STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

S & S Land Company Inc.
P. O. Box 1009
Branson West, MO 65737

Dear Permittee:

Pursuant to the Federal Water Pollution Control Act, under the authority granted to the State of Missouri and in compliance with the Missouri Clean Water Law, we have issued and are enclosing your State Operating Permit to discharge from Pinnacle Shores, Stone County, Missouri.

Please read your permit and enclosed Standard Conditions. They contain important information on monitoring requirements, effluent limitations, sampling frequencies and reporting requirements.

Monitoring reports required by the special conditions must be submitted on a periodic basis. The required forms are enclosed. Please make copies for your use. Completed forms should be mailed to this office.

This permit is both your Federal NPDES Permit and your new Missouri State Operating Permit and replaces all previous State Operating Permits issued for this facility under this permit number. In all future correspondence regarding this facility, please refer to your State Operating Permit number and facility name as shown on page one of the permit.

Please be aware that nothing in this permit relieves the permittee of any other legal obligations or restrictions, such as other federal or state laws, court orders, or county or other local ordinances or restrictions.

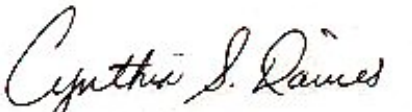
If you were adversely affected by this decision, you may be entitled to an appeal before the administrative hearing commission pursuant to 10 CSR 20-1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier.

If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission. Any appeal shall be directed to: Administrative Hearing Commission, Truman Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, MO 65102, Phone: 573-751-2422, Fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have questions concerning this permit please contact Mr. Joshua L. Grosvenor, EI, of my staff by calling 417-891-4300 or via mail at Southwest Regional Office, 2040 W. Woodland, Springfield, MO 65807-5912.

Sincerely,

SOUTHWEST REGIONAL OFFICE



Cynthia S. Davies
Regional Director

CSD/jgk

Enclosures

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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-0133825
Owner:	S & S Land Company Inc.
Address:	P O Box 1009, Branson West, MO 65737
Continuing Authority:	Same as Above
Address:	Same as Above
Facility Name:	Pinnacle Shores WWTF
Facility Address:	SW Corner of Highway 13 and Highway RB, Kimberling City MO 65686
Legal Description:	SE¼, SW¼, Sec. 21, T22N, R23W, Stone County
UTM (X/Y):	461402 / 4049355
Receiving Stream:	Unnamed Tributary to Table Rock Lake (U)
First Classified Stream and ID:	Table Rock Lake (L2) (07313) 303 (d)
USGS Basin & Sub-watershed No.:	(11010001-1401)

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

FACILITY DESCRIPTION

Outfall #001 - Subdivision - SIC #8641
The use or operation of this facility does not require a CERTIFIED OPERATOR.
Septic tanks as part of a Septic Tank Effluent Pump (STEP) system / recirculating sand or pea gravel filter system / chemical feed to facilitate phosphorus removal / coagulation / chlorination / dechlorination / sludge disposal by contract hauler.

Design organic population equivalent is 450
Design flow is 0.045 MGD.
Design sludge production is 4.5 dry tons/year.

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

June 6, 2012
Effective Date

Sara Parker Pauley, Director, Department of Natural Resources

June 5, 2017
Expiration Date

Cynthia S. Davies, Regional Director, Southwest Regional Office

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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
Outfall #001						
Flow	MGD	*		*	once/month**	24 hr. total
Biochemical Oxygen Demand$_5$	mg/L		22.5	15	once/month**	****
Total Suspended Solids	mg/L		22.5	15	once/month**	****
E. coli **(Note 1)**	#/100 ml	630		126	once/month**	grab
pH – Units	SU	***		***	once/month**	grab
Total Residual Chlorine as CL_2 **(Note 2)**	µg/L	17 (130 ML)		8 (130 ML)	once/month**	grab
Ammonia as N (April 1 – Sept 30) (Oct 1 – March 31)	mg/L	 3.7 7.5		 1.4 2.9	once/month**	grab
Total Phosphorous as P	mg/L	*		0.5	once/month**	****
Aluminum, Total Recoverable **(Note 3)**	µg/L	750		370	once/month**	****
Total Nitrogen	mg/L	*		*	once/month**	grab

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	DAILY MINIMUM	WEEKLY AVERAGE MINIMUM	MONTHLY AVERAGE MINIMUM	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001						
Dissolved Oxygen	mg/L	5.0		5.0	once/month**	grab

MONITORING REPORTS SHALL BE SUBMITTED **MONTHLY**; THE FIRST REPORT IS DUE **July 28, 2012**. 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 #17	Once/ permit cycle	24 hr. composite

MONITORING REPORTS SHALL BE SUBMITTED **ONCE PER PERMIT CYCLE**; THE FIRST REPORT IS DUE **January 28, 2016.**

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

MO 780-0010 (8/91)

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** Reports shall be submitted by the 28th day of the month following the reporting period, e.g. Reporting period is the month of March (samples collected monthly), report due by April 28th.

*** pH is measured in pH units and is not to be averaged. The pH for all facilities except lagoons is limited to the range of 6.5-9.0 pH units.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

**** A composite sample made up from a minimum of four grab samples collected within a 24-hour period with a minimum of two hours between each grab sample. A person may physically collect the four grab samples or a composite sampler may be set up to collect the four grab samples.

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. Geometric mean for n samples = $[a_1 \times a_2 \times a_3 \ldots . \times a_n]^{1/n}$.

Note 2 - This permit contains a Total Residual Chlorine (TRC) limit.

(a) This effluent limit is below the minimum quantification level (ML) of the most common and practical EPA approved CLTRC methods. The department has determined the current acceptable ML for total residual chlorine to be 130 µg/L when using the DPD Colorimetric Method #4500 – CL G. from Standard Methods for the Examination of Waters and Wastewater. The permittee will conduct analyses in accordance with this method, or equivalent, and report actual analytical values. Measured values greater than or equal to the minimum quantification level of 130 µg/L will be considered violations of the permit and values less than the minimum quantification level of 130 µg/L will be considered to be in compliance with the permit limitation. The minimum quantification level does not authorize the discharge of chlorine in excess of the effluent limits stated in the permit.

(b) Disinfection is required year-round unless the permit specifically states that "Final limitations and monitoring requirements for *E. coli* are applicable only during the recreational season from April 1 through October 31." If your permit does not require disinfection during the non-recreational months, do not chlorinate in those months.

(c) Do not chemically dechlorinate **if it is not needed to meet the limits in your permit.**

(d) If no chlorine was used in a given sampling period, an actual analysis is not necessary. Simply report as "0 µg/L" TRC.

Note 3 - If no Aluminum or Iron was used in a given sampling period, an actual analysis is not necessary. Simply report as "0 mg/L".

C. 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. 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:

C. SPECIAL CONDITIONS (continued)

(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.

5. 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.

6. Report as no-discharge when a discharge does not occur during the report period.

7. It is a violation of the Missouri Clean Water Law to fail to pay fees associated with this permit (644.055 RSMo).

8. The permittee shall comply with any applicable requirements listed in 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.

9. Bypasses are not authorized at this facility and are subject to 40 CFR 122.41(m). If a bypass occurs, the permittee shall report in accordance to 40 CFR 122.41(m)(3)(i), and with Standard Condition Part I, Section B, subsection 2.b. Bypasses are to be reported to the Southwest Regional Office Regional Office.

10. At least one sign shall appear on the fence on each side of each facility. Minimum wording shall be “SEWAGE TREATMENT FACILITY – KEEP OUT”, in letters at least 2 inches high.

