

Status of TCEQ Projects: Lake Houston Watershed Indicator Bacteria TMDLs

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Acknowledgements

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Texas Commission on Environmental Quality (TCEQ)
- Support Funding:
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Major Presentation Topics

- Previously completed TMDLs
- Fundamentals of TMDL equation
- Overview & status of two present TMDL projects

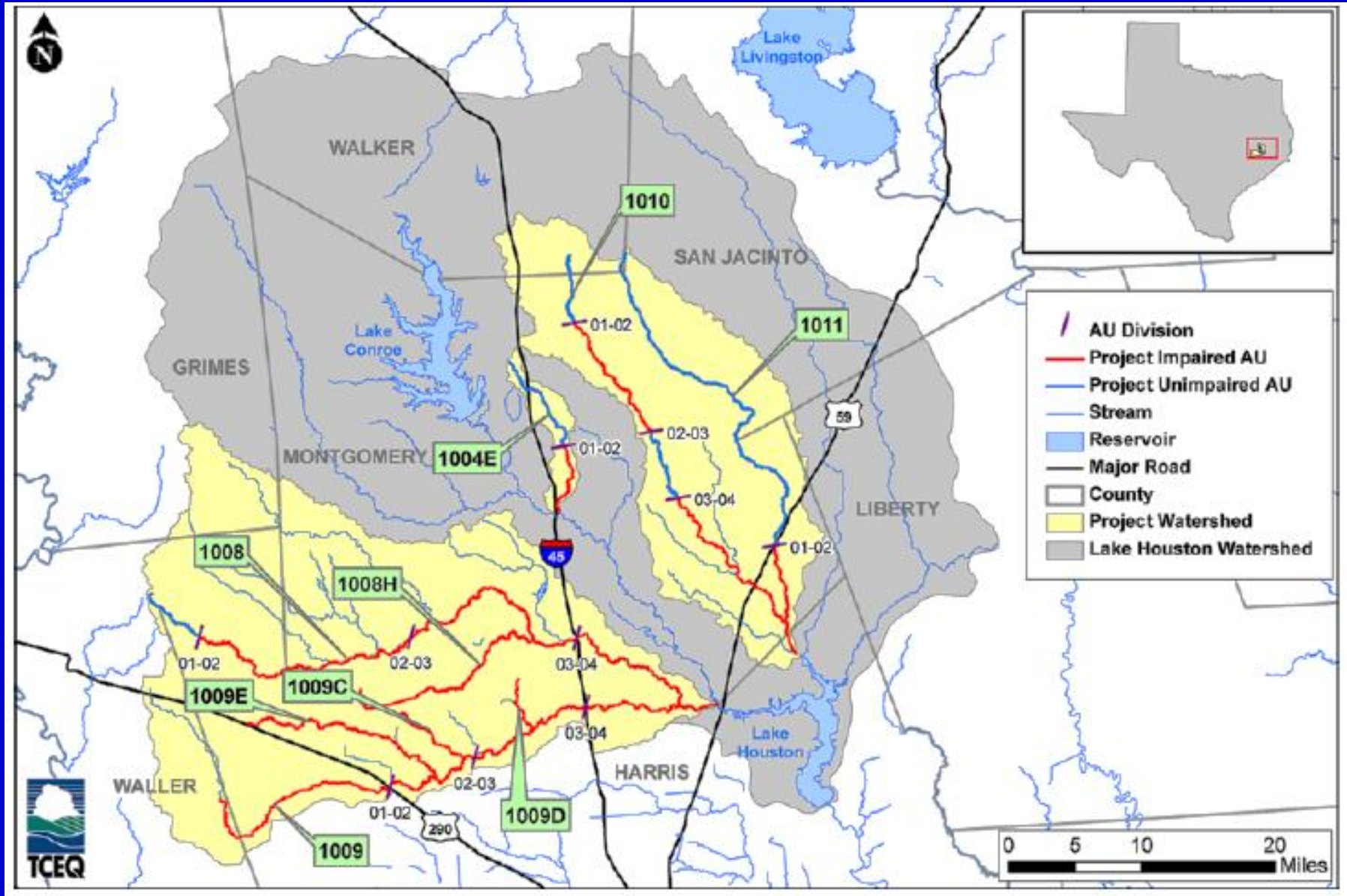


Previously Completed Indicator Bacteria TMDLs for Watersheds Upstream of Lake Houston

