Watershed	Eno River Watersh	Eno River Watershed							
Applicant Name	Triangle J Council of Governments								
Contact Person, Title	Mike Schlegel, Water Resources Program Manager								
Address	4307 Emperor Bou	ulevard, Suite 110, Durham	, NC 27703						
Phone Number/Email	(919) 295-0017 / r	nschlegel@tjcog.org							
Date of Submittal	February 22, 2016								
What plans will you be using	ng to document the	9 Elements required for 32	19 funding? Plea	se provide a full reference.					
Name of Plan(s)		Author/Developer	Year	Link/Location					
Riparian Buffer Preservatic Streambank Restoration in Basin		UNRBA and TJCOG	2000	http://archive.unrba.org/docs/unrbufpr.pdf					
Technical Memorandum: Summary of Modeling Tools Used in Assessing Management Measures in the Upper Neuse Watershed		LINBBA/Tetra Tech		http://archive.unrba.org/docs/unwmptools.pdf					
EPA's Small MS4 Stormwater Program Requirements		EPA	2015	http://water.epa.gov/polwaste/npdes/stormwater/Small- MS4-Stormwater-Program-Requirements.cfm					
Measurable Goals Guidance for Phase II Small MS4s		EPA		http://water.epa.gov/polwaste/npdes/swbmp/upload/measu rablegoals.pdf					
Upper Neuse Watershed N	Aanagement Plan	UNRBA /Tetra Tech	2003	http://archive.unrba.org/docs/finlplan.pdf					
Upper Neuse Watershed Management Plan Local Management Strategy Reviews				https://tjcog.box.com/s/vagblr84hvenq6e7rwk70ipozb03i7gy					
Neuse River Basinwide Ass	use River Basinwide Assessment		essment NC DEQ, Div. of Water Quality, now Div. of Water Resources		2006	https://tjcog.box.com/s/usqeq7iy6g51x5ijic60karfpnctd31b			
Neuse River Basinwide Water Quality Plan		NC DEQ, Div. of Water Quality, now Div. of Water Resources	2009	http://portal.ncdenr.org/web/wq/ps/bpu/basin/neuse/2009, Chapter 1 Neuse River Subbasin 03-04-01					

Falls Lake Rules	NC DEQ, Div. of Water Quality, now Div. of Water Resources	2009 to 2013	http://portal.ncdenr.org/web/fallslake/home
Falls Lake Watershed Analysis Risk Management Framework (WARMF) Development: Final Report	NC DEQ, Div. of Water Quality, now Div. of Water Resources	2009	http://portal.ncdenr.org/c/document_library/get_file?uuid=c cb8d8f8-a74b-415f-97f9-5e5f621255e6&groupId=38364
Neuse River Basin Restoration Priority Plan	NC Ecosystem Enhancement Program	2010	http://portal.ncdenr.org/web/eep/rbrps/neuse
Fiscal Analysis for Proposed Nutrient Strategy for Falls of Neuse Reservoir	NC DEQ, Div. of Water Quality, now Div. of Water Resources	2010	http://www.osbm.state.nc.us/files/pdf_files/DENR06082010_ v2.pdf
Falls Lake New Development Model Program	NC DEQ, Div. of Water Quality, now Div. of Water Resources	2011	http://www.fallslake.org/c/document_library/get_file?uuid= b7dc5937-d7ad-4c70-8bf7-791126a44a0f&groupId=38364
Falls Lake Stormwater Load Accounting Tool	NC DEQ, Div. of Water Quality, now Div. of Water Resources	2011	http://portal.ncdenr.org/web/jordanlake/implementation- guidance-archive
Final UNRBA Monitoring Plan	UNRBA	2014	http://unrba.org/sites/default/files/news- files/DWR_Approved_UNRBA_MonitoringPlan_20140715.pdf
Upper Neuse Monitoring Design Guidelines	TJCOG	2012	https://tjcog.box.com/s/rb13n8wplyz36i6kcrerlg73rgdqsde1
Piedmont Nutrient Reduction Sourcebook	TJCOG and PTRC	2011	http://www.piedmontnutrientsourcebook.org/
A Simplified Guide to Writing Watershed Restoration Plans and North Carolina 9- Element Plan Checklist	TJCOG	2013	http://portal.ncdenr.org/c/document_library/get_file?uuid=7 1ba2c9f-75f9-44ee-b214-8aba63f0e9f0&groupId=38364
NC BMP Manual	DEMLR	Updated continually	http://portal.ncdenr.org/web/lr/bmp-manual
Financial Assistance for Watershed Water Quality Grants, Cost Shares, and Loans	NC DEQ, Div. of Water Resources	online	http://portal.ncdenr.org/web/wq/ps/bpu/urw/funding

