PALMDALE WATER DISTRICT

2029 East Avenue Q • Palmdale, California 93550 • Telephone (661) 947-4111
Fax (661) 947-8604
www.palmdalewater.org

LAGERLOF, SENECAL, GOSNEY & KRUSE LLP
Attorneys

Board of Directors

ROBERT E. ALVARADO
Division 1

GORDON G. DEXTER
Division 2

GLORIA DIZMANG
Division 3

KATHY MAC LAREN
Division 4

STEVE R. CORDOVA
Division 5

October 17, 2013

Agenda for Regular Meeting of the Board of Directors of the Palmdale Water District to be held at the District's office at 2029 East Avenue Q, Palmdale

Wednesday, October 23, 2013

7:00 p.m.

NOTE: To comply with the Americans with Disabilities Act, to participate in any Board meeting please contact Dawn Deans at 661-947-4111 x1003 at least 48 hours prior to a Board meeting to inform us of your needs and to determine if accommodation is feasible.

Agenda item materials, as well as materials related to agenda items submitted after distribution of the agenda packets, are available for public review at the District's office located at 2029 East Avenue Q, Palmdale. Please call Dawn Deans at 661-947-4111 x1003 for public review of materials.

PUBLIC COMMENT GUIDELINES: **The prescribed time limit per speaker is three-minutes. Please refrain from public displays or outbursts such as unsolicited applause, comments, or cheering. Any disruptive activities that substantially interfere with the ability of the District to carry out its meeting will not be permitted and offenders will be requested to leave the meeting.**

Each item on the agenda shall be deemed to include any appropriate motion, resolution, or ordinance to take action on any item.

1) Pledge of Allegiance.

2) Roll Call.

3) Adoption of Agenda.

4) Public comments for non-agenda items.

5) Presentations:

   No presentations scheduled at this time.

6) Action Items - Consent Calendar (The public shall have an opportunity to comment on any action item as each item is considered by the Board of Directors prior to action being taken.)

6.1) Approval of minutes of regular meeting held October 9, 2013.

6.2) Payment of bills for October 23, 2013.

6.3) Ratification of Change Order No. 1 under Specification No. 1101-A being the construction of site improvements for the Granular Activated Carbon Adsorption System located at the Underground Booster Station. ($31,017.00 – Budgeted – Engineering Manager Knudson)

7) Action Items – Action Calendar (The public shall have an opportunity to comment on any action item as each item is considered by the Board of Directors prior to action being taken.)

7.1) Public hearing regarding Resolution No. 13-12, Resolution of the Board of Directors of Palmdale Water District modifying the policy regarding Capital Improvement Fees for new water service connections and adopting new Water Supply Fee. (Engineering Manager Knudson)

7.2) Consideration and possible action to adopt Resolution No. 13-12, Resolution of the Board of Directors of Palmdale Water District modifying the policy regarding Capital Improvement Fees for new water service connections and adopting new Water Supply Fee. (Engineering Manager Knudson)

7.3) Consideration and possible action on approving a Professional Services Agreement with Kennedy/Jenks Consultants for preparation of Palmdale Water District's Littlerock Creek Groundwater Recharge and Recovery Project Feasibility Study. ($899,493.00 – Budgeted – 2013A Water Revenue Bonds – Water & Energy Resources Manager Pernula/Engineering Manager Knudson)

7.4) Consideration and possible action on proposal received from Charles Z. Fedak & Company, CPAs for providing auditing services. ($18,250.00 per year for three years – Budgeted – General Manager LaMoreaux/Finance Committee)

7.5) Consideration and possible action on approving a Professional Services Agreement with Exante 360 for providing consulting and project management services relative to the physical security and video surveillance infrastructure improvement project. ($58,730.00 - Non-budgeted – Engineering Manager Knudson)

7.6) Consideration and possible action on Board and staff attendance at conferences, seminars, and training sessions as follows:

a) Remote 2013 Monitoring & Control Conference to be held December 12 – 13, 2013 in Las Vegas, Nevada.

8) Information Items:

8.1) Reports of Directors: Meetings/Committee Meetings/General Report.

8.2) Report of General Manager.

a) District vacancies. (no changes)

b) Palmdale Recycled Water Authority status.

c) Monthly Department Reports.

d) Update on monitoring of wind turbine through Black & Veatch. (Engineering Manager Knudson)

8.3) Report of Attorney.

9) Public comments on closed session agenda matters.

10) Closed session under:

10.1) Government Code Section 54956.9(d)(1), pending litigation: *Antelope Valley Ground Water Cases.*

10.2) Government Code Section 54956.9(d)(1), pending litigation: *United States, et al. v. J-M Manufacturing Company, Inc., et al., United States District Court for the Central District of California Case No. ED CV06-0055-GW.*

10.3) Government Code Section 54956.9(d)(1), pending litigation: *Central Delta Water Agency vs. Department of Water Resources, Sacramento Superior Court Case No. 34-2010-80000561.*

10.4) Government Code Section 54956.9(d)(1), pending litigation: *Velez v. City of Palmdale, et al, Los Angeles Superior Court Case No. MC023216.*

11) Public report of any action taken in closed session.

12) Board members' requests for future agenda items.

13) Adjournment.

Dennis D. LaMoreaux

DENNIS D. LaMOREAUX,
General Manager

DDL/dd

AGENDA ITEM NO. 6.3

PALMDALE WATER DISTRICT

BOARD MEMORANDUM

DATE:	October 15, 2013	**October 23, 2013**
TO:	BOARD OF DIRECTORS	**Board Meeting**
FROM:	Mr. Matthew Knudson, Engineering Manager	
VIA:	Mr. Dennis LaMoreaux, General Manager	
RE:	***AGENDA ITEM NO. 6.3 - RATIFICATION OF CHANGE ORDER NO. 1 UNDER SPECIFICATION NO. 1101-A BEING THE CONSTRUCTION OF SITE IMPROVEMENTS FOR THE GRANULAR ACTIVATED CARBON ADSORPTION SYSTEM LOCATED AT THE UNDERGROUND BOOSTER STATION***	

Recommendation:

Staff recommends that the Board:

1. Ratify and accept Change Order No. 1 as submitted by B.V. Construction, Inc. in the not-to-exceed amount of $31,017.00; and

2. Authorize the General Manager to execute the attached Change Order No. 1 with B.V. Construction, Inc. for same.

Financial Impact:

The approved 2013 Budget includes $1,638,000 in expenditures under the Water Quality Expenses. The following is a summary of the expenses throughout the year that were charged to the Water Quality account.

GAC Replacements at WTP:	$ 868,432.00 (Calgon)
GAC Replacements at WTP:	$ 216,776.00 (Siemens)
Yard Piping Preparation:	$ 15,000.00 (PWD Material Costs)
Related Labor and Overhead:	$ 106,000.00 (PWD Labor/Overhead)
Geotechnical and Structural Design/Testing:	$ 7,000.00 (JT Engineering)
Concrete Vault	$ 4,135.00 (Old Castle)
One – 30,000 lbs. GAC Adsorption System:	$ 89,000.00 (Prominent)
Initial Supply of GAC for Adsorption System:	$ 39,985.00 (Siemens)
Specification No. 1101-A; Site Improvements:	$ 77,952.00 (BV Contract)
Proposed Change Order No. 1:	*$ 31,017.00 (BV Change Order)*
Total Water Quality Expenses in 2013:	$ 1,455,297.00

Background:

Proposed Change Order No. 1 consists of the following items:

- Addition of approximately 105' of 8" piping and 10-8" fittings
- Addition of 1-12" butterfly valve and 2-8" gate valves
- Addition of a 4'L x 4'W x 6.5'D precast concrete vault with traffic-rated lid
- Addition of a new bacteriological test station

Additional piping, valves, and fittings are necessary to accomplish the backwash and flushing procedures in a less costly and more expeditious manner. Addition of a concrete vault is necessary to accommodate the relocated chlorine injection quill. The location of the injection quill was changed to eliminate water quality issues associated with dosing directly into the 1.5 MG Underground Tank. The new bacteriological test station is necessary to accommodate the relocated point of chlorine injection.

Strategic Plan Element:

Strategic Goal 3.1 – Plan for Improvements of the existing water delivery infrastructure.

Supporting Documents:

- Change Order No. 1
- B.V. Construction, Inc. Cost Proposal

CHANGE ORDER

No. 1

PROJECT Construction of site improvements for the Granular Activated Carbon Adsorption System located at the Underground Booster Station

DATE OF ISSUANCE October 11, 2013 EFFECTIVE DATE October 11, 2013

OWNER Palmdale Water District

OWNER's Contract No. Specification No. 1101-A

CONTRACTOR Barnett Van Dyne Construction, Inc. ENGINEER P.W.D.

You are directed to make the following changes in the Contract Documents.

Description: *Addition of: Piping, valves, and fittings, concrete vault with traffic-rated lid, and bacteriological test station.*

Reason for Change Order: *Additional piping, valves, and fittings are necessary to accomplish the backwash and flushing procedures in a less costly and more expeditious manner. Addition of the concrete vault is necessary to accommodate the relocated chlorine injection quill. The location of the injection quill was changed to eliminate water quality issues associated with dosing directly into the 1.5 MG Underground tank. The new bacteriological test station is necessary to accommodate the relocated injection quill.*

Attachments: *B.V. Construction, Inc. Proposal*

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIMES:
Original Contract Price $ 77,952.00	Original Contract Times Completion: N/A
Net Changes from previous Change Orders No. 0 to No. 0 $ 0.00	Net Changes from previous Change Orders No. 0 to No. 0 N/A Days
Contract Price prior to this Change Order $ 77,952.00	Contract Times prior to this Change order Completion: N/A Days
Net Increase (decrease of this Change Order) $ 31,017.00	Net Increase (decrease of this Change Order) N/A Days
Contract Price with all approved Change Orders $ **108,969.00**	Contract Times with all approved Change Orders Completion: N/A

CHANGE ORDER

No. 1

PROJECT Construction of site improvements for the Granular Activated Carbon Adsorption System located at the Underground Booster Station

DATE OF ISSUANCE October 11, 2013 EFFECTIVE DATE October 11, 2013

OWNER Palmdale Water District

OWNER's Contract No. Specification No. 1101-A

CONTRACTOR Barnett Van Dyne Construction, Inc. ENGINEER P.W.D.

RECOMMENDED:	APPROVED:	ACCEPTED:
By: _____	By: _____	By: _____
PWD, Engineering Manager	PWD, General Manager	Contractor (Authorized Signature)
Date: 10/14/13	Date: _____	Date: 10-14-13

B.V. CONSTRUCTION INC.
GENERAL ENGINEERING / GENERAL BUILDING / HAZ.
CALIF. LIC. NO. 555781

PROPOSAL

PROPOSAL NO.
DATE:October 8, 2013

PROPOSAL SUBMITTED TO: PALMDALE WATER DISTRICT WORK TO BE PERFORMED AT: EL CAMINO G.A.C TANK PIPING 1101-A
NAME:PETER THOMPSON
STREET:
MAIL ADDRESS:
CITY:
STATE:CA.
PH.NO.:(661) 947-4111 EXT: 1040 FAX NO:

DATE OF PLANS:N/A
ARCHITECT:N/A
NAME:
STREET:
CITY: STATE: CA.

WE HEREBY PROPOSE TO FURNISH ALL THE MATERIALS AND PERFORM ALL THE LABOR NECESSARY FOR THE COMPLETION OF:**CHANGE FROM THE ORIGINAL SET OF PLANS ADDED EXTRA PIPING TO COMPLETE G.A.C TANK AT EL CAMINO DRIVE BOOSTER STATION. PLANS SUPPLIED BY PALMDALE WATER DISTRICT. SPEC # 1101-A**

EXTRA COST = $32,294.00
DEDUCT FOR SPECTACLE FLANGES = $ 1,277.00
TOTAL CHANGE ORDER FOR = $ 31,017.00

ALL MATERIAL IS GUARANTEED TO BE AS SPECIFIED, AND THE ABOVE WORK TO BE PERFORMED IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS SUBMITTED FOR ABOVE WORK AND COMPLETED IN A SUBSTANTIAL WORKMANLIKE MANNER **FOR THE SUM OF THIRTY ONE THOUSAND SEVENTEEN DOLLARS. ($31,017.00)**
THE PAYMENTS ARE TO BE MADE AS FOLLOWS: ADDED TO EXISTING CONTRACT

ANY ALTERATION OR DEVIATION FROM ABOVE SPECIFICATIONS INVOLVING EXTRA COSTS, WILL BE EXECUTED ONLY UPON WRITTEN ORDERS, AND WILL BECOME AN EXTRA CHARGE OVER AND ABOVE THE ESTIMATE. ALL AGREEMENTS CONTINGENT UPON STRIKES, ACCIDENTS OR DELAYS BEYOND OUR CONTROL. OWNER TO CARRY FIRE, TORNADO AND OTHER NECESSARY INSURANCE UPON ABOVE WORK. WORKMEN'S COMPENSATION AND PUBLIC LIABILITY INSURANCE ON ABOVE WORK TO BE TAKEN OUT BY; B.V. CONSTRUCTION INC.

PROPOSAL NO: CONTINUED.

"NOTICE TO OWNER"
(SECTION 7019-CONTRACTORS LICENSE LAW)

UNDER THE MECHANICS' LIEN LAW, ANY CONTRACTOR, SUBCONTRACTOR, LABORER, MATERIAL MAN OR OTHER PERSON WHO HELPS TO IMPROVE YOUR PROPERTY AND IS NOT PAID FOR HIS LABOR, SERVICES OR MATERIAL, HAS A RIGHT TO ENFORCE HIS CLAIM AGAINST YOUR PROPERTY.

UNDER THE LAW, YOU MAY PROTECT YOURSELF AGAINST SUCH CLAIMS BY FILING, BEFORE COMMENCING SUCH WORK OR IMPROVEMENT, AN ORIGINAL CONTRACT FOR THE WORK OF IMPROVEMENT OR A MODIFICATION THEREOF, IN THE OFFICE OF THE COUNTY RECORDER OF THE COUNTY WHERE THE PROPERTY IS SITUATED AND REQUIRING THAT A CONTRACTOR'S PAYMENT BOND BE RECORDED IN SUCH OFFICE. SAID BOND SHALL BE IN A AMOUNT NOT LESS THAN FIFTY PERCENT (50%) OF THE CONTRACT PRICE AND SHALL, IN ADDITION TO ANY CONDITIONS FOR THE PERFORMANCE OF THE CONTRACT, BE CONDITIONED FOR THE PAYMENT IN FULL OF THE CLAIMS OF ALL PERSONS FURNISHING LABOR SERVICES, EQUIPMENT OR MATERIALS FOR THE WORK DESCRIBED IN SAID CONTRACT.

RESPECTFULLY SUBMITTED:

BARNETT VANDYNE CONSTRUCTION INC. dba: B.V. CONSTRUCTION (INC.)

PER Brent Barnett

(SIGNATURE)

STATE LIC. NO. 555781

NOTE— THIS PROPOSAL MAY BE WITHDRAWN BY US IF NOT ACCEPTED WITHIN 30 DAYS.

CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTOR'S STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS STATE LICENSE BOARD, (3132 BRADSHAW ROAD,) SACRAMENTO, CALIFORNIA. (MAILING ADDRESS: P.O. BOX 26OOO, SACRAMENTO, CALIFORNIA 95826.)

ACCEPTANCE OF PROPOSAL

THE ABOVE PRICES, SPECIFICATIONS AND CONDITIONS ARE SATISFACTORY AND ARE HEREBY ACCEPTED. YOU ARE AUTHORIZED TO DO THE WORK AS SPECIFIED. PAYMENT WILL BE MADE AS OUTLINED ABOVE.

ACCEPTED_____ **SIGNATURE**_____
(NAME AND TITLE)

DATE_____ **SIGNATURE**_____

AGENDA ITEM NO. 7.1

PALMDALE WATER DISTRICT

BOARD MEMORANDUM

DATE: October 15, 2013 **October 23, 2013**

TO: BOARD OF DIRECTORS **Board Meeting**

FROM: Mr. Matthew R. Knudson, Engineering Manager

VIA: Mr. Dennis D. LaMoreaux, General Manager

RE: ***AGENDA ITEM NO. 7.1 – PUBLIC HEARING REGARDING RESOLUTION NO. 13-12, RESOLUTION OF THE BOARD OF DIRECTORS OF PALMDALE WATER DISTRICT MODIFYING THE POLICY REGARDING CAPITAL IMPROVEMENT FEES FOR NEW WATER SERVICE CONNECTIONS AND ADOPTING NEW WATER SUPPLY FEE***

Background:

Pursuant to Government Code Section 66017, the notice and public hearing requirements of Government Code Section 66016 apply to adoption of a new development fee, such as the proposed modifications to the Capital Improvement Fee and adoption of a new Water Supply Fee. Staff has taken the following steps in order to comply with said noticing requirements:

- August 12, 2013 - District staff provided and reviewed with City of Palmdale staff a copy of the public workshop presentation.

- August 12, 2013 - The District held a public workshop and staff presented the background, need, and methodology used to calculate the proposed modifications to the Capital Improvement Fee and implementation of new Water Supply Fee.

- September 3, 2013 - District staff met with representatives of Building Industry Association (BIA) and KB Home to discuss proposed fee modifications, review current water supply availability, and water demands.

- September 25, 2013 - District staff met with a representative of BIA to review water supply availability and water demands, and review fees charged by other public water suppliers in the Antelope Valley.

- October 8, 2013 - District staff sent letter to BIA, City of Palmdale Planning, and Los Angeles County Regional Planning informing them of the Public Hearing and proposed Resolution No. 13-12.

- October 11, 2013 - Water Supply and Reliability Committee met to discuss proposed fee modifications and to talk through questions presented by BIA and The Epic Companies.

- The public hearing on October 23, 2013 has been advertised as required by the government code in the Public Notice section of the Antelope Valley Press (October 13 and 20, 2013).

Supporting Documents:

- Copy of "Notice of Public Hearing" published in A.V. Press
- Copy of letter to Building Industry Association
- Copy of letter to City of Palmdale Planning Department
- Copy of letter to Los Angeles County Regional Planning

PALMDALE WATER DISTRICT
NOTICE OF PUBLIC HEARING
FOR
MODIFYING PALMDALE WATER DISTRICT'S POLICY REGARDING CAPITAL IMPROVEMENT FEES FOR NEW WATER SERVICE CONNECTIONS AND ADOPTING NEW WATER SUPPLY FEE

NOTICE IS HEREBY GIVEN that Palmdale Water District will hold a public hearing on October 23, 2013, at 7:00 p.m., or as soon thereafter as the matter may be heard, in the Board room of Palmdale Water District's office at 2029 East Avenue Q, Palmdale, California 93550, to consider adoption of modifications to the District's existing Policy Regarding Capital Improvement Fees for New Water Service Connections, including adoption of a new Water Supply Fee to be applicable to new water service connections that may be constructed within the District's service area.

Specifically, the District's Board of Directors will be considering modifying the existing Capital Improvement Fee policy and including a water supply component.

In addition, relevant documents may be reviewed at the District office located at 2029 East Avenue Q, Palmdale, CA 93550.

For further information regarding this matter, you may contact Mr. Matthew Knudson, Engineering Manager, at Palmdale Water District, at (661) 456-1018.

Written comments are requested by the close of business on October 22, 2013, but in all events by the end of the public hearing.

PALMDALE WATER DISTRICT

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ACWA

Board of Directors

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KATHY MAC LAREN
Division 4

STEVE R. CORDOVA
Division 5

October 8, 2013

VIA FAX AND U.S. MAIL

Ms. Marta Golding Brown
BUILDING INDUSTRY ASSOCIATION
Los Angeles/Ventura Chapter
44903 10th Street West
Lancaster, CA 93534

RE: PALMDALE WATER DISTRICT – PROPOSED WATER SUPPLY FEE

Dear Sir/Madam:

Pursuant to subdivision (a) of Government Code Section 66016, this letter provides you with written notice that the Palmdale Water District Board of Directors will be considering adoption of a new Water Supply Fee and modification to the existing Capital Improvement Fee at the regular Board of Directors' meeting to be held at 7:00 p.m. on Wednesday, October 23, 2013 at the District's office located at 2029 East Avenue Q, Palmdale, California.

The proposed Water Supply Fee would be imposed on development projects within the District's service area to cover the cost of water resources and related infrastructure necessitated by a particular development project. Existing data pertaining to the proposed Water Supply Fee is available for review at the District's office. Any additional data indicating the amount of the estimated costs expected to be required to provide the service for which the Water Supply Fee will be levied and the revenue sources anticipated to provide such service will be available for public review at the District office starting on October 14, 2013.

Please contact the District's Engineering Manager, Matthew Knudson, at (661) 456-1018 if you have any questions regarding this matter.

Very truly yours,

MATTHEW R. KNUDSON, Engineering Manager
MRK/dd
cc: Mr. Dennis LaMoreaux, Palmdale Water District General Manager

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October 8, 2013

VIA FAX AND U.S. MAIL

CITY OF PALMDALE
Planning Department
ATTN: Mr. Richard Kite
38250 Sierra Hwy.
Palmdale, CA 93550

RE: PALMDALE WATER DISTRICT – PROPOSED WATER SUPPLY FEE

Dear Sir/Madam:

Pursuant to subdivision (a) of Government Code Section 66016, this letter provides you with written notice that the Palmdale Water District Board of Directors will be considering adoption of a new Water Supply Fee and modification to the existing Capital Improvement Fee at the regular Board of Directors' meeting to be held at 7:00 p.m. on Wednesday, October 23, 2013 at the District's office located at 2029 East Avenue Q, Palmdale, California.

The proposed Water Supply Fee would be imposed on development projects within the District's service area to cover the cost of water resources and related infrastructure necessitated by a particular development project. Existing data pertaining to the proposed Water Supply Fee is available for review at the District's office. Any additional data indicating the amount of the estimated costs expected to be required to provide the service for which the Water Supply Fee will be levied and the revenue sources anticipated to provide such service will be available for public review at the District office starting on October 14, 2013.

Please contact the District's Engineering Manager, Matthew Knudson, at (661) 456-1018 if you have any questions regarding this matter.

Very truly yours,

MATTHEW R. KNUDSON, Engineering Manager
MRK/dd
cc: Mr. Dennis LaMoreaux, Palmdale Water District General Manager

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Division 5

October 8, 2013

VIA FAX AND U.S. MAIL

LOS ANGELES COUNTY
Department of Regional Planning
ATTN: Sorin Alexanian, Deputy Director, Current Planning Division
320 West Temple Street, 13th Floor
Los Angeles, CA 90012

RE: PALMDALE WATER DISTRICT – PROPOSED WATER SUPPLY FEE

Dear Sir/Madam:

Pursuant to subdivision (a) of Government Code Section 66016, this letter provides you with written notice that the Palmdale Water District Board of Directors will be considering adoption of a new Water Supply Fee and modification to the existing Capital Improvement Fee at the regular Board of Directors' meeting to be held at 7:00 p.m. on Wednesday, October 23, 2013 at the District's office located at 2029 East Avenue Q, Palmdale, California.

The proposed Water Supply Fee would be imposed on development projects within the District's service area to cover the cost of water resources and related infrastructure necessitated by a particular development project. Existing data pertaining to the proposed Water Supply Fee is available for review at the District's office. Any additional data indicating the amount of the estimated costs expected to be required to provide the service for which the Water Supply Fee will be levied and the revenue sources anticipated to provide such service will be available for public review at the District office starting on October 14, 2013.

Please contact the District's Engineering Manager, Matthew Knudson, at (661) 456-1018 if you have any questions regarding this matter.

Very truly yours,

MATTHEW R. KNUDSON, Engineering Manager
MRK/dd
cc: Mr. Dennis LaMoreaux, Palmdale Water District General Manager

AGENDA ITEM NO. 7.2

P A L M D A L E W A T E R D I S T R I C T

B O A R D M E M O R A N D U M

DATE: October 17, 2013 **October 23, 2013**

TO: BOARD OF DIRECTORS **Board Meeting**

FROM: Mr. Matthew Knudson, Engineering Manager

VIA: Mr. Dennis D. LaMoreaux, General Manager

RE: ***AGENDA ITEM NO. 7.2 – CONSIDERATION AND POSSIBLE ACTION TO ADOPT RESOLUTION NO. 13-12, RESOLUTION OF THE BOARD OF DIRECTORS OF PALMDALE WATER DISTRICT MODIFYING THE POLICY REGARDING CAPITAL IMPROVEMENT FEES FOR NEW WATER SERVICE CONNECTIONS AND ADOPTING NEW WATER SUPPLY FEE.***

Recommendation:

Staff recommends that the Board:

1. Adopt Resolution No. 13-12, Resolution of the Board of Directors of Palmdale Water District modifying the policy regarding Capital Improvement Fees for new water service connections and adopting new Water Supply Fee; and

2. Accept and file the Water Supply Fee Analysis dated October 17, 2013 prepared by Carollo Engineers.

Background:

In order for the District to continue issuing Water Service Availability Letters and allowing the connection of new services to the water system, the District must establish an equitable revenue source that will fund the development and/or acquisition of new water sources based on identified needs. The District tracks historical and future water supply and demand within our service area through various planning documents. The attached table entitled "Palmdale Water District Water Supply and Availability" summarizes historical supply and demand. The table also shows that based on the current reliability of the available water resources, the District must acquire new water sources to support future service connections.

Earlier this year, the District retained the services of Carollo Engineers to perform a Water Supply Fee Analysis which outlined the overall methodology and fee development process. The findings of said analysis are founded on PWD's 2010 Strategic Water Resources Plan (SWRP). The SWRP identified future service area water demands and the potential water resource options available to the District in order to meet the increased water demands.

Staff and Carollo Engineers presented the draft findings to the Board at a public workshop on August 12, 2013. The presentation had two options, one that looked at the total costs to supply a total of 35,000 acre-feet per year (AFY) and the second option looked at the costs to supply the first 14,000 (AFY). Following the presentation, there were several meetings and discussions with the Building Industry Association (BIA) and representatives from the building community regarding the two options, water supply planning, water

service availability letters, and implementation of the new policy. Staff felt that those meeting were very productive and after some additional review of the two options, staff is recommending the Board adopt Resolution No. 13-12, which incorporates the second option as presented at the workshop.

Resolution No. 13-12 and Table 1 under Appendix H incorporates the proposed modifications to the existing Capital Improvement Fees and includes the new Water Supply component of said fees. At the October 11, 2013 Water Supply and Reliability Committee meeting, it was discussed to allow the increase in fees to be spread out over the next couple of years, therefore, the following table summarizes the proposed fees for the period of January 1, 2014 – December 31, 2014.

CAPITAL IMPROVEMENT FEE (EFFECTIVE JANUARY 1, 2014-DECEMBER 31, 2014)
(PER SINGLE-FAMILY DWELLING UNIT)

	EXISTING		PROPOSED		
SERVICE ZONE	INFRASTRUCTURE ($/EDU)	WATER SUPPLY ($/SFDU)	INFRASTRUCTURE ($/EDU)	WATER SUPPLY* ($/SFDU)	TOTAL
2800' & 2850'	$7,351	N/A	$1,441	$7,288	$8,729
2950' & 3000'	$7,192	N/A	$1,161	$7,349	$8,510
3200' & 3250'	$14,504	N/A	$9,089	$7,041	$16,130
3400' & 3400'+	$17,689	N/A	$12,274	$7,041	$19,315

*FEE BASED ON TYPICAL SFR DEMAND (0.79 AFY)

CAPITAL IMPROVEMENT FEE (EFFECTIVE JANUARY 1, 2014-DECEMBER 31, 2014)
(COMMERCIAL /INDUSTRIAL)

	EXISTING		PROPOSED		
SERVICE ZONE	INFRASTRUCTURE ($/EDU)	WATER SUPPLY ($/AFY)	INFRASTRUCTURE ($/EDU)	WATER SUPPLY* ($/AFY)	TOTAL
2800' & 2850'	$7,351	N/A	$1,441	$10,970	BASED ON EDU'S & AFY
2950' & 3000'	$7,192	N/A	$1,161	$10,970	
3200' & 3250'	$14,504	N/A	$9,089	$10,970	
3400' & 3400' +	$17,689	N/A	$12,274	$10,970	

* BASED ON FORECASTED AFY DEMAND

For the period of January 1, 2015 – December 31, 2015, the fees will increase to the amounts shown in the following table, plus the percentage based on the published Construction Cost Index for the comparable time frame, plus the difference in the amount of the fee between Year-1 and Year-2 that would have been collected by all new connections during Year-1 and spread out over the remaining single family dwelling units within the 14,000 AFY water supply.

CAPITAL IMPROVEMENT FEE (EFFECTIVE JANUARY 1, 2015-DECEMBER 31, 2015)
(PER SINGLE-FAMILY DWELLING UNIT)

	EXISTING		PROPOSED		
SERVICE ZONE	INFRASTRUCTURE ($/EDU)	WATER SUPPLY ($/SFDU)	INFRASTRUCTURE ($/EDU)	WATER SUPPLY* ($/SFDU)	TOTAL
2800' & 2850'	$7,351	N/A	$1,441	$8,665	$10,106
2950' & 3000'	$7,192	N/A	$1,161	$8,665	$9,826
3200' & 3250'	$14,504	N/A	$9,089	$8,665	$17,754
3400' & 3400'+	$17,689	N/A	$12,274	$8,665	$20,939

*FEE BASED ON TYPICAL SFR DEMAND (0.79 AFY)

CAPITAL IMPROVEMENT FEE (EFFECTIVE JANUARY 1, 2015-DECEMBER 31, 2015)
(COMMERCIAL /INDUSTRIAL)

	EXISTING		PROPOSED		
SERVICE ZONE	INFRASTRUCTURE ($/EDU)	WATER SUPPLY ($/AFY)	INFRASTRUCTURE ($/EDU)	WATER SUPPLY* ($/AFY)	TOTAL
2800' & 2850'	$7,351	N/A	$1,441	$10,970	BASED ON EDU'S & AFY
2950' & 3000'	$7,192	N/A	$1,161	$10,970	
3200' & 3250'	$14,504	N/A	$9,089	$10,970	
3400' & 3400' +	$17,689	N/A	$12,274	$10,970	

* BASED ON FORECASTED AFY DEMAND

After December 31, 2015, the fees will be adjusted annually by the percentage based on the published Construction Cost Index for the comparable time frame.

Strategic Plan Element:

The specific elements of the Strategic Plan addressed are (Ensure adequate water supplies for future and existing customers) Strategic Goal 2.1, (Improve reliability of groundwater) Strategic Goal 2.2, (Develop recycled water as a water source) Strategic Goal 2.3.

Budget:

Once the modified Capital Improvement Fee and Water Supply Fee is in place, the District will segregate the revenues derived from said fees and hold and account for them as specified in Government Code Sections 66001 and 66006. The revenue generated by theses fees will only be used on water supply acquisitions and projects associated with new water supply related to new development.

Supporting Documents:

- Resolution No. 13-12, including Table I of Appendix H
- Water Supply Fee Analysis, prepared by Carollo Engineers
- Palmdale Water District Water Supply and Availability Spreadsheet

RESOLUTION OF THE BOARD OF DIRECTORS OF PALMDALE WATER DISTRICT MODIFYING THE POLICY REGARDING CAPITAL IMPROVEMENT FEES FOR NEW WATER SERVICE CONNECTIONS AND ADOPTING NEW WATER SUPPLY FEE

RESOLUTION NO. 13-12

WHEREAS, following an update of its master plan in 1989, Palmdale Water District ("District") adopted a Capital Improvement Plan ("CIP") and a Capital Improvement Fee Policy ("Policy") which is set forth in Exhibit "H" to the District's Rules and Regulations; and

WHEREAS, the Policy established Capital Improvement Fees ("CIF") to be paid in connection with new service connections within the District's service area; and

WHEREAS, the new capital improvements identified in the CIP are the basis for determining the CIF under the Policy; and

WHEREAS, the purpose of the CIF is to create a fund to finance the estimated reasonable cost of capital improvements shown on the CIP to meet anticipated demand for water service arising from new connections; and

WHEREAS, as required under California Government Code Section 66002(b), the District has annually reviewed and, when necessary, updated the CIP and, based upon changes to the CIP, has modified the Policy and adjusted the CIF in accordance therewith; and

WHEREAS, since the initial planning period for the CIP would have expired in 1996, the District engaged Montgomery Watson in June, 1995, to review, study and update its master plan and to make recommendations to modify the CIP to meet projected needs and demands through the year 2005; and

WHEREAS, in January, 1996, Montgomery Watson submitted its final report entitled Water System Master Plan ("1996 Master Plan"), which report, among other things, made recommendations concerning the CIP to meet projected growth and development through year 2005; and

WHEREAS, on September 19, 1996, the District adopted the 1996 Master Plan which contained an updated CIP; and

WHEREAS, the 1996 Master Plan constituted an updating of the CIP, which update included the identification of recommended capital improvements to the District's water system and the estimated cost of constructing the capital facilities required to accommodate projected growth and development through year 2005; and

WHEREAS, following properly noticed and conducted public hearings in 1997, 1998, 1999, and 2000, the District duly adopted resolutions which updated the Capital Improvement Policy and modified the CIF; and

WHEREAS, in 2000, the District retained Montgomery Watson to review, study, and update the 1996 Master Plan and, among other things, make recommendations concerning the CIP to meet projected needs through year 2010; and

WHEREAS, in March 2001, Montgomery Watson submitted its final report entitled Water System Master Plan ("2001 Master Plan") including recommended modifications of the CIP, and the District has approved that report and adopted it as the District's 2001 Master Plan; and

WHEREAS, following properly noticed and conducted public hearings in 2001, 2002, 2003, 2004, 2005, and 2006 the District adopted Resolutions which updated the Capital Improvement Policy and modified the CIF; and

WHEREAS, in light of the economic slowdown which impacted growth and development within the District between 2007 and 2012, the District did not make changes to the CIP over those years; and

WHEREAS, following a properly noticed and conducted public hearing in March, 2013, the District adopted a Resolution which updated the Capital Improvement Policy and modified the CIF; and

WHEREAS, the District has adopted a Strategic Water Resources Plan ("SWRP"), which sets forth recommended water supply acquisitions and projects necessary to meet future anticipated growth within the District; and

WHEREAS, in 2013, the District retained Carollo Engineers to review, study, and calculate a proposed Water Supply Fee necessary to supply the next 14,000 acre feet per year of new water supply that will be necessary to meet anticipated growth and development within the District; and

WHEREAS, the purpose of the Water Supply Fee is to create a fund to finance the estimated reasonable cost of capital projects and water acquisitions necessary to meet anticipated demand for water service arising from new connections; and

WHEREAS, the District has considered the water supply costs and costs of constructing the capital facilities identified in the SWRP and CIP, and the impact on the existing capital improvement fees payable under the Policy and determined that the policy and the fees should be modified; and

WHEREAS, the District has given and published the required notices and conducted a public hearing with respect to the proposed modification of the Policy and CIF payable thereunder; and

WHEREAS, the Board of Directors of Palmdale Water District has found and determined that the establishment of capital improvement fees is exempt from the requirements of the California Environmental Quality Act pursuant to California Public Resources Code Section 21080(b)(8) and further has found and determined that said fees are for the purpose of obtaining funds for capital projects necessary to maintain service within existing service areas.

NOW, THEREFORE, BE IT RESOLVED that, the Board of Directors of Palmdale Water District hereby modifies and amends the Policy by deleting the existing Table 1 from Appendix "H" to the District's Rules and Regulations and inserting in place thereof proposed Table 1 attached hereto and incorporated herein.

FURTHER RESOLVED, that the General Manager of the District be and he hereby is, authorized and directed to implement this modified Policy until further order of the Board.

PASSED AND ADOPTED by the Board of Directors of the Palmdale Water District at a duly called and noticed public meeting of said Board held on October 23, 2013.

_____ _____

President (date)

_____ _____

Secretary (date)

APPENDIX H

CAPITAL IMPROVEMENT FEE

1. *Capital Improvement Fees per Article 10.07C:*

TABLE 1

2014 CAPITAL IMPROVEMENT FEE SUMMARY PER SERVICE ZONE (SINGLE FAMILY DWELLING UNIT)			
SERVICE / BENEFIT ZONE	**INFRASTRUCTURE ($/SFDU)**	**WATER SUPPLY* ($/SFDU)**	**TOTAL**
2800' & 2850'	$1,441	$7,288	$8,729
2950' & 3000'	$1,161	$7,349	$8,510
3200' & 3250'	$9,089	$7,041	$16,130
3400' & 3400' +	$12,274	$7,041	$19,315
*FEE BASED ON TYPICAL SFR DEMAND (0.79 AFY)			

2014 CAPITAL IMPROVEMENT FEE SUMMARY PER SERVICE ZONE (COMMERCIAL AND INDUSTRIAL)			
SERVICE / BENEFIT ZONE	**INFRASTRUCTURE ($/EDU)**	**WATER SUPPLY* ($/AFY)**	**TOTAL**
2800' & 2850'	$1,441	$10,970	BASED ON EDU'S & AFY
2950' & 3000'	$1,161	$10,970	
3200' & 3250'	$9,089	$10,970	
3400' & 3400' +	$12,274	$10,970	
* BASED ON FORECASTED AFY DEMAND			

Engineers...Working Wonders With Water®

PROJECT MEMORANDUM

Project Name:	Water Supply Fee Analysis	**Date:**	10/17/2013
Client:	Palmdale Water District	**Project Number:**	09226A.00
Prepared By:	Pierce Rossum		
Reviewed By:	Tom West		
Subject:	Water Supply Fee Analysis		
Distribution:	Final		

Introduction and Background

The purpose of this memorandum is to provide the results of the Water Supply Analysis and outline the overall methodology and fee development process. For Palmdale Water District (PWD), providing clean and reliable water is an imperative public service. The purpose of this study is to develop a new revenue source (Water Supply Fee) to equitably fund the development or acquisition of future sources based on identified needs. Although PWD has numerous rates and charges, it does not have a cost recovery mechanism (fee) to fund the future development or procurement of additional water supplies. Furthermore, the new fee cannot be developed in a vacuum; instead, it must account for the District's existing rates and charges, and clearly identify the new purpose, methodology, and uses of revenues for the Water Supply Fee. Primarily, the proposed fee is designed to complement PWD's Capital Infrastructure Fee (CIF) and Water Rate Charges and provide that same costs were not being recovered twice.

The findings of this analysis are founded on PWD's 2010 Strategic Water Resources Plan (SWRP) and water and recycled water master plans. The SWRP identified service area demands and the potential water resource options available to PWD in order to meet a nearly doubling of demand. Using these studies as the foundation of the Water Supply Fee provides sound justification and creates an internal consistency throughout PWD's engineering and planning documents.

Furthermore, as PWD maintains existing water rates and capital charges, it is necessary to identify, account for, and allocate capital project, potential conservation, and recycled water offsets to achieve an equitable and cost-of-service based Water Supply Fee. Development of this fee was performed to be in conformance with existing policies and Government Code §66000.

Strategic Water Resources Plan

The SWRP was prepared to establish objectives and indentify necessary steps in order to meet the projected future needs of PWD's customers. It forecasted that over the next 25 years (2035), the population residing within PWD's service area would more than double. Anticipated supply needs to meet those demands would likewise double.

As detailed in the SWRP, PWD has a number of water resource options available to it in order to meet these needs. These options include imported water, groundwater, local runoff, recycled water, conservation, and water banking. The plan evaluated various combinations of these options with respect to a variety of factors including cost, reliability, flexibility, ease of implementation, and sustainability. It was through this evaluation process a recommended water resources strategy was developed.

Based on the projection need of an additional 35,000 acre-feet per year (afy) to service nearly 37,000 connections, the recommended Water Resources Strategy projected capital needs of $552 million. The majority of additional supplies would be acquired through additional imported water purchases and groundwater pumping.

Table 1 below summarizes the SWRP recommended capital costs associated with the proposed facilities.

Table 1 Summary of Capital Costs
Water Supply Fee
Palmdale Water District

Water Resource Element	Capital Cost[1]
Imported Water	$355,923,439
Groundwater Pumping	111,581,756
Groundwater Recharge	34,597,738
Recycled Water	49,820,207
Conservation	0
	551,923,140

Note:
(1) Capital costs provided in the SWRP have been escalated to 2013 dollars.

As disclaimed in the SWRP, the SWRP is not meant to be a static document. As existing and future demands can vary, it is important to regularly revisit assumptions and necessary capital needs. For the purposes of this Water Supply Fee, the capital and demand needs are used "as is" and have not been modified unless specifically noted in the document or technical analysis.

APPROACH

Given PWD's existing rate structure, two approaches to the fee design were analyzed and calculated for discussion. The methodologies vary slightly in purchased water costs and time horizon assumptions. The cost to secure and supply an acre-foot of water is calculated.

In addition, both approaches have some SWRP project costs that were excluded from the Water Supply Fee. Carollo reviewed detailed recycled water project costs and excluded expenditures related to directly provide service to an end user. Overall, 40 percent of the recycled water project costs were excluded (laterals, pumping stations, storage) and are intended to be recovered in a separate recycled water charge.

The first approach, referred to as the "35,000 Acre-Feet SWRP" alternative, is calculated directly from the costs and demand assumptions set forth in the SRWP. Under this approach, the SWRP's proposed capital projects costs (over 25-years) are divided by the forecasted new

supply. Simply put, it defines the cost associated to acquire 1.0 afy of water. Under this structure, the proposed fee would be $15,205 per afy (or $12,010 per single-family connection).

Table 2 calculates the 35,000 AF SWRP Fee alternative.

Table 2	**35,000 AF SWRP Fee Alternative Water Supply Fee Palmdale Water District**
Total Capital Cost	$551,923,140
Excluded Capital Cost	19,752,837
Total Recovered Capital	$532,170,302
New Supply (AFY)	35,000
Water Supply Fee (Per AFY)	$15,205
Note: (1) New water supply as projected in the SWRP	

Alternatively, as projecting capital needs and water demands to supply 35,000 AF over 25 years comes with a certain margin of error, Carollo proposes a fee based on a supplying the first 14,000 AF (roughly 10 years of forecasted demand). In addition, based on economic principles, it is assumed that more economical (cost per AF) projects are pursued first. Simply, the first 10,000 afy is less expensive to supply than the second 10,000 afy. As shown in Table 3, the project costs to supply the first 14,000 acre-feet are roughly 29% of the full SWRP, while providing 40% of the future water supply. The proposed fee under this approach would be $10,970 per afy (or $8,665 per single-family connection).

Table 3 shows the calculated 14,000 AF SWRP fee alternative.

Table 3	**14,000 AF SWRP Fee Alternative Water Supply Fee Palmdale Water District**
Total Capital Cost	$162,072,451
Excluded Capital Cost	8,512,861
Total Recovered Capital	$153,559,590
New Supply (AFY)	14,000
Water Supply Fee (Per AFY)	$10,970
Note: (1) Assumes 10,000 AF of imported water at $5,000 per AF. (2) New supply is straight lines new water supply over the 25 year time period	

As part of the development of this fee alternative, and for discussion purposes only, Carollo calculated the present value of the fee given the remaining 21,000 AF (to complete the SWRP).

Following the development of the first 10,000 AF, this preliminary fee would fund remaining water supply costs to development the residual 21,000 AF of the SWRP.

Table 4 shows the preliminary fee analysis provide the remaining 21,000 AF of the SWRP.

Table 4 — 21,000 AF SWRP Fee
Water Supply Fee
Palmdale Water District

Total Capital Cost	$321,209,542
Excluded Capital Cost	11,239,976
Total Recovered Capital	$309,969,566
New Supply (AFY)	21,000
Water Supply Fee (Per AFY)	$14,760

Note:
Water Supply Costs for the remaining 21,000 AF are at the same per unit costs as the Full SWRP; however, it reflects the purchase of water incurred in the 14,000 AF SWRP.

DEVELOPMENT OF WATER SUPPLIES

Based on discussion with District staff, Carollo analyzed the portion of the proposed fee related to the purchase of water and that portion directly related to capital.

Table 5 presents the percent of each fee alternative related to the development of water resources.

Table 5 — Water Supply Fee Allocation
Water Supply Fee
Palmdale Water District

	35,000 AF SWRP	14,000 AF SWRP	Remaining 21,000 AF SWRP
Percent of Fee Related to Water Supply	66.9%	32.6%	76.6%
Percent of Fee Related to Capital Costs	33.1%	67.4%	23.4%
Proposed Fee $/AF	$15,205	$10,970	$14,760
Proposed Fee $/Tier 1 (0.79AF)	$12,010	$8,665	$11,659

Note:
Water Supply Costs for the remaining 21,000 AF (35,000-14,000) are at the same per unit costs as the Full SWRP; however, it reflects the purchase of water incurred in the 14,000 AF SWRP.

Please note, the SWRP provides a comprehensive water supply portfolio to meet the future demands of the District. The purchase of additional water supplies alone does not fully meet the District's desired water supply, reliability, and sustainability concerns. As such a capital

component of the proposed water supply fee is necessary to achieve the outlined SWRP objectives.

Rate Design Consistency

The proposed water supply fee is designed to mirror PWD's water rate structure. Under the existing budget-based tiered rate structure, each customer is budgeted a specific allotment of water in one of five-tiers. As a budget or allotment is exceeded, a user enters the next tier where water becomes more costly. This increase in costs is typically done to reflect the additional cost of acquiring additional water, additional energy use, or additional infrastructure needs.

As defined in the 2009 Water Rate Study, Tiers 2 through 5 include costs related to new water supplies and conservation. As a result, this approach is designed to capture water acquisition costs related only to a Tier 1 allotment.

The proposed Single-Family fee is defined by a typical SFR parcel. For Single-Family, the Tier 1 allotment up to 100% of its combined indoor and outdoor allocations. A user's indoor allocation is standardized at an assumed 4 residents consuming 66 gallons per capita per day. This is roughly 10.73 hundred cubic feet (hcf) 0.3 afy. To calculate the outside allotment, Carollo assumed a typical lot size of 8,000 square feet (consistent with the Water Rate Study). Based on the calculated irrigable area, landscape factor, conservation factor, and historical evaportranspiration (ETo), the typical outside allotment is 17.94 hcf or 0.49 afy. Combine indoor and outdoor allotments equate to a monthly volume of 28.7 hcf or 0.79 afy.

This assumption assumes each new connection pays immediately for a "baseline" amount of supply and will pay overtime for additional needs through tiers 2-5. Under this structure, the proposed fee would be $8,700 per single-family connection.

A non-residential customer's fee would be based on its forecasted annual water demand. To provide equity between structures, the customers subsequent budget based allocation would be based on the forecasted annual demand.

SUMMARY

This is a point-in-time analysis with numerous capital and financial assumptions and water demand forecasts. The purpose of this fee is to provide that new customers establishing new connections pay for new supplies and the infrastructure to deliver those supplies. This includes funding new imported water acquisition, recharge and recovery facilities, and recycled water facilities. This fee does not include the capital costs of transmission, treatment, or distribution, as these charges are recovered in PWD's CIF. Furthermore, operation and maintenance costs related to the new supplies are set to be recovered in PWD's monthly water rates and charges.

Table 6 outlines the projected water supply fee for each alternative.

Table 6 Water Supply Fee by Meter Size
Water Supply Fee
Palmdale Water District

	35,000 AF Fee	14,000 AF Fee
Per AFY	$ 15,205	$ 10,970
Single-Family	12,010	$8,665

Note:
(1) Based on a typical single family, a SFR is allocated 0.79 afy

Palmdale Water District
Water Supply and Availability

I: Historical Water Supply, Production, and Consumption

Supply	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	10-Year Average
State Water Project	11,547	12,162	11,712	12,492	19,634	14,256	15,498	10,989	10,743	16,540	13,557
Groundwater	10,607	11,046	11,086	11,359	10,427	9,786	7,764	7,776	7,025	7,543	9,442
Littlerock Reservoir	3,499	3,659	6,999	4,173	-	3,045	79	1,861	2,569	-	2,588
Total	25,653	26,867	29,797	28,024	30,061	27,087	23,341	20,626	20,337	24,083	25,588
Production / Consumption	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**10-Year Average**
Production	24,911	25,646	26,128	27,930	28,151	25,339	22,310	19,768	19,600	21,459	24,124
Consumption	23,929	24,715	24,548	25,711	26,109	23,325	20,635	18,043	17,572	19,258	22,385
Active Connections	23,681	24,418	25,243	26,173	26,284	25,644	25,822	26,073	26,255	26,219	N/A
GPCD (12-Mo. Avg.)	230	229	222	223	225	198	183	157	151	161	198

II: Available Raw Water Supply Summary

State Water Project (60%)	Groundwater (10-Year Average)	Littlerock Reservoir (10-Year Average)	Evaporation	Total Available Supply
12,780	9,442	2,588	(1,250)	23,560

III: Water Supply based on 2020 GPCD Goal of 176

Total Available Supply	Demand Based on 176 GPCD	System Losses	Total Demand	Supply Available for Commitment	WSA Letter Commitments
23,560	22,670	1,814	24,484	(924)	47

October 3, 2013

P A L M D A L E W A T E R D I S T R I C T

B O A R D M E M O R A N D U M

DATE: October 16, 2013 **October 23, 2013**

TO: BOARD OF DIRECTORS **Board Meeting**

FROM: Mr. Jon M. Pernula, Water & Energy Resources Mngr.
Mr. Matthew Knudson, Engineering Manager

VIA: Mr. Dennis D. LaMoreaux, General Manager

RE: ***AGENDA ITEM NO. 7.3 – CONSIDERATION AND POSSIBLE ACTION ON APPROVING A PROFESSIONAL SERVICES AGREEMENT WITH KENNEDY/JENKS CONSULTANTS FOR PREPARATION OF PALMDALE WATER DISTRICT'S LITTLEROCK CREEK GROUNDWATER RECHARGE AND RECOVERY PROJECT FEASIBILITY STUDY***

Recommendation:

Staff and the Water Supply and Reliability Committee recommend that the Board:

1. Approve a Professional Services Agreement with Kennedy/Jenks Consultants for the preparation of Palmdale Water District's Littlerock Creek Groundwater Recharge and Recovery Project Feasibility Study in a not-to-exceed amount of $899,493.00; and

2. Authorize the General Manager to execute the Professional Services Agreement with Kennedy/Jenks Consultants for same.

Background:

In June, the District distributed Requests for Proposals (RFP's) to prepare a Feasibility Study for the proposed Littlerock Creek Groundwater Recharge and Recovery Project. The District initially received proposals from six respondents, out of which four firms were selected to be invited back to participate in a workshop/interview with the Water Supply and Reliability Committee. The purpose of the interview was to provide the selected firms a forum for presentations and further clarification on their individual proposals. District staff has reviewed the proposals and interview results with careful evaluation and due consideration of response to the listed tasks in the RFP. After detailed consideration, it is staff's recommendation to select Kennedy/Jenks Consultants to perform this work.

The not-to-exceed amount shown above incorporates the proposed base study cost of $798,643.00 and further includes potential optional task costs as follows:

INSAR Investigation:	$ 36,885.00
Water infiltration Tests:	$ 41,220.00
Geophysical Testing:	$ 22,745.00
Total Optional Tasks Costs:	*$100,850.00*

The necessity of engagement in the listed optional tasks will be evaluated concurrent with progress of the Study, and if deemed requisite and intrinsic to completion of the Study, these tasks will be brought before the Water Supply and Reliability Committee for approval prior to initiating any optional work.

The total cost including optional tasks is not-to-exceed $899,493.00.

Strategic Plan Element:

The specific elements of the Strategic Plan addressed are (Ensure adequate water supplies for future and existing customers) Strategic Goal 2.1, (Improve reliability of groundwater) Strategic Goal 2.2, (Develop recycled water as a water source) Strategic Goal 2.3.

Budget:

This project will be funded through the 2013A Water Revenue Bonds, which has earmarked $1,500,000.00 for this project.

Supporting Documents:

- LCGRRP Feasibility Study Kennedy/Jenks proposal
- Summary of Proposals Received

Littlerock Creek Groundwater Recharge and Recovery Project (LCGRRP) - Feasibility Study

Consultant	Total Fee	Schedule	Key Staff	Sub-Consultant	Sub-Consultant Scope	Sub-Consultant Fee	Optional Tasks
Black & Veatch	$1,188,500	16 -Months	Steve Foellmi - PD Andrew Lazenby - PM Alan Rimer - Advisor James Strayer - QA/QC	Wildermuth	Hydrogeology	$388,720	InSAR - $102,200
				Cardno ENTRIX	Geophysics	$115,500	Website - $8,700
				Geo Digital	LiDAR		Stakeholder Interview - $20,700
				Katz	Public Relations	$58,200	
				Neva Ridge	InSAR	Optional	
				ESA	CEQA	$77,700	
					Total Sub-Costs:	**$640,120**	
Carollo	$899,536	22 - Months	Tom West - PIC David Rydman - PE Dennis Williams - Advisor Inge Wiersema - Advisor	Geoscience	Hydrogeology	$255,160	Monitoring Well Inst. - $242,252
				Provost & Pritchard	Advisor	$27,480	Local Scale Model - $39,382
				ESA	Environmental	$74,038	
				Geophysics	Geophysics	$150,000	
					Total Sub-Costs:	**$506,678**	
GEI	$1,427,846	20 - Months	Ron Schnabel - PM Marc Rozman - PIC	ESA	Environmental	$66,045	
				Cardno ENTRIX	Geophysics	$80,000	
				eurofinsUS	Water Quality	$27,500	
					Total Sub-Costs:	**$173,545**	
Kennedy/Jenks	$798,643	15 - Months	David Ferguson - PM Harold Glaser - PIC Lynn Takaichi - QA/QC	HELIX	Environmental	$48,150	InSAR - $36,885
				Mark Thomas & Company	LiDAR	$34,700	Water Infiltration Tests - $41,220
				Christensen Associates, Inc.	Flood Control & Road	$6,000	Geophysical - $22,745
				Foxall	InSAR	$15,000	
				earthforensics, inc.	Subsidence Modeling	$10,000	
				MIG, Inc.	Public Outreach	$32,900	
				Weck / Lawrence	Water Quality	$35,000	
					Total Sub-Costs:	**$181,750**	
MWH	$1,393,303	18 - Months	Victor Harris - PM Bill Swanson - Advisor Bill Leever - Advisor	Brown and Caldwell	Hydrogeology	$356,875	InSAR - $117,810
				Provost & Pritchard	Advisor	$127,765	Well Sampling - $31,065
				Paleo	Environmental Data	$5,750	Geophysics - $111,820
				Aspen	Environmental	$103,500	Field Surveys - $103,440
				Fugro	LiDAR	$34,500	
					Total Sub-Costs:	$628,390	
RMC	$1,328,511	18 - Months	Lyndel Melton - PM Brian Dietrick - DPM Dennis Williams - Advisor Tom Richardson - Advisor	Geoscience	Hydrogeology	$425,160	Monitoring Well Inst. - $217,490
				Nellor Environmental	Permitting	$20,900	Local Scale Model - $35,640
				ESA	Environmental	$66,045	
				M. Cubed	Economics	$30,000	
					Total Sub-Costs:	**$542,105**	

Proposal to prepare the

Littlerock Creek Groundwater Recharge and Recovery Project Feasibility Study



July 31, 2013

Kennedy/Jenks Consultants

Kennedy/Jenks Consultants

Engineers & Scientists

707 Wilshire Blvd., Suite 4700
Los Angeles, CA 90017
(213) 624-6180
FAX (213) 624-9894

31 July 2013

Mr. Matthew Knudson
Engineering Manager
Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

Subject: Proposal for the Littlerock Creek Groundwater Recharge and Recovery Project Feasibility Study

Dear Mr. Knudson,

Kennedy/Jenks will deliver a comprehensive feasibility study to define a constructible recharge and recovery project that can provide water supply reliability within three years.

Some of the advantages that the Kennedy/Jenks team brings to this project are:

Outstanding Water Resources Team with Current Local Knowledge

Our Project Manager, David Ferguson, has the breadth of water resources and water supply experience to understand and manage the range of science and engineering involved in large-scale groundwater recharge and recovery project; as proven with AVEK's Water Supply and Stabilization Program. In addition, we have selected specialized Task Leaders with in-depth knowledge in their respective areas, with Mary Lou Cotton for Water Demands and Supply, Mike Maley for Groundwater Modeling, and Walt McNab for Groundwater Quality Solute Transport. We have also brought our teaming partners from the successful AVEK water banking projects, including Helix Environmental, Converse Consultants, and Spectrum Geophysics, and we have teamed with MIG for Public Outreach who we are currently working with on Mojave Water Agency's Integrated Regional Water Management Plan (IRWMP). Technical specialty consultants have been added for LiDAR topographic survey, InSAR ground surface deformation investigations, isotope testing and dissolved gas analysis, subsidence, and creek diversion. Our team's technical expertise and knowledge, coupled with our local working experience will eliminate any learning curve and will provide an efficient analysis.

Practical, Results-Oriented Approach to Advance Your Project Forward

Our method of approach has been crafted to simultaneously provide for comprehensive coverage of all major project issues, while focusing on results in a practical, no-nonsense manner. All too often, groundwater programs stall or are victimized by budget overruns which impede their successful completion. Kennedy/Jenks has proposed an approach and scope of work which will address the technical, scientific, and engineering issues required to gain uniform stakeholder buy-in to the proposed program. As you review this proposal, you will see that a number of issues are approached by engaging in initial work first, and then determining if more

work and budget need to be expended, and whether the additional investment will generate worthwhile benefits that advance the project forward. We have successfully applied this approach with AVEK on their groundwater banking program, which has moved from study to design and implementation in three years.

A Highly Interactive Approach

We propose working closely with the District in a collaborative approach to address key issues as the project develops and a total of eight Stakeholder Meetings to obtain consensus on initial findings and preliminary recommendations from the stakeholder group. We have also included coordination and review meetings at key points with additional meetings for optional tasks, if desired by the District. This is planned to engage the right people at the right time. In addition, we have staggered the submittal schedule for TMs and report progress submittals to spread out the District's and stakeholder's reviews.

Unique Water Resources Qualifications

In addition to the strong qualifications of our water resources team, Kennedy/Jenks also brings unique experience in State Water Project and Department of Water Resources activities to the District. This will improve our ability to forecast availability and timing of surplus SWP supplies, as well as potential non-SWP transfer opportunities. Our team also has been instrumental in assisting clients in obtaining grants under State and Federally sponsored programs to offset the cost of project implementation.

We look forward to further discussions on this interesting and challenging project. Should you have any question, please contact our Project Manager, David Ferguson at 909-782-2896 or davidferguson@kennedyjenks.com.

Very truly yours,
KENNEDY/JENKS CONSULTANTS

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

David Ferguson, Ph.D., P.E.
Project Manager

Enclosure

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Appendix A - Detailed Resumes



Basic Qualifications



Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

Basic Qualifications

Leader in water and wastewater engineering in California for more than nine decades

Addressing water management challenges of California communities like the Palmdale Water District (District) is has been the hallmark of Kennedy/Jenks Consultants (Kennedy/Jenks). As a leader in California water and wastewater engineering for more than nine decades, Kennedy/Jenks has a proven track record of engineering performance. Since our founding in 1919, we have pioneered new water system technologies and designed applications for existing technology.

Kennedy/Jenks is a 425 member, employee-owned professional California corporation. Our firm currently maintains 24 offices throughout the western United States. Kennedy/Jenks is consistently ranked "excellent" through independent performance surveys. In Engineering News Record's 2013 Report of the Top 500 Firms in the U.S., Kennedy/Jenks is number 143.

Our multi-disciplined staff brings a solid background of experience and expertise to every project, providing planning, engineering and construction management services in water systems, water resource management, water quality, recycled water and wastewater delivery and treatment. The services we provide offer appropriate solutions tailored to the needs of our clients, and on a broader scale, to the communities our clients' serve. Our highly qualified professional staff includes:

- Civil, sanitary, chemical, mechanical, electrical, and structural engineers
- Architects
- Chemists/biologists
- Geologists/hydrogeologists
- CAD/GIS specialists
- Environmental scientists
- Technical and administrative staff to support these professionals.

The following is a list of recent award winning projects.

Kennedy/Jenks at a Glance

Legal Name of Firm:

Kennedy/Jenks Consultants, Inc.

Primary Contact:

David Ferguson, Ph.D., P.E.-
Project Manager

Address:

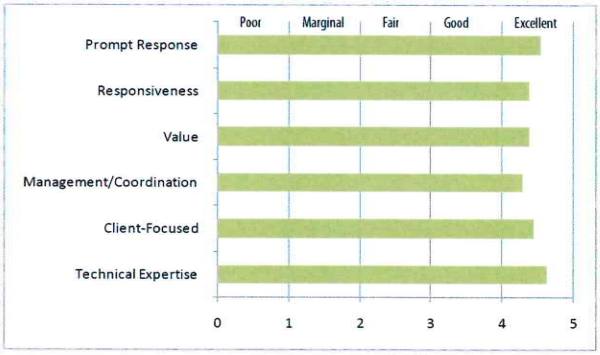
707 Wilshire Boulevard, Suite 4700
Los Angeles, CA 90017

Phone:

(213) 624-6180

Offices in Southern California:

Los Angeles
Oxnard
Bakersfield
Irvine
Temecula
San Diego



Kennedy/Jenks' team of engineers, scientists, managers, and administrative professionals, has a proven track record of performance as demonstrated through an independent survey of 140 clients.

Award Body/Year	Project
Honor Award - ACEC Oregon/2013	Gearhart Water Treatment and Supply Facilities Project
Environmental Communications Award – Grand Prize -AAEE/2012	Communicating Perspectives on Water Supply and Desalination Energy Use – Soquel Creek Water District and Santa Cruz Water District, CA
Local Track Silver Award - ACEC-Washington/2012	Wastewater Treatment Plant Upgrade and Expansion, City of Arlington, WA
Honor Award -ACEC-Oregon/ Local Track Silver Award - ACEC-Washington/2011	Wastewater Treatment Plant Upgrade and Expansion, City of La Center, WA
Sustainable Infrastructure and Partnership Special Award - ACEC – North Coast Chapter/2011	Santa Rosa Incremental Recycled Water – City of Santa Rosa, CA
Excellence in Engineering Award - PNWS-AWWA/2010	Ellsworth Booster Pump Station No. 2 and Transmission Main, City of Vancouver, WA
Merit Award ACEC-California 2010	Chevy Chase Reservoir and Booster Pump Station, City of Glendale, CA
Merit Award ACEC-California 2010	Lake of the Pines MBR Plant, Nevada County Sanitation District No. 1
Honor Award ACEC-Arizona	Avra Valley Sustainable Effluent Strategy, Pima County Wastewater Management Department
Honor Award ACEC-California/ 2009	GREAT Program Desalter, Oxnard, CA
Merit Award ACEC-California/ 2009	Climate Action Plan for Carlsbad Desalination Plant, Poseidon Resources, CA
Merit Award ACEC-California/ 2009	Bajamont Groundwater Treatment Facility, Carmichael Water District, CA
Grand Award, Planning AAEE/ACEC OR/ 2009	ACWA Energy Independence Project - Oregon ACWA

Kennedy/Jenks is an award-winning full service engineering firm with over 70 honors for clients' projects in the past three decades.

