FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)
FINDING OF NO SIGNIFICANT IMPACT (FONSI)
CITY OF BOILING SPRING LAKES
PROPOSED DAM REPAIR PROJECT
BRUNSWICK COUNTY, NORTH CAROLINA
FEMA-4393-DR-NC
PA-04-NC-4393-PW-00669-PN 68141 & PA-04-NC-4393-PW-02916-PN 126563

BACKGROUND

On September 14, 2018 and amended September 17, 24, 27, October 12, 22, 24, and November 15, President Trump signed a disaster declaration (FEMA-4393-DR-NC) for the state of North Carolina (recipient) due to damages caused by Hurricane Florence between September 7, 2018 and September 29, 2018. This disaster declaration authorized the Department of Homeland Security's (DHS) Federal Emergency Management Agency (FEMA) to provide federal assistance to the designated areas. The City of Boiling Spring Lakes, the subrecipient, is seeking funding from FEMA in the form of Public Assistance (PA) grant funding to repair and upgrade four dam facilities (collectively identified as the BSL system) in Boiling Spring Lakes, Brunswick County, NC.

The BSL system is comprised of Sanford Dam located along Alton Lennon Drive (34.04687, -78.03751), Upper Lake Dam located along West Dam Road (34.02147, -78.06966), North Lake Dam located along East Boiling Spring Road (34.04183, -78.05294), and Pine Lake Dam also located along East Boiling Spring Road (34.03351, -78.06360). In September 2018, Hurricane Florence caused heavy flood waters to overtop the BSL system. The embankment breach and failure at the largest dam, Sanford Dam, led to the failure of the other dams in the BSL system. The impounded water quickly flowed downstream into Allen Creek resulting in the lakes draining. Currently, the lakes remain drained and sections of Alton Lennon Drive and West Dam Road, where Sanford Dam and Upper Lake Dam breached, are closed. These post Hurricane Florence conditions are increasing emergency response time, hindering community connectivity, and impacting local business revenues.

The proposed repairs and upgrades to the BSL system include embankment reconstruction, spillway upgrades, upstream embankment slope hardening, and road repairs at all four dams. A seepage control cut off wall, Mix In Place (MIP) stability panels, and downstream embankment slope hardening will be installed at Sanford Dam. The existing culverts at North Lake Dam and Pine Lake Dam will also be removed. The upgraded BSL system would comply with the North Carolina Department of Environmental Quality (NCDEQ) Dam Safety Program requirements, thereby reducing future risk of dam failure, preventing injuries to persons, damage to downstream properties, and loss of reservoir storage.

In July 2022, an Environmental Assessment (EA) was prepared by FEMA field staff in accordance with the National Environmental Policy Act (NEPA) of 1969, the President's Council on Environmental Quality regulations to implement NEPA (40 Code of Federal Regulations (CFR) Parts 1500-1508), and FEMA's procedures for implementing NEPA (FEMA Instruction 108-1-1). FEMA is required to consider potential environmental impacts before funding or approving actions and projects.

A public notice is posted on the City of Boiling Spring Lakes' website, at the City of Boiling Spring Lakes City Hall building, and on FEMA's website. The FEMA EA is available for viewing by visiting the following website:
[https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa/environmental-assessment-city-boiling]

FINDINGS

The Proposed Action as described in the EA would cause minor impacts to water resources, vegetation, and environmental justice. Short-term impacts to air quality, water resources, vegetation, noise, traffic, public utilities, aesthetics, and public health and safety are anticipated. Impacts to coastal resources, threatened and endangered species and critical habitat, migratory birds, cultural resources, and hazardous materials and solid waste, are negligible and not anticipated to be long-term. Short-term benefits to economic development and land use are anticipated. Long-term benefits to geology, soils, and seismic stability, floodplains and wetlands, wildlife and aquatic resources, economic development and land use, and aesthetics are expected.

In consideration of the overall impacts of the proposed action in relation to impacts from past, present, and reasonably foreseeable future activities, the proposed action is not expected to have significant adverse cumulative impacts on any resource.

CONDITIONS

- The City of Boiling Spring Lakes (the City) is responsible for obtaining and complying with all required local, state, and federal permits and approvals.
- If deviations from the proposed Scope of Work (SOW) result in substantial design changes, the need for additional ground disturbance, additional removal of vegetation, or any other unanticipated changes to the physical environment, the City must contact FEMA so that the revised project scope can be evaluated for compliance with NEPA and other applicable environmental laws.
- All conditions outlined in the approved Erosion and Sediment Control (E&SC) plan, Stormwater Pollution Prevention Plan (SWPPP), National Pollutant Discharge Elimination System (NPDES) NCG010000, 404 General Permit Verification and Nationwide Permit (NWP) 03, 401 General Certification Verification and General Certification 4132, Dam Safety Certificate of Approval, Conditional Letter of Map Revision (CLOMR) document, Department of the Army (DOA) Easement Right-of-Entry Consent, and Floodplain Development Permit must be adhered to.

- Dewatering Permits are required prior to dewatering activities and the City must comply with all of the conditions prescribed by the permit.
- Upon completion of work that involves temporary stream impacts, streambeds are to be restored to pre-project elevations and widths using natural streambed material. Stream banks are to be restored to pre-project grade and contours or beneficial grade and contours if the original bank slope is steep and unstable. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
- All practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sedimentation and erosion control measures when replacing the failed dams.
- E&SCs should be installed and maintained between the construction site and the nearby down-gradient surface waters.
- Maintain natural buffers on all streams and creeks adjacent to the project site.
- A 402 NPDES Construction Stormwater permit (NCG010000) is required for the proposed 23.54 acres of ground disturbance. Coverage under NCG010000 for the proposed action is contingent upon the submittal of a Notice of Intent (NOI) and the approved E&SC plan, which also incorporates SWPPP requirements. The NOI and approved E&SC plan will be submitted to Department of Energy, Mineral, and Land Resources (DEMLR) for approval prior to the start of construction.
- The City must provide Coastal Area Management Act (CAMA) permitting or correspondence with North Carolina Division of Coastal Management (NCDCM) seeking determination of the permit requirement.
- The City shall comply with the agreed upon Migratory Bird Treaty Act (MBTA) Conservation Measures.
- Disturbed green spaces that will be revegetated shall use NC and region native species.
- The City shall adhere to all Federal Energy Regulatory Commission (FERC) Tree Management Plan requirements.
- If human remains or intact archaeological features or deposits (e.g., arrowheads, pottery, glass, metal, etc.) are uncovered, work in the vicinity of the discovery will stop immediately and all reasonable measures to avoid or minimize harm to the finds will be taken. The City will ensure that archaeological discoveries are secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries. The City's contractor will provide immediate notice of such discoveries to the City. The City shall contact the North Carolina Office of State Archaeology (NCOSA) and FEMA within 24 hours of the discovery. Work in the vicinity of the discovery may not resume until FEMA has completed consultation with State Historic Preservation Office (SHPO), Tribes, and other consulting parties as necessary. In the event that unmarked human remains are encountered during permitted activities; all work shall stop immediately, and the proper authorities notified in accordance with NC General Statues, Chapter 70, Article 3, Section 70-29 and 70-32.
- Prior to conducting repairs, the City must identify the source and location of fill material and provide this information to North Carolina State Historic Preservation Office (NCSHPO) and

FEMA. If the borrow pit is privately owned, or is located on previously undisturbed land, or if the fill is obtained by the horizontal expansion of a pre-existing borrow pit, FEMA consultation with the SHPO will be required.

- Any changes to the approved SOW will require submission to, and evaluation and approval by FEMA, SHPO, and relevant Tribal Historic Preservation Offices (THPOs), prior to initiation of any work, for compliance with Section 106.
- The City shall comply with the City Noise Ordinance Chapter 9, Article IV, and the Brunswick County Noise Ordinance Chapter 1-9, Article VIII. Permits will be obtained if required for any noise-generating construction activities that are regulated by these ordinances.
- The Traffic Control Plan will be adhered to during construction activities.
- All solid or hazardous wastes generated during construction will be removed and disposed of at a permitted facility or designated collection point.
- The construction contractor shall be required to develop and implement a Health and Safety Plan to assure worker safety during construction activities.
- Construction workers shall be required to comply with all applicable OSHA regulations, as well as other applicable regional regulations.

CONCLUSION

Based on the findings of the EA, coordination with the appropriate agencies, comments from the public, and adherence to the project conditions set forth in this FONSI, FEMA has determined that the proposed project qualifies as a major federal action that will not significantly affect the quality of the natural and human environment, nor does it have the potential for significant cumulative effects. As a result of this FONSI, and in accordance with FEMA Instruction 108-1-1, an Environmental Impact Statement (EIS) will not be prepared, and the proposed project as described in the attached EA may proceed.

APPROVAL

STEPHANIE D EVERFIELD
Digitally signed by STEPHANIE D EVERFIELD
Date: 2022.10.13 11:54:58 -04'00'

Stephanie D. Everfield
Regional Environmental Officer
FEMA Region 4

PAUL R WILSON
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Date: 2022.10.13 12:33:15 -04'00'

Paul Wilson
Acting Public Assistance Branch Chief
FEMA, Region 4

Final Environmental Assessment

City of Boiling Spring Lakes
Dams Repair
FEMA DR-4393-NC
Boiling Spring Lakes, Brunswick County, North Carolina

October 2022

U.S. Department of Homeland Security Federal Emergency Management Agency Region IV
3005 Chamblee-Tucker Road
Atlanta, GA 30341-4130

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LIST OF ACRONYMS AND ABBREVIATIONS

AHPA	Archaeological and Historic Preservation Act
Alt	Alternative
APE	Area of Potential Effect
ARPA	Archaeological Resources Protection Act
BCA	Benefit Cost Analysis
BFE	Base Flood Elevation
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BSL	Boiling Springs Lake
B	Class B Primary Recreation
CAA	Clean Air Act
CAMA	Coastal Area Management Act
CBIA	Coastal Barrier Improvement Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	Methane
CLOMR	Conditional Letter of Map Revision
CMP	Corrugated Metal Pipe
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CSZ	Charleston Seismic Zone
CWA	Clean Water Act
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act

C&D	Construction and Demolition
C	Class C Secondary Recreation
DOA	Department of the Army
DEMLR	Division of Energy, Mineral, and Land Resources
DHS	Department of Homeland Security
DWR	Department of Water Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
E&SC	Erosion and Sedimentation Control
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
HFC	Hydrofluorocarbon
H&H	Hydraulic and Hydrologic
IPaC	Information for Planning and Consultation
LOMR	Letter of Map Revision
LQS	Land Quality Section
MBTA	Migratory Bird Treaty Act
MIP	Mix in Place
MOTSU	Military Ocean Terminal Sunny Point
MPRSA	Marine Protection, Research, and Sanctuaries Act
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDEQ	North Carolina Department of Environmental Quality
NCDOT	North Carolina Department of Transportation
NCDCM	North Carolina Division of Coastal Management
NCEM	North Carolina Emergency Management
NCFMP	North Carolina Floodplain Mapping Program
NCGS	North Carolina General Statutes
NCNHP	North Carolina Natural Heritage Program
NCOSA	North Carolina Office of State Archaeology
NCOAH	North Carolina Office of Administrative Hearings

NCSHPO	North Carolina State Historic Preservation Office
NFIP	National Flood Insurance Program
NHPA	National Historical Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NDRF	National Disaster Recover Framework
NRHP	National Register of Historic Places
NO_2	Nitrogen Dioxide
NWP	Nationwide Permit
OSHA	Occupational Safety and Health Administration
O_3	Ozone
PA	Public Assistance
Pb	Lead
PL	Public Law
PMP	Probable Maximum Precipitation
PM_{25}	Particulate Matter less than 2.5 microns in aerodynamic diameter
PPD	Presidential Policy Directive
PPE	Personal Protective Equipment
PR&G	Principles, Requirements, and Guidelines for Federal Investments in Water Resources
RCRA	Resource Conservation and Recovery Act
RHS	Rural Housing Service
RSF	Recovery Support Functions
SCC	Sedimentation Control Commission
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Office
SHM&SW	State Hazardous Materials and Solid Waste Laws
SO_2	Sulfur Dioxide
SOI	Secretary of the Interior
SOW	Scope of Work
SW	Swamp Water
SWDA	Solid Waste Disposal Act
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
TSCA	Toxic Substances Control Act
US	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOCs	Volatile Organic Compounds
WOTUS	Waters of the United States
Zone A or AE	One percent annual chance floodplain zone

1.0 INTRODUCTION

Hurricane Florence impacted North Carolina (NC) with strong winds, storm surge, and prolonged inland flooding. On September 14, 2018, and as amended on September 17, 24, 27, October 12, 22, 24, and November 24, 2018, President Donald Trump declared a major disaster (FEMA-DR-4393-NC) for the State of NC due to Hurricane Florence. The major disaster declaration authorizes the Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA) to provide federal assistance to the designated areas of NC. This assistance is provided pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). Section 406 of the Stafford Act authorizes FEMA's Public Assistance (PA) Program to repair, restore, and replace facilities damaged as a result of the disaster event.

The City of Boiling Spring Lakes (City) is located in Brunswick County, NC which is a designated county eligible to receive federal assistance under FEMA-DR-4393-NC for Hurricane Florence. The City has applied under the FEMA PA Grant Program for the reimbursement of funding to repair and upgrade the dam facilities that were heavily damaged by Hurricane Florence. The City, having legal responsibility to repair and maintain the Boiling Spring Lakes (BSL) dam facilities, is eligible for funding through the FEMA PA Grant Program pursuant to Title 44 of the Code of Federal Regulations (CFR) Section 206.223(a)(3). The four dam facilities (collectively identified hereafter as the BSL system) are Sanford Dam, Upper Lake Dam, North Lake Dam, and Pine Lake Dam. The BSL system impounds five lakes: Pine Lake, North Lake, Upper Lake, Middle Lake, and Boiling Spring Lake. Middle Lake Dam is privately owned and will not be part of this environmental assessment (EA) analysis.

In April 2021, a Categorical Exclusion Report located under Appendix B, hereafter referenced as (McGill Associates, 2021 b), was prepared by McGill Associates, P.A. (Engineering Consultant) on behalf of the City to satisfy the National Environmental Policy Act (NEPA) requirements in conjunction with a United States Department of Agriculture (USDA) Rural Housing Service (RHS) Loan. This report is currently under review and pending final USDA confirmation that it satisfies NEPA requirements. Relevant environmental planning and historic preservation information from the report was incorporated into this EA, but FEMA is not able to formally supplement the proposed findings of the report without USDA final approval. Therefore, this EA has been prepared in accordance with the requirements of the NEPA of 1969, (Public Law (PL) 91-190, as amended), and its implementing regulations at 40 CFR Parts 1500-1508, promulgated by the President's Council on Environmental Quality (CEQ). FEMA will use the findings in this EA to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) for the proposed repairs and upgrades to the BSL system.

