Subapplicant information

Name of federal agency	**FEMA**
Type of submission	**Application**

CITY OF FAYETTEVILLE

467 HAY ST
FAYETTEVILLE, NC 28301 United States

State	DUNS #	EIN #
NC	040031700	566001226

Subapplicant type	**Local Government**
Is the subapplicant subject to review by Executive Order 12372 Process?	**No - Not covered**
Is the subapplicant delinquent on any federal debt?	**No**

Contact information

Subrecipient Authorized Representative (SAR)

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Point(s) of contact

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Aaron Henderson Senior Management Consultant aaron.henderson@arcadis.com	**Primary phone** 9049946081 Mobile **Fax**	**Additional phones** 9049946081 Mobile	**Mailing address** 2839 Paces Ferry Rd SE #900 Atlanta GA 30339

Community

Please provide the following information. If the Congressional district number for your community does not display correctly, please contact your State NFIP coordinator.

Add Communities

Please find the community(ies) that will benefit from this mitigation activity by clicking on the Find communities button. If needed, modify the Congressional District number for each community by entering the updated number under the U.S. Congressional District column for that community. When finished, click the Continue button. NOTE: You should also notify your State NFIP coordinator so that the updated U.S. Congressional District number can be updated in the Community Information System (CIS) database.

Community name	County code	CID number	CRS community	CRS rating	U.S. Congressional District
FAYETTEVILLE, CITY OF	051	370077	N		2,7

Please provide any additional comments below (optional).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

Mitigation plan

Please provide your plan information below.

Is the entity that will benefit from the proposed activity covered by the current FEMA approved multi-hazard mitigation plan in compliance with 44 CFR Part 201? **Yes**

Please provide plan detail

Plan name
Cumberland - Hoke Regional Hazard Mitigation Plan Cumberland County, Hoke County

Plan type
Local Multijurisdictional Multi-Hazard Mitigation Plan

Plan approval date
06/22/2021

Proposed activity description
This project aligns with the below goals and actions listed in the hazard mitigation plan. Overall Plan Goals Goal #1 Protect properties and natural resources that are at risk of damage due to hazards and undertake cost-effective mitigation measures to minimize losses. Goal #2 Reduce vulnerability of Cumberland and Hoke Counties and their municipalities to all hazards for existing development, future development, redevelopment and infrastructure. Goal #4 Establish and participate in local, state and federal mitigation-oriented and disaster-based programs and planning efforts to reduce damage and protect lives and property. Fayetteville Specific Actions F1: Provide stormwater infrastructure improvements to mitigate reported flooding. F7: Use natural systems, more open space and green surfaces to manage stormwater in a more resilient fashion.

Please provide any additional comments below (optional).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment A - 2021 Hazard Mitigation Plan Excerpts.pdf	11/23/2021	keren.bolter@arcadis.com	Mitigation Plan Attachments	*No description given.*	

Scope of work

The project Scope of Work (SOW) identifies the eligible activity, describes what will be accomplished and explains how the mitigation activity will be implemented. The mitigation activity must be described in sufficient detail to verify the cost estimate. All activities for which funding is requested must be identified in the SOW prior to the close of the application period. FEMA has different requirements for project, planning and management cost SOWs.

Subapplication title (include type of activity and location) **Fayetteville, NC - Wayland Drive Drainage Improvements - BRIC FY2021**

Activities

Primary activity type **Flood control**

Primary sub-activity type **Stormwater management**

Secondary activity type (Optional)

Geographic areas description **The City of Fayetteville is 147.8 square miles, 1.9 of which are water. It is the largest city in Cumberland County and sits in the Cape Fear River Basin. Fayetteville is in the Upper Coastal Plains section of North Carolina, distinctively known as the "Sandhills." With a diverse population of 209,468, Fayetteville has a significant population (over 17,000) in the military, serving Fort Bragg's Airborne and Special Operations Forces, one of the Nation's largest military bases. The area being mitigated by the proposed project encompasses mixed residential, commercial, and industrial zoned properties at the western edge of Fayetteville, east of the recently completed I-295 extension. The area west of the project area is farmland and a small strip of emergent wetlands. The maps in Attachment B show how the proposed project will protect a vulnerable watershed south of Cliffdale Road. The largest benefits will be in the area west of the intersection between Cliffdale Road and South Reilly Road (including Wayland Drive). Following project implementation, South Reilly Road itself will see much less flooding, with stormwater depths reduced by up to one foot. Additionally, the area along Reilly Road Industrial Park between South Reilly Road and 71 School Road will benefit, including a few houses to the north and buildings within the industrial park. For more information and maps of Fayetteville (including the proposed project area) please refer to ATTACHMENT B - GEOGRAPHIC AREAS DESCRIPTION**

Community lifelines

Primary community lifeline **Food, water, shelter**

Primary sub-community lifeline **Shelter**

Secondary community lifeline (optional) **Transportation**

Secondary sub-community lifeline **Highway/roadway/motor vehicle**

Tertiary community lifeline (optional)	**Safety and security**
Tertiary sub-community lifeline	**Community safety**

Hazard sources

Primary hazard source	**Flooding**
Secondary hazard source (optional)	
Tertiary hazard source (optional)	

Is this a phased project?	**Yes**
Are you doing construction in this project?	**Yes**
Population affected	**13.8**
Detail/description of stated percentage	**HOW THE PERCENTAGE WAS CALCULATED The project benefits 538 residents out of the total 3,885 population of Census Tract 33.07 in the City of Fayetteville. Documentation to support the stated percentage (13.8%) and the socioeconomic characteristics of the protected communities can be found in ATTACHMENT C. ATTACHMENT C also includes documentation for an additional 18,200 residents who will benefit from protection of roads used for transportation and business. The population most directly impacted by the proposed project is the resident population of 538 who will directly benefit from reduced or eliminated flooding of their homes and neighborhoods. Over 78% of the population living in the affected Census Tract, 33.07, identified themselves as a minority population (2,261 (58.2%) Black or African American alone, 23 (0.6%) American Indian and Alaska Native alone, 146 (3.8%) Asian alone, 29 (0.7%) Native Hawaiian and Other Pacific Islander alone, 256 (8.7%) some other race, and 482 (12.4%) identify as Hispanic or Latino ethnicity). Additionally, roughly 838 (20%) members of the population live below the poverty level. The CDC Social Vulnerability Index (SVI) scores Census Tract 33.07's overall vulnerability score as 0.8471 on a scale from 0 (least vulnerable) to 1 (most vulnerable) indicating a high level of vulnerability. These statistics support that the project will greatly benefit a large portion of low income and minority populations exceeding the standards of the Justice-40 initiative laid out in Executive Order 14008. COMMUNITY-WIDE BENEFITS AND COMMUNITY LIFELINES The City of Fayetteville has been shifting to incorporate a wider range of benefits into their projects to consider equity community-wide. In the context of the proposed project, "community-wide" refers to the equity-driven values that Fayetteville's residents share. There is also an intention to manage stormwater such that environmental contamination is prevented, a measure that also benefits the community at large. This project is aligned with the City's Stormwater Management Ordinance, helping the city to improve the quality and management of stormwater runoff. The purpose of the Stormwater Control Ordinance is to protect, maintain and enhance the public health, safety, environment, and general welfare by establishing minimum requirements and procedures to control the adverse effects of increased post-construction stormwater runoff and non-point source pollution associated with new development and redevelopment. This project will also reduce cascading impacts to Community Lifelines, residents, businesses, public services, infrastructure, and natural systems through three key lifelines: FOOD, WATER, SHELTER; TRANSPORTATION; and SAFETY AND SECURITY. The rationale is described below. FOOD, WATER, SHELTER - The proposed project significantly reduces the threat to property. Under the lifeline subcategory of shelter, the project increases the level of protection for over 18 residences across the area. Without the project, residents face the risk of inundation impacting their homes causing significant**