Adopted by TCEQ: April 6, 2011; Approved by EPA: June 29, 2011

Segment Name	Segment Number	Assessment Unit (AU)
Stewarts Creek	1004E	1004E_02
Spring Creek	1008	1008_02, 03 & 04
Willow Creek	1008H	1008H_01
Cypress Creek	1009	1009_01, 02, 03 & 04
Faulkey Gully	1009C	1009C_01
Spring Gully	1009D	1009D_01
Little Cypress Creek	1009E	1009E_01
Caney Creek	1010	1010_02 & 04
Peach Creek	1011	1011_02

Lake Houston Watershed showing areas of completed TMDLs



Fundamentals of TMDL Pollutant Load Allocation Equation

Expanded TMDL Allocation equation

$$\text{TMDL} = \text{WLA}_{\text{WWTF}} + \text{WLA}_{\text{SW}} + \text{LA}_{\text{AU}} + \text{LA}_{\text{RES}} + \text{FG} + \text{MOS}$$

- WLA_{WWTF} - Existing wastewater treatment discharges.
- WLA_{SW} - Construction, industrial and MS4 discharges.
- LA_{AU} - Unregulated loading originating within AU.
- LA_{RES} – Unregulated loading from upstream significant reservoir (Lake Woodlands & Lake Conroe).
- FG – Future growth from potential permitted facilities.
- MOS - Margin of safety.

Considerations for WWTFs

$$WLA_{\text{WWTF}} = \text{Target} * \text{Flow} * \text{CF}$$

Where:

Target = 63 MPN/100 mL (1/2 of criterion to provide instream and downstream load capacity)