The BSL system repair and upgrade work included in this EA is captured under two FEMA projects: PA-04-NC-4393-PW-00669 PN 68141 and PA-04-NC-4393-PW-02916 PN 126563. Even though there are two projects, the dams are interdependent and all four need to be repaired to continue functioning as a system. Additionally, the North Carolina Department of Environmental Quality (NCDEQ) Dam Safety Program (Dam Safety) analyzed the dams as one system when evaluating them for a high hazard classification. Therefore, all work associated with the two projects is considered a connected action. Connected actions are closely related or are a

part of a larger undertaking. They typically include actions that trigger other actions or when one action depends on another per the DHS Instruction Manual 023-01-001-01, Revision 01, Instruction Manual, Implementation of the National Environmental Policy.

The proposed action will require additional funding beyond what is being reimbursed under the FEMA PA program. The City anticipates receiving a RHS Loan from USDA and other outside funding to complete the project work. Further information regarding funding and other related projects is outlined in the Analysis of Environmental Impacts Section (6.0).

2.0 PURPOSE AND NEED

The objective of FEMA's PA Grant Program is to assist the community in recovering from the damage caused by natural disasters. The purpose of the action alternatives presented in this EA is to repair the BSL system and bring it into compliance with Dam Safety requirements. The need for this project is to reduce future risk of dam failure, prevent injuries to persons, damage to downstream properties, and loss of reservoir storage (15A North Carolina Administrative Code (NCAC) 02K .0100; 15A NCAC 02K .0105). This will allow the recreational, social, and economic development values the BSL system once provided for the impacted community to resume.

In accordance with federal laws and FEMA regulations, the EA process for a proposed federal action must include an evaluation of alternatives and a discussion of the potential environmental impacts. This EA was prepared in accordance with FEMA's regulations as required under NEPA. As part of this NEPA review, the requirements of other environmental laws and executive orders (EOs) are addressed.

3.0 PROJECT LOCATION AND BACKGROUND

The City's BSL system is comprised of Sanford Dam located along Alton Lennon Drive (34.04687, -78.03751), Upper Lake Dam located along West Dam Road (34.02147, -78.06966), North Lake Dam located along East Boiling Spring Road (34.04183, -78.05294), and Pine Lake Dam also located along East Boiling Spring Road (34.03351, -78.06360) as seen in Figure 1 of Appendix A. The BSL system prior to Hurricane Florence contained a series of earthen embankments, spillways, and culverts. City or State-maintained public roads also ran atop the four dams.

In September 2018, Hurricane Florence caused heavy flood waters to overtop the four dams. The embankment breach and failure at the largest dam, Sanford Dam, led to the failure of the other dams in the BSL system. The impounded water quickly flowed out into Allen Creek resulting in the lakes draining. See Figure 2 of Appendix A for photographs of the breached dams.

Sanford Dam and Upper Lake Dam remain breached and two sections of city- maintained roads, Alton Lennon Drive and West Dam Road, are currently closed. The North Carolina Department of Transportation (NCDOT) repaired North Lake Dam and Pine Lake Dam by installing two culverts at each location to reopen state-maintained East Boiling Spring Road, as seen in Figure 4

Appendix A. The culverts will be removed once the BSL system is repaired and upgraded. See Figure 3 of Appendix A for photographs of the repairs at North Lake Dam and Pine Lake Dam.

The City has formed much of its identity from the benefits the lakes provided. The lakes and surrounding park areas provided recreational activities for the community. Many local businesses also directly or indirectly benefited from the lake's draw for tourism and recreational opportunities, and it played a role in their economic development.

Since Hurricane Florence in September 2018, the BSL system embankment failure, closed roadways, and drained lakes have not provided the values that support the community and local business revenues. It is also hindering community connectivity, increasing emergency response time, and reducing residential property values. Additionally, a City inspector documented citizen's concerns about an increasing rat population. It is hypothesized that the increase in rat populations is due to the drained lakes and is increasing the risk of vector disease exposure to the community.

A Phase I Inspection Report, prepared by Law Engineering in 1980 as part of the federal interagency National Dam Safety Program, labeled Sanford Dam with a high hazard dam classification because the Military Ocean Terminal Sunny Point (MOTSU) railroad was located just downstream of the dam. The Sanford Dam has continued to hold this high hazard classification since 1980. Following Hurricane Florence, a meeting was held between Dam Safety, the City, the Engineering Consultants, FEMA, and NCDOT (McGill Associates, 2021 a, p. 124-127). Dam Safety determined during this meeting that due to the high average daily traffic on North Lake Dam and Pine Lake Dam, these dams would be raised to a high hazard classification (McGill Associates, 2021 a, p. 13-14). The dams would also be analyzed as one system resulting in Upper Lake Dam being raised to a high hazard classification as well (McGill Associates, 2021 a, p. 125).

A High Hazard Dam Classification is given to dams located where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary highways, or major railroads (15A NCAC 02K .0100; 15A NCAC 02K .0105). Dams categorized as high hazard are held to certain requirements when being constructed or repaired. The BSL system upgrades can reduce risk of dam failure, prevent injuries to persons, damage to downstream properties, and loss of reservoir storage (North Carolina General Statutes (NCGS) § 143-215.24). The upgrades also allow the spillway at Sanford Dam to handle more water during storm events and help prevent instability which could lead to future breaching (15A NCAC 02K .0205; 15A NCAC 02K .0207).

4.0 ALTERNATIVES

The alternatives considered in addressing the stated purpose and need are the No Action Alternative as well as the following Action Alternatives: bringing the BSL system up to current Dam Safety requirements through hard stabilization (Proposed Action Alternative 1), repairing the BSL system back to pre-disaster condition (Action Alternative 2), and repairing Sanford Dam Only (Action Alternative 3).

4.1 No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. The BSL system would remain vulnerable to future storm events and remain out of compliance with Dam Safety requirements. The repairs made to Pine Lake Dam and North Lake Dam by NCDOT would continue to facilitate access to the state-maintained roads crossing over Pine Lake Dam and North Lake Dam. However, the amount of water allowed to flow freely through the existing culverts would still drain the lakes. Sanford Dam and Upper Lake Dam would remain breached and Alton Lennon Drive and West Dam Road would remain inaccessible at these dams. The current conditions of the BSL system is resulting in downstream sedimentation and erosion, loss of lake habitats, loss of intended recreational opportunities, negative economic impacts, increase in pests, and increase in emergency response times. Based on the impacts of a No Action Alternative, the City evaluated alternatives that better meet the needs of their community.

4.2 Proposed Action Alternative 1 – Hard Stabilization Repair

Under Action Alternative 1, the repairs and upgrades to the BSL system would restore the dams to a more resilient and safer design than before through complying with Dam Safety requirements. This will reduce the risk of dam failure, prevent injuries to persons, damage to downstream properties, and loss of reservoir storage (NCGS) § 143-215.24). These improvements should also allow the spillway capacity to accommodate increased water flow during storm events and prevent instability which could lead to future breaching (15A NCAC 02K .0205; 15A NCAC 02K .0207).

The proposed repairs and improvements include earthen embankment reconstruction, spillway upgrades, upstream embankment slope hardening, and road repairs at all four dams. A seepage control cut off wall, Mix In Place (MIP) stability panels, and downstream embankment slope hardening will be installed at Sanford Dam. Temporary impacts include constructing staging areas and installing sheet pile or earth fill cofferdams at each of the dams to redirect water. Temporary diversion conduits will be installed at all dams except Upper Lake Dam and dewatering stations will be implemented at all the dams to control water during the construction process. The existing culverts at North Lake Dam and Pine Lake Dam will also be removed. Site plans with detailed construction impacts are included in Appendix B.

4.3 Action Alternative 2 – Repair BSL System to Exact Pre-disaster Condition

Action Alternative 2 would involve repairing all dams to their pre-disaster conditions. Dam Safety requires the high hazard dams be upgraded to specifications that would not be met if the BSL system was returned to pre-disaster condition (McGill Associates, 2021 a, p. 14). The repairs made to North Lake Dam and Pine Lake Dam by NCDOT to reopen state- maintained East Boiling Spring Road also do not meet the current Dam Safety requirements for high hazard dams. Returning the dams to their pre-disaster condition could increase the risk of overtopping and failure in an event similar to Hurricane Florence which would be a threat to public safety. In consideration of the above, this alternative was dismissed from further analysis.

4.4 Action Alternative 3 – Partial Reconstruction – Repairing only the Sanford Dam

This alternative will only repair and upgrade Sanford Dam to meet current Dam Safety requirements. The reconstruction of Sanford Dam would refill the largest lake, Boiling Spring Lake, to its historic depth of 30 feet. The water elevations of Pine Lake, North Lake, and Upper Lake would still be much lower than desired, resulting in Pine Lake and North Lake being on average 5 feet lower and Upper Lake being on average 8 feet lower. These lower elevations would essentially shrink the perimeter of these lakes away from the previous shoreline. Many docks would be left inaccessible to the water and property values would be impacted. Only a portion of the community in areas where the Boiling Spring Lake footprint is restored would have access to this resource. Sediment from the other drained lakes would continue to be released downstream and will require continual monitoring and maintenance to reduce downstream impacts (McGill Associates, 2021 b, pp. 199, 224, 226, 229). West Dam Road would remain inaccessible, and the culverts located at North Lake Dam and Pine Lake Dam would not comply with Dam Safety regulations (McGill Associates, 2021 a, pp. 7, 225). This alternative would only partially return the lake resources to the community and the BSL system would not fully comply with Dam Safety regulations; therefore, it was dismissed from further analysis.

4.5 Other Alternatives

The City considered other alternatives to repair and upgrade the BSL dam system. Installing riser structures upstream of the embankment rather than directly into the embankment were considered at North Lake Dam, Pine Lake Dam, and Upper Lake Dam. This alternative was dismissed due to economic infeasibility. An open channel spillway was considered for Upper Lake Dam and reusing the existing culverts at Pine Lake Dam and North Lake Dam was considered but this alternative was deemed undesirable and dismissed due to the extensive documentation and demonstration necessary to ensure proper function (15A NCAC 02K .0206 (f)(3)(A)).

4.6 PR&G Analysis

A Principles, Requirements, and Guidelines for Federal Investments in Water Resources (PR&G) analysis is required for federal investments that by purpose, directly or indirectly, alter water resources by affecting water quality or quantity, and have at least $10 million in project costs according to the Principles and Requirements for Federal Investments in Water Resources, Mar. 2013 and Interagency Guidelines, Dec. 2014. The PR&G are established pursuant to the Water Resources Planning Act, Pub. L. 89-8, as amended (42 United States Code (USC) § 1962 a-2) and consistent with the Water Resource Development Act of 2007, Pub. L. 110-114. FEMA's PR&G analysis requires that, in addition to meeting the purpose and need, the alternatives for a water resources project must also be evaluated against their ability to achieve the Federal Objective and conform to the Guiding Principles.

The Federal Objective specifies that federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by: seeking to maximize sustainable economic development; seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or

flood-prone area must be used; and protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

The guiding principles are six overarching concepts the federal government seeks to promote through federal investments in water resources. The Guiding Principles are: (1) Healthy and Resilient Ecosystems; (2) Sustainable Economic Development; (3) Floodplains; (4) Public Safety; (5) Environmental Justice (EJ); and (6) Watershed Approach. The alternatives are compared against the Guiding Principles in **Table 1** below.

Table 1. PR&G Guiding Principles

Alternatives	Healthy and Resilient Ecosystems	Sustainable Economic Development	Floodplains	Public Safety	Environmental Justice	Watershed Approach
No Action Alternative	Impacts lacustrine and forested wetland habitats; returns original pre 1960s stream system and sandy upland banks.	Impacts private business who depend on tourism and recreational opportunity & property value for lakefront residents.	Alteration in the floodplain from pre-disaster, from impoundment to stream system.	Rat issue, downstream sedimentation, and erosion.	May impact low- income communities downstream with sedimentation.	Previously impounded waters would behave as a stream system
Action Alternative 1 (Hard Stabilization - Proposed)	Returns post 1960s lacustrine and forested wetland habitats	Returns economic benefits of recreation and tourism which were drawn by lacustrine resource	Approved CLOMR indicates the alterations to the floodplain; designed to comply with Dam Safety requirements for adequate floodwater storage controls	In compliance with Dam Safety requirements	Reduced sedimentation impact to downstream communities	Impoundments would return storm water control to this drainage area
Action Alternative 2 (Pre-disaster)	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED
Action Alternative 3 (Sanford Dam Only)	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED
Other Alternatives	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED	DISMISSED

5.0 AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The President's Council on Environmental Quality (CEQ) notes: "Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (40 CFR §1508.8).

When possible, quantitative information is provided to establish potential impacts; otherwise, the potential qualitative impacts are evaluated based on the criteria listed in **Table 2**.

Table 2. Impact or Benefit Evaluation Criteria

Impact Scale	Criteria
None/Negligible	The resource area would not be affected and there would be no impact, or changes or benefits would either be non-detectable or, if detected, would have effects that would be slight and local. Impacts would be well below regulatory standards, as applicable.
Minor	Changes to the resource would be measurable, but the changes would be small and localized. Impacts or benefits would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential adverse effects.
Moderate	Changes to the resource would be measurable and have either localized or regional scale impacts/benefits. Impacts would be within or below regulatory standards, but historical conditions would be altered on a short- term basis. Mitigation measures would be necessary, and the measures would reduce any potential adverse effects.
Major	Changes to the resource would be readily measurable and would have substantial consequences/benefits on a local or regional level. Impacts would exceed regulatory standards. Mitigation measures to offset the adverse effects would be required to reduce impacts, though long-term changes to the resource would be expected.

The potential impact analysis in this EA evaluates the potential environmental direct and indirect impact of the No Action and the Proposed Action Alternative 1. A summary table of the potential impacts as well as the environmental protection measures and required permits for Alternative 1 is provided in **Table 3** below.

Table 3. Affected Environment and Potential Impact Summary Table

Resource Area and Type	Potential Impacts	Environmental Protection Measures for Alternative 1	Required Permits for Alternative 1
5.1 Physical Resources: 5.1.1 Air Quality	No Action: **No impact** Alternative 1: **Short-term, minor impact**	Follow all conditions and BMPs in NCDEQ DEMLR E&SC plan.	NCDEQ DEMLR E&SC plan.

