

Scope of Work for the South Truckee Meadows Water Reclamation Facility 2020 Expansion Project

Prepared for
**Washoe County
Community Services Department**

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Exhibit A: Scope of Work for the South Truckee Meadows Water Reclamation Facility 2020 Expansion Project

This exhibit is to the Agreement, between Jacobs (Consultant), and Washoe County Community Services Department (County), for engineering and consulting services related to the proposed expansion of the South Truckee Meadows Water Reclamation Facility (STMWRF).

Introduction

General

Washoe County Community Services Department is responsible for sanitary sewer collection, wastewater treatment, biosolids management, and reclaimed water treatment and distribution services within the South Truckee Meadows region of Reno, Nevada. The South Truckee Meadows Water Reclamation Facility (STMWRF) serves as a central and critical regional water resource recovery facility. STMWRF is permitted by the Nevada Division of Environmental Protection (NDEP) to treat a Max Month Flow of up to 4.1 million gallons of wastewater per day (MGD).

STMWRF was commissioned in 1990 and later expanded in 2003. More recent upgrades and unit process additions include: primary access road and site improvements; headworks screening; electrical and mechanical systems; effluent pumping; headworks electrical; biosolids digestion and dewatering; Ecowash filter enhancements; reservoir lining; maintenance warehouse; and, chemical storage building rehabilitation.

Current average daily influent flow is approximately 3.3 MGD. Liquid stream unit processes include: influent pumping; screening; flow splitting, metering; secondary treatment utilizing oxidation ditches and clarifiers; sand media filtration; sodium hypochlorite disinfection; effluent pumping; and, reservoir storage. Waste solids are treated aerobically prior to dewatering and then hauled to the regional Lockwood Landfill. STMWRF effluent is presently managed through a Category A reclaimed water distribution system.

Reclaimed water is stored seasonally in the Huffaker Hills Reservoir and delivered to over 300 customers through a distribution system network of transmission mains, pump stations, storage tanks, and distribution piping. Annual reclaimed water delivery is presently 3,000 acre-feet, and peak day demands can exceed 8 MGD.

A facility plan update (Facility Plan) for STMWRF was completed in 2016. The Facility Plan utilized a 20-year (2035) planning interval. The Facility Plan includes an analysis for population growth; flow and loading projections; infrastructure condition assessments; BioWin process model development; treatment unit process analysis; facility expansion alternatives; capital improvement plan; and, recommended improvements to the sanitary sewer collection system. Complimentary to the Facility Plan, studies for Reclaimed Water Quality Management Study and Effluent Reuse Planning were also completed in 2012 and

2016. The Facility Plan generally envisions STMWRF being expanded from 4.1 to approximately 6 MGD to meet the region's 2035 population projection.

The Facility Plan identifies the following treatment unit processes needing expansion, requiring major improvements, or new facilities built: influent pumping; screening; anaerobic selector; activated sludge bioreactors; dissolved-air-floatation; filters; effluent pumping to the Huffaker Hills Reservoir; and, export pumping to the reclaimed water distribution system.

Some other unit process that may require upgrades or be provided include grit removal; biosolids facility improvements; vector truck receiving; administrative offices; meeting and training space; laboratory facilities; computer server and IT space; process control room; and other ancillary facilities.

The project is being considered as occurring in two (2) phases. Phase 1 will include all the facilities previously identified to expand treatment capacity, enhance operations, and continue producing State of Nevada category A reclaimed water. Phase 2 contemplates Washoe County implementing a State of Nevada category A+ reclaimed water system in the future, with water sourced from STMWRF. Most critically, Phase 1 work to improve effluent water quality must be planned carefully to be complementary to Phase 2, if implemented.

Potential decentralized reclaimed water quality improvements will also be examined and possibly implemented in Phase 1. This work will only include the evaluation of Category A+ reclaimed water at a Facility Planning level. A high-level planning document, developed by Stantec, will be provided for the comparison between facilities located at the plant and potential decentralized facilities.

Project construction delivery will be Construction Manager at Risk (CMAR). An owner's representative will assist Washoe County to manage the project, and provide related functions, such as independent cost estimating, value engineering, and project support.

Project technical support will be conducted with the assistance from two independent committees, both managed by the University of Nevada, Reno's Nevada Water Innovation Institute (NWII). The Technical Advisory Committee (TAC) will be tasked with providing specific input on the project's more technical challenges relating to treatment process considerations and effectively meeting the overall water quality objectives. It's envisioned the TAC will convene at key project milestones, such as Project Definition (10-percent design), 30, 60, and 90 percent design efforts. The TAC will also be tasked with reviewing technical data throughout the project. Also managed by the NWII will be an Independent Expert Panel (IEP). The IEP is needed to evaluate if the work is in alignment with current and future water quality objectives, specifically, assuring Phase 1 and Phase 2 treatment unit processes are appropriate to meet State of Nevada category A+ reclaimed water quality, and the work is in alignment with the objectives of the current regional OneWater Nevada feasibility study.

