



Hog Bayou Levee Repair – Phase II

**Guadalupe-Blanco River Authority
933 East Court Street
Seguin, TX 78155**

**Project Manager:
Brian Perkins
933 East Court Street
Seguin, TX 78155
830-379-5822
bperkins@gbra.org**

Funding Opportunity Announcement No. BOR-DO-20-F006

**WaterSMART Grants: Small-Scale Water Efficiency Projects
for Fiscal Year 2020**

Submission Date: March 4, 2020

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Executive Summary

Date: March 4, 2020

Legal Name of Applicant: Guadalupe-Blanco River Authority

City: Seguin

County: Guadalupe

State: Texas

The Guadalupe-Blanco River Authority (GBRA) proposes to utilize WaterSMART Small-Scale Water Efficiency Projects (SWEP) grant funding to complete a reinforcement project to harden the east levee on Hog Bayou, upstream of the Hog Bayou Saltwater Barrier Gate Structure. The proposed project is located in Calhoun County on the Texas Gulf coast. The Hog Bayou east levee has shown accelerated wear since Hurricane Harvey made landfall in August 2017. A total of 250 linear feet will be repaired, preventing the loss of freshwater that has been diverted from the Guadalupe River to serve municipal, industrial, and agricultural customers. Additionally, the levee repairs will significantly lessen occurrences of saltwater intrusion into the public drinking water supply. More important, and directly related to the Reclamation priorities of this Funding Opportunity Announcement (FOA), this project will increase water supplies, storage, and reliability under the Water Infrastructure Improvements for the Nation (WIIN) Act and other Authorities. A primary concern related to water reliability is the susceptibility of Diversion System embankments to uncontrolled flood overflows, which has resulted in historic breaches and associated inefficiencies in water delivery. Following Hurricane Harvey in August 2017, this issue reached a point in August of 2018 when low Guadalupe River water levels combined with a large breach near the Hog Bayou Saltwater Barrier effectively stopped water deliveries.

Based on a grant start date of October 1, 2020, GBRA expects to complete all project activities within one year, by September 30, 2021. The proposed project is not located on a Federal facility.

Background Data

The Guadalupe-Blanco River Authority (GBRA) is a political subdivision of the State of Texas which was established to develop, conserve and protect the surface water resources of the Guadalupe River and its tributaries. GBRA was established by the Texas Legislature and created in 1933 as a water conservation and reclamation district called the Guadalupe River Authority. In 1935, it was reauthorized by an act of the Texas Legislature as the Guadalupe-Blanco River Authority. GBRA provides stewardship for water resources in its ten-county statutory district, which begins near the headwaters of the Guadalupe and Blanco Rivers, ends at San Antonio Bay, and includes Kendall, Comal, Hays, Caldwell, Guadalupe, Gonzales, DeWitt, Victoria,

Calhoun and Refugio counties. The mission of the GBRA is to: “protect, conserve, reclaim and steward the resources of the ten-county District in order to ensure and promote quality of life for those we serve.” The vision statement of the GBRA is to be a widely recognized leader in managing water resources that benefit both people and the environment.

GBRA operates a total of twelve divisions throughout the Guadalupe River Basin. Three of these twelve divisions are located in the coastal basin, which is the location of the proposed activity, and includes the Calhoun Canal System, Port Lavaca Water Treatment Plant Division, and the Calhoun County Rural Water Supply Division.

The Calhoun Canal System provides a reliable raw freshwater source for many entities in Calhoun County. The water source is the Guadalupe River near Tivoli which utilizes seven water rights permits issued to GBRA by the State of Texas, and include Certificates of Adjudications 18-5484, 18-5173, 18-5174, 18-5175, 18-5176, 18-5177, and 18-5178. The annual authorized water allocation associated with these rights totals 172,501 acre-feet per year (acft/yr).

The Lower Guadalupe River Diversion System (diversion system) is a surface water conveyance system located in the Lower Guadalupe River Delta in Calhoun and Refugio Counties, Texas. The diversion system is comprised of approximately 8 miles of man-made channels and with natural bayous, and is used to divert fresh surface water from the Guadalupe River. The system includes several control structures including the Saltwater Barrier Dam, Hog Bayou Control Structure, Goff Bayou Control Structure, and an inverted siphon underneath the Victoria Barge Canal. The Diversion System was constructed to protect the freshwater supply from saltwater intrusion by use of levees and barriers raised to an elevation of 4 ft-msl.