Flow = full permitted flow in MGD

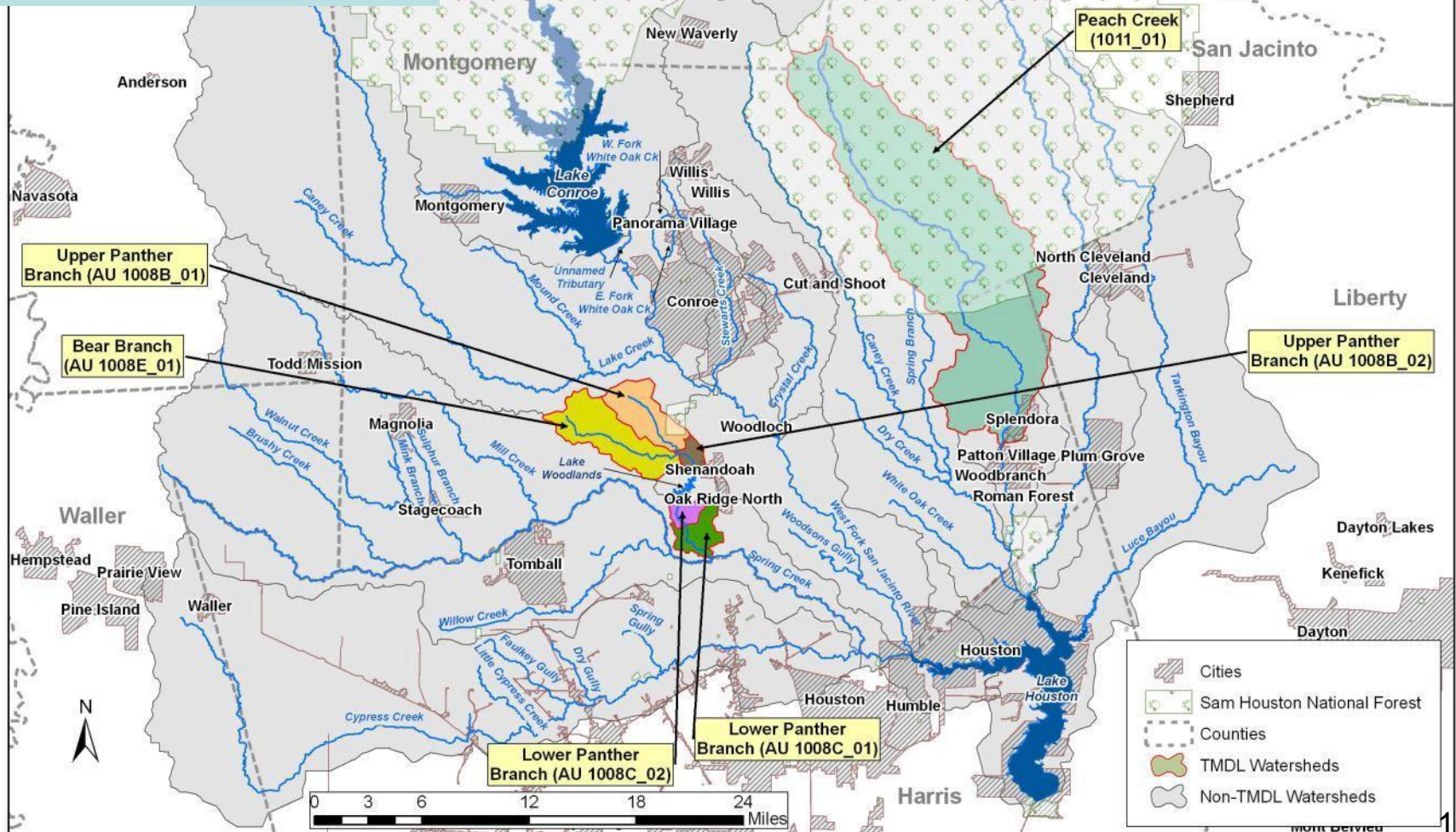
CF = 3.7854E+07 100 mL / MGD

FIRST NEW PROJECT

New/Additional Indicator Bacteria Listings in Existing Watersheds Upstream of Lake Houston

- Project water bodies (segments and assessment units)
 - Upper Panther Branch (1008B_01, 1008B_02)
 - Lower Panther Branch (1008C_01, 1008C_02)
 - Bear Branch (1008E_01)
 - Peach Creek (1011_01)
- Approach for TMDLS – FDCs/LDCs

