQRS removes any obligations to comply with county or other local ordinances or restrictions.

Mixing Considerations

Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile. [10 CSR 20-7.031(4)(A)4.B.(II)(a)]

Zone of Initial Dilution (ZID): One-tenth (0.1) of the mixing zone volume of flow [10 CSR 20-7.031(4)(A)4.B.(II)(b)].

	ASSUMED Flow (cfs)	Plus Actual Facility Flow +	MZ (cfs)	ZID (cfs)
7Q10	0.1	3.0	0.78	0.078
1Q10	0.1	3.0	0.78	0.078
30Q10	1.0	3.0	1.0	N/A

+ Cumulative design flow of several upstream discharges of the proposed facility as presented in MEC's *Water Quality Review and Impact Summary* was 3.96 cfs. We determined the actual flow from measurement obtained from the MDNR discharge monitoring reports. Below summarizes those measurements:

<u>Facility</u>	<u>Average flow (MGD)</u>
MO-0000698	0.0096
MO-0022853	1.86
MO-0058459	0.002
MO-0100609	0.0095
MO-0103837	0.0008
MO-0119296	0.0 (non-discharging land application facility)
MO-0119491	0.0014
MO-0128856	0.005
MO-0129739	0.0 (non-discharging land application facility)

Total = 1.88 MGD or 2.91 cfs.

$$AEC\% = \left(\frac{100}{DilutionRatio + 1} \right)$$

Permit Limits and Information

WASTELOAD ALLOCATION STUDY CONDUCTED (Y OR N): Y

USE ATTAINABILITY ANALYSIS CONDUCTED (Y OR N): N

WHOLE BODY CONTACT USE RETAINED (Y OR N): Y

OUTFALL #001

WET TEST (Y OR N): Y FREQUENCY: ONCE/PERMIT CYCLE AEC: 50% METHOD: SINGLE

PARAMETER	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	WQBEL (NOTE 2)	MONITORING FREQUENCY
FLOW (MGD)	*		*	N/A	Once/Month
BOD ₅ (MG/L)		45	30	FSR	Once/Quarter
TSS (MG/L)		45	30	FSR	Once/Quarter
PH (S.U.)	6.0 – 9.0		6.0 – 9.0	FSR	Once/Quarter
TEMPERATURE (°C)	*		*	N/A	Once/Quarter
AMMONIA AS N (MG/L) (MAY 1 – OCT 31)	18		7.0	Y	Once/Quarter
AMMONIA AS N (MG/L) (NOV 1 – APR 30)	19		7.5	Y	Once/Quarter
ESHERICHIA COLIFORM (E. COLI)	PLEASE SEE THE E. COLI DISCUSSION IN THE DERIVATION & DISCUSSION OF LIMITS SECTION OF THIS WQRS BELOW.				
FECAL COLIFORM (NOTE 1)	1000		400**	FSR	Once/Quarter
GREASE AND OIL (MG/L)	15		10	FSR	ONCE/QUARTER

* - Monitoring requirements only.

** - The Monthly Average for Fecal Coliform shall be reported as a Geometric Mean.

NOTE 1 – COLONIES/100 ML

NOTE 2 – THIS FIELD INFORMS THE APPLICANT IF THE PARAMETER’S EFFLUENT LIMITATION IS A WATER QUALITY BASED EFFLUENT LIMITATION (WQBEL): Y – YES; FSR – FEDERAL/STATE REGULATION; AND N/A – NOT APPLICABLE. ALSO, PLEASE SEE THE GENERAL ASSUMPTIONS OF THE WQRS #4 & #5.

Receiving Water Monitoring Requirements

No receiving water monitoring requirements 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:

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration
Cs = upstream concentration
Qs = upstream flow
Ce = effluent concentration
Qe = 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]. Influent monitoring may be required for this facility in its Missouri State Operating Permit.