The project will include the following, but may not be limited to: confirming population and loading projections; creating a roadmap to achieve water quality objectives; and, developing and delivering final products relating to project management, surveying,

geotechnical, mapping, quality assurance and quality control, updating flows and load projections, basis of design, reliability-centered design criteria, design development at likely 30/60/90/100 percent complete milestones, supplemental provisions, technical specifications, and value engineering workshops.

Reference Information and Projects

Reference Information

Several studies and investigations that are currently progressing and will be made available for use:

- Site horizontal and vertical survey including control points
- Water quality database
- Combined record (as-built) drawings, electronic as available
- Updated historical influent and operational data collected at the plant, including data developed as part of the latest biological process modeling efforts.
- Sanitary sewer interceptor and collection system infiltration study
- STMWRF BioWin process model including updated field calibration and validations
- Reclaimed water quality study
- STMWRF unit process capacity analysis
- Regional OneWater Nevada, a feasibility study broadly examining the potential benefits if category A+ reclaimed water quality was achieved
- Category A+ reclaimed water conceptual analysis specific to the South Truckee Meadows region
- Regional Effluent Water Planning
- Report on Decentralized versus STMWRF Located Category A+ Treatment Facilities
- STMWRF Secondary Treatment Capacity Evaluation

Projects

Several related projects to the STMWRF 2020 Expansion Project are in design. These projects include:

- Washoe County Utilities SCADA Master Plan
- Huffaker Hills Reservoir Lining Phase 3
- Pleasant Valley Sanitary Sewer Interceptor Reach 3 and Pleasant Valley Lift Station and Force Main
- Steamboat Lift Station Rehabilitation and Redundant Force Main
- South Truckee Meadows Sanitary Sewer Manhole and Pipe Rehabilitation

- Various projects to expand the reclaimed water distribution system within the South Truckee Meadows.
- Jet Aeration System for Huffaker Reservoir

This exhibit presents Consultant's scope of work, preliminary schedule, and associated budgets for the services (as noted herein) associated with the expansion of the STMWRF facilities. Consultant plans to engage Farr West Engineering, Inc. (Subconsultant) to assist with some of the planning tasks described in this Scope of Work.

Scope of Work

Consultant's services will consist of performing tasks necessary to validate the 2016 Facility Plan Update, in the form of a series of Technical Memorandums (TMs) with an executive summary TM. These TM's will be provided to update each of the 2016 Facility Plan Update technical memoranda based on the up-dated information. Some TM's will be extensive in the changes based on the validation while others may only have minor updates. The TM updates can group the information differently than in the 2016 Facility Plan Update if an alignment of the TM's makes more sense to disseminate the information.

The project will include project management and quality control (QC) activities to help ensure that project objectives, deliverables, and schedule are met. Existing Site Survey and Geotechnical data shall be used for the design. Should additional investigations or survey be required, they will covered as described in Task 3.1.

The final Facility Plan Update TM's will be reviewed by the County and the Technical Advisory Committee (TAC).

The engineering scope of services and estimated budget for Final Design and Services During Construction will be developed as the design project work is defined near the conclusion of the Project Definition phase and will be contracted under a separate Task Order.

Task 1 – Project Management and Meetings

Consultant will initiate and manage all project activities, schedule, and plan work to assure that activities are completed in a properly integrated and timely manner. Project management will include the following:

- Progress Monitoring – Monitor budget, work progress, and schedule. Monitor work efforts and evaluate actual versus planned progress. Supervise the project team and identify actions needed to maintain the project schedule. Manage scope changes, and take action to resolve impacts on budgets as soon as scope changes have been identified.
- Coordination and Staff Management – Coordinate and schedule appropriate staffing to meet project requirements. Supervise and control activities of assigned staff, and ensure that the authorized work is completed on schedule and within budget.
- Administration – Maintain project records, manage and process project communications, subcontracts, and coordinate project administrative matters.

- Meeting Preparation – Arrange for site visits and monthly project update meetings with County’s project team. Prepare and distribute agenda and meeting minutes.
- Team Chartering and Project Kickoff Workshop to discuss the project objectives and goals, the roles and responsibilities of project team members, the required deliverables for each work task, and the project schedule. Workshop will include staff from County, Consultant, Subconsultant, and others as desired by the County.
- Monthly progress meetings to keep County apprised of progress, direction, and findings. Meetings will be held at the County’s office. To the extent feasible, meetings will be scheduled to take place concurrent with other planned workshops. At a minimum, monthly meetings will be attended by three members of Consultant’s project team. Each meeting is expected to include the following:
 - Action items of the previous monthly meeting for discussion and completion status.
 - Monthly Progress Report. The monthly progress report will include at a minimum, the following:
 - ✓ Progress within the last month, by task and subtask
 - ✓ Problems encountered or anticipated
 - ✓ Items scheduled for work in the next month.
 - Decision Log Update, including outstanding and upcoming project issues. Items requiring decisions will be discussed, and any decisions entered into the decision log.
 - Project Schedule Update, including tasks completed to date and projected completion of tasks.

