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April 28, 2016

Ms. Teresa Lutes
City of Austin, Austin Water
625 East 10th Street, Suite 800
Austin, TX 78701

Subject: Consulting Services for Integrated Water Resource Plan
Solicitation Number: CLMP179
Draft Proposal and Fee Estimate – Revision 2

Dear Ms. Lutes:

CDM Smith Inc. appreciates the opportunity to provide engineering and consulting services to Austin Water (AW) for their Integrated Water Resource Plan (IWRP). Enclosed is a draft Scope of Work in **Attachment A**. Services will begin as soon as authorization is received and we understand that the project is anticipated to extend for 18 months, from approximately July 2016 through December 2017.

This submittal incorporates the following changes:

- Updated scope of work from Encotech, GHD, Rifeline and Susan Roth Communications
- Updated scope to address AW and IWRP Task Force Comments
- Updated schedule based on scope changes

CDM Smith will perform this project on a "Stipulated Sum" basis as defined in the contract for a lump sum amount of $999,969. We have prepared a revised fee estimate summary and it is included as **Attachment B.** The rates used for billing the scope of work listed above will use the City of Austin approved Category 2 rates for CDM Smith as of April 11, 2016. Draft proposals from subconsultants who will be supporting this effort are included in **Attachment C.**

Consulting Services for Integrated Water Resource Plan
April 28, 2016

On behalf of the entire CDM Smith Team, Dan Rodrigo and I are extremely excited about this opportunity to work with Austin Water on this marquee IWRP. Please do not hesitate to contact Dan or myself should you have any questions regarding the enclosed proposal.

Very truly yours,

Tina Petersen, PhD, PE
Project Principal
CDM Smith Inc.
TBPE Firm Registration No. F-3043

Dan Rodrigo, Senior Vice President
Project Manager
CDM Smith Inc.

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Attachment A

Draft Scope of Work - Consulting Services for Integrated Water Resource Plan

SCOPE OF WORK

Consulting Services for Development of an Integrated Water Resources Plan

April 29, 2016

This scope of work is to provide assistance to Austin Water (AW) with the development of the Austin Integrated Water Resource Plan (IWRP). Austin Water will work with the IWRP Task Force and others, including other City departments, stakeholder groups, and the public, in development of the IWRP. The Austin IWRP will be a planning document that will include the following:

- Open and participatory decision-making process with stakeholders (internal, public, or both) in meaningful ways;
- Demand-side (e.g., water conservation) and supply-side options for meeting water needs;
- Portfolios (combinations of options) against multiple, sometimes competing, objectives, instead of just supply reliability and cost;
- Risk and uncertainty, such as climate change; and
- Societal impacts, including benefits and costs to the environment.

Task 1: Conduct Public Outreach and Participation

CDM Smith will use the IWRP Public Outreach Framework as a guide throughout our work, focusing on an objectives driven process that will be geared towards gathering meaningful public input to develop a plan that is representative of Austin community values. For this task we will:

1. Develop a Public Outreach and Participation Plan – This outreach plan presents our overall approach in engaging the public for the duration of the IWRP and will guide our activities. The plan will identify key public stakeholder groups that reflect the diversity of Austin's population and the methods of the proposed public engagement. CDM Smith will assist AW in identifying key stakeholder groups and, if applicable, where and how often they formally meet. For the Key Public Stakeholder Groups, the CDM Smith Team will recommend how best to engage these groups.
2. Assist with developing up to ten (10), 2 hour Outreach events, which may include attending existing stakeholder group meetings and/or small group meetings with targeted groups of stakeholders identified in the Participation Plan. Assistance will include helping AW plan

the events, identifying existing community meetings to attend, providing ideas for public interaction, and reviewing materials for events, including surveys. Customer surveys will be collected at stakeholder events, and a summary report will be provided. Surveys will be developed by AW and the CDM Smith team will review and provide feedback.

3. Conduct three (3) Public Workshops – In addition to Austin Water attending scheduled meetings of Key Public Stakeholder Groups, CDM Smith will plan and facilitate three IWRP Public Workshops. These workshops, with an anticipated duration of up to 3 hours, will allow stakeholders and members of the public to interact and share ideas amongst themselves in addition with Austin Water. Draft suggestions for workshop topics are:

    - Workshop #1 – Objectives of IWRP, Review Criteria
    - Workshop #2 –Baseline Water Balance, Demand-side and Supply Options
    - Workshop #3 – Portfolio Development and scoring, Initial Recommendations

Assumptions:

- CDM Smith Team will provide planning assistance for three (3) Public Workshops, including helping to select venue and recommending layout for room, and identification of equipment needs; and helping to identify key stakeholders to invite.
- CDM Smith Team will provide professional facilitator from sub-consultant Rifeline for 3 Public Workshops. CDM Smith PM and sub-consultant facilitator from Rifeline will participate in workshop planning calls. They will provide a scribe and note taker for the workshops to provide documentation and feedback from the meetings. In addition to Rifeline facilitator, CDM Smith PM and Principal will attend three workshops in person as will sub-consultants Susan Roth and up to one staff member from Adisa.
- CDM Smith's public outreach sub-consultants (e.g., Rifeline, Adisa, and Susan Roth) will attend up to ten (10) stakeholder events, which can be a combination of targeted stakeholder group meetings, Community Events, or Outreach Events.
- CDM Smith Team will provide technical content for all stakeholder outreach for inclusion in materials, guidance on material development, and review of collateral developed by AW. CDM Smith will also provide up to five (5) printed poster boards and up to 500 color prints for use in public meetings.
- AW will be responsible for reserving/paying for the venues for the Public Workshops, mailing out invitations and noticing of the 3 Public Workshops, providing refreshments (if so needed), providing audio/video equipment, and providing support staff for room and audio/video set up.
- AW will be responsible for reserving/paying for venues for Outreach Events, noticing/invitations for Outreach Events, and providing the majority of printed materials and other logistics for the events.
- Subconsultants supporting this task include Rifeline, Susan Roth Consulting, and Adisa Communications.

Deliverables:

- Public Outreach and Participation Plan
- Summary report of public outreach and participation
    - Meeting notes for 3 Public Workshops
    - Summary Report for up to 10 Outreach Events prepared by CDM Smith's public outreach sub-consultants (e.g., Rifeline, Adisa, and Susan Roth) which will include documentation of demographic data provided and participation rates
    - Summary documentation provided by AW on outreach events conducted by AW

Task 2: Develop Methodology for Options and Portfolio Evaluation

CDM Smith will provide the City with a methodology to conduct a fair comparison of demand-side and supply-side options, as well as scoring portfolios. The 2014 task force previously identified a set of criteria which includes water supply benefit, economic impacts, environmental impacts, social impacts, implementability, and risk of alternative supplies. This will be used as a starting point. CDM Smith will work with AW (who will coordinate input from the IWRP Task Force) to refine these criteria and identify a final set of performance measures.

The methodology will first provide a review of the IWRP criteria. Formal decision-making science outlines characteristics of good criteria: (1) they should not be redundant, (2) they should be easily understood, (3) they should be measurable, and (4) they should not be large in numbers. CDM Smith will review the IWRP criteria with these characteristics in mind. The methodology will also recommend major performance metrics for the criteria.

The methodology will detail how demand-side and supply options will be characterized, screened, and compared (using metrics which provide a fair comparison). The methodology will also address whether an option is categorized as a demand- or supply-side option. CDM Smith will work closely with AW to define how options should be screened (e.g., what criteria should be used to eliminate unfeasible options), and which metrics are important for comparing the final list of options. Also included in this methodology is the process for cost-estimation of the options.

The methodology will lay out how portfolios are to be constructed (using themes which will be constructed in Task 8 with input from AW), and which technique for portfolio scoring and ranking will be used.

CDM Smith will work with AW (who will coordinate input from the IWRP Task Force) to identify water supply and demand management options for screening. The initial lists, not to exceed 25 demand management options and 22 water supply options, will potentially include selected options identified by the 2014 Task Force, the IWRP Task Force, CDM Smith, AW or others. CDM Smith will perform screening of options to select no more than 10 demand management options and 10 water supply options for evaluation.

Finally, the methodology will summarize the available tools needed for scoring options and portfolios. These tools will include CDM Smith recommended spreadsheets, as well as climate models and Water Availability Model (WAM) used by AW's other consultants to support this effort.

Assumptions:

- As a starting point, the IWRP criteria will be based on the Demand Management and Supply Management Evaluation Matrices developed by the 2014 Task Force.
- One in person working meeting with AW to summarize criteria and recommended performance metrics, and review methodology for scoring options and portfolios. In-person meeting will have 3 CDM Smith staff attending for up to 4 hours. This meeting will also include elements of the Project Quality Management Workshop, as described in the Project Management Task (PM.4)
- One remote working meeting with up to 2 CDM Smith staff attending for up to two hours.
- Attendance and presentation at an IWRP Task Force meeting is planned to be associated with this task. The budget assumes that the task force meeting will occur concurrently with another in-person meeting so no additional travel expenses are assumed for this task.
- A technical memorandum (TM) will be provided to AW for review. Comments received by AW on the TM will be incorporated into the IWRP report. TMs are not intended as final deliverables but working documents that will become the basis for the IWRP report. [this is assumed for all TMs throughout this scope of work. Additionally, it is assumed that for all memorandums AW gathers feedback from City of Austin staff and the IWRP Task Force and coordinates comments to develop a single, non-conflicting comprehensive document. When possible, comments will be made in "track changes" mode].
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Deliverables:

- Technical Memorandum (TM) on screening process, characterizing and scoring final criteria, performance metrics, and scoring methodology for both options and portfolios. . This will also include template for comparison of options.

Task 3: Evaluate and Forecast Disaggregated Water Demands

CDM Smith will review and enhance AW's 2020 and 2039/2040 water demand models and will use these models as a basis of the demand forecasting models for 2070 and 2115. The following tasks describe the specific tasks required to evaluate and forecast disaggregated water demands.

Task 3.1. Disaggregated Demand Forecasting Model.

CDM Smith will review AW's existing disaggregated, end-use based water demand forecast model for the planning years 2020 and 2039/2040, including the underlying method, structure and data sources. It is anticipated that AW's existing demand model will be an Excel-based model (with geospatial linkages) in draft form. CDM Smith's review of the existing demand model will include coordination with GHD to characterize the data requirements and required linkages between the disaggregated demand model and the GHD Geospatial Process.

CDM Smith will enhance the 2020 and 2039/2040 demand model to include end uses for the multifamily and commercial sectors to include six commercial subsectors. This task will be achieved through assumptions of standard literature value end-uses for those sectors, with a calibration to AW's customer overall consumption data. The end uses will be developed considering the needed data linkages between the GHD Geospatial Tool and the conservation end use analysis.

For the multifamily sector, six (6) end uses will be developed. For the commercial sector, a maximum of eight end uses will be developed per commercial subsector. .

Additionally, CDM Smith will conduct a statistical analysis of AW's historical water use to estimate elasticities for weather and price impacts. To the extent possible, given the readily available data and the best fit of the model, CDM Smith will conduct this analysis on the indoor/outdoor components of water use for the sectors. CDM Smith will enhance AW's existing demand model for the single-family sector and will develop the other sector models as such to allow for the weather and price impacts to be estimated.

To address the 2070 and 2115 planning periods, CDM Smith will build from the modified 2020 and 2039/2040 disaggregated, spatially-referenced demand model. Likewise, the 2070 and 2115 demand models will be an Excel-based model disaggregated to the Delphi Trends and Imagine Austin (DTI) polygon level by sector. The implemented level of detail in the model will be driven by the requirements of the GHD Geospatial Process, reasonable level of accuracy that can be achieved for the projections of the drivers of demand. Projecting the drivers of demand, such as employment, population, and housing, to the long-range planning horizons will rely heavily on resources such as input from AW and the City demographer, DTI projections, US Census, County Business Patterns, and zoning data sets. CDM Smith will develop an Excel-based modeling tool that includes options to select alternative model inputs for future demographic growth, water rates, median household income, weather conditions and a range of elasticities as well as climate factors which will be based on results from AW's Climate Consultant.

Task 3.2. Water Needs, Budgeting Options, and Approaches.

The water demand model developed by AW and CDM Smith will be applied to perform preliminary water needs identification and quantification. In addition, the Consultant will develop a baseline water balance schematic, incorporating demands developed in Task 3.1 in addition to existing water supply information.

It is anticipated that the demand models developed in Task 3.1 will serve as the basis for this task and that additional Excel-based tools will be developed so that aggregated results can easily be reviewed. CDM Smith will work with AW to define the desired aggregations and will take into consideration the requirements of the study when developing the aggregated demands and various displays of the results.

Assumptions

- AW will develop preliminary disaggregated water demand forecasting model out to the 2020 and 2039/2040 planning horizons, with CDM Smith review. Any agreed upon revisions to the model will be carried out by AW staff. The model, or a subset thereof, will be provided to CDM Smith in MS Excel format for use in developing the extended model. AW will provide a geospatial summary of sector water demands (single-family, multifamily, commercial, wholesale, large volume, irrigation meters, City of Austin, and City of Austin irrigation meters).
- CDM Smith will enhance the 2020 and 2039/2040 models to include end uses for the commercial and multi-family residential sectors. The sector models will be enhanced to incorporate analysis of climate change and price impacts.

- AW will provide end use estimates for the single family, wholesale, large volume, irrigation meters, City of Austin, and City of Austin irrigation meters sectors.
- CDM Smith will develop the extended demand forecasting model, building from the 2020 and 2039/2040 models, for 2070 and 2115. The extended models will be developed in MS Excel format with geospatial linkages. Demographic projections will be developed with input from AW and the City demographer.
- Two working meetings with AW staff, of which one will be an in person working meeting to review AW's demand model. The other meeting will be a remote meeting to present CDM Smith's extended forecast.
- All data requested related to this task will be provided by AW in an analysis ready format that requires minimal clean up or processing by CDM.
- AW's WAM Consultant will provide a baseline, existing water supply for comparison to forecasted water demands.
- Subconsultants supporting this task will include GHD will provide feedback and guidance on the desired input format for the decentralized reuse evaluation model.

Deliverables

- TM on CDM Smith's review/recommendations for AW Water Demand Forecast Model
- TM and MS Excel model with geospatial linkage on the following:
    - CDM Smith's 2020 and 2039/2040 demand model incorporating climate change, price elasticity, and end use for commercial and multi-family residential.
    - CDM Smith's extended demand forecast to 2070 and 2115, which will include a methodology to develop disaggregated water demand forecasting model.
    - Preliminary water needs identification, and quantification
    - Baseline water balance schematic

Task 4: Conduct Water Conservation Potential Assessment

Water conservation programs (i.e., demand management) have been and will continue to be a critical element in Austin's management of water resources. Accordingly, AW and the IWRP Task Force have established water conservation as a major focal point for the IWRP. The purpose of Task 4 is to describe existing conservation measures implemented by AW, identify potential new measures for future implementation, screen the existing and proposed measures to a list of those considered for the future, and characterize and quantify those measures.

Task 4.1. Demand Management Screening.

Building off the criteria established by the 2014 task force and refined and finalized in Task 2, CDM Smith will work with AW to screen the universe of demand management options down to those measures which should be evaluated. The initial list, not to exceed 25 measures, will be developed by CDM Smith based on the existing measures already implemented or planned within the AW service area, as identified in Task 4.7, and potentially include selected additional measures identified by the 2014 Task Force, IWRP Task Force, CDM Smith or AW which have potential for success within the AW service area. The list of measures may also include any cooperative

conservation arrangements identified in Task 4.6. This analysis will consider results of the Water Conservation Study developed by the City's Office of Sustainability.

Each potential measure initially identified will be screened according to the factors defined in Task 2. The review of these measures will be cursory, based on the expertise and knowledge of the CDM Smith team and AW staff. The result of this task will be an approved list of no more than 10 demand management measures to be fully evaluated and thereby carried forth into the subsequent tasks.

Task 4.2. Evaluate Demand Management Options.

Working from the final list developed in Task 4.1 the criteria and methodology developed in Task 2, and using the demand models developed in Task 3.1, CDM Smith will evaluate and characterize the demand management measures under consideration. The evaluation will include the characterization needed to properly rank and score each measure within the matrix and details needed to quantify the demand reduction opportunity (Task 4.4) and develop the cost and yield data (Task 4.5). CDM Smith will build upon the conservation program assessments conducted by AW staff, utilizing, to the extent practical, existing calculations, assessments, and data.