11. An Operation and Maintenance (O & M) manual shall be maintained by the permittee and made available to the operator. The O & M manual shall include key operating procedures and a brief summary of the operation of the facility.

16. An all-weather access road shall be provided from a public right-of-way to the treatment facility.

D. SPECIAL CONDITIONS (continued)

17. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

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

* A 24-hour composite sample is composed of a minimum of 48 aliquots (subsamples) collected at 30 minute intervals by an automatic sampler.

Dilution Series							
AEC%	100% effluent	50% effluent	25% effluent	12.5% effluent	6.25% effluent	(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.

(i) 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.

(ii) 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 analysis performed upon any other effluent concentration.

(iii) 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.

(2) The WET test will be considered a failure if mortality observed in effluent concentrations equal to or less than the AEC is 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, synthetic laboratory control water may be used.

(3) 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.

(4) If the effluent fails the test for BOTH test species, 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: Note: Written request regarding single species multiple dilution accelerated testing will be address by THE WATER PROTECTION PROGRAM on a case by case basis.

(i) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.

(ii) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(5) Follow-up tests do not negate an initial failed test.

(6) 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.

(7) Additionally, the following shall apply upon failure of the third follow up MULTIPLE DILUTION test The permittee should 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. If the permittee does not contact THE WATER PROTECTION PROGRAM upon the third follow up test failure, a toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. 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 the

E. SPECIAL CONDITIONS (continued)

automatic trigger or 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.

(8) 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.

(9) 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.

(10) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.

(11) Submit a concise summary in tabular format of all WET test results with the annual report.

(b) 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 unless approved by the department on a case by case basis.

(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) Tests will be run with 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent, and 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.

(9) Whole-effluent-toxicity test 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

Missouri Department of Natural Resources
Statement of Basis
Pinnacle Shores WWTF
MSOP #: MO-0133825
Stone County

A Statement of Basis (Statement) gives pertinent information regarding the applicable regulations and rationale for the development of the NPDES Missouri State Operating Permit (operating permit). This Statement includes Wasteload Allocations, Water Quality Based Effluent Limitations, and Reasonable Potential Analysis calculations as well as any other calculations that effect the effluent limitations of this operating permit. This Statement does not pertain to operating permits that include sewage sludge land application plans and variance procedures, and does not include the public comment process for this operating permit.

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

Part I – Facility Information

Outfall #001 - Subdivision - SIC #8641
The use or operation of this facility does not require a CERTIFIED OPERATOR.
Septic tanks as part of a Septic Tank Effluent Pump (STEP) system / recirculating sand or pea gravel filter system / chemical feed to facilitate phosphorus removal / coagulation / chlorination / dechlorination / sludge disposal by contract hauler.

Design organic population equivalent is 450
Design flow is 0.045 MGD.
Design sludge production is 4.5 dry tons/year.

OUTFALL(S) TABLE:

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	EFFLUENT TYPE	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.07	Secondary	Domestic	0.25

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

This is for a new facility.

Comments: None

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:

Not Applicable ☒; This facility is not required to have a certified operator.

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**
Unnamed Tributary to Table Rock Lake	U	N/A	General Criteria	11010001	Ozark/ White
Table Rock Lake	L2	07313	LWW, AQL, WBC-A, SCR		

* - 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).
** - Ecological Drainage Unit

RECEIVING STREAM(S) LOW-FLOW VALUES TABLE:

RECEIVING STREAM (U, C, P)	LOW-FLOW VALUES (CFS)		
	1Q10	7Q10	30Q10
Unnamed Tributary to Table Rock Lake	0	0	0

MIXING CONSIDERATIONS
Mixing Zone: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(a)].
Zone of Initial Dilution: Not Allowed [10 CSR 20-7.031(4)(A)4.B.(I)(b)].

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.

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

☒ - New facility, backsliding does not apply.

AREA-WIDE WASTE TREATMENT MANAGEMENT & CONTINUING AUTHORITY:
As per [10 CSR 20-6.010(8)(A)10.], when a Continuing Authority under paragraph 10 CSR 20-6.010(3)(B)1. or 2. is expected to be available for connection within the next five (5) years, any operating permit issued to a permittee under this paragraph, located within the service area of the paragraph (3)(B)1. or 2. facility, shall contain the following special condition… This language is contained in Special Condition #3 of this operating permit.

ANTIDEGRADATION:
Policies which ensure protection of water quality for a particular water body where the water quality exceeds levels necessary to protect fish and wildlife propagation and recreation on and in the water. This also includes special protection of waters designated as outstanding natural resource waters. Antidegradation requirements are consistent with 40 CFR 131.12 that outlines methods used to assess activities that may impact the integrity of a water and protect existing uses. This policy may compel the state to maintain a level of water quality above those mandated by criteria.

Applicable ☒;

Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

APPLICABLE PERMIT PARAMETERS:
Effluent parameters for conventional, non-conventional, and toxic pollutants have been obtained from the technology based effluent limits, water quality based limits, and from appropriate sections of the application.

Bio-solids, 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.

☒ - 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.

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

FINDING OF AFFORDABILITY:
Pursuant to Section 644.145, RSMo., the Department is required to determine whether a permit or decision is affordable and makes a finding of affordability for certain permitting and enforcement decisions. This requirement applies to discharges from combined or separate sanitary sewer systems or publically-owned treatment works.

☒ Not Applicable;

The Department is not required to determine findings of affordability because the facility is not a **combined or separate sanitary sewer system for a publically-owned treatment works.**

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

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):
Limitations must control all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above the Missouri Water Quality Standards.

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 (BOD_5) and Total Suspended Solids (TSS) for Publicly Owned Treatment Works (POTWs). 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 @ www.epa.gov/fedrgstr/EPA-WATER/1999/August/Day-04/w18866.htm

Not Applicable ☒;
This wastewater treatment facility is not a POTW. Influent monitoring is not being required to determine percent removal.

SANITARY SEWER OVERFLOWS (SSOS), BYPASSES, INFLOW & INFILTRATION (I&I) – PREVENTION/REDUCTION:
Sanitary Sewer Overflows (SSOs) are defined as an untreated or partially treated sewage release are considered bypassing under state regulation [10 CSR 20-2.010(11)] and should not be confused with the federal definition of bypass. SSO's have a variety of causes including blockages, line breaks, and sewer defects that allow excess storm water and ground water to (1) enter and overload the collection system, and (2) overload the treatment facility. Additionally, SSO's can be also be caused by lapses in sewer system operation and maintenance, inadequate sewer

design and construction, power failures, and vandalism. SSOs also include overflows out of manholes and onto city streets, sidewalks, and other terrestrial locations.

Additionally, Missouri RSMo §644.026.1 mandates that the Department require proper maintenance and operation of treatment facilities and sewer systems and proper disposal of residual waste from all such facilities.

☒ - 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.

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 *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices* [EPA 832-R-92-006] (Storm Water Management), 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.

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

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 to total amount of pollutant that may be discharged into that stream without endangering its water quality.

Applicable ☒;
Wasteload allocations were calculated where applicable using water quality criteria or water quality model results and the dilution equation below:

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

Where C = downstream concentration
C_s = upstream concentration

Q_s = upstream flow
C_e = effluent concentration
Q_e = effluent flow

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

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

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.

WLA MODELING:
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 are 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 RSMo 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 NH_3)
☒ Facility is a municipality or domestic discharger with a Design Flow ≥ 22,500 gpd.
☐ Other – please justify.

