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August 29, 2019

Mr. Tim Howe, Director of Water/Wastewater
City of Seguin
P.O. Box 591
Seguin, Texas 78156-0591

**RE: Geronimo Creek WWTP
Expansion to 5.54 MGD Average Flow
Engineering Services Proposal**

Dear Mr. Howe:

As requested by the City of Seguin (City), TRC Engineers, Inc. (TRC) has prepared this proposal for professional engineering services for the proposed flow expansion to the City's Geronimo Creek Wastewater Treatment Plant. The plant's flow will be increased to 5.54 MGD average flow and 16.62 MGD peak flow (11,542 GPM peak two-hour flow).

The expanded plant will consist of the following major processes and structures, which are further described in the project summary below:

- Raw sewage lift station rehabilitation (re-using existing concrete structure).
- New headworks structure.
- Aeration basin rehabilitation (re-using existing oxidation ditch).
- New final Clarifier No. 3.
- New tertiary filtration structure.
- New chlorine contact basin with chlorine and Sulphur dioxide feed equipment.
- Effluent flow measurement.
- Plant effluent piping.
- Two aerobic digesters.
- Sludge dewatering building.
- Administration building with laboratory.
- Maintenance building.
- Sitework and miscellaneous improvements.

PROJECT SUMMARY

The project consists of the following components:

1. Raw Sewage Lift Station
 - a. Four new submersible pumps (3,847 GPM each). New discharge pipe for Pump No. 4 only.
 - b. Force main extension.
 - i. Extend two 20" force mains to proposed headworks structure.
 - ii. Provide multiple quick connects with valve for bypass pumping.
 - c. Replace/upsized generator.
 - i. Modify existing elevated structure to facilitate the new larger generator. The platform elevation will remain the same.
 - d. Motor controls with variable speed drives.
 - e. Increase crane capacity (if needed).
 - f. SCADA – Pump on/off status, VFD speed, pump run time, and alarms.
2. Headworks
 - a. New concrete structure.
 - b. Mechanical bar screen and manual bar screen on bypass channel.
 - c. Channel flow control gates.
 - d. Screenings conveyor/compactor.
 - e. Influent flow meter with parshall flume.
 - f. Grit removal equipment with pump and washer/classifier.
 - g. Electrical and lighting.
 - h. SCADA - Equipment run status/failure alarm and influent flow monitoring.
3. Aeration Basins (convert existing oxidation ditch to two basins)
 - a. Remove existing mechanical aerators.
 - b. Structural modifications - Add internal walls to form two basins. Will require using aerobic digesters for temporary treatment.
 - c. Fine bubble membrane aeration diffusers.
 - d. Aeration blowers with concrete slab and canopy, air piping, and valves.
 - e. Motor controls with variable speed drives (controlled from aeration basin dissolved oxygen).

- f. Effluent box with flow control gates.
 - g. SCADA – Dissolved oxygen and MLSS measurement. Provide blower control from dissolved oxygen.
- 4. Final Clarifier No. 3
 - a. Final clarifier structure with sludge removal mechanism.
 - b. Clarifier flow split box for three clarifiers.
 - c. RAS/Scum Pump Station – VFD for RAS control, timer for WAS control.
 - d. Provide chlorine feed for filamentous bacteria control.
 - e. Motor controls.
 - i. SCADA - Monitor ammonia concentration in effluent, sludge blanket monitors for all clarifiers.
- 5. Tertiary Filters
 - a. Concrete filter structure with three cloth media disk filters.
 - b. Piping and valves.
 - c. Motor controls.
 - i. SCADA - Connect to filter control panel and monitor alarms.
- 6. Disinfection
 - a. Concrete chlorine contact basin with concrete baffles.
 - b. Scum removal system for basins.
 - c. Flow split structure for three basins.
 - d. Chlorination/dechlorination feed equipment.
 - e. Flow control gates.
 - f. SCADA - Leak detectors for Cl₂ and SO₂, monitor chlorine residual before and after dechlorination, and monitor pH and DO.
- 7. Sulfur Dioxide Storage Structure
 - a. Concrete slab with metal canopy, monorail and hoist, electrical and lighting.
- 8. Effluent Flow Measurement
 - a. Flow measurement structure with parshall flume.
 - b. Sample building - ISCO refrigerated samplers, potable water, Heat/AC, work table.
 - c. Sample station to collect grab samples.
 - d. SCADA - Monitor flow.