At the onset of this task, CDM Smith will review all data previously provided to by AW in support of other tasks and will identify any additional data requirements to be provided by AW.

Task 4.3. Developing Cost Benchmarks.

CDM Smith will work with AW to establish a set of cost benchmarks. The basis for this analysis will be discussed with AW at the onset of this task. AW has previously developed cost benchmarks for water conservation programs and will provide details to CDM Smith for review. CDM Smith will review the existing AW water conservation cost benchmarks and, with discussion with AW, create new or update the existing benchmarks as agreed upon.

Task 4.4. Identify Demand Reduction Opportunities.

The demand management strategies identified in Task 4.2 and the demand model developed in Task 3, CDM Smith will identify the potential demand reduction opportunities for the evaluated measures. The demand savings will be calculated in close coordination so that potential impacts, such as reduced wastewater, are quantified. Savings will be calculated based on parameters of the demand forecast model for the 2020, 2039/2040, 2070, and 2115 planning horizons.

Task 4.5. Develop Cost and Yield Data.

Implementation costs and resulting savings will be developed for up to 10 demand management measures. CDM Smith will conduct an economic benefit-cost assessment that will include calculation of the net present value, benefit-cost ratio, levelized unit cost (e.g., dollars per thousand gallons saved), pay-back period, and return on investment for each measure. These economic indicators will be used to further rank the measures on the basis of economic benefit. The unit cost of measures will be compared with unit costs of current water and other supply alternatives in Task 7 and later tasks for a fair comparison.

Task 4.6. Coordination and Cooperative Conservation Improvements.

CDM Smith will evaluate and recommend opportunities for coordination of demand management measures between LCRA (wholesale raw water provider) and AW, City of Pflugerville, Barton

Springs Edwards Aquifer Conservation District and potentially other adjacent communities. This type of coordinated approach may identify additional measures to be evaluated in Task 4.1.

Task 4.7. Summarize Conservation Progress.

CDM Smith will summarize AW's progress to date, starting with the program's genesis in 1985 and summarizing achievements as documented in the 2006 and 2009 Citizen Water Conservation Implementation Task Force, the 2012 Report prepared as part of AW's pro-rata curtailment plan, and supplement with input from AW staff. This task will summarize the conservation measures implemented, both past and current, and serve as a foundation for Task 4.1 through Task 4.5.

Assumptions

- One in person working meetings with AW staff, one to select the measures for full evaluation as stated in Task 4.1.One remote meeting is planned to review the results from Task 4.5.
- Attendance and presentation at a IWRP Task Force meeting is planned. The budget assumes that the task force meeting will occur concurrently with another in-person meeting so no additional travel expenses are assumed for this task.
- The number of individual measures to screen will not exceed 25. Not more than 10 demand side options will be identified for evaluation.
- CDM Smith will provide AW a data requirements request at the onset of Task 4.2. Data will be provided in the requested format by AW to the extent possible.
- Amy Vickers (to be replaced by Peter Mayer) will provide support on Task 4. Susan Roth who will lead Tasks 4.6 and 4.7 and development of Task 4 memorandum.
- Subject to further appropriations and written authorizations from the Owner, in accordance with Section 3.6 of the Professional Services Agreement for Consulting Services for Integrated Water Resource Plan between Austin, Texas and CDM Smith, Inc., the Consultant agrees to provide the following scope of services in the amounts specified below:
    - Additional demand management options can be included in the initial screening step for $3,500 per option, and in the evaluation step for $10,500 per option.

Deliverables

- TM on Conservation Potential Assessment, which will include information on Tasks 4.6 and 4.7.

Task 5: Incorporate Impacts of Climate Change on Water Supply and Demand

Climate change is projected to cause changes in both long-term trends as well as the frequency and magnitude of extreme events associated with temperature and precipitation (floods, drought, heat, and fires). There is uncertainty associated with these changes, and the changes in the Colorado River basin that may impact Austin's supply may be different from the changes in Austin's service

zone that may impact demand. A robust climate-resilient water plan will address these four aspects of climate change: trends, extremes, regional variations, and uncertainty.

Task 5.1. Impacts of Climate Change on Supply- and Demand-Side Options.

CDM Smith will work with AW's climate science (Dr. Katherine Hayhoe) and hydrology consultants (Dr. Richard Hoffpauir) to incorporate climatic and hydrologic forecast data into the evaluation of supply- and demand-side options identified in Tasks 4 and 6 – including making the recommendation to develop a set of climate ensembles specific to AW to characterize the following:

- Hotter Temperature, Lower Precipitation
- Warmer Temperature, Higher Precipitation

CDM Smith will conduct a vulnerability assessment of supply-side and demand-side options. A climate resiliency score that indicates how well the option would perform under projected climate changes (including trends and extreme events) will be generated for different water supply (both supply-side and demand-side) options. The climate resiliency score may be a qualitative score that is informed by quantitative information.

Climate-change adjusted streamflow and evaporation time series will be developed by ATMOS Research and Consulting (Dr. Katherine Hayhoe) using statistical regression relationships between local hydrology and climate. CDM Smith will work with Dr. Hoffpauir to implement the new streamflow and evaporation patterns into the WAM analysis and evaluate changes to reservoir storage, availability, and reliability as well as establish the strategy's dependence on climactic conditions as input to both supply –and demand-side scoring in Task 7 and as input to portfolio evaluation in Task 8.

Task 5.2. Water Demand Impacts.

Using the same selected climate change scenarios for supply impacts, CDM Smith will evaluate changes to monthly demands using demand forecast models developed in **Task 3** based on normal weather conditions—keeping all variables the same except future weather variables. The resulting demand forecasts will then be evaluated in various portfolios to assess climate change impacts on reliability under projected climate changes (again including trends, extreme events, and regional variations)**.**

Assumptions

- Up to two climate change scenarios will be incorporated into the water supply and demand evaluations.
- The CDM Smith team will provide guidance regarding selection of the two climate change scenarios; however, responsibility for the evaluation and final selection of these scenarios belongs to AW, AW's Climate Consultant (Dr. Katherine Hayhoe), and AW's WAM Consultant (Dr. Richard Hoffpauir).
- Two remote meetings with AW staff, one to establish water supply impacts and one to establish water demand impacts
- Climate change impact analysis will be provided by Dr. Katherine Hayhoe who is procured by the City separately outside of this scope of work

- WAM support will be provided by Dr. Richard Hoffpauir who is procured by the City separately outside of this scope of work
- Assessment of extreme events impacts on water supply options and water demand may not have robust data projections and thus may require a more qualitative approach, including looking at thresholds or sensitivities. CDM Smith will provide guidance on the best available practices for this effort with the analysis being performed by ATMOS Research and AW.

Deliverables

- TM on Incorporating Climate Change, which will include incorporation of water supply and water demand into option scoring and portfolio evaluation

Task 6: Evaluate Water Supply and Diversification Options

Given Austin's reliance on a single source that is vulnerable to climate change and drought, evaluation of water supply and diversification options is of critical importance for the IWRP.

Task 6.1. Identify Water Supply Options for Matrix Evaluation.

CDM Smith will work with AW to identify no more than 22 water supply options for screening. AW will work with the Task Force and others to gather input on potential options to be included in the screening process. CDM Smith will perform screening of options to select no more than 10 options for evaluation in Task 6.2.

Task 6.2. Evaluate Water Supply Options.

CDM Smith will use performance measures to evaluate the selected water supply options. Potential supply options for evaluation include, but are not limited to:

Surface water supply options such as:

- lake storage and operations,
- off-channel reservoir storage and operations,
- outflow from Barton Springs/other local springs and creeks into Lady Bird Lake,

Reuse options such as:

- direct potable reuse,
- direct non-potable reuse,
- indirect reuse (for potable and non-potable)

Decentralized options (analyzed in **Task 6.3** below) such as:

- green infrastructure,
- on- site systems for stormwater, graywater, black water, wastewater skimming, AC condensate, recycled water package plants

Groundwater options such as:

- desalination of brackish groundwater or other saline water sources,
- aquifer storage and recovery (ASR)

The evaluation of water supply options will take into account the objectives defined in **Task 2** and other considerations that are important to AW such as the Lower Colorado River Authority (LCRA) Water Management Plan (and revisions), emergency orders, and LCRA environmental flow requirements; water supply agreements between the City and LCRA in the form of firm contracts for stored water and run- of-river backup, and additional supplies for steam-electric demands; energy-water nexus dynamics; surface and groundwater law/permitting; City of Austin return flows and the Joint Application for Reuse (JAR) pending at TCEQ; potable/non-potable connection standards and public health and safety; end use water quality; potential policy and financial incentives; climate change impacts; environmental and water quality impacts, flows, and habitat; identification of potential impacts on wastewater collection and treatment systems (pipe flow rate reductions and/or impacts to waste constituent concentrations); and wastewater, graywater, and rainwater use, codes, and ordinances, and incorporation of Net Zero concepts.

In performing this evaluation, CDM Smith will estimate planning-level costs for the options.

CDM Smith will coordinate with Dr. Richard Hoffpauir and Dr. Katherine Hayhoe (procured by the City separately outside of this scope of work) to incorporate the results of WAM analyses, primarily for surface water on a regional/basin-wide scale, into the evaluation of water supply options.

Task 6.3. Perform Comprehensive Distributed Supply Analysis.

GHD will utilize its Geospatial Process to analyze the supply yield and cost-effectiveness of distributed, alternative water supplies to include avoided costs of deferring large water and wastewater treatment plant expansions due to an alternative supply (stormwater, graywater, blackwater, and wastewater skimming). End use water demands will be matched with potential sources and availability of supplies for a pre-defined resolution of spatial disaggregation. GHD and CDM Smith work with AW to develop the level of geospatial disaggregation based on availability of data (both in terms of water demands, and GIS layers for water, wastewater, recycled water and stormwater systems).

The geospatial analysis will start by developing a baseline map, including data such as zoning, flood plains, major infrastructure, and boundaries. Maps will be generated for both potable and non-potable water consumption for the current and future scenarios to show hot spots that will inform opportunities for water conservation and alternative water supply. We will then work with AW's hydrology consultant to evaluate impacts of storm/gray/black water capture scenarios on environmental and return flows. From this analysis, we will integrate our findings into a decision making framework for reuse to provide guidance on the effective uses of reclaimed water by AW.

Distributed options will be summarized by location, potential supply yield, and cost. Additional information to be used to populate the Options Template developed in Task 2 will be summarized and may include cost-effectiveness, impact on return flows to River, water quality, and other impacts (energy and environment).

Assumptions

- GHD and CDM Smith will provide AW a data requirements request at the onset of this task. Data will be provided in the requested format by AW to the extent possible. All data requested related to this task will be provided by AW in an analysis ready format that requires minimal clean up or processing by CDM Smith.

- The number of initial individual supply side options to screen will not exceed 22. Not more than 10 supply side options will be identified for characterization for use in portfolio development. This includes options developed as part of Task 6.3.
- Supply-side options will be screened using data generated from previous work completed by AW. CDM Smith will review this data and identify cost and other data may need to be updated for use in the evaluation process. AW will work with CDM Smith to update provided cost and other information as necessary. CDM Smith understands some of these options may not have previous studies or cost data completed. Our budget includes CDM Smith conceptualizing up to six (6) supply options, including options identified in Task 6.3, that have little to no information from previous studies. Conceptual level evaluations will include development of information to populate the Options Template developed in Task 2, which may include identification of estimated yield (to be performed by WAM consultant), source water, estimated water quality, end use, yield, high level cost estimate, and infrastructure requirements.
- WAM support will be provided by Richard Hoffpauir who is procured by the City separately outside of this scope of work
- Two in person working meetings with AW staff, one to review results of water supply option evaluation (with up to two CDM Smith staff in attendance) and one to review results of the decentralized supply analysis (with two CDM Smith staff in attendance as well as two staff from GHD)
- Subconsultants supporting this task will include the following:
    - Task 6.2: Crespo and LBG Guyton will support water supply option evaluations
    - Task 6.3: GHD will lead Task 6.3 with review from Dr. Michael Barrett
- Attendance and presentation at a IWRP Task Force meeting is planned. The budget assumes that the task force meeting will occur concurrently with another in-person meeting so no additional travel expenses are assumed for this task.
- Subject to further appropriations and written authorizations from the Owner, in accordance with Section 3.6 of the Professional Services Agreement for Consulting Services for Integrated Water Resource Plan between Austin, Texas and CDM Smith, Inc., the Consultant agrees to provide the following scope of services in the amounts specified below:
    - Additional supply options can be included in the initial screening step for $5,000 per option, included in the evaluation step for $12,000 per option and included as a new option that requires conceptualization for $16,500 per option.

Deliverables

- TM on water supply options evaluation results and associated option templates for each strategy, as defined in Task 2
- TM on comprehensive distributed supply analysis.
- All Geospatial Process datasets and results, including geospatial map products in ArcGIS compatible format (shapefiles, geodatabases or other similar formats).

Task 7: Characterize Demand and Supply Side Options

CDM Smith will use the process described in Task 2 to score the demand and supply side options identified for characterization.

CDM Smith will prepare a matrix that compares the screened options against the performance measures identified in Task 2, such as supply yield, climate resiliency, water quality, and environmental impacts. A unit-cost metric will also be developed that normalizes the comparison of these options. For example, some options provide a consistent supply throughout the year and under most hydrologic conditions, while other options only provide supplies when water is captured and not uniform throughout the year. The unit cost methodology will allow for a fair comparison of the options.

Assumptions

- A total of 20 options combined from Task 4 (demand side) and Task 6 (supply side) will be will be fully characterized and reconciled.
- One in person meeting with AW to review options matrix with up to two CDM Smith staff in attendance.
- One coordination meetings (remote) with AW.
- Subconsultants supporting this task will include Crespo, Susan Roth, Michael Barrett, and LBG Guyton.

Deliverables

- TM on Comparison of Options which will include a reconciled list of demand and supply side options

Task 8: Develop and Evaluate Portfolios

Task 8.1. Process to Develop Portfolios.

CDM Smith will work closely with AW to build portfolios from the strategies and options evaluated in Task 7 that satisfy baseline conditions (no climate change impacts). As described in Task 2, AW and the IWRP Task Force input is a critical aspect to this process.

The portfolios will consider different mixes of the characterized options from Task 7 (both demand side and supply side). Themes, to be developed in this task, will be used to develop the portfolios, such as: high resiliency, lower cost, higher sustainability. Up to five (5) initial portfolios will be developed, with the potential for creating up to two (2) hybrid portfolios (re-combining the initial portfolios) to develop super performing ones.

Task 8.2. Portfolio Evaluation.

CDM Smith will use a spreadsheet-based evaluation to add up the supplies for each portfolio, identify and eliminate any "competing" options, and ultimately compare to projected demands. As part of this evaluation, we will work with Dr. Hoffpauir to conduct WAM analyses that will provide input to the portfolio evaluation process. Reliability of the portfolios will be assessed using the WAM model under 3 future conditions (1 baseline + 2 climate change scenarios).

Assumptions

- Up to 5 initial portfolios will be developed and evaluated using the portfolio evaluation spreadsheet with up to 2 hybrid portfolios
- One in person meetings with AW with one meeting to obtain input on the portfolio screening, for up to four hours with up to two staff attending
- One remote meeting with AW one meeting to present results, for up to four hours with up to two staff attending
- One coordination meetings (remote) with AW
- Attendance and presentation at a IWRP Task Force meeting is planned. The budget assumes that the task force meeting will occur concurrently with another in-person meeting so no additional travel expenses are assumed for this task.
- Each portfolio will be evaluated for two timeframes (mid and long-term, and for 1 baseline scenario and 2 climate change scenarios (discussed in Task 5).
- The CDM Smith team will provide portfolio definitions and guidance; however, responsibility for each required WAM simulation belongs to AW and AW's WAM Consultant (Dr. Richard Hoffpauir). The reliability analysis in WAM may require up to 15 WAM simulations (3 scenarios x 5 portfolios).
- Task 8, including WAM analysis, may involve up two additional iterations in sequence with Task 9 and 10 to account for development of hybrid portfolios

Deliverables

- TM to summarize portfolio evaluation which will include:
    - Prioritized option portfolios with quantitative and qualitative information including, but not limited to, storage graphs using WAM-based conditional reliability modeling results
    - List of selected and prioritized option portfolios for further evaluation

Task 9: Conduct Financial Analysis and Evaluation

Task 9.1. Evaluate Financial Considerations.