A History in Groundwater Management

Kennedy/Jenks teams have provided groundwater and conjunctive water supply solutions through groundwater recharge, extraction and treatment projects combining with water conveyance, groundwater banking and treated drinking water quality compliance that improve our clients' water portfolio reliability. Our groundwater modeling teams have provided services for predicting recharge residence time, in place blending and theoretical storage capacity for solutions that work. This modeling expertise includes development of groundwater basin management tools, contamination fate and transport predictions and informative animation and graphics for public and stakeholder outreach.

Our engineering teams have guided the siting, drilling, development and equipping of groundwater wells providing reliable service through simplified solutions. Unique to groundwater banking well design is the wide range of

pumping water levels controlling the well screen placement and the optimum pump performance conditions.

Throughout our history, Kennedy/Jenks has successfully provided professional consulting services for groundwater studies, investigations, well design and conjunctive use projects, as well as analysis of demands and requirements, water conservation, and capital improvement plans.

Whether the water is industrial waste, drinking water, wastewater, recycled water or stormwater; high public expectations, tougher regulatory requirements and changing physical environments present technical challenges and make compliance difficult.



David Ferguson, Ph.D., P.E.
Project Manager

Developing a groundwater resource entails a series of tasks, including analysis of the aquifer, design, drilling, testing, sampling, construction, and post-construction maintenance. Hydraulic analysis and the selection of well type and well design often prove to be the most important aspect of this process.

From exploratory drilling and determining geological conditions and groundwater characteristics to equipment selection and construction management, Kennedy/Jenks is able to select the most effective means to maximize yield and optimize water quality.



Lynn Takaichi, P.E.
QA/QC



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

A staff with proven experience and expertise in Groundwater Management

The Kennedy/Jenks team has substantial experience in the planning, design, and construction of capital improvement projects. **David Ferguson, Ph.D., P.E.,** will serve as **Project Manager** for this project. He has more than 33 years of experience in the planning, design, construction and operation of water/groundwater, infrastructure, as well as management and/or operation of three large water utilities in Southern California. David is currently serving as project manager for the Antelope Valley-East Kern Water Agency's Water Supply Stabilization Program which will provide water supply stabilization through banking and compliance with the Stage 2 Disinfectants/Disinfection ByProducts Rule by providing banked groundwater as an alternative water supply source during winter months when THM compliance is most challenging.



Peter Murphy, P.G.
QA/QC



Mike Maley, P.E.
GW Model Update



Walt McNab, Ph.D., P.G.
GW Quality
Solute Transport



Mary Lou Cotton, CCP
Water Demands

David is supported by a management team with the experience and expertise to provide a successful project for the District. **Harold Glaser, P.E.** will serve as **Principal-in-Charge**. Harold has served in this capacity for large public agency projects including a major nine year water resources, ecosystem, and natural resources management contract providing technical assistance in the areas of groundwater hydrogeology, ecosystem management, water rights, and environmental compliance.

Quality Assurance/Quality Control (QA/QC) is a necessity in all our projects. **Lynn Takaichi, P.E.**, and **Peter Murphy, P.G.** will provide QA/QC leadership for this project. Lynn has directed a wide range of water projects including water resource studies, water system master plans, water treatment investigations, water facilities design, and utility management plans. Peter has extensive experience managing, supervising and performing hydrogeologic, geologic, and environmental characterization projects.

Mary Lou Cotton, CCP, will lead our efforts in **Water Demands**. She has more than 20 years of experience with water agencies statewide, specifically in conducting water resource planning and management programs. Mary Lou assists the State Water Contractors in an advisory capacity on Bay-Delta matters and is also serving as the General Manager of the State Water Project Contractors Authority.

Critical to developing a successful project understanding is the translation of complex hydrogeologic analysis into plain language descriptions. Providing clear descriptions supported by logical analysis and a transparent and process-driven approach are key to gaining stakeholder support of the scientific study of groundwater movement within the District's project limits. Mike Maley, PE,, P.G., CHg and Walt McNab, Ph.D., P.G. bring exactly these skills to the team. **Mike Maley,** responsible for the **Groundwater Model Update,** has more than 25 years of engineering experience and has been working collaboratively to manage similar projects. **Walt McNab, Ph.D., P.G.,** will be responsible for **Groundwater Quality Solute Transport**. He has more than 22 years of experience with a wide range of issues in physical and chemical hydrogeology and soil science, particularly those involving coupled process phenomena.

A complete organization chart and brief summaries of the entire team are included in the next section, Specific Qualifications. Resumes of the team are included in Appendix A.

Specific Qualifications



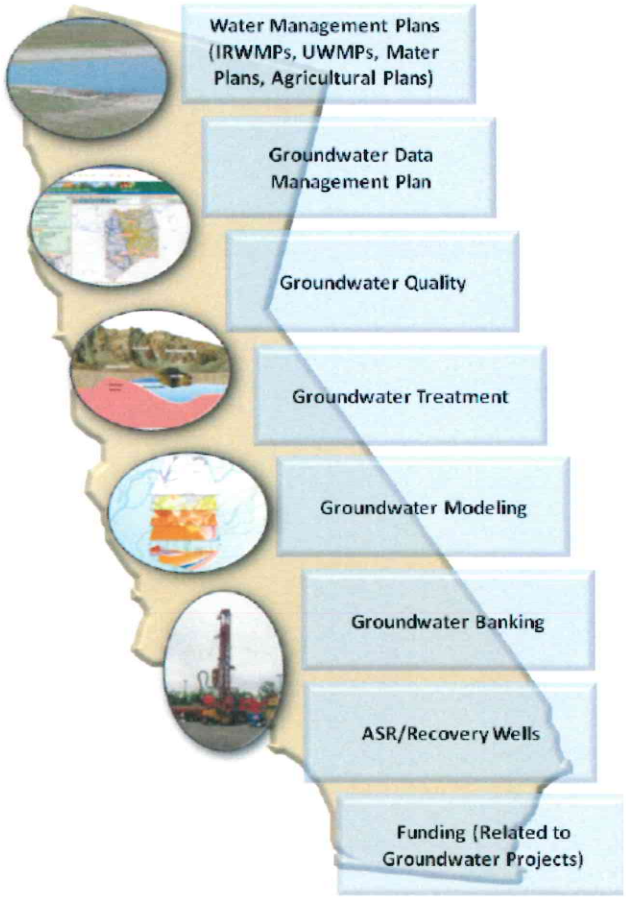
Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

Specific Qualifications

Leader in California Water Resources Planning and Engineering

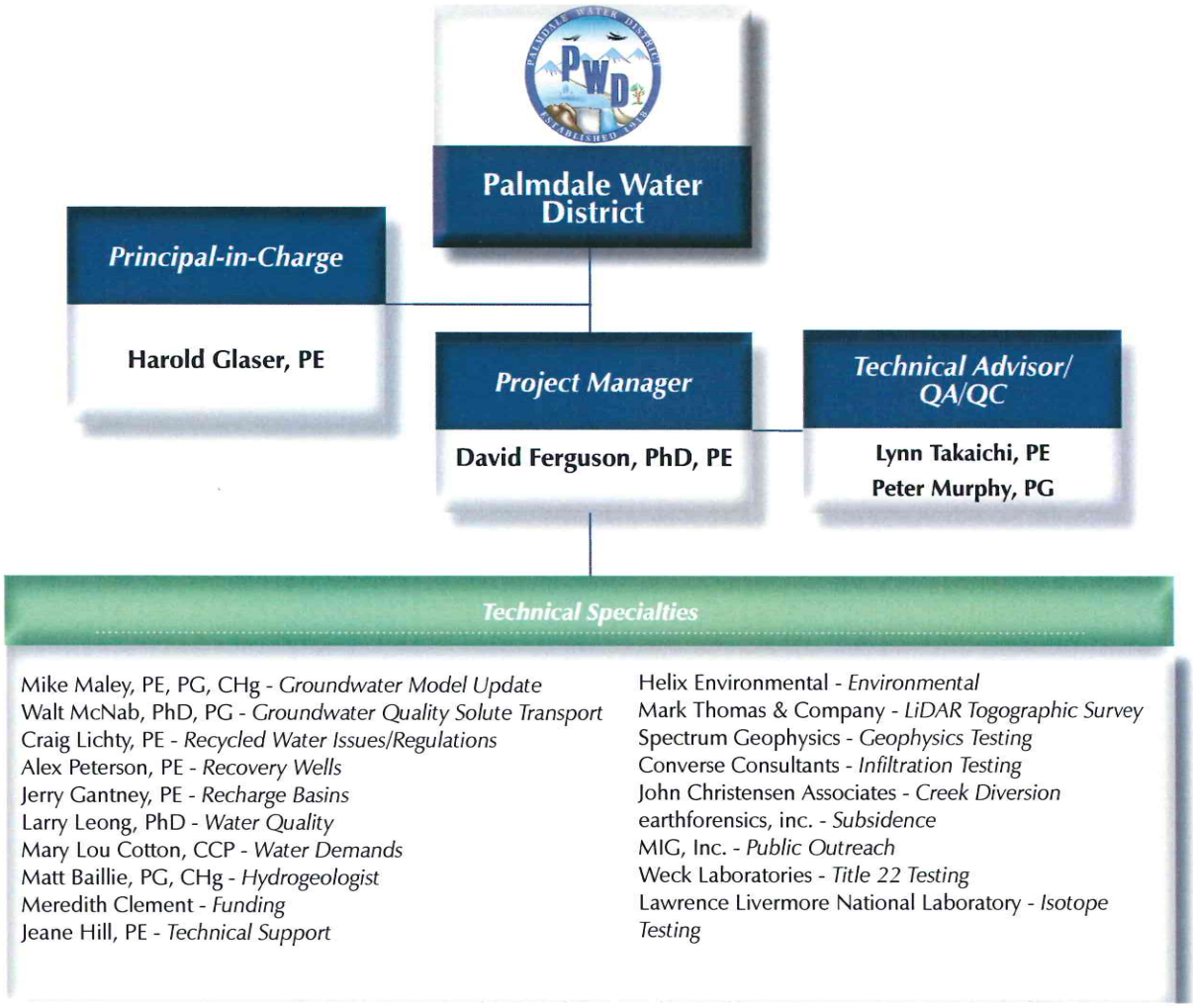
At Kennedy/Jenks, we believe a knowledgable, motivated project team is the primary element to the successful completion of this project. This is a complicated project and will require robust assessments combined with stakeholder coordination. Kennedy/Jenks offers the District such a team of experts with ample experience in groundwater resources and evaluations, hydrogeology, as wells as groundwater modeling and GIS capabilities. Our team has outstanding technical qualifications and the ability to communicate clearly to continually meet and exceed your expectations.



Anticipating an adjudicated safe yield allocation, all parties will be considering banking of imported water to ensure a sustainable "net" groundwater production to meet their customer's needs. The Littlerock Creek project is the largest of the projects identified in the District's banking vision and it's planning will set the bar for the process of evaluation, collaboration and development of consensus building going forward. Our team's combined technical experience of modeling, planning and development of capital project scenarios for surface water, storm water and reclaimed water recharge, conjunctive use and reuse will provide sound feasible solutions. The technical supporting documentation will describe the different recharge schemes and include cost opinions, environmental study and resource modeling demonstrating the overall feasibility of the LCGRRP.

Our team experience with groundwater risk evaluations, groundwater quality studies, municipal infrastructure improvements for conjunctive use, surface and groundwater treatment, permitting, and environmental assessment covers the full spectrum of skills needed to complete this work all within one company.

The Kennedy/Jenks' team to provide these results is shown in the Organization Chart demonstrating the depth of skills available to the District for all major skills to complete this work. A brief summary of the Key Staff experience follows the chart with fill resumes provided in Appendix A.





Project Management

David Ferguson, Ph.D., P.E.
Project Manager

Dr, Ferguson will provide the project management leadership necessary through his attention to quality, issues and resolutions to meld technical issues, robust solutions and broad stakeholder interests. David Ferguson has more than 33 years of experience in the planning, design, construction, and operation of water supply, infrastructure, and treatment projects. His background includes project and program management, as well as management of engineering and/or operations for three large water utilities in Southern California relying on a combination of groundwater and surface water to meet their needs. He has been responsible for the design of bid packages for a $30 million Phase 1 groundwater banking and blending program, as well as feasibility studies for developing groundwater basins as potable groundwater supply sources.

David's recent experience includes:

Project Manager, Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, CA - Hydrogeologic modeling, planning and design of 4 of 7 bid packages for the $30 million Phase 1 groundwater banking and blending program that will provide both water supply stabilization through banking and compliance with the Stage 2 Disinfectants/ Disinfection ByProducts Rule (D/DBP) for TTHM Control by providing potable groundwater as an alternative water supply source.

Project Manager, Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - Groundwater modeling, facility conceptual design and feasibility level planning for developing the Santa Monica and Hollywood groundwater basins as potable groundwater supply sources for the City of Los Angeles.

Project Engineer, Water Supply Study, City of Riverside, CA - Prepared a comprehensive water supply analysis and evaluation of 10 water supply alternatives, including a hydrogeologic investigation, water quality evaluation, review of water rights, technical feasibility, and financial analysis.

"David is an incredibly talented engineer and project manager. For the past 4 years [2006 – 2009] at Riverside he managed our Water Operations division and oversaw millions of dollars in pump station, well, and other construction and rehabilitation projects. I'm confident that, if selected, KJ and David would surpass expectations."

Kevin S. Milligan, P.E., Assistant General Manager / Water, City of Riverside Public Utilities



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

Harold will be responsible for providing guidance to the project manager to ensure he has the right resources to successfully complete this project. He will participate in critical meetings to keep a pulse on project progress and execution, and he will take an active role in making sure we are staying on track with budget and schedule deadlines.

Harold Glaser has 33 years of experience in civil and environmental engineering, information technology, and management consulting. He has served on the quality management team simultaneously for consultant projects performed for the Los Angeles Department of Water and Power, and the Metropolitan Water District of Southern California. In that capacity, he has had oversight responsibility for client service, project management, delivery, and performance of all technical assignments for these agencies. Harold's comprehensive water system design and management experience will benefit project quality and execution.

Relevant Project Experience

- **Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - Principal-in-Charge -** Groundwater modeling, facility level planning for developing the Santa Monica and Hollywood groundwater basins as potable groundwater supply sources for the City of Los Angeles.
- **Technical Services to Support Owens Valley Natural Resources Management, Los Angeles Department of Water and Power, CA - Principal-in-Charge -** Responsible for a nine year water resources contract including groundwater hydrogeology.
- **Integrated Resource Plan, Castaic Lake Water Agency, CA - Principal-in-Charge -** Responsible for plan development with consideration of multiple sources of water, including groundwater conjunctive use and water conservation.



Lynn Takaichi, P.E., QA/QC

Lynn Takaichi's experience with integrated planning, water banking and transfers, regulatory expertise and engineering knowledge will lend a well-balanced approach to project process.

Lynn is responsible for major planning and design projects, particularly assignments involving complex institutional and financial arrangements. He has directed a wide range of water projects including water resource studies, water system master plans, water treatment investigations, water facilities design and utility management plans.

Lynn has particular expertise in complex institutional arrangements and he works closely with specialized legal counsel, financial consultants, and water managers. His experience includes water agency formation, drafting of enabling legislation, negotiation of water supply and water service agreements, development of annexation policies and agreements, and management of a wide variety of water programs. He also has expertise in water system appraisals and has assisted numerous public agencies with the acquisition of investor-owned utilities.

Relevant Project Experience

- **Professional and Engineering Services, Charnock Groundwater Subbasin Restoration Project, City of Santa Monica, CA - Client Service Manager -** The project involved implementation of a water treatment system and other improvements that would help to remove groundwater contamination from the Charnock groundwater sub-basin and restore this resource as a water supply for the City of Santa Monica.
- **Integrated Sustainable Water Master Plan, City of Santa Monica, CA - Project Manager -** Integration of relevant components of existing plans and evaluation of the full range of supply and demand management options to develop an integrated Sustainable Water System Master Plan.
- **Antelope Valley Integrated Regional Water Management Plan, Los Angeles County, Department of Public Works, CA - Client Service Manager -** Provided water management strategy development, grant application preparation, and water management strategy integration and prioritization.



Peter Murphy, P.G., QA/QC

Peter has 35 years experience managing, supervising and performing hydrogeologic, geologic, and environmental characterization projects. His technical expertise is in the fields of hydrogeology, groundwater quality, and environmental characterization and remediation. At complex environmental sites, Peter has successfully combined traditional drilling and sampling techniques with direct push alternatives such as CPT/MIP and CPT/ ROS, downhole and surface geophysical methods, and alternative groundwater sampling techniques.

Relevant Project Experience

- **Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, CA - Geologist/ Contruction Manager -** for the drilling contract for 10 potable recovery wells; proveded interpretation of soils and logs to select screen intervals.
- **Lower VDC Recharge Pond Subsurface Investigation and Groundwater Analysis, Rancho California Water District, CA - Geologist -** Conducted a subsurface investigation and groundwater analysis to evaluate the use of vadose zone wells at the site.
- **Groundwater Monitoring Disposal, Twentynine Palms Water District, CA - Engineering Support -** Provided engineering services for preparation of a groundwater monitoring program.



Technical Support

Mike Maley, P.E., PG, CHg, Groundwater Model Update

Mike is both a licensed professional geologist and civil engineer with over 25 years of experience in water resources and environmental projects. He is an experienced project manager who has successfully managed large, complex projects. He has extensive experience in developing technical reports and working with regulatory agencies to resolve project issues. He has conducted and managed comprehensive hydrogeological evaluations that include groundwater, surface water and air modeling, field work coordination, well design and installation, aquifer testing and chemical sampling.

Relevant Project Experience

- **Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - Hydrogeologist -** Performed comprehensive groundwater assessment of groundwater resources in the Santa Monica and Hollywood Groundwater Basins.
- **Groundwater Management Plant Update, Twentynine Palms Water District, CA - Hydrogeologist -** Developed groundwater management objectives and strategies.
- **Groundwater Model Update, Mendocino City Community Services District, CA - Hydrogeologist -** Support ongoing groundwater management by development of Drought Contingency Plan.

Mike has extensive groundwater management experience including groundwater basin evaluations, sustainable yield estimates, water quality evaluations, groundwater-surface water interactions, and groundwater recharge programs. He has conducted comprehensive hydrogeological evaluations, ground water modeling, design and operation of remediation systems, field work coordination, well design and installation, aquifer testing and chemical sampling. He has developed basin-scale, integrated groundwater-surface water models throughout the Western United States. Through this work, he has evaluated the perennial yield and groundwater quality for many heavily-used groundwater basins for groundwater management plans in California. Mike has provided groundwater and water quality analysis for CEQA/NEPA support for large water resources and engineering projects. He has developed technical reports and worked with local, state, and federal regulatory agencies including presenting project information and resolving project issues.



Walt McNab, Ph.D., PG, Groundwater Water Quality Solute Transport

Dr. Walt McNab is an environmental geoscientist with more than 22 years of experience as a project manager, researcher, and consultant. His interests and experience span a wide range of issues in physical and chemical hydrogeology and soil science, particularly those involving coupled process phenomena. He has developed and applied numerical, analytical, and semi-analytical methods for simulating flow and transport processes in porous media to problems entailing variably-saturated fluid flow and reactive transport in a variety of environmental settings. Dr. McNab has directed or played leadership roles in projects that have included statistical studies of populations

Relevant Project Experience

- **Lawrence Livermore National Laboratory, CA - Environmental Scientist -** Provided technical leadership, conducted research, and published results for variety of groundwater environmental characterization and remediation projects funded by the DOE.
- **Source Remediation Technology Modeling Assess for Groundwater Restoration Program, Lawrence Livermore National Laboratory, CA - Task Leader-** Conducted a comparative analysis of the suitability for alternative remediation strategies for plume source areas.

of groundwater contaminant plumes, design and deployment of novel groundwater treatment technologies, construction of compartmentalized groundwater contamination source models, evaluation of water quality impacts associated with reservoir construction, artificial recharge and seepage from agricultural impoundments, modeling the impact of geologically sequestered CO2 on the geochemistry of formation minerals and wellbore cement as informed by experimental data, and radiological contamination assessments.



Craig Lichty, P.E.
Recycled Water Issues/ Regulations

Craig Lichty has 30 years of consulting experience associated with the development and implementation of water, wastewater and recycled water projects. This experience encompasses a variety of services in the areas of applied research, planning, program development, and facilities design and construction management. Craig's projects have addressed a wide variety of technical, public, institutional, and regulatory issues that have often led to the development of integrated water supply and wastewater management solutions on the local- and regional-level. He has served as project manager for recycled water projects ranging small to large public agencies, including a $6M study and siting analysis looking at the feasibility of relocating a 100+ mgd peak wet weather discharge of the Laguna Subregional water Reclamation System from the Laguna de Santa Rosa to locations along a 31-mile stretch of the Russian River.

Relevant Project Experience

- **Recycled Water Project, Redwood City/South Bayside System Authority, CA - Project Manager-** Feasibility study that included a market assessment, treatment evaluation, distribution evaluation, alternatives evaluation, life cycle cost comparison, recommended phased capital improvement program, and final report.
- **Incremental Recycled Water Program Discharge Compliance, City of Santa Rosa, CA - Project Manager -** $6M study and siting analysis looking at feasibility of relocation a 100+ mgd peak wet weather discharge.



Larry Leong, Ph.D.
Water Quality

Dr. Leong has extensive experience examining the fate and transport of environmental contaminants in air, water and soil. He has significant experience in four technical areas: water quality, air quality, hazardous wastes and laboratory consulting.

For the Water Environment Federation, his professional experience includes past member of the Editorial Advisory Board for Laboratory Solutions, a past member of the Reuse Committee, and the past chairmanship of the Air Quality Impacts Committee. He served on a WEF task force that published the Special Publication entitled "Emissions of Toxic and Related Air Pollutants from Wastewater Facilities," was on the organizing committee and a session moderator for the Second WEF Specialty Conference, Control of Odors and VOC Emissions, and co-chair of the WEF pre-conference workshop, "Complying with Clean Air Act Accidental Chemical Release Prevention Regulations".

Relevant Project Experience

- **Riverpark Groundwater Impact Study, City of Oxnard, CA - Task Leader-** Provided technical analysis for the water resources section of an EIR.
- **Perchlorate Treatment for Groundwater Supply, Castaic Lake Water Agency, CA - Technical Reviewer -** Provided peer review of all the deliverables for activities that included screening of alternatives for well-head treatment, pilot-scale testing, permitting, and preliminary design of a 2,000 gpm treatment facility.



Mary Lou Cotton, CCP
Water Demands

Mary Lou Cotton is a water resources planning and water conservation expert, with more than 20 years of management experience with water agencies statewide, specifically in conducting water resource planning and management programs including surface water and groundwater investigations; water transfer, banking and exchange transactions and agreements; water conservation planning and management; master planning and design studies; water quality and hazardous waste investigations; and supporting the preparation of CEQA Compliance documents and obtaining project permits. Ms. Cotton is working in an advisory capacity for several clients on a wide variety of water banking (supply reliability) programs, as well as water transfers or exchanges for short-term and long-term water supplies. In addition, Ms. Cotton assists the State Water Contractors in an advisory capacity on Bay-Delta matters and is also serving as the General Manager of the State Water Project Contractors Authority.

Relevant Project Experience

- **Integrated Regional Water Management Plan Assistance and Regional Acceptance Process Application, Kern County Water Agency, CA - Project Manager -** Assisted with preparation of plan with goal of linkage to IRWMPs prepared by other regions within the Kern County portion of the Tulare Lake Hydrologic Region.
- **Integrated Regional Water Management Plan, Mojave Water Agency, CA - Project Manager -** Comprehensive plan using a collaborative process that integrates public outreach, stakeholder involvement and coordination with local and regional agencies to identify Mojave region water challenges and opportunities.



Alex Peterson, PE
Recovery Wells

Alex is a registered civil engineer with 28 years of experience as an engineering consultant with extensive expertise in planning, design, bidding, and construction of water resources related infrastructure projects. He has provided consulting services ranging from small system improvements replacing exhausted infrastructure to regional projects involving multiple users, consensus building, and complex siting conditions using conventional and design/build contracting solutions.

Relevant Project Experience

- **Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, CA - Team Leader -** Siting and design of 10 extraction wells for groundwater banking recovery of water recharged through spreading basins.
- **Strand Ranch Recovery Facilities, Irvine Ranch Water District, CA - Technical Lead** on the design of nine aquifer storage and recovery wells.
- **Aquifer Storage and Recovery Wells, Rosedale/ Rio Bravo Water Management District, CA - Technical Lead -** Design of nine aquifer storage and recover wells.



Jerry Gantney, PE
Recharge Basins

Jerry Gantney has a broad background in the civil and sanitary engineering fields, specializing in preparing design plans and specifications, with 30 years of experience in designing wastewater and water treatment plants, and sanitary, potable, and reclaimed water pipeline projects. He has also provided engineering services for recharge basin improvements and groundwater production restoration of pipelines, as well as pipeline design, site design, grading plans, horizontal control plans, and yard piping plans, including highway and subdivision projects.

Relevant Project Experience

- **Recharge Basin Improvements, Inland Empire Utilities Agency, CA - Civil Engineer -** Design of upgrades and improvements to five recharge basins that receive a combination of water supplies for groundwater recharge.
- **Groundwater Production Restoration Pipeline Project, Castaic Lake Water Agency, CA - Civil Engineer -** Provided engineering services for design of the Pipelines to convey untreated groundwater from the Saugus Wells to a new groundwater treatment plant and restore lost capacity due to groundwater contamination.



Matt Baillie, PG, CHg
Hydrogeologist

Matt Baillie has experience with water resources consulting in California and Arizona, including groundwater basin studies and management programs, groundwater modeling, production well design and installation, and water quality investigations including isotope geochemistry. Matt has been involved with several recent groundwater basin studies including the development and application of basin-wide groundwater models for long-term groundwater management of water resources, engineering analysis of aquifer recharge programs, and evaluation of water quality issues. He has performed field and office work related to drilling, development, completion, and sampling of groundwater wells in California and Arizona.

Relevant Project Experience

- **Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, CA -** Helped construct a groundwater flow and transport model to evaluate movement of water and dissolved solids in aquifer beneath applied surface groundwater recharge.
- **Conjunctive Use Project, Santa Cruz County Department of Health Services, Santa Cruz, CA.** Applied MODFLOW model to evaluate a variety of potential methods to mitigate groundwater level declines in the Scotts Valley area.
- **Strand Ranch Recovery Facilities, Irvine Ranch Water District, CA. Technical Lead** on the design of nine aquifer storage and recovery wells.



Meredith Clement
Funding

Meredith has more than 13 years of environmental consulting experience on projects throughout California. She has special expertise with water planning projects, urban planning, and environmental compliance documentation, including the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). This skill set has proven valuable to clients seeking grants. Meredith has successfully applied for both federal (WaterSMART, EPA) and state grants (California Department of Public Health, Department of Water Resources).

Relevant Project Experience

- **Grant Administration Support, County of Ventura, CA. Grant Administrator** - Acting as administrator for 11 project proponents that successfully competed for Proposition 50 Integrated Regional Water Management Plan funding.
- **As-Needed Grant Support, Western Municipal Water District, CA - Project Manager -** Provided as-needed grant support services to actively minimize costs to its customers in identifying and completing grant applications for assistance with construction projects.



Jeane Hill, P.E.
Technical Support

Jeane Hill's engineering experience includes engineering work related to the planning, hydraulic design, CAD drafting, project management, construction and/or modification, and operation of water distribution facilities; including water mains, wells, reservoirs, canals, turnouts, pump stations, treatment systems, and buildings.

Relevant Project Experience

- **Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, CA - Project Engineer -** for design and construciton support for 4 of 7 bid purchases for the $30 mil Phase 1 water banking program.
- **Title 1 Preliminary Design, National Park Service, CA - Project Engineer -** Preliminary and Final Design for water system and road improvements at the Solstice Canyon dormitory.

Subconsultants

Helix Environmental Planning *Environmental*	HELIX Environmental Planning, Inc. (HELIX) is a leader in environmental planning and natural resource sustainability. The primary environmental planning services provided by HELIX include CEQA/NEPA compliance, biological studies, mitigation monitoring programs, regulatory assistance/permitting, landscape architecture & LEED®, GIS services, acoustics and noise control, habitat restoration and conservation plans, air quality analysis, and agricultural resource evaluation.
Mark Thomas & Company *LiDAR Togographic Survey*	Since 1927, Mark Thomas & Company has provided land surveying and engineering services that have set the stage for countless California roadways, structures, communities, and flood control and wastewater systems. Their experience breadth and depth covers each aspect of infrastructure; utilities, drainage, wastewater, parks, bicycle and pedestrian trails, streetscape and transportation for new, upgrade, or improvement projects.
Spectrum Geophysics *Geophysics Testing*	Spectrum Geophysics locates, delineates, and documents near-surface features. Sites include military bases, landfills, schools, national parks, refineries, power plants, state highways, movie studios, hospitals, residential, commercial, and industrial facilities. Spectrum Geophysics employs state-of-the-art utility locating and geophysical methods in heavy industrial and urban settings, where the subsurface can be highly complex.
Converse Consultants *Infiltration Testing*	Converse Consultants provides qualified and experienced Special Inspectors certified in multiple disciplines to observe the construction activities and perform quality control tests on concrete, reinforcing steel, masonry, structural steel, fireproofing, welding (destructive and non-destructive)
John Christensen Associates *Creek Diversion*	Mr. Christensen is Founder and President of Christensen Associates Inc., a California-based specialty water resources engineering firm. He has over 38 years of professional experience in project management, planning, engineering design and development of major water resource and hydropower projects on the west coast of the United States, Canada and overseas. His broad practical water resources development experience spans the project planning and implementation process from early inception through site investigations, permitting and licensing, into implementation and operation.
Dr. William Foxall *InSAR*	Dr. Foxall is a recognized expert in InSAR technology and evaluating and applying Envisat Satellite data to measure ground surface changes such as the Ground Surface Deformation evaluation for the District. He is proficient in applying the GMTSAR software package.
earthforensics, inc. *Subsidence*	Dr. Laton (earthforensics, inc.) is an expert in the field of hydrology/hydrogeology. He is currently an Associate Professor of Hydrogeology in the Department of Geological Sciences, California State University, Fullerton. Dr. Laton possesses extensive knowledge in the areas of hydrogeology, soil and water contamination, hydrology and surface water, wetlands, coastal monitoring/geomorphology, field sampling techniques and well hydraulics as well as environmental remote sensing/GIS.
MIG, Inc. *Public Outreach*	MIG, Inc. is a multidisciplinary firm specializing in public outreach and participation, marketing and communications, planning and design, and management for public agencies, cities and counties throughout the West and nationally. MIG combines expertise in communications and behavior-change marketing with extensive experience in community-based planning. They help clients strategize and implement outreach and education programs to support a wide variety of projects related to stormwater management, recycling and solid waste, water, wastewater, as well as natural resource plans, climate action plans and ballot measures to support programs and services.
Weck Laboratories *Title 22 Testing*	State of California Environmental Laboratory Accreditation Program (ELAP) Certificate and State of California NELAP Certificate
Lawrence Livermore National Laboratory *Isotope Testing*	Specialized isotope and dissolved gas analysis. Occupational Health and Safety (OH&S) Management System OHSAS 18001:2007 certified.

Relevant Experience

This section presents Kennedy/Jenks' pertinent experience and communicates both the credentials as a firm, our staff, and our basic values for quality services meeting the client's expectations. We have chosen these projects to establish Kennedy/Jenks' qualifications, and emphasize our team's expertise in the areas of groundwater resource studies, investigations, and modeling projects. These projects illustrate only the "tip of the iceberg" in terms of our capabilities, and we believe they clearly exhibit Kennedy/Jenks' knowledge with similar issues facing the District concerning groundwater resources banking and reliable sustained conjunctive use programs.

We have provided project descriptions with relevant experience demonstrating our ability to develop various groundwater recharge and banking sceneries, integrate modeling of surface water and groundwater recharge and produce concise reports and presentations. The projects' successes reflect our commitment to providing a service based relationship that adapts with the client to provide a sound technical outcome. Our teams experience includes recent major groundwater banking studies and recovery wells, collection and delivery systems. Our work includes delivery of recovered groundwater directly to the State Water Project canals as well as providing a potable groundwater supply blended with surface water to meet increasingly stringent disinfection byproduct standards.

The key points of our experience that demonstrate our qualifications include:

- Groundwater/Surface Water modeling for recharge combined with engineered scenarios suitably developed to support performance and cost based alternative screening, ranking and selection.
- Supply management strategies combining conventional surface water and groundwater approaches expanded to consider reclaimed wastewater and stormwater recovery. Our team provides Master Planning studies, Feasibility Plans, Management Plans and other high level/high visibility consulting where the stakeholder participation is crucial to the timely progress of technically viable solutions.
- In depth knowledge of the basin through our work with AVEK provides insight into key benchmark field testing to consider to prove up assumptions as to water quality and aquifer storage and yield at a single well/single recharge site scale. This single site scale provides the specificity needed to develop implementation costs and operation and management strategies to allow effective ranking of alternatives.
- Teamwork building on the history of project experience working together over several years as leaders within Kennedy/Jenks brings a group of consultants all sharing the business approach of sound solutions, lasting commitment to relationships and reliable judgment.

Groundwater Banking

Antelope Valley-East Kern Water Agency (AVEK), Palmdale, CA

Kennedy/Jenks is working with AVEK to develop new groundwater banks in two locations. These groundwater banks have dual purposes: water-supply stability and THM control. AVEK is State Water Project (SWP) contractor that provides water to more than 20 municipal users and other entities. AVEK plans to recharge surplus SWP water during average-to-wet periods and withdrawal groundwater during dry-to-drought periods.

Kennedy/Jenks is providing hydrogeology and engineering services to evaluate water-bank performance using groundwater flow modeling, provide locations and designs for extraction wells and recharge basins, design delivery systems and connections to water-supply lines, and estimate the TOC concentration of discharge water from the new extraction wells.

Two key objectives of the modeling effort were to evaluate the ability of the aquifer system to allow (1) infiltration and percolation to the saturated zone of a defined volume of SWP water during a specified recharge season and (2) extraction of defined volumes of banked groundwater during specified pumping periods. A third key objective is to simulate the TOC concentration of water discharged from proposed WSSP-2 extraction wells, which would consist of SWP water blended with native groundwater.

Kennedy/Jenks designed well drilling and well equipping for 10 potable extraction wells. The model used in this effort is derived from the USGS regional-scale model for the Antelope Valley Groundwater Basin, which was provided to Kennedy/Jenks by the USGS. The USGS model provided a widely accepted geologic and hydrogeologic framework from which to develop two local-scale sub-models with successively increasing spatial resolution. The spatial resolution was increased to simulate more precisely the hydrologic response caused by the groundwater banks.



Project Elements:

- Develop new groundwater banks in two locations with dual processes
- Providing hydrogeology and engineering services to evaluate water-bank performance
- Designed well drilling and well equipping for 10 potable extraction wells

Client Reference:

Michael Flood, Project Manager
AVEK
6500 West Avenue N
Palmdale, CA 93351
(661) 943-3201

Kennedy/Jenks Consultants has provided excellent professional services to the Antelope Valley-East Kern Water Agency (AVEK) since January 2011... Kennedy/Jenks has completed their projects on budget and schedule. Their engineering was technically competent, and they coordinated, communicated , and worked very well together with our staff. Kennedy/Jenks put our requests and requirements as their top priority.

-Dwayne Chisam
Assistant General Manager
AVEK

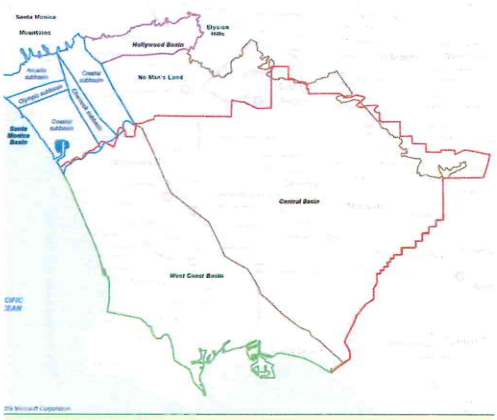
Groundwater Development Feasibility Study

Los Angeles Department of Water and Power, CA

Kennedy Jenks conducted for the Los Angeles Department of Water and Power (LADWP) a project entitled the "Strategic Planning Services Relating to Investigating the Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply." The purpose of this study was to evaluate the feasibility of developing the Santa Monica and Hollywood groundwater basins as potable groundwater supply sources for the City of Los Angeles. For each groundwater basin, the study included:

- Hydrogeologic characterization, including an estimation of groundwater quantity available and review of safe yield estimates;
- Review of groundwater quality using available data
- Review of existing facilities and groundwater production in the study area;
- Development of treatment scenarios needed to produce potable water; and
- Identification and development of alternatives, including preliminary siting of wells, pipelines, and treatment facilities.

As a result of the study, it was determined that the development of a new potable water supply of up to 3,000 AF/yr from the Hollywood Basin and up to 2,000 AF/yr from the Santa Monica Basin is viable and technically feasible.



Project Elements:

- Hydrogeologic characterization
- Groundwater evaluation
- Develop treatment scenarios
- Develop alternatives

Client Reference:

Albert G. Gastelum
Director of Water Quality
Los Angeles Department of Water and Power
111 North Hope Street
Los Angeles, CA 90012
(213) 367-4211

Kennedy/Jenks Consultants has provided professional services to the Los Angeles Department of Water and Power (LADWP) for the Santa Monica and Hollywood Groundwater Basins Investigation. Kennedy/Jenks completed the project on budget and schedule. Their engineering was technically competent, and they coordinated, communicated, and worked very well together with our staff. LADWP is satisfied with the quality of service we received, and values Kennedy/Jenks' role in developing sound technical solutions.

-Albert G. Gastelum
Director of Water Quality
Los Angeles Department of Water and Power

Apex Ranch Conjunctive Use Project

Kings County Water District, Hanford, CA

The Kings County Water District operates the Apex Ranch Conjunctive Use Project (Apex Ranch Project) to store Kings River water in the aquifer when water is available and recover the groundwater during periods of water scarcity. In recent years, KCWD has received complaints from neighboring landowners about low groundwater levels in their irrigation wells that reduced or eliminated their ability to produce water from these wells. Kennedy/Jenks was hired as an independent reviewer of the monitoring and operations for the Apex Ranch Project.

The Apex Ranch Project is located in an old river channel along the Kings River where a series of small dams impounds the water allowing it to infiltrate to the groundwater. The objective is to reestablish recharge to local groundwater that resembles historical recharge patterns when the river flowed through the old channel, rather than under present conditions, where this channel has been bypassed by the river. Groundwater recovery is performed in the summer using groundwater recovery wells that is then pumped into adjacent irrigations ditches for delivery for use in other parts of the District.

Kennedy/Jenks has provided third-party outside review of project operations, monitoring and regional groundwater conditions as part of the District's Stakeholder review process. The issue is to determine whether or not groundwater levels in off-site agricultural and domestic supply wells decline excessively due to Apex Ranch Project pumping operations resulting in increased pumping costs or forcing wells out of production. As a result of Kennedy/Jenks' involvement in the project, the District has installed additional monitoring wells in key areas near the potentially affected landowners. Kennedy/Jenks was able to further evaluate the horizontal and vertical effects of groundwater pumping at the Apex Ranch Recovery Wells by analyzing the current and historical data.

The results of this review are documented in a series of technical reports that provides a concise summary of the data analysis and recommendations. For this project, Kennedy/Jenks developed a Groundwater Monitoring Plan, an Operations Plan, a Recovery Well Assessment Report, an Operations Data Analysis Report and a Regional Groundwater Evaluation Report. Kennedy/Jenks has presented this information during a series of public meetings with local landowners, adjacent agencies and other interested parties.



Project Elements:

- Provided third-party review of project operations, monitoring and regional groundwater conditions
- Evaluated horizontal and vertical effects of groundwater pumping
- Developed Groundwater Monitoring Plan, Operations Plan, Recovery Well Assessment Report, Operations Data Analysis Report, and Regional Groundwater Evaluation Report

Client Reference:

Don Mills, General Manager
Kings County Water District
200 Campus Drive
Hanford, CA 93230
(559) 584-6412

Kennedy/Jenks Consultants has provided excellent professional services to the Kings County Water District since May 2011... Kennedy/Jenks has completed their projects on budget and schedule. Their engineering was technically competent, and they coordinated, communicated, and worked very well together with our staff... Kings County Water District continues to be satisfied with the consistent quality service we receive, and values Kennedy/Jenks' role in developing technical solutions to our projects.

-Don Mills
General Manager
Kings County Water District

Conjunctive Use and Enhanced Aquifer Recharge

Santa Cruz County Environmental Health Services, CA

The Conjunctive Use and Enhanced Aquifer Recharge Project was the first phase of a larger Feasibility Study to evaluate potential conjunctive use projects in the southern Santa Margarita Groundwater Basin.

The project area included the southwestern portion of the Santa Margarita Groundwater Basin south of Bean Creek. This area included the western portions of Scotts Valley and the Pasatiempo Pines area. The project area included portions of both the Scotts Valley Water District and the San Lorenzo Valley Water District. This area also supplied significant baseflow for critical habitat and the City of Santa Cruz water supply. The area was characterized by significant declines in groundwater levels in response to increased pumping.

The primary objective of the project was to evaluate methods to mitigate declines in groundwater levels in the project area to provide a more secure and reliable water supply. The project evaluated a variety of approaches to off-stream diversion of water to optimize utilization of flows to off-stream groundwater recharge ponds, in a manner that satisfied aquatic habitat preservation requirements while fulfilling operational objectives. The Conjunctive Use Project addressed the following issues:

- Determine the maximum average annual surface water rights availability and to whom and when they are available within the study area.
- Determine the maximum surface water that can be safely diverted on an average annual basis to support a conjunctive use project in the study area and at what times of the year the water is available, based on flow, water quality, other water rights, and instream flow needs. Assess differences in water availability during wet years and dry years.
- Compile and analyze potentially available water resources (i.e. surface water, groundwater, recycled water, desalinated seawater, and storm water runoff) for each of the major water purveyors within the study area, when and where these resources are available, and the purveyors' current and projected needs.
- Identify existing infrastructure that can be used to support a conjunctive use project(s). In light of the closing and future sale of the Hanson and Olympia quarries, the consultant should evaluate the importance of these quarries as part of a regional conjunctive use project.
- Identify additional infrastructure and water rights that would be needed to support a conjunctive use project(s).



Project Elements:

- Compile and analyze available water resources
- Identify existing infrastructure
- Identify water rights needed to support conjunctive use projects

Client Reference:

Mike Cloud, Geologist
Santa Cruz County
Environmental Health Services
701 Ocean Street, Room 312
Santa Cruz, CA 95060
(831) 454-2022

Kennedy/Jenks Consultants provided very good professional services to the Santa Cruz County Environmental Health Services during the completion of the Conjunctive Use and Enhanced Aquifer Recharge Project... I appreciate their partnership approach working with the Santa Cruz County in addressing problems and developing creative solutions to our project needs.

-Mike Cloud
Geologist
Santa Cruz County
Environmental Health Services

Phase II Recharge Basin Improvements

Inland Empire Utilities Agency, Fontana, CA

Inland Empire Utilities Agency's (IEUA's) Phase II Recharge Basin Project was the culmination of more than 25 years of highly successful groundwater recharge operations in partnership with the Chino Basin Watermaster, Chino Basin Water Conservation District, and San Bernardino County Flood Control District. The program's aim is to reduce the dependency on imported water that may not be available in the future and provide a local drought-proof supply of water. Ultimately, the Recharge Basin Project anticipates percolating about 22,000 acre-feet per year (AFY) of stormwater, 22,000 AFY of recycled water, and 120,000 AFY of imported water to the various recharge basins.

With these goals in mind, IEUA contracted with Kennedy/Jenks to design recharge basin upgrades, raw water turnout connections, drainage pipelines, and SCADA system improvements through three separate construction packages.

Recharge basin improvement designs were provided for five recharge basins: San Sevaine, Hickory, Ely, Eighth Street, and Declez. These basin upgrades were designed to create conservation berms to promote greater retention and recharge of groundwater, berm hardening (using soil cement to provide improved durability), improved outlet weir designs, enhanced drainage, valving and piping systems throughout the recharge basins. In addition, Kennedy/Jenks designed access road, storm drain, and SCADA system improvements for the recharge basins. The SCADA system allowed the remote operation of recharge basins valves enabling IEUA and the Watermaster to remotely adjust recharge basin operations in response to rain events and recharge needs.

As part of the project, Kennedy/Jenks designed three turnouts to provide raw water service connections from Metropolitan's Rialto Feeder to several basin inlets. Kennedy/Jenks' experience with Metropolitan's turnout standards specifications, and design process facilitated timely reviews and approvals by Metropolitan to support the construction of these elements of the program.

The Phase II Recharge Basin Improvements Project was the continuation of IEUA's efforts to better utilize locally available water resources and to decrease dependence on imported water supplies. The project was designed and constructed in keeping with the Proposition 13 Grant secured by IEUA and the Santa Ana Watershed Project Authority (SAWPA).



Project Elements:

- Designed recharge basin upgrades for five recharge basins
- Designed access road, storm drain, and SCADA system improvements for recharge basins
- Design three turnouts to provide raw water services connections

Client Reference:

Mr. Joel Ignacio, PE
Senior Engineer
Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91708
(909) 993-1913

Kennedy/Jenks Consultants has provided excellent professional services to the Inland Empire Utilities Agency (IEUA) for the Phase II Basin Recharge Improvement Project. Kennedy/Jenks has completed their projects on budget and schedule. Their engineering was technically competent, and they coordinated, communicated , and worked very well together with our staff... Based on their overall capabilities and performance, I would recommend this firm to others for engineering services.

-Joel Ignacacio, PE
Senior Engineer
Inland Empire Utilities Agency

Additional Project Experience

Project/Client	Well Rehab	Siting/Drilling New Wells	Well Equipping	Hydrogeologic Study	Groundwater Modeling	Groundwater Quality	Monitoring Wells	Aquifer Tests
Groundwater Model Evaluation, Impacts of Nitrate Plumes on Municipal Wells, Elsinore Valley Municipal Water District, CA				•	•	•		
Rancho California Well Asset Management Planning, Rancho California Water District, Rancho, CA	•			•				
Groundwater Development Feasibility Study, Los Angeles Department of Water and Power, Los Angeles, CA		•	•	•		•		
Turquoise Trail Hydrogeologic Study, US Indian Health Services, Arizona		•		•		•		
Sacramento Groundwater Authority Quality Risk Assessment, Citrus Heights, CA				•		•		
Hayfield Groundwater Storage Program, Metropolitan Water District, Los Angeles, CA		•	•	•	•	•	•	•
Drought Buffer Aquifer Storage Recovery Well Rehabilitation, Goleta Water District, Goleta, CA	•		•			•		
Joy Street Water Equipping Project, Elsinore Valley Water District, CA		•	•					
Terra Cotta Well, Elsinore Valley Municipal Water District, CA			•					
GREAT Program, Brackish Water Desalter Project/Blending Station No. 1 South Property Wells Project, City of Oxnard, CA			•			•		
Island Wells Facilities, Elsinore Valley Water District, Lake Elsinore, CA			•			•		
Trilogy Well, Elsinore Valley Water District, Lake Elsinore, CA			•					
Strand Ranch Recovery Facilities Project, Irvine Ranch Water District, Western Kern County, CA			•					
Well Condition Assessment, County of Los Angeles Department of Public Works, Los Angeles, CA	•		•					
Well Site Feasibility Study, Long Beach Water Department, Long Beach, CA	•	•	•	•		•		
Groundwater Management Services, Twentynine Palms Water District, San Bernardino, CA				•	•	•	•	
AVEK Banking and Blending Study, Eastern Kern Water Agency, Antelope Valley, CA		•	•	•	•	•	•	•
Lakehaven Well 16 Improvements, Lakehaven Utility District, Federal Way, WA	•		•					
ASR Well Pump Failure RPT, Elsinore Valley Municipal Water District	•							
Groundwater Well Sitting Evaluation, Calleguas Municipal Water District, Ventura County, CA		•		•	•	•		
Montebello Forebay Attenuation and Dilution Studies, Montebello, CA					•	•	•	•

Approach to Project



Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

Approach to Project

Project Understanding

The Antelope Valley Groundwater Basin has been in continuous overdraft since about 1930. The groundwater production in the basin currently exceeds the safe yield. The District's objective is to bank surplus amounts of imported water in years when it is available, for subsequent production and use in years when allocations of imported water are substantially reduced. The District proposes banking programs that include the development of new spreading grounds and recovery facilities that will be used to recharge imported water, local storm water, and potentially recycled water.

In 2010 the District completed a Strategic Water Resources Plan (SWRP) and in 2011 adjudication reached a critical milestone with the Court finding that the safe yield is 110,000 acre-ft/year. The District certified the Programmatic Environmental Impact Report (PEIR) in 2012 for the SWRP and adjudication continues to consider allocation of safe yield. Although it remains unclear ultimately what pumping rights will be available to the District it is clear that it is likely the District will need to implement a conjunctive banking, storage and extraction program. This project is to explore the specific feasibility of replenishment of groundwater production in times when water is available to meet their existing and future demands through a logical, transparent and process driven approach to produce robust feasibility findings.

Contributing to the challenge is the absolute need to stop continued subsidence through recharge and to resolve compatible solutions for overall cumulative management strategies of all adjudication parties. The recharge and modeling work will have to be considered in the context of this work as being part of the larger Antelope Valley solution. The magnitude of the challenge can begin to be understood when you consider that the District has estimated a recharge capacity goal of 105,000 acre-ft/year in a basin identified as have 110,000 acre-ft/year of sustainable yield. The work will ultimately include multiple recharge sites and strategies. This project will investigate the feasibility of the proposed largest project located along Littlerock Creek.

The LCGRRP provides for a variety of facilities for improving the recharge of waters through the natural channel and overbank areas. The options can support recharge of imported water through the natural channel and recycled water through the overbank regions with perhaps the greatest flexibility coming from a design that allows for combined diversion of main channel flows to take advantage of enhanced recharge through detention in the overbank while relying on the main channel for substantial recharge.

Perhaps more important, however, than how to recharge the desired volume of water is understanding where the water goes and ultimately knowing that the stored water will be in the right place for recovery by the District. The following discussion describes the LCGRRP and possible pipeline considerations to optimize recovery through a refined point of discharge into the Littlerock Creek channel. Optimized recovery may favor recharging the Buttes and Lancaster subbasins as discussed in the section under Pipeline Alternatives.

Littlerock Creek Groundwater Recharge and Recovery Project (LCGRRP)

The LCGRRP is the largest of the planned recharge corridors and the RFP describes the concepts and operations as follows:

- State Water Project (SWP) and other imported water discharged from the East Branch of the SWP aqueduct where the aqueduct crosses Littlerock Creek and then conveyed in the active channel of Littlerock Creek toward the project endpoint located about 9 miles downstream.
- Imported water recharge, occurring when capacity exists in the East Branch of the aqueduct, primarily in winter. Recharge could occur at other times of the year, provided there is surplus SWP water available or when surplus capacity in the aqueduct is available to convey non-SWP water to LCGRRP.



As a "Run-of-the-River" project with releases from the East Branch, the LCGRRP will traverse three groundwater subbasins: Pearland, Buttes, and Lancaster.

The project would be expanded if the desired recharge cannot be accomplished in the active channel within the project area or if recharge of recycled water is included.

- A diversion works would be constructed in the active channel just upstream of Palmdale Boulevard to split the remaining discharge in Littlerock Creek so that imported water discharge remaining in Littlerock Creek can completely recharge in the active channel in the project area.
- Diverted imported water would be conveyed to shallow off-channel basins constructed adjacent to the active channel and within the floodplain. Imported water diverted into these basins would recharge completely within the project area.
- Off-channel basins would be constructed in a strip of land parallel to the active channel. A feeder channel (or pipeline) would be constructed from the diversion works at Palmdale Boulevard and run along the west side of the off-channel basins in order to convey water from the Littlerock Creek diversion to off-channel basins.
- Imported water discharged to Littlerock Creek would be modulated to ensure that all the imported water discharged to Littlerock Creek would be completely recharged in the active channel and off-channel basins in the project area.

Recycled water recharge would be accomplished by conveying recycled water (from the north) to the off-channel basins in the project area.

Pipeline Alternatives

Since the majority of the Districts groundwater pumping is from the Lancaster subbasin, and very little to none is currently from the Buttes subbasin, it will be important to clarify the District's objective and expectations early in the project regarding the subbasins to receive recharge and for location of recovery wells.

Kennedy/Jenks proposes several pipeline alternatives to deliver East Branch water past the Pearland Subbasin with the flexibility to recharge the Buttes Subbasin or Lancaster Subbasin, or both.

Groundwater storage volumes (historic and recent) calculated for the upper aquifer (Layer 1) for each of the three subbasins (Pearland, Buttes, and Lancaster) in a report for the District (Wildermuth 2007) are summarized in the table below.

Storage Volumes

Subbasin	1915 (AF)	2006 (AF)	Decrease in Storage (AF)
Pearland	2,342,600	1,741,900	600,000
Buttes	3,370,700	2,881,900	500,000
Lancaster	14,572,500	9,902,900	4,700,000
Total	**20,284,800**	**14,526,700**	**5,800,000**

The study reported that storage volumes reached a low in 1979 and there has been a slight recovery of roughly 280,000 AF over 17 years, with an increase in storage of 50,000 AF in the Pearland subbasin, 20,000 AF in the Buttes subbasin, and 200,000 AF in the Lancaster subbasin.

As illustrated Figure 1, direct releases of water from the East Branch into Littlerock Creek would need to travel approximately 3.2 miles before leaving the Pearland subbasin. Over this distance substantial percolation through the creek bed and infiltrate into the Pearland subbasin will occur. The Pearland subbasin is defined by an inferred fault along its north boundary with the Buttes subbasin and west boundary with the Lancaster subbasin identified by USGS, with an abrupt change in groundwater level. In a report for the District, Standish-Lee (1999) states "outflow appears to occur from the Pearland sub-unit into the Lancaster sub-unit although no quantitative data has been gathered". With current water levels at about 250 feet below ground surface, the Pearland subbasin has about 250 to 300 feet of saturated aquifer with moderate transmissivity.

In modeling the sand and gravel quarries adjacent to the Upper Littlerock Creek, Wildermuth (2007) estimated that 50,000 AF added would mound to the surface within the first year, but that 10,000 AF could be added for 18 years before mounding to the surface.

In a Recharge Report for the AVSWCA (Stetson 2002) a recharge test is briefly described whereby AVSWCA released water from the East Branch and allowed it to flow down Littlerock Creek. The report states "as the water percolated into the soils, it also moved laterally and into some of the gravel pits adjacent to the creek, causing quarry operations to be disrupted". In discussions with District staff, Kennedy/Jenks learned that this Littlerock Creek Demonstration Project (performed in 2002) involved the release of 5,000 AF from the East Branch into Littlerock Creek and none of the flow passed the sand and gravel quarry, roughly 2.5 miles or halfway to Palmdale Boulevard (the proposed location for diversion of recharge water to off-creek recharge basins).

Given the high percolation rates along the creek bed and the hydraulic conductivity and transmissivity within the Pearland subbasin sufficient to disperse mounded groundwater from under the creek, Kennedy/Jenks believes that roughly the first 50 cfs released from the East Branch over a period of 120 days per year (12,000 AF) would likely not reach Palmdale Boulevard for recharge into the Buttes subbasin or beyond into the Lancaster subbasin. However, such releases would likely interfere with quarry operations on the west side of the Upper Littlerock Creek.

To eliminate the loss of recharge water to the Pearland subbasin through the creek, Kennedy/ Jenks is proposing several pipeline alternatives that are presented in our Project Approach. In the Figure 1, we have shown three tentative pipeline routes from the Littlerock Creek East Branch turn-out and one from a combination of the 95th St and 96th St turn-outs, as follows:

- **Route 1 –** 6.3 miles of pipeline from the Littlerock turn-out primarily along 70th Street to Palmdale Boulevard
- **Route 2 –** 6.6 miles of pipeline from the Littlerock turn-out primarily along 87th and 90th Streets to Palmdale Boulevard
- **Route 3 –** 1.9 miles of pipeline discharging to 1.7 miles of existing LA County Flood Control Channel (lined to Avenue T, then unlined to Littlerock Creek)
- **Route 4 –** 5.4 miles of pipeline from the 95th and 96th Street turn-outs, along 96th Street to East Avenue S to 90th Street, to Palmdale Boulevard

Understanding benefits of planning recharge where it can reduce risk of subsidence, increase reliability through a sustainable net production capacity and improve the health of the Antelope Valley are at the core of the Kennedy/Jenks project understanding.

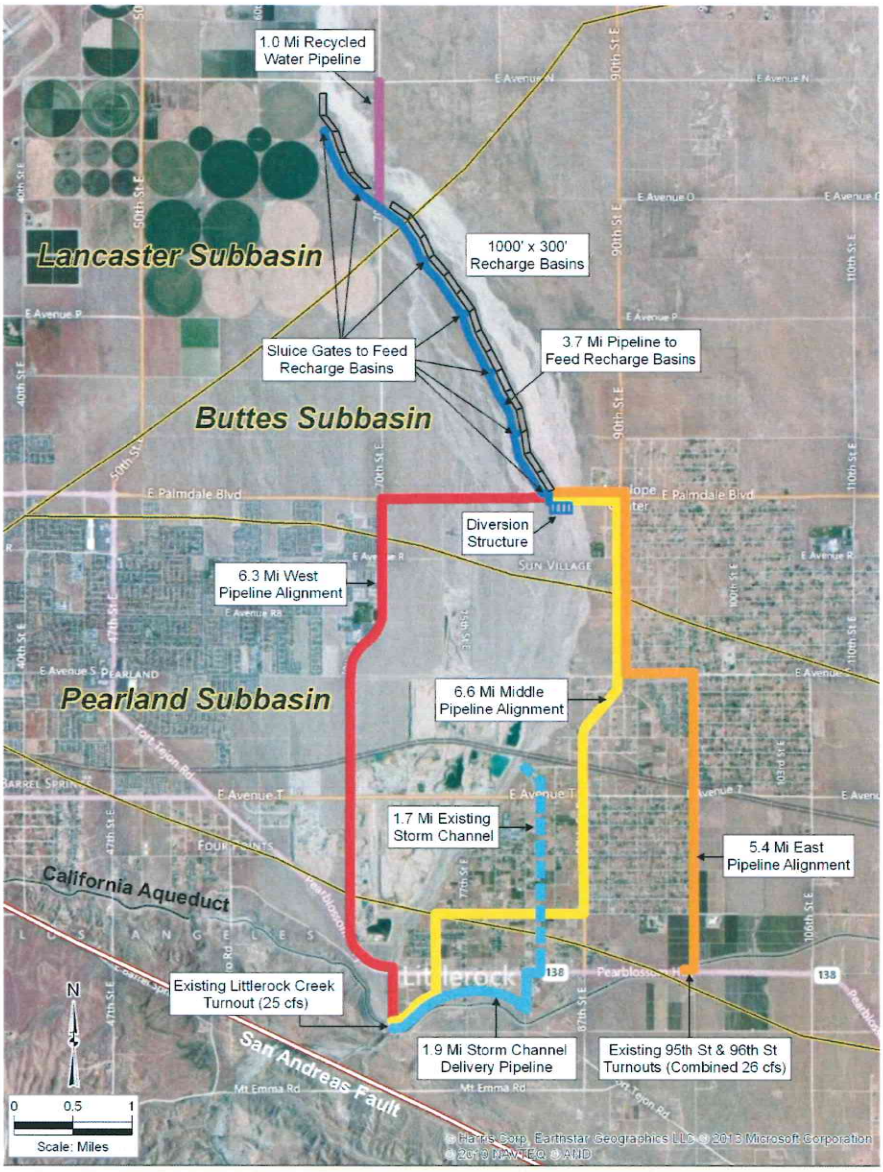


Figure 1. Kennedy/Jenks proposes a combination of Upper, Mid, and Lower Littlerock Creek delivery alternatives for east Branch recharge water using pipeline gravity flow to by-pass the Pearland Subbasin.

Key Issues Table

Issue	Approach	Benefit
Valley-wide Water Supply Plan	Assist PWD in development of an Integrated Groundwater Banking Plan	Stakeholder support based on clear regional benefits
Magnitude and Timing of Recharge Supplies	Determine capacity in the East Branch and the LC turn-out; alternative supplies acceptable to DWR; and optimal mix	Optimize available capacity for maximum recharge potential
Recycled Water Considerations	Use Kennedy/Jenks' experts to clarify the regulatory requirements and approval process; impact on recovery well locations	Early input for decision making based or sound advise
Storm Water Control	Maximize recharge of available storm water flows, by-pass high flows, protect facilitates	Define vulnerability and strategy to control O&M costs
Viable Recharge and Recovery Alternatives	Provide alternatives that consider by-passing the Upper Littlerock Creek via pipeline(s)	Optimizes recharge for recovery
Environmental Constraints	Use a leading environmental firm, Helix, to perform a reconnaissance of the initial alternatives followed by biological and cultural surveys for the shortlisted alternatives	Efficient assessments; no surprises
Recharge Capacity and Subsistence Issue	Update the existing USGS MODFLOW groundwater flow and subsistence model; calibrate Active Channel with accurate water level measurements; demonstrate benefits of water banking	Practical "fresh look" at the hydrogeology and potential benefits for subsidence management
Potable Water Quality	Collect, evaluate, perform data reduction, and characterization of existing groundwater quality, and develop a Solute Transport Model to assess the recharge influence on key constituents	Reduce uncertainty regarding recovered groundwater quality as ready to serve potable supply
Define the Quantity, Quality, and Costs of Banking	Refine and optimize initial alternatives; present practical implementation plan with capital, operation and maintenance costs	Feasible and financially viable alternatives
Stakeholder Involvement and Public Outreach	Use a specialty firm, MIG, to facilitate Public Outreach	Stakeholder buy-in based on involvement

Kennedy/Jenks has developed a list of key issues for your project, our approach to each issue, and the benefit to PWD.

