

CITY CLERK
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C-9627-1
12/06/2016

AMENDMENT NO. 1
Cholla Water Treatment Plant Improvements
(City Project No. 131418, Contract No. C-9627)

This Amendment No. 1 ("Amendment") to the Professional Services Agreement ("Agreement") is made this 6 day of December 2016, ("Effective Date"), by and between the City of Glendale, an Arizona municipal corporation ("City") and Black & Veatch Corporation, a Delaware corporation, authorized to do business in Arizona ("Contractor").

RECITALS

- A. City and Black & Veatch Corporation ("Contractor") previously entered into a Professional Service Agreement, Contract No. C-9627, dated January 13, 2015 ("Agreement"); and
- B. the initial study phase of the work has been completed with recommendations having been made on how to proceed in the near term for design of critical plant improvements.
- C. Expanding the Scope of Work (attached under Exhibit B) under the original Agreement will allow the improvements to be designed and ultimately implemented which will increase the efficiency and reliability of the Water Treatment Plant.
- D. City and Contractor wish to modify and amend the Agreement subject to and strictly in accordance with the terms of this Amendment.

AGREEMENT

In consideration of the mutual promises set forth herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the City and Contractor hereby agree as follows:

1. **Recitals.** The recitals set forth above are not merely recitals, but form an integral part of this Amendment.
2. **Term.** The term of the Agreement is extended for a three-year period from January 1, 2017 through December 31, 2019, unless otherwise terminated or canceled as provided by the Agreement. All other provisions of the Agreement except as set forth in this Amendment shall remain in their entirety.
3. **Scope of Work.** This project will design selected improvements resulting from the Phase 1 plant assessment of the Cholla Water Treatment Plant - See Exhibit B. The scope of services for Phase 3 - Construction Administration Services will be finalized in separate contract amendment at a later date.

4. **Compensation.** Phase 1 resulted in previous compensation of \$491,960. Phase 2 compensation will result in an additional increase in compensation of \$1,298,140 and as shown in the attached Exhibit D.
5. **Insurance Certificate.** Current certificate will expire on November 1, 2017 and a new certificate applying to the extended term must be provided prior to this date to Materials Management and the Contract Administrator.
6. **Non-discrimination.** Contractor must not discriminate against any employee or applicant for employment on the basis of race, color, religion, sex, national origin, age, marital status, sexual orientation, gender identity or expression, genetic characteristics, familial status, U.S. military veteran status or any disability. Contractor will require any Sub-contractor to be bound to the same requirements as stated within this section. Contractor, and on behalf of any subcontractors, warrants compliance with this section.
7. **No Boycott of Israel.** The Parties agree that they are not currently engaged in, and agree that for the duration of the Agreement they will not engage in, a boycott of Israel, as that term is defined in A.R.S. §35-393.
8. **Attestation of PCI Compliance.** When applicable, the Contractor will provide the City annually with a PCI-DSS attestation of compliance certificate signed by an officer of Contractor with oversight responsibility.
9. **Ratification of Agreement.** City and Contractor hereby agree that except as expressly provided herein, the provisions of the Agreement shall be, and remain in full force and effect and that if any provision of this Amendment conflicts with the Agreement, then the provisions of this Amendment shall prevail.

[Signatures on the following page.]

CITY OF GLENDALE, an Arizona
municipal corporation



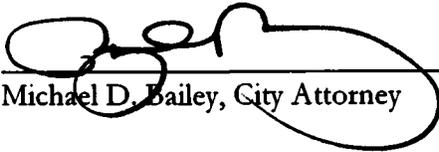
Kevin R. Phelps, City Manager

ATTEST:



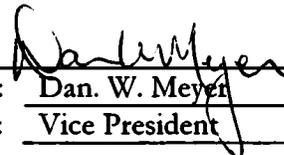
Julie K. Bower, City Clerk (SEAL)

APPROVED AS TO FORM:



Michael D. Bailey, City Attorney

Black & Veatch Corporation
licensed to do business in Arizona



By: Dan. W. Meyer

Its: Vice President

EXHIBIT A
Professional Services Agreement

CHOLLA WATER TREATMENT PLANT PROCESS IMPROVEMENTS – PHASE II

Design Services – Phase 2 – Amendment 1

City Project No. 131418

DESCRIPTION OF PROJECT:

The Cholla Water Treatment Plant began operations in 1978, treats Salt River Project (SRP) water from the Arizona Canal, and has a current design capacity of 30 million gallons per day (mgd) after having undergone multiple expansion and modification projects.

Phase 1 of the project has been completed and included water treatment plant's (WTP) existing condition evaluation and recommendations for improvement. Phase 2 includes design of the selected recommended improvements. Phase 3 includes construction administration services for the improvements. The Scope of Services for Phase 3 will be finalized at a later date.

Requested services could include assisting City staff with Council presentations, public meetings, and other related public involvement activities. The City may or may not utilize the services of a Construction Manager at Risk (CMAR). This optional delivery method will be decided at a later time. The engineering firm (Consultant) will be a member of a project team that includes, but is not limited to, city staff and possibly a construction manager at risk contractor.