Task 1 - Deliverables and Meetings

- Project Management Plan (PMP)
- Monthly project meeting agenda and meeting notes
- Monthly project schedule updates
- Monthly project progress reports and Decision Log updates
- Monthly project billings showing labor hours and earned value by task

Task 2 – Influent Wastewater Characterization, Facility Capacity Analysis, Plant Performance and Process Modeling, Condition Assessment, Treatment Alternatives Assessment, and Facility Plan Validation

Task 2.1 – TM 1 Executive Summary

This task will update TM 1 – Executive Summary of the 2016 Facility Plan Update based on the information developed in the following TM’s.

Task 2.1 - Deliverables and Meetings

- Technical Memorandum 2A - Planning Framework Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 2.2 – TM 2 Planning Framework Validation

Task 2.2.1 - Service Area, Land Use, and Collection System Validation

This task will validate Section 2.0 – Service Area, Land Use, and Collection System of the Planning Framework TM 2 in the 2016 Facility Plan Update. The land use planning will be updated based on current projections and planning.

Consultant and Subconsultant will hold a workshop with County staff to review the build-out estimates of potential flows. Adjustments to assumptions made for individual tracts of large undeveloped parcels will be made and revisions to estimates of flow provided to County staff for final approval, prior to initiating any further assessments and analysis. This task will document if the 6 mgd is the appropriate value for the plant expansion over a 20-year planning cycle.

Task 2.2.2 – Inflow and Infiltration Evaluation

This task will validate Section 3.0 – Inflow and Infiltration Evaluation of the Planning Framework TM 2 in the 2016 Facility Plan Update. Updated data and information will be used based on the mitigation work that has been completed since the Facility Plan. It is not expected that any further work will be needed within this section expect to update it for the current conditions.

Task 2.2.3 – Population Flow and Load Projections

This task will validate Section 4.0 – Population Flow and Load Projections of the Planning Framework TM 2 in the 2016 Facility Plan Update.

Population and Flow Projections: New population projections will be developed. Wastewater flow projections will be updated based on new data and information.

Load Projections: Wastewater influent BOD, TSS, TKN and TP loading projections will be updated based on sampling data. The County will perform sampling over a two-week period in April. The sampling plan will be coordinated between the County and Jacob's. In addition to the sampling set being gathered in the two-week window, the County will perform regular sampling for common data sets within the plant. This data will come from operations sampling and data gathered from the SCADA system.

Additional sampling will be performed quarterly, with additional sampling occurring in July and September. Based on the data gathered in April, Consultant will update or revise the sampling plan as needed for the July and September sampling events.

In addition to the sampling being done at the plant, sampling will also need to be performed at Field Creek reservoir to determine the water quality for the existing category A reuse system and for Advanced Water Treatment Plant influent. This will be done at the same time as the July and September plant sampling events. The County will also provide the data from the 2015 lab data for use in the load projections.

The sampling data from the April event will be used to assess the plant loadings for a 20-year projection. The analysis will look at past data and the new data in assessing the future planning values.

After the data has been gathered, the Consultant will develop an equation that will serve as a basis for charging the industrial dischargers based on the loadings they are contributing to the collection system. The County will provide the data from the pretreatment program for the industrial user discharges for support in this evaluation.

Task 2.2.4 – Regulatory Requirements

This task will validate Section 5.0 – Regulatory Requirements of the Planning Framework TM 2 in the 2016 Facility Plan Update. The regulatory requirements will be updated based on any new or other requirements for the STMWRF Expansion. This will include regulatory requirements for Category A and Category A+ water and any air quality requirements that may come from the expansion. Regulatory support for Category A+ water will be with Washoe County, NWII, and One Water Nevada. Washoe County will work directly with NDEP.

Task 2.2.5 – Reliability and Design Criteria

This task will validate Section 6.0 – Reliability and Design Criteria of the Planning Framework TM 2 in the 2016 Facility Plan Update. This will include updating Table 2.23 for the reliability criteria for the STMWRF Expansion based on the selected treatment processes described in the validation of TM No. 6 of the 2016 Facility Plan Update. It will also be updated based on the reliability characteristics of the Biosolids Facility and for the potential AWT decentralized treatment processes and the proposed DAF to treat Huffaker Reservoir water.

Task 2.2 - Deliverables and Meetings

- Workshops for each task as part of the validation process.
- Meeting agenda and meeting notes for each workshop.
- Technical Memorandum 2A - Planning Framework Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 2.3 – TM 3 Wastewater Collection System Evaluation Validation**Task 2.3.1 – Wastewater Loads**

This task will validate Section 4.0 – Wastewater Loads of the Wastewater Collection System Evaluation TM 3 in the 2016 Facility Plan Update. This will be updated based on infrastructure improvements that have been completed or planned to be completed in the collection system and the planning performed in the validation done under Task 2.2.