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DWR Ambient Monitoring System	NC DEQ, Div. of Water Resources	online	http://portal.ncdenr.org/web/wq/ess/eco/ams				
to meet all of the 9 Elements and is eligible for Section 3 http://portal.ncdenr.org/web/wq/ps/nps/319program/n	Once completed, please submit your checklist to Kim Nimmer at <u>kimberly.nimmer@ncdenr.gov</u> . 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 <u>http://portal.ncdenr.org/web/wq/ps/nps/319program/nc-watershed-plans</u> . If you are developing a plan that you are hoping to submit to 319 in the same year, please contact Kim Nimmer by <u>email</u> or by phone at (919) 807-6438. Your plan will need to be submitted for approval at least 45 days prior to the 319 Grant application due date.						

NB: many UNRBA-related documents can be found at the UNRBA archive, online here: <u>http://archive.unrba.org/downloads.htm</u>. Falls Lake Rules and associated resources (2009 to 2013) are online here: <u>http://portal.ncdenr.org/web/fallslake/home</u>.

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 ch	necked	Yes ir	n order to be eligible as a 9 Element plan)	
Does the plan(s) identify stressors and sources in the watershed?	V		The Neuse Basinwide Plan identifies conversion of lands to urbanized uses as a stressor throughout the Falls Lake watershed. The Falls Lake watershed model developed for the Falls Rules included this watershed, and it examined sources of nutrients in this watershed. Based on the receiving waters and the composition of the watershed, nutrients are likely to contribute to water quality impairment in this watershed. The 2014 303(d) list identifies AU 27-2-(1), Eno River from source to a point 0.4 mile upstream of Dry Run as Category 5, EC Benthos Fair (Nar, AL, FW), collection year 2010, listing year 2012. This segment was listed after the Neuse Assessment and Basinwide Plan were completed, so there is no information on them there.	Subbasin 03-04-01 (<u>http://portal.ncdenr.org/web/wq/ps/bpu/basi</u> n/neuse/2009)
OPTIONAL (Supplemental and/or support	ing info	ormat	ion)	
Was a GIS desktop analysis performed?			Yes, the watershed has been mapped and characterized in a number of documents.	The Upper Neuse Watershed Management Plan, pp. 30-38 (<u>http://archive.unrba.org/docs/finlplan.pdf</u>)
	\checkmark		The 2003 Upper Neuse Watershed Management Plan analyzed by subwatershed:	Neuse Basinwide Plan, Chapter 1 Neuse River Subbasin 03-04-01
			 then-current and future impervious cover biochemical oxygen demand and dissolved oxygen 	(http://portal.ncdenr.org/web/wq/ps/bpu/basi n/neuse/2009)

		 urban stormwater runoff construction activities agricultural runoff fecal coliform bacteria toxics wetlands and riparian area protection an restoration The Neuse River Basin Plan includes watershed map, a brief statement of impairment, land use within watershed, and background of activities in the watershed.	
 Has existing water quality or biological data been reviewed? Ambient water quality data USGS data Other? 	\checkmark	 Yes, existing water quality or biological data been reviewed. The Neuse River Basinwide Assessment provides an overview of the watershed and instream habitat. The Neuse Basinwide Plan summarizes data collected by DENR as well as watershed conditions. USGS has collected flow data throughout the Falls Lake watershed as well as water quality and flow data under the Triangle Area Water Monitoring Project. The Upper Neuse Watershed Management Plan and the Falls Lake WARMF Model both included reviews of data on nutrients and flow. 	(<u>https://tjcog.box.com/s/usqeq7iy6g51x5ijic60</u> <u>karfpnctd31b</u>)
Do(es) the plan(s) identify any water quality impairments in this watershed (303(d) list)?	\checkmark	Water quality impairments in this watershed are listed in the Final 2014 303(d) List. In addition to the assessment units within the watershed that are listed as impaired on the 2014	Final 2014 303(d) List: <u>http://portal.ncdenr.org/c/document_library/g</u> <u>et_file?uuid=28b97405-55da-4b21-aac3-</u> <u>f580ee810593&groupId=38364</u>