9. Effluent Piping
 - a. New plant discharge pipe.
 - b. Parallel existing discharge pipe.
 - c. Existing creek outfall structure to remain in use.
10. Aerobic Digesters
 - a. Concrete tanks with coarse bubble aeration diffusers.
 - b. Aeration blowers with concrete slab, canopy, air piping and valves.
 - c. Sludge piping.
 - d. Decanting equipment.
 - e. Motor controls.
 - f. Provide for future thickeners – GBT or gravity.
 - g. Provide for expansion to take Walnut Branch WWTP sludge.
 - h. SCADA – Monitor equipment status and alarms.
11. Sludge Dewatering Building
 - a. Belt filter press with support structure with canopy – Provide for future expansion to add second press.
 - b. Sludge conveyor – Provide capability to move dumpsters.
 - c. CMU room for polymer feed, sludge pumps, and motor controls.
 - d. Piping and valves.
 - e. Motor controls.
12. Administration Building and Laboratory
 - a. Location near plant entrance.
 - b. Full laboratory with equipment.
 - c. Control room.
 - d. Electrical and lighting.
 - e. IT space and record retention storage.
 - f. Convert existing operations building to electrical building; improve exterior appearance.
13. Maintenance Building
 - a. Metal building on concrete slab.
 - b. Parking for maintenance equipment.

- c. Building electrical and lighting.
 - d. Provide work bench, equipment hoist, welder, compressed air and small tools.
14. Sitework
- a. Pave new roads.
 - b. Provide sidewalks.
 - c. Relocate intruder resistant fence to 10-15 feet inside property line.
 - d. Automatic front gate with keypad and video monitoring, badge/fob access.
 - e. Miscellaneous site electrical including site LED lighting.
 - f. Miscellaneous site piping.
15. Miscellaneous Improvements
- a. Plantwide SCADA System to include Tower
 - i. Transmit to Walnut Branch WWTP.
 - ii. Remote monitoring/control with laptops.
 - iii. Web based.
 - iv. Password control.
 - b. Motor operators for frequently operated gates (SCADA controlled).
 - c. Replace/upsized plant emergency electrical generator.
 - i. Consider capability to use generator for peak shaving (requires separate controls).
16. Existing Plant Rehabilitation
- a. Repave existing asphalt roads.
 - b. Rebuild drying beds (Bid as Additive Alternate).
 - c. Clarifier rehabilitation (replace scum boxes in base bid; additive alternate for replacing clarifier mechanisms).
 - d. Variable speed drives for existing RAS pumps.
 - e. Demolish mobile press pad.
 - f. Retrofit existing chlorine basins with concrete baffles (if possible).
 - g. Upgrade non-potable pump station for increased flow.

SCOPE OF WORK/WORK TASKS

The following tasks and subtasks correlate with Task Order No. 02 of the Master Service Agreement executed between the City of Seguin and TRC dated December 16, 2003:

Task 100. General Requirements

101. Attend kickoff meeting with the City to set major milestone dates, establish design standards and confirm goals and deliverables for the project. TRC will provide meeting minutes to establish agreed-upon determinations.
102. Obtain and Review Available Data, including:
 - a) Historical operational data from existing WWTP.
 - b) Maps and Data Sources for review of the Design, as provided by the City.
 - c) Soil Surveys.
 - d) USGS 7.5-minute Quadrangle Maps.
103. Conduct Field Review of Project – Conduct field review with representatives of the City to ensure avoidance or minimization of environmental, permitting, and engineering issues and determine presence of any additional constraints.
104. Arrange for and participate in informal meetings with the City throughout the design phase to review progress and exchange ideas and information. A maximum of eight (8) meetings will be attended by TRC personnel.
105. Arrange for and conduct field WWTP site visits for determination of Plant processes and equipment. A maximum of four (4) site visits are included in TRC's scope.
106. Maintain a log of issues on the design and the party responsible for resolution.
107. Submit applications and/or permits for:
 - a. Handicap Accessibility (ADA/TDLR) for the operations building only.
 - b. Texas Commission on Environmental Quality (TCEQ).
108. Prepare construction plans/specifications for the proposed project, including all details. Construction plans shall include the following primary disciplines, as a minimum:
 - a) General
 - b) Demolition
 - c) Civil
 - d) Mechanical
 - e) Structural
 - f) Architectural
 - g) Electrical and HVAC
 - h) Provide process control description for SCADA
 - i) Miscellaneous details
 - j) SWPPP and erosion control plan
109. Provide design submittals to the City for review for 30%, 60%, 90% and 100% completion milestones.

