**EXHIBIT A**

**WORK ORDER NO. 1**
**CITY OF BAY CITY**
**Project No. 20W09155**

This WORK ORDER ("Work Order") is made by and between the **City of Bay City** (hereinafter referred to as "Owner") and **Garver, LLC**, (hereinafter referred to as "Garver") in accordance with the provisions of the MASTER AGREEMENT FOR PROFESSIONAL SERVICES executed on _____ (the "Agreement").

Under this Work Order, the Owner intends to make the following improvements for **Bay City Wastewater Treatment Plant Improvements**:

Generally, the Scope of Services includes professional services necessary for the preliminary engineering phase of the Bay City WWTP Improvements project. The project will be funded by the Texas Water Development Board (TWDB) through their Clean Water State Revolving Fund (CWSRF) loan program.

Garver shall perform project administration, alternatives evaluation, and preliminary engineering of the selected alternatives for the improvements at the WWTP. No work will begin on the preliminary design drawings until the environmental review by the TWDB is complete.

Garver will provide professional services related to these improvements as described herein. Terms not defined herein shall have the meaning assigned to them in the Agreement.

## 1. SCOPE OF SERVICES

1.1. Garver shall provide the following Services:
  1.1.1. Refer to APPENDIX A – SCOPE OF SERVICES.
1.2. In addition to those obligations set forth in the Agreement, Owner shall:
  1.2.1. Retain the services of a geotechnical services provider to perform a geotechnical investigation at the wastewater treatment plant (WWTP) based on the boring locations provided by Garver in the preliminary engineering phase.

## 2. PAYMENT

3. For the Services set forth above, Owner will pay Garver as follows: Refer to APPENDIX B – FEE SUMMARY.

## 4. APPENDICES

4.1. The following Appendices are attached to and made a part of this Work Order:
4.2. Appendix A - Scope of Services
4.3. Appendix B – Fee Summary

This Work Order may be executed in two (2) or more counterparts each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

The effective date of this Work Order shall be the last date written below.

| CITY OF BAY CITY | GARVER, LLC |
| --- | --- |
| By: _____ *Signature* | By: D N Olson *Signature* |
| Name: Robert K. Nelson *Printed Name* | Name: Daniel N. Olson, P.E. *Printed Name* |
| Title: Mayor | Title: Principal |
| Date: _____ | Date: 10/22/2020 |
| Attest: _____ | Attest: Caroline Dallas |

## APPENDIX A – SCOPE OF SERVICES

### General

In prior agreements, Garver performed conceptual design work for the Bay City Wastewater Treatment Plant (WWTP) located in Bay City, including:

- Process modeling of the existing facility
- Condition assessment of the existing facility
- Conceptual Design for renovating the existing facility, including a Conceptual Design Report (CDR) and Opinion of Probable Construction Cost (OPCC)
- Funding Assistance for Texas Water Development Board (TWDB) funding source

Through these efforts, a comprehensive renovation of the facility was recommended, but it was noted that additional alternatives may be considered to optimize investment in the facility.

As a follow-up to the original scope of work, the scope of services for this agreement includes professional services for:

1. Performing an Alternatives Evaluation to optimize the improvements
2. Performing Preliminary Engineering for the selected alternatives.

Work under this contract is expected to set up for future final design, bidding, and construction phase services. Construction for this work is expected to be executed under a single design-bid-build contract.

An overview of the major process areas for the Bay City WWTP, a list of alternatives to be evaluated, intended scope items for the preliminary engineering, is included below:

A. Influent Lift Station
    a. A new lift station will be designed, assuming a new wet well, submersible pumps and firm capacity of 17.2 MGD.

B. Headworks
    a. Modifications will be designed for the headworks/screening structure, including miscellaneous rehabilitation (replacement of grating and butterfly gates, addition of drop chutes, and miscellaneous site area improvements), addition of screenings washer/compactors, addition of a second mechanical screen, and the addition of grit removal (alternatives to be evaluated as noted).
    b. Two grit removal alternatives will be evaluated: 1) a stacked tray removal system and 2) a vortex grit removal system. Equipment selection for washer/classifiers, grit pumps, and grit handling will be considered for both alternatives.