MEC Water Resources submitted the Streeter Phelps Modeling as shown in Appendix A to demonstrate that 45 mg/L weekly average was protective of dissolved oxygen standards. This modeling showed a critical dissolved oxygen concentration of 5.0 mg/L at the outfall. Staff reviewed and recalculated using the approved spreadsheet model. We altered the reaeration rate and BOD decay rate coefficients to match the model’s suggested values and the critical dissolved oxygen concentration was still 5.0 mg/L at outfall. We set Nitrogenous Oxygen Demand (N BOD₅) to zero which resulted in minor changes to the critical dissolved oxygen concentration. As a result, dissolved oxygen is protected in Hubble Creek from a BOD discharge of 30 mg/L monthly average and 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]. Influent monitoring may be required for this facility in its Missouri State Operating Permit.
- **pH.** pH shall be maintained in the range from six to nine (6 – 9) standard units [10 CSR 20-7.015(8)(B)2].
- **Temperature.** Monitoring requirement due to the toxicity of Ammonia varies by temperature.
- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. MEC Water Resources determine ammonia concentrations upstream of the proposed Village of Gordonville outfall by decaying in stream ammonia from the City of Jackson, Mo discharge. Using a simplified first-order decay model, background total ammonia nitrogen = 0.9 mg/L in summer and 2.6 mg/L in winter.

For the Gordonville discharge, staff cannot include ammonia limits determination using ammonia decay within the regulatory mixing zone because this procedure is not addressed in our ammonia policy. We have other issues with this procedure if the City needs the department to provide them.

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/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

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

Chronic WLA: $C_e = ((0.10 + 1.0)1.5 - (1.0 * 0.9)) / 0.10$
 $C_e = 7.5 \text{ mg/L}$

Acute WLA: $C_e = ((0.10 + 0.078)12.1 - (0.078 * 0.9)) / 0.10$
 $C_e = 21 \text{ mg/L}$

$LTA_c = 7.5 \text{ mg/L} (0.780) = \mathbf{5.9 \text{ mg/L}}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 21 \text{ mg/L} (0.321) = 6.7 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = $5.9 \text{ mg/L} (3.11) = 18 \text{ mg/L}$ [CV = 0.6, 99th Percentile]
AML = $5.9 \text{ mg/L} (1.19) = 7.0 \text{ mg/L}$ [CV = 0.6, 95th Percentile, n = 30]

Winter

$$C_e = (((Q_e + Q_s) * C) - (Q_s * C_s)) / Q_e$$

Chronic WLA: $C_e = ((0.10 + 1.0)3.1 - (1.0 * 2.6)) / 0.10$
 $C_e = 8.1 \text{ mg/L}$

Acute WLA: $C_e = ((0.10 + 0.078)12.1 - (0.078 * 2.6)) / 0.10$
 $C_e = 20 \text{ mg/L}$

$LTA_c = 8.1 \text{ mg/L} (0.780) = \mathbf{6.3 \text{ mg/L}}$ [CV = 0.6, 99th Percentile, 30 day avg.]
 $LTA_a = 20 \text{ mg/L} (0.321) = 6.4 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = $6.3 \text{ mg/L} (3.11) = 19 \text{ mg/L}$ [CV = 0.6, 99th Percentile]
AML = $6.3 \text{ mg/L} (1.19) = 7.5 \text{ mg/L}$ [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	18	7.0
Winter	19	7.5

- **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.A.]. Future renewals of the facility-operating permit will contain effluent limitations for E. coli that will replace fecal coliform as the applicable bacteria criteria in Missouri’s water quality standards when Missouri adopts the implementation of the E. coli standards. Also, please see **GENERAL ASSUMPTIONS OF THE WQRS #7.**

Reviewer: Todd Blanc
Date: 4/09/2008
Section Chief: Refaat Mefrakis

Reviewer: Todd Blanc
Date Revised: 10/22/08
Section 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.

Appendix A: Streeter Phelps Modeling.

Streeter-Phelps analysis of critical dissolved oxygen sag.

