

TMDL APPROVAL

Project:

Sugar Creek Watershed TMDL for Dissolved Oxygen

Location:

Mecklenburg County, NC and York County, SC

Scope/Size:

The water quality study encompasses 32.3 stream miles in the Sugar Creek, Little Sugar Creek and McAlpine Creek watersheds in the above counties.

Water Quality Issue(s):

The goal of the field study and water quality modeling was to provide a tool to assist with the management of wastewater discharge issues in the Sugar Creek watershed, to prevent dissolved oxygen (DO) from dropping below the instream standard during 7Q10 conditions. In addition, Sugar Creek is impacted by urban stormwater from the Charlotte area.

Applicable Water Quality Standard(s):

The DO standard for non-trout Class C waters is not less than a daily average of 5.0 mg/l with a minimum instantaneous value of not less than 4.0 mg/l.

Water Quality Model:

A calibrated QUAL2E water quality model was used to predict dissolved oxygen, ammonia, and biochemical oxygen demand at low flow conditions.

Critical Conditions:

The modeling was conducted under seasonal (summer/winter) low flows (7Q10). Since the 7Q10 is not zero, background water quality due to nonpoint source loading was accounted for by using instream data.

TMDL:

The new permit limits in the table below are predicted to prevent the dissolved oxygen levels from dropping below the instream standard during 7Q10 conditions.

## WASTELOAD ALLOCATION (WLA) BREAKDOWN

Receiving Stream	Discharger	Flow MGD	BOD5 mg/l	NH3-N mg/l	Comments
Irwin Creek	Irwin Creek WWTP	15.0	16	8	Summer limits. Limits from 1991.
"	"	"	30	18	Winter limits. Limits from 1991.
"	"	"	5	1	Summer limits. Limits effective April 01, 1995.
"	"	"	10	2	Winter limits. Limits effective April 01, 1995.
McAlpine Creek	McAlpine Creek WWTP	48	4	1	Summer limit. Before expansion.
"	"	"	8	1.9	Winter limit. Before expansion.
"	"	64	4	1	Summer limit after expansion. Permit issued 11/13/95.
"	"	64	8	1.9	Winter limit after expansion. Permit issued 11/13/95.
Little Sugar Creek	Sugar Creek WWTP	14.7	21	8	Summer limit before expansion.
"	"	"	30	N/A	Winter limit before expansion.
"	"	20	5	1	Summer limit after expansion. Limits effective April 01, 1995.
"	"	20	10	2	Winter limit after expansion. Limits effective April 01, 1995.

## LOAD ALLOCATION (LA) BREAKDOWN

The nonpoint source loading was accounted for in the water quality model by using headwater or background conditions based on instream data and the summer/winter 7Q10 flows. The following table summarizes the background loadings used in the water quality model (note that BOD is in terms of BOD ultimate instead of BOD5):

Receiving Stream	7Q10 (cfs)		BODU Background mg/l, (lbs/day)		NH3-N Background mg/l, (lbs/day)	
	Summer	Winter	Summer	Winter	Summer	Winter
Irwin Creek	4.90		7.1,	(187.5)	0.03,	(0.79)
	7.70		7.1,	(294.7)	0.03,	(1.25)
McAlpine Creek	1.3		6.0,	(42.0)	0.1,	(0.70)
	5.8		6.0,	(187.5)	0.1,	(3.13)
Little Sugar Creek	3.4		7.4,	(135.6)	0.03,	(0.55)
	5.5		7.4,	(219.4)	0.03,	(0.89)

Sugar Creek is impacted by urban stormwater from the Charlotte area. The City of Charlotte is currently covered by the NPDES stormwater requirements. The permit became effective on November 1, 1993 and covers discharges of stormwater from the city's storm sewer system as it exists today and any additional storm sewer outfalls that may be added. The permit expires on June 30, 1998.

## MARGIN OF SAFETY (MOS)

The water quality model used to predict the dissolved oxygen response to point source loads accounted for summer/winter low flows (7Q10).

Availability for Public Comment:

The NPDES permit limits for Irwin Creek WWTP and Sugar Creek WWTP were public noticed in 1991 prior to permit issuance. These 1991 permits included the more stringent limits to be met by April 01, 1995. These two permits will be up for renewal in February, 1996, and are scheduled to be reissued in September, 1996.

A public notice for the McAlpine Creek WWTP NPDES permit was issued on September 27, 1995. This notice requested comments on the permit including permit limits. The permit

was issued on November 13, 1995.

Date Submitted:

EPA approved the water quality limits for McAlpine Creek WWTP on November 6, 1995. The less stringent (or pre-upgraded/expanded plant) limits for Irwin Creek WWTP and Sugar Creek WWTP were approved by EPA on February 2, 1990. The more stringent limits (after upgrade/expansion) for Irwin Creek and Sugar Creek WWTPs, were approved by EPA prior to permit issuance in 1991 since no record of an objection was found during a file search.

The Catawba River Basin Plan containing the Sugar Creek strategy was sent to EPA on December 14, 1995. Due to the furlough, EPA did not receive the Basin Plan until January 10, 1996.

This TMDL is hereby approved as meeting the requirements of Section 303(d) of the Clean Water Act (CWA).

Technical Approver

*John A. Kroshke*

Technical Reviewer

*M. L. Smith*  
*R4 TMDL Coordinator*

Approved

*R. F. McGhee*  
Robert F. McGhee, Director  
Water Management Division

Date

*2/05/96*