	damage. It would take months for residents whose homes may be damaged to stabilize their living situation. Given the level of damage expected, residents could be displaced for extended periods while repairs to homes occurred. TRANSPORTATION - The proposed project will protect 3.84 miles of roadway (S Reilly Road: 2.23 miles; 71st: 1.61 miles. Under the existing conditions, Wayland Drive, South Reilly Road, Reilly Road Industrial Park and 71st School Road are flooded according to ATTACHMENT F and G. Estimates for the number of people who use the area for transportation and business were taken from Annual Average Daily Traffic (AADT) data from 2018 indicating 16,000 trips at South Reilly Road and 2,200 trips at 71st School Road. The inundation on such roads has required the Fire Department on several occasions to rescue families trapped in flooded homes and stranded vehicles which can be seen in ATTACHMENT D. SAFETY AND SECURITY - The proposed project significantly alleviates the flood threat to lives for the approximately 1535 people who work and live in the area. In the case of a flood event, predicted levels of inundation would prove a significant physical safety concern. Additionally, floodwater is likely to be contaminated and contain foreign objects making it both a physical and biological threat that may harm residents. Flooding has submerged vehicles and inundated several warehouses and homes in the area. A significant emergency response would be required to rescue any residents that were not able to evacuate, with the potential for loss of life. ATTACHMENT D has more information on historic losses and project need, and ATTACHMENT E has the Stormwater Management Ordinance. ATTACHMENT F shows the full drainage options report, and ATTACHMENT G shows Stormwater Modeling Results and Flood Inundation Maps.
Provide a clear and detailed description of your proposed activity	**INFRASTRUCTURE PROJECT With the Wayland Drive Drainage Improvements project, the City of Fayetteville will promote community resilience by mitigating the impacts of flood risk to historically flooded properties near Wayland Drive and the surrounding area. There are three main elements to the project: diverting drainage with new ditches, downstream drainage improvements, and a new downstream stormwater storage area (north of Old Bunce Road). Improving drainage in this high-risk area will reduce flooding from high-intensity rainfall events by an average of 2 feet during the 25-year storm, with significant reductions in potential floods and partial benefits for more intense storms. Overall, the project will benefit a total of 18,738 people and 23 structures. The construction of the new drainage measures will divert most of the stormwater from the Wayland Drive area, redirecting it downstream to a newly constructed storage area. The first portion of the drainage measure will consist of a 6-foot wide 3 to 1 slope ditch running approximately 1,200 feet from the northwest end of the residential properties on Wayland Drive to South Reilly Rd. The ditch will transition to two 48-inch pipes to pass under South Reilly Road and the railway line. Once on the east side of South Reilly Road, a second 3-foot-wide ditch will run parallel to Reilly Road Industrial Park for approximately 100 feet. From there, water will be conveyed under property throughout the Reilly Road Industrial Park in approximately 1,000 linear feet of 54-inch reinforced concrete pipe. For a brief portion of the 1000 feet of pipe, where the pipe crosses Reilly Road Industrial Park, the 54-inch pipe will transition to two 48-inch pipes, and back. The 54-inch pipe will then end at a newly excavated and graded storage basin. The City will excavate currently vacant land to provide 15,000 cubic yards of stormwater storage across 4.8 acres. The project will require grading and storage of stormwater on private property, which will require land easements at the storage basin, through Reilly Road Industrial Park, and along existing farmland west of Reilly Road. The project scope of work consists of methods and best practices that have been used by the City of Fayetteville in the past and have been proven successful to mitigate flood related damages and losses. All recommended actions have been verified as technically feasible by engineers and approved by the City of Fayetteville. The analysis included an evaluation of**

existing plans, hydrologic and hydraulic (H&H) assessments, and other preliminary engineering done in accordance with local regulations, codes, and policies. More information on the H&H analysis is provided in the technical feasibility and risk reduction section. The City of Fayetteville chose this design after review of three different options, as detailed in the Wayland Drive at South Reilly Road Drainage Improvement Options Study (ATTACHMENT F). The chosen option (Option 3) avoids water impoundment within a farm field directly upstream of the North Carolina Department of Transportation's right of way. Additionally, the project will allow for future drainage improvements under South Reilly Road and the railroad. The project will not lead to any additional downstream structure flooding. The mitigation designs, specifications, and installations performed will meet standards in line with the City of Fayetteville NPDES Permit Program Stormwater Quality Management Program Plan and will be conducted in accordance with all relevant American Water Works Association (AWWA), American Society for Testing and Materials, and American National Standards Institute (ANSI) standards including AWWA C901, AWWA C906, ASTM D2239, ASTM D2737, ASTM D3035, and ANSI/NSF 14/61. There is a demonstrated need for investment in the Wayland Drive Drainage Improvements. There is a log of stormwater complaint in the neighborhood, and photos and media coverage of recent flooding events (ATTACHMENT D) indicates that flooding is a frequent problem for the area. A final consideration of the proposed scope is a new church development site adjacent to the first proposed drainage ditch, just to the west of South Reilly Road. The City has modeled the impacts of this new development within the project area and found no significant impact or need to alter their design. As part of the church development, stormwater control measures will be installed to control and treat stormwater runoff from the new development, fully addressing a 10-year storm event. Additional recent size increases to the North Carolina Department of Transportation (NCDOT) pipes within the roadside ditch are able to convey the remainder of the potential additional runoff. As this project is downstream of Wayland Drive, there is no impact or reduction of flooding upstream, and the Wayland Drive drainage improvements are still necessary. NATURE-BASED SOLUTIONS AND GREEN INFRASTRUCTURE Fayetteville's approach to flood resilience is collaborative and multidisciplinary, which ensures maximization of how investing in resilience pays off. The Wayland Drive Drainage Improvements has abundant potential for nature-based innovation to integrate multifunctional solutions for water storage, conveyance, treatment, and of course flood protection. Vegetation and green infrastructure will be examined during final design to provided additional benefits. Drainage interventions proposed here will consider local ecosystems to bolster sustainability and will coexist with existing infrastructure. Opportunities for Green Infrastructure in the downstream sections will be fully examined as part of the design effort for the overall storm drainage improvements during Phase 1 of the project. Drainage ditches conveying stormwater in the upper part of the project are likely candidates for the implementation of vegetated swales to treat stormwater as it flows, however groundwater depth and soil characteristics may reduce the capacity for infiltration. The southern portion of the industrial park, however, appears to have soils with a greater depth to groundwater which would be more likely to infiltrate, thus reducing the runoff volume from this area. Again, verification of the feasibility and efficacy of these elements will be conducted during final design. Phase 1 of the project will further explore various opportunities for additional advanced green measures. The City is exploring ways to include nature-based solutions that have not previously been used on this project or by the City to further incorporate innovative flood mitigation elements. Attachment E includes excerpts from the latest draft of the City's Consultant Management and Standards Manual an element of the Watershed Master Plan under development. These excerpts show the City's commitment to incorporating green infrastructure and nature-based solutions into their project portfolio and some of the