To create a comprehensive estimate of the supply and demand-side portfolios selected in Task 8, CDM Smith will develop a cost spreadsheet that will be used to evaluate financial considerations for each of the portfolios. The Unified Cost Model (UCM), an MS Excel based spreadsheet which was developed by the Texas Water Development Board for regional water planning, will form the basis of the costing spreadsheet. Once cost analysis is complete on these projects, the resulting cost estimate will be organized into a summary spreadsheet.

Task 9.2. Financing Options.

CDM Smith will summarize, at a high level, potential financing options including alternate project delivery methods. This summary will identify potential opportunities for regional partnerships and cooperation, cost sharing, and revenue-positive or revenue-neutral opportunities for consideration in infrastructure and facilities planning when feasible. Financing options to be explored will include expansion of the use of impact fees to support projects aimed at improving water use efficiency.

CDM Smith will also evaluate funding mechanisms and requirements for decentralized, graywater, and rainwater harvesting options, exploring the use of private capital options to finance

decentralized infrastructure throughout the city, including a potential Service Extension Request (SER) process approach.

CDM Smith will conduct a survey of other cities and summarize the implications of decentralized infrastructure on other cities revenue streams, including revenue opportunities, and approaches taken to develop fee for service models. It is assumed that the cities used for the case studies in Task 9.3 will be used to conduct the survey.

Task 9.3. Alternative Utility Rate Structure and Business Model Approaches.

CDM Smith will develop case studies for up to three water-conscious cities with recent alternative rate structure innovations that are intended to address revenue variability while maintaining a conservation incentive. This qualitative analysis will examine techniques from cities that will be determined in coordination with AW.

Assumptions

- The IWRP Cost Spreadsheet will be of a similar level of detail to and build on previous cost tools developed by the Consultant (Colorado) and also the Unified Costing Model developed by the Texas Water Development Board. The IWRP Cost Spreadsheet will include both capital and O&M costs.
- Up to three (3) case studies will be included in Task 9.3.
- Two coordination meetings (remote) with AW with up to 2 CDM Smith Staff attending)
- Subconsultants supporting this task will include Encotech, who will use the Cost Spreadsheet to prepare cost estimates for each supply and demand-side portfolio, Susan Roth who will assist with Financing Options and GHD, who will assist with the Australian case study.
- Task 9 may involve up two additional iterations in sequence with Task 8 and 10.

Deliverables

- TM to include the following:
    - financial evaluation for up to five (5) portfolios (and up to two (2) hybrid portfolios) which will be provided as a Populated IWRP Cost Spreadsheet and Unified Costing Model
    - case studies on financing options.
    - case studies on up to three alternative utility rate structure business model approaches.

Task 10: Score Portfolios

CDM Smith will score and rank portfolios using a process called multi-criteria decision analysis (MCDA). This process will use the criteria and criteria weighting developed from Task 2, along with performance measures, to compare the portfolios. A simple spreadsheet tool will be used to add up the supplies from each portfolio to meet specified water demands.

CDM Smith will use Criterium Decision Plus (www.infoharvest.com) software to rank the portfolios. This software converts the uniquely measured units for the criteria into a standardized units for

easy comparison and ranking of alternatives. Because metrics are measured in different units (e.g, supply in acre-feet, cost in dollars, water quality in milligrams per liter) it is necessary to convert these metrics into standardized scores so they can be compared to each other. The ranking of portfolios will easily show trade-offs between them and allow for stakeholders to understand the advantages and disadvantages of the portfolios.

Assumptions

- Up to 5 initial portfolios will be developed and evaluated using the portfolio evaluation spreadsheet with up to 2 hybrid portfolios
- One in person meeting with AW with one meeting to obtain discuss outcomes of Portfolio scoring with up to two CDM Smith staff attending
- One coordination meeting (remote) with AW
- Each portfolio will be evaluated for two planning periods (mid and long-term) and for 1 baseline scenario and 2 climate change scenarios (discussed in Task 5).
- The CDM Smith team will provide portfolio definitions and guidance; however, responsibility for each required WAM simulation belongs to AW and AW's WAM Consultant (Dr. Richard Hoffpauir). The reliability analysis in WAM may require up to approximately 15 WAM simulations (3 scenarios x 5 portfolios).
- Task 10 may involve up two additional iterations in sequence with Task 8 and 9.

Deliverables

- TM summarizing outcomes of Portfolio Scoring
- Populated Criterium Decision Plus software file and spreadsheet summary of portfolio rankings. (If desired, AW will be responsible for purchasing Criterium Decision Plus software separately for future use.)

Task 11: Develop Plan Recommendations

At the conclusion of the scoring processes for supply/demand options and portfolios, we will arrive at a set of recommendations that reflect the community's values in terms of affordability, supply diversity, sustainability, environmental protection, and drought resilience. These will be organized as short-, medium-, and long-term recommendations, consistent with previous AW concepts. We will also identify short term strategies that have potential as drought response options.

We will prepare three case studies that highlight how similar strategies within the Plan recommendations have been implemented by other cities/agencies and found to have been successful. AW will work with CDM Smith to identify the strategies and cities to be included in the case studies.

Assumptions

- One in-person meeting with AW on initial recommendations with up to three staff attending
- One coordination meeting (remote) with AW(with up to three CDM Smith staff attending)

- Attendance and presentation at a IWRP Task Force meeting is planned. The budget assumes that the task force meeting will occur concurrently with another in-person meeting so no additional travel expenses are assumed for this task.

Deliverables

- TM that includes
    - Supply and demand management plan recommendations
    - Updated short-term tiered drought management plan
    - Medium and long term plan recommendations
    - Case studies for demand and supply side options

Task 12: Develop Plan Report

The CDM Smith Team views the Austin IWRP report as a document that will be developed throughout the 18-month timeframe for the contract. We will develop the deliverables for each task as technical memoranda, which will be compiled into a comprehensive report at the conclusion of the study. The report will be a cohesive document that tells a complete picture of the planning process, evaluation of options and portfolios, and recommendations.

CDM Smith will identify potential risk triggers and uncertainties that may impact the implementation of Plan recommendations developed in Task 11. The City envisions the potential for plan updates every 5 years—we propose to develop a process to revisit the plan which is timed to coincide with the Texas Regional Water Planning process and update the IWRP in a structured and comprehensive manner.

Assumptions

- One in-person meeting with AW for up to2 hours, up to 2 CDM Smith staff attending.
- One coordination meeting (remote) with AW with up to 2 CDM Smith staff attending
- AW will provide a style guide to CDM Smith at project inception detailing the "look and feel" of memorandum and report text, mapping/figures, and tables.
- One set of comments will be provided for the Draft Plan and incorporated by CDM Smith. Upon approval by AW that the comments have been reflected and incorporated, a Final Plan will be developed.
- Subconsultants supporting this task will include K2, who will provide printing services on the project and Susan Roth, GHD, Michael Barrett who will provide written text for the report and/or review services.
- Final Plan will consist of 1 electronic version (PDF) and 10 hard copies

Deliverables

- Draft Plan (75% complete)
- Final Draft Plan, incorporating comments coordinated by AW

PM: Project Management

The objective of this task is to assure the Project is delivered to the expectations of the AW Project Team. Only hours specifically related to project management are included in this task; technical task management is reflected in each individual task.

Task PM.1. Communications and Project Management Plan.

CDM Smith will prepare a Communications and Project Management Plan to include procedures and protocols that will support effective coordination of the CDM Smith Project Team.

Task PM.2. Project Team eRoom.

In order to establish a common platform for sharing and maintain project files, CDM Smith will establish a Project Team eRoom. This task will be to establish and maintain an electronic eRoom incorporating meeting agendas, draft technical memoranda, outstanding issues list, and frozen issues list, at a minimum.

Task PM.3. Project Quality Control Plan.

Under this task, a Quality Control Plan will be prepared. The goal of this plan will be to establish a Quality Assurance (QA) process that includes all activities to ensure that the Quality Control (QC) process for the Project is being followed. The following are key tenets of CDM Smith's quality process:

- Develop Project-specific QC processes and a schedule for their completion;
- Provide that the Quality Management Plan meets the requirements of the City;
- Assign an independent QA/QC manager to ensure that all quality control procedures are being followed and that products and services provided meet both CDM Smith and AW requirements.

Task PM.4. Project Quality Management Workshop.

Quality Management (PQM) Workshop, which is a formal requirement of CDM Smith's Quality Assurance Program, and is a team-oriented working session designed to develop a deep understanding of the Project challenges and a sense of teamwork and commitment to Project success. The PQM Workshop will review two basic tenets of effective Project delivery: the importance of planning; and the value of a unified and motivated Project delivery team. The PQM Workshop will concern:

- Setting goals;
- Establishing critical success factors;
- Clarifying responsibilities; and
- Anticipating difficulties and managing risks, all of which will contribute to a successful Project.

The PQM process stresses a team approach – both to planning the Project and to executing delivery of the Project. Identifying all the key individuals that have a stake in the success of the Project and

having them actively participate in the PQM meeting is essentially a team building activity. Through the facilitated discussions, everyone develops a thorough understanding the Project and a sense of shared commitment to the Project success that cannot be accomplished by reading, phone calls or e-mails to team members. Beyond its value as a planning and a team building tool, the PQM truly is an effective Project quality management tool that is recommended for the Project.

The PQM will be incorporated into the in-person meeting held as part of Task 2 and facilitated by the CDM Smith Project Manager. The hours included in this task reflect the additional effort (2 hours for two CDM Smith staff) required to incorporate the PQM process goals into the technical workshop.

Task PM.5. Bi-weekly meetings.

Bi-weekly project management calls, which are budgeted as short (up to 30 minutes), focused calls on activities and potential issues. The bi-weekly calls will be between AW PM and CDM Smith PM, and CDM Smith Principal with others brought on if needed. This task includes preparation of agenda and meeting minutes. A detailed list of planned project meetings is included in **Attachment 1.**

Task PM.6. Monthly Reporting and Project Administration.

CDM Smith will prepare monthly status reports of Project progress, expenditures to date, cost-to-budget information, and WBE/MBE utilization and submit in conjunction with monthly services invoice. As project deliverables are submitted (i.e., technical memorandum) on a task-by-task basis, release of retainage will be requested.

Task PM.7. Project Schedule.

In order to conduct this Project in a manner consistent with the AW management team objectives, CDM Smith Project Team will develop a schedule using Microsoft Project. Once the Project schedule is established, it will be maintained throughout the Project to reflect actual progress and will include any changes requested by the AW management team. CDM Smith will provide AW access to project schedule in Microsoft Project format in Project Team eRoom. A preliminary schedule is provided in **Attachment 2.**

Task PM.8. Task Force Meetings.

This task provides in person attendance for up to five (5) Task Force meetings by one CDM Smith staff (for two hours), with the understanding that these would be limited to only when AW feels consultant would provide value in being there. It is assumed that these meetings will be coordinated with other in-person meetings conducted as part of the tasks described above and therefore, no additional travel funds have been allocated for this task.

Assumptions

CDM Smith will conduct internal coordination meetings as necessary within each phase of the Project to accomplish this goal. It is assumed that internal coordination meeting budget is incorporated into each of the technical tasks.

City of Austin - Austin Water Utilities
Consulting Services for the Integrated Water Resources Plan
Solicitation Number: CLMP179
April 11, 2016

ATTACHMENT 1. SUMMARY OF PROJECT MEETINGS - SUBJECT TO CHANGE

TASK	TASK	In Person Meetings (1)	Remote Meetings (2)	Coordination Meetings (remote, 3)	Task Force Meetings (4)
Task 1	Conduct Public Outreach and Participation	3			
Task 2	Develop Methodology for Options Evaluation	1	1		1
Task 3	Evaluate and Forecast Disaggregated Water Demands (5)	1	1		
Task 4	Conduct Water Conservation Potential Assessment	1	1		1
Task 5	Incorporate Impacts of Climate Change on Water Supply and Demand		2		
Task 6	Evaluate Water Supply and Diversification Options (5)	2			1
Task 7	Score Demand and Supply Side Options	1		1	
Task 8	Develop and Evaluate Portfolios	1	1	1	1
Task 9	Conduct Financial Analysis and Evaluation			2	
Task 10	Score Portfolios	1		1	
Task 11	Develop Plan Recommendations	1		1	1
Task 12	Develop Plan Report	1		1	
PM	Project Management (6)			36	
	Total	**13**	**6**	**43**	**5**

Notes:
1. In person meetings include up to two CDM Smith staff attending a 2 hour meeting with AW staff. For Task 1, the in person meetings represent the three (3) Public Workshops (the ten Outreach Events are not included in the summary above.
2. Remote meetings include up to two CDM Smith staff attending a 2 hour meeting with AW staff.
3. Coordination meetings include up to two CDM Smith staff attending a 1 hour meeting with AW staff.
4. Task force meetings are assumed to occur concurrently with other in-person meetings. Therefore, no additional travel expenses have been budgeted for these meetings.
5. Includes participation (in person) with GHD for one meeting in this task.
6. Project management coordination meetings include up to two CDM Smith staff attending a 30-minute phone meeting with AW staff.

City of Austin - Austin Water Utilities
Consulting Services for the Integrated Water Resources Plan
Solicitation Number: CLMP179
April 28, 2016

ATTACHMENT 2. CDM SMITH PRELIMINARY PROJECT SCHEDULE - SUBJECT TO CHANGE

	Month ---->	1 7/16	2 8/16	3 9/16	4 10/16	5 11/16	6 12/16	7 1/17	8 2/17	9 3/17	10 4/17	11 5/17	12 6/17	13 7/17	14 8/17	15 9/17	16 10/17	17 11/17	18 12/17
	NTP	✸																	
Task 1	Public Outreach and Participation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Outreach events (estimated schedule)		❖		❖		❖		❖	❖	❖		❖		❖		❖		❖
	Workshops (estimated schedule)			♦					♦					♦					
Task 2	Options and Portfolio Methodology	■	■																
	Meetings	♦	◊																
	Task Force Meeting (in person)	○																	
Task 3	Disaggregated Water Demands	■	■	■	■	■													
	Demand Forecast through 2040	■	■	■															
	Demand Forecast through 2115		■	■	■														
	Water Needs					■													
	Task Force Meeting (in person)	♦				◊													
Task 4	Water Conservation Potential Assessment	■	■	■	■	■	■												
	Demand Screening	■	■																
	Demand Management Options		■	■															
	Performance Benchmarks	■																	
	Demand Reduction Opportunities				■	■													
	Cost/Yield						■												
	Coordination and Cooperative Improvements		■																
	Conservation Progress		■																
	Meetings	♦				◊													
	Task Force Meeting (in person)			○															
Task 5	Climate Change						■	■	■										
	Supply Impacts						■	■	■										
	Demand Impacts						■	■	■										
	Meetings						◊		◊										

ATTACHMENT 2. CDM SMITH PRELIMINARY PROJECT SCHEDULE - SUBJECT TO CHANGE

	Month ---->	1 7/16	2 8/16	3 9/16	4 10/16	5 11/16	6 12/16	7 1/17	8 2/17	9 3/17	10 4/17	11 5/17	12 6/17	13 7/17	14 8/17	15 9/17	16 10/17	17 11/17	18 12/17
Task 6	Supply Evaluation	■	■	■	■	■	■	■											
	Evaluate Supply Options		■	■	■	■													
	Decentralized Evaluation	■	■	■	■	■	■	■											
	Meetings					♦		♦											
	Task Force Meeting (in person)					○													
Task 7	Characterize Demand and Supply Options							■	■										
	Meetings								♦										
Task 8	Develop and Evaluate Portfolios									■	■								
	Meetings									♦	◊								
	Task Force Meeting (in person)									○									
Task 9	Conduct Financial Analysis and Evaluation	■	■	■	■	■	■	■	■	■	■	■							
	Financial Evaluation									■	■	■							
	Financing Options			■	■	■													
	Alternative Utility Rate Structure	■	■																
	Meetings																		
Task 10	Score Portfolios											■	■	■					
	Meetings												♦						
Task 11	Plan Recommendations													■	■	■			
	Meetings														♦				
	Task Force Meeting (in person)														○				
Task 12	Plan Report													■	■	■	■	■	■
	Meetings																♦		

◊	Remote meeting
♦	In person meeting
❖	Outreach event
○	In person Task Force meeting (aligned with another in person meeting)

Schedule assumes the following:

