PROFESSIONAL CONSULTANT SERVICES AGREEMENT

KENNEDY/JENKS CONSULTANTS, INC.

Water System Hydraulic Model Development Project

THIS PROFESSIONAL CONSULTANT SERVICES AGREEMENT ("Agreement") is made and entered into this _____ day of _____, 20____ ("Effective Date"), by and between the CITY OF RIVERSIDE ("City"), a California charter city and municipal corporation and KENNEDY/JENKS CONSULTANTS, INC., a California corporation ("Consultant").

1. **Scope of Services**. City agrees to retain and does hereby retain Consultant and Consultant agrees to provide the services more particularly described in Exhibit "A," "Scope of Services" ("Services"), attached hereto and incorporated herein by reference, in conjunction with Water System Hydraulic Model Development Project ("Project").

2. **Term**. This Agreement shall be effective on the date first written above and shall remain in effect for one year and six months, unless otherwise terminated pursuant to the provisions herein.

3. **Compensation/Payment**. Consultant shall perform the Services under this Agreement for the total sum not to exceed Two Hundred Thirty-Six Thousand Eight Hundred Thirty Dollars ($236,830), payable in accordance with the terms set forth in Exhibit "B." Said payment shall be made in accordance with City's usual accounting procedures upon receipt and approval of an itemized invoice setting forth the services performed. The invoices shall be delivered to City at the address set forth in Section 4 hereof.

4. **Notices**. Any notices required to be given, hereunder shall be in writing and shall be personally served or given by mail. Any notice given by mail shall be deemed given when deposited in the United States Mail, certified and postage prepaid, addressed to the party to be served as follows:

To City	To Consultant
Public Utilities Department City of Riverside Attn: Gaurav Agarwal Senior Water Engineer 3750 University Avenue, 3rd Floor Riverside, CA 92501	Kennedy/Jenks Consultants, Inc. Attn: Bijan Sadeghi, P.E., Project Manager Harold Glaser, P.E., Principal-in-Charge 3210 El Camino Road, Suite 150 Irvine, CA 92602

5. **Prevailing Wage**. If applicable, Consultant and all subcontractors are required to pay the general prevailing wage rates of per diem wages and overtime and holiday wages determined by the Director of the Department of Industrial Relations under Section 1720 et seq. of the California Labor Code and implemented by Resolution No. 13346 of the City Council of the City of Riverside.

The Director's determination is available on-line at www.dir.ca.gov/dlsr/DPreWageDetermination.htm and is referred to and made a part hereof; the wage rates therein ascertained, determined, and specified are referred to and made a part hereof as though fully set forth herein.

6. **Contract Administration.** A designee of the City will be appointed in writing by the City Manager or Department Director to administer this Agreement on behalf of City and shall be referred to herein as Contract Administrator.

7. **Standard of Performance.** While performing the Services, Consultant shall exercise the reasonable professional care and skill customarily exercised by reputable members of Consultant's profession practicing in the Metropolitan Southern California Area, and shall use reasonable diligence and best judgment while exercising its professional skill and expertise.

8. **Personnel.** Consultant shall furnish all personnel necessary to perform the Services and shall be responsible for their performance and compensation. Consultant recognizes that the qualifications and experience of the personnel to be used are vital to professional and timely completion of the Services. The key personnel listed in Exhibit "C" attached hereto and incorporated herein by this reference and assigned to perform portions of the Services shall remain assigned through completion of the Services, unless otherwise mutually agreed by the parties in writing, or caused by hardship or resignation in which case substitutes shall be subject to City approval.

9. **Assignment and Subcontracting.** Neither party shall assign any right, interest, or obligation in or under this Agreement to any other entity without prior written consent of the other party. In any event, no assignment shall be made unless the assignee expressly assumes the obligations of assignor under this Agreement, in a writing satisfactory to the parties. Consultant acknowledges that any assignment may, at the City's sole discretion, require City Manager and/or City Council approval. Consultant shall not subcontract any portion of the work required by this Agreement without prior written approval by the responsible City Contract Administrator. Subcontracts, if any, shall contain a provision making them subject to all provisions stipulated in this Agreement, including without limitation, the insurance obligations set forth in Section 12. The Consultant acknowledges and agrees that the City is an intended beneficiary of any work performed by any subcontractor for purposes of establishing a duty of care between any subcontractor and the City.

10. **Independent Contractor.** In the performance of this Agreement, Consultant, and Consultant's employees, subcontractors and agents, shall act in an independent capacity as independent contractors, and not as officers or employees of the City of Riverside. Consultant acknowledges and agrees that the City has no obligation to pay or withhold state or federal taxes or to provide workers' compensation or unemployment insurance to Consultant, or to Consultant's employees, subcontractors and agents. Consultant, as an independent contractor, shall be responsible for any and all taxes that apply to Consultant as an employer.

11. **Indemnification.**

11.1 **Design Professional Defined.** For purposes of this Agreement, "Design

Professional" includes the following:

A. An individual licensed as an architect pursuant to Chapter 3 (commencing with Section 5500) of Division 3 of the Business and Professions Code, and a business entity offering architectural services in accordance with that chapter.

B. An individual licensed as a landscape architect pursuant to Chapter 3.5 (commencing with Section 5615) of Division 3 of the Business and Professions Code, and a business entity offering landscape architectural services in accordance with that chapter.

C. An individual registered as a professional engineer pursuant to Chapter 7 (commencing with Section 6700) of Division 3 of the Business and Professions Code, and a business entity offering professional engineering services in accordance with that chapter.

D. An individual licensed as a professional land surveyor pursuant to Chapter 15 (commencing with Section 8700) of Division 3 of the Business and Professions Code, and a business entity offering professional land surveying services in accordance with that chapter.

11.2 **Defense Obligation For Design Professional Liability**. Consultant agrees, at its cost and expense, to promptly defend the City, and the City's employees, officers, managers, agents and council members (collectively the "Parties to be Defended") from and against any and all claims, allegations, lawsuits, arbitration proceedings, administrative proceedings, regulatory proceedings, or other legal proceedings to the extent the same arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of Consultant, or anyone employed by or working under the Consultant or for services rendered to the Consultant in the performance of the Agreement, notwithstanding that the City may have benefited from its work or services and whether or not caused in part by the negligence of an Indemnified Party. Consultant agrees to provide this defense immediately upon written notice from the City, and with well qualified, adequately insured and experienced legal counsel acceptable to City. This obligation to defend as set forth herein is binding on the successors, assigns and heirs of Consultant and shall survive the termination of Consultant's Services under this Agreement.

11.3 **Indemnity For Design Professional Liability**. When the law establishes a professional standard of care for Consultant's services, to the fullest extent permitted by law, Consultant shall indemnify, protect and hold harmless the City and the City's employees, officers, managers, agents, and Council Members ("Indemnified Parties") from and against any and all claim for damage, charge, lawsuit, action, judicial, administrative, regulatory or arbitration proceeding, damage, cost, expense (including counsel and expert fees), judgment, civil fines and penalties, liabilities or losses of any kind or nature whatsoever to the extent the same arise out of, pertain to, or relate to the negligence, recklessness or willful misconduct of Consultant, or anyone employed by or working under the Consultant or for services rendered to the Consultant in the performance of the Agreement, notwithstanding that the City may have benefited from its work or services and whether or not caused in part by the negligence of an Indemnified Party.

11.4 **Defense Obligation For Other Than Design Professional Liability.** Consultant agrees, at its cost and expense, to promptly defend the City, and the City's employees, officers, managers, agents and council members (collectively the "Parties to be Defended") from and against any and all claims, allegations, lawsuits, arbitration proceedings, administrative proceedings, regulatory proceedings, or other legal proceedings which arise out of, or relate to, or are in any way connected with: 1) the Services, work, activities, operations, or duties of the Consultant, or of anyone employed by or working under the Consultant, or 2) any breach of the Agreement by the Consultant. This duty to defend shall apply whether or not such claims, allegations, lawsuits or proceedings have merit or are meritless, or which involve claims or allegations that any or all of the Parties to be Defended were actively, passively, or concurrently negligent, or which otherwise assert that the Parties to be Defended are responsible, in whole or in part, for any loss, damage or injury. Consultant agrees to provide this defense immediately upon written notice from the City, and with well qualified, adequately insured and experienced legal counsel acceptable to City. This obligation to defend as set forth herein is binding on the successors, assigns and heirs of Consultant and shall survive the termination of Consultant's Services under this Agreement.