The Lower Guadalupe Diversion System is a gravity flow system that extends approximately eight (8) miles from the Guadalupe River to an open junction box on the east side of the Victoria Barge Canal, then under the canal to the Calhoun Canal System pump station.

This diversion system serves a major portion of Calhoun County with water delivered from the Guadalupe River, including over 75% of the population of the county, three large industrial facilities, farmers/ranchers, and wildlife areas. The average system delivery in recent years is 50,000 acre-feet per year. On average, water delivery for agriculture and industrial users is 44,000 acre-feet per year, and 6,000 acre-feet per year for residential customers. Water is also delivered to agricultural users through 26 irrigation turnouts, primarily for rice irrigation but also including row crop, pasture, aquaculture and waterfowl operations. Through the Canal delivery system, approximately 1000 acres of rice is irrigated. The water supply is also used in various industrial

processes by petrochemical facilities operated by Seadrift Coke, INEOS Nitriles and the Dow Chemical Company near Seadrift, Texas. The GBRA Port Lavaca Water Treatment Plant processes the raw water supplied from the Calhoun Canal Division into treated drinking water. On-site water quality monitoring and testing is done to ensure that treated water meets all standards set by the Texas Commission on Environmental Quality, Texas Department of State Health Services and the United States Environmental Protection Agency. With a peak capacity of 6 million gallons per day, the plant provides treated water for the domestic and business needs of approximately 28,500 people (including permanent residents and vacationers). The permanent population of Calhoun County is projected to grow 55% from 24,037 to 37,454 people by 2070 according to the 2021 Draft Region L Water Plan, which when coupled with the increasingly large number of weekend and vacation homes in the county, highlights the continued need to deliver a safe and reliable water supply in an efficient manner. GBRA has a previous working relationship with Reclamation. A grant in the amount of \$450,000 was awarded in 2014 for the purpose of conducting a feasibility study for a desalination plant which would have been located off the Texas coast. The grant was completed in September 2017. The grant number was R14AC00052.

Project Location

The proposed project is located in the State of Texas and Calhoun County approximately 14 miles southwest of Port Lavaca and 7.5 miles northwest of Seadrift. The project latitude is 28.4836'N and longitude is -96.8133'W. A project site map is shown in Figure 1 on Page 6.