1. Data identified during scoping meetings will be available at the start of Task 3 and will be in an analysis ready format that requires minimal clean up or processing by CDM Smith.
2. Geospatial data layers and billing data are also fully available.
3. The disaggregated demand model (which includes single family residential sector demands) will be provided within two weeks of the NTP
4. When feedback required to move on to next task, the schedule assumes 1 month for AW review coordination
5. NTP issued at the beginning of the month
6. Coordination meetings are not included on project schedule

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Attachment B
Engineering Level of Effort Fee Proposal - Subject to Change

City of Austin - Austin Water Utilities
Consulting Services for the Integrated Water Resources Plan
Solicitation Number: CLMP179
April 28, 2016

ENGINEERING LEVEL OF EFFORT FEE PROPOSAL - SUBJECT TO CHANGE

	Title	Man-aging Planner VI	Super-visory Planner VI	Project Manager / Managing Planner VI	Principal / Managing Engineer IV	Supervisory Engineer II	Pro-fessional Planner II	Pro-fessional Planner II	Pro-fessional Planner I	CDM Smith Hours	CDM Smith Total Labor	Reimbur-sable Expenses	CDM Smith	Outside Professionals										Sub-consultant Mark Up	Total
	Rate/hour	$302.24	$171.50	$299.13	$201.88	$148.26	$108.10	$98.42	$111.81				Total	Rifeline	Susan Roth	K2	Adisa	Amy Vickers (to be replaced with Peter Mayer)	Michael Barrett	Crespo	Encotech	GHD	Guyton		TOTAL
TASK	DESCRIPTION																								
Task 1	**Conduct Public Outreach and Participation**	**2**	**0**	**36**	**36**	**8**	**0**	**0**	**0**	**82**	**$ 19,827**	**$ 5,400**	**$ 25,227**	**$ 69,995**	**$ 12,788**	**$ -**	**$19,150**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 5,097**	**$ 132,257**
Task 2	**Develop Methodology for Options Evaluation**	**2**	**4**	**22**	**22**	**24**	**12**	**0**	**0**	**86**	**$ 17,168**	**$ -**	**$ 17,168**	**$ -**	**$ 2,616**	**$ -**	**$ -**	**$ -**	**$ 770**	**$ -**	**$ -**	**$ 4,298**	**$ -**	**$ 384**	**$ 25,237**
Task 3	**Evaluate and Forecast Disaggregated Water Demands**	**8**	**12**	**28**	**24**	**0**	**248**	**208**	**4**	**532**	**$ 65,424**	**$ 4,200**	**$ 69,624**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 17,011**	**$ -**	**$ 851**	**$ 87,486**
3.1	Disaggregated Demand Forecasting Model	8	12	16	20	0	224	168	0	448	$ 54,049			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 17,011	$ -		$ 71,060
3.2	Water Needs, Budgeting Options, and Approaches	0	0	12	4	0	24	40	4	84	$ 11,376			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 11,376
Task 4	**Conduct Water Conservation Potential Assessment**	**0**	**22**	**11**	**9**	**0**	**112**	**261**	**4**	**419**	**$ 47,122**	**$ -**	**$ 47,122**	**$ -**	**$ 40,108**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,005**	**$ 89,236**
4.1	Demand Management Screening	0	0	1	0	0	16	16	0	33	$ 3,603			$ -	$ 3,488	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 7,091
4.2	Demand Management Options	0	6	1	1	0	24	24	0	56	$ 6,486			$ -	$ 3,488	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 9,974
4.3	Developing Water Use Benchmarks	0	6	4	2	0	24	24	0	60	$ 7,586			$ -	$ 4,650	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 12,236
4.4	Identify Demand Reduction Opportunities	0	4	1	1	0	20	76	0	102	$ 10,829			$ -	$ 4,650	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 15,479
4.5	Develop Cost and Yield Data	0	6	4	2	0	20	73	0	105	$ 11,976			$ -	$ 3,488	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 15,464
4.6	Coordination and Cooperative Conservation Improvements	0	0	0	1	0	4	24	0	29	$ 2,996			$ -	$ 8,719	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 11,716
4.7	Summarize Conservation Progress	0	0	0	2	0	4	24	4	34	$ 3,645			$ -	$ 11,626	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 15,271
Task 5	**Incorporate Impacts of Climate Change on Water Supply ar**	**2**	**2**	**22**	**16**	**32**	**32**	**40**	**4**	**150**	**$ 23,346**	**$ -**	**$ 23,346**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 7,499**	**$ -**	**$ -**	**$ -**	**$ 375**	**$ 31,220**
5.1	Water Supply Impacts	0	0	10	8	32	0	0	0	50	$ 9,351			$ -	$ -	$ -	$ -	$ -	$ -	$ 7,499	$ -	$ -	$ -		$ 16,849
5.2	Water Demand Impacts	2	2	12	8	0	32	40	4	100	$ 13,995			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 13,995
Task 6	**Evaluate Water Supply and Diversification Options**	**16**	**0**	**24**	**84**	**122**	**24**	**0**	**8**	**278**	**$ 50,549**	**$ 3,600**	**$ 54,149**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,541**	**$ 65,004**	**$ -**	**$ 92,268**	**$ 9,200**	**$ 8,401**	**$ 230,563**
6.1	Identify Water Supply Evaluation Criteria	4	0	4	4	6	4	0	0	22	$ 4,535			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,994	$ -		$ 16,529
6.2	Evaluate Water Supply Options	8	0	8	60	92	0	0	6	174	$ 31,235			$ -	$ -	$ -	$ -	$ -	$ -	$ 65,004	$ -	$ -	$ 9,200		$ 105,438
6.3	Perform Comprehensive Distributed Supply Analysis	4	0	12	20	24	20	0	2	82	$ 14,780			$ -	$ -	$ -	$ -	$ -	$ 1,541	$ -	$ -	$ 80,274	$ -		$ 96,595
Task 7	**Score Demand and Supply Side Options**	**4**	**4**	**16**	**14**	**48**	**32**	**0**	**2**	**120**	**$ 20,307**	**$ 1,800**	**$ 22,107**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 3,082**	**$ -**	**$ -**	**$ 1,926**	**$ 3,084**	**$ 405**	**$ 30,602**
7.1	Score Options	2	4	10	8	32	16	0	0	72	$ 12,371			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,926	$ 3,084		$ 17,380
7.2	Reconciliation of Scoring	2	0	6	6	16	16	0	4	50	$ 8,160			$ -	$ -	$ -	$ -	$ -	$ 3,082	$ -	$ -	$ -	$ -		$ 11,241
Task 8	**Develop and Evaluate Portfolios**	**10**	**2**	**20**	**20**	**48**	**16**	**0**	**4**	**120**	**$ 22,679**	**$ 1,800**	**$ 24,479**	**$ -**	**$ 2,325**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 4,611**	**$ 3,205**	**$ 507**	**$ 35,127**
8.1	Process to Develop Portfolios	2	0	12	8	16	8	0	0	46	$ 9,046			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 9,046
8.2	Portfolio Evaluations	8	2	8	12	32	8	0	4	74	$ 13,633			$ -	$ 2,325	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,611	$ 3,205		$ 23,774
Task 9	**Conduct Financial Analysis and Evaluation**	**6**	**0**	**52**	**32**	**96**	**24**	**0**	**4**	**214**	**$ 41,103**	**$ -**	**$ 41,103**	**$ -**	**$ 16,276**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 29,988**	**$ 6,589**	**$ 2,643**	**$ 96,599**
9.1	Evaluate Financial Considerations (tool development + analysis)	1	0	16	16	64	16	0	0	113	$ 19,537			$ -	$ 2,325	$ -	$ -	$ -	$ -	$ -	$ -	$ 29,988	$ -		$ 51,850
9.2	Financing Options	1	0	24	8	16	4	0	0	53	$ 11,901			$ -	$ 11,626	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 23,527
9.3	Alternative Utility Rate Structure and Business Model Approaches	4	0	12	8	16	4	0	4	48	$ 9,665			$ -	$ 2,325	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,589	$ -		$ 18,580
Task 10	**Score Portfolios**	**8**	**2**	**12**	**8**	**32**	**0**	**16**	**2**	**80**	**$ 14,508**	**$ 1,800**	**$ 16,308**	**$ -**	**$ 2,325**	**$ -**	**$ -**	**$ -**	**$ 1,541**	**$ 9,964**	**$ 18,998**	**$ -**	**$ -**	**$ 1,641**	**$ 50,777**
Task 11	**Develop Plan Recommendations**	**8**	**4**	**16**	**16**	**24**	**8**	**0**	**4**	**80**	**$ 15,990**	**$ -**	**$ 15,990**	**$ -**	**$ 3,924**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 7,534**	**$ -**	**$ 8,460**	**$ -**	**$ 996**	**$ 36,904**
Task 12	**Develop Plan Report**	**4**	**4**	**24**	**60**	**100**	**40**	**40**	**16**	**288**	**$ 46,063**	**$ 1,800**	**$ 47,863**	**$ -**	**$ -**	**$7,813**	**$ -**	**$ -**	**$ 2,696**	**$ -**	**$ -**	**$ 8,541**	**$ -**	**$ 953**	**$ 67,866**
PM	**PM**	**4**	**0**	**50**	**110**	**0**	**8**	**0**	**124**	**296**	**$ 53,102**	**$ -**	**$ 53,102**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 31,423**	**$ -**	**$ 1,571**	**$ 86,095**
PM.1	Communications and Project Plan	0	0	4	2	0	4	0	0	10	$ 2,033			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 2,033
PM.2	Project Team eRoom	0	0	2	0	0	0	0	24	26	$ 3,282			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 3,282
PM.3	Project Quality Control Plan	2	0	2	8	0	0	0	22	34	$ 5,278			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 5,278
PM.4	Project Quality Management Workshop	2	0	2	2	0	0	0	0	6	$ 1,607			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 1,607
PM.5	Bi-weekly PM Meeting	0	0	18	18	0	0	0	0	36	$ 9,018			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 9,018
PM.6	Monthly Reporting and Project Administration	0	0	18	72	0	0	0	54	144	$ 25,957			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 31,423	$ -		$ 57,380
PM.7	Project Schedule	0	0	4	8	0	4	0	24	40	$ 5,927			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 5,927
PM.8	Task Force Meetings	0	0	15	0	0	4	0	0	19	$ 4,919			$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -		$ 4,919
Total		**74**	**56**	**333**	**451**	**534**	**556**	**565**	**176**	**2,449**	**$ 437,188**	**$ 20,400**	**$457,588**	**$ 69,995**	**$ 80,362**	**$7,813**	**$19,150**	**$ -**	**$ 9,630**	**$ 90,000**	**$ 48,986**	**$ 175,127**	**$ 15,489**	**$ 25,828**	**$ 999,968**

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Attachment C
Draft Subconsultant Proposals

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Adisa Communications

Adisa Communications
13492 Research Blvd
120-631
Austin TX 78750

CDM Smith
Tina Perterson
11490 Westheimer, Suite 700
Houston TX 77077

Estimate #	0000129
Estimate Date	March 26, 2016
PO #	IRWP101 - Estimate
Estimate Total (USD)	**$19,150.40**

Task	Time Entry Notes	Rate	Hours	Line Total
Project Management and Coordination	Participate in monthly planning meetings with the project team (CDM Smith, Rifeline) to provide consultation and strategy for the benefit of the project (President/CEO)	173.14	44	7,618.16
Public Involvement - Planning	Assist Rifeline in the development of a public involvement plan as follows: · Review and provide feedback on plan · Identify key stakeholders for the IWRP (Public Relations Assistant)	106.06	20	2,121.20
Creative and Graphic Design	Design related to Public involvement (Creative Director)	157.40	12	1,888.80
Outreach	Participate in 3 stakeholder meetings · Provide logistics for 3 stakeholder meetings · Attend planning meetings for stakeholder meetings (anticipated to be approximately 8 meetings) · Attend stakeholder meetings · Document stakeholder feedback. · Review summary of documentation and feedback. (Public Relations Assistant)	106.06	60	6,363.60
Reporting	Assist with drafting a summary report on stakeholder feedback from events (Public Relations Assistant/Specialist)	48.70	12	584.40
Reporting	Review and edit reports (Public Relations Assistant)	106.06	4	424.24

Item	Description	Unit Cost	Quantity	Line Total
Copies	Project related copies (internal)	0.15	500	75.00
Distribution	Mailing, deliveries	25.00	3	75.00

Estimate Total (USD)	**$19,150.40**

Notes
Revised 4/13/16 AM
Based on the budget allocation, Adisa is did not include support for the following tasks:

Participate in up to 12 outreach events. Austin Water will lead these events, but Adisa would provide the following:

· Provide guidance on appropriate public outreach opportunities
· Attend public events
· Document input from outreach event participants through surveys or other materials.

Solicit feedback from stakeholders

· Review proposed surveys (online or phone)
· Assist with conducting 30 surveys and provide feedback on surveys
· Review and provide feedback on survey summary report

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Michael Barrett, Ph.D., P.E.

Michael E. Barrett, Ph.D., P.E., D.WRE
5104 Beverly Skyline
Austin, TX 78731

I will assist CDM Smith in the development of the City of Austin Integrated Water Resource Plan through participating in the following tasks:

Task 2: Develop Methodology for Options and Portfolio Evaluation. Review methodology to conduct an "apples-to-apples" comparison of demand-side and supply-side options, as well as scoring portfolios. (4 hours)

Task 6: Evaluate Water Supply and Diversification Options, **Task 6.3: Perform Comprehensive Distributed Supply Analysis**. Review a geospatial tool to analyze the supply yield and cost effectiveness of distributed, alternative water supplies (stormwater harvesting, graywater, blackwater, and wastewater skimming) prepared by GHD (8 hours).

Task 7: Characterize Demand and Supply Side Options. Participate in the process described in Task 2 to score the demand/supply side options against screening criteria to remove unfeasible options (8 hours) and review the memo developed as part of this task (8 hours).

Task 10: Score Demand and Supply Side Portfolios. Participate in an internal workshop to score and rank portfolios (combinations of options) using multi-criteria decision analysis (8 hours).

Task 12: Develop Plan Report. Review and critique the draft final report (14 hours).

Cost: This work will be done on a time and material basis. My approved City of Austin hourly billing rate is $192.60/hr, which is inclusive of all direct costs. Total costs for this work will not exceed $9,630 (50 hours).

Notes

Revised 4/8/16 PM

Based on the budget allocation, Adisa is did not include support for the following tasks:

Participate in up to 12 outreach events. Austin Water will lead these events, but Adisa would provide the following:

· Provide guidance on appropriate public outreach opportunities

· Attend public events

· Document input from outreach event participants through surveys or other materials.

Solicit feedback from stakeholders

· Review proposed surveys (online or phone)

· Assist with conducting 30 surveys and provide feedback on surveys

· Review and provide feedback on survey summary report

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Crespo Consulting Services

Crespo Consulting Services, Inc.
Civil & Environmental Engineering

April 8, 2016

Tina Petersen, Ph.D., P.E.
CDM Smith, Inc.
3050 Post Oak Blvd, Suite 300
Houston, TX 77056

Project: Austin Water – Integrated Water Resource Plan

Dear Tina:

Crespo Consulting Services, Inc. (Crespo) appreciates the opportunity to provide engineering and consulting services to CDM Smith for the Austin Water (AW) Integrated Water Resource Plan (IWRP) development.

SCOPE OF WORK

Crespo will provide engineering, environmental, water supply and technical services to assist and support CDM Smith in the development of the IWRP. Crespo with provide assistance and support for four (4) tasks. The task numbers used below match the associated tasks in the overall project scope.

Task 5. Incorporate Impacts of Climate Change on Water Supply and Demand

Task 5.1. Water Supply Impacts.

Crespo will provide support to CDM Smith with interactions with the AW's climate scientist and hydrology consultant in relation to incorporation of climatic and hydrologic forecast data into the water supply evaluation. Crespo will also provide assistance with feedback regarding implementation of the climate change information in the WAM.

Task 6: Evaluate Water Supply and Diversification Options

Task 6.1. Evaluate Water Supply Options.

Crespo will assist with evaluation of selected water supply options using previous established performance measures. This effort will include support related screening of options associated with selection of further strategies. The performance measures that would be evaluated as part of this task would include: supply volume, drought resilience, yield, instream flow impacts, water quality, infrastructure requirements, and cost. For options that have been proposed but do not have the detail necessary to be evaluated under this task, Crespo would assist with development and evaluation of the options at a conceptual level.