C. Aerations Basins
    a. Modifications will be performed to the existing parallel complete mixed reactor Aeration Basins to establish a more plug-flow reactor configuration with the intent that the configuration will maximize future biological nutrient removal potential.
    b. Two alternatives will be evaluated: 1) modification of the existing aeration basins into subdivided and/or series configurations, or 2) building completely new aeration basins independent of the existing basins (this option will include the potential re-purpose of the existing aeration basins as either anaerobic selector zones or as aerobic sludge holding tanks).

D. Blower Facility
    a. A new blower facility will be designed, including dedicated systems to isolate the aeration basin blowers from the aerated sludge holding tank (ASHT) blowers. The facility will include dissolved oxygen control for the aeration basin, a new blower

electrical room with engineered HVAC system, and above-grade air piping with supports sized for hurricane-force winds.

b. Two alternatives for blower technologies will be evaluated: 1) multi-stage centrifugal blowers and 2) positive displacement blowers.

E. Final Clarifiers

a. The design will improve the existing final clarifiers by providing new mechanisms with spiral-blade removal (as opposed to suction tube as is currently used), along with appurtenant repairs for concrete, grouting, and scum removal.

F. RAS Channels and Pumping Improvements

a. RAS pumping will be modified to submersible, VFD-controlled pumps with flow control capacity (away from the current airlift pump configuration). Telescoping valves will be used to control RAS flow from each clarifier.

G. WAS Pumping

a. The existing WAS system will be improved by the installation of new controls and instrumentation. Existing WAS pumps will remain in place.

H. Disinfection System

a. The disinfection makedown system will be improved, with the existing chlorine contact basin remaining in service.

b. Two alternatives will be evaluated for the type of disinfectant: 1) chlorine gas and 2) liquid sodium hypochlorite. Dechlorination will be considered for both alternatives along with the location of the makedown facility, and/or safety improvement to the existing chlorine makeup facility if it remains in service (and does not need to be deconstructed for the new aeration basins).

I. Non-Potable Water (NPW) System

a. The NPW system will be expanded as needed for future operations. Evaluations will include NPW demand characterization, distribution network analysis, existing system capacity, and recommendations, as needed, for expansion

J. Aerated Sludge Holding

a. New aerated sludge holding (ASHTs) will be provided to facilitate holding and conditioning of sludge prior to dewatering and disposal into a landfill application. The evaluation will not consider the potential for Class A or Class B sludge.

b. Two alternatives will be evaluated: 1) utilizing the existing complete mix aeration basins as sludge holding tanks and 2) building new dedicated ASHTs.

K. Solids Dewatering Facility

a. A new dewatering building will be provided for mechanical dewatering of sludge. It is assumed that a 3-belt belt filter press (BFP) will be utilized as the primary dewatering equipment, emulsion polymer by tote delivery will be used, and that containers will be filled under cover. Overall system redundancy (number of belt filter presses, use of different feed pumps/polymer between presses, etc.) will be evaluated.

b. Two alternatives will be evaluated for type of feed pump: 1) double disc, and 2) progressive cavity.

c. Two alternative methods of waste hauling will be evaluated: 1) city-performed, and 2) contracted.

d. Three alternative types of haul-off containers will be evaluated: 1) roll-off container, 2) dump trucks, and 3) end-dump trailers.

e. Two alternatives for conveyance from belt press discharge to container will be evaluated: 1) belt, and 2) screw conveyors.

L. Plant Electrical Feed
    a. New service entrance electrical distribution equipment will be provided for electrical distribution throughout the plant. The plant will utilize the existing generator system recently designed by Garver as backup power supply.
    b. Alternatives to be considered for the electrical system will include: 1) Providing a new main electrical building to house the new electrical distribution equipment, and 2) Reusing the existing blower building electrical room to house the new electrical distribution equipment.