40 CFR 122.41(m) - Bypasses:
The federal Clean Water Act (CWA), Section 402 prohibits wastewater dischargers from "bypassing" untreated or partially treated sewage (wastewater) beyond the headworks. A bypass, which includes blending, is defined as an intentional diversion of waste streams from any portion of a treatment facility, [40 CFR 122.41(m)(1)(i)]. Additionally, Missouri regulation 10 CSR 20-2.010(11) defines a bypass as the diversion of wastewater from any portion of wastewater treatment facility or sewer system to waters of the state. Only under exceptional and specified limitations do the federal regulations allow for a facility to bypass some or all of the flow from its treatment process. Bypasses are prohibited by the CWA unless a permittee can meet all of the criteria listed in 40 CFR 122.41(m)(4)(i)(A), (B), & (C). Any bypasses from this facility are subject to the reporting required in 40 CFR 122.41(l)(6) and per Missouri's Standard Conditions I, Section B, part 2.b. Additionally, Anticipated Bypasses include bypasses from peak flow basins or similar.

☒ - Not Applicable, this facility does not bypass.

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 ☒;
Table Rock Lake is listed on the 2010 Missouri 303(d) List for Nutrients, Chlorophyll and Nitrogen.

☒ – This facility is considered to be a source of or has the potential to contribute to the above listed pollutant(s). When the nutrient implementation procedure is approved, the permit may be reopened and modified to include nutrient monitoring. Once a TMDL is developed, the permit will be modified to include WLAs from the TMDL.

Adjusted Design Flow:
10 CSR 20-6.011(1)(B)1. provides for an Adjusted Design Flow when calculating permit fees on human sewage treatment facilities. If the average flow is sixty percent (60%) or less than the system's design flow, the average flow may be substituted for the design flow when calculating the permit fee on human sewage treatment facilities. If the facility's actual average flow is consistently 60% or less than the permitted design flow, the facility may qualify for a reduction in your fee when:

- The facility has a valid permit, or has applied for re-issuance, is in compliance with the terms, conditions and effluent limitations of the permit, and the facility has a good compliance history; and
- Flow is not expected to exceed 60% of design flow for the remaining term of the existing operating permit.

Not Applicable ☒;

At this time, the permittee has not requested an Adjusted Design Flow modification.

Outfall #001 – Main Facility Outfall

EFFLUENT LIMITATIONS TABLE:

PARAMETER	UNIT	BASIS FOR LIMITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MODIFIED	PREVIOUS PERMIT LIMITATIONS
FLOW	MGD	1	*	--	*	N/A	N/A
BOD_5	MG/L	6	--	22.5	15	N/A	N/A
TSS	MG/L	6	--	22.5	15	N/A	N/A
PH (S.U.)	SU	1	6.5-9.0	--	6.5-9.0	N/A	N/A
AMMONIA AS N (OCTOBER - MARCH)	MG/L	3,5	7.5	--	2.9	N/A	N/A
AMMONIA AS N (APRIL - SEPTEMBER)	MG/L	3,5	3.7	--	1.4	N/A	N/A
ESCHERICHIA COLI	***	1,2,3	630	--	126	N/A	N/A
CHLORINE, TOTAL RESIDUAL	µG/L	1	17	--	8	N/A	N/A
DISSOLVED OXYGEN	MG/L	6	5.0	--	5.0	N/A	N/A
TOTAL PHOSPHORUS	MG/L	1	*	--	0.5	N/A	N/A
ALUMINUM, TOTAL RECOVERABLE	µG/L	3,8	750	--	370	N/A	N/A
TOTAL NITROGEN	MG/L	6	*	--	*	N/A	N/A
WHOLE EFFLUENT TOXICITY (WET) TEST	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.

**** - Parameter not previously established in previous state operating permit.

N/A – Not applicable

S – Same as previous operating permit

Basis for Limitations Codes:

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

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 (BOD_5).
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

Total Suspended Solids (TSS).
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

pH.
☒ – pH is limited to the range of 6.5 – 9.0 pH units, as per [10 CSR 20-7.031(4)(E)]. pH is measured in pH units and is not to be averaged.

Ammonia as N.
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

Escherichia coli (E. coli). Monthly average of 126 per 100 ml as a geometric mean and Daily Maximum of 630 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (A) designated use of the receiving stream, as per 10 CSR 20-7.031(4)(C). Daily Maximum effluent variability will be evaluated in development of a future effluent limit. An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d).

Total Residual Chlorine (TRC).
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

Total Phosphorus
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

Total Nitrogen.
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

Aluminum, Total Recoverable
Please see **APPENDIX A – ANTIDEGRADATION ANALYSIS.**

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 ≥ 22,500 gpd, but less than 1.0 MGD.
- ☐ Other, please justify.

Allowable Effluent Concentration (AEC) calculations determine if the facility is to conduct single dilution or multiple dilution WET testing. Facilities that discharge to unclassified or Class C receiving streams, the AEC% is 100%. Facilities with less than 100% for an AEC% will have multiple dilution WET testing. Facilities that discharge to Lakes and have Acute WET testing, the AEC% is 100% due to [10 CSR 20-7.031(4)(A)4.B.(IV)(b)] ZID not allowed for Lakes.

Minimum Sampling and Reporting Frequency Requirements.

PARAMETER	SAMPLING FREQUENCY	REPORTING FREQUENCY
FLOW	MONTHLY	MONTHLY
BOD_5	MONTHLY	MONTHLY
TSS	MONTHLY	MONTHLY
PH	MONTHLY	MONTHLY
AMMONIA AS N	MONTHLY	MONTHLY
E. COLI	MONTHLY	MONTHLY
TOTAL RESIDUAL CHLORINE	MONTHLY	MONTHLY
DISSOLVED OXYGEN	MONTHLY	MONTHLY
TOTAL NITROGEN	MONTHLY	MONTHLY
ALUMINUM, TOTAL RECOVERABLE	MONTHLY	MONTHLY
TOTAL PHOSPHORUS	MONTHLY	MONTHLY

Sampling Frequency Justification:

This facility is a new facility monthly sampling is required to determine if the facility will be in compliance with the operating permit in accordance with Appendix U of Missouri's Water Pollution Control Permit Manual.

Sampling Type Justification

Due to the small amount and nature of the flow, sample type shall be modified composites.

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.

Date of Factsheet: April 18, 2012

Mr. Joshua L. Grosvenor, EI
WP Engineering Unit
(417) 891-4300
josh.grosvenor@dnr.mo.gov

APPENDIX A – ANTIDEGRADATION ANALYSIS:

Pinnacle Shores
MO-0133825
Stone County

STATE OF MISSOURI

Jeremiah W. (Jay) Nixon, Governor Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

dnr.mo.gov

JAN 27 2011

S & S Land Company, Inc.
ATTN: Jay Steed
PO Box 607
Kimberling City, MO 65686

RE: Water Quality and Antidegradation Review Preliminary Determination for Pinnacle Shores Wastewater Treatment Facility.

Dear Mr. Reece:

In accordance with the Missouri Antidegradation Rule and Implementation Procedure, your proposed discharge is subject to an Antidegradation Review. Enclosed is the *Water Quality and Antidegradation Review (WQAR)*, which summarizes this preliminary determination based upon your *Antidegradation Review Report for Pinnacle Shores WWTF* dated December 2010, which proposed an expansion of the Pinnacle Shores WWTF (0.035 MGD to 0.045 MGD).

The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Rule and Implementation Procedure* (AIP) dated May 7, 2008, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources (Department) initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

You may proceed with submittal of an application for an operating permit and antidegradation review public notice, an engineering report, or a complete application for a construction permit to Southwest Regional Office or to the Financial Assistance Center if you are seeking funding assistance. These submittals must reflect the design flow, facility description, and general treatment components of this WQAR or this preliminary determination may have to be revisited.

