

**FINDING OF NO SIGNIFICANT IMPACT  
AND ENVIRONMENTAL ASSESSMENT**

**TOWN OF ELKIN**

**RAW WATER SYSTEM IMPROVEMENTS**

**RESPONSIBLE AGENCY: NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENTAL QUALITY**

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**May 1, 2017**

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## FINDING OF NO SIGNIFICANT IMPACT

Article I, Chapter 113A of the North Carolina General Statutes requires an action to be subject to the requirements of the North Carolina Environmental Policy Act (NCEPA) if it involves the expenditure of public funds and if a potential impact is anticipated to the environment. The project has been evaluated for compliance with the NCEPA and is determined to be a major agency action, which will affect the environment.

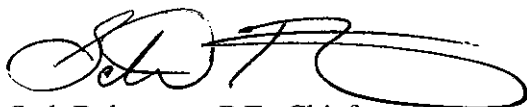
**Project Applicant:** Town of Elkin, North Carolina  
**Project Description:** The project will include the following improvements to the Town's drinking water infrastructure: (1) restoration of approximately 700 linear feet (l.f.) of stream bank; (2) 3,900 l.f. of new 12" water main to extend the existing emergency raw water line to the Town's existing reservoir; (3) improvements to the existing reservoir outlet structure; and (4) replacement of existing submersible raw water pumps with three new vertical turbine pumps, electrical controls, valves, and pump intake sediment scour system.

**Project Number:** WIF 1905  
**Project Cost:** \$1,724,152  
**Drinking Water State Revolving Loan Fund:** \$1,690,345  
**Local Funds:** \$33,807

The review process indicated that significant adverse environmental impacts should not occur if mitigative measures are implemented, and an environmental impact statement will not be required. The decision was based on information in the Engineering Report and reviews by governmental agencies. The attached Environmental Assessment supports this action and outlines mitigative measures that must be followed. This Finding of No Significant Impact (FONSI) completes the environmental review record, which is available for inspection at the State Clearinghouse.

No administrative action will be taken on the proposed project for at least 30 days after notification that the FONSI has been published in the North Carolina Environmental Bulletin.

Sincerely,



Seth Robertson, P.E., Chief  
State Revolving Fund Section  
Division of Water Infrastructure

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## ENVIRONMENTAL ASSESSMENT

### A. Proposed Facilities and Actions

The proposed project will make improvements to the Town of Elkin's raw water supply line between the Town's reservoir and water treatment plant (WTP), the emergency raw water line from the Yadkin River to the WTP, and the reservoir water intake pumps and outlet structures. Approximately 700 linear feet (l.f.) of stream bank will be restored and stabilized along Elkin Creek in endangered areas of the existing 24" raw water line. The existing emergency raw water line, which currently runs from the Yadkin River directly to the WTP, will be extended with 3,900 l.f. of 12" line to connect to the existing influent supply line going into the reservoir to allow for pre-settling of the raw water prior to treatment. The existing submersible raw water intake pumps will be replaced with three new vertical turbine pumps, electrical controls, valves, and pump intake sediment scour system. At the outlet structure in the reservoir, sluice gates will be replaced to facilitate optional water withdrawal from the reservoir at different levels.

Funding Status: The estimated total cost for the project is \$1,724,152. The Town is applying for a Clean Water State Revolving Fund (CWSRF) loan of \$1,690,345. The loan fee of \$33,807 will be covered by local funds.

### B. Existing Environment

Topography and Soils. Surry County is located in the Piedmont Physiographical Province. Elevations in the project area range from approximately 970 feet to 1,000 feet above mean sea level. The project area is located within the valley created by Elkin Creek and is in the Metagraywacke, Amphibolite, and Kyanite Schist geologic unit composed primarily of metasedimentary rock and amphibolite.

Soils in the project area include the occasionally flooded Colvard and Suches complex with zero to three percent slopes, very rocky Devotion-Rhodhiss-Bannertown complex with forty to ninety-five percent slopes, moderately eroded Fairview Sandy Clay Loam with fifteen to twenty-five percent slopes, and stony Woolwine-Fairview-Westfield complex with fifteen to twenty-five percent slopes.

Surface Water. The project area is located in the Upper Yadkin River Sub-Basin (HUC 03040101). Elkin Creek into and including the Elkin Reservoir is designated as WS-II, HQW, and CA, and it is designated Class C below the reservoir.

Water Supply. The Town provides drinking water drawn from Elkin Creek immediately above and within the project area.