Task 200. Environmental

201. Perform a desktop review to identify existing conditions and documented cultural resources within the area of potential effect (APE) that could potentially be impacted by the proposed Project. This data will be summarized in a letter of consultation and submitted to the Texas Historical Commission (THC) for review.
202. An archeological file search and review of sources will be performed to ensure compliance under the Antiquities Code of Texas. TRC archaeologists will compile current information on previously recorded cultural resources within the APE and within a 1-mile radius of the APE. Other documents including historic aerial photographs and topographic maps, Sanborn maps, and cemetery records may be reviewed. The results of the search will be compiled in a letter report for submittal to the THC.

Task 300. Preliminary Engineering

Task 310. Topographical Surveying

311. Acquire field topographical data for the design portion of the project on City's coordinate system, to include detailed survey including utility locates (as furnished by the specific utility provider). This will include the areas needed within the city-owned plant property and the outfall pipe to Geronimo Creek.
312. Provide survey field notes for four property easements (construction and permanent easement for each) for the outfall pipe.

Task 320. Geotechnical Services

321. Provide geotechnical engineering services at the WWTP site including exploratory work, laboratory and field testing, and professional guidance in tests to be made based on preliminary drawings and designs and including professional interpretations of exploratory and test data (maximum of 4 bores at 20 feet deep, 6 bores at 40 feet deep and 15 cores at 10 feet deep).
322. Field Investigation – Provide geotechnical exploratory for soil borings. Groundwater observations will be made at boring completion.
323. Laboratory Tests – Unconfined compression tests, liquid limit, plastic limit, sieve analysis, moisture content and penetrometer test will be performed on soils, rock formations, and other geophysical phenomena, which are required to provide information for design.
324. Geotechnical Report – Prepare a geotechnical report by a geotechnical firm interpreting the data of the exploratory work and testing and setting out the site conditions that can be anticipated from the initial exploratory work, including foundation and pavement design recommendations.

Task 330. Design Memorandum

- 331. Prepare the Basis of Design Memorandum to establish the design parameters for the items listed under Project Summary above. The memorandum will be in accordance with TCEQ's design requirements (Chapter 217, subsection 217.10, paragraph g) and include a flow schematic, site plan, layout of proposed buildings, structures and streets, description of the proposed facilities, and preliminary design calculations.
- 332. Submit three (3) draft copies to the City for review.
- 333. Meet with the City and obtain comments. Resolve any issues if necessary, and resubmit five (5) final copies to the City.
- 334. Submit the final Design Memorandum to TCEQ for review.

Task 340. Process O&M Manual

- 341. Prepare the Process O&M Manual to include site plan, flow schematic, hydraulic profile, basin dimensions, flows, return flows, process design calculations and safety requirements. Include descriptions of individual processes/equipment for liquid stream treatment, solids processing treatment and chemical feed systems.
- 342. Submit three (3) draft copies to the City for review.
- 343. Meet with the City and obtain comments. Resolve any issues if necessary, and resubmit five (5) final copies to the City.
- 344. Submit the final Process O&M Manual to the City.

Task 400. Construction Contract Documents

Task 410. Level 1 (30%) Design

- 411. Provide sketches and drawings showing conceptual plan views of processes and structures.
- 412. Provide a site plan showing the location of paving and structures and major pipelines.
- 413. Provide a preliminary P&ID.
- 414. Provide selected cut-section views of structures for clarification as appropriate.
- 415. A total of three (3) sets of Level 1 documents will be submitted to the City for review.
- 416. The City will provide a written response to TRC regarding review comments.
- 417. A meeting will be conducted with the City to review the comments.