EXHIBIT B
SCOPE OF SERVICES FOR CITY OF GLENDALE
CHOLLA WATER TREATMENT PLANT IMPROVEMENTS – PHASE II
DESIGN SERVICES – Phase 2 – Amendment 1
CITY PROJECT NO. 131418

BACKGROUND

The City of Glendale's (City's) Cholla Water Treatment Plant (WTP) was built in 1978 after the Cholla 1 finished water reservoir and booster station were built in 1972. Various modification & improvement projects have been implemented since then, including the recent addition of two filters and relocation of the filter backwash pump station in 2006. Other improvements included an off-site finished water reservoir and solids handling facility. Much of the original plant's equipment is still in operation and may be approaching the end of its useful life. Under the first phase of this project, a facility assessment was performed which identified and recommended system optimizations as well as categorized asset improvements for rehabilitation or replacement into immediate, near and long term groups.

PURPOSE

Black & Veatch (Consultant) has completed Phase 1 work which included an evaluation of the facility's existing conditions and recommendations for improvements. Phase 2 includes detailed design of recommended Group 1 improvements. Phase 3 includes construction administration services for the Phase 2 improvements. The Scope of Services and compensation for Phase 3 will be performed under a separate contract or amendment to this contract at a later date.

SCOPE

The Cholla WTP Improvements – Phase 2 project is comprised of the following tasks.

Group 100: Project Management

Task 110: General Management & Administration

The Consultant will provide general coordination of the project with the City staff including Water Services, Engineering, Plant Operations and other departments as necessary to facilitate the project.

Consultant will develop the Phase 2 project schedule, and perform other administrative functions including, maintaining project data files, tracking project progress and invoicing throughout Phase 2.

Phase 2 project management documentation consists of monthly progress reports and schedule updates. The monthly project reports will summarize the work progress, project issues, and project schedule status. Consultant will also submit quarterly cash flow schedule and quarterly updates regarding future funds needed to complete the project.

Task 120: Project Meetings & Workshops

Consultant will prepare meeting documentation and conduct monthly meetings and up to two workshops to discuss the progress, direction and technical aspects of the project. Project documentation will consist of preparing and distributing meeting agendas and minutes. Meeting minutes will summarize key discussions, comments, decisions, and any action items required. Ten



progress project meetings, including two Electrical and I&C discipline specific meetings are anticipated as part of the work scope tasks. Consultant will provide draft meeting minutes to the City for review and final minutes incorporating comments from the City on the draft minutes, as required.

Group 100 Deliverables:

- Project Schedule
- Meeting Agenda and Minutes, with Action Items
- Monthly Progress Reports and Schedule Updates
- Document and Data Request Log
- Action Items and Decision Log
- Quarterly cash flow projections

Task 200: Preliminary Evaluations & Basis of Design Report

Preliminary Evaluations will be completed to support the Basis of Design (BOD) as described herein.

Task 201 – Data Collection and Site Investigations

The following information and plant facility records will be obtained and reviewed:

- Three years of digital data (Excel or other database) for the following parameters:
 - Oasis and Cholla Zone 1 and 2 hourly flow and pressure data
 - WTP production (low lift pump station) hourly flow
 - Chemical feed rates
 - WTP Facility and Cholla 2 AutoCAD files
 - Cholla Zone 1A/1B and 2 pump curves

Site investigations will include visual observations and inspection of equipment for confirming results of system evaluation and planned modifications.

Task 202 – Cholla WTP Plant Production and Zone Demand Evaluation

Provide distribution system operational flexibility by operating Cholla WTP at reduced demand. The task involves minimum plant production, Cholla Zones 1 and 2, and Oasis Zone 1 Booster Pump Station Demand Evaluation.

- A. B&V will review historic water demand (metered sales data) and production supply (SCADA data) for each month for the last five years. A workshop with the City will be held to establish desired production / operational plan during minimum demand months (groundwater versus surface water) to develop minimum Cholla WTP production.
- B. Minimum Cholla WTP production will also be determined to support sizing of raw water pump station recirculation and chemical feed modifications as described herein.
- C. Maximum Zone 1 and Zone 2 required demands to support sizing of the emergency generator as described herein.
- D. Up to five (5) system operating scenarios will be run to determine the best Zone 2 pumping efficiency point for energy conservation.
- E. Minimum plant production, Zone demands, and diurnal curves will be provided to the City to be used by Others for analysis of Cholla Zones 1A, 1B, and 2 minimum pumping requirements as well as its interaction with the Oasis Zone 1 pumping. B&V to support the City answer questions by Others.



Task 203 – Raw Water Pump Station Modification

Assess and confirm Cholla WTP Raw Water Pump Station (RWPS) turn down capacity and modify the pump station to accommodate plant production < 8 mgd identified in Task 202 to facilitate the following tasks:

- A. Recirculation pipeline and control valve sizing from the RWPS discharge to the Pre-sedimentation Splitter Box. When existing pump is operated at lowest turndown capacity, the pipeline will recirculate excess flow to meet lower plant production rate.
- B. Develop associated control description and electrical/I&C for the control valve.

Task 204 – Chemical Feed Metering Pump Modifications

Identified plant minimum production rate in Task 202 will drive assessment of chemical feed equipment capacity to achieve required turndown to meet plant production flow and dosage rates. The following chemical feed systems:

- Aluminum Sulfate
- Coagulant Aid Polymer
- Sodium Hydroxide
- Hydrofluosilicic Acid

This task will assess and update:

- A. Chemical metering pumps resizing to meet minimum maximum plant flow / chemical dosage based on required minimum plant production rate. Pumps will either be peristaltic or diaphragm metering.
- B. Review existing unutilized plant control system automatic control strategy and update the control description to allow the new chemical metering pumps to operating in local manual, remote manual, and remote automatic.