11.5 **Indemnity For Other Than Design Professional Liability.** Except as to the sole negligence or willful misconduct of the City, Consultant agrees to indemnify, protect and hold harmless the Indemnified Parties from and against any claim for damage, charge, lawsuit, action, judicial, administrative, regulatory or arbitration proceeding, damage, cost, expense (including counsel and expert fees), judgment, civil fine and penalties, liabilities or losses of any kind or nature whatsoever whether actual, threatened or alleged, which arise out of, pertain to, or relate to, or are a consequence of, or are attributable to, or are in any manner connected with the performance of the Services, work, activities, operations or duties of the Consultant, or anyone employed by or working under the Consultant or for services rendered to Consultant in the performance of this Agreement, notwithstanding that the City may have benefited from its work or services. This indemnification provision shall apply to any acts, omissions, negligence, recklessness, or willful misconduct, whether active or passive, on the part of the Consultant or anyone employed or working under the Consultant.

12. **Insurance.**

12.1 **General Provisions.** Prior to the City's execution of this Agreement, Consultant shall provide satisfactory evidence of, and shall thereafter maintain during the term of this Agreement, such insurance policies and coverages in the types, limits, forms and ratings required herein. The rating and required insurance policies and coverages may be modified in writing by the City's Risk Manager or City Attorney, or a designee, unless such modification is prohibited by law.

12.1.1 **Limitations.** These minimum amounts of coverage shall not constitute any limitation or cap on Consultant's indemnification obligations under Section 11 hereof.

12.1.2 **Ratings.** Any insurance policy or coverage provided by Consultant or subcontractors as required by this Agreement shall be deemed inadequate and a material breach of this Agreement, unless such policy or coverage is issued by insurance companies authorized to

transact insurance business in the State of California with a policy holder's rating of A or higher and a Financial Class of VII or higher.

12.1.3 **Cancellation**. The policies shall not be canceled unless thirty (30) days prior written notification of intended cancellation has been given to City by certified or registered mail, postage prepaid.

12.1.4 **Adequacy**. The City, its officers, employees and agents make no representation that the types or limits of insurance specified to be carried by Consultant pursuant to this Agreement are adequate to protect Consultant. If Consultant believes that any required insurance coverage is inadequate, Consultant will obtain such additional insurance coverage as Consultant deems adequate, at Consultant's sole expense.

12.2 **Workers' Compensation Insurance**. By executing this Agreement, Consultant certifies that Consultant is aware of and will comply with Section 3700 of the Labor Code of the State of California requiring every employer to be insured against liability for workers' compensation, or to undertake self-insurance before commencing any of the work. Consultant shall carry the insurance or provide for self-insurance required by California law to protect said Consultant from claims under the Workers' Compensation Act. Prior to City's execution of this Agreement, Consultant shall file with City either 1) a certificate of insurance showing that such insurance is in effect, or that Consultant is self-insured for such coverage, or 2) a certified statement that Consultant has no employees, and acknowledging that if Consultant does employ any person, the necessary certificate of insurance will immediately be filed with City. Any certificate filed with City shall provide that City will be given ten (10) days prior written notice before modification or cancellation thereof.

12.3 **Commercial General Liability and Automobile Insurance**. Prior to City's execution of this Agreement, Consultant shall obtain, and shall thereafter maintain during the term of this Agreement, commercial general liability insurance and automobile liability insurance as required to insure Consultant against damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from or which may concern operations by anyone directly or indirectly employed by, connected with, or acting for or on behalf of Consultant. The City, and its officers, employees and agents, shall be named as additional insureds under the Consultant's insurance policies.

12.3.1 Consultant's commercial general liability insurance policy shall cover both bodily injury (including death) and property damage (including, but not limited to, premises operations liability, products-completed operations liability, independent contractor's liability, personal injury liability, and contractual liability) in an amount not less than $1,000,000 per occurrence and a general aggregate limit in the amount of not less than $2,000,000.

12.3.2 Consultant's automobile liability policy shall cover both bodily injury and property damage in an amount not less than $1,000,000 per occurrence and an aggregate limit of not less than $1,000,000. All of Consultant's automobile and/or commercial general liability insurance policies shall cover all vehicles used in connection with Consultant's performance of this Agreement, which vehicles shall include, but are not limited to, Consultant owned vehicles,

Consultant leased vehicles, Consultant's employee vehicles, non-Consultant owned vehicles and hired vehicles.

12.3.3 Prior to City's execution of this Agreement, copies of insurance policies or original certificates along with additional insured endorsements acceptable to the City evidencing the coverage required by this Agreement, for both commercial general and automobile liability insurance, shall be filed with City and shall include the City and its officers, employees and agents, as additional insureds. Said policies shall be in the usual form of commercial general and automobile liability insurance policies, but shall include the following provisions:

> It is agreed that the City of Riverside, and its officers, employees and agents, are added as additional insureds under this policy, solely for work done by and on behalf of the named insured for the City of Riverside.

12.3.4 The insurance policy or policies shall also comply with the following provisions:

a. The policy shall be endorsed to waive any right of subrogation against the City and its sub-consultants, employees, officers and agents for services performed under this Agreement.

b. If the policy is written on a claims made basis, the certificate should so specify and the policy must continue in force for one year after completion of the services. The retroactive date of coverage must also be listed.

c. The policy shall specify that the insurance provided by Consultant will be considered primary and not contributory to any other insurance available to the City and Endorsement No. CG 20010413 shall be provided to the City.

12.4 **Errors and Omissions Insurance.** Prior to City's execution of this Agreement, Consultant shall obtain, and shall thereafter maintain during the term of this Agreement, errors and omissions professional liability insurance in the minimum amount of $1,000,000 to protect the City from claims resulting from the Consultant's activities.

12.5 **Subcontractors' Insurance.** Consultant shall require all of its subcontractors to carry insurance, in an amount sufficient to cover the risk of injury, damage or loss that may be caused by the subcontractors' scope of work and activities provided in furtherance of this Agreement, including, but without limitation, the following coverages: Workers Compensation, Commercial General Liability, Errors and Omissions, and Automobile liability. Upon City's request, Consultant shall provide City with satisfactory evidence that Subcontractors have obtained insurance policies and coverages required by this section.

13. **Business Tax.** Consultant understands that the Services performed under this Agreement constitutes doing business in the City of Riverside, and Consultant agrees that Consultant

will register for and pay a business tax pursuant to Chapter 5.04 of the Riverside Municipal Code and keep such tax certificate current during the term of this Agreement.

14. **Time of Essence**. Time is of the essence for each and every provision of this Agreement.

15. **City's Right to Employ Other Consultants**. City reserves the right to employ other Consultants in connection with the Project. If the City is required to employ another consultant to complete Consultant's work, due to the failure of the Consultant to perform, or due to the breach of any of the provisions of this Agreement, the City reserves the right to seek reimbursement from Consultant.

16. **Accounting Records**. Consultant shall maintain complete and accurate records with respect to costs incurred under this Agreement. All such records shall be clearly identifiable. Consultant shall allow a representative of City during normal business hours to examine, audit, and make transcripts or copies of such records and any other documents created pursuant to this Agreement. Consultant shall allow inspection of all work, data, documents, proceedings, and activities related to the Agreement for a period of three (3) years from the date of final payment under this Agreement.

17. **Confidentiality**. All ideas, memoranda, specifications, plans, procedures, drawings, descriptions, computer program data, input record data, written information, and other materials either created by or provided to Consultant in connection with the performance of this Agreement shall be held confidential by Consultant, except as otherwise directed by City's Contract Administrator. Nothing furnished to Consultant which is otherwise known to the Consultant or is generally known, or has become known, to the related industry shall be deemed confidential. Consultant shall not use City's name or insignia, photographs of the Project, or any publicity pertaining to the Services or the Project in any magazine, trade paper, newspaper, television or radio production, website, or other similar medium without the prior written consent of the City.

18. **Ownership of Documents**. All reports, maps, drawings and other contract deliverables prepared under this Agreement by Consultant shall be and remain the property of City. Consultant shall not release to others information furnished by City without prior express written approval of City.

19. **Copyrights.** Consultant agrees that any work prepared for City which is eligible for copyright protection in the United States or elsewhere shall be a work made for hire. If any such work is deemed for any reason not to be a work made for hire, Consultant assigns all right, title and interest in the copyright in such work, and all extensions and renewals thereof, to City, and agrees to provide all assistance reasonably requested by City in the establishment, preservation and enforcement of its copyright in such work, such assistance to be provided at City's expense but without any additional compensation to Consultant. Consultant agrees to waive all moral rights relating to the work developed or produced, including without limitation any and all rights of identification of authorship and any and all rights of approval, restriction or limitation on use or subsequent modifications.