Following the Department's public notice of draft Missouri State Operating Permit including the antidegradation review findings and preliminary determination, the Department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final. Following issuance of the construction permit and completion of the actual facility construction, the Department will proceed with the issuance of the operating permit.

If you should have questions, please feel free to contact Keith Forck by telephone at (573) 526-4232, by e-mail at keith.forck@dnr.mo.gov, or by mail at P.O. Box 176, Jefferson City, Missouri 65102-0176.

Sincerely,

WATER PROTECTION PROGRAM

Refaat Mefrakis, P.E. Chief
NPDES Permits and Engineering Section Chief

RM:kfn

Enclosures

c: Heithaus Engineering & Associates, Inc.
Southwest Regional Office
File Copy

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

Water Quality and Antidegradation Review

For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to the
Unnamed Tributary to Table Rock Lake

January 2011

Pinnacle Shores Wastewater Treatment Facility
Point Pinnacle Drive
Kimberling City, MO 65686

Table of Contents

1. Facility Information

FACILITY NAME: Pinnacle Shores WWTF NPDES #: MO-0133825

FACILITY TYPE/DESCRIPTION: Proposed facility expansion from 35,000 gallons per day to 45,000 gallons per day. The 35,000 gallon per day facility is under construction (Construction Permit SWRO-2417). The preferred alternative of the submitted alternatives analysis (AA) was expansion of the recirculating sand filter with chlorine disinfection. The facility will discharge into the Unnamed Tributary to Table Rock Lake (Location – See Appendix A).

EDU:	Ozark/White	ECOREGION:	Ozark Highland
8-DIGIT HUC:	11010001	COUNTY:	Stone
LEGAL DESCRIPTION:	SE¼, SW¼ , Sec. 21, T22N, R23W	UTM COORDINATES:	X: 461402 Y: 4049355

2. Water Quality Information

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 Missouri Department of Natural Resources (MDNR) developed 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 August 30, 2008, a facility is required to use *Missouri's Antidegradation Rule and Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1 Water Quality History:

Since this is an expansion of new discharging facility, which is still under construction; there is no water quality history.

3. Outfall Characteristics

Outfall	Design Flow (cfs)	Treatment Type	Receiving Waterbody	Distance to Classified Segment
001	0.07	Secondary	Unnamed Tributary to Table Rock Lake	0.25

4. Receiving Waterbody Information

Waterbody	Class	WBID	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	*Designated Uses
Unnamed Tributary to Table Rock Lake	U	–	–	–	–	General Criteria
Table Rock Lake	L2	7313	0.1	0.1	1.0	LWW, AQL, WBC(A), SCR

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

RECEIVING WATER BODY SEGMENT #1: Unnamed Tributary to Table Rock Lake
Upper end segment* UTM or Lat/Long coordinates: X: 461402 Y: 4049355 (Outfall)
Lower end segment* UTM or Lat/Long coordinates: X: 461044 Y: 4049173 (Confluence with Mill Creek Arm)

RECEIVING WATER BODY SEGMENT #2: Mill Creek Arm of Table Rock Lake
Upper end segment* UTM or Lat/Long coordinates: X: 461044 Y: 4049173 (Confluence with Unnamed Tributary)
Lower end segment* UTM or Lat/Long coordinates: X: 459945 Y: 4049984 (Confluence with Table Rock Lake)

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

5. General Comments

Heithaus Engineering & Associates prepared, on behalf of Pinnacle Shores, the *Antidegradation Review Report for Pinnacle Shores WWTF* (Report) revised December 2010. The Geohydrological Evaluation submitted with the report stated this is a gaining stream setting. A Tier Analysis was submitted by the applicant. A dissolved oxygen modeling analysis was submitted for review (See Appendix B). This discharge is proposed to serve 150 single-family residences and assumed to result in significant degradation for all pollutants of concern (POCs) in the unnamed tributary to Table Rock Lake (~0.25 miles), and the Mill Creek Arm of Table Rock Lake (~1.0 mile). Table Rock Lake is on the 2008 303(d) and 305(b) Lists, because of nutrients.

The effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. MDNR has determined that the submitted report is sufficient and meets the requirement of the AIP. Information found in the submitted report and in the summary forms provided by the applicant in Appendix C was used to develop this review document. A Missouri Department of Conservation Natural Heritage Review was obtained by the applicant; and no endangered species were found to be impacted by the discharge.

6. ANTIDEGRADATION REVIEW INFORMATION

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 was 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 August 30, 2008, a facility is required to use *Missouri's Antidegradation Rule and Implementation Procedure (AIP)*. This procedure is applicable to new and expanded wastewater facilities. The following is a review of the *Pinnacle Shores WWTF* Report.

6.1 TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix B: Tier Determination and Effluent Limit Summary). Pollutants of concern are defined as those pollutants "proposed for discharge that affect beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge." (AIP, Page 7).

Table 1. Pollutants of Concern and Tier Determination

POLLUTANTS OF CONCERN	TIER	DEGRADATION	COMMENT
Ammonia as Nitrogen	2	Significant	
Biochemical Oxygen Demand	2	Significant	*
Dissolved Oxygen	2	Significant	
Bacteria (E. Coli)	2	Significant	
Total Residual Chlorine	2	Significant	
pH	2	Significant	**
Total Suspended Solids***	2	Significant	*
Total Phosphorus	1	Significant	
Total Recoverable Aluminum	2	Significant	
Total Nitrogen	1	Significant	

* No in-stream standards for these parameters, therefore tier determination was not possible.
** Standards for these parameters are ranges and therefore tier determination was not possible.
*** Narrative criteria.

The following Antidegradation Review Summary attachments in Appendix C were used by the applicant:

☒ Tier Determination and Effluent Summary
For pollutants of concern, the attachments are:
☒ Attachment A, Tier 2 with significant degradation.
☐ Attachment B, Tier 2 with minimal degradation.
☐ Attachment D, Tier 1 Review. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment

6.2 Existing Water Quality

No existing water quality data was submitted.

6.3 Assimilative Capacity Calculations

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is no need to calculate the assimilative capacity for this review.

6.4 Alternative Analysis

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance included in the report. The report included an analysis of seven alternatives ranging from non-degrading to less degrading to the degrading alternative (base case alternative). The non-degrading alternatives of land application, subsurface irrigation, and regional sewer collection / treatment were each determined to be not practicable due to land availability and cost. The less degrading alternatives of Recirculating Sand/Sand Filter (Base Cost Alternative), Pura Max – Moving Bed Biological Reactor (MBBR), Bioficient, and Pura M system consisting of activated sludge bio-reactor process with ultrafiltration membrane were considered practicable with the economic efficiency analysis shown in Table 2. All meet Water Quality Standards. The preferred alternative is expansion of the currently being constructed recirculating sand filter. To the secondary treatment alternatives, tertiary Phosphorus removal alternatives were compared with the additional cost of $93,804 for the recirculating sand filter, and $63,556 for the other secondary treatment alternatives.

Table 2. Technology-Based Effluent Limits and Economic Efficiency Analysis

Discharging Alternatives	BOD_5 (mg/L)	TSS (mg/L)	E. Coli (#/100 ml)	DO (mg/L)	NH_4 (mg/L)	Present Worth Cost*	% Base Cost
Recirculating Sand filter	15	15	126	5	1.4/2.9	$225,826	100% (base)
Pura Max – (MBBR)	15	15	126	5	1.4/2.9	$750,038	332%
Bioficient	20	20	126	5	1.4/2.9	$847,753	375%
Pura M (membrane)	5	2	126	5	1.0/2.0	$1,089,285	482%

* Present Worth Cost: 20 year design life and 7% interest

6.5 Demonstration of Necessity and Social and Economic Importance

This antidegradation review assumed significant degradation for all Pollutants of Concern, so there is a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance that was included in the report. This facility will provide the wastewater service to accommodate residential development. The development will create short-term construction related and real estate jobs and generate sales tax for the community. Increased property tax revenue will be a long-term benefit from this development.