Task 10: Score Demand and Supply Side Portfolios

In this task, the overall project team will prepare a matrix that compares the available portfolios and then use multi-criteria decision analysis to score and rank the portfolios. Crespo will assist with providing feedback on the developed portfolios, including potential competing supply issues that may need to be evaluated with the WAM.

Task 11: Plan Recommendations

At the conclusion of the scoring processes for supply/demand options and portfolios, the overall project team will arrive at a set of recommendations that reflect the community's values in terms of affordability, supply diversity, sustainability, environmental protection, and drought resilience. These will be organized as short-, medium-, and long-term recommendations, consistent with previous AW concepts and will also identify short-term strategies that have potential as drought response options. Crespo will provide feedback on the recommended portfolios that may need to be further evaluated with the WAM considering the overall plan recommendations. This may include a meeting with the team and the AW's hydrology consultant.

EXCLUSIONS

The following services are excluded from this scope of work except as specifically mentioned above:

- State and Federal Permitting
- Water Availability Modeling (WAM) or other simulations with WRAP
- Development of climate change impacts
- Water quality modeling
- Groundwater modeling
- Environmental Assessments (EAs) or Environmental Impacts Statements (EIS)
- Public outreach or attendance at public meetings

COST

Crespo will perform this project on a time and materials basis for a total not-to-exceed-amount of $90,000. The cost estimate is included as an attachment to this proposal. Services will begin as soon as authorization is received. The rates used for billing the scope of work listed above will use the City of Austin approved Category 1 rates for Crespo as of 4/1/2016. Any addenda or further authorizations will use the City of Austin approved rates at that time.

This proposal is valid for a period of 150 days from date of proposal.

Thank you for requesting these services and we look forward to working with CDM Smith again. Please call me if you have any questions or need additional information.

Sincerely,

L. Stephen Stecher, P.E.
Crespo Consulting Services, Inc.
President

Attachment

CDM Smith - City of Austin IWRP
Crespo Subconsultant Budget

Description	Professional Engineer VI	Professional Engineer I	Engineer-in-Training I	Scientist Associate I	Professional Scientist IV	Total Labor	Copy Repro.	Large Scale Plots	Misc.	Total Expenses	Total Cost
	$186.20	$152.58	$103.02	$80.08	$114.41	$	$	$	$	$	$
Task 5. Incorporate Impacts of Climate Change on Water Supply and Demand: Task 5.1. Water Supply Impacts.	16	4	36	1	1	$7,493	6	0	0	$6	$7,499
Task 6: Evaluate Water Supply and Diversification Options: Task 6.1. Evaluate Water Supply Options.	120	60	160	161	36	$64,994	10	0	0	$10	$65,004
Task 10: Score Demand and Supply Side Portfolios	20	4	41	16	1	$9,954	10	0	0	$10	$9,964
Task 11: Plan Recommendations	20	0	35	1	1	$7,524	10	0	0	$10	$7,534
TOTAL HOURS	176	68	272	179	39	734					
TOTAL COST	$32,771	$10,375	$28,021	$14,334	$4,462	$89,964	$36	$0	$0	$36	**$90,000**

4/8/2016

4/1/2016 COA Approved Rates

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Encotech

ENCOTECH

8500 Bluffstone Cove, Bldg B, Suite 103 | Austin, TX 78759 | 512.338.1101
700 N. Mary's Street, Suite 1400 | San Antonio, Texas 78205 | 210.545.3558
www.encotechengineering.com

April 20, 2016 (Revised)

Christina Petersen, Ph.D., P.E.
CDM Smith
11490 Westheimer, Suite 700
Houston, TX 77077

D: (713) 423-7320
C: (713) 816-7830
E: petersoncm@cdmsmith.com

RE: INTEGRATED WATER RESOURCES PLAN, CLMP179
Structural and Plumbing & Electrical Engineering Services
Consultation Services: Adding Task 9 and Task 10

Encotech Engineering Consultants (ENCOTECH) is pleased to submit this proposal for services on the above referenced project to CDM Smith (CLIENT) for consulting services for support of development of the Austin Water Integrated Water Resource Plan.

I. SCOPE:

A. Probable Cost Estimating

1. Infrastructure Related Items
2. Rainwater Harvesting
3. Gray Water Reuse Concepts

B. Planning Level Concepts:

1. Rainwater Harvesting
2. Gray Water Reuse Concepts

II. BASIC SERVICES:

1. Coordinating with CLIENT to determine project requirements.
2. Provide consultation support to CLIENT on Structural, Plumbing and Electrical related issues and requirements.
3. Attend project kick-off meeting.
4. TASK 9: Conduct Financial Analysis and Evaluation

   Encotech will assist CDM Smith to develop a costing spreadsheet. The basis for the tool will be the Unified Cost Model (UCM), an MS Excel based tool which was developed by the Texas Water Development Board for regional water planning, and similar tools developed by CDM Smith for Colorado. Using the cost spreadsheet, Encotech will develop cost curves that will be used for calculating portfolio costs in Task 10.

   To augment this effort, Encotech will work with CDM Smith and GHD to evaluate cost curves for decentralized reuse options that have been developed in Australia and validate the costs for Austin to the extent practical and possible.

   Encotech will prepare summary tables and documentation that will be integrated into a technical memorandum documenting the development of the costing spreadsheet.

5. TASK 10: Score Demand and Supply Side Portfolios

   Encotech will develop cost estimates using the costing spreadsheet and cost curves developed in Task 9 that will be input into the scoring/ranking process for the portfolio evaluation process. Encotech will input the cost data into the Portfolio Spreadsheet tool for use in portfolio scoring.

   Encotech will prepare summary tables and documentation that will be integrated into a technical memorandum documenting the development of the portfolio financial evaluation.

II. ASSUMPTIONS AND CONDITIONS:

The scope of services presented herein and associated estimated budgets are based upon ENCOTECH'S understanding of the project. Changes in the project that affect the underlying contract assumptions may impact the required professional service fee.

Accordingly, ENCOTECH wishes to inform the CLIENT and/or the Owner that this proposal is based on the following assumptions and conditions:

1. Proposal is based on scope that is not clearly defined. Therefore, ENCOTECH will provide services on an hourly not to exceed basis.
2. Services provided will be limited to the usage of the available fees.
3. Scope related to Rainwater Harvesting and Gray Water Reuse Concepts will be refined once proposed by GHD
4. Electrical services is limited to any plumbing implications.
5. CLIENT will provide City of Austin standards as applicable to the scope.
6. This proposal does not provide for Preliminary Engineering, Design, Bidding, or Construction Administration services.

III. COMPENSATION:

The hourly not to exceed fee to provide the anticipated services outlined above shall be as follows:

TASK 9 ..... **$29,987.95**

TASK 10 ..... **$18,998.13**

IV. REIMBURSABLE:

Reimbursable expenses are defined as follows and shall be invoiced at direct cost. These include, but are not limited to:

1. Reproduction of documents.
2. Expedited shipping, mailing, courier expenses
3. Testing and Measurements

V. ADDITIONAL SERVICES:

It is recognized that certain elements within the scope of engineering work cannot be accurately predetermined or controlled entirely by ENCOTECH. Therefore, such engineering work will be performed as Additional Services.

ENCOTECH will perform Additional Services only with prior written approval/agreement from the CLIENT. Such work may include but not limited to:

1. Services required beyond the available fees.
   Note: Once scope is clearly defined, ENCOTECH reserves the right to further define items considered Additional Services.

HOURLY RATES: All Additional Services shall be conducted on an hourly rate basis per Attachment A:

VI. EXCLUSIONS:

Services that are not provided for in this Agreement specifically include, but are not limited to:

1. Preliminary Engineering, Design, Bidding, and Construction Administration services.
2. Means and methods of construction.
3. Testing and Inspections; a qualified testing and inspection firm shall conduct all inspections.
4. Assistance to the CLIENT as an expert witness in any litigation with third parties, arising from the planning, development or construction of the project.
5. Detailed Quantity Take-offs, Estimates or Construction Cost.

VII. CLIENT PROVIDED SERVICES:

1. CLIENT/Owner shall furnish ENGINEER with full information as to CLIENT/Owner project requirements including special considerations or special services needed, and also to make available all project pertinent data.
2. CLIENT shall be responsible for final printing and distribution of documents.

VIII. RESPONSIBILITY OF OTHERS:

In accordance with accepted professional practice it is the responsibility of Owner to provide the design team with complete and accurate information concerning known existing physical and legal conditions of the site/building that are beyond the scope of the professional engineering services described in this document. Certain unusual or unforeseeable conditions may materially alter the scope of the project in a manner not provided for in this contract.

If the project is cancelled prior to completion of project design, then ENCOTECH shall be paid for percentage of work completed up to the date of cancellation.

Please call us if you have any questions. Thank you for giving us the opportunity to render our service to you. We are dedicated to making it a full success.

Sincerely,

Ali Khataw, PE
President / C.E.O.

AGREED & ACCEPTED: CDM Smith

_____

Authorized Corporate Officer (Please print name, title& sign)

Date: _____

Encotech / City of Austin 2016
CDM - Water Management Strategies

Date: 04/20/2016

Integrated Water Resources Plan CLMP179 Project	Principal	Professional Engineer IV	Professional Engineer IIIB	Professional Engineer II	Project Manager I	Engineering Associate III	Engineering in Training IV	Total Hours by Task	**Totals by Task**
Task 9	3	8	45	36	62	29.5	18	201.5	$29,987.95
Task 10	3	8	33	25	35	9	9	122	$18,998.13
								0	$0.00
Total Hours	6	16	78	61	97	38.5	27	323.5	
Billing Rate	$277.50	$232.80	$177.06	$137.25	$140.13	$125.86	$110.19		
Total Fees	$1,665.00	$3,724.80	$13,810.68	$8,372.25	$13,592.61	$4,845.61	$2,975.13		**$48,986.08**

Consulting Services for Integrated Water Resource Plan
April 28, 2016

GHD

11 April 2016

Christina Peterson, Ph.D., P.E.
Associate Water Resources Engineer
CDM Smith
11490 Westheimer, Suite 700
Houston TX 77077

Our ref: 21/0917071/

Your ref:

Dear Tina

Austin Integrated Water Resource Plan
Proposal

Please find enclosed our proposal to, in partnership with CDM Smith, provide consultancy services to the City of Austin over the period June 2016 to December 2017 for the development of their Integrated Water Resource Plan.

This proposal comprises two documents, *GHD's Methodology and Scope* (06 April 2016) and *GHD's Fee Estimate* (06 April 2016). These are based on the City's request for tenders dated 13 July 2015 (CLMP179) and subsequent discussions between GHD, CDM Smith and the City of Austin.

We note that the following matters are yet to be resolved:

- Management and costs associated with disbursements – Travel and accommodation for Australian staff
- Contractual matters documented in previous correspondents.

GHDs legal entity in the United States will be GHD Inc 2889127.

If you or the City of Austin have any further questions or would like to further discuss this proposal, please don't hesitate to contact either myself (+61 3 8687 8827 or ryan.brotchie@ghd.com) or Mike Healey (+61 2 9239 7342 or mike.healey@ghd.com).

Kind regards

Mike Healey
Manager - Water Systems Planning
0418 426 137

GHD Pty Ltd

11 April 2016

Austin IWRP

GHD's tasks & methodology

1. Purpose

GHD is partnering with CDM Smith in providing consultancy services to the City of Austin for the development of their Integrated Water Resource Plan (IWRP), as per their request for tenders dated 13 July 2015 (CLMP179).

The purpose of this document is to provide the CDM Smith with a revised methodology and scope based on CDM Smith's discussions with the City of Austin, and revised request to GHD.

2. Methodology

The following section outlines GHD's understanding of the City of Austin's brief and the tasks that CDM Smith has indicated that GHD will either undertake or contribute to. It provides an overview of how we will approach these tasks, who will be involved, a broad timeline, and key assumptions.

2.1 Project Management

Task 0-A	Project Management
Description	GHD has assigned Ryan Brotchie as our project manager. Mike Healy will be GHD's Project Director. Mike and Ryan will lead the GHD involvement and manage tasks undertaken in Australia, with Ryan managing the day-to-day requirements of the project. During the intensive task periods allocated to GHD, Ryan and Mike will report to and meet with CDM Smith on a monthly basis via Webex/Video-conference, and with the City of Austin as required. Ryan will also have more informal weekly to fortnightly discussions during periods of GHD activity via telephone with the CDM Smith task manager, Chris Kurtz. Ryan will manage monthly reporting and invoicing throughout the project. Ryan and Mike will attend a start-up meeting with CDM Smith and City of Austin, via Webex/Video-conference, in Texas in May or June 2016 to develop a strong working relationship and build understanding with the wider project team. Ryan and Mike will also attend a project close out meeting, via Webex/Video-conference, at the conclusion of the project.

Inputs	Templates from CDM Smith, including: • Monthly progress reporting • Invoicing resource allocation sheet Use guidelines and access details for e-room.
Outputs	Monthly written reports Monthly invoices
Assumptions	Project will run for 18 months only Monthly invoicing based on project progress GHD will liaise with CDM Smith primarily, and directly with City of Austin as required by CDM Smith.
Key Team members	Ryan Brotchie Mike Healy
Timing	Throughout the project, specifically during GHD allocated major tasks.

2.2 Project Inception

Task 0-B	**Project Inception**
Description	It is expected that Ryan and Mike will attend a start-up meeting with CDM Smith in Texas in May or June 2016 to develop a strong working relationship and build understanding with the wider project team. They will then brief the GHD team on project requirements. Kate Williams and Ryan will liaise with CDM Smith and the City of Austin to collate the required input datasets. Kate Williams, lead spatial analyst, will meet with CDM Smith and City of Austin to collate the required data and fully understand the input and output requirements of GHDs scope of works. Data will be collated and documented in a data register for sharing throughout the life of the project. GHD will develop a mapping style guide and map template which will be agreed upon with CDM Smith and City of Austin at this point.
Inputs	CDM Smith to provide agenda for start up meetings.
Outputs	Inception Meeting Project Plan including: • Agreed scope • Timelines • Communication protocols Data Library Data Register Agreed Map Template and Style Guide

	Agreed Report Template
Assumptions	All data will be provided at no cost to the project team All data will be provided in digital analysis ready format Data will be supplied as per correspondence from Tina Peterson dated 15th of March
Key Team members	Ryan Brotchie Mike Healy Kate Williams
Timing	Month 1

2.3 Task 1 – Conduct Public Outreach and Participation

No GHD input required

2.4 Task 2 - Develop Methodology for Options Evaluation

Task 2	**Develop Methodology for Options Evaluation**
Description	While CDM Smith will lead this task, the methodology should be compatible with GHD's spatial approach for analysing and assessing alternative and decentralised supply options (See Task 6). Therefore GHD will provide input to this task, drawing on our capability and experience on past integrated water management projects developing and applying spatially variable multi-criteria assessments and scoring.
Input	Draft evaluation method and criteria
Outputs	Memorandum - Advice on suitable evaluation criteria with respect to Task 6.3.
Assumptions	GHD will provide advice and review of CDM Smith developed method and criteria. We assume that relates only to the evaluation method for Task 2 and excludes the options identification and analysis method that GHD will employ in Task 6.
Key Team members	Ryan Brotchie Kate Williams Shane Tyrell
Timing	Month 1

2.5 Task 3 - Evaluate and Forecast Disaggregated Water Demands

Task 3	**Evaluate and Forecast Disaggregated Water Demands**
Description	***Develop disaggregated demand model (Task 3.1)*** GHD will work with CDM Smith on the methodology for the disagregrated demand model, providing input to and review of the methodology and model. This input will predominantly relate to the customer classes defined, how end use demands are defined, and the definition of the spatial scale of the disaggregated

demand forecast. This is to ensure the disagregrated demand forecast is suitable for integration in the geospatial analysis undertaken in Task 6.

Demand mapping

GHD understands that CDM Smith will provide GHD with demands disaggregated to the spatial scales required for the decentralised options analysis in Task 6. This will be for the future planning horizons and scenarios (i.e. climate change scenarios). GHD will liaise with CDM Smith on this task, and have made an allowance for this.