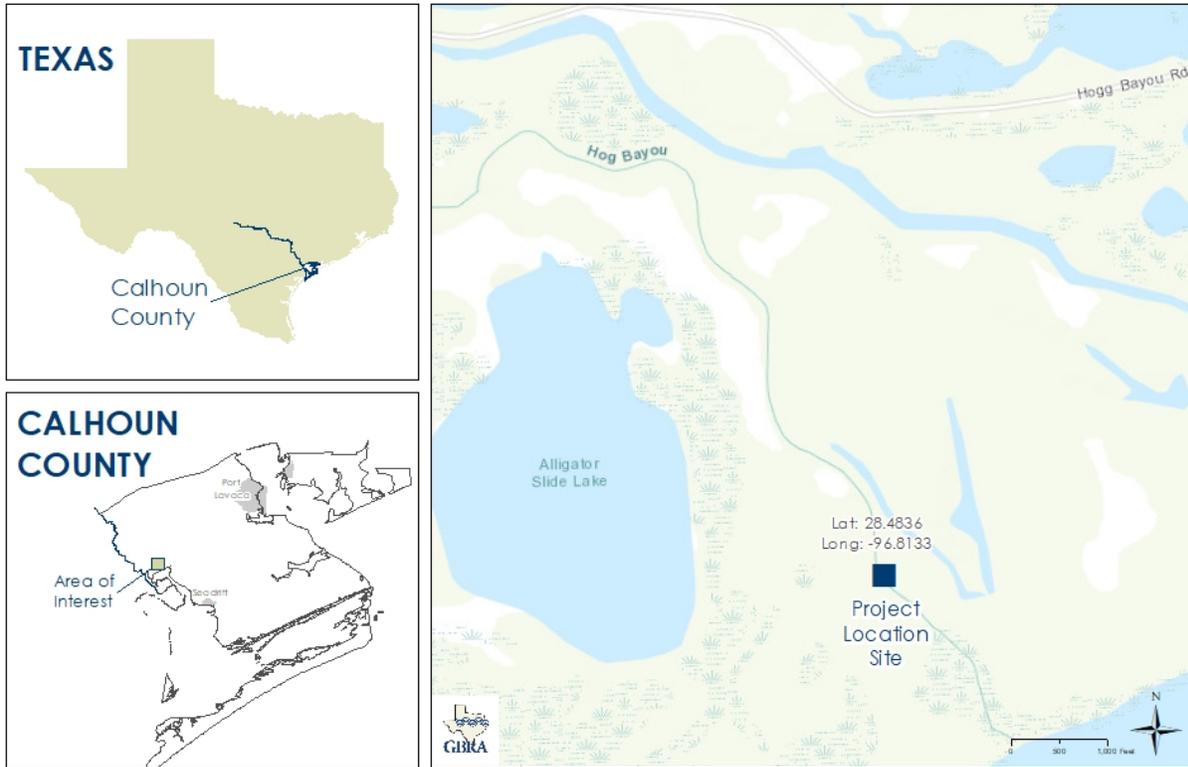


Figure 1 – Project Location

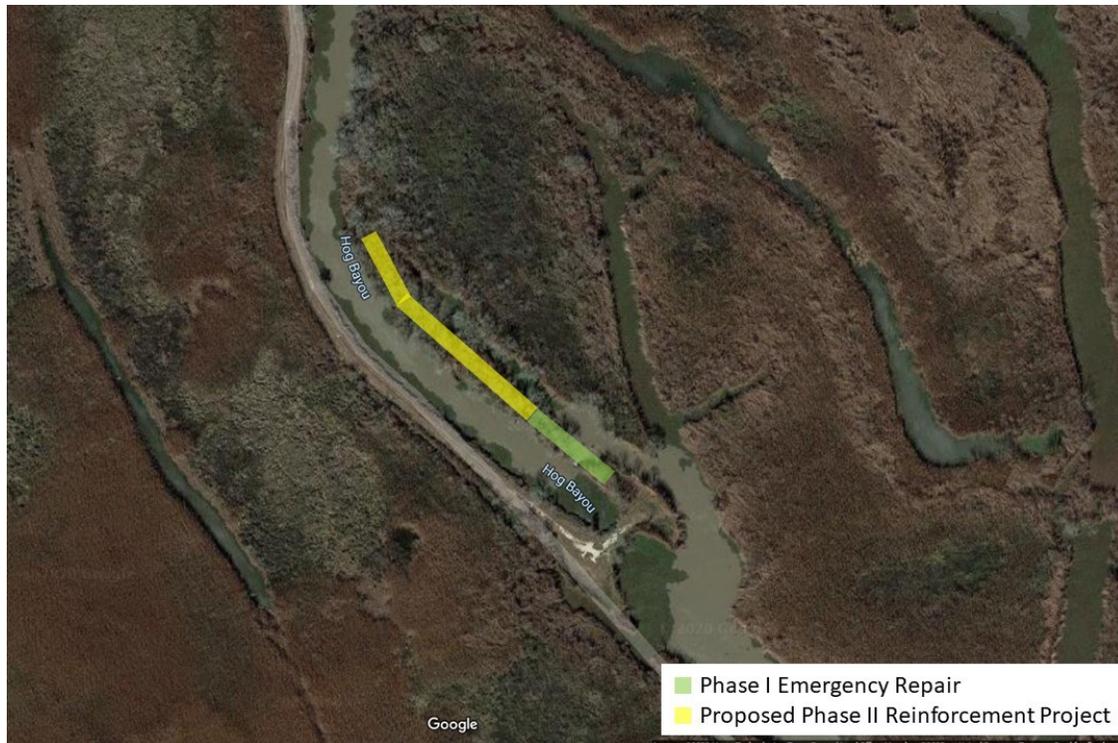


Figure 2 – Detailed Project Location

Technical Project Description

GBRA proposes the utilization of grant funds awarded under this FOA to reinforce the east levee of Hog Bayou, upstream of the saltwater gate control structure. The Hog Bayou east levee near the Hog Bayou gate structure has shown unprecedented wear since Hurricane Harvey in August 2017. Increased tide levels, along with the weakening of the levee caused by Harvey, have exacerbated the cuts made by native alligator species. It is important to note that these repairs are above and beyond normal O&M practices, and that through these repairs, GBRA is upgrading the levee that will lead to improved freshwater efficiency.