Project Approach

We have developed our Project Approach to address the key issues for each of the tasks outlined in the RFP. We will be able to leverage our extensive knowledge, maximize use of available data, work closely with District staff, and clearly articulate the results. Given the breath of the scope of work, our approach is described by categories and sequence to match the RFP.

The Project Approach is followed by a section describing our Management Approach. This is followed by our proposed Scope of Work.

Valley-Wide Water Supply Plan

Kennedy/Jenks will consider a valley-wide view of how water banking fits into the water demands and supply plans for all of the valley water purveyors. Our approach includes interviews of all water and wastewater agencies, agency workshops, documentation of findings, public outreach, and a Draft and Final Integrated Groundwater Banking Plan. We believe it is critical for project participation by AVEK and Littlerock Creek Irrigation District to participate in the project, so that all parties can understand each another's long-term water banking plans because of the overlapping groundwater basin boundaries, and the potential impacts of banking activities to shareholders.

Kennedy/Jenks has the regional experience to assist the District in development of an Integrated Groundwater Banking Plan



Kennedy/Jenks prepared the Antelope Valley Integrated Regional Water Management Plan for the Regional Water Management Group (2007), as well as the Antelope Valley Recycled Water Project Master Planning Report prepared for the Los Angeles County Water Works District 40 (2006); and we are currently working with AVEK on two water banks.

Magnitude and Timing of Recharge Supplies

The LCGRRP needs to be designed with the recharge capacity to accommodate a range in deliveries from the East Branch of SWP (including potential non-SWP supplies) as well as local surface runoff. At the same time, the project infrastructure needs to withstand flash floods, prolonged flooding, and potential releases from Littlerock Dam. The timing and magnitude of deliveries from the East Branch can be controlled, but due to the objective of storing surplus SWP when available (for recovery in dry years) there will be variations year to year that relate to Table A allocations by DWR on the SWP. However, Article 21 water (as available) and Carryover Water can be used as additional supply when coordinated among the Antelope Valley's State Contractors (PWD, AVEK, and Littlerock Creek Irrigation District). There may also be seasonal capacity limitations in the East Branch, which Kennedy/Jenks will work to identify.

Kennedy/Jenks has unique insights into the availability of SWP and water transfers to be conveyed by the East Branch



Our Water Demands Task Leader, Mary Lou Cotton, serves as the General Manager of the State Water Project Contractors Authority and has many years of experience with the SWP and the State Water Contractors. Her interactions with other contractors and the DWR would offer current information on the availability and timing of potential surplus supplies.

Recycled Water Considerations

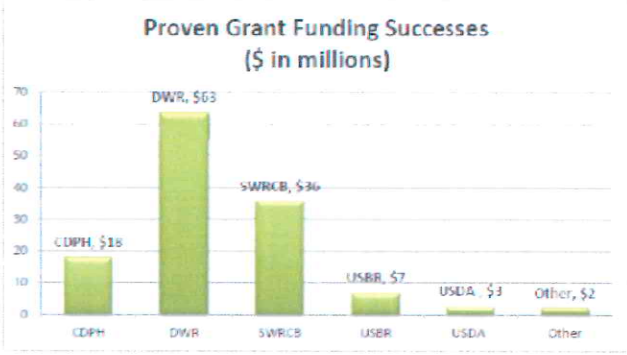
Groundwater replenishment with recycled water requires special considerations to comply with CDPH and Regional Board regulations. Kennedy/Jenks' experts will help clarify the regulatory requirements and approval process, as well as the impact on recovery well locations. CDPH requires a minimum

Kennedy/Jenks is well versed in the details of the new CDPH Groundwater Recharge Regulations

Our Recycled Water Task Leader, Craig Lichty, is Past President of Water Reuse and a contributor to the regulation language. Craig's experience includes planning, design, and construction management of groundwater recharge using recycled water.

of six months travel time from the point of recycled water recharge to the nearest potable supply well, which increases the set-back distance from the recharge basins from 200 feet to typically 2,000 feet or more. Kennedy/Jenks will estimate the travel time through the saturated zone using MODFLOW and related modeling tools.

Kennedy/Jenks will review previous recycled water reports and confirm the amount and timing of recycled water that could be used for recharge. This will include the evaluation of the infrastructure and probable construction costs for alternative sources of dilution water such as storm water, imported raw water, imported treated water, groundwater, and potable water. We will evaluate and recommend the optimal location for the construction of recharge basins in order to maximize the natural underflow of dilution water. This analysis could greatly reduce the need to deliver large volumes of dilution water.



Over the past decade Kennedy/Jenks has assisted clients in obtaining over $140 mil in grants and grant funding with a return on investment of roughly 160 times our fee in grant application preparation; in other words, on average $4,000,000 in grant funding requires roughly $24,000 in grant preparation.

The evaluation of whether or not to include recycled water along with SWP and non-SWP deliveries from the East Branch and local runoff, involves a combination of technical planning, regulatory strategy, institutional arrangements, and a strategy for public acceptance.

Recycled water projects have successfully received substantial funding grants at both the federal and state level. Kennedy/Jenks will research and recommend for consideration grant funding methods and opportunities, including federal, state, and/or local grants, State Revolving Loan (SRL) programs, and proposition funds, where appropriate.

Storm Water Control

As a key project objective is to recharge local storm water, alternative scenarios must address how to maximize recharge of runoff within the creek bed and adjacent shallow recharge basins while by-passing high flows to protect the facilities. In addition, the design of an in-creek diversion structure must address the high sediment load in the creek. Effective designs utilize the difference in physical characteristics between water, debris and sediment to separate them so that water is diverted, but diversion of debris and sediment is limited to that which can be accommodated within the receiving water supply system. Siting of the structure relative to the creek is also important in determining the performance of the diversion intake.

Since the combination of topography, hydrology, geology and environmental resources of each water course is unique, small intake designs are highly site-

The Kennedy/Jenks Team includes a stream and river intake structure expert to provide the District with a viable diversion structure concept

CHRISTENSEN ASSOCIATES INC

John P. Christensen, Principal of Christensen Associates Inc. (CAI) is an expert in stream and river intake structures and will explore feasible types of intakes that address the high sediment load in the creek and seasonal flooding.

specific. Shallow intakes draw water from near the water surface and generally have to cope with higher water velocities, floating debris and sediment transport. In order to gain better control of the stream at a shallow intake and increase its reliability, a small diversion weir is normally included which provides hydraulic head for diversion by gravity from the stream and provides more stable control of water level. However, introducing a weir and the associated small impoundment is not without some challenges since it affects the stream profile, water velocities and sediment transport which must also be addressed in design of the weir and intake system. Often the buildup of bed load sediments and debris in the impoundments also allows the river to bypass these intakes requiring modifications to the streambed to restore flow to the intake after a large storm.



Kennedy/Jenks estimates that discharges from the East Branch of up to 12,000 AFY will infiltrate in the Upper Littlerock Creek and not reach Palmdale Blvd.

To further support the conceptual design of the diversion structure, the Kennedy/Jenks team includes John P. Christensen, Principal of Christensen Associates Inc. (CAI). Mr. Christensen is an expert in stream and river intake structures and will explore feasible types of intake within the unique constraints of the site. CAI's extensive experience in the evaluation of existing small intake structures and in the planning, investigation and design of small intake structures will be essential in efficiently determining the range of feasible options.

Early informal consultation with regional or local staff of key permitting agencies such as the California Department of Fish and Game (Section 1602 - Lake or Streambed Alteration Permit), US Army Corps of Engineers (Section 404 Clean Water Act– Dredge or Fill - Wetlands permit), State Water Resources Control Board (Section 401 Clean Water Act - Water Quality Permit) and any local stakeholders is important before initiating the formal permitting process.

Viable Recharge and Recovery Alternatives

There are a number of issues that have to be evaluated to determine if a recharge and recovery alternative is viable. These include a determination of the following:

- The recharge method assessment will determine the appropriate approach for directing the recharge water into the subsurface. This can include surface methods such as discharge to a stream or engineered recharge basins, or subsurface methods such as injection wells. The approach selection is typically driven by site-specific geologic conditions, surrounding land use, and nearby groundwater usage. Factors that can influence this selection include the presence of shallow clay layers or hardpans, the proximity of airports or residential areas, or the presence of nearby groundwater wells or wastewater discharge.

Our approach is based on our history of involvement with groundwater storage and recovery projects across California



Kennedy/Jenks brings extensive experience assessing viable groundwater recharge and recovery alternatives for our clients throughout California, including the San Francisco PUC on their Westside Basin Groundwater Storage and Recovery Project in Northern California, the Kings County Water District's Apex Ranch Conjunctive Use Project in the San Joaquin Valley, and the assessment of the Santa Monica and Hollywood Basins for LADWP.

- The recovery method typically entails groundwater wells installed in the vicinity of the recharge area for the purpose of pumping the recharge water. Design issues for the recovery method include determining the appropriate well spacing to avoid excessive drawdown and configuring the wells to maximize pumping efficiency.

Our approach is to first develop a clear understanding of the fundamental site characteristics based on the available data and then proceed to more sophisticated analyses. For example, we will start with a thorough compilation and review of the existing local hydrogeological data collected from the District, AVEK, DWR, USGS and other relevant data sources.

Kennedy/Jenks uses GIS extensively to develop maps that are used with air photo and satellite data to conduct site reconnaissance. Taken together, these data provide insight into local land uses. Additionally, we will review the relevant local planning documents to evaluate if alternatives may be affected and to ascertain impacts to current or planned neighboring infrastructure. This initial review we will also aid in planning the cost-effective use of geophysical, LiDAR and field investigations differentiating the strengths or weaknesses of the various recharge and recovery alternatives for the feasibility study.

Helix is very familiar with the local terrain, having just surveyed the Littlerock/ Pearblossom area, and will provide the District with a cost-effective approach



Helix is working with Kennedy/Jenks on the AVEK Eastside Water Bank and the LCGRRP recharge basin area is very similar; primarily vegetated with creosote bush scrub (which is not a sensitive habitat) but with some Joshua tress which are protected under the California Desert Native Plants Act. A permit is required for impacts to this and other yucca species and an inventory and mapping of the Joshua trees may be required during design to properly calculate the impacts for the permits. The project site will likely fall within the known range of desert tortoise, Mojave ground squirrel, and burrowing owl. These species have designated time frames (typically spring) for focused surveys for habitat assessment, which are costly and should be performed closer in time to construction.

Environmental Constraints

Kennedy/Jenks, through its subconsultant Helix Environmental (HELIX), will evaluate and survey the multiple proposed project sites. The overall environmental approach will be to identify and determine the potential severity of constraints for the various project alternatives. This will be done as cost-effectively as possible while also ensuring that sufficient information is available to provide for informed evaluation of alternatives. HELIX and Applied Earthworks will review available existing information regarding potential biological and cultural resource constraints, respectively, and will conduct reconnaissance-level surveys to review current conditions in the field. The results of this effort, including recommendations for additional, more detailed work required for future review under the California Environmental Quality Act (CEQA), will be presented in a constraints report and associated meetings/ workshops. Information provided regarding potential constraints, survey and processing requirements, and associated cost and schedule implications, will be presented in a manner designed to assist the District in selecting a preferred alternative for additional evaluation.

Recharge Capacity and Subsidence Issues

The recharge capacity assessment will determine whether there is sufficient volume in the unsaturated portion of the aquifer to meet for the storage requirements for the recharge and recovery alternative. Factors that can influence this selection include

determining if sufficient coarse-grained sediments are present to provide the necessary aquifer storage capacity based on the site-specific geologic conditions. A second factor is determining the potential losses from aquifer storage over time from groundwater pumping from non-project wells, as well as groundwater flow away from the project recovery area or groundwater discharge to lakes or streams. Our initial analysis will be based on the review of the existing data and reports for the project area. Our approach will be to use the appropriate tools to assess the site conditions to assess the recharge capacity and subsidence issues.

A key issue in this assessment is determining how much of the recharged water can ultimately be recovered. We will review existing well logs and groundwater level data, including seasonal variations, to determine the potential recharge capacity of the site. A key tool of this analysis will be the existing USGS MODFLOW model of the Antelope Valley that incorporates much of the information that the USGS has collected over years of study in the region. Kennedy/Jenks has extensive experience using the USGS MODFLOW model of the Antelope Valley to assess the recharge capacity of the WSSP-2 and Eastside groundwater banking projects for AVEK. Our approach for the Palmdale Water District recharge study will follow a similar process where we develop a focused subregional and local groundwater models from the basinwide USGS model. Additional site-specific geology and wells can be included into the model based on the review of the basic hydrogeologic data. The model calibration will be updated with local groundwater elevation data; however, the regional influences will be based the USGS model.

Subsidence is the reduction of aquifer storage due to decreased groundwater levels and resultant compaction of sediments. In the Antelope Valley, buried lake bottom sediments from ancient playa lakes are the primary source of the subsidence. Subsidence is induced when groundwater levels fall below historical lows, thus reducing the pore pressure in the fine-grained sediments. Subsidence could become problematic during the recovery phase of the project if groundwater levels fall below historic levels. This has been a critical issue in the development of other groundwater recharge and recovery projects in the state. Because of the historic subsidence issues in the Antelope Valley, this issue will need to be addressed in the design and environmental documentation. We will review nearby well logs to determine the extent of potentially compressible layers that could lead to subsidence. In addition, Kennedy/Jenks modeling staff is experienced in applying the Interbed Storage package in MODFLOW for the assessing the change in aquifer storage due to subsidence. We have applied this approach in the Antelope Valley model and in the Santa Clara-Calleguas (Ventura County) groundwater model.

Kennedy/Jenks has teamed with Dr. Richard Laton to provide a comprehensive assessment of the subsidence potential

Dr. Laton, a professor at Cal State-Fullerton, also has his own consulting firm, Earth Forensics. Dr. Laton has worked on numerous groundwater projects and evaluated aquifer subsidence in Southern California such as the Mojave Water Agency.

To further support the subsidence evaluation, the Kennedy/Jenks team includes Dr. Richard Laton. Dr. Laton will work with Kennedy/Jenks staff to provide a comprehensive assessment of the subsidence potential of the region and provide an initial assessment of monitoring and other mitigation measures as appropriate.

In an attempt to determine the groundwater flow pathways for recharge within the Littlerock Creek, Kennedy/Jenks will apply Synthetic Aperture Radar Interferometry (InSAR) technology to measure ground surface elevations. Spatial variability in groundwater recharge in the vicinity of Littlerock Creek will be assessed primarily through (1) review of the 2002 artificial recharge test, in conjunction with groundwater flow modeling (Task 6.1), and (2) groundwater isotopic data (Task 6.3). Specifically, storm events in 1998 and 2005 that produced flood events along the Littlerock Creek would have locally recharged the aquifer from the creek bed. InSAR measures small (millimeter-scale) perturbations in the land surface elevation between satellite passes. Land surface uplift resulting from the recharge events – when combined with modeled pore pressures and mechanical properties of the aquifer – can then be used to infer the locations of permeable pathways within the aquifer.

Kennedy/Jenks proposes a phased approach for employing InSAR technology so the District does not over commit funds on this effort

To obtain the raw data and process and review the data we have teamed with Dr. William Foxall, a recognized expert in InSAR technology. Dr. Walt McNab, our Task Leader, has used this technology and co-authored with Dr. Foxall the publication referenced in the figure below.

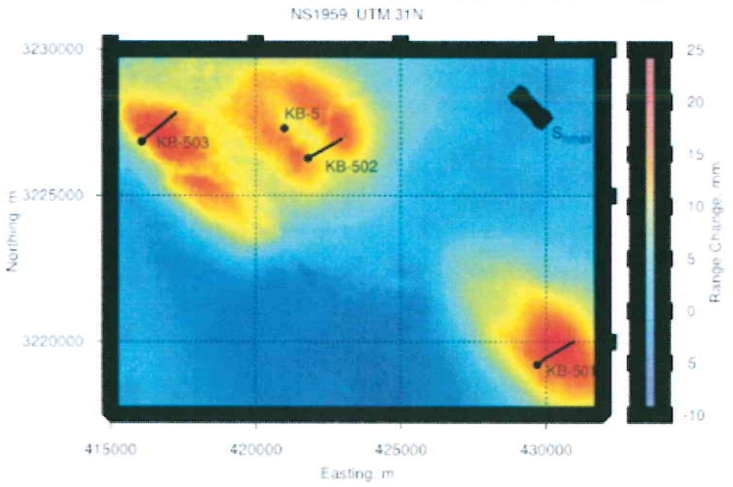


Figure 2. InSAR land surface deformation measurements for the In Salah gas field in central Algeria (March 2010) associated with fluid (CO2) injection. These data were used to constrain reservoir properties and to identify fluid migration pathways in the subsurface (Morris, J.P., Y. Hao, W. Foxall, and W. McNab, A study of injection-induced mechanical deformation at the In Salah CO2 storage project, Int. Jo. Greenhouse Gas Control, 10.1016/j.ijggc.2010.10.004, 2010).

The successful application of InSAR for measuring uplift in response to recharge will depend upon the existence of a coherent uplift signal. Given the variety of issues that can impact such a signal (e.g., flood debris in the creek bed, swelling and shrinking of clay minerals in shallow soils, temporal availability of InSAR data that would exclude other processes that could disturb the ground surface elevation), the applicability of InSAR to the recharge assessment cannot be known *a priori*. Consequently, we propose that an initial scoping review of existing InSAR data be conducted to elucidate whether or not meaningful land surface uplift data exist for the two flood events. Specifically, this task will entail obtaining raw data from an archival source such as Envisat and then processing and reviewing the data (e.g., comparing post-flood data sets with baselines) using the GMTSAR public-domain software package. If useful InSAR uplift data are identified in this initial screening, a subsequent follow-on task for matching the uplift data to permeable pathways within the aquifer will be implemented.

Potable Water Quality

Kennedy/Jenks will identify and quantify the groundwater quality impacts stemming from the introduction of recharge water to the aquifer system. Two broad sets of processes will act upon the groundwater composition in the context of artificial

recharge: (1) simple mixing and (2) reactions involving aquifer minerals in response to changing water chemistry. Kennedy/Jenks will quantitatively address these processes using different modeling approaches.

Simple Mixing

Simple mixing entails dilution of comparatively elevated total dissolved solid (TDS) groundwater with lower-TDS recharge water. The extent of mixing will vary in both time and space depending on the location and rate of recharge along the Littlerock Creek as well as the permeability structure of the aquifer. This mixing will be modeled by employing the MT3DMS solute transport package in conjunction with the modified MODFLOW model for the Littlerock Creek injection developed under Task 6.1. The deliverable for this subtask will consist of maps of predicted dilution contours (ranging from 0 to 1) in the aquifer, as well as projected dilute water-groundwater mixing ratios in pumping wells, as a function of time under various extraction scenarios.

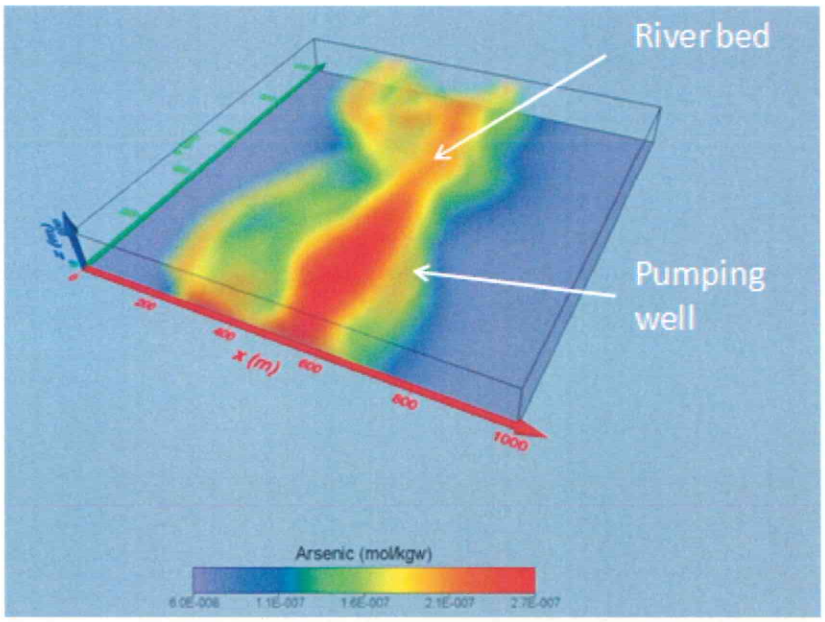


Figure 3. Kennedy/Jenks hydrogeologists employ reactive transport modeling approaches to identify and quantify aquifer geochemical processes, stemming from artificial recharge, which can mobilize trace elements of concern. In this example simulation, based on data developed under a prior artificial recharge pilot test in the northern San Joaquin Valley (McNab WW, Jr, Singleton MJ, Moran JE, Esser BK. Ion exchange and trace element surface complexation reactions associated with applied recharge of low-TDS water in the San Joaquin Valley, California, Appl Geochem 2009; 24(1):129–137), elevated arsenic concentrations develop following artificial recharge through a stream bed as a consequence of desorption.

Reactive Mixing

Reactive mixing entails potential equilibration reactions of aquifer minerals (e.g., dissolution, precipitation, adsorption/desorption, ion exchange) in response to changing water chemistry – concentrations of major cations and anions, trace elements, and pH. Predicting which water quality constituents, such as certain trace elements of regulatory concern, may undergo changes in concentration beyond what would be expected from simple mixing requires a geochemical modeling approach (e.g., Figure 3). As an initial step, we propose to collect water samples from at least ten (10) area monitoring wells and subject the samples to a suite of analyses (Title 22 general minerals and metals, plus isotopic data and dissolved gases) that will inform the geochemical model. Major ion, pH, and trace element data will be used to develop an aquifer mineralogy model that will include significant reactive minerals (e.g., calcite), ion exchange, and reactive surfaces associated with iron and aluminum oxides that can complex elements of concern, such as arsenic. Geochemical modeling will employ the U.S. Geological Survey's PHREEQC code. The modeling approach will posit the existence of varying quantities of these reactive materials in equilibrium with ambient groundwater. The geochemical response of the aquifer – and the net groundwater chemistry – will be modeled assuming varying degrees of mixing with recharge water (0 to 1), with the aquifer maintained in an assumed state of chemical equilibrium.

The deliverable for the geochemical modeling task will consist of a series of predicted groundwater concentration responses for both major and trace ions as a function of mixing fraction with recharge water, subject to different sets of assumptions regarding aquifer mineralogy and mineral surface exchange reactions. The distribution of the modeled concentration in the aquifer will be assessed vis-à-vis the MT3DMS solute transport model.

Recent construction cost data from bids on our AVEK Groundwater Banking Program will improve the accuracy of cost estimates for the LCGRRP project.

Define the Quantity, Quality, and Costs of Banking

The preliminary LCGRRP alternatives will be ranked on capital and O&M costs as well as non-economic factors. The shortlisted alternatives will be refined with updated opinions of probable construction cost and further ranking of their feasibility. The objective is to define the quantity of recharge and recovery, projected water quality for the recovery wells, and capital and O&M costs.

Kennedy/Jenks will also develop an implementation plan for each of the refined alternatives which will address the technical, regulatory, institutional, and operational challenges.

Kennedy/Jenks will provide a completion report that covers the entire feasibility investigation. Kennedy/Jenks will utilize the preparation and submittal of Technical Memoranda to solicit review and comment from the District, the Water Group, other stakeholders, and the public. The Draft Report will combine the Task 2 report and the multiple technical memoranda into a single report that identifies the priority and phasing for project components. GIS maps showing the existing infrastructure will be developed with consideration for illustrating the improvements associated with the project and any phasing. The Executive Summary will clearly highlight the main findings of the feasibility study. Following receipt of comments, Kennedy/Jenks will prepare a Final Report.

Stakeholder Involvement and Public Outreach

We recognize that a collaborative stakeholder process is essential to the success of the LCGRRP. Kennedy/Jenks has extensive experience working with and involving a wide range of diverse stakeholders through its experience with various UWMP and IRWMP efforts. Working closely with District staff and the Kennedy/Jenks team, MIG will develop a stakeholder group that includes Antelope Valley water agencies, businesses, relevant agency and organization representatives, public advocacy groups and others to provide an opportunity for community values and stakeholder input to be included in the LCGRRP development. Our team will meet with District staff to review existing databases and identify a final list of stakeholders; develop a stakeholder group task and scope, mission statement, and principles of participation, as well as obtain approval of these concepts at the first stakeholder group meeting; draft and obtain approval of a letter to stakeholders requesting participation from specific individuals or a representative from an agency or organization; recruit participants if necessary; and develop a final stakeholder group contact list.

Kennedy/Jenks will utilize a specialty public relations subconsultant, MIG, to facilitate public workshops

MIG is currently working with Kennedy/Jenks on Mojave Water Agency's Integrated Regional Water Management Plan (IRWMP). MIG is leading the public outreach component which is focused on ensuring the IRWMP incorporates public input, including six public workshops in communities throughout the high desert region and providing support and documentation for a series of nine stakeholder group meetings.

As a minimum, the Water Group includes:

- Antelope Valley-East Kern Water Agency
- Antelope Valley State Water Contractors Association
- City of Lancaster
- City of Palmdale
- Littlerock Creek Irrigation District
- Los Angeles County Sanitation District Nos. 14 and 20
- Los Angeles County Waterworks District No. 40
- Palmdale Water District
- Quartz Hill Water District
- Rosamond Community Services District

MIG will facilitate workshops and public meetings to accomplish the group's mission, as identified by the District and the entire project team. Working directly with the Kennedy/Jenks team, MIG staff will create all meeting materials, with the objective of ensuring these materials are informative and interactive. Materials may include a fact sheet and FAQ sheet that describe the District's water supply as well as future goals and requirements. MIG has strong experience facilitating stakeholder and community meetings and recommends including a dry run among project team participants and presenters before each meeting and participating in a debrief after each meeting to prepare subsequent meeting agendas. MIG will also prepare a summary of each meeting and assemble all materials and summaries into a final report documenting meeting discussions and any recommendations from the stakeholder team.

Management Approach

The previous section of our proposal describes Kennedy/Jenks' approach to addressing the technical challenges of the LCGRRP Feasibility Study. The project management approach summarized below further describes the way in which we will deliver a successful project to the District.

Successfully planned and executed projects begin with clear communication of mutually shared expectations between the Client, Project Manager and project team.

Kennedy/Jenks will strive to understand your expectations for the work in every respect important to you, such as work scope, schedule requirements, level of detail, technical quality, deliverable appearance, staff involvement, team effort and cost. Kennedy/Jenks has prepared a detailed Scope of Work with clearly defined deliverables, a project schedule with multiple deliveries, coordination meetings, stakeholder meetings, and public workshops over 12 months, and a budget with clearly defined assumptions.

Through thousands of water and wastewater projects in the past 90 years, Kennedy/Jenks has developed effective project management methods and planning tools to ensure that your design guidelines achieve accurate construction drawings. They are time-proven techniques. These tools will be used by David Ferguson and the project team to control quality, and to track adherence to the project scope, schedule and budget. These tools include:

- Communication Plan
- Quality Control Plan
- Cost Schedule Control Plan

Communication Plan

At the Project Kick-off Meeting, the project team and District staff will meet for an open discussion of the work to set the project in motion.

Kennedy/Jenks' Project Manager and key project staff will remain informed of all project issues: Kennedy/Jenks recognizes the importance of effective communication with the District through the course of the project.

Quality Control Plan

Quality Assurance and Quality Control (QA/QC) are integrated into Kennedy/Jenks' project management system from project inception. We use experienced staff, familiar with but not directly involved in the project work, to provide QA/QC review of work products and project deliverables. We will prepare a QA/QC Plan at the start of the project which will be provided to the District. This plan will outline QA/QC reviews and specific technical protocols and methods for preparing work products and performing engineering and construction management.

Our Project Manager, David Ferguson, will schedule update reviews with senior staff to discuss the progress of the work. This offers the project team timely reviews and valuable comments that enhance the design. Each deliverable will be reviewed for content, clarity, correctness of calculations, incorporation of standards, constructability, and other items necessary to ensure successful project completion.

Budget and Schedule Monitoring

Effective and dependable project management is the keystone on which all other elements of a successful project depend. Our project management approach relies on the concept of "ownership." That is, each member of the project team takes personal responsibility to assure that not only are their individual tasks performed to meet the District's expectations and requirements, but also is aware of other aspects of the project that may impact or be impacted by their actions to assure that the overall project or projects are successfully completed.

The control of project scope, schedule and budget is the major element of project management. There are a number of tools and systems which are essential to allow the team to work together to undertake and meet their responsibilities. The major tool is Kennedy/Jenks Consultants' management information system (MIS).

Our MIS is a relational database that allows for:

- Budgeting and labor planning
- Detailed cost accounting for each task
- Timely comparison of actual spent versus budgeted labor hours and costs for each project member by task
- Work in progress monitoring
- Individual subconsultant expense monitoring

Kennedy/Jenks' Project Manager will dedicate time every month to prepare a monthly invoice, update the project status report, and maintain the project schedule. The format of the monthly invoice will be discussed with District staff at the project kick-off meeting but in general will include the contract budget, current and previous billings, remaining budget, and the total percentage of work completed.

Scope of Work

This scope of work for the Littlerock Creek Groundwater Recharge and Recovery Project (LCGRRP) Feasibility Study is based on a set of assumptions as described below. The scope includes nine base tasks and three optional tasks with numerous subtasks, as follows:

Task	Description
Task 1	Project Administration
Task 2	Update Water Demands and Water Supply Plans for the District and Other Stakeholders
Task 3	Determine the Timing and Magnitude of Imported, Local Surface, and Recycled Water for Recharge
Task 4	Develop Preliminary LCGRRP Alternatives
Task 5	Conduct Site Specific Investigations to Determine Environmental Issues and Constraints
Task 6	Assess the Groundwater Response of Each Alternative
Task 7	Refine the LCGRRP Alternatives and Evaluate Feasibility
Task 8	Prepare the LCGRRP Report
Task 9	Conduct Public Outreach
Task 10	Follow-on for Ground Surface Deformation (InSAR) Investigation (Optional)
Task 11	Water Infiltration Rate Tests (Optional)
Task 12	Geophysical Testing for Depth to Bedrock (Optional)

Scope Enhancements

Kennedy/Jenks will provide its base professional services for the LCGRRP four specific with enhancements.

1. Since the LCGRRP will traverse three groundwater subbasins (Pearland, Buttes, and Lancaster) in order to eliminate the loss of recharge water to the Pearland subbasin through the creek bottom, Kennedy/Jenks has included a scope enhancement of evaluating several pipeline alternatives roughly as follows:
   - Conceptual pipeline alternatives for delivery from the East Branch Littlerock Creek turn-out
     - A west pipeline route approximately 6.3 miles
     - An east pipeline route approximately 6.6 miles
     - An east pipeline route (approximately 1.9 miles) to a lined channel route (approximately 1.7 miles)
   - Conceptual pipeline alternative for delivery from the East Branch 95th Street and 96th Street turn-outs
     - An east pipeline route approximately 5.4 miles
2. During the update of water demands and water supply plans for the District and other stakeholders under Task 2, Kennedy/Jenks will assist the District in the development of a valley-wide Integrated Groundwater Banking Plan.

3. From the latest available USGS MODFLOW groundwater flow and subsidence model of the Antelope Valley, Kennedy/Jenks will prepare and calibrate a new sub-regional MODFLOW model with significantly higher accuracy that those in recent reports. We propose to calibrate our new model using 220 x 220 foot squares based on available water levels, and to refine and run the model using 110 x 110 foot squares with up to five vertical layers.
4. For the development of the water quality solute transport model, Kennedy/Jenks will expand the scope from sampling 10 wells for a Title 22 evaluation to also include a suite of analyses that will include isotopic data and dissolved gases that will inform the geochemical model. The additional sampling and laboratory costs are included in our scope of work.

TASK 1 – PROJECT ADMINISTRATION

Kennedy/Jenks will provide project management as outlined below.

1.1 Kick-Off Meeting

The project kick-off meeting will be scheduled immediately after receipt of a notice-to-proceed. At this kickoff meeting, project reporting/communication protocols will be established, a project schedule will be provided and key technical issues will be discussed to establish the project guidelines. This meeting will include Kennedy/Jenks' Project Manager and key staff. Kennedy/Jenks will prepare an agenda for the District's review prior to the meeting. Meeting minutes with action items will be distributed within five working days following the meeting.

1.2 Coordination Meetings, Stakeholder Meetings, and Monthly Updates

Kennedy/Jenks has included nine coordination and/or review meetings over the course of the project.

Kennedy/Jenks will hold Stakeholder Meetings (approximately every two months) to discuss the technical work in progress, evaluate progress and performance, and to receive stakeholder feedback. Kennedy/Jenks will prepare an agenda for the District's review prior to the meetings. Draft meeting minutes with action items will be distributed within five working days following the meetings.

Kennedy/Jenks will hold a monthly conference call with the District's Project Manager following invoicing to discuss progress and work to be done in the next billing period. The updates will identify and discuss project issues, coordination efforts, action items, schedule, budget, and other items of concern.

1.3 Quality Assurance/Quality Control (QA/QC)

Technical Memorandum, Draft Report, and Final Report will be reviewed by a senior manager knowledgeable of similar projects but not directly involved with the day to day project activities prior to delivery.

Task 1 Deliverables
Project Kick-off Meeting (1)
Coordination and/or Review Meetings (9)
Stakeholder Meetings (8)
Public Outreach Workshops (5)
Monthly Update Telephone Calls (12)

1.4 Project Management

This task addresses the management responsibilities associated with proper scheduling, budget control, invoice preparation and coordination with the District's and Kennedy/Jenks' project team.

The meetings will be held at the District's office of other Antelope Valley locations with the appropriate members of Kennedy/Jenks' project team.

The five public outreach workshops are included in Task 9.

TASK 2 - UPDATE WATER DEMANDS AND WATER SUPPLY PLANS FOR THE DISTRICT AND OTHER STAKEHOLDERS

The objective of this task is to update water demand and supply plans for all of the major water supply entities that have demands on the East Branch of the SWP, recycled water, and groundwater in order to determine how groundwater banking in general, and the LCGRRP area specifically, can be integrated into the valley-wide water supply plan.

Kennedy/Jenks will perform this task in the following steps:

2.1 Data Collection and Analysis

Verify the water supply entities in the Antelope Valley to be included starting with the Water Group to determine if any entities should be added to the list.

For water demands and water supply, Kennedy/Jenks proposes to start with the IRWMP (Kennedy/Jenks 2007) demand set and update using the 2010 Urban Water Management Plans (UWMPs).

For wastewater flows and recycled water availability, Kennedy/Jenks proposes to evaluate and tabulate the data from the Regional, Lancaster, and PWD recent Recycled Water Plans, then verify/update with the wastewater agencies in the Antelope Valley.

2.2 Interviews

Meet with each water supply entity individually in an interview setting to review and verify the data on water demands and supply and to inquire about current and future water banking plans as well as current and future recycled water use.

Meet with each of the wastewater agencies in the Antelope Valley and confirm the data on wastewater flows and recycled water availability, as well as the status of on-going regional recycled water projects: quantity and quality, pipelines, interconnections, seasonal storage, land application and agricultural use, and related infrastructure.

2.3 Water Banking with SWP Supplies

Kennedy/Jenks proposes to assist PWD in the development of a valley-wide Integrated Groundwater Banking Plan. The AVSWCA is a JPA of the three local SWP contractors (AVEK, LCID, and PWD) has established a Statement of Principals and Objectives to frame its roles and responsibilities. Two of the objectives are

- To develop plans for maximum cooperative use of the available water resources, and
- To provide a mechanism for the storage and recovery of water.

The IRWMP (Kennedy/Jenks 2007) also recognizes the importance of conjunctive use operations in order to meet the water supply needs in the Antelope Valley Region and lists a large number of conjunctive use projects, many ranked with high priority.

The proposed scope of this subtask is to update the IRWMP water banking project list during the interviews with all of the water supply entities and to review the resulting list during the Stakeholders Meeting. The findings will be included in the Draft and Final Technical Memorandum described under Tasks 2.6 and 2.7.

2.4 Water Banking that includes Recycled Water

Determine the availability of recycled water for groundwater recharge and given the technical, regulatory, institutional, and public acceptance challenges to implementation of Indirect Potable Reuse (IPR), identify the agencies and water banking projects most likely to include recycled water. Provide an update to the quantity estimates provided in the Regional, Lancaster, and PWD recent Recycled Water Plans and 2010 UWMPs.

2.5 Stakeholder Meeting and Public Workshop

Coordinate and lead two Stakeholders Meetings for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination of the information from this task.

2.6 Draft Integrated Groundwater Banking Plan

A draft Integrated Groundwater Banking Plan will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memorandum, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager.

Kennedy/Jenks will meet with District staff to review the draft Integrated Groundwater Banking Plan to discuss and address any concerns that staff may have.

We have assumed a 30-day review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

Task 2 Deliverables
Shareholder Meetings (2)
Coordination Meetings (1)
Workshop on Task 2
Draft Integrated Groundwater Banking Plan (8 copies & PDF)
Final Integrated Groundwater Banking Plan (25 copies & PDF)

2.7 Final Integrated Groundwater Banking Plan

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue 25 hard copies of the final Integrated Groundwater Banking Plan and an electronic PDF file.

TASK 3 - DETERMINE THE TIMING AND MAGNITUDE OF IMPORTED. LOCAL SURFACE, AND RECYCLED WATER FOR RECHARGE

The objectives of this task are: (1) to determine the capacity within the East Branch of the SWP to deliver SWP and non-SWP waters to the LCGRRP, (2) to identify the types of non-SWP water that can be conveyed and recharged, and (3) the amount and timing of recycled water that could be recharged at the LCGRRP. This work will identify the range and types of water that can be recharged, the timing of deliveries, and the probable costs of these water sources. In addition, the agreements and processes required to obtain and convey these waters to the LCGRRP will be described.

3.1 East Branch Capacity

Kennedy/Jenks will review available reports and documents, such as the 2013 DWR SWP Final Delivery Reliability Report, and the most recent edition of Bulletin 132, Management of the SWP. to determine the range in capacity available in the East Branch for various times of the year under wet, normal, and dry year conditions.

3.2 SWP and Non-SWP Supplies

Kennedy/Jenks will review the 2013 DWR SWP Final Delivery Reliability Report for the latest information on the expected future SWP water deliveries, especially the reliability of SWP Table A water.

In its role working with the State Water Contractors, Kennedy/Jenks will estimate the multiple options for the delivery of recharge water through the East Branch, including Table A, Article 21 (as available), Carry-over, Turn Back Pool, the multiyear Pool (as available). Dry Year Purchases, and other purchase opportunities, including water transfers.

3.3 Recycled Water Availability

Kennedy/Jenks will clarify the findings from Task 2 to provide the amount and timing of recycled water that could be recharged at the LCGRRP.

3.4 Meetings

Coordinate and lead a Stakeholders Meeting for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination the information from this task along with Tasks 2 and 4.

3.5 Draft Technical Memorandum

A draft Technical Memorandum will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memorandum, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager.

Kennedy/Jenks will meet with District staff to review the draft Technical Memorandum to discuss and address any concerns that staff may have.

We have assumed a three week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

Task 3 Deliverables
Shareholder Meetings (1)
Coordination Meetings (1)
Subsequent Workshop
Draft Technical Memorandum (8 copies & PDF)
Final Technical Memorandum (1 copy & PDF)

3.6 Final Technical Memorandum

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue one final Technical Memorandum and an electronic PDF file.

TASK 4 - DEVELOP PRELIMINARY LCGRRP ALTERNATIVES

The objective of this task is to develop up to 10 preliminary LCGRRP alternatives and to describe them in sufficient detail so that they can be evaluated for performance, environmental challenges, and cost. Kennedy/Jenks will perform this task under 11 subtasks, as follows:

4.1 Hydrogeology

Our approach is to first develop a clear understanding of the fundamental site characteristics based on the available data and then proceed to more sophisticated analyses. For example, we will start with a thorough compilation and review of the existing local hydrogeological data collected from the District, AVEK, DWR, USGS and other relevant data sources. We will review available well logs, geophysical investigations, groundwater levels, etc. The information will be compiled into a GIS database described under Task 4.7.

In addition to recharge capacity, the hydrological data will provide a basis to estimate the depth and capacity of potential recovery wells.

4.2 Geophysical Investigations

Based on the review of hydrogeologic information (including geophysical investigations) under Task 4.1, Kennedy/Jenks will determine if additional field geophysical testing would be beneficial and the scope and cost associated with such testing. Therefore, the base scope of work includes only paper studies, field site visits, and communications with experts in the area such as USGS.

Kennedy/Jenks has defined an Optional Task (Task 12) to perform geophysical testing for depth to bedrock with the objective of more clearly defining the aquifer depth in the area of proposed recharge.

4.3 Initial Screening for Ground Surface Deformation (InSAR) Investigation

Kennedy/Jenks through Dr. William Foxall as a subconsultant, will perform an InSAR investigation for past Littlerock Creek Flood Events. This work will be performed in two phases. First an initial screen as a base scope of work (Task 4.4). If useful InSAR uplift data are identified in this initial screening, a subsequent (and "Optional") follow-on task (Task 10) for matching the uplift data to permeable pathways within the aquifer will be implemented with District approval to proceed.

Spatial variability in groundwater recharge in the vicinity of Littlerock Creek will be assessed primarily through (1) review of the 2002 artificial recharge test, in conjunction with groundwater flow modeling (Task 6.1) and (2) groundwater isotopic data (Task 6.3). Synthetic Aperture Radar Interferometry (InSAR) may provide an additional means for determining groundwater recharge pathways. Specifically, storm events in 1998 and 2005 that produced flood events along the Littlerock Creek would have locally recharged the aquifer from the creek bed. InSAR measures small (millimeter-scale) perturbations in the land surface elevation between satellite passes. Land surface uplift resulting from the recharge events – when combined with modeled pore pressures and mechanical properties of the aquifer – can then be used to infer the locations of permeable pathways within the aquifer.

The successful application of InSAR for measuring uplift in response to recharge will depend upon the existence of a coherent uplift signal. Given the variety of issues that can impact such a signal (e.g., flood debris in the creek bed, swelling and shrinking of clay minerals in shallow soils, temporal availability of InSAR data that would exclude other processes that could disturb the ground surface elevation), the applicability of InSAR to the recharge assessment cannot be known a priori. Consequently, we propose that an initial scoping review of existing InSAR data be conducted to elucidate whether or not meaningful land surface uplift data exist for the two flood events. Specifically, this task will entail obtaining raw data from an archival source such as ERS, Envisat or ALOS and then processing and reviewing the data (e.g., comparing post-flood data sets with baselines) using the GMTSAR public-domain software package. If useful InSAR uplift data are identified in this initial screening, a subsequent follow-on task for matching the uplift data to permeable pathways within the aquifer can be implemented.

4.4 Topographic Survey Using LiDAR Technology

Kennedy/Jenks through its subconsultant Mark Thomas & Company (MT), will provide topographical survey using high-resolution airborne laser mapping (LIDAR). A 3,000 acre area centered over Littlerock Creek has been assumed as the basis for our fee proposal. The topographic maps will be used for the layout of facility plans.

4.5 Water Infrastructure Information

Kennedy/Jenks will collect existing and planned potable and non-potable water infrastructure information from the District and other potential project participates. These data will be used to prepare reconnaissance level estimates of the pipelines required to deliver potable groundwater from the recovery wells to the appropriate water agency distribution system.

4.6 Flood Control and Road Infrastructure Information

Kennedy/Jenks will collect existing and planned flood control and road infrastructure information for the project area.

4.7 GIS Database

Kennedy/Jenks will compile the information and data described in Task 4.1 through 4.6 into a GIS database as the basis to develop alternative facility and operating plans.

4.8 Feasibility Evaluation Criteria

Since the preliminary LCGRRP alternatives developed under Task 4 will be further evaluated under Task 5 for environmental issues and constraints; under Task 6 for impacts on groundwater levels, water quality, and subsidence; and, then updated and re-evaluated under Task 7 using a set of feasibility evaluation criteria, Kennedy/Jenks proposes to develop the evaluation criteria early in the process. These criteria will first be reviewed with the District then presented in stakeholder meetings and public workshops. For each alternative Kennedy/Jenks will develop an opinion of probable construction cost and O&M costs.

4.9 Meetings

Coordinate and lead a Stakeholder Meeting for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination the information from this task along with Tasks 2 and 3.

4.10 Draft Technical Memorandum

A draft Technical Memorandum will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memorandum, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager.

Kennedy/Jenks will meet with District staff to review the draft Technical Memorandum to discuss and address any concerns that staff may have.

We have assumed a 3 week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

4.11 Final Technical Memorandum

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue one final Technical Memorandum and an electronic PDF file.

Task 4 Deliverables
Shareholder Meetings (1)
Coordination Meetings (1)
Workshop on Task 2, 3, and 4
Draft Technical Memorandum (8 copies & PDF)
Final Technical Memorandum (1 copy & PDF)

TASK 5 - CONDUCT SITE SPECIFIC INVESTIGATIONS TO DETERMINE ENVIRONMENTAL ISSUES AND CONSTRAINTS

The objectives of this task are: (1) to identify potential impacts of the LCGRRP alternatives on the hydrological, biological, cultural, and mineral resources, (2) the potential for exacerbating flooding, geological, and seismic hazards, and (3) impacts on groundwater levels, water quality, and subsidence.

5.1 Environmental Documentation

Kennedy/Jenks through its subconsultant Helix Environmental (Helix) will conduct biological and cultural resources surveys. The overall environmental approach will be to identify and determine the potential severity of constraints for the various project alternatives. This will be done as cost-effectively as possible while also ensuring that sufficient information is available to provide for informed evaluation of alternatives. HELIX and Applied Earthworks will review available existing information regarding potential biological and cultural resource constraints, respectively, and will conduct reconnaissance-level surveys to review current conditions in the field. The results of this effort, including recommendations for additional, more detailed work required for future review under the California Environmental Quality Act (CEQA), will be presented in a constraints report and associated meetings/workshops. Information provided regarding potential constraints, survey and processing requirements, and associated cost and schedule implications, will be presented in a manner designed to assist the District in selecting a preferred alternative for additional evaluation.

The Biological Resources Constraints Study includes general and programmatic mapping of the approximate locations of biological resources found within the 1,500-acre study area. Detailed and fine-scale mapping of vegetation communities, potential jurisdictional waters and wetlands, and other biological resources is not included within the scope of work and cost estimate.

5.2 Biological Resources Constraints Study

HELIX will perform the biological resources constraints study for the Project, which will include tasks for a database search and literature review; general biological survey and constraints mapping; and preparation of a biological constraints map and supporting narrative. The constraints study will be conducted for an approximately 1,500-acre area planned for potential groundwater recharge and recovery facilities near Littlerock Creek, which includes approximately 420 acres being considered for off-channel basins, 1,000 acres for in-channel recharge, and 80 acres to be identified by Kennedy/Jenks for potential well placement. The biological resources constraints study tasks are described in detail below.

Literature Review, Database Search, and Field Preparation. HELIX will perform literature and database reviews, prepare base maps to be used during field surveys, and gather readily available information pertaining to the approximately 1,500-acre study area. HELIX will consult both internal and external sources of available literature pertaining to the environmental and regulatory setting of the Project, including recent studies and environmental documents prepared for similar projects in the vicinity. The biological resources section of the Strategic Water Resources Plan PEIR will be thoroughly reviewed and relevant information will be referenced for the constraints study. The conservation goals, objectives, and policies for the Los Angeles County General Plan Antelope Valley Significant Ecological Area (SEA) and Draft West Mojave

Habitat Conservation Plan (HCP) will also be reviewed for applicability to the Project. HELIX will perform queries of sensitive biological resources, databases and lists, including the California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants, and U.S. Fish and Wildlife Service (USFWS) Species Lists, National Wetlands Inventory Mapper, and Critical Habitat Portal. This task will also include the assembly of data and preparation of maps using Geographic Information Systems (GIS) to be used during research, field surveys, and preparation of figures.

General Biological Survey and Constraints Mapping. HELIX will conduct a general biological survey of the approximately 1,500-acre study area to obtain a current inventory of existing biological resources and map associated constraints. The survey will be conducted on foot and by vehicle, and will include 100 percent visual coverage of the area to map existing vegetation communities and habitat types; determine the potential for sensitive plant and animal species to occur; preliminarily identify waters and wetlands potentially subject to regulatory agency jurisdiction; and note other sensitive biological resources encountered within the study area. The presence or absence of suitable habitat for sensitive species will be confirmed, especially listed endangered and/or threatened species such as the arroyo toad, least Bell's vireo, and Mojave ground squirrel. The general locations of drainage features, dry washes, and other wetland-related constraints will be preliminarily mapped in the field. Plant and animal species observed during the survey will be recorded in field notebooks. In the event that sensitive biological resources are encountered during the survey, including sensitive species, their locations will be mapped in the field using hand-held Global Positioning Satellite (GPS) receivers. In addition, representative photographs of the Project site and associated biological resources will be taken. The survey findings will inform the preparation of a biological constraints map and supporting narrative, as discussed below.

Biological Constraints Map and Summary Description. Using the information from the research and survey tasks described above, HELIX will prepare a constraints map that will depict the locations of significant biological resources-related constraints within the 1,500-acre study area. The map will illustrate the general locations of vegetation communities and habitat types, including sensitive habitat requiring mitigation for unavoidable impacts; potential jurisdictional waters and wetlands, including dry wash and riparian habitat associated with Littlerock Creek and tributaries; sensitive plant and animal species database records and those encountered during the survey; and other sensitive resources encountered (e.g., Joshua tree concentrations, potential wildlife corridors, etc.). The map and associated data will be provided to the Project team for use in facility siting and planning. In addition, HELIX will prepare summary text describing the research and survey methods, existing biological resources, and significant biological constraints. The narrative will include a discussion of the potential for sensitive species to occur and will identify additional studies that may be required to support environmental review and permitting for the project. It will highlight any time-sensitive survey dates, required survey protocols, and the approximate cost of additional studies that may be required. The narrative and map will be submitted to Kennedy/Jenks for inclusion of the findings within a complete constraints report.

Costs associated with rare plant surveys, Joshua tree inventories, protocol-level animal species surveys, formal wetland delineations, permit preparation and processing, CEQA

processing, and/or technical studies and reports ("additional work") are not included within the scope of work and cost estimate.

5.3 Cultural Resources Constraints Study

Working as a subconsultant to HELIX, Applied Earthworks will perform the cultural resources constraints study for the Project, which will include tasks for a database search and literature review; reconnaissance-level cultural survey; and preparation of a constraints narrative. The constraints study will be conducted for an approximately 1,500-acre area, as described above for biological resources. The cultural resources constraints study tasks are described in detail below.

Literature Review, Database Search, and Field Preparation. Applied Earthworks will complete a cultural resources literature and records search at the South Central Coastal Information Center (SCCIC), housed at the California State University, Fullerton. For purposes of this Project, this search will encompass a one-mile radius of the Project area. Applied Earthworks will contact the Native American Heritage Commission (NAHC) for a search of the Sacred Lands Files. Applied Earthworks will also contact individuals listed by the NAHC that may have an interest in the Project. Coordination will be initiated by letter, and followed by telephone contact. Once the records and Sacred Lands File searches are complete, Applied Earthworks will review relevant historical maps and aerial images, Government Land Office Plat maps, geological maps and soils data, the cultural resources records search and other pertinent sources and identify areas of high sensitivity for cultural resources.

Reconnaissance-level Survey. Applied Earthworks will conduct a reconnaissance-level survey, investigating areas identified as sensitive for cultural resources. This survey will not exceed 10 percent of the Project study area (150 acres) and will entail a reconnaissance-level archaeological survey consisting of 30-meter transects of sensitive areas of the Project area by a qualified archaeologist. Landforms likely to contain or exhibit archaeologically or historically sensitive cultural resources will be inspected carefully to ensure that visible, potentially important cultural resources are discovered and documented. Additionally, the surveyor will investigate unusual contours, soil changes, distinctive vegetation patterns, features (e.g., road cuts, ditches, and stream cuts), and other potential cultural site markers.

Identified cultural resources will be documented on using Primary forms only (DPR 523a) and location maps (DPR 523j), with descriptions consisting of the estimated size of the resources, a site characterization, the natural environment, and potential for subsurface deposits.

Cultural Constraints Summary Description. At the conclusion of fieldwork, Applied Earthworks will summarize its findings. This narrative, provided in electronic format for incorporation into the constraints report to be prepared by Kennedy/Jenks, will include a project description, cultural setting, methods, sensitivity analysis, survey results, and recommendations for further cultural resources management and possible constraints on Project development. Recommendations could include, but not be limited to, full documentation and Phase-II testing, should the site be impacted by further Project activities. The report would also incorporate results of the Sacred Lands Search from the NAHC as well as consultation with local Native American tribes, and the records search from the SCCIC.

The cost for the Cultural Resources Constraints Study assumes that three cultural resources (either previously recorded or newly recorded) will be identified; identification of additional resources would incur additional costs.

5.4 Environmental Support at Meetings and Workshops

HELIX's Project Manager will attend up to four project team coordination meetings and three public workshops.

5.5 Evaluation of Groundwater Levels and Subsidence in the Project Area

The recharge capacity assessment will determine whether there is sufficient volume of the unsaturated portion of the aquifer to allow for the storage requirements for the charge and recovery alternative. Factors that can influence this selection include determining if sufficient coarse-grained sediments are present to provide the necessary aquifer storage capacity based on the site-specific geologic conditions. A second factor is determining the potential losses from aquifer storage over time from groundwater pumping from non-project wells, as well as groundwater flow away from the project recovery area or groundwater discharge to lakes or streams. Our initial analysis will be based on the review of the existing data and reports for the project area. Our approach will be to use the appropriate tools to assess the site conditions to assess the recharge capacity and subsidence issues.

A key issue in this assessment is determining how much of the recharge water can ultimately be recovered. We will review existing well logs and groundwater level data, including seasonal variations, to determine the potential recharge capacity of the site. These data will be used in Task 6 for evaluation and update of the USGS MODFLOW model.

Subsidence is the reduction of aquifer storage due to decreased groundwater levels and resultant compaction of sediments. In the Antelope Valley, buried lake bottom sediments from ancient playa lakes are the primary source of the subsidence. Subsidence is induced when groundwater levels fall below historical lows, thus reducing the pore pressure in the fine-grained sediments. Subsidence can become problematic during the recovery phase of the project if groundwater levels fall below historic levels. This has been a critical issue in the development of other groundwater recharge and recovery projects in the state. Because of the historic subsidence issues in the Antelope Valley, this issue will need to be addressed in the design and environmental documentation. We will review the nearby well logs to determine the extent of potentially compressible layers that could lead to subsidence. These data will be used in Task 6 for evaluation and update of the Interbed Storage package in MODFLOW.

5.6 Evaluation of Water Quality in the Project Area

As an initial step, we propose to collect water samples from up to ten (10) area monitoring wells. Before proceeding, a Sampling and Analysis Plan (SAP), including a quality assurance project plan (QAPP) and a Health and Safety Plan (HSP) will be developed. The samples will be delivered to Weck Laboratory, an ELAP-certified laboratory, for Title 22 analysis.

For the development of the water quality solute transport model under Task 6.2, Kennedy/Jenks will expand the scope from sampling 10 wells for a Title 22 analysis to

also include a suite of analyses that will include isotopic data and dissolved gases that will inform the geochemical model. The additional samples will be sent to Lawrence Livermore National Laboratory for analysis of:

- Water H and O isotopes
- Nitrate $\delta^{15}N/\delta^{14}N$
- Tritium by ^{3}He accumulation
- Excess nitrogen (N_2, O_2, Ar)
- TIC/TOC, $\delta^{13}C$

The Weck and Lawrence Livermore National Laboratory costs are included in our scope of work.

5.7 Meetings

Coordinate and lead two Stakeholders Meetings for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination the information from this task along with Tasks 6.

5.8 Draft Technical Memorandum

A draft Technical Memorandum will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memorandum, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager. Kennedy/Jenks will also submit draft copies (PDF) of the subsidence data files and the water quality data files that will be collected under Task 5 for use in Task 6.

Kennedy/Jenks will meet with District staff to review the draft Technical Memorandum to discuss and address any concerns that staff may have.

We have assumed a 3 week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

Task 5 Deliverables
Shareholder Meetings (2)
Coordination Meetings (2)
Subsequent Workshop
Draft Environmental Technical Memorandum (8 copies & PDF)
Final Environmental Technical Memorandum (1 copy & PDF)
Draft Subsidence Data Files (PDF) - for use in Task 6
Draft Water Quality Data Files (PDF) - for use in Task 6

5.9 Final Technical Memorandum

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue one final Technical Memorandum and an electronic PDF file.

TASK 6 - ASSESS THE GROUNDWATER RESPONSE OF EACH ALTERNATIVE

The objectives of this task are: (1) to evaluate the hydrogeologic feasibility of the LCGRRP, (2) evaluate the groundwater level, water quality, and subsidence impacts of the preliminary LCGRRP alternatives, and (3) suggest refinements to the preliminary LCGRRP alternatives that improve project performance and minimize impacts to the groundwater resource.

6.1 Groundwater Flow Modeling

A key tool of this analysis will be the existing USGS MODFLOW model of the Antelope Valley that incorporates much of the information that the USGS has collected over

years of study in the region. From the latest available USGS MODFLOW groundwater flow and subsidence model of the Antelope Valley, Kennedy/Jenks will prepare and calibrate a new sub-regional MODFLOW model with significantly higher accuracy that those in recent reports. Additional site-specific geology and wells can be included into the model based on the review of the basic hydrogeologic data.

We propose to calibrate our new model using 220 x 220 foot squares based on available water levels; however, the regional influences will be based the USGS model. The calibrated model will then be refined and run using 110 x 110 foot squares with up to five vertical layers.

6.2 Subsidence Modeling

Kennedy/Jenks modeling staff is experienced in applying the Interbed Storage package in MODFLOW for the assessing the change in aquifer storage due to subsidence.

To further support the subsidence evaluation, the Kennedy/Jenks team includes Dr. Richard Laton of Cal State-Fullerton who also has his own consulting firm, Earth Forensics. Dr. Laton has worked on numerous groundwater projects and evaluated aquifer subsidence in Southern California such as the Mojave Water Agency. Dr. Laton will work with Kennedy/Jenks staff to provide a comprehensive assessment of the subsidence potential of the region and provide an initial assessment of monitoring and other mitigation measures as appropriate.

6.3 Modeling of Groundwater Quality Impacts

Kennedy/Jenks will identify and quantify the groundwater quality impacts stemming from the introduction of recharge water to the aquifer system. Two broad sets of processes will act upon the groundwater composition in the context of artificial recharge: (1) simple mixing and (2) reactions involving aquifer minerals in response to changing water chemistry. Kennedy/Jenks will quantitatively address these processes using different modeling approaches.

Simple Mixing

Simple mixing entails dilution of comparatively elevated total dissolved solid (TDS) groundwater with lower-TDS recharge water. The extent of mixing will vary in both time and space depending on the location and rate of recharge along the Littlerock Creek as well as the permeability structure of the aquifer. This mixing will be modeled by employing the MT3DMS solute transport package in conjunction with the modified MODFLOW model for the Littlerock Creek injection developed under Task 6.1. The deliverable for this subtask will consist of maps of predicted dilution contours (ranging from 0 to 1) in the aquifer, as well as projected dilute water-groundwater mixing ratios in pumping wells, as a function of time under various extraction scenarios.

Reactive Mixing

Reactive mixing entails potential equilibration reactions of aquifer minerals (e.g., dissolution, precipitation, adsorption/desorption, ion exchange) in response to changing water chemistry – concentrations of major cations and anions, trace elements, and pH. Predicting which water quality constituents, such as certain trace elements of regulatory concern, may undergo changes in concentration beyond what would be expected from simple mixing requires a geochemical modeling approach. As an initial step, we propose to collect water samples from at least ten (10) area monitoring wells and subject the samples to a suite of analyses (Title 22 general minerals and

metals, plus isotopic data and dissolved gases) that will inform the geochemical model. Major ion, pH, and trace element data will be used to develop an aquifer mineralogy model that will include significant reactive minerals (e.g., calcite), ion exchange, and reactive surfaces associated with iron and aluminum oxides that can complex elements of concern, such as arsenic. Geochemical modeling will employ the U.S. Geological Survey's PHREEQC code. The modeling approach will posit the existence of varying quantities of these reactive materials in equilibrium with ambient groundwater. The geochemical response of the aquifer – and the net groundwater chemistry – will be modeled assuming varying degrees of mixing with recharge water (0 to 1), with the aquifer maintained in an assumed state of chemical equilibrium.

The deliverable for the geochemical modeling task will consist of a series of predicted groundwater concentration responses for both major and trace ions as a function of mixing fraction with recharge water, subject to different sets of assumptions regarding aquifer mineralogy and mineral surface exchange reactions. The distribution of the modeled concentration in the aquifer will be assessed vis-à-vis the MT3DMS solute transport model.

6.4 Meetings

Coordinate and lead a Stakeholders Meeting for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination the information from this task along with Tasks 5.

6.5 Draft Technical Memorandum

Three draft Technical Memoranda will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memoranda, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager.

Kennedy/Jenks will meet with District staff to review the draft Technical Memoranda to discuss and address any concerns that staff may have.

We have assumed a 3 week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format for each technical memoranda.

6.6 Final Technical Memorandum

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue final Technical Memoranda and an electronic PDF file.

Task 6 Deliverables
Shareholder Meetings (1)
Coordination Meetings (2)
Workshop on Tasks 5 and 6
Draft Groundwater Flow Model Technical Memorandum (8 copies & PDF)
Draft Subsidence Model Technical Memorandum (8 copies & PDF)
Draft Water Quality Model Technical Memorandum (8 copies & PDF)
Final Groundwater Flow Technical Memorandum (1 copy & PDF)
Final Subsidence Model Technical Memorandum (1 copy & PDF)
Final Water Quality Model Technical Memorandum (1 copy & PDF)

TASK 7 - REFINE THE LCGRRP ALTERNATIVES AND EVALUATE FEASIBILITY

The preliminary LCGRRP alternatives developed under Task 4 will be further evaluated under Task 5 for environmental issues and constraints (including biological and cultural resource surveys), geological and geophysical considerations, the impacts on flood

control. Task 5 will also compile and analyze existing groundwater level and water quality data to define ambient groundwater conditions. Task 6 will evaluate the impacts on groundwater levels, water quality, and subsidence of the preliminary alternatives compared to the baseline (no-LCGRRP) as well as suggest refinements to some of the alternatives to improve performance and minimize impacts to the groundwater resource.

