

**STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION
AUTHORITY**

**MID-BRETON SEDIMENT DIVERSION PROJECT
STATE PROJECT No. BS-0030**

**CONSTRUCTION MANAGEMENT AT-RISK (CMAR)
SCOPE OF SERVICES**

October 23, 2018



**Coastal Protection and
Restoration Authority of Louisiana**

STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY

SCOPE OF SERVICES FOR MID-BRETON SEDIMENT DIVERSION
CONSTRUCTION MANAGEMENT AT RISK (CMAR)

October 2018

Acronyms and Abbreviations	4
Definitions	6
1 Project Introduction.....	9
1.1 Intent	9
1.2 Mississippi River Sediment Diversion Program Background	9
1.3 Mid-Breton Project Overview.....	10
1.4 Project Elements	13
1.4.1 River Inlet and Diversion Structure	13
1.4.2 Conveyance Channel	13
1.4.3 Gated Back Structure	13
1.4.4 Outfall Channel.....	13
1.4.5 Site Drainage.....	13
1.4.6 LA-39 Highway Crossing	13
1.4.7 Relocation of Utilities	13
1.4.8 Dredge Material Placement Area.....	14
1.5 Existing and Proposed Team Members	14
2 Scope of Services	16
2.1 Pre-Construction Phase Services	16
2.1.1 Project Management, General Administration, and Coordination.....	16
2.1.2 Scope Management.....	17
2.1.3 Cost Estimating and Cost Control.....	18
2.1.4 Constructability Review and Value Engineering.....	19
2.1.5 Project Schedule	19
2.1.6 Construction Planning.....	20
2.1.7 GMP Development	21

2.1.8	Deliverables	22
•	15% Design Milestone (BOD).....	22
•	30% Design Milestone.....	23
•	60% Design Milestone.....	23
•	90% Design Milestone.....	23
•	GMP Milestone.....	23
2.2	Construction Phase Services.....	23
3	Costs and Fees.....	26
3.1	Explanation of GMP	26
3.2	Cost of Work.....	26
3.3	General Conditions	26
3.4	CMAR Contractor Fee.....	26

Figures

Figure 1:	Mid-Basin Sediment Diversion Program Location	10
Figure 2:	Project Delivery Team.....	12
Figure 3:	Project Location	14

Acronyms and Abbreviations

AHP	Above Head of Passes
BOD	Basis of Design
CMAR	Construction Management at Risk
CPRA	Coastal Protection & Restoration Authority
EIS	Environmental Impact Statement
GC	General Conditions
GEBF	Gulf Environmental Benefit Fund
GMP	Guaranteed Maximum Price
ICE	Independent Cost Estimator
LAPELS	Louisiana Professional Engineering & Land Surveying
LCA	Louisiana Coastal Area
MBSD	Mid-Barataria Sediment Diversion Project
MBrSD	Mid-Breton Sediment Diversion Project
MRL	Mississippi River Levee
NEPA	National Environmental Policy Act
NFWF	National Fish & Wildlife Foundation
NOGC	New Orleans & Gulf Coast Railroad
NRDA	National Resource Damage Assessment
NTP	Notice to Proceed
NOV	New Orleans to Venice
OSHA	Occupational Safety & Health Administration
PDT	Project Delivery Team
PMP	Project Management Plan
Program	Mississippi River Mid-Basin Sediment Diversion Program

PMT	Program Management Team
QMP	Quality Management Plan
RFQ	Request for Qualifications
ROW	Right of Way
SAR	Safety Assurance Review
TPC	Third Party Contractor
USACE	United States Army Corps Engineers
WBS	Work Breakdown Structure

Definitions

All other capitalized terms used, but not defined herein, shall have the meaning ascribed to such term in this Scope of Services.

Business Day	Day on which CPRA is officially open for business.
Calendar Day	Every day shown on the calendar, beginning and ending at midnight.
Claim	A separate demand by CMAR Contractor for (a) a time extension which is disputed by CPRA, or (b) payment of money or damages arising from work done by or on behalf of CMAR Contractor in connection with the Contract which is disputed by CPRA. A Claim will cease to be a Claim upon resolution thereof, including resolution by delivery of a Change Order or Contract amendment signed by all parties.
Construction Contract	The written agreement between CPRA and the CMAR Contractor setting forth the obligations of the parties with respect to the construction of the Project, including, but not limited to, the performance of the work, the furnishing of labor, materials, and equipment, and the basis of payment.
Construction Management At Risk	A project delivery system that entails a commitment by the construction manager to deliver the Project within a guaranteed maximum price (GMP), in most cases. The CMAR Contractor acts as the construction manager to CPRA in the development and design phases and as the equivalent of a general contractor during the construction phase.
Contract	Depending on the context, (a) the Pre-Construction Services Contract, or (b) the Construction Contract.
Contract Documents	The term “Contract Documents” shall mean this Pre-Construction Services Contract including all exhibits hereto.
Cost Proposal	Construction Manager’s proposed reimbursement rates for performing the work under this Pre-Construction Services Contract.
Day	References to “days” or “Days” shall mean Calendar Days unless otherwise specified, provided that if the date to perform any act or give any notice specified in the Contract Documents (including the last date for performance or provision of notice “within” a specified time period) falls on a non-Business Day, such act or notice may be timely performed on the next succeeding day which is a Business Day.
Disadvantaged Business Enterprise	A for-profit small business concern as defined in 49 CFR Part 26.
Guaranteed Maximum Price	Negotiated price between CPRA and CMAR Contractor for construction of the Project or portion thereof.

Holidays	Those days designated as State holidays in the Government Code.
Indirect Costs	Jobsite Overhead and General Conditions are included when Indirect Costs are referenced in the document.
Key Personnel	The persons listed in the CMAR Contractor's SOQ to perform the Pre-Construction services work, subject to revision in accordance with the Contract.
Opinion of Probable Cost (OPCC)	An estimate prepared by the CMAR Contractor that reflects the estimator's opinion as to the probable costs that a prudent contractor would include in his/her tender to construct the defined facilities. Unless specifically stated, the OPCC does not capture framework costs borne by CPRA for Pre-Construction activities or for expenses related to the management and support of field construction activities. The OPCC is intended to be an indication of fair market value and is not necessarily a predictor of lowest bid. Fair market value is assumed to be a mid-range tender considering four or more competitive bids. Finally, OPCC pricing is predicated on the contractor's compliance with all contract specifications and design parameters during field execution activities. OPCC may also be referred to as the cost estimate.
Person	Any individual, corporation, company, voluntary association, partnership, trust, unincorporated organization or Governmental Person, including CPRA.
Pre-Construction Services Contract	This written agreement between CPRA and the CMAR Contractor setting forth the obligations of the parties with respect to the performance of certain services during the design phase including, but not limited to, scheduling, pricing, and phasing to assist CPRA to design a more constructible Project.
Project	Mid-Breton Sediment Diversion Project and all other work product to be provided by Construction Manager in accordance with the Contract Documents.
Scope of Work, Work	All duties and services to be furnished and provided by CMAR Contractor as required by the Contract Documents, including the administrative, quality control, quality assurance, procurement, legal, professional, manufacturing, supply, installation, supervision, management, testing, verification, labor, materials, equipment, documentation and all other efforts necessary or appropriate to complete the Scope of Work contained in Exhibit B except for those efforts which the Contract specify will be performed by CPRA or other Persons. In certain cases, the term is also used to mean the products of the work.
State	The State of Louisiana acting through its elected officials and their authorized representative, or the State of Louisiana in the geographic sense, depending on the context.