Lake Houston Watershed Showing Project Areas



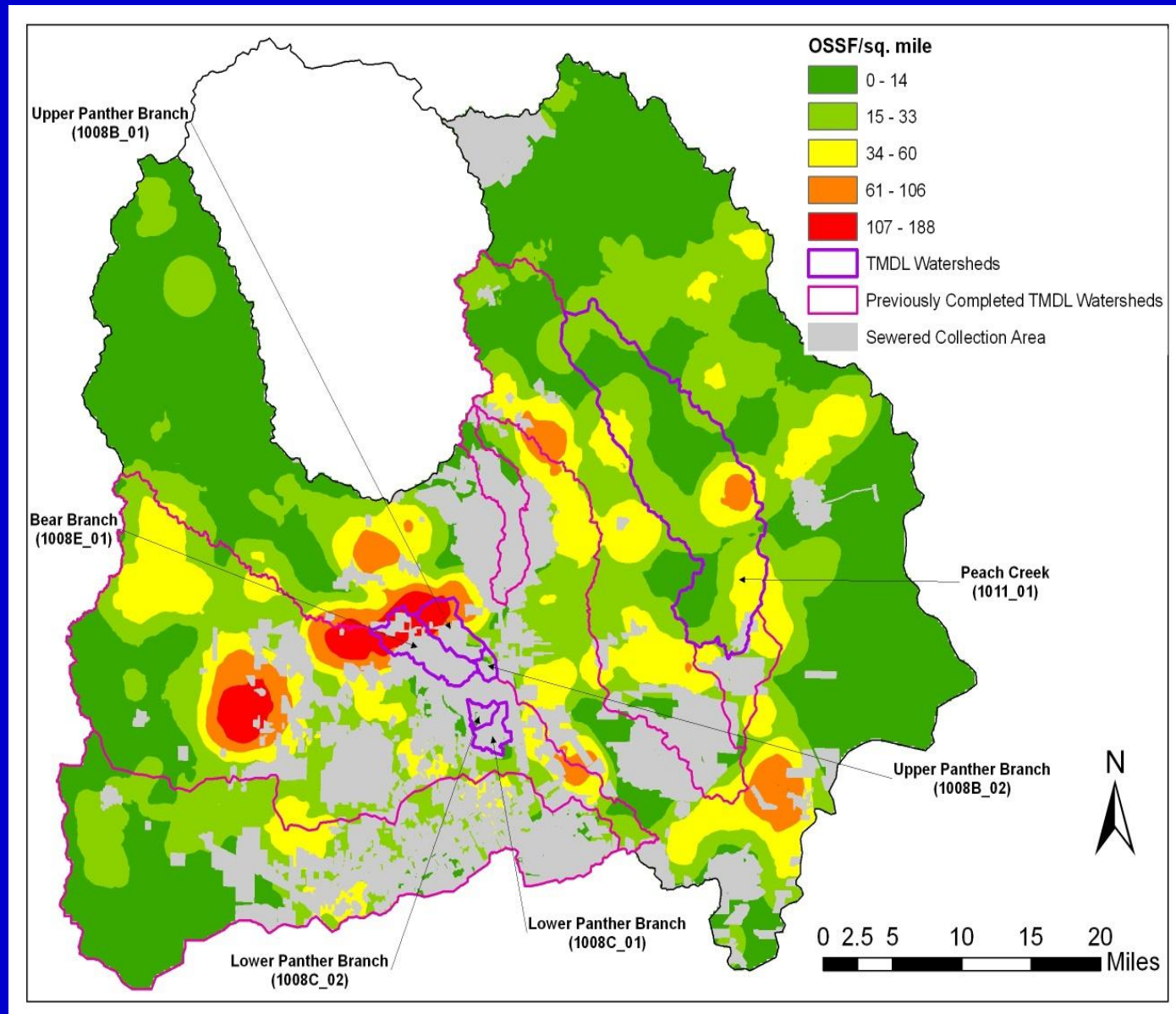
Summary 2012 Integrated Report

Findings for *E. coli* Assessment

(criterion = 126 MPN/100 mL)

Water Body	Assessment Unit (AU)	No. of Samples	Geometric Mean (MPN/100 mL)
Upper Panther Branch	1008B_01	28	158
Upper Panther Branch	1008B_02	28	246
Lower Panther Branch	1008C_01	28	198
Lower Panther Branch	1008C_02	28	157
Bear Branch	1008E_01	27	167
Peach Creek	1011_01	43	162

On-Site Sewage Facility Densities – Lake Houston Watershed



Estimated Area under Stormwater Permit Regulations

AU	AU Area within 2010 Urbanized Areas (acres)	AU watershed area (acres)	Percentage of drainage area under stormwater regulation (%)
1008B_01	3,763	6,406	58.7
1008B_02	1,377	1,377	100.0
1008C_01	2,897	3,188	90.8
1008C_02	1,598	1,613	99.0
1008E_01	9,028	10,106	89.3
1011_01	1,312	86,601	1.5

Pollutant Load Allocation from LDC

The assimilative capacity is calculated for the median value of Wet Conditions flow regime (0% - 30%, median at 15%).