	creative mechanisms they are exploring to incentivize and implement those elements.
How will the mitigation activity be implemented?	**The process of project implementation includes procurement, planning, and outreach strategies, including close coordination with local partners. The City has a dedicated staff led by Stormwater Manager Byron Reeves, PE, CFM with extensive experience in implementing and managing stormwater projects. City staff will also be supported by an expert contractor specializing in stormwater management projects and procured in accordance with federal and state regulations. Cost and schedule will be managed judiciously by this expert team to ensure a successful, on time, and on budget implementation of this project. The City of Fayetteville proposes to implement the project in two phases in accordance with FEMA guidelines on phased projects. Phase 1 will complete the evaluation of construction constraints, finish surveying, and finalize engineering and permitting. Additionally, the six required land easements will be purchased. Permits will be obtained through the public services department. It is anticipated that this will include a NCDEQ Erosion and Sediment Control Permit, a USACE permit, and a NCDEQ 401 permit. The proposed diversion ditch will require grading and potentially impact emergent wetland areas adjacent to the Wayland Drive properties which may trigger more extensive environmental permitting. Upon completion of Phase 1 deliverables and approval from FEMA, Phase 2 will consist of acquisition of equipment and materials, and project construction. Specific construction tasks include staking, clearing and grubbing, channel excavation, storage area excavation and grading, pipe installation, debris removal, utility conflict resolution, traffic control, and erosion control and dewatering. PROCUREMENT The City is taking advantage of procurement processes which keeps contingency costs down and keeps a tight schedule. The City is planning to involve the contractor early in the process, optimizing design for cost and schedule. The City is fully aware of and complies with the provisions for non-federal entity contracts under federal award. The procurement plan aligns with the eligible methods of procurement in accordance with federal regulations including but not limited to 2 C.F.R. §§ 200.317 – 200.326. PLANNING PROCESSES AND OUTREACH ACTIVITIES Planning, design, and hydrologic and hydraulic studies are intended to promote innovative installation technologies which will minimize environmental impacts and disturbance footprint. Over the years, a number of small area plans have been developed to guide growth and development. The City considered the preferences and feedback collected when identifying this proposed project. Fayetteville aims to have the planning process be inclusive and flexible, and two outreach meetings specifically about the proposed project will take place. The City is committed to an effective outreach effort coupled with this project, including coordination with the various partners. The details of the proposed project have already been shared on the City's website, along with flood preparedness, resilience, and mitigation information, enhancing the community's resilience by educating the public about the natural hazard risks they face. The proposed project is aligned with the City's Stormwater Management Plan (ATTACHMENT E) which includes a program providing the public, business, and industry with valuable information on general water quality, pollution prevention, and reporting problems, as well as specialized information on various activities that have the potential to cause pollution harming water quality. This information is provided using a wide range of media including print, radio, and television. In addition, this program provides an opportunity to participate in various programs within the City's Stormwater Plan. Fayetteville also maintains a Stormwater Advisory Board (SWAB), which is an appointed citizen panel to review and comment on the City's stormwater programs. REALISTIC COST ESTIMATES AND SCHEDULE The project costs have a significant level of detail and identify all needed components. Costs for major components of the project have been determined based on experience with similar projects, discussions with manufacturers, and adjusted**

for recent price fluctuations driven by COVID-19 and inflation. The schedule is realistic based on construction activities to be completed and anticipated durations. The project tasks within the schedule are realistic and specific yet allow for flexibility to adjust for potential changes, including a buffer to allow for unforeseen delays during construction. However, proactive project management will ensure that the project is successfully implemented. The project team has tailored a strategy to initiate, plan, execute, and control the project scope, schedule, and budget, ensuring effective communication and reporting throughout the grant implementation process. Should funding be awarded, the City will work with the State and FEMA to adjust the schedule and to be flexible in the case of adapting to changing circumstances as needed. MONITORING STRATEGIES REPORTING TO THE STATE OF NORTH CAROLINA ON GRANT PROGRESS The City understands how critical state and federal level guidance and reporting requirements can be during project development, implementation, reimbursement, and closeout. The City designated Project Manager (PM) for the project will manage communication between the local, state, and federal levels. Understanding federal guidelines is a necessary component for being able to navigate projects through FEMA policy and regulation requirements. QUALITY ASSURANCE / QUALITY CONTROL PROCESS The City of Fayetteville and the contractor will ensure accurate data on program performance to make sound policy and management decisions and maintain credibility with FEMA, the public, and the state of North Carolina. Accurate data is critical for ensuring consistently high-quality deliverables with low levels of error, allowing spokespersons to communicate data to outside entities with ease. The City and the contractor will work with all involved stakeholders to ensure a rigorous Quality Assurance/Quality Control (QA/QC) process is implemented and maintained throughout the life of the project. FINANCIAL MANAGEMENT AND CONTRACT ADMINISTRATION The City of Fayetteville and the contractor will deploy systems, processes, policies, and procedures that integrate financial discipline, data management, and innovative technology to support sound project management, audit compliance, and enhanced financial performance, across all phases of the funding lifecycle. TECHNICAL AND MANAGERIAL STAFF The project will be supported by staff within the City of Fayetteville Stormwater Department within the Engineering Division, of the Public Services Department and headed by the Stormwater Manager, Byron Reeves, PE, CFM. Byron holds a degree in Environmental/Environmental Health Engineering from North Carolina State University and has served the City of Fayetteville for over seven years. Prior to his time at the City Byron served for nearly seven years as an Environmental Engineer with the North Carolina Department of Environment and Natural Resources, and his extensive experience will be utilized to ensure successful project completion. Byron will be supported by a highly skilled staff that includes stormwater engineers, stormwater inspectors, and staff from the Traffic Services, Real Estate, and Construction departments. Staff from the Engineering Division will also be supplemented by expert contractors skilled in stormwater system design verified through the procurement process. The combination of the City team and hired contractor(s) will provide a mix of stormwater experts with local knowledge and third-party perspective. This combination will result in a high-quality project shaped and informed by local conditions and national best practices alike.