Subcontract	Any subcontract to perform any part of the work or provide any Materials, equipment or supplies for any part of the work between Construction Manager and a Subcontractor, or between any Subcontractor and its lower tier Subcontractor, at any tier.
Subcontractor, Subconsultant or SubCMAR Contractor	Any Person with whom CMAR Contractor has entered into any Subcontract and any other Person with whom any Subcontractor has further subcontracted any part of the work, at any tier.
Work Breakdown Structure	A deliverable-oriented grouping of Project components that organizes and defines the total scope of the Project.

1 Project Introduction

1.1 Intent

This Scope of Services is for Construction Management At-Risk (CMAR) Services, for the Mid-Breton Sediment Diversion Project (CPRA Project Number BS-0030) (Mid-Breton Project or the Project), with a focus on the Pre-Construction Phase Services. The Project is located on the east bank of the Mississippi River at river mile 68 AHP. The intent of the project is to capture and convey sediment laden water from the Mississippi River to the Breton Sound Basin.

Engineering and Design (E&D) Services for the Project will be performed by the Design Team, led by Stantec. The CMAR Contractor will collaborate with the Design Team during the Pre-Construction Phase to facilitate constructability, cost control, scope management, temporary works planning and design, and other project elements as fully described in this scope of services. The intent of the CMAR delivery method is to establish an environment of collaboration, trust, and partnership between the CMAR Contractor, the Design Team, CPRA, and the appropriate regulatory agencies from the beginning of the Pre-Construction services through project delivery. The CMAR Contractor, Design Team, and CPRA have a common goal to design and, if CPRA approves, construct a quality project meeting CPRA's needs, within CPRA's schedule, at a reasonable and appropriate cost to CPRA, and with a reasonable and appropriate fee for the CMAR Contractor and Design Team.

1.2 Mississippi River Sediment Diversion Program Background

The CPRA identified sediment diversions as one of the types of projects critical to the restoration of Louisiana's coastal ecosystem. By reconnecting the river, these projects will reestablish the deltaic processes to build, sustain and maintain wetlands in accordance with the Louisiana Comprehensive Master Plan for a Sustainable Coast (Coastal Master Plan), whose overarching objectives are:

- Flood Protection: Reduce economic losses from storm surge based flooding to residential, public, industrial, and commercial infrastructure.
- Natural Processes: Promote a sustainable coastal ecosystem by harnessing the natural processes of the system.
- Coastal Habitats: Provide habitats suitable to support an array of commercial and recreational activities coast wide.
- Cultural Heritage: Sustain the unique cultural heritage of coastal Louisiana by protecting historic properties and traditional living cultures and their ties and relationships to the natural environment.
- Working Coast: Promote a viable working coast to support regionally and nationally important businesses and industries.

In November 2015, upon the conclusion of several in-depth studies and modeling efforts, CPRA decided to initiate implementation of the Mid-Breton Project. To assist with timely efforts for procurement and management of design, environmental requirements, and construction of the Mid-Breton and Mid-Barataria Projects, the CPRA created the Mississippi River Mid-Basin Sediment Diversion Program (Program).

The funding for the planning, permitting, engineering and design for the Project is through the National Fish and Wildlife Foundation (NFWF) from the Gulf Environmental Benefit Fund (GEBF). The GEBF resulted from plea agreements on the *Deepwater Horizon* Oil Spill to fund projects benefiting the natural resources of the Gulf Coast that were impacted by the spill. Some elements of the Program may be funded from other settlement agreements from the *Deepwater Horizon* Oil Spill.

The Program includes diversion projects located on the west and east banks of the Mississippi River as shown on Figure 1.

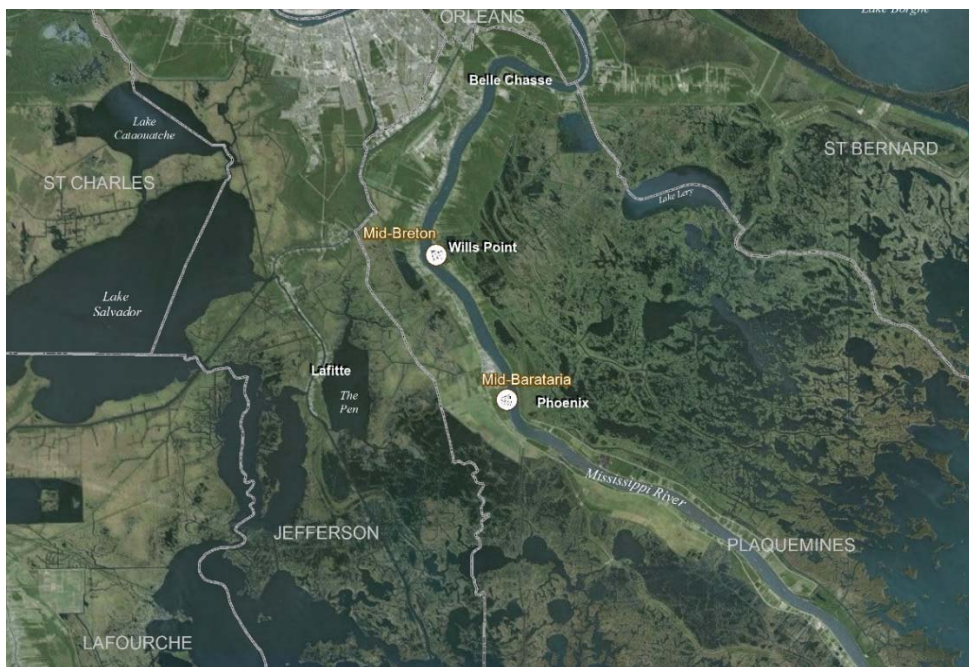


Figure 1: Mid-Basin Sediment Diversion Program Location

Both diversion projects will be designed to capture high amounts of sediment and freshwater carried downstream by the river during flood events and deliver them into their respective basins' wetlands and open water areas. The sediment deposited as a result of these projects is intended to build new wetlands, and to maintain and sustain existing wetlands in both basins.

