

Initial Modeling Results

Buck Creek WPP Development Project

July 21, 2009

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Texas Water Resources Institute make every drop count Lucas Gregory TWRI Project Manager

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Load Duration Curves

• Graphical representation of streamflow and pollutant loadings

• Real data can be compared to the stream's maximum load to indicate reductions needed

• Can <u>*HELP*</u> to identify the type of pollutant load



Streamflow



Streamflow and Pollution Samples





Needed Pollutant Reduction Example







LDC for Historic Data (Hwy 83) Site 11 1997 – 2005 Red River Authority data

Load Duration Curve (Historic Buck Creek)





LDC for Historic Data (Hwy 83) Site 11 1997 – 2005 data



Combined 20% reduction needed













LDC for Site 5

All Project Data

Load Duration Curve (Site 5)



% of Days Load Exceeded





LDC for Site 5

All Project Data











Maximum Allowable E. Coli Load

80

Monitored E. Coli Load

60



100











% of Days Load Exceeded





LDC for Site 11 (1997 – 2009)





LDC for Historic Data (Hwy 83) Site 11 1997 – 2005 data



Combined 20% reduction needed



LDC for Site 11 Likely Assessment Data



SELECT Model Input

- Land use/ land cover data updated
- Watersheds delineated
- Data layers included in SELECT analysis
 - Land use
 - Hydrography (stream network)
 - Urban areas
 - Watershed boundary
 - County boundary
 - Soils
 - Wastewater treatment plants
 - Census
 - Population density
 - Cattle
 - Wildlife







Land Use Percentages & Acres



Teaching • Research • Extension • Service

Acres

155,856

86,792

4,580

2,705

2,152

656

324

80



Questions?

http://twri.tamu.edu/buckcreek/



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Buck Creek Data Review

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Lucas Gregory TWRI Project Manager



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Buck Creek Water Quality Data

ALL BUCK CREEK DATA

Summary of water sample results for E. coli collected 12/11/1997 - 5/13/2009

		Number of Samples	Number of Flow Data Points	~~~~~~~ E. coli ~~~~~~~~					
ne vila	Site #			Geometric means ¹			Single sample exceedances ²		
				Number of <i>E.</i> coli colonies	Pass	Fail	Percent exceeded	Pass	Fail
	1	0	0	no sample					
N 8 1	2	7	4	258			28.6		
	3	89	14	15			9		
ACTOR DECK	4	70	6	61			20		
100 A	5	79	20	88			13.9		
11	6	47	13	23			6.4		
	7	14	4	198			42.9		
	8	5	4	168			20		
	9	0	0	no sample					
	10A	96	14	135			27		
	10B	38	3	110			10.5		
	10C	64	16	44			10.9		
	11	110	51	48			17.3		
	12	19	1	100			15.8		
	13	21	1	81			19		
		an of at least				IDC E anti ant		of water	

Geometric mean of at least 10 samples must not exceed the current standard of 126 E. coli colonies per 100 ml of water

² 25% of the samples collected must not exceed the single sample limit of 394 E. coli colonies per 100 ml of water

Rows highlighted in Orange indicate that the site did not meet current water quality standards

Rows highlighted in Gray indicate that the sited did not have the required 10 data points



Data Grouped by TCEQ Assessment Units

ALL DATA Grouped by Sites within TCEQ Assessment Units



Summary of water sample results for E. coli collected 12/11/1997 – 5/13/2009

		Number of Samples	~~~~~~ E. coli ~~~~~~~~					
Site #s	Unit		Geometric means ¹			Single sample excedances ²		
			Number of <i>E.</i> coli colonies	Pass	Fail	Percent exceeded	Pass	Fail
1, 2, 3, 4, 5, 6, 7 and 8	0207A_02 (above House Log Creek)	311	43	\checkmark		14.5	\checkmark	
9, 10A, 10B, 10C, 11, 12 and 13	0207A_01 (below House Log Creek)	348	83	\checkmark		18.4	\checkmark	

¹ Geometric mean of at least 10 samples must not exceed the current standard of 126 *E. coli* colonies per 100 ml of water







Questions?

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