Describe how the project is technically feasible and will be effective in reducing the risk by reducing or eliminating damage to property and/or loss of life in the project area. Please include engineering design parameters and references to the following: preliminary schematic or engineering drawings/design; applicable building codes; engineering practices and/or best practices; level of protection (e.g., life safety, 100-yr flood protection with freeboard, 100-yr wind design, etc.):

RISK REDUCTION/RESILIENCY EFFECTIVENESS This project will be effective in reducing flood depths for the project area to an effective depth of zero feet up to the 25-year 24-hour rainfall event for all but one structure and for all but three structures up to the 100-year 24-hour rainfall event (Attachment K). This will improve resilience for residents and businesses in the area as reduced or eliminated flood depths will reduce displacement times, and damages, getting activities back to normal faster. The project scope of work consists of methods and best practices that have been used by the City of

Fayetteville in the past and have been proven successful to mitigate flood related damages and losses. It also demonstrates innovation for the City of as they take an approach that sets a higher level of protection than for similar projects of the past, and will serve as a case study for future flood mitigation projects. Innovation will also be demonstrated for the City by examining the feasibility of nature-based solutions to passively treat and infiltrate stormwater where it falls and as it flows. Finally, ancillary benefits will include improved conditions for some of the City's most vulnerable minority and low-income populations, potential economic opportunity as additional businesses can locate in the mitigated Reilly Road Industrial Park, and water quality benefits as stormwater is infiltrated into the ground and/or treated as it flows. They will also include avoided public health impacts including avoided injury and/or death, as well as social benefits derived from avoided mental stress and anxiety, and lost wages. Feasibility and preliminary design have been addressed in the completed Wayland Drive at South Reilly Road Drainage Improvement Options Study (ATTACHMENT F), which include assessments of drainage issues, improvement options, and mitigation impacts. Hydrologic and hydraulic (H&H) modeling was conducted using GIS information, LiDAR, and survey data (where available) to determine pre- and post-mitigation flood elevations. This allowed the City to compare multiple options and ensure no adverse flooding impacts downstream from the drainage improvements and alignment with existing plans. Given the H&H methodology followed, the City is confident in their analysis. The following are key highlights of the methodology: • The drainage basin and subbasins of the project area were developed using GIS and State LiDAR. • Drainage area hydrology was estimated using existing land cover conditions, while rainfall distributions were based on NOAA Atlas 14 precipitation-frequency data were used to develop runoff hydrographs. • PCSWMM (EPA SWMM engine) software was then used to formulate flood hydrographs, and then develop the hydraulic model. The hydraulic model used a combination of a 1-D channel model and 2-d overland flow model. In the areas along Wayland Drive, 2 to 3 feet of flooding is seen during a 25-year rain event. H&H modeling suggests that this project will reduce flooding by an average of 2 feet, limiting 25-year event flooding to minor flooding within ditches. Significant flood depth decreases will also be achieved during more severe flooding events, though residual risk will remain. Additional detail on the preliminary studies and modeling results are provided in ATTACHMENTS F and G. In reviewing ATTACHMENT F please note that the selected alternative for this project is referred to as "Drainage Improvement Option #3. This option was chosen because it was the only alternative that avoided water impoundment directly upstream of the North Carolina Department of Transportation's right of way. The City and partners have taken several actions to ensure that they are working within accepted federal standards. A wide range of the most recent codes and standards have been adhered to surrounding the drainage design, as discussed below. CODES AND STANDARDS The City is currently enforcing the 2018 North Carolina State Building Codes and does not have other local building codes. The City also has its Unified Development Ordinance (UDO) to protect the public health, safety, and general welfare of the citizens and landowners of Fayetteville, and to implement the policies and objectives of City-adopted plans addressing the City's growth and development. On December 30, 1994, the City of Fayetteville began operating under Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit Number NCS000246 as issued by the North Carolina Department of Environment and Natural Resources (NCDENR). In 2007, the City Council of Fayetteville adopted a Stormwater Management Ordinance that gives the City authority to establish programs and procedures that will help the City to improve the quality of stormwater runoff. An Administrative Manual for the Implementation of the Stormwater Control Ordinance has been developed to provide guidance and information to the staff of the City of Fayetteville as well as the general public for the effective and

	efficient implementation and administration of the Stormwater Control Ordinance. The Administrative Manual includes application requirements and forms, submission schedules, fee schedule, maintenance agreements, criteria for recordation of documents, inspection report forms, requirements for submittal of bonds and where to obtain copies of the Stormwater Control Ordinance. The City of Fayetteville has recently developed a Stormwater Management Plan that details how the Stormwater Program plans to execute its current permit. The purpose of the Infrastructure Permit is to provide a mechanism for the review, approval, and inspection of the approach to be used for the management and control of stormwater for a development or redevelopment site consistent with the requirements of the Stormwater Control Ordinance. The Infrastructure Permit Application is used to demonstrate how post-construction stormwater runoff shall be controlled and managed and how the proposed project shall meet the requirements of the Ordinance. An Infrastructure Permit is required for all development and redevelopment unless exempt pursuant to the Stormwater Control Ordinance Section 23-24. Land development activity, such as land clearing and grading, can be initiated for such development or redevelopment with a state issued erosion control permit. If site grading is anticipated prior to the issuance of an Infrastructure Permit, it is required that a Pre-Application or Consultation Meeting with the City staff be conducted to review and discuss the proposed stormwater management system for the development project. The Fayetteville City Code can be found at the Municode website www.municode.com. The UDO, as well as excerpts from the Stormwater Management Ordinance, the Administrative Manual, and the Stormwater Management Plan are presented in ATTACHMENT E.
Who will manage and complete the mitigation activity?	**This City will work together with other departments (as appropriate), consultants, and partners to complete the mitigation activity. Existing staff will be utilized from the Stormwater/Engineering, Traffic Services, Real Estate, and Construction Departments. In general, staff of the Fayetteville Stormwater Division, under the oversight of the City's Stormwater Manager Byron Reeves, PE, CFM, are responsible for the fulfillment of most of the activities discussed in the Stormwater Plan (ATTACHMENT E). The project will be managed by Abha Dwivedy, Ph.D, MBA an Engineer III with the City who will directly oversee the project for the City. Kecia Parker, NCCP, Real Estate Manager for the City, will manage any aspects pertaining to property and Real Estate on the project. Kecia will ensure proper notifications are sent to homeowners, handle easement, right-of-way, and acquisitions requirements, and verify and conduct any title work that is necessary. Lee Jernigan, PE – Assistant Directory of Public Services – Traffic and Street Maintenance, will be responsible for traffic control and coordination with the North Carolina Department of Transportation. Finally, Jeff Riddle, PLS, will be the Construction Manager on the project in charge of utility coordination and construction oversight. In addition to the staff listed above, the City's Street Maintenance Division and the Environmental Services Department have responsibility for maintenance of portions of the MS4, in coordination with the Fayetteville Stormwater Division. The one exception is the Construction Site Runoff Control program where the local office of NCDENR is the primary responsible agency.**
Will the project address the hazards identified and what risks will remain from all hazards after project implementation (residual risk)?	**The proposed project does address the hazard identified and would protect the area to the 25-year precipitation event, with any flooding limited to drainage ditches. Some residual risk remains for larger events, but flood levels are greatly decreased. In and around Wayland Drive, the average ground elevation is 234.7 feet. Currently, the area sees between 1.01 and 1.34 feet of flooding for a 2-year and 100-year event, respectively. The Wayland Drive Drainage Improvements will bring the water elevations down to between 233.32 to 234.6 or a reduction of 2.39 to 1.44 fee. When the water level is significantly below the average elevation, this means that flooding is limited to within the drainage ditches. Maps illustrating the residual flood risk**