Task 205 - Carbon Dioxide Strainer Replacement

Site inspection carried out during the facilities condition assessment indicated clogging of the existing simplex basket strainer. This task will involve:

- A. Replacement of the existing simplex basket strainer will be replaced with a duplex basket strainer with appropriate materials of construction.
- B. Piping modifications as required to accommodate the new strainer.
- C. Modify / replace existing discharge diffuser to reduce plugging while meeting manufacturer backpressure requirements

Task 206 - Zone 2 Booster Pump Station Standby Generator & Switchgear Shade Structure

A vulnerable condition for the Cholla WTP is its potential inability to support Zone 2 and 3 if Pyramid Peak WTP is out of service and the Cholla WTP loses utility power. This task includes:

- A. Consultant will design a new diesel fueled, standby, engine generator with 24-hour sub-base fuel tank will be installed and connected to a new Automatic Transfer System (ATS) designed by City's Consultant (Others). The new engine generator will be sized as required to support the required Zone 2 booster pumps as identified in Task 202. Design will include conduit and cabling from the new generator to Zone 2 Electrical Building.
- B. Consultant will review the existing Zone 1A/1B electrical switchgear and how the existing standby generator is fed and identify means to connect new generator to the existing Zone 1A/1B electrical gear. Operation of new generator with Zone 1A/1B pumps will be designed to be done manually. Automation of feeding both Zone 1A/1B and Zone 2 from the same new generator through an ATS can be performed as an allowance.

- C. Consultant (B&V) will coordinate with the City's Consultant as required for locating new generator, gear location inside the Zone 2 Electrical Building, conduit and cables.
- D. The City's Consultant as part of another project will provide Consultant (B&V) with their electrical/control single line diagrams of the new Zone 2 Motor Control Center that will be modified to 480 volts from its current medium voltage. The City's Consultant's other design project includes complete modification to the Zone 2 Motor Control Equipment with an integral ATS for connection to the standby generator designed by the Consultant (B&V). The City's Consultant will coordinate the exchange of external input/output signals from the new generator to the ATS and to the City's PLC.
- E. Up to two options for a switchgear shade structure to provide UV protection to the existing switchgear.

Task 207 - Programmable Logic Controller (PLC) Replacement

Assess non-Ethernet compatible PLCs and evaluate available platforms to provide long-term product support. This task includes:

- A. Chemical Building (Chem). Replace existing Compaq Chem PLC, Momentum Presed RIO, Compaq Low Lift PLC, Quantum Ammonia PLC and Quantum CO2 RIO with new redundant Modicon M580 PLC with remote IO. The CO2 is currently part of the existing Filter PLC RIO network but will be modified and moved to new Chem PLC RIO. The existing operator interface terminals (OITs) at the Chem PLC and Ammonia PLC will not be replaced however provisions for local iFix workstations will be provided in both locations. The existing Low Lift variable frequency drives (VFDs) are not currently on the network but will be added to the Ethernet network if compatible communication module can be added.
- B. Filter Area. Replace existing Quantum Filter Master PLC and four Quantum Filter RIO with redundant Modicon M580 PLC with remote IO. As noted in Chem Area. The CO2 RIO will be removed from the Filter remote IO loop. The UF PLC will not be upgraded as part of this project. Replace Modbus Plus network with Ethernet network which will include replacement of existing OITs at the Filter Master PLC and at each of three filter consoles and addition of serial to Ethernet convertors for existing backwash pump VFDs.
- C. Finished Water Area. The Zone 1A, Zone 1B and Zone 2 PLCs are being upgraded as part of a separate project. As part of this project, provide coordinate with that design team to maintain design philosophy consistency.
- D. Dewatering System. Replace existing Quantum PLC-SHF with Modicon M580 redundant PLC and replace the associated existing Quantum RIO with M580/M340 RIO. Coordinate with centrifuge manufacturer for replacement of existing centrifuge control panel PLCs with M340/M580 PLCs. Replace existing Modbus Plus network with Ethernet compatible devices which will include replacement of the existing OITs at PLC-SHF, the polymer feed system RIO and both centrifuge control panels plus addition of serial to Ethernet convertors for centrifuge VFDs.
- E. Miscellaneous Network Upgrades. Coordinate with finished water area design team the possible addition of new fiber from Administration Building to Zone 2 pump station and from Zone 1B pump station to the Filter Electrical Building. Provide new fiber from the Chem Area to the Dewatering Area for communication redundancy to the Dewatering Area.
- F. Administration Building. The existing Quantum PLC Admin are being upgraded as part of a separate project by the City. The Remote Facility redundant Quantum PLCs will not be replaced as part of this project but rather as part of a future Remote Facility PLC upgrade project.



Task 208 - Uninterruptible Power Supply (UPS) Replacement

Assess existing Uninterruptible Power Systems based on the recommended improvements during facilities condition assessment. This task will provide:

- A. A new, centralized Uninterruptible Power Supply (UPS) unit will be installed with a dedicated electrical distribution panel to refeed UPS loads at the Chemical Building and Filter Buildings. A maintenance bypass switch to the UPS will be provided.
- B. The UPS unit(s) at the Zone 1A, 1B and 2 Booster Pump Stations are being upgraded as part of a separate project by City.