Task 2.3.2 – Collection System Analysis

This task will validate Section 5.0 – Collection System Analysis of the Wastewater Collection System Evaluation TM 3 in the 2016 Facility Plan Update. This will be updated based on infrastructure improvements that have been completed or planned to be completed in the collection system. This will also identify any permitted industrial dischargers into the collection system including their industry type, permitted flows, and any local limits established for each of them. The County has a local limits process in place. There may be a need for some sampling at the influent to the plant to cover wastewater characteristics that may be present which are important to the functionality of advanced treatment facilities. It is not expected that any additional infrastructure improvements will be required as part of this process. Should any further evaluation or collection system modeling be needed based on the updated flow projections, it will be performed under the Additional Engineering Services.

Task 2.3.3 – Capital Improvement Plan

This task will validate Section 6.0 – Capital Improvement Plan of the Wastewater Collection System Evaluation TM 3 in the 2016 Facility Plan Update. The 2016 Facility Plan Update identified four components that required expansion:

- Pleasant Valley Interceptor Reach 3A (in design)
- Pleasant Valley Interceptor Reach 3B (in design)
- Pleasant Valley Interceptor Reach 4 (developer built)
- 3520 feet of 15-inch Sewer Main Near Whitecliff Drive and Parma Valley (being upsized by the developer)

These were based on dry and wet weather flows with infiltration. The County has been embarking on mitigation to the infiltration issues and has been performing the work for the collection system expansion. Updates are not required to the four listed components; this TM section will remain as is. It is not expected that any additional infrastructure improvement will be required as part of this process. Should any further evaluation be needed based on the updated flow projections, it will be performed under the Additional Engineering Services.

Task 2.3 - Deliverables and Meetings

- Workshops for each task as part of the validation process.
- Meeting agenda and meeting notes for each workshop.
- Technical Memorandum 3A – Wastewater Collection System Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 2.4 – TM 4 Condition Assessment

This task will validate the Condition Assessment TM 4 of the 2016 Facility Plan Update. A high-level visual inspection was performed in the 2016 Facility Plan Update. In addition, Consultant performed a Fix and Finish Plant Assessment in 2010. This scope of work will include performing a detailed condition assessment of the existing Plant facilities expected to remain in service after the expansion, including updating the assessment based on the current condition of equipment and work that has already been performed. A useful life analysis shall be performed to determine which equipment will not be able to stay in service over the 20-year planning cycle. The Consultant condition assessment team will perform this assessment. The outcome of this assessment may include selected equipment that will need to be replaced early as part of early construction work to be performed by the Construction Manager at risk (CMAR).

In support of the condition assessment, Consultant will work with the County to obtain the asset management information for each piece of equipment being evaluated including the identification data within the adhesive tag scan codes, where applicable, and identify equipment lacking identification data.

Task 2.4 - Deliverables and Meetings

- Workshops for each task as part of the validation process.
- Meeting agenda and meeting notes for each workshop.

- Technical Memorandum 4A – Condition Assessment Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 2.5 – TM 5 Plant Performance and Process Model

Task 2.5.1 – Current and Anticipated Permit Requirements

This task will validate Section 2.0 – Current and Anticipated Permit Requirements of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will include permitting requirements for Category A+ water, collaborating with NWII and One Water Nevada to understand the State of Nevada Category A+ requirements. A permit matrix, schedule, and action log for obtaining regulatory approval will also be provided as part of the validation.

Task 2.5.2 – Effluent Water Quality Requirements

This task will be a new Section in the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update or a new TM. This will include the effluent water quality requirements from the STMWRF and from the filters when treating Huffaker Reservoir. The Consultant will also evaluate the water quality improvements from the use of the jet aeration system, currently in design, and planned for operation in September, 2019. This task will also include summarizing all Category A+ pilot testing water quality data that has been obtained to date.

The requirements for the potential decentralized treatment at Field Creek reservoir to improve the Class A water quality, or a STMWRF located treatment process, if required, in support of the AWT design will be evaluated under this Task. The water quality information gathered in Task 2.2.3 will be summarized in this TM.

Task 2.5.3 – Historical Wastewater Flows and Characteristics

This task will validate Section 3.0 – Historical Wastewater Flows and Characteristics of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will include the analysis of the additional sampling performed by the County in April, as described in Task 2.2.3, for impacts to the criteria for the projected 20-year project conditions. The plant influent will be characterized to provide fractionated inputs to the process model for the various COD, nitrogen and phosphorous components required for model calibration.

Task 2.5.4 – Existing Plant Description

This task will validate Section 4.0 – Existing Plant description of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will update any unit processes or operational strategies that have been modified since the 2016 Facility Plan Update.

Task 2.5.5 – Process Modeling Summary

This task will validate Section 5.0 – Process Modeling Summary of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will assessing the current process model and generating a calibrated model using the latest sampling data gathered in Task 2.2.3 and coordinating with the County for process model updates that have been performed after the 2016 Facility Plan Update.

Task 2.5.6 – Capacity and Performance Evaluation

This task will validate Section 6.0 – Capacity and Performance Evaluation of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will include updating the capacity and performance of the unit processes based on the updated process model completed in Task 2.5.4.

The Consultant will also review the Secondary Treatment capacity Analysis, developed by Stantec in April 2019 as part of this task.