6.6 Preliminary Determination

The proposed facility is assumed to result in significant degradation for all POCs in the noted waterbody segments. Heithaus Engineering & Associates assumed significant degradation for the segments mentioned above and provided an alternatives analysis which showed that a recirculating sand filtration plant would be the most economically efficient and practicable option for treatment. The Social and Economic Importance of the proposed facility will provide housing and a tax base increase for the area. The effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. MDNR has determined that the submitted report is sufficient and meets the requirement of the AIP. No further analysis is needed for this discharge.

7. General Assumptions of the Water Quality and Antidegradation Review

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR 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 after the drafting of this WQAR 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 supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR 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 WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.

8. Mixing Considerations

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

Zone of Initial Dilution (ZID). Not allowed [10 CSR 20-7.031(4)(A)5.B.(IV)(b)].

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

9. PERMIT LIMITS AND INFORMATION

TMDL WATERSHED: (Y OR N) [N] W.L.A. STUDY CONDUCTED: (Y OR N) [N] DISINFECTION REQUIRED: (Y OR N) [Y] USE ATTAINABILITY ANALYSIS: (Y OR N) [N]

9.1 OUTFALL #001– Main Facility Outfall

WET TEST (Y OR N): N FREQUENCY: N/A A.E.C. 100 % METHOD: N/A

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	WQBEL (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*	FSR	Once/Month
BIOCHEMICAL OXYGEN DEMAND (BOD_5)	MG/L		22.5	15	PAL	Once/Month
TOTAL SUSPENDED SOLIDS	MG/L		22.5	15	PAL	Once/Month
DISSOLVED OXYGEN	MG/L	5.0 (MINIMUM)		5.0 (MINIMUM)	PAL	Once/Month
PH	SU	6.5 – 9.0		6.5 – 9.0	FSR	Once/Month
ESCHERICHIA COLIFORM (E. COLI)	**	630		126***	FSR	Once/Month
CHLORINE, TOTAL RESIDUAL	MG/L	0.017		0.008	FSR	Once/Month
AMMONIA AS N (APRIL 1- SEPT 30)	MG/L	3.7		1.4	WQBEL	Once/Month
AMMONIA AS N (OCT 1 – MARCH 30)	MG/L	7.5		2.9	WQBEL	Once/Month
TOTAL PHOSPHORUS	MG/L	*		0.50	FSR	Once/Month
ALUMINUM, TOTAL RECOVERABLE	MG/L	0.75		0.37	WQBEL	Once/Month
TOTAL NITROGEN	MG/L	*		*		Once/Month

Note 1– Water Quality-based Effluent Limitation --WQBEL; or Minimally Degrading Effluent Limit--MDEL; or Technology-based Effluent Limit-TBEL; or No Degradation Limit--NDL; or PAL—Preferred Alternative Effluent Limit; or FSR – Federal/State Regulation; or N/A--Not Applicable. Also, please see the **General Assumptions of the WQAR #4 & #5.**

* – Monitoring Requirement Only
** – colonies/100 mL
*** – The Monthly Average shall be reported as a Geometric Mean.

10. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

11. DERIVATION AND DISCUSSION OF LIMITS

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

$$C = \frac{(Cs \times Qs) + (Ce \times Qe)}{(Qe + Qs)}$$ (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).

11.1 OUTFALL #001 – Main Facility Outfall – Limit Derivation

- **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 (BOD_5).** Preferred alternative effluent limits: 15 mg/L monthly average. Proposed limit of 15.0 mg/l was provided by applicant in the Antidegradation Report. To derive the Average Weekly Limit (AWL), the average monthly limit was multiplied by 1.5, thus the AWL =22.5 mg/l. Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Suspended Solids (TSS).** Preferred alternative effluent limits: 15 mg/L monthly average. Proposed limit of 15.0 mg/l was provided by applicant in the Antidegradation Report. To derive the Average Weekly Limit (AWL), the average monthly limit was multiplied by 1.5, thus the AWL =22.5 mg/l. Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Dissolved Oxygen.** Dissolved oxygen in the stream is dependent upon the wastewater treatment plant effluent concentration of dissolved oxygen. Because the Streeter-Phelps water quality modeling used a minimum dissolved oxygen concentration of 5.0 mg/L for the effluent, the department is requiring this dissolved oxygen limit of 5.0 mg/L as a daily minimum and monthly average for the outfall to ensure water quality criteria in Table Rock Lake is not violated. Water Quality Standards for dissolved oxygen is 5.0 mg/L [10 CSR 20-7.031, Table A].

- **pH.** pH shall be maintained in the range from 6.5 – 9.0 standard units [10 CSR 20-7.015(8)(B)2.].

  Escherichia Coliform (E. Coli). In accordance with 10 CSR 20-7.031(4)(C) and Table A, discharge shall not contain more than a monthly geometric mean of 126 colonies per 100 ml and 630 colonies per 100 ml weekly average during the recreational season (April 1 – October 31). Daily Maximum effluent variability will be evaluated in development of a future effluent limit. An effluent limit for both monthly average and daily maximum is required by 40 CFR 122.45(d). Monitoring frequency is the same as the BOD monitoring frequency per the January 12, 2011 Clean Water Commission directive. Also, please see **GENERAL ASSUMPTIONS OF THE WQRS #7.**

- **Total Residual Chlorine (TRC).** Warm-water Protection of Aquatic Life CCC = 10 µg/L, CMC = 19 µg/L [10 CSR 20-7.031, Table A]. Background TRC = 0.0 µg/L.

  C_e =(((Qe+Qs)*C) - (Qs*Cs))/Qe

  Chronic WLA: C_e = ((0.022 + 0.0)10 – (0.0 * 0.00))/0.022
  C_e = 10 mg/L

  Acute WLA: C_e = ((0.022 + 0.0)19 – (0.0 * 0.00))/0.022
  C_e = 19 µg/L

LTA_c = 10 µg/L (0.527) = **5.3 µg/L** [CV = 0.6, 99th Percentile]
LTA_a = 19 µg/L (0.321) = 6.1 µg/L [CV = 0.6, 99th Percentile]

MDL = 5.3(3.114) = 17 µg/L [CV = 0.6, 99th Percentile]
AML = 5.3(1.55) = 8 µg/L [CV = 0.6, 95th Percentile, n = 4]

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

- **Total Ammonia Nitrogen.** Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg 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: April 1 – September 30, Winter: October 1 – March 31.

No time of travel calculations were submitted due to the short distance to Table Rock Lake.

Summer

C_e =(((Qe+Qs)*C) - (Qs*Cs))/Qe

Chronic WLA: C_e = 1.5 mg/L
Acute WLA: C_e = 12.1 mg/L

LTA_c = 1.5 mg/L (0.780) = **1.2 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.88 mg/L [CV = 0.6, 99th Percentile]

MDL = 1.2 mg/L (3.11) = 3.7 mg/L [CV = 0.6, 99th Percentile]
AML = 1.2 mg/L (1.19) = 1.4 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: C_e = 3.1 mg/L
Acute WLA: C_e = 12.1 mg/L

LTA_c = 3.1 mg/L (0.780) = **2.4 mg/L** [CV = 0.6, 99th Percentile, 30 day avg.]
LTA_a = 12.1 mg/L (0.321) = 3.9 mg/L [CV = 0.6, 99th Percentile]

MDL = 2.4 mg/L (3.11) = 7.5 mg/L [CV = 0.6, 99th Percentile]
AML = 2.4 mg/L (1.19) = 2.9 mg/L [CV = 0.6, 95th Percentile, n = 30]

The proposed effluent limits provided in the Antidegradation Report were the same as the calculated water quality based effluent limits.

