

**Division of Water Quality
Point Source Branch/NPDES Unit
January 5, 2001**

MEMORANDUM

To: Tommy Stevens
Through: Coleen Sullins
Bill Reid
Dave Goodrich
From: Tom Belnick
Subject: Goose Creek NPDES Permitting Policy
Yadkin Pee Dee River Basin (Subbasin 030712)
Union County

Goose Creek is an environmentally sensitive waterbody with the presence of endangered species and an impaired use support rating. This NPDES permitting policy was developed specifically for current and proposed future wastewater dischargers to Goose Creek, and will remain in effect until water quality improvements are documented. Long-range plans include elimination of all small dischargers in the Goose Creek watershed by connecting to a proposed regional facility.

BACKGROUND

Stream Data. Goose Creek, a Class C waterbody with headwaters in Mecklenburg County, flows through Union County before joining Rocky River. The creek is inhabited by a small population of the federally endangered freshwater mussel Carolina heelsplitter (*Lasmigona decorata*), which was listed as an endangered species in 1993. A small number of individuals have also been reported in Duck Creek, a tributary to Goose Creek. The decline in the species has been attributed to a combination of urban growth pressures, wastewater dischargers, and agricultural activities.

The entire Goose Creek waterbody is listed in the North Carolina Draft 2000 303(d) list as biologically impaired waters, and was designated by DWQ as one of the top five priorities among all the waters on the 1998 303(d) listing. A "poor" bioclassification was assigned to Goose Creek based on 1996 benthic macroinvertebrate data, and a 1998 biological assessment conducted by the Division's Environmental Sciences Branch found few benthic macroinvertebrates despite generally good habitat (see **Attachment A**). The current use support rating is NS (Not Supporting).

Goose Creek is approximately 17 miles in length, with a drainage area of 42 square miles and an estimated s7Q10 flow of 0.52 cfs at its confluence with Rocky River. Currently, there is an irrigation withdrawal from Goose Creek for a golf course at approximately mid-length during summer months of up to 188 gpm (0.42 cfs), which can significantly affect the available dilution for downstream dischargers. Time of travel dye studies revealed that the average stream velocity in Goose Creek is very slow, particularly in the lower half (0.05 fps).

NPDES Discharger Status. There are currently six permitted dischargers of treated domestic wastewater to Goose Creek or its tributaries (i.e., Stevens Creek, Paddle Creek, Duck Creek); refer to **Table 1**. Permittees include 5 subdivisions and 1 school, with permitted flows ranging from 0.004 - 0.67 MGD. Based on the Union County Sewer System Master Plan (1996), long range plans for the Goose Creek drainage basin include construction of a new Rocky River Regional WWTP, which would include an activated sludge plant with nutrient removal, tertiary filtration, and UV disinfection. The proposed

regional outfall would be located at the confluence of Goose Creek and Rocky River. Presently several Goose Creek dischargers are evaluating alternative discharge options.

QUAL2E Model Results. The Modeling/TMDL Unit developed a QUAL2E model for Goose Creek to evaluate potential impacts of existing domestic dischargers on instream dissolved oxygen (DO) levels. Model results indicate that Goose Creek is over-allocated at current permitted limits, with DO concentrations predicted to drop below the instream water quality standard of 5 mg/l during summer low flow conditions along a 3.8-mile downstream segment. Actual instream DO data from DMR reports and a 1997 intensive survey showed no DO violations; however, more recent data collected during Summer 2000 by the Yadkin-Pee Dee River Basin Association show some instream DO values at or below 5.0 mg/l at Stations Q8360000 and Q8359000 in Goose Creek. The modeling report notes that there are model uncertainties due to the slow time of travel, particularly in the lower half. A summary of model results is included as **Attachment B**.

Basin Plan Recommendations. The 1998 Basin Plan reports that "elevated fecal coliform levels are likely primarily due to nonpoint sources, while the cumulative effect of elevated chlorine and ammonia levels from the small wastewater dischargers may also be affecting the aquatic community of Goose Creek." The 1998 Basin Plan recommended that 1) existing facilities discharging into Goose Creek receive TRC limits at permit renewal; 2) DWQ be supportive of efforts to eliminate the small discharges in the Goose Creek watershed by connecting to the proposed Rocky River regional WWTP in 2000 to 2010.

Agency Comments. A meeting was held on July 7, 2000, with staff from the U.S. Fish and Wildlife Service (USFWS) and the North Carolina Wildlife Resources Commission (WRC). The purpose of the meeting was to seek agency comments on a proposed NPDES permitting strategy for Goose Creek. Primary agency concerns focused on potential toxic impacts to the endangered mussel populations from direct wastewater dischargers. WRC provided maps of Goose Creek mussel distributions and abundances, which suggest impairment to mollusk populations below point source discharges. Both USFWS and WRC were opposed to any additional hydraulic expansions. USFWS recommended instream monitoring for toxic constituents (TRC, ammonia) to be added to the existing permits.

Attachment C includes agency comments and maps.