M. Supervisory Control and Data Acquisition (SCADA) System
    a. A new SCADA System will be provided for monitoring, data logging, alarming, and diagnostic functions.
    b. Alternatives to be considered for the SCADA system will include: 1) monitoring of plant systems, and 2) monitoring and controlling of plant systems.

N. Site Civil and Yard Piping
    a. Site civil improvements and new yard piping will be necessary to ensure cohesive function of plant operations. The extent of improvements will be determined by the overall site plan and final selected locations for all facilities.
    b. Improvements will be evaluated and recommended for roadways (material, width, elevation) and pipe materials.

O. Administration Building
    a. A new administration building will be designed as part of this project.
    b. Two alternative floor plans will be developed based on coordination with city staff indicating their functionality requirements of the building (such as number of active staff, need for a lab facility, training rooms, head operator workstation, suitability for emergency operations, etc.). Garver will illustrate (via existing photos, drawings, hand sketch, etc.) no more than two potential facility layouts prior to meeting with City staff to coordinate functionality needs. Upon discussion of functionality needs, Garver will refine no more than the two facility layouts based on the needs identified by City staff for review, and following decision by facility staff, Garver will detail the building for only one option.

P. Building Design Standards
    a. Between three to five new buildings will be required by the improvements as identified above, including the new administration building, new main electrical building (could be combined with new administration building or new blower building), new blower building, new disinfection makeup facility (if new facilities are provided), and new dewatering building.
    b. Three alternative building types will be evaluated: 1) metal building, 2) precast building, and 3) concrete/CMU.

## 1. Project Management

Garver will perform project management tasks, including:

A. Advise Owner as to the necessity of Owner providing data or services that are not part of Garver's Basic Services.
B. Maintain an overall schedule for the project and routinely advise the Owner of critical path items affecting project progress versus schedule.
C. Maintain and monitor project budget and submit monthly invoices based on progress of work to date.
D. Conduct monthly progress meetings with Owner's staff. (Half in person, half via teleconference,

with up to three Garver representatives; for no more than 6 progress meetings total)

E. Provide an agenda in advance of all scheduled meetings and provide subsequent meeting minutes.
F. Coordinate the work of surveying subconsultant.

1.1. Project Kick-off Meeting

Garver will schedule and conduct a project kick-off meeting (with up to three Garver employees) at the City offices to confirm project goals, expectations, and path forward. Following the meeting, Garver will prepare meeting minutes for distribution to all participants.

## 2. Alternatives Evaluation

2.1. DRAFT Alternatives Evaluation

Garver will perform alternative evaluations for the processes, facilities, and/or alternatives as listed above. The goal of this effort will be to optimize the scope of improvements and to facilitate the selection of alternatives. Findings of the evaluation for each item noted above will be incorporated into a technical memorandum (TM).

The TM shall generally include:

A. Executive Summary – Prepare an Executive Summary providing concise findings and recommendations.
B. Introduction – Compose an introductory chapter providing the history and basic assumptions for the report.
C. Alternatives Evaluation Sections – For each alternative process area listed above, write descriptions of each alternative considered, clearly indicating advantages, disadvantages, comparison of capital and operational/lifecycle costs (where impactful between options), and parameters relevant for selection between the alternatives. The selected alternative will be based on monetary and non-monetary considerations.
D. Recommendations - Provide detailed description of the recommendations for each of the selected alternatives.
E. Provide an overall Opinion of Probable Construction Cost (OPCC) for the entire project based on recommended facility alternatives (and other facilities not included in the evaluation). Note: it is expected that the preliminary engineering will progress on facilities that are not included in the alternative evaluation during the alternative evaluation period; this will allow the development of the OPCC for these facilities, which can then be incorporated into the overall OPCC for the Alternatives Evaluation TM.

2.2. Alternatives Evaluation Review Workshop

Garver will schedule and conduct an Alternatives Evaluation workshop (with up to three Garver employees) at the City offices to discuss the findings of the Alternatives Evaluation TM. Following the meeting, Garver will prepare meeting minutes for distribution to all participants.

