NORTH CAROLINA 9 ELEMENT CHECKLIST

Watershed	Upper Salem Creek			
Applicant Name	City of Winston Salem			
Contact Person/Title	Andy Allen, Special Projects Coordinator			
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Date of Submittal	March 1, 2016			
What plans will you be using to document the 9 Elements required for 319 funding? Please provide a full reference.	**Name of Plan(s) (abbreviation used in table)**	**Author/Developer**	**Year**	**Link/Location**
	Total Maximum Daily Load for Fecal Coliform for Salem Creek and Turbidity for Grants Creek in North Carolina (**TMDL**)	NCDENR Water Quality Section – Planning Branch	2006	Attached
	City of Winston-Salem NPDES Stormwater Permit Program Water Quality Recovery Plan Salem Creek Fecal Coliform TMDL (**WQRP TMDL**)	City of Winston-Salem	2009	Attached
	Upper Salem Creek Watershed Master Plan (**Salem WMP**)	City of Winston Salem & HDR Engineering, Inc. of the Carolinas	2010	Attached
	Technical Memo EPA SUSTAIN Modeling for Salem Creek Watersheds (**SUSTAIN Tech Memo**)	City of Winston Salem & HDR Engineering, Inc. of the Carolinas	2013	Attached
	City of Winston-Salem NPDES Stormwater Permit Program Total Daily Maximum Loading (TMDL) Implementation Plan Salem Creek Watershed (**TMDL IP**)	City of Winston-Salem	2014	Attached
	City of Winston-Salem Stormwater & Erosion Control Division FY 2014-2015 Stormwater Management Plan (SWMP)	City of Winston-Salem	2014	Attached

Once completed, please submit your checklist to Heather Jennings at heather.b.jennings@ncdenr.gov. DWR will conduct an internal review and notify you when the plan has been determined to meet all of the 9 Elements and is eligible for Section 319 Grant implementation funding. As they are approved, they will be listed on DWR's list of 319 watershed plans at http://portal.ncdenr.org/web/wq/ps/nps/319program/nc-watershed-plans. If you are developing a plan that you are hoping to submit to 319 in the same year, please contact Heather Jennings by email or by phone at (919) 807-6437. Your plan will need to be submitted for approval at least 45 days prior to the 319 Grant application due date.

1. Identification of the Causes and Sources Checklist	Yes	No	Notes	Identify location of information (include link or attach plan and identify section and page number)
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Does the plan(s) identify stressors and sources in the watershed?	X		Fecal coliform is the pollutant of concern as described in the TMDL and documents based on the TMDL. Pollutant loading was also calculated for 12 other pollutants as part of the Salem WMP including copper and zinc which are other pollutants of concern in the watershed.	TMDL – Section 3.1; page 14 WQRP TMDL – Section – Introduction; page 5 TMDL IP – Section Introduction; page 9 Salem WMP – Section 4.1; page 37
OPTIONAL (Supplemental and/or supporting information)				
Was a GIS desktop analysis performed?	X		The Salem WMP used GIS to evaluate physical characteristics of the watershed.	Salem WMP – Section 2.2; page 17
Has existing water quality or biological data been reviewed? • Ambient water quality data • USGS data • Other?	X		Salem WMP included review of data collected for previous master plans. The TMDL relied on a study conducted in 2005 – Pathogen Source Assessment for TMDL Development and Implementation in Salem and Muddy Creek Watershed Winston-Salem by MapTech HDR.	TMDL – Section 3.2; page 16-18 and Appendix A; page 41 Salem WMP – Section 2.3; page 19-23 TMDL IP – Section BMP C; page 9 SWMP – Section 16.1; page 40
Does the plan(s) identify any water quality impairments in this watershed (303(d) list)?	X		Fecal coliform	TMDL – Section 3.1; page 14
Has a field assessment been conducted? • CWP (Center for Watershed Protection) Method • EEP (Ecosystem Enhancement Program) Manual • Other?	X		Salem WMP included use of the EPA's Rapid Bioassessment Manual including water quality sampling and fish and benthic surveys Stream walking in order to identify illicit discharges occurs on an on-going basis in the Salem Creek watershed	Salem WMP – Section 2.3; page 19-23 SWMP – Section 16.3; page 41