20. **Conflict of Interest**. Consultant, for itself and on behalf of the individuals listed in Exhibit "C", represents and warrants that by the execution of this Agreement, they have no interest, present or contemplated, in the Project affected by the above-described Services. Consultant further warrants that neither Consultant, nor the individuals listed in Exhibit "C" have any real property, business interests or income interests that will be affected by this project or, alternatively, that Consultant will file with the City an affidavit disclosing any such interest.

21. **Solicitation**. Consultant warrants that Consultant has not employed or retained any person or agency to solicit or secure this Agreement, nor has it entered into any agreement or understanding for a commission, percentage, brokerage, or contingent fee to be paid to secure this Agreement. For breach of this warranty, City shall have the right to terminate this Agreement without liability and pay Consultant only for the value of work Consultant has actually performed, or, in its sole discretion, to deduct from the Agreement price or otherwise recover from Consultant the full amount of such commission, percentage, brokerage or commission fee. The remedies specified in this section shall be in addition to and not in lieu of those remedies otherwise specified in this Agreement.

22. **General Compliance With Laws**. Consultant shall keep fully informed of federal, state and local laws and ordinances and regulations which in any manner affect those employed by Consultant, or in any way affect the performance of services by Consultant pursuant to this Agreement. Consultant shall at all times observe and comply with all such laws, ordinances and regulations, and shall be solely responsible for any failure to comply with all applicable laws, ordinances and regulations. Consultant represents and warrants that Consultant has obtained all necessary licenses to perform the Scope of Services and that such licenses are in good standing. Consultant further represents and warrants that the services provided herein shall conform to all ordinances, policies and practices of the City of Riverside.

23. **Waiver**. No action or failure to act by the City shall constitute a waiver of any right or duty afforded City under this Agreement, nor shall any such action or failure to act constitute approval of or acquiescence in any breach thereunder, except as may be specifically, provided in this Agreement or as may be otherwise agreed in writing.

24. **Amendments**. This Agreement may be modified or amended only by a written agreement and/or change order executed by the Consultant and City.

25. **Termination**. City, by notifying Consultant in writing, shall have the right to terminate any or all of Consultant's services and work covered by this Agreement at any time. In the event of such termination, Consultant may submit Consultant's final written statement of the amount of Consultant's services as of the date of such termination based upon the ratio that the work completed bears to the total work required to make the report complete, subject to the City's rights under Sections 15 and 26 hereof. In ascertaining the work actually rendered through the termination date, City shall consider completed work, work in progress and complete and incomplete reports and other documents only after delivered to City.

25.1 Other than as stated below, City shall give Consultant thirty (30) days' prior written notice prior to termination.

25.2 City may terminate this Agreement upon fifteen (15) days' written notice to Consultant, in the event:

25.2.1 Consultant substantially fails to perform or materially breaches the Agreement; or

25.2.2 City decides to abandon or postpone the Project.

26. **Offsets**. Consultant acknowledges and agrees that with respect to any business tax or penalties thereon, utility charges, invoiced fee or other debt which Consultant owes or may owe to the City, City reserves the right to withhold and offset said amounts from payments or refunds or reimbursements owed by City to Consultant. Notice of such withholding and offset, shall promptly be given to Consultant by City in writing. In the event of a dispute as to the amount owed or whether such amount is owed to the City, City will hold such disputed amount until either the appropriate appeal process has been completed or until the dispute has been resolved.

27. **Successors and Assigns**. This Agreement shall be binding upon City and its successors and assigns, and upon Consultant and its permitted successors and assigns, and shall not be assigned by Consultant, either in whole or in part, except as otherwise provided in paragraph 9 of this Agreement.

28. **Venue.** Any action at law or in equity brought by either of the parties hereto for the purpose of enforcing a right or rights provided for by this Agreement shall be tried in a court of competent jurisdiction in the County of Riverside, State of California, and the parties hereby waive all provisions of law providing for a change of venue in such proceedings to any other county. In the event either party hereto shall bring suit to enforce any term of this Agreement or to recover any damages for and on account of the breach of any term or condition of this Agreement, it is mutually agreed that each party will bear their own attorney's fees and costs.

29. **Nondiscrimination**. During Consultant's performance of this Agreement, Consultant shall not discriminate on the grounds of race, religious creed, color, national origin, ancestry, age, physical disability, mental disability, medical condition, including the medical condition of Acquired Immune Deficiency Syndrome (AIDS) or any condition related thereto, marital status, sex, genetic information, gender, gender identity, gender expression, or sexual orientation, in the selection and retention of employees and subcontractors and the procurement of materials and equipment, except as provided in Section 12940 of the California Government Code. Further, Consultant agrees to conform to the requirements of the Americans with Disabilities Act in the performance of this Agreement.

30. **Severability**. Each provision, term, condition, covenant and/or restriction, in whole and in part, of this Agreement shall be considered severable. In the event any provision, term, condition, covenant and/or restriction, in whole and/or in part, of this Agreement is declared invalid, unconstitutional, or void for any reason, such provision or part thereof shall be severed from this Agreement and shall not affect any other provision, term, condition, covenant and/or restriction of this Agreement, and the remainder of the Agreement shall continue in full force and effect.

31. **Authority**. The individuals executing this Agreement and the instruments referenced herein on behalf of Consultant each represent and warrant that they have the legal power, right and actual authority to bind Consultant to the terms and conditions hereof and thereof.

32. **Entire Agreement**. This Agreement constitutes the final, complete, and exclusive statement of the terms of the agreement between the parties pertaining to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements of the parties. Neither party has been induced to enter into this Agreement by and neither party is relying on, any representation or warranty outside those expressly set forth in this Agreement.

33. **Interpretation**. City and Consultant acknowledge and agree that this Agreement is the product of mutual arms-length negotiations and accordingly, the rule of construction, which provides that the ambiguities in a document shall be construed against the drafter of that document, shall have no application to the interpretation and enforcement of this Agreement.

33.1 Titles and captions are for convenience of reference only and do not define, describe or limit the scope or the intent of the Agreement or any of its terms. Reference to section numbers, are to sections in the Agreement unless expressly stated otherwise.

33.2 This Agreement shall be governed by and construed in accordance with the laws of the State of California in effect at the time of the execution of this Agreement.

33.3 In the event of a conflict between the body of this Agreement and Exhibit "A" - Scope of Services hereto, the terms contained in Exhibit "A" shall be controlling.

34. **Exhibits**. The following exhibits attached hereto are incorporated herein to this Agreement by this reference:

Exhibit "A" - Scope of Services
Exhibit "B" - Compensation
Exhibit "C" - Key Personnel

IN WITNESS WHEREOF, City and Consultant have caused this Agreement to be duly executed the day and year first above written.

CITY OF RIVERSIDE, a California charter city and municipal corporation a California corporation

By: _____
City Manager

Attest: _____
City Clerk

Certified as to Availability of Funds:

By: _____
Finance Director

Approved as to Form:

By: _____
Assistant City Attorney

KENNEDY/JENKS CONSULTANTS, INC.
a California corporation

By: _____
DAVID FERGUSON
[Printed Name]
Vice President
[Title]

By: _____
JOSEPH A. WOJSLAW
[Printed Name]
ASSISTANT SECRETARY
[Title]

CA#17-0242
\\Rc-Citylawprod\Cycom\Wpdocs\D013\P027\00317110.DOCX

EXHIBIT "A"

SCOPE OF SERVICES

(SEE ATTACHED)

Our approach to construct and calibrate your hydraulic model is graphically shown below in Figure 2. Key features of our approach are described on the following sections.