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	3.7	1.4
Winter	7.5	2.9

- **Total Phosphorous.** Average monthly limit 0.5 mg/L [10 CSR 20-7.015(3)G.]. Table Rock Lake is 303(d) and 305(b) listed for nutrients. Limits have been applied by regulation to affect the Tier 1 status of the POC with Table Rock Lake.

- **Total Nitrogen.** Monitoring only requirement. The proposed facility discharges to a tributary to Table Rock Lake, which is on the 2008 303(d) and 305(b) list for nutrients. The department has adopted nutrient criteria for discharges to lakes and reservoirs in 10 CSR 20-7.031(4)(N)(3)(B), however has not developed an approved implementation procedure for total nitrogen. Wasteload allocation and effluent limits will be established upon issuance of the total maximum daily load (TMDL) for Table Rock Lake.

- **Aluminum, Total Recoverable.** Protection of Aquatic Life Acute Criteria = 0.75 mg/L.

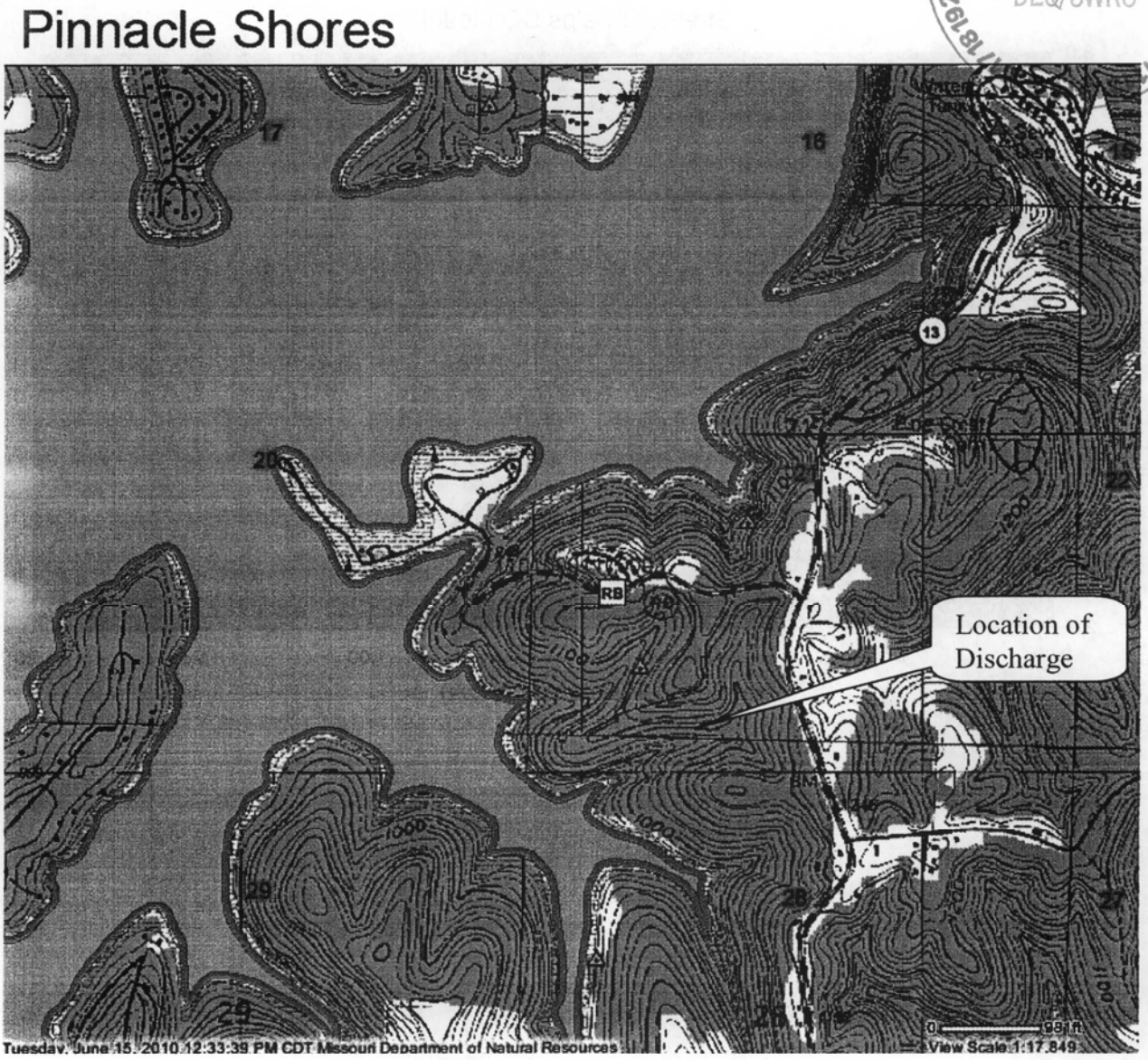
$$WLA_a = \frac{(((0.233 + 0.0) * 0.75) - (0 * 0.00))}{0.233} = 0.75 \text{ mg/l}$$

$LTA_a = 0.75(0.321) = 0.241$ mg/L [CV = 0.6, 99th Percentile]
MDL = 0.241(3.11) = **0.75 mg/L** [CV = 0.6, 99th Percentile]
AML = 0.241(1.55) = **0.37 mg/L** [CV = 0.6, 95th Percentile, n = 4]

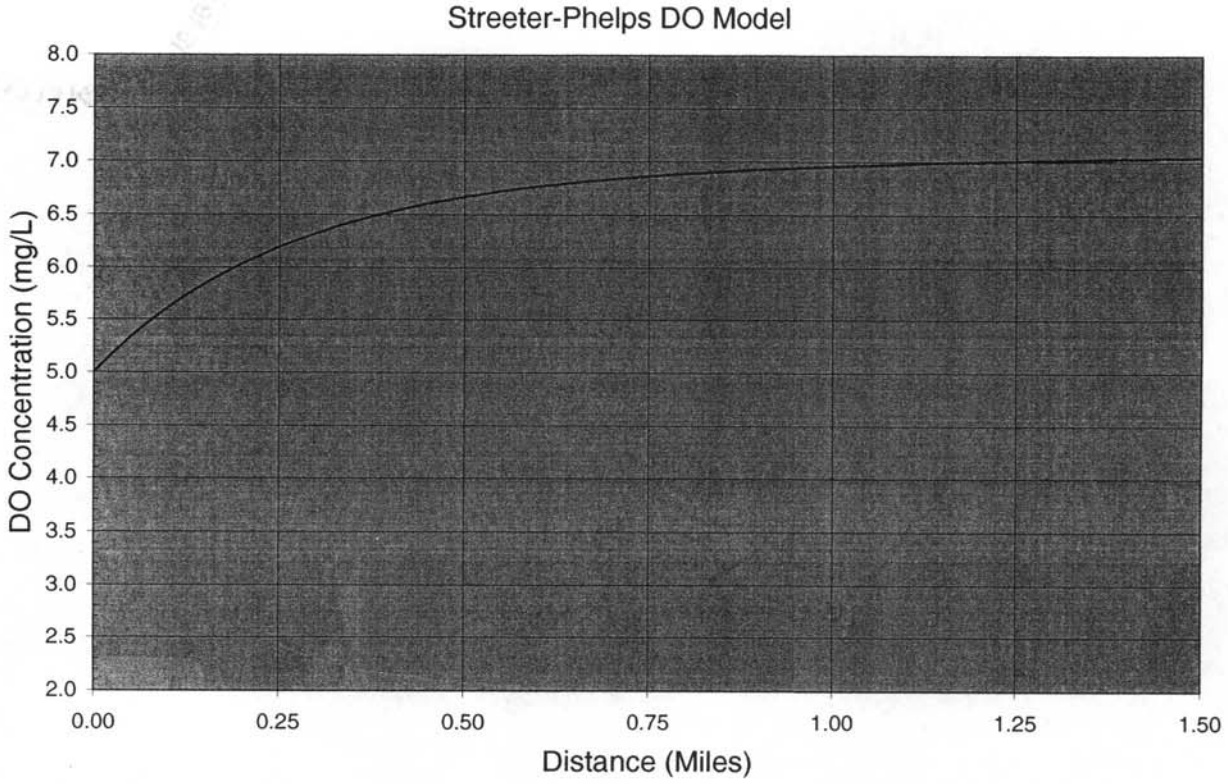
Reviewer: Keith Forck
Date: January 18, 2011
Unit Chief: John Rustige