### **C. Existing Wastewater Facilities**

The Town's water system has 2,064 service connections, approximately 75% of which are residential meters. The Town also supplies wholesale water to Surry County and the Town of Ronda. The Town's WTP has a permitted capacity of 3.0 MGD. The water system also includes a raw water intake pumping station on Elkin Creek; a 63 million gallon reservoir with influent and intake structures; approximately 4,000 l.f. of 24" raw water supply piping for conveyance of raw water from the reservoir to the WTP; an emergency 12" raw water line from the Yadkin River to the WTP for standby service during drought conditions; a finished water distribution system with a 1 million gallon clearwell storage and elevated tank storage in each of the three pressure zones providing a total of 2.9 million gallons of storage; and approximately 55 miles of water mains ranging from 1" to 8" of asbestos cement, PVC, and cast iron for distribution of finished drinking water. Original portions of the water system serving the downtown area were installed in the 1920s. The raw water pumping station, reservoir, raw water supply line, and WTP were constructed in the mid-1960s with the emergency line added in 2004. The pumps at the raw water intake pump station were replaced in the mid-1980s.

### **D. Need for Proposed Facilities and Actions**

Erosion of the stream bank has resulted in exposure and undermining of sections of the raw water supply line along Elkin Creek, which puts the line at risk of compromise. The existing pumps at the raw water intake pump station have operational, maintenance, and performance issues, and the valves and piping are showing signs of severe corrosion. The reservoir outlet structure sluice gates for changing the intake water level are inoperable. The emergency raw water line from the Yadkin River frequently has turbidity levels that exceed the treatment capabilities of the plant without pre-settling. The project will address these problems to ensure the Town's ability to continue to provide safe water.

### **E. Alternatives Analysis**

No-Action Alternative: The No-Action Alternative would leave the raw water subject to continued undermining, potentially resulting in failure of the line, with catastrophic consequences to the Town's ability to provide safe water to the community.

Alternative 1 – Complete Replacement and Relocation of 4,000 l.f. of the Raw Water Line: This alternative would replace approximately 4,000 l.f. of the existing 24" cast iron raw water supply line with ductile iron pipe and relocating the line away from the areas subject to erosion and undermining. This alternative would also include a 3,900 l.f. extension of the emergency raw water line from the Yadkin River to the reservoir to allow for pre-settling, replacement of raw water intake pumps, controls, and valves, and replacement of the reservoir outlet sluice gates. This alternative was rejected because of the environmental impact that would result from right of way clearing and six stream crossings to relocate the raw water line and because of the high capital and present worth costs.

Alternative 2 – Replacement and Relocation of 1,700 l.f. of the Raw Water Line: This alternative is similar to Alternative 1 but would replace and relocate a shorter segment of the water line (1,700 l.f.) that is most at-risk of failure. Like Alternative 1, this alternative would also include the extension of the emergency raw water line, new intake pumps, and replacement of the reservoir outlet sluice gates. The proposed alignment of this alternative presented topography constraints to permit gravity flow, construction constraints associated with the Highway 286 bridge, and environmental impacts associated with clearing and three stream crossings to relocate the raw water line. This alternative was rejected because of these constraints, environmental impacts, and higher capital and present worth costs.

Alternative 3 – New 4,000 l.f. Raw Water Line and Conversion of Existing Line: This alternative would construct a new 4,000 l.f. ductile iron raw water line and convert the existing cast iron raw water line into an emergency raw water line by reversing the flow direction and connections to the existing emergency raw water line from the Yadkin River. This alternative would include stream bank restoration, new intake pumps, and replacement of reservoir outlet sluice gates. This alternative has similar environmental impacts as the Preferred Alternative including four stream crossings and clearing for the new line; however, this alternative was rejected due to higher capital and present worth costs.

Alternative 4 – Continued use of Existing Raw Water Line: This alternative will include restoration of approximately 700 l.f. of stream bank in areas of exposed pipe and installation of J-hook boulder in the stream to divert water and stabilize the stream bank in areas at risk of erosion to allow continued use of the existing raw water line. Like Alternatives 1 and 2, this alternative will also include the extension of the emergency raw water line, new intake pumps, and replacement of the reservoir outlet sluice gates. This alternative is preferred because of the favorable environmental impacts achieved by stabilizing the stream bank to avoid the construction impacts associated with relocating the line and lower capital and present worth costs.

## **F. Environmental Consequences and Mitigative Measures**

Topography and Soils: Some temporary changes in topography are expected from construction activities to stabilize the stream bank, the emergency raw water line extension, replacement of existing sluice gates, and installation of the new raw water pumps. These construction areas will be returned to pre-construction elevation and slope upon completion of construction. Minor permanent changes to topography are anticipated from installation of a j-hook to redirect flows away from the existing raw water line. Permanent impacts to the 100-year floodplain or floodway are not expected. A no-rise study will be conducted and if the results indicate that the initial design will impact the Elkin Creek floodway, design modifications will be implemented to offset impacts to obtain a No-Rise Certification. Applicable floodplain development permits will be obtained from the Town of Elkin.