7.1 Refine the LCGRRP Alternatives

In Task 7, Kennedy/Jenks will update (finalize) the preliminary LCGRRP alternatives using the results from Task 5 and 6 including refinements or modifications developed through the process, including input from stakeholder meetings and public workshops.

7.2 Update Cost Opinions

For each alternative Kennedy/Jenks will update the opinion of probable construction cost and O&M costs.

7.3 Alternatives Ranking

The alternatives will be scored against weighted ranking criteria to access their feasibility. An implementation plan will be developed the highest ranked (most feasible) four or five alternatives (Task 7.4).

In addition to initial capital cost and annual O&M cost, non-economic weighted ranking criteria will be developed in conjunction with the District and with consensus from the stakeholders and may include:

- Recharge and Recovery Capacity
- Recovery Water Quality
- Impacts on Aquifer Water Quality
- Subsidence Mitigation
- Impacts on Flood Management
- Impacts on the Environment
- Risk (Proven Approach; Data Gaps)
- Ease of Operation and Maintenance
- Sustainability
- Land Acquisition Requirements
- Regulatory/Permitting Issues
- Institutional Issues
- Public Acceptance

Generally some criteria are more important than others. This may involve the constraints and values of the District and/or stakeholders, how the criteria are defined, or if certain criteria are of similar nature. A typical method of normalizing the importance of one criterion over another is to weight each of these factors. Typically it's convenient to assign weighting factor that sum up to 100%. Once criteria and weighting factors are developed, a rating matrix can be created.

After scoring is completed, Kennedy/Jenks will perform sensitivity analysis by re-computing scores with certain criteria removed and adjusting weights to determine how sensitive the results are relative to changes in weighting values.

7.4 Implementation Plans

Kennedy/Jenks will develop an implementation plan for each of the refined alternatives which will address the technical, regulatory, institutional, and operational challenges.

7.5 Meetings

Coordinate and lead a Stakeholders Meeting for presentation and discussion of the findings.

Coordinate and facilitate a Public Workshop as defined in Task 9 for dissemination the information from this task. We have assumed that this Public Workshop would be repeated.

7.6 Draft Technical Memorandum

A draft Technical Memorandum will be created for this task incorporating the information compiled and analyzed. Kennedy/Jenks will submit eight hard copies of the Draft Technical Memorandum, with electronic files in Portable Document Format (PDF) delivered by email to the District's Project Manager.

Kennedy/Jenks will meet with District staff to review the draft Technical Memorandum to discuss and address any concerns that staff may have.

We have assumed a 3 week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

Task 7 Deliverables
Shareholder Meetings (1)
Coordination Meetings (1)
Workshop on Task 7
Draft Technical Memorandum (8 copies & PDF)
Final Technical Memorandum (1 copy & PDF)

7.7 Final Technical Memorandum

After receiving the District's comments Kennedy/Jenks will incorporate the comments and issue one final Technical Memorandum and an electronic PDF file.

TASK 8 - PREPARE THE LCGRRP REPORT

The intent of this task is to create a Final Report. The Final Report will be a compilation of reports and technical memoranda created in Tasks 2 through 7, (and Optional Tasks 10, 11, and 12 if authorized).

8.1 Draft Final Report

A draft Final Report will compile the Integrated Groundwater Banking Plan (Task 2) and seven technical Memoranda from Task 3 through 7 and create a comprehensive feasibility study document and appendix.

8.2 Draft Final Report Review Meeting & Incorporate Comments

Kennedy/Jenks will meet with District staff to review the draft Final Report, incorporate comments, provide meeting minutes, and develop a Final Report.

Kennedy/Jenks will prepare and submit eight hard copies of the Draft Final Report, with electronic files in both Word/Excel and Portable Document Format (PDF) delivered by email to the District's Project Manager. We have assumed a 3-week review period after which the District will submit to Kennedy/Jenks one consolidated set of comments in redline format.

8.3 Final Report

After receiving the District's comments Kennedy/Jenks will meet with District staff to discuss and address any concerns that staff may have. Kennedy/Jenks will then incorporate the District's comments and issue one Final Report and a PDF.

Task 8 Deliverables
Draft Report and Appendix (8 copies & PDF)
Final Report and Appendix (25 copies & PDF)

TASK 9 - CONDUCT PUBLIC OUTREACH

Kennedy/Jenks, through MIG as a subconsultant, will provide a public outreach program to disseminate information related to the LCGRRP project.

9.1 Project Stakeholder Meetings

The MIG project manager will attend four Project Stakeholder meetings. The MIG team will use the information gleaned from these meetings to refine the approach to the Community Workshops and provide any feedback related to other public relations and community participation issues or needs.

Following the first Project Stakeholder meeting MIG will develop an Outreach Plan that outlines the timing and topics for the Community Workshops, methods to advertise the public workshops, team roles and proposed materials. The Outreach Plan will be reviewed and revised just prior to each round of Community Workshops. The task also assumes time for conference calls with the project team to revise the approach and prepare for the rounds of Workshops.

9.2 Fact Sheet

MIG will design a one, two-sided 8 ½" x 11" fact sheet that describes the process to develop the Littlerock Creek Groundwater Recharge and Recovery Feasibility Study. The fact sheet will be graphically oriented with information about the project including background, purpose, schedule, and opportunities for public input. This collateral will also include information regarding water supply and policies relevant to the LCRRP. MIG will work collaboratively with the project team to identify this information. MIG will provide a PDF version of the fact sheet for posting to the Palmdale Water District's website.

9.3 Community Workshops

MIG will design and conduct five interactive Community Workshops to gather community feedback for incorporation into the LCRRP. It is anticipated there will be three rounds of community workshops.

The first round will include two Community Workshops. The workshops will be held to present highlights from the updated water demand and supply plans, recharge determinations, and review the preliminary alternatives.

The focus of the second round of workshops will be to review the alternative performance and impact analysis. Two workshops are proposed for this round.

The third and final round includes one workshop where the final LCGRRP alternatives and feasibility will be presented.

Each two-hour workshop will include a presentation and opportunity for questions and comments from the public. MIG will facilitate all workshops and develop handout materials. These will include an agenda and a comment tool. MIG will work with the project team to confirm the workshop objectives, agenda and comment tool. MIG will also develop a flyer and provide a PDF for posting to the Palmdale Water District's website and distribution to stakeholders and the community. MIG will produce agendas and comment tool for all workshops. MIG will develop a summary of the comments generated for each workshop. This task assumes two MIG staff attending each workshop.

9.4 Prepare the LCGRRP Final Outreach Report

MIG will compile the summaries from all of the Community Workshops into a final Outreach Report. This report would also include a narrative summarizing the outreach activities including location of workshops, number of attendees and any key findings. MIG will provide a final Word version for incorporation into the LCGRRP.

Task 9 Deliverables
Attend selected Shareholder Meetings (4)
On, two-sided Fact Sheet (PDF)
Workshop (5-PDF)
Community Workshops (5)
Agendas (5)
Comment Tools (5)
Workshop Summaries (5)
One Final Outreach Report (1 copy & PDF)

TASK 10 – FOLLOW-ON FOR GROUND SURFACE DEFORMATION (InSAR) INVESTIGATION

If the initial review of the InSAR data for the 1998 and 2005 flood events (Task 4.4) indicates the presence of a discernible land surface response to groundwater recharge, then we propose this follow-on task be undertaken to reconcile the aquifer conceptual model (and, by extension, the MODFLOW model) with the data set(s). This task will entail iteratively adjusting the distributions of hydraulic conductivity, specific yield and/or specific storage, and compaction model coefficients (elastic and/or inelastic terms, as appropriate) to produce land surface uplift predictions consistent with the InSAR data. Reconciliation of model predictions with measurements will thus provide key support for the predictions of groundwater flow model. Specific technical issues which must be addressed under this task will include (1) quantifying the degree of uncertainty associated with the InSAR land surface uplift data, (2) quantifying the parameter space uncertainties associated with aquifer properties and well as surface water fluxes associated with the past flood events in Littlerock Creek, (3) employing a methodology to determine localized property heterogeneities with the aquifer at a suitable resolution, and, (4) conducting multiple MODFLOW runs to refine property values estimates and their spatial distributions, possibly aided using PEST or equivalent parameter inversion packages.

Task 10 Deliverables
Coordination Meeting (1)
Include with Task 4 Draft Technical Memorandum
Include with Task 4 Final Technical Memorandum

TASK 11 – WATER INFILTRATION RATE TESTS (OPTIONAL)

Kennedy/Jenks, through Converse Consultants (Converse) as a subconsultant, will assess the water infiltration rates at three locations within the active channel and off-channel basins. Infiltration tests will be conducted both at the surface and at a depth of approximately 10 feet below existing ground surface.

11.1 Document Review

Converse will review published and unpublished geologic/geotechnical reports pertaining to the project area for the following:

- Appropriate seismic and faulting information, including designated earthquake zones and faulting in the general site vicinity that may impact project design and construction
- Depth to groundwater and its impact on the proposed project
- Site geology

11.2 Project Set-up

As part of the project set-up, staff personnel from Converse will conduct the following:

- Coordinate site access with representative from the District
- Conduct field reconnaissance to map the surface conditions
- Obtain permits from the agencies that have jurisdiction over the project
- Stake/mark the infiltration test locations in the field such that drill rig access is available to all the locations.
- Notify Underground Service Alert (USA) at least 48 hours prior to drilling to clear the boring locations of any conflict with existing underground utilities

11.3 Subsurface Exploration

Subsurface exploration will consist of drilling 12 exploratory borings, four at each proposed recharge basin location. The purpose of the borings will be to:

- Obtain subsurface information at the site
- Obtain undisturbed and bulk samples of the various soil types for laboratory testing
- Record depth to bedrock or groundwater (if encountered)
- Prepare the borings for water infiltration tests

The borings will be advanced from a truck mounted drill rig (CME 75 or equivalent) equipped with 8-inch diameter hollow-stem auger for soils sampling. The borings will be visually classified in accordance with the Unified Soil Classification System and logged and sampled at regular depth intervals and at changes in subsurface soils. Relatively undisturbed ring and bulk samples of the subsurface soils will be obtained at frequent intervals in the borings for laboratory analysis. The mechanically driven hammer for the sampler is 140 pounds, falling thirty (30) inches for each blow. The number of successive drops of the driving weight ("blows") required for each six (6) inches of penetration will be shown on the boring logs.

Soil samples obtained during exploratory drilling will be tested in the laboratory to evaluate their engineering properties. Laboratory testing will likely include: Moisture and Density, Sieve Analysis, and Modified Proctor.

11.4 Water Infiltration Tests – At the Surface

Water Infiltration Tests at the surface will be conducted using the double-ring infiltrometer test in accordance with ASTM Standard D-3385, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometers. The method consists of driving two open cylinders, one (1) inside the other, into the ground, partially filling the rings with water liquid, and then maintaining the water liquid at a constant level for a minimum of six hours. The volume of water liquid added to the inner ring, to maintain the water liquid level constant, is the measure of the volume of water liquids that infiltrates the soil. The volume infiltrated during timed intervals is converted to an incremental infiltration velocity, usually expressed in cm/h or in/hr and plotted versus elapsed time. The maximum steady state or average incremental infiltration velocity, depending on the purpose/application of the test is equivalent to the infiltration rate.

Converse will conduct 12 surface infiltration tests, four tests at each of three recharge locations. We have assumed that a water truck provided by Converse can be filled locally from Palmdale Water District at no cost to the project.

11.5 Water Infiltration Tests – Below the Surface

Water Infiltration Tests below the surface will be conducted using the constant (falling head) test method in accordance with Los Angeles County "Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting".

The borings drilled as part of the field exploration will be prepared for infiltration testing. A 2-inch diameter perforated plastic pipe will be installed inside each boring. Pea gravel filter pack will be poured down the center of the auger while withdrawing the auger to surround the pipe casing and the hole bottom with the gravel filter pack. Water will be added to the bore hole until the water level is as near the ground surface as could be achieved, and allowed to pre-soak for at least two hours. After presoak, we will conduct the test. Each separate trial will be conducted by adding water to the borehole until the water level was at ground surface. The water level will be measured every ten (10) minutes to the nearest 1/10-foot. At least four sets of measurements will be taken for each test.

Attempt will be made to remove the pipes from the borings. If it fails, the pipes will be abandoned in place and the hole backfilled with soils cutting.

11.6 Percolation Report

Converse will provide a Percolation Report that includes:

- A description of the field investigation method
- A description of subsurface conditions, including a documentation of the borings/test pits and sampling locations and groundwater level
- Laboratory test result
- Discussion on the percolation test procedure
- Field data
- Percolation rates at each recharge basin site
- Excavatibility of soils within the proposed basins
- Site slopes of the basins
- Protection of the slope face from erosion

Task 11 Deliverables
Coordination Meeting (1)
Include as Appendix to Task 4 Draft and Technical Memoranda

TASK 12 – GEOPHYSICAL TESTING FOR DEPTH TO BEDROCK (OPTIONAL)

Kennedy/Jenks, through Spectrum Geophysics (Spectrum) as a subconsultant, will perform geophysical testing to estimate the depth to bedrock at three (3) locations within the active channel and off-channel basins. Spectrum recommends DC electrical resistivity methods to address the objective.

Spectrum will establish three 1800-foot transects where a linear array of 56 ten-meter electrodes will be established along each transect. Once established, either 2D Schlumberger, 2D dipole-dipole or 2D pole-dipole data will be collected along each transect (each array uses a slightly different measurement geometry so which is best will be determined for the project prior to the investigation). Once collected the data will be processed to generate 2D images of the electrical resistivity variation along each transect. The field testing will involve two days of field time plus data analysis and yield a color cross-section illustrating the resistivity variation versus depth for each transect with a brief interpretation of findings.

Task 12 Deliverables
Include as Appendix to Task 4 Draft and Technical Memoranda

Past Performance



Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

Past Performance

What our clients say about us

The Kennedy/Jenks team has a proven track record of performance as evidenced by the reference letters included from our clients. The following letters include client recommendations from projects highlighted in the Specific Qualifications sections as follows:

- **Antelope Valley-East Kern Water Agency (AVEK):** Groundwater Banking
- **Los Angeles Department of Water and Power:** Groundwater Development Feasibility Study
- **Kings County Water District:** Apex Ranch Conjunctive Use Project
- **Santa Cruz County Environmental Health Services:** Conjunctive Use and Enhanced Aquifer Recharge
- **Inland Empire Utilities Agency:** Phase II Recharge Basin Improvements

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ANTELOPE VALLEY - EAST KERN WATER AGENCY
AVEK
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A PUBLIC AGENCY

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DAN FLORY
General Manager

HOLLY H. HUGHES
Secretary-Treasurer

July 24, 2013

Harold Glaser
Three Better World Circle
Suite 200
Temecula, CA 92590

To Whom It May Concern:

Kennedy/Jenks Consultants has provided excellent professional services to the Antelope Valley-East Kern Water Agency (AVEK) since January 2011. Project work by Kennedy/Jenks has included:

- Conceptual Design and Groundwater Modeling of the Water Supply Stabilization Program (WSSP-2) and Eastside Water Banks;
- Design and construction support for the WSSP-2 well drilling, well equipping, operational storage tank, and disinfection facilities; and,
- Assistance with CDPH permit amendment and preparation of an Operations Plan.

Kennedy/Jenks has completed their projects on budget and schedule. Their engineering was technically competent, and they coordinated, communicated, and worked very well together with our staff. Kennedy/Jenks put our requests and requirements as their top priority.

AVEK continues to be satisfied with the consistent quality service we receive, and values Kennedy/Jenks' role in developing sound technical solutions. We appreciate the expertise and commitment of Kennedy/Jenks' Project Manager, Dr. David Ferguson.

Based on their overall capabilities and performance, I would recommend this firm to others for engineering services.

Very truly yours,

Dwayne Chisam
Assistant General Manager

6500 WEST AVENUE N • PALMDALE, CALIFORNIA 93551
(661) 943-3201 • FAX (661) 943-3204

Department of Water and Power the City of Los Angeles

ERIC GARCETTI
Mayor

Commission
THOMAS S. SAYLES, President
ERIC HOLOMAN, Vice President
RICHARD F. MOSS
CHRISTINA E. NOONAN
JONATHAN PARFREY
BARBARA E. MOSCHOS, Secretary

RONALD O. NICHOLS
General Manager

July 23, 2013

Harold T. Glaser, PE
Kennedy/Jenks Consultants
Three Better World Circle Suite 200
Temecula, California 92590

Dear Mr. Glaser:

Subject: Letter of Recommendation

Kennedy/Jenks Consultants has provided professional services to the Los Angeles Department of Water and Power (LADWP) for the Santa Monica and Hollywood Groundwater Basins Investigation.

Kennedy/Jenks completed the project on budget and schedule. Their engineering and scientific work was technically competent, and they coordinated, communicated, and worked together with our staff. Kenney/Jenks put our requests and requirements as a top priority. LADWP is satisfied with the quality of service we received, and values Kennedy/Jenks' role in developing sound technical solutions.

Based on their overall capabilities and performance, I would recommend this firm to others for professional engineering and scientific services.

If you have any questions, please contact Mr. Milad Taghavi, Assistant Director of Water Quality, at (213) 367-1032.

Sincerely,

Albert G. Gastelum
Director of Water Quality

GRR:bdc
c: David R. Pettijohn
Milad Taghavi

Water and Power Conservation ... a way of life

111 North Hope Street, Los Angeles, California 90012-2607 *Mailing address:* Box 51111, Los Angeles 90051-5700
Telephone: (213) 367-4211 *Cable address:* DEWAPOLA

Recycled paper

Don Mills
General Manager
Kings County Water District
200 Campus Drive
Hanford, CA 93230-5923

July 17, 2013

Harold Glaser
Three BetterWorld Circle
Suite 200
Temecula, CA 92590

To Whom It May Concern:

Kennedy/Jenks Consultants has provided excellent professional services to the Kings County Water District since May 2011. Kennedy/Jenks has provided an independent review of the monitoring and operations for the Apex Ranch Conjunctive Use Project. Kennedy/Jenks developed a Groundwater Monitoring Plan, an Operations Plan, an Operations Data Analysis Report and a Regional Groundwater Evaluation Report. Kennedy/Jenks presented this information during a series of public meetings with local landowners, adjacent agencies and other interested parties.

Kennedy/Jenks has completed their projects on budget and schedule. Their hydrogeological analysis was technically competent, and they coordinated, communicated, and worked very well together with our staff. Kennedy/Jenks put our requests and requirements as their top priority.

Kings County Water District continues to be satisfied with the consistent quality service we receive, and values Kennedy/Jenks' role in developing sound technical solutions. We appreciate their partnership approach working with the Kings County Water District in addressing problems and developing creative solutions to our project needs. The staff has continued to be timely, thorough and flexible on all projects performed for Kings County Water District.

Based on their overall capabilities and performance, I would recommend this firm to others for engineering services.

Very truly yours,

Don Mills
General Manager
Kings County Water District

County of Santa Cruz

HEALTH SERVICES AGENCY

701 OCEAN STREET, ROOM 312, SANTA CRUZ, CA 95060-4073
(831) 454-2022 FAX: (831) 454-3128 TDD: (831) 454-2123
www.co.santa-cruz.ca.us/eh/ehhome.htm

ENVIRONMENTAL HEALTH

July 24, 2013

Harold Glaser
Three BetterWorld Circle
Suite 200
Temecula, CA 92590

To Whom It May Concern:

Kennedy/Jenks Consultants provided very good professional services to the Santa Cruz County Environmental Health Services during the completion of the Conjunctive Use and Enhanced Aquifer Recharge Project from August 2008 to December 2010. Kennedy/Jenks conducted the initial Feasibility Study process to evaluate methods to increase groundwater levels in the southern Santa Margarita Groundwater Basin. Kennedy/Jenks identified three preferred alternatives that consisted of identifying a water source and defining a recharge methodology that achieved the Project goals by best meeting the technical feasibility and cost criteria while minimizing long-term environmental impacts.

Kennedy/Jenks completed this project in a timely manner and worked closely with Santa Cruz County staff to adapt the budget and schedule to changing project conditions. Kennedy/Jenks successfully managed a multi-disciplinary team of subconsultants that was responsive to our requests and requirements to complete this project. Their hydrogeological and engineering analysis was technically competent, and they coordinated, communicated, and worked very well together with our staff.

I was satisfied with the technical quality of the service we received, and value Kennedy/Jenks' role in developing sound technical solutions for the Conjunctive Use and Enhanced Aquifer Recharge Project. I appreciate their partnership approach working with the Santa Cruz County in addressing problems and developing creative solutions to our project needs.

Based on their overall capabilities and performance, I would recommend this firm to others for engineering services.

Very truly yours,

Mike Cloud

Mike Cloud
Geologist
Santa Cruz County Environmental Health Services

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Ave, • Chino, CA 91708
P.O. Box 9020 • Chino, Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-9000
www.ieua.org

July 25, 2013

Mr. Edward C. Yang, PE
Kennedy/Jenks Consultants
707 Wilshire Blvd.
Suite 4700
Los Angeles, CA 90017

Subject: Letter of Recommendation

Dear Mr. Yang

Kennedy/Jenks Consultants has provided professional services to the Inland Empire Utilities Agency (IEUA) for the Phase II Basin Recharge Improvement Project.

Kennedy/Jenks has completed their project(s) on budget and schedule. Their engineering was technically competent, and they coordinated, communicated, and worked very well together with our staff. Kennedy/Jenks put our requests and requirements as their top priority. IEUA is satisfied with the quality of service received and values Kennedy/Jenks' role in developing sound technical solutions.

Based on their overall capabilities and performance, I would recommend this firm to others for engineering services.

If you have any questions, please feel free to contact me at the number below.

Sincerely,

Inland Empire Utilities Agency

Mr. Joel Ignacio, PE
Senior Engineer
Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91708
909-993-1913
jignacio@ieua.org

Water Smart – Thinking in Terms of Tomorrow

Terry Catlin, President
Michael E. Camacho, Vice President
Steven J. Elie, Secretary/Treasurer
Gene Koopman, Director
Angel Santiago, Director

Project Fee and Schedule



Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

Project Fee and Schedule

Project Fee

Kennedy/Jenks has prepared a fee and cost breakdown by tasks for Tasks 1 through 9 described in our base Scope of Work. A detailed fee breakdown is attached with fully-burdened labor costs, hours, subconsultants, and expenses by task and subtask. A communication charge will not be added on this project. A five percent mark-up will be charged for subconsultants and other direct charges. A Custom Schedule of Charges is also attached and the proposed hourly rates will be held constant through 2014.

Kennedy/Jenks has also provided a fee and cost breakdown for each of three Optional Tasks as described in our Scope of Work.

Task	Description	Fee Estimate
1	Project Administration	$59,540
2	Update Water Demands and Water Supply Plans for the District and Other Stakeholders	$103,725
3	Determine the Timing and Magnitude of Imported, Local Surface, and Recycled Water for Recharge	$49,855
4	Develop Preliminary LCGRRP Alternatives	$152,940
5	Conduct Site Specific Investigations to Determine Environmental Issues and Constraints	$114,543
6	Assess the Groundwater Response of Each Alternative	$128,500
7	Refine the LCGRRP Alternatives and Evaluate Feasibility	$70,785
8	Prepare the LCGRRP Report	$61,300
9	Conduct Public Outreach	$57,455
	TOTAL PROJECT	**$798,643**

10	Follow-on for Ground Surface Deformation (InSAR) Investigation (Optional)	$36,885
11	Water Infiltration Rate Tests (Optional)	$41,220
12	Geophysical Testing for Depth to Bedrock (Optional)	$22,745

Proposal Fee Estimate

Kennedy/Jenks Consultants

CLIENT Name: Palmdale Water District
PROJECT Description: LCGRRP Feasibility Study
Proposal/Job Number: _____ **Date:** 7/31/2103

Classification:	Eng-Sci-9	Eng-Sci-8	Eng-Sci-7	Eng-Sci-6	Eng-Sci-5	Eng-Sci-4	Eng-Sci-3	Eng-Sci-2	Eng-Sci-1	Designer	CAD	Project Admin.	Admin. Assist.	Total	KJ	KJ	Sub	Sub	KJ	KJ	KJ	Total	Total	Total	Total Labor + Subs + Expenses
Hourly Rate:	$230	$225	$215	$190	$170	$155	$140	$120	$110	$125	$100	$90	$75	Hours	Labor Fees	Comm. Charge 0%	Subs - Name	Subs - Cost Fees	Sub-Markup 5%	ODCs Fees	ODCs Markup 5%	Total Labor	Total Subs	Total Expenses	Fees
Task 1 - Project Administration																									
1.1 Kick-Off Meeting	2	10			6									18	$3,730	$0			$0	$800	$40	$3,730	$0	$840	$4,570
1.2 Coordination/Stakeholder Mtgs & Monthly Updates		88	10		48							4		150	$30,470	$0			$0	$3,600	$180	$30,470	$0	$3,780	$34,250
1.3 Quality Assurance/Quality Control	10	28	16										2	56	$12,190	$0			$0		$0	$12,190	$0	$0	$12,190
1.4 Project Management		22			8							18	8	56	$8,530	$0			$0		$0	$8,530	$0	$0	$8,530
Task 1 - Subtotal	12	148	26	0	62	0	0	0	0	0	0	22	10	280	$54,920	$0		$0	$0	$4,400	$220	$54,920	$0	$4,620	$59,540
Task 2 - Update Water Demands/Supply																									
2.1 Data Collection and Analysis		22				32		48					4	106	$15,970	$0			$0	$100	$5	$15,970	$0	$105	$16,075
2.2 Interviews		48				36								84	$16,380	$0			$0	$400	$20	$16,380	$0	$420	$16,800
2.3 Water Banking with SWP		24				32		16					4	76	$12,580	$0			$0		$0	$12,580	$0	$0	$12,580
2.4 Water Banking that includes Recycled Water	14	20				36								70	$13,300	$0			$0		$0	$13,300	$0	$0	$13,300
2.5 Meetings/Workshops (in Task 1.2 & Task 9.3)														0	$0	$0			$0		$0	$0	$0	$0	$0
2.6 Draft Integrated Groundwater Banking Plan		32				72		48		32		8	4	196	$29,140	$0			$0	$800	$40	$29,140	$0	$840	$29,980
2.7 Final Integrated Groundwater Banking Plan		12				30		20		10		6	4	82	$11,840	$0			$0	$3,000	$150	$11,840	$0	$3,150	$14,990
Task 2 - Subtotal	14	158	0	0	0	238	0	132	0	42	0	14	16	614	$99,210	$0		$0	$0	$4,300	$215	$99,210	$0	$4,515	$103,725
Task 3 - Timing & Magnitude of Recharge																									
3.1 East Branch Capacity		20			36									56	$10,620	$0			$0		$0	$10,620	$0	$0	$10,620
3.2 SWP and Non-SWP Supplies		22			30									52	$10,050	$0			$0		$0	$10,050	$0	$0	$10,050
3.3 Recycled Water Availability	4	20			32									56	$10,860	$0			$0		$0	$10,860	$0	$0	$10,860
3.4 Meetings (in Task 1.2)														0	$0	$0			$0		$0	$0	$0	$0	$0
3.5 Draft Technical Memorandum		24			40							4	2	70	$12,710	$0			$0	$100	$5	$12,710	$0	$105	$12,815
3.6 Final Technical Memorandum		10			16							2	2	30	$5,300	$0			$0	$200	$10	$5,300	$0	$210	$5,510
Task 3 - Subtotal	4	96	0	0	154	0	0	0	0	0	0	6	4	264	$49,540	$0		$0	$0	$300	$15	$49,540	$0	$315	$49,855
Task 4 - Develop Prel LCGRRP Alternatives																									
4.1 Hydrogeology		16				92								108	$17,860	$0			$0	$400	$20	$17,860	$0	$420	$18,280
4.2 Geophysical Investigations		4				48								52	$8,340	$0			$0		$0	$8,340	$0	$0	$8,340
4.3 Initial Screening for InSAR Investigation			16											16	$3,440	$0	Dr. Foxall	$15,000	$750		$0	$3,440	$15,750	$0	$19,190
4.4 Topographic Survey using LiDAR Technology		4				4						2		10	$1,700	$0	Mark Thomas	$34,700	$1,735		$0	$1,700	$36,435	$0	$38,135
4.5 Water Infrastructure Information		6			24		40							70	$11,030	$0			$0	$100	$5	$11,030	$0	$105	$11,135
4.6 Flood Control & Road Infrastructure		6			24		36							66	$10,470	$0	CAI	$6,000	$300	$100	$5	$10,470	$6,300	$105	$16,875
4.7 GIS Database		4				80			48					132	$18,580	$0			$0		$0	$18,580	$0	$0	$18,580
4.8 Feasibility Evaluation Criteria	2	4			16									22	$4,080	$0			$0		$0	$4,080	$0	$0	$4,080
4.9 Meetings/Workshops (in Task 1.2 & Task 9.3)														0	$0	$0			$0		$0	$0	$0	$0	$0
4.1 Draft Technical Memorandum		24			40							4	2	70	$12,710	$0			$0	$100	$5	$12,710	$0	$105	$12,815
4.11 Final Technical Memorandum		10			16							2	2	30	$5,300	$0			$0	$200	$10	$5,300	$0	$210	$5,510
Task 4 - Subtotal	2	78	16	0	120	224	76	0	48	0	0	8	4	576	$93,510	$0		$55,700	$2,785	$900	$45	$93,510	$58,485	$945	$152,940
Task 5 - Site Specific Investigations																									
5.1 Environmental Documentation		2										2		4	$630	$0	Helix	$6,600	$330		$0	$630	$6,930	$0	$7,560
5.2 Biological Resources Constraints Study														0	$0	$0	Helix	$16,350	$818		$0	$0	$17,168	$0	$17,168
5.3 Cultural Resources Constraints Study														0	$0	$0	Helix	$15,400	$770		$0	$0	$16,170	$0	$16,170
5.4 Environmental Support at Meetings/Workshops														0	$0	$0	Helix	$9,800	$490		$0	$0	$10,290	$0	$10,290
5.5 Evaluation of Groundwater Levels & Subsidence		16				80								96	$16,000	$0			$0	$100	$5	$16,000	$0	$105	$16,105
5.6 Evaluation of Water Quality			6	12				24						42	$6,450	$0	Weck & LLNL	$35,000	$1,750	$400	$20	$6,450	$36,750	$420	$43,620

Proposal Fee Estimate

Kennedy/Jenks Consultants

CLIENT Name: Palmdale Water District
PROJECT Description: LCGRRP Feasibility Study
Proposal/Job Number: _____ **Date:** 7/31/2103

Classification:	Eng-Sci-9	Eng-Sci-8	Eng-Sci-7	Eng-Sci-6	Eng-Sci-5	Eng-Sci-4	Eng-Sci-3	Eng-Sci-2	Eng-Sci-1	Designer	CAD	Project Admin.	Admin. Assist.	Total	KJ Labor	KJ Comm. Charge	Sub - Name	Sub - Cost	KJ Sub-Markup	KJ ODCs	KJ ODCs Markup	Total Labor	Total Subs	Total Expenses	Total Labor + Subs + Expenses
Hourly Rate:	$230	$225	$215	$190	$170	$155	$140	$120	$110	$125	$100	$90	$75	Hours	Fees	0%		Fees	5%	Fees	5%				Fees
5.7 Meetings (in Tak 1.2)														0	$0	$0			$0		$0	$0	$0	$0	$0
5.8 Draft Env Technical Memorandum		4		8										12	$2,420	$0			$0		$0	$2,420	$0	$0	$2,420
5.9 Final Env Technical Memorandum		2		4										6	$1,210	$0			$0		$0	$1,210	$0	$0	$1,210
Task 5 - Subtotal	0	24	6	24	0	80	0	24	0	0	0	2	0	160	$26,710	$0		$83,150	$4,158	$500	$25	$26,710	$87,308	$525	$114,543
Phase 6 - Assess GW Response for Alts																									
6.1 Groundwater Flow Model		40	10			160			24				2	236	$38,740	$0			$0		$0	$38,740	$0	$0	$38,740
6.2 Subsidence Modeling		16				40			24				2	82	$12,590	$0	Earth Forensics	$10,000	$500		$0	$12,590	$10,500	$0	$23,090
6.3 Modeling of Groundwater Quality Impacts		4	50			80							2	136	$24,200	$0			$0		$0	$24,200	$0	$0	$24,200
6.4 Meetings/Workshops (in Task 1.2 & Task 9.3)														0	$0	$0			$0		$0	$0	$0	$0	$0
6.5 Draft Technical Memorada (3 TMs)		24	24			80			40			8	4	180	$28,380	$0			$0	$200	$10	$28,380	$0	$210	$28,590
6.6 Final Technical Memoranda (3 TMs)		12	12			40			12			4	4	84	$13,460	$0			$0	$400	$20	$13,460	$0	$420	$13,880
Task 6 - Subtotal	0	96	96	0	0	400	0	0	100	0	0	12	14	718	$117,370	$0		$10,000	$500	$600	$30	$117,370	$10,500	$630	$128,500
Task 7 - Refine LCGRRP Alts & Feasibility																									
7.1 Refine the LCGRRP Alternatives		30	14		30	36	24			8				142	$24,800	$0			$0		$0	$24,800	$0	$0	$24,800
7.2 Update Cost Opinions		6			16									22	$4,070	$0			$0		$0	$4,070	$0	$0	$4,070
7.3 Alternative Ranking	2	6			20									28	$5,210	$0			$0		$0	$5,210	$0	$0	$5,210
7.4 Implementation Plans		14	4		40	16	40					2		116	$19,070	$0			$0		$0	$19,070	$0	$0	$19,070
7.5 Meetings/Workshops (in Task 1.2 & Task 9.3)														0	$0	$0			$0		$0	$0	$0	$0	$0
7.6 Draft Technical Memorandum		24			32		8					4	2	70	$12,470	$0			$0	$100	$5	$12,470	$0	$105	$12,575
7.7 Final Technical Memorandum		8			16							2	2	28	$4,850	$0			$0	$200	$10	$4,850	$0	$210	$5,060
Task 7 - Subtotal	2	88	18	0	154	52	72	0	0	8	0	8	4	406	$70,470	$0		$0	$0	$300	$15	$70,470	$0	$315	$70,785
Task 8 - Prepare the LCGRRP Report																									
8.1 Draft Final Report		50	16		40	48	24	20	12	24		8	4	246	$40,030	$0			$0	$1,000	$50	$40,030	$0	$1,050	$41,080
8.2 Review Meeting (in Task 1.2)														0	$0	$0			$0		$0	$0	$0	$0	$0
8.3 Final Report		20	6		24	16	8			12		6	4	96	$15,810	$0			$0	$4,200	$210	$15,810	$0	$4,410	$20,220
Task 8 - Subtotal	0	70	22	0	64	64	32	20	12	36	0	14	8	342	$55,840	$0		$0	$0	$5,200	$260	$55,840	$0	$5,460	$61,300
Task 9 - Conduct Public Outreach																									
9.1 MIG attendance at Project Stkeholder Meetings														0	$0	$0	MIG	$10,900	$545		$0	$0	$11,445	$0	$11,445
9.2 Fact Sheet		4			10									14	$2,600	$0	MIG	$3,500	$175		$0	$2,600	$3,675	$0	$6,275
9.3 Community Workshops	2	50	6		24									82	$17,080	$0	MIG	$15,000	$750	$2,000	$100	$17,080	$15,750	$2,100	$34,930
9.4 Prepare the Final Outreach Report		2			4									6	$1,130	$0	MIG	$3,500	$175		$0	$1,130	$3,675	$0	$4,805
Task 9 - Subtotal	2	56	6	0	38	0	0	0	0	0	0	0	0	102	$20,810	$0		$32,900	$1,645	$2,000	$100	$20,810	$34,545	$2,100	$57,455
Project Total	**36**	**814**	**190**	**24**	**592**	**1058**	**180**	**176**	**160**	**86**	**0**	**86**	**60**	**3462**	**$588,380**	**$0**		**$181,750**	**$9,088**	**$18,500**	**$925**	**$588,380**	**$190,838**	**$19,425**	**$798,643**
Task 10 Follow-On InSAR Work (Optional)																									
10.1 Follow-On InSAR Investigation		1	10			86						2		99	$15,885	$0	Dr. Foxall	$20,000	$1,000		$0	$15,885	$21,000	$0	$36,885
Task 10 (Optional)	0	1	10	0	0	86	0	0	0	0	0	2	0	99	$15,885	$0		$20,000	$1,000	$0	$0	$15,885	$21,000	$0	$36,885
Task 11 - Water Infiltration Tests (Optional)																									
11.1-11.6 Water Infiltration Rate Tests		2						4				2		8	$1,110	$0	Converse	$38,000	$1,900	$200	$10	$1,110	$39,900	$210	$41,220
Task 11 (Optional)	0	2	0	0	0	0	0	4	0	0	0	2	0	8	$1,110	$0		$38,000	$1,900	$200	$10	$1,110	$39,900	$210	$41,220
Task 12 - Geophysical Testing (Optional)																									
12.1 Geophysical Testing for Depth to Bedrock		1				4		20				2		27	$3,425	$0	Spectrum Geo.	$18,100	$905	$300	$15	$3,425	$19,005	$315	$22,745
Task 12 (Optional)	0	1	0	0	0	4	0	20	0	0	0	2	0	27	$3,425	$0		$18,100	$905	$300	$15	$3,425	$19,005	$315	$22,745

Client/Address: Palmdale Water District
2029 East Avenue Q
Palmdale, CA 93550

Contract/Proposal Date: July 31, 2013

Custom Schedule of Charges

Date: July 31, 2013

PERSONNEL COMPENSATION

Classification	Hourly Rate
CAD-Technician	$100
Designer-Senior Technician	$125
Engineer-Scientist-Specialist 1	$110
Engineer-Scientist-Specialist 2	$120
Engineer-Scientist-Specialist 3	$140
Engineer-Scientist-Specialist 4	$155
Engineer-Scientist-Specialist 5	$170
Engineer-Scientist-Specialist 6	$190
Engineer-Scientist-Specialist 7	$215
Engineer-Scientist-Specialist 8	$225
Engineer-Scientist-Specialist 9	$230
Project Administrator	$90
Administrative Assistant	$75
Aide	$65

In addition to the above Hourly Rates, a 0 percent Communications Surcharge will be added to Personnel Compensation for normal and incidental copies, communications and postage.

DIRECT EXPENSES

Reimbursement for direct expenses, as listed below, incurred in connection with the work, will be at cost plus 5 percent for items such as:

a. Maps, photographs, 3rd party reproductions, 3rd party printing, equipment rental, and special supplies related to the work.
b. Consultants, soils engineers, surveyors, contractors, and other outside services.
c. Rented vehicles, local public transportation and taxis, travel and subsistence.
d. Project specific telecommunications and delivery charges.
e. Special fees, insurance, permits, and licenses applicable to the work.
f. Outside computer processing, computation, and proprietary programs purchased for the work.

Reimbursement for vehicles used in connection with the work will be at the federally approved mileage rates or at a negotiated monthly rate.

Rates for professional staff for legal proceedings or as expert witnesses will be at rates one and one-half times the Hourly Rates specified above.

Excise and gross receipts taxes, if any, will be added as a direct expense.

The foregoing Schedule of Charges is incorporated into the agreement for the services provided, effective _____, 2013 through December 31, 2014. After December 31, 2014, invoices will reflect the Schedule of Charges currently in effect.

Project Schedule

Task 1

Task 1 – Project Administration, covers the entire project period of 15 months from October 1, 2014 through December 23, 2014. It includes the kick-off meeting plus nine coordination and/or review meetings as well as eight Stakeholder Meetings.

Tasks 2, 3 and 4

All three tasks (Task 2, 3, and 4) begin immediately upon NTP with Tasks 2 and 3 producing technical memoranda under the same schedule, with Draft Technical Memoranda submitted on January 7, 2014 and Final Technical Memoranda submitted on February 4, 2014. We propose that the Draft and Final Technical Memorandum for Task 4 be staggered by two weeks after the Task 2 and 3 submittals.

Task 5

This task has assumed that the environmental surveys will be performed prior to the field investigations, including water quality sampling. The water quality results become the Critical Path for the water quality solute transport model, which in turn, is the Critical Path for Tasks 7 and 8.

Task 6

This task includes three sets of groundwater modeling: flow, subsidence, and water quality. The latter two are subsets of the first. We show the groundwater flow model and the subsidence model Draft Technical Memoranda complete but on hold for 18 and 16 weeks, respectively, waiting for completion of the water quality solute transport model. The water quality model will be run in conjunction with the groundwater flow model and the Draft Technical Memorandum submitted and reviewed prior to finalizing all three technical memoranda (scheduled for submittal on July 29, 2014).

Tasks 7 and 8

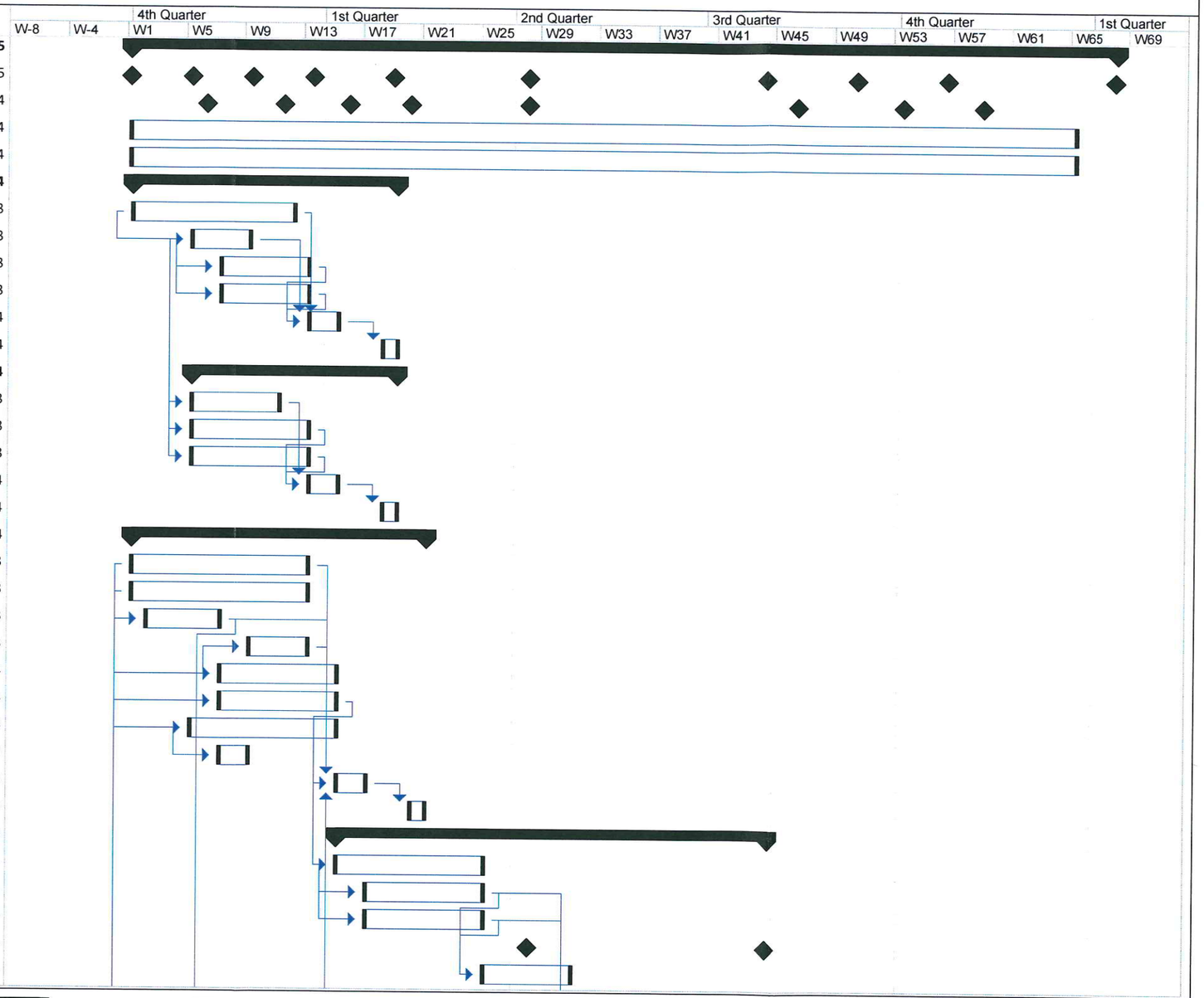
Task 7 involves the refinement of the preliminary LCGRRP alternatives using all of the work from Tasks 2 through 6. As the Draft Technical Memorandum for Task 7 is being prepared, work will begin on the Draft Final Report which incorporates the report from Task 2 and all of the technical memoranda from Tasks 3 through 7. Kennedy/Jenks understands that there may be a delay in review of the Final Draft Report by the multiple stakeholders and we have assumed there will be a delay of roughly 2 months before we can work on the Final Report. We have shown the submittal of the Draft Report on October 7, 2014 and anticipate completing the Final Report on December 23, 2014.

Task 9

The Public Outreach task covers the period of time from the first stakeholder meeting (which MIG will attend for information) thorough the Final Outreach Report to be submitted within two weeks of the last Public Workshop.

Littlerock Creek Groundwater Recharge and Recovery Project (LCGRRP) Feasibility Study
Proposed Project Schedule
Palmdale Water District

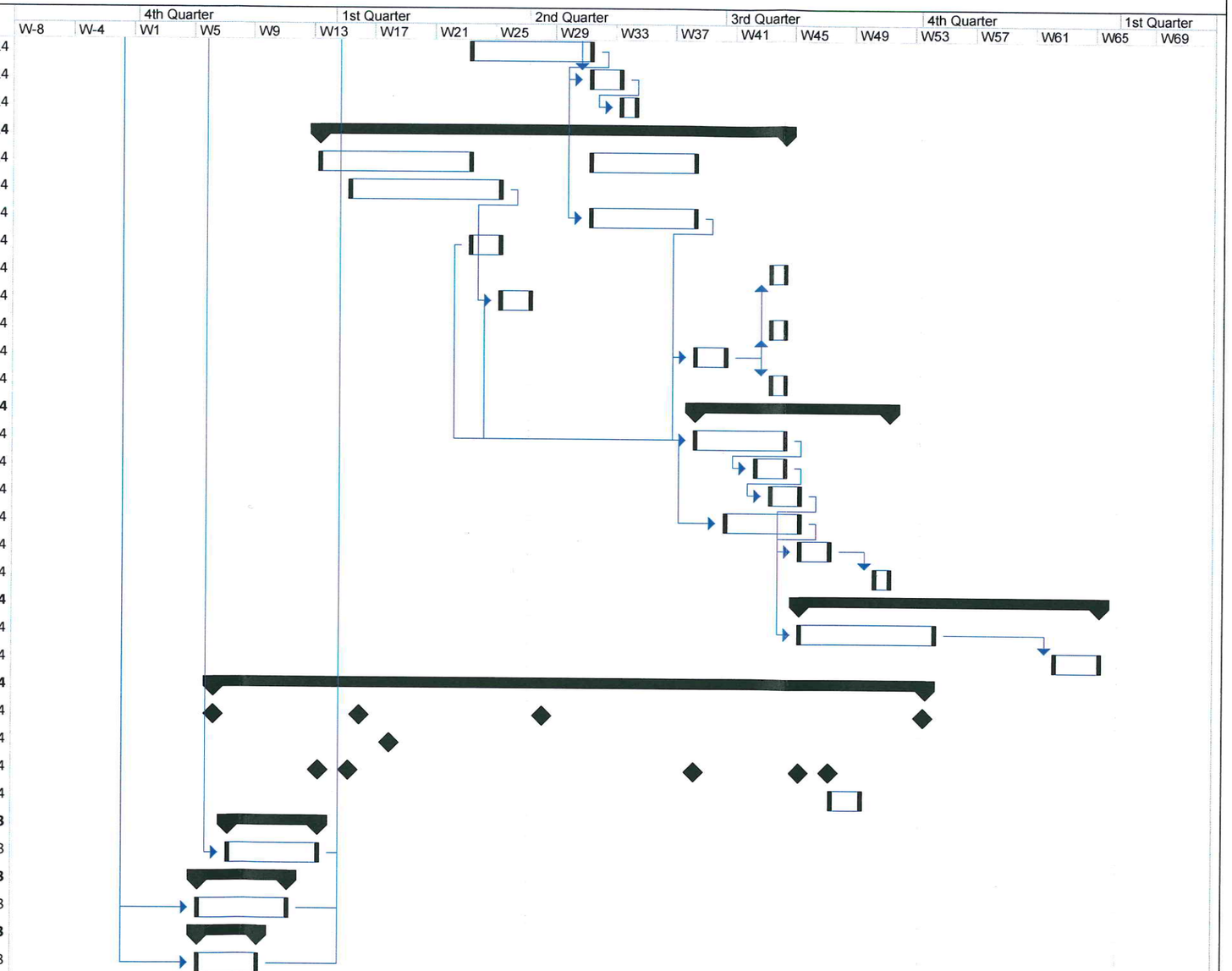
ID	Task Name	Duration	Start	Finish
1	**Task 1 - Project Administration**	**335 days**	**Tue 10/1/13**	**Mon 1/12/15**
2	Kick-Off and Coordination Meetings	335 days	Tue 10/1/13	Mon 1/12/15
13	Stakeholder Meetings	264 days	Wed 11/6/13	Mon 11/10/14
22	Quality Assurance/Quality Control	321 days	Tue 10/1/13	Tue 12/23/14
23	Project Management	321 days	Tue 10/1/13	Tue 12/23/14
24	**Task 2 - Update Water Demands/Supply**	**90 days**	**Wed 10/2/13**	**Tue 2/4/14**
25	Data Collection and Analysis	11 wks	Wed 10/2/13	Tue 12/17/13
26	Interviews	4 wks	Wed 10/30/13	Tue 11/26/13
27	Water Banking with SWP	6 wks	Wed 11/13/13	Tue 12/24/13
28	Water Banking that includes Recycled Water	6 wks	Wed 11/13/13	Tue 12/24/13
29	Draft Integrated Groundwater Banking Plan	2 wks	Wed 12/25/13	Tue 1/7/14
30	Final Integrated Groundwater Banking Plan	1 wk	Wed 1/29/14	Tue 2/4/14
31	**Task 3 - Timing & Magnitude of Recharge**	**70 days**	**Wed 10/30/13**	**Tue 2/4/14**
32	East Branch Capacity	6 wks	Wed 10/30/13	Tue 12/10/13
33	SWP and Non-SWP Supplies	8 wks	Wed 10/30/13	Tue 12/24/13
34	Recycled Water Availability	8 wks	Wed 10/30/13	Tue 12/24/13
35	Draft Technical Memorandum	2 wks	Wed 12/25/13	Tue 1/7/14
36	Final Technical Memorandum	1 wk	Wed 1/29/14	Tue 2/4/14
37	**Task 4 - Develop Prel LCGRRP Alternatives**	**100 days**	**Wed 10/2/13**	**Tue 2/18/14**
38	Hydrogeology	12 wks	Wed 10/2/13	Tue 12/24/13
39	Geophysical Investigations	12 wks	Wed 10/2/13	Tue 12/24/13
40	Initial Screening for InSAR Investigation	5 wks	Wed 10/9/13	Tue 11/12/13
41	Topographic Survey using LiDAR Technology	4 wks	Wed 11/27/13	Tue 12/24/13
42	Water Infrastructure Information	8 wks	Wed 11/13/13	Tue 1/7/14
43	Flood Control & Road Infrastructure	8 wks	Wed 11/13/13	Tue 1/7/14
44	GIS Database	10 wks	Wed 10/30/13	Tue 1/7/14
45	Feasibility Evaluation Criteria	2 wks	Wed 11/13/13	Tue 11/26/13
46	Draft Technical Memorandum	2 wks	Wed 1/8/14	Tue 1/21/14
47	Final Technical Memorandum	1 wk	Wed 2/12/14	Tue 2/18/14
48	**Task 5 - Site Specific Investigations**	**147 days**	**Wed 1/8/14**	**Thu 7/31/14**
49	Environmental Documentation	10 wks	Wed 1/8/14	Tue 3/18/14
50	Biological Resources Constraints Study	8 wks	Wed 1/22/14	Tue 3/18/14
51	Cultural Resources Constraints Study	8 wks	Wed 1/22/14	Tue 3/18/14
52	Environmental Support at Meetings/Workshops	82 days	Wed 4/9/14	Thu 7/31/14
55	Evaluation of Groundwater Levels & Subsidence	6 wks	Wed 3/19/14	Tue 4/29/14



Task — Progress — Summary — External Tasks — Deadline
Split — Milestone — Project Summary — External Milestone

Littlerock Creek Groundwater Recharge and Recovery Project (LCGRRP) Feasibility Study
Proposed Project Schedule
Palmdale Water District

ID	Task Name	Duration	Start	Finish
56	Evaluation of Water Quality	8 wks	Wed 3/5/14	Tue 4/29/14
57	Draft Env Technical Memorandum	2 wks	Wed 4/30/14	Tue 5/13/14
58	Final Env Technical Memorandum	1 wk	Wed 5/14/14	Tue 5/20/14
59	**Task 6 - Assess GW Response for Alts**	**155 days**	**Wed 12/25/13**	**Tue 7/29/14**
60	Groundwater Flow Model	125 days	Wed 12/25/13	Tue 6/17/14
63	Subsidence Modeling	10 wks	Wed 1/8/14	Tue 3/18/14
64	Modeling of Groundwater Quality Impacts	7 wks	Wed 4/30/14	Tue 6/17/14
65	Draft Groundwater Flow Model TM	2 wks	Wed 3/5/14	Tue 3/18/14
66	Final Groundwater Flow Model TM	1 wk	Wed 7/23/14	Tue 7/29/14
67	Draft Subsidence Model TM	2 wks	Wed 3/19/14	Tue 4/1/14
68	Final Subsidence Model TM	1 wk	Wed 7/23/14	Tue 7/29/14
69	Draft Water Qualtiy Model TM	2 wks	Wed 6/18/14	Tue 7/1/14
70	Final Water Quality Model TM	1 wk	Wed 7/23/14	Tue 7/29/14
71	**Task 7 - Refine LCGRRP Alts & Feasibility**	**65 days**	**Wed 6/18/14**	**Tue 9/16/14**
72	Refine the LCGRRP Alternatives	6 wks	Wed 6/18/14	Tue 7/29/14
73	Update Cost Opinions	2 wks	Wed 7/16/14	Tue 7/29/14
74	Alternative Ranking	2 wks	Wed 7/23/14	Tue 8/5/14
75	Implementation Plans	5 wks	Wed 7/2/14	Tue 8/5/14
76	Draft Technical Memorandum	2 wks	Wed 8/6/14	Tue 8/19/14
77	Final Technical Memorandum	1 wk	Wed 9/10/14	Tue 9/16/14
78	**Task 8 - Prepare the LCGRRP Report**	**100 days**	**Wed 8/6/14**	**Tue 12/23/14**
79	Draft Final Report	9 wks	Wed 8/6/14	Tue 10/7/14
80	Final Report	3 wks	Wed 12/3/14	Tue 12/23/14
81	**Task 9 - Conduct Public Outreach**	**238 days**	**Wed 11/6/13**	**Fri 10/3/14**
82	MIG attendance at Project Stakeholder Meetings	238 days	Wed 11/6/13	Fri 10/3/14
87	Fact Sheet	1 day	Mon 1/27/14	Mon 1/27/14
88	Community Workshops	171 days	Wed 12/25/13	Wed 8/20/14
94	Prepare the Final Outreach Report	2 wks	Thu 8/21/14	Wed 9/3/14
95	**Task 10 Follow-On InSAR Work (Optional)**	**30 days**	**Wed 11/13/13**	**Tue 12/24/13**
96	Follow-On InSAR Investigation	6 wks	Wed 11/13/13	Tue 12/24/13
97	**Task 11 - Water Infiltration Tests (Optional)**	**30 days**	**Wed 10/30/13**	**Tue 12/10/13**
98	Water Infiltration Rate Tests	6 wks	Wed 10/30/13	Tue 12/10/13
99	**Task 12 - Geophysical Testing (Optional)**	**20 days**	**Wed 10/30/13**	**Tue 11/26/13**
100	Geophysical Testing for Depth to Bedrock	4 wks	Wed 10/30/13	Tue 11/26/13



Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Appendix A. Detailed Resumes



Proposal to Provide:
Littlerock Creek Groundwater Recharge
and Recovery Project Feasibility Study

Kennedy/Jenks Consultants

David W. Ferguson, Ph.D., P.E.

Project Manager

Education

BS, Civil Engineering, University of Massachusetts, 1980
BS, Environmental Science, University of Massachusetts, 1977
MBA, Business Management, California State University, San Bernardino, 1985
MS, Civil Engineering, University of Massachusetts, 1980
PHD, Executive Management, Claremont Graduate University, 1993

Registrations

Professional Civil Engineer, California (34626)

Awards

American Academy of Environmental Engineers, Excellence in Environmental Engineering, 1993
"Grand Prize in Research", for Metropolitan Water District's Oxidation Demonstration Project

Memberships/Affiliations

American Water Works Association (AWWA)
Design-Build Institute of America (DBIA)
American Academy of Environmental Engineers (AAEE) - Board Certified Environmental Engineer (BCEE)

Professional Summary

Dr. Ferguson has extensive experience in the planning, design, construction, and operation of water supply, infrastructure, and treatment projects. His background includes project and program management, as well as management of engineering and/or operations for three large water utilities in Southern California. He has served as manager for an $80 million water supply pipeline and pump station for the City of Irving, Texas, a $143 million five-year capital improvement program for the City of Long Beach, and a $26 million ozone water treatment research program for the Metropolitan Water District of Southern California. Dr Ferguson has been responsible for the evaluation and/or design of upgrades, rehabilitation, retrofit, and/or replacement for over 40 water treatment plants, 30 reservoirs, and 20 pumping stations for 15 different water utilities.

Project Experience

Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, Palmdale, CA - *Project Manager* - for the design of 4 of 7 bid packages for the $30 million Phase 1 groundwater banking and blending program that will provide both water supply stabilization through banking and compliance with the Stage 2 Disinfectants/Disinfection ByProducts Rule (D/DBP) for TTHM Control by providing potable groundwater as an alternative water supply source. The development of a sub-regional groundwater model in combination with water quality testing of various groundwater and treated surface water blends provided operational strategies for THM compliance. The design packages for well drilling, treatment/chlorination facilities and storage tank construction have been successfully bid, with the well equipping design currently at 90% completion. The well drilling construction contract (seven 20-inch diameter wells with depths up to 600 feet) is currently 50% complete.

Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - *Project Manager* - for the feasibility of developing the Santa Monica and Hollywood groundwater basins as potable groundwater supply sources for the City of Los Angeles. For each groundwater basin, the study included: hydrogeologic characterization, basin governance, groundwater quality, treatment evaluations, and siting studies. Seven alternative sites and a total of 14 alternatives were identified.

Kennedy/Jenks recommended a treatment process of green sand pressure filters followed by granular activated carbon (GAC) for the Hollywood Basin, and reverse osmosis (RO) for the Santa Monica Coastal Subbasin.

Treatment Plant Upgrades, Antelope Valley-East Kern Water District, CA *Project Manager* - for the D/DBP compliance evaluation, pilot study, preliminary design, and design for $80 million in treatment plant upgrades including the addition of ozone, deep-bed GAC filters, and related upgrades for four water treatment plants with a total treatment capacity of 136 mgd.

Water Supply Study, City of Riverside, CA *Project Engineer* - for a comprehensive water supply analysis and evaluation of 10 water supply alternatives, including a hydrogeologic investigation, water quality evaluation, review of water rights, technical feasibility, and financial analysis. The hydrogeologic investigation evaluated existing production and the water-producing potential for each of five groundwater basins underlying and/or north of the City.

Capital Improvement Program, City of Long Beach, CA *Program Manager* - for planning and implementation of a $143 million five-year capital improvement program for the City of Long Beach Water Department. Projects included a 62.5 mgd water treatment plant, 150,000-linear foot cast iron pipeline replacement program, a pump and motor replacement program, a large valve replacement program, well rehabilitation, a sewer main replacement and lining program, and other miscellaneous water supply and wastewater collection facilities.

Hydraulic Modeling, Long Beach Water Department, CA *Project Director* - for a Student Intern Program sponsored by CalPoly, Pomona under which the Long Beach Water Department funded a 3-member student team for a semester-long senior project under which the students performed the network hydraulic analysis of the entire LBWD distribution network. The working model was turned over to LBWD to be calibrated and then used by LBWD staff for an in-house water master planning effort.

Treatment Plant Upgrades, City of Riverside, CA *Water Systems Operations Manager* - for eight treatment plants with a total capacity over 50 mgd, including two Ion Exchange (IX) well-head treatment systems for Perchlorate removal, three regional treatment plants with Granular Activated Carbon (GAC) and IX for TCE and Perchlorate removal, two regional GAC plants for DBCP removal, and an ultrafiltration submerged membrane treatment plant for treating groundwater under the direct influence (GWUDI) of surface water. During his 3-year tenure, Dr Ferguson was involved with three plant expansions, one new plant, conversion from coal-based to coconut-based GAC, change in IX resin from 21-03 to PSR2, security upgrades, SCADA upgrades, vessels re-lining and painting, and numerous maintenance projects.

Harold T. Glaser, P.E.

Principal-in-Charge

Education

BS, Civil and Environmental Engineering, Clarkson University, 1976
MS, Civil and Environmental Engineering, Clarkson University, 1978

Registrations

Professional Civil Engineer, California (30437)

Memberships/Affiliations

American Society of Civil Engineers
American Water Works Association
Association of Metropolitan Water Agencies
Colorado River Water Users Association
Association of California Water Agencies
Tau Beta Pi, Engineering Honor Society
Chi Epsilon, Civil Engineering Honor Society

Professional Summary

Harold Glaser has extensive experience in civil and environmental engineering, information technology, and management consulting. Emphasis is on projects related to planning, design, construction management, and evaluation of water, wastewater, storm water, and flood control facilities; computer aided design; automated mapping and facilities management; geographic information systems; and analysis, design, and development of engineering and scientific computing systems. He recently served as Client Service Manager simultaneously for the Metropolitan Water District of Southern California, and the Los Angeles Department of Water and Power, and was responsible for client service, project management, delivery, and performance of all technical assignments for these clients. Harold is currently serving as the firm's Business Development Director.