Task 209 - Site Lighting Upgrades

Under this task, Consultant will perform existing site lighting upgrades consisting of:

- A. Review of the existing site lighting will be performed to determine current level of lighting and confirm whether areas with low lighting are intended / acceptable.
- B. Based on lighting study results, identify whether existing poles are sufficient, and provide up to two (2) options for conversion of existing lighting to energy-efficient LED lighting fixtures.
- C. Level of effort described herein assumes the existing lighting system controls and power supply and voltage will remain unchanged. Lighting associated with structure interiors is not included. Change of lighting controls, power source, or voltage, or conversion for lighting internal to structures may be accommodated under the allowance.

Task 210 - Cholla 1 Bypass Pipeline / Cholla 2 Reservoir Return to Service

Existing Cholla 2 reservoir is currently out of service, while the 48-inch bypass pipeline is abandoned in place. In addition, means to bypass Cholla 1 reservoir is not available and the reservoir can be operated only in series to route filtered water to offsite Cholla 2 reservoir. This task involves:

- A. Bypass of the Cholla 1 reservoir utilizing the majority of the existing on-site pipeline. Level of effort it based on interception of the 48-inch bypass pipeline east of the existing Splitter Box and routing it south and west to the existing elbow of the original 48-inch Cholla 2 reservoir inlet which is currently abandoned. It is assumed abandoned portion of 48-inch pipeline not inspected is in a condition similar to that of the other piping inspected.
 - 48-inch portion of Cholla 1 inlet piping was not investigated due to damaged valve actuator. If additional investigation of this portion of piping is desired, a subconsultant will be selected for additional manned investigation of the pipeline after valve repair which will include safety planning and coordination with plant and distribution personnel.
- B. Based on initial investigation of existing bypass piping between Cholla 1 and Cholla 2 reservoirs, improvements anticipated to only consist of internal joint seals and mortar repair specifications. Cholla 2 inlet (66-inch section) and outlet (66-inch pipeline) based on Phase 1 findings for bypass pipeline connecting existing Cholla 1 bypass to Cholla 2 inlet pipeline.
- C. Improvements associated with bringing Cholla 2 back on-line. Note: this task is anticipated to entail notes and specifications for crack repairs, baffle curtain angle repair/replacement, and existing chemical piping demolition only; re-design of existing reservoir (i.e. addition of overflow) is not included in this scope of work. Leakage testing of the Cholla 2 reservoir is anticipated prior to recommissioning.
- D. Cholla 1 investigation and rehabilitation will be completed as part of Task 212.

Task 211 - Cholla Plant Entrance Gates, Fence, & Parking Improvements

Based on the evaluation of the existing chain link fence during the facilities condition assessment, this task involves:



- A. Replacement of existing chain link perimeter fencing with masonry block wall and tubular steel fencing to match existing while maintaining security needs along the north side of the plant site. Conduit will be designed for lighting and/or security; security design / upgrades by Others.
- B. Replace existing main plant entrance gate on W. Cholla Street with tubular steel rolling gate. Upgrades to existing call-box will be included to maintain gate control, access control, audio only intercom, and Glendale Fire Department access & knox box.
- C. Replace southwest entrance gate on N. 49th Avenue with tubular steel rolling gate. Existing fence will be modified to allow 18-wheeled trucks to pull completely off of 49th Avenue before gate is opened with masonry block wall and tubular steel fencing. New call-box will be included to provide gate control, access control, audio only intercom, and Glendale Fire Department access & knox box.
- D. Utilizing the existing spaces, include 10-16 parking spaces on the south side of the existing Administration Building. Existing plantings will be relocated to elsewhere in the WTP, if feasible.
- E. Demolish existing landscape island north of the Administration Building. Include up to two options for paving and grading and drainage improvements as a result of the island demolition. Saguaro cactus and other plantings in the island will be relocated elsewhere in the WTP, if feasible. Stormdrain improvements are not anticipated or included.
- F. Existing renderings will be reviewed and updated if needed; additional views / renderings are not anticipated. Coordination of renderings for submittal to Glendale Planning Design Review will be completed under Task 251.

Task 212 - Cholla 1 Reservoir Rehabilitation

Cholla 1 rehabilitation tasks described below are currently anticipated based on previous reservoir investigations and age of the structure.

- A. Upon completion of the Cholla 1 bypass pipeline construction, the Cholla 1 reservoir will be isolated and drained for internal inspection. Level of effort described herein assumes structural foundation and columns are sound. Geotechnical investigation and other reservoir improvements not identified herein are included as an allowance.
- B. Demolish the existing standing seam metal roof, which has reached the end of its useful life, and replace in kind. Details will include new anchorage details to existing support beams and potential structural improvements / replacement of beams. Consultant will include design of polyurethane foam for reduced thermal expansion.
- C. Review up to two venting options (passive vs. active) for inclusion in design. Demolish the existing geo-membrane liner. Consultant will present up to two (2) options for liner replacement will be evaluated, for initial capital costs, longevity and life cycle costs.
- D. Provide up to two (2) options for baffling of reservoir to increase baffling factor for reduced TTHM formation. Consultant will review the City's existing baffling factor used for disinfection CT calculations and confirm desired baffling factor. Reservoir baffle wall configuration (load bearing cast-in-place concrete baffles as well as non-load bearing baffles constructed of cast-in-place concrete, FRP, aluminum material) will be evaluated, for initial capital costs, longevity and life cycle costs.
Up to three (3) potential baffle wall configurations will be evaluated using computational flow dynamic modeling to meet the desired level effective detention time based on most conservative water quality used to calculate disinfection contact time and discussed with the City and CMAR for constructability.
- E. City will provide existing reports from recent inspections and design reports / studies by Others for review.