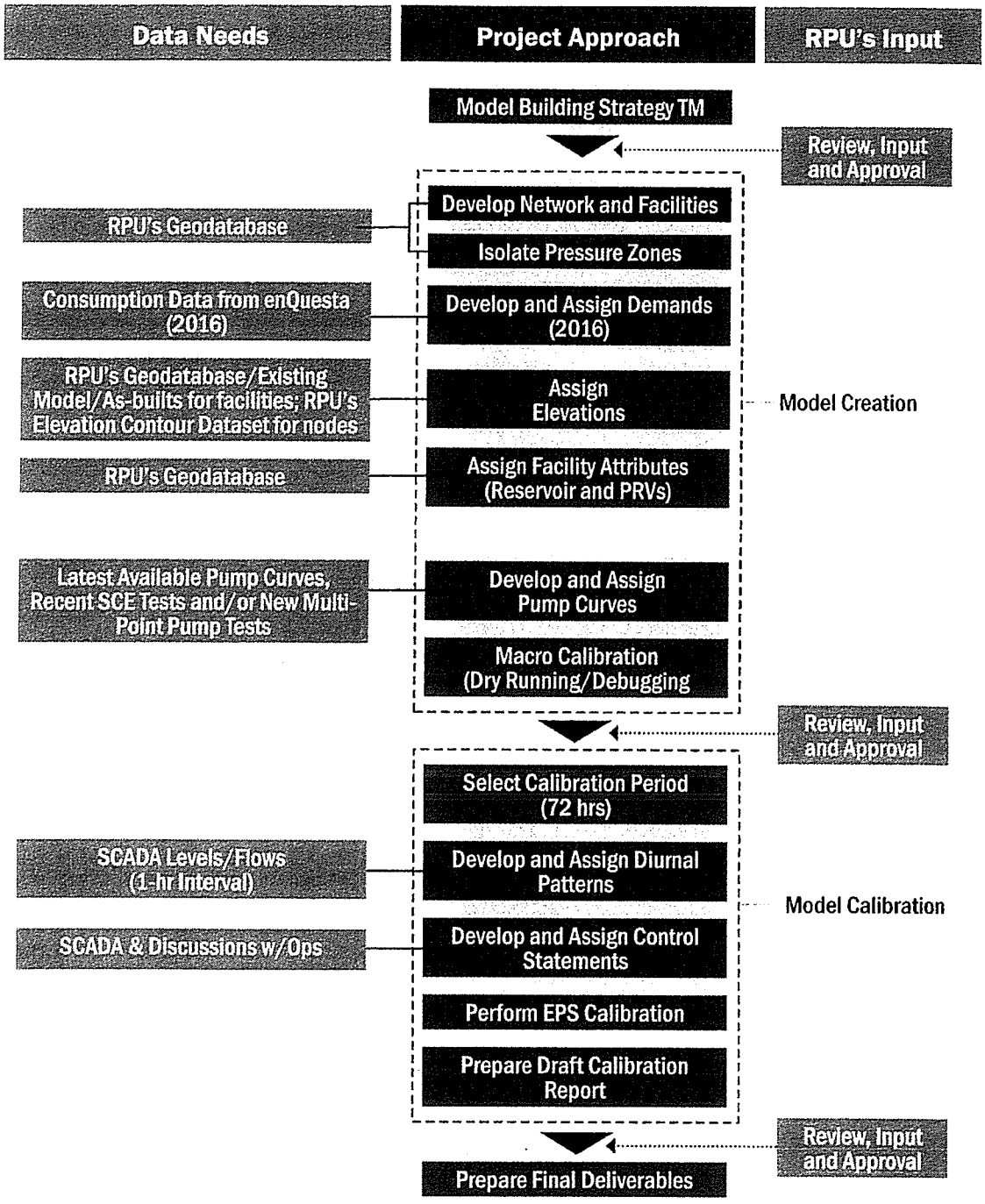


Figure 2

Our detail-oriented model development approach results in accurate hydraulic models promoting confident decision making for RPU.

MODEL CREATION APPROACH

Network and Facilities Development

Our review of your Water Distribution System geodatabase shows that the majority of the system representation is complete and pipelines are "snapped" and categorized in a manner useful to proceed with the creation of an all-pipe hydraulic model.

While booster pumps and pressure regulating valves (PRVs) are also connected to the network, some point features including storage tanks and groundwater wells are not. As part of network development, all relevant facilities will be integrated and snapped. Additionally, pipeline breaks at locations where a pipeline changes in diameter, age, material, or lining properties will be maintained. The modeling methodology for key water system facilities are briefly described on the Supply and Distribution System Facilities Modeling Methodology exhibit (Figure 4) presented on the following page.

Demand Allocation Strategy

One of the key elements of model development is average annual demand allocation. We propose to allocate consumptions from your billing system enQuesta for the most recent year with complete data (2016). The allocation will be performed using GIS routines and by establishing a link between the meter layer and the billing database.

The challenge of this process is the allocation of demands to the appropriate pressure zone in locations where pipelines of multiple zones are located on the same street. To avoid allocation of demands to the wrong zone, a demand node set will be first created for the entire model by excluding model nodes at facilities and along pipelines without service laterals. GIS routines will then be run to trace the network topology from the meter location to the appropriate distribution pipeline using the service laterals. Laterals will not be included in the model and are solely used for the purpose of demand allocation. Once the linkage between meters and pipelines are properly established, Thiessen polygon methodology will be used to allocate meter consumptions to proper demand nodes.

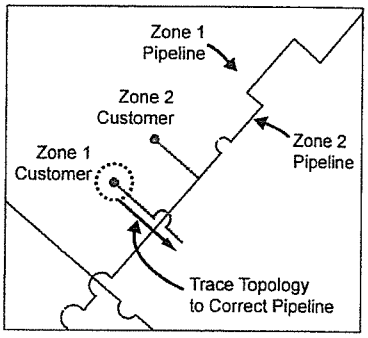


Figure 3

By tracing topology of laterals, demands are allocated to the correct pressure zone.

Nodal and Facility Elevations and Attributes

High resolution datasets, available from RPU, will be used to assign ground surface elevations to model nodes. For facilities such as booster pumps, well pumps and PRVs with missing elevation from the geodatabase, we propose to use information from the existing model. If calibration results point to elevation discrepancies, we will use as-builts to confirm the elevations. For storage tanks, we will use as-builts for dimensions and development of volume curves in the case of hopper-bottom tanks.

Prior to importing facility information from the geodatabase to the model, we make sure to preserve a unique identifier so that updated information in the model can be easily updated in the geodatabase if desired by RPU.

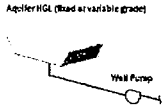
Pump Curves Update

Our experience with past model calibration efforts has shown that the accuracy of pump curves greatly impact the accuracy of the model calibration overall. To address this, we propose to update pump curves for all booster and groundwater well pumps using the most recent energy efficiency test data. Southern

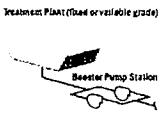
Supply and Distribution System Facilities Modeling Methodology.

Supply Sources

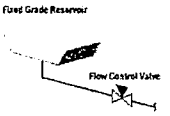
Untreated Groundwater Well



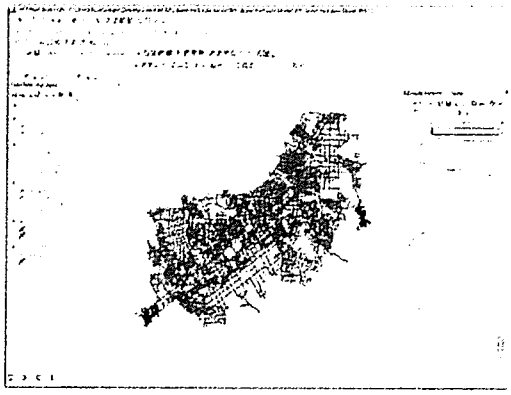
Treated Groundwater Well



Interconnections



- Groundwater wells with down hole level sensors will be modeled with a variable head reservoir with a pattern representing pumping ground water level variations during calibration period, followed by the well pump. Although additional detail could be added, it is our recommendation to keep the modeling of the supply sources simple to increase model stability.
- Groundwater wells without down hole level sensors will be modeled with a fixed head reservoir with a HGL of the pumping groundwater level as manually measured during the calibration period.
- For treated groundwater wells with a discharge booster pump station, the pump station's suction side will be modeled with a fixed or variable head reservoir depending on suction pressure variation and data availability.
- Although interconnections may not be operational during calibration period, they will be modeled with a fixed head reservoir and a downstream flow control valve.

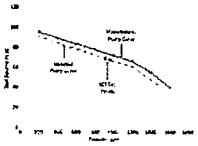


Pump Stations

- Each pump unit will be modeled using multiple point curves.
- New pump curves will be constructed based on recent SCE tests or new performance tests.
- Ground elevations will be used for node elevations, unless a station is located in a vault, or elevated structure.
- Simple or logic controls will be used, as appropriate.
- Time-based controls will be avoided where possible for a robust modeling of a wide variety of scenarios.
- Control valves within pump stations will be modeled, if used for typical operations.
- For VFD controlled pump units, we will use InfoWater's VFD modeling capabilities.