Note:

- *Bottom up demand estimation will be useful in the spatial analysis for certain customer segments. For example, large water users, golf courses or high water using public/green open spaces/parks/gardens. It is understood these demands may be aggregated to larger spatial units (e.g. neighbourhoods or water supply pressure zones), and this information pathway should be considered when undertaken Task 3.*
- *Similarly, aggregated water demands at large spatial units may not be suitable as an input to the spatial analysis in Task 6.3, and will require disaggregation to a fit for purpose spatial unit and customer class. For example, the location/presence of future high density developments in existing/developed areas.*

GHD assumes that CDM Smith will generate the demand maps/spatial datasets at a minimum for both potable and non-potable water consumption for the current and future planning horizons. These will show hot spots of water demands that will inform opportunities for alternative and decentralised water supply.

Figure 1 belowshows an example of the land use mapping completed by GHD for the City of Sydney Decentralised Water Master Plan. Figure 2 below shows an example of demand mapping that was prepared for the City of Sydney Decentralised Water Master Plan.

GHD will have the opportunity to review and provide feedback on the draft demand mapping at this point.

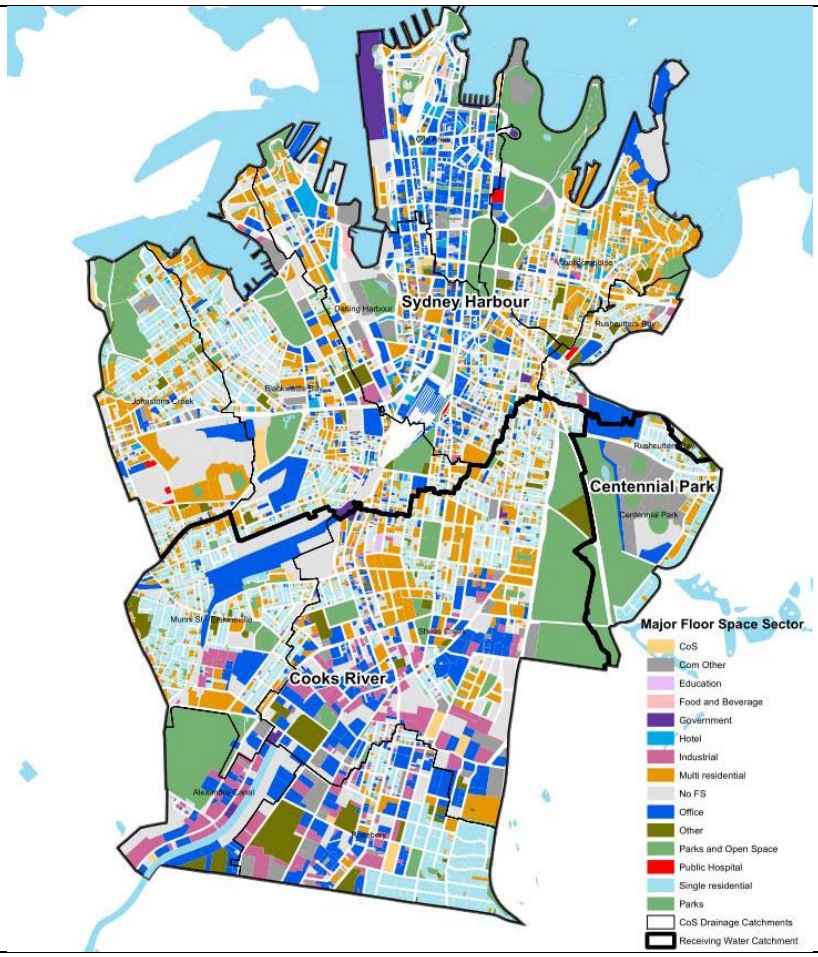
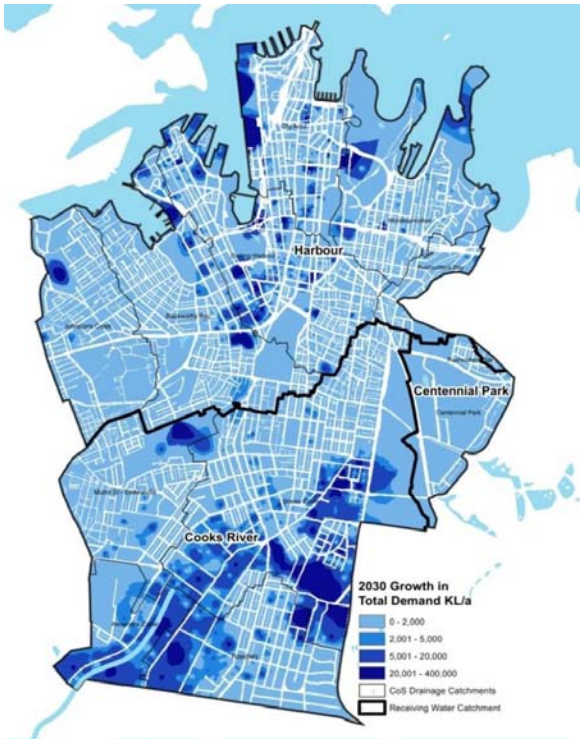

Sydney Harbour
Centennial Park
Cooks River
Major Floor Space Sector
CoS
Com Other
Education
Food and Beverage
Government
Hotel
Industrial
Multi residential
No FS
Office
Other
Parks and Open Space
Public Hospital
Single residential
Parks
CoS Drainage Catchments
Receiving Water Catchment

Figure 1 Example of land use baseline mapping for the City of Sydney



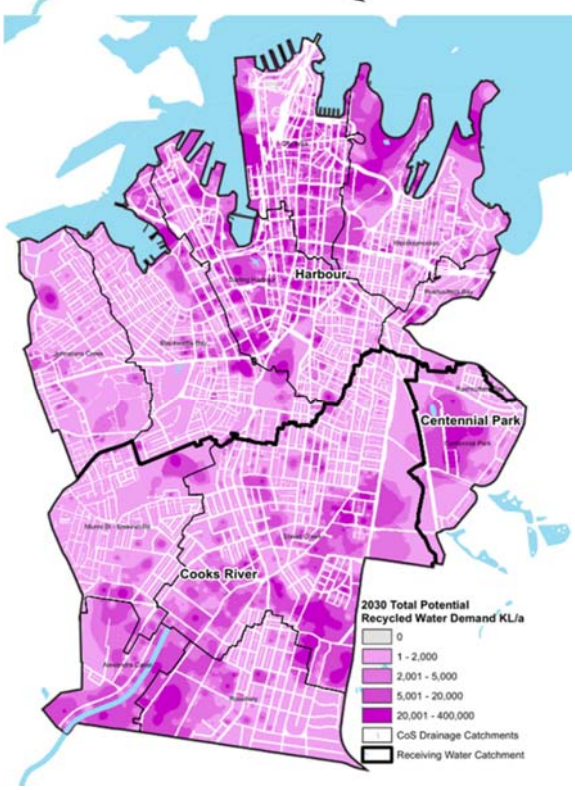


Figure 2 Example of growth in potable (blue) and non-potable (purple) demand consumption

Develop water needs budgeting options and approaches (Task 3.2)

	No GHD input required
Inputs	Draft methodology describing spatial units, customer classes, end uses, etc. Draft demand forecasts, demand map and spatial datasets.
Outputs	Memoranda with feedback on draft products and advise.
Assumptions	Maximum 5 planning horizons. Ryan and Kate will meet with CDM Smith in Austin at the commencement of Task 3.
Key Team members	Ryan Brotchie Kate Williams
Timing	Months 2 and 3

2.6 Task 4 - Conduct Water Conservation Potential Assessment

No GHD input required

2.7 Task 5 – Evaluate Impacts of Climate Change on Water Supply and Demand

No GHD input required

2.8 Task 6 - Evaluate Water Supply and Diversification Options

Task 6	**Evaluate Water Supply and Diversification Options**
Description	We have assumed that others will carry out the assessment of bulk water supplies. Our water supply related tasks will be limited to identification and evaluation of alternative supplies and decentralized water supply options using spatial analysis techniques. ***Identify Water Supply Options for Matrix Evaluation (Task 6.1)*** While CDM Smith will lead this task, GHD will provide input to this task. This will involve advise and review of the types of options that are considered, and the way in which they are formulated/described. ***Evaluation Water Supply Options (Task 6.2)*** No GHD input required. ***Identify and scale decentralized supply opportunities (Task 6.3)*** Overview The objective of this task is to identify, using spatial analysis techniques, infrastructure and non-infrastructure based alternative and decentralised supply opportunities. Key team members will work together to interrogate the results of earlier tasks to identify and scope opportunities. The options, determined from the matrix evaluation (Task 6.1), may include: • Sewer mining, for example tapping into a large sewer main passing the site to extract wastewater generated elsewhere (i.e. wastewater reuse from existing sewers);

- Blackwater reuse, for example capturing wastewater generated within a small development and recycling it back for reuse within that development
- Greywater reuse, for example separating toilet waste from other wastewater and treating it at the household scale for reuse within the dwelling
- Roof water capture and harvesting, for example property scale rain water tanks
- Stormwater harvesting, for example capturing runoff from roofs as well as hard surfaces such as footpaths and storing it in a large precinct scale underground storage (or in an existing storage site such as a lake, unused quarry or water supply tanks, or retarding basin), for reuse.
- Stormwater reliability, for example a case study assessment to provide an indicative level of reliability of stormwater supply for given catchment and demand characteristics

Opportunity Identification

For opportunities that can be assessed across the study area, GHD will develop a set of feasibility/suitability criteria that will allow for the rapid identification of a refined list of opportunities. This will include both spatial and non-spatial criteria and may potentially include technical, social, environmental, commercial, and economic criteria as part of a spatial multi criteria assessment (spatial MCA).

GHD will prepare a technical memorandum describing the basis for options identification and analysis, including description of the criteria.

CDM Smith and the City of Austin will have the opportunity to review and provide feedback on the draft criteria memorandum at this point.

Opportunity Analysis and Assessment

Following the identification of alternative water supply 'opportunities' (or 'projects' or 'schemes'), we will analyse and assess the opportunities, using the available spatial data. Spatial technology and tools that GHD has developed and applied for several water supply option assessment projects will be utilised on this project.

These processes will draw on the assessment criteria identified in Task 2, and confirmed in the reviewed technical memorandum. The information created is expected to include supply yields, costs (e.g. capital, operating, maintenance and lifecycle), greenhouse gas emissions, environmental impacts, etc.).

Opportunity Analysis and Assessment

The opportunities will each be scaled and aggregated, at different spatial scales and for the whole city, to provide an overview of the potential to use alternative/decentralised supply sources to meet non-potable water demands.

CDM Smith and the City of Austin will have the opportunity to review and provide feedback on the draft outcomes at this point.

Examples

Figure 3 below shows an example of criteria that have been used by GHD in the past to rapidly identify and assess locations for sewer mining as a potential supply source for non-potable demands in new development.

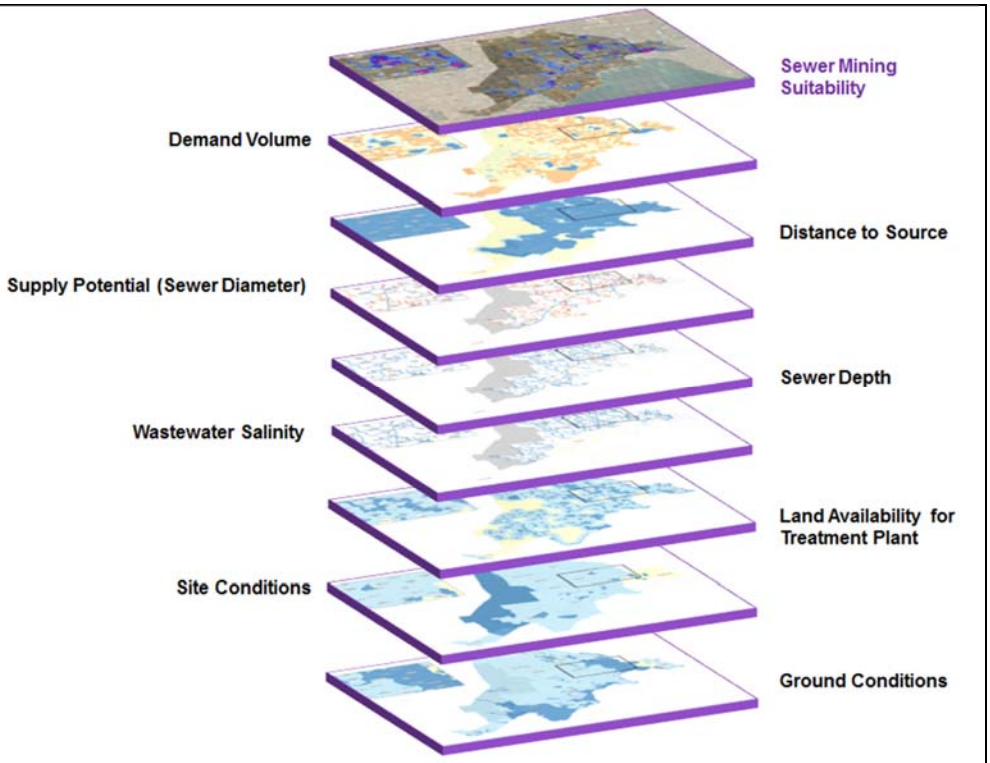


Figure 3 Example Spatial MCA used by GHD to identify sewer mining locations

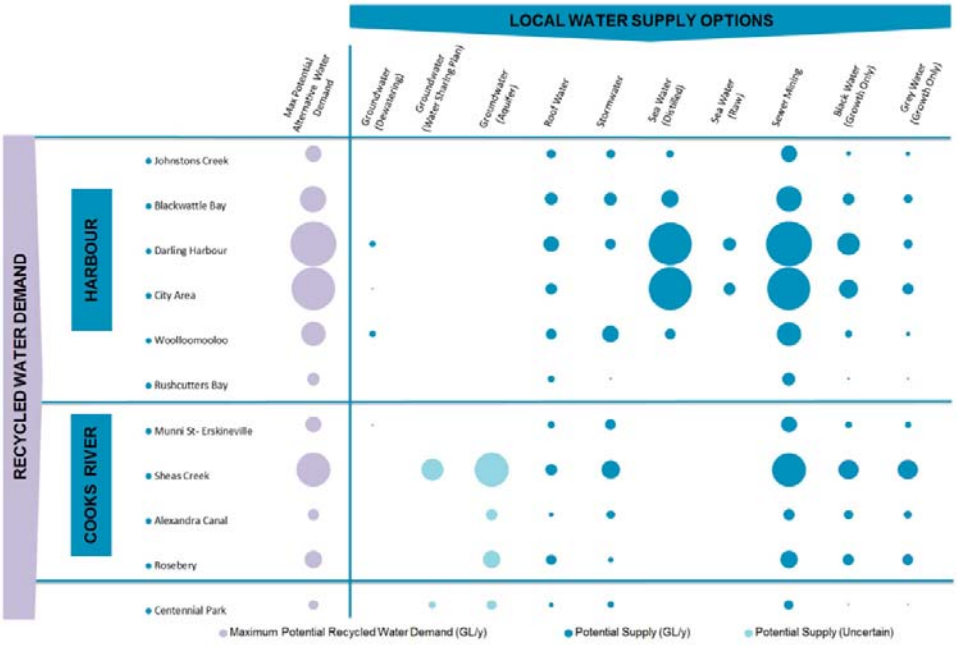


Figure 4 Example of matching recycled water demands with supply opportunities

Direct reuse (purple pipe) decision making framework (Task 6.3 cont.)

We understand from discussions with CDM Smith that City of Austin require a decision making framework to assist with analysis of direct ruse (purple pipe) options.