Task 250 – Basis of Design Report

A Basis of Design Report (BOD) will be prepared for the Cholla WTP Improvements – Phase 2 project. The BOD will summarize and update the selected alternatives and design information developed from Phase 1 investigations and documented in Technical Memorandum 2 (TM2). The BOD will be used to document the information needed to prepare the detailed design drawings and specifications. The BOD will generally include the following items.

- General project scope and background references
- Process design criteria
- Applicable codes and standards, including fire and safety codes
- Equipment tagging / Asset Management information management
- Local building, planning, and zoning department requirements
- Site considerations, including subsurface conditions and drainage
- Preliminary site plan, layouts, and architectural renderings
- Structural and Electrical design criteria

Survey and geotechnical information will be based on existing record drawings and reports. Survey, geotechnical investigation, and potholing are included as an allowance. A Draft BOD will be issued to City for review; comments received will be incorporated as mutually agreed upon and a Final BOD will be issued.

Task 251 – Agency Coordination

Initial coordination will be performed with review agencies to review the scope and schedule of the work and the requirements of each agency. These agencies include the following:

- Maricopa County Environmental Services Department (MCESD)
- Glendale Planning
- Glendale Development Services

Required permits will be identified and coordinated with the respective agency. It is anticipated that up to 4 separate meetings with the regulatory agencies may be required.

Group 200 Deliverables

- Design Review Submittal for Gate / Fence Modifications
- Architectural elevations
- Draft Basis of Design – electronically
- Final Basis of Design – electronically and six (6) hard copies

Group 300: Design

Group 300 includes the detailed design of the Cholla WTP Improvements.

The final deliverable from this phase of the project is a single complete set of contract documents. The drawings will be provided on 22 by 34 inch sheets using AutoCAD and assume use of conformed to construction record base files as starting point provided by the City. The contract documents will include the following:

- Glendale’s “boiler plate” front-end specifications
- B&V special provisions
- B&V standard technical specifications
- Contract drawings utilizing B&V Drafting Standards on Glendale title block
- Glendale cover sheet



The facilities identified in this scope of services as basic components are included in the final design of the Cholla WTP Improvements. Consultant's quality control and design will be in accordance with the Consultant's Quality Management Plan. The scope of work is based on coordination with a CMAR Contractor to bid and construct the facilities. If the City decides on a traditional design-bid-build approach, adjustments will be made as required to reallocate CMAR related services for a traditional design-bid-build approach.

The Consultant will identify new assets as part of the project for entry into the City's asset management system. City will provide the Consultant with the City's asset tagging convention Excel file template. Upon completion of the detailed design, the asset file template will have been completed for City review for design-related information only (name, location, tag number, etc.). Completion of final asset file will be performed during construction phase services under a separate amendment.

Any additional improvements that are not presented herein may be incorporated as an allowance described below or as an amendment to this Agreement upon written approval of Glendale.

The City standard SCADA template will be utilized and provided by Others. Control descriptions will be provided for new equipment only. Control descriptions of existing equipment / processes will be developed by B&V as part of the B&V-provided programming task associated with Engineering Services during Construction (Phase 3).

Task 310: Preliminary Design (30% Design)

The Final Basis of Design will be utilized to create a 30% preliminary design set of plans for City and CMAR Contractor review and facilitate CMAR's budget pricing. The Preliminary Design package will include preliminary layout drawings, typical details, and construction and demolition notes for the identified improvements.

An internal quality assurance / quality control (QA/QC) review will be performed and QC/QC comments incorporated prior to issuance of the documents to the City for distribution to the CMAR.

30% design includes:

- a. General
 - Abbreviations, general notes, typical details
- b. Civil / Site
 - Site plan with structures, drives, and grading
 - Initial yard piping layouts
- c. Civil / Mechanical / Structural / Architectural
 - Plans and major sections with equipment, piping and valve layouts including:
 - Cholla 1 roof & linear replacement
 - Cholla 1 bypass pipeline
 - Raw water pump station recirculation pipe and CO₂ feed system equipment
 - Chemical feed system equipment
 - Main plant and SW entrance gates upgrades
 - Major draft specifications
 - Initial major equipment added to asset management template



d. Electrical

- Layout space requirements for major electrical equipment
- Zone 2 booster pumps standby generator
- Initial power single line diagrams, lighting fixture schedule

e. Instrumentation and Control

- Initial control system block diagrams
- Chemical feed systems P&IDs
- Cholla 1 & 2 Reservoir P&ID
- Initial PLC & UPS system specifications

The level of effort for the design is based on the below drawing and specification lists. Existing AutoCAD drawings of the existing Cholla WTP facility are not readily available and will require creation of new 2015 AutoCAD drawings. Consultant will provide the City with recommended additional Supplemental Conditions to the City standard front end documents. The City will provide the CMAR with all necessary City front end documents.