GBRA released a Request for Qualifications in May 2018 that sought professional engineering services to conduct a study of the diversion system to evaluate necessary levee repairs and the rehabilitation, replacement, adjustment and installation of associated control structures. GBRA engaged with a firm in August 2018, and they were tasked with updating an available hydraulic model and evaluating temporary and permanent diversion system repair alternatives. A draft report was submitted in March 2019, outlining multiple repair alternatives.

Phase I emergency repairs were completed on the most severely eroded portions of the Hog Bayou east levee, immediately upstream of the Hog Bayou gate structure, in 2019. The linear distance of the repair covered approximately 100 feet. Through the use of 3,330 cubic yards of dense clay brought in from Bloomington, TX and 667 square yards of turf reinforced mat material, the Phase I repairs have been successful in decreasing loss of fresh water intended for municipal, industrial, agricultural, and wildlife uses.



Figure 3 – Pictures of Dense Clay Being Installed During Phase I Emergency Repairs



Figure 4 – Completed Phase I Project Showing Reinforced Mat Material

The Phase II repairs seek to extend these efforts to approximately 250 linear feet along the eastern levee and repair/reinforce additional cuts/breaches upstream of the Phase I repairs. It is estimated that approximately 5000 cubic yards of dense clay and 1000 square yards of turf reinforced mat material will be needed for the project.

Hydraulics Evaluation

Hog Bayou south of SH 35 is intended to be a closed hydraulic system during typical water deliveries. Thus, if there are no breaches along the levee system downstream of SH 35, the system acts as many diversion canal delivery systems and has an efficiency with minimal losses due to seepage and evapo-transpiration. However, the closed hydraulic system downstream of SH 35 has been weakened due to large storm events, such as Hurricane Harvey, and rising sea level tides. As such, cuts made by native alligators are magnified, causing large breaches that are unnecessarily wasting freshwater lost to the estuary.

Hydrologic Evaluation

The aforementioned Arcadis/HDR study developed the discharge rating curves for various cuts and breaches in the diversion canal system. Losses from Hog Bayou, based on these rating curves, are determined based on the headwater and tailwater conditions. However, as shown in Figure 4, minor variations in headwater/tailwater conditions can rapidly lead to water loss over 50 cfs. Reinforcement of the eastern levee will drastically reduce these losses and through the use of improved clay material and the reinforced mat.