Based on Lotus File DOSAG2.WK1 Revised 19-Oct-93

INPUT				
1. EFFLUENT CHARACTERISTICS				
Discharge (cfs):				0.1
CBOD5 (mg/L):				46
NBOD (mg/L):				127
Dissolved Oxygen (mg/L):				5
Temperature (deg C):				26
2. RECEIVING WATER CHARACTERISTICS				
Upstream Discharge (cfs):				1.03
Upstream CBOD5 (mg/L):				1.0
Upstream NBOD (mg/L):				4.5
Upstream Dissolved Oxygen (mg/L):				5
Upstream Temperature (deg C):				26
Elevation (ft NGVD):				440
Downstream Average Channel Slope (ft/ft):				0.0081
Downstream Average Channel Depth (ft):				0.44
Downstream Average Channel Velocity (fps):				0.15
3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):				
	Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
	Churchill	1.5 - 6	2 - 50	7.29
	O'Connor and Dobbins	.1 - 1.5	2 - 50	17.20
	Owens	.1 - 6	1 - 2	27.67
	Tsivoglou-Wallace	.1 - 6	.1 - 2	8.39
4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):				
	Reference			Suggested Value
	Wright and McDonnell, 1979			3.33
OUTPUT				
1. INITIAL MIXED RIVER CONDITION				
CBOD5 (mg/L):				5.0
NBOD (mg/L):				15.3
Dissolved Oxygen (mg/L):				5.0
Temperature (deg C):				26.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)				
Reaeration (day ⁻¹):				11.88
BOD Decay (day ⁻¹):				1.38
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU				
Initial Mixed CBODU (mg/L):				7.3
Initial Mixed Total BODU (CBODU + NBOD, mg/L):				22.7
4. INITIAL DISSOLVED OXYGEN DEFICIT				
Saturation Dissolved Oxygen (mg/L):				7.987
Initial Deficit (mg/L):				2.99
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):				
				0.00
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):				
				0.00
7. CRITICAL DO DEFICIT (mg/L):				
				2.99
8. CRITICAL DO CONCENTRATION (mg/L):				
				5.00

APPENDIX B - CLASSIFICATION WORKSHEET:

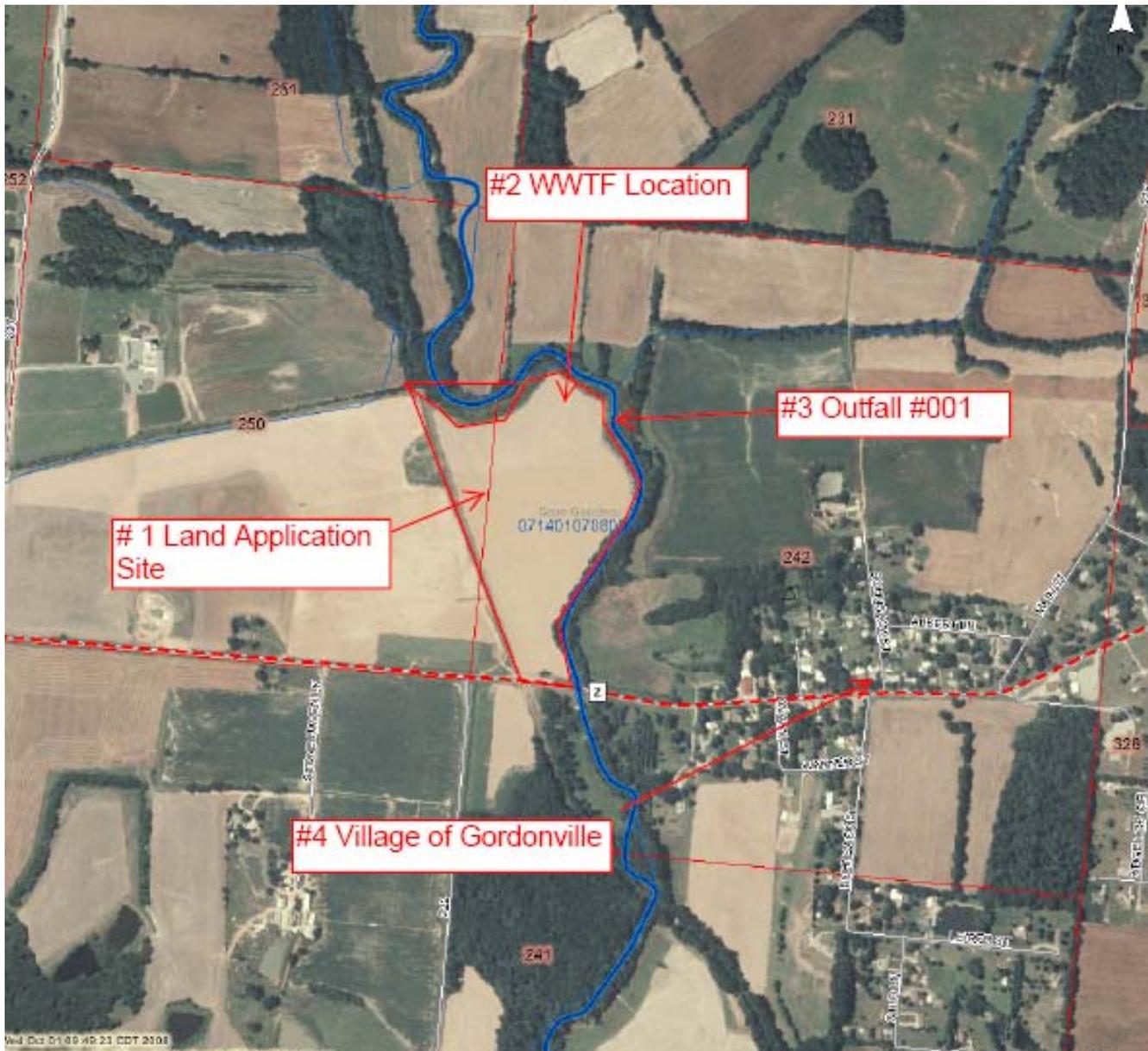
ITEM	POINTS POSSIBLE	POINTS ASSIGNED
Maximum Population Equivalent (P.E.) served (Max 10 pts.)	1 pt./10,000 PE or major fraction thereof.	
Maximum: 10 pt Design Flow (avg. day) or peak month; use greater (Max 10 pts.)	1 pt. / MGD or major fraction thereof.	
EFFLUENT DISCHARGE RECEIVING WATER SENSITIVITY:		
Missouri or Mississippi River	0	
All other stream discharges except to losing streams and stream reaches supporting whole body contact	1	
Discharge to lake or reservoir outside of designated whole body contact recreational area	2	
Discharge to losing stream, or stream, lake or reservoir area supporting whole body contact recreation	3	3
PRELIMINARY TREATMENT - Headworks		
Screening and/or comminution	3	
Grit removal	3	
Plant pumping of main flow (lift station at the headworks)	3	
PRIMARY TREATMENT		
Primary clarifiers	5	
Combined sedimentation/digestion	5	
Chemical addition (except chlorine, enzymes)	4	
REQUIRED LABORATORY CONTROL – performed by plant personnel (highest level only)		
Push – button or visual methods for simple test such as pH, Settleable solids	3	3
Additional procedures such as DO, COD, BOD, titrations, solids, volatile content	5	
More advanced determinations such as BOD seeding procedures, fecal coliform, nutrients, total oils, phenols, etc.	7	
Highly sophisticated instrumentation, such as atomic absorption and gas chromatograph	10	
ALTERNATIVE FATE OF EFFLUENT		
Direct reuse or recycle of effluent	6	
Land Disposal – low rate	3	
High rate	5	
Overland flow	4	
Total from page ONE (1)	----	6