Pump Stations

Update Pump Curves



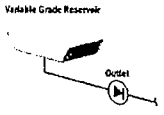
Update Controls Based on Operations

Storage Tanks

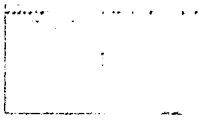
Storage Tanks

- Each tank will be modeled as a circular tank or with a depth volume curve, as appropriate.
- Ground surface, inlet, and outlet elevations will be input based on as-built drawings.
- For tanks, the initial water level will be input as recorded in SCADA at the start of the calibration period.
- In the distribution system model's calibration scenario, Linden and Evans storage tanks will be modeled as variable head reservoirs with patterns representing water level variations during the calibration period. In the supply model's calibration scenario, they will be modeled as variable area tanks with actual volume curves.

Linden/Evans (distribution system model)



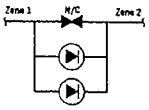
Treatment Losses Simulated as General Purpose Valve



PRV Stations

- Each valve will be modeled individually (multiple valves will not be combined).
- We have experience coordinating configurations to reduce logging.
- PRV elevations where unavailable from Geodatabase, will be input from the existing model or as built drawings.
- Pressure settings will be assigned based on Operations input and RPU's Geodatabase, and potential field testing.

PRV Stations



California Edison (SCE) provides free pump test services every two years for facilities within its service area such as Flume 2, 3, 4, and 6, Waterman wells, Cage-electric wells, and JW North and Ross Pump Stations. For Flume 7, the North Orange wells, and the majority of pump stations, RPU has outsourced pump efficiency testing to a local specialty firm. These tests typically provide three data points for each pumping unit (flow vs head) which could be used to construct a pump curve. Where recent energy efficiency test data are unavailable or deemed inadequate, we propose RPU staff schedule updated SCE tests, contract an outside test firm, or perform multi-point performance tests in-house.

Dry Running or Debugging the Model (Macro Calibration)

Once the model is created and facility attributes such as pump curves, reservoir dimensions and PRV set points are assigned, a "macro calibration" will be performed in steady state mode to ensure pressure zones are properly isolated and hydraulic grades are within the expected range. The macro-calibrated model will then be submitted to RPU for review and approval.

MODEL CALIBRATION APPROACH

Calibration Period Selection

To calibrate the model over an extended period (EPS), a calibration period must first be selected. RPU has indicated its preference for a 72-hr calibration period. Calibration periods are typically selected during high demand summer months when the system is most stressed. We anticipate the completion of the macro-calibrated model by sometime in the summer of 2017 providing a perfect opportunity to calibrate against the most recent system condition.

Despite shortening the overall project schedule by allowing the concurrent development of the model, diurnal patterns and facility control statements, calibration against the previous year's data is not recommended. Based on previous experience, often times it is difficult or impossible for Operations to confirm system conditions on a particular day in the past such as the set point or status of certain valves that might become questionable during the EPS calibration. Additionally, 2017 data will capture any operational and/or facility changes that might occur between the summer of 2016 and 2017.

Diurnal Patterns Development

An important step in accurate model calibration is the development of diurnal patterns by pressure zone or group of pressure zones that can be isolated based on available level and flow information from SCADA. Diurnal patterns will be developed for the calibration period so that water demands by pressure zone could be concurrently estimated.

Due to the absence of flow meters at several PRV stations and the large number of stations that connect many pressure zones, it is not possible to create diurnal patterns for individual or small groups of pressure zones. To overcome this challenge, some typically used strategies when developing diurnal patterns are to temporarily adjust PRV settings to deactivate them or to assume approximate flows at each station. Alternatively or in conjunction with these strategies, temporary flow meters could be installed in the field to isolate smaller areas and create more specific pressure zone diurnal patterns.

We will meet with RPU's Operations staff to discuss the above mentioned strategies as well as the hydraulic schematic of the system to identify the stations that are already metered, normally closed or not flowing. We will provide a list of PRV stations that should be monitored or closed during the calibration period in order to better define the transfer of flow between zones. The goal will be to delineate as many pressure zones or groups of pressure zone as possible for the purpose of diurnal patterns development. For larger regulated zones such as the 925 zone, we anticipate the need to install temporary flow meters at individual active PRV stations that are not already metered.

Control Statements Development

Another key aspect of a successful EPS calibration is to develop accurate control statements to simulate pumps operation. Control statements are typically developed based on downstream tank levels. This method usually results in a "flexible" model in which demands could be scaled in any direction with minimal modifications to the model to represent system conditions other than those of the calibration period. However, this method does not always yield the desired calibration level. This is often due to the complex nature of field conditions that results in operational adjustments on a daily basis beyond typical controls and set points.

As such and to achieve the Root Mean Square Error (RMSE) targets specified in the RFP, we may resort to time-based controls for certain facilities to increase the confidence in the calibrated model. Upon the successful macro calibration of the model, we will meet with RPU staff to discuss various methods of control statement development, their pros and cons and applicability to this project given RPU's goals and intended use of the calibration scenario.

EPS Calibration and Reporting

The final step of the EPS calibration is to make model adjustments as necessary to resolve discrepancies between the model and SCADA to achieve the desired RMSE targets. Depending on the level of discrepancy, adjustments to pipeline connectivity, diameters, elevations, facility set points, and control statements may be necessary.

The last parameter to adjust is pipeline roughness coefficient (C-factors). C factors will be initially assigned based on pipeline age, material and diameter. For example, based on typical industry values, the C factor for small diameter (6- to 16-inch) 30-year old ductile iron (DI) pipe varies from 115 to 120 while the C factor for a 60-year old unlined cast iron (CI) pipe varies from 70 to 80. C factors will be adjusted for groups of pipelines with similar characteristics by about 5 to 10 percent to reduce the RMSE between the observed parameters (SCADA) and model simulated values. RPU staff will be consulted as necessary to resolve any major discrepancy between field data and model results.

EPS model calibration graphs and corresponding RMSE values will be developed for all reservoir levels and pump station flows, and discharge and suction pressures. The results will be presented in a model calibration report for RPU's review, commenting and approval. The report will also include possible explanations for parameters exceeding RMSE targets specified in the RFP.

Water Quality Modeling

Kennedy/Jenks proposes for RPU's consideration the development of a "blend model" operating within Innovyze's SCADAWatch software. This software will be programmed to extract the on/off status and instantaneous flow rate of all potable wells and treatment plants from the Water Operations SCADA/ Oracle database. A customized dashboard screen will be developed using iframe dashlet tied to RPU's LIMs cloud as the source of water quality data. The dashboard will present well flows and weighted average water quality (the "blend") at each treatment plant and along each water supply transmission system as well as the entrance to Linden and Evans Reservoirs (total system blend). Up to 10 water quality constituents will be incorporated into the model and presented in the dashboard screen(s).

Scope of Work

Kennedy/Jenks has carefully reviewed the Request for Proposal (RFP) and we acknowledge the detailed and comprehensive Scope of Work.

Task 1 - Project Management

In this task, the Consultant will use project management tools, including systems for tracking work progress and expenditures, and quality assurance and quality control best practices to keep the project on schedule and budget.

The Consultant shall provide a communication plan that enables clear and timely communication between RPU and the Consultant. The plan shall include Consultant's proposed single point of contact, number of on-site and telephone meetings, and a time-line of the meeting commensurating with the project schedule. RPU proposes bi-weekly conference calls between RPU and Consultant's project managers to review project status, including work completed during the latest report period, work anticipated to be completed during the next reporting period, identified problems/issues that could affect project budget or schedule, outstanding issues to be resolved, and action items.

In addition to the biweekly project management telephone meetings, four onsite meetings (including the kick-off meeting) at a minimum, should be assumed during the project.

Task 2 – Model Building Strategy

The intent behind this task is to establish a clear understanding between RPU and the Consultant as to how the hydraulic model will be created. In this task, the Consultant shall provide details about the methodology to include but not limited to the following:

- Type of all-pipe model that is being proposed.
- Extended period simulation; a 72-hour period is preferred.
- Initial C-factor based on diameters and materials.
- Linkage between GIS and the model.
- Naming convention used for facilities, scenarios, etc.
- Demand calculation methodology identifying steps to convert billing data into demands on nodes.
- Demand allocation methodology.
- Scheme to create the existing and potential future scenarios (Scenario Manager vs. Facility Manager).
- Calibration strategy, including any field data needed for calibration beyond the SCADA data.
- Diurnal pattern creation for hydraulic zones. There are 19 unique diurnal patterns in the current model and new model is expected to have a similar number of unique patterns.

The Consultant shall provide a written memorandum for RPU's review and approval.

