

## FY 22 HMA – Grant Application Review Summary

<b>Subapplication Number</b>	EMA-2022-BR-001-0024		
<b>Project Title</b>	Grove Circle Lift Station		
<b>Applicant Name</b>	North Carolina Department of Public Safety		
<b>Subapplicant Name</b>	Town of Kenansville		
<b>Project Type</b>	Flood Risk Reduction		
<b>Recommendation</b>	Yes with Conditions		
<b>Federal Cost (FEMA GO)</b>	\$839,600	<b>Phased Project</b>	Yes
<b>BCR (subapplication)</b>	1.00	<b>Duplicate Project</b>	No
<b>BCR (reanalysis)</b>	1.04	<b>Benefits (reanalysis)</b>	\$1,024,659

### Summary

This is a technical feasibility and cost-effectiveness review in support of the National Technical Review process. Additional Environmental Planning and Historic Preservation (EHP), eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding. No contact was made with the applicant or subapplicant; this review is solely based on information provided in the subapplication.

### Scope of Work

The scope of work is well-defined and clearly explains the activities necessary to complete the work. The subapplicant has submitted a subapplication for the flood risk reduction of the Grove Circle Lift Station located in Kenansville, North Carolina. The project includes elevating the lift station and its critical systems above the 100-year flood elevation. This will reduce the potential sanitary sewer overflows created by flood water.

### Technical Feasibility

#### *Project Schedule*

The schedule duration is 27 months. The schedule does not include all items in the scope of work but appears reasonable. The proposed schedule includes time for design, permitting, surveying, bidding, and construction. The schedule does not include time for project closeout.

#### *Cost Estimate*

The cost estimate includes sufficient line items consistent with the scope of work. The cost estimate includes line items for design, contingency, and an itemized construction estimate separately.

#### *Technical Design Information*

The following information and documentation were provided to support the project:

Item	Documentation	Evaluation
Design Codes and Standards	Scope of work narrative	The subapplicant states that all activities will be in compliance with federal, state, and local applicable rules and regulations. The subapplication states that permits will be obtained from all appropriate local, state, and federal agencies.

Item	Documentation	Evaluation
Design Drawings, Maps, Photographs	Maps/Photographs	Documentation was provided to support the project. Design drawings will be prepared in the first phase of the project.
Before-Mitigation Level of Protection	Scope of work narrative	Before mitigation, the level of protection for the pump station is under water in times of flooding. Information about equipment elevation and pump station grade elevation was not provided.
After-Mitigation Level of Protection	Scope of work narrative	After mitigation, the level of protection will be a lift station and equipment raised above the 100-year flood elevation. The project will consider climate change in determining the design flood elevation (DFE).
Flood Hazard Data	Scope of work narrative, FEMA NFIP map, NC flood map	The site is located in AE 72 in the Special Flood Hazard Area. The documentation indicates the construction will be in compliance with local floodplain ordinance requirements.
Design Flood Elevation	Scope of work narrative	Subapplication does not indicate the DFE or that it meets or exceeds the criteria of FFRMS and ASCE 24-14. However, the subapplicant states the lift station and equipment will be raised above the 100-year flood elevation.

Based on the documentation provided, the project is technically feasible and effective at reducing risk to individuals and property from natural hazards. The following conditions were identified:

- Amend the proposed schedule to include essential scope of work elements, such as project closeout.
- Provide a list of missing technical data that will be collected and a list of minimum deliverables to be completed during Phase 1.
- Verify that the design flood elevation will meet the elevation requirements of FFRMS and ASCE 24-14.

Provide the following Phase 1 deliverables needed to determine technical feasibility:

- Studies and/or reports to support the proposed design, such as structural and geotechnical reports.
- Hydrologic and hydraulic modeling, documentation supporting the DFE, and other relevant technical data; documentation should demonstrate that the project will not have adverse upstream or downstream impacts or impacts on the adjacent areas.
- Engineering design and cost estimate.

**Cost-Effectiveness**

The Benefit-Cost Analysis (BCA) was completed based on historical damages.

The following was found during review of the submitted BCA:

*Cost Estimation*

Input	Value	Evaluation
Project Useful Life (PUL)	50 years	This value is consistent with the FEMA standard value.
BCA Toolkit Initial Project Cost	\$1,000,000	This amount is consistent with the subapplication project cost estimate.
Annual Maintenance Cost	\$1,250	This amount is reasonable.
BCA Toolkit Total Project Cost	\$1,032,162	This amount is calculated based on the initial project cost, the annual maintenance costs, the PUL, and 3% discount rate.