Task 420. Level 2 (60%) Design

- 421. Provide drawings showing the details of pipelines, mechanical equipment, processes and structures to be included in the project.
- 422. Provide drawings showing standard details.
- 423. Major electrical equipment will be shown on background drawings to indicate preliminary design concepts. Provide WWTP site electrical loads to the City for electrical distribution service to the site.
- 424. Structural drawings and notes will be provided on the major structures.
- 425. Provide preliminary equipment specifications in CSI format including Divisions 0 and 1.
- 426. A total of three (3) sets of Level 2 documents will be submitted to the City for review.
- 427. The City will provide a written response to TRC regarding review comments.
- 428. A meeting will be conducted with the City to review the comments.
- 429. Update the opinion of probable construction cost based on new information provided.

Task 430. Level 3 (90%) Design

- 431. Provide substantially complete drawings showing the details of all facilities. All drawings will be produced in AutoCAD. Completed standard and general detail sheets will be provided.
- 432. Completed technical specifications and front-end documents will be included. Specifications will include construction sequences and schedules as appropriate. Specifications will be in word format.
- 433. A total of three (3) sets of Level 3 documents will be submitted to the City for review.
- 434. The City will provide a written response to TRC regarding review comments.
- 435. A meeting will be conducted with the City to review the comments.
- 436. Update the opinion of probable construction cost based on new information provided.

Task 440. Final Drawings and Specifications

- 441. Incorporate all of the City's comments into a final set of drawings and specifications ready for bidding. Provide three (3) sets of documents to the City.
- 442. Submit final documents to TCEQ for review.

Task 450. Pre-award Services

- 451. Coordinate bid letting date, time and place with the City and prepare final Invitation to Bid.
- 452. Assist and advise the City in placing the advertisements of the Invitation to Bid.
- 453. Identify potential contractors and suppliers acceptable to the City and distribute copies of Invitation to Bid.
- 454. Distribute copies of Invitation to Bid to plan rooms and contractor organizations. When requested, furnish copies of the Plans and Specifications to these organizations.
- 455. Set up the project on CivCastusa.com to distribute the contract documents to prospective bidders and plan rooms.
- 456. Distribute plan holders list to recipients of contract documents prior to bid opening. Maintain a record of prospective bidders and suppliers to whom contract documents have been issued.
- 457. Interpret construction contract documents. Prepare and issue addenda to the construction contract documents when required.
- 458. Coordinate mandatory pre-bid conference date, time and place with the City, facilitate pre-bid meeting and prepare meeting minutes issued as a project bid addendum.

Task 460. Bid Processing

- 461. Assist the City during bid opening, make preliminary tabulation of bids and review bids for completeness.
- 462. Review and evaluate the qualifications of the apparent successful bidder. The review and evaluation will include such factors as work previously completed, equipment and staffing that is available for the work, publicly available financial resources, technical experience and responses from references.
- 463. Prepare and distribute formal bid tabulation sheets, evaluate bids, and make written recommendation to the City concerning contract award.
- 464. Prepare conformed set of construction documents to reflect any project addendums or modifications.

Task 500. Construction Phase Services

- 501. Project Administration – Perform project administration services during the construction phase of the project by performing the services described herein. The Engineer shall not have the authority or responsibility to supervise, direct, or control the Contractor's work of the Contractor's means, methods, techniques, sequences, or procedures of construction.

The Engineer shall not have the authority or responsibility for safety precautions and programs incident to the Contractor's work or for any failure of the Contractor to comply with laws, regulations, rules, ordinances, codes, or orders applicable to the Contractor furnishing and performing the work.