1.3 Mid-Breton Project Overview

The Mid-Breton Project is a riverine sediment diversion being designed to strategically reintroduce sediment and freshwater inputs into the Breton Sound Basin. The proposed project location is on the east bank of the Mississippi River near Wills Point, near river mile 68 AHP (Figure 1). The project is anticipated to include an inlet channel, a gated structure at the Mississippi River Levee (MRL), a conveyance channel, interior drainage improvements, a structure/connection to the non-federal back levee, and highway alignment accommodations.

The Mid-Breton Project has a history in restoration planning in coastal Louisiana. The Mid-Breton Sediment Diversion Project (BS-030), previously referred to as the 'Medium Diversion at White Ditch (MDWD) Project' originated with the Louisiana Coastal Area (LCA) Ecosystem Restoration Study and was later authorized as a Water Resources and Development Act (WRDA) 2007 project. The State of Louisiana, acting through the CPRA, was the non-Federal sponsor for the LCA project, and the US Army Corps of Engineers (USACE) was

the federal sponsor that acted as the technical planning lead. The feasibility study resulted in a Chief's Report (signed December 31, 2010) containing a Recommended Plan to construct a Mississippi River diversion in the vicinity of White Ditch.

The project was recommended by the CPRA in fall 2015 to move forward to the preliminary engineering and design phase and was included in the 2017 Coastal Master Plan. The CPRA has performed limited studies and modeling to determine a recommended location of the diversion. Little to no field data collection has been performed for the previous work. A conceptual design has not been performed on this project. Relevant studies, modeling results and reviews are provided at <http://coastal.la.gov/mid-breton-existing-documents/>.

The vision for the Mid-Breton Project encompasses restoration of the natural sedimentation processes along the Mississippi River near Wills Point. The purpose of the Mid-Breton Project is to divert sediment-laden Mississippi River water into the Breton Sound Basin to re-establish the connection between the Mississippi River and the basin to build, sustain, and maintain land. The CPRA proposes to construct the diversion intake and control structure through the MRL on the east side of the Mississippi River near river mile 68 AHP, in Plaquemines Parish, LA, and to construct the diversion outfall through the non-federal levee into the Breton Sound Basin to allow sediment-laden water from the Mississippi River to flow into the Breton Sound Basin.

Goals and features of the project as provided include:

- Reconnect and reestablish the deltaic sediment deposition process between the Mississippi River and the Breton Sound Basin.
- Reduce land loss rates and sustain wetlands in the Breton Sound Basin through the delivery of sediment, freshwater, and nutrients from the Mississippi River.
- Use, as an initial basis of design, a peak flow capacity of approximately 35,000 cubic feet per second (cfs) from the Mississippi River Levee ("MRL") through the diversion structure and conveyance channel to the Breton Sound Basin. The final diversion flow rates are to be designed to meet the project goals.
- Design and construct the diversion intake and control structure, conveyance channel, flood protection features and any additional necessary appurtenances to maximize sediment capture, maximize flow efficiency, and allow for operations adaptability, while minimizing Operations, Maintenance, Repair, Replacement and Rehabilitation.
- Meet state and federal design criteria and environmental compliance requirements as required to achieve project regulatory approval.
- Maintain the current level of flood risk reduction of the MRL and Plaquemines Parish non-federal levee system.

The CMAR Contractor will collaborate with the Design Team throughout the Pre-Construction Phase and provide input to the design pertaining to constructability, means and methods, sequencing, temporary works, cost and schedule to prepare for successful execution of the construction of this Project. The Design Team and the CMAR Contractor will prepare final, coordinated Construction Documents that detail the proposed Project. The CPRA Management Team (Program Management Team) will include CPRA staff and support staff from Jacobs. The full Mid-Breton Project Delivery Team (PDT) is shown on Figure 2 below.

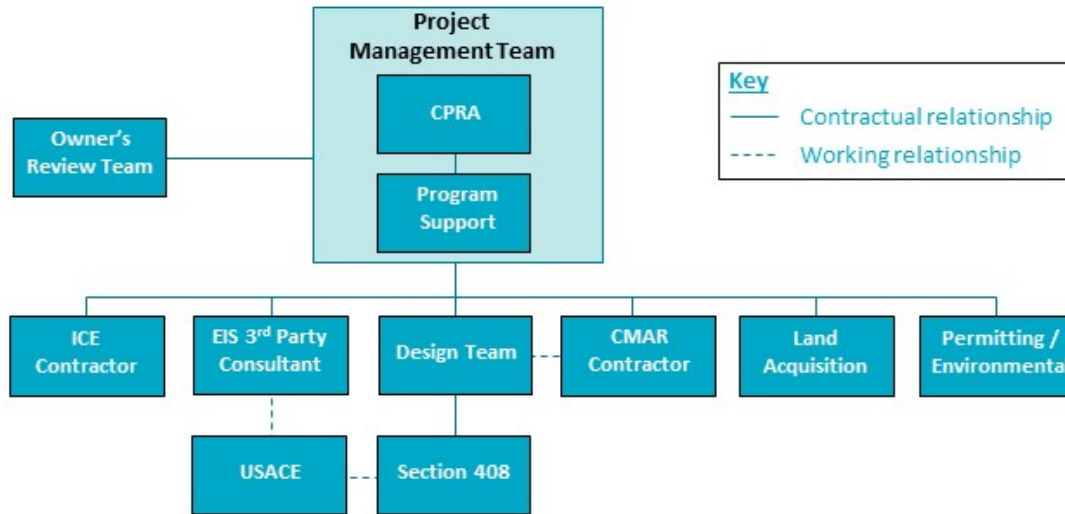


Figure 2: Project Delivery Team

The Project is subject to USACE Section 404/10 regulatory programs, and 33 United States Code Section 408 permissions to modify federal projects, which includes the Mississippi River Levee (MRL). The CPRA expects to submit a Section 404/10 permit application to the USACE in December 2018. The CPRA will procure the services of a third-party contractor (TPC) firm to prepare the Environmental Impact Statement (EIS) as required for National Environmental Policy Act (NEPA) compliance. The EIS work and efforts will be progressing concurrently with the development of the Project design.

These regulatory processes are critical to the delivery and schedule of the Project and will be coordinated by the CPRA and/or the Design Team and third-party contractor firm.

The Project milestones, as of October 2018 are provided in Table 1. These milestones are subject to modification due to permitting, EIS, or Section 408 process schedules.