			303(d) List, the receiving waterbody of Falls Lake is listed on the draft NC 2008 303(d) list in its entirety for exceedances of water quality standards for chlorophyll- <i>a</i> as well as for turbidity above I-85.	Falls Lake impairments are described here: http://portal.ncdenr.org/web/fallslake/backgro und
 Has a field assessment been conducted? CWP (Center for Watershed Protection) Method EEP (Ecosystem Enhancement Program) Manual Other? 			The planning efforts conducted in these watersheds have not included extensive field assessment efforts.	
Does the plan indicate if a TMDL has been developed for this watershed?			The 2014 303(d) lists includes these assessment units, indicating that a TMDL has not been developed that addresses the particular stressors / causes of impairment for this specific subwatershed.	Final 2014 303(d) List: http://portal.ncdenr.org/c/document_library/g et_file?uuid=28b97405-55da-4b21-aac3- f580ee810593&groupId=38364
	\checkmark		The NC Division of Water Resources has a nutrient management strategy for Falls Lake and its tributary watersheds for nitrogen and phosphorous that is equivalent to TMDLs for those pollutants. Details can be found at <u>http://portal.ncdenr.org/web/fallslake/home</u> .	<u>Falls Lake Rules</u> (http://portal.ncdenr.org/web/fallslake/home)
Does the plan(s) include a map that shows where stressors and sources are concentrated?		\checkmark	Although maps have been developed for the Upper Neuse River Basin, planning efforts to date have not developed HUC-scale maps that show where specific stressors and pollutant sources are concentrated.	
			The Neuse RBP shows locations of NPDES dischargers but it is a very large-scale map.	The Neuse River Basinwide Plan, p.34
			The UNRBA has done extensive analyses of the	Upper Neuse Watershed Management Plan (http://archive.unrba.org/docs/finlplan.pdf)

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	entire Falls Lake watershed for nutrient sources.	
		1

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 ch	necked	l Yes ir	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? (<i>note:</i> <i>prioritization of projects would be</i> <i>considered to meet this element</i>)			All watersheds, especially urbanizing watersheds, benefit from implementation of NPDES MS4 six minimum measures. The Neuse Basinwide Plan describes management measures appropriate for this subwatershed. Other specific management measures that address the watershed's stressors and sources	Six Minimum Measures: http://water.epa.gov/polwaste/npdes/stormwater/ Small-MS4-Stormwater-Program-Requirements.cfm Neuse Basinwide Plan, Chapter 1 Neuse River Subbasin 03-04-01 Riparian Buffer Preservation and Streambank Restoration in the Upper Neuse Basin, http://archive.unrba.org/docs/unrbufpr.pdf
	\checkmark		 include: Stormwater wetlands: protection and restoration Riparian buffers: protection and restoration Livestock exclusion Land use planning Since the Eno River watershed includes both urban and working land uses, management measures for stressors and sources should focus on nonpoint measures for urbanized and agricultural land uses.	Stormwater control measures for new construction are described here: <u>http://www.piedmontnutrientsourcebook.org/</u> <u>newconstruction.html</u> agricultural BMPs are described here: <u>http://www.piedmontnutrientsourcebook.org/</u> <u>agriculture.html</u> Watershed restoration practices are discussed here: <u>http://www.piedmontnutrientsourcebook.org/</u> restoration.html

3. ESTIMATE OF THE LOAD REDUCTIONS EXPECTED FOR THE MANAGEMENT MEASURES	Yes	No	Note	Identify location of information (include link or attach plan and identify section and page number
REQUIRED (This box(es) below must be cl	necked	l Yes ir	n order to be eligible as a 9 Element plan)	
Have potential indicators been identified for each management measure to determine success?	V		 Success indicators for these management measures include Flow/cross-section measurements Visual survey of stream-banks/channel Metals, chlorophyll-a, DO, bacteriological, TSS and turbidity measurements Number of beach closings Number of fish kills Temperature, DO, nutrient, TSS and turbidity measurements Flow and cross section measurements Visual survey of stream-banks/channel TSS, turbidity Number of violations Chlorophyll-a, DO, and bacteriological Measurements Number of livestock animals in stream 	Simplified Guide, Table 1 (http://portal.ncdenr.org/c/document_library/ get_file?uuid=71ba2c9f-75f9-44ee-b214- 8aba63f0e9f0&groupId=38364)
Has it been roughly quantified how much each management measure will reduce one or more parameters identified in Element 1?	V		Table 4 in the Simplified Guide provides information on potential pollutant reductions associated with management activities. The NC BMP Manual provides guidance on quantifying pollutant reductions due to stormwater control measures. The SCM Crediting Team is working on refinements to SCM credits.	Simplified Guide, Table 3 (http://portal.ncdenr.org/c/document_library/ get_file?uuid=71ba2c9f-75f9-44ee-b214- 8aba63f0e9f0&groupId=38364) NC BMP Manual (http://portal.ncdenr.org/web/lr/bmp-manual)