2.3. FINAL Alternatives Evaluation TM

After receiving comments from the City, Garver will update the Alternatives Evaluation TM. Evaluation of additional alternatives beyond those listed in Scope Section **Error! Reference source not found.** will be considered extra work.

## 3. Preliminary Engineering Report

### 3.1. Preliminary Engineering Report

The preliminary engineering phase will provide for preliminary engineering and summarize key design criteria for each process area as defined in the Scope Introduction above and as selected during the alternatives evaluation (where applicable). This submittal will include preliminary representative figures of the proposed design at each facility, such as representative mechanical plans and sections and process and instrumentation diagrams (P&IDs) necessary to establish process control descriptions. The submittal will also include the proposed overall site plan, yard piping plan, and building/facility floorplans. This submittal will not include detailed design drawings, technical specifications or "front end" contract documents.

A. Design Information Memoranda/Preliminary Design Report

A preliminary engineering report will be developed that will compile a set of Design Information Memoranda (DIMs) under a single cover, will serve as a preliminary design report. The following list describes the report sections/DIMs sections to be developed for this project:

1. Executive Summary
2. Overall Facility Design Criteria and Mass Balance
3. Facility Hydraulics
4. Influent Pump Station
5. Headworks
6. Aeration Basins
7. Blower Building
8. Clarifiers
9. RAS/WAS Pumping
10. Disinfection and Contact Basin
11. Non-Potable Water System
12. Sludge Holding Tanks
13. Dewatering Facility
14. Site Civil and Yard Piping
15. Structural Design Criteria and Foundation Design
16. Electrical System
17. SCADA System
18. Administration Building
19. Building Design Criteria
20. Construction Sequencing/Maintenance of Plant Operations
21. Opinion of Probable Construction Cost

Each DIM will detail the applicable system description, design criteria, intended equipment manufacturers (where applicable), and control descriptions for the area under consideration (where applicable). Process design criteria will be documented to identify basis of unit sizing and verification of Texas Commission of Environmental Quality (TCEQ) regulatory conformance.

The OPCC will update the Bay City WWTP Improvements 2019 Conceptual Design Report estimate of construction costs. For preliminary design, Garver will consider these opinions as estimates and the expected range of accuracy for this type of estimate is that the actual project construction cost should range from -20% to +30% of the preliminary design phase's cost opinion.

3.2. Preliminary Engineering Workshop

Prior to submittal of the Preliminary Engineering Report deliverable, Garver will lead and participate in a Preliminary Engineering workshop (with up to five Garver employees) at the City offices. The purpose of this meeting will be to build consensus in the design and operation of the facilities prior to the delivery of the 30-percent design submittal. The major items of discussion will include:

- Review and refinement of preliminary site plan, hydraulic profile, and facilities layout.
- Review and refinement of process design criteria.
- Review and preliminary selection of major equipment items.
- Proposed construction sequencing.

After the meeting, the City will be provided with meeting minutes and be provided the opportunity to provide feedback on the intended design elements.

3.3. Preliminary Engineering Report Deliverable Review Workshop

After submittal of the Preliminary Engineering Report Deliverable (including the DIM Report), Garver will schedule and conduct a Deliverable workshop (with up to three Garver employees) at the City offices to discuss the Preliminary Engineering Report Deliverable. Garver will prepare meeting minutes and provide a format for the City to provide review comments.

3.4. FINAL Preliminary Engineering Report Submittal

After receiving comments from the City on the Preliminary Engineering Report deliverable, Garver will update the DIMs to incorporate City comments.

## 4. Geotechnical Services

Garver will be responsible for coordination with the geotechnical consultant selected and contracted by the Owner. Geotechnical investigations and associated consulting services are not included in the Agreement. Final geotechnical findings and recommendations will be provided to Garver by the Owner for design and development of the opinion of probable construction cost. Garver will provide a drawing with requested bore sites, and a list of geotechnical requirements.

## 5. Agencies Coordination

Garver will furnish the DRAFT Preliminary Design Submittal to the following agencies for information only:

- TCEQ
- TWDB

Note that Garver will not pause the scoped project schedule or wait for comments from these agencies during this agreement.