Does the plan indicate if a TMDL has been developed for this watershed?	X		A TMDL for Salem Creek has been developed by DEQ (formerly NCDENR)	TMDL
Does the plan(s) include a map that shows where stressors and sources are concentrated?	X		The WQRP TMDL includes maps with land use, outfalls and storm sewer inventory. The Salem WMP also includes map of inlets and outlets. The map is a result of a study to locate, characterize, and digitize all major outfalls within Salem watershed.	WQRP TMDL – Section Background; page 5-8 Salem WMP – Figure 2-6 TMDL IP – Section BMP A; page 6

2. Description of the NPS Management Measures Checklist	Yes	No	Notes	Identify location of information (include link or attach plan and identify section and page number
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Does the plan(s) identify management measures that address the stressors and sources identified in Element 1? (*note: prioritization of projects would be considered to meet this element*)	X		Yes, the TMDL IP reviews management measures in place as well as additional measures to be implemented. The Salem WMP identified operational and structural BMPs while the SUSTAIN Tech Memo focused on structural BMPs. The City's SWMP includes a Capital Improvement Plan with six structural BMPs to be implemented that aim to reduce fecal coliform in the Salem Creek watershed. One of these BMPs is the construction of a wet pond on the site of the City Yard where extensive cleanup has been occurring (City Yard Contamination Phase III).	TMDL IP – Section BMP B Existing Measures to reduce MS4's Waste Load Allocation; page 7 and Section BMP E Additional Measures for Implementation; page 11. Salem WMP – Section 4.3; page 39-47 SUSTAIN Tech Memo SWMP – Section 16.7; page 46-47
3. Estimate of the load reductions expected for the management measures	**Yes**	**No**	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have potential indicators been identified for each management measure to determine success?	X		The TMDL IP states how each management measure will be evaluated including those identified in the Salem WMP and the SUSTAIN Tech Memo.	TMDL IP – Section BMP B Existing Measures to reduce MS4's Waste Load Allocation; page 7 and Section BMP E Additional Measures for Implementation; page 11.

Has it been roughly quantified how much each management measure will reduce one or more parameters identified in Element 1?	X		Yes, the SUSTAIN Tech Memo explains how the model was used to quantify reduction from identified structural BMPs and how it can be used for future modeling and prioritization purposes. The TMDL IP quantifies how much each operational or structural BMP will reduce the pollutant of concern	TMDL IP – Section BMP B Existing Measures to reduce MS4's Waste Load Allocation; page 7 and Section BMP E Additional Measures for Implementation; page 11.
OPTIONAL (Supplemental and/or supporting information)				
Has a water quality, watershed or lake response model been developed for this watershed?	X		Yes, HDR developed a P-8 Urban Catchment Model to be used with XP-SWMM. They also developed a SUSTAIN model as it is more flexible than XP-SWMM as it relies on land use load estimation tools along with fate and transport processes.	Salem WMP – Section 4.1; page 37 SUSTAIN Tech Memo –Section Background
4. Estimate of the technical and financial assistance needed	Yes	No	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have the potential costs associated with management activities listed in the plan(s) been identified?	X		Yes, the Salem WMP identified costs associated with the recommended activities and the SUSTAIN Tech Memo included costs for structural BMPS identified. The City's SWMP includes costs for the strucutreal BMPs including the wet pond at City Yard	Salem WMP – Section 5.3.1; page 52 and Section 6.1; page 58, Table 6.2-3, 4, 5 SUSTAIN Tech Memo – Table 6 SWMP – Section Appendix G
Has the technical assistance that may be required to help with design, construction, implementation and monitoring of management strategies listed in the plan(s) been identified?	X		Yes, TMDL IP has specifics on what is needed to accomplish each item throughout the plan. The SUSTAIN Tech Memo includes a list of improvements that should be undertaken by modelers to improve the model. It also contains a list of next steps that will require additional technical assistance.	TMDL IP – Section BMP E and BMP F; page 11-15