- Provides the maximum flexibility for managing the loadings
- The critical flow for bacteria loadings
- Typically the flow with the highest concentrations and loads

TMDL Allocations for Impaired AUs

All loads expressed as Billion MPN/day

$$TMDL = WLA_{WWTF} + WLA_{SW} + LA + MOS$$

AU	TMDL	WLA _{WWTF}	WLA _{SW}	LA	MOS
1008B_01	102.7	30.10	39.64	27.84	5.14
1008B_02	109.0	32.44	56.29	14.78	5.45
1008C_01	282.5	22.66	30.62	226.3	2.91
1008C_02	282.0	22.66	31.90	224.5	2.89
1008E_01	91.10	2.33	75.22	8.98	4.56
1011_01	214.1	2.24	3.05	198.1	10.70

Status of TMDL Development

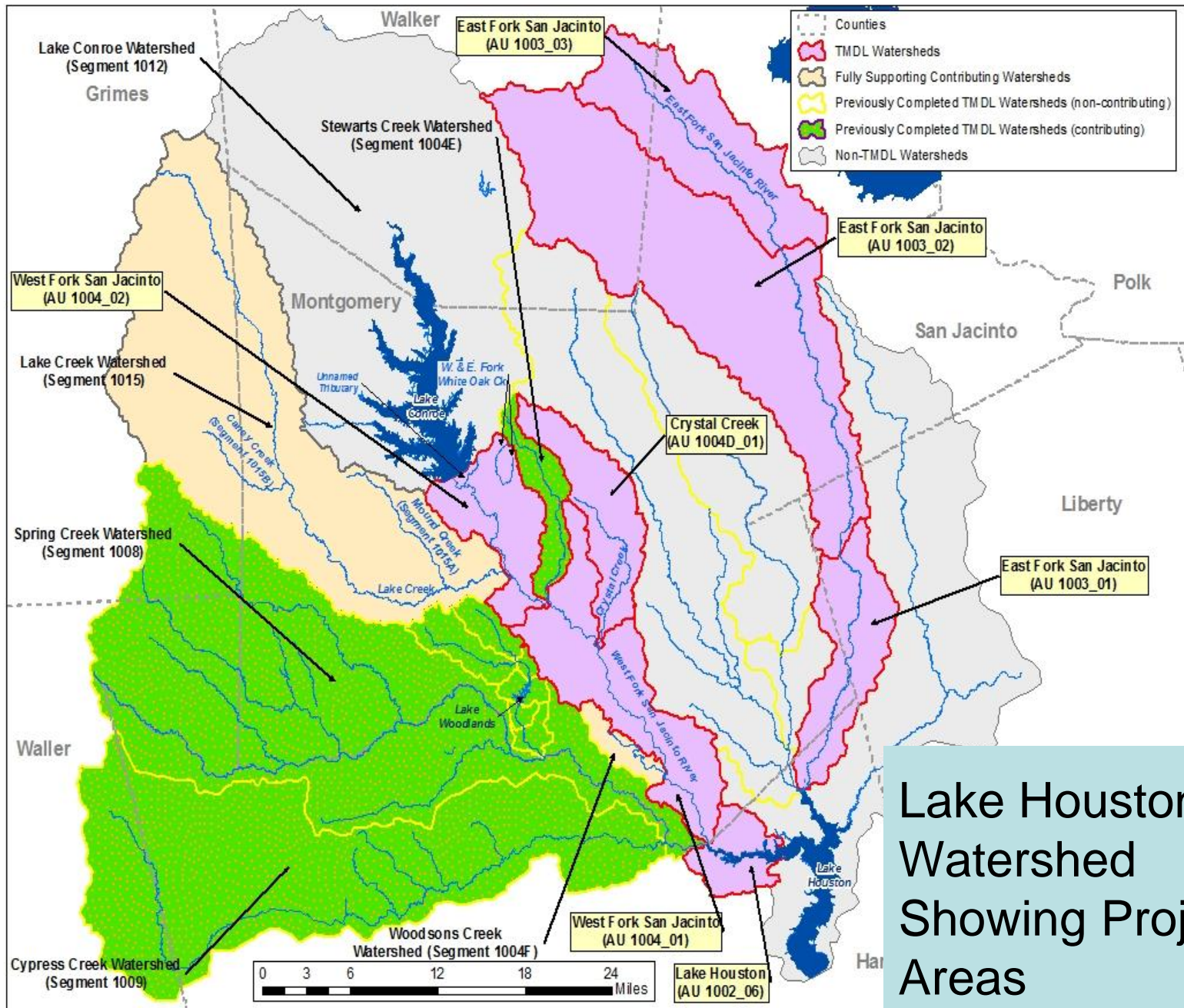
Upper and Lower Panther Branch,
Bear Branch and Peach Creek