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: MAP OF DISCHARGE LOCATION



Appendix B: Dissolved Oxygen Modeling Analysis



Appendix C: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant

1) Tier Determination and Effluent Limit Summary Sheet: Water Body Segment coordinates have been modified. Total Nitrogen and Phosphorus are Tier 1 Pollutants of Concern.

2) Attachment A: Tier 2 – Signification Degradation

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

ANTIDEGRADATION REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

1. FACILITY

NAME			TELEPHONE NUMBER WITH AREA CODE
PINNACLE SHORES WWTF			417-739-9996
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
STATE HWY RB AT STATE HWY 13	KIMBERLING CITY	MO	65686

2. RECEIVING WATER BODY SEGMENT #1

NAME
TABLE ROCK LAKE

2.1 UPPER END OF SEGMENT (Location of discharge)
UTM _____ OR Lat 36°35'18" N, Long 93°25'52" W

2.2 LOWER END OF SEGMENT
UTM _____ OR Lat 36°35'40" N, Long 93°26'52" W

Per the Missouri Antidegradation Rule and Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME

3.1 UPPER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

3.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

4. WATER BODY SEGMENT #3 (IF APPLICABLE)

NAME

4.1 UPPER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

4.2 LOWER END OF SEGMENT
UTM _____ OR Lat _____, Long _____

5. PROJECT INFORMATION

Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto?

☐ Yes ☒ No

In Tables D and E of 10 CSR 20-7.031, Outstanding National Resource Waters and Outstanding State Resource Water are listed. Per the Antidegradation Implementation Procedure Section 1.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.

Will the proposed discharge of all pollutants of concern, or POCs, result in net increase in the ambient water quality concentration of the receiving water after mixing?

☐ Yes ☒ No

If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.

Will the discharge result in temporary degradation?

☐ Yes ☒ No

If yes, complete Attachment C.

Has the project been determined as non-degrading?

☐ Yes ☒ No

If yes, complete No Degradation Evaluation – Conclusion of Antidegradation Review form.
Submit with the appropriate Construction Permit Application as no antidegradation review is required.

If yes to one of the above questions, skip to Section 8 - Wet Weather.

6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data by approved the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section.

Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section:

Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:

Approval date of the project sampling plan by the Water Quality Monitoring and Assessment Section:

Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:

Comments/Discussion:

7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(S)

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.S. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

Water Body Segment One
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
		BOD5* & TSS*
		DO*
		AMMONIA AS N* & TN
		E.COLI*
		PHOS. (TP) & AL *

Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.

Water Body Segment Two
Pollutants of Concern and Tier Determination(s)

Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
		BOD5* & TSS*
		DO*
		AMMONIA AS N* & TN
		E.COLI*
		PHOS. (TP) & AL *

- For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A.
- For pollutants of concern that are Tier 2 with minimal degradation, complete Attachment B.
- For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment.

8. WET WEATHER ANTICIPATIONS

If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 1.0

Wet Weather Design Summary:
NO WET WEATHER BYPASS IS BEING REQUESTED AT THIS TIME

MO780-2025 (01/09)

9. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS

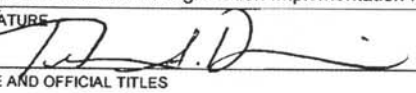
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:

Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L	20	20	30
TSS	MG/L	20	20	30
Dissolved Oxygen	MG/L	5.1 MINIMUM	5.1	5.1
Ammonia	MG/L	1.4/2.9	1.4/2.9	1.4/2.9
Bacteria (E. Coli)	COLONIES/100 ML	126	126	126
PHOSPHOROUS	MG/L	0.5	0.5	0.5
ALUMINUM	UG/L	750	750	750
TN	MONITORING ONLY			

These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.

Attach the Antidegradation Review report and all supporting documentation.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.

SIGNATURE  DATE 12/28/10

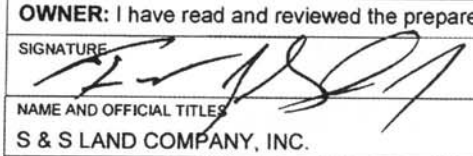
NAME AND OFFICIAL TITLES
TERESA A DAVISON, P.E.

COMPANY NAME
HEITHAUS ENGINEERING & ASSOC., INC.

ADDRESS	CITY	STATE	ZIP CODE
535 W BATTLEFIELD	SPGFD	MO	65807

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
(417)887-3238	TERESA@HEIWEB.COM

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE

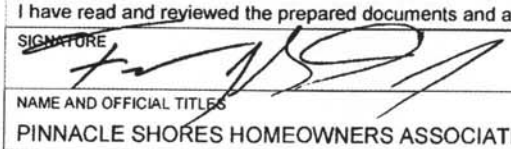
NAME AND OFFICIAL TITLES
S & S LAND COMPANY, INC.

ADDRESS	CITY	STATE	ZIP CODE
P.O. BOX 1009	BRANSON WT	MO	65737

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
417-739-9996	JAY@SSLANDCOMPANY.COM

CONTINUING AUTHORITY: Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf.

I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE  DATE

NAME AND OFFICIAL TITLES
PINNACLE SHORES HOMEOWNERS ASSOCIATION

ADDRESS	CITY	STATE	ZIP CODE
P.O. BOX 1009	BRANSON WT	MO	65737

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
417-739-9996	JAY@SSLANDCOMPANY.COM

MO780-2025 (01/09)

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH

ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT A: TIER 2 – SIGNIFICANT DEGRADATION

1. FACILITY

NAME		TELEPHONE NUMBER WITH AREA CODE	
PINNACLE SHORES WWTF		417-739-9996	
ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE
STATE HWY RB AT STATE HWY 13	KIMBERLING CITY	MO	65686

2. RECEIVING WATER BODY SEGMENT #1

NAME
TABLE ROCK LAKE

3. WATER BODY SEGMENT #2 (IF APPLICABLE)

NAME
N/A

4. IDENTIFYING ALTERNATIVES

Supply a summary of the alternatives considered and the level of treatment attainable with regards to the alternative. "For Discharges likely to cause significant degradation, an analysis of non-degrading and less-degrading alternatives must be provided," as stated in the Antidegradation Implementation Procedure Section II.B.1. Per 10 CSR 20-6.010(4)(D)1., the feasibility of a no-discharge system must be considered. Attach all supportive documentation in the Antidegradation Review report.