Resource Area and Type	**Potential Impacts**	**Environmental Protection Measures for Alternative 1**	**Required Permits for Alternative 1**
5.1 Physical Resources: 5.1.2 Geology, Soils, and Seismic Stability	No Action: **Long- term**, **moderate impact** Alternative 1: **Long- term, moderate benefit**	Follow all conditions and BMPs in NCDEQ DEMLR E&SC plan, NPDES NCG010000, NWP Number 3, and 401 General Certification 4132.	NCDEQ DEMLR E&SC plan, SWPPP, NPDES NCG010000, 404 NWP 03, 401 General Certification 4132, Dam Safety Certificate of Approval, Floodplain Development Permit.
5.2 Water Resources: 5.2.1 Clean Water Act	No Action: **Long- term, moderate impact** Alternative 1: **Short- term and long-term, minor impact**	Follow all conditions and BMPs outlined in approved NCDEQ DEMLR E&SC plan, NPDES NCG010000, NWP Number 3, and 401 General Certification 4132. Upon completion of work that involves temporary stream impacts, streambeds are to be restored to pre-project elevations and widths using natural streambed material. Stream banks are to be restored to pre-project grade and contours or beneficial grade and contours if the original bank slope is steep and unstable.	NCDEQ DEMLR E&SC plan, 404 USACE NWP Number 3, 402 NPDES NCG010000, and 401 General Certification 4132. The City must coordinate with the USACE, NCDEQ DEMLR, and NCDEQ DWR to amend or modify the existing permit authorization.
5.2 Water Resources: 5.2.2 EO 11988 Floodplains and EO 11990 Protection of Wetlands	No Action: **Long- term, moderate impact** Alternative 1: **Long- term, moderate benefit**	None. Refer to 8 Step.	CLOMR approved and Floodplain Development Permit obtained. City will apply for a LOMR within 6 months of completion of construction.
5.2 Water Resources: 5.2.3 Coastal Zone Management Act (CZMA)	No Action: **No impact** Alternative 1: **No or Negligible impact**	The City will obtain any required State approvals or authorizations to maintain consistency with CZMA.	Project will be conditioned for Coastal Area Management Act (CAMA) permitting or approval.
5.3 Biological Resources: 5.3.1 Threatened and Endangered Species and Critical Habitat Critical Habitat	No Action: **No impact** Alternative 1: **No or negligible impact**	All practicable measures should be taken to avoid any adverse impacts to aquatic species; Follow all conditions and BMPs in NCDEQ DEMLR E&SC plan; E&SCs should be installed and maintained between the construction site and any nearby down-gradient surface waters.	NCDEQ DEMLR E&SC plan.

Resource Area and Type	**Potential Impacts**	**Environmental Protection Measures for Alternative 1**	**Required Permits for Alternative 1**
5.3 Biological Resources: 5.3.2 Migratory Bird Treaty Act	No Action: **No impact** Alternative 1: **No or negligible impact**	The City agreed to Conservation Measures to minimize impacts to migratory bird species and their habitats.	Not applicable.
5.3 Biological Resources: 5.3.3 Wildlife and Aquatic Resources	No Action: **Long- term, moderate impact** Alternative 1: **Long- term, moderate benefit**	The City and contractors will implement appropriate avoidance, minimization, and mitigation recommendations per USFWS and NCDEQ.	Not applicable.
5.3 Biological Resources: 5.3.4 Vegetation	No Action: **No impact** Alternative 1: **Short- term moderate impact and long-term minor impact**	Per design plans, City intends on planting native trees and vegetation in impacted areas. Follow BMPs outlined in approved NCDEQ DEMLR E&SC plan.	NCDEQ DEMLR E&SC plan.
5.4 Cultural Resources: 5.4.1 Historic Properties and Archeological Resources	No Action and Alternative 1: **No impact**	If human remains or intact archaeological deposits are uncovered during any future activities, work in the vicinity of the discovery will stop immediately and all reasonable measures to avoid or minimize harm to the finds will be taken. Prior to conducting further repairs that require fill, City must identify the source and location of fill material that is obtained offsite and provide this information to FEMA and SHPO. Any changes to the approved Scope of Work will require submission to, and evaluation and approval by FEMA, SHPO, and relevant THPOs, prior to initiation of any work, for compliance with Section 106.	Not applicable.
5.4 Cultural Resources: 5.4.2 Native American and Religious Sites	No Action and Alternative 1: **No impact**	Not applicable.	Not applicable.

Resource Area and Type	Potential Impacts	Environmental Protection Measures for Alternative 1	Required Permits for Alternative 1
5.5 Socioeconomic Resources: 5.5.1 Environmental Justice	No Action: **No impact** Alternative 1: **There would be long- term, minor impact**	Not applicable.	Not applicable.
5.5 Socioeconomic Resources: 5.5.2 Noise	No Action: **Long- term, minor impact** Alternative 1: **Short term, minor impact**	Permits will be obtained if required for any noise-generating construction activities that are regulated by local ordinances.	Adherence to City of Boiling Spring Lakes Noise Ordinance Chapter 9, Article IV and the Brunswick County Noise Ordinance Chapter 1-9, Article VIII.
5.5 Socioeconomic Resources: 5.5.3 Traffic	No Action: **Long- term, moderate impact** Alternative 1: **Short- term, minor impact**	Construction will be completed in phases and according to a Traffic Control Plan; measures such as early public notification and planned detours will be followed.	Not applicable.
5.5 Socioeconomic Resources: 5.5.4 Public Utilities	No Action: **No impact** Alternative 1: **Short- term, minor impact**	Not applicable.	DOA Easement Right-of-Entry Consent
5.5 Socioeconomic Resources: 5.5.5 Economic Development and Land Use	No Action: **Short- term and long-term, significant impact** Alternative 1: **Short- term and long-term, moderate benefit**	Not applicable.	Not applicable.
5.5 Socioeconomic Resources: 5.5.6 Hazardous Materials and Solid Waste	No Action: **No impact** Alternative 1: **No or negligible impact**	All solid or hazardous wastes generated during construction will be removed and disposed of at a permitted facility or designated collection point.	Not applicable.
5.5 Socioeconomic Resources: 5.5.7 Aesthetics	No Action: **Long- term, moderate impact** Alternative 1: **Short- term, minor impact and long-term, moderate benefit**	Construction will be completed in phases, which will diffuse the short-term negligible impacts during active construction.	Not applicable.
5.5 Socioeconomic Resources: 5.5.8 Public Health and Safety	No Action: **Long- term, moderate impact** Alternative 1: **Short- term, minor impact**	Workers required to comply with OSHA regulations, and other applicable regulations.	NCDEQ Dam Safety Certificate of Approval.

The following Laws and EOs listed under **Table 4** are not applicable to the federal undertaking and were dismissed from the potential impact analysis review:

Table 4. Dismissed Laws and Executive Orders

Resource Topic	Reason
Coastal Barrier Resources Act	The project is inland and is not located in or adjacent to a coastal barrier resource zone.
Fish & Wildlife Coordination Act	This law is not applicable to federal reimbursement.
Farmland Protection Policy Act (FPPA)	No work is being performed in or anticipated to impact areas of prime and unique farmland.
Magnusson- Stevens Fisheries Conservation Act	Work will not take place in or near essential fish habitat designated by National Marine Fisheries Service.
Wild and Scenic Rivers Act	Allen Creek is not a wild and scenic river as defined by this law. The project is not adjacent to any wild and scenic rivers.
American Indian Religious Freedom Act (AIRFA)	This work is not restricting any religious areas or religious freedoms of Native Americans. Work is restricted to the footprint of the dams and surrounding areas and during Tribal Historic Preservation Office (THPO) consultation there were no comments from all 3 tribes that potentially have interests in the area.
Archaeological Resources Protection Act (ARPA)	It was determined during an NC Office of State Archeology (NCOSA) query that no underground resources were identified. If during construction, the discovery of any resources will be reported to the State Historic Preservation Office (SHPO).
Archeological and Historic Preservation Act (AHPA)	After consulting with the SHPO, it was determined that no historic properties were affected.
Coastal Barrier Improvement Act (CBIA)	The project is inland and is not located in or adjacent to coastal barrier resources.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	This project does not involve the cleanup of a superfund site, nor will it take place within a superfund site.
Marine Protection, Research, and Sanctuaries Act (MPRSA)	The project is inland and away from marine environments.
Native American Graves Protection and Repatriation Act (NAGPRA)	No Native American burial grounds were located in the project area. The 3 tribes that have interests in Brunswick County were consulted with and had no concerns. If any human remains are found during work, it will be reported to the State Office of Historic Preservation.
Toxic Substances Control Act (TSCA)	The project scope does not involve the production, importation, use, or disposal of chemicals designated by the EPA as needing compliance requirements.
EO 13007: Indian Sacred Sites	This projects scope does not pertain to managing federal lands nor is the project located in a sacred Native American site. Consultation was performed with the 3 tribes in the area with no concerns.
EO 13175: Consultation and Coordination with Tribal Governments	This projects scope does not pertain to the development of federal policies. The 3 tribes in Brunswick County were consulted with and had no concerns.

5.1 Physical Resources

5.1.1 Air Quality

The Clean Air Act (CAA) authorizes the United States Environmental Protection Agency (EPA) to create national ambient air quality standards (NAAQS) for prevalent pollutants (33 USC § 1251 et seq; 40 CFR part 50). Subsequently, EPA established NAAQS for the following criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM2.5), and sulfur dioxide (SO2). Areas that meet the air quality standards for the criteria pollutants are designated as being in attainment. Areas that do not meet the air quality standards for one of the criteria pollutants are designated as being in non-attainment for that standard.

Greenhouse gases (GHGs) trap heat in the atmosphere and are caused primarily by human activity (EPA, 2021 a). GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases such as hydrofluorocarbons (HFCs) found in foams, aerosol propellants, and refrigerants. According to guidance from the CEQ, federal agencies should consider how GHG emissions from their proposed actions would impact future conditions (CEQ, 2016). The threshold level for a significant impact to air quality is defined as a violation of an ambient air quality standard or regulatory threshold.

Brunswick County is not identified as a non-attainment area per the NAAQS-EPA Green Book (EPA, 2022 e). At the state level jurisdiction, NCDEQ lists Brunswick County as in attainment/unclassified for NAAQS pollutants CO, O3, and PM2.5 (Figures 5-7, Appendix A). Brunswick County was also reclassified from an unclassifiable area to an attainment/ unclassifiable area for the 2010 1-hour primary SO2 NAAQS on October 28, 2021 (EPA, 2021 b, p. 1).

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. Construction activities causing temporary exhaust and dust emissions would not occur. Therefore, the No Action Alternative would have no effect on air quality or GHG emissions.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would generate temporary construction equipment exhaust and dust emissions from site preparation, asphalt roadway reconstruction, existing spillway demolition and subsequent construction and demolition (C&D) debris removal, soil disturbance and stockpiling, vegetation removal, embankment grading, and placement and compaction of engineered fill soils for embankment stabilization. These emissions would fluctuate depending on the specific construction phase occurring during the estimated construction duration of 24-48 months. Exhaust emissions from construction vehicles and equipment may temporarily increase the levels of some criteria pollutants and certain GHGs.

However, these emissions are not expected to exceed the federal *de minimis* thresholds for criteria pollutants and Volatile Organic Compounds (VOCs) (40 CFR § 93.153). The temporary increase in exhaust emissions will be mitigated by properly maintaining construction equipment and running fuel burning equipment and vehicles only when necessary. Fugitive dust generated by the construction activities would be minimized by adhering to the Best Management Practices (BMPs) outlined in the Erosion and Sedimentation Control (E&SC) Plan approved on April 22, 2022 (Appendix D) by the Division of Energy, Mineral, and Land Resources (DEMLR) Land Quality Section (LQS) under direction of the Sedimentation Control Commission (SCC). Appropriate BMPs would include removing any accumulated dirt and mud from the roads, applying a stabilization seed mix to disturbed areas, and enclosing or covering stockpiled material. The community would be notified of the construction schedule and any updates through posting on the City website (City of BSL, 2021 a) and social media Facebook page (City of BSL, 2021 b) for individual planning purposes. Construction work signs would also be installed at the active work sites. No permanent impacts to air quality through GHGs or emissions would be anticipated upon completion of the repairs for the four dams. Based on the analysis conducted, Alternative 1 would cause short-term minor impacts to air quality and GHG emissions.

5.1.2 Geology, Soils, and Seismic Stability

The BSL system is located within the flat low lying land area of the Coastal Plain Region. The soil typically consists of loosely combined fossiliferous sand with silt and clay of the Waccamaw formation per the 1985 Geologic Map of NC (Schnabel Engineering, 2020, p. 34). According to the USDA Natural Resources Conservation Service's Web Soil Survey for Brunswick County, the project area consists of sandy soils with slopes varying from nearly level to 8 percent (USDA, 2021). The area east of Sanford Dam and within Allen creek consists of organic muck soil, which is a designated Subclass of the Streambed Class (Federal Geographic Data Committee, 2013, pp. 26-27; USDA, 2021). Phase 1 and Phase 2 subsurface explorations of the project area confirmed the presence of sandy soils underneath the top stratum layer of fill soil utilized during the initial construction of the four dams (Schnabel Engineering, 2020, pp. 23-26).

Soluble limestone formations are commonly located in the lower stratum of southeastern Coastal Plain counties, including Brunswick County where the BSL system is located. Karst topography, also common in this area, is a geologic feature where sinkholes can form from the dissolution of soluble rock by surface or ground water (USGS, 2014). Sinkholes at a dam embankment can exacerbate soil erosion leading to dam failure. During 2019 subsurface explorations, a limestone stratum layer at Sanford Dam was documented when soil and rock boring samples were collected for the BSL system (Schnabel Engineering, 2020, pp. 19-20). The highly permeable soil and underlying limestone layer at Sanford Dam were described as favorable conditions for the initiation of concentrated seepage and internal erosion, which can eventually create a sinkhole (McGill Associates, 2021 a, p. 63). There was no evidence of sinkholes or uncontrolled seepage at North Lake Dam, Pine Lake Dam, or Upper Lake Dam (McGill Associates, 2021 a, p. 68). However, several uncontrolled seepage events and sinkholes at or near Sanford Dam have been documented as far back as 1962 (Schnabel Engineering, 2020, p. 12).

Earthquakes, also referred to as seismic events, do occur in eastern NC but strong damaging ones are uncommon. According to the 2018 USGS National Seismic Hazard map, the project covered by this EA is located within an area of low to moderate risk for seismic ground shaking (USGS, 2018). However, the Charleston Seismic Zone (CSZ) is one of the most seismically active regions in the southeastern United States and is approximately 150 miles south of the project area (McGill Associates, 2021 a, p. 266). The CSZ is considered the dominant source and contributor of seismic activity for the project area and was used as the modal event for seismic hazard analyses (McGill Associates, 2021 a, p. 266). The foundation soils beneath the four dams were tested for seismic stability by Schnabel in 2019 and 2020. It was concluded that the cohesionless soils at the dams have the potential to experience cyclic liquefaction and lose strength when subjected to seismic ground motions (USGS, 2018). Cohesionless soil contains particles that do not stick together, and its strength is dependent upon friction between particles (USDA, 2012, p. 13). Liquefaction occurs when saturated cohesionless soils lose friction strength when subjected to ground motion through vibration from earthquakes (McGill Associates, 2021 a, p. 59). Cyclic liquefaction of embankment foundation soils can cause slope deformations and possible dam failure from overtopping or uncontrolled water release from the BSL system (McGill Associates, 2021 a, p. 66).