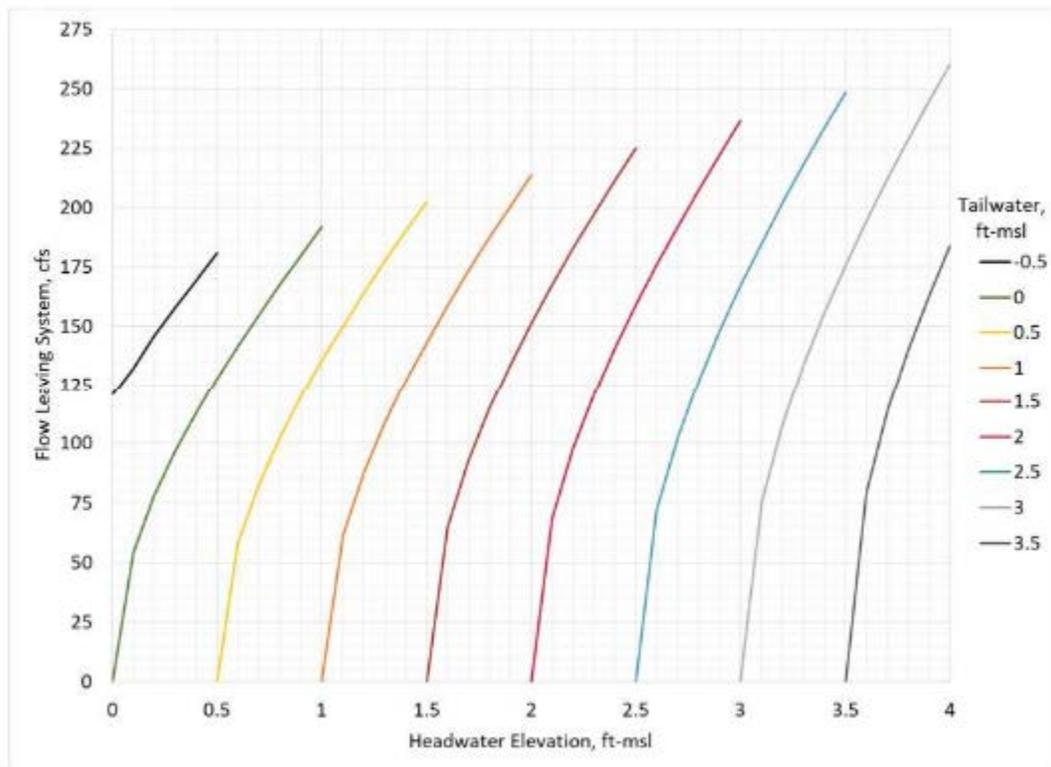


Figure 5 – Hog Bayou Water Loss Estimates

Evaluation Criteria

E.1.1. Evaluation Criterion A—Project Benefits

- Describe the expected benefits and outcomes of implementing the proposed project.
 - What are the benefits to the applicant’s water supply delivery system?

Completion of the proposed project will result in a reduction of the loss of freshwater diverted from the Guadalupe River for municipal, industrial, and agricultural customers.

The repairs to be made through WaterSMART funding would extend beyond normal operations, maintenance, and replacement. These repairs would instead result in an upgraded levee that could better withstand sea level rise, increased tide levels, and tropical weather and flood events. It is estimated that repair of the levee would eliminate up to 10% of freshwater loss in the diversion canal system - or up to 36,200 acre-feet - on an annual basis.

Upgrading the east levee with improved clay and reinforced mat material would improve water supply reliability through the elimination of up to 36,200 acre-feet of freshwater losses annually. The expected geographic scope benefits include Calhoun County, of which 75% of its permanent residents receive drinking water from the diversion canal system. In addition, the tourism and recreation sectors would receive the positive impacts of improved water supply reliability for the large number of weekend homes and recreational visitors to Calhoun County.

The project will not complement any current work done in coordination with NRCS in the area; however, GBRA is considering applying for conservation funding through the EQIP program in current or future funding cycles.

E.1.2.Evaluation Criterion B—Planning Efforts Supporting the Project

Describe how your project is supported by an existing planning effort.

- **Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?**

The proposed project addresses a need identified in a report produced by a professional engineering firm GBRA engaged with to conduct a study of the diversion canal system for the evaluation of necessary levee repairs.

In addition, water resources planning efforts of GBRA, the South Central Texas Regional Water Planning Group, and the State Water Plan encourage the efficient use of existing supplies, either through elimination of waste or reallocation. The proposed project will make the best use of an existing source by eliminating 36,200 ac-ft/yr of water loss.

Finally, the proposed project aligns with the goals outlined in GBRA's Mission Statement. Specifically, GBRA is committed to "protect, conserve, reclaim, and steward the resources" of the district, and ensuring efficient freshwater supplies to valued customers in the lower basin is paramount to that commitment. The proposed project has been identified as an area of priority, mainly due to high amount of freshwater loss that could be averted – up to 36,200 acre-feet on an annual basis. In addition, the proposed project is of utmost importance due to the fact that the diversion system is the

sole source of water for 75% of Calhoun County residents, large-scale industries, and agricultural and wildlife interest. The citizens and the economy of Calhoun County is reliant upon the freshwater from the Guadalupe River delivered by this canal system.

E.1.3. Evaluation Criterion C—Project Implementation

- **Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.**

GBRA projects that all project activities will be completed within one year. The following project schedule is based on a grant start date of October 1, 2020; however, the project milestones and one-year schedule will remain the same regardless of grant award and project start dates.

**Hog Bayou Levee Repair – Phase II
Project Schedule**

| | 2020 | | | 2021 | | | | | | | | |
|---|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Grant Start-Up | | | | | | | | | | | | |
| Procurement of Contractor for Levee Repairs | | | | | | | | | | | | |
| Develop Repair Schedule | | | | | | | | | | | | |
| Levee Repairs | | | | | | | | | | | | |
| Inspections | | | | | | | | | | | | |
| Project Completion | | | | | | | | | | | | |

- **Describe any permits that will be required, along with the process for obtaining such permits.**

No permits are required for this project.