Non-degrading alternatives: LAND APPLICATION, SUBSURFACE IRRIGATION, REGIONAL SEWER

Alternatives ranging from less-degrading to degrading including Preferred Alternative (All must meet water quality standards):

Alternatives	Level of Treatment Attainable for each Pollutant of Concern					
	BOD	TSS	Ammonia as N	Bacteria (E. Coli)	P	Al
	(mg/L)	(mg/L)	(mg/L)	(#/100mL)	mg/L	ug/L
RECIRC. SAND FILTER	15	15	1.4 / 2.9	100 / 400	0.5	750
PURAMAX MBBR	15	15	1.4 / 2.9	100 / 400	0.5	750
BIOFICIENT	20	15	4 / 6	100 / 400	0.5	750
PURA M	5	2	1 / 2	3 / 100	0.5	750

Identifying Alternatives Summary: NON-DEGRADING AND LESS-DEGRADING ALTERNATIVES HAVE BEEN EVALUATED IN THE ATTACHED REPORT TO DETERMINE THE FEASIBILITY OF EACH ALTERNATIVE. THE NON-DEGRADING ALTERNATIVES HAVE BEEN DETERMINED TO BE NOT PRACTICAL AND/OR ECONOMICALLY EFFICIENT.

5. DETERMINATION OF THE REASONABLE ALTERNATIVE

Per the Antidegradation Implementation Procedure Section II.B.2, "a reasonable alternative is one that is practicable, economically efficient and affordable." Provide basis and supporting documentation in the Antidegradation Review report.

Practicability Summary:

"The practicability of an alternative is considered by evaluating the effectiveness, reliability, and potential environmental impacts," according to the Antidegradation Implementation Procedure Section II.B.2.a. Examples of factors to consider, including secondary environmental impacts, are given in the Antidegradation Implementation Procedure Section II.B.2.a.

THE NON-DEGRADING ALTERNATIVES HAVE BEEN DETERMINED NOT PRACTICICABLE BASED ON EXISTING SOIL CONDITIONS, LAND AVAILABLITY/VALUES, AND RIGHT-OF-WAY &/OR EASEMENT ACQUISITION. LESS-DEGRADING ALTERNATIVES ARE EVALUATED IN THE ATTACHED REPORT AS WELL.

Economic Efficiency Summary:

Alternatives that are deemed practicable must undergo a direct cost comparison in order to determine economic efficiency. Means to determine economic efficiency are provided in the Antidegradation Implementation Procedure Section II.B.2.b.

THE REPORT ANALYZES THE ECONOMIC EFFICIENCY OF PRACTICAL LESS-DEGRADING ALT'S TO EXPAND THE CURRENT PLANT WITH PHOSPHOROUS REMOVAL DETERMINED TO BE AS FOLLOWS: 100% RSF W/TERTIARY P (BASE COST) VS 332% MBBR, 375% BIOFICIENT, 482% PURA M W/SECONDARY

Affordability Summary:

Alternatives identified as most practicable and economically efficient are considered affordable if the applicant does not supply an affordability analysis. An affordability analysis per the Antidegradation Implementation Procedure Section II.B.2.c, "may be used to determine if the alternative is too expensive to reasonably implement."

ALT 1B WITH 3P TERIARY P REMOVAL IS THE ONLY ECONOMICALLY EFFICIENT AND PRACTICAL ALTERNATIVE SINCE IT WILL EXPAND TANKS CURRENTLY UNDER CONSTRUCTION. AN AFFORDABILITY SUMMARY IS NOT NECESSARY TO DETERMINE THE PREFERRED CHOSEN ALTERNATIVE.

Preferred Chosen Alternative:

1B, RECIRCULATING SAND FILTER (RSF) W/ 3P TERTIARY P REM. IS THE PREFERRED CHOSEN ALT SINCE IT WAS DETERMINED TO BE THE ONLY PRACTICABLE & ECONOMICALLY EFFIICIENT ALT. THE RSF EXPANSION WILL ADD CAPACITIES TO COMPONENTS CURRENTLY UNDER CONSTRUCTION.

Reasons for Rejecting the other Evaluated Alternatives:

ALT 2B, 3B & 4B WERE REJECTED BECAUSE THEY WERE NOT ECONOMICALLY EFFICIENT OR PRACTICABLE. ALSO, NEW TECHNOLOGIES INCOMPATIBLE WITH CURRENT WWTP WOULD BE REQUIRED.

Comments/Discussion:

A SEPARATE NUTRIENT REMOVAL ANALYSIS FOR PHOSPHOROUS HAS BEEN INCLUDED IN THE ALT ANALYSIS TO MEET THE 0.5 MG/L PHOSPHOROUS LIMIT REQUIRED WITHIN THE TABLE ROCK LAKE WATERSHED.

6. SOCIAL AND ECONOMIC IMPORTANCE OF THE PREFERRED ALTERNATIVE

If the preferred alternative will result in significant degradation, then it must be demonstrated that it will allow important economic and social development in accordance to the Antidegradation Implementation Procedure Section II.E. Social and Economic Importance is defined as the social and economic benefits to the community that will occur from any activity involving a new or expanding discharge.

Identify the affected community:

The affected community is defined in 10 CSR 20-7.031(2)(B) as the community "in the geographical area in which the waters are located.: Per the Antidegradation Implementation Procedure Section II.E.1, "the affected community should include those living near the site of the proposed project as well as those in the community that are expected to directly or indirectly benefit from the project."

PINNACLE SHORES, THE LODGES AT PINNACLE SHORES, MILL CREEK CAMPGROUNDS
NEIGHBORING SUBDIVISIONS & RESORTS, TABLE ROCK LAKE (DOWNSTREAM)

Identify relevant factors that characterize the social and economic conditions of the affected community:

Examples of social and economic factors are provided in the Antidegradation Implementation Procedure Section II.E.1., but specific community examples are encouraged.

THE LODGES OF PINNACLE SHORES HAS BEEN APPROVED TO BE DEVELOPED AS SINGLE-FAMILY RESIDENTIAL. PINNACLE SHORES PROVIDES POTABLE WATER DISTRIBUTION TO THE LODGES AS WELL. THE PROPOSED WWTP EXPANSION WILL COMBINE THE TWO DEVELOPMENTS WW TREATMENT

Describe the important social and economic development associated with the project:

Determining benefits for the community and the environment should be site specific and in accordance with the Antidegradation Implementation Procedure Section II.E.1.

THE PROPOSED WWTF EXPANSION WILL ALLOW FOR DEVELOPMENT AND GROWTH WITHIN THE COMMUNITY WHICH WILL INCREASE THE COUNTY'S TAX BASE WHILE COMBINING FLOWS FROM TWO DEVELOPMENTS TO PROTECT THE ENVIRONMENT, PUBLIC HEALTH AND DOWNSTREAM WATER QUALITY.

PROPOSED PROJECT SUMMARY:

EXPAND THE APPROVED PINNACLE SHORES WWTF (AN RSF SYSTEM) CURRENTLY UNDER CONSTRUCTION (STATE CONSTR. PERMIT # SWRO-2417) FROM 35,000 GPD TO 45,000 GPD AVERAGE DAILY DESIGN FLOW TO SERVE THE LODGES OF PINNACLE SHORES

Attach the Antidegradation Review report and all supporting documentation. This is a technical document, which must be signed, sealed and dated by a registered professional engineer of Missouri.

CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed in consistent with the Antidegradation Implementation Procedure and current state and federal regulations.

SIGNATURE	DATE
T. A. D	12/28/10

PRINT NAME	LICENSE # :
Teresa A. Davison	PE-2002003148

TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS:
417-887-3238	TERESA@HEIWEB.COM

OWNER: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE

CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.

SIGNATURE	DATE