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system, and it would remain vulnerable to slope instability and internal erosion. Without permanently stabilizing the breached portions of Sanford Dam and Upper Lake Dam earthen embankments, further soil erosion would occur and exacerbate sediment impacts to downstream wetlands and open water bodies. Therefore, the No Action Alternative would have long-term, moderate impacts on soil, geology, and seismic stability.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would involve earthen embankment reconstruction, spillway upgrades, and upstream embankment slope hardening at all four dams as well as a seepage control cut off wall, MIP stability panels, and downstream embankment slope hardening at Sanford Dam. The NCDEQ DEMLR LQS issued a Dam Safety Certificate of Approval for the proposed action on January 31, 2022 (Appendix D). Upon completion of the repair and upgrade work, the high hazard classified dams would be in compliance with Dam Safety. The proposed upgraded spillway structures would increase the handling capacity of water during high water storm events thereby reducing the risk of future embankment failures. The additional riprap along the upstream embankment slopes would stabilize and better protect the embankment soil from wave action. The new seepage collection system, upgraded spillway, and cut off wall along the entire earthen embankment at Sanford Dam would decrease excessive seepage, soil instability, and soil erosion. The MIP panels installed along the toe of the embankment at Sanford Dam would increase seismic stability by reducing foundation liquefaction. These proposed measures would help minimize overall impacts from future storm events and possible seismic activity. Seismic controls will not be installed at Pine Lake Dam, Upper Lake Dam, or North Lake Dam due to the embankment widths and insufficient seismic risk

(McGill Associates, 2021 a, p. 70). Temporary soil disturbance due to the BSL system repairs would be minimized by implementing the BMPs listed in the approved E&SC plan. Based on the above, Action Alternative 1 would have long-term moderate benefits on soil, geology, and seismic stability.

5.2 Water Resources

5.2.1 Clean Water Act

The Clean Water Act (CWA) of 1977 establishes the basic structure for regulating discharges of pollutants into the waters of the United States (WOTUS) and regulating quality standards for surface waters (33 U.S.C. § 1251 et seq). The CWA does not define WOTUS; rather it allows for the EPA and the United States Army Corps of Engineers (USACE) to define WOTUS in regulations (33 U.S.C. § 1251 et seq). Construction stormwater runoff is also regulated under this Act, and EPA requires that construction sites have proper stormwater controls in place and an approved Stormwater Pollution Prevention Plan (SWPPP) (EPA, 2022 c; EPA, 2007).

Section 404 of the CWA establishes the USACE as the permitting authority for the discharge of dredged or fill material into WOTUS, including wetlands (33 U.S.C. § 1344). Wetland impacts associated with the proposed action are evaluated under subsection 5.2.2. Floodplain Management (EO 11988) and Protection of Wetlands (EO 11990).

Under the CWA, the EPA delegates aspects of the Section 401 and Section 402 permitting requirements to state and tribal governments. Section 401 requires that, for any federally licensed or permitted project that may result in a discharge into WOTUS, a water quality certification be issued to ensure that the discharge complies with applicable water quality requirements (33 U.S.C. § 1341). Section 401 Water Quality Certifications for NC are issued under the NC Division of Water Resources (DWR) Water Quality Section. Section 402 prohibits the discharge of pollutants through a point source into a WOTUS unless they have a National Pollutant Discharge Elimination System (NPDES) permit (33 U.S.C. § 1342). In NC, the NPDES Construction Stormwater Permits are issued by the NCDEQ DEMLR Stormwater Program and apply to construction activities that either disturb land of one acre or more or are part of a common plan of development of that size.

The project area is located within the southern part of the Cape Fear River Basin; specifically, the Cape Fear River SubBasin 03-06-17 (NCDEQ, 2005). This subbasin is typically associated with slow moving tannin-stained tributary streams, as well as estuary and tidal creeks of the Cape Fear River (NCDEQ, 2005). Tannin staining, or brownish colored water, is a by-product of the natural break down of decaying plant material. Most of the subbasin watershed is forested with growing urban areas on the west side of the Cape Fear River in Brunswick County. Waters released from the BSL lakes move downstream through Allen Creek, Lilliput Creek, Cape Fear River and out into the Atlantic Ocean.

The BSL lakes receive water from Allen Creek and its tributaries upstream from Upper Lake Dam. Prior to Hurricane Florence, the Sanford Dam impounded water for the BSL lakes directly upstream of Allen Creek. The Sanford Dam was also operated to release impounded water

downstream ahead of a storm event. The Upper Lake Dam traverses Allen Creek further upstream and impounded Upper Lake. The Pine Lake Dam and North Lake Dam traverse tributaries north of Allen Creek and impounded Pine Lake and North Lake respectively. The historic impoundment water elevation for the BSL system is between 30-38 feet. Currently, newly formed creek channels conduct water through the lakebed and breached areas (McGill Associates, 2021 b, pp. 196-199). Surface Water Classifications are designations applied to surface water bodies, such as streams, rivers and lakes, which define the best uses to be protected within these waters (NCDEQ, 2022 b). They are used by state and federal agencies to manage and protect streams, rivers, lakes, and other surface waters in NC (NCDEQ, 2022 b). Specific water quality standards are applied to each classification and are designed to protect water quality, fish and wildlife, the free-flowing nature of a stream or river, or other special characteristics (NCDEQ, 2022 b). Per the NCDEQ Surface Water Classification Mapper, the BSL lakes are identified as Class B primary recreation and Swamp Waters (B;Sw) (NCDEQ, 2022 b). Allen Creek, downstream of Sanford Dam, is listed as Class C secondary recreation and Swamp Water (C;Sw) (NCDEQ, 2022 b). Class B systems meet the standard for frequent water contact primary recreational uses such as swimming, as well as, for Class C secondary recreational uses such as fishing and boating. Class C systems are protected for secondary recreational use and for infrequent or incidental water contact activities. Swamp Waters is a supplemental classification used to recognize topographically related low velocity waters which are different from adjacent streams draining land from steeper topography according to the NCDEQ Surface Freshwater Classifications Guide in Appendix B.

Per the National Wetlands Inventory Mapper, the BSL lakes are designated as a lake or open pond feature. Allen Creek, downstream of Sanford Dam and upstream of Upper Lake Dam is designated as a freshwater and forested scrub wetland as shown in the floodplain and wetland map under Appendix A. During an October 17, 2019 site visit, the USACE and NCDEQ DWR confirmed the presence of open waters within the project area.

The threshold level for a significant impact to WOTUS is considered a violation of state water quality criteria, non-compliance with federal or state discharge permits, or unpermitted dredge or fill within the boundary of jurisdictional WOTUS, including wetlands.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. This alternative would eliminate open water and wetland impacts associated with the BSL system repairs and upgrades. However, sediment from the lake beds and breached embankments at Sanford Dam and Upper Lake Dam would continue to migrate downstream and further decrease water quality. The drained lakes would also no longer be able to support water related recreational activities. The lakes would continue to reflect the channeling characteristics of Allen Creek and may be reclassified from a Class B (primary recreational use) to a Class C (secondary recreational use). This reclassification would restrict all lake related recreational activities. Therefore, the No Action Alternative would result in long-term, moderate impacts to WOTUS including wetlands.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would cause temporary and permanent impacts to WOTUS. A total of 0.74 acres of permanent open water impacts and 90 linear feet of permanent creek impacts are required for the installation of a new spillway and earthen embankment at each of the dam facilities, and for the installation of a 90 linear foot riprap dissipator pad within Allen Creek downstream of Sanford Dam. A total of 5.90 acres open water and 30 linear feet of temporary creek impacts are required for equipment access and staging areas.

The USACE issued General Permit Verification SAW-2021-00216 (Appendix D) on March 18, 2021, confirming WOTUS impacts from the proposed action are covered under Nationwide Permit (NWP) 3 for maintenance activities. **Table 5** below is a list of permitted temporary and permanent impacts to WOTUS.

Table 5. WOTUS Permitted Impacts

Dam Facility	Permanent Impacts	Temporary Impacts
Sanford Dam	0.50-Acres Open Water, 90LF Allen Creek	2.50-Acres Open Water, 30LF Allen Creek
North Lake Dam	0.07-Acres Open Water	1.30-Acres Open Water
Pine Lake Dam	0.09-Acres Open Water	1.40-Acres Open Water
Upper Lake Dam	0.08-Acres Open Water	0.70-Acres Open Water

NCDEQ DWR Water Quality Section confirmed the proposed action impacts under Table 5 are covered under Section 401 Water Quality General Certification Number 4132 (NCDWR 401 approval, Appendix D). Section 401 approval was originally granted on April 21, 2021, and then renewed on March 9, 2022. Per General Condition #8 of General Certification 4132 and the E&SC Letter of Approval, a 402 NPDES Construction Stormwater permit (NCG010000) is required for the proposed 23.54 acres of ground disturbance (Water Quality General Certification Number 4132 and Letter of Approval with Modifications and Performance Reservations, Appendix D). Coverage under NCG010000 for the proposed action is contingent upon the submittal of a Notice of Intent (NOI) and the approved E&SC plan, which also incorporates SWPPP requirements (NPDES NCG010000 permit, Appendix D). The NOI and approved E&SC plan will be submitted to DEMLR for approval prior to the start of construction.

The construction-related ground disturbance and stormwater runoff from the proposed action may cause temporary water quality impacts, but these impacts would be minimized by adhering to the approved E&SC plan, Section 401 Water Quality certification, Section 402 Construction Stormwater permit, and Section 404 Nationwide permit for the proposed action. Permit conditions include restoring all temporarily impacted areas to pre-construction contours and elevations after construction and keeping erosion control measures in place during construction. The open water impacts will not cause any permanent loss of form or function to the lakes. The riprap dissipator pad within Allen Creek will cause a permanent partial loss of creek function. The riprap will cover

90 linear feet of creek bed eliminating existing vegetation and soil. However, once the project is complete sediment will no longer migrate downstream into Allen Creek and the water quality is anticipated to improve. The BSL lake facilities would, in time, achieve historic impoundment water elevations again. The water related recreational activities would resume and the community's social and economic values would be met. Therefore, it was concluded that the proposed action alternative would result in short-term and long-term minor impacts to WOTUS including wetlands.

5.2.2 EO 11988 Floodplain Management and EO 11990 Protection of Wetlands

Executive Order 11988 Floodplain Management (EO 11988) amended on January 29, 2015, and as implemented in by FEMA 44 CFR Part 9, requires federal agencies to "avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Each federal agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."

Executive Order 11990 Protection of Wetlands (EO 11990) directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the values of wetlands on federal property. Wetlands are identified as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (44 CFR Part 9).

Both Brunswick County and the City participate in the National Flood Insurance Program (NFIP) that regulates construction within designated floodplains. The BSL system is located within a Special Flood Hazard Area (SFHA) per the FEMA Flood Insurance Rate Map (FIRM), panel numbers: 3720218000K and 3720219000K, dated 8/28/2018. A majority of the project area is located within the one percent annual chance floodplain boundaries (Zone A or AE). Sanford Dam and Upper Lake Dam are within a Regulatory Floodway. The Regulatory Floodway is regulated by Federal, State or local requirements to control the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the NFIP).

The dams meet the criteria defined in 44 CFR Part 9 for functional dependence as they cannot perform their intended purpose unless located in close proximity to water. A Flood Insurance Study (FIS) for Brunswick County was completed in 2006 and revised on December 6, 2019 (FEMA, 2019).

Natural and beneficial values provided by floodplains and wetlands in the project area include but are not limited to the following: recharge groundwater supplies in aquifers, support of fish and wildlife populations as well as habitat, riparian areas, open space, natural beauty, and recreation. The BSL system in its current state is not able to moderate water levels within the Allen Creek watershed, therefore the values of the floodplain and downstream wetlands have been diminished.

Per the National Wetlands Inventory Mapper, the BSL system is designated as a lake or open pond feature. Allen Creek, downstream of Sanford Dam and upstream of Upper Lake Dam is designated as a freshwater and forested scrub wetland per the floodplain/wetland map under Appendix A. The Engineering Consultant noted during a site visit after Hurricane Florence that forested riparian wetlands were prevalent along Allen Creek downstream of the Sanford Dam. Over-bank flooding appeared to have a significant impact on the establishment and maintenance of hydric conditions in these types of wetland systems. Many wetland areas were buried with sand and debris that migrated from the upstream lake beds since the breaches. Consequently, large portions of the wetland system appear to be highly degraded and exhibit characteristics of uplands (McGill Associates, 2021 a, p. 82).

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. There would be long-term moderate impacts to the natural and beneficial values of the floodplain and the wetlands downstream of Sanford Dam. As Allen Creek would be left unobstructed, the wetlands transitioning to an upland habitat downstream of Sanford Dam and the upstream drained lakes habitat would continue to mature and establish. Although this new ecological environment may provide suitable habitat for similar wildlife species, provide water quality benefits, and an opportunity for ground water recharge, it would not equate to an impoundment scenario which provides aquatic habitat, a more aesthetic natural beauty, and a wider variety of recreation such as boating and fishing. Per the Engineering Consultant's assessment of downstream and upstream effects, without the dam system extreme erosive activities will occur. Major weather events such as hurricanes will promote further channel migration (Appendix B). In addition, sediment from the lake beds and breached embankments at Sanford Dam and Upper Lake Dam will continue to migrate downstream and further exacerbate the wetland degradation of Allen Creek and decrease water quality.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would cause permanent changes to the Base Flood Elevation (BFE) and Regulatory Floodway upstream and/or downstream of the BSL system. A hydraulic and hydrologic (H&H) study and a flood study were completed to document water flow changes resulting from Hurricane Florence as well as from the proposed BSL system upgrades (Appendix B). The BFEs will decrease along Allen Creek upstream of Sanford Dam and increase downstream of Sanford Dam. Upstream of North Lake Dam, BFEs will also decrease along North Lake. Throughout the floodplain, there will be both increases and decreases of the AE, shaded X, and Regulatory Floodway zones. The channel stability within these areas is not anticipated to be adversely affected. The area of greatest discharge velocity change is located immediately downstream of the Sanford Dam spillway. The design plans include armoring this area and energy dissipation to mitigate erosion downstream.

A Conditional Letter of Map Revision (CLOMR) was completed for the proposed BFE changes to the floodplain on February 16, 2022 (Appendix D). A Floodplain Development Permit was issued to the City on March 31, 2022. As required, the City will apply for a Letter of Map Revision (LOMR) through FEMA within 6 months of completion of the proposed encroachment (Floodplain Development Permit, Appendix D).

Under Executive Order (EO) 11988 and EO 11990, FEMA is required to consider alternatives and to provide a public notice of any proposed actions in or affecting floodplains or wetlands. FEMA completed an 8-step review (Appendix B) to evaluate the alternatives and proposed action in the floodplain. The Public Notice for the EA, which includes the requirement for considerations under EO 11988 and EO 11990, was posted on FEMA Region IV's website and the City's website (www.cityofbsl.org, www.facebook.com/BoilingSpringLakesNC).