Task 311 - CMAR Cost Model Review & Coordination

Consultant will review the CMAR's initial construction cost model and provide input to the City. It is anticipated after the initial review comments are provided by the Consultant, a follow up review of the updated model and comments resulting from the second review will also be provided. Consultant's review shall be made on the basis of experience and qualifications as a professional engineer.

The CMAR will attend regularly scheduled design team meetings with Consultant and Glendale. The CMAR coordination will include:

- Constructability review meeting with the CMAR.
- Up to two meetings with the CMAR will be held to clarify preliminary design elements and potential value engineering option discussions.
- Incorporate the agreed upon CMAR's comments by Glendale and Consultant into the construction documents.
- Construction cost estimates will be prepared by the CMAR.

An overall Project Schedule will be developed by the CMAR. Consultant will provide input into the schedule by identifying key milestones with Glendale.

Task 312 – Agency Coordination

Review agencies will be contacted to discuss the project status and coordinate the design of the project. The requirements of each agency (MCESD, Glendale Planning, and Glendale Development Services) will be identified and incorporated into the project.

Group 310 Deliverables

- One PDF copy of the 30% drawing set
- Comments on CMAR cost model

Task 320: Detailed Design – 60% Design

Consultant will review and summarize comments received from the City and/or CMAR from the Preliminary (30%) Design and provide responses. Comment resolution documentation will be provided



to the City for review and follow on discussions at project meetings if required. Consultant will incorporate agreed upon City / CMAR comments into the Detailed (60%) Design documents along with additional details. Consultant will perform an internal QA/QC review and incorporate QA/QC comments into the Detailed (60%) Design documents prior to issuance of the documents to the City for distribution to the CMAR Contractor.

60% design includes:

- a. **General**
 - Abbreviations, general notes, typical details
- b. **Civil / Site**
 - Site plan with structures, drives, and grading
 - Yard piping layouts
- c. **Civil / Mechanical / Structural / Architectural**
 - Plans and major sections with equipment, piping and valve layouts for treatment systems including:
 - Updated Cholla 1 roof, liner, and baffle details
 - Updated Cholla 1 bypass pipeline layout and details
 - Updated raw water pump station recirculation pipe and CO₂ feed system equipment details
 - Updated chemical feed system equipment layout and details
 - Updated Main plant and SW entrance gates layout and details
 - Remaining draft specifications
 - Update additional equipment to asset management template
- d. **Electrical**
 - Updated Layout space requirements for major electrical equipment
 - Updated Zone 2 booster pumps standby generator
 - Updated power and initial control single line diagrams, lighting fixture schedule
- e. **Instrumentation and Control**
 - Updated control system block diagrams
 - Updated chemical feed systems P&IDs
 - Updated Cholla 1 & 2 Reservoir P&ID
 - Updated PLC & UPS system specifications

Task 321 - CMAR Cost Model Review and Coordination

Consultant will review the CMAR's construction cost model and provide input to the City. It is anticipated after the initial review comments are provided by the Consultant, a follow up review of the updated model and comments resulting from the second review will also be provided. Consultant's review shall be made on the basis of experience and qualifications as a professional engineer.

The CMAR will attend regularly scheduled design team meetings with Consultant and Glendale. The CMAR coordination will include:

- Constructability review meeting with the CMAR.

- Up to two meetings with the CMAR will be held to clarify preliminary design elements and potential value engineering option discussions.
- Incorporate the agreed upon CMAR's comments by Glendale and Consultant into the construction documents.
- Construction cost estimates will be prepared by the CMAR.

An overall Project Schedule will be developed by the CMAR. Consultant will provide input into the schedule by identifying key milestones with Glendale.

Task 322 – Agency Coordination

Review agencies will be contacted to update the project status and coordinate the design of the project. The requirements of each agency (MCESD, Glendale Planning, and Glendale Development Services) will be identified and incorporated into the project.

Group 320 Deliverables

- One PDF copy of the 60% drawing set
- Comments on CMAR cost model

Task 330: Final Design (Agency Review)

Consultant will review and summarize comments received from the City and/or CMAR from the Detailed (60%) Design and provide responses required to finalize the design documents. Comment resolution documentation will be provided to the City for review and follow on discussions at project meetings.

Consultant will incorporate agreed upon City / CMAR comments into the Final Design documents and perform a final internal QA/QC review. QA/QC comments will be incorporated into the Final Design documents which will then be signed and sealed for Agency Review. The Consultant will submit the Agency Review documents to the City Development Services Department and Maricopa County Environmental Services Department (MCESD) for approval.

Agency review fees will be paid by the Consultant and reimbursed by the City.

The 100% design includes:

- a. General
 - Final abbreviations, general notes, typical details
- f. Civil / Site
 - Site plan with structures, drives, and grading
 - Yard piping layouts
- g. Civil / Mechanical / Structural / Architectural
 - Plans and major sections with equipment, piping and valve layouts for treatment systems including:
 - Final Cholla 1 roof, liner, and baffle details
 - Final Cholla 1 bypass pipeline layout and details
 - Final raw water pump station recirculation pipe and CO₂ feed system equipment details
 - Final chemical feed system equipment layout and details
 - Final Main plant and SW entrance gates layout and details
 - Final specifications
 - Final additional equipment to asset management template



h. Electrical

- Final Layout space requirements for major electrical equipment
- Final Zone 2 booster pumps standby generator
- Final power and control single line diagrams
- Final duct bank sections and schematics
- Final lighting fixture schedule

i. Instrumentation and Control

- Final control system block diagrams
- Final chemical feed systems P&IDs
- Final Cholla 1 & 2 Reservoir P&ID
- Final PLC & UPS system specifications

Task 331: For Construction Plans (100% Design)

Revisions to drawings or specifications will be completed to satisfy Agency review comments. Copies of Final 100% plans will be provided to City and CMAR in electronic and hard copy formats.