APPENDIX B - CLASSIFICATION WORKSHEET (CONTINUED):

ITEM	POINTS POSSIBLE	POINTS ASSIGNED
VARIATION IN RAW WASTE (highest level only) (DMR exceedances and Design Flow exceedances)		
Variation do not exceed those normally or typically expected	0	
Recurring deviations or excessive variations of 100 to 200 % in strength and/or flow	2	
Recurring deviations or excessive variations of more than 200 % in strength and/or flow	4	
Raw wastes subject to toxic waste discharge	6	
SECONDARY TREATMENT		
Trickling filter and other fixed film media with secondary clarifiers	10	10
Activated sludge with secondary clarifiers (including extended aeration and oxidation ditches)	15	
Stabilization ponds without aeration	5	
Aerated lagoon	8	
Advanced Waste Treatment Polishing Pond	2	
Chemical/physical – without secondary	15	
Chemical/physical – following secondary	10	
Biological or chemical/biological	12	
Carbon regeneration	4	
DISINFECTION		
Chlorination or comparable	5	
Dechlorination	2	
On-site generation of disinfectant (except UV light)	5	
UV light	4	4
SOLIDS HANDLING - SLUDGE		
Solids Handling Thickening	5	
Anaerobic digestion	10	
Aerobic digestion	6	
Evaporative sludge drying	2	
Mechanical dewatering	8	
Solids reduction (incineration, wet oxidation)	12	
Land application	6	
Total from page TWO (2)	----	14
Total from page ONE (1)	---	6
Grand Total	---	20

- A: 71 points and greater
- B: 51 points – 70 points
- C: 26 points – 50 points
- D: 0 points – 25 points

APPENDIX C - FACILITY LOCATION



1. Land application site South of the proposed facility and is approximately 20 acres in size.
2. Proposed location of the new facility.
3. Outfall #001 approximate discharge location to the receiving stream.
4. Location of Village of Gordonville in proximity to the proposed facility.