Project Experience

Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - *Principal-in-Charge* - for the feasibility of developing the Santa Monica and Hollywood groundwater basins as potable groundwater supply sources for the City of Los Angeles.

As-Needed Services Contract, Metropolitan Water District of Southern California, Los Angeles, CA *Principal Consultant*- Providing consulting services to Metropolitan in the areas of business process facilitation associated with reorganization of the Engineering Services Section, and internal partnering associated with the Control System Expansion and Automation Master Plan (CSEAMP). For the ESS, Mr. Glaser led a series of workshops designed to identify and address major issues and concerns associated with the reorganization process. Workshops consisted of a highly participative resolution of key issues and concerns. For the CSEAMP, Mr. Glaser provided partnering services to five organizations within Metropolitan to increase the level of awareness, understanding, and cooperation among the groups. The overall focus of the partnering/team building efforts was to coordinate the activities included as part of the CSEAMP with the activities required as a part of on-going, new, and anticipated programs and projects to improve efficiency and avoid duplication of effort. Examples of key issues addressed included training, documentation standards for hardware and software, and documentation standards, and organizational issues which arise on projects involving several different groups.

Technical Services to Support Owens Valley Natural Resources Management, Los Angeles Department of Water and Power, Los Angeles, CA *Principal-in-Charge* - Responsible for a major nine year water resources, ecosystem, and natural resources management support services contract

to provide technical assistance to the Department of Water and Power. Skill areas covered in the contract include groundwater hydrogeology (including modeling), ecosystem management (also including modeling), water management plan development, environmental compliance, revegetation, water rights, geochemistry, and development of a comprehensive geographic information system for the Owens Valley. Challenges on this project have included the need to respond to peak staffing requirements for engineering and scientific personnel resources. Emphasis was also placed on public outreach through development of briefings, public meetings, and a web-site.

Water Master Plan, City of Pasadena Department of Water and Power, Pasadena, CA *Technical Review Leader* - Served as leader of internal Technical Review Committee for development of a calibrated water distribution system model as a portion of the overall scope for a capital facilities master plan update. Extensive upgrade of facilities was required to modernize the system and provide for a high level of customer service and reliability.

Water Master Plan Update, City of Riverside Department of Water and Power, Riverside, CA *Technical Review Leader* - Served on internal Technical Review Committee for a water distribution system model incorporated into a water master plan update. Provided extensive input on overall capital program sizing, in response to the need for facility rehabilitation, upgrade, expansion, and accommodation of imported surface water supplies used in conjunction with locally produced groundwater. Focus was placed on pipelines, transmission mains, groundwater production wells, pump stations, and storage facilities.

As-Needed Engineering Services Contract, Planning and Resources Division, Metropolitan Water District of Southern California, Los Angeles, CA *Project Manager* - Responsible for providing consulting services to Metropolitan in connection with their development of groundwater storage agreements within their Service Area. To date, Mr. Glaser has researched institutional barriers to conjunctive use agreements in nine groundwater basins including Orange County Basin. Services include consultation on technical, water rights, water quality, financial, and operational issues.

Lake Bottom Modification Feasibility Study, Big Bear Municipal Water District, Big Bear, CA *Project Manager* - The purpose of this project was two-fold: (1) Evaluate the technical feasibility of recontouring the bottom of Big Bear Lake to remove phosphorous-laden sediment, improve navigation and recreation, control aquatic plants, enhance the fishery and wildlife habitat and improve water quality. Material handling options will be evaluated, and a reconnaissance level estimate of costs will be prepared along with a schedule and proposed program of future activities. (2) Identify compliance requirements and concerns of selected stakeholders, including regulatory, environmental, fisheries, and recreation interests. The scope of work included a bathymetric survey of the lake bottom performed by a subconsultant.

Integrated Resource Plan, Castaic Lake Water Agency, Castaic Lake, CA *Principal-in-Charge* - Responsible for Integrated Water Resources Plan Development, with consideration of multiple sources of water. These include securing of additional imported water entitlement from the California Water Project, local water recycling, groundwater conjunctive use, and water conservation. Significant emphasis is being placed upon water supply reliability during droughts by analysis of storage options (groundwater and local surface water).

Lynn M. Takaichi, P.E.

QA/QC

Education

BS, Civil Engineering, University of California, Berkeley, 1971
COC, Study in Water Resources Planning Civil Defense Preparedness Agency, University of Hawaii, 1969
MS, Civil (Sanitary) Engineering, University of California, Berkeley, 1972
OTHER, Special Study in Environmental Impact Assessment, University of California, 1970

Registrations

Professional Civil Engineer, California (24082)

Memberships/Affiliations

American Society of Civil Engineers
American Water Works Association
National Society of Professional Engineers
Society of American Military Engineers
Water Pollution Control Federation

Professional Summary

Mr. Lynn Takaichi is responsible for major planning and design projects, particularly assignments involving complex institutional and financial arrangements. He has directed a wide range of water projects including water resource studies, water system master plans, water treatment investigations, water facilities design, and utility management plans. In addition, he has managed the preparation of numerous environmental impact assessments.

He has served as the Agency Engineer of the Castaic Lake Water Agency since 1984. In addition, he has served on the Los Angeles County Reclaimed Water Advisory Committee, Association of Clean Water Agency's (ACWA) Safe Drinking Water Act Subcommittee, and the Technical Criteria Committee for Urban Runoff Pilot Project of the Santa Monica Bay Restoration Project.

Mr. Takaichi has particular expertise in complex institutional arrangements for which he works closely with specialized legal counsel, financial consultants, and water managers. His experience includes waste agency formation, drafting of enabling legislation, negotiation of water supply and water service agreements, development of annexation policies and agreements, and management of a wide variety of water programs. He also has expertise in water system appraisals and has assisted numerous public agencies with the acquisition of investor-owned utilities.

Project Experience

Integrated Sustainable Water Master Plan, City of Santa Monica, CA - *Project Manager* - Integration of relevant components of existing plans and evaluation of the full range of supply and demand management options to develop an integrated Sustainable Water System Master Plan.

Antelope Valley Integrated Regional Water Management Plan & Proposition 50 Implementation Grant Application, Los Angeles County, Department of Public Works, Alhambra, CA - *Client Service Manager* - Provided engineering services in connection with the Antelope Valley Integrated Regional Water Management Plan. Phases included water management strategy development, Proposition 50 Steps 1 and 2 grant application preparation and submittal, preparation of Proposition 84 and 1E submittal, professional plan presentation, establishment of interim governance, assistance with workshop, water management strategy integration and prioritization, framework for implementation, public outreach, project management and QA/QC, and final Integrated Water Management Plan document.

Professional and Engineering Services, Charnock Groundwater Subbasin Restoration Project, City of Santa Monica, Santa Monica, CA - *Client Service Manager* - Professional services for engineering support to the Charnock Engineering Committee (CEC) on behalf of the City of Santa Monica. The project involves implementation of a water treatment system and other improvements that would help to remove groundwater contamination from the Charnock groundwater sub-basin and restore this resource as a water supply for the City of Santa Monica. Services provided included contract negotiations, project management for Phase I, kickoff meetings and workshop, Project Management Plan development and preparation, preparation of the Malcolm Pirnie Rebate, pilot and bench scale studies, delivery methods evaluation, Q&IP and technical reviews, sustainability vision and goal definition, public outreach, and CEC meetings.

Groundwater Production Restoration Pipeline Project, Castaic Lake Water Agency, Santa Clarita, CA - *Project Manager* - Provided engineering services in connection with the Groundwater Production Restoration Pipelines Project.

Feasibility Study, Valencia Water Company, Valencia, CA - *Client Service Manager* - Provided engineering services to conduct a Feasibility Study of Wellhead Softening

Negotiations for Rosedale-Rio Bravo Water Banking Program, Castaic Lake Water Agency, Santa Clarita, CA - *Client Service Manager* - Consulting services in connection with Assistance with Negotiations for Rosedale-Rio Bravo Water Banking Program - Additional Capacity. Facilitated discussions with Water Resources Manager and Rosedale-Rio Bravo staff about options for obtaining extraction capacity. The project is at greater than 60% of budget. In addition, held conference calls and meetings to discuss proposals by Rosedale-Rio Bravo regarding additional well capacity. Also provided consulting services to review and amend various draft documents.

Water Supply Plan Update and Model, Castaic Lake Water Agency, Santa Clarita, CA - *Client Service Manager* - Engineering services in connection with Water Supply Reliability Plan Update and Optimization Model. This project updated the Agency's 2003 Draft Water Supply Reliability Plan, and provided an optimization model. Kennedy Jenks finalized the plan document and the subconsultant produced the optimization model and report. Agency staff is reviewed these work products and will be incorporate into the final plan document.

Biological Nitrate and Perchlorate Wellhead Treatment Project, West Valley Water District, Rialto, CA - *Project Manager* - Provided consulting services related to the Wellhead Treatment Project. Tasks included project management, source water assessment, raw water characterization, California Environmental Quality Act (CEQA) support, funding, engineer's opinion of probable cost, hydraulic analysis, coordination/design offsite controls, well testing implementation plan, design coordination and review, Phase I Environmental Site Assessment (ESA), and soil sampling.

Water Utility Master Plan, Infrastructure Engineering Corporation, Sunnyvale, CA - *Project Manager* - Provided professional and technical services for City of Sunnyvale's Water Utility Master Plan (WUMP). Tasks included agency coordination, evaluation of cost for supply strategy, assessment of water rates for supply strategy, groundwater supply assessment, and preparation of the base project Water Utility Management Plan.

Removal Action Work Plan , Castaic Lake Water Agency, Southern California, CA - *Client Service Manager* - Provided engineering services in connection with preparing the Removal Action Work Plan related to Perchlorate Contamination of the Saugus Aquifer. Specific tasks included technical oversight, QA/QC, work plan preparation and submittal, and containment piping services.

Peter J. Murphy, P.G.

QA/QC

Education
BS, Geology, Eastern Illinois University, 1974
MS, Geology, University of Wisconsin, Milwaukee, 1979

Registrations
Professional Geologist, California (7163)
Registered Geologist, Alabama (1088)
Registered Geologist, Wisconsin (1093-013)

Memberships/Affiliations
Ground Water Resource Association of California, President Southern California Section
National Ground Water Association
International Association of Hydrogeologists

Professional Summary
Peter (Pete) has 35 years of experience managing, supervising and performing hydrogeologic, geologic, and environmental characterization projects. His technical expertise is in the fields of hydrogeology, groundwater quality, and environmental characterization and remediation. His project experience includes negotiations with state, regional, and local regulatory agencies including the California Department of Toxic Substances Control (including DTSC's School Sites Program), and many of the California Regional Water Quality Control Boards. Working at sites with single and multiple responsible parties, he has demonstrated his ability to clearly communicate technical issues to clients, regulatory agencies and other stakeholders.

His environmental experience has emphasized chlorinated volatile organic compounds and petroleum hydrocarbons in groundwater and soil, but has also included metals, perchlorate, and other organic and inorganic compounds. At complex environmental sites, Pete has successfully combined traditional drilling and sampling techniques with direct push alternatives such as CPT/MIP and CPT/ROS, downhole and surface geophysical methods, and alternative groundwater sampling techniques.

Pete has worked extensively at sites located throughout Southern California and at sites in northern and central California, Nevada, Oregon, Washington, Utah, Alabama, Mississippi and Illinois.

Project Experience
Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, Palmdale, CA - *Geologist* - Design of bid packages for the $30 million Phase 1 groundwater banking and blending program that will provide both water supply stabilization through banking and compliance with the Stage 2 Disinfectants/Disinfection ByProducts Rule.

C-6 Facility Groundwater Well, Boeing, Long Beach, CA - *Task Leader* - Compiled the existing hydrogeologic database (regional and site-specific) pertinent to understanding groundwater conditions in the vicinity of the former C-6 Facility in Los Angeles, California. A status report was compiled that included reviews of regional and site-specific groundwater data, data evaluation, and report graphics that display the regional and local groundwater conditions. The report provided a comprehensive technical basis for understanding the hydrogeology of the site vicinity as determined by groundwater data collected at the adjacent former Montrose Chemical and Del Amo facilities. The status report was used to help develop and prepare technical work plans, sampling and analysis plans, presentation materials, and other documents necessary for future actions regarding groundwater at the site.

Wastewater Disposal- Groundwater Monitoring Disposal, Twentynine Palms Water District, Twentynine Palms, CA - *Engineering Support* - Provided engineering services for preparation of a Groundwater Monitoring Program for the Twentynine Palms Treatment Plant Wastewater Disposal Project.

Lower VDC Recharge Pond Subsurface Investigation and Groundwater Analysis, Rancho California Water District, Temecula, CA - *Geologist* - Conducted a subsurface investigation and groundwater analysis to evaluate the use of vadose zone wells at the site including a pilot vadose zone well and technical specifications for additional wells if needed.

2010 GW Monitoring Plan, Washoe County, Department of Water Resources - *Project Manager* - Provided professional services to perform the scope of work described in "2010 Implementation of Groundwater Monitoring Plan for Central Truckee Meadows Remediation District Program"

Huntsville, Arrow Electronics, Inc., Melville, NY - *Geologist* - Designed and implemented a characterization program to assess the horizontal and vertical extent of VOCs in soil and groundwater and characterize the local groundwater flow system. Work was performed under a work plan that was submitted to, and approved by, the Alabama Department of Environmental Management (ADEM). The work included multiple seismic reflection and dipole-dipole resistivity profiles to investigate variations in the depth to bedrock and in water content of rock and soil. Also included were: 1) drilling and sampling of soil borings and the installation and monitoring of groundwater monitoring wells. Previous investigations included 1) a review of the regional hydrogeology and 2) a reconnaissance for possible water wells in the site vicinity.

Waste Discharge Report and CEQA Document Preparation, Pauma Valley Community Services District, Pauma Valley, CA - *Engineering Support* - Provided professional engineering services for preparation of Report of Waste Discharge and California Environmental Quality Act documents for the proposed expansion of the District reclamation plant in accordance with the contract between Kennedy/Jenks Consultants and Pauma Valley CSD.

Superfund Remediation, BNSF Railway Company, Seattle, WA - *Geologist* - Prepared a report documenting the effects of natural attenuation on petroleum hydrocarbons in groundwater at a leaking underground storage tank site. Seasonal variations in the direction of groundwater flow complicated the analysis and required a careful examination of spatial and temporal changes biodegradation indicator parameters. The report was submitted to and recommendations accepted by U.S. EPA, Region 10.

Septic System Engineering Support Services, Lake Cuyamaca Recreation and Park District, Julian, CA - *Geologist* - Reviewed regional geologic and hydrogeologic investigations and limited site data in support of a Report of Waste Discharge for this infiltration disposal system that is situated in a hydrogeologic environment dominated by fractured bedrock. Currently, preparing a groundwater monitoring plan for submittal to and approval by the San Diego RWQCB.

MT Fueling Facility-Havre, MT, BNSF Railway Company, Helena, MT - *Geologist* - Observed direct-push, soil-conductivity testing and discrete groundwater sampling program performed by a third party in support of litigation. Observed push, sampling, and decontamination procedures. Also reviewed slug-test interpretations performed in wells at the site.

Michael P. Maley, P.E., P.G., C.Hg.

Groundwater Model Update

Education

BS, Geology, Texas Christian University, 1983
MS, Geology, University of Oklahoma, 1986
MS, Geological Engineering, University of Missouri, Rolla, 1987

Registrations

Licensed Geologist, North Carolina (1085)
Professional Civil Engineer, California (53424)
Professional Geologist, California (5270)
Registered Hydrogeologist, California (654)

Professional Summary

Michael (Mike) Maley is both a licensed professional geologist and civil engineer with over 30 years of experience [as of 7/17/13] in water resources and environmental projects. He is an experienced project manager who has successfully managed large, complex projects. He has extensive experience in developing technical reports and working with regulatory agencies to resolve project issues. He has conducted and managed comprehensive hydrogeological evaluations that include groundwater, surface water and air modeling, field work coordination, well design and installation, aquifer testing and chemical sampling.

He has extensive groundwater management experience including groundwater basin evaluations, sustainable yield estimates, water quality evaluations, groundwater-surface water interactions, and groundwater recharge programs. He has conducted comprehensive hydrogeological evaluation, ground water modeling, design and operation of remediation systems, field work coordination, well design and installation, aquifer testing and chemical sampling. He has developed basin-scale, integrated groundwater-surface water models throughout the Western United States. Through this work, he has evaluated the perennial yield and groundwater quality for many heavily-used groundwater basins for groundwater management plans in California. He has provided groundwater and water quality analysis for CEQA/NEPA support for large water resources and engineering projects. Mike has developed technical reports and worked with local, state, and federal regulatory agencies including presenting project information and resolving project issues.

Project Experience

Apex Ranch Technical Review & Monitoring Plan, Kings County Water District, Hanford, CA - *Hydrogeologist* - Provide independent third-party during mediation of a controversial groundwater bank project between District and local landowners. Responsible for developing monitoring and operation plans during mediation period.

Feasibility of Developing the Santa Monica and Hollywood Basins as Sources of Groundwater Supply, City of Los Angeles, Department of Water and Power, Los Angeles, CA - *Hydrogeologist* - Performed comprehensive groundwater assessment of groundwater resources in the Santa Monica and Hollywood Groundwater Basins to evaluate potential remaining groundwater potential for engineering design of water supply wells and water treatment facilities. Evaluated water quality impacts from contamination sites and seawater intrusion.

Conjunctive Use Project, Santa Cruz County Department of Health Services, Santa Cruz, CA - *Project Manager* of study to evaluate methods to mitigate declines in groundwater levels in the project area to provide a more secure and reliable water supply. The project will evaluate a variety of approaches to off-stream diversion of water to optimize utilization of flows to off-stream

groundwater recharge ponds, in a manner that satisfies aquatic habitat preservation requirements while fulfilling operational objectives.

Groundwater Management Plant Update, Twentynine Palms Water District, Twentynine Palms, CA - *Hydrogeologist* - Developed groundwater management objectives and strategies for 2008 groundwater management plan.

Groundwater Model Update, Mendocino City Community Services District, Mendocino, CA - *Hydrogeologist* - Support ongoing groundwater management by development of Drought Contingency Plan. Evaluated drought scenarios using MODFLOW model to define criteria for defining a drought emergency. Defined perennial yield and evaluated groundwater management options.

General Engineering Services, Scotts Valley Water District, Scotts Valley, CA - *Hydrogeologist* - Produced comprehensive annual report for groundwater management program. Updated geologic interpretation of complex Santa Margarita Groundwater Basin. Developed and calibrated a MODFLOW model of the Scotts Valley groundwater basin to define perennial yield and support groundwater management.

Mesquite Lake Groundwater Basin Evaluation, Twentynine Palms Water District, Twentynine Palms, CA - *Project Manager* - Comprehensive study of the Mesquite Lake Groundwater Basin including evaluation of geology, water budget, groundwater recharge, and change in groundwater storage. Developed 3D MODFLOW model of the basin to evaluate the relative impacts of moving groundwater pumping from one area to another.

Groundwater Protection Plan, Twentynine Palms Water District, Twentynine Palms, CA - *Hydrogeologist* - The primary purpose was to assess potential groundwater quality impacts from septic tanks and develop a strategy to monitor and protect the groundwater resources. Based on the findings of this report, the recommended action was to implement measures to improve the overall monitoring of the groundwater and to implement a Septic System Management Program to limit the further impacts to groundwater.

Los Angeles Department of Water and Power, Los Angeles, CA – Performed groundwater assessment to evaluate potential groundwater availability and to support of engineering design of water supply wells and water treatment facilities. Evaluated impacts from both contamination sites and seawater intrusion.

Groundwater Vulnerability Study, Sacramento Groundwater Authority, Sacramento County, CA - Conduct a groundwater vulnerability study for northern Sacramento County to evaluate potential future impacts of existing and potential future groundwater contamination. The project will provide SGA a mechanism for long-term planning to better focus groundwater protection efforts, and provide decision makers with information on groundwater vulnerability.

Water Resource Evaluation, Scotts Valley Water District, Santa Cruz County, CA - Produced comprehensive annual report for groundwater management program. Presented report finding at a public meeting to Board of Directors. Updated geologic conceptual model of complex Santa Margarita Groundwater Basin in Santa Cruz Mountains. Evaluated hydrogeology to define aquifer layering and spatial distribution groundwater inflow and outflow to the basin. Developed and calibrated a MODFLOW model of the Scotts Valley groundwater basin to define perennial yield and support groundwater management. Conducted surface water quality sampling. Produced comprehensive annual report for groundwater management program.

Walt W. McNab

Groundwater Water Quality Solute Transport

Education

BA, Geology, University of California, Berkeley, 1988
MS, Mineral Engineering - Hydrogeology, University of California, Berkeley, 1990
PHD, Mineral Engineering - Hydrogeology, University of California, Berkeley, 1995

Registrations

Professional Geologist, California (7312)

Memberships/Affiliations

American Geophysical Union
American Society of Ground Water Scientists and Engineers
Geological Society of America
Peer reviewer for Bioremediation Journal, Chemosphere, Environmental Science & Technology, Ground Water Monitoring & Remediation, Journal of Contaminant Hydrology, Transport in Porous Media, Vadose Zone Journal, and Water Resources Research

Professional Summary

Dr. Walt McNab is an environmental geoscientist with over 22 years of experience as a project manager, researcher, and consultant. His interests and experience span a wide range of issues in physical and chemical hydrogeology and soil science, particularly those involving coupled process phenomena. He has developed and applied numerical, analytical, and semi-analytical methods for simulating flow and transport processes in porous media to problems entailing variably-saturated fluid flow and reactive transport in a variety of environmental settings. He has also worked extensively with geochemical process models, addressing issues such as oxidation-reduction phenomena, mineral and gas phase equilibria, cation exchange, the effects of surface complexation on trace element mobility, and reconciliation of multiple environmental data sets (e.g., groundwater age data, artificial tracer data, stable isotope data) with major geochemical parameters. Dr. McNab has directed or played leadership roles in projects that have included statistical studies of populations of groundwater contaminant plumes, design and deployment of novel groundwater treatment technologies, construction of compartmentalized groundwater contamination source models, evaluation of water quality impacts associated with reservoir construction, artificial recharge and seepage from agricultural impoundments, modeling the impact of geologically sequestered CO2 on the geochemistry of formation minerals and wellbore cement as informed by experimental data, and radiological contamination assessments.

Project Experience

Lawrence Livermore National Laboratory, Livermore, CA Environmental Scientist, Atmospheric, Earth, and Energy Division *Project management* responsibilities include (1) management of LLNL's contribution to the U.S. Department of Energy's (DOE) Underground Test Area (UGTA) project entailing characterization of subsurface radionuclide migration at the Nevada Test Site ($1.5 M annual budget), and (2) management of LLNL's modeling effort, jointly funded by DOE and industry, supporting the In Salah Project, an industrial-scale CO2 storage enterprise currently underway at a natural gas field in Algeria, operated by BP, Statoil, and Sonatrach ($1M annual budget). Also provides technical input - principally simulation-related - to these and other projects.

Lawrence Livermore National Laboratory, Livermore, CA Environmental Scientist, Environmental Restoration Division Provided technical leadership, conducted research, and published results for variety of groundwater environmental characterization and remediation projects funded by the DOE.

Yucca Flat, Nevada Test Site, DOE, NV - *Project scientist* supporting radionuclide transport modeling for unsaturated zone tests at Yucca Flat, Nevada Test Site under the DOE-funded UGTA program. Flow modeling was conducted using both analytical and numerical approaches to assess wetting front propagation from episodic ponding events in detonation-induced collapse craters.

Lawrence Livermore National Laboratory, Livermore, CA - *Task leader* for a source area remediation technology modeling assessment for LLNL's groundwater restoration program. Conducted a comparative analysis of the suitability for alternative remediation strategies for plume source areas at the LLNL Livermore Site. Designed a compartmentalized model of plume source areas which was used to analyze multiple source area data sets. Presented the source area remediation evaluation approach to DOE management, regulatory agency representatives, a community work group, and subject matter experts from the EPA's Office of Research & Development.

Data Analysis, DOE - Data analysis *task leader* for nation-wide statistical study of chlorinated hydrocarbon groundwater plume behavior for the DOE. Responsibilities included statistical interpretation and modeling of contaminant and hydrologic data from approximately 100 groundwater contamination sites across the U.S. (DOD, DOE, and commercial/industrial facilities) impacted by chlorinated hydrocarbon plumes. Initial study results led to follow-on funding and three peer-reviewed journal publications.

Lawrence Livermore National Laboratory, Livermore, CA - *Principal investigator,* in collaboration with scientists from Stanford University, on an LLNL-funded research project involving in situ catalytic destruction of dissolved chlorinated hydrocarbons in groundwater; supported in part by a competitive three-year ($125K/year) research grant. Results of project research yielded two peer-reviewed journal publications, two functioning groundwater treatment systems, a U.S. patent, and follow-on funding.

Project consultant contributing geochemical modeling support for a litigation project entailing atypical water well chemistry and the possible role of a nearby natural gas production well in Pennsylvania; confidential client.

Project scientist for a California State Water Resources Control Board-funded study addressing key groundwater quality issues in California's San Joaquin Valley. Tasks included (1) identifying the geochemical footprint of animal waste lagoon seepage in an aquifer underlying an instrumented dairy facility, and (2) identifying ion exchange and trace element surface complexation reactions associated with an artificial recharge project. Project work led to two peer-reviewed journal articles, both as first author.

CO2 storage simulation task leader for the DOE- and industry-funded Clean Energy Research Center (CERC) project, a multifaceted, multi-institutional collaborative project between the U.S. and China to address clean energy research needs. The CO2 storage simulation task involves application of multiphase flow and reactive chemistry models to geologic data sets from multiple sites to inform optimized CO2 injection strategies.

Craig W. Lichty, P.E.

Recycled Water Issues/Regulations

Education

BS, Civil Engineering, Colorado State University, 1982
OTHER, Computer Applications and Business Management, University of Colorado, 1987

Registrations

Professional Engineer, Colorado (25048)
Professional Civil Engineer, California (47536)

Memberships/Affiliations

Association of California Water Agencies
California Water Environment Association
Pacific Northwest Clean Water Association
Stanford University: Fall Semester 2000 and 2001, Instructor - Managing Civil Engineering Projects
Water Environment Federation
WateReuse Association
Program Co-chair, National Symposium XV, 2000
Program Chair California Conference 2003
Program Chair USDA Joint Specialty Conference 2006/2008
Board of Trustees, California Section, 2001-Present
President, California Section 2008 - Present
Director, National WateReuse Association 2006 - Present
National Growth Committee Chair 2006 - Present
Third Party Validation Committee, California Section, 2001-2004
Indirect Potable Reuse Committee, National Association, 2001-2004
WateReuse Foundation
Technical Advisor - MBR Pilot Performance Project with University of Hawaii
Participant - Research Needs Annual Assessment w/WERF, AWWARF, NWRI, USBR and USDA
Participant - Understanding Human Reactions to Water Reuse Study
Technical Advisor - Manual of Practice, Developing a Recycled Water Program
State of Washington Technical Review Committee, 2008 Water Reclamation Regulations Update
U.S. EPA Technical Review Committee, 2004 Guidelines for Water Reuse (Update)

Professional Summary

Craig Lichty has numerous years of consulting experience associated with the development and implementation of water, wastewater and recycled water projects. This experience encompasses a variety of services in the areas of applied research, planning, program development, and facilities design and construction management. Craig currently serves as Kennedy/Jenks Consultant's Market Sector Leader for Recycled Water and has recent involvement with projects, research efforts and regulatory developments in the states of California, Washington, Oregon, Colorado, and Hawaii.

Project Experience

Redwood City/South Bayside System Authority Recycled Water Project, City of Redwood City, Redwood City, CA - *Project Manager* - Feasibility study that included a market assessment, treatment evaluation, distribution evaluation, alternatives evaluation, life cycle cost comparison, recommended phased capital improvement program, and final report. The market assessment included a site-specific evaluation of 12 representative customer sites with respect to current planting types and irrigation system configurations, water quality review and irrigation demand assessment based on a comparison of both theoretical replacement evapo-transpiration and meter data. The market assessment and customer priority system was created in GIS with an accompanying database at a parcel level, for use in performing hydraulic modeling and to manage implementation of the site retrofit conversions and track the efficiency of the completed project. Treatment alternatives were performed for the South Bayside System Authority Treatment Works, and alternative disinfection methods (ultraviolet light and chlorination) were reviewed and costs compared on a life-cycle basis.

The project objective was water supply, and the market assessment priority classifications were used as a tool for rapid implementation of the largest water use customers to reduce a current overdraft on the City's water supply via the Hetch Hetchy system. A planning grant was coordinated and approved through the State Water Resources Control Board Office of Water Recycling for $75K, and a construction grant has been processed under Propositions 13 and 50, with the City being placed first on the priority list for eligibility in 2003. A project web site was constructed for the client and project team's use, allowing rapid dissemination of task work deliverables to the City and their Public Relations Consultant, and to help coordinate preparation of several City Council presentations using the GIS mapping.

Incremental Recycled Water Program (IRWP) Discharge Compliance, City of Santa Rosa, Santa Rosa, CA - *Project Manager* - $6M study and siting analysis that is looking at the feasibility of relocating the 100+ mgd peak wet weather discharge of the Laguna Subregional Water Reclamation System from the Laguna de Santa Rosa to locations along a 31-mile stretch of the Russian River. The project costs are currently estimated to range between $50M and $150M. The relocation is being driven by regulatory compliance issues associated with the California Toxics Rule (CTR) and strategies for compliance include looking at direct discharge and indirect discharge concepts using a number of types of facilities such as side-stream outfalls, diffusers, infiltration basins, percolation ponds, injection wells and pressurized leach fields. Current technical work tasks include a review of similar projects worldwide, investigation of regulatory requirements for future direct/indirect discharge compliance, geotechnical characterization of the study area, field studies of infiltration basin and percolation system performance for CTR water quality constituents identified in the reasonable potential analysis, soil-column and photo-oxidation pilot studies, mixing zone and water-effects ratio studies, development of conceptual groundwater and surface water interaction models and conveyance system evaluations. To support communications with the program management consultants and subconsultants, a GIS based, web-enabled project portal was constructed. A GIS system, covering the entire study area, serves as a water quality data hub and analysis tool for project siting. In addition, stakeholder outreach and regulatory support services are being provided.

Santa Rosa Non-Potable Groundwater Feasibility Study, Camrosa Water District, Camarillo, CA - *Project Manager* - Preparation of a feasibility study that reviewed conjunctive use alternatives where recycled water and non-potable groundwater would be used to serve irrigation demands associated with nurseries, vegetable crops, parks, a golf course, and large single family homes with attached avocado orchards. Reviewed the District's water pricing and conservation incentives to select potential users. Prepared a conceptual service plan, facilities site plan, cost estimate and phasing plan for the best apparent alternative.

Bailey Facility Improvements Study, City of San Buenaventura, Ventura, CA - *Project Manager* - Responsible for preparing a Preliminary Design Report to identify a water treatment strategy and implementation plan for expanding iron and manganese treatment capability for two widely-varying well sources having a combined production capacity of 10,500-gpm. Work elements included a regulatory review, pilot testing program and an operation and maintenance review. Facilities site plan alternatives were developing depicting how new improvements would fit into an operating treatment and storage facility. Recommendations and cost estimates for improvements were identified. Impacts to offsite facilities were identified and surface water blending alternatives were investigated to further reduce taste and odor problems associated with high TDS well water. Eight traditional and non-traditional contracting strategies were reviewed and an implementation plan and report were developed.

Alexander R. Peterson, P.E.

Engineering/Infrastructure

Education
BS, Civil Engineering, California State University, Sacramento, 1985

Registrations
Professional Civil Engineer, California (46095)
Professional Civil Engineer, Oregon (16795)
Professional Civil Engineer, Nevada (9735)

Memberships/Affiliations
Association of California Water Agencies
Sacramento Area Water Works Association

Professional Summary
Alex is a registered civil engineer with decades-long experience as an engineering consultant. He has extensive expertise in planning, design, bidding, and construction of water resources related infrastructure related projects. Alex has provided consulting services ranging from small system improvements replacing exhausted infrastructure to regional projects involving multiple users, consensus building, and complex siting conditions.

Project experience involves working with military, campus, state, local, and municipal clients; each with their own set of expectations and project requirements. Mr. Peterson has acted as principal-in-charge, project manager, project engineer, team leader, and staff engineer depending on the demands of the project team. He provides leadership through his capacity as staff mentor and coach, quality control reviewer and manager.

Project Experience
Water Supply Stabilization Program, Antelope Valley-East Kern Water Agency, AECOM Technology Corporation, Palmdale, CA - *Project Director* - Team Leader for siting and design of seven extraction wells for groundwater banking recovery of water recharged through spreading basins. Recovery wells provide direct potable use supply to the AVEK distribution system with blending for THM reduction.

Well 22C Groundwater Facility Plan, Golden State Water Company, Rancho Cordova, CA - *Project Manager* - Preliminary design of a 3,000-gpm well sited in the vicinity of a regional contamination plume. Work included close coordination with Golden State Water regarding risk and reliability associated with the construction of this well as part of a replacement water supply plan.

Strand Ranch Recovery Facilities Project, Irvine Ranch Water District, Western Kern County, CA - *Task Leader* - Technical Lead on the design of nine aquifer storage and recovery wells with an average pumping capacity of 2,200 gpm, each utilizing 300-hp vertical turbine pumps. The work is part of a groundwater banking project with Rosedale/Rio Bravo Water Management District and required coordination with several adjoining agencies for improvements to neighboring facilities to allow access for water deliveries and return flows.

Olympic Club Golf Course Well Drilling, The Olympic Club, San Francisco, CA - *Project Manager* - Siting, design, and construction of a 750-gpm irrigation production well in San Mateo County replacing an existing irrigation well. Work included complex permitting issues and siting constraints with regard to environmental factors, development of construction cost estimates, estimates to produce water, and a comparison of the cost of purchasing surface water versus proceeding with the well construction.

New Well Facilities & Improvements, City of Manteca, Manteca, CA - *Project Manager / Project Engineer* - Assisted the City of Manteca in the improvement of their supply capacity as they responded to rapid growth pressures. Work included all phases from water system modeling to predict system impacts, through well drilling design, pumping plant design, and bidding and construction phase services.

Interim Well Field Treatment Investigation, City of Lathrop, Lathrop, CA - *Project Engineer* - Responsible for the evaluation of groundwater quality information and development of treatment alternatives for the removal of manganese and arsenic from new water supplies being developed south of the City. The recommendations included aquifer zone isolation to reduce nitrate and gross alpha radioactivity issues as well as three primary treatment approaches. Effort included meeting with a consortium of project proponents and support of project funding efforts with cost estimates, cash flow projections and alternative schedules corresponding to possible development scenarios.

Surface/Ground Water Blending Study, City of Lathrop, Lathrop, CA - *Project Engineer* - Evaluation of surface and groundwater blending alternatives as a treatment approach to the reduction of manganese and arsenic in groundwater supplies generated by the interim well field (Well 21,22, & 23) projects. Work included development of process alternatives, conceptual site plans and process diagrams, and preparation of cost estimates. Results indicated that no surplus surface capacity for blending of groundwater supplies for arsenic compliance existed. This determination was based on the assumption that all existing City wells would use blending as the treatment approach before proceeding to a removal type process.

Well No. 21 Groundwater Treatment Plant, City of Lathrop, Lathrop, CA - *Project Engineer* - Evaluation of surface and groundwater blending alternatives as a treatment approach to the reduction of manganese and arsenic in groundwater supplies generated by the interim well field (Well 21,22, & 23) projects. Work included development of process alternatives, conceptual site plans and process diagrams, and preparation of cost estimates. Results indicated that no surplus surface capacity for blending of groundwater supplies for arsenic compliance existed. This determination was based on the assumption that all existing City wells would use blending as the treatment approach before proceeding to a removal type process.

Well No. 14 Arsenic and Manganese Treatment Pilot Testing, City of Manteca, Manteca, CA - *Project Manager / Project Engineer* - Development of treatment alternatives to address elevated manganese and arsenic levels in an existing well. The work included installation of pilot scale treatment facilities testing a coagulation assisted oxidation filtration process using chlorine, ferric hydroxide, and an anthracite/greensand pressure filter system. The results of the pilot testing were reviewed with the local Department of Health Services with favorable feedback, pending the final arsenic MCL determination made by the State in 2004. This work included design review support of an in-house design project to implement the recommendations.

NDMA Groundwater Extraction Treatment Design, Carmichael Water District, Carmichael, CA - *Project Manager* - Provided preliminary design, design, and construction phase services for the completion of two groundwater remediation facilities treating contamination from an Aerospace manufacturing facility in Rancho Cordova, California. Treatment included Ultraviolet light for destruction of NDMA, Hydrogen Peroxide with Ion Exchange for VOC destruction, and Granular Activated Carbon for reduction of Perchlorate. Project Management included development of collaborative relationships between the Potential Responsible Party, Sacramento County, and the regulators. Work is proceeding under PRP funding by agreement to expedite cleanup by cooperating versus litigating. Estimated flow rates are 1,200 gpm in Phase 1 and over 4,000 gpm in future phases.

Cornelius J. Gantney, P.E., P.L.S.

Recharge Basins

Education
BS, Civil Engineering, California Polytechnic State University, San Luis Obispo, 1981

Registrations
Professional Civil Engineer, California (34674)
Professional Land Surveyor, California (6342)

Memberships/Affiliations
American Society of Agronomy
American Society of Civil Engineers
American Water Works Association
Southern California Water Utilities Association
American Public Works Association
California Land Surveyors Association

Professional Summary

Jerry has a broad background in the civil and sanitary engineering fields, specializing in preparing design plans and specifications, with 30 years of experience in designing wastewater and water treatment plants, and sanitary, potable, and reclaimed water pipeline projects. Jerry is skilled in pipeline design, site design, grading plans, horizontal control plans, and yard piping plans, including highway and subdivision projects. He specializes in sewer and storm drain hydraulic structures, including junction structures manholes, flow diversions, large diameter sewer pipelines, debris dams through storm drain channel design, and he has experience in pump station design for both water and wastewater applications. In addition to his strong design plans and specifications expertise, Mr. Gantney is Land Surveyor skilled in preparing easements, subdivision maps, Record of Survey Maps, Parcel Maps, lot line adjustments, legal descriptions, and deed exchanges. He is also knowledgeable in HEC-RAS v4.0, KY-Pipe, MS Office 97, including EXCEL, WORD and Lotus Notes e-mail and data base systems, RIP WIN and WSPG software. Jerry is a skilled microstation J, V8 and XM CADD operator.

Project Experience

Groundwater Production Restoration Pipeline Project, Castaic Lake Water Agency, Santa Clarita, CA - *Civil Engineer* - Provided engineering services for design of the Pipelines to convey untreated groundwater from the Saugus Wells to a new groundwater treatment plant and restore lost capacity due to groundwater contamination.

Groundwater Recharge Phase 2, Inland Empire Utilities Agency, Upland and Rancho Cucamonga, San Bernardino County, CA - *Project Engineer* - Prepared plans specifications and estimates for two MWD turnouts (CB-14 and CB-20) on the MWD owned Foothill Feeder for raw water recharge in the San Sevaine and 8th Street Basins. The project included removal and replacement of an existing turnout for a 40 cfs flow (CB-14) and construction of a new 30 cfs turnout (CB-20). In addition the CB-20 facility constructed a new 36-inch RCP storm drain from the turnout facility north of 18th Street and Winston Avenue. The new storm drain connected to the existing 42-inch RCP storm drain at 17th Street and Winston Avenue of a length of approximately 2200 lineal feet. Several catch basins and laterals were connected to the 36-inch pipeline on Winston Avenue.

20-Acre Martinez Canyon Pilot Groundwater Recharge Project, Coachella Valley Water District, Thermal, CA - *Lead Civil Engineer and Civil Engineering Design Manager* - Provided the design of a 5,000 gpm raw water pumping station and 2.5 mile 18" Dia. Forcemain to the 20-Acre recharge pond facility. The project consisted of 2-300 hp constant speed split case horizontal pumps in an existing irrigation pump station. The recharge ponds were divided into two zones with a sedimentation pond to reduce the raw water silt and debris before distribution into the percolation ponds.

20-Arcre Martinez Canyon Pilot Groundwater Recharge Project, Coachella Valley Water District, Thermal, CA - *Lead Civil Engineer and Civil Engineering Design Manager* - Provided the design of a 4,000 acre-feet per year (AFY) 5,000 gpm raw water turnout connection and a pumping station plus a 2.5 mile 18" Dia. Forcemain in Tyler and 72nd St. to the 20-Acre recharge pond facility, constructed along Martinez Canyon, near the Salten Sea. The Pilot Groundwater Recharge Facility was constructed to determine the recharge characteristics for the nearby 40,000 AFY full scale ground water recharge project. The pilot project consisted of a pump station with 2-300 horsepower constant speed split case horizontal pumps with a surge control system connecting to an existing irrigation turnout. The 20 acres of recharge ponds were divided into two zones with a sedimentation pond to reduce the raw water silt and debris before distribution into the percolation ponds. The recharge ponds were controlled through manually operated gates and overflow devices.

Cities of Glendale, Pasadena, and Fontana and the Upper San Gabriel Valley Municipal District - *Project Engineer* - Prepared Reclaimed Water Feasibility Study reports utilizing up to 47,000-acre feet of reclaimed water for irrigation and groundwater replenishment purposes. The projects evaluated over 100 miles of piping ranging in size from 48 inch to 6 inch, including evaluating reservoir storage, groundwater recharge, and booster pumping stations in separate reports for each city and District.

Wastewater Treatment Plant, Los Osos Community Services District (LOCSD), Los Osos, CA - *Civil Engineering Design Lead* - The 1.4 MGD Wastewater Treatment Plant project was located in Midtown Los Osos. Mr. Gantney was responsible for civil design and managed the design team for the on-site improvements, including the street improvements, yard piping, the main influent sewer trunk pipelines and effluent pipelines. The treatment plant was located on a 6 acre site with sensitive habitat and other environmental constraints. The treatment plant design was completed in a complete 3D BIM model with each engineering discipline contributing to the design model. The project also included easement acquisition and a County Park and a 2 acre drainage and wetland pond improvements to reduce off-site runoff. Mr. Gantney also provided design oversight and quality review of the Collector System design and the effluent disposal system. The Collection System consisted of gravity and pumped flows from throughout community. The collection system of about 40 miles ($67M) of new sewer pipelines was divided into 4 districts, included a series of "pocket" pump stations for small community sewers that produce low flows and pump into the trunk sewer mains. The effluent disposal system was a 100 acre site using subsurface recycled water dispersal system for groundwater recharge and reducing seawater intrusion.

100-Acre Wetlands Enhancement Project, City of Riverside, CA - Provided design and technical specifications for this water reclamation project along the Santa Ana River. The project consisted of 40 acres (120-acre feet) of percolation and nitrate removal ponds and 60 acres (120-acre feet) of natural ponds for removing nitrate from highly treated tertiary effluent originating from the City's Regional Water Quality Control Plant. The project also included 5500 lineal feet of 18- to 36-inch-diameter reinforced concrete pipe, pond inlet and outlet structures, splitter boxes, dike construction, water quality monitoring stations, and lysimeters for measuring the nitrate removal effectiveness.

Lawrence Y.C. Leong, Ph.D.

Water Quality

Education

BA, Biology, Lawrence University, 1968
MS, Environmental Health Sciences, University of California, Berkeley, 1970
PHD, Environmental Health Sciences, University of California, Berkeley, 1974

Registrations

Qualified Environment Professional, (11940146)

Memberships/Affiliations

American Chemical Society
American Water Works Association
California Water Environment Association
Water Environment Federation
International Water Association

Professional Summary

Dr. Leong has extensive experience examining the fate and transport of environmental contaminants in air, water and soil. He has significant experience in four technical areas: water quality, air quality, hazardous wastes and laboratory consulting.

For the Water Environment Federation, his professional experience includes past member of the Editorial Advisory Board for Laboratory Solutions, a past member of the Reuse Committee, and the past chairmanship of the Air Quality Impacts Committee. He served on a WEF task force that published the Special Publication entitled "Emissions of Toxic and Related Air Pollutants from Wastewater Facilities," was on the organizing committee and a session moderator for the Second WEF Specialty Conference, Control of Odors and VOC Emissions, and co-chair of the WEF pre-conference workshop, "Complying with Clean Air Act Accidental Chemical Release Prevention Regulations".

He has published 14 peer review articles, made 25 peer selected presentations, and given 46 presentations at professional meetings. Recently, he was a reviewer of the Protocols for Estimating Greenhouse Gas Emissions from Municipal Wastewater Sources for the Water Environment Federation and the National Research Council report, Management and Effects of Coalbed Methane Development and Produced Water in the Western United States.

Project Experience

RiverPark Groundwater Impact Study, City of Oxnard, Planning and Environmental Services, Oxnard, CA - *Task Leader* - The project was to provide technical analysis for the water resources section of an EIR for the proposed RiverPark Development in Oxnard, CA. Tasks included describing the existing land use which is for agricultural and gravel mining operations in the Forebay of the Oxnard groundwater basin. Of key concern are three open pits at the mining facility that are usually in direct contact with groundwater. Currently these pits receive storm water runoff from agricultural, industrial, and residential areas. The project team performed the following work for both the baseline and the project conditions: identified chemicals of concern (nitrates, pesticides, viruses, bacteria, and heavy metals), developed baseline water quality conditions of the groundwater, estimated influent storm water runoff based on sampling data and literature values for different land uses, conducted "reverse engineering" to determine maximum concentrations of contaminants into the pits that would impact receptor wells based on estimates of attenuation through dilution, natural decay, and soil retardation for selected contaminants.

Perchlorate Treatment for Groundwater Supply, Castaic Lake Water Agency, Santa Clarita, CA - *Technical Reviewer* - Whittaker-Bermite Site, Selection of Perchlorate Treatment for Groundwater Supply, Peer Reviewer. A number of municipal wells that total over 7,500 gpm of production has been voluntarily removed from service due to perchlorate contamination from the Whittaker-Bermite site. Other chemicals of concern that have been found on the Site, but have not yet shown up in these potable wells include VOCs, NDMA, HMX, RDX, and Uranium. CLWA's primary interest is to return this water resource back to drinking water and needs to determine the best well-head treatment technology to return to service an interim treatment plant of 2,000 gpm. Dr. Leong is providing peer review of all the deliverable for activities that includes screening of alternatives for well-head treatment, pilot-scale testing, permitting, and preliminary design of a 2,000 gpm treatment facility. Fluidized and fixed bed biological treatment and ion exchange have been selected for pilot scale testing. He has been involved in a number of meetings with DHS personnel who have 97-005 oversight and other project team members.

Professional and Engineering Services, Charnock Groundwater Subbasin Restoration Project, City of Santa Monica, Santa Monica, CA - *Task Leader* - Dr. Leong led an analytical team composed of Dr. Gerard Spinnler, Equilon, Richard Amano, President, Laboratory Data Consultants and Robert DeGaetano, President, ChemData Professional. The overall objective of this project was to identify a suitable treatment technology to remove fuel oxygenate additives to gasoline so that it could be utilized for drinking water for the City of Santa Monica. Initially, only MtBE was identified as a chemical of concern. However, two months into the initial pilot study to evaluate air stripping, GAC, and advanced oxidation process (AOP) using UV-peroxide, the K/J team was informed that tertiary butyl alcohol (tBA) would also be a contaminant of concern. Conventional methods based on purge and trap GC/MS had a reporting limit of 50 ug/L. The review agencies required a reporting limit of ~5 ug/L. A laboratory was identified that was using a reporting limit of 1 ug/L using a modification of EPA 524. Dr. Leong lead a team of subconsultants and the client to "bullet-proof" the execution of the method by imposing the requirements of EPA 8260. Activities included laboratory audits, on a quarterly frequency, perform a level 4 data reviews for all samples performed on a single day, weekly analytical conference calls, and a report summarizing the QA/QC program and the findings and corrective action of the laboratory audits and data package reviews.

Feasibility Study and Bench-Scale Studies for Groundwater Remediation, Jefferson Site PRP Group, LLC, Los Angeles, CA - *Task Leader* - Currently, the site is a year round school operated by the Los Angeles Unified School District. Formerly the site was occupied by industrial manufacturing businesses until 1990 that released trichloroethylene (TCE) to soil and groundwater. Support for Operable Unit 3 (OU-3) tasks extends to Closure of the OU by the California Department of Toxic Substances (DTSC) include conducting bench and/or pilot treatability studies. Across from street from this site is an orphan hard chrome site which is being cleanup up by DTSC. A former business released Cr(VI) to the soil and groundwater and DTSC is using calcium polysulfide (CPS) to reduce it to Cr(III). Dr. Leong authored the DTSC approved bench testing work plan that is being performed by the Department of Chemical and Environmental Engineering, University of California, Riverside (UCR). Initial conditions range from 2.5 mg/L TCE and 2.5 to 250 mg/L Cr(VI). Technologies being evaluated include zero-valent iron (ZVI) configured for in-situ (serial extraction) and ex-situ (column testing) treatment and in-situ bio-augmentation using lactate and molasses as the electron doners. Complicating factors include Cr(VI) toxicity (>2.5 ppm) to the in-situ biological approach and the elevated pH (~11) caused by the CPS affecting the ZVI and biological approach. Dr. Leong is providing advice and comment during the execution of the plan as well as review and comment of the UCR final report.

Mary Lou Cotton, CCP

Water Demands

Education

BS, Biological Sciences, University of Southern California, 1976
MS, Geological Sciences, University of Southern California, 1979

Memberships/Affiliations

Certified Conservation Practitioner
California Urban Water Conservation Council
Association of California Water Agencies, Water Use Efficiency and Communications Committees

Professional Summary

Mary Lou is a water resources planning and water conservation expert, with over 20 years of management experience with water agencies statewide, specifically in conducting water resource planning and management programs including surface water and groundwater investigations; water transfer, banking and exchange transactions and agreements; water conservation planning and management; master planning and design studies; water quality and hazardous waste investigations; and supporting the preparation of CEQA Compliance documents and obtaining project permits. Mary Lou is working in an advisory capacity for several clients on a wide variety of water banking (supply reliability) programs, as well as water transfers or exchanges for short-term and long-term water supplies. In addition, Mary Lou assists the State Water Contractors in an advisory capacity on Bay-Delta matters and is also serving as the General Manager of the State Water Project Contractors Authority.

She is assisting several agencies with a wide variety of planning efforts, including Urban Water management Plans, Integrated Regional Water Management Plans, water use efficiency master plans, conservation program development and design, water conservation Best Management Practices (BMP) implementation and reporting, and conservation policy development. Prior to joining Kennedy/Jenks Consultants, Mary Lou served as Water Resources Manager for the Castaic Lake Water Agency, managing all aspects of the Agency's water resource projects, and served as the agency's Conservation Coordinator, responsible for BMP implementation and reporting, and also supervised the development of Urban Water Management Plans and SB610 water supply assessments. Mary Lou served in the position of Conservation Coordinator during her tenure with the Kern County Water Agency and also produced Urban Water Management plans while there.

Mary Lou has served on the California Urban Water Conservation Council for over a dozen years, as representative for Council members Kern County water Agency, Castaic Lake Water Agency and now Kennedy/Jenks Consultants. She has served on the Council Steering Committee for eight years, and is currently Secretary/Treasurer of the organization; this experience has made her extremely familiar with the requirements of the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). Mary Lou is also a member of the Association of California Water Agencies Water Use Efficiency and Communications Committees. She is an AWWA registered Level 1 Water Conservation Practitioner and currently serves on the AWWA Water Conservation Certification Committee.

This wide experience has made Mary Lou an expert on all aspects of California water management policy and practice. She has participated in numerous high-level efforts regarding water conservation in California, including the CALFED Bay-Delta Program Water Use Efficiency advisory committee and

the Department of Water Resources Urban Water Management Plan guidebook advisory committee, and has worked on various pieces of conservation-related legislation. In addition, she has served on numerous CUWCC project advisory committees and participated in the 1997 and 2008 revisions of the MOU.

Project Experience

IRWMP & Salt/Nutrient, Mojave Water Agency, CA- *Project Manager* - In 2012, Kennedy/Jenks was selected to prepare a comprehensive IRWM Plan update for the Mojave Integrated Regional Water Management Plan. This ongoing project is a collaborative process that integrates public outreach, stakeholder involvement and coordination with local and regional agencies to identify Mojave region water challenges and opportunities, and to plan for how water resources management agencies and other municipal agencies and their communities can work together to manage their resources for the benefit of the region's residents, its ecosystem and wildlife. The project updates the original 2005 Mojave IRWM Plan to reflect the new Proposition 84 guidelines as well as new priorities, objectives, and challenges. There are a number of new elements to the Plan that were not addressed in 2005 and these include the development of metrics for the objectives and ranking the list of proposed projects, as well as more specificity in a number of other elements, including but not limited to governance, flood management, and plan performance and monitoring. The Plan will also incorporate climate change as an entirely new consideration, identifying vulnerabilities and potential adaptation and mitigation strategies. The complete Plan update will also evaluate impacts and benefits, financing, technical analysis, and relation to local land and water use planning.

Integrated Water Resources Management Plan, Western Municipal Water District, Riverside, CA - *Project Team Member* - Preparation of an integrated water resources plan for the Western Municipal Water District and retail agencies within the District (Riverside County). Project involved assistance to, and coordination of, a six member management group and approximately 20 stakeholders. Developed materials for stakeholder education, assisted with identification of water management objectives, and evaluation of projects put forth by stakeholders for consistency with objectives, financial feasibility, and compliance with State mandated requirements.

Upper Santa Clara Integrated Resources Water Management Plan, Castaic Lake Water Agency, Santa Clarita, CA - *Project Manager* - For the preparation of an integrated water resources plan for the Upper Santa Clara River Region (Los Angeles County). Project involves assistance to, and coordination of, an eight member management group and approximately 30 stakeholders. Develop materials for stakeholder education, assist with identification of water management objectives, and evaluate projects put forth by stakeholders for consistency with objectives, financial feasibility, and compliance with State mandated requirements.

Water Supply Rev, San Gorgonio Pass Water Agency, CA - *Project Manager* - Kennedy/Jenks will update the 2007 review of potential supplemental imported surface water supplies for the San Gorgonio Pass Water Agency (SGPWA). We understand that SGPWA is in the process of assessing its future water supply demands and may be interested in obtaining water supplies in addition to its State Water Project (SWP) Table A Amount of 17,000 acre-feet per year. The objectives of this review are to update the evaluation of the key assumptions and parameters that form the basis for the need for an additional water supply, and to identify current potential available sellers and the issues associated with various potential supplies. An updated qualitative review of the administrative processes attendant to obtaining a supplemental water supply will be provided.

Matthew Baillie, P.G.

Hydrogeologist

Education
BS, Geology, Arizona State University, 2001
MS, Hydtology, University of Arizona, 2005

Registrations
Professional Geologist, California (8811)
Registered Geologist, Arizona (52310)

Professional Summary

Matthew Baillie has water resources consulting experience in California and Arizona. His experience includes groundwater basin studies and management programs, groundwater modeling, production well design and installation, and water quality investigations including isotope geochemistry. Mr. Baillie has been involved with several recent groundwater basin studies including the development and application of basin-wide groundwater models for long-term groundwater management of water resources, engineering analysis of aquifer recharge programs, and evaluation of water quality issues. He has performed field and office work dealing with drilling, development, completion, and sampling of groundwater wells in California and Arizona. He has experience logging wells drilled in alluvium and bedrock, and performing aquifer tests on wells in complex hydrological systems in California and throughout Arizona.

His research background generally involved investigations of groundwater-surface water exchange along small streams in New Mexico and Arizona using environmental tracers, including major ions, stable and radioactive isotopes, and temperature. These projects focused on quantification of sources to streamflow and the characterization of hillslope and hyporheic zone hydrology.

Project Experience

Groundwater Banking and Blending Study, Antelope Valley, CA. Helped construct a groundwater flow and transport model to evaluate the movement of water and dissolved solids in the aquifer beneath an applied surface groundwater recharge area. The model was constructed from an existing regional groundwater model through the use of mesh refinement, modified by field data collected during the course of the project. Banking and blending alternatives were investigated using the model and were used to modify the construction of the large banking project.

Conjunctive Use Project, Santa Cruz County Department of Health Services, Santa Cruz, CA. Applied MODFLOW model to evaluate a variety of potential methods to mitigate groundwater level declines in the Scotts Valley area including groundwater recharge basins, injection wells, and stormwater management. Developed a comprehensive analysis to evaluate areas of potential impact and the benefits to groundwater storage and stream baseflow based on model results and hydrogeological evaluation of the groundwater basin.

Groundwater Modeling for Nitrate Transport Evaluation, Elsinore, CA. Updated an existing groundwater flow and transport model to evaluate the movement of nitrate within the groundwater basin. The model was used to simulate the effect of transition of septic systems to sewerage on the transport of nitrate within the basin.

Groundwater Modeling for Remedial Alternatives Evaluation, Hilmar, CA. Helped construct a groundwater flow and transport model to evaluate the movement of water and dissolved solids in the aquifer beneath a land application area. This included the translation of a complex history of amount, quality, and locations of land applications into a time series of recharge. Used the groundwater model to compare several potential remedial alternatives and provide recommendations.

Water Resource Evaluation, Mendocino City Community Services District, CA. Provide annual updates to the basin-wide MODFLOW model to calculate annual changes in groundwater storage to estimate the perennial yield. Evaluated model scenarios to evaluate impact of recent multi-year drought conditions. Provide subregional zone water budget to evaluate local scale issue.

Water Resource Evaluation, Scotts Valley Water District, Santa Cruz County, CA. Provide annual updates to the basin-wide MODFLOW model to calculate annual changes in groundwater storage to estimate the perennial yield of the basin for annual groundwater management report. Provide subregional zone water budget to evaluate short-term and long-term changes to groundwater storage. Oversaw installation and testing of monitoring wells designed to provide additional information of the numerical model. Helped upgrade the existing numerical model to increase its flexibility and applicability to investigations into the response of the basin to future changes in land use and runoff management practices and climate.

Hydrogeological Assessment, food processing facility, San Joaquin County, CA. Developed a numerical groundwater flow model using MODFLOW-SURFACT to produce revised estimates of infiltration capacity to address regulatory concerns, and management of nutrient and salt applications.

Westside Basin Conjunctive Use Project, San Francisco Public Utilities Commission, San Francisco, CA. Evaluated potential for seawater intrusion for conjunctive use project and coastal groundwater pumping project to support CEQA analysis. Analysis based on MODFLOW model output and empirical data analysis. Provided support for development of Developed Drinking Water Source and Assessment Program (DWSAP) reports for a series of 14 new groundwater production wells in San Mateo County. Provided technical and field support of the installation of monitoring wells and water quality sampling.

Groundwater Modeling, Paratransit Site, Sacramento, CA. Developed numerical MODFLOW-SURFACT model to evaluate contaminant transport of hydrocarbons in support of regulatory compliance of enhanced bioremediation project. Utilized the model to help optimize the proposed pump-and-treat system for most complete and effective capture of contaminant plumes.

Squaw Valley Water Supply Document Review Report, Brownstein Hyatt Farber Shreck, LLP, Squaw Valley, CA. Reviewed, studied, evaluated, and summarized previous investigations in the Olympic Valley Groundwater Basin to provide a picture of the hydrologic state (past, present, and future) of the basin. This included evaluating existing estimates of sustainable yield and the likelihood of the availability of alternative water sources.

Mesquite Lake Groundwater Basin Evaluation, Twentynine Palms Water District, San Bernardino County, CA. Was primary hydrogeologist for performing a comprehensive study of the Mesquite Lake Groundwater Basin including evaluation of geology, water budget, groundwater recharge, and change in groundwater storage. Developed 3D MODFLOW model of the basin to evaluate the relative impacts of shifting groundwater pumping.

Meredith E. Clement

Funding

Education

BS, Environmental Policy, Analysis and Planning, University of California at Davis, 1996
MS, City and Regional Planning, California Polytechnic State University, 2000
MS, Transportation Engineering, California Polytechnic State University, 2000

Memberships/Affiliations

American Public Works Association
American Water Works Association
Association of Environmental Professionals

Professional Summary

Meredith Clement has over 13 years of environmental consulting experience on projects throughout California. Meredith has special expertise with water planning projects, urban planning, and environmental compliance documentation, including the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Project Experience

Conjunctive Use and Enhanced Aquifer Recharge Project, County of Santa Cruz, Santa Cruz, CA - *Technical Advisor* - Assisted the Community Foundation of Santa Cruz with development of a customized database for use with the Kennedy/Jenks Grant Administration Tool. This website tool and database is assisting these two agencies with management of Proposition 50 Implementation grants.

Grant Administration Support, County of Ventura, Ventura, CA - *Grant Administrator* - Acting as grant administrator for 11 project proponents that successfully competed for Proposition 50 Integrated Regional Water Management Plan funding. Assist project proponents with contract negotiations, coordination of deliverables, regulatory compliance for projects, preparation of invoices, and progress reports. Act as contact for the 11 projects with the State Water Resources Control Board. As part of grant administration, assisted with the design and development of a web platform, electronic input forms, and database.

Proposition 50 Grant Administration Tool and Integrated Regional Water Management Plan, Contra Costa Water District, Concord, CA - *Technical Advisor* - Assisted Contra Costa Water Agency with development of a customized database for use with the Kennedy/Jenks Grant Administration Tool. This website tool and database is assisting these two agencies with management of Proposition 50 Implementation grants.

Santa Barbara Countywide Integrated Regional Water Management Plan-Prop 50, Implementation Grant Administration, County of Santa Barbara, DPW, Santa Barbara, CA - *Project Manager* - Assisted with grant administration for the agreement between the County of Santa Barbara and the State Water Resources Control Board (SWRCB). Tasks include assisting with submittal of materials necessary for grant execution and maintenance, completion of a web platform and electronic database for invoice preparation.

Grant Assistance, City of Corona Department of Water & Power, Corona, CA - *Grant Writer* - Assisted in the preparation of state and federal grant applications related to recycled water, water and water reclamation projects including energy efficiency.

Grant Funding Assistance for Recycled Water Storage and Demineralization, San Elijo Joint Powers Authority, San Elijo, CA - *Grant Writer* - Assisted in the monitoring and preparation of state and federal funding opportunities, as well as providing as needed services in refining materials needed for grant and loan applications specific to SEJPA's Recycled Water Storage and Demineralization Project.