Task 2.5.6.A: As part of this task, specific unit processes or combination of unit processes will be put through stress testing to ascertain any potential bottlenecks in the system. The Consultant team will work with the County to develop stress test plans and will provide engineering, measurement, and sampling support during the stress testing process. The anticipated stress testing would be on the secondary clarifiers, filters, blowers, and influent screw pumps unit processes or combination of processes. Upon completion of the stress testing, additional recommendations will be developed to mitigate any capacity issues that were found as part of the stress testing. The planned approach to stress testing will include the following steps:

1. Hold a workshop with the County to determine which unit processes or combination of unit processes should be stress tested.
2. Develop stress test plans for the unit processes. The plans will include the issue, desired approach to testing, process configuration for the testing, and table for documentation of results. An overall stress test schedule will also be developed.
3. Perform the stress testing. This will be a combination of County and Consultant staff
4. Develop a memorandum summarizing the results of the stress testing.

Task 2.5.6.B: The Consultant will be a dynamic hydraulic model of the overall Facility to support this effort. The model will be developed in the Consultant's Replica™ software and will include the current control strategies that are in operation. After the completion of the stress testing, the model will be considered to be a calibrated model and will be used in the development of the Basis of Design and future expansion work.

Task 2.5.7 – Optimization Opportunities

This task will validate Section 7.0 – Optimization Opportunities of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will include updating the section based on the capacity and performance evaluation done in Task 2.5.5 and the process model completed in Task 2.5.4. This task will include the evaluation of biosolids polymers to improve performance.

Task 2.5.8 – Recommendations for Field Implementation

This task will validate Section 8.0 – Recommendations for Field Implementation of the Plant Performance and Process Model TM 5 in the 2016 Facility Plan Update. This will include updating the section based on the data gathered in the other tasks for Performance and Process Model TM.

Task 2.5 - Deliverables and Meetings

- Workshops for each task as part of the validation process.

- Meeting agenda and meeting notes for each workshop.
- Technical Memorandum 5A – Performance and Process Model Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 2.6 – TM 6 Facility Plan

Task 2.6.1 – Summary of Planning Studies

This task will validate Section 2.0 – Summary of Planning Studies of the Facility Plan TM 6 in the 2016 Facility Plan Update. This will include the inclusion of studies and planning work that has been completed after the 2016 Facility Plan Update.

Task 2.6.2 – Description of Existing Facilities

This task will validate Section 3.0 – Description of Existing Facilities of the Facility Plan TM 6 in the 2016 Facility Plan Update. This will updating the section based on changes that have been made to the facility after the 2016 Facility Plan Update.

Task 2.6.3 – Plant Hydraulics

This task will validate Section 4.0 – Plant Hydraulics of the Facility Plan TM 6 in the 2016 Facility Plan Update. A hydraulic model will be developed for the plant to evaluate the current conditions and future 2035 conditions.

Task 2.6.4 – Proposed Liquid Treatment Processes

This task will validate Section 5.0 – Proposed Liquid Treatment Processes of the Facility Plan TM 6 in the 2016 Facility Plan Update. This validation will include the potential to have a Category A+ water flow stream from the plant and the associated unit processes that would be required.

The Consultant will develop alternatives for expansion of the STMWRF liquid treatment processes (preliminary treatment, secondary treatment, filtration, and disinfection) for Category A and the treatment processes for the potential Category A+ water facilities located at Field Creek reservoir (500 to 1000 gpm) to supply two injection wells. At this time, it is assumed that the County and TMWA will undertake the analysis and design for the injection wells.

As a part of this alternative development, the Consultant will evaluate liquid unit processing facilities and assess whether existing processes should be replicated, or other processes should be considered. This will include looking at potential changes to disinfection including in-channel or in-vessel Ultraviolet disinfection systems. As part of this analysis, the Consultant will look at concerns with flushing, chlorine injection, and other aspects of the transition that may create risks to the reclaimed system water quality. The plant process design model and current site plan expansion schematics from Task 2.6.9 will be used to analyze options for expansion. Consultant will revise the plant flow diagrams, hydraulic profile, and site plans to reflect the potential expansion for each alternative.

A Class 5 cost estimate, as defined by the Association for the Advancement of Cost Engineering (AACE), will also be generated for each alternative. Consultant will work with County to develop appropriate weighting for each non-monetary category and score each of the alternatives with respect to how they meet the criteria. The alternatives will be ranked in accordance with their Net Present Worth. Cost items will be based on an Owner's

Representative developed estimate structure so as to align with the CMAR's Opinion of Probable Cost.

This task will focus on:

- Screen preliminary list of liquid process alternatives for fatal flaws. (Note: this may also screen out certain reuse/disposal alternatives).
- Finalize design criteria and sizing information for the alternatives that survive screening
- Preliminary ranking of cost and non-monetary considerations

A hydraulic model will be developed for the plant to evaluate the current conditions and future 20-year planning conditions.