- **Identify and describe any engineering or design work performed specifically in support of the proposed project.**

GBRA released a Request for Qualifications in May 2018 that sought professional engineering services to conduct a study of the diversion system to evaluate necessary levee repairs and the rehabilitation, replacement, adjustment and installation of associated control structures. GBRA engaged with a firm in August 2018, and they were tasked with updating an available hydraulic model and evaluating temporary and permanent diversion system repair alternatives. A draft report was submitted in March 2019 outlining multiple repair alternatives, of which the proposed project was identified.

- **Describe any new policies or administrative actions required to implement the project.**

There are no new policies or administrative actions required to implement the project.

- **Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office?**

An environmental compliance estimate will not be required for the proposed project.

E.1.4. Evaluation Criterion D— Nexus to Reclamation

- **Is the proposed project connected to Reclamation project activities? If so, how? Please consider the following:**

- **Does the applicant receive Reclamation project water?**

GBRA does not receive Reclamation project water.

- **Is the project on Reclamation project lands or involving Reclamation facilities?**

The proposed project is not located on Reclamation lands and does not involve Reclamation facilities.

- **Is the project in the same basin as a Reclamation project or activity?**

There are no Reclamation projects or activities in the Guadalupe River Basin.

- **Will the proposed work contribute water to a basin where a Reclamation project is located?**

The project will not contribute water to a basin where a Reclamation project is located.

- **Will the project benefit any tribe(s)?**

The project will not benefit any tribes.

E.1.5. Evaluation Criterion E—Department of the Interior Priorities

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

- a. Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;**

As the agency charged with stewarding water resources in the Guadalupe River Watershed, GBRA will utilize data provided in current and future hydraulic studies to ensure that best practices are incorporated into managing these resources.

- b. Examine land use planning processes and land use designations that govern public use and access;**

Although this project is not located on any public lands, GBRA is cognizant of land use planning processes and land use designations that govern land use designations that govern public use and access throughout its statutory district.

- c. Revise and streamline the environmental and regulatory review process while maintaining environmental standards.**

GBRA will adhere to all federal and state environmental standards in the implementation of this project.

- d. Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;**

GBRA will review DOI water storage, transportation and distribution systems to identify opportunities to resolve any future conflicts and expand capacity.

- e. Foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;**

GBRA has long-established relationships with conservation organizations in the project area, including the Guadalupe-Blanco River Trust, the Aransas Project, Texas Parks and Wildlife Department, and the San Antonio Bay Partnership.

f. Identify and implement initiatives to expand access to DOI lands for hunting and fishing;

There are no DOI lands in the project area.

g. Shift the balance towards providing greater public access to public lands over restrictions to access.

The project is not located on any public lands.

2. Utilizing our natural resources

a. Ensure American Energy is available to meet our security and economic needs;

GBRA makes every effort to ensure that all natural resources are available to meet the nation's security and economic needs.

b. Ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;

There are no known mineral resources in the project area.

c. Refocus timber programs to embrace the entire 'healthy forests' lifecycle;

There are no forests in the project area.

d. Manage competition for grazing resources.

There are no lands suitable for grazing in the project area.

3. Restoring trust with local communities

a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;

Although there are no Reclamation lands in the project area, GBRA is committed to being a better neighbor with those closest to Reclamation resources by maintaining, and improving when necessary, dialogue and relationships with persons and entities bordering Reclamation lands.

- b. Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.**

When necessary, GBRA will assist Reclamation in expanding the lines of communication with the Governor of the State of Texas, state natural resource officers, Fish and Wildlife offices, water authorities, county commissioners and local communities.

4. Striking a regulatory balance

- a. Reduce the administrative and regulatory burden imposed on U.S. industry and the public;**

GBRA is committed to supporting efforts to reduce the administrative and regulatory burden imposed on U.S. industry and the public.

- b. Ensure that Endangered Species Act decisions are based on strong science and thorough analysis.**

GBRA supports all efforts to ensure that Endangered Species Act decisions are based on strong science and thorough analysis.

5. Modernizing our infrastructure

- a. Support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;**

GBRA fully supports the White House Public/Private Partnership Initiative to modernize U.S. infrastructure.