	for each water level modeled can be found in ATTATCHMENT G Risk also remains for hazards not targeted by this mitigation action including earthquake, droughty, extreme heat, tornado, wildfire, winter storm and others.
When will the mitigation activity take place?	**The design and related studies for the project are already underway, as demonstrated in ATTACHMENTS F AND G. If awarded the project is expected to begin in January of 2023 aligned with funding award. Construction will be procured competitively and will be completed within the three-year period of performance.**
Explain why this project is the best alternative. What alternatives were considered to address the risk and why was the proposed activity considered the best alternative?	**A recent study had the primary purpose of investigating methods of mitigating flooding in the Wayland Drive area. The proposed activity was considered the best alternative because among the three options, it is the only one that did not impound water directly upstream of DOT's right-of-way which could become a risk to those assets. Two additional alternatives were considered and are described below. Please see ATTACHMENT F for more details. Option #1: Diverting drainage with new ditch while using farm field for storage Option #2: Diverting drainage with new ditch, create storage on west side of South Reilly and make some improvements on east side of South Reilly All options reduce the flooding significantly; however, both Option #1 and #2 may require extensive environmental permitting and study, as well as land acquisition on private property. Option #1 also assumes there will be no drainage improvements made on the drainage pipes that cross South Reilly Road and the railroad. If drainage improvements are made in these areas, Option #1 would increase downstream flooding. Option #2 would require an additional diversion ditch and land acquisition within Reilly Road Industrial Park property.**
Please identify the entity that will perform any long-term maintenance and provide a maintenance, schedule and cost information. The subapplicant or owner of the area to be mitigated is responsible for maintenance (including costs of long-term care) after the project is completed?	**The City is prepared to oversee a project of this size, and the City will be responsible for long-term operations and maintenance. Fayetteville's Engineering/Stormwater Department will be responsible for maintenance activities. Existing staff will be used to maintain the drainage infrastructure and will fund maintenance such as inspections, clearing culverts and outfalls, and preventative maintenance and repairs for embankment erosion. However, NCDOT will manage the maintenance of the infrastructure within their right of way. In addition to the entities listed above, the City's Street Maintenance Division and the Environmental Services Department have responsibility for maintenance of portions of the MS4, in coordination with the Fayetteville Stormwater Division The Stormwater Plan's Administrative Manual (ATTACHMENT E) states that prior to Engineering Plan Approval, an Operation and Maintenance Agreement must be submitted, approved, and executed. The document shall be signed by the responsible party and notarized. The document shall also be signed by the City Engineer. The guidelines for developing and implementing a maintenance plan will be followed. Please refer to ATTACHMENT H: Maintenance Agreement The City has managed and maintained many projects of larger scale with great success in the past with staff skilled in design, bidding, construction management, and maintenance. The City is confident that the project can be completed successfully as designed and maintained for the expected project useful life. Please see ATTACHMENT I for details on Fayetteville's successfully completed Stormwater Capital Improvement Projects (SWCIP).**
Additional comments (optional)	

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment C - Supporting Documentation for Population Impacted.pdf	01/06/2022	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment G – Stormwater Modelling Results Flood Inundation Map.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment E – Ordinances and Stormwater Plan Excerpts.pdf	01/06/2022	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment F – Wayland Drive Drainage Improvement Options Report.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment I - Completed Stormwater CIP Projects.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment B - Geographic Areas Description.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment H - Maintenance Agreement.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment D - Historic Losses and Project Need.pdf	11/24/2021	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	
Attachment K - Structure Inventory and Flood Damages.pdf	01/06/2022	keren.bolter@arcadis.com	Scope of Work Attachments	*No description given.*	

Schedule

Specify the work schedule for the mitigation activities.

Add tasks to the schedule

Please include all tasks necessary to implement this mitigation activity; include descriptions and estimated time frames.

Task Name
Design and Bidding

Start Month
1

Task Duration (in Months)
17 months

Task Description
Design completion and bidding

Task Name
Permitting

Start Month
14

Task Duration (in Months)
3 months

Task Description
Permitting

Task Name
Survey and Easement Plats

Start Month
14

Task Duration (in Months)
3 months

Task Description
Survey and easement plats

Task Name
Mobilization

Start Month
18

Task Duration (in Months)
2 months

Task Description
Mobilization

Task Name
Site Work

Start Month
20

Task Duration (in Months)
6 months

Task Description
Includes construction survey and staking, utility conflict resolution, traffic control, and erosion and dewatering.

Task Name
Demolition and Removal

Start Month
20

Task Duration (in Months)
6 months

Task Description
Includes clearing and grubbing, 15” driveway pipe removal, and asphalt removal and disposal

Task Name
Excavation

Start Month
20

Task Duration (in Months)
6 months

Task Description
Includes channel excavations (#1 and #2) and storage excavation and grading

Task Name
Drainage Installation

Start Month
27

Task Duration (in Months)
6 months

Task Description
Includes 46” driveway pipes, 54” RCP, 48” RCO, 48” B&J, and drainage structure

Task Name
Concrete Headwall Installation

Start Month
27

Task Duration (in Months)
6 months

Task Description
Concrete headwall installation

Task Name
Asphalt Installation

Start Month
27

Task Duration (in Months)
6 months

Task Description
Asphalt installation

Task Name
Riprap Installation

Start Month
27

Task Duration (in Months)
6 months

	Task Description Riprap installation

Task Name Project Closeout	**Start Month** 33	**Task Duration (in Months)** 3 months
	Task Description Project closeout	

Estimate the total duration of your proposed activities (in months).	**36**
Proposed project start and end dates	
Start Date	**2023-01-01**
End Date	**2026-12-31**

Budget

Budget cost estimate should directly link to your scope of work and work schedule. You must add at least one item(s) greater than 0 for your cost estimate. As necessary, please adjust your federal/non-federal cost shares, and add the non-federal funding source(s) you are planning to use this project. Once you have completed this section, please click the Continue button at the bottom of this page to navigate to the next section.

Add budget cost types and item(s)

First, click the Add cost type button below to add cost type cost estimate and then click the Add item(s) button to add the item(s) for the cost estimate.

Grand total: $3,732,289.68

Budget type: Construction

Cost type: Cost estimate	**$3,554,561.60**
Cost type: Management cost	**$177,728.08**

Program income (optional)

Cost share

Cost share or matching means the portion of project costs not paid by federal funds.

Proposed federal vs. non-federal funding shares
Hazard Mitigation Assistance (HMA) funds may be used to pay up to 75% federal share of the eligible activity costs. For Building Resilient Infrastructure and communities (BRIC), small impoverished communities may be eligible for up to 90% federal share. For Flood Mitigation Assistance (FMA), and severe repetitive loss (SRL) properties may be eligible for up to 100% federal share. Repetitive loss (RL) properties may be eligible for up to 90% federal share. Flood Mitigation Assistance (FMA) and severe repetitive loss (SRL) properties may be eligible for up to 100% federal share. Repetitive loss (RL) properties may be eligible for up to 90% federal share.

Is this a small impoverished community? This determines your federal/non-federal share ratio. No		**% Percentage**	**$ Dollar amount**
	Proposed federal share	**70.00**	**2612602.78**
	Proposed non-federal share	**30.00**	**1119686.90**

	Based on total budget cost: $3,732,289.68

Non-federal funding sources here
That portion of the total costs of the program provided by the non-federal entity in the form of in-kind donations or cash match received from third parties or contributed by the agency. In-kind contributions must be provided and cash expended during the project period along with federal funds to satisfy the matching requirements.