Task 2.6.5 – Solids Treatment Processes

This task will validate the improvements required for the Biosolids facility to accommodate solids loads associated with a max month flow determined in Task 2.2.1. The validation will include projected solids loads based on planned secondary treatment processes selected for implementation in Task 2.6.4. This task includes developing a time-based plan for hauling of dewatered solids to landfill.

Task 2.6.6 – Recycle Stream Management

This task will validate Section 7.0 – Recycle Stream Management of the Facility Plan TM 6 in the 2016 Facility Plan Update. The validation will include the potential recycle streams that would occur from the liquids and solids treatment processes described in Tasks 2.6.4 and 2.6.5.

Task 2.6.7 – Effluent Reuse

This task will validate Section 8.0 – Effluent Reuse of the Facility Plan TM 6 in the 2016 Facility Plan Update. The validation will include the potential of Category A+ water and other options for effluent reuse. This task will incorporate the information developed in task 2.5.2 into the facility planning effort, including the potential siting of Category A+ facilities at Field Creek reservoir or at STMWRF. Should they be located at Field Creek, the County will provide survey information for use in the facility layouts.

Task 2.6.8 – Plant Utilities and Support Facilities

This task will validate Section 9.0 – Plant Utilities and Support Facilities of the Facility Plan TM 6 in the 2016 Facility Plan Update. The validation will include the utilities and facilities in the 2016 Facility Plan Update and the 2019 SCADA Master Plan recommendations, and will also address the following:

- Electrical System Capacity and Expansion (including support reviews for the Jet Aeration System electrical service)
- Renewable Energy Alternatives – High level assessment (Digester heat usage, Turbine in Huffaker Reservoir pipeline)
- Standby Power Capacity
- Site Security

- Laboratory Facilities
- Administrative Office Facilities
- Server and IT Space Allocation
- Operator Process Control Room Facilities

Task 2.6.9 – Proposed Expansion Plan and Site Layout

This task will validate Section 10.0 – Proposed Expansion Plan and Site Layout of the Facility Plan TM 6 in the 2016 Facility Plan Update. The validation will include updating the layout based on the facilities and unit processes described in Tasks 2.6.4 through 2.6.8.

Task 2.6.10 – Implementation Schedule and Cost

This task will validate Section 11.0 – Implementation Schedule and Cost of the Facility Plan TM 6 in the 2016 Facility Plan Update. The validation will include creating a new implementation schedule with phasing of facilities and cost estimates that can be evaluated with the CMAR and Owner's Representative.

Task 2.6 - Deliverables and Meetings

- Consultant will conduct a workshop to present initial scoring of the alternatives evaluated under Task 2.6.4 and 2.6.7. Category weightings and individual criteria scores will be discussed and modified as agreed upon by consensus decision during the workshop. Scores for each alternative will be totaled under each non-cost category, and overall non-cost rankings will be established. During the workshop the Consultant and County will capture specific challenges for each of the treatment alternatives.

This workshop will focus on the following activities:

- Review of the preliminary ranking for each alternative with respect to operational issues, construction issues, compatibility with reuse requirements, and discharge water quality requirements.
- Review the impact of air emissions, odor, safety criteria, and capital and lifecycle costs.
- Selection of processes to use in the project definition report for the expanded facilities.
- Workshops for each task as part of the validation process.
- Meeting agenda and meeting notes for each workshop.
- Technical Memorandum 6A – Facility Plan
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Assumptions:

- Footprint of STMWRF will not expand beyond the property line (except for potential decentralized facilities)

Task 2.7 – TM 7 Overall CIP and Implementation Plan**Task 2.7.1 – Proposed Facilities**

This task will validate Section 3.0 – Proposed Facilities of the Overall CIP and Implementation Plan TM 7 in the 2016 Facility Plan Update. The validation will include updating the section based on the information in Task 2.5.

Task 2.7.2 – Project Phasing and Implementation

This task will validate Section 4.0 – Project Phasing and Implementation of the Overall CIP and Implementation Plan TM 7 in the 2016 Facility Plan Update. The validation will include updating the section based on the information in Task 2.5.

Task 2.7.3 – Cost Estimates and Funding Requirements

This task will validate Section 5.0 – Cost Estimates and Funding Requirements of the Overall CIP and Implementation Plan TM 7 in the 2016 Facility Plan Update. The validation will include updating the section based on the information in Task 2.5.

Task 2.7 - Deliverables and Meetings

- Workshops for each task as part of the validation process.
- Meeting agenda and meeting notes for each workshop.
- Technical Memorandum 7A – Overall CIP and Implementation Plan Validation
- Consultant will submit ten copies of the TM to the County, plus a softcopy of the document in pdf format.

Task 3 – STMWRF 2020 Expansion Phase 1 Project Definition

Consultant will prepare the Project Definition (approximately 10-percent design) of the processes selected in Task 2 for the expansion of the liquid treatment and biosolids handling facilities. This work will not include the Phase 2 facilities, but will anticipate the requirements of the most probably Phase 2 facilities. The Project Definition Report will consist of a series of technical memorandums and a summary report. A project definition project schedule will be developed for final design, bidding, construction, testing, startup, and operator training.