Grant Support Services, City of Camarillo, Camarillo, CA - *Grant Writer* - Responsible for the preparation of grant application for the Clean Water State Revolving Fund (CWSRF) Project Priority List for several of the City's projects including Stormwater Trash TMDL implementation, Pleasant Valley Road Reclaimed Water Main Phase II, Wastewater Treatment Plant Diversion Discharge to Camrosa, and the Sewer Main Replacements per the Sewer System Upgrade Plan.

Application for U.S. Bureau of Reclamation Grant Program, Calleguas Municipal Water District, Thousand Oaks, CA - *Grant Writer* - Responsible for the preparation of a grant application for the U.S. Bureau of Reclamation (USBR) Challenge Grant Program: Recovery Act of 2009 Water Marketing and Efficiency Grants for the Turnout Automation and Vault Improvements Project.

Conservation Block Grant Application, City of Camarillo, Camarillo, CA - *Grant Writer* - Responsible for the preparation of a grant application for the U.S. Department of Energy (DOE) National Energy Technology Laboratory Recovery Act Energy Efficiency and Conservation Block Grants Funding Opportunity DE-FOA-000013 for the Corporation Yard Solar Improvements Project.

FY 2009-2010 Grant Application Assistance, Western Municipal Water District, Murrieta, CA - *Project Manager* - Responsible for the preparation of grant applications for upcoming grant programs for the 2009 - 2010 fiscal period. Tasks included assisting Western with grant program monitoring, and grant application preparation for state and federal grants and loans programs, and preparation of applications for the Metropolitan Water District Local Resources Program.

Integrated Regional Water Management Plan Grant Application Preparation, Castaic Lake Water Agency, Santa Clarita, CA - *Project Scientist* - Assisted in the preparation of a Proposition 84 Integrated Regional Water Management (IRWM) Grant. The Upper Santa Clara River IRWMP Region received approval into the IRWM Grant Program by DWR during the Region Acceptance Process, allowing the USCR Region to apply for funds to directly assist in developing, updating, or improving its IRWM Plan.

As-Needed Grant Support, Western Municipal Water District, Murrieta, CA - *Project Manager* - Provided Western Municipal Water District with As-Needed Grant Support Services to actively minimize costs to its customers in identifying and completing grant applications for assistance with the construction of projects such as the Riverside/Corona Feeder (R/C Feeder), the Chino and Arlington Desalters, as well as miscellaneous projects proposed by retail water agencies in Western's service area.

Integrated Regional Water Management Plan Prop 84 Grant Application, Castaic Lake Water Agency, Santa Clarita, CA - *Project Scientist* - Assisted in the preparation of a final Proposition 84 Integrated Regional Water Management (IRWM) Implementation Grant Proposal Solicitation Package to gain grant funding to implement projects outlined in the Agency's IRWM plan. Preparation of the grant application included information collection, workshops with stakeholders and the preparation of work plan to adopt the IRWM plan's goals and objectives

Jeane M. Hill, P.E.

Technical Support

Education
BS, Civil Engineering, University of California, Irvine, 1992

Registrations
Professional Civil Engineer, California (60012)

Memberships/Affiliations
American Society of Civil Engineers
American Public Works Association

Professional Summary

Jeane Hill's engineering experience includes engineering work related to the planning, hydraulic design, CAD drafting, project management, construction and/or modification, and operation of water distribution facilities; including water mains, wells, reservoirs, canals, turnouts, pump stations, treatment systems, and buildings.

Project Experience

Recharge Basin Improvements, Inland Empire Utilities Agency, Fontana, CA - *Technical Advisor* - Technical oversight of Project Engineer for the design of facility improvements to Declez Basin, 8th Street Basin No. 1, Hickory Basin and San Sevaine Basin. Improvements included raising existing earth and soil cement berm elevations, constructing concrete spillways, constructing new gated outlet structures, modifying existing outlet structures, constructing a new 233 foot soil cement access ramp, installing 150 feet of 30-inch RCP and 155 feet of 36-inch RCP, installing riprap with RSP fabric.

Analysis of District's Distribution System, West Kern Water District, Taft, CA - *Project Engineer* - Project Engineer for the hydraulic analysis of the West Kern Water District's distribution system and recommended improvements due to increased capacity demands required to serve the Sunrise Power Plant.

Mojave NP-Scoping Trips Title 1, U.S. Department of Interior, National Park Service, Oakland, CA - *Project Manager / Project Engineer* - Project Manager/Engineer for preliminary design of water system improvements. Title I services included water quality analysis of the existing well and evaluation of three treatment and distribution alternatives, including a hydraulic model of the entire system. Steady state, extended period simulation, and chlorine residual analyses were incorporated to the hydraulic model.

NPS MOJA Rehab ZZYZX Water District, Engineering Solutions, Inc., Pearl City, HI - *Project Manager / Project Engineer* - Project Manager/Engineer for preliminary design of water system improvements. Title I services included water quality analysis of the existing well and evaluation of three treatment and distribution alternatives, including a hydraulic model of the entire system. Steady state, extended period simulation, and chlorine residual analyses were incorporated to the hydraulic model.

IRWMP Assistance and Regional Acceptance Process Application, Kern County Water Agency, Bakersfield, CA - *Project Team Member* - Project team member for the preparation of an integrated regional water management plan for the Tulare Lake Basin portion of Kern County, in accordance with Propositions 50 and 84.

Grant Application Assistance, Kern County Water Agency, Bakersfield, CA - *Project Engineer* - Prepared a DWR AB303 grant application for a monitoring well project proposed to be installed near Pumping Plant No. 6 to monitor a contamination plume at a nearby refinery and the effects of pumping at the Rosedale-Rio Bravo/ID4 joint groundwater recovery program.

Title 1 Preliminary D, U.S. Department of Interior, National Park Service, Oakland, CA - *Project Engineer* - Project Engineer for Preliminary and Final Design for water system and road improvements at the Solstice Canyon dormitory at the Santa Monica Mountains National Recreation Area. The project included evaluation of the existing water tank and fire suppression system and design of a new distribution system, booster station, fire storage tank, retaining wall, and road and drainage improvements.

Title II, U.S. Department of Interior, National Park Service, Oakland, CA - *Project Engineer* - Project Engineer for Preliminary and Final Design for water system and road improvements at the Solstice Canyon dormitory at the Santa Monica Mountains National Recreation Area. The project included evaluation of the existing water tank and fire suppression system and design of a new distribution system, booster station, fire storage tank, retaining wall, and road and drainage improvements.

Engineering Support Services, Castaic Lake Water Agency, Santa Clarita, CA - *Project Team Member* - Assisted the Engineering Division on an as-needed basis on various capital projects. Project work was completed at the office of the Agency and project duration was 2 years.

OX Ranch Title II, U.S. Department of Interior, National Park Service, Oakland, CA - *Project Engineer* - Project Engineer for the design of the water distribution system which included well head protection with pitless adapter, well pump/motor, drop pipe, and electrical cable with electronic controls, chlorination treatment system, waterline distribution piping and appurtenances, and bladder tank for water storage and system pressure regulation.

Kessler Springs - Title II, U.S. Department of Interior, National Park Service, San Bernardino County, CA - *Project Engineer* - Project Engineer for the design of the water distribution system which included well head protection with pitless adapter, well pump/motor, drop pipe, and electrical cable with electronic controls, chlorination treatment system, in-line filtration system, waterline distribution piping and appurtenances, and bladder tank for water storage and system pressure regulation.

10% Conceptual Design Report for West Kern Water District Conveyance System Improvements, Sunrise Power Company, LLC, Bakersfield, CA - *Project Engineer* - Project Engineer and Construction Project Coordinator for the design and construction of over 13 miles of 48-inch through 12-inch ductile pipe, two 2MG welded steel reservoirs, three pumping stations and three groundwater wells. Project ultimately provided an additional 12,000 gpm to the District's distribution facilities. The pump stations included 450 HP electric motors and 600 HP natural gas/LPG engines

Developer Impact Fee Rev 04/05, Castaic Lake Water Agency, Santa Clarita, CA - *Project Team Member* - Assist Agency in the review of calculations for developer impact fees. The reviews are performed on a monthly basis and include performing quantity takeoffs of developer plans, verifying quantities on Agency calculations sheets, and providing written documentation of the evaluations performed.

Karl Osmundson

Biology Group Manager

HELIX Environmental Planning

Summary of Qualifications

Mr. Osmundson serves as Biology Group Manager at HELIX. He brings a comprehensive technical background to the team, with expertise in wildlife and fish biology, botany, restoration ecology, mitigation planning, and endangered species and wetlands permitting. He has managed CEQA/NEPA biological resources studies, endangered species surveys, environmental permitting, and mitigation programs for a range of water infrastructure, reservoir, pipelines, pump stations, access roads, revegetation, and emergency projects. Mr. Osmundson has extensive experience supporting water districts with biological constraints analyses to inform facilities siting, biological studies to support CEQA/NEPA documentation, and resource agency coordination to support consultations and permitting. He has directed teams during survey efforts, provided technical review in the preparation of environmental documentation, and provided support in implementation of project mitigation and permit conditions. He has also managed consultations with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), in addition to wetlands permitting with the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and CDFW.

Previous Project Experience

Hi-Desert Water District (HDWD) Wastewater Collection System Biological Studies (2012 - 2013). As Project Biologist, assisted with identification of sensitive biological constraints in support of project scoping, planning, and design. Performed research and identified areas potentially supporting habitat for desert tortoise and burrowing owl, Joshua trees, and CDFW-jurisdictional desert washes. Led planning efforts for regulatory permitting with the CDFW. Project is a new wastewater collection system proposed by HDWD in Yucca Valley, California.

Lake Morena Oak Shores Mutual Water Company Poppy Drive Loop Pipeline Project Biological Studies (2013). As Project Biologist, conducted vegetation mapping, jurisdictional assessment, and oak tree inventory for constraints analysis to inform project siting and planning. Prepared biological report for submittal to USFS. Project is a new potable water pipeline near Lake Morena, California.

Northern Route Pipeline Project EIR/EA (2009 - 2010). As Project Biologist, led vegetation mapping, wetland delineation, rare plant surveys, and endangered species surveys. Prepared mitigation strategy for impacts to sensitive habitat and endangered species. Developed permitting approach for impacts to jurisdictional wetlands. Project includes 11.7-mile potable water pipeline and related support facilities for Yuima Municipal Water District near Pala and Pauma Valley, California.

City of Carlsbad and CMWD Sewer, Water, and Recycled Water Master Plans EIR (2011 - 2012). As Project Biologist, performed biological assessment of CIP

Education

Bachelor of Science, Wildlife, Fish and Conservation Biology, University of California, Davis, 2003

Registrations/ Certifications

USFWS Federal 10(a)(1)(A) Permit #TE161620-0, vernal pool branchiopods

CDFW State Scientific Collecting, Permit #801063-04

Certified USACE, Wetland Delineator, Arid West and Western Mountains, Valleys and Coast Regions

County of San Diego, CEQA Approved Consultant

County of San Bernardino, CEQA Approved Consultant

AIA/CES, Trained Project Manager

projects, including sewer, water, and recycled water storage reservoirs, pump stations, and pipelines. Prepared impact analysis and developed mitigation requirements for over 100 improvement projects.

Vallecitos Water District (VWD) 2008 Master Plan EIR (2010 - 2011). As Project Biologist, performed biological surveys within 59 VWD CIP sites, including reservoirs, pump stations, and pipelines. Prepared biological section of EIR, including analyses of effects on special-status species, sensitive natural communities, wetlands, wildlife corridors, local policy, and conservation plans.

Otay Water District (OWD) 2009 Water Resources Master Plan Update EIR (2009). As Project Biologist, prepared biological resources section of EIR, including analyses of 24 CIP projects and combination of water and wastewater storage reservoirs, pump/lift stations, and pipelines.

Adelfa Booster Station Redesign Project MND (2012). As Project Biologist, prepared biological technical resources studies in support of project's IS/MND, including general biological survey, burrowing owl habitat assessment, rare plant survey, biological technical report, and Riverside County MSHCP consistency.

Southern California Edison (SCE) East End Hydro Division Regulatory Permitting (2009 – 2011). As Project biologist, served as SCE's authorized representative for wetland delineations and regulatory permitting with USACE, RWQCB, and CDFW for hydropower projects in Los Angeles and San Bernardino Counties. Performed endangered species surveys, fisheries studies, rare plant surveys, ESA consultation, wetland permitting, and mitigation implementation.

Oak Hills Tentative Tract Map 16544 (2005). As Project Biologist, conducted habitat assessment survey, jurisdictional assessment survey, and protocol surveys for burrowing owl desert tortoise. Prepared biology report and protocol survey reports. Project included subdivision of 78 acres for residential development near Hesperia, California.

Trimark Pacific Project (2006). As Project Biologist, conducted habitat assessment and jurisdictional assessment surveys. Target species included Booth's evening primrose, short-joint beavertail, small-flowered androstephium, desert tortoise, Mohave ground squirrel, burrowing owl, coast horned lizard, Le Conte's thrasher, and California horned lark. Project includes subdivision of 40 acres proposed for residential development in Victorville, California.

Melissa Whittemore

Project Manager

HELIX Environmental Planning

Summary of Qualifications

Ms. Whittemore's responsibilities include managing and preparing environmental compliance documents in accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Direct professional experience has included the preparation of Mitigated Negative Declarations (MNDs)/Initial Studies (ISs), Findings of No Significant Impact (FONSIs)/Environmental Assessments (EAs), Environmental Impact Reports (EIRs) and Environmental Impact Statements (EISs). In addition, Ms. Whittemore has participated in the preparation of Biological Technical Reports, Biological Assessments, Mitigation Monitoring Report Programs, Habitat Management Plans, Socioeconomic Impact Studies, Land Use Analyses, Growth Inducement Studies, and Public Services and Utilities Analyses.

Selected Project Experience

AVEK - Banking and Blending Study (2012 - Present). Managing and preparing an IS/MND for a water banking and blending project in the Antelope Valley region of unincorporated Los Angeles County, between the communities of Pearblossom and Little Rock, south of the City of Palmdale. The project would include construction and operation of two 3-acre recharge basins, up to five extraction wells, and associated pipelines and other facilities. The project would allow banking of surplus State Water Project (SWP) raw water for later use during drought conditions when SWP deliveries may be limited. Also managing biology work being conducted for the project, including focused surveys for desert tortoise, burrowing owls, and Mohave ground squirrel, as well as cultural work being completed by a subconsultant. Work is being completed for Kennedy/Jenks, and the lead agency is Antelope Valley-East Kern Water Agency.

East Diamond Valley Lake Recycled Water Storage Pond Demonstration IS/MND (2012 - Present). Managing and preparing an IS/MND for a recycled water storage basin to collect data for a period of up to four years. The project would generate data to provide an improved understanding of geotechnical, hydrogeologic, water quality, regulatory, and water system requirements for long-term seasonal storage of water within the Diamond Valley Lake Eastern Recreation Area. The project would require earthwork to the pond and immediate area to repair erosion and prepare the site to accept recycled water. The project also would include associated facilities, such as pipelines, water inflow/outflow structures, temporary pump facilities, power supply, storage/staging area, monitoring wells, lysimeters, other test facilities, and an access road. Recycled water would be piped to the basin. The project site is located on the Diamond Valley Lake property east of the East Dam within the City of Hemet in Riverside County. Work was done for Eastern Municipal Water District.

Education

Bachelor of Science, Biology with an emphasis in Ecology, San Diego State University, 2001

Graduate Certificate, National Environmental Policy Act, Utah State University, 2003

Professional Affiliations

Association of Environmental Professionals

Hemet/San Jacinto Integrated Recharge & Recovery Program (2004). Prepared noise impact analysis section for the EIR based upon the noise technical report for the project. Provided as-needed assistance, including proofreading of EIR sections. The project included 15 groundwater recharge basins in the San Jacinto River channel in Riverside County, an approximately eight-mile-long water supply pipeline, and several groundwater monitoring and extraction wells. The project would provide seasonal and long-term groundwater storage. Work performed for the Eastern Municipal Water District.

Sun City Force Main (Rigemoor Road to Salt Creek Channel) (2011 - Present). Managed and prepared an IS/MND for the improvement of operational capacity of the Sun City Force Main and replacement two segments of existing recycled water pipelines in the cities of Menifee and Perris. The combined length of the pipelines (both sewer and recycled water) was approximately 6.3 miles within an approximately 5-mile-long corridor. Work was done for Kennedy/Jenks and the lead agency was Eastern Municipal Water District.

Mid City Pipeline Phase 2 (2011). Managed and prepared an Environmental Impact Identification and Recommended CEQA Actions memorandum for the design and construction of a proposed water pipeline. This memorandum analyzed potential environmental issues for four alternative pipeline alignments within the cities of San Diego and La Mesa. Biological, cultural, and paleontological resources; land use; and community/business and traffic disruption were analyzed. Work was done for the City of San Diego.

San Diego District 2012-2014 Main Replacements (2012 - Present). Managing the preparation of a Biological Technical Report and IS/MND for the replacement of an existing 6,630-foot-long aged water main segment with a new polyvinyl chloride (PVC) water main of equal diameter. Replacement of the line is needed as the cast iron pipe has been in service for over 70 years, is deteriorated, and has reached the end of its useful service life. The proposed replacement line would be installed parallel to the existing pipeline alignment and entirely within the paved roadway and/or dirt shoulder area of the road right-of-way limits of Hollister Street. The existing pipeline would be abandoned in place. The project site is within the City of San Diego, south of San Diego Bay and north of the Tijuana River. The City of San Diego is the lead agency.

City of San Diego Storm Water System Maintenance Program EIR (2010). Assisted in preparation of a Program EIR for future maintenance activities of the City of San Diego's storm water system in order to provide for public safety and protection of property. Program also would include the construction of maintenance access roads, some of which would occur through sensitive biological resources areas. Work was done for the City of San Diego.

RÉSUMÉ

VANESSA A. MIRRO, R.P.A.

EXPERTISE

Cultural resources management and legal compliance; prehistory of California, identification and analyses of human remains, historical and prehistoric mortuary archaeology, project management, paleontology, predictive modeling, and archaeological method and theory. Certified by the Register of Professional Archaeologists since 2003.

EDUCATION

M.A. Anthropology, Colorado State University, Fort Collins, Colorado, 2002.
B.A. Anthropology (*cum laude)*, University Western Ontario, London, Ontario, Canada, 1998.

PROFESSIONAL EXPERIENCE

2004–	Regional Manager (2012–), Assistant Soutwestern Division Manager (2010–2011), Senior Archaeologist (2004–), Applied EarthWorks, Inc., Hemet, California..
2001–2004	Field Supervisor/Crew Chief/Staff Osteologist, Applied EarthWorks, Inc., Lompoc, California.
1999–2000	Instructor/Lab Supervisor, Colorado State University, Fort Collins, Colorado.
1997–2003	Archaeological Field School Instructor/Supervisor/Staff Osteologist, Western Belize Regional Cave Project, Belize, Central America (summers only).
1997–1999	Field Technician, various cultural resources management firms in the eastern United States and Canada.

TECHNICAL QUALIFICATIONS

Ms. Mirro has served in various capacities on cultural resources projects involving prehistoric and historical resources in the United States, Canada, and Belize over the past 14 years. Her areas of expertise include the prehistory of California, human osteology, bioarchaeology, and mortuary practices. Ms. Mirro has performed osteological analyses for a number of sites in the United States, Canada, and Belize. As a Regional Manager and Senior Archaeologist, Ms. Mirro directs professional staff and subcontractors and provides quality assurance for all project work. She has served as project manager or principal investigator on projects throughout Riverside, San Bernardino, Kern, San Diego, and Imperial counties, California. These include large-scale projects, such as cultural resource investigations for Metropolitan Water District's San Diego 6 Pipeline Project (SD6), which included survey, testing, data-recovery excavations, and monitoring of sites within the project corridor, and more recently, preparation for studies in support of the SD6 – South Reach and SDCWA Reach, which includes archival research, Native American coordination, and predictive modeling. For the past eight years, Ms. Mirro has served as Project Manager for the State Route 79 cultural resources investigations. Responsibilities include coordination and management of archaeological surveys, testing, and evaluations; consultation with Native Americans and historical societies; literature and archival research; regional landscape studies; paleontological studies; and preparation of various cultural resources documents. Ms. Mirro has also managed numerous linear projects for agencies such as the City of Riverside Public Utilities Department, Riverside County Flood Control, and the Coachella Valley Water District. Most recently, she has managed four large solar power projects, including Solar Millennium's Blythe and Palen Solar Power Projects, the NextEra Genesis Solar Project, and Horizon Wind Energy's Rising Tree Wind Farm Project. Ms. Mirro is certified by the Register of Professional Archaeologist (RPA).

Laura L. Cathcart-Dodge, P.GP.

Vice President
Senior Geophysicist
Santa Ana Office Manager

EDUCATION

M.S., Geophysics, University of Arizona, Tucson, Arizona; 1990
B.S., Geology and Geophysics, University of Wisconsin, Madison, Wisconsin; 1988
Short Course in Borehole Geophysics for Environmental and Engineering Investigations, 1995

Completed 40-hour OSHA Health and Safety Training Course (29-CFR 1910.120) in November, 1990 and is current with required refreshers.

MEMBERSHIPS/AFFILIATIONS

Arizona Geophysical Society
Environmental & Engineering Geophysical Society
Association of Engineering Geologists
Society of Exploration Geophysicists
Examination Committee, Board of Registration for Geologists and Geophysicists, State of California

PUBLICATIONS

Cathcart, Laura L., 1990, "Crustal Thickness and Upper Mantle Velocity from the Regional Inversion of the Pnl waveform in the Western Syntaxis of the Himalayas," Master's Thesis, The University of Arizona, Tucson, Arizona.

Alalawi et al., 1989, "Geophysical Surveys in the Pima Mining District, Arizona;" *Laboratory for Advanced Subsurface Imaging, LASI-89-1*, The University of Arizona, Tucson, Arizona.

PROFESSIONAL BACKGROUND

Nov. 2003 to present: ***Vice President, Spectrum Geophysics***
As Vice President of Spectrum Geophysics, Ms. Cathcart-Dodge is responsible for technical and business development for the Corporation, and for management of the Santa Ana office. Ms. Cathcart-Dodge also manages a team of geophysicists who conduct a wide variety of geophysical projects.

Jan. 1999 to present: ***Senior Geophysicist and Principal, Spectrum Geophysics, Irvine, California.*** As Senior Geophysicist for Spectrum Geophysics, Ms. Cathcart-Dodge was responsible for the coordination of geophysical projects and field services, processing and interpretation of a wide

variety of geophysical data, project oversight, report review of 6 project managers, and client liaison. Ms. Cathcart also participated significantly in marketing and maintaining business relationships, as well as remote-site fieldwork.

May 1997 to Dec. 1998: ***Geophysics Manager, Converse Consultants, Costa Mesa, California.*** As Geophysics Manager for Converse Consultants, Ms. Cathcart-Dodge was responsible for all marketing, proposal preparation, field data acquisition, data interpretation and report generation associated with geophysical methods. Investigations included ground penetrating radar, seismic refraction, electrical resistivity, and extensive utility location at various sites in Southern California.

May 1995 to Nov. 1996: ***Senior Project Geophysicist, IT Corporation, Irvine, California.*** As Senior Project Geophysicist for IT Corporation, Ms. Cathcart-Dodge was responsible for the management of all geophysics projects for IT for the western half of the United States. Also responsible for the design, coordination, processing, and interpretation of geophysical surveys in support of **RI/FS** investigations for **Navy CLEAN** and **DOE** sites as well as the development of new applications of geophysics to these investigations.

Oct. 1990 to May 1995: ***Project Geophysicist, IT Corporation, Irvine, California.*** As Project Geophysicist for IT Corporation, Ms. Cathcart-Dodge conducted magnetics, electromagnetics, GPR and utility locating surveys to delineate undocumented disposal sites and UST locations for a **$1.5M** geophysical investigation is support of an **RI/FS** at MCLB Barstow under the **Navy CLEAN** contract. Additionally, she conducted downhole EM induction and natural gamma logging surveys to correlate stratigraphy. Her responsibilities included data validation and processing along with preparation and coordination of technical reports.

REPRESENTATIVE PROJECTS

Vermilion Dam, Fresno County, California

Ms. Cathcart-Dodge designed, coordinated and managed a detailed seismic refraction investigation to determine rippability and identify shallow granitic boulders along a proposed trench line at the toe of Vermilion Dam in Fresno County, California. The Spectrum team was air-lifted to the site as the mountains were snow-covered and there was no vehicle access at this high-elevation site. A total of 640 line-feet of p-wave data were collected using 10-foot geophone spacing and a 24-channel Seistronix RAS-24 signal enhancement seismograph, 10-Hz vertical geophones, and a 20-lb. sledgehammer. The data were processed using both Viewseis and SeisOpt@2D™ software. A report of findings and a PowerPoint presentation were provided to the Client.

Yosemite National Park, California

Ms. Cathcart-Dodge designed, coordinated and field managed a geophysical investigation to delineate shallow boulders that could interfere with trenching activities for a proposed employee housing expansion within a 7-acre wooded area at Yosemite National Park. EM-31 and magnetics data were collected along lines spaced 5 feet apart within the entire 7 acres, and detailed utility locating was conducted in order to distinguish EM-31 and magnetics anomalies caused by utilities from those caused by shallow boulders. In addition, GPR profiles were collected over identified anomalies. A detailed report was provided that included color contour maps of the data and a geophysical interpretation map.

Commercial Site, Lake Perris, California

Ms. Cathcart-Dodge designed, coordinated and field managed a large-scale geophysical investigation adjacent to the Lake Perris Dam to delineate a stream channel in granitic bedrock buried 400 feet below ground surface at a property in Lake Perris, California. A challenge for this project was to pinpoint the center of the stream channel for optimal placement of a proposed municipal water well. Over 2 miles of pole-dipole DC resistivity data were collected using AGI's R8/IP SuperSting unit, six-meter cable and overlapping arrays of 56 electrodes. A detailed report with resistivity profiles and a top-of-bedrock topo map was provided to the Client.

Commercial Site, Long Beach, California

Ms. Cathcart-Dodge designed, coordinated and field managed a geophysical investigation to identify the trace of the Newport-Inglewood Fault Zone where it crossed a property in Long Beach, California. As the groundwater table was shallow and saline the electrical resistivity method was used. Two parallel transects were established where Schlumberger data were collected using AGI's Sting/Swift system, four-meter cable and overlapping arrays of 56 electrodes. The Main Fault and two apparent fault splays were identified. A detailed report with resistivity profiles and a geophysical interpretation map was provided to the Client.

Commercial Site, Huntington Beach, California

Ms. Cathcart-Dodge designed, coordinated and managed an extremely detailed shear wave reflection investigation to delineate existing large dense objects beneath a recently installed gravity sewer. A total of 355 line-feet of s-wave data were collected using a CMP configuration with shot and geophone intervals of 2.5 feet. Data were collected using a 48-channel StrataVisor NZII signal enhancement seismograph, 28-Hz horizontal geophones, and a 20-lb. sledgehammer. A report of findings was provided to the Client.

Commercial Site, Lakeside, California

Ms. Cathcart-Dodge designed, coordinated and provided project oversight for a high-resolution large-scale seismic refraction investigation to determine seismic rippability, identify fault locations and delineate the alluvium/ conglomerate/granitic bedrock interface to a depth of 150 feet for a quarry near Lakeside, California. A total of 5300 line-feet of p-wave data were collected using approximately 13 shots per spread with a 24-channel Seistronix RAS-24 signal enhancement seismograph, 10-Hz vertical geophones, and a 20-lb. sledgehammer. A detailed report of findings was provided to the Client.

Commercial Site, Lake Elsinore, California

Ms. Cathcart-Dodge coordinated and field-managed a large-scale seismic refraction investigation for rippability and delineation of the alluvium/bedrock interface for proposed development of a property in Lake Elsinore, California. A challenge for this project was topographic relief of 200 feet or more and no vehicle access along several transects. A total of 6800 line-feet of p-wave data were collected using a Seistronix RAS-24 signal enhancement seismograph, 8-Hz vertical geophones, and a 20-lb. sledgehammer. A detailed report with seismic profiles was provided to the Client.

Commercial Site, Texas:

Ms. Cathcart-Dodge coordinated and field managed a geophysical investigation to delineate subsurface caves and voids within a 2-acre wooded area in Texas. Ground penetrating radar (GPR) profiles along with dipole-dipole electrical resistivity data were acquired along each of seven 54-meter transects. GPR data were acquired and interpreted in the field, and resistivity data were interpreted with the RES2DINV

package and contoured with a commercially available software program. Provided a detailed report of identified anomalies and their probable association with subsurface caves or voids.

Commercial Site, Southern California:

Ms. Cathcart-Dodge managed a geophysical investigation to identify voids or fissures in poorly-constructed concrete sludge tanks at a water treatment facility. Nearly 3 miles of high frequency and high-resolution GPR data were acquired along the walls of the dry sludge tanks. Provided a detailed report with a geophysical interpretation map of GPR anomalies found in each of the four sludge tanks. Results of the survey were to be used in a lawsuit against the concrete contractor.

Commercial Site, Alpine, California:

Ms. Cathcart-Dodge managed a seismic refraction investigation for a proposed grocery store in Alpine, California. The purpose of the survey was to determine rippability and delineate the alluvium/bedrock interface to a depth of 40 feet in an area of undulating granitic bedrock. Provided a detailed report with seismic sections of each traverse of data acquired. Results were subsequently used to plan cut-and-fill operations in the construction of the grocery store.

Commercial Site, Western NV:

As field supervisor teamed with another firm, Ms. Cathcart-Dodge managed geophysical field data acquisition to map the hydraulic anisotropy of the site using DC electrical resistivity techniques. Five Schlumberger arrays were conducted during Phase I, and gridded data measurements of the electric field about a DC-current dipole were taken during Phase II of the investigation. Duties included data QA/QC.

NAWS China Lake, China Lake, CA:

Ms. Cathcart-Dodge managed a large-scale utility investigation at each of 17 separate locations at NAWS China Lake. Data acquisition consisted of GPR and utility line tracing. The purpose of the survey was to delineate utilities along the length of all clay piping associated with hazardous sumps and settling ponds. This work was in support of remediation efforts being conducted to remove the contaminated clay piping.

March Air Force Base, Riverside, CA:

Ms. Cathcart-Dodge supervised seismic refraction and EM induction data acquisition at a landfill encompassing 70 acres at March AFB. The purpose of the seismic refraction survey was to determine the depth of the fill, the depth to bedrock, and rippability properties of the surrounding material. The purpose of the EM survey was to delineate the landfill boundary. Provided a detailed report with seismic sections and color-enhanced contour maps of the landfill area investigated.

Rebecca Ullett

Project Geophysicist
Santa Ana Office Assistant

EDUCATION

Bachelor of Science in Geophysics, University of Calgary, Calgary, Alberta, Canada, 2003

Completed OSHA Health and Safety Training Course (29-CFR 1910.120) in November 2006 and is current with required refreshers.

PROFESSIONAL EXPERIENCE

Sept. 2006 to present: ***Project Geophysicist, Spectrum Geophysics***

As a Project Geophysicist for Spectrum Geophysics, Ms. Ullett conducts many geophysical investigations using such techniques as p-wave seismic refraction, shear wave seismic reflection and electrical resistivity. She is also responsible for all data quality, data processing and report preparation.

July 2002-July 2006: ***Senior Seismic Data Processor, Earth Signal Processing Ltd.***

As a Seismic Data Processor for Earth Signal Processing, Ms. Ullett coordinated 2D and 3D seismic reflection projects. She was responsible for 2D/3D refraction modeling, velocity analysis, 2D/3D seismic reflection processing, 3D merges, creating processing flows specific to each client's needs and final product preparation.

REPRESENTATIVE PROJECTS

Military Site, Santa Barbara County, California

Ms. Ullett assisted in collecting electrical resistivity, seismic refraction and TEM data along a total of eight transects. Electrical resistivity data were collected using AGI's R8/IP SuperSting unit, four-meter cable and arrays of 56 electrodes. TEM data were collected using a Geonics EM-47 system and a 5-meter offset sounding configuration. Ms. Ullett assisted in producing two-dimensional profiles of the data collected and helped prepare a detailed report that indicated the center of the paleochannel.

Corona, California

Ms. Ullett assisted in collecting electrical resistivity data to identify the depth to bedrock on a property in Corona, California. A total of 12,000 line-feet of electrical resistivity were

collected using AGI's R8/IP SuperSting unit, six-meter cable and arrays of 56 with a 12 electrode roll-along. Ms. Ullett assisted in producing two-dimensional profiles of the data collected and helped prepare a detailed report indicated the depth to bedrock across the property.

Lakeside, California

Ms. Ullett assisted in collecting data for a large-scale seismic refraction investigation to determine seismic rippability, identify fault locations and delineate the conglomerate/granitic bedrock interface for a quarry near Lakeside, California. A challenge for this project was topographic relief of 200 feet or more and no vehicle access along several transects. A total of 5300 line-feet of p-wave data were collected using a Seistronix RAS-24 signal enhancement seismograph, 10-Hz vertical geophones, and a 20-lb. sledgehammer. Ms. Ullett assisted in preparing two-dimensional profiles of the data collected and helped prepare a detailed report identifying faults and depth to bedrock on the property.

Huntington Beach, California

Ms. Ullett assisted in collecting data for an extremely detailed shear wave reflection investigation to delineate existing large dense objects beneath a recently installed gravity sewer. A total of 355 line-feet of s-wave data were collected using a CMP configuration with shot and geophone intervals of 2.5 feet. Data were collected using a 48-channel StrataVisor NZII signal enhancement seismograph, 28-Hz horizontal geophones, and a 20-lb. sledgehammer. Ms. Ullett assisted in preparing a detailed report of findings.

Vermilion Dam, Fresno County, California

Ms. Ullett assisted in collecting data for a detailed seismic refraction investigation to determine rippability and identify shallow granitic boulders along a proposed trench line at the toe of Vermilion Dam in Fresno County, California. The Spectrum team was air-lifted to the site as the mountains were snow-covered and there was no vehicle access at this high-elevation site. A total of 640 line-feet of p-wave data were collected using a Seistronix RAS-24 signal enhancement seismograph, 10-Hz vertical geophones, and a 20-lb. sledgehammer. Ms. Ullett assisted in processing the data using both Viewseis and SeisOpt@2D software.

John P. Christensen P.E.

Principal Water Resources Engineer – Intake Restoration

Education

B Eng, Civil Engineering, University of Auckland, New Zealand.
Graduate Studies, Water Resources Engineering, University of British Columbia, Canada.

Professional Registration

California Civil 36271
Washington Civil 49067

Memberships/Affiliations

U.S. Society on Dams – Life Member
American Society of Civil Engineers
International Hydropower Assoc.

Awards

2008 – Narrows 2 Flow Bypass Project -NHA Outstanding Steward of American Waters

Professional Summary

Mr. Christensen will be responsible for planning and restoration of the existing water intake facility on Cucamonga Creek.

Mr. Christensen is Founder and President of Christensen Associates Inc., a California-based specialty water resources engineering firm. He has over 38 years of professional experience in project management, planning, engineering design and development of major water resource and hydropower projects on the west coast of the United States, Canada and overseas.

His broad practical water resources development experience spans the project planning and implementation process from early inception through site investigations, permitting and licensing, into implementation and operation including: engineering design, bidding, equipment procurement, construction management, claim resolution, asset management, system operation and regulatory compliance. Today he focuses on forming and managing small multidisciplinary project teams of experts to assist owners to successfully implement their water resource projects in today's challenging business, and regulatory environment.

Intake structures are crucial to the successful operation of hydropower facilities and water supply intakes on California streams. Through his extensive work in the hydropower industry in planning, licensing and design of small hydroelectric facilities and surface water supply facilities in California, Mr. Christensen has developed a unique expertise and experience in successful engineering and environmental approaches to developing or restoring water supply infrastructure.

Representative Project Experience

Enloe Hydroelectric Project Intake, Oroville, WA. Conceptual design and Federal Energy Regulatory Commission Licensing of restoration of an existing hydroelectric project at an existing 57 foot high concrete arch dam constructed in 1923. This work includes design of a 1600 cfs hydraulic capacity stream intake to address sedimentation, ice and fish issues.

Duncan Creek Intake Modifications, Middle Fork American River Project, Auburn, CA Project manager for evaluation of existing 400 cfs capacity shallow stream intake and preliminary design of intake modifications to improve intake performance and to screen out fish and high sediment load.

North Fork Long Canyon Intake Modifications, Middle Fork American River Project, Auburn, CA Project Manager for evaluation of existing stream intake and preliminary design of intake modifications to improve intake reliability and screen out fish and high sediment load.

South Fork Long Canyon Intake Modifications Middle Fork American River Project, Auburn, CA Project Manager for evaluation of existing stream intake and preliminary design of intake modifications to improve intake reliability and screen out fish and high sediment load.

Waiau Hydro Project, Hilo, Hi Project manager for evaluation of repowering of 1100 kW small hydroelectric project in Hawaii. Work included evaluation of design and hydraulic capacity of existing stream intake structure on the Wailuku River near Hilo on the Big Island of Hawaii.

Narrows 2 Flow Bypass, Marysville, CA Project manager for planning, engineering design and construction management of award winning environmental restoration project at YCWA's55-MW hydroelectric plant on the Yuba River downstream of Englebright Dam.

Puueo Hydro Restoration Project, Hilo, HI. Project manager for repowering of a 3-MW small hydroelectric project in Hilo for Hawaii Electric Light Company. Work included modifications to existing stream intake to improve hydraulic capacity and debris exclusion.

Southern California Hydropower Relicensing, San Bernardino and Bishop, CA Hydrology and **e**ngineering support services on Federal Energy Regulatory Commission relicensing of ten Southern California Edison hydro projects. Projects included Mill Creek, Lytle Creek, Santa Ana River Projects 1, 2 and 3, and San Gorgonio Creeks in the San Bernardino Mountains. The work also included Kern Projects 1 and 3, Bishop Projects 1-5, Lee Vining, Rush Creek in the Sierra Nevada Mountains.. These services included inspection and evaluation of hydraulic capacity of small intakes on small streams in the San Bernardino Mountains and on the east slope of the Sierras.

Adobe Creek Conjunctive Use Project, Big Valley, CA. Project Manager for feasibility study and CEQA Initial Study for a conjunctive use water supply project near Clear Lake, California. Today, conjunctive use of surface and groundwater storage is one of the most promising environmentally acceptable options for improving the reliability and yield of water supply in California. The Adobe project involves modifying the outlet works and seasonal operation of an existing flood control reservoir to provide water to recharge the Big Valley Groundwater Basin.

Hashmi Quazi, Ph.D., P.E., G.E.

Project Manager

EDUCATION

Ph.D., Civil Engineering, University of Arizona, 1987
M.S., Civil Engineering, Arizona State University, 19
B.S., Bangladesh Engineering University, 1978

REGISTRATIONS/CERTIFICATIONS

California, Civil Engineer, #46651
California, Geotechnical Engineer, #2517

PROFESSIONAL MEMBERSHIPS

American Society of Civil Engineers (ASCE)
National Society of Professional Engineers
American Water Works Association (AWWA)
American Council of Engineering Companies (ACEC)

EXPERIENCE SUMMARY

Dr. Hashmi Quazi is the Regional Manager and Principal Engineer of Converse's Southern California offices. He has over 26 years of experience in civil and geotechnical engineering and has been with Converse for over 24 years. Over these years, he has earned a reputation of providing quality service to both private and public clientele.

REPRESENTATIVE PROJECTS

Wells No. 45, 46, and 47, Ontario, CA: **Principal in Charge -** Provided technical oversight and budget control for the geotechnical investigation. The project consisted of planned construction of Wells No. 45, 46, and 47 within three different sites in Ontario, California. Each site was planned to include a building to house pump, disinfections equipment, standby power generation unit, electrical feed system with approximately 2,000 linear feet of pipelines.

Well No. 29, Beaumont, CA: Principal in Charge - Provided technical oversight and budget control for the geotechnical investigation, observation, and testing. The rectangular shaped property is located about 60 feet south of Cherry Valley Boulevard, at the west boundary of Egg Ranch. The project included construction of cast-in-place concrete pump vault about 15 feet deep, masonry buildings for chemical/electrical facilities, pads for transformer and a future generator, asphalt concrete paved access road, and 18"-inch discharge pipe.

Well No. 5 Improvement Zone J, Oak Hills, CA: Principal in Charge – Provided technical oversight and budget control for the geotechnical observation and testing. The project consisted of grading of the pad and driveway for proposed Well No. 5 – a 16-inch diameter well with a proposed depth of 1,300 feet below ground surface to be used for a potable water supply.

Well No. 20, Yucca Valley, CA: Principal in Charge – Provided technical oversight and budget control for the roughly rectangular shaped site was bounded by Sunland Trail on the north, Cherokee Trail on the east, Coyote Trail on the south, and vacant land on the west. The project consisted of planned construction of approximately 1,200 linear feet of water pipeline, originating from the existing Well No. 20 and running parallel along Cherokee Trial to the intersection with Sunland, and then turning west along Sunland to the recharge basin. The project included construction of a percolation basin to dispose of waste water.

Harihar Shiwakoti, P.E.

Project Engineer/Project Manager

EDUCATION

M.S. Civil Engineering (Geotechnical Eng.), University of Kansas, Kansas, 2007
B.S. Civil Engineering, Institute of Engineeri Tribuvan University, Nepal, 2002

PROFESSIONAL MEMBERSHIPS

American Society of Civil Engineers (ASCE)

REGISTRATIONS/CERTIFICATIONS

State of California, Civil Engineer, # 76035
Caltrans 105 Calculations Pertaining to Grading & SpG
Caltrans 201 Soil & Aggregate Sample Preparation
Caltrans 202 Sieve Analysis of Fine & Coarse Aggregates
Caltrans 216 Relative Compaction, Soils & Aggregates
Caltrans 217 Sand Equivalent
Caltrans 226 Determination of Moisture Content by Oven Drying

EXPERIENCE SUMMARY

Mr. Shiwakoti has over 9 years of experience in civil engineering, including 6 years as a geotechnical engineer. His areas of expertise are geotechnical engineering analysis and calculations, geotechnical and foundation design recommendations, subsurface explorations, geotechnical laboratory and in-situ testing, and pavement analysis and design.

REPRESENTATIVE PROJECTS:

Northwest Area Recycled Water Pipeline and Pump Station, Cities of Upland, Rancho Cucamonga and Ontario, CA: Project Engineer - Supervised the geotechnical investigation, performed analyses and prepared the geotechnical report. The project consisted of approximately 31,000 linear feet of 24-inch diameter recycled water pipeline (Northern and Southern Segments) within the cities of Upland, Rancho Cucamonga and Ontario in the County of San Bernardino, and a pump station and restroom building located at the northwest corner of Vineyard Park in the city of Ontario, San Bernardino County, California.

San Bernardino Water Supply Line, Colton, CA: Project Engineer - Supervised the geotechnical investigation, performed analyses and prepared the geotechnical report. The project consists of construction of 48-inch diameter water pipeline with an average depth of four (4) feet from finished surface to top of pipe. The length of pipe will be about 6,500 linear feet.

Eastside Water Distribution Main Replacement, Riverside, CA: Project Engineer – Supervised the geotechnical investigation, performed analyses and prepared the geotechnical report. The project consists of replacing approximately 16,000 linear feet of different diameter water mains with new eight (8) inch diameter Ductile Iron (DI) pipeline. The bottom of the pipeline would be approximately four (4) feet below the existing grade.

earthforensics, inc.

W. RICHARD LATON, Ph.D.

12532 VISTA PANORAMA
NORTH TUSTIN, CA 92705
714-296-4055; 714-771-2620 fax
wlaton@earthforensics.com

VITAE

EDUCATION

Ph.D. (1997), Geology with an emphasis in Hydrogeology, Western Michigan University
Groundwater – Kalamazoo River Interaction near the Parchment City Well Field, Parchment, Michigan.

M.S. (1992), Environmental Earth Science (Coastal Geomorphology), Western Michigan University
Small-Scale Coastal Cells as Control Mechanisms on Sediment Movement; Identification and Mapping.

B.S. (1989), Earth Science (Oceanography), Saint Cloud State University, Minnesota
Density Flow Analysis of Turbidity Currents.

PROFESSIONAL SUMMARY

Dr. Laton is an expert in the field of hydrology/hydrogeology. He is currently an Associate Professor of Hydrogeology in the Department of Geological Sciences, California State University, Fullerton. This is a continuation of a career that includes years of teaching, consulting, litigation support and management experience. Dr. Laton possesses extensive knowledge in the areas of hydrogeology, soil and water contamination, hydrology and surface water, wetlands, coastal monitoring/geomorphology, field sampling techniques and well hydraulics as well as environmental remote sensing/GIS. His classes at the university encompass topics including: water quality, environmental sampling, groundwater modeling, well hydraulics, oceanography, and basic geology. He enjoys introducing students to applied research and acts as the faculty advisor to a large number of upper-level students. He has also acted as a consultant for a numerous companies and agencies that need input on the above subjects as well as natural hazard assessment and mapping.

CERTIFICATIONS

California Professional Geologist (PG-7098)
Alaska Professional Geologist (PG-673)
Arizona Professional Geologist (PG-42253)
Florida Professional Geologist (PG-2618)
Illinois Professional Geologist (196.001370)
Indiana Professional Geologist (LPG-2191)
Minnesota Professional Geologist (PG-44868)
Oregon Professional Geologist (G2153)
California Professional Hydrogeologist (CHg-958)
Pennsylvania Professional Geologist (PG-5095)
Texas Professional Geologist (PG-10018)
Washington Professional Geologist (PG-2517)
Washington Professional Hydrogeologist (CHg-2517)

AIPG-Certified Professional Geologist (CPG-10544)

SELECTED CONSULTING, RESEARCH, AND EMPLOYMENT EXPERIENCE

Professional Profile

2010 - Present, President of *Earth Forensics Inc.*
1995 – 2010, Partner (Owner Operator) with *Environmental Science & Planning, LLC.*
1998 – 2001 & 2007 – 2012, Senior Consultant with *Earth Consultants International.*
2001 – 2007, Consultant to *Hromadka & Associates.*
1996 – 1998, Senior Hydrogeologist with *SimulProbe Technologies.*

2010 – Present. ***Earth Forensics, Inc.*** President (www.earthforensics.com)
Project experience includes project management, expert testimony, field work and oversight and training. Clients have included the State of California, various cities, private firms and other consulting companies.

2013

- Malibu, CA. Hired to review and reply to EIR comments as they pertain to wastewater discharge and hydrology, hydrogeology and geology.
- Olivenhain Municipal Water District, CA. Hired to evaluate groundwater resources.

2012

- Torrance, CA. Retained to provide expert testimony on groundwater seepage. (Defense – Torrance Matrix Center Property Owners Association v. Headlands Realty Corporation, et al. – Case No. BC462023)
- Duncan, OK. Retained to provide expert testimony on fate and transport of contaminants of concern, geology and hydrogeology. Included Expert Report and Deposition. (Plaintiff – Alexander, et al. v. Halliburton Company, et al., No. 5:11-cv-01343-M)
- North Central Texas. Hired to evaluate possible causation of potable water well failures.
- San Francisco, CA. Conducted evaluation of contaminated soils for CalTrans.
- Malibu, CA. Hired to conduct groundwater investigation and model of wastewater discharge into the subsurface. Includes the evaluation of ASR wells and groundwater-sea water interaction.
- Malibu, CA. Hired to conduct groundwater investigation for wastewater treatment system upgrade on single family residence.
- Fennville, MI. Retained to provide expert testimony on fate and transport of contaminants of concern, geology and hydrogeology. Included Expert Report and Deposition. (Plaintiff - Barnes, et al. v. Birds Eye Foods - Case No. 1:10-cv-541)
- San Nicolas Island, CA. Developed white paper on the feasibility of deep-well injection of brine.
- Long Beach, CA. Developed calculations of dewatering operations for Gerald Desmond Bridge Replacement Project.
- Malibu, CA. Hired to conduct quarterly and annual groundwater and effluent sampling of commercial property.

2011

- Orange County, CA. Retained to provide expert testimony on hydrogeology, contaminant sources and remediation. Included Deposition. (Defense – Orange County Water District v. Sabic Innovative Plastics – Case No. 30-2008-00078246-CU-TT-CXC)
- Parker Dam, CA. Semi-Annual Groundwater Reporting to Bureau of Land Management.
- Baldwin Park, CA. Hired to oversee soil and groundwater sampling for CalTrans freeway expansion in association with FlatIron Corp. Includes both environmental and geotechnical sampling.

- Pomona, CA. Retained as a rebuttal expert to provide opinions on hydrogeology, contaminant sources (perchlorate), and historical fertilizer use. Included Expert Rebuttal Reports. (Defense – City of Pomona v. SQM North America Corporation – Federal Court)
- Malibu, CA. Retained and hired to evaluate groundwater conditions of a landslide area in association with geotechnical mitigation. Included overseeing groundwater monitoring, drilling of monitoring wells and meteorological assessment. Included Mediation. (Defense)
- Laguna Beach, CA. Hired to photo-document cave collapse.
- Baldwin Park, CA. Hired to evaluate the soil contamination of several stockpiles in association with FlatIron Corp. road construction.
- Malibu, CA. Hired to evaluate and construct artificial recharge wells in association with City wastewater system. Included drilling of test wells, aquifer testing and water chemistry.
- San Jose, CA. Aid in development of construction proposal for FlatIron Corp.
- Riverside County, CA. Review of ADL reports for SEMA Construction Corp.
- Fullerton, CA. Retained to provide expert testimony on contamination source and remedial alternatives. (Plaintiff- M&H Realty Partners v. Aerojet-General Corp et al. – State Court)
- Los Angeles County, CA. Provided Hydrogeologic evaluation of landslide impacted area.
- City of Los Angeles and Riverside County, CA. ADL Reports for CalTrans.

2010

- Carson, CA. Provided review of contaminated soil data and sampling plan for hydrocarbon investigation.
- Fresno, CA. Wastewater sampling at National Raisin Plant. Provide consulting services on wastewater reuse.
- Pleasant Hill, CA. Retained to provide expert assessment of BTEX/MTBE. Included Declaration. (Plaintiff)
- Victorville, CA. Hired to provide background information on Desert Knolls Wash.
- Placer County, CA. Retained to provide hydrogeological assessment of production well and its impact on neighboring domestic wells.
- Merced, CA. Retained as designated expert for Chromium VI contamination case. Work included providing hydrogeological analysis and guidance. Included Declarations, Expert Reports, Deposition and Trial Testimony. (Plaintiff - Abarca, et. Al. v. Merck-Federal Court)

1995 – 2010. ***Environmental Science & Planning, LLC.*** Partner (Owner Operator).
Project experience includes management, expert testimony, field work, bid preparation and consulting for public agencies as well as private companies in the areas of remediation, water resource evaluations, geophysical investigations, surface water management, sampling, and modeling. Selected consulting as follows:

2008

- Torrance, CA. Provided expert analysis of Dry Cleaner facility for commercial property.
- Long Beach, CA. Aided in developing conceptual model of manufacturing facility.
- Provide technical oversight and alternatives for San Bernardino County Flood Control.
- Orange County, CA. Retained as designated expert on single family home in association with potential water issues. (Defense-Settled)
- San Bernardino County, CA. Provided consulting services in relation to water supply to area of single family residences.
- Signal Hill, CA. Provided expert analysis of downhole video of suspected drain.

2007

- La Jolla, CA. Retained as designated expert on surface and groundwater issues related to landslide. (Plaintiff-Settled)

- Long Beach, CA. Retained as designated expert on surface and groundwater issues surrounding a coastal condominium complex. (Plaintiff-Settled)
- Norco, CA. Provide expert oversight to Wildermuth Environmental, Inc., on surface water and groundwater sampling protocols and training.

2006

- Riverside, CA. Environmental Impact Report. Provided technical support on land development associated with an old mining claim.
- Irvine, CA. Environmental Engineering and Contracting. Provided support and review of CPT, ROST data for environmental contamination project in the state of Illinois.

2005

- Malibu, CA. Retained as designated expert for hydrogeologic analysis of existing wastewater system. Included Deposition. (Defense - Settled)
- Riverside, CA. Oversaw specialized soil and groundwater sampling for Layne Christenson.

2004

- Oakland, CA. Soil and groundwater sampling for CalTrans.
- California. Statistical analysis of lead in soil samples for CalTrans highway expansion.
- Carpenteria, CA. Retained as wetland expert, included HEC-RAS modeling.

2002

- Playa Vista, CA. Developed methane mitigation plan for residential and commercial development.

1999 – 2000

- Norco, CA. Oversaw development of methane sampling and mitigation standards for Riverside California.
- Norco/Corona, CA. Methane Mitigation Investigation.
- Long Beach, CA. Carlin Environmental Consulting. Soil and groundwater sampling.

1997

- Kalamazoo, MI. Worked with United Environmental Technologies, Inc. to help develop sampling and well construction protocols for various projects.

1998 – 2001 & 2007 – 2012. ***Earth Consultants International, Inc.*** Senior Consultant (www.earthconsultants.com) Work includes project management and project hydrogeologist duties. Other activities include business development and marketing. Projects include wastewater, oil field seepage and methane mitigation, dewatering for construction purposes, EIR development, water resources investigations, watershed studies, and a regional groundwater GIS study for Riverside County.

2010

- Ocotillo/Coyote Wells. Retained to review groundwater basin conditions in association with Wind Zero development. (Testimony on behalf of client – Imperial County)

1998 – Present: City of Malibu Specific Projects

- Retained to provide hydrogeologic services in association with a zero-discharge wastewater system. Aided in Salt Management Plan.
- Retained to provide hydrogeologic services in association with on-site wastewater, Miramar Investment Co.
- Retained to provide consulting services associated with wastewater discharge impacts to the subsurface at Malibu Racquet Club, Casa Malibu Inn, Wavebreak Restaurant and Malibu Cantina Restaurant. (Testimony on behalf of Client – LARWQCB)
- Retained by the City of Malibu to represent them in surface water lawsuit. (Defense - Settled)
- Oceanographic-Hydrogeological analysis and modeling of tidal fluctuations, storm surge and impacts to a coastal developments wastewater discharge system.

Esmeralda García
Senior Facilitator

AREAS OF EXPERTISE

Strategic Planning / Organizational Development
Community Planning / Facilitation

Education

Bachelor of Arts, Art History, California State University, Los Angeles, 1993

Qualifications

Esmeralda García is a public involvement specialist and Director of Operations for MIG's Pasadena office. Ms. García has managed numerous public involvement programs that engage the public in projects addressing a wide range of issues from transportation and land use to economic development, environmental and community services. She brings a unique perspective to her projects, having worked with public and private sector clients as well as non-profit organizations. Ms. García applies her facilitative leadership skills in developing interactive program methodology to actively engage diverse stakeholders, including policymakers, advocacy groups, community leaders, and the public at-large.

Most recently Ms. García has managed the outreach program for the I-710 Corridor Improvement Project EIR/EIS. The program includes facilitation of corridor stakeholders meetings and discussions to identify and evaluate alternatives, discuss contentious environmental issues and developing recommendations for consideration in the environmental process.

In addition, Ms. García has extensive experience in developing interactive program methodology to identify the needs of ethnically diverse communities. Specifically, Ms. García has a great understanding of the Latino community and the issues that affect Latino families. Fluent in both Spanish and English, Ms. García has facilitated community meetings, workshops and focus groups in Spanish to determine community challenges, issues and opportunities.

Relevant Experience

Mojave Water District Integrated Regional Water Management Plan, *San Bernardino County, California*
Los Angeles County Water Quality Funding Initiative, Los Angeles County Department of Public Works, *Los Angeles County, California*

Los Angeles County Metropolitan Transportation Agency (MTA) I-710 Major Corridor Study and Corridor Project EIR/EIS, *Los Angeles County, California*
Environmental Protection Agency Green Zones Commerce Facilitation, *Commerce, California*
Barrio Logan Community Plan Update, *San Diego, California*
Jacobs Center for Neighborhood Innovations Market Creek Village Center Project, *San Diego, California*
Los Cerritos Wetlands Facilitation, *Los Cerritos, California*
Santa Clarita McBean Regional Transit Center Outreach, *Santa Clarita, California*
Santa Monica Buffer Zone Facilitation, *Santa Monica, California*
Gold Line Transit-Oriented District Plans and Market Studies, *Los Angeles, California*

RCTC Mid County Parkway Project, *Riverside, California*
SR-91/I-605/I-405 Initial Feasibility Study, Gateway Cities COG,
Los Angeles County, California
Riverside County-Orange County MIS (Riverside County-Orange County Connector),
Riverside County, California
Omnitrans E Street BRT Major Investment Study, *San Bernardino County, California*
I-5 Major Improvement Project, *Los Angeles, California*
Port of Los Angeles Transportation Master Plan, *Los Angeles, California*
County of San Bernardino General Plan, *San Bernardino County, California*
Los Angeles-Pasadena Blue Line Light Rail Public Participation Services,
Los Angeles, California
Modoc County Transportation Commission - Tri County Non-Emergency Medical Transportation
Coordination Study, *Modoc, California*
Burbank Airport Plan Evaluation Review Committee, *Burbank, California*
Riverside Vision and General Plan Update, *Riverside, California*
South County Review and Evaluation Program (SCORE), *Orange County, California*

Noemi Bass
Project Associate

Education

Bachelor of Arts, Environmental Analysis and Design, University of California, Irvine

Affiliations

American Planning Association, Inland Empire Section

Qualifications

Ms. Bass is a Project Associate in MIG's Pasadena office. She has been an integral part on numerous planning and public involvement efforts, and recently developed public outreach material for the Housing Element update for the City of West Hollywood.
She is currently involved in developing and implementing a community engagement plan for the Mojave Integrated Regional Water Management Plan for the Mojave Water Agency. Her role on MIG's planning projects is to craft and carry out community workshops, as she has recently successfully accomplished for housing element updates in Azusa and Baldwin Park. Ms. Bass is fluent in Spanish, and has translated public outreach materials, and presented information to better reach non-English speaking communities. She has experience working with the public on various planning projects and also brings with her extensive research skills.

Ms. Bass has professional experience on a variety of private and public planning assignments. She has a thorough understanding of current and advanced land use planning practices. In addition, she is experienced in working with public agencies in outreach programs to gain community support for proposed projects. Ms. Bass has coordinated, presented, and translated in Spanish at community meetings for both government agencies and private developers.

Ms. Bass is knowledgeable of State and Federal resources for community development and has experience in administering and operating CDBG and HOME programs, such as Homeowner Property Rehabilitation Loan and Grant Program, Rental Rehabilitation Program, First-time Homebuyer Program and Davis Bacon Monitoring.

She is experienced in California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) requirements, and has prepared and assisted in the preparation of: Initial Studies, Negative Declarations, Mitigated Negative Declarations, Environmental Impact Reports (EIRs), NEPA Environmental Assessments and NEPA Finding of No Significant Impact

Ms. Bass has been involved with projects that include the preparation and presentation of staff reports to the Planning Commission and City Council for Conditional Use Permits, Site Plans, Zone Changes, Development Agreements, Tract and Parcel Maps, Code Amendments, General Plan Amendments and Updates, Education

Relevant Experience

Mojave Water Agency Integrated Regional Water Management Plan Public Outreach, *San Bernardino County, California*

West Hollywood Housing Element Update, *West Hollywood, California*
Azusa Housing Element Update, *Azusa, California*

Azusa SB 244 Code Amendment, *Azusa, California*

Baldwin Park Sustainability Element, *Baldwin Park, California*

Baldwin Park Housing Element Update, *Baldwin Park, California*

National City Consolidated Plan, *National City, California*

Joshua Tree Downtown Design Guidelines, *Joshua Tree, California*

Grand Terrace Business Corridor Specific Plan, *Grand Terrace, California*

Mark Sillings
Project Manager

EDUCATION

Master of Business Administration, Boston University, Boston, Massachusetts

Bachelor of Arts, History, University of Chicago, Chicago, Illinois

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Qualifications

Mark Sillings has over 20 years of experience in public agency planning and management consulting, including over ten years as a Project Manager with MIG. He has used project management, group facilitation, research, and communication skills to ensure the successful implementation of complex, multi-year projects and planning processes in a wide range of fields, including strategic planning, organizational development, community planning, environmental studies, parks and recreation planning, watershed management, and open space and natural resources.

Over the past five years Mr. Sillings has applied his planning, research and facilitation skills to several water resource management projects, including a water quality funding initiative currently under development for the Los Angeles County Flood Control District. His work has included the development of an Integrated Regional Water Management Plan (IRWMP) for the Upper Santa Clara River Watershed and the Tulare Lake Basin/Kern County IRWMP. Mr. Sillings was also the project manager for development of the Rio Hondo Watershed Management Plan and for the San Gabriel River Corridor Master Plan. Both of these efforts focused on the interrelated issues of flood control, water conservation and water quality improvement.

In addition to his water resource management experience, Mr. Sillings has particular expertise in strategic planning, organizational consulting and group facilitation. He has assisted clients in the public and non-profit sectors to shape organizational goals and priorities identify desired changes and develop strategies for achieving long-term goals. He has also played a key role in the development of visions and strategic plans for cities, parks and recreation agencies, and transit operators.

Mr. Sillings managed the first-ever strategic plan for the Orange County Harbors, Beaches and Parks Department (now OC Parks) and has applied his strategic planning skills to a number of other park and recreation agencies, as well as other agencies engaged in water resource management. These include the development of the first Master Plan for the Kern County Parks and Recreation Department, a process involving both extensive community outreach and staff participation. His successful strategic planning work with the Watershed Management Division of the Los Angeles County Department of Public Works has led to his more recent involvement in the development of a strategic plan for the entire Public Works Department. He is currently engaged in the development of a strategic plan for the Los Angeles County Public Library system.