Funding source	Funding amount	% Non-federal share by source
Funding source: City Funds	**$1,119,686.90**	**100.00%**

Please provide any additional comments below (optional).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment J - Cost Share Commitment Letter and Pre-Award Cost Request Form.pdf	11/24/2021	keren.bolter@arcadis.com	Budget Attachments	*No description given.*	

Cost-effectiveness

How was cost-effectiveness determined for this project?

- [x] BCA completed in FEMA's BCA toolkit
  Subapplicant must attach supporting documentation.
- [ ] Pre-calculated benefits
- [ ] Substantial damage in special flood hazard area
- [ ] Other BCA methodology approved by FEMA in writing
- [ ] Not applicable

- [ ] Not applicable

What are the total project benefits? ($)	**7033992**
What are the total project cost? ($)	**3568362**
What is the benefit-cost ratio (BCR) for the entire project?	**1.97**
Was sea level rise incorporated into the flood elevations in the BCA?	**No**
Were environmental benefits added to the project benefits?	**No**
Were social benefits added to the project benefits?	**No**
Does the mitigation measure incorporate nature-based solutions?	**Yes**

Please provide any additional comments below (optional).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment M - BCA Methodology Appendices including BCA Report.pdf	11/24/2021	keren.bolter@arcadis.com	Cost Effectiveness Attachments	*No description given.*	
Attachment L - BCA Methodology.pdf	11/24/2021	keren.bolter@arcadis.com	Cost Effectiveness Attachments	*No description given.*	

Environmental/Historic Preservation (EHP) Review Information

Introduction

An environmental/historic preservation review is required for all activities for which FEMA funds are being requested. FEMA will complete this review with the assistance of both the state or tribal government and the local applicant. It is important that you provide accurate information. If you are having problems completing this section, please contact your application point of contact.

A. National Historic Preservation Act - Historic Buildings and Structures

1. Does your project affect or is it in close proximity to any buildings or structures 50 years or more in age? **Yes**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] The property address and original date of construction for each property affected (unless this information is already noted in the Properties section).
- [x] A minimum of two color photographs showing at least three sides of each structure (Please label the photos accordingly).
- [x] A diagram or USGS 1:24,000 scale quadrangle map displaying the relationship of the property (s) to the project area.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Information gathered about potential historic properties in the project area, including any evidence indicating the age of the building or structure and presence of buildings or structures that are listed or eligible for listing on the National Register of Historic Places or within or near a National Register listed or eligible historic district. Sources for this information may include the State Historic Preservation Officer, and/or the Tribal Historic Preservation Officer (SHPO/THPO), your local planning office, historic preservation organization, or historical society.
- [ ] Consideration of how the project design will minimize adverse effects on known or potential historic buildings or structures, and any alternatives considered or implemented to avoid or minimize effects on historic buildings or structures. Please address and note associated costs in your project budget.
- [ ] For acquisition/demolition projects affecting historic buildings or structures, any data regarding the consideration and feasibility of elevation, relocation, or flood proofing as alternatives to demolition.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Please provide an explanation and any information about this project that could assist FEMA in its review.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 1 - USGS Map.pdf	11/23/2021	keren.bolter@arcadis.com	closeProximityTo50YearOldBuilding.attachmentIds	*No description given.*	
EHP Attachment 2 - Historic Sites Map.pdf	11/23/2021	keren.bolter@arcadis.com	closeProximityTo50YearOldBuilding.attachmentIds	*No description*	

Filename	Date uploaded	Uploaded by	Label	Description	Action
				given.	
EHP Attachment 4 - Properties 50 Years or More in Age Photo Log.pdf	11/23/2021	keren.bolter@arcadis.com	closeProximityTo50YearOldBuilding.attachmentIds	*No description given.*	
EHP Attachment 3 - Coordination Letter to SHPO.pdf	11/23/2021	keren.bolter@arcadis.com	closeProximityTo50YearOldBuilding.attachmentIds	*No description given.*	

B. National Historic Preservation Act - Archeological Resources

Does your project involve disturbance of ground? **Yes**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] A description of the ground disturbance by giving the dimensions (area, volume, depth, etc.) and location.
- [x] The past use of the area to be disturbed, noting the extent of previously disturbed ground.
- [x] A USGS 1:24,000 scale or other site map showing the location and extent of ground disturbance.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Any information about potential historic properties, including archeological sites, in the project area. Sources of this information may include SHPO/THPO, and/or the Tribe's cultural resources contact if no THPO is designated. Include, if possible, a map showing the relation of any identified historic properties to the project area.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional) **Please see EHP Attachments one through four above and EHP Attachment five below.**

Please provide an explanation and any information about this project that could assist FEMA in its review.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 5 - Ground Disturbance Map.pdf	11/23/2021	keren.bolter@arcadis.com	involveDisturbanceOfGround.attachmentIds	*No description given.*	

C. Endangered Species Act and Fish and Wildlife Coordination Act

1. Are federally listed threatened or endangered species or their critical habitat present in the area affected by the project? **Not known**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please provide the required documents either through attachment and/or comment box below.)

- [ ] Information you obtained to identify species in or near the project area. Provide the source and date of the information cited.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [ ] Any request for information and associated response from the USFWS, the National Marine Fisheries Service (NMFS) (for affected ocean-going fish), or your State Wildlife Agency, regarding potential listed species present and potential of the project to impact those species.
- [ ] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Please provide an explanation and any information about this project that could assist FEMA in its review.	**The project area does not included any areas listed by USFWS as Critical Habitats or Endangered Species territory.**
2. Does your project remove or affect vegetation?	**Yes**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please provide the required documents either through attachment and/or comment box below.)

- [x] Description of the amount (area) and type of vegetation to be removed or affected.
- [x] A site map showing the project area and the extent of vegetation affected.
- [x] Photographs or digital images that show both the vegetation affected and the vegetation in context of its surroundings.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [ ] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Please provide an explanation and any information about this project that could assist FEMA in its review.

3. Is your project in, near (within 200 feet), or likely to affect any type of waterway or body of water?	**No**

If Yes, and project is not within an existing building, you must confirm that you have provided the following: (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [ ] A USGS 1:24,000 scale quadrangle map showing the project activities in relation to all nearby water bodies (within 200 feet).
- [ ] Any information about the type of water body nearby including: its dimensions, the proximity of the project activity to the water body, and the expected and possible changes to the water body, if any. Identify all water bodies regardless whether you think there may be an effect.
- [ ] A photograph or digital image of the site showing both the body of water and the project area.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [ ] Evidence of any discussions with the US Fish and Wildlife Service (USFWS), and/or your State Wildlife Agency concerning any potential impacts if there is the potential for the project to affect any water body.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 8 - Coordination Letter to NCWRC.pdf	11/23/2021	keren.bolter@arcadis.com	endangeredSpecies.attachmentIds	*No description given.*	
EHP Attachment 7 - Vegetation Photo Log.pdf	11/23/2021	keren.bolter@arcadis.com	endangeredSpecies.attachmentIds	*No description given.*	
EHP Attachment 6 - Endangered Species Map and List.pdf	11/23/2021	keren.bolter@arcadis.com	endangeredSpecies.attachmentIds	*No description given.*	