Task 3.1 –Basis for Final Design

The Project Definition will include design criteria, equipment lists, preliminary drawings, and a brief description of the facilities required for each process to expand the STMWRF to the capacity recommended in the Task 2 TM's. Consultant will revise the plant flow diagram, hydraulic profile, and site plan to reflect the expansion. The project definition will be consistent with the regulatory requirements summarized under Task 2.

Consultant will also recommend STMWRF support system improvements to be included in the project scope. Electrical one-lines, control system block diagrams, and building floorplans will be modified to reflect these recommendations.

Existing site survey and geotechnical investigation information will be used, with supplemental data gathered where needed under the allowance budget.

Process Improvements

Summarize the recommended facilities for expansion to the flow rate established in Task 2.2.1 in individual technical memorandums for the following processes at the STMWRF and the potential decentralized Advanced Treatment Facilities at Field Creek reservoir:

STMWRF

- Preliminary Treatment (screenings and grit removal)
- Secondary Treatment (biological treatment and nutrient removal, as appropriate)
- Filtration and DAF (to meet expected requirements for reclaimed water use)
- Disinfection (to meet expected requirements for reclaimed water use and Advanced Treatment Facilities)
- Biosolids handling processes and facilities

Field Creek Reservoir AWT

- Pretreatment
- Treatment Process

Process Improvements - Deliverables: Final Technical Memorandums for each of the above processes. Consultant will submit ten copies of the overall TM's to the County, plus a softcopy of the document in pdf format.

Support System Improvements

Based on the results of Task 2.6.8, Consultant will work with County to determine future expected staffing levels, expected number and type of laboratory analyses, and any anticipated new testing requirements. Once these determinations are made, Consultant will prepare draft floor plans and building elevations for expansion of laboratory and administrative facilities.

Consultant will also provide two alternatives for improving the plant control and operator interface systems along with the planned plant expansion. Consultant will prepare a draft Technical Memorandum for distribution to the County. Consultant will facilitate a workshop to review the draft TM and finalize the preferred alternative.

Consultant will prepare a technical memorandum to summarize the following support areas:

- Site Conditions
- Control and Operator Interface Systems
- Electrical Systems
- Site Security Systems
- Administration/Lab/Operations Facilities

Support System Improvements - Deliverables: Final Technical Memorandum: Support System Improvements. Consultant will submit ten copies of the TM's to the County, plus a softcopy of the document in pdf format.

Task 3.2– Cost Opinion

Consultant will prepare a detailed opinion of construction cost for the proposed facilities to expand to the flow rate identified in Task 2.2.1. A Class 4 cost estimate will be provided, as defined by AACE and will match Owner's Representative Cost Estimate structure.

Task 3.2 - Deliverables: Construction cost estimate. Consultant will submit five copies of the responsibility matrix to the County, plus a softcopy of the document in pdf format.

Task 3.3– Project Definition Report Summary

Prepare a summary report for the Project Definition (10% design) that summarizes the information developed in Tasks 3.1 and 3.2. The summary report will include an estimated construction schedule, estimates of construction and total project costs, and estimated cash flow.

Once endorsement of the Project Definition Report has been received from the County, NDEP, and the City's of Reno and Sparks, the final version of the report will be prepared.

Task 3.3 - Deliverables: Consultant will submit ten copies of the final documents to the County, plus a softcopy of the documents in pdf format.

Task 4 – CMAR Coordination

The Consultant will work with the County and County's CMAR procurement consultant in developing the following for use in the CMAR procurement and throughout the design phases of the Project:

- **Responsibility Matrix.** Prior to procuring the CMAR, the County and Consultant will define and scope and responsibility of the CMAR, Consultant and Construction Manager. The County and Consultant will develop a Responsibility Matrix identifying responsibilities throughout the construction project.
- **Documentation Processes.** Based on the results of the Responsibility Matrix above, the County and Consultant will develop standard forms for RFI's and submittals, Work Change Directives and Design Change Notices that document anticipated scope, schedule and cost changes.
- **General Conditions and Markups.** Consultant will work with the County and the CMAR to review the General Conditions and General Requirements portions of the specifications. The County is currently working on the General Conditions for the CMAR contract and will provide them to the Consultant for alignment with the General Requirements documents
- **VE/Constructability Reviews.** Value Engineering (VE)/constructability reviews will be completed by the CMAR at the 60% design completion stages for any Early Construction packages identified in Task 5.
- **Guaranteed Maximum Price (GMP):** It is expected that the GMP will be based on the 100% construction documents.
- **Cost Models.** For any design that are provided under Task 5, the Consultant and the CMAR will develop independent cost models for each of the milestone submittals. If the cost models are different by more than 2.5%, the CMAR and Consultant shall meet and reconcile the cost models and submit a single cost model to the County.

- **Electronic Information.** The County and Consultant will determine the software to be used for the project and the agreed upon media for all submittals, including level of electronic security of documents.