Environmental and Water Resource Management Experience

Mojave Water Agency Integrated Regional Water Management Plan, *San Bernardino County, California*
Los Angeles County Water Quality Funding Initiative, Los Angeles County Department of Public Works, *Los Angeles County, California*

Upper Santa Clara River Integrated Regional Water Management Plan, Los Angeles County Department of Public Works, *Los Angeles County*, California

Tulare Lake Basin/Kern County Integrated Regional Water Management Plan, Kern County Water Agency, *Kern County, California*

San Gabriel River Corridor Master Plan, *Los Angeles County, California*

Rio Hondo Watershed Management Plan, San Gabriel Valley Council of Governments, *Pasadena, California*

Los Angeles County Department of Public Works Watershed Management Division Strategic Plan, *Los Angeles County, California*

Los Angeles County Department of Public Works Strategic Plan Update, *Los Angeles County, California*

Kern County Parks and Recreation Master Plan, *Kern County, California*

Orange County Harbors, Beaches and Parks Strategic Plan, *Orange County, California*

Los Angeles County Department of Public Health, Environmental Health Division Strategic Plan, *Los Angeles County, California*

PALMDALE WATER DISTRICT
BOARD MEMORANDUM

DATE: October 16, 2013 **October 23, 2013**

TO: BOARD OF DIRECTORS **Board Meeting**

FROM: Mr. Bob Egan, Financial Advisor

VIA: Mr. Dennis D. LaMoreaux, General Manager

RE: ***AGENDA ITEM NO. 7.4 – CONSIDERATION AND POSSIBLE ACTION ON PROPOSAL RECEIVED FROM CHARLES Z. FEDAK & COMPANY, CPAS FOR PROVIDING AUDITING SERVICES***

Recommendation:

Staff and the Finance Committee recommend approval of the proposal received from Charles Z. Fedak & Company, CPAs for providing auditing services for years 2013, 2014, and 2015 in the not-to-exceed amount of $18,250 ($17,000 plus $1,250 expenses) per year.

Alternative Options:

The alternative is to accept a proposal from a higher-priced auditor.

Impact of Taking No Action:

The District must take action on this item in order to have auditing services performed.

Background:

Requests for Proposals for auditing services were solicited from Brown Armstrong Accountancy Corporation, Fritz Russell, CPAs, Burkey Cox Evans & Bradford Accountancy Corporation, and Charles Z. Fedak & Company, CPAs. These proposals, as well as the cost summary, were reviewed at the Finance Committee meeting. The summary of the proposals is as follows:

Summary of proposals	2013	2014	2015
Brown Armstrong	18,880	18,880	18,880
Burkey Cox	23,000	23,500	24,000
Chas Fedak	18,250	18,250	18,250
Fritz Russell	20,000	20,000	20,000

Strategic Plan Element:

This work is part of Strategic Element 6.0 Financial Management.

Budget:

The annual contractual amounts will be included in the budget for each year through 2014.

Supporting Documents:

- Cost proposal from Charles Z. Fedak & Company, CPAs.

Charles Z. Fedak & Company
Certified Public Accountants
An Accountancy Corporation

Charles Z. Fedak, CPA, MBA
Paul J. Kaymark, CPA
Christopher J. Brown, CPA

6081 Orange Avenue
Cypress, California 90630
(714) 527-1818
(562) 598-6565
FAX (714) 527-9154
EMAIL czfco@czfcpa.com
WEB www.czfcpa.com

September 20, 2013

Mr. Robert Egan
Palmdale Water District
2029 E. Avenue "Q"
Palmdale, CA 93550

Re: Request for Proposal for Independent Auditor Services

Dear Mr. Egan

We will continue the audit technical and cost proposal we submitted for the year ended December 31, 2012 with one additional year as follows:

Based on our understanding of the Palmdale Water District's (District) requirements, our fee for audit services at our discounted rates for the fiscal year ending December 31, 2013 is $17,000. This fee is based on our understanding of the District's audit requirements.

Assuming there is no substantial change in the District's activities and operations, our fee for audit services for the fiscal years ending December 31, 2014 and 2015 would be $17,000 and $17,000, respectively.

Our estimate for out-of-pocket expenses is $1,250 per year and may not be utilized in total to the amount estimated. Again, these fees are based on the estimated hours using our discounted hourly rates. The components of this audit services fee proposal and out-of-pocket costs for the years ending December 31, 2013 through 2015.

Our not-to-exceed fee proposal is contingent upon our understanding of your requirements and the assistance we require as noted in our original audit technical proposal.

Additional services not included in this proposal will be based on our discounted billing rates based on the level of experience required. We would execute a separate contract for these services, if they are requested by the District.

I am authorized to make representations for Charles Z. Fedak & Company CPAs – An Accountancy Corporation and am duly authorized to sign a contract with the District.



Paul J. Kaymark, CPA
Charles Z. Fedak & Company CPAs – An Accountancy Corporation

P A L M D A L E W A T E R D I S T R I C T

B O A R D M E M O R A N D U M

DATE: October 17, 2013 **October 23, 2013**

TO: BOARD OF DIRECTORS **Board Meeting**

FROM: Mr. Matthew Knudson, Engineering Manager
Mr. Jim Stanton, Information Technology Manager
Mr. Tim Moore, Facilities Manager

VIA: Mr. Dennis D. LaMoreaux, General Manager

RE: ***AGENDA ITEM NO. 7.5 – CONSIDERATION AND POSSIBLE ACTION ON APPROVING A PROFESSIONAL SERVICES AGREEMENT WITH EXANTE 360 FOR PROVIDING CONSULTING AND PROJECT MANAGEMENT SERVICES RELATIVE TO THE PHYSICAL SECURITY AND VIDEO SURVEILLANCE INFRASTRUCTURE IMPROVEMENT PROJECT***

Recommendation:

Staff and the Facilities Committee recommend that the Board:

1. Approve a Professional Services Agreement with Exante 360 for providing consulting and project management services relative to the physical security and video surveillance infrastructure improvement project in the not-to-exceed amount of $58,730.00; and

2. Authorize the General Manager to execute the Professional Services Agreement with Exante 360 for same.

Background:

Recent incidents and losses have brought to surface certain inadequacies in the current security system for the District's facilities including Access Control, CCTV, and alarm systems.

Through discussions with the Facilities Committee, it was recommended that staff develop a Request for Proposals (RFP) which outlines a process to hire a consultant that has experience in performing a needs assessment and designing and implementing security systems for public facilities.

Staff distributed an RFP to six consulting firms that outlined the proposed scope of work and proposal submittal requirements. The scope of work described below was included in the RFP and has been designed to be executed in a logical, transparent, and process-driven manner and to produce a feasibility/needs assessment. The scope includes tasks to disseminate information relatively continuously as the project unfolds and provide a process to review and coordinate the project among those individuals involved. The scope of work consists of three major tasks, which include:

- Task 1 Planning and Development
- Task 2 Project Management
- Task 3 Installation Oversight, Testing, and Acceptance

This scope will first identify the needs to improve security and surveillance systems here at the District headquarters and facilities yard. Based on those recommendations and needs, then the consultant will develop detailed plans, technical specifications, and bidding documents that the District can competitively put out to bid to contractors and vendors that provide and install security systems. The consultant will also provide standard operating procedures, installation oversight, testing, and acceptance of the equipment and hardware provided and installed under a separate future contract.

The District received two proposals, Exante 360 in the amount of $58.730.00 and Security Options & Solutions, LLC in the amount of $51,145.00. Staff is recommending Exante 360 based on the firm's understanding of the scope, experience, and past performance on similar projects. Exante 360 also has more resources available to them to ensure this project meets the District's expectations.

Strategic Plan Element:

This work is part of Strategic Goal 3.5 – Improve the security of PWD facilities.

Budget:

This project is not budgeted for 2013, and if awarded, it is anticipated that approximately $29,100 would be expensed in 2013 and the remaining $29,630 would be budgeted for in 2014.

Supporting Documents:

- Proposal from Exante 360



Palmdale Water District
RFP for Consulting and Project Management Services Relative to the Physical Security and Video Surveillance Infrastructure Improvement Project

Presented To | **Palmdale Water District**
Attn. Mr. Matt Knudson, Engineering Manager

2029 East Avenue Q
Palmdale, CA 93550
(661) 456-1018
mknudson@palmdalewater.org

Presented By | **Nick DeKeyzer**, MBA
Principal
Exante360, LLC

505 Avenida Lucia
Newport Beach, CA 92660
(949) 485-1710
ndekeyzer@exante360.com

Issue Date | September 15, 2013

Exante\ 360

Palmdale Water District
Attn. Mr. Matt Knudson, Engineering Manager
2029 East Avenue Q
Palmdale, CA 93550
(661) 456-1018
mknudson@palmdalewater.org

September 15, 2013

Project: Consulting and Project Management Services Relative to the Physical Security and Video Surveillance Infrastructure Improvement Project (Exante360 Project# 13.N22.1139)

Mr. Knudson,

Exante360 LLC is pleased to submit this proposal for Security design, consulting and project management services in response to the Palmdale Water District's request for proposal that is due on 9/16/2013. As prime consultant, Exante360 LLC has teamed with sub-consultant Marquis Systems Inc. that is located at 111 N. Market Street in San Jose, California 95113 and that can be reached at (408) 291-0001 or at Vasken@marquis-sys.com. Both Exante360 and Marquis are small businesses in the State of California.

Exante360 LLC is an Orange County-based professional services practice that is specialized in all low voltage systems that are required during new construction and renovation projects. We provide innovative consulting, design, and management services that balance realistic business needs with industry-best, cost-effective solutions. Our team of certified Subject Matter Experts has a proven track record with completing hundreds of security technology projects locally as well as domestically.

Exante360 is an independent consultant (technical advisor) that has no affiliations nor do we accept sales commissions from any product manufacturer or contractor. Our design recommendations are completely objective and catered to meet the individual needs of each client.

We look forward to providing security design and consulting services to PWD. Should you require further information, please don't hesitate to reach out to me directly.

Sincerely,

Nick DeKeyzer

Nick DeKeyzer, MBA
Principal
Exante360, LLC
ndekeyzer@exante360.com

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BASIC QUALIFICATIONS

a. Company Profile

Exante360 LLC was founded in 2013 by Nick DeKeyzer and Kyle Wilson in response to architectural and end-user client demands for a customer service oriented low voltage systems design and consulting firm. During the course of their careers working for integrators and consulting firms they consistently found that aging company structures were not conducive to providing the services at the level required by their clients. These companies prioritized short term project profitability by limiting the number of expert resources and by utilizing entry-level employees to perform the bulk of the work.

The result of such a "sweat shop" model has been an industry-wide inability to perform basic consulting tasks such as attending meetings in person or staying current with evolving technologies and construction Best Practices. Getting deliverables out the door quickly so that costs can be minimized and profit maximized has inevitably resulted in the design/consulting dichotomy that clients have experienced from many low voltage systems design firms since the 2007 economic recession.

"The whole is greater than the sum of its parts." Aristotle

In an effort to permanently change this trend, Exante360 has hand-picked and successfully attracted some of the most qualified Subject Matter Experts in the technology industry in Southern California. In fact, Exante360 consists of certified industry consultants with proven experience in the design and construction management of low voltage building systems such as security, data networking, telephone, audio visual, patient entertainment, nurse call, indoor & outdoor wireless communications, distributed antenna systems, clock systems, overhead paging, mass notification, and much more. In addition to our all-encompassing low voltage systems offering, our team provides peer-review, project management, construction administration and commissioning services as well as feasibility studies.

Furthermore, our consultants possess extensive experience in all aspects of Security Master Planning including risk assessments, industry benchmarking, program audits, policies & procedures, staff and organizational analyses as well as Crime Prevention Through Environmental Design (CPTED), security technology design, and implementation management.

Our associates are consultants first and designers second. They understand that project profitability comes second to customer satisfaction. Our consultants' modus operandi is centered towards customer service, quality, confidentiality, timeliness and cost-effectiveness. We complete projects at high quality, quickly and inexpensively. The project team is eager to apply our skills and capabilities to improve the overall security environment at the Palmdale Water District.

From a financial point of view Exante360 consists of a single location, two employees and 17 independent consultants. The firm is well funded by its owners. Exante360's is on track to reach one half-million dollars in new revenue by year's end. In addition to stockholder's equity and 2013 profit, the company's owners hold numerous financial investments that can be converted to cash assets within three days if necessary. Exante360 does not have any long term liabilities such as loans, bonds or mortgages. Exante360's owners are US Citizens and they have never been subject to bankruptcy, pending litigation, planned office closures nor are they planning to merger or to be acquired.

Nick DeKeyzer, MBA

Principal
Exante360, LLC

Nick DeKeyzer is an information technology and physical security professional with more than 15 years of enterprise and government experience. As Principal he is accountable for company business activities with a focus on quality assurance, business management and program management.

Mr. DeKeyzer specializes in lifecycle management of large scale design-to-implementation A/E/C and end-user projects. He has implemented innovative solutions for medical institutions, higher education facilities, Fortune 1000 companies and the United States government. He is also experienced with critical path analysis, risk management, financial reporting, cost estimating, customer relations, staff supervision and training.

He is active with several professional organizations, in particular the International Association for Healthcare Security and Safety (IAHSS) where he was the 2011 Chair for the San Diego & Imperial Counties Chapter. Nick holds a Bachelor's Degree obtained overseas and a Masters in Business Administration from California State University San Marcos.

Selected Experience

Scripps Health
San Diego California

Nick DeKeyzer assisted Scripps Health with establishing a new Standards & Best Practices-based Security technology and operations roadmap to allow for a more efficient use of resources and decreased liability exposure. His deliverables included drawings and specifications for new head-end systems as well as rough order of magnitude budgets and implementation schedules. During the course of his engagement with Scripps, Mr. DeKeyzer participated in network design meetings with Scripps' IT to accommodate the requirements of all new security systems and components on the Scripps LAN.

Westfield Malls, USA

Mr. DeKeyzer managed the design and implementation of a 1,000+ network-based camera system for 72 malls across the United States. As senior project manager, Nick was accountable for the management of all project resources necessary to facility company profit & loss goals, quality control as well as meeting scheduling milestones.

Education

California State University San Marcos
Masters of Business Administration
Erasmus Hogeschool, Brussels
Bachelor's Degree - Education
Fluent in French, Dutch, English

Affiliations

American Society for Industrial Security (ASIS)
International Association of Healthcare Security & Safety (IAHSS)
TSA Transportation Worker Identification Credential (TWIC)
Infraguard

Certifications

AireSpace (now Cisco): Systems Engineer Certification
Cisco CCNA: Cisco Certified Network Associate
Cisco WSE - WAM: Wireless Systems Engineer & Account Manager
DVTEL Digital Video Recorder: 5.0 technical training
Netscreen Firewalls
Adtran ATLAS 800 Series
Adtran Wireless Tracer
Proxim Wireless Silver & Gold
PMP Certification Class on Project Planning, Analysis, and Control

Systems Experience

Communication/Data Networks:
Ethernet Networks - LANs
Wireless
Licensed & Unlicensed
Point-to-Point
Point-to-Multipoint

Security:
Network-based Access Control
CCTV
Network Video Recorders

Major Project Participation

UC Los Angeles
20th Century Fox
University of Southern California
Westfield Malls

Kyle Wilson, RCDD, PMP, PSP, CPP

Sr. Project Manager
Exante360, LLC (Principal)

Mr. Wilson is an experienced and industry certified project manager with a proven track record of managing client's needs to ensure project profitability through the application of technical expertise, strategic planning, and team supervision.

Prior to joining Exante360, Mr. Wilson served as a project manager for IT integrator companies and as a senior project manager with a national low voltage consulting firm. In his previous roles he managed the design and deployment of multi-million dollar integrated systems projects consisting of digital surveillance, wireless, access control networks, and data applications for Fortune 500 and federal clients. Mr. Wilson is a certified BICSI Registered Communications Distribution Designer (RCDD) and has proven experience with design and engineering across multiple low voltage infrastructure disciplines including structured cabling, outside plant (OSP), integrated security networks to name a few.

Mr. Wilson's project management experience and formal training has allowed him to achieve board certification as a Project Management Professional (PMP) through the globally-recognized PMI organization. He also holds a Physical Security Professional (PSP) certification And Certified Protection Professional (CPP) from the American Society of Industrial Security.

Selected Experience

City of Hope National Medical Center Security Master Plan
Duarte, California

Mr. Wilson provided Security Master Planning services for the City of Hope National Medical Center Duarte campus as well as the Pasadena and Monrovia clinics. The Master Plan included an in-depth assessment of their existing security technology, physical security and security operations. The deliverable included a 100+ page report with findings and recommendations, GAP analysis, ROM budget and implementation schedule.

USC Heritage Hall Renovation
Bakersfield, California

Mr. Wilson is in the process of commissioning the newly renovated $35M Heritage Hall project at USC. As the security consultant on record he designed the security systems for this building in coordination with USC's Department of Public Safety, Facilities Management, Capital Construction as well as with the architect and their sub-consultants. The project included card readers, cameras, intrusion alarm, biometrics as well as physical security items such as lighting and barriers. He recently completed several other major construction projects at USC as well.

Affiliations

BICSI
Project Management Institute (**PMI**)
American Society of Industrial Security (**ASIS**)
International Association for Healthcare Security & Safety (**IAHSS**)
TSA Transportation Worker Identification Credential (**TWIC**)

Certifications

BICSI Registered Communications Distribution Designer (**RCDD**) - Registration # 11996

PMI Project Management Professional (**PMP**) - PMP# 1336581

Physical Security Professional (**PSP**); ASIS International

Certified Protection Professional (**CPP**); ASIS International

State of California and *Fiber Optic Association* licensed instructor for Postsecondary and Vocational Education in Fiber Optics.

DvTel Latitude NVMS 5.0 & 3.5

Lenel: CR1000R VAR-Hardware Course & CR2000R VAR-Access Control Essentials

Engineer Equipment Mechanic School, USMC.

Interior Wiring, Solid State Devices, and Construction Blueprint Reading, USMC (ACE accredited)

Project Experience

Martin Luther King Hospital
UCSD Health System
UCI Medical Center
VA West Los Angeles
VA San Diego
Apria Healthcare
Scripps Health
Sempra Energy
Northrop Grumman
UC Riverside Residential Housing
HSBC
Federal Aviation Administration
Coca-Cola

Roger Marsh, RCDD

Subject Matter Expert: Teledata Infrastructure
Exante360, LLC (IC)

Mr. Marsh is a Project Manager with over 30 years of experience with developing innovative low voltage system design solutions. He has designed and implemented secure network systems for government and military agencies as well as corporate and higher education clients.

Mr. Marsh is able to see simple solutions for complex problems, finding common ground for technically diverse organizations. He is skilled at being able to communicate complex technical issues to non-technical people.

Mr. Marsh is a certified BICSI Registered Communications Distribution Designer (RCDD) and has proven experience with design and engineering across multiple low voltage infrastructure disciplines including structured cabling, outside plant (OSP) and with integrated security networks. He holds certifications in countless technology systems.

Selected Experience

US NAVY-NMCI
San Diego, California

As a contractor to General Dynamics and EDS, Mr. March prepared complete base infrastructure designs and bid packages. Included were underground and aerial OSP packages. ISP designs included fiber tie lines, fiber to the desktop, high availability redundant path, and hardened carrier. Base design packages for: Naval Weapons Station - Seal Beach CA, NOLF - Imperial Beach CA, NAAS El Centro CA, 9 Navy Marine Corps Recruiting Centers (SW), and other smaller locations. Installation contractor for: NAF North Island - San Diego CA, Marine Corps AGCC - Twentynine Palms CA, Puget Sound Naval Shipyard - Bremerton WA, and various other locations.

VA Hospitals of Southern California (VISN22)
Los Angeles, California

Mr. Marsh provided low voltage systems infrastructure design and installation services for a major multi-year communications upgrade effort for existing VA hospitals and clinics in Southern California. As Director of Technical Services he was responsible for all aspects of the project including budgeting, scheduling, team management, technical design, standards adherence and documentation.

Certifications

BICSI Registered Communications Distribution Designer (**RCDD**)
Hirsch Electronics, Cisco, Novell, Juniper, 3Com, NetScreen, Proxim, Western Multiplex, Aironet, Niksun, Isher, Amp, Panduit, Sumitomo, DEC, Wang, BICSI, Fiber Senses, ONSSI, Qualified SME (subject matter expert) Telecommunications Infrastructure

Affiliations

BICSI

Systems Experience

Ethernet Networks - LANs
Wide Area Networks
Audio Visual Systems
Telecommunications Infrastructure
Outside Plant
Wireless
Access Control
CCTV
Mass Notification

Project Experience

Grand Coulee Dam, WA
Federal Building, Oakland, CA
LAUSD
IUSD
Verizon
AT&T
SPAWAR, San Diego
UCLA Medical Center
Antelope Valley Medical Center
Cox Cable
VA Hospitals, VISN22
US Navy NMCI
USMC Camp Pendleton California
SPAWAR San Diego
US Missile Defense Airborne Laser
Headquarters Kirtland AFB
Goodfellow AFB

Carol Hayes, M.S., Ed.D.

Subject Matter Expert: IT Engineering Change Management
Exante360, LLC

Carol Hayes has 35+ years of experience with providing design, project management and change management consulting services for a multitude of security implementation projects nationally and internationally. Her professional experience, formal education combined with her leadership and communication skills have resulted in substantial cost and schedule reductions during the implementation of complex IT and Physical Security projects at USC.

As Technology Director/Deputy Chief for the Department of Public Safety at USC she oversaw the operation that consisted of 40+ individuals funded by a $13.5M annual budget. Furthermore she played a pivotal role with the establishment of a new technical support group that would provide services to 400 business users. She was responsible for system-wide cross-functional technology initiatives as well with the standardization of technologies and implementation processes at the University.

Mrs. Hayes consulted with other university leaders related to technology change management initiatives, university's master planning, business continuity and emergency planning, university-wide timekeeping system as well as the accreditation for USC's research programs. She initiated and managed the vendor selection process and implementation of the university's emergency notification system along with the roll out of the web-based registration design and procedures as well.

Selected Experience

USC - DPS Crime Suppression Technology Initiative
Los Angeles, California

Mrs. Hayes provided leadership and technology change management services for the $12M DPS Crime Suppression Technology Initiative which included the implementation of 70+ CCTV Cameras in a 2-mile perimeter outside the University as well as on campus. The video data traffic leveraged a wireless mesh network installed on city fixtures to travel back to the USC NOC that is located on campus. This project also included license plate cameras tied to a law enforcement database, a new LED video wall as well as the implementation of video analytics.

Education

Bachelor of Science: Management
Pepperdine University - Malibu, CA

Master of Science : Technology Management, Pepperdine University - Malibu, CA

Doctorate in Education: Higher Education Management, University of Pennsylvania - Philadelphia, PA

Affiliations

American Society for Industrial Security (ASIS)

Systems Experience

IT systems
Physical Security systems
Communication systems
Audio Visual systems
Teledata infrastructure
Wireless

Major Project Participation

USC Ronald Tutor Campus Center
USC Broad CIRM Research Center
USC King Stoops Hall
USC Engemann Student Health Cntr
USC Utyengsu Aquatics Center
USC Wallis Anneberg Hall
USC Social Science Interdisciplinary Building
USC Soto Street Building
USC Bio-Safety Level 3 Facility
USC Crime Suppression Technology Initiative

Mark Rose, CCNP, MCSE, CNE

Subject Matter Expert: Network Design & Engineering
Exante360, LLC (IC)

Mark Rose has worked in IT for more than 25 years and Healthcare IT for 15+ years. Mr. Rose was a network and systems integration consultant for 10+ years before taking a position with the UCLA Healthcare System as the network architect and later as the IT Director for the department, where he managed the Networking, Voice, Wireless, Security, Video, Desktop, Communications, Project Management and IT facilities groups.

At UCLA Healthcare, Mr. Rose was responsible for designing and implementing all Medical Enterprise networks and projects, including the new and recently opened UCLA Ronald Reagan and UCLA Santa Monica Medical Centers.

Mr. Rose has overseen hundreds of major IT infrastructure projects throughout his career.

Selected Experience

UCLA Ronald Reagan Hospital
Los Angeles, California

Mark Rose was the lead architect and oversaw the budget, planning and implementation of the IT Infrastructure for the newly constructed UCLA Ronald Reagan Medical Center. Mr. Rose worked with the architects to ensure that the physical and facilities components of IT were designed and constructed properly to meet the needs of the network, wireless, voice, video, security and management solutions that they later designed and implemented for the facility. At the time, UCLA Healthcare was one of the first large hospital facilities to successfully deploy 802.11 wireless VoIP handsets for the medical staff.

System-wide Voice over IP roll-out
UCLA Health System, Los Angeles, CA

Mr. Rose was responsible for gathering and documenting the workflow requirements in order to properly design a VoIP and Wireless solution that would support multiple buildings on the southern part of the UCLA Campus. In addition, Mr. Rose worked with UCLA Campus IT staff to develop a wireless and wireless voice solution that would allow staff to roam from the medical teaching facilities to the other academic facilities on the campus. 5000+ wired and wireless VoIP phones were initially implemented across (5) School of Medicine buildings.

Education

University of California at Los Angeles,
BS Computer Science

Affiliations

AHA - American Hospital Association
HIMSS - Healthcare Information and Management Systems Society
iHT² - Institute for Health Technology Transformation

Certifications

Cisco - CCNA, CCNP
Cisco - QoS, DWDM, UC
Microsoft - MCSE
Novell - CNE
Foundry - FCNE

IT Systems Experience

LAN\MAN\WAN
Wireless
IP Telephony
Video Services
Information Security
Desktop Security

Major Project Participation

UCLA Ronald Reagan Hospital
UCLA Santa Monica Medical Center
UCLA School of Medicine
University of Kentucky
UCLA Wilshire Center
Gonda Neuroscience and Genetic Research Center
McDonald Medical Research Lab
Starwood Hotels

Vasken Arzoumanian

Production Manager
Exante360, LLC

Mr. Arzoumanian has 30 years professional experience in designing and production management including security, life safety and communications projects. He has designed Security Operations Centers in which security systems were integrated with networks and communication backbones while ensuring compliance with life-safety and construction codes.

Mr. Arzoumanian is a technical expert in security systems and standards. He successfully completed designs for over 500 systems projects, including construction drawings and specifications. He has also developed Corporate Security Technical Standards / Guidelines.

Selected Experience

Commercial: Novell, San Jose, Ca. & Provo, Utah. Hewlett Packard, Cupertino, Ca. Dole World Headquarters, Westlake Village, Ca. Boston Properties Gateway Project, South San Francisco, Ca. Business Objects, San Jose, Ca. e-Bay, San Jose, Ca. Adobe Towers, San Jose, Ca. CALSTRS, Sacramento, Ca.

Data Centers: Pacific Bell, Fairfield Wells Fargo Bank, Roseville Pacific Gas & Electric, Sacramento Equinix, New Jersey and Illinois

Financial: Wells Fargo Bank, San Francisco First Hawaiian Bank, Honolulu Franklin Resources, Foster City

Health Care: Kaiser Permanente medical centers, medical office buildings, regional buildings, parking structures, distribution centers, and command centers throughout California. CHW - Stockton, Ca. & CHLA -Los Angeles, Ca.

Federal: Drug Enforcement Agency, San Juan, P.R., San Diego, San Francisco, Ca. and three other regional labs in the U.S. 2800 Cottage Way Federal Building, Sacramento Department of Justice -Santa Rosa & Santa Barbara, Ca.

Municipal: District Attorney Department, County of Sonoma Dept. of Detention & Enforcement, City of Las Vegas State of California DMV Headquarters, Sacramento, Ca.

Military: NASA Ames Research Labs, Mountain View, TRW Sunnyvale.

Other: Sacramento Bee, Sacramento Wells Fargo Museum, Sacramento

Education

California State University Los Angeles
B.S. Electrical Engineering

Affiliations

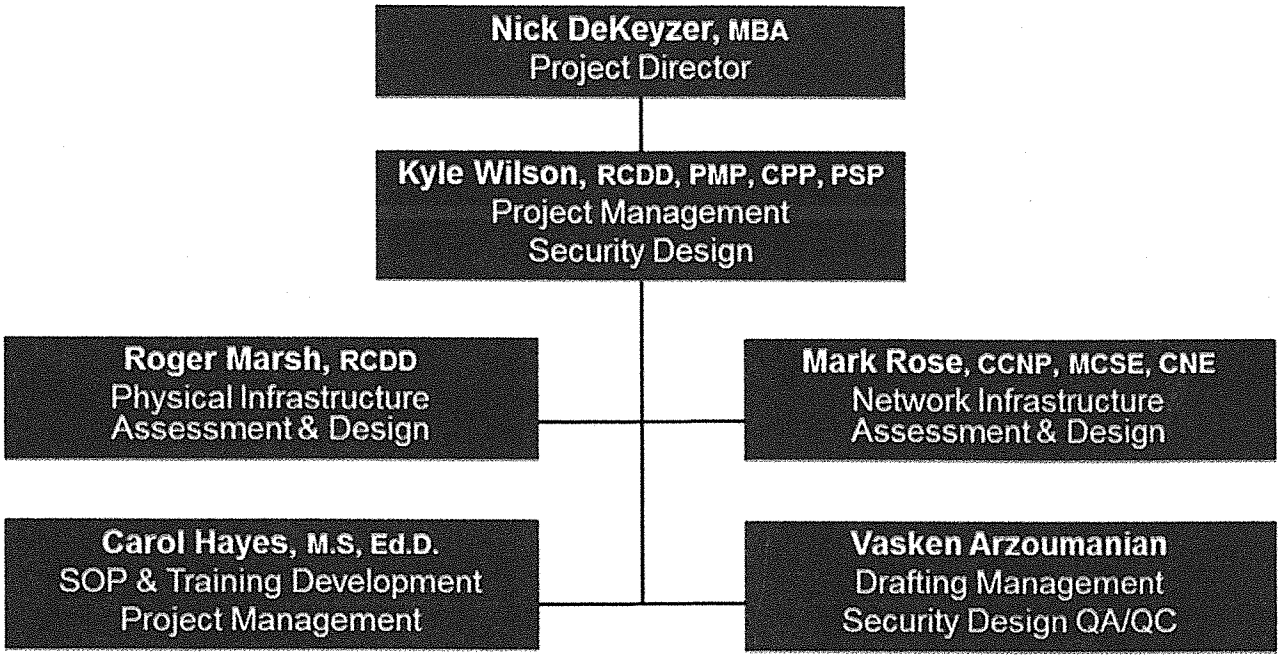
American Society for Industrial Security (ASIS)
International Association of Healthcare Security & Safety (IAHSS)

Systems Experience

CCTV cameras
Network Video Recorders
Digital Video Recorders
Access Control Systems
Intrusion Alarm Systems
Crime Prevention Through Environmental Design (CPTED)
Ethernet Networks - LANs
Wireless

Specific Qualifications & Past Performance

a. Organization Chart



b. Roles & Responsibilities

Nick DeKeyzer, MBA – Exante360 Principal

Project Role: *Principal-in-Charge*

Mr. DeKeyzer, Exante360's Principal has more than 15 years of experience with designing and managing implementations of low voltage technologies in particular with data communications networks, physical security, CPTED and integrated building systems.

- Project Tasks:

  As Project Director, Mr. DeKeyzer assumes overall responsibility for the project and has authority and control over all resources deemed necessary to meet the project requirements. He is also responsible for overall quality control and client satisfaction.

Kyle Wilson, RCDD, PMP, PSP, CPP – Exante360 Principal

Project Role: *Project Manager / Subject Matter Expert in Teledata Infrastructure & Security*

Mr. Wilson has over 10 years of experience in the design, installation, and project management of a diverse array of low voltage technology solutions, including teledata and security.

- Project Tasks:

  As Project Manager, Mr. Wilson is responsible for the day-to-day management of this engagement, including staff assignments, schedule management, financial management but also security system design. Mr. Wilson will coordinate the work internally and be the single point of contact to PWD for all project deliverables.

Roger Marsh, RCDD – Exante360 Independent Consultant

Project Role: *Subject Matter Expert in Teledata Infrastructure*

Mr. Marsh has over 30 years of experience with developing innovative low voltage system design solutions. He has designed and implemented security systems and teledata infrastructure solutions for government, military agencies, corporate, higher education and healthcare clients.

- Project Tasks:

  Mr. Marsh's extensive experience will be leveraged by Mr. Wilson primarily during the assessment phase of the project. He will participate in the site assessments, GAP analysis, ROM budgetting, preliminary system design, and he will perform quality assurance during the construction phase of the project.

Carol Hayes, M.Si., Ed.D. – Exante360 Independent Consultant

Project Role: *Project Manager / Subject Matter Expert in Security Operations*

Mrs. Hayes has 35+ years of experience with providing security design, project management and change management consulting services. As the Deputy Chief and Director of Administrative Operations for USC's Department of Public Safety, Mrs. Hayes was responsible for the establishment of Standard Operating Procedures and training programs. She also spearheaded the evaluation, selection and deployment of new public safety technologies and services.

- Project Tasks:

  Mrs. Hayes will be responsible for change management on this project. She will work with all members of the project team to ensure uniformity and adherance to PWD's standards and industry Best Practices. She will establish and manage SOP and training processes to facilitate optimal transition of the new systems to PWD staff and stakeholders.

Mark Rose, CCNP, MCSE, CNE – Exante360 Independent Consultant
Project Role: *Subject Matter Expert in IT Network Design*

Mr. Rose has more than 27 years of IT design experience. He held the Director of Network Services position at UCLA where he managed the Networking, Voice, Wireless, Security, Desktop, Communications and IT facilities groups. Mr. Rose and his team were responsible for designing and implementing the UCLA Ronald Reagan and UCLA Santa Monica Medical Centers.

- Project Tasks:
  Mr. Rose's extensive knowledge of IT technologies and LAN\MAN\WAN and Wireless design will be used during the design and construction administration phases of this project to ensure adequate end-to-end functionality of the data network at the various PWD properties.

Vasken Arzoumanian – Marquis Systems **(Strategic Partner, Subconsultant)**
Project Role: *Drafting Management, 2D & 3D Drafting*

Mr. Arzoumanian has more than 30 years of experience with providing security technology consulting services in California. As the owner of Marquis Systems he has been responsible for delivering countless security construction packages that resulted in eventless construction administration and project close-out.

- Project Tasks:
  As Drafting Manager for the PWD project, Mr. Arzoumanian assumes overall responsibility for the AutoCad project deliverables. He has authority and control over all production resources necessary to meet the project requirements. He is also responsible for reviewing field designs as well as quality control and uniformity. Mr. Arzoumanian will use drafters Lawrence McNeill and Michael Wright. Both individuals work for Marquis Systems and they each have more than 30 years of experience with drafting and engineering security solutions.

c. Resource Utilization Chart

EXANTE360	Project Title	Current Workload	Availability (6 months)
Nick DeKeyzer	Project Director	USC CSTI-3 (15%) VA San Diego (5%) Shire Pharmaceuticals (10%)	70%
Kyle Wilson	Project Manager	USC Heritage Hall 15% LA Harbor College 5% UCLA Teaching Center 20%	60% (up to 90%)
Roger Marsh	SME	Catholic Healthcare Initiative (40%)	60% (up to 100%)
Carol Hayes	SME	0%	100%
Mark Rose	SME	Elixir Manufacturing (10%) Mesa Water District (15%)	75% (up to 100%)

MARQUIS	Project Title	Current Workload	Availability (6 months)
Vasken Arzoumanian	Drafting Management	Cupertino Union School District (25%) Gov't Border Station (25%)	50%
Larry McNeill	Drafting & Engineering	Impax Labs (10%) Kaiser MCs (15%)	75%
Michael Wright	Drafting	Various projects (65%)	35%

Exante360 and Marquis have successfully worked with each other in the past and are currently engaged on the Shire Pharmaceutical project with DPR Construction in San Diego. This project includes security technology design, physical security barriers as well as deliverables in REVIT (AutoCad 3D).

d. Experience & References

Exante360 team members that will be assigned to the PWD project have provided security design & consulting services directly to the client or via an architect to the following companies and institutions: (partial list)

- 20th Century Fox
- Claremont College of Theology
- Clovis Unified School District
- CSU Dominguez Hills
- City of El Segundo
- LACCD: LA Harbor College
- Matanuska-Susitna School District
- San Diego County
- Southern California Edison
- State Compensation Fund
- Shire Pharmaceuticals
- The Irvine Company
- Vulcan, Inc.
- Westfield Malls

- Cedar-Sinai Medical Center
- City of Hope National Medical Center
- Hoag Memorial Hospital
- Kaiser Permanente
- Riverside County Medical Center
- Scripps Health System
- UC Irvine Medical Center
- UC Los Angeles
- UC Riverside
- UC Santa Barbara
- University of Southern California
- UC San Diego Medical Center
- VA Hospitals VISN22
- White Memorial Medical Center

Exante360 has extensive experience with the evaluation of existing security systems, with the design of security for new construction or tenant improvement projects, with assisting clients with selection of products and contractors as well as with construction administration and project management of fast-paced multi-site projects.

It is against Exante360's policy to ask customers for letters of recommendation because we believe that our team members' performance should be measured on a continual basis given our customer service-centric business model. We encourage PWD to reach out to the project contacts below to validate the relevancy of our proposed project team. Additional references can be made available upon request.

Project experience relevant to PWD's scope of work includes:

UC San Diego Health System (UCSDHS) Security Master Plan

UC San Diego
HEALTH SYSTEM

Exante360 employees Kyle Wilson and Nick DeKeyzer developed a Security & Safety Master Plan for UCSDHS. This project included technical, operational, regulatory compliance, Crime Prevention Through Environment Design (CPTED) and architectural elements such as gates, fencing and bollards. The scope was very similar to the PWD RFP with regards to the all-encompassing nature of the engagement, except that it was at a larger scale given UCSD's 50+ buildings across multiple campuses. The Master Plan Security Assessment was successfully presented to the CEO and Board.

Contact: Raymond V. Osborne

University of California Health System, San Diego

Director, Security Services & Patient Transport

(619) 209-9771

rvosborne@ucsd.edu

University of Southern California (USC) Crime Suppression Technology Initiative

USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

Today's social realities in the surrounding neighborhoods at USC have inevitably become unalike those from the university's inaugural years. As a result, the USC security group led by Chief John Thomas has implemented a universal approach to security that combines the various elements of an effective security program.

Exante360's Nick DeKeyzer has been involved with scope definition, contractor selection, construction administration and commissioning of USC's $10M+ "Crime Suppression Technology Initiative" for four years now. The system consists of 70+ video patrol cameras on and off campus (Prism), 20+ license plate cameras, video analytics, a Firetide wireless mesh and an elaborate command center with large Barco wall for live viewing.

In addition, Exante360 team members have been involved with the design and implementation management of physical security as well as security technology for USC John McKay, USC Heritage Hall, USC BSL-3 Lab, USC Swim Center, USC Village, USC SOTO-2, USC Raulston Research. Exante360 team members established the security technology installation standards for the University's Real Estate and Capital Construction departments.

Contact: Sam T. Hinojosa II, MBA

University of Southern California

Director, Information Technology

(213) 300-1022

sam@caps.usc.edu

Matanuska-Susitna School District: District-wide CCTV Camera Implementation



Exante 360 team members Nick DeKeyzer and Roger Marsh provided security consulting services to a large safety and security upgrade project for the Matanuska-Susitna Borough School District located forty miles north of Anchorage, Alaska. These improvements provided safer and more secure schools throughout the District, which serves approximately 16,000 students in grades K-12, in 40 buildings which are located in a geographical area that is as vast as the state of West Virginia.

This project included security fencing, exterior lighting, keyless lock entries, exterior doors, electronic security gates and panic buttons, 104 interior and exterior cameras and other security systems. The work consisted of a security assessment, standards development, production of drawings and specifications, project budgeting and construction administration.

Noteworthy is that the security assessment and production of construction drawings was completed during the first 90 days of the project during the cold Alaskan winter. Construction cost was $12,000,000.

Contact: Henry Cottle

Matanuska-Susitna Borough School District

Director Operations & Maintenance Department (Ret)

(907) 841-3858

henry.cottle@gmail.com

Scripps Health Security Master Plan and Implementation

Scripps

Exante360 team members were selected to develop a security master plan for the entire Scripps Health portfolio of 5 hospitals, 27 clinics as well as well as numerous Scripps Coastal and Scripps Real Estate facilities located in San Diego County.

The master plan included services such as performing a physical security risk assessment, developing construction cost estimates, reviewing security policies & procedures, assessing security technology systems currently in use, establishing technology standards, establishing migration procedures, identifying new security platforms and products and evaluating the Scripps proprietary security guard force.

A separate task included in our Master Plan was the identification, cost estimation and implementation management of a new Access Control Head-End, as well as managing the re-badging process system-wide.

Contact: Alex Branisteanu

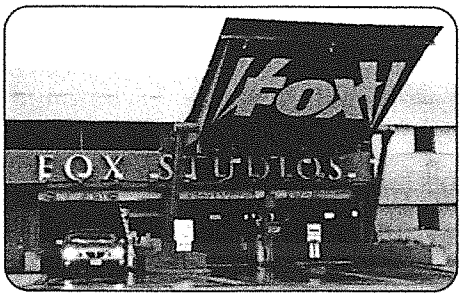
Scripps Health

Director, Information Security Assurance

(858) 678-6408

Branisteanu.Alexandra@scrippshealth.org

20th Century Fox Entertainment Group



Exante360's Nick DeKeyzer provided consulting and design services for a global implementation of physical security technology at 20th Century Fox Entertainment Group located in Los Angeles, California.

The project included schematic design, design development, construction documents, contractor selection, project management and construction administration for access control, IP-based CCTV cameras & recording system as well as burglar alarm, call boxes, intercoms and other network-enabled technologies.

Contact: James A. Davis*

Harley Davidson Inc.

Manager, Security Technical & International Operations

(414) 248-1057

James.davis2@harley-davidson.com

* Jim Davis was the director of security technology at Fox during the time of Nick DeKeyzer's engagement with the company.

Approach to Project

a. A Strong Project Strategy to Address PWD's Needs

Exante360's PWD proposed team members have succeeded in the design, project management and construction administration of security projects involving multiple sites and dozens or even hundreds of buildings. The strategic approach for this project may include the following elements and resources:

- **Multiple project teams** – We can field multiple project teams during the initial survey and assessment phase, allowing simultaneous work at several facilities
- **Holistic approach** – We will develop an appropriate, high-level Security Implementation Program for the District. Rather than simply focus on one particular aspect of design, such as electronic systems for example, our approach addresses all primary elements of the Security Program: (i) Operational issues such as policies, procedures regarding equipment use (ii) architectural issues such as coordination of space planning and physical security infrastructure requirements (iii) electronic systems and components such as cameras, card readers, workstations and IT communications equipment. The Security Implementation Program will adhere to PWD's Standards and Best Practices.
- **Modular, standards-based solutions** – Exante360 will work with the District to develop a "menu" of applications and solutions which address the objectives established in the Program.
- **Site-specific adaptation** – Each site will be surveyed. Where possible, standard solutions from the "menu" will be identified and applied to the facility. Where necessary, solutions will be modified or custom solutions designed
- **Prioritization** – If applicable, needs, current condition, and site history will be considered when prioritizing available budget resources. Sites may be ranked as high, moderate, or low in terms of needs for new technology measures.
- **Design for Maintainability & Constructability** – All technology designs and recommended equipment will be easy to maintain, troubleshoot, and repair. Exotic, custom solutions will be avoided to ensure a longer product lifeline.
- **Procurement & Construction Strategy** – We have found that certain types of work can be successfully pre-engineered or bundled to allow construction of certain assemblies to occur off-site in a factory or workshop environment. The goal is to minimize required on-site labor, which is more costly and time-consuming than centralized work. This will benefit the budget, the schedule, and the quality of work.

- **Quality Control & Quality Assurance** – Exante360 will work with the District to design, implement and manage quality for the project. Quality Control + Schedule Control = Cost Control.
- **Communication** – Exante360 is committed to communicating clearly and frequently with all project stakeholders. Communication includes both listening and speaking, verbally and in writing.

b. Special Issues That Are Likely To Be Encountered

Client's time requirement to respond to certain questions or review deliverables:
In our experience, it can sometimes be difficult to obtain answers to questions from clients that have multiple stakeholders in a project. We understand that internal delays can occur and we are used to working around this restriction. We like to establish a critical path assessment for the project with focus on maximizing the client's time to review documents while minimizing Exante360's time requirement to establish documents. We also like to start processes that do not require client approvals so that certain time consuming action items do not delay the project.

Obtaining approvals from various agencies:
Working with public agencies that have jurisdiction over the work can be exigent and puzzling at times. Exante360 plans to identify all agencies of interest during the first 2 weeks of our engagement. Our strategy is to meet with each of the agencies to make them aware of the project and to obtain their initial feedback. If possible we also like to obtain a high level sign off on the installation typicals early in the project on to avoid surprises at the last minute. This process has had the opportunity to prove itself on numerous occasions in the past.

The requirement to awarding the project to the lowest bidder could result in hiring the wrong integrator for the job:
When working with Public clients, Exante360 often finds that the requirement to award a project to the lowest qualified bidder can be a challenge during implementation. Even with complete bid documents in their hands, some contractors underestimate the complexity of a project during the bidding phase. On occasion they find themselves running out of project dollars before the completion of the project. Exante360 handles this situation by establishing a highly detailed contractor RFP with the added requirement for contractors to submit an itemized bid. We also require contractors to be certified and to provide proof of financial stability, proof of insurance and on occasion we request a certified bond as well. Finally, we intend to participate in the contractor selection process to avoid these kinds of issues.

c. Project Approach

As mentioned previously, Exante360's approach is to provide consulting services in a proactive and holistic manner in order to ensure that a comprehensive, affordable and adequate solution is ultimately achieved. Rather than simply focus on one particular aspect of design, such as electronic systems for example, our approach addresses all primary elements of the technology program: (i) Operational issues such as policies, procedures regarding equipment use (ii) architectural issues such as coordination of space planning and infrastructure requirements (iii) electronic systems and components such as projectors, conferencing equipment and IT communications equipment.

Exante360 is well versed in the standard architectural design process that consists of Schematic Design, Design Development, Construction Documents and Bidding, Construction Monitoring and Project Close-out. PWD's scope of work consists of three major tasks that follow a similar process to the above-mentioned method. Exante360 likes to submit deliverables for client review at 75%, 95% and 100% intervals to ensure ongoing client participation, alignment with expectations and to facilitate change management. Such teaming with the client results in all parties meeting performance expectations in a timely fashion.

d. Project Description

Task 1: Planning and Development

- Assess existing conditions as they relate to physical security and security electronics.

- Establish a written narrative (Physical Security & Video Surveillance Infrastructure Improvement Plan) that includes recommendations on physical security improvements such as lighting and barriers, infrastructure requirements for new equipment installation, permit details, types and quantities of security technology devices, Roles & Responsibilities Matrix (RRM), training requirements, Rough Order of Magnitude Budget (ROM) and high level project schedule with phasing plan. Prioritize by risk. Add sketches as needed.

- Produce Systems Drawings in AutoCad 2013 2D that will include:
  1. Title sheet, with General Notes, Conventions, Symbols List, Abbreviation List, Drawing Index, and Security Systems Matrix.
  2. Site and floor plans showing devices and equipment locations.
  3. System block diagrams for each system described under Project Goals. System block diagrams show the logical relationships between equipment and sub-systems.

4. Wire rooms, showing equipment layout and space requirements for security panels, and all new security system conduit sizing and layout.

- Produce System Specifications in CSI format. Specifications are the written part of the construction documents that identifies the materials and equipment of the systems and infrastructure. Exante360 will produce detailed system specifications for the installation of the systems and infrastructure. Specifications will be developed for each portion of the system and infrastructure. The specifications will have individual sections describing the following items: General Requirements, Products, Execution (installation, testing and service requirements). They will also include system requirements, contractor minimum qualifications, acceptance & commissioning requirements, installation methods, practices and procedures. The specifications will also include the sequence of operations relevant to the project.

- Specifications and system drawings will be established such that they set the Standard for security and video equipment for the District.

- Establish multiple specifications and RFP documents as determined by the needs of the project described in the "Physical Security & Video Surveillance Infrastructure Improvement Plan" that is a part of this scope of work.

- Assist the District to the best of our ability (and up to 8 billable hours) in seeking, applying and obtaining Federal, State or local grants that can be applied to this project.

- All submittals will be drafter per the District's requirements, compliance conditions, response terms, conditions and format.

- We will participate in one bid kick-off and one implementation planning meeting. As a result of this meeting we will incorporate any District suggested revisions into the final detailed bid documents.

- Bidding & Negotiation: During the bidding process, Exante360 will respond to bidders' questions and issues, as necessary. Once the bids are received, Exante360 will review the contractor proposals as a member of the bid team and we will evaluate both product and vendor qualifications. We will provide written preliminary opinions based on District evaluation criteria. We will participate in the final selection with the District which includes attending presentations by the bidding contractors.

Task 2: Project Management

Exante360's PMP-certified project manager will perform the following action items as a part of this task:

- Progress management
- Financial management
- Contracts administration
- Preparation of monthly progress reports & Invoicing
- Attend, moderate and take meeting minutes during monthly telephonic meetings
- Attend, moderate and take meeting minutes during bi-monthly stakeholder meetings

Task 3: Installation, Testing and Acceptance

Exante360 will advise and assist the client in monitoring the contractor(s) to properly construct, install, and commission the systems in conformance with the construction documents. In addition, Exante360 will provide administration of the contract between the Owner and the Contractor(s) per General Conditions of the Contract for Construction commencing with the award of the initial contract for construction and terminating with the issuance to the Owner of the final Certificate for Payment.

- Exante360 will facilitate one pre-construction meeting between the District and the Installation Contractor(s) to formally start the project. We will review the work requirements, access & escort requirements, parking, work hours and all other matters pertinent and specific to the work to be conducted by the contractor at the District.
- Exante360 will review the contractor's submittals, shop drawings, and the final equipment list before the work proceeds.
- Exante360 will interface with the systems contractor(s) and the client and/or project team at meetings and at appropriate intervals to assist in efficient and timely installation and compliance. Formal meeting minutes will be developed and distributed for each meeting.
- Exante360 will perform periodic Progress Inspections.
- Exante360 will monitor and review the final system testing, punch lists, commissioning, and acceptance for the Project. We will also assist the client in evaluating whether the contractor's work conforms to the system specifications and that the equipment functions according to the manufacturer's and project specifications.
- If applicable, Exante360 will follow-up when there are reports of contractor noncompliance.
- Exante360 will assist the District with the development of Standard Operating Procedures as well as a training plan per the requirements of the RFP.
- Exante360 will collect, review and disperse the project's as-builts (record documents).

Task 3.1: Partnership

Exante360 understands that all activities shall be coordinated with the District Representative. We also understand and commit to adhere to the District's travel expense report process.

Exante360 takes no exception to the scope of work and sample agreement in PWD's Request for Proposal from 8/18/2013.

Project Fee and Schedule

a. Billable Rates

Principal	$ 160
Subject Matter Expert	$ 160
Project Manager	$ 140
Designer	$ 110
Drafter	$ 75
Project Coordinator	$ 60

b. Compensation

The proposed services will be provided time & material not-to-exceed **$54,380.**

In addition to fees, PWD will reimburse Exante360 for all ordinary and necessary costs and any expenses directly relating to the project and approved by the Authority. Reimbursable expenses include items such as copy and blueprint services, crime statistics reports, permits, meals, overnight delivery service and mileage if applicable. The reimbursable expenses shall be billed at cost. Expenses are estimated at **$4,350**.

A detailed breakdown can be found on the next page.

Task	PM	SME	Designer	Drafter	Fee
Task 1: Planning and Development					
Assess existing conditions	16	8			$ 3,520
Establish written narrative	16	8	4	4	$ 4,260
Produce drawings & specifications			52	96	$ 12,920
Bidding & negotiation	8				$ 1,120
Meetings	32				$ 4,480
				Task 1 Subtotal	**$ 26,300**

Task 2: Project Management					
Perform project management activities	32				$ 4,480
Assist District with seeking public grants	8				$ 1,120
				Task 2 Subtotal	**$ 5,600**

Task 3: Installation, Testing and Acceptance					
Facilitate pre-construction meeting	4				$ 560
Perform Progress inspections	40				$ 5,600
Commissioning & project close-out	8				$ 1,120
Develop SOP's		40			$ 6,400
Develop a training plan		20			$ 3,200
Meetings	40				$ 5,600
				Task 3 Subtotal	**$ 22,480**

c. Project Schedule

Schedule		
Planning and Development	Start	Finish
Contract Awarded	25-Sep	
Obtain existing documentation (blueprints, as-builts, etc)	25-Sep	1-Oct
Survey existing conditions	2-Oct	4-Oct
Submit 95% written narrative	18-Oct	
Meet with the district to discuss the narrative	25-Oct	
Submit 95% drawings & specs	1-Nov	
Meet with the district to discuss the 95% submittal	8-Nov	
Submit 100% narrative, drawings & specs	13-Nov	
Bidding & negotiation	13-Nov	TBD

Task 3: Installation, Testing and Acceptance	Start	Finish
Facilitate pre-construction meeting	one day	
Perform Progress inspections	TBD	
Commissioning & project close-out	TBD	
Develop SOP's	one week	
Develop a training plan	one week	

d. Assumptions & Exclusions

- Exante360's services under this proposal are limited to those expressly specified.
- Submittals will be issued *once* at 95% and 100% completion intervals.
- This proposal does not include P.E. review of drawings and stamp.
- Preparation of maintenance and operation manuals or as-built drawings will be the systems contractor's responsibility.
- Actual training to be performed by the systems contractor.
- This proposal does not include electrical engineering of new circuits. If required, this work is to be performed by others.
- This proposal does not include construction permits or agency fees.
- This proposal does not include submittals in BIM/Revit.
- LEAN delivery is not included.
- This proposal does not include work to show fire or smoke barriers.
- This proposal does not include structural engineering.
- This proposal and the prices quoted are valid for 120 days from the date of this Proposal.

Thank you very much for taking the time to read our proposal. We are excited to work with the District and we hope to have the opportunity to present our project team to you during the interviews.

Sincerely,

Nick DeKeyzer

Nick DeKeyzer
Principal
Exante360, LLC
505 Avenida Lucia
Newport Beach, CA 92660
(949) 485-1710
ndekeyzer@exante360.com

AGENDA ITEM NO. 7.6

REMOTE 2013 MONITORING & CONTROL CONFERENCE
December 12 - 13, 2013
Las Vegas, Nevada

NAME:_____

ADVANCE REGISTRATION DEADLINE**:** OCTOBER 10, 2013

MEALS: ___YES ___NO SPOUSE: ___YES ___NO SPOUSES' TOUR: ___YES ___NO

DEPARTMENTAL TRAVEL BUDGET:

REGISTRATION:_____ TRAVEL:_____
TOTAL REMAINING BALANCE:_____

PROPOSED EXPENSES:

Registration:	_____
Transportation:	_____
Meals:*	_____
Miscellaneous:	_____
TOTAL:	_____

*DIRECTORS: Expenses are outlined in Section 4.06.1 of the District's Rules and Regulations.
*FOR STAFF: Meal limitations are outlined on pages 30 and 31 of the District's Employee Manual.
Please review these limitations.

HOTEL ACCOMMODATIONS: ___YES ___NO REGISTRATION DEADLINE:11-19-13
ARRIVAL DATE/TIME:_____ DEPARTURE DATE/TIME:_____

TYPE OF ACCOMMODATIONS:

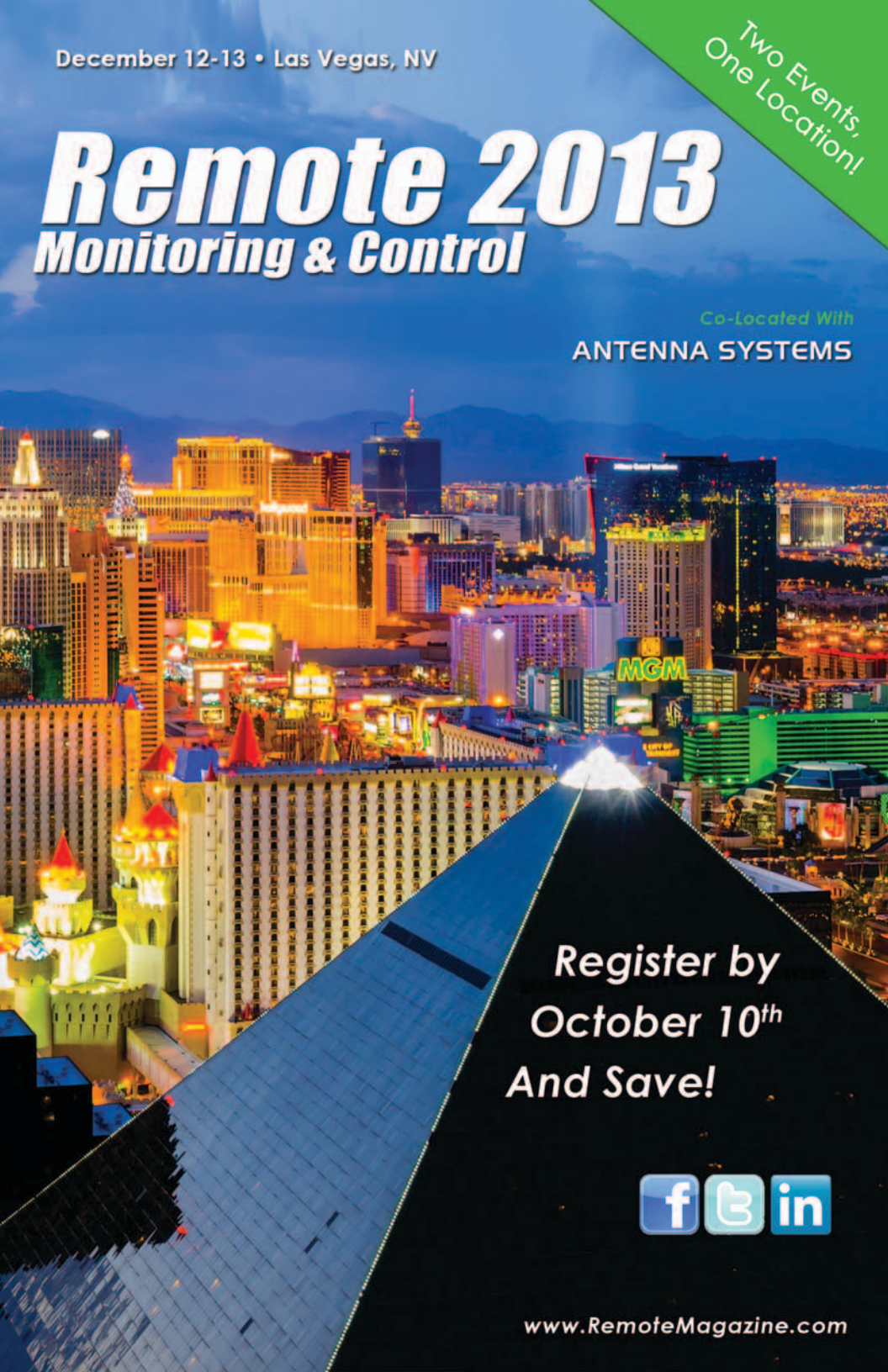
_____	SINGLE (1 PERSON)
_____	DOUBLE (2 PEOPLE)
_____	(2 PEOPLE/2 BEDS)

AIRLINE RESERVATIONS: ___YES ___NO

DEPART FROM _____ on _____ at _____ AM/PM
(airport) (date) (time)

RETURN FROM _____ on _____ at _____ AM/PM
(airport) (date) (time)

SUPERVISOR APPROVAL:_____ DATE:_____


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taoglas antenna solutions

vodafone

Waterfall One Way to Connect

Welcome

The 2013 Remote Monitoring & Control and Antenna Systems conferences are two events being held together in Las Vegas, Nev. on December 12th & 13th, 2013. Remote 2013 is the leading conference covering monitoring, managing, controling, automating, networking and securing distributed equipment and facilities. While the co-located Antenna Systems 2013 covers the new technology implementations, market opportunities and future applications for antennas and their components.

These industry leading events have once again been co-located for 2013, offering a dynamic learning experience for OEMs, engineers, system and facility managers, carriers, end-users and other visionaries in these fields. Attendees are welcome to register for either event, or combine their learning experience with one of our combo passes.

In this brochure you'll find the advance programs, a list of current sponsors and exhibitors, hotel and travel guides and registration information for both of these events. We hope to see you in Vegas!

Nick Depperschmidt - Director of Content

Remote Monitoring & Control 2013

Remote Monitoring & Control 2013 will cover the latest advancements for monitoring and managing distributed equipment and facilities via recent developments in SCADA, remote networks (wireless & wired), security (cyber & physical), automation, onsite and back-up power, M2M and all other manner of technology that allows for the management of remote assets.

This technology-driven and solution oriented event brings together the innovators and users from multiple industries, including utilities/T&D, infrastructure, oil & gas, telecom, water & wastewater, facilities management, manufacturing, process industry, railroads and transportation.

New for 2013 is the SCADA Technology Summit, a full one day program dedicated to nothing but SCADA technology sessions covering multiple industries and applications.

Remote 2013 is also offering a discounted $395 rate for end-users of remote technology working at utility/T&D, oil & gas, water/wastewater and telecom companies. Sign up today!

Co-Located Event: Antenna Systems 2013

Antenna Systems 2013 brings the industry together to evaluate new market opportunities, implement new technologies and discover future applications and technical developments.

This symposium will address the antenna market including Antenna Design, Integration & Manufacturing, 4G Developments & Insights, Emerging & Growth Applications, Supporting Technology & Integration, and Short-Range Wireless Technologies. Each track is designed to cover the latest advancements in the applications, technology, materials, and economic development of antennas and antenna systems.

Antenna Systems 2013 will serve OEM developers of products that utilize antennas and antenna systems, operators of wireless communications systems, design engineers, integrators, antenna manufacturers, and component and material suppliers interested in learning the latest capabilities and best practices in this rapidly changing field.

Registration is Easy

Whether you want to attend one, or both events, we have an option for you.

Early Registration	2-Day Pass	Combo (both events)	Single Day	OEM Pass	Expo Only
Remote 2013	$550	$750	$395	$395	Free
Antenna 2013	$550	$750	$395	$395	Free

Register by Oct. 10th for early bird pricing. Team Discounts also available.
Prices will increase on Oct 10th. Onsite Registration pricing begins December 6th. *Save $345!*



Benefits of Attending the Remote Monitoring & Control 2013 Conference

Discover New Ways to Improve Every Aspect of Your Business

Educational Programs Developed for You
The programs of Remote Monitoring & Control and Antenna Systems 2013 will provide insight into the most pressing challenges and technical developments emerging in each industry, while forecasting the future business markets to help your company grow and thrive.

In-Depth Training
Remote 2013 and Antenna Systems have joined forces to provide in-depth workshops to compliment their educational programs. Instructed by recognized experts in their fields, the workshops will cover DNP3/IEEE 1815, Cyber Security Strategies for SCADA, Telecommunications for the Smart Grid, and Remote Monitoring and Control/SCADA 101.