OPTIONAL (Supplemental and/or support	ing inf	ormati	on)	
Has a water quality, watershed or lake response model been developed for this watershed?			, , ,	Falls Lake Rules (<u>http://portal.ncdenr.org/web/fallslake/home</u>)

4. ESTIMATE OF THE	Yes	No	Notes	Identify location of information (include link or attach
TECHNICAL AND FINANCIAL				plan and identify section and page number
ASSISTANCE NEEDED				
REQUIRED (This box(es) below must be cl	hecked	l Yes ir	order to be eligible as a 9 Element plan)	
Have the potential costs associated			Tables 4 and 5 in the Simplified Guide	Simplified Guide, Tables 4 and 5
with management activities listed in the			provides information on potential costs	(http://portal.ncdenr.org/c/document library/get file?uuid
plan(s) been identified?			associated with management activities.	=71ba2c9f-75f9-44ee-b214-8aba63f0e9f0&groupId=38364)
	v		A Fiscal Analysis was conducted for the	Fiscal Analysis for Proposed Nutrient Strategy for Falls
			Falls Nutrient Management Strategy.	of Neuse Reservoir
				(http://www.osbm.state.nc.us/files/pdf_files/DENR06
				<u>082010_v2.pdf</u>)
Has the technical assistance that may			Technical assistance may be obtained	Financial Assistance for Watershed Water Quality
be required to help with design,			through consultants, UNRBA, USGS, NC	Grants, Cost Shares, and Loans
construction, implementation and	\checkmark		State University/Cooperative Extension,	(http://portal.ncdenr.org/web/wq/ps/bpu/urw/funding)
monitoring of management strategies	v		local governments, DWR, Kerr-Tar COG,	
listed in the plan(s) been identified?			and TJCOG. DEQ provides a helpful list of	
			programs; see link at right.	
OPTIONAL (Supplemental and/or support	ing inf	ormat		
Have potential partners and funding			Potential partners in implementation	
sources to assist with implementation			have been involved for several decades	
of the watershed plan(s) been			through the UNRBA, TJCOG, the Falls	
identified and/or contacted?	\checkmark		Lake Rules and other regulatory	
			processes, as well as project	
			implementation efforts. A specific	
			outreach event is planned for 2016.	
Have potential partners/funding			NCSU is a great partner for project	

sources to assist with maintenance	monitoring. DWR and USGS are great	
and/or monitoring (following	partners to monitor waterway response.	
completion) been identified?	See the checklist for Element 9 in this	
	document below for a list of potential	
	partners for ambient/ongoing	
	monitoring.	

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?	\checkmark		A number of education and public information options are available to those seeking to conduct implementation work in this watershed. These are described in the Piedmont Nutrient Reduction Sourcebook.	Piedmont Nutrient Reduction Sourcebook (<u>http://www.piedmontnutrientsourcebook.org/outrea</u> <u>ch.html</u>)	
OPTIONAL (Supplemental and/or support	ting in	format	tion)		
Have resource agencies that can be integrated into the watershed planning process been identified and/or contacted?	V		The NC Clean Water Education Partnership, local governments, TJCOG, and county Soil & Water Conservation Districts already conduct outreach in this watershed and could also be integrated into the project implementation process.		
	1				
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	\checkmark		Implementation and monitoring of site- specific management measures would		

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recommendations been identified?	follow this process:
	 Identify potential project locations (short-term) Coordinate with landowners (short-term) Design project (short-term) Create monitoring plan and / or QAPP (short-term) Conduct pre-project baseline monitoring (mid-term) Construct and install projects (mid-term) Identify parties responsible for maintenance (mid-term) Identify parties responsible for maintenance (mid-term) Inspect project, create as-built certifications (mid-term) Establish maintenance protocols and agreements (mid-term) Execute maintenance protocols and agreements (long-term) Conduct post-project water- quality monitoring (long-term) Identify stakeholders and target land areas (short-term) Establish program goals and determine key objectives (e.g., specific pollutants that will be targeted) (short-term) Determine implementation approach and project-specific
	evaluation mechanisms (short- term)