Task 4 - Deliverables: Consultant will submit ten copies of the responsibility matrix to the County, plus a softcopy of the document in pdf format.

Task 5 – Early Construction Packages

The consultant will develop a 60% design for early construction packages for the CMAR work. Value Engineering will be performed by the CMAR at a 60% level of design for the Early Construction packages. A preliminary budget of \$300,000 will be allotted to this Task to allow for early design progression of the selected targeted early work packages, which may include the following:

- Replacement of STMWRF equipment that is beyond its useful life
- Electrical Service Upgrade
- Influent Pumping Facility Capacity Increase and Improvements
- Miscellaneous Earthwork and Grading Packages
- SCADA System Improvements determined by the SCADA Master Plan.
- RAS/WAS Bottleneck Improvements

Task 6 – Quality Control

Consultant's quality control manager will arrange for timely QC review of each deliverable. The QC reviewers will review calculations and work products before they are delivered to County for review. Consultant's project manager will be responsible for verification that each deliverable has been reviewed. The detailed project schedule will include milestones to identify the QC review activities.

In addition to the standard quality control process, the Consultant will implement a reliability centered design process to bring the reliability centered maintenance principles forward into the design process. This will include workshops to determine the likelihood of failure and consequence of failure for all elements of the facility once the P&ID's are at 90% completed.

Task 7 – Public Involvement and Outreach

Once the facility plan update has been reviewed and accepted by the County, Consultant will assist County in preparing presentation materials for one public meeting to present the general plan for the expansion. The budget for this scope is limited to one day trip to coordinate presentation materials and provide support during the presentation.

In addition, the Consultant will work with NWII and other stakeholders in support of the Category A+ treatment facility process arrangements and criteria.

The Consultant will support any special use meeting with the Neighborhood Advisory Board. The budget for this scope is limited to one day trip to coordinate presentation materials and provide support during the presentation.

Task 8 – Other Permit Support

The Consultant will provide support for the following permits and applications:

Air Permit from Washoe County – The Consultant will update the existing odor control evaluation based on the new treatment processes and the potential generator addition.

Work with NDEP for permitting related to Phased Construction.

Premeeting with the Building Department to discuss the CMAR delivery model and phased construction.

The County will be responsible for the payment of permit fees.

Task 9 – Additional Engineering Services

County may request that Consultant provide additional services not included in this scope of work. A budget of \$50,000 has been allocated to this task.

Future Services

An amendment or separate Agreement will be required for any work exceeding the budget allocated to this scope of services. Services not included in this scope of work and fee estimate, will be negotiated under a separate contract.

Examples of future services are as follows:

- Final Design for Phase 1 STMWRF 2020 Expansion Project improvements
- Engineering Services for Phase 1 STMWRF 2020 Expansion Project improvements
- Preliminary and Final Design for Phase 2 STMWRF 2020 Expansion Project improvements
- Engineering Services for Phase 2 STMWRF 2020 Expansion Project improvements
- Preparation of specifications or RFQ's for equipment preselection or vendor prequalification
- Services related to training of County or Plant operations personnel
- Preparation of Operations and Maintenance manuals
- Other services mutually agreeable to the County and Consultant

County Responsibilities

The services described below are assumed to be provided by County:

- Engagement of the NWII, including the TAC and IEP.
- Prepare/file applications and pay fees for permits and licenses required by local, state, and federal authorities.

- Performing cultural resource investigations as required for the Project.
- Participate in project workshops and provide input & review comments Project deliverables/recommendations.
- Coordinate input from the Washoe County Building Department and the Truckee Meadows Fire Department, including review of deliverables.
- Coordinate input/review from any other stakeholders beyond the County's core project team.

Schedule

Consultant has developed a schedule that includes the Facility Plan Validation in a 7-month period, followed by the Basis of design and Early Construction Packages, attached to this scope of work, for completing the proposed project tasks. The schedule was prepared assuming that activities will commence the June 2019.

Compensation

Compensation for the services described herein will be on a time and expense basis using the billing rates specified in Exhibit B. The amount invoiced each month will be based on actual hours of labor and expenses expended. For services enumerated in Tasks 1 through 9, the total estimated fee is \$1,530,922, plus applicable sales, use, value-added, business transfer, gross receipts, or other similar taxes. This total fee will not be exceeded without prior authorization from the County. A breakdown of the estimated fee is summarized in Table 1. County understands and agrees that individual tasks may be completed either under or over budget and that Consultant can reallocate budgets within and across tasks provided the total authorized estimated fee is not exceeded.

TABLE 1
Fee Estimate Summary

Task	Description	Estimated Fee (\$)
1	Project Management and Meetings	\$101,560
2	Facility Plan Update Validation	\$792,322
3	STMWRF Expansion Project Definition	\$181,780
4	CMAR Coordination	\$25,900
5	Early Construction Packages	\$300,000 Budget Allowance
6	Quality Control	\$56,720
7	Public Involvement	\$10,352
8	Other Permit Support	\$12,288
8	Additional Engineering Services	\$50,000
Total		\$1,530,922