502. Review the Contractor's insurance certificates and forward the certificates to the City for acceptance by the City's legal counsel. Engineer's review of the insurance certificates is only for the purpose of determination if the Contractor maintains the general types and amounts of insurance required by the contract documents and is not a legal review to determine if the Contractor's insurance coverage complies with all applicable requirements.
503. Prepare and distribute six (6) sets of the construction contract documents, to include furnishing to the contractor unsigned documents, review for conformance with contract requirements and transmitting the documents to the City for signature and distribution.
504. At a date and time selected by the City and at a facility provided by the City, attend the preconstruction conference and assist the City during the conference. Prepare an agenda for the conference. The preconstruction conference shall include a discussion of the Contractor's tentative schedules, procedures for transmittal and review of the Contractor's submittals, processing payment applications, critical work sequencing, change orders, record documents, the City's expectations of the Contractor throughout construction, and the Contractor's responsibilities for safety and first aid.
505. Provide periodic inspections/meetings by a staff engineer on an as-needed basis to observe progress of the work and consult with the City and the Contractor concerning problems and progress of the work. A maximum of forty-eight (48) inspections/meetings are included in the costs provided. It is acknowledged that some amount of inspections/meetings will be required that is over and above this amount and if additional inspections/meetings are desired by the City, TRC will submit a separate proposal to address this additional need.
506. Continuous construction inspection is included as a separate cost in the Compensation for Services provided below, and is described as follows:
 - a) Services will be provided for a consecutive 24-month construction period.
 - b) Services assume a maximum 50-hour work week, Monday through Friday.
 - c) TRC's on-site inspector will not be a registered professional engineer, but he will have daily communication with the senior design engineer responsible for the project.
507. Review and comment on the Contractor's initial and updated construction schedules and advise the City as to acceptability.
508. Analyze the Contractor's construction schedule, schedule of values, activity sequence, and construction procedures.

509. Review the Contractor's initial and updated schedule of estimated monthly payments and advise the City as to acceptability.
510. Review drawings and other data submitted by the Contractor as required by the construction contract documents. Engineers review shall be for general conformity with the construction contract documents and shall not relieve the Contractor of any of his contractual responsibilities. Such reviews shall not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions and programs incident thereto.
511. Interpret construction contract documents when requested by the City or the Contractor.
512. Review the Contractor's monthly payment requests. Review shall be for the purpose of making a full independent mathematical check of the Contractor's payment request. Verify the quantities of work which are the basis of payment requests.
513. Provide documentation and administer the processing of change orders, including applications for extension of construction time. Evaluate the cost and scheduling aspects of all changes.
514. Interpret claims of the City and the Contractor relating to the acceptability of the work or the requirements of the construction contract documents.
515. Analyze data from performance testing of equipment by the Contractor or supplier when the construction contract documents require the equipment to be tested after installation. Submit conclusions to the City.
516. Receive and review guarantees, bonds and certificates of inspection, which are to be assembled by the Contractor and transmit them to the City.
517. Review and approve equipment O&M manuals and require Contractor to deliver the approved manuals to the City in 3-ring binder sets.
518. Upon substantial completion, in conjunction with the City, prepare a punch list of those items to be completed or corrected before final completion of the project. Submit results of the observation to the City and the Contractor.
519. Upon completion of the items of work on the punch list, conduct a final observation with the City and Contractor to determine if the work is completed. Provide to the City written recommendations concerning final payment, including a list of items, if any, to be completed prior to making such payment.
520. Upon completion of the project, revise the construction contract drawings to conform to the construction records. Record drawings will be based on the information furnished by the contractor, reflecting changes in the project made during construction. Submit four copies of the prints and an electronic version (CD format) to the City.

ASSUMPTIONS

As the basis for the preparation of this proposal and the associated cost of services, the following assumptions were made, which if found to be incorrect, may result in request(s) for additional compensation from TRC:

- The plant design will be based on the WWTP Expansion Study prepared by TRC (dated April, 2019).
- TRC's standard construction contract documents, specifications and drawings will be used for the project.
- The City will acquire and provide access agreements for access to all private properties by TRC representatives.
- Subconsultants for the use of project design will be selected by TRC.
- Monthly progress meetings will be held during construction.
- The entire project will consist of a single bid/construction project.
- TRC's effort and costs for construction services are based on a twenty-four (24) month construction project duration.
- Easement field notes will be needed only for the effluent outfall pipe and will be limited to four (4) properties.
- On-site, full-time Construction inspection will consist of maximum 50-hour weeks for a period of twenty-four consecutive months. If the construction period exceeds twenty-four months, TRC will provide an additional task order based on time-and-materials.
- The proposed effluent pipe will run parallel and adjacent to the existing effluent pipe.