Table 1: Project Milestones as of October 2018

Milestone	Month/Year
Design Team NTP	May 2018 (Actual)
5% Design	December 2018
CMAR Anticipated NTP	June 2019
15% (BOD) Design	March 2020
30% Design	May 2021
60% Design	June 2022
90% Design	November 2022
100% Design	May 2023
Construction Start	October 2023
Construction End	June 2028

1.4 Project Elements

The Project is anticipated to include the below features:

1.4.1 River Inlet and Diversion Structure

A controlled gravity flow reintroduction structure, installed through the MRL will be required. The conveyance channel would continue east to a possible back structure and into the Breton Sound Basin. The diversion inlet is expected to consist of the following features: Revetment Inlet Channel, Approach Channel, Control Structure, Outlet Channel, Transition Structure, and Transition Walls. The Diversion Structure may consist of the following: gate channels with foundation pilings, gates with mechanical operators, stop logs (one each side of the gates to allow for dewatering of gate as may so be required for maintenance).

1.4.2 Conveyance Channel

The conveyance channel will be designed based on hydraulic and geotechnical considerations to convey the sediment-laden river water from the Control Structure to the Basin without overtopping the guide levees and with enough velocity to prevent buildup of siltation in the channel and with protection against scour.

1.4.3 Gated Back Structure

A gated back structure may or may not be required through the non-federal levee, on the downstream end of the conveyance channel. The design may consist of a transition, back structure with gated channels and a dredged transition into the basin.

1.4.4 Outfall Channel

The design is expected to have an Outfall Channel that will disperse the channel flow into the basin. The outfall is a dredged channel extending into the basin beyond the non-federal levee.

1.4.5 Site Drainage

The new Conveyance Channel will divide the current drainage area. Many options exist for handling the storm water from the north of the Conveyance Channel. The need for a new pump station, a drop structure, or a siphon structure/pipe(s) will be evaluated during the Design Phase.

1.4.6 LA-39 Highway Crossing

Louisiana Highway LA-39 is a north–south state highway that serves Plaquemines Parish. The new Conveyance Channel will require modifications to the existing highway. All associated roadway and bridge work is to be designed and constructed in accordance with Louisiana Department of Transportation and Development (DOTD) design standards and construction specifications and DOTD Bridge Load Rating requirements and in coordination with DOTD.

1.4.7 Relocation of Utilities

The Design Team is responsible for identifying all utilities in the project area and for coordinating with and accommodating all utilities that will be impacted by the diversion. These utilities should be assumed to be required to be relocated prior to the start of construction of the diversion complex. Details of these potential relocations are to be coordinated by the Design Team with the utility companies and CMAR planned construction activities.

1.4.8 Dredge Material Placement Area

This element is for the placement of materials hydraulically and mechanically dredged for the construction of the Diversion Complex or other areas where large scale excavation may occur. The amount of available material to be placed in the Dredge Fill Area will depend on the cut and fill balance of the Conveyance Channel as designed.

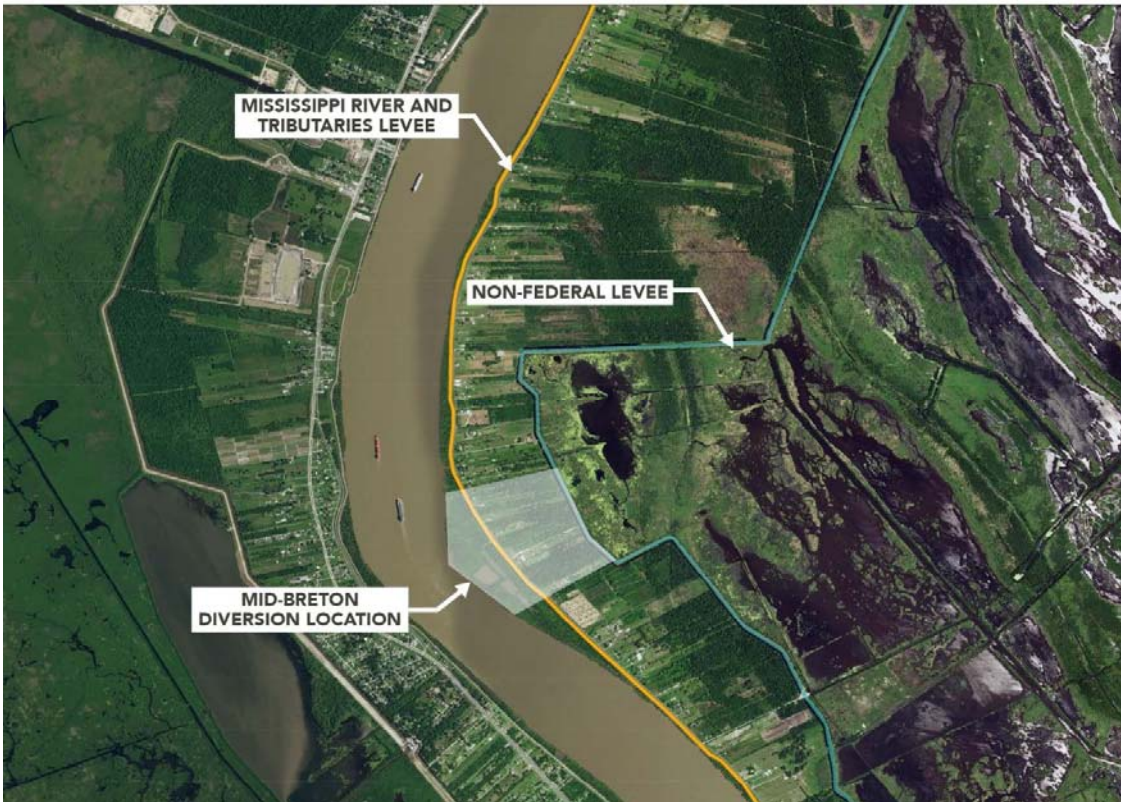


Figure 3: Project Location

1.5 Existing and Proposed Team Members

The full PDT will be composed of the Program Management Team (CPRA and support staff from Jacobs), CMAR Contractor, Design Team, EIS TPC, Independent Cost Estimator (ICE), and other consultants as determined by CPRA (Figure 2). The PDT is tasked by CPRA to be cooperative and collaborative in successfully completing the Project on schedule and within the overall budget.

- **Project Delivery Team.** CPRA has selected Stantec as the Project Design Team. The Design Team's designated representative for the Project will be identified at a later date. The Program Management Team will be comprised of CPRA employees assigned to this Project and support staff from Jacobs.
- **CMAR Contractor Selection Method.** CPRA is required by state law to follow specific procedures in selecting the CMAR Contractor for this Project. CPRA intends to select the CMAR by issuing a

Request for Qualifications as set forth in 2014 Louisiana Laws, RS 38:2225.2.4 - Construction Management at Risk; Public Entity.