D. Clean Water Act, Rivers and Harbors Act, and Executive Order 11990 (Protection of Wetlands)

1. Will the project involve dredging or disposal of dredged material, excavation, adding fill material or result in any modification to water bodies or wetlands designated as 'waters of the U.S' as identified by the US Army Corps of Engineers or on the National Wetland Inventory?	**Not known**
Please provide an explanation and any information about this project that could assist FEMA in its review.	**The project interacts with a small strip of emergent freshwater wetland as can be seen in EHP Attachment 9.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 9 - Wetlands Map.pdf	11/23/2021	keren.bolter@arcadis.com	waterBodyOrWetlandModification.attachmentIds	*No description given.*	
EHP Attachment 10 - Coordination Letter to USACE.pdf	11/23/2021	keren.bolter@arcadis.com	waterBodyOrWetlandModification.attachmentIds	*No description given.*	
Attachment F – Wayland Drive Drainage Improvement Options Report.pdf	11/23/2021	keren.bolter@arcadis.com	waterBodyOrWetlandModification.attachmentIds	*No description given.*	

E. Executive Order 11988 (Floodplain Management)

1. Does a Flood Insurance Rate Map (FIRM), Flood Hazard Boundary Map (FHBM), hydrologic study, or some other source indicate that the project is located in or will affect a 100 year floodplain, a 500 year floodplain if a critical facility, an identified regulatory floodway, or an area prone to flooding?	**Yes**
Please explain in the text box below and/or provide any documentation to identify the means or the alternatives considered to eliminate or minimize impacts to floodplains (See the 8 step process found in 44 CFR Part 9.6.) to help FEMA evaluate the impact of the project:	**This project does not impact a modeled FEMA special flood hazard area. The project does address flooding issues identified through independent modeling seen in Attachment G - Stormwater Modelling Results Flood Inundation Maps.**

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

2. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?	**Yes**

If Yes, please indicate below any other information you are providing to help FEMA evaluate the impact of the project:

- [x] Hydrologic/hydraulic information from a qualified engineer to demonstrate how drainage and flood flow patterns will be changed and to identify down and upstream effects.
- [x] Request for information and response letter from the state water resource agency, if applicable, with jurisdiction over modification of waterways.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 11 - FIRM.pdf	11/23/2021	keren.bolter@arcadis.com	affectTo100Or500YearFloodplain.attachmentIds	*No description given.*	
EHP Attachment 12 - Coordination Letter to Floodplain Manager.pdf	11/23/2021	keren.bolter@arcadis.com	affectTo100Or500YearFloodplain.attachmentIds	*No description given.*	
Attachment G – Stormwater Modelling Results Flood Inundation Maps.pdf	11/23/2021	keren.bolter@arcadis.com	affectTo100Or500YearFloodplain.attachmentIds	*No description given.*	

F. Coastal Zone Management Act

1. Is the project located in the state's designated coastal zone? **No**

G. Farmland Protection Policy Act

1. Will the project convert more than 5 acres of prime or unique farmland outside city limits to a non-agricultural use? **No**

H. Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (Hazardous and Toxic Materials)

1. Is there a reason to suspect there are contaminants from a current or past use on the property associated with the proposed project? **No**

2. Are there any studies, investigations, or enforcement actions related to the property associated with the proposed project? **No**

3. Does any project construction or operation activities involve the use of hazardous or toxic materials? **No**

4. Do you know if any of the current or past land-uses of the property affected by the proposed project or of the adjacent properties are associated with hazardous or toxic materials? **No**

I. Executive Order 12898, Environmental Justice for Low Income and Minority Populations

1. Are there low income or minority populations in the project's area of effect or adjacent to the project area? **Yes**

If Yes, you must confirm that you have provided the following either in the text box below or by attachment: (If you have not provided these documents in any other section of the application, please attach the required documents or provide the description below.)

- [x] Description of any disproportionate and adverse effects to these populations.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Description of the population affected and the portion of the population that would be disproportionately and adversely affected. Please include specific efforts to address the adverse impacts in your proposal narrative and budget.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)	**This project is not anticipated to have any adverse impacts on low income or minority populations. The project will improve flood protections for residents in the area without causing adverse flood impacts in another area nor does it require displacement of any residents. Over 78% of the Population living in the affected Census Tract 33.07 identified themselves as a minority population and roughly 20% of the population lives below the poverty level. The CDC Social Vulnerability Index (SVI) scores Census Tract 33.07's overall vulnerability score as 0.8471 on a scale from 0 (least vulnerable) to 1 (most vulnerable) indicating a high level of vulnerability. These statistics indicate that the project will greatly benefit a large portion of low income and minority populations exceeding the Justice-40 initiative laid out in Executive Order 14008.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment C - Supporting Documentation for Population Impacted.pdf	11/23/2021	keren.bolter@arcadis.com	lowIncomeMinority.attachmentIds	*No description given.*	

J. Other Environmental/Historic Preservation Laws or Issues

1. Are there other environmental/historic preservation requirements associated with this project that you are aware of?	**No**
2. Are there controversial issues associated with this project?	**No**
3. Have you conducted any public meeting or solicited public input or comments on your specific proposed mitigation project?	**No**

K. Summary and Cost of Potential Impacts

Having answered the questions in parts A. through J., have you identified any aspects of your proposed project that have the potential to impact environmental resources or historic properties?	**No**

Evaluation

Is the applicant participating in the Community Rating System (CRS)?	**Yes**
Select rating.	**8**
Is the applicant a Cooperating Technical Partner (CTP)?	**No**
Was this created from a previous FEMA HMA Advance assistance / Project scoping award?	**No**

Has the applicant adopted building codes consistent with the international codes?	**Yes**
Year of building code	**2015**
Please provide the building code.	**IRC and ICC**
Have the applicant's building codes been assessed on the Building Code Effectiveness Grading Schedule (BCEGS)?	**Yes**
Select rating.	**5**
Describe involvement of partners to enhance the mitigation activity outcome.	**The City aims to build a culture of preparedness and foster partnerships through Wayland Drive Drainage Improvements. This project directly affects NCDOT assets and previous flooding has disrupted service on South Reilly Road. A City Council working session worked closely with NCDOT to prepare the proposed solution to this issue, and coordination with the Department will be ongoing through completion of the project. These organizations have also been in contact with State Senator Ben Clark and Representative William Richardson to strengthen State level awareness and support for the project. Additionally, the City has a Stormwater Advisory Board that meets regularly. The board is made up of citizens in the community and has been providing advice on Wayland Drive Drainage Improvements. The Board's official letter of support is forthcoming and will be provided upon receipt. These partnerships are demonstrated through the following meetings: • An October 8, 2020, meeting where the City worked with the NCDOT to review the alternatives that were modelled and jointly choose the third alternative. The selected alternative was the only option that did not impound water directly upstream of NCDOT's right-of-way (see ATTACHMENT N). • A November 2, 2020, meeting which was attended by the City, NCDOT, and elected officials including Representative William Richardson and Senator Ben Clark. The City described the project and shared the report and exhibits. They also shared the desire to seek federal pre-disaster mitigation funding. All were in alignment and offered support to help implement the project. • A September 21, 2021, meeting with NCDOT was held affirming continued support for the project and bolstering communication and coordination between the entities involved (ATTACHMENT N). • A January 4, 2022, meeting with the Storm Water Advisory Board indicating support for and approval of the project (ATTACHMENT N).**
Discuss how anticipated future conditions are addressed by this project.	**Future conditions were accounted for through considerations of changing precipitation patterns driven by climate change, as well as population and land use changes that would impact stormwater capacity requirements. FUTURE CHANGES IN PRECIPITATION Due to climate change, North Carolina is expected to see increased precipitation during all seasons, with more significant increases expected in the Winter and Spring. It is also expected that heavy precipitation events (above the 99th percentile of daily values) will increase across the country including for Fayetteville, requiring stormwater systems to accommodate more water over shorter periods. ATTACHMENT O includes projected precipitation change by season from the Fourth National Climate Assessment (NCA) derived from CMIP5 simulations, and projected change in heavy precipitation also from the NCA. Additionally, the City of Fayetteville is at risk from impacts brought on by hurricanes. Although the risk associated with high winds is less of a concern due to the City's inland location, hurricanes can bring large amounts of precipitation. With climate change driving an increased frequency and intensity of these storms, the City must be prepared for the likely eventuality of one of these events. To prepare for future conditions the City assumes a 6% increase (ATTACHMENT O) to existing rainfall depths obtained from NOAA Atlas 14 point precipitation frequency estimates to account for uncertainty in future precipitation characteristics. Increased precipitation requires the City to manage stormwater effectively to continue protecting its residents from the risk of flooding today and**