Alternative 1 will have moderate, long-term benefits to the natural and beneficial values of the floodplain and the wetlands downstream of Sanford Dam. The BSL system upgrades will bring the dams up to high hazard dam classification standards as well as restore the lake to its historic water levels. Wetland vegetation along the Allen Creek embankment downstream of Sanford Dam will be exposed to a longer hydroperiod, which should offset impacts from sediment-induced hydric conditions currently transitioning forested wetland systems into non-wetland uplands. Once the project is complete, sediment will no longer migrate downstream into Allen Creek, the water quality is anticipated to improve, and appropriate wetland vegetation should reestablish along the banks. The Sanford Dam has historically been used to control water levels during storm events and the restoration of the BSL system will further protect the improved property in the floodplain. The re-impoundment of the lakes will also return a natural resource to the community which the City relies on for their key industries of hospitality and recreation. There are multiple businesses, such as Lakes Country Club, and parks, like Alton Lennon Park, which benefit from the natural and beneficial values of the floodplain as it existed prior to Hurricane Florence.

5.2.3 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) was passed in 1972 to proactively manage natural resources, balancing resource protection with economic, recreational, and cultural needs (CZMA, Pub. L. 92-583 (16 U.S.C. §§1451-1465); 15 C.F.R. part 930). The CZMA defines the coastal zones where development must be managed to protect areas of natural resources unique to coastal regions. States are required to define the area that will comprise coastal zone and develop management plans that will protect these unique resources through enforceable policies of state Coastal Zone Management (CZM) programs. As defined in the Act, the coastal zone includes coastal waters extending to the outer limit of state submerged land title and ownership, adjacent shorelines, and land extending inward to the extent necessary to control shorelines. Federal as well as local actions must be determined to be consistent with the CZM plans and policies before they can proceed.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. The No Action Alternative would not involve any construction activities; therefore, there would be no impact to coastal resources.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would be subject to CZMA regulation. NC is a participating state and implements CZMA through the Coastal Area Management Act (CAMA) of 1974 and is enforced by the North Carolina Division of Coastal Management (NCDCM) per North Carolina General Statutes (NCGS) § 113A. The City is in Brunswick County which is one of 20 designated coastal counties subject to CAMA regulations (NCDEQ, 2022 c). To satisfy the Federal consistency review, FEMA sent a determination letter to NCDCM on October 28, 2021, requesting concurrence that the proposed action is consistent with NC's approved coastal management program. Concurrence from NCDEM was received December 17, 2021. For Federal assistance to state and local governments, the City is responsible for fulfilling state consistency review requirements; therefore, the project will be conditioned for CAMA permitting or correspondence with NCDCM seeking determination of the permit requirement. Due to concurrence by NCDCM and conditioned CAMA permitting, under Alternative 1, impacts to coastal resources will be negligible.

5.3 Biological Resources

5.3.1 Threatened and Endangered Species and Critical Habitat

The Endangered Species Act (ESA), Pub. L. 97-304 (16 U.S.C. §§1531-1544) as amended, addresses actions that could affect species in danger of becoming extinct. Listed species protected under the ESA may be designated as Endangered, which means the species is considered in danger of extinction throughout all or a significant portion of its range, or Threatened, which means the species is considered to likely become endangered within the foreseeable future. For specific areas formally designated by the United States Fish and Wildlife Service (USFWS) as critical habitat for species listed under the ESA, Federal agencies must ensure that actions undertaken, funded, or authorized by the agency do not destroy or adversely modify that habitat. The Information for Planning and Consultation (IPaC) is an online tool developed and utilized by the USFWS to assist project proponents in identifying potential species of concern or designated critical habitat that may be present within the project area for any of these species.

The affected environment includes the earthen embankment reconstruction, bank stabilization, upgraded spillways, and associated roadway repairs. The environment and habitats of the drained lakebed are also being considered for this project. The aquatic habitats upstream and downstream of the BSL system are also considered as part of the affected environment for project review.

In accordance with Section 7 of the ESA, the project was evaluated for the potential occurrences and impacts to federally listed threatened and endangered species that may be present in the project area. The IPaC report generated on November 11, 2021, for the project area (Appendix B), identified sixteen (16) federal endangered or threatened species, or species threatened due to similarity of appearance. The project does not take place in suitable habitat for eleven (11) of these species and will not be discussed further due to our determination of no effect. Four (4) species that could occur within the area and should be evaluated for consideration of effects: red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), Cooley's meadowrue (*Thalictrum cooleyi*), rough-leaf loosestrife (*Lysimachia asperulaifolia*). The American alligator (*Alligator mississippiensis*) may also occur in the area but based on its status as Threatened due to Similarity of Appearance, no effects determination is required.

For higher data resolution based on occurrences, the North Carolina Natural Heritage Program (NCNHP) database was utilized on July 1, 2021. Maintained by NCDNR and in collaboration with NatureServe, other state natural heritage programs, and federal partners, the NCNHP provides best available data from information gathered by researchers, biologists, and citizen scientists. Only the red-cockaded woodpecker, American alligator, and rough-leaf loosestrife from the IPaC resource listing were in the NCNHP database as being observed in the proposed action area. There are no designated critical habitats in or near the proposed action areas nor would any designated critical habitats be indirectly impacted by the work. During a field study conducted on July 30-31, 2019, suitable habitat was identified for four (4) of the listed species: red-cockaded woodpecker, wood stork, Cooley's meadowrue, and rough-leaved loosestrife, however, no individuals were observed during the time of the survey.

Red-cockaded woodpeckers occur in family groups that nest in cavities excavated in large, living pines generally greater than 60 years in age within pine-dominated habitats. The family groups forage in pine-dominated habitats with pines generally greater than 30 years in age located within 0.5 mile of, and contiguous to, the nesting cavities. USFWS reports that in general, red-cockaded woodpeckers require between 100 and 400 acres of foraging habitat per group. The USFWS identified BSL system as being ecologically important with suitable long leaf pine habitat and coordinated a process to reduce impacts of development on the species, particularly for work involving tree removal. Lots within the City are designated via a color-coded system of red (known community, most sensitive), blue and green (outside of known communities, still suitable habitat). The current project area occurs within sections of blue designations.

Wood storks' nest in groups, called colonies, in trees or woody vegetation emerging from standing water, generally associated either with swamps or lakes in NC. Foraging occurs for fish and other aquatic animals within the shallows of flooded wetland habitats, impoundments, and ditches. Wetland habitat within the project evaluation area could provide potentially suitable nesting habitat for wood stork, and shallow flooded areas could provide potentially suitable foraging habitat. The shallow lakeshore edges present before the dams were breached and may have provided suitable foraging habitat conditions. The lakebed in its present condition after breaching is majority dry with minimal areas of water-fill, minimizing foraging potential.

Cooley's meadowrue is an endangered perennial herb in the buttercup family and flowers between June and July. This plant can be found in areas of wet pine savannahs, savannahs, along fire plow lines, ditches alongside of roads, cleared woodlands, and powerlines. As a poor competitor, this species depends on some sort of disturbance to maintain their habitat. Fire or mowing commonly are types of disturbance that maintain these habitats. Threats to the Cooley's meadowrue include habitat loss, vegetative succession, land clearing, herbicides, and development. The maintained rights-of-ways and areas around the BLS system could be suitable habitat.

Rough-leaf loosestrife is a perennial herb that flowers from May to June. This plant can be found in longleaf pine uplands and pine pocosins. As they depend on disturbance, typically fire, for growth, they also can be found at roadsides and right of ways where maintenance mimics fire. Threats to the rough-leaf loosestrife include habitat loss, vegetative succession, land clearing, herbicides, and development. The maintained rights-of-ways and areas around the BSL system could be suitable habitat. The threshold level for a significant impact to threatened and endangered species is defined by the take of an individual protected under the ESA.

Potential Impacts

No Acton Alternative

Under the No Action Alternative, the City would not repair and upgrade the BSL system. Loss of the shallow lake habitats potentially suitable as wood stork foraging habitat would be anticipated to be offset in part by replacement with early successional swamp habitats and eventually regrowth of swamp forest within the present drained lakebed, of which areas containing shallow flooded depressions and areas exhibiting shallow flooding following rains could be potentially suitable as wood stork foraging habitats. No or negligible impacts to federally listed endangered or threatened species would be expected as a result of the No Action Alternative.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the BSL system would be repaired and upgraded. Consultation on the proposed undertaking with the USFWS in a letter dated October 8, 2019 (Appendix D), covered the following project components: earthen embankment, concrete spillway, primary outlet, emergency spillway and bank stabilization. By letter response dated November 18, 2019, and July 15, 2021, the USFWS concurred with the determination that the proposed project may affect, but is not likely to adversely affect, red-cockaded woodpecker, wood stork, Cooley's meadowrue, and rough-leaf loosestrife. FEMA contacted the USFWS on January 4, 2022 (Appendix D), to seek concurrence on the adoption of the already completed consultation, as well as to confirm all responsibilities under the red-cockaded woodpecker ordinances had been met. The USFWS agreed that the consultation was sufficient and that no further steps such as tree surveys would be necessary given the completed Section 7 consultation and previously concurred "may affect, not likely to adversely affect" determination for the red-cockaded woodpecker. Therefore, Alternative 1 is expected to have no or negligible impacts to federally listed endangered or threatened species and no effects to critical habitat

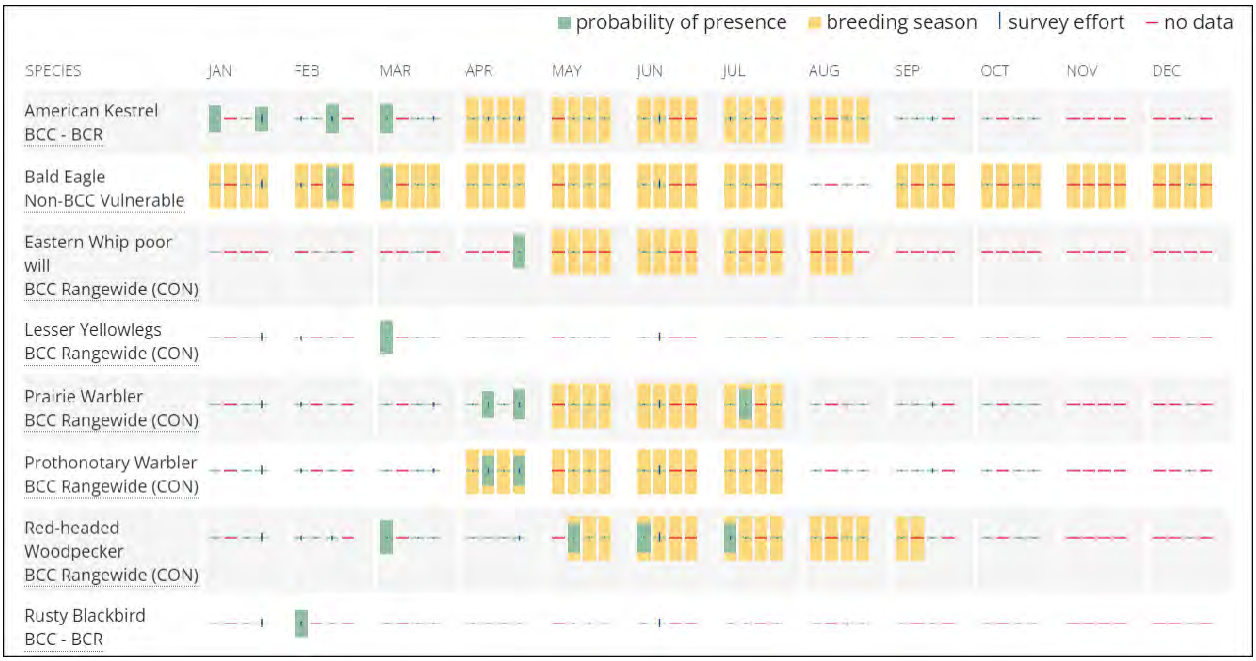
5.3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) provides a program for the conservation of migratory birds that fly through lands of the United States. The lead Federal agency for implementing the MBTA is the USFWS. This law was enacted in 1918 to fulfill the United States' requirement, as agreed upon during a convention between the United States and Great Britain, to protect migratory birds and reduce take. The 50 CFR 10.12 defines take as "to pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect". Additionally, it is "unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell…" any migratory bird species (16 USC § 703). Therefore, incidental, or unintentional take shall be considered with the potential impacts to migratory birds.

The entire state of NC is considered a flyway zone for migratory birds. According to USFWS IPaC report (Appendix B), eight (8) migratory bird species were identified as being potentially present within the project area; six (6) have a designated breeding season. See **Table 6** for IPaC chart of listed migratory birds and associated breeding season as available. Apart from bald eagles, the IPaC probability chart identifies peak breeding season occurring from mid-April to early August. The earliest breeding season for any given year is the first week of April for the prothonotary warbler and American kestrel. Red-headed woodpeckers' breeding season is the last to end for any given year during the second week of September. There are no occurrences of bald eagles in the project and surrounding areas according to NCNHP (NCNHP, 2021; USFWS, 2022).

On November 23, 2021, FEMA EHP discussed the recommended Nationwide Conservation Measures with the City and their Engineering Consultant. The Engineering Consultant agreed to implement the applicable measures recommended to protect migratory birds. See Appendix D for the list of Conservation Measures. This conversation and agreed upon measures ensure a good-faith effort was achieved in mitigating adverse impacts to migratory birds as practicable as possible.

Table 6. IPAC Migratory Bird & Bald Eagle Probability of Presence & Breeding Season Table



Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. There would be no construction activities; therefore, there would be no impact or potential to take migratory birds.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would involve construction activities and require the removal of trees, shrubs, and other vegetation to facilitate the dike and breach repairs. Construction work under bridges would result in a noise disturbance to any breeding populations of migratory birds. To avoid, minimize, and reduce the production of impacts to migratory birds and their nests from both noise and vegetation removal activities, applicable nationwide conservation measures will be conditioned to the project and contractors will be required to adhere at the extent practicable. The City has agreed to implement these conservation measures into the construction contracts. Most notable of these conservation measures is to schedule all vegetation removal outside of peak breeding season. This conservation measure would substantially decrease the anticipated moderate impacts to migratory birds and nests. If incidental take were to occur, the nearest NC Migratory Bird Field Office is to be contacted to assist in rectifying the take. The conservation measures to be followed to the practicable extent are listed in Section 7.3. Based on the above, there would be no or negligible impacts to migratory bird species and habitat.

5.3.3 Wildlife and Aquatic Resources

The affected environment includes the same areas identified for threatened and endangered species in Section 5.3.1. The current status of the site is that the lakes have been drained due to the breached dams. Wildlife in the area ranges from interior forest species, riparian and aquatic species, and species adapted to living alongside humans in developed areas. The mixed woodland and lacustrine wetland areas found intermittently along the lake and stream shores may serve as foraging and refuge habitats for numerous species such as migratory birds and small mammals. Within the riverine habitats, common freshwater varieties of fish can be found that include bass, sunfish, carp, and catfish.