EXCLUSIONS

The following items are specifically excluded from TRC's scope of work:

- Improvements or relocations for franchise utilities, if applicable.
- Electrical supply upgrades to the site, if applicable. This will be evaluated to determine the need for upgrades.
- Improvements to the potable water main that feeds the treatment plant.
- Improvements to the raw sewage pipeline that feeds the lift station.
- Environmental or cultural review of project limits (other than listed above), archaeological surveys, endangered species mitigation plan/costs, or species-specific threatened and endangered survey.
- Detailed title search or title policy, attendance at or preparation for condemnation hearings, plat documents, landowner contact or easement negotiations.

- Clean Water Act Section 404 individual permit.
- Design of Landscaping and/or irrigation design, if applicable.
- GIS mapping.
- Construction survey and staking, post construction survey, or quality assurance testing for construction.
- Determination of the FEMA flood plain level for the site or other flood event levels for Geronimo Creek or the Guadalupe River.
- Services required to rebid the project for any reason or to resolve bid protests.
- Storm sewer design.
- Subsurface utility engineering (for surveying).
- Payment of ADA/TDLR application or inspection fees.
- PLC logic description and design, arc flash testing, and breaker coordination for electrical equipment/devices.
- Design of bid alternates or multiple bid packages, unless specifically stated herein.
- Engineering studies of alternative systems and equipment locations.
- Value engineering design services after approval of 100% Construction Documents.
- Any items not reflected in the scope of work/work tasks.
- Geotechnical bores or report for piping portion (outfall pipe, etc.) of the project.
- During the construction phase - Investigations, analyses, studies or design for substitutions of equipment or materials, corrections of defective or deficient work of the contractor or other deviations from the construction contract documents.
- Providing shop, mill, field, laboratory or factory inspection of materials and equipment.
- Preparing data and reports for assistance to the City in preparation for hearings before regulatory agencies, courts, arbitration panels or mediators, giving testimony or expert representation or preparations therefore.
- Making revisions to drawings, specifications or other documents when such revisions are not consistent with approvals or instructions previously given to TRC or due to other causes not within the control of TRC.

COMPENSATION FOR SERVICES

The cost to provide the engineering services will be invoiced as a lump sum project. The invoicing will be phased, as follows:

Phase 1 – For the City's fiscal year 2020, the topographical surveying, geotechnical and environmental services and engineering design to the 60% completion level will be invoiced.

Topographical Surveying:	\$34,358.00
Geotechnical Services and Report:	\$36,615.00
Environmental Services:	\$3,812.00
Engineering Design:	<u>\$1,025,215.00</u>
Phase 1 Total:	\$1,100,000.00

Phase 2 – For the City's fiscal year 2021 and subsequent years, the remaining engineering design, bidding/construction administration and construction inspection will be invoiced.

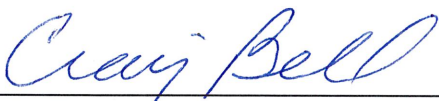
Engineering Design:	\$1,253,313.00
Bidding/Construction Administration:	\$376,302.00
Continuous Construction Inspection:	<u>\$588,693.00</u>
Phase 2 Total:	\$2,218,308.00

Total Project: **\$3,318,308.00 (lump sum)**

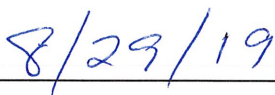
Services will be provided in accordance with the Master Service Agreement (dated December 16, 2003) executed by the City and TRC. Fees for services quoted in this proposal are valid for a period of time not to exceed 60 days from the date of this letter.

We appreciate the opportunity to assist with this project and are available to proceed immediately with your written approval. Please review this proposal and, upon acceptance, sign in the space provided below.

Sincerely,



H. Craig Bell, P.E.
Austin CES Practice Leader



Date

City of Seguin

Date