- **Additional Professional Services.** CPRA may contract separately for the following services. CPRA reserves the right to retain other professionals and consultants to assist with monitoring the Work.
 1. Third Party Construction Administration, Testing, and Inspection services;
 2. Independent Cost Estimator services;
 3. Owner's Review Team services;
 4. Engineering Services during Construction; and,
 5. Safety Assurance Review (SAR).

2 Scope of Services

CMAR services will be carried out in a minimum of two phases with separate contracts and fees for each. In the Pre-Construction Phase, the CMAR Contractor will provide services during the engineering and design phase of the Project, as specified herein. The intent of the CMAR delivery method is to establish an environment of collaboration, trust, and partnership between the CMAR Contractor, the Design Team, the Program Management Team, and the appropriate regulatory agencies from the beginning of the Pre-Construction Phase throughout Project delivery.

At design completion, or at any point during the Pre-Construction Phase as may be required by CPRA, the CMAR Contractor will provide a Guaranteed Maximum Price (GMP) for the construction of the Project. If a GMP agreement is reached between CPRA and CMAR Contractor, the CMAR Contractor will be awarded a contract for the Construction Phase. Construction Phase services are generally outlined in this scope of services; however, the full scope of Construction Phase services will be developed during the Pre-Construction Phase. Construction Phase services will generally include, but not be limited to, mobilization, execution of subcontract and supplier agreements, construction works, demobilization, commissioning, etc.

The CMAR Contractor will not perform any phase of services until CPRA provides written notice to proceed for that phase. The CPRA may determine not to proceed with any and/or a portion of the Construction Phase Services, at the CPRA's sole discretion.

2.1 Pre-Construction Phase Services

The Pre-Construction Phase begins once the NTP is issued and ends once a final GMP has been agreed to by both the CMAR Contractor and the CPRA. Pre-Construction services to be provided by the CMAR Contractor include constructability reviews, value engineering, cost estimating and management, scope management, schedule development, construction planning, and GMP development as detailed below. As specified, the CMAR Contractor will have design responsibility for temporary works necessary to construct the project including, but not limited to, cofferdams, temporary retaining structures, and dewatering / unwatering systems.

CMAR Pre-Construction services will include, but not be limited to, the following:

2.1.1 Project Management, General Administration, and Coordination

- The CMAR Contractor shall collaborate with Program Management Team, Design Team and regulatory agencies and maintain a cooperative attitude throughout the life of the Project.
- The CMAR Contractor shall attend early action item workshops.
- The CMAR Contractor shall attend Pre-Construction chartering/team building meetings. The CMAR Contractor shall collaboratively work with Program Management Team to plan, attend, and actively participate in the Pre-Construction chartering meetings.
- The CMAR Contractor shall attend design review meetings and project team meetings.
- The CMAR Contractor shall have a minimum of five key personnel collocated with the Design Team and Program Management team for the duration of the Pre-Construction Phase. Collocation facilities will be secured by the Design Team and will be located within a five-mile radius of downtown Baton

Rouge. Co-located key personnel shall include the Senior Project Manager, Construction Manager, and Scope Manager meeting the minimum qualifications specified below.

- The CMAR Contractor shall participate in the Project Stage Gate review process with the Program Management Team at the completion of each phase of the Project prior to proceeding to the next phase.
- The CMAR Contractor shall integrate CPRA Program controls into CMAR Contractor Project delivery strategy.
- The CMAR Contractor shall become familiar with site conditions, site geology and geotechnical conditions, and constraints as they relate to design and construction.
- The CMAR Contractor shall attend brainstorming workshops for identification and ordering of long lead items.
- The CMAR Contractor shall be available to attend and assist with public presentations as requested by CPRA.
- The CMAR Contractor shall assist with providing documentation for permit applications as needed.
- The CMAR Contractor shall perform field visits and activities, as required.
- The CMAR Contractor shall develop, maintain, and distribute progress reports at a frequency as determined by the CPRA.
- CMAR Contractor shall incorporate CPRA requirements relating to quality, safety, community, and environmental factors.
- The CMAR Contractor shall secure additional necessary construction permits, including but not limited to dewatering, Plaquemines building / construction permit, occupancy permit, etc. (agency permit fees to be paid by the CMAR and reimbursed by CPRA with no markup).
- The CMAR Contractor shall participate in reviews and meetings as required for the 408 Construction Approval process.
- The CMAR Contractor shall become thoroughly familiar with the site and conditions surrounding the site and document the conditions observed on the site with photos or videos as required by CPRA.
- The CMAR Contractor shall follow the development of the design through final construction documents, review the in-progress plans and specifications, and become familiar with the evolving plans and specifications.
- The CMAR Contractor shall review the Risk Register developed by the Program Management Team and participate in Risk, Opportunity, and Innovation workshops to identify, define, and document other project-specific risk, opportunity, and/or innovation.
- The CMAR Contractor shall develop and maintain a Risk Register that will form the basis of the CMAR Construction Contingency.

2.1.2 Scope Management

- The CMAR Contractor shall conduct scope management during each design phase to ensure that design can be constructed for the established budget.
- The CMAR Contractor shall develop and maintain a scope management log to track scope and quantity changes along with cost impact with the objective of achieving a net zero change to the construction cost.
- The CMAR Contractor shall continuously monitor the impact of the proposed design on project schedule and recommend adjustments in the design documents including phasing and sequencing to ensure completion of the project in the most expeditious and cost-effective manner possible.

- CMAR Contractor shall provide scope management update as part of their progress reports.

2.1.3 Cost Estimating and Cost Control

- The CMAR Contractor shall review Basis of Design (BOD) and provide feedback on adequacy of the current project budget.
- The CMAR Contractor (in coordination with ICE Contractor) shall provide intermediate estimating support to the Design Team for design alternatives beginning with the BOD stage and continuing throughout the design phase.
- The CMAR Contractor shall participate in a meeting with the Program Management Team, Design Team and ICE Contractor, to establish baseline production rate assumptions and standards for formulation of future cost estimates and schedule estimates.
- The CMAR Contractor shall work with the Program Management Team to develop and align the work breakdown structure (WBS).
- The CMAR Contractor shall work with the Program Management Team to develop the format for the progressive estimates.
- The CMAR Contractor shall provide detailed open book cost estimates at 30%, 60% and 90% design milestones accompanied with prepared estimate narratives which include assumptions and clarifications.
- The CMAR Contractor shall prepare a detailed cash flow analysis for construction activities.
- The CMAR Contractor estimates shall be detailed open book estimates and shall include, but are not limited to the following:
 - WBS breakdown by facility, discipline, bid group or subcontract package, as agreed to by the Program Management Team
 - Material quantity take offs
 - Unit prices
 - Crew size/make up
 - Labor and equipment rates
 - Labor man hours and equipment hours
 - Labor and equipment production rates
 - Fuel consumption rates/costs
 - Subcontractor costs at an appropriate time and as subcontractors are brought on board
 - Scope assumptions and clarifications
- CMAR Contractor shall use commercial off-the-shelf estimating software. The estimating software Sage Timberline®, MC2®, US Cost Success®, and HCSS are acceptable software to be used to create construction cost estimates.
- The CMAR Contractor shall attend and participate in estimate review workshops to reconcile quantities and cost differences at 30%, 60% and 90% design milestones.
- The CMAR Contractor shall assist in reviewing the design to identify long lead procurement items (equipment, materials and supplies). When each item is identified, the CMAR Contractor shall notify the CPRA Project Manager of the required procurement and schedule.
- The CMAR Contractor shall monitor conditions in the construction market to identify factors that would or may affect costs and time for completing the project. CMAR contractor shall monitor and report escalation trends as required and determined by the CPRA.