Deliverable: Model Building Strategy Task Memorandum

Task 3 - Data Collection

In this task, the Consultant shall provide a data need list for model creation and calibration. This list will include details of the data needed to build an all-pipe model including but not limited to GIS shapefiles or coverages for all facilities, hydraulic zones, meters, control points and settings, gate valve settings, billing data, pump curves, etc.

Task 4 – Model Creation

In this task, the consultant shall build a model based on the model building strategy approved as part of Task 2. A typical workflow for the task will include processing and preparing facilities' GIS data in a format conducive for hydraulic model building, importing the prepared data into InfoWater software, creating appropriate scenarios, loading demands to nodes, and "dry-running" the model to check for connectivity and control point issues. Upon a successful dry-run of the model, the Consultant shall send the model to RPU for a review.

Deliverable: A working, non-calibrated hydraulic model with two distinct scenarios – supply and distribution.

Task 5 – Calibration

In this task, the Consultant shall calibrate the model based on SCADA data and any available field data for a specified 24-hour period. The calibration will include comparison of the following data points against SCADA or field data and obtaining root mean square error (RMSE) value within the specified range:

- Reservoir Level: RMSE <= 1 ft.
- Pump or Pump Station Flow: RMSE <= 15% of the design flow.
- Pump Station Suction and Discharge Pressures: RMSE <= 5 psi.

Before calculating RMSEs, the consultant should screen the data for outliers that are clearly data errors and not include these errors into the RMSE calculation. The consultant shall provide a calibration report in the form a technical memorandum demonstrating the accuracy of calibration. The report shall also identify facilities and hydraulic zone where calibration was not achieved per the aforementioned methodology and also specify potential causes. This report shall include hourly comparison for water levels for 16 reservoirs, and flow, suction and discharge pressures for all booster stations, where data is available.

Deliverable: Technical memorandum demonstrating the accuracy of calibration via graphs and tables comparing SCADA data with modeled results.

Task 6 – Water Quality Modeling (Optional Award)

As mentioned earlier in this RFP, RPU receives its water from three water basins located in San Bernardino, Rialto/Colton, and north Riverside. Water quality varies for many constituents within each basin and across basins. This optional task requires the Consultant to add water quality constituents to the supply scenario of the hydraulic model to simulate water quality with changing well operation and treatment. All the constituents that need to be modeled are non-decaying and thus the water quality model will essentially be a "blend" model. This model shall be calibrated against the water quality data from RPU's cloud-based Laboratory Information Management (LIM) system. RPU expects a RMSE value for each constituent to be less than 10% of the average value.

Task 7 – Extended Period Fire Flow Runs (Optional Award)

The Consultant shall run 4-hour extended period simulation to model fire flow for approximately 7,900 fire hydrants. The fire flow scenario shall be run under a max-day condition. The fire flow volume shall be determined using the zoning of the parcels served by each hydrant. The max-day condition will be simulated using a global demand multiplier which RPU staff will provide during the project.

Task 8 – Training (Optional Award)

The Consultant shall provide two-day onsite training to RPU's staff to include basics of hydraulics and details of hydraulic modeling using InfoWater.

Kennedy/Jenks Consultants

Engineers & Scientists

3210 El Camino Real, Suite 150
Irvine, California 92602
949-261-1577

21 February 2017

Mr. Gaurav Agarwal, P.E.
Senior Water Engineer
City of Riverside Public Utilities
3750 University Avenue, 3rd Floor
Riverside, CA 92501

Subject: Proposal for Additional Scope of Work Related to Water System Hydraulic Model Development Project

Dear Mr. Agarwal:

Kennedy/Jenks is pleased to submit this proposal to provide additional services as part of the Water System Hydraulic Model Development Project. This letter is prepared per the City of Riverside Public Utilities' (RPU's) request and amends the Scope of Work specified in the Request for Proposal for the subject project issued on December 13, 2016 and our corresponding proposal submitted on January 13, 2017.

Additional Scope of Services

Task 9 – As-Needed GIS Support Services

The purpose of this task is to provide as-needed support services to update RPU's geodatabase of network and facilities. For budgeting purposes, our proposal assumes a total of up to 54 hours of support for this task.

Task 10 – As-Needed Hydraulic Modeling Support Services

The purpose of this task is to provide as-needed hydraulic modeling support services beyond project's completion. For budgeting purposes, our proposal assumes a total of up to 50 hours of support for this task.

Task 11 – Distribution Pipeline Condition Assessment Methods Evaluation

The purpose of this task is to assist RPU define a method of approach for condition assessment of its distribution pipeline system given that the condition assessment techniques can vary for each pipe material and for different sizes. The proposed scope for this task includes the following:

- Tabulate pipeline data from GIS and/or hydraulic model
- Conduct a brief workshop (by conference call) to identify other data sources for RPU's consideration and to identify data gaps to be listed in the Technical Memorandum
- Review of applicable condition assessment technologies and their anticipated unit costs; identify the advantages and disadvantages of using evasive versus non-evasive condition assessment techniques; including:
    - Pure Technologies (Smart Ball, PipeDiver, Sahara, Zoom Camera, REFC/TC electromagnetic pigs)
    - PICA (SeaSnake)
    - JD-7 (tethered CCTV)
    - Echologics (Acoustic Wave Technology - used extensively for asbestos cement pipe)
    - IBAK Panorama (CCTV)
- Define the assessment methodologies that could be used for RPU's pipelines asset including the test methods by pipe material
- Prepare and submit a 12 to 15 page Technical Memorandum titled "Preliminary Pipeline Condition Assessment Approach" summarizing findings and recommendations in PDF format
- Conduct one meeting to present the Technical Memorandum to RPU staff

Fee Estimate

The work will be performed on a time and expense basis in accordance with the rate schedule previously provided as part of our proposal submitted on January 13, 2017. The fee estimate for the proposed additional tasks is estimated at $36,020. The total project fee for Tasks 1 through 11 is estimated at $236,830. The revised project fee sheet with all tasks included is presented in Appendix A attached to this letter.

Schedule

We have extended the duration of Task 4 (Model Creation) by 8 working days to accommodate Task 9 (As-Needed GIS Support). This is the maximum extension before having to extend the schedule for Task 5 (Model Calibration).

Additionally, we have assumed Task 10 (As-Needed Hydraulic Modeling Support) will occur over six calendar months beyond the completion of Task 8 (Training).

Task 11 is scheduled over 3 months from early August to early November 2017.

The revised project schedule with all tasks included is presented in Appendix B attached to this letter.

We appreciate the opportunity to provide this proposal amendment to RPU. Please do not hesitate to contact me at (949) 567-2124 should you have any questions or need additional information.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Bijan Sadeghi, P.E.
Project Manager

Harold Glaser, P.E.
Principal-In-Charge

Enclosure

EXHIBIT "B"

COMPENSATION

(SEE ATTACHED)

Attachment A - Revised Fee Estimate

Kennedy/Jenks Consultants

CLIENT Name: City of Riverside Public Utilities
PROJECT Description: Water System Hydraulic Model Development
Proposal/Job Number: B10440020/0005 Date: Feb 2017