Task 332 - CMAR GMP Review

Consultant will review the CMAR's Guaranteed Maximum Price (GMP) proposal and provide input to the City. It is anticipated after the initial review comments are provided by the Consultant, a follow up review of the updated model and comments resulting from the second review will also be provided. Consultant's review shall be made on the basis of experience and qualifications as a professional engineer.

Group 330 Deliverables

- Final Design (Agency Review) – One PDF copy of drawing set to the City and CMAR.
- For Construction – Four (4) bond and one PDF copy of drawing sets to the City and one bond and PDF to the CMAR after Agency approvals.
- Comments on CMAR GMP

Task 400: Bid Phase Services

Consultant will coordinate with City-selected CMAR Contractor at each deliverable answer up to ten (10) CMAR Contractor RFIs at each deliverable to facilitate CMAR's final GMP based on Agency Review document set. Consultant will assist to resolve any modifications made as a result of Agency comments. Responses to additional RFIs will be provided as a supplemental service.

CMAR to provide City and Consultant their anticipated comprehensive MOPO plan for review based on CMAR's anticipated construction schedule. Consultant will review and provide feedback on the plan.

Task 500: Engineering Services During Construction

This task will be performed under a separate amendment scoped at a later date.

SUPPLEMENTAL SERVICES ALLOWANCES

All allowances described below cannot be performed until authorized by the City.

Allowance A: Fiber Optic Availability Evaluation

This allowance includes an evaluation of the available existing fiber optic cabling between the Cholla WTP and Oasis WTP. Consultant would confirm whether a pathway between the WTPs exists within the City's existing fiber optic network, and whether spare strands are available. Consultant will coordinate with various City departments as required.

Allowance B: Smart Analytics

As part of the allowance, the Consultant will meet with the City regarding use of smart data analytics to optimize operations and streamline monitoring and reporting. Discussion will include specifications for the server required and who supplies it, determination of Key Result Areas (KRAs) with Key Performance Indicators (KPIs) that provide real-time trending and data analytics, making previous KRAs/KPIs "live," preparation of a Performance Summary Report documenting results of the full-scale demonstration, providing training to City employees on how the platform can be used, on-going monitoring, or other related tasks.

Allowance C: Subconsultant Services

An allowance for various subconsultant services including, but not limited to, the following:

- Survey
- Geotechnical services
- Potholing
- Manned inspection of Cholla 2 reservoir 48-inch piping
- Inspection / repair of Cholla 2 reservoir inlet isolation valve actuator
- Public relations

Allowance D: Owner's Allowance

An additional allowance is provided for miscellaneous tasks at the City's discretion. Such tasks could include, but are not limited to:

- Chemical storage capacity evaluation
- Design of new generator automatic transfer system for Zone 1A/1B pump station.
- Air Scour Blower design
- Assistance with inspection of underdrains for corrosion
- Review / update of plant electronic O&M manual
- Group 2 or 3 tasks from Phase 1 – TM2
- Other miscellaneous improvements

SCHEDULE

See attached Schedule Exhibit C.