Land Use: No permanent direct impacts to land use are anticipated. Temporary impacts to Town greenways will occur during construction, but the construction site will be restored to existing conditions and use for greenways and trails following construction.

Wetlands: Construction of the emergency raw water line will include two wetlands crossing with less than 0.10 acre of temporary impacts. Disturbed areas will be returned to original slope and contour and will be replanted with native vegetation. Construction will be in accordance with a NCDENR-approved and county-approved erosion and sedimentation control plan and other provisions of the Sedimentation Pollution Control Act of 1973 to minimize impacts from erosion and sedimentation. The U.S. Army Corps of Engineers was consulted and did not object to the project (August 11, 2016).

Important Farmlands: There will be no net loss of important farmlands. Silt fences will be used during construction, and following construction, soil will be backfilled and returned to preconstruction slope and contour. Land that will be disturbed is not currently in agricultural use.

Public Lands and Scenic, Recreational, and State Natural Areas: There will be no negative permanent impacts to public lands or scenic, recreational, or state natural areas. The project will improve long term water quality and aquatic habitat in Elkin Creek, which will benefit area parks.

Cultural Resources: In a memorandum dated August 29, 2016, (No. ER 16-1400, the North Carolina State Historic Preservation Office (SHPO) stated that no historic resources are likely to be affected by the project.

Air Quality: Temporary impacts to air quality including increased dust and vehicle exhaust emissions may occur during construction activities. Proper vehicle maintenance and emission control devices will reduce these impacts. No permanent impacts are expected.

Noise Levels: There will be a temporary increase in noise related to construction equipment during weekday working hours. Weekend and after-hours construction work is not anticipated. There will be no permanent impacts to noise levels once construction is complete.

Water Resources: There is the potential for temporary impacts due to erosion and sedimentation during construction, including four stream crossings. Two crossings will be open cut, one will be jack and bore, and one will be installed in existing fill over an existing culvert. Stream bank stabilization will utilize natural channel design methods to restore the banks to their pre-erosion condition and J-hooks to divert flow away from sensitive areas of the streambank. To minimize construction impacts, all construction will be in accordance with a NCDENR-approved and county-approved erosion and sedimentation control plan and other provisions of the Sedimentation Pollution Control Act of 1973. Long term impacts will be positive with the restoration and stabilization of the stream banks resulting in improved water quality and aquatic habitat in Elkin Creek.



Forest Resources: Impacts to forest resources are not expected to be significant. Much of the alignment will use maintained greenways and easements. Where clearing is required, permanently maintained corridor widths will be limited to approximately 15 feet, and areas that do not require maintenance will be allowed to return to their natural conditions following construction.

Shellfish or Fish and Their Habitats: Net impacts to shellfish, fish, and their habitats are expected to be positive. Construction impacts will be minimized through adherence to a NCDENR-approved and county-approved erosion and sedimentation control plan and other provisions of the Sedimentation Pollution Control Act of 1973. Restoration and stabilization of the stream bank will improve water quality and aquatic habitat in Elkin Creek.

Wildlife and Natural Vegetation: Impacts to wildlife and natural vegetation will be temporary due to construction activities. Much of the construction will take place within or adjacent to existing maintained rights of way and trails with very limited, temporary impacts to habitats.

Introduction of Toxic Substances: Introduction of toxic substances from construction activities is possible from vehicle fluids. Such impacts will be minimized by proper vehicle maintenance and proper collection of and disposal of fluids.

The U.S. Fish and Wildlife Service reviewed the proposed project and concluded that the requirements of Section 7(a)(2) of the Endangered Species Act have been fulfilled (September 15, 2015, Log No. 4-2-16-382). The North Carolina Wildlife Resources Commission, Natural Heritage Program, and DWR Winston-Salem Regional Office, and U.S. Army Corps of Engineers concur with the proposed project. The North Carolina Department of Cultural and Natural Resources is not aware of any properties of architectural, historical, or archaeological significance that would be affected by the project.