under the conditions of tomorrow. FUTURE LAND USE AND POPULATION GROWTH ATTACHMENT O contains an excerpt from the Demographic Profile Report, a component of the 2040 Comprehensive Plan (June 2020). The report uses 2014-2018 ACS 5-Year Estimates estimating the population of Fayetteville to be 209,867. This population is projected to grow to 232,366 by the year 2040, roughly 11% over the next 20-years. The project is in a likely growth area given the appeal of the new interchange off highway 295 (ATTACHMENT P) and has been identified as such in the Future Land Use Plan (ATTACHMENT O). The Plan designates the area primarily for a future land use of Medium Density Residential, and Employment Center and observes that "Much of the vacant land within the City is located around the I-295 corridor. This is expected to change over the next decade as the project nears completion." This observation is further corroborated by suitability maps that indicate opportunities in the area. Therefore, it is expected that a significant portion of the expected population growth will take place within and around the project area. This project also considers land use change on a more local scale, accounting for a proposed church development just south of Wayland Drive. A comparison scenario was modeled that included the proposed church development and replacing two 18-inch driveway pipes with a single 48-inch driveway pipe. Without pipe replacement flooding would increase at Wayland Drive, however in anticipation of potential development NCDOT, a partner on the project, has replaced the 18-inch driveway pipes with the single 48-inch pipe to allow water to flow through the system, reducing impacts to Wayland Drive. Additionally, as part of the church development, a stormwater control measure (SCM) will be required to control and treat the 10-year storm event. More details about the proposed church development can be found in ATTACHMENT F. To effectively manage stormwater the City of Fayetteville must account for changes in land use that increase impervious surfaces, increases in population that that drive land use change, as well as changing climate conditions. By implementing this project, the City is taking steps to mitigate the risk of flooding today and proactively designing for the risks it expects to face in the future.

Additional comments (optional)

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment N - Partnership and Outreach Activities.pdf	01/07/2022	keren.bolter@arcadis.com	Evaluation Attachments	*No description given.*	
Attachment P – NCDOT Project for 295 Extension.pdf	11/24/2021	keren.bolter@arcadis.com	Evaluation Attachments	*No description given.*	
Attachment Q - Fayetteville NC BCEGS Report.pdf	11/24/2021	keren.bolter@arcadis.com	Evaluation Attachments	*No description given.*	
Attachment O - Future Conditions.pdf	01/06/2022	keren.bolter@arcadis.com	Evaluation Attachments	*No description given.*	

Comments & attachments

- **Community** — **0 comment, 0 attachments**
- **Mitigation plan** — **0 comment, 1 attachments**

▸ **Scope of work**	**0 comment, 9 attachments**
▸ **Budget**	**0 comment, 1 attachments**
▸ **Cost-effectiveness**	**0 comment, 2 attachments**
▸ **Evaluation**	**0 comment, 4 attachments**
▸ **Environmental/Historic Preservation (EHP)**	**0 comment, 15 attachments**
▸ **Location**	**0 comment, 5 attachments**

Introduction

Project location

Provide a detailed description of the proposed project's location.	**EHP ATTACHMENT 1 shows the general project location in western Fayetteville near the newly constructed I-295 corridor. As shown in EHP ATTACHMENT 5, construction activities will span from a storage facility on Wayland Dr that is adjacent to existing farmland to an approximately 5-acre section of woods near Yewelene Dr and Old Bunce Rd. The surrounding area is a mix of residential, commercial, industrial, and agricultural development. Additionally, there are multiple churches and a fire station adjacent to the project.**
Latitude	**35.055557**
Longitude	**-079.015149**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
EHP Attachment 1 - USGS Map.pdf	11/23/2021	keren.bolter@arcadis.com	Project Location Attachments	*No description given.*	
EHP Attachment 5 - Ground Disturbance Map.pdf	11/23/2021	keren.bolter@arcadis.com	Project Location Attachments	*No description given.*	

Project benefiting area

Provide a detailed description of the proposed project's benefiting area.	**The benefitting area is composed of residential and industrial land. It is the drainage she along part of South Reily Road, extending to just north of Cliffdale and south to Glencorra Drive. The primary benefit of the project will convey to properties along Wayland Drive and within the Reily Road Industrial Park which will see a reduction in flooding from the proposed drainage improvements. The benefiting area also includes portions of South Reily Road, the rail line that runs parallel to that road, and the roads running through Reily Road Industrial Park.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment Q – Project Benefiting Area.pdf	11/23/2021	keren.bolter@arcadis.com	Location project benefiting area Attachments	*No description given.*	

Project impact area

Provide a detailed description of the proposed project's impact area.

The proposed project will impact a narrow corridor following the designed drainage improvements. These areas include the improved drainage ditch running from the west of the Wayland Drive properties southeast to the crossing point of Reily Road and the parallel rail line. Impacts will also run parallel to the east-west road in Reily Road Industrial Park going east-southeast towards Seventy First School Road. Finally, there will be impacts where the proposed stormwater storage area is to be located in a currently vacant area north of Old Bunce Road.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
Attachment F – Wayland Drive Drainage Improvement Options Report.pdf	11/23/2021	keren.bolter@arcadis.com	Location project impact area Attachments	*No description given.*	
EHP Attachment 5 - Ground Disturbance Map.pdf	11/23/2021	keren.bolter@arcadis.com	Location project impact area Attachments	*No description given.*	

Project site inventory

Does this project subapplication propose to mitigate a property/structure(s)? (Examples: residential home, commercial building, bridge, fire station, levee, pumping station, wastewater treatment plant, telephone pole, electric line, etc.) **No**

Please download the excel template, and then fill out the template with building or infrastructure data.

Assurances and certifications

OMB number: 4040-0009, Expiration date: 02/28/2022 View burden statement

SF-424D: Assurances - Construction Programs

Content:

OMB Number: 4040-0009
Expiration Date: 02/28/2022

Certain of these assurances may not be applicable to your project or program. If you have any questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure nondiscrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C.§794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C.§§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C.§874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a--1 et seq.).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.