Classification:	Eng-Sci-9	Eng-Sci-6	Eng-Sci-5	Eng-Sci-4	Eng-Sci-3	Eng-Sci-2	Project Administrator	Aide	Total	KJ Labor	Sub Subs	KJ Sub-Markup	KJ ODCs	Total Labor	Total Expenses	Total Labor + Expenses
Hourly Rate:	$270	$210	$190	$185	$155	$145	$110	$70	Hours	Fees	Fees	5%	Fees			Fees
Phase 1 - Project Management																
Biweekly Conference Calls (16)	8	16							24	$5,520		$0		$5,520	$0	$5,520
Meetings (4)	8	16			8	8			40	$7,920		$0	$500	$7,920	$500	$8,420
Project Status Updates (7)		8							8	$1,680		$0		$1,680	$0	$1,680
Project Management		16					10	2	28	$4,600		$0		$4,600	$0	$4,600
Task 1 - Subtotal	16	56	0	0	8	8	10	2	100	$19,720	$0	$0	$500	$19,720	$500	$20,220
Task 2 - Model Building Strategy																
Prepare Technical Memorandum	6	32			4	4		2	48	$9,680		$0		$9,680	$0	$9,680
Task 2 - Subtotal	6	32	0	0	4	4	0	2	48	$9,680	$0	$0	$0	$9,680	$0	$9,680
Task 3 - Data Collection																
Prepare and Update Data Request List		4			10	6			20	$3,260		$0		$3,260	$0	$3,260
Task 3 - Subtotal	0	4	0	0	10	6	0	0	20	$3,260	$0	$0	$0	$3,260	$0	$3,260
Task 4 - Model Creation																
Develop Network and Facilities	4	8	16			24			52	$9,280		$0		$9,280	$0	$9,280
Isolate Pressure Zone		2	2			4			8	$1,380		$0		$1,380	$0	$1,380
Develop and Assign Demands	1	4	16			40			61	$9,950		$0		$9,950	$0	$9,950
Assign Nodal Elevations			12			24			36	$5,760		$0		$5,760	$0	$5,760
Assign Facility Elevations and Attributes	1	8			36				45	$7,530		$0		$7,530	$0	$7,530
Develop and Assign Pump Curves	4	8			60				72	$12,060		$0		$12,060	$0	$12,060
Macro Calibration (Debugging)	4	24							28	$6,120		$0		$6,120	$0	$6,120
Task 4 - Subtotal	14	54	46	0	96	92	0	0	302	$52,080	$0	$0	$0	$52,080	$0	$52,080
Task 5 - Model Calibration																
Select Calibration Period		4							4	$840		$0		$840	$0	$840
Develop and Assign Diurnal Patterns		24			40				64	$11,240		$0		$11,240	$0	$11,240
Develop and Assign Control Statements		32			78				110	$18,810		$0		$18,810	$0	$18,810
Perform EPS Calibration	2	78							80	$16,920		$0		$16,920	$0	$16,920
Prepare Draft Calibration TM	2	24			36				62	$11,160		$0		$11,160	$0	$11,160
Prepare Final Calibration TM	2	8			20				30	$5,320		$0		$5,320	$0	$5,320
Task 5 - Subtotal	6	170	0	0	174	0	0	0	350	$64,290	$0	$0	$0	$64,290	$0	$64,290

Attachment A - Revised Fee Estimate

Kennedy/Jenks Consultants

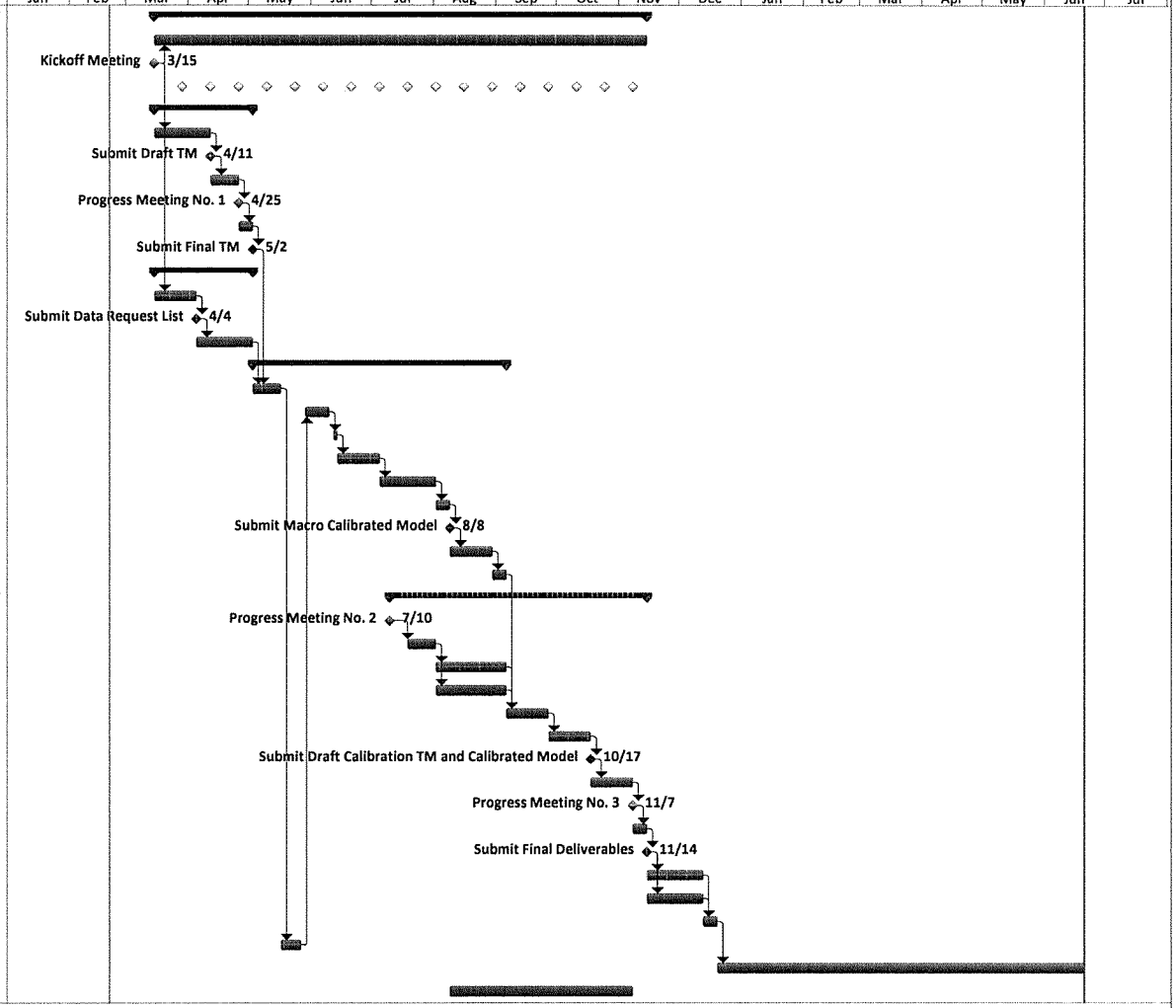
CLIENT Name: City of Riverside Public Utilities
PROJECT Description: Water System Hydraulic Model Development
Proposal/Job Number: B10440020/0005 Date: Feb 2017

Classification:	Eng-Sci-9	Eng-Sci-6	Eng-Sci-5	Eng-Sci-4	Eng-Sci-3	Eng-Sci-2	Project Administrator	Aide	Total	KJ Labor	Sub Subs	KJ Sub-Markup	KJ ODCs	Total Labor	Total Expenses	Total Labor + Expenses
Hourly Rate:	$270	$210	$190	$185	$155	$145	$110	$70	Hours	Fees	Fees	5%	Fees			Fees
Task 6 - Water Quality Modeling																
Water Quality Modeling	8	8		40		16		4	76	$13,840	$12,000	$600	$100	$13,840	$100	$26,540
Task 6 - Subtotal	8	8	0	40	0	16	0	4	76	$13,840	$12,000	$600	$100	$13,840	$100	$26,540
Task 7 - EPS Fire Flow Runs																
EPS Fire Flow Runs	8	24			80				112	$19,600		$0		$19,600	$0	$19,600
Task 7 - Subtotal	8	24	0	0	80	0	0	0	112	$19,600	$0	$0	$0	$19,600	$0	$19,600
Task 8 - Training																
Training		24							24	$5,040		$0	$100	$5,040	$100	$5,140
Task 8 - Subtotal	0	24	0	0	0	0	0	0	24	$5,040	$0	$0	$100	$5,040	$100	$5,140
Task 9 - As-Needed GIS Support																
As-Needed GIS Support		4	50						54	$10,340		$0	$200	$10,340	$200	$10,540
Task 9 - Subtotal	0	4	50	0	0	0	0	0	54	$10,340	$0	$0	$200	$10,340	$200	$10,540
Task 10 - As-Needed Hydraulic Modeling Support																
As-Needed Hydraulic Modeling Support		30	20						50	$10,100		$0	$200	$10,100	$200	$10,300
Task 10 - Subtotal	0	30	20	0	0	0	0	0	50	$10,100	$0	$0	$200	$10,100	$200	$10,300
Task 11 - Distribution Pipeline Condition Assessment Methods Evaluation																
Distribution Pipeline Condition Assessment Methods Evaluation	50	8							58	$15,180		$0		$15,180	$0	$15,180
Task 11 - Subtotal	50	8	0	0	0	0	0	0	58	$15,180	$0	$0	$0	$15,180	$0	$15,180
All Tasks Total	108	414	116	40	372	126	10	8	1194	$223,130	$12,000	$600	$1,100	$223,130	$1,100	$236,830

* Labor hours for optional Tasks 6 and 7; are tentatively estimated and are subject to revision upon the completion of the model and review of available data.