NPDES PERMITTING POLICY

As a result of the presence of endangered species, an impaired use support rating, and model results indicating current overallocation, the following NPDES permitting policy for NPDES-permitted dischargers to the Goose Creek drainage will be effective immediately and remain in effect until water quality improvements are documented:

- New Facilities and Expansions. No new or expanding dischargers will be allowed. This moratorium on additional hydraulic and pollutant loading can be revisited after sources of water quality impairment are well characterized, strategies are implemented to reduce that impairment, and water quality has been demonstrated to improve.
- Existing Facilities: Refer to **Table 1** for a summary of proposed changes at permit renewal. Existing facilities will receive TRC limits (minimum of 17 µg/L, with upper cap = 28 µg/L) if they are not already present, and ammonia limits will be adjusted according to mass balance calculations to protect for ammonia toxicity. To account for the decreased streamflow during summer irrigation for the single existing facility located downstream of the golf course withdrawal (i.e., Fairview Elementary, NC0030538), a s7Q10 flow of 0.10 cfs will be used in limits development for TRC and NH3. Compliance schedules may be included in permits to allow for securement of an ATC permit and installation of equipment, if needed, to meet potential new permit limits for TRC and NH3. Also, summer instream monitoring (U,D) for TRC and NH3 will be added to each permit at the current

instream monitoring frequency, in order to evaluate whether instream criteria are being maintained. Instream monitoring for TRC and NH3 may be removed at the next permit cycle, if data show no instream problems. Current effluent BOD limits will remain unchanged with one exception; for the already permitted phased 0.35 MGD flow at NC0072508, the BOD limit will be changed from 30 mg/l down to 5 mg/l. Nutrient monitoring (TN,TP) appropriate for the permitted flow will be maintained. Finally, the following language will be added to each permit cover letter: "**Please note that Goose Creek is listed in the Draft 2000 303(d) list as a biologically impaired water based on benthic macroinvertebrate data. The stream is also listed as impaired due to excessive instream fecal coliform concentrations. In addition, Goose Creek is considered environmentally sensitive due to the presence of the federally endangered freshwater mussel Carolina heelsplitter. If degradation of the stream can be attributed to point source dischargers, then mitigative measures, including the removal of the discharge, may be necessary. Finally, based on the Goose Creek NPDES Permitting Policy, no new or expanding wastewater discharges will be allowed until instream water quality improvements are documented.**"

The Point Source Branch requests your comments and concurrence with our permitting policy. You should note that the Division has three requests that would be denied as a result of this policy: 1) Goose Creek Utility Company (NC0034762) has requested an increase in permitted flow from 0.07 to 0.095 MGD to accommodate hydraulic loading from infiltration/inflow; 2) Heater Utility/Country Wood (NC0065684) has requested an increase in permitted flow from 0.67 to 0.70 MGD to accommodate future development; and 3) Howie Bottoms (NC0086282) submitted an application for a proposed subdivision wastewater discharge in January 1998, but the application has been held pending complete submission. Please feel free to call me at extension 543 if you have any questions or comments.

cc: (without attachments)
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Frank McBride, NCWRC
Mooresville Region, Water Quality
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Andy McDaniel, Modeling/TMDL Unit
Basin Planning, Yadkin River Basin

Table 1. NPDES-permitted facilities in Goose Creek and Permit Renewal Strategy

Permit#	Facility	Permitted Flow (MGD)	Receiving Stream (cfs)	NH3-N Limit (summer/winter)	TRC Limit (Daily Max)	BOD Summer Limit (Current and Renewal)	Instream (U,D) Monitoring
1. NC0072508	Union CO PWD-Hunley Cr.	Phased limits 0.231/0.35	Goose Creek S7Q10= 0.1 W7Q10= 0.3	Current: 2/4 mg/l Renewal: 2/4 mg/l	Current: 20 µg/L Renewal: 20 µg/L	Current:30 mg/l for both phases. Renewal: Change 0.35 MGD phased limit to 5 mg/l	Renewal: Add monthly TRC and NH3-N.
2. NC0034762	Goose Creek Util. Co.	0.07 (Requested increase to 0.095 not allowed)	Goose Creek S7Q10= 0.1 W7Q10= 0.4	Current: 5/10 mg/l Renewal: 2/7.6 mg/l (Basis- see IWC)	Current: No Limit Renewal: 28 µg/L (Basis- C _A = 33 µg/L, thus set upper TRC limit)	16 mg/l	Renewal: Add monthly TRC and NH3-N.
3. NC0065684	Heater Utility.-Country Wood	0.67 (Requested increase to 0.70 not allowed)	Goose Creek S7Q10= 0.1 W7Q10= 0.4	Current: 2/4 mg/l Renewal: 2/4 mg/l	Current: 19 µg/L Renewal: 19 µg/L	10 mg/l	Renewal: Add monthly TRC and NH3-N.
4. NC0030538	Union CO School-Fairview Elem	0.004	Goose Creek S7Q10=0.36 W7Q10= 0.91 With withdrawal S7Q10= 0.1 W7Q10= 0.4	Current: No Limit Renewal: 13.6/NL mg/l (Basis- see IWC with withdrawal factored in)	Current: No Limit Renewal: 28 µg/L (Basis- C _A = 1004 µg/L and C _{AW} = 291 µg/L, thus set upper TRC limit)	30 mg/l	Renewal: Add monthly TRC and NH3-N.
5. NC0065749	Heater Utility-Ashe Plantation	0.100	Duck Creek S7Q10= 0 W7Q10= 0	Current: 2/4 mg/l Renewal: 2/4 mg/l	Current: No Limit Renewal: 17 µg/L (Basis- C _A = 17 µg/L)	5 mg/l	Renewal: Add monthly TRC and NH3-N.
6. NC0063584	Heater Utility-Oxford Glen	0.075	Stevens Creek S7Q10= 0.05 W7Q10= 0.13	Current: 2/4 mg/l Renewal: 2/4 mg/l	Current: No Limit Renewal: 24 µg/L (Basis- C _A = 24 µg/L)	11 mg/l	Renewal: Add monthly TRC and NH3-N.

C_A= Allowable effluent concentration at s7Q10 flow

C_{AW} = Allowable effluent concentration, with golf course irrigation withdrawal considered.