A review of NCNHP was conducted on August 16, 2019. The Eastern chicken turtle (Deirochelys reticularia reticularia) and venus flytrap (Dionaia muscipula) were identified as species of Special Concern within the project area. Three ecologically significant natural communities were identified within the project area: cypress gum swamp, pond pine woodland, and sandy pine savanna. There are four managed or natural areas within the project area: NC Coastal Land Trust Easement, BSL Limesink Complex, Allen Creek, and multiple Brunswick County open spaces, such as parks. The NCNHP also identified elemental occurrences of 4 species of bird, 1 dragonfly, 1 freshwater fish, 1 moss, 6 reptiles, and 38 vascular plants, identified within a one-mile radius of the project area (NCNHP, 2021).

The bald eagle (Haliaeetus leucocephalus) while not protected under ESA, they are protected under the Bald and Golden Eagle Protection Act (BGEPA), the MBTA (see Section 5.3.2 above for details), and the Lacey Act. The survey conducted July 30-31, 2019, did not identify any individuals however habitat exists in the project impact area in the form of small open water features and nearby canopy trees. A review of NCNHP records on July 1, 2021, indicates no known bald eagle occurrences within 1.0 mile of the study area.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. Loss of the lake habitats would reduce the ecological diversity and adversely affect the fishing and other aquatic recreational opportunities. Hydrologic conditions for the drained lakebed areas sustained by precipitation would likely present a spectrum including: seasonally saturated, but not flooded, habitats occupying topographically higher portions of the area; seasonally flooded and temporarily flooded habitats that flood for relatively short durations in response to seasonally higher water tables and precipitation events, respectively; and semi-permanently to permanently flooded habitats that may be present in depressions within the lakebed and low areas adjacent to springs.

There would be an increase in species populations adapted to swamp habitats as well as potentially increase the presence of nuisance species such as snakes and rodents. Therefore, the No Action would have long-term, moderate impacts.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would restore the lake levels to historic impoundment water elevations. The repair of the BSL system and refilling the lake will return the area to its pre-event habitats and therefore allow for the return of the pre-existing species including fishes and increase recreational fishing opportunities. The repair of the BSL system and refilling of the impounded lake would return to the community of BSL a critical natural resource. In order to mitigate the impacts of erosion and sedimentation, an E&SC plan approved by the NCDEQ will be implemented. Alternative 1 would have moderate, long-term moderate benefits to wildlife, aquatic vegetation, and fishes present as a result of repairing the dam and refilling the lake.

5.3.4 Vegetation

The mixed pine woodland and savanna habitat found at the project area is typical of the Coastal Plain region, with a majority of the project area being dominated by shrubs and grasses. A variety of flowering plants and grasses can be observed within the project area. The loss of the lakes has caused a conversion from wetland and aquatic vegetation to more upland and terrestrial species as well as a change in soil characteristics from anaerobic to aerobic. The drained lakes now consist primarily of dogfennel (Eupatorium capillifolium), crabgrass (Digitaria spp.), fescue (Festuca spp.), soft rush (Juncus effusus), sedges (Carex spp.), scutch grass (Cynodon dactylon), pine saplings (Pinus spp.), and black willow (Salix nigra). Coordination with USFWS completed on January 5, 2022, confirmed that the ESA consultation was sufficient, and no tree survey would be required for work occurring in designated red-cockaded woodpecker area.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. There would be no construction and therefore no impacts to vegetation within the project area. The vegetation that has grown and established since the breach of the dam would remain and continue to dominate the drained lakebeds.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would require temporary staging of equipment and materials, equipment and human traffic within the designated areas of disturbance, and removal of vegetation. The multiple proposed staging areas are either pre-existing vacant lots or within the designated area of disturbance. A single, temporary gravel access road would be installed within the drained lakebed on the eastern side of Boiling Spring Lake to facilitate access to Sanford Dam. All temporary fill used for the staging areas and access road will be removed upon completion of the BSL system work. Clearing of vegetation will be minimal and only necessary within the immediate vicinity for the four dams to provide clearance and prevent roots from impacting the stability of the BSL system. Once the dams are repaired and the lakes are refilled, the vegetation which has overgrown the drained lakebeds will be submerged. Vegetation

will be used for bank stabilization with native plant seeding mixes including big bluestem (Andropogon gerardii), Indiangrass (Sorghastrum nutans), and switchgrass (Panicum virgatum). Native trees such as silky dogwood (Cornus amomum) and elderberry (Sambucus canadensis) will also be planted for stabilization. Due to the tree removal at the dam sites, the staging areas, and access road, short-term moderate impacts and long-term minimal impacts are expected.

5.4 Cultural Resources

5.4.1 Historic Properties and Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA), Pub. L. 89-665 (54 U.S.C. §§ 300101 – 320303) as amended, and 36 CFR Part 800 require federal agencies to consider the effects of their actions on historic properties. This process includes collecting information and the identification of cultural resources (historic properties and archeological resources) that may be affected by the project Alternatives and supported by the "Secretary of the Interior's (SOI) Standards and Guidelines for Archeology and Historic Preservation". Under Section 106 of NHPA, historic properties are defined as any prehistoric or historic districts, sites, buildings, structures, or objects that are eligible for listing or already listed in the National Register of Historic Places (NRHP) under the criteria for evaluation outlined in 36 CFR § 60.4.

The nature (construction, ground disturbance, and viewshed) and location of the project action must be taken into consideration for defining the project the Area of Potential Effects (APE). As defined in 36 CFR §800.16(d), the APE is the "geographic area or areas within which an action may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."

In addition, to identifying historic properties within the project's APE, the federal agency must also determine, through consultation with the appropriate State Historic Preservation Office (SHPO), tribes, and other consulting parties, what effect, if any, the proposed action would have on historic properties. Information regarding previously surveyed above ground cultural resources is available online via the North Carolina State Historic Preservation Office (NCSHPO), Division of Historical Resources and the NRHP database.

The purpose of the federal action presented in this EA is to provide funding for the restoration repairs and improvement of Sanford Dam, Upper Lake Dam, North Lake Dam, and Pine Lake Dam, all the structures are part of the BSL system and have been serving as connectors and attractions for locals and visitors since the 1960's.

Sanford Dam, North Lake Dam, and Pine Lake Dam were designed by Henry von Oesen and Associates Consulting Engineers of Wilmington and constructed ca. 1960 by Lincoln Construction Company. The three (3) dams were designed and constructed to support the development of the City. The City was named for the Boiling Spring that was previously known as the Bouncing Log Spring and was a local attraction in the mid-20th century. Upper Lake Dam is the smallest of the four (4) structures. Desktop research did not reveal any historic information, including the design and construction method, about Upper Lake Dam.

Sanford Dam was surveyed as an individual resource, and according to a NCSHPO letter dated December 3, 2019 (Appendix C), the dam was created with the purpose of creating a centerpiece for development of the BSL community and the importance of this structure is related to its engineering and use in community planning.

After a review of existing information and evaluation on historic properties, none of the damaged dams in this project are listed or eligible for listing in the NRHP. There are no historic districts or properties in the vicinity of the dam's location. No known above ground resources (architectural or engineering) that are listed in or considered eligible for listing in the NRHP are located within the APE of the project.

A request for an archaeological site research was submitted to the North Carolina Office of State Archeology (NCOSA) to identify archaeological resources on land and beneath state waters within a half mile of Sanford Dam, Upper Lake Dam, North Lake Dam, and Pine Lake Dam. Confirmation was received, dated June 17, 2021, and November 3, 2021, that no recorded archaeological sites are located within a half mile of Upper Lake Dam, North Lake Dam, and Pine Lake Dam (Appendix C). However, two (2) previously recorded archaeological sites were identified within a half mile of Sanford Dam. These sites have not been evaluated for eligibility in the NRHP. Both archaeological sites would not be directly or indirectly affected by the project and no ground disturbance will occur within or near their areas.

The threshold level for significant impacts to cultural resources under NHPA would be those impacts that adversely affect any historic property that is eligible for or listed in the NRHP under Section 106 or has been identified by a federally recognized tribe as a sacred site or traditional cultural property.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. There would be no construction or ground disturbance (dredging and filling) within the lake. There would be no impacts at the area where the equipment and material would be staged. The BSL system is an important and integral part of the lake for the use of the community and visitors as a recreational area. The structures provide daily access to residential properties and emergency access for the use of first responders. None of the four dams included on the project are listed or determined eligible for listing in the NRHP and there are no prehistoric or historic districts, sites, buildings, structures, or objects listed or eligible for listing in the NRHP within or close to the project area. Therefore, the No Action Alternative would have no impact on historic properties (architectural and engineering) and archeological resources (above ground, underground and beneath state waters).

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would include updating the spillways to meet the minimum capacity, installation of seepage controls, installation of rip rap, earthen embankments, and construction of temporary cofferdams at each dam site for the construction work, including access and staging of heavy machinery and materials. Work at Sanford Dam will occur southwest of Alton Lennon Drive and the recorded and unassessed (not listed nor eligible in the NRHP) archaeological sites are located southeast of the roadway. Therefore, the construction activities are distant and will not cause an impact on archeological resources (above ground, underground and beneath state waters).

FEMA has placed the following conditions on the project for the treatment of fortuitous finds or unexpected discoveries during ground disturbance activities within the project area:

- If human remains or intact archaeological features or deposits (e.g., arrowheads, pottery, glass, metal, etc.) are uncovered, work in the vicinity of the discovery will stop immediately and all reasonable measures to avoid or minimize harm to the finds will be taken. The City will ensure that archaeological discoveries are secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries. The City's contractor will provide immediate notice of such discoveries to the City. The City shall contact the NCOSA and FEMA within 24 hours of the discovery. Work in the vicinity of the discovery may not resume until FEMA has completed consultation with SHPO, Tribes, and other consulting parties as necessary. In the event that unmarked human remains are encountered during permitted activities; all work shall stop immediately, and the proper authorities notified in accordance with NC General Statues, Chapter 70, Article 3, Section 70-29 and 70-32.

- Prior to conducting repairs, City must identify the source and location of fill material and provide this information to NCSHPO and FEMA. If the borrow pit is privately owned, or is located on previously undisturbed land, or if the fill is obtained by the horizontal expansion of a pre-existing borrow pit, FEMA consultation with the SHPO will be required.

- Any changes to the approved Scope of Work (SOW) will require submission to, and evaluation and approval by, the State and FEMA, prior to initiation of any work, for compliance with Section 106.

None of the four dams included in the project are listed or determined eligible for listing in the NRHP and there are no prehistoric or historic districts, sites, buildings, structures, or objects listed or eligible for listing in the NRHP within or close to the project area. Therefore, Alternative 1 Hard Stabilization Repair would have no impact on prehistoric and historic properties (architectural and engineering).

5.4.2 Native American and Religious Sites

FEMA initiated consultation on the proposed project with NCSHPO for Sanford Dam and Upper Lake Dam on July 1, 2021, and for North Lake Dam and Pine Lake Dam on November 18, 2021. FEMA's determination of effect for this undertaking is No Historic Properties Affected. Concurrence was received from NCSHPO in letters dated, August 25, 2021, and January 5, 2022, with no additional comments or changes to FEMA's determination. Consultation was also submitted for the proposed action to the Seminole Nation of Oklahoma, the Catawba Indian Nation, and the Shawnee Tribe, via letter dated November 18, 2021 (see Appendix C). The consulted Tribes did not object to this project or provide comments within the 45-day review period. Therefore, there would be no impacts to Native American and Religious Sites.

5.5 Socioeconomic Resources

5.5.1 EO 12898 Environmental Justice

EO 12898, entitled "Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations" mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations. This EO also tasks federal agencies with ensuring that public notifications regarding environmental issues are concise, understandable, and readily accessible.

Socioeconomic and demographic data were studied to determine if a disproportionate number of minority or low-income persons have the potential to be adversely affected by the proposed project. The affected environment includes the properties surrounding the BSL system and properties being impacted by the proposed downstream and upstream floodplain and Regulatory Floodway changes per the City CLOMR approval (Appendix B).

The affected environment is located within both the City of BSL and unincorporated Brunswick County. The 2020 US Census Bureau estimates that the population in the City of BSL is approximately 5,943. Minority persons account for approximately 22.3% of the population and include African American, American Indian, Alaska Native, Asian, Hispanic or Latino or a mix of these races. The poverty level is approximately 6.2% of the population. Brunswick County contains an estimated population size of 136,693. Minority persons account for approximately 18.3% of the total population and the poverty level is estimated at 11.2%. See Appendix A for Census Data information.

The EPA EJ Screening and Mapping Tool was utilized to identify EJ Indexes for the entire affected environment and supplemented Census Bureau data (EJ index report located under Appendix B). EJ Indexes combine demographic factors with a single environmental factor. A higher EJ Index percentile typically indicates that mainly low-income and/or minority residents are being exposed to that specific environmental factor. The EJ Indexes for the affected environment are within the 40-50th state percentile group apart from three EJ Indexes. The Traffic Proximity is in the 54th percentile, Hazardous Waste 52nd percentile, and Wastewater Discharge Index is in the 39th percentile statewide (EPA, 2022 b).

The EPA EJ Screening and Mapping Tool was also used to review low income and minority population EJ data for the four census block groups located within the affected environment (see EJ data reports under Appendix B). A block group is a geographical area defined by the Census Bureau that usually has in the range of 600-3,000 people living in this defined area (EPA, 2022 a, p. 2; Census Bureau, 2018). Block group 370190202022 (downstream BG) is located downstream of Sanford Dam and block group 370190202042 (upstream BG) is located upstream of Upper Lake Dam. Block groups 370190202043 and 370190202044 (adjacent BG) are both located adjacent to the BSL system and are combined under one EJ data report. The data revealed that the Low-Income Population State Percentiles is higher within upstream BG (85th percentile) when compared to downstream BG (40th percentile) and adjacent BG (53rd percentile). Conversely, the Minority Population State Percentiles is lower within upstream BG (19th percentile) than within the downstream BG (57th percentile) and adjacent BG (40th percentile).

The following discussion utilizes the above data to determine the potential for low-income and/or minority residents within the affected environment to be disproportionately and adversely impacted by the proposed action. The threshold level for a significant impact to environmental justice is disproportionately high or adverse human health or environmental effects on minority or low-income populations.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. The No Action Alternative would not cause temporary or permanent changes within the affected environment; therefore, no impacts to minority and/or low-income populations would occur.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would restore the BSL system back to an open water feature thereby meeting the community's economic and social needs surrounding it. The BSL system upgrades would also cause permanent changes to the Regulatory Floodway and floodplain; specifically, the Regulatory Floodway and 1% annual chance floodplain will widen and narrow and the 1% annual chance floodplain water surface elevation will increase and decrease within the affected environment. The CLOMR for the proposed floodplain changes was approved on February 16, 2022 and involved notifying the impacted individuals and organizations and provided the opportunity for public comment. The CLOMR Public Notice was posted in the State Port Pilot Newspaper on October 27, 2021 (see Appendix E) and no public comments on the proposed changes were received.