2.1.4 Constructability Review and Value Engineering

- The CMAR Contractor shall review the Design Team's BOD submittal for constructability and provide written comments.
- The CMAR Contractor shall analyze the design for constructability, including construction feasibility and practicality, phasing and sequencing, and alternative materials and methods.
- The CMAR Contractor shall provide input and plan construction sequencing, access, temporary works, staging, laydown areas, storage, and sequencing on and off the site. Design of temporary works shall be the responsibility of the CMAR Contractor, as specified in Section 2.1.6 of this Scope of Services.
- The CMAR Contractor shall provide constructability and value engineering review of design at BOD, 30%, 60% and 90% development stages. The constructability review will outline items that in CMAR's opinion may cause problems during construction and identify discrepancies between the drawings and specifications that may result in Change Orders or claims during construction. The value engineering review will offer suggested revisions to the design that will reduce construction cost and/or construction duration, while not impacting project function and/or operating costs.
- The CMAR Contractor shall provide input on construction feasibility; availability of materials and labor; time requirements for installation and construction; temporary project facilities; cost factors, including costs of alternative materials or designs, preliminary budgets, and possible cost savings.
- The CMAR Contractor shall review and consult with the Design Team on the life cycle design and costs for operations and maintenance of the proposed Project. The CMAR Contractor shall review and consult with the Design Team on individual products or Project component's service life which may differ from the overall Project service life considering life cycle design and cost. For purposes of this scope of services, the CMAR Contractor should assume a minimum service life of 100 years for the Project. The life cycle design shall ensure Project performance throughout the service life, with reasonable ownership requirements for inspection, evaluation, maintenance, repair, rehabilitation, and replacement considering the life cycle cost over the entire Project service life.
- The CMAR Contractor shall provide suggestions on possible alternatives that could reduce costs, improve Project quality, reduce risk, and/or shorten the schedule. The CMAR Contractor will advise on likely construction phasing and sequencing approaches as well.
- The CMAR Contractor shall assist in exploring alternative innovative cost and time saving approaches, materials and systems to minimize total construction and operation costs.
- The CMAR Contractor shall provide recommendations for the use of fast tracking, early ordering of materials, and any other procedures that will maximize the available funds for the project and speed project delivery, actions designed to minimize adverse effects of labor or material shortages, and time requirements for procurement.

2.1.5 Project Schedule

- The CMAR Contractor shall create a baseline draft Project construction schedule at the 30% design milestone.
- The CMAR Contractor will update the construction schedule with each progressive estimate and again with the GMP submittal. The CMAR Contractor shall provide a finalized construction schedule with its GMP, which will be included as part of the Construction Phase Services Contract (if awarded).
- The CMAR Contractor shall provide project planning and scheduling (using the critical path method) to minimize the construction impact and duration.

- Schedules shall be established according to the Program WBS and shall be kept in Primavera P6.
- Schedule submittals shall meet the following minimum requirements:
 - Baseline Progress Schedule Format: CMAR Contractor shall use the precedence diagramming methods. The WBS of the Baseline Schedule shall be formatted in a manner consistent with the Program WBS.
 - Project Calendars: Holidays and non-Work days, such as weather days, shall be established in coordination with the Program Management Team.
 - Activity Identification Number: Each activity shall have a unique identification number.
 - Activity Description: Each activity shall be clearly described. Use of descriptions referring to percent of a multi-element item will not be acceptable. Separate activities shall represent different elements of multi-element activities multiple activities with the same Work description shall include a location description.
 - Activity Duration: Work shall be subdivided into individual activities having durations of no longer than 30 Working Days each. Exceptions to this rule will be reviewed by the Program Management Team.
 - Production rates or other information needed to justify the reasonableness of activity time durations shall be made available by CMAR Contractor.
 - Seasonal Conditions: Expected seasonal conditions, such as river stage, precipitation and temperature, shall be included by the CMAR Contractor in the planning and scheduling of activities.
 - Start and Finish Dates: The earliest start date, earliest finish date, latest start date, and latest finish date shall be shown for each activity.
 - Total Float: Total float shall be shown for each activity. Total float is the full amount of time by which the start on an activity may be delayed without causing the Project to last longer.
 - Activity Codes: Activities shall be coded to allow for summaries including responsible party for the accomplishment of each activity (i.e. CMAR Contractor, Subcontractor, CPRA), phase / stage during which activity is planned to be accomplished, and area / location of activity.
 - Activity Constraints: No activity shall be restrained unless specifically required.
 - Activity Price: Final baseline schedule (GMP submittal) shall include total price per activity. The total of the price-loaded schedule shall equal the approved GMP.
 - Sequence of Operations: The logic diagram or PERT chart shall show the sequence and interdependence of activities required for complete performance.

2.1.6 Construction Planning

- The CMAR Contractor shall prepare a Project Management Plan (PMP).
- The CMAR Contractor shall prepare and submit a Project Specific Construction Emergency Response Plan.
- The CMAR Contractor shall prepare and submit a Hurricane / Severe Weather Plan.
- The CMAR Contractor shall prepare and submit a Project Specific Construction Site Safety Plan.
- Prior to commencing the Work with respect to each Project Stage, the CMAR shall develop and submit to CPRA for review and approval a comprehensive safety plan for the Work related to each Project Stage. This safety plan shall include a detailed trench safety plan and related plans for any means, methods or construction techniques that involve structural support or other engineered systems or components, which plans shall be designed and sealed by a validly licensed Louisiana Professional

Engineer, as required by applicable Codes. The CMAR shall then comply with the safety plan as approved by CPRA.