- Technical Support Document (TSD)
(Completed; Posted on TCEQ Website)
- TCEQ used TSD to develop an Addendum to be included in October Water Quality Management Plan update (TCEQ will notify BIG when this is available for public review and comment)
- TMDLs within the BIG I-Plan area

Second NEW PROJECT

Indicator Bacteria Listings in the East and West Fork San Jacinto River and Tributaries

- Project water bodies (segments and assessment units)
 - Lake Houston (1002_06)
 - East Fork San Jacinto River (1003_01, 1003_02, 1003_03)
 - West Fork San Jacinto River (1004_01, 1004_02)
 - Crystal Creek (1004D_01)
- Approach for TMDLs – FDCs/LDCs



Lake Houston Watershed Showing Project Areas

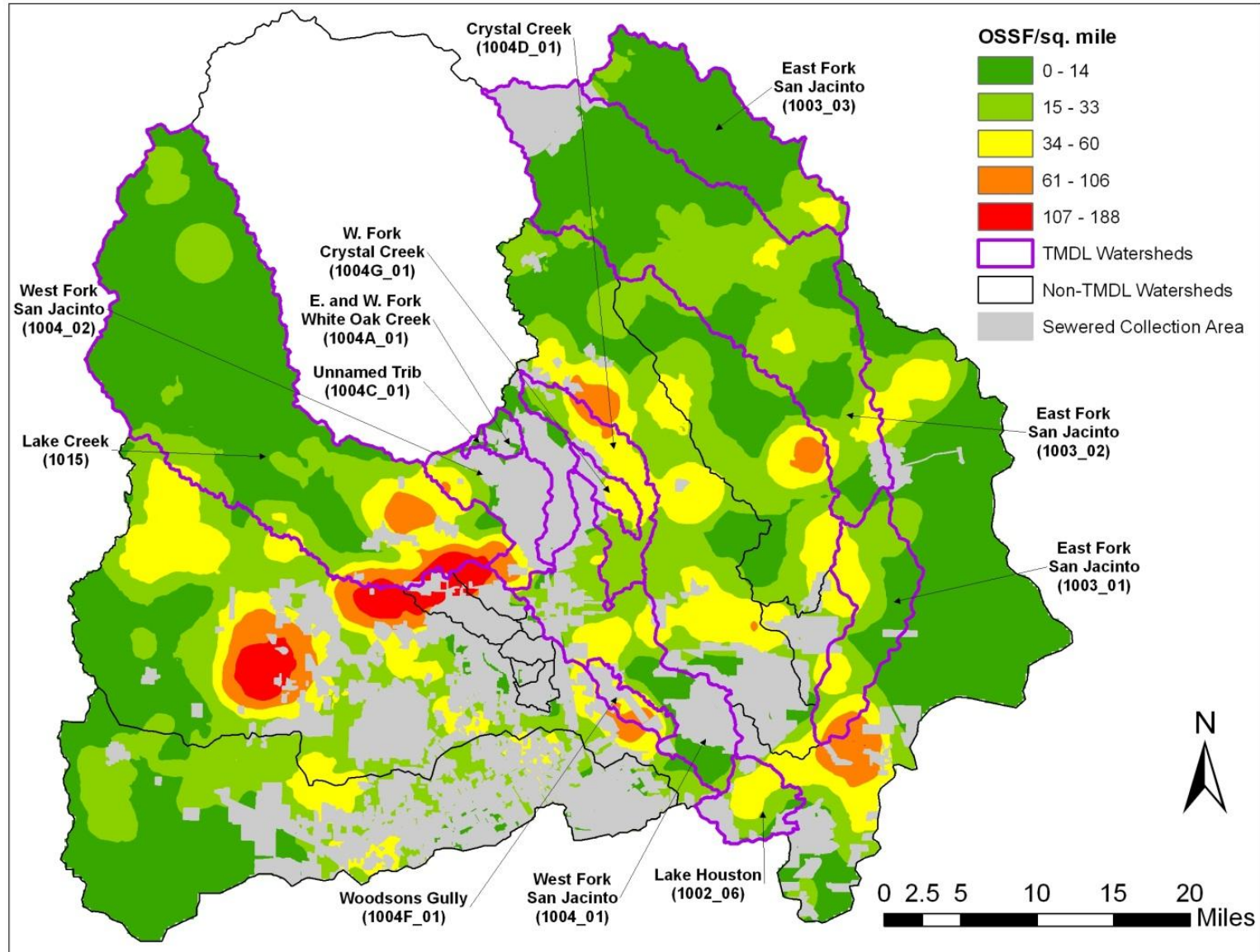
Summary 2012 Integrated Report

Findings for *E. coli* Assessment

(criterion = 126 MPN/100 mL)

Water Body	Assessment Unit (AU)	No. of Samples	Geometric Mean (MPN/100 mL)
Lake Houston	1002_06	218	235
East Fork San Jacinto	1003_01	84	193
East Fork San Jacinto	1003_02	37	158
East Fork San Jacinto	1003_03	11	197
West Fork San Jacinto	1004_01	24	179
West Fork San Jacinto	1004_02	59	170
Crystal Creek	1004D_01	24	338

On-Site Sewage Facility Densities



Estimated Area under Stormwater Permit Regulations

