

FY 22 HMA – Grant Application Review Summary

Subapplication Number	EMA-2022-BR-001-0030		
Project Title	Indian Hills Sub Station		
Applicant Name	North Carolina Department of Public Safety		
Subapplicant Name	County of Burke		
Project Type	Flood Risk Reduction		
Recommendation	Yes with Conditions		
Federal Cost (FEMA GO)	\$2,400,126	Phased Project	Yes
BCR (subapplication)	1.70	Duplicate Project	No
BCR (reanalysis)	1.01	Benefits (reanalysis)	\$3,307,421

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 Indian Hills Sewer Pump Station located in Hickory, North Carolina. The Indian Hills Sewer Pump Station serves the Town of Rhodiss, NC, and portions of three additional surrounding communities. The phased project includes the stabilization of an eroding bank adjacent to the site, the expansion of equipment to handle double the current maximum flow, and the relocation of essential equipment to a higher elevation.

Technical Feasibility

Project Schedule

The schedule duration is 36 months. The schedule includes all items in the scope of work and is reasonable. The schedule includes engineering, permitting, construction, and closeout.

Cost Estimate

The cost estimate includes sufficient line items consistent with the scope of work. The cost estimate includes design, earthwork, access road construction, sewer main relocation, and equipment relocation.

Technical Design Information

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

Item	Documentation	Evaluation
Design Codes and Standards	No documentation provided	The subapplication does not provide information about specific design codes, standards, and code editions that apply to the project.
Design Drawings, Maps, Photographs	Collection system as-built drawings, BCA report, site photos	Documentation was provided to support the project. As-built drawings provide elevation information for the project. The BCA report provides information for

Item	Documentation	Evaluation
		the Phase 1 design objectives, including the Design Flood Elevation (DFE).
Before-Mitigation Level of Protection	Scope of work narrative, BCA report	Before mitigation, the level of protection for the site elevations varied from 976.35 to 980.9, whereas the base flood elevation (BFE) for the site is 979. The pump station has a finished floor elevation of 981.25, which matches top of wall elevations for the wet wells.
After-Mitigation Level of Protection	Scope of work narrative, BCA report, collection system as-builts	After mitigation, the level of protection will be a DFE that is 2 feet above the 500-year MRI, at approximately 982 to 983 feet. The DFE will be finalized following the Phase 1 H&H study.
Flood Hazard Data	BCA report with supporting FIRMs	The site is in the Special Flood Hazard Area, Zone AE 979. The documentation does not indicate whether the construction will be in compliance with local floodplain ordinance requirements.
Design Flood Elevation	Scope of work narrative, BCA report	Subapplication indicates the DFE and that it meets or exceeds the criteria of FFRMS and ASCE 24-14.

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:

- Provide documentation to support that the proposed mitigation activities will be designed and built in compliance with all applicable federal and local standards, including compliance with local floodplain ordinance requirements.
- Provide a list of missing technical data that will be collected and a list of minimum deliverables to be completed during Phase 1.

Provide the following Phase 1 deliverables to verify technical feasibility of the proposed project:

- H&H data/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 (typically 30/60/90) and cost estimate.
- Studies and/or reports to support the proposed design, such as structural and geotechnical reports.

Cost-Effectiveness

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

The following was found during review of the submitted BCA:

Cost Estimation

Input	Values	Evaluation
Project Useful Life (PUL)	30 years	This value is less than the FEMA standard value.
BCA Toolkit Initial Project Cost	\$3,200,180	This amount is consistent with the subapplication project cost estimate.
Annual Maintenance Cost	\$5,380	This amount is reasonable.
BCA Toolkit Total Project Cost	\$3,266,941	This amount is calculated based on the initial project cost, the annual maintenance costs, and the PUL.

Professional Expected 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	<p>The loss of function is based on loss of wastewater services to 5,621 customers using the FEMA standard value of unit of service of \$60 per person per day. The number of customers is based on the following:</p> <ul style="list-style-type: none"> • 90% of the population of Hildebran, resulting in 1,517 customers • 100% of the population of Rhodhiss, resulting in 974 customers • 250 customers from Icard and George Hildebran • 90 customers from the Carolina Rehab Center • 294 students from George Hildebran Elementary School • 842 students from East Burke High School • 651 students from East Burke Middle School • 354 students from Hildebran Elementary School • 438 students from Ray Childers Elementary School • 427 students who live in the service area were removed to eliminate double counting.
Before-Mitigation Damages	The before-mitigation damages are based on two recent flood events. The recurrence intervals for these events were determined by comparing the rainfall amounts preceding these events to historical data of the frequency of similar rain events. The Indian Hills Sewer Pump Station currently experiences one impact day annually and three impact days at 5-year intervals. See the table below for a summary of before-mitigation damages.
After-Mitigation Damages	The after-mitigation damages are based on elevating the essential systems above the 500-year flood elevation and assuming minimal flooding during a 500-year event. An impact of 0.5 days was used for a 501-year event.

Before-Mitigation Damages	
Recurrence Interval (Years)	Impact (Days)
1	1
5	3

Reanalysis BCA

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

Input	Value	Explanation
Project Useful Life (PUL)	50 years	PUL was increased to 50 years to be consistent with the FEMA standard value for major utility projects.
Loss of Function	2,831 customers	The number of customers served was conservatively reduced to 2,831, which is the population that permanently resides within the service area of the Indian Hills Sewer Pump Station. The number of people at the schools was removed from the population served, as this population is temporary.
Professional Expected Damages Before Mitigation	1-year recurrence interval event removed 5-year event changed to 500-year event	No supporting documentation was provided demonstrating that an overtopping of the access road with flood waters will interrupt operations of the pump station; the drawings indicate that the pump station is not a manned facility. Therefore, the 1-year event was removed from the BCA. The 5-year event was changed to a 500-year event. The November 12, 2020, flood event had a High-Water Mark of 1-foot above the finished floor (approx. elevation of 982.25), which is at or exceeds the 500-year flood event. The 3-day loss of service for this event was retained.
Professional Expected Damages After Mitigation – Impact Days	1 day	To account for the project’s residual risk, the outage duration for the 501-year event was changed from 0.5 day to 1 day.
Additional Benefits Included	1,350 residents	Social benefits were included in the reanalysis for 1,350 residents. The project qualifies for social benefits because the Indian Hills Sewer Pump Station is part of the wastewater system for Hickory, North Carolina.

The total benefits associated with this project, \$3,307,421, are greater than the total project cost of \$3,274,428, producing a BCR of 1.01.

Based on the documentation provided, the project is cost-effective.

Provide the following Phase 1 deliverable needed to verify 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:

- Provide documentation to support that the proposed mitigation activities will be designed and built in compliance with all applicable federal and local standards, including compliance with local floodplain ordinance requirements.
- Provide a list of missing technical data that will be collected and a list of minimum deliverables to be completed during Phase 1.

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

- H&H data/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 (typically 30/60/90) and cost estimate.
- Studies and/or reports to support the proposed design, such as structural and geotechnical reports.
- 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.