			 Obtain resources for implementation (mid-term) Roll out program/initiative with involvement of key stakeholders (e.g., training, workshop) (mid- term) Implement program (mid-term) Collect data on implementation and adjust as necessary (adaptive management) to sustain the program/initiative (long-term) 	
Has it been determined if these tasks and activities are short-term, medium, or long-term in nature (<i>note:</i> <i>prioritization of projects is acceptable</i> <i>for meeting this element</i>)?			Yes, see previous list of site-specific and jurisdictional/programmatic measures for the time scale (specified in parentheses).	
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 c	hecked	d Yes i	n 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?	\checkmark		The management measures and activities listed in Element 6, above, serve as milestones for tracking implementation. As measures and activities are completed, they are effective milestones	
			for tracking progress.	
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		For these watersheds, progress toward	Upper Neuse Monitoring Design Guidelines
can be used to determine if		milestones and implementation of	(https://tjcog.box.com/s/rb13n8wplyz36i6kcrerlg73rg
management strategies and activities		management measures can be	dqsde1)
listed in the plan(s) are being effective		measured through achievement of	
been identified?		short-term administrative outputs and	
		milestones (partnerships formed, grants	
		sought), mid-term outcomes (SCMs and	
		other projects designed and/or	
		implemented), and long-term impacts	
		(water quality improvements).	
		Indicators of long-term impacts and	
		implementation effectiveness could	
		include	
		include	
		Flow/cross-section	
		measurements	
	\checkmark	 Visual survey of stream- 	
		banks/channel	
		 Metals, chlorophyll-a, DO, 	
		bacteriological, TSS and turbidity	
		measurements	
		 Number of beach closings 	
		 Number of fish kills 	
		 Temperature, DO, nutrient, TSS 	
		and turbidity measurements	
		 Flow and cross section 	
		measurements	
		 Visual survey of stream- 	
		banks/channel	
		TSS, turbidity	
		 Chlorophyll-a, DO, and 	
		bacteriological measurements	
		TJCOG conducted a project to develop	

			monitoring design guidelines that could	
			inform evaluation of specific projects,	
			many of which are innovative.	
9. MONITORING	Yes	No	Notes	Identify location of information (include link or attach
				plan and identify section and page number
	hecke	d Yes i	n order to be eligible as a 9 Element plan)	
Has a monitoring plan that includes			The UNRBA has developed a monitoring	UNRBA Local Management Strategy Reviews
each of the criteria and/or indicators			plan for the Falls Lake watershed. Sarah	(https://tjcog.box.com/s/vagblr84hvenq6e7rwk70ipoz
identified in Element 8 been			Bruce developed an evaluation	<u>b03i7gy)</u>
developed?			framework for the Upper Neuse	
			Watershed Management Plan (Local	
			Management Strategy Reviews) that	
			applies to that comprehensive suite of	
	\checkmark		site-specific and jurisdictional/	
			programmatic watershed management	
			measures.	
			DWR has an ambient monitoring	
			program that conducts intensive	DWR Ambient Monitoring System
			monitoring in subwatersheds as well as	(http://portal.ncdenr.org/web/wq/ess/eco/ams)
			Falls Lake watershed as a whole.	
OPTIONAL (Supplemental and/or suppor	ting in	format		
Are there plans for conducting water			Federally funded projects require a	Final UNRBA Monitoring Plan
quality monitoring?			QAPP be approved prior to	(http://unrba.org/sites/default/files/news-
quality monitoring.			implementation.	files/DWR_Approved_UNRBA_MonitoringPlan_20140
 Intensive/On-going? 				715.pdf)
 Field kits? 			The Neuse Basinwide Plan summarizes	<u></u>
• FIEld Kits?			data collected by DENR.	City of Durham (<u>http://www.durhamwaterquality.org</u>)
			data collected by DENK.	
	\checkmark			(You will need to set up an account to view data.)
			USGS has collected flow data	
			throughout the Falls Lake watershed as	
			well as water quality and flow data	
			under the Triangle Area Water	
			Monitoring Project.	

		UNRBA has a monitoring plan and is collecting data on nutrients. Potential partners for ambient/ongoing monitoring generally include USGS, discharger monitoring partnerships, the Upper Neuse River Basin Association/local governments in the watershed, DWR, and NCSU. The City of Durham currently has a very robust water quality monitoring program that includes stations in the	
If water quality monitoring is expected to be conducted, have you contacted NCDWR?	\checkmark	Eno River. The monitoring programs mentioned above coordinate closely with DWR.	