Attachment B - Revised Schedule
Water System Hydraulic Model Development Project

ID	Task Name	Duration	Start	Finish
1	**Task 1 - Project Management**	**175 days**	**Wed 3/15/17**	**Tue 11/14/17**
2	Project Control	175 days	Wed 3/15/17	Tue 11/14/17
3	Kickoff Meeting	0 days	Wed 3/15/17	Wed 3/15/17
4	Biweekly Conference Call	160 days	Tue 3/28/17	Wed 11/8/17
23	**Task 2 - Model Building Strategy**	**35 days**	**Wed 3/15/17**	**Tue 5/2/17**
24	Prepare Draft Technical Memorandum (TM)	20 days	Wed 3/15/17	Tue 4/11/17
25	Submit TM	0 days	Tue 4/11/17	Tue 4/11/17
26	RPU's Review and Commenting	10 days	Wed 4/12/17	Tue 4/25/17
27	Progress Meeting No. 1	0 days	Tue 4/25/17	Tue 4/25/17
28	Prepare Final TM	5 days	Wed 4/26/17	Tue 5/2/17
29	Submit Final TM	0 days	Tue 5/2/17	Tue 5/2/17
30	**Task 3 – Data Collection**	**35 days**	**Wed 3/15/17**	**Tue 5/2/17**
31	Prepare Data Request List	15 days	Wed 3/15/17	Tue 4/4/17
32	Submit Data Request List	0 days	Tue 4/4/17	Tue 4/4/17
33	Data Collection by RPU	20 days	Wed 4/5/17	Tue 5/2/17
34	**Task 4 - Model Creation**	**90 days**	**Wed 5/3/17**	**Tue 9/5/17**
35	Develop Network and Facilities	10 days	Wed 5/3/17	Tue 5/16/17
36	Develop and Assign Demands	10 days	Mon 5/29/17	Fri 6/9/17
37	Assign Elevations	2 days	Mon 6/12/17	Tue 6/13/17
38	Assign Facility Attributes	15 days	Wed 6/14/17	Tue 7/4/17
39	Develop and Assign Pump Curves	20 days	Wed 7/5/17	Tue 8/1/17
40	Macro Calibration (Debugging)	5 days	Wed 8/2/17	Tue 8/8/17
41	Submit Model	0 days	Tue 8/8/17	Tue 8/8/17
42	RPU's Review and Commenting	15 days	Wed 8/9/17	Tue 8/29/17
43	Finalize Model Creation	5 days	Wed 8/30/17	Tue 9/5/17
44	**Task 5 - Model Calibration**	**92 days**	**Mon 7/10/17**	**Tue 11/14/17**
45	Progress Meeting No. 2	0 days	Mon 7/10/17	Mon 7/10/17
46	Field Data Collection for EPS Calibration	10 days	Wed 7/19/17	Tue 8/1/17
47	Develop and Assign Diurnal Patterns	25 days	Wed 8/2/17	Tue 9/5/17
48	Develop and Assign Control Statements	25 days	Wed 8/2/17	Tue 9/5/17
49	Perform EPS Calibration	15 days	Wed 9/6/17	Tue 9/26/17
50	Prepare Draft Calibration TM	15 days	Wed 9/27/17	Tue 10/17/17
51	Submit Draft Calibration TM and Calibrated Model	0 days	Tue 10/17/17	Tue 10/17/17
52	RPU's Review and Commenting	15 days	Wed 10/18/17	Tue 11/7/17
53	Progress Meeting No. 3	0 days	Tue 11/7/17	Tue 11/7/17
54	Prepare Final Deliverables	5 days	Wed 11/8/17	Tue 11/14/17
55	Submit Final Deliverables	0 days	Tue 11/14/17	Tue 11/14/17
56	**Task 6 - Water Quality Modeling**	20 days	Wed 11/15/17	Tue 12/12/17
57	**Task 7 - Extended Period Simulation Fire Flow Runs**	20 days	Wed 11/15/17	Tue 12/12/17
58	**Task 8 - Training**	5 days	Wed 12/13/17	Tue 12/19/17
59	**Task 9 - As Needed GIS Support**	8 days	Wed 5/17/17	Fri 5/26/17
60	**Task 10 - As Needed Hydraulic Modeling Support**	131 days	Wed 12/20/17	Wed 6/20/18
61	**Task 11 - Condition Assessment Methods Evaluation**	65 days	Wed 8/9/17	Tue 11/7/17



Date: Tue 2/21/17 | Task | Submittal | Summary | RPU Review Period | Onsite Meeting

EXHIBIT "C"

KEY PERSONNEL

(SEE ATTACHED)

Personnel

PROVEN LOCAL LEADERSHIP WITH INDUSTRY-LEADING EXPERTISE

Kennedy/Jenks has assembled a balanced team with technical expertise, local knowledge, and leadership forged from direct experience working with you, and from similar Southern California projects. As shown in our organizational chart, Bijan Sadeghi will serve as our Project Manager and the RPU's single point of contact. Bijan will leverage his nearly 15 years of experience, prior knowledge of your system, and our extensive depth of resources to execute this project to your satisfaction. Additionally, the majority of our proposed personnel are located locally with less than an hour away from RPU.

Brief descriptions of our key staff are summarized on the following pages. Staff resumes are included in the Appendix.

Riverside Public Utilities
WATER DIVISION
Gaurav Agarwal, PE
Senior Engineer and Project Manager

PRINCIPAL-IN-CHARGE
QA/QC
Harold Glaser, PE

TECHNICAL ADVISOR
David Ferguson, PhD, PE

PROJECT MANAGER
Bijan Sadeghi, PE

Support Team

GIS
Mario Osorio
Rachel Druffel-Rodriguez, EIT

MODELING/ CALIBRATION
Bijan Sadeghi, PE,
Paul Chau, PE, CEM
Brandon Hale, PE

BLEND MODEL (OPTIONAL)
Janel Grebel, PhD

Bijan Sadeghi, PE
Project Manager

Bijan will proactively manage the project and will provide the day-to-day management and will be in regular contact with the City. He brings nearly 15 years of experience in master planning, engineering case studies, design and management of municipal water, recycled water and wastewater projects. He is well versed in model development and system analysis and has extensive knowledge of your supply and distribution system.

David Ferguson, PhD, PE
Technical Advisor

Dr. Ferguson has more than 35 years of experience in planning, design, construction, and operation of water supply, infrastructure, and treatment projects. He specializes in comprehensive groundwater resource analysis and evaluation, including a hydrogeologic investigation, water quality evaluation, treatment process alternatives, technical feasibility, and financial analysis. Dr. Ferguson has managed or performed technical review of numerous master plans for utilities in Southern California, including Chino Hills, Riverside, Ontario, Inland Empire Utilities Agency, Los Angeles County Waterworks District No. 40, Las Virgenes, and San Bernardino.

 **Harold Glaser, PE** **Principal-in-Charge/QA/QC**	Harold has over 36 years of experience in water resources engineering, with emphasis on planning, design, and construction management. He has performed a wide range of water demand forecasting, water supply assessment, facility planning, modeling of ground and surface waters, water quality, and regulatory compliance for regional and local water wholesalers and retailers.
 **Mario Osorio** **GIS**	Mario brings over 23 years of experience as a GIS Analyst. He is responsible for processing and preparing your network and facility geodatabase and preparing it for importation to InfoWater. Mario has extensive GIS project experience related to utility infrastructure, environmental data, and water resources.
 **Rachel Druffel-Rodriguez, EIT** **GIS**	Rachel has two years of experience in GIS modeling, advanced GIS mapping, and digital elevation models. In her role as GIS Support, she will assist Mario with the model creation task. Rachel and Mario have successfully worked together on a number of GIS related projects in the past couple of years.
 **Paul Chau, PE, CEM** **Model Calibration**	Paul Chau is a civil engineer with nearly 10 years of a diverse background in master planning, hydraulic water modeling, and infrastructure design. He has built, developed, calibrated, and analyzed several hydraulic water models using both Innovyze and Bentley software. He has also provided engineering analyses such as demand development, pipe & pump station sizing, and CIP development. In his role as modeling support, he will assist Bijan with the model calibration task.
 **Brandon Hale, PE** **Modeling Support**	Brandon is a project engineer with 4 years of experience in planning and design of water utility projects in Southern California with a focus on utility master planning. He has developed multiple hydraulic models for various agencies across Southern California. Brandon and Bijan recently collaborated on the City of Thousand Oaks Water Master Plan project, where he assisted Bijan in model update and calibration.
 **Janel Grebel, PhD** **Blend Model (Optional)**	Dr. Grebel has more than a decade of research experience in water quality. Areas of academic specialization include disinfection chemistry and by-product formation, advanced oxidation and photochemical treatment processes, stormwater contamination and reclamation, salt and nutrient management plans, as well as surface and subsurface attenuation of environmental contaminants.