## 6. Preliminary Design Drawings

Preliminary design drawings will not be authorized until the environmental review is completed by the Texas Water Development Board (TWDB).

## 7. Final Design (Future Phase)

Final Design Services are not included in this scope of services. They are expected to be performed under a separate, future contract.

## 8. Bidding Services & Construction Phase Services (Future Phase)

Bidding Services and Construction Phase Services are not included in this scope of services. They are expected to be performed under a separate, future contract.

## 9. Project Deliverables

The following will be submitted to the Owner, or others as indicated, by Garver.

A. One (1) digital copy (PDF format) of the DRAFT Alternatives Evaluation Technical Memorandum
B. One (1) hard copies and 1 digital copy (PDF format) of the FINAL Alternatives Evaluation Technical Memorandum
C. Three (3) hard copies and 1 digital copy of the DRAFT Preliminary Design Submittal. Printed drawings will be delivered as half-size (11x17).
D. Three (3) hard copies and 1 digital copy of the FINAL Preliminary Design Submittal.
E. Electronic files as requested.

## 10. Extra Work

The following items are not included under this agreement but will be considered as extra work:

A. Construction materials testing.
B. Design of improvements off-site.
C. Easement coordination or easement documents.
D. Environmental Handling and Documentation, including wetlands identification or mitigation plans or other work related to environmentally or historically (culturally) significant items.
E. Environmental Services
F. Floodplain delineation and coordination with FEMA and preparation/submittal of a CLOMR and/or LOMR.
G. Hydraulics and hydrology for floodway No-Rise Certification and Individual 404 permit.
H. Invasive structural evaluation techniques beyond visual observation of existing structures at grade and existing record drawings.
I. Jar Testing or Sampling Services
J. Meetings and/or Workshops in addition to those listed herein.
K. Preparation of a Storm Water Pollution Prevention Plan (SWPPP).
L. Redesign for the Owner’s convenience or due to changed conditions after previous alternate direction and/or approval.
M. Sludge Management Plan
N. SSES, I&I analysis, and/or sewer system survey.
O. Submittals or deliverables in addition to those listed herein.
P. TMDL and NPDES permitting assistance
Q. Utility rate study
R. Warranty Assistance

Extra Work will be as directed by the Owner in writing for an addition fee as agreed upon by the Owner and Garver.

## 11. Schedule

Garver shall begin work under this Agreement within ten (10) days of a Notice to Proceed and shall complete the work in accordance with the schedule below:

| Phase Description | Calendar Days |
|---|---|
| Kick-off Meeting | 5 days from Notice to Proceed |
| **Deliver DRAFT Alternatives Evaluation TM** | **75 days from NTP** |
| Alternatives Evaluation Workshop | 7 days after delivery of DRAFT Alternatives Evaluation TM |
| Deliver FINAL Alternatives Evaluation TM | 14 days from receipt of DRAFT Alternatives Evaluation comments from the City |
| **Deliver DRAFT Preliminary Report Submittal** | **75 days from Final Alternatives Evaluation TM** |
| Preliminary Engineering Report Deliverable Review Workshop | 7 days from delivery of DRAFT Preliminary Engineering Report Submittal |
| Deliver FINAL Preliminary Engineering Report Submittal | 14 days from receipt of DRAFT Preliminary Engineering Report Submittal Comments from City |
| Initiate Geotechnical Investigation | Within 20 days of first monthly progress meeting |
| Receive Geotechnical Study | 90 days from initiation of study |

*Note: for planning purposes, 10 days are assumed for City review from receipt of a DRAFT submittal until comments are expected to be received.

# Appendix B

# Bay City WWTP Improvements
# Preliminary Phase

# FEE SUMMARY

| Title I Services | Estimated Fees |
|---|---|
| Project Administration | $84,496.00 |
| Alternatives Evaluation | $264,297.00 |
| Preliminary Engineering | $787,191.00 |
| Topographical Survey | $50,000.00 |
| **Subtotal for Title I Services** | **$1,185,984.00** |