The Regulatory Floodway and 1% annual chance floodplain changes under the proposed action would benefit some property owners but could potentially adversely impact others. The change would remove several properties from the floodplain altogether or redesignate them to a floodplain of lesser flood risk. The properties that could potentially be adversely impacted by floodplain water surface elevation increases are concentrated either upstream of Upper Lake Dam or downstream

of Sanford Dam. Per the 2017 City of BSL Comprehensive Land Use Plan and the 2012 Brunswick County Future Land Use Map, these impacted properties are primarily either vacant residential zoned land or conservation areas. However, these changes could impact the cost of flood insurance for any future development of the vacant residential properties. Existing structures on the developed residential zoned land would not be affected by the proposed action, per the Structure No-Impact Statement completed on November 12, 2020, and attached under Appendix B. This Statement does not determine if the proposed changes would impact any existing underground utilities. Based on the above, the proposed action will have minor impacts to low-income and minority populations.

5.5.2 Noise

The Noise Control Act of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare (42 U.S.C. § 4901 et seq.). Noise is typically described as unwanted or disturbing sound and can interfere with normal everyday activities. Over time, these interferences or annoyances can have negative impacts on one's overall health. The primary responsibility of noise regulation is delegated to State and Local Governments by EPA and both Brunswick County and the City of BSL have active Noise Ordinances in place. The threshold level for a significant noise impact is defined as a permanent increase in noise or prolonged periods of nighttime noise in noise-sensitive areas.

The BSL system is surrounded by residential properties, undeveloped residential zoned properties, and recreational/open space use land. Common noise sources for the surrounding area are vehicular traffic, park activities, intermittent trains along the Sunny Point railroad system located directly east of Sanford Dam, and natural ambience sounds. For the purposes of this EA, noise impacts beyond those normally existing within the vicinity of the project area were discussed.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. The increase in vehicular traffic noise within the residential communities is anticipated to remain due to continued rerouted traffic for the closed sections of roads over Sanford Dam and Upper Lake Dam. Therefore, the No Action Alternative will cause long term minor impacts to the BSL residential communities.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the BSL system would be repaired and upgraded. Noise impacts associated with the proposed action will come from construction activities during the BSL system repairs and upgrades and road repairs atop the four dams. The construction noise impacts will be temporary over a period of 24-48 months and will only occur between the hours of 7:00 a.m. to 8:00 p.m. to minimize disruptions to the surrounding residential communities. The residents will also be notified of the construction schedule through postings on the City's website and social media page to allow for individual planning during these times. The project will comply with the City of BSL

Noise Ordinance Chapter 9, Article IV, and the Brunswick County Noise Ordinance Chapter 1-9, Article VIII (Appendix B). Permits will be obtained if required for any noise-generating construction activities that are regulated by these ordinances. Construction vehicles or equipment out of repair or loaded in a manner as to create unreasonably loud, disturbing sounds will not be used. The discharge into the open air of exhaust from any combustion engines or motor vehicles will be through a muffler or other device which will prevent unreasonably loud, disturbing sounds. The use of any mechanical devices operated by compressed air will be effectively muffled and reduced. Based on the expected noise increases from construction activities, Alternative 1 would cause short-term minor impacts to the surrounding residential areas. This determination is based on the noise impacts being temporary, intermittent, and only occurring during daytime hours.

5.5.3 Traffic

Prior to Hurricane Florence in September 2018, there were several crossover points for the BSL system. The three major traffic crossovers were where Alton Lennon Drive crosses Sanford Dam to the east, George II Highway SE crosses by way of bridge to the west, and East Boiling Spring Road crosses Pine Lake Dam and North Lake Dam to the north. These arterial roads connected the residential communities to the City's business and commercial districts. The Sanford Dam, North Lake Dam, and Pine Lake Dam are classified as high hazard dams due, in part, to the documented high average daily traffic encountered on these roadways (McGill Associates, 2021 a, p. 124). West Dam Road, located on the far western side of the BSL system, ran atop Upper Lake Dam. This local road served as an alternative route to George II Highway SE for residents and first responders.

Alton Lennon Drive and West Dam Road are currently closed to traffic due to breaches at Sanford Dam and Upper Lake Dam. George II Highway SE is not a part of this project and is open to traffic. East Boiling Spring Road is operating across North Lake Dam and Pine Lake Dam, but the dams are currently out of compliance with the high hazard Dam Safety requirements. Traffic impacts were evaluated by identifying road access interruptions, permanent traffic route changes, and increases in traffic volume.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. The traffic rerouted around these breached dams would create long term traffic volume increases within the surrounding residential communities and along the only other alternate arterial road that crosses over the BSL system from north to south, George II Highway SE. Higher traffic volume within the residential communities could increase the risks of pedestrian injuries and fatalities and as well as property damage. Response time for emergency services is also increasing due to a major road crossover point being inaccessible at Sanford Dam. The four dams would also remain out of compliance with the Dam Safety requirements, which requires certain standards for high traffic roads. Based on the above, the No Action Alternative would have long-term moderate impacts on traffic.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would account for the high average daily traffic documented at Sanford Dam, Pine Lake Dam, and North Lake Dam. Road closures needed for the proposed action would increase traffic within residential communities temporarily. However, the BSL system repairs will be completed using a phased approach to allow some roads to remain open while others are being repaired. North Lake Dam will not be constructed simultaneously with the other three dams, and this will avoid rerouting traffic onto surrounding residential roads. North Lake Dam will be repaired once Sanford Dam and Alton Lennon Road repairs are complete so this road can serve as an alternate route for traffic. Road access interruptions, temporary traffic changes, and temporary increases in traffic volume will also be addressed by implementing the Traffic Control Plan which includes Phase 1 and Phase 2 Detour Route maps (BSL Dam Construction/Reconstruction Project site plans sheets G-06 and G-07) (Appendix B). Based on the above, short term minor impacts to traffic are anticipated for Alternative 1.

5.5.4 Public Utilities

There are electrical, fiber optic, and water utility lines within the BSL system project area. Utility poles carrying power lines and fiber optic cable run parallel to Alton Lennon Drive and cross over the eastern side of Sanford Dam. Aerial power lines and fiber optic cables are located on the north side of East Boiling Spring Road and traverse over Pine Lake Dam and North Lake Dam and a 12” water main line runs beneath this road as well (McGill Associates, 2021 b, pp. 68-80). Properties within and surrounding the project area manage wastewater through septic tank systems; therefore, no sewer line utilities are located within the area. The threshold level for significant impact to utilities would be an exceedance of the existing utility service capacity.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. In this alternative, construction on the BSL system and roads would not occur; therefore, no impacts to utilities would occur.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would cause limited interruptions to utility services. The overhead utilities along Alton Lennon Drive would be temporarily realigned to allow for construction activities to occur within the railroad easement. A DOA Easement Right-of-Entry Consent was granted to the City on March 21, 2022 (Appendix D). Prior to the completion of the project, these lines would be permanently relocated and converted to underground lines, but interruption of services would not occur. The switchover would be immediate and any lapses in power would be unnoticeable. Construction activities for North Lake Dam and Pine Lake Dam would not impact or cause disruptions to existing power and fiber optic lines, utility poles, or water main lines. Unanticipated impacts may occur during the utility relocation at Sanford Dam as well as during construction work when conducted in close proximity to existing above and below

ground utilities at North Lake Dam and Pine Lake Dam. Based on the risk involved when operating construction equipment and completing clearing, excavation, and grading work near utility lines, it was determined that the proposed action would cause short-term minor impacts to utilities.

5.5.5 Economic Development and Land Use

Under the direction of Presidential Policy Directive (PPD)-8: National Preparedness, FEMA established the National Disaster Recovery Framework (NDRF) with six Recovery Support Functions (RSF) to facilitate coordinated interagency capacities across all disaster- related mission areas, including economic and community planning. Economic development is listed in the PR&G under both the Federal Objective and Guiding Principles to be analyzed if the Federal water resources investment is maximized and sustainable.

As required under PR&G Agency Specific Procedures, FEMA PA completed a Benefit Cost Analysis (BCA) V.6.0 for the Preferred Alternative utilizing FEMA's BCA online tool. The overall costs reflect current pricing at the time of the analysis (February 2022). The results are presented in **Table 7** below.

Table 7. Benefit Cost Ratio Calculation Summary

Mitigation Benefits	$25,684,623
Mitigation Costs	$16,272,248
Benefit Cost Ratio	1.58

The hazard type selected for this assessment was "Dam/Levee Break" and the mitigation type selected was "Other." Based on FEMA guidance, a FEMA 406 mitigation analyst utilized a project useful life of 100-years for this project (BCA Reference Guide, 2009, p. 107). The analyst used estimated loss of property values as a result of the BSL system not being repaired. An approximate value loss of $100,000 per home was used based on data collected from a study completed in 2018 by Collateral Analytics which calculated the per square foot values of 1.2 million residential properties nationwide; lakefront homes had an average 25% price premium as opposed to non-waterfront properties (Rogacz, C., & Holtje, M. 2022). Expected damages before mitigation were estimated based on 270 lakefront properties that could potentially be impacted on a 15-year recurrence interval. The damages after mitigation were estimated based on 270 lakefront properties that could be impacted on a 10-year recurrence interval. The damages before mitigation estimate losses at approximately $27 million. A project is considered cost-effective when the benefit cost ratio is 1.0 or greater; the repair of the BSL system under the proposed action was calculated to be a ratio of 1.58.

Per the City of BSL Land Use Plan (2017), 90% of land within corporate limits in undeveloped, with 6,400 acres of the over 14,000 acres being Single-family residential development accounts for most developed land. A majority of the undeveloped land is currently zoned for residential purposes; over 600 acres are zoned for commercial or recreational use (City of BSL, 2017, pp. 49-50). The City has seen consistent population growth over the past two decades and account for approximately 4.3% of the Brunswick County population, per 2020 US Census data. Commercial and office or institutional land use only accounts for 0.82% (Census Bureau, 2020). The major

employment industries are retail, recreation, and hospitality services, with the County and Duke Energy being the largest employers. Per the vision statement in the Land Use Plan, the community "shall strive to remain a quiet residential community with a thriving commercial corridor that preservers its abundant natural resources for conservation and recreation value" (City of BSL, 2017, p. 18).

The BSL system and lakes are primarily surrounded by suburban residential at the North end near Sanford Dam and North Lake Dam, and a mix of residential, undeveloped land, and recreation spaces to the South and East near Upper Lake Dam and Pine Lake Dam. The City is the responsible party for the BSL system and associated project areas. The lakes are an integral part of the lakefront residences and community. The lakes are utilized for recreational purposes, such as boating and fishing, by both citizens and visitors which provides an economic stimulus to the area. The Lakes Country Club is located near Patricia Lake, with its clubhouse being waterfront. Events held at the property, including golfing tournaments, provide a recreational and economic service to the City. There are five parks (North Lake Park, Alton Lennon Park, Tate Lake Park) around the lakes that are open to the public and provide a range of resources including fishing docks, bench swings, leashed pet areas, restroom facilities, boat ramps, picnic shelters with tables, and swimming areas. There is a 2.9-mile nature trail maintained by local groups located east of Upper Lake Dam and meanders South along Upper Lake. The project area does contain undeveloped land zoned for both residential and commercial development. The development of property within the floodplain within the project area, as well as upstream and downstream, is restricted by floodplain development regulations.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. This alternative would result in short and long-term significant impacts to economic development in the area by reducing property values and removing a natural resource from the community which plays an important role in their recreational and hospitality industries.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would cause short-term moderate economic benefits from construction activities associated with the dam repairs as well as return of recreational usage of the lakes such as boating and fishing. Long-term socioeconomic benefits would be maintaining the increased property values at the current waterfront properties as well as future residences built in the currently undeveloped areas around the lake. The refilling of the lakes will also allow for the continued growth of the recreational and tourism industries.

5.5.6 Hazardous Materials and Solid Waste

Hazardous materials and solid wastes are regulated under a variety of federal and state laws, including 40 CFR Part 260, the Resource Conservation and Recovery Act (RCRA) of 1976, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the State

Hazardous Materials and Solid Waste Laws (SHM&SW), the Solid Waste Disposal Act (SWDA), the Toxic Substances Control Act (TSCA), and the CAA of 1970. The Occupational Safety and Health Administration (OSHA) standards seek to minimize adverse impacts on worker health and safety. Evaluations of hazardous substances and wastes must consider whether any hazardous material would be generated by the proposed action activity and/or already exists at or in the general vicinity of the site (40 CFR Part 312.20). The requirements of RCRA are implemented at the state and local levels and are often included as conditions or BMPs in permits required at those levels. If hazardous materials are discovered, they must be handled by properly permitted entities per the NC Waste Management Act and NC Waste Management Rules and Regulations.

The EPA's NEPAssist tool and the NCDEQ Division of Waste Management Site Locator Tool were searched for potential CERCLA and RCRA concerns for within a 1-mile radius of the project area (EPA, 2022 d; NCDEQ, 2022 a).

The search identified two facilities regulated by RCRA within a half mile of the project area. One site has changed functions, from a construction company to a tax service, and the second is a North American Industry Classification System (NAICS) identified beer, wine, and liquor store owned by the City's Alcoholic Beverage Control Board. See **Table 8** below. There are no Superfund or Brownfield sites within half mile radius of the project area and associated any staging/laydown areas. Two Superfund sites were identified within one mile of the project area: one is an inactive hazardous site and the other is a pre-regulatory landfill site which is no longer in use. There are no TSCA regulated sites within the half mile radius.

The threshold for a significant impact to hazardous materials and waste would include a release of hazardous materials or waste, or a violation of local, state, or federal regulations pertaining to hazardous materials or waste. Regarding CERCLA and RCRA, the threshold level for a significant impact would be if unsafe exposure may occur, the release of hazardous substances, pollutants, or contaminants cannot be avoided, and/or if institutional and/or engineering controls may be breached.

Table 8. RCRA Regulated Sites Within a 0.5 mile of the BSL Project Area

Site Name	Handler ID	Address	Waste Type	Distance to BSL system
Harward Brothers Development Co	NCS000001169	3058-3 George II Hwy Southport, NC 28461	Unspecified	Not existing, changed function; 0.45 mile, proximity to Pine Lake Dam and Upper Lake Dam
BSL Alcoholic Beverage Commission	NCP022212007	3130 George II Hwy SE Southport, NC 28461	Unspecified	.28 mile, proximity to Pine Lake Dam and Upper Lake Dam

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. There would be no construction activities; therefore, there would be no potential to disturb hazardous materials or create any potential new hazardous waste sites within the area. No impacts to human health or the surrounding environment from hazardous or solid waste would occur.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system could involve the handling of hazardous materials. Waste generated or inadvertently discovered during construction activities would be handled in accordance with applicable RCRA, TSCA, and State regulations for managing solid and hazardous waste materials. Potential for spills from construction equipment would be minimized and handled in accordance with applicable regulations and BMPs. There is no potential for any construction activities related to this project to impact regulated or designated sites as they are all over .5 mile from the project areas. Based on the analysis conducted, this alternative would have a no or negligible impact to human health and safety from hazardous materials and solid waste regulated under federal and state laws.