	This will take the form of a decision support framework, typically including a decision tree accompanied with elements of a multi-criteria assessment. This will assist thinking through the costs, benefits and issues associated with certain reuse options or combinations of options.
Inputs	Outputs of all previous tasks. All data listed in Appendix A. All additional data created in previous tasks. In addition, we expect the Outputs of Task 6.2 provided to GHD will include: • Existing and future projected water supply sources (inc alternative sources) (location, volumes, costs etc). Including alternative sources and recycled water infrastructure (e.g. transfer pipelines and outfalls). • Sewer system inc treatment plants (infrastructure, customers, operational areas location, current and future predicted flows, costs, age, condition etc) and planned system augmentations/ renewals. • Existing or potential existing storage assets that could be used for alternative/decentralised supply storage (e.g. lakes, retarding basins, quarries, ASR sites, unused or underutilised tanks/basins); • Stormwater systems (infrastructure, customers, operational areas, age) and planned system augmentations/ renewals. • Stormwater runoff volumes/flows at sub-catchment or development scale (if available). In addition, we require all datasets relevant to the criteria that the options will need to be evaluated against (e.g. social or environmental impacts or benefits). Template for options description and scoring.
Outputs	Memorandum providing feedback on matrix evaluation (Task 6.1). Memorandum describing options identification and analysis method for CDM Smith to review. List of identified alternative and decentralsed water supply opportunities across the study area, by project unit (e.g. water supply pressure zone or precinct), including: • Technical memorandum defining the basis for options identification, analysis and assessment; • Description of the opportunities; • Table including assessment requirements, including costs, yield, etc. (for input to Task 7). • Appropriate mapping to communicate outcomes (PDF) Direct reuse (purple pipe) decision making framework.
Assumptions	Data will be supplied to GHD as per correspondence from Tina Peterson dated 15th of March, as per Appendix A. CDM Smith and the City of Austin will each be able to provide one round of review for each draft deliverable.

	The potential need for code changes associated with different options considered in the reuse analysis is assumed to be undertaken by CDM Smith. The development of cost estimates and quantitative information for other criteria for a very large number of alternative/decentralised opportunities at various geographic scales will be undertaken by GHD, using cost-curves, unit costs, and other similar automated approaches developed in Australia, taking into consideration local conditions and factors where data is available. This will require an adjustment/scaling/indexing to achieve consistency with costs in the U.S. This will also require input from and collboration with CDM Smith to ensure compatibility with local conditions/rates, and to ensure a consistent basis for costing is used for centralised and decentralised options. Any avoided or deferred systems costs will be calculated separately by CDM Smith. If stormwater runoff volumes/flows at sub-catchment or development scale are not available, GHD will make simplifying assumptions based on the available land use and/or imperviousness data and rainfall data, for analysis of stormwater harvesting potential. City of Austin is to provide all templates, schemes, formats, etc. for GIS/Mapping. Data delivery – GHD will provide final spatial datasets in Geodatabase format only. No MXD documents or models used for analysis will be provided. Ryan and Kate will meet with CDM Smith in Austin at the commencement of Task 6, and either Kate or Ryan will meet with CDM Smith in Austin at the completion of Task 6.
Key Team members	Kate Williams Ryan Brotchie Arash Jafari
Timing	Month 3 - 6

2.9 Task 7 – *Score Demand and Supply Side Options*

Task 7	**Score Demand and Supply Side Options**
Description	GHD to provide advice on using outputs of task 6 to score the options. ***Score options (Task 7.1)*** GHD will have provided the outputs of Task 6 in the necessary format to enable CDM Smith to undertake the scoring of options (e.g. costs, yield, environmental impacts, etc.). CDM Smith will undertake the scoring of options. GHD's input is limited to review.
Inputs	Draft scoring of options to be provided by CDM Smith for review.
Outputs	NA
Assumptions	CDM Smith will undertake the scoring of options. GHD's input is limited to review.

Key Team members	Ryan Brotchie Kate Williams
Timing	Month 7

2.10 Task 8 – Develop and Evaluate Water Supply and Demand Management Portfolios

Task 8	**Develop and Evaluate Water Supply and Demand Management Portfolios**
Description	***Develop process to create, evaluate and select portfolios (Task 8.1)*** While CDM Smith will lead this task, the evaluation methodology should be compatible with GHD's geospatial approach. Therefore GHD will provide input to this task, in the form of advise and review. ***Assist in creation and priotisation of portfolios for further evaluation (Task 8.2)*** GHD will provide input to this task reviewing the integration of alternative/decentralised options into the portfolios.
Inputs	Draft Methodology. Developed portfolios provided by CDM Smith for review.
Outputs	Memorandum with feedback on methodology. Reviewed portfolios.
Assumptions	This task will be under the direction of CDM Smith.
Key Team members	Kate Williams Ryan Brotchie
Timing	CDM Smith to clarify.

2.11 Task 9 – Conduct Financial Analysis and Evaluation

Task 9	**Conduct Financial Analysis and Evaluation**
Description	***Evaluate financial considerations & Evaluate financing options (Tasks 9.1 & 9.2)*** No GHD input required. ***High level summary of alternative utility rate structure business model approaches (Task 9.3).*** GHD to provide a case study summarising a utility rate structure business model from an Australian water utility. The case study utility will be discussed and agreed with CDM Smith.
Inputs	Template for case study.
Outputs	Case study memorandum

Assumptions	CDM Smith will use the case studies to analyse the effects of the alternative business model on water demand. It is unclear to GHD what level of detail is required for this task. We have currently allowed 38 hours of time in total.
Key Team members	Mike Healy Shane Tyrell
Timing	Month 13

2.12 Task 10 – Score Demand and Supply Side Portfolios

No GHD input required

2.13 Task 11 - Develop Plan Recommendations

Task 11	**Develop Plan Recommendations**
Description	We understand that CDM Smith would like GHD's input to Task 11. This will be predominantly in the form of advise and review. **Develop supply and demand management plan recommendations** GHD will provide advise and review of the recommendations developed by CDM Smith. **Develop medium and long term plan recommendations** GHD will provide advise and review of the recommendations developed by CDM Smith. ***Identify case studies for demand & supply side options for the report*** GHD will assist with preparation of case studies for the report, based on previous tasks. Additionally, GHD will draw on the Australian experience, particularly post-drought, to provide input to a list of emerging issues and risks associated with supply and demand management opportunities. This information will be prepared to inform Task 12. Issues may include: • Risk to drivers disappearing, for example what happens when the climate gets wetter again, • Changes in community expectations, • Affordability, • Advances in technology, • Regulatory issues and uncertainty, • Public health risk, and • Unknown costs such as those associated with complexity of commissioning third pipe systems. A risk workshop, with CDM Smith and City of Austin may be required to confirm and agree on the emerging issues.

Inputs	Draft supply and demand management plan recommendations Draft medium and long term plan recommendations Report template/structure
Outputs	Review of supply and demand management plan recommendations. Review of medium and long term plan recommendations. Input to preparation of case studies for report. Input to **a** list of emerging issues with the supply and demand management options.
Assumptions	If a risk workshop is required, this will be organised and facilitated by CDM Smith with inputs from GHD. GHD will attend at a minimum via teleconference.
Key Team members	Mike Healey Ryan Brotchie Shane Tyrell
Timing	Months 13 - 15

2.14 Task 12 - Develop Plan Report

Task 12	**Develop Plan Report**
Description	GHD envision that much of the information, figures, graphs and tables required for the final report will be sourced from the technical memorandums provided. However, we will also allow time for our team to provide support to CDM Smith in integrating our work into the final report and crafting a compelling integrated water resources plan for Austin.
Inputs	Report structure and template (beneficial if this is resolved early so that any work can populate the relevant section) Draft Report
Outputs	Report Mapping. Report Content – chapters describing GHD methodology, outputs. Report Review.
Assumptions	CDM Smith can provide one round of feedback on GHD Content. GHD to review final version of report in total. GHD will provide all inputs in MS Word.
Key Team members	Mike Healy Ryan Brotchie Kate Williams
Timing	Month 15 - 18

3. Clarifications, Assumptions & Items for discussion

In addition to the specific assumptions for each task, please note the following assumptions and items still for discussion or clarification:

- Our assumptions about level of project management and communication activities required by GHD with CDM Smith and City of Austin:
    - Communication protocols between GHD and CoA and other sub-consultants.
    - Client communication and meetings
    - Presentations and attendance at additional meetings in Austin
- Timing of tasks and activities (detailed program)
- Invoicing arrangements (timing)
- Data delivery – GHD will provide final spatial datasets in Geodatabase format only. No MXD documents or models used for analysis will be provided.
- Review approach to any project deliverables & iterations - We have assumed currently that CDM Smith can provide one round of feedback on GHD deliverables and vice-versa.

Appendix A - Data list

It is assumed the following data will be supplied to GHD during the course of the project. This list has been refined based on correspondance from Tina Peterson on 15th March 2016.

Where the data is limited or unavailable, we will work with what we have and/or identify additional actions to identify strategic data or agree on simplifying assumptions.

Land Data

- Parcel (cadastre)
- Land use current and forecast growth areas/ change to land use/ capacity assessments.
- Agricultural regions
- Parks, areas of urban irrigation
- Land use change projections – e.g. growth zones, new major developments, etc.
- Surface coverings (or if unavailable, imperviousness/impervious fractions)
- Irrigation areas
- Ground Levels (understood to be available from LiDar data)
- Waterways (Rivers Creeks)
- Flood mapping data
- Jurisdiction areas
- Roads and classification and names
- Rail

We understand that land use and land use change information will be available through to around 2040, and that CDM Smith will be developing forecasts for 2070 and 2115.

We understand information on irrigation areas is available to some extent, but that not all irrigation is conducted through a meter specifically assigned for irrigation. In lieu of that, irrigation areas can be inferred from land use.

Water Systems

- Existing water supply sources (inc alternative sources) (location, volumes, costs etc)
- Water supply system (infrastructure, customers, operational areas, age, condition) and planned system augmentations/ renewals – available for the most part.
- Sewer system inc treatment plants (infrastructure, customers, operational areas location, volumes, costs, age, condition etc) and planned system augmentations/ renewals – available for most part
- Stormwater systems (infrastructure, customers, operational areas, age) and planned system augmentations/ renewals.
- Current re-use facilities.
- Reuse master plan, shows planned portions of the system.

We understand that water supply, sewer system and stormwater system information is for the most part available, but there there may be less data on augmentation/renewals and particularly stormwater system augmentation renewals.

Property Data

- Floor Space
- Capacity assessments (understand to be available for 12 inch lines and greater)
- Air conditioning / cooling systems
- Roof areas
- Rainwater tank
- Onsite reuse
- Building codes/ sustainability requirements that influences water consumption
- Un-serviced properties (water, sewer)
- Age

We understand that information such as floor heights, floor use, air-conditioning or cooling systems, is not available.

We understand that information about rainwater tanks and onsite reuse may be limited.

Stock Data (end uses)

- Toilets
- Faucet/ flow restrictors
- Showers
- Baths
- Dishwashers
- Washing machines
- Air conditioning/ water condensers
- Rainwater tanks

We understand that this data may not be available in detail, but that City of Austin are building an end use model.

People Data

- Population
- Population projections
- Employment
- Employment projections
- Demographic (if deemed important)

We understand that the City has this data for 2020 and 2040, and that CDM Smith will develop projections for 2070 and 2115 and provide to GHD.

Water Data

- Billing & consumption by property/ customer/ category e.g residential, commercial, industrial
- Planned water conservation activities
- Historic water conservation programs

- River extraction limits and historic and forecast flows
- Any end uses studies that may have been undertaken.

We understand this data is for the most part available on spatially referenced parcel level, and that City of Austin has cleaned the data for use in this project.

Cost data

- Energy costs and usage
- Water treatment costs and volumes
- Water extraction costs and scheduled charges, current and future
- Wastewater discharge costs and volumes
- Cost schedules for typical infrastructure
- Consumer costs
- Production costs

Climate Data

- Rainfall, temperature, evaporation (or evapotranspiration)
- Climate change impacted datasets (Rainfall, temperature, evaporation (or evapotranspiration) – *Understood to be provided by climate change consultant.*

Miscellaneous

- Green infrastructure objectives.
- Cities liveability objectives.
- Existing drought management strategies.
- Environmental flow objectives and requirements.
- Water Sensitive Urban Design policies.

City of Austin
Integrated Water Resource Plan
Task List and Fee Estimate
GHD Ref: 21\0917071
25.04.2016

Tasks	Approved Standard Titles	Hours Estimate				Fee Estimate (USD)		
		Managing Engineer VI	Supervisory GIS III	Professional Engineer I	Task Time (hrs.)	Time	Disbursements	TOTAL
	Hourly Rates (CAT1)	$257.53	$145.73	$94.96				
0	Project Management	51	46	122	219	$31,423	$0	**$31,423**
1	Public Outreach	0	0	0	0	$0	$0	**$0**
2	Methodology for Options Evaluation	4	12	16	32	$4,298	$0	**$4,298**
3	Evaluate and Forecast Disaggregated Water Demands	2	24	40	66	$7,811	$9,200	**$17,011**
4	Conduct Water Conservation Potential Assessment	0	0	0	0	$0	$0	**$0**
5	Evaluate Impacts of Climate Change on Water Supply and Demand	0	0	0	0	$0	$0	**$0**
6.1	Identify Water Supply Options for Matrix Evaluation	2	0	24	26	$2,794	$9,200	**$11,994**
6.2	Evaluate Water Supply Options	0	0	0	0	$0	$0	**$0**
6.3i	Decentralised Options Identification, Analysis, Assessment	18	186	382	586	$68,016	$0	**$68,016**
6.3ii	Direct Reuse Decision Making Framework	24	0	64	88	$12,258	$0	**$12,258**
7	Score Demand and Supply Side Options	0	8	8	16	$1,926	$0	**$1,926**
8	Develop and Evaluate Water Supply and Demand Management Portfolios	0	16	24	40	$4,611	$0	**$4,611**
9	Conduct Financial Analysis and Evaluation	16	0	26	42	$6,589	$0	**$6,589**
10	Score Demand and Supply Side Portfolios	0	0	0	0	$0	$0	**$0**
11	Develop Plan Recommendations	24	0	24	48	$8,460	$0	**$8,460**
12	Report	16	16	22	54	$8,541	$0	**$8,541**
	Total Team Member Hours	**157**	**308**	**752**	**1217**			
	Total $ (Excl. GST & Tax)					**$156,727**	**$18,400**	**$175,127**

Consulting Services for Integrated Water Resource Plan
April 28, 2016

K2 Partners

REPROGRAPHICS | DIGITAL COPYING
SCANNING | PLOTTING | CADD | GIS

K2 PARTNERS, LLC
114 Silla Sendero
Wimberley, Texas 78676
TEL: 512-415-4408
www.k2partners.com

WBE | HUB CERTIFIED

April 8, 2016

Tina Petersen, P.E.
CDM Smith, Inc.
12537A Riata Trace Parkway
Suite 210
Austin, Texas 78727

Re: City of Austin – Integrated Water Resources Plan Update

Dear Ms Petersen,

K2 Partners, LLC (K2) is pleased to submit this proposal in response to your request for our services for the above referenced project for printing, and document coordination. We appreciate the opportunity to work with CDM Smith and intend to provide quality services to meet the needs of this project.

Scope and Fee Schedule:

Printing and coordination for Draft and Final Report (approximately 20 sets)

Supervisory CADD VI - 16 hours @ $100.81/hr =	$1,612.96
Printing/Documentation/ftp	$6,200.00
Total	$7,812.96

Work will be billed on a time and materials basis. Deviation from original project scope and schedule as transmitted to K2 by CDM Smith may also result in additional fees.

Please do not hesitate to call if you any questions.

Sincerely,

Cheryl D. Sandefur
Managing Member

Consulting Services for Integrated Water Resource Plan
April 28, 2016

LBG Guyton

LBG-GUYTON ASSOCIATES

PROFESSIONAL GROUNDWATER AND ENVIRONMENTAL ENGINEERING

1101 CAPITAL OF TEXAS HIGHWAY
SUITE B-220
AUSTIN, TX 78746
512-327-9640
FAX: 512-327-5573
www.lbgweb.com

April 6, 2016

Tina (Christina) Petersen, Ph.D., P.E.
Associate Water Resources Engineer
CDM Smith
11490 Westheimer, Suite 700
Houston, TX 77077

RE: Scope and Budget Supporting CDM Smith Inc. on Evaluating Water Supply Options for the City of Austin.

Tina,

CDM Smith Inc. is requesting the assistance of LBG-Guyton Associates on the evaluation and development of feasible water supply options for the City of Austin. The scope of work includes the technical analyses needed for the development of potentially feasible groundwater strategies. In addition, LBG-Guyton will support CDM Smith Inc. on surface water, reuse and decentralized supply options and participate in the development of a demand management portfolio. Our scope is detailed below.

Scope of Work

Task 6. Support CDM Smith Inc. on evaluating potentially feasible water supply options to include, but are not limited to groundwater supply, surface water supply, reuse supply and decentralized supply. LBG-Guyton will take the lead in developing feasible groundwater strategies. Technical analyses will include cost assessments, evaluating environmental impacts, and determination of water quality. In addition, LBG-Guyton will support the development and review of a memorandum on water supply options and evaluation results.