AU	AU Area within 2010 Urbanized Areas (acres)	AU watershed area (acres)	Percentage of drainage area under stormwater regulation (%)
1002_06	11,195	15,495	72.2
1003_01	171	37,450	0.46
1003_02	159	158,364	0.10
1003_03	0	58,846	0
1004_01	27,307	64,016	42.7
1004_02	12,437	243,442	5.1
1004D_01	4,856	30,930	15.7

TMDL Allocations for Impaired AUs

All loads expressed as Billion MPN/day

$$TMDL = WLA_{WWTF} + WLA_{SW} + LA + MOS$$

AU	TMDL	WLA _{WWTF}	WLA _{SW}	LA	MOS
1002_06	6,232	191.1	301.0	5,629	110.5
1003_01	856.9	5.36	1.05	807.7	42.85
1003_02	722.8	4.36	0.50	681.8	36.14
1003_03	203.3	0.27	0	192.9	10.17
1004_01	2,765	185.8	196.1	2,295	88.09
1004_02	1,140	93.34	4.03	1,034	9.07
1004D_01	135.7	9.67	18.72	100.5	6.78

Status of TMDL Development

East Fork San Jacinto River, West Fork San Jacinto River, Crystal Creek and Lake Houston

- Technical Support Document (completed; Posted on TCEQ Website)
- Contractor TMDL Report (Completed).
- Project area adjacent to BIG I-Plan area.
- TCEQ – Internal development of TMDL report; then Public Review

Thank You

Any Questions?

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TCEQ Websites for Projects:

<http://www.tceq.texas.gov/waterquality/tmdl/nav/42-houstonbacteria/42-houstonareabacteria-library>

<http://www.tceq.texas.gov/waterquality/tmdl/82-sanjacintobacteria>