- The CMAR Contractor shall prepare and submit a Quality Management Plan (QMP) which includes quality control plan and proposed organization. The Contractor proposed QMP will meet or exceed minimum requirements of the Program Quality Management Plan. The QMP shall be submitted within 30 days of Notice to Proceed (NTP).
- The CMAR Contractor shall identify work that the CMAR Contractor proposes to self-perform (which must be between 30% and 70% of the cost of work, measured on a dollar value basis) and shall identify all additional sub-CMAR Contractors.
- The CMAR Contractor shall provide an Environmental Management Plan detailing programs for a Storm Water Pollution Prevention Plan, Spill Pollution Prevention Plan and handling other environmental issues required to comply with permits and regulations.
- The CMAR Contractor shall obtain construction-related approvals of public agencies and authorities with jurisdiction over the Project work.
- The CMAR Contractor shall prepare a detailed Project Schedule using most current project sequencing/packaging.
- The CMAR Contractor shall prepare and submit a Procurement Plan describing approach for self-performance, competitive bidding, equipment selection, and subcontractor selection.
- The CMAR Contractor shall prepare and submit a Document Management Plan.
- The CMAR Contractor shall prepare and submit a Construction Risk Management Plan.
- The CMAR Contractor shall prepare and submit a Scope/Change Management Plan.
- The CMAR Contractor shall prepare and submit a Project Communications Plan.
- The CMAR Contractor shall submit the final draft of all plans mentioned above by the end of the 60% phase, with the exception of the QMP, which shall be submitted within 30 days of NTP.
- The CMAR Contractor shall have responsibility for design of, and preparation of signed / sealed construction documents for, temporary works as required. These items shall include, but shall not be limited to, cofferdams and other temporary structures (retaining structures), dewatering systems, and unwatering systems.
- Design progress submittals for temporary works shall be submitted for Owner's Technical Review at the 30%, 60%, and 90% design phases, and for USACE approval as required. Submittals shall include construction drawings, applicable specifications, design narrative, and support documentation (calculations, etc.).
- Temporary works design shall be performed under the responsible charge of a competent Louisiana-licensed Professional Engineer. All construction drawings, specifications, and other applicable work products shall be sealed by the Engineer of Record in accordance with Louisiana Law and the Rules of the State Board of Registration for Professional Engineers and Land Surveyors (LAPELS).

2.1.7 GMP Development

- The CMAR Contractor shall incorporate CPRA's terms relating to quality, safety, community, and environmental factors.
- The CMAR Contractor shall identify work that the CMAR Contractor proposes to self-perform (which must be between 30% and 70% of the cost of work, measured on a dollar value basis). The CMAR Contractor will submit a narrative report that describes how the mix of self-performed and sub-

contracted work ensures that the overall division of work and pricing will be most advantageous to CPRA.

- The CMAR Contractor shall conduct subcontractors and material suppliers outreach to inform them about the Project to gain interest.
- The CMAR Contractor shall pre-qualify subcontractors (including second tier and lower) to determine qualification, financial stability, safety record, bonding capacity, and available resources. CMAR shall only employ subcontractors who are duly licensed and qualified to perform the Work consistent with the Contract Documents. CMAR shall flow down the appropriate clauses of the prime contract to each respective subcontractor. Owner may reasonably object to CMAR's selection of any Subcontractor, provided that the Contract Price and/or Contract Time(s) shall be adjusted to the extent that Owner's decision impacts the CMAR's cost and/or time of performance.
- The CMAR Contractor shall schedule and conduct pre-bid conferences with pre-qualified bidders; subcontractors, material suppliers, and equipment suppliers.
- The CMAR Contractor shall obtain bids only from the pre-qualified subcontractors.
- The CMAR Contractor shall review with CPRA the proposed packaging of the construction work to facilitate competitive bidding of work elements not planned for self-performance by the CMAR Contractor.
- The CMAR Contractor shall solicit competitive sealed proposals from subcontractors. The CMAR Contractor shall open all trade contractor or subcontractor bids or proposals in a manner that does not disclose the contents of the bid or proposal to a person not employed by CMAR, Program Management Team, or the Design Team.
- The CMAR Contractor shall develop and submit recommendations to CPRA for the award of the subcontracts to construct the Project.
- The CMAR Contractor shall provide a complete GMP proposal to include the following: clarifications, assumptions, general conditions, construction costs, payment and performance bonds, insurances, overhead and profit, contingency, and associated schedule as required for a GMP Amendment.
- The CMAR Contractor shall provide a finalized Critical Path Method (CPM) schedule with the GMP. The schedule shall include the following key milestones; NTP, Substantial Completion, Final Completion.

2.1.8 Deliverables

The deliverables listed below shall be completed and submitted by the CMAR Contractor prior to the end of each Pre-Construction Phase.

- **15% Design Milestone (BOD)**
 - Final draft of the QMP.
 - Constructability review report / written comments resulting from BOD Report review.
 - Operations and Maintenance review report analyses for the Project life cycle design and cost.
 - Cost estimating standards report documenting established baseline production rate, and standards to be used for cost estimates, including WBS and estimate format.
 - Monthly Progress Reports.
 - Quarterly cost escalation trend reports.

- **30% Design Milestone**

- Constructability review report / written comments resulting from 30% Design review.
- Operations and Maintenance review report analyses for the project life cycle design and cost.
- 30% Value Engineering Report.
- 30% Cost Estimate and Narrative.
- Baseline Construction Schedule.
- 30% Temporary Works Design Submittal.
- Monthly Progress Reports.
- Quarterly cost escalation trend reports.

- **60% Design Milestone**

- Constructability review report / written comments resulting from 60% Design review.
- Operations and Maintenance review report analyses for the Project life cycle design and cost.
- 60% Value Engineering Report.
- 60% Cost Estimate and Narrative.
- Construction Schedule Update.
- 60% Temporary Works Design Submittal.
- Final Draft of all Plans required by Section 2.1.6 of this Scope of Services.
- Monthly Progress Reports.
- Quarterly cost escalation trend reports.

- **90% Design Milestone**

- Constructability review report / written comments resulting from 90% Design review.
- Operations and Maintenance review report analyses for the Project life cycle design and cost.
- 90% Value Engineering Report.
- 90% Cost Estimate and Narrative.
- Construction Schedule Update.
- 90% Temporary Works Design Submittal.
- Monthly Progress Reports.
- Quarterly cost escalation trend reports.

- **GMP Milestone**

- GMP Proposal.
- Final Project Construction Schedule.
- Final Temporary Works Construction Package.

2.2 Construction Phase Services

As described herein, if a GMP agreement is reached between CPRA and the CMAR Contractor, the CMAR Contractor will perform Construction Phase Services under a separate contract. Expected Construction Phase requirements are listed in this section; however, the full Construction Phase scope of services will be developed during the Pre-Construction Phase. All items listed herein are subject to change pending Pre-Construction activities.