*Historical Damages*

Input	Evaluation
Facility Type	The facility type of wastewater services was used in the BCA. This input is consistent with the proposed project in the subapplication.
Loss of Function	The loss of function is based on loss of wastewater services to 1,614 customers, using the FEMA default value of unit of service \$60 per person per day. The number of customers served is based on 648 connections and an average number of people per household of 2.49, which is based on U.S. Census data for Duplin County. Supporting documentation for the number of connections was not provided.
Before-Mitigation Damages	The before-mitigation damages were calculated based on a 2018 flood event that left the station inoperable for three days. The flood also caused damage to pumps and electrical control systems that required replacement, which cost \$5,000 and \$2,209.55, respectively, to repair. The rain preceding the event was compared to precipitation records to show the event had a 100-year recurrence interval. Documentation to support a flood recurrence interval of 100-years is required, as rainfall recurrence intervals does not always equate to flooding recurrence intervals.
After-Mitigation Damages	After-mitigation damages were based on the same 100-year flood event as the before-mitigation damages. The outage duration associated with this event is assumed to be 0.06 days. No documentation was provided to support the after-mitigation impact days for this event.

**BCA Assistance**

This subapplication qualified for additional BCA assistance.

A reanalysis BCA was performed, and the following edits were made:

Input	Value	Explanation	Documentation
Initial Project Cost	\$952,000	Grant management costs were removed from the BCA.	Subapplication, lift station cost estimate
Number of customers served	1,614 customers	The number of customers served is based on information provided in the subapplicant's BCA.	Documentation needed
Expected Damages Before-Mitigation – Recurrence Interval	100 years	The before-mitigation damages are based on an event with a recurrence interval of 100 years.	Documentation needed
Expected Damages Before-Mitigation – Impact Days	3 days	The reanalysis BCA includes 3 impact days associated with the 100-year event based on the subapplicant's BCA.	Documentation needed
Expected Damages Before-Mitigation – Repair Costs	\$7,209.55	For the 100-year event, the reanalysis BCA includes \$5,000 in damages to pumps and \$2,209.55 in damages for electrical control systems based on the subapplicant's BCA.	Documentation needed
Expected Damages After-Mitigation – Recurrence Interval	500 years	The subapplication does not state the elevation to which the lift station will be raised. An after-mitigation recurrence interval of 500 years was assumed.	Documentation needed
Expected Damages After Mitigation – Impact Days	1 day	An after-mitigation outage duration associated with the 500-year event of 1 day was assumed.	Documentation needed
Social Benefits	390 residents	Social benefits were included in the reanalysis for 390 residents. The project qualifies for social benefits because the Grove Circle Lift Station is part of the wastewater system in Kenansville, North Carolina.	Census data

The subapplication qualified for the Alternative Cost-Effectiveness Methodology, as noted in the “Alternative Cost-Effectiveness Methodology for Fiscal Year 2022 BRIC and FMA Application Cycle” Memorandum. The project primarily benefits an area at the census tract level with a Social Vulnerability Index (SVI) score greater than or equal to 0.6, based on Centers for Disease Control and Prevention (CDC) data.

The BCR generated at the 7% discount rate was 1.02, and the BCR generated at the 3% discount rate was 1.04. The total benefits associated with this project (at a 3% discount rate), \$1,024,659, are greater than the total project cost of \$984,162, producing a BCR of 1.04.

Based on the documentation provided, the project is cost-effective. The following conditions were identified:

- Provide documentation supporting the 648 connections served by the lift station.

- For the before-mitigation damages, provide documentation supporting the 2018 flood event had a 100-year recurrence interval with a 3-day utility outage and \$7,209.55 in repair costs. Documentation to support a flood recurrence interval of 100 years is required, as rainfall recurrence intervals does not always equate to flooding recurrence intervals.
- Indicate to which elevation the lift station and associated equipment will be raised to support the after-mitigation recurrence interval of 500 years used in the reanalysis BCA.

Provide the following Phase 1 deliverables needed to determine cost-effectiveness:

- Refinement of the BCA.

### **Conclusion**

Based on the information provided, the project is technically feasible and cost-effective; therefore, it is recommended for further consideration with the following conditions:

- Amend the proposed schedule to include essential scope of work elements, such as project closeout.
- Provide a list of missing technical data that will be collected and a list of minimum deliverables to be completed during Phase 1.
- Verify that the design flood elevation will meet the elevation requirements of FFRMS and ASCE 24-14.
- Provide documentation supporting the 648 connections served by the lift station.
- For the before-mitigation damages, provide documentation supporting the 2018 flood event had a 100-year recurrence interval with a 3-day utility outage and \$7,209.55 in repair costs. Documentation to support a flood recurrence interval of 100 years is required, as rainfall recurrence intervals does not always equate to flooding recurrence intervals.
- Indicate to which elevation the lift station and associated equipment will be raised to support the after-mitigation recurrence interval of 500 years used in the reanalysis BCA.

Provide the following Phase 1 deliverables needed to determine technical feasibility and cost-effectiveness:

- Studies and/or reports to support the proposed design, such as structural and geotechnical reports.
- Hydrologic and hydraulic modeling, documentation supporting the DFE, and other relevant technical data; documentation should demonstrate that the project will not have adverse upstream or downstream impacts or impacts on the adjacent areas.
- Engineering design and cost estimate.
- Refinement of the BCA.
- Additional documentation required to support compliance with eligibility, technical feasibility, cost-effectiveness, and EHP requirements.

This review is an evaluation of the project's technical feasibility and cost-effectiveness. Additional EHP, eligibility and completeness, and funding limitation considerations may affect the selection of this subapplication for further consideration and funding.