- b. Remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;**

GBRA supports efforts to remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs.

c. Prioritize DOI infrastructure needs to highlight:

- 1. Construction of infrastructure;**
- 2. Cyclical maintenance;**
- 3. Deferred maintenance.**

GBRA will make every effort to prioritize DOI infrastructure needs to highlight construction of infrastructure, cyclical maintenance, and deferred maintenance.

- **Describe any permits that will be required, along with the process for obtaining such permits.**

No permits are required for this project.

- **Identify and describe any engineering or design work performed specifically in support of the proposed project.**

No engineering or design work is required to be performed in support of the proposed project.

- **Describe any new policies or administrative actions required to implement the project.**

GBRA does not anticipate the need for any new policies or administrative actions to implement the project.

- **Describe how the environmental compliance estimate was developed. Has the compliance cost been discussed with the local Reclamation office?**

An environmental compliance estimate will not be required for the proposed project.

Project Budget

Funding Plan and Letters of Commitment:

Project funding will not be provided by a source other than GBRA; therefore a letter of commitment is not included. GBRA's non-Federal share of project costs will include in-kind contributions of staff salaries and fringe benefits. The total value of GBRA in-kind contributions is \$17,801.03. GBRA will also contribute \$57,198.97 in cash as the cost-share portion of project costs for fill material/reinforcement and material installation costs. The source of the cash contribution is the GBRA General Fund.

| SOURCE | AMOUNT |
|---|---------------------|
| Costs to be reimbursed with the requested Federal funding | \$75,000.00 |
| Costs to be paid by the applicant | \$78,801.03 |
| Value of third party contributions | \$0.00 |
| TOTAL PROJECT COST | \$153,801.03 |

Budget Proposal

The proposed project budget is enclosed as a separate attachment.

BUDGET NARRATIVE

A. Salaries and Wages

Total: \$12,669.77

1. Stephanie Shelly, Division Manager – Calhoun/Refugio Counties – 2% of time on project; annual salary: \$94,762.90; cost-share portion: \$1,895.26
2. Curtis Gosnell, Chief Water Tender – 2% of time on project; annual salary: \$71,948.90; cost-share portion: \$1,438.98
3. Billy Penney, Maintenance Chief - 2% of time on project; annual salary: \$48,392.19; cost-share portion: \$967.84
4. Branden Wilson, Water Tender - 2% of time on project; annual salary: \$41,049.83; cost-share portion: \$821.00
5. Walter Brown, Heavy Equipment Operator – 2% of time on project; annual salary: \$45,929.73; cost-share portion: \$918.59
6. Brian Perkins, Senior Water Resource Engineer – 2% of time on project; annual salary: \$155,000; cost-share portion: \$3,100.00
7. Victor Castillo, Purchasing Manager – 2% of time on project; annual salary: \$57,844.80; cost-share portion: \$1,156.90
8. Tim Dusek, Grants Administrator – 3% of time on project; annual salary: \$79,040.00; cost-share portion: \$2,371.20

B. Fringe Benefits

Total: \$5,131.26

FICA will be paid for all salaries = \$1,006.24
 Long-Term Disability cost = \$55.42
 Group Life Insurance cost = \$87.23
 Workers Compensation cost = \$526.47
 Retirement for full-time employees: \$824.59
 Health/Dental Insurance cost for full-time employees: \$2,631.31

C. Fill Material & Reinforcement Costs **Total: \$122,000.00**

1. Dense Clay Fill Material – 5,000 cubic yards x \$22.00 per cubic yard = \$110,000.00
2. Turf Reinforced Mat Material – 1000 square yards X \$12.00 per square yard = \$12,000.00

D. Material Installation Costs **Total: \$14,000.00**

100 hours x \$140.00 per hour = \$14,000.00

E. Indirect Costs **Total: \$0**

N/A

Total Project Costs **Total: \$153,801.03**

Environmental and Cultural Resources Compliance

The proposed project will not require any environmental or cultural resources compliance.

Required Permits or Approvals

The proposed project will not require any permits or approvals.

Letter of Project Support

A letter of support is enclosed as a separate attachment.

Official Resolution

An official resolution will be approved by the GBRA Board of Directors at its March 18, 2020 meeting and will be submitted upon approval.

Unique Entity Identifier and System for Award Management

GBRA's registration in the System for Award Management (SAM) is active through 03/06/2020. The entity DUNS Number is 056311608, and the CAGE is 4WZE4.