Construction Phase services are expected to include, but not be limited to: provision of all labor, supervision, management, materials, tools, equipment, temporary facilities, permits and permit coordination, utility coordination, scheduling and schedule management, subcontractor coordination and all other services necessary to timely complete the Project in accordance with the requirements of the Contract Documents for each work package identified and defined in the Pre-Construction Phase. These services include, but are not limited to, the following:

- The CMAR Contractor shall coordinate and manage the construction of the Project including all required appurtenances, necessary site improvements, and all other work required to make the MBrSD Project a complete and operable system that meets all performance requirements within the Guaranteed Maximum Price and within the scheduled time.
- The CMAR Contractor shall furnish all labor, material, equipment, suppliers and subcontractors for the performance of the construction in strict accordance with all applicable Contract Documents.
- The CMAR Contractor shall provide construction project administration.
- The CMAR Contractor shall administer a formal Project Management Information System (for progress reports, schedule reports, cost controls, accounting, etc.).
- The CMAR Contractor shall establish field offices for Program Management Team, CMAR Contractor, and USACE personnel.
- The CMAR Contractor shall identify, quantify, document, and implement Project and construction risks and opportunities, risk avoidance, reduction, mitigation strategies as well as monitor and provide written input into a Project risk register. The risk register will be maintained by the CPRA's PM. The CMAR Contractor shall participate in the preparation, modifications, and maintenance of the Project's risk register and the CMAR Contractor shall continuously communicate its assumptions regarding impacts to risk and opportunities as the design progresses.
- The CMAR Contractor shall coordinate and comply with various Federal, State, and local and state agencies, as necessary.
- The CMAR Contractor shall maintain a comprehensive health and safety program and ensure subcontractors adherence to those programs, providing a safe work site for all project participants and visitors.
- The CMAR Contractor shall execute standardized project subcontract agreements and material and equipment purchase order agreements.
- The CMAR Contractor shall manage all subcontractor and supplier work including inspection of the work performed by subcontractors to ensure conformance with the Contract Document.
- The CMAR Contractor shall monitor and manage all quality controls on the Project site as well as maintaining quality controls over shop drawings, equipment and materials.
- The CMAR Contractor shall provide a payment and performance bond and all insurances as required by the RFQ.
- The CMAR Contractor shall implement the Construction Site Safety Plan to provide a safe working site for the project.
- The CMAR Contractor shall participate in the Project Stage Gate review process with the Program Management Team at the completion of each phase of the project prior to proceeding to the next phase.
- The CMAR Contractor shall conduct a Pre-Construction meeting with all the subcontractors performing the major elements of the work prior to the start of their work activities.

- The CMAR Contractor shall track construction costs and maintain detailed construction cost records, including development of a Change Order submission and tracking system.
- The CMAR Contractor shall review and process shop drawings and other submittals for submission to Design Team for approval.
- The CMAR Contractor shall monitor and update the construction CPM schedule.
- The CMAR Contractor shall review and process all pay request applications from subcontractors and suppliers.
- The CMAR Contractor shall provide regular open-book financial accounting status reports on Project costs.
- The CMAR Contractor shall conduct recurring progress meetings with the on-site trade foremen and superintendents.
- The CMAR Contractor shall plan and lead weekly activity coordination and monthly progress meetings with CPRA and Program Management Team.
- The CMAR Contractor shall coordinate all compliance inspections by regulatory agencies, Program Management Team and CPRA representatives.
- The CMAR Contractor shall manage the start-up and testing necessary for CPRA to accept the completed project.
- The CMAR Contractor shall implement close out procedures necessary for the CPRA to accept the overall project as being finally complete.
- The CMAR Contractor shall maintain strict enforcement of prevailing wage requirements, as required.
- The CMAR Contractor shall prepare and submit Monthly Progress Reports. The contents of each monthly report should include at a minimum the following items:
 - Introduction
 - Safety metrics (man-hours worked, DART, OSHA, Recordable incidents, near-misses, training attendances)
 - Schedule Update Describing Recovery Efforts on elements of the project falling behind schedule
 - Permitting and Environmental
 - Project Quality (Status of quality reviews, issues)
 - Plans and Submittals (Status of submittals for acceptance)
 - Construction activities completed in the last month
 - Project Cost Summary (Contract Invoice Log, Cash-flow curves, Production curves)
 - Procurement Activities
 - Risk and Opportunities Update (Risk distributions, Expiring risks, new risks, mitigations)
 - Change Management (Decision Matrix, CMAR Contingency Log)
 - Record drawings

3 Costs and Fees

3.1 Explanation of GMP

If a GMP agreement is reached between CPRA and the CMAR Contractor, the GMP amount will be incorporated into the Contract for Construction Phase Services. A GMP is the sum of the Cost of Work, General Conditions (GC), bonds and insurance, CMAR Contractor Fee, and any agreed upon contingency.

GMP = Cost of Work + GCs + Bonds & Insurance + CMAR Contractor Fee (Overhead & Profit) + Contingency

CPRA anticipates requesting a final proposed GMP no later than completion of 90% contract documents. CPRA reserves the right not to award any part(s) or all of the Construction Phase Services, and bid/award some or all of the construction work separately. The CMAR Contractor shall deliver to CPRA a proposed GMP and GMP Supporting Documents at any appropriate design milestones identified in the sequencing plan.

The CPRA is desirous of incentivizing the CMAR Contractor to continue to find ways of reducing costs during construction through diligent and professional construction management of the procurement and construction processes & techniques.

3.2 Cost of Work

The Cost of Work shall be for all direct costs of construction, to include the labor, equipment, materials, supplies, and subcontracts directly attributed to construction of the completed project works and features.

3.3 General Conditions

The GC category shall be for onsite personnel that will provide management oversight during construction and any equipment, materials, utilities, facilities, office supplies and travel expenses necessary for execution of the Project.

The CMAR Contractor shall provide general condition items that include the following: temporary jobsite facilities, utilities, data/telecom services, office supplies, local staff phones, project vehicles, safety supplies, printing and reproduction services, project signs, etc. The GCs for each GMP will be negotiated on an open book basis and could be converted to a Lump Sum value at the sole discretion of CPRA. Development of this value shall be based on the rates submitted in the proposal. Rates in this category shall be all inclusive and include travel, lodging, overhead, burden, insurance, retirement, cell phones, and vehicles. This cost shall be based on the level of effort, facilities, and duration required to manage and oversee each work package.

3.4 CMAR Contractor Fee

The CMAR Contractor shall be entitled to a CMAR Contractor Fee expressed as a percentage of the Cost of Work as part of the negotiated GMP. The CMAR Contractor Fee shall be for head office overhead costs and provide for a reasonable profit to be earned by successfully delivering the Project.

The CPRA intends to establish the CMAR Contractor Fee component of the GMP during negotiations for Pre-Construction Services.