Task 7. Provide CDM Smith Inc. input on the scoring of groundwater supply strategies. Analysis includes a comparison evaluation between available water supply options and identified performance measures such as supply yield, climate resiliency, water quality, and environmental impacts. In addition, LBG-Guyton will support the review of a memorandum summarizing a reconciled list of demand and strategy supply options.

Task 8. Assist CDM Smith Inc. with the development of groundwater supply and demand management portfolios. Provide CDM Smith Inc. input on potential competing groundwater options, and develop efficient portfolios reliant on the combination of premium groundwater supply options. In addition, LBG-Guyton will support the review of a memorandum summarizing prioritized option portfolios.

Cost Estimate for Project

Our cost estimate to complete this work is $15.488.74. We can start work as soon as we are authorized and a contract is executed.

We look forward to completing the recommended scope of work and assisting CDM and the City of Austin with the water supply option evaluation. Please feel free to call me at (512)-327- 9640 if you have any questions about the scope or budget for this project.

Sincerely,

LBG-GUYTON ASSOCIATES

James Beach, P.G.
Principal

LBG-Guyton Associates / City of Austin 2016
CDM - Water Management Strategies

	Environmental Services Compliance Manager	Professional Engineer IV	Supervisory Scientist III	Professional Scientist II	Professional Scientist I	Total Hours by Task	**Totals by Task**
Task 6 - Evaluate Water Supply Options	10	16	24	0	18	68	$9,199.66
Task 7 - Characterize Demand and Supply Side Options	8	0	4	0	8	20	$3,084.12
Task 8 - Formulate Water Supply and Demand Management Portfolios	8	0	6	0	6	20	$3,204.96
Total Hours	26	16	34	0	32	108	
Billing Rate	$252.84	$147.01	$128.73	$83.60	$68.31		
Total Fees	$6,573.84	$2,352.16	$4,376.82	$0.00	$2,185.92		**$15,488.74**

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Rifeline

CDM Smith
Integrated Water Resource Plan

SCOPE OF WORK

Contract:

Estimated Time Frame: 18 months, June 2016 – December 2017

Estimated Budget:

	Rifeline Principal	Rifeline Public Involvement Manager (Community Engagement Consultant)	Rifeline Business Manager (Administrative Supervisor II)	Total Labor Hours	Total Direct Labor Costs
Rates	$189.32	$155.85	$53.54	--	--
Task A	11	11	25	38	$3,523.00
Task B	102	261	91	454	$64,567.00
Total Hours	113	272	116	492	**$69,995.00**

SERVICES TO BE PROVIDED BY THE CONSULTANT

INTRODUCTION
The City of Austin would like to refine a framework for the public outreach and participation process for the IWRP. This framework will address the incorporation of public input into the plan development process and the identification of local and regional stakeholders. The City intends to provide multiple opportunities for meaningful public input on water demand-side and supply-side strategies and plan development, seeking stakeholder input that reflects the diversity of Austin's population.

DESCRIPTION OF TASKS
Rifeline will assign a staff member to serve as project manager for this effort and serve as the primary point of contact for CDM Smith.

Task A: PROJECT MANAGEMENT AND ADMINISTRATION
Rifeline will prepare monthly invoices and handle administrative matters as needed.

Task B: PUBLIC INVOLVEMENT STRATEGY AND FACILITATION
Rifeline will call in to 18 monthly planning teleconferences with the project team. Tasks could include:

- Draft agenda
- Facilitate meeting, or assist in facilitation
- Send out action items

Rifeline will develop a public involvement plan. Tasks could include:

- Draft plan
- Identify stakeholders
- Assist Austin Water with some stakeholder outreach
- Draft up to four (4) online or phone surveys, or a combination of the two

- Produce a survey summary report

Rifeline will also set up and facilitate three (3) public workshops. Tasks could include:

- Provide logistics for three (3) public workshops
- Facilitate workshops
- Assist with material development
- Provide documentation and feedback from workshops

Rifeline will assist in up to ten (10) planned Austin Water Utility outreach activities or existing community events on an as-needed basis. Tasks could include:

- Provide guidance on public outreach opportunities
- Attend public events
- Review and provide feedback on surveys or other materials
- Draft a summary report on stakeholder feedback from events

Consulting Services for Integrated Water Resource Plan
April 28, 2016

Susan Roth Consulting

SUSAN K. ROTH, P.E., PMP

WATER AND WASTEWATER CONSULTING

April 10, 2015

Tina Petersen, Ph.D., P.E.
Associate Water Resources Engineer
CDM Smith Inc.
11490 Westheimer, Suite 700
Houston, TX 77077

Re: City of Austin – Integrated Water Resources Plan Project

Dear Tina:

I am pleased to submit this proposal to assist CDM Smith Inc. with various services for the above referenced project. My proposed involvement would include the following, as outlined in the Supplemental Scope of Work:

TASK 1 – CONDUCT PUBLIC OUTREACH AND PARTICIPATION

The City of Austin would like to refine a framework for the public outreach and participation process for the IWRP. This framework will address the incorporation of public input into the plan development process and the identification of local and regional stakeholders. The City intends to provide multiple opportunities for meaningful public input on water demand-side and supply-side strategies and plan development, seeking stakeholder input that reflects the diversity of Austin's population. Susan Roth Consulting will assist as a public involvement sub-consultant, working closely with Rifeline and specializing in technical advice.

Susan Roth Consulting will call in to up to 12 monthly planning meetings with the project team depending on her available budget. Tasks could include reviewing agendas and attending meetings. Susan Roth Consulting will also assist in the development of a public involvement plan. Tasks could include:

- Review and provide feedback on plan
- Identify stakeholders
- Review and provide feedback on up to four (4) online or phone surveys, or a combination of the two
- Review and provide feedback on survey summary report

Susan Roth Consulting will also set up and help facilitate the technical aspects of three (3) public workshops. Tasks could include the following depending on her available budget:

- Attend three (3) public workshops
- Facilitate technical portion of workshops
- Assist with material development
- Review documentation and feedback from workshops for technical aspects

Susan Roth Consulting will assist in up to 12 planned Austin Water Utility (AWU) outreach activities on an as-needed basis; tasks could include the following depending on her available budget:

- Provide guidance on public outreach opportunities
- Attend public events
- Review and provide feedback on surveys or other materials
- Assist with drafting a summary report on stakeholder feedback from events

TASK 2 – DEVELOP METHODOLOGY FOR OPTIONS AND PORTFOLIO EVALUTION

This task is focused on developing a methodology to conduct an "apples-to-apples" comparison of demand-side and supply-side options, as well as scoring portfolios. This methodology will detail how options will be characterized, screened, and compared as well as how portfolios will be constructed (using themes) and anticipated techniques for portfolio scoring and ranking. Susan Roth Consulting will assist CDM Smith Inc. with reviewing the methodology developed by the team and providing necessary feedback and input.

TASK 4 – CONDUCT WATER CONSERVATION POTENTIAL ASSESSMENT

Water conservation programs (i.e., demand management) have been and will continue to be a critical element in Austin's management of water resources. Accordingly, AWU and the 2015 Task Force have established demand management strategies as major focal points for their IWRP. The purpose of Task 4 is to describe existing conservation measures implemented by AWU, identify potential new measures for future implementation, screen the existing and proposed measures to a list of those considered for the future, and characterize and quantify those measures. The deliverable for this task ('Conservation Potential Assessment Technical Memorandum') will be managed and overseen by Susan Roth Consulting.

Task 4.1: Demand Management Screening

Each potential measure initially identified will be screened according to the factors defined in Task 2. The review of these measures will be cursory, based on the expertise and knowledge of the CDM Smith team and AWU staff. Susan Roth Consulting will review and provide feedback on the screening process.

Task 4.2: Evaluate Demand Management Options

Working from the final list developed in Task 4.1 and the criteria and methodology developed in Task 2, CDM Smith will evaluate and characterize the demand management measures under consideration. The evaluation will include the characterization needed to properly rank and score each measure within the matrix and details needed to quantify the demand reduction opportunity (Task 4.4) and develop the cost and yield data (Task 4.5). CDM Smith will build upon the conservation program assessments conducted by AWU staff, utilizing, to the extent practical, existing calculations, assessments, and data. Susan Roth Consulting will review and provide feedback on the demand management options.

Task 4.3: Developing Water Use Cost Benchmarks

CDM Smith will work with AWU to establish a set of performance benchmarks that define the success factors for each demand management measure under evaluation. The benchmarks will be specific and meaningful to the measure. As an example, rebates may be evaluated according to the number issued per year. The performance benchmarks developed in this task will be useful in monitoring the success of implemented conservation measures in the future. Susan Roth Consulting will review and provide feedback on the water use cost benchmarks.

Task 4.4: Identify Demand Reduction Opportunities
The demand management strategies identified in Task 4.2 and the demand model developed in Task 3, CDM Smith will identify the potential demand reduction opportunities for the evaluated measures. The demand savings will be calculated in close coordination so that potential impacts, such as reduced wastewater, are quantified. Susan Roth Consulting will review and provide feedback on the potential demand reduction opportunities.

Task 4.5: Develop Cost and Yield Data
CDM Smith will conduct an economic benefit-cost assessment that will include calculation of the net present value, benefit-cost ratio, levelized unit cost (e.g., dollars per thousand gallons saved), pay-back period, and return on investment for each measure. These economic indicators will be used to further rank the measures on the basis of economic benefit. The unit cost of measures will be compared with unit costs of current water and other supply alternatives in Task 7 and later tasks for a true "apples-to-apples" comparison. Susan Roth Consulting will review and provide feedback on the economic benefit-cost assessment.

Task 4.6: Coordination and Cooperative Conservation Improvements
Susan Roth Consulting will evaluate and recommend opportunities for coordination of demand management measures between LCRA (wholesale raw water provider) and AWU, City of Pflugerville, Barton Springs Edwards Aquifer Conservation District and potentially other adjacent communities. The results of this task will be summarized in a technical memorandum.

Task 4.7: Summarize Conservation Progress
Susan Roth Consulting will summarize AWU's successes to date, starting with the program's genesis in 1985 and summarizing achievements as documented in the 2006 and 2009 Citizen Water Conservation Implementation Task Force, the 2012 Report prepared as part of AWU's pro-rata curtailment plan, and supplement with input from AWU staff in a technical memorandum. The outcome of this task will be a document that summarizes not only the history of AWU's conservation efforts but also the estimated water savings from each of the implemented programs. This task will summarize the conservation measures implemented, both past and current, and serve as a foundation for Task 4.1 through Task 4.5.

TASK 8 – FORMULATE WATER SUPPLY AND DEMAND MANAGEMENT PORTFOLIOS

Task 8.2: Portfolio Evaluation
CDM Smith will use a spreadsheet-based evaluation to add up the supplies for each portfolio, identify and eliminate any "competing" options, and ultimately compare to the projected demand. Then reliability of the portfolios can be assessed using the WAM model. Susan Roth Consulting will assist CDM Smith with providing input on potential competing options, best ways to structure portfolios as a combination of water conservation options, and reviewing a technical memorandum developed by CDM Smith.

TASK 9 – CONDUCT FINANCIAL ANALYSIS AND EVALUATION

Task 9.1: Evaluate Financial Considerations
To create a comprehensive estimate of the supply and demand-side portfolios selected in Task 8, CDM Smith will develop a cost spreadsheet that will be used to evaluate financial considerations for each of the portfolios. The Unified Cost Model (UCM), an MS Excel based spreadsheet which was developed by the Texas Water Development Board for regional water planning, will form the basis of the costing spreadsheet. Once the cost analysis is complete on

these projects, the resulting cost estimate will be organized into a summary spreadsheet. Susan Roth Consulting will review and provide necessary feedback and comments on the summary spreadsheet.

Task 9.2: Financial Options
CDM Smith and Susan Roth Consulting will summarize, at a high level, potential financing options including alternate project delivery methods. This summary will identify potential opportunities for regional partnerships and cooperation, cost sharing, and revenue-positive or revenue-neutral opportunities for consideration in infrastructure and facilities planning when feasible. Financing options to be explored will include expansion of the use of impact fees to support projects aimed at improving water use efficiency.

CDM Smith and Susan Roth Consulting will also evaluate funding mechanisms and requirements for decentralized, graywater, and rainwater harvesting options, exploring the use of private capital options to finance decentralized infrastructure throughout the city, including a potential Service Extension Request (SER) process approach. This information will be summarized in a technical memorandum.

Task 9.3: Alternative Utility Rate Structure and Business Model Approaches
CDM Smith will develop case studies for up to three water-conscious cities with recent alternative rate structure innovations that are intended to modify behavior and reduce total demand and/or peak demand. This qualitative analysis will examine scarcity pricing techniques from one Australia city and two U.S. cities that will be determined in coordination with AWU. Susan Roth Consulting will attend one coordination meeting with AWU and the CDM Smith team, as well as review and provide necessary feedback and comments on the case studies/technical memorandum; the final deliverable for Task 9 will be managed and overseen by Susan Roth Consulting.

TASK 10 – FORMULATE WATER SUPPLY AND DEMAND MANAGEMENT PORTFOLIOS

CDM Smith will score and rank portfolios using a process called multi-criteria decision analysis (MCDA). This process will use the criteria and criteria weighting developed from Task 2, along with performance measures, to compare the portfolios. A simple spreadsheet tool will be used to add up the supplies from each portfolio to meet specified water demands.

CDM Smith will use Criterium Decision Plus software to rank the portfolios. This software converts the uniquely measured units for the criteria into standardized units for easy comparison and ranking of alternatives. The ranking of portfolios will easily show trade-offs between them and allow for stakeholders to understand the advantages and disadvantages of the portfolios. Susan Roth Consulting will provide input on qualitative performance measures for the developed portfolios and review the memorandum that would summarize outcomes of portfolio scoring.

TASK 11 – DEVELOP PLAN RECOMMENDATIONS

At the conclusion of the scoring processes for supply/demand options and portfolios, CDM Smith will arrive at a set of recommendations that reflect the community's values in terms of affordability, supply diversity, sustainability, environmental protection, and drought resilience. These will be organized as short-, medium-, and long-term recommendations, consistent with previous AWU concepts. CDM Smith will also identify short term strategies that have potential as drought response options.

CDM Smith will prepare a set of case studies using elements from the three case studies (cities identified in Task 9) for AWU to use in their communications with the City Council, other departments, Boards, Commissions, 2015 Task Force, and stakeholders. Each case study will showcase supply and demand management options and identifying emerging supply and demand management issues. Susan Roth Consulting will assist in the development of the updated short-term tiered drought management plan that would be included as part of this task. Susan Roth Consulting will also provide input on the recommendations coming out of the project.

My estimated fee for the activities listed above, including travel time, expenses and mileage is a lump sum amount of $80,361.96; please note detailed budget provided in table below.

Task No.	*Description of Task*	*No. of Hours*	*Budget Amount*
1.0	Conduct Public Outreach and Participation	88	$12,788.16
2.0	Develop Methodology for Options and Portfolio Evaluation	18	$2,615.76
4.1	Demand Management Screening	24	$3,487.68
4.2	Demand Management Options	24	$3,487.68
4.3	Developing Water Use Benchmarks	32	$4,650.24
4.4	Identify Demand Reduction Opportunities	32	$4,650.24
4.5	Develop Cost and Yield Data	24	$3,487.68
4.6	Coordination and Cooperative Conservation Improvements	60	$8,719.20
4.7	Summarize Conservation Progress	80	$11,625.60
8.2	Portfolio Evaluation	16	$2,325.12
9.1	Evaluate Financial Considerations	16	$2,325.12
9.2	Financial Options	80	$11,625.60
9.3	Alternative Utility Rate Structure & Business Model Approaches	16	$2,325.12
10.0	Score Demand and Supply Side Portfolios	16	$2,325.12
11.0	Develop Plan Recommendations	27	$3,923.64
	TOTAL	**553**	**$80,361.96**

If CDM Smith Inc. needs additional services from me, then my time, including meeting preparation and travel time, will be charged at the approved hourly rate of $145.32. I will submit invoices to CDM Smith Inc. on a monthly basis; payment is due within 30 days.

I look forward to working with you and the City of Austin. Please let me know if this proposal is acceptable; feel free to call me at (512) 796-6692 with any questions.

Sincerely,

Susan K. Roth

Susan K. Roth, P.E., PMP
President
Susan Roth Consulting, LLC