OPTIONAL (Supplemental and/or supporting information)				
Have potential partners and funding sources to assist with implementation of the watershed plan(s) been identified and/or contacted?	X		Yes, the TMDL IP lists different City staff as well as outside agencies that are responsible for implementing the watershed plan.	TMDL IP – Section BMP E; page 11
Have potential partners/funding sources to assist with maintenance and/or monitoring (following completion) been identified?		X		
5. Information/Education component	Yes	No	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have a range of information and education options been identified in the watershed plan?	X		Yes, many of the additional measures listed in the TMDL IP involve increasing public awareness about water quality and the steps they can take to reduce fecal coliform. The City's SWMP includes extensive education and outreach that is targeted on the City's TMDLs including Salem Creek.	TMDL IP – Section BMP E; page 11 SWMP – Section 8; page 14-16
OPTIONAL (Supplemental and/or supporting information)				
Have resource agencies that can be integrated into the watershed planning process been identified and/or contacted?	X		Yes, the TMDL IP lists different City staff as well as outside agencies that are responsible for implementing the watershed plan.	TMDL IP – Section BMP E; page 11
6. Schedule for implementing management measures	Yes	No	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have the tasks and activities that are related to the implementation and monitoring of management recommendations been identified?	X		Yes, the TMDL IP has a list of items needed to implement the various identified BMPs. The City's SWMP includes a list of tasks to be carried out for the TMDL.	TMDL IP – Section BMP B; page 7 & BMP E; page 11 SWMP – Section 16; page 40

Has it been determined if these tasks and activities are short-term, medium, or long-term in nature (*note: prioritization of projects is acceptable for meeting this element*)?	X		Yes, the TMDL IP has a schedule with implementation year identified for the additional measures for implementation as well as the status of those that are on-going. The WQRP TMDL contains a program implementation schedule with year. The City's SWMP includes a 5-year plan that is continuously updated with new SWMPs.	TMDL IP – Section BMP B; page 7 & BMP E; page 11 WQRP TMDL – Section Program Implementation Schedule; page 13 SWMP – Section 16.1; page 40

7. Description of interim, measurable milestones	Yes	No	Notes	Identify location of information (include link or attach plan and identify section and page number
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have interim, measurable milestones (things that you can track) that can help determine if management measures (in Element 2) are being implemented been identified?	X		The WQRP TMDL has a section on assessing and reporting on the implementation of the identified strategies. The SUSTAIN Tech Memo recommends using the model to track pollution control measures as a tool for MS4 compliance.	WQRP TMDL – WQRP Assessment and Reporting; page 14 SUSTAIN Tech Memo – Section Recommended Next Step TMDL IP – Section Documentation of WLA Incremental Success; page 16
8. Criteria that can be used to determine if loading reductions are being achieved	Yes	No	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Have criteria and/or indicators that can be used to determine if management strategies and activities listed in the plan(s) are being effective been identified?			Yes, the TMDL established the total maximum daily load for meeting water quality standards. The TMDL IP also includes the percent reduction needed. The SUSTAIN Tech Memo includes options on how the model can be used in the future to track and quantify implemented BMPs	TMDL – Section 3.3.3.2.1; page 23 TMDL IP – Section Introduction page 6 SUSTAIN Tech Memo – Future Model Capabilities
9. Monitoring	Yes	No	Notes	**Identify location of information (include link or attach plan and identify section and page number**
REQUIRED (This box(es) below must be checked Yes in order to be eligible as a 9 Element plan)				
Has a monitoring plan that includes each of the criteria and/or indicators identified in Element 8 been developed?			Yes, the City has a monitoring plan in place and the TMDL IP proposes additional modifications to the monitoring. The monitoring plan is further described in the City's stormwater management plan. The SUSTAIN Tech Memo recommends monitoring to support calibration of the SUSTAIN model.	TMDL IP – Section BMP D; page 9 SUSTAIN Tech Memo – Section Future Model Capabilities

OPTIONAL (Supplemental and/or supporting information)				
Are there plans for conducting water quality monitoring? • Intensive/On-going? • Field kits?			The City conducts water quality monitoring as part of its NPDES permit.	SWMP – Section 15; page 39
If water quality monitoring is expected to be conducted, have you contacted NCDWR?				