These workshops have limited seating to ensure attendees receive individual instruction. Register early to ensure a spot.

New Antenna Systems Event Focus
Antenna Systems 2013 will offer new tracks addressing the antenna market including Antenna Design, Integration & Manufacturing, 4G Developments & Insights, Emerging & Growth Applications, and Supporting Technology & Integration. If you've never attended the Antenna Systems Conference, or if it's been a few years, 2013 is the year to attend.



No Empty Stomachs
This is not your normal trade show where you scramble for a $10 hot dog. Full conference attendees enjoy a continental breakfast, networking & coffee breaks, luncheons with industry experts, and a cocktail reception stocked with great snacks.

Networking Opportunities
These events provide the best networking experience in the industry. The conferences are built to provide you with easy and convenient opportunities to meet and discuss issues and trends affecting your business. Each day features a continental breakfast, multiple networking breaks and luncheons. At the end of day one there is also the invaluable cocktail reception, where you can talk over what you've learned throughout the day.



Comprehensive Conference Proceedings
Attendees with a full conference registration receive the show's presentations and the event's proceedings, as well as online access to the presentations. Combo pass holders get presentations from both events!

Combined Exhibit Hall
Expand your business contacts in the co-located exhibit hall. Remote Monitoring/Control and Antenna Technology have a natural synergy, allowing for a highly targeted exhibit hall for all attendees. Discuss the latest technology and find solutions for your needs.

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Build an Education Foundation

DNP3 Primer & DNP3 Under the Hood
Presented by: Parker McCauley, Principal DNP3 Consultant/DNP3 Committee - UPInnovation
Dec. 11th, 2013
8:00 AM to 12:00 PM (DNP3 Primer) / 1PM to 5 PM (DNP3 Under the Hood)
Registration: $300 Individually - $495 when combined

DNP3 Primer: This DNP3 introductory course will provide students with a foundation for understanding and implementing DNP3 in the real world. Students will learn about the protocol, its origins and evolution, plus technical features such as data types, message structure and polling options and as well as DNP3 documentation that can be useful in your daily activities.

DNP3 Under the Hood: This interactive course provides a solid understanding of the fundamentals of DNP3, as well as familiarity with recent additions to the protocol. Attendees will comprehend fundamental operating philosophies including typical configurations and polling techniques; understand considerations for interoperability, and learn how to identify and interpret DNP3 messages.

How Secure is your SCADA System? – Cyber-Security Strategies for SCADA
Presented by: Charles Drobny, President & CEO - GlobalLogix
Dec. 11th, 2013
8:00 AM to 4:00 PM
Registration: Before Oct. 10th: $349 / After Oct. 10th: $399

Controlling the access to SCADA systems involves more than just firewalls and anti-virus software. This day long class will discuss Malware, Worms, Virus attacks and Zero Day Attacks. Participants will take away information about what is transpiring in terms of coming regulations and standards for the operators of SCADA systems. Participants will be exposed to tactics and strategies that can be implemented with current systems to anticipate those regulations as well as to harden the defenses against unwanted intrusions in a company's SCADA systems.

SCADA/Remote Monitoring and Control 101
Presented by: Chuck Keller - Applied Professional Training
Dec. 12th, 2013
Time: 8:00 AM to 12:00 PM
Registration: $195

The course will focus on the fundamentals of SCADA systems hardware, software and the numerous communications mediums now available consisting of wireline, wireless and fiber optic technologies. The course will broadly cover the main concepts of equipment organization, master station operation, remote terminal control, intelligent electronic devices and how utility control is integrated into SCADA systems. Topics are ideal for practicing managers, engineers and technicians who need a basic understanding of electrical utility control system technologies. The basics of LAN architecture and physical connectivity will also be presented as it relates to TCP/IP and security methods.

Telecommunications for the Smart Grid
Presented by: Chuck Keller - Applied Professional Training
Dec. 11th, 2013
Time: 8:00 AM to 4:00 PM
Registration: $385

The course emphasizes the importance of physical and electronic security in maintaining 24/7 grid operations plus ensuring that regulatory compliance requirements are met. Complete overview coverage of technologies used to monitor and control wide area transmission and distribution power grids include fiber optics, wireline, wireless, Broadband Power Line, and Power Line Carrier systems unique to the Smart Grid. This course brings together all the elements of modern telecommunications, electrical energy management and control systems into one quality course that enhances industry change.

Register for these Courses at www.RemoteMagazine.com/Conferences

Thursday, December 12th

7:00 AM **Registration Opens/ Continental Breakfast**

8:00 AM **Welcome Address**

8:00 AM **Keynote Address**



Managing Change and Survival Mechanisms
Mark Grant, SCADA Solutions Expert, Invensys

Change is an inevitable part of any competitive company and managing change can be difficult. There are numerous elements that any organization implementing remote monitoring and control should look at when evaluating a change management program. How will I create the actual change program? What kind of records will I keep? How am I going to perpetuate the changes? How am I going to manage changes to developed programs?

To handle each element requires involvement of senior management, middle management, tactical teams and even vendors. A change management program can be made even more difficult when a company doesn't recognize that there is a need for change. Transferring knowledge can come from within the company, but research shows that it can also be absorbed from outside the company.

From an industry specific point of view, SCADA companies should look for ways to drive these changes to the control room operators, the training groups, the health and safety teams, and the regulatory group. We will touch on a few ways that any industry can use to manage procedural elements. Workflow tools, communication tools and information maintenance tools are all good methods to answer each of the questions noted above.

9:00 AM
Smarter SCADA for Oil and Gas
Mike Brule, Big Data Solutions Executive, Oil & Gas, IBM
Arlen Nipper, President & CTO, Cirrus Link Solutions

Worldwide demand for new oil and gas pipelines is extremely high. But opposition to new pipelines due to the environmental risk is also high. A lack of data, a high latency of data, and an inability to correlate data are serious and real issues that the oil and gas industry needs to address. And can address! Smarter SCADA can improve the basic information delivery backbone in Oil and Gas enterprises. It is not a theoretical idea. It has been implemented in companies such as Phillips 66.

This session will outline what Smarter SCADA is all about and how it can be used to dramatically reduce environmental risk in Oil and Gas.



Padre Dam's Water System Migration from RTU to PLC System using Wireless Ethernet
Rich Mellor, SCADA Technician Padre Dam, Municipal Water District
Jim Ralston, Wireless Product Manager, ProSoft Technology

This session will focus on the steps the Padre Water Dam Authority took to migrate from a closed RTU system, to an open PLC architecture using Ethernet for communications. The challenging terrain required a site survey to determine the most reliable and economical method to communicate to each of the 70 sites. The recommendation was to use a combination of private RF technologies and cellular for the sites where private RF was not practical. The communication network now uses a combination of 802.11, frequency hopping and cellular data connections to seamlessly connect the 70 sites back to the main water plant. The system supports Ethernet operator interfaces where needed and provides an easy way to monitor the health of the communication networks.

10:00 AM **Exhibit Hall Opens/ Networking Break**

11:00 AM
Increasing Efficiency with Real-time Operational Intelligence
Kyle Reissner, Senior Global Product Manager, Proficy Automation Software, GE Intelligent Platforms

With the increase of mobile devices in infrastructure industries, operators are now free to move about the facility, rather than sitting at a desk in a control room monitoring processes and keeping a close watch for alerts. With mobile SCADA systems, end-users can increase efficiency by utilizing Real-time Operational Intelligence (RtOI). Many of these new mobile SCADA systems utilize GPS systems to provide the type of situational awareness typically found only in consumer apps. With mobile devices combining the control capabilities of SCADA and the type of analytics provided by RtOI, operators and companies have the information they need at their fingertips 24/7. This session will describe the different ways plant operators are utilizing this new wave of real-time operational intelligence, the current and potential benefits they are realizing and the best practices for implementing this type of system.

Register by Oct. 10th for Discounted Rates



Top 10 Transformative Technologies in Physical and Cyber Security

Steve Surfaro, Security Industry Liaison, Axis Communications

This session offers a multimedia-rich look at the technologies of greatest impact for both physical and cyber security. You'll not only learn how to have a positive impact in both physical security and information technology (IT) program design, but also contribute to safety and operations management. The rapid advances in technology can positively or negatively influence you every day as a security professional. Learn how to assess the competence and adoption of these technologies and prepare to achieve a leading industry credential. Each technology is ranked and presented with a brief overview and case study.



11:45 AM

Enterprise SCADA for Smart Grids: The Need For Change

Brad Witter, Founder and President, Blue Pillar

This presentation will cover a brief overview of SCADA as it has presented itself in the energy space and highlight several of the many pitfalls and risks of traditional SCADA in today's internet-enabled environment. The focus of the presentation will define and discuss the need for Enterprise SCADA and the shift from the traditional "open and do anything" nature of SCADA to much more technology-forward and industry-focused vertical implementations of enterprise grade automation and software products.



How Secure is your SCADA System?

Charles Drobny, President & CEO, GlobaLogix

The SCADA systems serving the Oil & Gas industry have direct connections to the process control networks that control the production, processing and transportation of hydrocarbons from the wellhead through to the refineries and distribution points. The Oil & Gas companies who use these SCADA systems have risk exposure that is only limited by the level of cyber security of the networks on which these systems reside. It doesn't take much to imagine the damage a hacker with access to control valves and safety systems could accomplish remotely. This paper will discuss the typical network design for SCADA systems and common security approaches, and why they may not be adequate. It will also offer suggestions for higher levels of security without breaking a budget.

12:30 PM Networking Lunch



1:30 pm

Remote Monitoring for Wind and Solar Farms

Younan Lawando, Assistant Manager of Asset Management, Power Systems Services Division, S&C Electric Company

This presentation will dive into the anatomy of a renewable power system including the collection system, interconnection substation and transmission interconnection. We will then take a look at what the critical assets through these systems are and the types of monitoring that can be done to avoid a failure in the equipment. We will show a current project in Texas where we are monitoring critical assets in real-time and go over examples of where this service has helped the renewable owner avoid curtailment or disconnection of their assets. Attendees will walk away a detailed knowledge of how remote monitoring is being used beyond turbines and solar panels, but within these facilities substations to assure that they can continue to provide reliable renewable power.



Cyber Security in the Global Hydrocarbon Process Industry

Fred Czubba, Senior Oil & Gas Manager, Control Industry Solutions Division, Phoenix Contact USA

Faced with the certainty that attackers will get into their systems, Oil & Gas organizations must take a proactive approach to risk management. This approach includes focusing security efforts on protecting mission-critical data. To focus those efforts, organizations need situational awareness. They must know the location of critical data, identify the characteristics of the systems that carry the data, understand the vulnerabilities of the systems, and detect changes in activity that signal a threat.

SCADA systems are the most commonly used system to control infrastructures spread out over a large area, including oil & gas applications. The Department of Homeland Security has focused a major effort on cyber security for SCADA systems for gas and liquid pipelines and distribution networks. In the US, several agencies, including DHS, PHMSA and the NTSB, along with the CFATS Act, jointly provide the guidelines to protect this critical infrastructure from cyber attacks.

This paper will give the owner/operators a better perspective to consider in designing and maintaining a cyber secure control and communications network infrastructure throughout the supply chain, from the wellhead to the final distribution point.

2:15 PM
Using Mobile Devices as Portable HMIs
Marcia Gadbois, President, InduSoft

New SCADA software is enabling mobile devices, such as smartphones and tablets, to be used as portable HMIs. For example, a detention center is able to have guards open and close the facility's doors by using their smartphones to access the SCADA system. This does not just improve operations, it helps protect workers as well. As workforces continue to have to do more with less and as seasoned operators retire, the ability to access the SCADA system easily from low-cost mobile devices will become mission critical. This presentation will explain the benefits in terms of cost savings and response time from remote access to SCADA data by mobile devices, while also covering some of the challenges.



13 Ways Through a Firewall – What You Don't Know Will Hurt You
Michael Firstenberg, Director of Industrial Security, Waterfall Security Solutions

Firewalls are a given, everyone assumes that every security posture includes a firewall. But are they really secure? Join us to see 13 kinds of ways to break through a firewall. Each kind of way through a firewall has between dozens and thousands of examples circulating in the wild. Up to five of the kinds of breaches will be demonstrated live, time permitting. For each kind of attack, seven compensating measures are briefly discussed and their effectiveness compared.

3:00 PM Networking Break/Exhibit Hall Time



3:30 PM
Case study: Intelligent Site Management Deployment
Ben Stump, Senior VP & CTO, Kentrox/Westell

This case study presentation is based on a Tier 1 customer in growing telecommunications market that needed to expand their network intelligently to monitor, manage and control multiple applications at 2,100 cell sites. Multiple sources of power exist at most sites (commercial, batteries and generators).

The case study will discuss how this customer utilized a comprehensive power, security, and environmental management solution to meet their customers' Service Level Agreements (SLAs), minimize operating costs by reducing truck rolls and optimizing energy usage, and enhance site security for both personnel and equipment.

The Rise of Critical Infrastructure Attacks: Understanding the Privileged Connection
Adam Bosnian, EVP Americas & Corp. Development, Cyber-Ark Software

The increase of cyber attacks, viruses and data breaches targeting infrastructure has kept organizations on high alert. ICS-CERT highlighted that the combination of network connectivity with these vulnerabilities would "significantly increase the ICS threat landscape." This has led to a debate between isolating network assets vs. allowing connectivity to other networks for operational and business benefits.

The problem for the thousands of businesses using OT, which include SCADA systems, ICS, etc., is that these technologies were not designed with security in mind. Instead, they were built to be segregated and not designed to address security issues when connected to a network. As a result, simple security protocols, such as regularly changing passwords, have been largely ignored. In the session we will explore the challenges of separation and methods for providing secure connectivity through the management of privileged accounts and access points. Attendees will learn where these accounts exist on their networks and how to protect ICS against today's security threats.

4:15 PM
Video Monitoring Solutions for Remote Environments – Issues, Requirements & Examples
John McClean, Director, Operations, PowerStream
Angelo Rizzo, VP Business Development, Systems with Intelligence, Inc.

Video systems have the versatility to be used for a range of applications for critical infrastructure located in remote environments. Although typically used for security, video systems can also be used for equipment monitoring, asset management, process control, safety and automation. However, many challenges exist in implementing video monitoring solutions due to the conditions present within a harsh environment.

From this paper, learn about scenarios where video systems can, and have played, an important role in monitoring and optimizing operation for various industries including electric utilities, oil and gas, and other manufacturing and process industries. This session will examine the various issues and requirements needed for reliable and effective video monitoring solutions; guidelines for video systems design and architecture; and recommendations for hardware specifications and software features.

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Mitigating Basic Persistence Threats in Digital Energy
Paul Coggin, Internetwork Consulting Solutions Architect, Dynetics

This session will provide an overview of how next generation service provider and utility/smart grid/SCADA networks are being architected and implemented. We will cover the OSS/BSS and network management, transport networks (DWDM, MPLS), aggregation and access network (GPON, 3/4G, SONET/SDH, FTTX, XDSL) architectures that service providers and infrastructure organizations are implementing. The trust relationships, interdependencies and integration of the various layers of network architectures will be outlined to insure the audience understands the network architecture (the original WAN cloud) that enables the "cloud" today.

This presentation will educate you about mistakes that are commonly being made in network architectures and implementation that enables an aggressor to successfully launch attacks that can lead to a complete takeover of a network.

5:00 PM Cocktail Reception

Friday, December 13th

7:30 AM Registration & Continental Breakfast



8:00 AM Day 2 Keynote

The Future of Wireless in Industry
Tom Moore, Analyst, Discrete Automation, IHS Electronics & Media (Formerly IMS Research)

The presentation will outline key findings from the latest research on wireless communication in the automation industry. The presentation will include information on wireless technology adoption by major region and automation product. Insight into key trends, areas of growth, and analysis of why the factory and process markets have been slow to adopt will be discussed. Analysis of the industrial sectors utilizing wireless will also be presented.

9:00 AM
Breaking Out of the Clouds
Mike Sutter, Director of Marketing, Ctek, Inc.

Remote applications are racing to connect to cloud services for management and control capabilities. But what if the cloud becomes a constellation of smart, network aware end-points? Is it still a cloud?

This session presents an alternative view of the cloud. In our view most small to medium size remote management and control projects will find happiness in a cloud that is made up of intelligent end-points that are self-aware, network aware and capable of completely managing the application at a location without intervention from a centralized application. In this model end-points interact with each other on a peer-to-peer basis to accomplish tasks at geographically separated sites. Alarms and reports originate at the end-point and are served in IT friendly formats that can be processed by off-line systems that perform statistical and regulatory reporting.

Satellite M2M for Remote Management
Joel Schroeder, Director, M2M Program, Inmarsat

Terrestrial cellular networks are the workhorses for M2M communications and they have improved in recent years in terms of coverage area and speed. But they are also limited. Satellite communications, can offer a comparable service to a 3G network with uninterrupted connectivity, weather resistance (in the case of L-band services) and general reliability that businesses need to rely on to ensure constancy of their M2M networks.

This presentation will examine the crucial role that can be played by satellite networks within M2M deployments. The discussion will center on satellite's ability to serve as either a front-line, primary network or as an always-on back-up for emergencies and redundancies. The presentation will also examine the industries best suited for a satcoms-based M2M network, those like utilities and energy where real-time data knowledge is key and assets may lie outside the terrestrial footprint and will address the myths and stigmas often associated with satellite communications.

Supporting Organizations & Media Sponsors



9:45 AM
4G LTE Implications for M2M Networking
Bill Conley III, Manager, Energy and Natural Resources, B&B Electronics Manufacturing Company

As the 4G LTE cellular network build-out continues in North America, M2M network designers will be able to take advantage of both its great throughput, up to 1 GBps, and its low latency. With a latency as low as 30 milliseconds, 4G LTE will also open the door to true supervisory control.

In the meantime, M2M network designers are doing interesting things with 3G networks by combining old technology and protocols with the new. Using a recently developed system in Arizona as a case study, Conley will describe some of the ways Modbus devices can be networked locally via radio and Ethernet, powered by solar panels, and given access to the Internet via the fiber optic or cellular data networks. He will also describe some of the ways data from remote installations can be made secure, including VPN tunneling.

Conley will discuss new ways network engineers can integrate 4G LTE with existing networks, thus protecting investments that have been made in legacy devices and network infrastructure.

Building the Right Foundation for Network Operations with Network Monitoring and Other Emerging Technologies
Ashish Singh, Director of Product Management, GridMaven

M2M networks and SCADA or SCADA-like deployments are increasing. Expansion, in the form of new traffic on existing networks and entirely new networks increases network management complexity, competing bandwidth demands and varying performance expectations. Once networks are operationally optimized, new technologies can be more readily adopted that continue to enhance network management.

Software-defined networking (SDN) is an emerging technology in which software controls where switches send packets of information. SDN is quite a change from traditional hardware-centric switch and router architectures. But given the expanding needs of industrial and operational grids to remotely monitor and manage sensors, devices and networks with growing diversity of traffic, it's time to give serious attention to SDN to deliver an integrated communication management infrastructure that accommodates the growth of M2M and SCADA.

10:30 AM Networking Break/Exhibit Hall Time



11:00 AM
Bringing Technology & Automation to the 80% in the Oil & Gas Production Industry
Rodney Montrose, Director of Device Development, Numerex

This session will discuss the common issues shared by the 80 percent small oil producers in the US. Technology has reached the point where the small marginal well producers can implement M2M to help them manage their sites, produce more oil and reduce the risk of oil spills and fines.

Smaller oil producers are sometimes still utilizing pen and paper to run their business. We will show how bringing in new technology (cell phone forms) to enter the same information can help them take the first step towards a fully implemented system.

Tank monitoring and pump control is the one area that is most easily identified as a first step to automation. Understanding the various sensors that measure the tank contents is important to selecting the sensor that will produce the results that the producer needs.

Developing a Complete Power System for Your Remote Site using Hybrid Solutions
Gord Petroski, Director, Strategic Planning, Alpha Energy & OutBack Power

This session will cover hybrid style power solutions and break them down into three parts. First, the presentation will go over the advantages of using multiple power generation sources (solar, gensets, fuels, batteries, etc.) and how they should be configured, monitoring and controlled. Secondly, we'll no in-depth on using solar for onsite power, covering design principles and methodologies and common oversights. Lastly the presentation will focus on using low power systems specifically tailored for monitoring and control applications, and the multiple voltage options available.



11:45 AM
Wireless Technology Options for Remote Monitoring and Control
Tim Cutler, Director of Business Development – M2M Business, RFM

There are almost as many wireless technology options as there are remote monitoring and control applications. So how does one know which one to select? This presentation will provide an overview of the various types of wireless remote monitoring and control applications and network architectures. The presentation then provides a look at the various wireless technologies available and presents strengths and weaknesses of each technology as they pertain to the needs of remote

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monitoring and control applications. The presentation will include cellular technologies, Wi-Fi, Bluetooth and Bluetooth Low Energy, WirelessHART, as well as proprietary Frequency Hopping technology in the 900 MHz and 2.4 GHz bands. The presentation will look at wide area applications as well as aggregator/concentrator applications.

Automation Initiatives for Critical Infrastructure Integrating Remote Monitoring and Control with FLISR Systems
Jerry Baskin, Sr. Product Manager Switchgear, Federal Pacific

In today's environment of heightened awareness of the need for enhanced security measures for critical infrastructure, such as waste water treatment facilities, media communication installations, data centers as well as smart-grid inter-ties to distributed renewable energy resources, it is important to be aware of initiatives that can provide an increased level of power availability. Automated products such as equipment furnished with a remote operation scheme (for monitoring and control) and automatic-transfer schemes are ways of providing back-up power for such installations, as are standby generators. This presentation discusses enhanced automatic-transfer schemes, FLISR automated sectionalizing schemes and equipment to support planned outages, training, short-term emergency outages and long-term outages resulting from damage to major equipment all capable of integration with remote-operation capability.

12:30 PM Networking Lunch



1:30 PM
Satellite M2M for Water Metering & Other Water Applications
Anu Sood, Global Channels Manager, SkyWave Mobile Communications

Imagine you had a faucet that was on full blast for six hours a day and you could not shut it off. What would your water bill look like? For a large water utility operating in remote regions of northern US, that was their reality. They were losing 25 percent of their water due to leaks and burst pipes and they needed a way to shut off the "leaky faucet". In this presentation we will cover how this utility was able to leverage satellite M2M technology to detect over 30 customer leaks ranging in size from 4,000 to 42,000 US gallons per day in the first 3 months of deployment. Besides municipal drinking water applications, we will also cover how satellite M2M technology is being used to save water, reduce costs and optimize operations in agriculture and other industries.

Long-Duration Remote Powering: Lessons Learned From Afghanistan
Phil Robinson, Vice President, Defense Power Systems, Protonex Technology Corp.

The US Army, Air Force and Navy have partnered to fund development of both traditional and alternative energy sources for long-duration remote operations. Many of these solutions include multiple energy sources (hydrogen fuel cell, solar, battery) combined into a single lightweight, easy to deploy system. Because these systems are typically transportable, they are extremely rugged, portable, and require no advanced technical knowledge to deploy and operate. While typically too expensive for generic commercial applications, these solutions have matured to the point of being commercially viable for difficult-to-reach and austere remote monitoring applications. The presentation explores solar, fuel-cell, and hybrid solutions now being deployed by the US military, and suggests mission characteristics which would be indicative of a possible fit of this equipment for commercial applications.

2:15 PM
Using Analytics to Automatically Analyze Equipment Data to Detect Issues, Trends, Faults and Anomalies
John Petze, C.E.M., Partner, SkyFoundry

Smart devices of all types are now capable of communicating valuable information about their environment and operation. Access to the data is just the first step in that journey, however. The new challenge is how to manage and derive value from the exploding amount of data available from our smart and connected devices. Manual processes and conventional alarming technologies cannot take full advantage of the available data and cost-effectively identify patterns and relationships in performance data.

New software tools that synthesize business intelligence techniques with functionality designed for the needs of smart devices and real time data, and are enabling organizations to derive new levels of value from the data available from their existing investments in equipment. The new generation of analytics software tools automatically and continuously processes equipment data, applying rules to detect patterns that represent, issues, faults, deviations from expected performance and opportunities for process improvement. In this presentation we will review the method of application and the capabilities of automated analytics for smart devices through the presentation of two case studies.

3:00 PM Conference Conclusion

Thursday, December 12th

7:00 AM **Registration / Continental Breakfast**
8:15 AM **Welcome Address**
8:20 AM **Keynote Presentation**



New Antennas for Mobile Connectivity
Bob Giometti, Vice President of R&D and Engineering – SkyCross

Mobile device makers are struggling to accommodate the multiple MIMO antennas needed for optimal LTE and LTE-A performance. How can they deliver all of these technologies' capabilities and reconcile conflicting demands for increasing data throughput and lighter, thinner form factors? This presentation will discuss why tunable antenna technology is the ideal solution and how it can be a major driving factor for LTE and LTE-A adoption. Also addressed: Top benefits and unique capabilities of active tunable antenna technology; Solutions for spatial differentiation challenges; and How tunable antennas enhance the ergonomic design of mobile devices.



9:20 AM
Antenna Tuning is Not a Trend; It's Critical to Pervasive Wireless Connectivity
Jeff Shamblin, Chief Scientist Ethertronics, Inc.

Antenna Tuning is the newest "buzz word" in the RF front-end space. But what is it exactly and how can it be applied to improve connectivity for next-generation networks and mobile devices? This session will explore why antenna tuning is necessary for network operators and OEMs to continue delivering a superior user experience despite network and device challenges such as frequency bands required for 4G LTE and global roaming, and reduced space and BoM for RF components. Also addressed will be the antenna system components such as Band/Aperture Switching and Null Steering to improve network capacity and link budget.

10:00 AM – Networking Break / Exhibit Hall Opens



10:40 AM
Airborne on the Move: Situational Awareness with In-Flight Monitoring
Karl Fuchs, Vice President of Technology - iGT

Delivering reliable satellite communications to a plane is challenging. Planes move rapidly and fly in and out of satcom coverage. Airborne antennas and systems need to switch satellites seamlessly without delays to provide continuous and effective communications. The best chance for success is the implementation of an in-flight management system that can "look" at airborne satcom's global multi-satellite environment and provide network operators with a complete picture and status of their airborne networks including modem and antenna control unit (ACU) states, as well as a countdown to beam-switch timer. This session will review the importance and capabilities of in-flight monitoring.



11:20 AM
Antenna Radome Effects on High Performance SATCOM Antenna Systems
Dr. Kozakoff, Chief Scientist USDigiComm Corp.

This presentation is a technical review of the antenna performance required for commercial SATCOM services as particularly applicable to mobile (maritime, airborne or vehicular) platform systems where dynamic antenna beam forming or pointing is required. Properly accomplished, these low sidelobe high performance antenna systems must take the antenna radome into account during the antenna design phase. Specifically, antenna parameters that will be modified by the presence of a radome include gain, depolarization, far-out sidelobe performance, antenna noise temperature, boresight error and registration effort (difference between uplink and downlink boresight error.) Some of these radome effects can be compensated for in the antenna design.

12:00 PM – Networking Lunch



1:00 PM
Space-Efficient UWB 2-D and 3-D Antenna Elements
Dr. Anatoliy Boryssenko, Senior Scientist - A&E Partnership

Attend this presentation to learn about several designs of UWB antennas implemented in 2-D printed circuit technology, 3-D volumetric fabrication and a hybrid mode using both 2-D and 3-D fabrication processes. For those antennas, optimal occupancy of physical space is achieved and measured with respect to supported lambda_max. Design approaches, CAD modeling and numerical full-wave electromagnetic techniques used to advance performance of our antenna designs that can be used as single radiators, array elements or reflector feeds will be discussed.



1:40 PM
Antenna Performance of LTE Enabled Hand-Held Tablets
Derek Campbell, Application Engineer - EM Software & Systems (USA), Inc.

LTE is one of the 4G mobile communication technologies developed at different frequencies. These frequencies range from 400 to 4,000 MHz with bandwidths up to 20 MHz. LTE utilizes multiple antennas on both ends of the wireless channel i.e. multiple-input-multiple-output (MIMO) to support high data rate 4G applications. Design challenges are not limited to miniaturized multi-band integrated antennas, but also include optimization of multiport matching networks, accounting for specific absorption rate (SAR) and the complex electromagnetic interaction between a mobile LTE device and the users, affecting antenna patterns and channel capacity. This presentation will show how these complicated and often conflicting challenges can be overcome.



2:20 PM
MLFMA for Broadband Analysis Of Antenna Systems Installed on Electrically Large Platforms
Jonatan Aronsson, President CEMWorks, Inc.

Learn about a novel Multi-Level Fast Multipole Algorithm (MLFMA) that is suitable for broadband modeling of geometrically complex antennas that are mounted on electrically large platforms. Unlike the standard MLFMA formulation, the new algorithm can efficiently handle multi-scale features on electrically large models from low to multi-GHz frequencies. The improved performance is realized by utilizing spherical wave functions to expand the EM field. We will show that the method is applicable for electromagnetic analysis of composite metal-dielectric 3D models.

3:00 PM – Networking Break in Exhibit Hall



3:40 PM
Remote Antenna Site Failure Detection by Site Scanning Using AISG Modems
Rick Dumont, Global Marketing Director - NXP Semiconductors

NXP proposes a system called "Base station Site Scanning" or "Site Scan" – a reliable and scalable method to verify base station antenna site connectivity remotely, making use of intelligent connectors. Site Scan can be performed at any time under operating conditions without affecting the tower operation. We will explain how available antenna site technologies like AISG communication can be used to implement a complete Site Scan process, from mapping the tower equipment and connections, including equipment changes over time, to tracing connections, storing connectivity information and real-time tracing, repair, and verification of any antenna site connection and equipment failure.



4:20 PM
Wireless Sensor Technologies From Ant to ZigBee
Rodney C. Montrose, Director of Device Development - Numerex

This session will discuss the prominent wireless sensor technologies available in the market today and what does the future hold for this technology. We will discuss the impact of identifying the correct antennas for these sensors to ensure that critical communications to the end destination. Learn lessons identified from the field – what happens when the wrong antennas are selected, and the impact of obstacles in sensor communications (shrubs and trees ARE obstacles). We will discuss the effects of grounding antennas and how costly not grounding can be when dealing with sensors especially in remote areas. Lastly, hear about what impact with the decision of AT&T announcing sun setting of their 2G system by 2016 mean for the millions of 2G devices and the sensors that are attached to their networks.

5:00 PM – Cocktail Reception in Exhibit Hall

Friday, December 13th

7:30 AM – Registration / Continental Breakfast



8:30 AM - Featured Presentation
Migrating Macro Cell Antenna Systems to LTE Advanced
Keith Radousky, CTO Americas Quintel

Wireless subscribers are ravenous for bits and carriers are scrambling to deploy additional infrastructure such as small cells, DAS and more macrocells. DAS and small cells are getting much attention, but they are only feasible in a very small footprint of the network. More attention is needed on how to increase capacity on existing macrocells. Accordingly, this session will focus on deploying LTE Advanced while also increasing 3G capacity. LTE at multiple frequency bands and migration from LTE 2Tx-2Rx to 8Tx-8Rx will be discussed. This session will explore options for the tower-top evolution including, active, integrated and passive antenna solutions.



9:20 AM
Managing DAS Effectively And Efficiently
Ben Stump, Senior VP and CTO Kentrox/Westell

Intelligent monitoring of a DAS means interpreting information from equipment throughout the network and translating that into actionable items. During this presentation, we'll discuss how to best address the following challenges of a DAS to ensure an effective system: Management of numerous alarms; Automated notification to the appropriate personnel (operator or service provider) based on the fault information; and Intelligent dispatching to ensure the relevant personnel are visiting the problem location with the right equipment. Additionally, we'll discuss how this same solution can be used for monitoring commercial and generator power, HVACs, and environmental conditions.

10:00 AM – Networking Break in Exhibit Hall



10:40 AM
A Practical Guide to Using Tunable Components for Aperture-Tuned Antennas
Paul Tornatta, VP of Product and Customer Engineering Cavendish Kinetics

The venerable Planar Inverted F Antenna (PIFA), which is used in the vast majority of smartphones today is under pressure due to shrinking antenna volume and the wide number of bands it must support. Antenna Frequency Tuning is extending the performance of the PIFA, enhancing the radiation efficiency and widening the effective bandwidth. Although the basic design techniques for tuning have been well documented, understanding the performance of the tuning components is essential to realize the full potential of Antenna Frequency Tuning. This presentation will derive the key parameters to maximize radiation efficiency across LTE/3G/2G cellular bands and show case studies of antenna designs in smart phones in very small antenna volume.

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11:20 AM
Injection Moldable, Controlled Dielectric Constant Materials For Antennas
Dr. Antti Helminen and Mr. Tuomas Kiikka - Premix Oy

A new set of materials with controlled dielectric constant and low dielectric constant has been developed. These thermoplastic materials fill the gap between typical plastic materials and high frequency ceramics. They can be injection molded to complex 3D shapes. The dielectric constant can be tuned from 2 to 20 depending on the composition.

12:00 PM – Networking Lunch



1:00 PM
Co-Site and Parasitic Antenna Interference Reduction Using Plasma Antennas
Dr. Ted Anderson, CEO - Haleakala Research and Development, Inc.

Co-site antenna interference and/or parasitic antenna interference are greatly reduced or eliminated using plasma antennas because the plasma antennas not in use can be turned off with the plasma being extinguished. Metal cannot be extinguished so interference of one metal antenna with another metal antenna nearby is a problem which can be solved or greatly mitigated by using plasma antennas. Higher frequency plasma antennas can transmit and receive through lower frequency plasma antennas. Higher frequency plasma antenna arrays can transmit and receive through lower frequency plasma antenna arrays.



1:40 PM
Harry Potter Gets Real: Where Will Invisibility Cloaks Take Us?
Nathan Cohen, Ph.D., CEO - Fractal Antenna Systems

The science fiction fantasy of invisibility cloaks has now been realized as a practical devise at RF and microwaves. While that may be of limited interest to those who want to be Harry Potter, invisibility cloaks at RF pose dramatic and versatile options for dealing with environment restricting placements of existing and future wireless and RF infrastructure. Attend this presentation to learn about the present state of the art of invisibility cloaks and the problems they will help solve in the coming years.

2:20 PM - Conference Conclusion

At-a-Glance Schedule

Wednesday - December 11th, 2013
7:30 AM: Pre-Conference Workshops Registration Opens
12:00 PM to 4:00 PM: Exhibitor Set-Up Time

Thursday - December 12th, 2013
7:00 AM: Registration Opens
7:00 AM to 10:00 AM: Additional Exhibitor Set-Up Time
8:00 AM Sessions Begin
10:00 AM Exhibit Hall Opens
5:00 PM Cocktail Reception in the Exhibit Hall
6:30 PM: Day One Ends

Friday - December 13th, 2013
7:30 AM: Registration Opens
8:00 AM: Exhibit Hall Opens
8:00 AM: Sessions Start
12:00 PM: Exhibit Hall Closes
3:00 PM: Conference Concludes

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MINUTES OF MEETING OF THE OUTREACH COMMITTEE OF THE PALMDALE WATER DISTRICT, SEPTEMBER 9, 2013:

A regular meeting of the Outreach Committee of the Palmdale Water District was held Monday, September 9, 2013, at 2029 East Avenue Q, Palmdale, California, in the Board Room of the District office. Chair Dizmang called the meeting to order.

1) Roll Call.

Attendance:	**Others Present:**
Outreach Committee:	Dennis LaMoreaux, General Manager
Gloria Dizmang, Chair	Jim Stanton, Information Technology Mngr.
Robert Alvarado, Committee Member	Claudette Beck, Water Conservation Spvsr.
	Dawn Deans, Executive Assistant
	0 members of the public

2) Adoption of Agenda.

It was moved by Committee Member Alvarado, seconded by Chair Dizmang, and unanimously carried to adopt the agenda, as written.

3) Public Comments.

There were no public comments.

4) Action Items:

4.1) Consideration and Possible Action on Approval of Minutes of Meeting Held August 5, 2013.

After a brief discussion, it was moved by Committee Member Alvarado, seconded by Chair Dizmang, and unanimously carried to approve the minutes of the meeting held August 5, 2013, as written.

4.2) Discussion of Next Issue of Water News. (Water Conservation Supervisor Beck)

Water Conservation Supervisor Beck reviewed the articles for the next issue of Water News followed by discussion of the articles, revisions, and future articles including continued articles on reducing gallons per capita per day.

4.3) Discussion of "Before the First Drop" Marketing Campaign. (Water Conservation Supervisor Beck/Information Technology Manager Stanton)

Water Conservation Supervisor Beck informed the Committee of the items completed for the "Before the First Drop" marketing campaign and stated that videos have been presented to the schools; that the landscape makeover contest winner has not yet contacted the District; and that the flash-mob dance needs to be completed.

Chair Dizmang then reviewed a draft letter to Senator Steve Knight, Assemblyman Steve Fox, Congressman Buck McKeon, Supervisor Michael Antonovich, and Mayor Jim Ledford regarding the Before the First Drop marketing campaign packets followed by a discussion of the intent of the packets, materials to be included with the packets, and scheduled appointments to present the packets after which General Manager LaMoreaux stated that the packets will be further developed for Committee review.

Information Technology Manager Stanton then stated that he will update the Committee on providing subtitles or closed captioning for the "Before the First Drop" video as information becomes available.

4.4) Discussion of Development of an Outreach Plan Based on the District's Strategic Plan. (General Manager LaMoreaux)

General Manager LaMoreaux distributed "Creating a Strategic Communication Plan That Gathers No Dust" from the AWWA Journal that discusses developing an overall Communications Plan, which would be developed and reviewed at the Committee level and eventually approved by the Board, and recommended the Committee review the article for further Committee discussions.

4.5) Discussion of Meeting California Urban Water Conservation Council Requirements and Maintenance of Year 2020 Gallons Per Capita Per Day. (Water Conservation Supervisor Beck)

General Manager LaMoreaux reviewed the establishment of the District's year 2020 goal for a 20% reduction in water use, which is 176 gallons per capita per day, and the 2015 goal, which is 198 gallons per capita per day, after which Water Conservation Supervisor Beck reviewed the District's gallons per capita per day since 2000 and proposed options for reducing gallons per capita per day including increasing the number of Water News to one each month to maintain consistent contact with our customers,

developing specific artwork, developing a landscape contest, developing a commercial water use campaign with a urinal rebate program and efficient measuring methods for commercial dishwashers and food and drink preparation, and enhancing the school education program focusing on the importance of water through irrigation and science projects, developing activities around Smart Irrigation Month, developing Aquadog artwork to teach about gallons per capita per day, and developing a landscape art school contest using sustainable plants for the high desert.

Developing a gallons per capita per day graphic for the website was then discussed and Information Technology Manager Stanton stated that he will work on developing this for future Committee review.

Chair Dizmang then commended Water Conservation Supervisor Beck on a job well done.

5) Information Items.

5.1) Update on Application for Special District Leadership Foundation "District Transparency Certificate of Excellence." (General Manager LaMoreaux)

General Manager LaMoreaux stated that all items for the Special District Leadership Foundation "District Transparency Certificate of Excellence" application are complete; that the needed items have been placed on the District's website; and that he has requested Information Technology Manager Stanton to develop a Transparency in Government page for the website redesign with this page to include all items on the application's checklist as well all items the District is required to provide by law.

5.2) Status of District Website Redesign. (Information Technology Manager Stanton)

Information Technology Manager Stanton stated that final website content updates have been requested from Department Heads and will be incorporated into the redesign and that the District's website consultant is working on the website redesign and development of the District's intranet site.

5.3) Other.

Committee Member Alvarado inquired about the District's participation in the Antelope Valley International Heritage Festival, which is scheduled for September 14, 2013 from 10 a.m. to 3 p.m., after which Water Conservation Supervisor Beck stated that the District will have a booth at the event for the Aquadog Toss.

Chair Dizmang then inquired about public outreach for the upcoming Proposition 218 process after which General Manager LaMoreaux stated that discussions on the upcoming rate study and Proposition 218 process will begin at the Finance Committee level; that his tentative recommendation is to hire consultants to conduct the rate study and public relations; and that the Outreach Committee's involvement will be in establishing the scope of work for the public relations consultant.

General Manager LaMoreaux then stated that staff met with representatives of the B.I.A. last week to discuss the District's proposed Water Supply Fee; that staff was able to address their questions; and that the meeting went very well.

There were no additional information items.

6) Board Members' Requests for Future Agenda Items.

There were no requests for future agenda items.

The next Outreach Committee meeting was scheduled for October 7, 2013 at 3:00 p.m.

7) Adjournment.

There being no further business to come before the Outreach Committee, the meeting was adjourned.

Gloria A. Dizmang
Chair

MINUTES OF MEETING OF THE FINANCE COMMITTEE OF THE PALMDALE WATER DISTRICT, SEPTEMBER 11, 2013:

A meeting of the Finance Committee of the Palmdale Water District was held Wednesday, September 11, 2013, at 2029 East Avenue Q, Palmdale, California, in the Board Room of the District office. Chair Dizmang called the meeting to order.

1) **Roll Call.**

Attendance:	**Others Present:**
Finance Committee:	Dennis LaMoreaux, General Manager
Gloria Dizmang, Chair	Mike Williams, Finance Manager
Steve Cordova, Committee Member	Dennis Hoffmeyer, Senior Accountant
	Bob Egan, Financial Advisor
	Dawn Deans, Executive Assistant
	0 members of the public

2) **Adoption of Agenda.**

It was moved by Committee Member Cordova, seconded by Chair Dizmang, and unanimously carried to adopt the agenda, as written.

3) **Public Comments.**

There were no public comments.

4) **Action Items:**

4.1) Consideration and Possible Action on Approval of Minutes of Meeting Held August 14, 2013.

It was moved by Committee Member Cordova, seconded by Chair Dizmang, and unanimously carried to approve the minutes of the meeting held August 14, 2013.

4.2) Discussion and Overview of Cash Flow Statement and Current Cash Balances as of July 31, 2013. (Financial Advisor Egan)

Financial Advisor Egan reviewed the investment funds and cash flow reports as of July 31, 2013, including the decrease in cash due to an unanticipated payment to the Department of Water Resources and anticipated payments for Granular Activated Carbon, State Water Project costs, and Butte payments and stated that water sales are

higher and assessments are slightly above anticipated amounts; that reserves are lower than they should be; but that year-end is projected $1.7 million above budgeted.

4.3) Discussion and Overview of Financial Statements, Revenue and Expense and Departmental Budget Reports for July 31, 2013. (Finance Manager Williams)

Finance Manager Williams reviewed the balance sheet, profit and loss statement, year-to-year comparisons, month-to-month comparisons, consumption comparisons, and revenue and expense analysis reports for the period ending July 31, 2013 and stated that all departments are operating at or below the targeted expenditure percentage of 58% or less and continue to keep expenses down and operate very efficiently.

4.4) Discussion and Overview of Committed Contracts Issued. (Engineering Manager Knudson)

General Manager LaMoreaux reviewed payments included in the Committed Contracts and Payout Schedules for capital projects, projects funded by the Water Quality Fee, and projects funded from the Water Revenue Series 2013A Bonds.

4.5) Discussion and Review of 2014 Budget. (Finance Manager Williams)

Finance Manager Williams reviewed the timeline for staff's budget planning process through adoption after which Senior Accountant Hoffmeyer reviewed the factors to be included in the 2014 budget, the process for collecting budget data from Department Managers, projected year-end at December, 2014, and Southern California Edison Company's projected rate increase.

Finance Manager Williams then stated that a full review of the budget financial information with initial projections will be presented at the next Committee meeting.

Chair Dizmang then requested Department Managers include specific savings achieved in their accomplishments.

4.6) Discussion of Development of Departmental Budget Worksheets. (Chair Dizmang)

Chair Dizmang requested simplified financial information be presented for the Committee's use after which the items to be included in a budget worksheet were discussed, and General Manager LaMoreaux stated that a budget worksheet will be developed and presented to the Committee for review.

4.7) Consideration and Possible Action on Reserve Policy. (Chair Dizmang)

Finance Manager Williams reviewed the draft Reserve Policy based on recommendations from the last Committee meeting.

Financial Advisor Egan then stated that the Board has to raise rates and keep expenses flat to increase reserves and that 2013 did not see a slide until now.

After a brief discussion of the draft Reserve Policy and the consequences of a dry year, General Manager LaMoreaux stated that the draft Reserve Policy will be presented to Mr. Steve Perez, General Manager for Rosamond Community Services District, for review and comment with a final Reserve Policy then presented to the Committee.

4.8) Consideration and Possible Action on Request for Proposals for Auditor. (Financial Advisor Egan)

Financial Advisor Egan stated that Requests for Proposals for auditing services were submitted to Brown & Armstrong, Burkey Cox, Fritz Russell, and Charles Fedak; that proposals are expected by Friday and are anticipated to have a rate of $20,000 per year with a three-year contract; and then reviewed why he does not see the need to change auditors.

After a brief discussion, staff recommended the Committee review all proposals at the next Committee meeting and recommend the finalists to the full Board for consideration.

The upcoming state audit was then discussed.

4.9) Consideration and Possible Action on Request for Proposals for Preparing a Rate Study. (General Manager LaMoreaux)

General Manager LaMoreaux stated that the District must complete the Proposition 218 process in 2014 and recommended staff prepare a Request for Proposals for conducting a rate study, and after a brief discussion of including public relations assistance in the Request for Proposals and of the potential cost of the rate study, the Committee concurred with staff's recommendation.

General Manager LaMoreaux then stated that a draft Request for Proposals will be presented at the next Committee meeting for discussion.

5) Information Items.

Finance Manager Williams presented an analysis that shows a comparison of payment types from January through August, reviewed the shift in how customers are paying their bills, and stated that front lobby customers have an average wait time of five to seven minutes with a service time of approximately three minutes and that revisions have been made to the District's telephone system to help with customer wait time.

There were no further information items.

6) Board Members' Requests for Future Agenda Items.

There were no requests for future agenda items.

The next Finance Committee meeting was then scheduled for October 9, 2013 at 5:00 p.m.

7) Adjournment.

There being no further business to come before the Finance Committee, the meeting was adjourned.

Chair

MINUTES OF MEETING OF THE FACILITIES COMMITTEE OF THE PALMDALE WATER DISTRICT, SEPTEMBER 16, 2013:

A meeting of the Facilities Committee of the Palmdale Water District was held Monday, September 16, 2013, at 2029 East Avenue Q, Palmdale, California, in the Board Room of the District office. Chair Alvarado called the meeting to order.

1) Roll Call.

Attendance:	**Others Present:**
Facilities Committee:	Dennis LaMoreaux, General Manager
Robert Alvarado, Chair	Matt Knudson, Engineering Manager
Gordon Dexter, Committee Member	Tim Moore, Facilities Manager
	Jim Stanton, Information Technology Manager
	Peter Thompson II, Operations Manager
	Randy Hardenbrook, Equipment Mechanic Spvsr.
	Kelly Jeters, Systems Supervisor
	Dawn Deans, Executive Assistant
	0 members of the public

2) Adoption of Agenda.

It was moved by Committee Member Dexter, seconded by Chair Alvarado, and unanimously carried to adopt the agenda, as written.

3) Public Comments.

There were no public comments.

4) Action Items:

4.1) Consideration and Possible Action on Approval of Minutes of Regular Meeting Held August 19, 2013.

It was moved by Committee Member Dexter, seconded by Chair Alvarado, and unanimously carried to approve the minutes of the Facilities Committee meeting held August 19, 2013, as written.

4.2) Consideration and Possible Action on District Participation in the Municipal Water Quality Investigations Technical Advisory Committee. ($23,250.00 – Budgeted – Operations Manager Thompson II)

Operations Manager Thompson II provided an overview of the District's participation on the Municipal Water Quality Investigations Technical Advisory Committee, and after a brief discussion of the benefit of the District's participation and of evaluating this benefit, it was moved by Committee Member Dexter, seconded by Chair Alvarado, and unanimously carried that the Committee concurs with staff's recommendation to continue District participation on the Municipal Water Quality Investigations Technical Advisory Committee in the not-to-exceed amount of $23,250.00 and that this item be taken to the full Board for consideration.

4.3) Discussion and Review of Deferred Maintenance. (Facilities Manager Moore)

Equipment Mechanic Supervisor Hardenbrook reviewed the high cost to the District from deferred maintenance on the District's vehicles and equipment and from deferring the purchase of new vehicles and equipment after which Chair Alvarado requested staff prepare a list of all vehicles with the mileage, model, make, year, and the target replacement date, and it was determined that this list will be included in the upcoming budget discussions as well as through recommendations from The Mathis Group.

Facilities Manager Moore then reviewed the consequences of deferring pipeline replacement projects, which can result in overtime, property and injury liabilities, lost water, maintenance issues that affect all departments, and additional costs to the District and then reviewed the effect of a recent leak on Edison poles and power lines after which General Manager LaMoreaux stated that staff is moving ahead with pipeline replacements, which are now possible due to the 2013A Water Revenue Bonds.

Operations Manager Thompson II then reviewed the equipment that failed at the Leslie O. Carter Water Treatment Plant due to lack of a budget and the resulting budget line items that will be over-budget as this equipment was critical and necessary to the District's operations and had to be replaced.

The impact to the Operations and Facilities Departments caused by deferred maintenance was then discussed including having to prioritize multiple projects critical to

the District's operations, sacrifices that staff does not want to have to make, the negative impact on efficiency and morale from not having the resources to handle these critical items, and deferring even more maintenance to avoid going over budget as certain items have to be replaced.

Chair Alvarado then stated that he understands and sympathizes with the respective departments and requested staff work together with the Committee to develop an accurate list of staff's needs and wants with the most critical items at the top of the list and that his goal is to see what the Committee can do to make sure staff's jobs are a little bit easier this year.

5) Information Items.

5.1) Update on Facilities Committee Goals and District Projects. (Chair Alvarado)

Chair Alvarado stated that in order to accomplish the Committee's goals and objectives, staff needs the tools; that to have the tools, the funds need to be committed in the budget; and that the Committee will work on that this year to make sure staff gets what they need.

5.2) Update on Pending Water Quality Regulations. (Operations Manager Thompson II)

Operations Manager Thompson II stated that he will be meeting with the District's consultant regarding the Chromium 6 study at Well No. 4; that this well will be over the proposed MCL; and that staff will be reviewing the cost effectiveness of treating Well No. 4 followed by discussion of the location and production of Well No. 4, the need for this well to prevent stress on other wells, enforcement of the Chromium 6 MCL, and testing for the MCL.

Chair Alvarado then stated that he looks forward to seeing a list of District equipment that is aging and needs replacement now or in the near future including wells, pipes, and vehicles, in order to plan ahead and prevent having to spend funds on repairs; that it needs to be mentioned more often that critical and urgency items need replacement so the Committee can be more effective in obtaining dollars to fund these projects so staff can do their jobs and work together, and the quality of the water is unaffected after which General Manager LaMoreaux stated that a list of deferred items needing repair or

replacement to get caught up along with a list of items needing repair or replacement in order to stay current and moving forward will be prepared.

Chair Alvarado then stated that he ensures the Board is aware of staff's efforts and reports made at the Committee meeting; that it is important for all Directors to keep abreast of Committee activities and discussions; that he will relay to the Board the importance and critical need to keep up with deferred maintenance; and that staff is appreciated.

5.3) Update on Security Improvements to Facilities Located at 20th Street East and Avenue Q. (Information Technology Manager Stanton/Facilities Manager Moore)

Information Technology Manager Stanton stated that the RFP for security improvements closed today; that two proposals were received; that he, Facilities Manager Moore, Engineering Manager Knudson, and General Manager LaMoreaux will review the proposals; and that a recommendation will be made to the Committee at the next meeting.

5.4) Other.

There were no additional information items.

6) Board Members' Requests for Future Agenda Items.

There were no requests for future agenda items.

The next Facilities Committee meeting was then scheduled for October 14, 2013 at 5:15 p.m.

7) Adjournment.

There being no further business to come before the Facilities Committee, the meeting was adjourned.

Robert E Alvarado
Chair

MINUTES OF MEETING OF THE PERSONNEL COMMITTEE OF THE PALMDALE WATER DISTRICT, SEPTEMBER 16, 2013:

A meeting of the Personnel Committee of the Palmdale Water District was held Monday, September 16, 2013, at 2029 East Avenue Q, Palmdale, California, in the Board Room of the District office. Chair Mac Laren called the meeting to order.

1) **Roll Call.**

Attendance:	**Others Present:**
Personnel Committee:	Dennis LaMoreaux, General Manager
Kathy Mac Laren, Chair	Robert Alvarado, PWD Director
Gloria Dizmang, Committee Member	Matt Knudson, Engineering Manager
	Dennis Hoffmeyer, Senior Accountant
	Dawn Deans, Executive Assistant
	1 member of the public

2) **Adoption of Agenda.**

It was moved by Committee Member Dizmang, seconded by Chair Mac Laren, and unanimously carried to adopt the agenda, as written.

3) **Public Comments.**

There were no public comments.

4) **Action Items:**

4.1) Consideration and Possible Action on Approval of Minutes of Meeting Held August 7, 2013.

It was moved by Committee Member Dizmang, seconded by Chair Mac Laren, and unanimously carried to approve the minutes of the Personnel Committee meeting held August 7, 2013, as written.

4.2) Discussion and Possible Action on Removing Freeze on Merit and Bonus Incentives and Review of Performance Evaluation Process. (General Manager LaMoreaux)

General Manager LaMoreaux provided an overview of the District's policy governing merit and bonus incentives, the Performance Evaluation Form, the nine-step salary schedule and performance-based merit process to move through these steps, and the performance-based one-time bonus process for employees on step 9 of the salary schedule, and after a brief discussion of the benefit of the merit and bonus incentives, of the District's budget, and of the $103,000 on hold in the 2013 budget for merit and bonus incentives being $45,000 for merit incentives and $58,000 for bonus incentives, it was moved by Committee Member Dizmang, seconded by Chair Mac Laren, and unanimously carried to present this item to the full Board for further discussion and consideration.

The Board's Committees were then discussed.

4.3) Discussion and Review of the District's Grievance Policy. (Committee Member Dizmang/General Manager LaMoreaux)

After a brief discussion of revisions to the District's Grievance Policy, it was moved by Committee Member Dizmang, seconded by Chair Mac Laren, and unanimously carried to finalize the Grievance Policy and present the Grievance Policy to the full Board for consideration.

5) Project Updates.

5.1) Status on Organizational Assessment. (General Manager LaMoreaux)

General Manager LaMoreaux stated that The Mathis Group will be at the District this Friday for the Ad Hoc Legal Committee meeting; that a meeting with the Directors-elect will also be held Friday; that the Human Resources Manager ad is still open; that there are enough solid candidates to schedule interviews; and that he has invited the Human Resources Manager from the City of Palmdale to sit on that interview panel.

6) Information Items.

General Manager LaMoreaux stated that based on 2014 insurance rates, the added Blue Cross Advantage Plan no longer falls under the $1,600 cap; that the amount is still close to the cap; that letters will be reissued informing District staff of the 2014 rates so there is an opportunity to make changes during open enrollment in October; that the

District's Benefits Fair is scheduled for October 14; and that ACWA/JPIA will have a representative at the Benefits Fair to answer any questions.

There were no further information items.

7) Board Members' Requests for Future Agenda Items.

Committee Member Dizmang requested "Discussion and possible action on development of an intern program including funding" be included on the next agenda.

There were no further requests for future agenda items.

The next Personnel Committee meeting was then scheduled for October 2, 2013 at 6:30 p.m.

8) Adjournment.

There being no further business to come before the Personnel Committee, the meeting was adjourned.

Chair

MINUTES OF MEETING OF THE WATER SUPPLY & RELIABILITY COMMITTEE OF THE PALMDALE WATER DISTRICT, SEPTEMBER 23, 2013:

A meeting of the Water Supply & Reliability Committee of the Palmdale Water District was held Monday, September 23, 2013, at 2029 East Avenue Q, Palmdale, California, in the Board Room of the District office. Chair Dexter called the meeting to order.

1) **Roll Call.**

Attendance:	**Others Present:**
Water Supply & Reliability Cmte:	Dennis LaMoreaux, General Manager
Gordon Dexter, Chair	Vincent Dino, PWD Director Elect
Gloria Dizmang, Committee Member	Jon Pernula, Water & Energy Resources Manager
	Matt Knudson, Engineering Manager
	Dawn Deans, Executive Assistant
	0 members of the public

2) **Adoption of Agenda.**

It was moved by Committee Member Dizmang, seconded by Chair Dexter, and unanimously carried to adopt the agenda, as written.

3) **Public Comments.**

There were no public comments.

4) **Action Items:**

4.1) Consideration and Possible Action on Approval of Minutes of Meeting Held August 30, 2013.

It was moved by Committee Member Dizmang, seconded by Chair Dexter, and unanimously carried to approve the minutes of the Water Supply & Reliability Committee meeting held August 30, 2013, as written.

4.2) Consideration and Possible Action on Proposal Received From Kennedy/Jenks Consultants for Preparation of Palmdale Water District's Littlerock Creek Groundwater Recharge and Recovery Project Feasibility Study. ($899,493.00 – Budgeted – 2013A Water Revenue Bonds – Water & Energy Resources Manager Pernula/Engineering Manager Knudson)

Water & Energy Resources Manager Pernula reviewed staff's recommendation to enter into a contract with Kennedy/Jenks Consultants for the preparation of a feasibility study for the Littlerock Creek Groundwater Recharge and Recovery Project, and after a brief discussion of the proposal received from Kennedy/Jenks Consultants, it was moved by Committee Member Dizmang, seconded by Chair Dexter, and unanimously carried that the Committee concurs with staff's recommendation and that the proposal received from Kennedy/Jenks Consultants for the preparation of a feasibility study for the Littlerock Creek Groundwater Recharge and Recovery Project in the not-to-exceed amount of $899,493.00 be presented to the full Board for consideration.

4.3) Presentation of Monthly Water Demand and Supply Status. (Water & Energy Resources Manager Pernula)

Water & Energy Resources Manager Pernula reviewed the water supply projections and charts included with the agenda packet and stated that water use is slightly lower than last month; that actual production is close to budgeted production; that gallons per capita per day is leveling off; that water will be shut off from the State Water Project for maintenance at Palmdale Lake, and this water will be carried-over to next year; that next year is predicted to be a very dry year with low initial State Water Project allocations; and that water is being pulled from Littlerock Reservoir followed by discussion of the potential increase in water bills due to cooler evening weather.

4.4) Discussion of the District's Water Banking Opportunities. (Chair Dexter)

Water & Energy Resources Manager Pernula informed the Committee that staff continues negotiations on different water banking opportunities with several agencies, including Semitropic and Westside-Dudley Ridge, and that a full report will be provided when available.

4.5) Status on the Operations of the State Water Project. (Water & Energy Resources Manager Pernula)

Water & Energy Resources Manager Pernula reviewed the amount of water being released from Oroville, the District's share of water in San Luis Reservoir, and current reservoir conditions and stated that the Department of Water Resources has 250,000 acre feet more water in Oroville than initially indicated; that this equates to 5% more water for each of the State Water Contractors, and the State Water Contractors have questioned the use of this additional water; and that the Department of Water Resources has indicated they will keep the State Water Contractors informed about this additional water.

4.6) Discussion and Review of the Desalination Process. (Committee Member Dizmang)

Water & Energy Resources Manager Pernula stated that 80% of the cost of desalination plants are energy and construction-related, and prime real estate along the coast is needed; that desalinated water is cost-prohibitive for the District; that State Water Contractors with desalinated water typically use their State Water Project water to blend the cost of desalinated water; that reducing desalinated water energy costs with solar technology is cost prohibitive, and the water component alone is very high; that staff continues to maintain the idea of developing and building an exchange for desalinated water; that surface water is much less expensive; and then reviewed the existing, under construction, and in development desalination plants, the two major forms of desalination, and environmental issues with brine disposal.

5) Project Updates.

5.1) Palmdale Recycled Water Authority. (General Manager LaMoreaux)

General Manager LaMoreaux stated that at the last Palmdale Recycled Water Authority meeting, a resolution supporting the City of Palmdale's power plant was approved; that Authority staff provided a few reports; and that the next meeting is scheduled for November 20.

He continued that he also attended a meeting to discuss recycled water allocations; that there is agreement on the concept of taking water from the two sanitation plants and allocating it based on where it came from to the City of Lancaster, the City of Palmdale, and Los Angeles County Waterworks; that it appears that Los Angeles County Waterworks will not serve its customers other than the power plant; and that the Authority would take the remainder of recycled water from the Palmdale plant for distribution to meters.

5.2) Water Purchase Opportunities. (Water & Energy Resources Manager Pernula)

Water & Energy Resources Manager Pernula stated that water purchase opportunity negotiations are ongoing including extension negotiations with Butte County.

5.3) Littlerock Dam Sediment Removal Project. (Engineering Manager Knudson)

General Manager LaMoreaux stated that once Littlerock Reservoir is empty, an aerial and topographic survey of the Reservoir will be conducted to measure sediment accumulation for removal and that the Forest Service has not yet responded to the District's letter requesting assistance on moving this Project forward.

6) Information Items.

Water & Energy Resources Manager Pernula informed the Committee that he is working on State Water Project delivery requests, which must be submitted by October 1.

There were no additional information items to discuss.

7) Board Members' Requests for Future Agenda Items.

There were no requests for future agenda items.

The next Water Supply & Reliability Committee meeting was scheduled for October 21, 2013 at 5:00 p.m.

8) Adjournment.

There being no further business to come before the Water Supply & Reliability Committee, the meeting was adjourned.

Chair

STAFF CONFERENCE/SEMINAR REPORT FORM

NAME: Erik Bouthillier DATE: 10/8/13

POSITION: Senior Plant Maintenance Mehanic

CONFERENCE SUMMARY:

- TITLE: Service training/ AC parameterization
- ORGANIZATION: Auma Actuators
- LOCATION AND DATES: Tustin, CA September 26, 2013
- GENERAL SUBJECT MATTER: Actuator Maintenance

SESSION/CLASS ATTENDANCE:

		CEU EARNED (HRS):	N/A
	Actuator Maintenance Training	8	
2			
3			
4			
5			

KEY POINTS/BENEFITS RELATING TO WORKGROUP, DEPARTMENT AND/OR OVERALL OPERATIONS:

How to operate, maintain, program, and adjust our AUMATIC actuators for in house maintenance.

REVIEWED BY:

SUPERVISOR: Kelly P Peters DATE: 10/11/13

DEPARTMENT MANAGER: DATE: 10-11-13