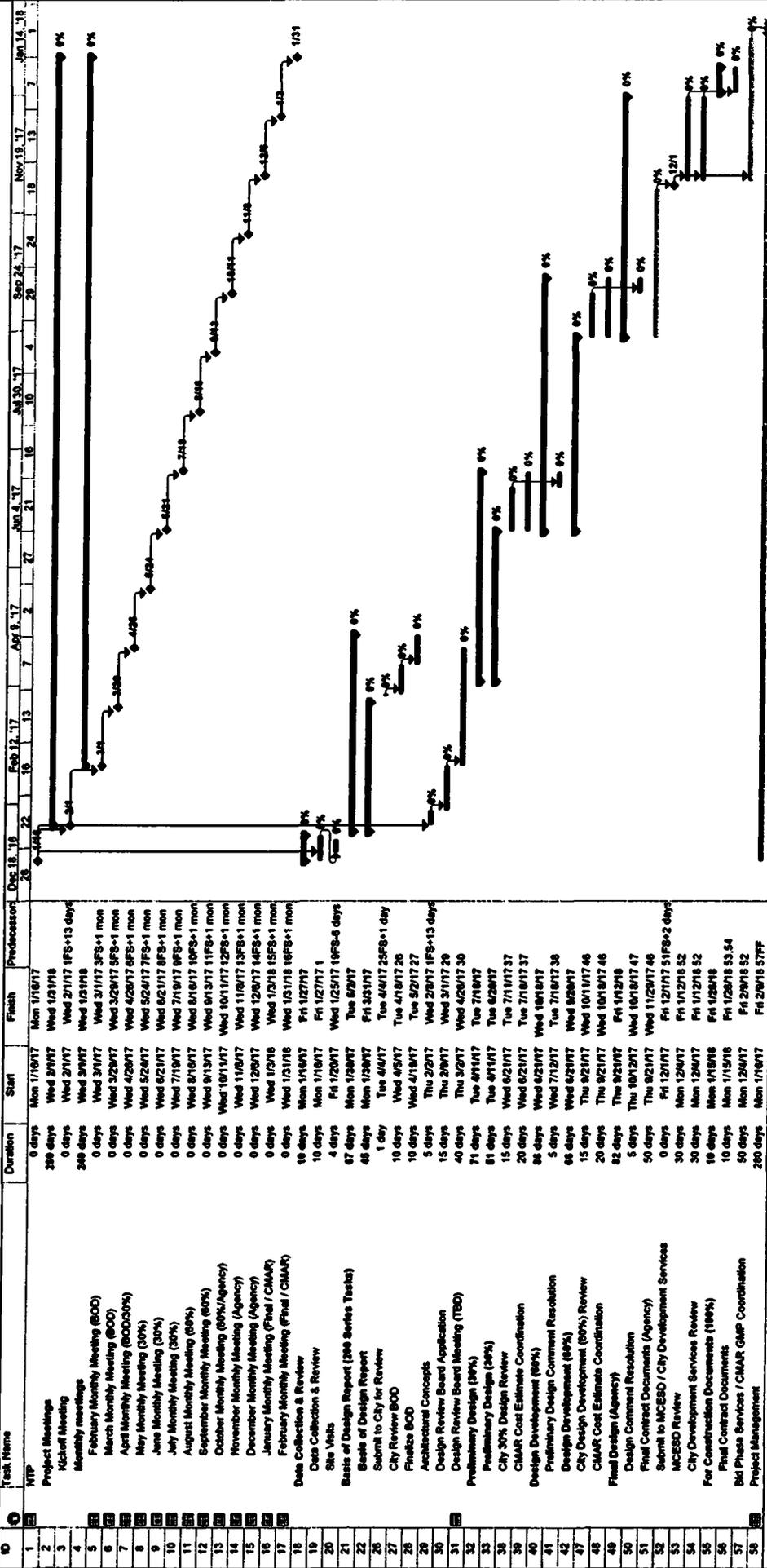
BUDGET

See attached Level of Effort Exhibit D.

EXHIBIT C

Cholla WTP Improvements Design Services - Phase 2 - Amendment 1

City PN 131418



Project: Cholla WTP Improvements Pr
Date: 11.02.2016

Legend:

- Task Progress: [Solid Bar]
- Task Baseline: [Dotted Bar]
- Task Split: [Bar with vertical line]
- Milestone: [Diamond]
- Summary Progress: [Bar with dots]
- Summary: [Bar with horizontal lines]
- Project Summary: [Bar with vertical lines]
- External Tests: [Bar with vertical lines]
- External Milestone: [Diamond]
- Inactive Task: [Bar with diagonal lines]
- Inactive Milestone: [Diamond]
- Manual Summary: [Bar with vertical lines]
- Manual Task: [Bar with vertical lines]
- Manual Summary Rollup: [Bar with vertical lines]
- Manual Start-only: [Bar with vertical lines]
- Manual Finish-only: [Bar with vertical lines]
- Manual Duration-only: [Bar with vertical lines]

Page 1



BLACK & VEATCH

**Exhibit D Compensation
City of Glendale
Cholla WTP Design Services Phase 2 - Amendment 1
City PN 131418**

Phase	Description	Total Hours	Total Fee
100	PHASE 100 - PROJECT MANAGEMENT	268	\$41,884
200	PHASE 200 - PRELIMINARY EVALUATIONS & BASIS OF DESIGN REPORT	1,276	\$200,248
300	PHASE 300 - DESIGN (Preliminary, Detailed & Final)	3,906	\$577,018
400	PHASE 400 - BID PHASE SERVICES	186	\$30,990
500	PHASE 500 - ENGINEERING SERVICES DURING CONSTRUCTION	-	\$0
	REIMBURSIBLE EXPENSES	-	\$18,000
	BLACK & VEATCH PHASE 2 SUBTOTAL w/o ALLOWANCES	5,636	\$868,140
	SUPPLEMENTAL SERVICES ALLOWANCES		
A	Allowance A - Fiber Optic Availability Evaluation	-	\$50,000
B	Allowance B - Smart Analytics	-	\$50,000
C	Allowance C - Subconsultant Services	-	\$80,000
D	Allowance D - Owner's Allowance	-	\$250,000
	Subtotal	-	\$430,000
	BLACK & VEATCH PHASE 2 TOTAL w/ ALLOWANCES	5,636	\$1,298,140
	The level of effort for Phase 500 tasks will be estimated at a later date.		
Notes:			
1. Expenses include delivery such as Courier, Fed Exp and UPS, travel costs, including meals, lodging, and travel mileage at IRS approved rates, for any required subconsultants or reproduction (printing, reproduction of deliverable).			
2. The level of effort estimate is based on data currently provided by the City. Unforeseen conditions which require additional Engineer and subconsultant services will be considered as supplemental services that will be performed following scopes of services and level of effort negotiations as required and approval by the City.			

DETAILED PROJECT COMPENSATION

Original Study (Phase 1)	\$491,960
Amendment No. 1 (Phase 2 - Preliminary, Detailed and Final Design) (Includes City Allowances)	\$1,298,140
Total Professional Services Fee	\$1,790,100