5.5.7 Aesthetics

Sanford Dam, North Lake Dam, and Pine Lake Dam were constructed in the 1960's to form the impoundments, to provide a resource for the community to be further developed around, and contributes to the aesthetics of the waterfront residences, recreational areas, and the community. The lakes are currently drained with Allen Creek flowing through the center of Boiling Springs Lake. The lack of impounded water has caused extensive drying of the lakebeds and overgrowth which has also led to the presence of nuisance species, such as rats.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system and the lakes would not be returned to pre-disaster water levels. As a result, the No Action Alternative would result in long-term moderate impacts to aesthetics. The dry lakebed would continue to become densely vegetated and eventually migrate into a swamp forest habitat with the potential to harbor increased nuisance species. Waterfront homeowners would be most directly impacted and potentially incur property value losses. Activities and revenues associated with the major industries of the City, such as recreation and hospitality, which benefit from an aesthetic lake would not return.

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would have long-term moderate benefits, returning the water levels and aesthetics of the lake to pre-disaster condition. The lakes, which the City is known for, would be restored and recreational pastimes such as birdwatching, boating, and fishing would be enjoyed in an appealing environment again. Potential minor aesthetic impacts from removal of trees and vegetation from the dam embankment to conduct work and maintain the integrity of the dams would not be expected to be significant or adverse over the long-term.

5.5.8 Public Health and Safety

Public health and safety have been broken into two categories for this analysis: public safety and occupational health. The threshold level for a significant impact to public safety and occupational health would be exposure of workers to health and safety hazards without proper protection or creating health and safety hazards that could affect the public.

Public Safety

The BSL system and impacted areas are located within the floodplain and Regulatory Floodway of Allen Creek. A majority of the land surrounding the lakes is residentially developed, particularly on the northern edges of the lake parallel to East Boiling Spring Road. Sanford Dam has been classified as a high hazard dam due to its proximity to MOTSU railroad which is a critical ammunition transportation route for the Department of Defense (US Army, 2022). After the damages incurred by Hurricane Florence, all four dams were classified as high hazard based on the road traffic and the impacts each dam would have on the other dams in future potential failures.

Occupational Health

Occupational health risks are defined as risks arising from physical, chemical, and other workplace hazards that interfere with establishing and maintaining a safe and healthy working environment. Hazards could include chemical agents, physical agents (such as loud noise or vibration), physical hazards (such as slip, trip, and fall hazards), electricity, or dangerous machinery, and natural hazards, such as flooding, botanical hazards (poison ivy and thorned plants), or wildlife hazards (stinging insects, poisonous spiders, venomous snakes, and ticks and tickborne pathogens). Safety and occupational health issues include exposure to natural hazards, exposure to asbestos, Pb, radiation, chemicals, and other hazardous materials, and injuries or deaths resulting from a one-time accident. Safety and occupational health concerns could affect personnel working on the dam and in the surrounding area.

Potential Impacts

No Action Alternative

Under the No Action Alternative, the City would not repair or upgrade the BSL system. This would have a long-term moderate impact on public health and safety. There would be no occupational health or public safety concerns associated with construction as the BSL system and lakes would be left in their current state. If left as is, the BSL system would not meet Dam Safety requirements and as high hazard classification dams could leave the area susceptible to flooding which can lead

to numerous health and safety risks for residents such as exposure to contaminated water, damage to improved property, vehicle hazards (such as water on roads and debris), and fast-moving water, which increases the risk for falls, serious injuries, and drowning. Floods may also damage or otherwise close off access to homes and routes to hospitals and other emergency resources, causing public safety issues (e.g., NC Highway 87, East Boiling Spring Road, and Alton Lennon Road).

Alternative 1 – Hard Stabilization Repair (Proposed Action)

Under Alternative 1, the repairs and upgrades to the BSL system would reduce the risk of breaches and similar future damages occurring which could adversely impact public safety and improved property. Since all four of the dams have been categorized as high hazard dams, these structures need to be constructed to function with adequate spillway design, seepage control, conduits, structural stability and slope stabilization, sediment control, and other design requirements (Dam Safety, 2021). For the reconstruction of the BSL system, it is required that:

- SPILLWAY DESIGN: Sanford Dam shall have a spillway with capacity to pass a flow resulting from the 1/2 Probable Maximum Precipitation (PMP) storm. The other three dams shall have spillways with capacity to pass a flow resulting from the 1/3 PMP (5A NCAC 02K .0205).

- SEEPAGE CONTROL: All dams shall be designed and constructed to prevent the development of instability due to excessive seepage forces, uplift forces, or loss of materials in the embankment, abutments, spillway areas, or foundation (15A NCAC 02K .0207).

A CLOMR has been issued for the changes to the floodplain, including to BFE, the dam repairs will create both upstream and downstream; the City is responsible for submitting necessary data for the revisions of effective FIRMs and FIS report to receive the final LOMR. A Certificate of Approval from NCDEQ DEMLR for the repair and modifications to the four dams was received January 26, 2022.

Construction activities with Alternative 1 would have inherent occupational health and safety hazards that would be minimized through standard worker protection measures. Construction workers and equipment operators would be required to wear appropriate personal protective equipment (PPE) and be properly trained for the work being performed. All solid or hazardous wastes that might be generated during construction would be removed and disposed of at a permitted facility or designated collection point. Throughout construction, the active work area in vicinity of the BSL system would be closed to the public. The public will be made aware prior to construction beginning via various signs, such as traffic and digital signage. The construction contractor would be required to develop and implement a Health and Safety Plan to assure worker safety during construction activities. The contractor would also be required to schedule construction during reasonable weather to avoid risk of flooding or impacts to downstream water quality. All construction areas would be clearly marked with appropriate signage. Construction workers would be required to comply with all applicable OSHA regulations, as well as other applicable regional regulations. The Engineering Consultant concurred with the above during an

EA update meeting on February 1, 2022 and added that responsibility for observance will ultimately fall on contractors. Based on the above, there would be minor, short- term impacts on public health and safety and minor, short-term, occupational health impacts.

6.0 ANALYSIS OF ENVIRONMENTAL IMPACTS

NEPA defines effects or impacts as: "changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may include effects that are later in time or farther removed in distance from the proposed action or alternatives" (44 CFR 1508.1(g)). Effects also "include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic (such as the effects on employment), social, or health effects. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial" (44 CFR 1508.1(g)(1)). In accordance with NEPA and to the extent reasonable and practical, this EA considers the effect of the No Action Alternative and Proposed Action (Alternative 1) combined with other actions that have a reasonably close causal relationship including those that happen at the same time or in the future within the vicinity of the BSL system. There is one known future residential development project within the vicinity of the project area, North of Sanford Dam, which is in early planning phases; therefore, not enough information is available to be able to make a determination on potential impacts on the human or natural environment.

Conditions of work and mitigation measures are in place to manage potential environmental impacts, therefore no significant impacts to the human and natural environment are anticipated from the proposed action in combination with other close causal relationships and foreseeable future actions near and at the BSL system. The combined impacts of the FEMA funded portion of the proposed project along with the further repairs being completed via USDA RHS Loan and other funding, will have beneficial impacts to the community due to increased flood resiliency and promoting other benefits including socioeconomic impacts, recreational uses, and support of the areas hospitality industry. The entire proposed action will achieve the updated Dam Safety requirements including regulatory certification requirements to meet the high hazard classifications of the dams. Therefore, the project will not significantly contribute to area or regional impacts and have no significant impacts to environmental resources.

7.0 AGENCY COORDINATION, PUBLIC INVOLVEMENT, PERMIT/COMPLIANCE DOCUMENTS AND PROJECT CONDITIONS

7.1 Agency Coordination

The following agencies and stakeholders were contacted during the during preparation of this EA:

- Catawba Indian Nation
- North Carolina Department of Natural and Cultural Resources, State Historic Preservation Office
- North Carolina Department of Coastal Management
- Seminole Nation of Oklahoma
- Shawnee Tribe
- United States Department of Agriculture
- United States Fish and Wildlife Service

Letters and correspondence sent to regulatory agencies and stakeholders including responses received to date are provided in Appendix C or Appendix D.

7.2 Public Involvement

FEMA's notice to the public was posted on October 25, 2018, via both FEMA and NC's websites. The notice to the public described its intent to reimburse eligible counties through North Carolina Emergency Management (NCEM) for eligible costs for damages associated with Hurricane Florence under the disaster declaration FEMA DR-4393-NC.

The City of Boiling Spring Lakes Planning and Zoning Department and Brunswick County Floodplain Management Department posted the CLOMR Public Notice in the State Port Pilot Newspaper on October 27, 2021 (see Appendix E). This posting gave notice of the City's intent to revise the flood hazard information as a result of the proposed action and allowed for public comment. No public comments on the proposed changes were received within the 15-day comment period.

The public was notified of the availability of this EA for review and comment by posting of the public notice (Appendix E) on FEMA's website and the City's websites (www.cityofbsl.org, www.facebook.com/BoilingSpringLakesNC.) A hard copy of the EA was made available at the City of Boiling Springs Lake City Hall Building, located at 9 East Boiling Springs Road, Boiling Spring Lakes, North Carolina, 28461. FEMA conducted a 30 calendar-day public comment period starting on the first publication date of the public notice, July 15, 2022. The public comment period ended on August 14, 2022 with no substantive comments received (see Appendix E).

7.3 Permits/Compliance Documents and Project Conditions

The City is responsible for compliance with federal, state, and local laws and regulations including obtaining all required federal, state, and local approvals or permits prior to beginning

constructions activities, and adhering to any conditions laid out in these approvals or permits. While a good faith effort was made to identify all necessary permits and approvals for this EA, the following list may not include all approvals or permits required for this project. Before, and no later than, submission of a project closeout package, the City shall provide FEMA with a copy of the required permit(s) from all pertinent regulatory agencies.

Obtained permits and approvals are summarized in Table 3 in Section 5.0. Permits and compliance documentation applicable to this project are listed below.

- CLOMR (February 16, 2022)
- CZMA Concurrence (December 17, 2021)
- NCDEQ Certificate of Approval [Dam Safety] (January 31, 2022)
- NCDEQ E&SC Permit (April 22, 2022)
- NCDEQ Section 401 Water Quality General Certification Number 4132 Verification (April 21, 2021)
- USACE General Permit Verification for Section 404 NWP Number 03 – Maintenance [Action Id. SAW-2021-00216] (Mar 18, 2021)
- SHPO Concurrence (January 5, 2022)
- USFWS Concurrence (October 7, 2019)
- DOA Easement Right-of-Entry Consent (March 21, 2022)
- Floodplain Development Permit (March 31, 2022)

Copies of these permits and approvals are provided in Appendix C or D.

The project will be conditioned for CAMA permitting or correspondence and Section 402 NCG010000 Certificate of Coverage.

A LOMR will be applied for once construction is complete. The LOMR will use as-built information.

Project Conditions

The City must adhere to the following conditions should the proposed action be implemented. Failure to comply with FEMA grant conditions may jeopardize federal funding. The City must also adhere to all conditions listed under any permits and approvals obtained for the proposed action not identified below.

1. The City is responsible for obtaining and complying with all required local, state, and federal permits and approvals.
2. If deviations from the proposed SOW result in substantial design changes, the need for additional ground disturbance, additional removal of vegetation, or any other unanticipated changes to the physical environment, the City must contact FEMA so that the revised project scope can be evaluated for compliance with NEPA and other applicable environmental laws.
3. All conditions outlined in the approved E&SC plan, SWPPP, NPDES NCG010000, 404 General Permit Verification and NWP 03, 401 General Certification Verification and

General Certification 4132, Dam Safety Certificate of Approval, CLOMR document, DOA Easement Right-of-Entry Consent, and Floodplain Development Permit must be adhered to.

4. Dewatering Permits are required prior to dewatering activities and the City must comply with all of the conditions prescribed by the permit.
5. Upon completion of work that involves temporary stream impacts, streambeds are to be restored to pre-project elevations and widths using natural streambed material. Stream banks are to be restored to pre-project grade and contours or beneficial grade and contours if the original bank slope is steep and unstable. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
6. All practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sedimentation and erosion control measures when replacing the failed dams.
7. E&SCs should be installed and maintained between the construction site and the nearby down-gradient surface waters.
8. Maintain natural buffers on all streams and creeks adjacent to the project site.
9. City must provide CAMA permitting or correspondence with NCDCM seeking determination of the permit requirement.
10. The City shall comply with the agreed upon MBTA Conservation Measures.
11. Disturbed green spaces that will be revegetated shall use NC and region native species.
12. The City shall adhere to all Federal Energy Regulatory Commission (FERC) Tree Management Plan requirements.
13. If human remains or intact archaeological features or deposits (e.g., arrowheads, pottery, glass, metal, etc.) are uncovered, work in the vicinity of the discovery will stop immediately and all reasonable measures to avoid or minimize harm to the finds will be taken. The City will ensure that archaeological discoveries are secured in place, that access to the sensitive area is restricted, and that all reasonable measures are taken to avoid further disturbance of the discoveries. The City's contractor will provide immediate notice of such discoveries to the City. The City shall contact the NCOSA and FEMA within 24 hours of the discovery. Work in the vicinity of the discovery may not resume until FEMA has completed consultation with SHPO, Tribes, and other consulting parties as necessary. In the event that unmarked human remains are encountered during permitted activities; all work shall stop immediately, and the proper authorities notified in accordance with NC General Statues, Chapter 70, Article 3, Section 70-29 and 70-32.
14. Prior to conducting repairs, City must identify the source and location of fill material and provide this information to NCSHPO and FEMA. If the borrow pit is privately owned, or is located on previously undisturbed land, or if the fill is obtained by the horizontal expansion of a pre-existing borrow pit, FEMA consultation with the SHPO will be required.
15. Any changes to the approved Scope of Work will require submission to, and evaluation and approval by FEMA, SHPO, and relevant THPOs, prior to initiation of any work, for compliance with Section 106.
16. The City shall comply with the City Noise Ordinance Chapter 9, Article IV, and the Brunswick County Noise Ordinance Chapter 1-9, Article VIII. Permits will be obtained if required for any noise-generating construction activities that are regulated by these ordinances.

17. The Traffic Control Plan will be adhered to during construction activities.
18. All solid or hazardous wastes generated during construction will be removed and disposed of at a permitted facility or designated collection point.
19. The construction contractor shall be required to develop and implement a Health and Safety Plan to assure worker safety during construction activities.
20. Construction workers shall be required to comply with all applicable OSHA regulations, as well as other applicable regional regulations.

8.0 LIST OF PREPARERS

Table 9: List of Preparers

Name	Organization	Role
Kristin Morris	FEMA	Environmental Planning and Historic Preservation Advisor
Robyn Wharton	FEMA	Environmental Planning and Historic Preservation Manager
Josef Simme	FEMA	Environmental Protection Specialist
Dustin Ducote	FEMA	Environmental Protection Specialist
Karla Torres	FEMA	Historic Preservation Specialist
Michael Duquette	FEMA	Environmental Protection Specialist

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Appendices are available for review upon request to FEMA-R4EHP@fema.dhs.gov