### **G. Public Participation, Sources Consulted**

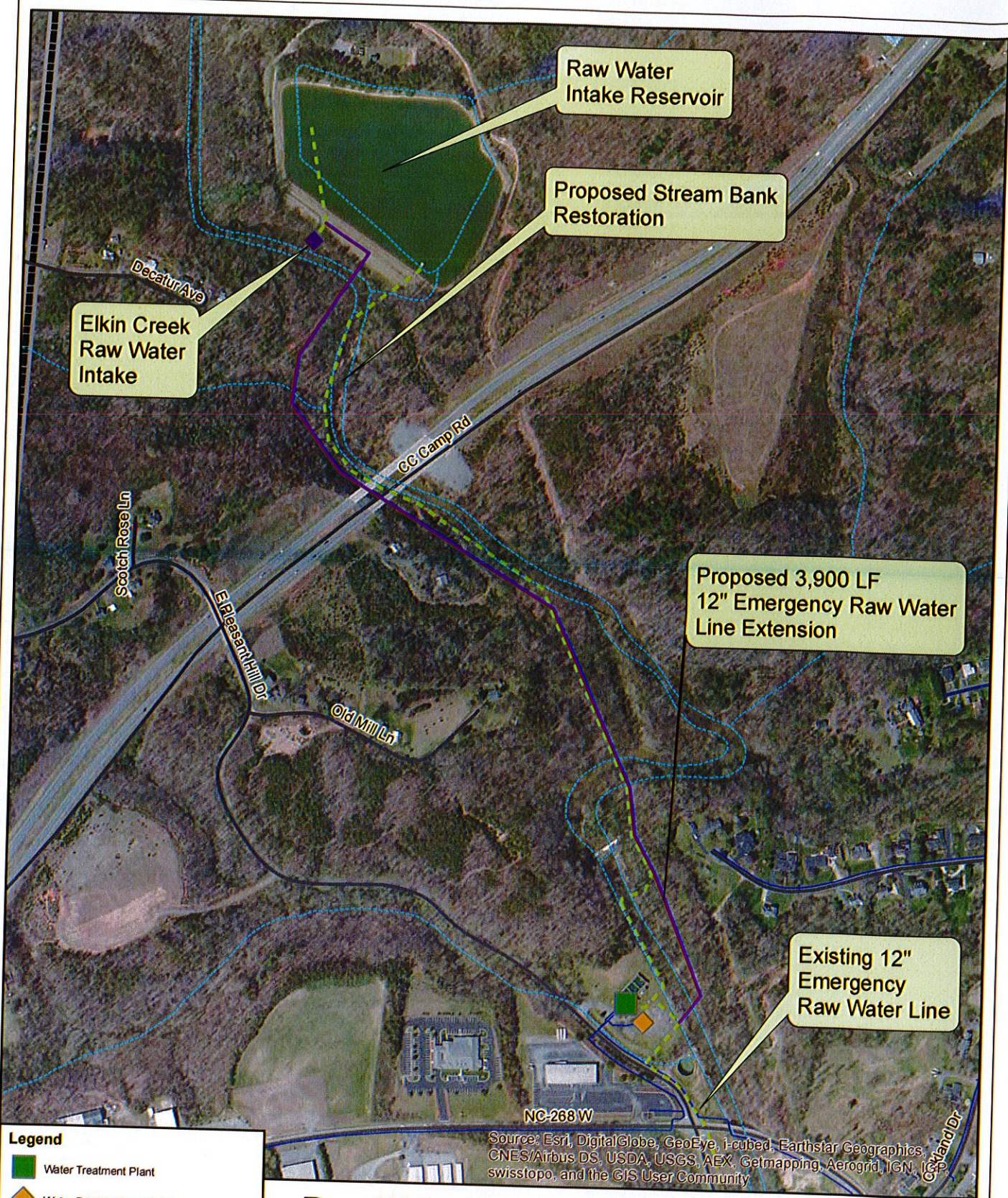
A public meeting was held on February 13, 2017 including a presentation about the meeting. There were no objections to the project. The current user charge for a typical customer is \$73.75 per month for 5,000 gallons for sewer and water combined. The proposed project is expected to cause an increase of \$10.06 per month for a total of \$83.81.

Sources consulted about this project for information or concurrence included

- 1) Town of Elkin
- 2) North Carolina Department of Environmental Quality
  - Wildlife Resources Commission
  - Natural Heritage Program
  - DEQ Winston-Salem Regional Office
  - Division of Air Quality
  - Division of Water Resources
  - Division of Forest Resources
  - Division of Environmental Assistance and Customer Service
  - Division of Waste Management

- 3) North Carolina Department of Cultural and Natural Resources
- 4) North Carolina State Clearinghouse
- 5) North Carolina Department of Public Safety
- 6) U.S. Fish and Wildlife Service
- 7) U.S. Army Corps of Engineers





Elkin Creek Raw Water Intake

Raw Water Intake Reservoir

Proposed Stream Bank Restoration

Proposed 3,900 LF 12" Emergency Raw Water Line Extension

Existing 12" Emergency Raw Water Line

**Legend**

- Water Treatment Plant
- Water Booster Pump Station
- Water Tank
- Water Intake
- Proposed Emergency Raw Water Line Ext.
- Existing Raw Water Lines
- Existing Water Lines
- Stream/River
- Roads
- County Boundary

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, i-cubed, swisstopo, and the GIS User Community

# Raw Water Line Improvements

Figure H.1: Alternative 4

Elkin, NC  
July, 2014





